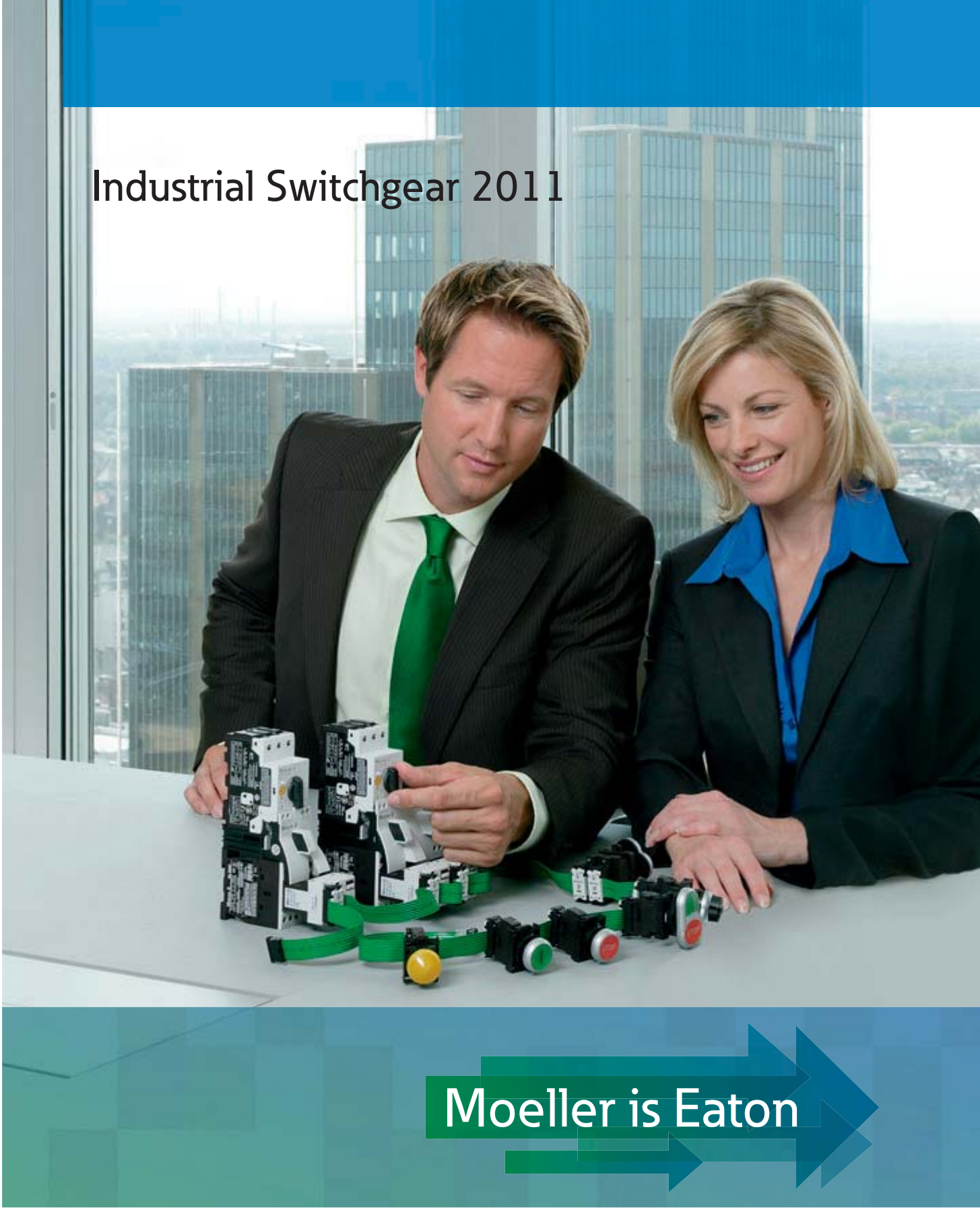
Industrial Switchgear 2011



Moeller is Eaton

EATON

Powering Business Worldwide


Electrical


Automotive


Hydraulics

Powering business more sustainably

Sustainability – smaller footprint in the world

The principle of sustainability means meeting the current needs of our own society without compromising the needs or options of future generations. It is a principle, which forms the very core of our design and production philosophy and guides all our activities across the world. Our commitment to reducing our own ecological footprint covers a wide range of green technologies, products and services that help our customers utilise electrical power more efficiently , while improving environmental performance.

2009 WORLD'S MOST ETHICAL COMPANIES WWW.ETHISPHERE.COM

Eaton has been recognised throughout the world for its uncompromising business ethics. For example, it was listed as one of the 'World's Most Ethical Companies' on the Ethisphere Institute's annual list for three consecutive years (2007, 2008 and 2009).

Automotive

A supplier of critical components that reduce emissions and fuel consumption and improve stability and performance of cars, light trucks and commercial vehicles. Principal products include engine valves and valve train components, transmission and engine controls, supercharger, locking and limited slip differentials, cylinder heads, fluid conveyance components, body mouldings and spoilers.

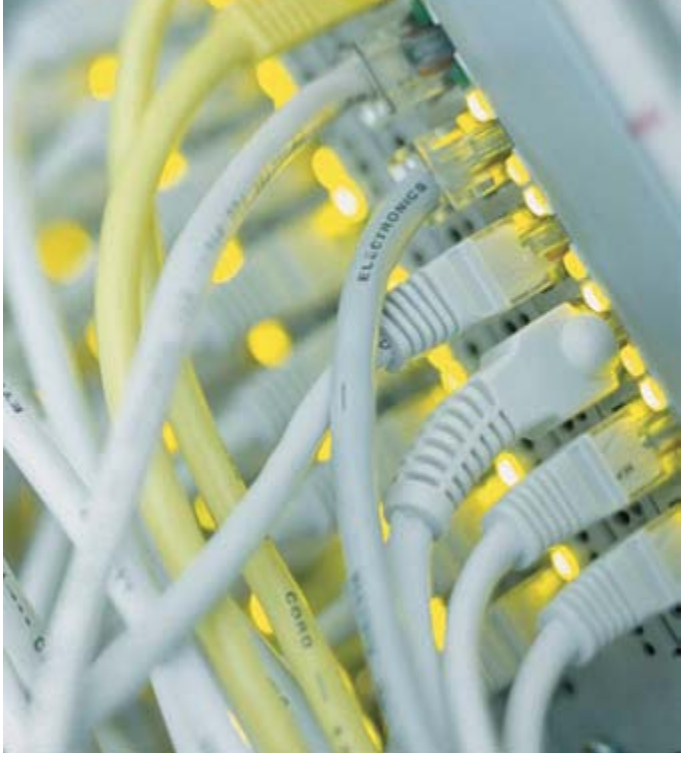
Hydraulics

A worldwide leader in reliable, high-efficiency hydraulic systems and components for use in mobile and industrial applications. Markets include agriculture, construction, mining, forestry, utility, material handling, earth moving, truck and bus, machine tools, moulding, primary metals, automotive, power generation, port machinery and entertainment.

An Eaton Green Solution

When you see this symbol, you know the solution represents an Eaton benchmark for environmental performance.







Powering electrical systems worldwide

Buildings

- Residential
- Healthcare
- Education
- Commercial offices
- Retail
- Public sector
- Airports

- Electrical distribution solutions for safe and efficient power delivery
- Power quality systems for uptime and reliability
- Power metering and monitoring to add intelligence and save costs
- Industrial control products for HVAC applications

Information Technology

- Data centers
- Telecommunication
- Networks
- Computer rooms

- World's most efficient line of UPSs to reduce footprint and save energy
- Reliable power systems with inherent redundancy to improve availability
- Power metering and monitoring to diagnose problems and lower costs
- Local service and support for quick response





Public and private sectors

Buildings, Information Technology, Industrial & Machinery, Energy & Utilities
We provide reliable, efficient and safe power management.

Industrial & Machinery

- Manufacturing
- Agriculture
- Construction
- Mining and metals
- Processing:
  - Petrochemicals
  - Pharmaceuticals
  - Pulp and paper
- Material handling

- Electrical distribution equipment to deliver power throughout the enterprise
- Control & automation and power quality equipment for process control
- Power metering and monitoring to manage energy costs and uptime
- Power and motion control products to optimize productivity, reliability, safety and operator comfort

Energy & Utilities

- Renewable energy:
  - Solar
  - Wind
  - Hydropower
- Traditional energy:
  - Oil
  - Gas
- Smart grid
- Water and waste water

- Electrical balance of system and turnkey services for residential, utility and commercial solar installations
- Power distribution equipment, control components and system installations services
- Network power grid technology for intelligent data, lower costs and crew / publicsafety









Complete coverage of the market – worldwide in all standards

Local market leader with global competence

As in so many respects with Eaton and Moeller , the presence of one in the different regions of this world also complements that of the other . In markets that adhere to IEC standards, components from Moeller are established, and in the world of UL/CSA , Eaton is a key player . Now all customers are benefiting from first-rate engineering and the combined know-how in research and development – no matter which standards they use.

In electrical engineering, it was less continents and regions but rather standards that drew boundaries. Historically grown in the U.S. market, Eaton focused on product series according to UL/CSA standards. Consequently, Eaton's Electrical Sector was always strongly geared towards the markets in North and South America, the Middle East, Benelux as well as the United Kingdom.

Moeller series products from Eaton are the customers' first choice in markets adhering to IEC standards for innovative switchgear and control circuit devices, control, drive and operating systems as well as sophisticated visualization and communication.



There's a certain energy at Eaton. It's the power of uniting some of the world's most respected names to build a brand you can trust to meet every power management need. The energy created supports our commitment to powering business worldwide.

EATON

Powering Business Worldwide

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Highlights

SmartWire-Darwin Communication System

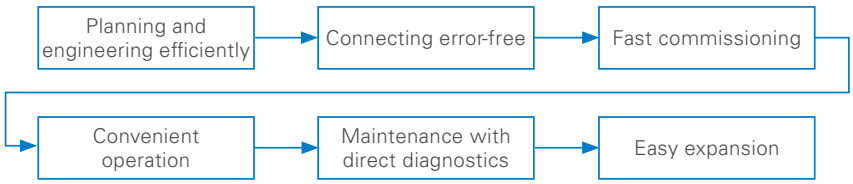
Evolution in the control panel

For the manufacturer of machinery and installations, finding the optimal balance between maximum functionality and optimal costs is paramount. Designed for further development, SmartWire Darwin is a communication system for industrial switchgear in control panels and the periphery: from control, protection and switching to actuation, operation and monitoring.

One technology from which you will profit, now and in the future.



SmartWire Darwin reduces cabling effort on many switchgear systems by over 60 percent and helps save costs along the entire work chain – from design through construction and commissioning, up to expansion. Here, SmartWire-DT relies on proven Moeller industrial switchgear devices and enables them to communicate.



SmartWire Darwin products in this catalogue:

Chap. 1 – SmartWire Darwin- the complete range
Chap. 2 – Pilot devices
Chap. 5 – Contactors
Chap. 7 – Motor protective circuit breaker
Chap. 9 – Softstarter
Chap. 17 – Compact circuit-breakers

xBoard enclosure and energy distribution program

Utilised in industry and buildings – enclosures from Eaton are convincing.

High flexibility, easily adapted to frequently changing circumstances.

Designed for long-term mechanical loads.

High mechanical stability.

Numerous enclosure variants.

Time-saving mounting units.

Prefabricated energy and control distributions.

Our system partner switchgear systems operate prefabricated energy and control distributions worldwide.

www.moeller-systempartner-schaltanlagen.net

Moeller Systempartner Schaltanlagen



CS sheet steel wall-mounting enclosure

45 enclosure sizes: 250 x 200 x 150 mm – 1200 x 1200 x 250 mm.

Effective protection against direct contact with live parts. Full safety and protection from damaging ambient conditions through protection type IP66. Ideal for inclusion of SmartWire Darwin components.

▸ **Chap. 21**



Busbar system SASY 60i

Utilized in control panels in machinery and installations worldwide. Large air and creepage distances according to UL508A.

Especially suitable for CI insulated enclosures (Chap. 20), CS steel enclosures (Chap. 21) and combination enclosures (Chap. 22).

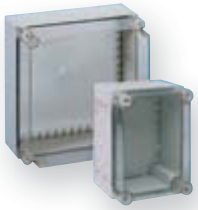
▸ **Chap. 16**



Service distribution board IVS

A wide variety of mounting units, tailored to original Eaton switchgears and protection devices. Time-saving, easy mounting.

▸ **Chap. 22**



CI insulated enclosures

Flexible in assembly: individual enclosures, wall-mounting distribution systems, floor standing distribution boards in many sizes – always the right solution.

Ideal for the circuit-breaker NZM (Chap. 17) and the photovoltaic components (cf. alongside) from Eaton.

▸ **Chap. 20**



Combination enclosure XVTL

55 sizes to select from.
Height: 1400–2000 mm,
width: 425–1200 mm
depth: 300–800 mm.

Robust type, in commercial buildings as well as in industry.

▸ **Chap. 22**

Safety Technology - Control the unexpected



Safety Technology from Eaton – the comprehensive product portfolio for safety-related solutions.

Depending on the specific application and requisite hazard protection, the appropriate safety functions in compliance with the highest requirements of international safety norms are utilized.

Safety Technology components from Eaton are certified by TÜV-Rheinland or the German Institute for Occupational Health and Safety (BGIA) and cover the entire safety chain:

- Input: fast and safe recording.
- Logic: safe monitoring and processing.
- Output: reliable switching off.

Safety engineering in this catalogue:

The fundamental purpose of all Eaton devices is to help you control electricity safely and reliably. Several components are especially designed and constructed for safety-related applications.

Chap. 2 – Pilot devices, hand and foot switches
Chap. 2 – Pilot devices, emergency stop devices
Chap. 2 – Pilot devices, signal colums with acoustic alarm
Chap. 3 – Position switches, sensors, safety position switches
Chap. 4 – Cam switches, switch-disconnectors
Chap. 5 – Contactors, power contactors
Chap. 5 – Contactors, contactor relays
Chap. 5 – Contactors, contactor monitor CMD
Chap. 13 – Safety relay ESR5
Chap. 13 – Control relay suitable for safety circuits easySafety

Safe logic processing with safety relay ESR and safety-related control relay easySafety.

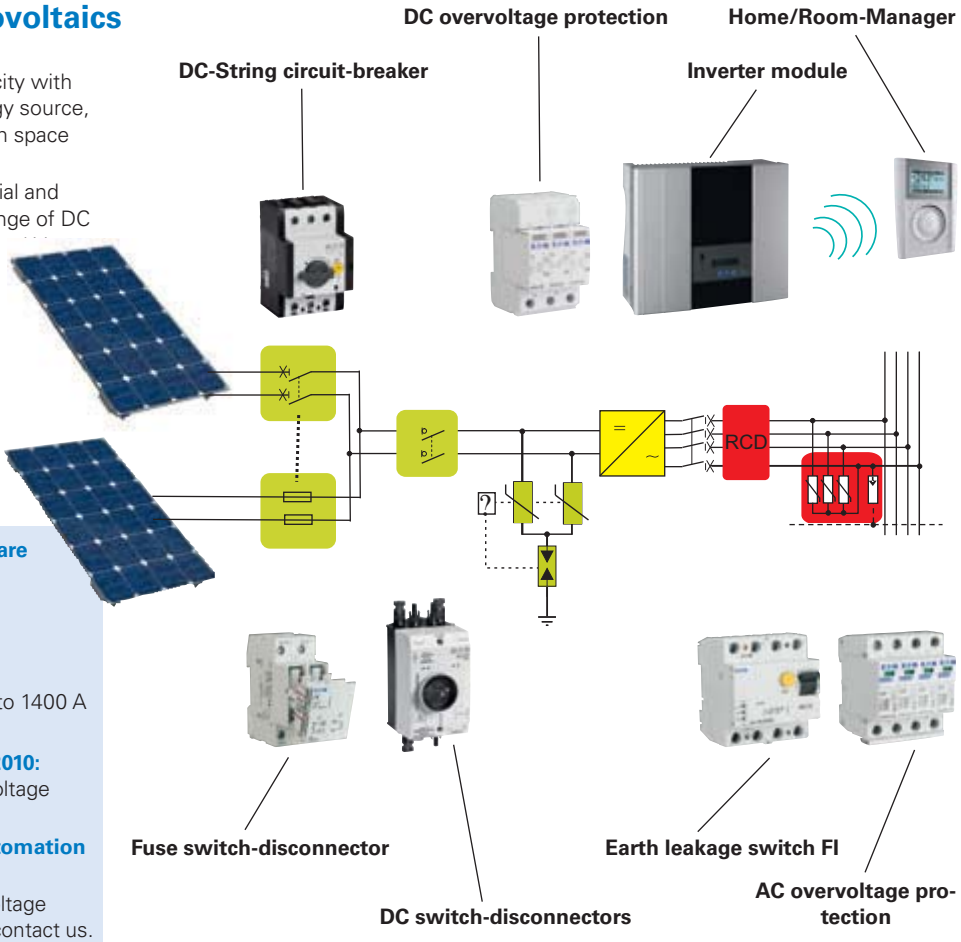
Flexible processing with safety-related control relay easySafety. All in one: easySafety combines safety and control functions in one device.

Cost-effective monitoring with safety relay ESR5. The appropriate safety function for each application, in a smaller enclosure width.

Renewable energy – photovoltaics

Photovoltaics – Covert sunlight to electricity with solar cells. A sustainable, renewable energy source, used in private or public buildings and open space installations.

For photovoltaic applications in the industrial and building sectors, Eaton offers a product range of DC switching devices for direct voltages up to .



Devices for photovoltaic applications are found in these catalogues:

Chap. 5 – DC contactors
Chap. 7 – DC string circuit-breaker
Chap. 7 – DC switch-disconnector
Chap. 17 – Compact circuit-breakers up to 1400 A
Chap. 19 – DC fuse switch-disconnector

In the catalogue Installation Devices 2010: Residual current devices, AC transient voltage surge suppression

In the catalogue Building Services Automation xComfort 2009: Home/Room-Manager

For information regarding DC transient voltage surge suppression and inverters, please contact us.

Highlights

Eaton Sensors

The Eaton sensors significantly extend the previous Moeller spectrum of position switches and sensors.

The familiar position switches of the series LS-Titan have been supplemented by a great number of electrical sensors: inductive, optical and capacitive.

The basic devices have been supplemented and completed by a comprehensive scope of accessories for mounting aids, cables and multi-sensor connection blocks.



GLOBAL series E57:

Inductive sensors in standard industrial design.



Comet series:

Optoelectronic sensors with integrated one-way or reflection light barriers, with/without background suppression, optional connection of fibre optic cables.



PREMIUM plus series:

Inductive sensors in miniature design. Include greater clearances, longer lifespans.



E58 Harsh Duty:

For use in harsh environments, where high pressure or steam jets etc. are used.



iProx series:

The programmable inductive sensor permits variable setting of switching interval and functionality as well as shielding from background metals.



E65 SM:

The TargetLockTM technology stands for the simplest setting work. Optimal performance in a smaller construction type.



Series E52 and E56:

Inductive proximity switch. High performance and durability in industrial standard enclosures.

→Page 3/xx

Eaton Sensors in this catalogue:

Chap. 3 – Position switches, sensors, pressure switches

Switchgear for the global market and for North America:

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508, CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA Certified
Degree of Protection	IEC: IP65, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Practically all devices can be used in compliance with IEC norms.

The selection pages of this catalogue indicate the products that have been approved for the North American market with the USA and Canadian flags. This does not mean these devices are exclusively for North America! Approval for North America has been granted special emphasis due to the strong export share of these devices and because standards deviate from IEC/EN norms, selection and and processing requirements must be highlighted. The article "Switchgear for North America" in the appendix of this catalogue contains everything you need to know about this subject.

A glossary in the appendix explains the specifically American technical terms.

Example for such an instruction.

The Std. pack column on the order pages also uses flags to indicate the articles for which the UL/CSA notes apply.

Selecting a technically appropriate device also opens information to help you document suitability for use in North America on your own with a minimum of research (see above).

Eatons After Sales Service



This is the new name of the familiar **Field Service from Moeller**. Whilst the name has been changed, the reliable, fist class service remains. Comprehensive information and Terms and Conditions are found in Chapter 23. The overview pages at the beginnings of the chapters also refer to Eaton After Sales Service whenever services relevant to you exist for the indicated product.

Service Specialists

Gain the benefit of our Service personnel. Comprehensive expertise linked with long term experience and modern equipment help you find the solution to your tasks.

Material

Components, cards and spare parts of the Eaton product range are available for your use.

Logistics

Personnel and material are furnished according to your requirements, professionally and on time.

Service products

The After Sales Service offers appropriate service products for the Eaton products.

Hotline

Free malfunction service around the clock.
+49 (0) 180 522 3822 (24/7)
€ 0.12 € per minute through the Deutsche Telecom network.

Onsite Service

Onsite service, analysis, installations, expansions and maintenance.

Repairs

Repair and exchange service for Eaton devices.

Online Service

Downloads, FAQs and interactive troubleshooting.

Air circuit breakers IZM





Versatile circuit-breakers up to 6300 A – for profit-optimised solutions.

The widths of the switches IZM20 to IZM63 increase with the rated operational current. To accommodate uniform installation conditions, height and depth remain constant.

For especially compact solutions: the new circuit-breaker IZMX16.

Use with robust safety, engineer with optimised costs.

With the circuit-breakers IZM20 to IZM63, Eaton presents a complete offering of open circuit-breakers (ACB) up to 6300 A. Four sizes offer the most economical circuit-breaker for each project. Only the width increases with the required rated operational current.
A compact, cost-effective size can always be selected.

These especially robust circuit-breakers are already deployed worldwide

in many hundreds of thousands of heavy duty industrial applications. Large material thicknesses and a high short-time withstand current are its characteristic features.

Open circuit-breakers in this catalogue:

Chap. 18 – Molded-case circuit breaker IZM and switch-disconnector IN up to 6300 A

Frequency inverters M-Max™, H-Max™





Frequency inverter M-Max™

Small and compact for assigned motor outputs up to 14 A (7.5 kW at 400 V). Especially suitable for applications where simple operation and economic efficiency are important. With integrated EMC filter and serial interface (RS485, Modbus RTU), preferred for use in compact machinery controls. Optional field bus connections such as CANopen, DeviceNet und PROFIBUS DP expand communication possibilities.

Frequency inverter H-Max™

Compact design in IP20 and IP54 for assigned motor outputs up to 310 A (160 kW at 400 V). With integrated DC link choke and EMC filter, ideal for heating, ventilation and air conditioning technology.

Serial interfaces and field bus connections as with M-MAX and additional networking protocol BACNet.

Frequency inverters in this catalogue:

Chap. 10 – Frequency inverters

Your guide through the Main Catalogue for Industry 2010

The main catalogue Industry 2010 presents a wide offering of widely differing products. Product descriptions in this catalogue are correspondingly complex and varied. Nonetheless, you can easily and quickly find your way to the desired product.

Familiarise yourself with the systematics of this catalogue.

Three orientation aids to entry:

- Table of contents
- Part number list
- Alphabetical index

Quicklinks

Each ordering page contains a Quicklink, e.g. HPL01001DE. Go to the web page of your Eaton company in Germany, Austria or Switzerland and enter the Quicklink in the search window there.

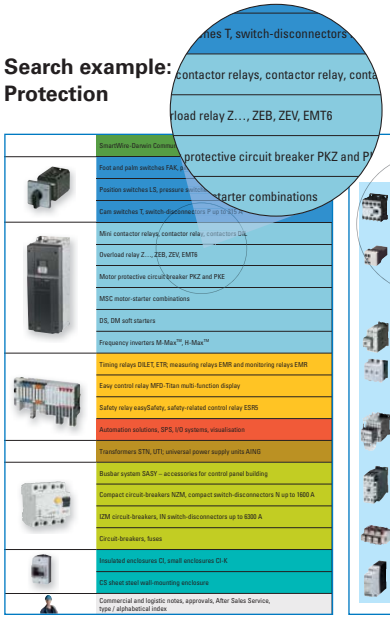
In each chapter, the products are always presented in the same sequence on six different page types:

- Chapter entry with table of contents
- System and technical overviews
- Ordering
- Engineering
- Technical data
- Dimensions

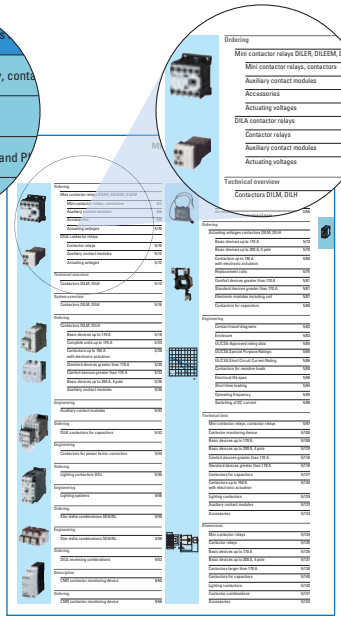
This systematic generally stretches itself once over the entire chapter, e.g. for the circuit-breakers and switch-disconnectors NZM up to 1600 A.

However, it may also repeat itself several times within a chapter, as in the pilot devices, where the themes foot and hand switches, RMQ-Titan, RMQ16 and signal columns SL each comprise a small sub-chapter with the sequence: entry, overview, ordering, engineering, technical data, dimensions.

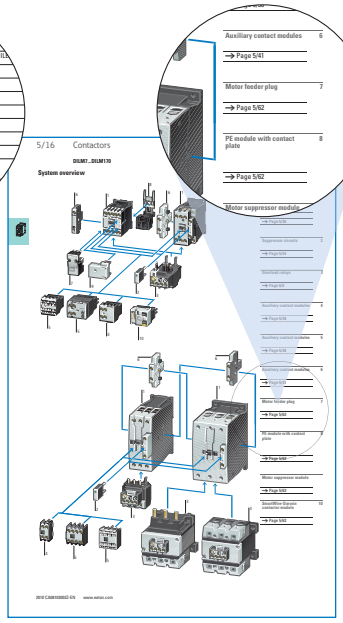
Search example: Protection



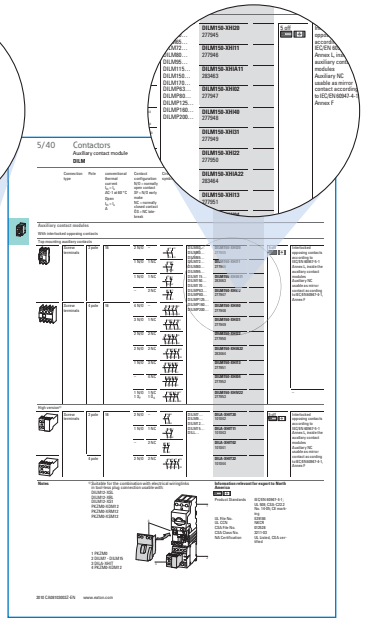
A glance in the entire table of contents or the alphabetical index brings you to Chapter 5.



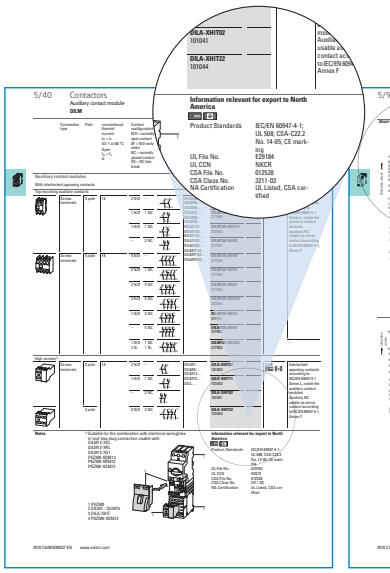
The table of contents for Chapter 5 guides you to the page where ordering information in located.



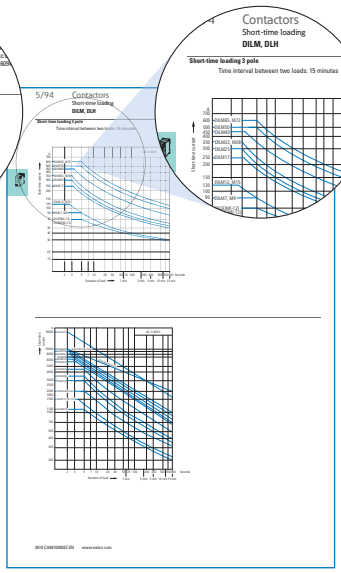
Or you may go to the graphic overview at the start of the chapter, where all detail information is available.



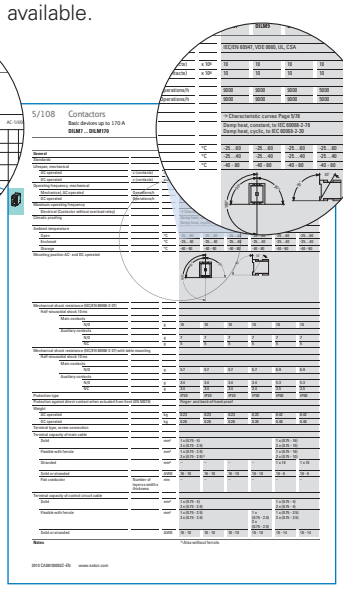
The ordering page contains all the information you need to place an order.



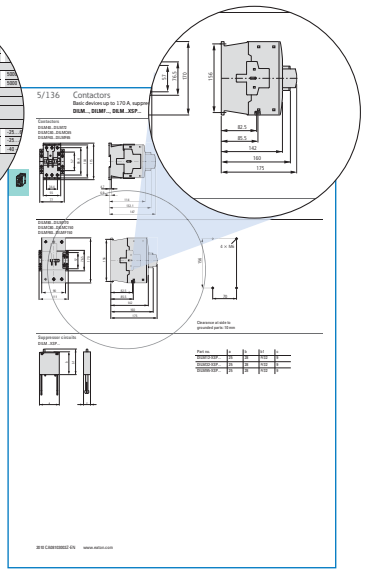
New in this catalogue: extensive information for the use of Eaton Moeller devices for world markets in North America.



Notes to the use of the device is provided by the pages from type "Engineering".



Comprehensive technical data is found on the pages with that name.



The dimensions needed to plan mounting and installation are found in the "Dimensions" pages.

Darwin Technology
The easy way to connect



xCommand
Control and Indication



xStart
Switching, protecting and actuating motors



xCommand
xSystem
Automation, control and visualization

Safety Technology
Control the unexpected



Matching of Voltage and Current



xEnergy
Xpole
Energy distribution, switching and protection



Xboard
Optimal switchgear enclosure



Service

SmartWire-Darwin Communication System



Foot and palm switches FAK, pilot devices RMQ, signal towers SL

Position switches LS, pressure switches MCS, sensors

Cam switches T, switch-disconnectors P up to 315 A



Mini contactor relays, contactor relay, contactors DIL

Overload relay Z..., ZEB, ZEV, EMT6

Motor protective circuit breaker PKZ and PKE

MSC motor-starter combinations

DS, DM soft starters

Frequency inverters M-Max™, H-Max™



Timing relays DILET, ETR; measuring relays EMR and monitoring relays EMR

Easy control relay MFD-Titan multi-function display

Safety relay easySafety, safety-related control relay ESR5

Automation solutions, SPS, I/O systems, visualisation

Transformers STN, UTI; universal power supply units AING



Busbar system SASY – accessories for control panel building

Compact circuit-breakers NZM, compact switch-disconnectors N up to 1600 A

IZM circuit-breakers, IN switch-disconnectors up to 6300 A

Circuit-breakers, fuses



Insulated enclosures CI, small enclosures CI-K

CS sheet steel wall-mounting enclosure



Commercial and logistic notes, approvals, After Sales Service,
type / alphabetical index

Darwin Technology
The easy way to connect



SmartWire Darwin communication system
Connect don´t wire

For the manufacturer of machinery and installations, nothing is more important than finding the balance between maximum functionality and optimal costs. Designed for further development, SmartWire-Darwin is a communication system for industrial control equipment in control panels and in the periphery: from control, protection and switching to actuation, operation and monitoring.

A technology that will win you profits, now and in the future.

SmartWire-Darwin greatly reduces wiring expenses and helps save costs: from design through construction and commissioning, up to expansions. SmartWire-Darwin relies on the proven Eaton Moeller industrial control equipment and enables these devices to communicate.

- Planning and engineering efficiently
- Fast commissioning
- Maintenance with direct diagnostics
- Connecting error-free
- Convenient operation
- Simple expansion



Information about SmartWire-Darwin
is available in the Online Manual on www.moeller.net/support:
SmartWire Darwin: System (AWB2723-1617de)
SmartWire Darwin: Gateways (AWB2723-1612de)
SmartWire Darwin: Stations (AWB2723-1613de)

SmartWire Darwin products in this catalogue:
Chap. 1- SmartWire Darwin- the complete range
Chap. 2- RMQ-Titan pilot devices, RMQ connections
Chap. 5- contactors, contactor modules
Chap. 7- motor-protective circuit-breaker
Chap. 9- soft starter, DS7
Chap. 17- NZM circuit-breaker to 1600 A, interface module

SmartWire-Darwin communication system (SWD)








SmartWire-Darwin System

Description	1/2
System overview	1/4

SWD Gateways, I/O modules, power feed modules

Ordering	1/6

SWD connections at RMQ-Titan pilot devices

System overview	1/8
Ordering	1/10

SWD modules to connect contactors and motor starters.

System overview	1/12
Ordering	1/14

SWD-capable Soft starter DS7

System overview	1/15
Ordering	1/15

SWD interface module for NZM circuit-breakers

System overview	1/16
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SWD accessories

Ordering	1/17

Engineering

Power-/current consumption of the SWD stations	1/19

Technical data

SWD gateways, Powerfeed modules	1/20
SWD I/O modules	1/22
SWD connections at RMQ-Titan pilot devices	1/24
SWD modules to connect contactors, motor starters and circuit breaker NZM.	1/26
SWD accessories	1/28

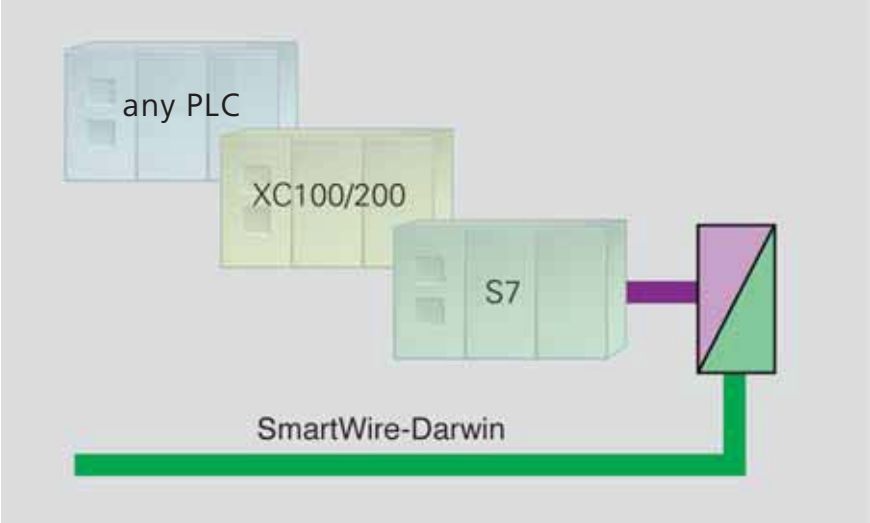
Dimensions

SWD modules and RMQ connections	1/30
Accessories	1/31

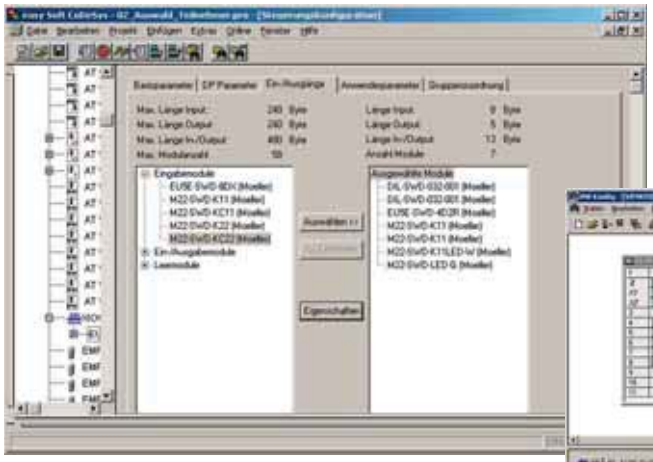
Description

SmartWire-Darwin.

Secures your know-how.
SmartWire-Darwin significantly cuts your wiring requirements and helps you save costs across the entire value chain from design through construction, programming, commissioning to extending your system.
Utilizing Eaton's industrial switchgear, SmartWire-Darwin is based on tried-and-tested technology. SmartWire-Darwin makes Eaton industrial switchgear communications-enabled.

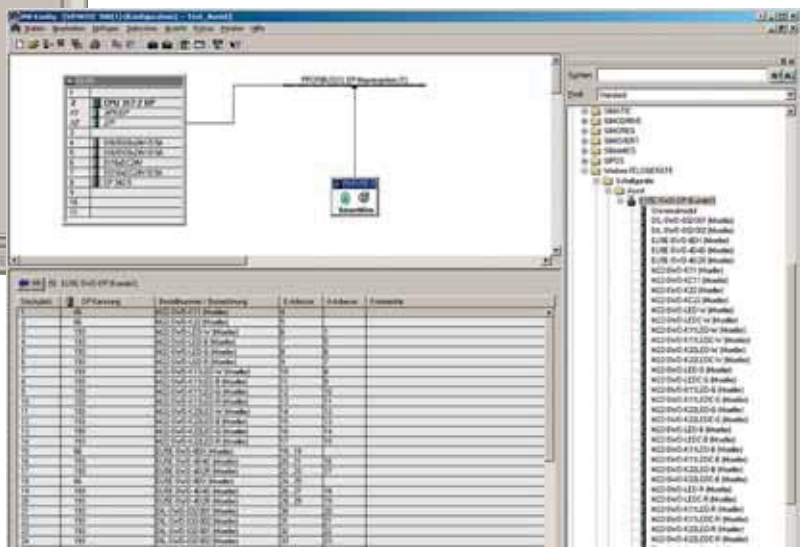


Your user program remains intact
Incorporating the SmartWire-Darwin gateway in the Eaton PLC program is also easy. Only the PLC configuration needs to be modified—the user program remains unchanged making the transition to SmartWire-Darwin, including PLC programming quick and easy.
Your software expertise is safe!



SmartWire-Darwin in the easySoft-CoDeSys PLC configuration

SmartWire-Darwin in the STEP 7 PLC configuration

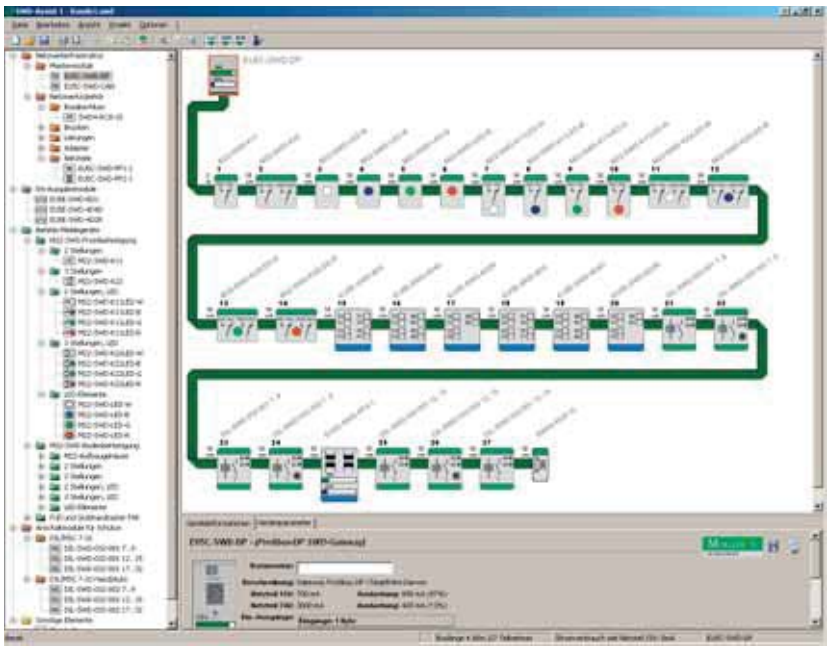






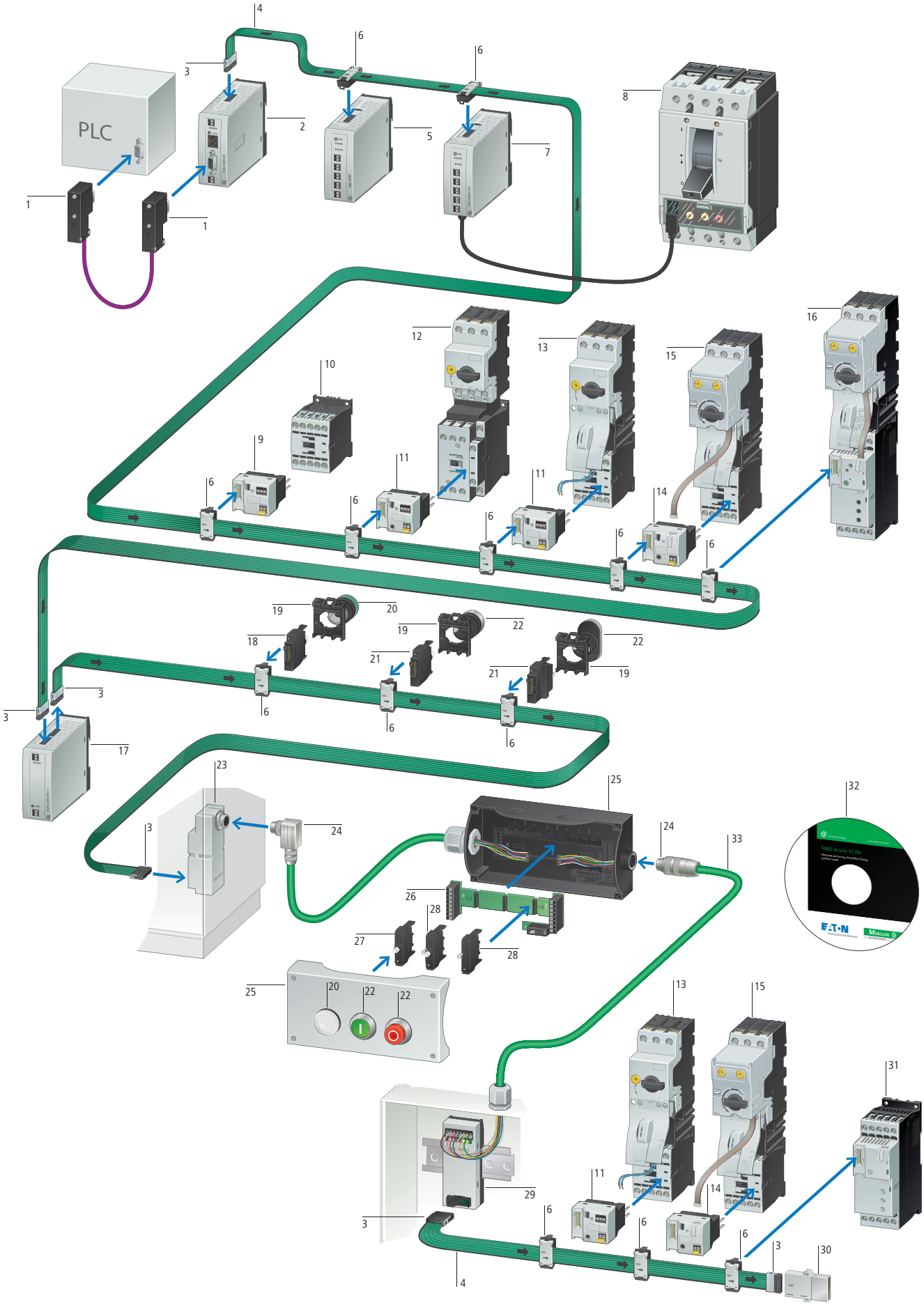
Planning and ordering help (SWD?Assist)

- Easy generation of applications with the SmartWire-Darwin System
- Integrated function for the generation of ordering lists
- Integrated plausibility check
- Online functionality
  – Simple preliminary commissioning of SmartWire-Darwin inputs and outputs and function testing
  – Easy diagnostics of SmartWire-Darwin slaves
- Download
  – Free download under
  http://downloadcenter.moeller.net



Planning a SmartWire-Darwin string is quick and easy with the SWD-Assist software

System overview



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Features

SmartWire-Darwin gateway

- Connection of SmartWire-Darwin to fieldbus.
- Supports the PROFIBUS-DP and CANopen fieldbuses.
- Provides of the supply voltage for the SmartWire-Darwin slaves.
- Supplies the control voltage for the motor starters or contactors.
- Configuration button for automatic addressing of the SmartWire-Darwin slaves.
- Support of up to 99 SmartWire-Darwin slaves.
- Connection of the SmartWire-Darwin ribbon cable via blade terminal.

SmartWire-Darwin input/output module

- Connection to SmartWire-Darwin ribbon cable via device plug.
- Integration of other switching devices without integrated Smart-Wire-Darwin technology.
- Variant with 8 digital inputs, or 4 digital inputs and 4 non-isolated transistor outputs, or 4 digital inputs and 2 relay outputs 250 V AC.
- SmartWire-Darwin diagnostics LED for signalling of the communication status of the module.

Power feeder module

- Connection to SmartWire-Darwin ribbon cable via blade terminal.
- Provides of the supply voltage for the SmartWire-Darwin slaves.
- Control voltage feeder for the motor starters and contactors.
- Formation of emergency-stop groups.

Planning and ordering help (SWD-Assist)

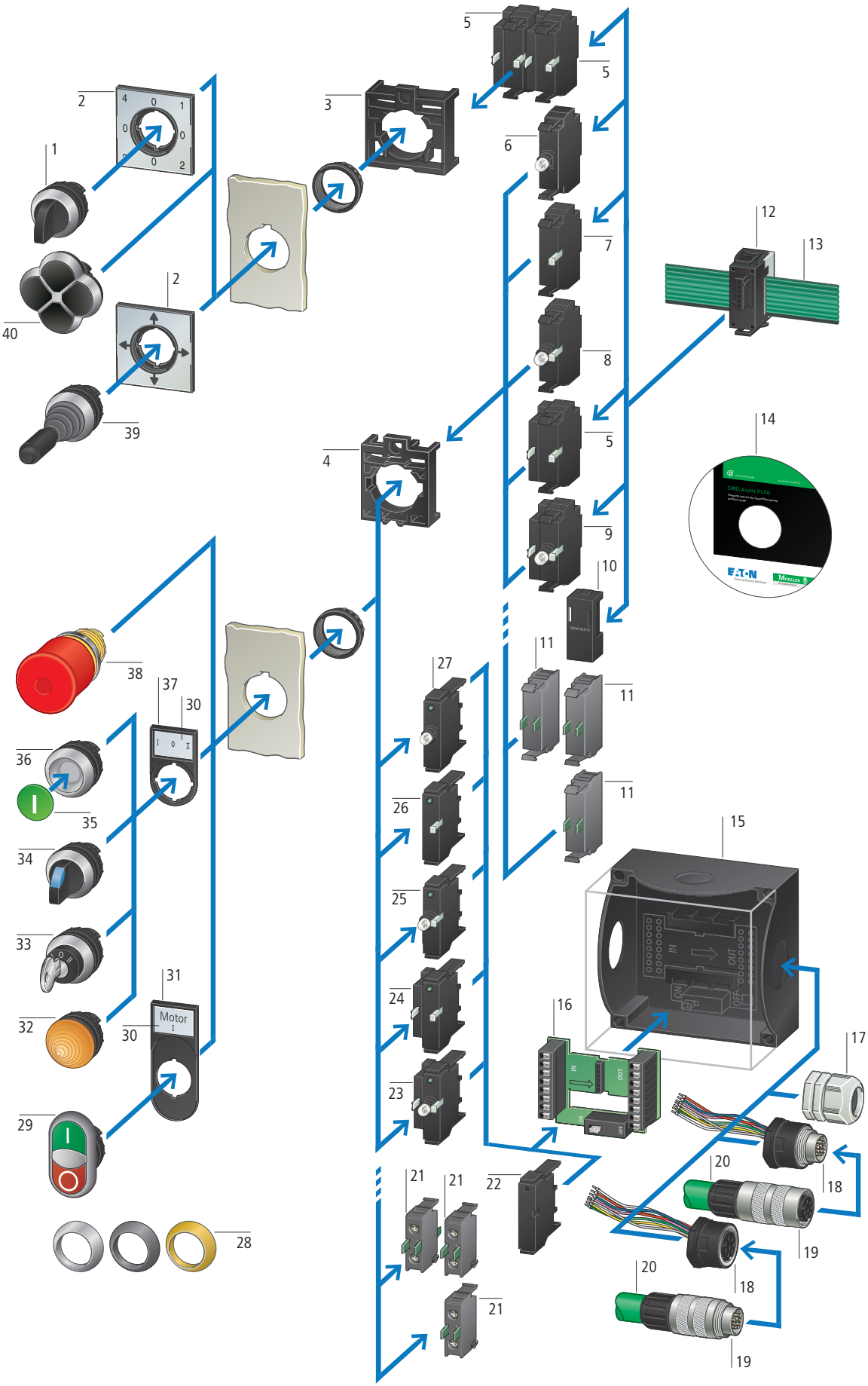
- Easy generation of applications with the SmartWire-Darwin system.
- Integrated function for the generation of ordering lists.
- Integrated plausibility check.
- Online functionality
  – Simple preliminary commissioning of SmartWire-Darwin inputs and outputs and function testing.
  – Easy diagnostics of SmartWire-Darwin slaves
- .
- Free download under http://downloadcenter.moeller.net

Ordering

	Description	Part no. Article no.	Price See price list	Std. pack
SWD gateways				
Gateway to the connection to the fieldbus and for supplying the SmartWire-Darwin (SWD) slaves and switchgear.				
	Connection to PROFIBUS-DP as slave. Automatic baud rate detection from 9.6 kBit/s to 12 Mbit/s. Address range 1 - 126. 9 pole SUB-D socket. Connection of up to 58 SWD slaves.	**EU5C-SWD-DP** 116308		1 off
	Connection to CANopen as slave. Automatic baud rate detection from 10 kBit/s to 1 Mbit/s. Address range 1 - 32. 9 pole SUB-D plug. Connection of up to 99 SWD slaves.	**EU5C-SWD-CAN** 116307		1 off
SWD I/O modules				
SmartWire-Darwin slaves for the connection of digital I/O signals.				
	Digital module with 8 digital inputs 24 V DC	**EU5E-SWD-8DX** 116381		1 off
	Digital module with 4 digital inputs 24 V DC and 4 transistor outputs 24 V DC/0.5 A	**EU5E-SWD-4D4D** 116382		
	Digital module with 4 digital inputs 24 V DC and 2 relay outputs 250 V AC	**EU5E-SWD-4D2R** 116383		
SWD powerfeed module				
	For additional control voltage supply of the motor starters and contactors. For the formation of emergency-stop groups for the motor starters and contactors.	**EU5C-SWD-PF1-1** 116309		1 off
	For the supply of other SWD slaves. For additional control voltage supply of the motor starters and contactors. For the formation of emergency-stop groups for the motor starters and contactors.	**EU5C-SWD-PF2-1** 116380		1 off

Information relevant for export to North America

NA Certification	Request filed for UL and CSA UL/CSA approval applied for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Motor
ON
OFF
IN
OUT

RMQ-Titan, 4-way selector switch → Chapter 2 1
RMQ-Titan, label with label mount for 4-way selector switch and joystick → Chapter 2 2
SWD front mounting adapter for 2 × M22-SWD-K22 → Page 1/11 3
RMQ-Titan, front mounting adapter with three mounting locations → Page 1/11 4
SWD function element with 3 positions for front mounting → Features 5
SWD LED element for front mounting → Features 6
SWD function element with 2 positions for front mounting → Features 7
SWD function element with 2 positions and LED for front mounting → Features 8
SWD function element with 3 positions and LED for front mounting → Features 9
Link for SWD device plugs → Features 10
RMQ-Titan, M22 contact elements for front mounting → Chapter 2 11
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SWD ribbon cable → Page 1/17 13
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RMQ-Titan, surface mounting enclosure → Chapter 2 15
SWD PCB for surface mounting enclosure → Features 16
Cable gland for SWD round cable → Chapter 2 17
SWD bulkhead plug/socket RJ45 with prefabricated signal cables → Features 18
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RMQ-Titan, double actuators → Chapter 2 29
RMQ-Titan, insert labels → Chapter 2 30
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RMQ-Titan, indicator light → Chapter 2 32
RMQ-Titan, key-operated actuator → Chapter 2 33
RMQ-Titan, selector switch actuator → Chapter 2 34
RMQ-Titan, button plates/ button lenses → Chapter 2 35
RMQ-Titan, pushbutton actuators → Chapter 2 36
RMQ-Titan, label mounts → Chapter 2 37
RMQ-Titan, emergency stop pushbuttons (for safety circuits use only standard contacts M22) → Chapter 2 38
RMQ-Titan, joystick → Chapter 2 39
RMQ-Titan, 4-way pushbutton → Chapter 2 40

Features

SWD-RMQ connection for front fixing → Page 1/10

- Adaptation with standard adapter M22-A or M22-SWD-A4 for 4-way selector switch/pushbutton and joystick.
- Combination with standard pilot devices of the RMQ-Titan M22 serie.
- Types with one or two change over contacts and with/without integrated LED element.
- LED elements in four colors.
- SmartWire-Darwin diagnostics LED for signalling of the communication status of the function element.
- Connection to SmartWire-Darwin ribbon cable with device plug.

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Link for device plug → Page 1/11

- Connection to SmartWire-Darwin device plug.
- Suitable for bridging adapted external SmartWire-Darwin device plugs (e.g. as placeholders).

Surface mounting enclosure with PCB → Page 1/11

- Connection of SmartWire-Darwin function elements for base fixing.
- Type with 1, 2, 3, 4 and 6 slots.
- Bridging of free slots with link for base fixing.
- Integrated connectable network terminator.

SWD RMQ connection for base fixing → Page 1/10

- For use with SWD PCB, RMQ-Titan surface mounting enclosure and RMQ-Titan M22 control circuit devices.
- Types with one or two change over contacts and with/without integrated LED element.
- LED elements in four colors.
- SmartWire-Darwin diagnostics LED for signalling of the communication status of the function element.

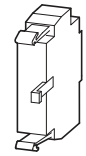
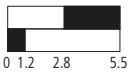
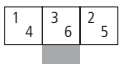
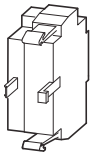
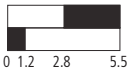
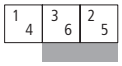
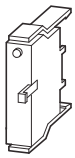
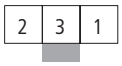
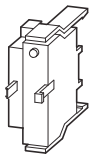
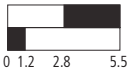
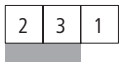
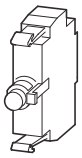
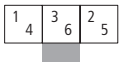
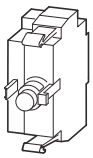
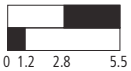
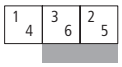
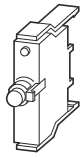
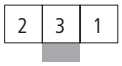
Housing bushing socket → Page 1/18

- Use for RMQ-Titan M22 surface mounting enclosure or control panel.
- Type plug/socket.
- Prefabricated signal cable with ferrules for connection to PCB for surface mounting enclosure.

Planning and ordering help (SWD Assist)

- Easy generation of applications with the SmartWire-Darwin system.
- Integrated function for the generation of ordering lists.
- Integrated plausibility check.
- Online functionality:
  - Simple preliminary commissioning of SmartWire-Darwin inputs and outputs and function testing.
  - Easy diagnostics of SmartWire-Darwin slaves.
- Free download under http://downloadcenter.moeller.net

Ordering

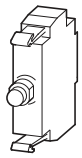
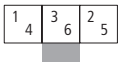
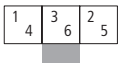
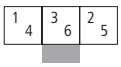
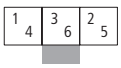
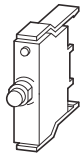
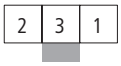
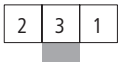
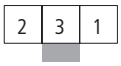
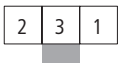
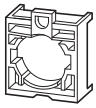
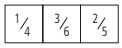
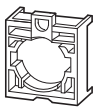
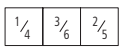
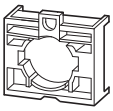
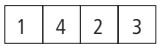
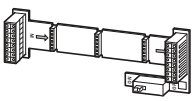
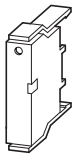
	Number of contacts	Circuit symbol	Contact travel diagram in connection with front element	Configuration	Color LED	**Part no.** Article no.	**Price** See price list	Std. pack
Function elements								
Front fixing								
	1 change over contact				without LED	**M22-SWD-K11** 115964		20 off
	2 change over contacts				without LED	**M22-SWD-K22** 115965		10 off
Base fixing								
	1 change over contact				without LED	**M22-SWD-KC11** 115995		20 off
	2 change over contacts				without LED	**M22-SWD-KC22** 115996		10 off
Front fixing								
	1 change over contact					**M22-SWD-K11LED-W** 115972		20 off
						**M22-SWD-K11LED-B** 115973		
						**M22-SWD-K11LED-G** 115974		
						**M22-SWD-K11LED-R** 115975		
	2 change over contacts					**M22-SWD-K22LED-W** 115978		10 off
						**M22-SWD-K22LED-B** 115979		
						**M22-SWD-K22LED-G** 115980		
						**M22-SWD-K22LED-R** 115981		
Base fixing								
	1 change over contact					**M22-SWD-K11LEDC-W** 116003		20 off
						**M22-SWD-K11LEDC-B** 116004		
						**M22-SWD-K11LEDC-G** 116005		
						**M22-SWD-K11LEDC-R** 116006		
	2 change over contacts					**M22-SWD-K22LEDC-W** 116009		10 off
						M22-SWD-K22LEDC-B 116010		
						M22-SWD-K22LEDC-G 116011		
						M22-SWD-K22LEDC-R 116012		

Notes SWD function elements can be combined with RMQ-Titan operating elements M22... → Chapter "Control circuit devices"

Information relevant for export to North America

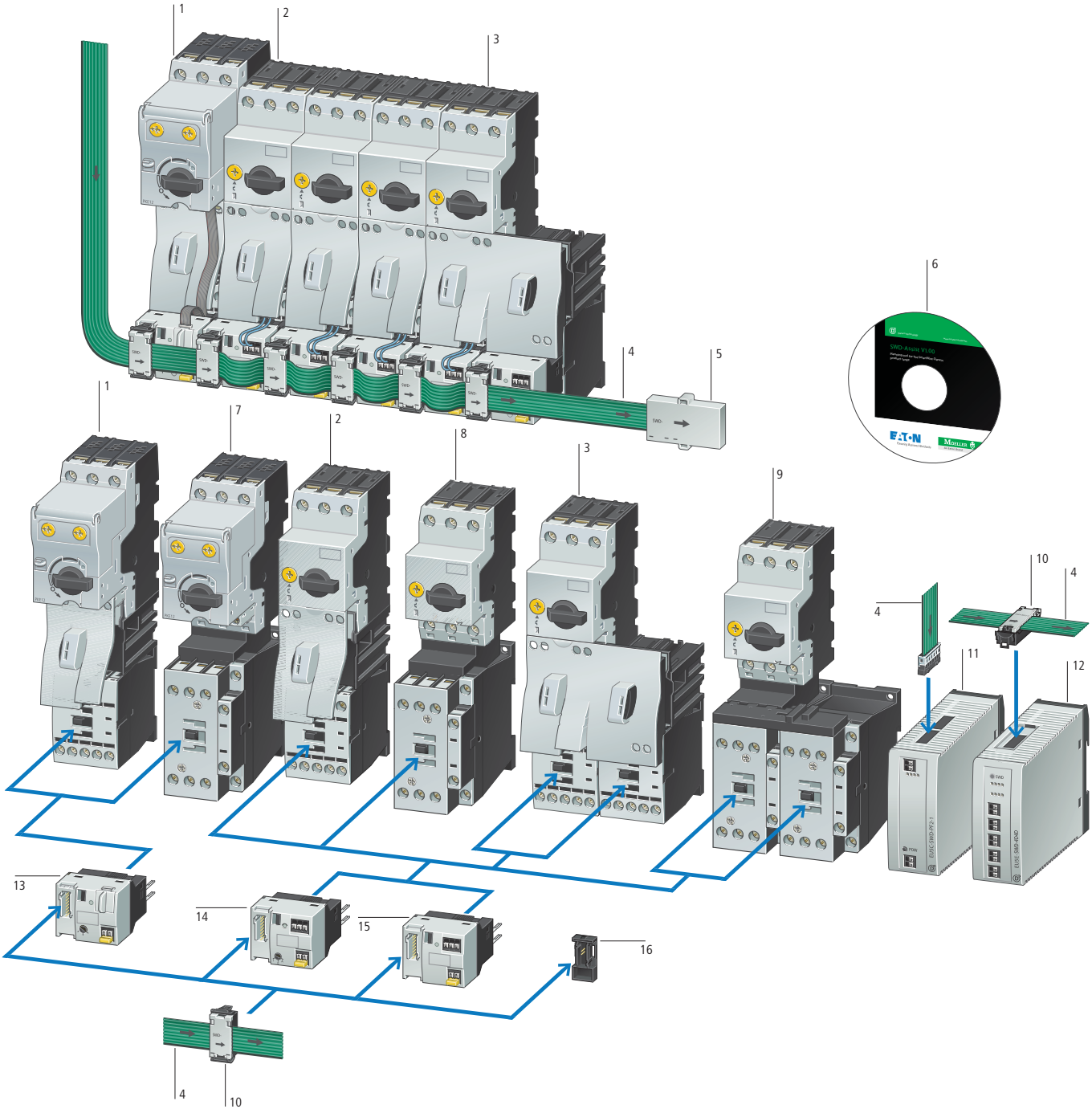
NA Certification Request filed for UL and CSA
UL/CSA approval applied for

HPL010111EN

		Configuration	Color LED	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
LED elements							
Front fixing							
			○	**M22-SWD-LED-W** 115966		20 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for.
			●	**M22-SWD-LED-B** 115967		20 off	
			●	**M22-SWD-LED-G** 115968		20 off	
			●	**M22-SWD-LED-R** 115969		20 off	
Base fixing							
			○	**M22-SWD-LEDC-W** 115997		20 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for.
			●	**M22-SWD-LEDC-B** 115998		20 off	
			●	**M22-SWD-LEDC-G** 115999		20 off	
			●	**M22-SWD-LEDC-R** 116000		20 off	
Fixing adapters							
Front fixing							
	For 1 function element M22-SWD-K… or LED element M22-SWD-LED… In addition 1 or 2 contact elements M22-K.. possible. Sequence number on fixing adapter.			**M22-A** 216374		50 off	UL/CSA certification not required
				**M22-A-GVP** 216375		500 off	UL/CSA certification not required
	For 2 function elements M22-SWD-K22... For use with M22-WR4, -WRJ4, -D4 in conjunction with M22-(SWD)-K			**M22-SWD-A4** 116016		10 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for.
Printed circuit boards							
PCBs for surface mounting enclosure M22-I.. for mounting base function elements M22-SWD...K. Integrated, connectable SWD network terminator							
	Number of mounting locations:	1		**M22-SWD-I1-LP01** 115990		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for.
		2		**M22-SWD-I2-LP01** 115991		1 off	
		3		**M22-SWD-I3-LP01** 115992		1 off	
		4		**M22-SWD-I4-LP01** 115993		1 off	
		6		**M22-SWD-I6-LP01** 115994		1 off	
Link							
Bridging of open mounting locations on M22-SWD-I...-LP01 PCB							
Base fixing							
				**M22-SWD-SEL8-10** 116698		5 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for.

Notes SWD LED elements can be combined with RMQ-Titan indication elements M22... → Chapter "Control circuit devices"

System overview



MSC-DEA networkable PKE-based motor starters up to 7 kW → Features	1	Network terminator → Page 1/17	5	MSC-R reversing starters based on PKZM0 up to 15 kW → Chapter 8	9	Modules SWD PKE modules → Features	13
MSC-D DOL starters based on PKZM0 up to 7 kW → Chapter 8	2	Planning and ordering help, SWD assist → Features	6	SWD device plug → Page 1/17	10	SWD contactor module with manual/auto functionality → Features	14
MSC-R reversing starters based on PKZM0 up to 7 kW → Chapter 8	3	MSC-DEA networkable PKE-based motor starters up to 15 kW → Features	7	Power feeder module → Features	11	SWD contactor module → Features	15
SWD ribbon cable → Page 1/17	4	MSC-D DOL starters based on PKZM0 up to 15 kW → Chapter 8	8	SWD input/output module with relay outputs → Features	12	Link for device plug → Page 1/17	16

Features

MSC-DEA networkable PKE-based motor starter ⟶ Chapter 8
- Plug & play-capable motor starter combi-nation up to 15 kW, consisting of PKE basic unit, contactor DILM and PKE trip block PKE-XTUA.
- Exchangeable trip blocks for cover of current ranges.
- Wide-range overload protection ratio 4:1.
- Adjustable time-lag classes (CLASS 5, 10, 15, 20) for different tripping characteristics.
- Networkable via SWD PKE module.

Powerfeed module ⟶ Page 1/6
- Provision of SmartWire-Darwin supply voltage.
- Provision of 24 V DC supply voltage for activating the contactors.
- Formation of emergency-stop groups.

SWD PKE module ⟶ Page 1/14
- Pluggable onto contactors in the xStart range.
- Suitable for motor starters MSC-DEA-…(24 V DC) or DILM(C)7 -DILM(C)32 in combination with PKE12/32 and trip block PKE-XTUA-…
- Use of the standard switchgear of the xStart range.
- Use of the standard accessories in the xStart range.
- Integrated mechanical contactor switching state indication.
- Integrated contactor switching state scanning.
- Transmission of PKE-specific data (switch position PKE, relative motor current, thermal motor image, trip indications (overload, short-circuit,…), type PKE trip block, set value of overload release and time-lag class).
- Communication cable (PKE32-COM) for connection to PKE trip block included as standard.
- Contactor actuation.
- Selectable ZMR functionality (contactor opening on overload).
- SWD diagnostics LED for signalling the communication status of the modules and signalling of the switch command via SmartWire-Darwin.
- Manual/Auto functionality for automatic or manual switching on of the connected contactor.
- Connection to SmartWire-Darwin ribbon cable via device plug.

SWD contactor module ⟶ Page 1/14
- Pluggable onto contactors in the xStart range.
- Suitable for contactors DILM7 DILM38 (24VDC), DILMC7…DILMC32 (24 VDC), DILA DILMP20 DILMP45 (24 VDC RDC24) or motor starter MSC-…(24 VDC).
- Use of the standard switchgear of the xStart range.
- Use of the standard accessories in the xStart range.
- Suitable for contactor combinations with PKZ or with Z overload relays.
- Integrated switch position scanning.
- Integrated mechanical switch position indication.
- Contactor actuation.
- SWD diagnostics LED for signalling the communication status of the modules and signalling of the switch command via SmartWire-Darwin.
- Two digital inputs for scanning floating contacts, such as motor-protective circuit-breaker auxiliary contacts.
- For DIL-SWD-32-002 built-in Manual/Auto functionality for automatic or manual switching on of the connected contactor.
- Connection to SmartWire-Darwin ribbon cable via device plug.

SWD input/output modules ⟶ Page 1/6
- Digital module with four 24 V DC digital inputs and two relay outputs for actuating contactors DILM40-DILM72.
- Connection to SmartWire-Darwin through device plug.

Link for device plug ⟶ Page 1/17
- Connection to SmartWire-Darwin device plug.
- Suitable for the bridging of already adapted device plugs (e.g. as a placeholder).

Planning and ordering help (SWD assist)
- Easy generation of applications with the SmartWire-Darwin system.
- Integrated function for the generation of ordering lists.
- Integrated plausibility check.
- Online functionality.
  - Simple preliminary commissioning of SmartWire-Darwin inputs and outputs and function testing.
  - Simple diagnostics of SmartWire-Darwin slaves.
- Free download under http://downloadcenter.moeller.net

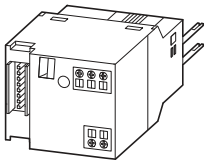
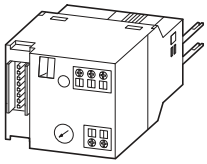
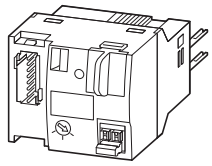
Safety engineering
- Emergency-stop disconnection to IEC/EN 954-1, switching category 3; EN ISO 13849-1 PL d; IEC 62061 SIL 2
- Central switch off of the control voltage at the gateway or power feeder module.
- Combination with safety-related switchgears possible.

Design note

"The number of motor starters or DILM contactors that can be connected is dependent upon the power consumption of the magnet systems per SmartWire Darwin line. To increase the number of SmartWire-Darwin modules that can be connected power feeder modules can be used."

24 V DC	DILM(C)7, DILA	DILM(C)9	DILM(C)12, DILMP20	DILM(C)15	DILM(C)17	DILM(C)25	DILM(C)32, DILMP32	DILM38, DILMP45
Pick-up power [W]	3	3	4.5	4.5	12	12	12	12
Holding power [W]	3	3	4.5	4.5	0.5	0.5	0.5	05

Ordering

	Description	For use with	Part no. Article no.	Price See price list	Std. pack
SWD contactor modules[1]					
SmartWire-Darwin module for surface-mounting on contactors. Per contactor 1 module.					
	Two digital inputs for floating contacts. 1 electrical interlock for the surface mounting of reversing starters. Messages: contactor switch status, status of the digital inputs 1 and 2. Commands: contactor actuation	DILM(C)7… - DILM(C)32 DILM38 DILA MSC-D(E)-...(24VDC)	**DIL-SWD-32-001** 118560		5 off
	Two digital inputs for floating contacts. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Messages: contactor switch status, status of the digital inputs 1 and 2, switch position 1-0-A switch. Commands: contactor actuation	DILM(C)7… - DILM(C)32 DILM38 DILA MSC-D(E)-...(24VDC)	**DIL-SWD-32-002** 118561		5 off
SWD PKE module[1][2]					
SmartWire-Darwin module for connection of motor starter combination, model “extended” 24 V DC (MSC-DEA-…) up to 15 kW. One module per contactor and PKE.					
	Surface-mounting to contactors. Interface for connection of PKE trip block PKE-XTUA-… Connecting cable between module and trip block PKE-XTUA-… included as standard. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Selectable overload relay function (ZMR) for disconnecting the contactor on overload. Messages: - Switch position contactor/PKE/1-0-A switch - Motor current in % - Thermal motor image in % - Trip-indicating auxiliary contact (overload, short-circuit,...) - Set value of overload release - Set value of time lag (CLASS), type of trip block Commands: contactor actuation, activation of overload relay function (ZMR)	DILM(C)7… - DILM(C)32 MSC-DEA	**PKE-SWD-32** 126895		4 off

Notes

[1] • Take into account the max. current consumption of the contactor coils per SmartWire-Darwin line.
• A2 connections must not be bridged.
• Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used.
• Connection terminals for electrical interlocking are not suitable for safety technology.

[2] • Additional SWD contactor module required fir actuation of reversing starter.

Information relevant for export to North America

NA Certification	Request filed for UL and CSA
	UL/CSA approval applied for

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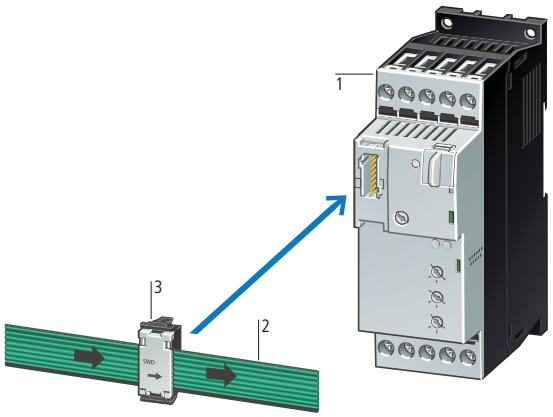
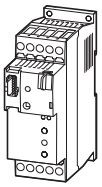
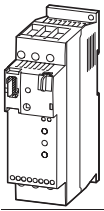
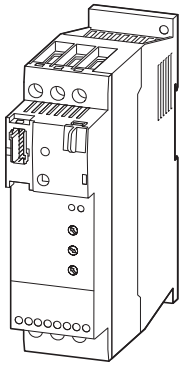
System overview



DS7 smartWire-Darwin soft starters	1
SWD ribbon cable	2
SWD device plug	3

Short description
The DS7-…-D soft starters are designed for connection to SmartWire-Darwin. These two-phase-controlled soft starters control three-phase motors for applications with normal operating frequency in the 4 to 200 A rating range (1.5 to 110 kW at 400 V mains voltage). Due to Eaton's special control method the true running behavior of a DS7 can be compared with that of three-phase soft starters.
SmartWire-Darwin provides a direct connection to the DS7 without control signal wiring. Through SmartWire-Darwin the PLC transmits all control signals directly to the soft starter. The device data are available for processing in the master controller without any additional requirements. The connection with SmartWire-Darwin is fast, easy, inexpensive and convenient.
Note:
For further details see section "Soft starters"

Ordering

	Rated operational current of the soft starter	Assigned motor rating 400 V	480 V	460 V	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	I_e	P	P	P				
	A	kW	HP	HP				
Soft starters Soft starters for three-phase loads, mains supply voltage 230–480 V AC (50/60 Hz) Rated control circuit voltage U_c: 24 V DC SmartWire-Darwin								
	4	1.5	2	2	**DS7-34DSX004N0-D** 134943		1 off	Product Standards: IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking
	7	3	3	3	**DS7-34DSX007N0-D** 134945			NA Certification: Request filed for UL and CSA
	9	4	5	5	**DS7-34DSX009N0-D** 134946			Suitable for: Branch circuits
	12	5.5	7.5	7.5	**DS7-34DSX012N0-D** 134947			Max. Voltage Rating: 480 V
	16	7.5	10	10	**DS7-34DSX016N0-D** 134948			Degree of Protection: IP20; UL/CSA Part no. 1
	24	11	15	15	**DS7-34DSX024N0-D** 134949			
	32	15	20	20	**DS7-34DSX032N0-D** 134950			
	41	22	30	30	**DS7-34DSX041N0-D** 134952			
	55	30	40	40	**DS7-34DSX055N0-D** 134953			
	70	37	50	50	**DS7-34DSX070N0-D** 134954			
	81	45	60	60	**DS7-34DSX081N0-D** 134955			
	100	55	75	75	**DS7-34DSX100N0-D** 134956			
	135	75	100	100	**DS7-34DSX135N0-D** 134957			
	160	90	125	125	**DS7-34DSX160N0-D** 134958			
	200	110	150	150	**DS7-34DSX200N0-D** 134959			

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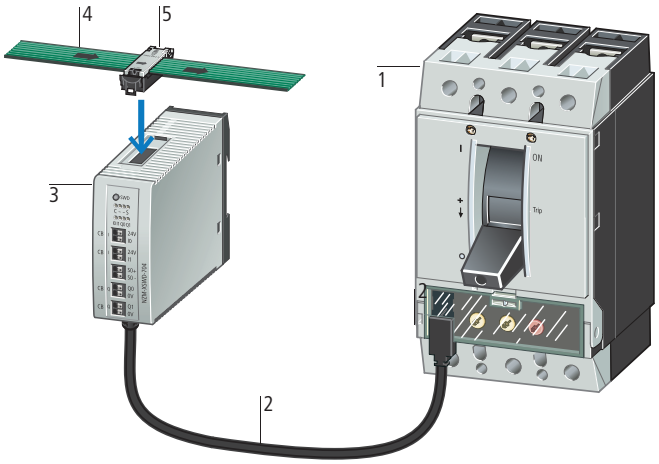
System overview



SmartWire-Darwin NZM circuit-breakers	1
Connection cable from NZM to NZMX-SWD-704	2
NZM interface for Smart-Wire-Darwin	3
SWD ribbon cable	4
SWD device plug	5

Short description

The NZM interface module implements the data connection between circuit-breakers NZM2/3/4 with electronic release and SmartWire-Darwin. It transmits the following digital status data:

- On-Off-Tripped
- Load warnings
- Reason for last trip
- Actual currents, the switch type and the current settings of the rotary coding switches.

The switch can also be operated with a remote operator.

Note:
For further details see section "NZM circuit-breakers".

Ordering

	Description	Part no. Article no.	Price See price list	Std. pack	Notes
NZM interface to SmartWire-Darwin					
	The module implements the data connection between the NZM2/3/4 with electronic release and the SmartWire-Darwin. The following data is transmitted: • Digital status data (ON/OFF/TRIPPED) • Load warnings • Reason for last trip • The actual currents • The switch type • The current settings of the rotary coding switches The switch can also be operated with a remote operator. • Two digital inputs for the switch status • Two transistor outputs for remote operation • Retentive memory for energy data (kWh) Energy data is transmitted through digital input (S_0) from an external energy measuring module NZN...-XMC-SO.	**NZM-XSWD-704** 135530		1 off	A connection cable to the circuit-breaker is included as standard.

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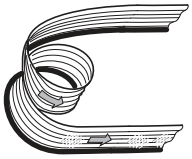
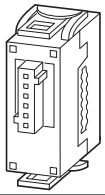
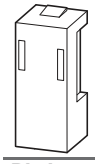
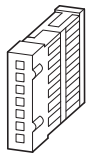
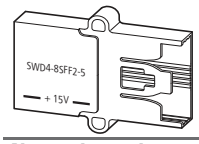
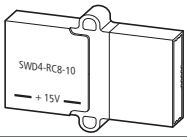
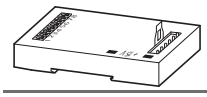
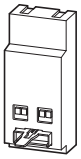
	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Ribbon cable, 8 pole					
For laying the SmartWire-Darwin network inside the control panel.					
	Length: 100 m	**SWD4-100LF8-24** 116026		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
	Length: 3 m Prefabricated with 2 blade terminals SWD4-8MF2.	**SWD4-3LF8-24-2S** 116027		1 off	
	Length: 5 m Prefabricated with 2 blade terminals SWD4-8MF2.	**SWD4-5LF8-24-2S** 116028		1 off	
	Length: 10 m Prefabricated with 2 blade terminals SWD4-8MF2.	**SWD4-10LF8-24-2S** 116029		1 off	
Device plug					
Device plug for connecting SmartWire-Darwin slaves					
		**SWD4-8SF2-5** 116022		10 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Link					
Bridging open mounting locations for device plugs					
	Link for device plug SWD4-8SF2-5	**SWD4-SEL8-10** 116021		5 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Blade terminal					
	8 pole blade terminal for connection to gateway, power feeder module, coupling, network termination	**SWD4-8MF2** 116023		10 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Coupler					
	Coupling for 8 pole blade terminal	**SWD4-8SFF2-5** 116024		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Network terminator					
	Network terminator for 8 pole ribbon cable	**SWD4-RC8-10** 116020		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Cable adapter					
	Cable adapter for flat cable (plug) to round cable (terminal)	**SWD4-8FRF-10** 121377		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Switch cabinet bushing					
Transition from SWD ribbon cable to round cable, can be plugged-in on both sides. Additional control voltage feeder for the motor starters and contactors. Suitable for wall thickness up to 4 mm. Protection type IP67, drill hole 18.5 mm. Connection of ribbon cable with blade terminal SWD4-8MF2 8 pole					
	Connection round cable via socket.	**SWD4-SFL8-20** 121380		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
	Connection round cable via plug.	**SWD4-SML8-20** 121381		1 off	

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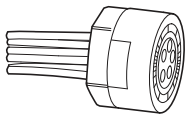
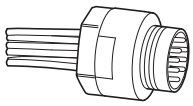
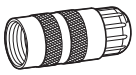
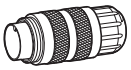
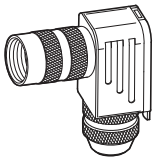
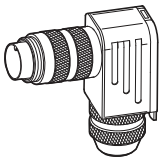
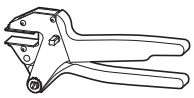
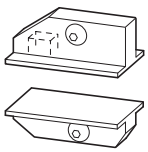
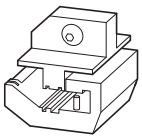
	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Round cable, 8 pole					
For laying the SmartWire-Darwin network outside of the control panel.					
	Length: 50 m, HK-SO-Li2YY, 8 mm diameter	**SWD4-50LR8-24** 116030		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
Housing bushing socket					
Enclosure bushing for installation in surface mounting enclosure M22-I... 8 pole socket/plug, IP67, for connection to SWD4-S(M,F)-67... 8 prefabricated cables for connection to PCB M22-SWD-I...					
	8 pole socket, M20	**SWD4-SF8-20** 116031		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
	8 pole plug, M20	**SWD4-SM8-20** 116032		1 off	
Connectors for SWD round cables					
	8 pole socket, straight	**SWD4-SF8-67** 116033		1 off	NA Certification Request filed for UL and CSA UL/CSA approval applied for
	8 pole plug, straight	**SWD4-SM8-67** 116034		1 off	
	8 pole socket, 90° angled	**SWD4-SF8-67W** 116035		1 off	
	8 pole plug, 90° angled	**SWD4-SM8-67W** 116036		1 off	
Tools for plugs					
	Pliers for device plugs	**SWD4-CRP-1** 116025		1 off	UL/CSA certification not required
	Pliers for blade terminal	**SWD4-CRP-2** 116699		1 off	
	Insert for toggle lever press of device plugs	**SWD4-CRPAD-1** 116700		1 off	
	Insert for toggle lever press of blade terminal	**SWD4-CRPAD-2** 116701		1 off	

HPL01019EN

Engineering

Current consumption 15 V SWD supply voltage **Part no.**	Article no.	Current consumption mA	**Notes**
M22-SWD-K11	115964	7	-
M22-SWD-K22	115965	7	-
M22-SWD-LED-W	115966	19	-
M22-SWD-LED-B	115967	19	-
M22-SWD-LED-G	115968	19	-
M22-SWD-LED-R	115969	19	-
M22-SWD-K11LED-W	115972	19	-
M22-SWD-K11LED-B	115973	19	-
M22-SWD-K11LED-G	115974	19	-
M22-SWD-K11LED-R	115975	19	-
M22-SWD-K22LED-W	115978	19	-
M22-SWD-K22LED-B	115979	19	-
M22-SWD-K22LED-G	115980	19	-
M22-SWD-K22LED-R	115981	19	-
M22-SWD-KC11	115995	7	-
M22-SWD-KC22	115996	7	-
M22-SWD-LEDC-W	115997	19	-
M22-SWD-LEDC-B	115998	19	-
M22-SWD-LEDC-G	115999	19	-
M22-SWD-LEDC-R	116000	19	-
M22-SWD-K11LEDC-W	116003	19	-
M22-SWD-K11LEDC-B	116004	19	-
M22-SWD-K11LEDC-G	116005	19	-
M22-SWD-K11LEDC-R	116006	19	-
M22-SWD-K22LEDC-W	116009	19	-
M22-SWD-K22LEDC-B	116010	19	-
M22-SWD-K22LEDC-G	116011	19	-
M22-SWD-K22LEDC-R	116012	19	-
DIL-SWD-32-001	118560	40	-
DIL-SWD-32-002	118561	40	-
PKE-SWD-32	126895	58	-
EU5E-SWD-8DX	116381	12	-
EU5E-SWD-4D4D	116382	45	-
EU5E-SWD-4D2R	116383	45	-
NZM-XSWD-704	135530	35	-
M22-SWD-I1-LP01	115990	17	With terminating resistor switched on
M22-SWD-I2-LP01	115991	17	
M22-SWD-I3-LP01	115992	17	
M22-SWD-I4-LP01	115993	17	
M22-SWD-I6-LP01	115994	17	
SWD4-RC8-10	116020	17	-

Power consumption/current consumption 24 V SWD control voltage U_{AUX}		**DIL-SWD-32-…**	**PKE-SWD-32**
Pick-up power			
for DILM(C) 7-9, DILA	W	3	3
for DILM(C) 12-15, DILMP20	W	4.5	4.5
for DILM(C) 17-38, DILMP32-45	W	12	12
Pick-up current			
for DILM(C) 7-9, DILA	mA	125	125
for DILM(C) 12-15, DILMP20	mA	188	188
for DILM(C) 17-38, DILMP32-45	mA	500	500
Sealing power			
for DILM(C) 7-9, DILA	W	3	3
for DILM(C) 12-15, DILMP20	W	4.5	4.5
for DILM(C) 17-38, DILMP32-45	W	0.5	0.5
Sealing current			
for DILM(C) 7-9, DILA	mA	125	125
for DILM(C) 12-15, DILMP20	mA	188	188
for DILM(C) 17-38, DILMP32-45	mA	21	21

Technical data

			EU5C-SWD-DP	EU5C-SWD-CAN	EU5C-SWD-PF1-1	EU5C-SWD-PF2-1
General						
Standards			IEC/EN 61131-2 EN 50178			
Dimensions (W x H x D)		mm	35 x 90 x 127		35 x 90 x 124	
Weight		kg	0.16	0.16	0.11	0.17
Weight		g	–	–	–	–
Mounting			Top-hat rail IEC/EN 60715, 35 mm			
Mounting position			Vertical			
Ambient mechanical conditions						
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)						
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	0.3	0.3	0.3
Electromagnetic compatibility (EMC)						
Overvoltage category			II	II	II	II
Pollution degree			2	2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)						
Air discharge (Level 3)		kV	8	8	8	8
Contact discharge (Level 2)		kV	4	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)						
80-1000 MHz		V/m	10	10	10	10
1.4 - 2 GHz		V/m	3	3	3	3
2 - 2.7 GHz		V/m	1	1	1	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A			
Burst (IEC/EN 61131-2:2008, Level 3)						
Supply cables		kV	2	2	2	2
CAN/DP bus cable		kV	1	1	–	–
SmartWire-Darwin cables		kV	1	1	1	1
Surge (IEC/EN 61131-2:2008, Level 1)						
Supply cables/CAN/DP bus cable			Supply cables 0.5 kV, CAN/DP bus cable 1 kV 10			
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	10	10	10
Ambient climatic conditions						
Operating ambient temperature (IEC 60068-2)		°C	-25 … +55	-25 … +55	-25 … +55	-25 … +55
Condensation			Prevent with suitable measures			
Storage		°C	-40 - 70	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95	5 … 95	5 … 95	5 … 95
Supply voltage U_{Aux}						
Rated operating voltage		V	24 DC -15% +20%			
Input voltage residual ripple		%	≦ 5	≦ 5	≦ 5	≦ 5
Protection against polarity reversal			Yes	Yes	Yes	Yes
Max. current	I_{max}	A	3	3	3	3
			If contactors with a total power consumption > 3 A are connected, a power feeder module EU5C-SWD-PF1/2 has to be used.			
Short-circuit rating			no, external fuse FAZ Z3			
Heat dissipation		W	Normally 1	Normally 1	Normally 1	Normally 1
Potential isolation			No	No	No	No
Rated operating voltage of 24 V DC stations		V	Normally U_{Aux} - 0.2	Normally U_{Aux} - 0.2	Normally U_{Aux} - 0.2	Normally U_{Aux} - 0.2

			EU5C-SWD-DP	EU5C-SWD-CAN	EU5C-SWD-PF1-1	EU5C-SWD-PF2-1
Supply voltage U_{Pow}						
Supply voltage		V	24 DC -15 % + 20 %	24 DC -15 % + 20 %	–	24 DC -15 % + 20 %
Input voltage residual ripple		%	≦ 5	≦ 5	–	≦ 5
Protection against polarity reversal			Yes	Yes	–	Yes
Rated operational current	I	A	0.7	0.7	–	0.7
Overload proof			Yes	Yes	–	Yes
Inrush current and length		A	12.5 A/6 ms	12.5 A/6 ms	–	12.5 A/6 ms
Heat dissipation at 24 V DC		W	3.8	3.8	–	3.8
Potential isolation between U_{Pow} and 15 V SmartWire-Darwin supply voltage			No	No	–	Yes
Bridging voltage dips		ms	10	10	–	10
Repeat rate		s	1	1	–	1
Status indicator		LED	Yes	Yes	–	Yes
Provision of SmartWire-Darwin supply voltage						
Rated operational voltage	U_e	V	14.5 ± 3 %	14.5 ± 3 %	–	14.5 ± 3 %
Max. current	I_{max}	A	0.7	0.7	–	0.7
			If SWD modules with a total power consumption > 0.7 A are connected, a power feeder module EU5C-SWD-PF2 has to be used.			
Short-circuit rating			Yes	Yes	–	Yes
Connection supply voltages						
Terminal type			Push-in terminals			
Solid		mm^2	0.2 - 1.5 (AWG 24 - 16)			
Flexible with ferrule		mm^2	0.25 - 1.5	0.25 - 1.5	0.25 - 1.5	0.25 - 1.5
SmartWire-Darwin network						
Station type			SmartWire-Darwin master		–	–
Number of SmartWire-Darwin slaves			58	99	–	–
Baud rate		kBd	125	125	–	–
Address setting			Automatic	Automatic	–	–
Status indicator		LED	SmartWire-Darwin master LED: green Configuration LED: red		–	–
Connections			Plug, 8 pole		2 x plug, 8 pole	
Plug connectors			Blade terminal SWD4-8MF2		2 blade terminals SWD4-8MF2	
Fieldbus interface						
Function			PROFIBUS-DP slave	CANopen slave	–	–
Bus protocol			PROFIBUS-DP	CANopen	–	–
Baud rate			Up to 12 MB	Up to 1 MB	–	–
Baud rate detection			Automatic	Automatic	–	–
Station address			2 … 125	2 … 32	–	–
Address setting			DIP switches	DIP switches	–	–
Status indication of fieldbus interface		LED	Two-colored red/ green	Two-colored red/ green	–	–
Terminal resistor			Switchable via plug	DIP switches	–	–
Terminal type fieldbus			1 x SUB-D, 9 pole, socket	1 x SUB-D plug, 9 pole	–	–
Potential isolation			Yes	Yes	–	–

			EU5E-SWD-8DX	EU5E-SWD-4D4D	EU5E-SWD-4D2R
General					
Standards			IEC/EN 61131-2 EN 50178		
Dimensions (W x H x D)		mm	35 x 90 x 101		
Weight		kg	0.1	0.1	0.11
Mounting			Top-hat rail IEC/EN 60715, 35 mm		
Mounting position			Vertical		
Ambient mechanical conditions					
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)					
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	0.3	0.3
Electromagnetic compatibility (EMC)					
Overvoltage category			II	II	II
Pollution degree			2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)					
Air discharge (Level 3)		kV	8	8	8
Contact discharge (Level 2)		kV	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)					
80-1000 MHz		V/m	10	10	10
1.4 - 2 GHz		V/m	3	3	3
2 - 2.7 GHz		V/m	1	1	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A		
Burst (IEC/EN 61131-2:2008, Level 3)					
Supply cables		kV	2	2	2
Signal cables		kV	1	1	1
SmartWire-Darwin cables		kV	1	1	1
Surge (IEC/EN 61131-2:2008, Level 1)			–	Supply cables 0.5 kV	–
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	10	10
Ambient climatic conditions					
Operating ambient temperature (IEC 60068-2)		°C	-25 … +55	-25 … +55	-25 … +55
Condensation			Prevent with suitable measures		
Storage		°C	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95	5 … 95	5 … 95
SmartWire-Darwin network					
Station type			SmartWire-Darwin station (slave)		
Baud rate detection			Automatic		
SmartWire-Darwin status		LED	Green		
Connection			Plug, 8 pole Connection plug: Device plug SWD4-8SF2-5		
Current consumption (15 V SWD supply)			→ Page 19		
Connection supply and I/O					
Terminal type			Push-in terminals		
Solid		mm^2	0.2 - 1.5 (AWG 24 - 16)		
Flexible with ferrule		mm^2	0.25 - 1.5	0.25 - 1.5	0.25 - 1.5
			Minimum length 8 mm		
24 V DC supply for output supply					
Rated operational voltage	U_e	V	–	24 DC -15 % / +20 %	–
Input voltage residual ripple		%	–	≤ 5	–
Protection against polarity reversal			–	Yes	–

			EU5E-SWD-8DX	EU5E-SWD-4D4D	EU5E-SWD-4D2R
Digital inputs					
Number			8	4	4
Input current		mA	Normally 4 at 24 V DC		
Voltage level to IEC/EN 61131-2					
Limit value type 1			Low < 5 V DC; High > 15 V DC		
Input delay			High → Low typ. < 0.2 ms Low → High typ. < 0.2 ms		
SmartWire-Darwin status		LED	Yellow		
Digital semiconductor outputs					
Number			–	4	–
Output current		A	–	Normally 0.5 at 24 V DC	–
Short-circuit tripping current		A	–	Max. 1.2 over 3 ms	–
Lamp load	R_{LL}	W	–	≦ 3	–
Overload proof			–	Yes, with diagnostics	–
Switching capacity			–	EN 60947-5-1 utilization category DC-13	–
Relay outputs					
Number			–	–	2
Contact type			–	–	Normally open contact
Operations					
Utilization category AC-1, 250 V, 6 A			–	–	> 6 x 10^4
Utilization category AC-15, 250 V, 3 A			–	–	> 5 x 10^4
Utilization category DC-13, 24 V, 1 A			–	–	> 2 x 10^5
Safe isolation according to EN 50178		V AC	–	–	230
Minimum load current		mA	–	–	100 mA , 12 V DC
Response/reset time		ms	–	–	5/2.5
Bounce duration		ms	–	–	Normally 1.5
Short-circuit protection			–	–	External 4 A gL/gG
Status display outputs		LED	–	Yellow	Yellow
Potential isolation					
Inputs from SmartWire-Darwin			Yes	Yes	Yes
Semi-conductor outputs from SmartWire-Darwin			–	Yes	–
Semi-conductor outputs from inputs			–	No	–
Relays from SmartWire-Darwin			–	–	Yes
Relays from inputs			–	–	Yes
Relays from relays			–	–	Yes

			M22-SWD-K11	M22-SWD-KC11	M22-SWD-LED-…	M22-SWD-LEDC-…	M22-SWD-K11-LED…	M22-SWD-K11LEDC-…	M22-SWD-K22	M22-SWD-KC22	M22-SWD-K22-LED…	M22-SWD-K22LEDC-…
General												
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Dimensions (W x H x D)		mm	12 x 42 x 39	12 x 45 x 37	10 x 42 x 45	10 x 45 x 42	12 x 42 x 45	12 x 45 x 42	17 x 42 x 39	17 x 45 x 37	17 x 42 x 45	17 x 45 x 42
Weight		g	10	10	10	10	10	10	14	14	14	14
Mounting position			Any	Any	Any	Any	Any	Any	Any	Any	Any	Any
Ambient mechanical conditions												
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)												
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9	9	9	9	9	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50	50	50	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Electromagnetic compatibility (EMC)												
Overvoltage category			Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Pollution degree			2	2	2	2	2	2	2	2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)												
Air discharge (Level 3)		kV	8	8	8	8	8	8	8	8	8	8
Contact discharge (Level 2)		kV	4	4	4	4	4	4	4	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)												
80-1000 MHz		V/m	10	10	10	10	10	10	10	10	10	10
1.4 - 2 GHz		V/m	3	3	3	3	3	3	3	3	3	3
2 - 2.7 GHz		V/m	1	1	1	1	1	1	1	1	1	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A
Burst (IEC/EN 61131-2:2008, Level 3)												
Supply cables		kV	2	2	2	2	2	2	2	2	2	2
SmartWire-Darwin cables		kV	1	1	1	1	1	1	1	1	1	1
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	10	10	10	10	10	10	10	10	10
Ambient climatic conditions												
Operating ambient temperature (IEC 60068-2)		°C	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55	-30 … +55
Condensation			Prevent with suitable measures									
Storage		°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	9 … 95	9 … 95	9 … 95	9 … 95	9 … 95	9 … 95	5 … 95	5 … 95	5 … 95	5 … 95
SmartWire-Darwin network												
Station type			SmartWire-Darwin station (slave)									
Number			–	–	–	–	–	–	–	–	–	–
Baud rate setting			Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
SmartWire-Darwin status		LED	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Connections			Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole
Plug connectors			SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP
Number of insertion cycles			≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
Current consumption (15 V SWD supply)			→ Page 19			→ Page 19						
Function element												
Contacts			1 changeover contact	1 changeover contact	–	–	1 changeover contact	1 changeover contact	2 changeover contacts	2 changeover contacts	2 changeover contacts	2 changeover contacts
Lifespan mechanical/electrical	Switch operations		1×10^6	1×10^6	–	–	1×10^6	1×10^6	1×10^6	1×10^6	1×10^6	1×10^6
LED display		LED	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Diagnostics			Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Fixing			Front fixing	Base fixing	Front fixing	Base fixing	Front fixing	Base fixing	Front fixing	Base fixing	Front fixing	Base fixing

			DIL-SWD-32-001	DIL-SWD-32-002	PKE-SWD-32	NZM-XSWD-704
General						
Standards			IEC/EN 61131-2 EN 50178 IEC/EN 60947			
Dimensions (W x H x D)		mm	45 x 38 x 76	45 x 38 x 76	45 x 38 x 76	35 x 90 x 101
Weight		kg	0.04	0.04	0.04	0.1
Mounting			on DILM7 … DILM38	on DILM7 … DILM38	on DILM7 … DILM32	Top-hat rail I EC/EN 60715, 35 mm
Mounting position			as DILM7 … DILM38	as DILM7 … DILM38	as DILM … DILM32	Vertical
Ambient mechanical conditions						
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)						
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	0.3	0.3	0.3
Electromagnetic compatibility (EMC)						
Overvoltage category			II	II	II	II
Pollution degree			2	2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)						
Air discharge (Level 3)		kV	8	8	8	8
Contact discharge (Level 2)		kV	4	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)						
80 - 1000 MHz		V/m	10	10	10	10
1.4 - 2 GHz		V/m	3	3	3	3
2 - 2.7 GHz		V/m	1	1	1	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A
Burst (IEC/EN 61131-2:2008, Level 3)						
Supply cables		kV	–	–	–	2
CAN/DP bus cable		kV	1	1	1	1
SmartWire-Darwin cables		kV	1	1	1	1
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	10	10	10
Ambient climatic conditions						
Operating ambient temperature (IEC 60068-2)		°C	-25 … +60	-25 … +60	-25 … +60	-25 … +55
Condensation			Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures
Storage		°C	-30 - 70	-30 - 70	-30 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95	5 … 95	5 … 95	5 … 95
SmartWire-Darwin network						
Station type			SmartWire-Darwin station (slave)	SmartWire-Darwin station (slave)	SmartWire-Darwin station (slave)	SmartWire-Darwin station (slave)
Address setting			Automatic	Automatic	Automatic	Automatic
Status SmartWire-Darwin		LED	Green/orange	Green/orange	Green/orange	Green
Connections			Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole
Plug connectors			Device plug SWD4-8SF2-5	Device plug SWD4-8SF2-5	Device plug SWD4-8SF2-5	Device plug SWD4-8SF2-5
Current consumption (15 V SWD supply)			→ Page 19			

			DIL-SWD-32-001	DIL-SWD-32-002	PKE-SWD-32	NZM-XSWD-704
Operation mode						
Manual/automatic mode			No	Yes	Yes	–
Setting			–	Rotary switch	Rotary switch	–
Connection auxiliary contact						
Number			2	2	–	–
Rated voltage	U_e	V DC	15	15	–	–
			Self-supplied	Self-supplied	–	–
Input current at 1 signal, typical		mA	3	3	–	–
Potential isolation			No	No	–	–
Cable length		m	≤2.8	≤2.8	–	–
Terminal type			Push-in terminals	Push-in terminals	–	Push-in terminals
Terminal capacity						
Solid		mm^2	0.2 - 1.5 (AWG 24 - 16)	0.2 - 1.5 (AWG 24 - 16)	0.2 - 1.5 (AWG 24 - 16)	0.2 - 1.5 (AWG 24 - 16)
Flexible with ferrule		mm^2	0.25 - 1.5	0.25 - 1.5	0.25 - 1.5	0.25 - 1.5
			Minimum length 8 mm	Minimum length 8 mm	Minimum length 8 mm	Minimum length 8 mm

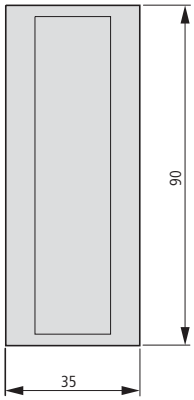
Part no.			SWD4-RC8-10	SWD4-8SF2-5	SWD4-8SFF2-5
General					
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Dimensions (W x H x D)		mm	48.5 x 34.5 x 10	15 x 36.5 x 17.5	48.5 x 34.5 x 10
Weight		kg	–	–	–
Weight		g	10	5.5	4.5
Mounting position			Any	Any	Any
Ambient mechanical conditions					
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)					
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	–	–
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	–	–
Electromagnetic compatibility (EMC)					
Overvoltage category			II	–	–
Pollution degree			2	–	–
Electrostatic discharge (IEC/EN 61131-2:2008)					
Air discharge (Level 3)		kV	8	–	8
Contact discharge (Level 2)		kV	4	–	4
Electromagnetic fields (IEC/EN 61131-2:2008)					
80-1000 MHz		V/m	10	–	–
1.4 - 2 GHz		V/m	3	–	–
2 - 2.7 GHz		V/m	1	–	–
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A	–	–
Burst (IEC/EN 61131-2:2008, Level 3)					
SmartWire-Darwin cables		kV	1	–	–
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	–	–
Ambient climatic conditions					
Operating ambient temperature (IEC 60068-2)		°C	-25 … +55	-25 … +55	-25 … +55
Condensation			Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures
Storage		°C	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95	5 … 95	5 … 95
Connection options					
SWD-In			Plug, 8 pole	Plug connector	Plug, 8 pole
Number of insertion cycles			≥ 200	≥ 1	≥ 200
SWD-Out			–	Socket, 8 pole	Plug, 8 pole
Number of insertion cycles			–	≥ 200	≥ 200
Current consumption (15 V SWD supply)			→ Page 19		

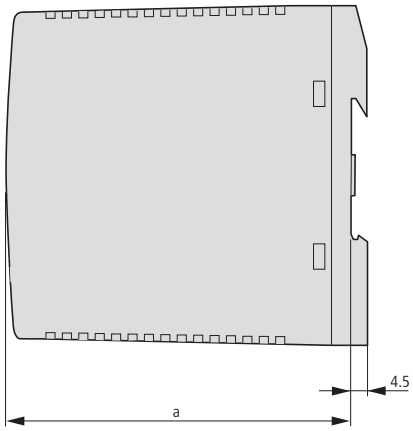
SWD4-SF8-20	SWD4-SM8-20	SWD4-8FRF-10	SWD4-SFL8-20	SWD4-SML8-20
IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
24 x 26 x 162	24 x 26 x 170	35 x 90 x 35	35 x 83 x 40	35 x 83 x 46
–	–	–	–	–
20	22.5	42	50	50
Any	Any	Any	Any	Any
IP67	IP67	IP20	IP67	IP67
		5 … 8.4	5 … 8.4	5 … 8.4
		8.4 … 150	8.4 … 150	8.4 … 150
–	–	9	9	9
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	8	8	8
–	–	4	4	4
–	–	–	10	10
–	–	–	3	3
–	–	–	1	1
–	–	–	–	–
–	–	–	–	–
–	–	–	10	10
-25 … +55	-25 … +55	-25 … +55	-25 … +55	-25 … +55
Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures	Prevent with suitable measures
-40 - 70	-40 - 70	-40 - 70	-40 - 70	-40 - 70
5 … 95	5 … 95	5 … 95	5 … 95	5 … 95
–	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole	Plug, 8 pole
–	≥ 500	≥ 200	≥ 200	≥ 500
Socket, 8 pole	–	Push-in terminals	Socket, 8 pole	Plug, 8 pole
≥ 500	–	–	≥ 500	≥ 200
→ Page 19				

Dimensions

SWD gateways, input/output module, power feed modules

EU5C-SWD-DP



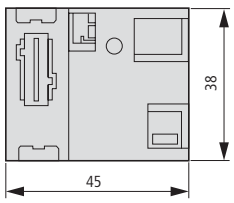


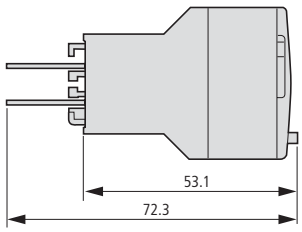
	a
EU5C-SWD-DP	122
EU5C-SWD-CAN	122
EU5E-SWD-...	97
EU5C-SWD-PF...	120

SWD contactor modules

DIL-SWD-32-001

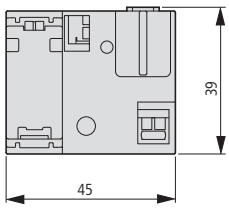
DIL-SWD-32-002

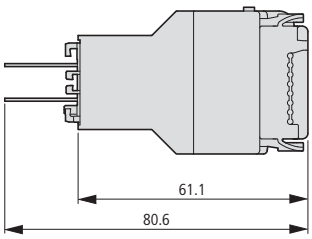




SWD PKE module

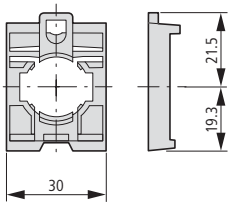
PKE-SWD-32



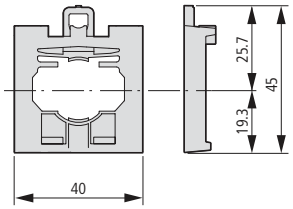


Fixing adapter (front fixing) for 3-contact/LED elements

M22-A-…



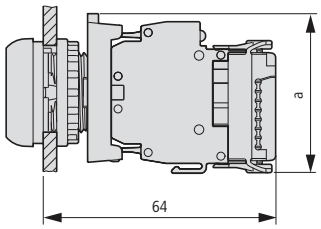
M22-SWD-A4



Function elements

M22-SWD-K...

M22-SWD-LED…



	a
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M22-SWD-A4	48

SWD soft starter DS7

DS7-34DSX

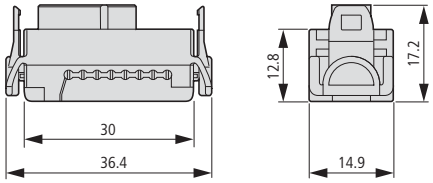
Dimension → Chapter "Soft starter"

SWD interface for NZM circuit-breakers

Dimensions → Chapter " NZM Circuit-breakers"

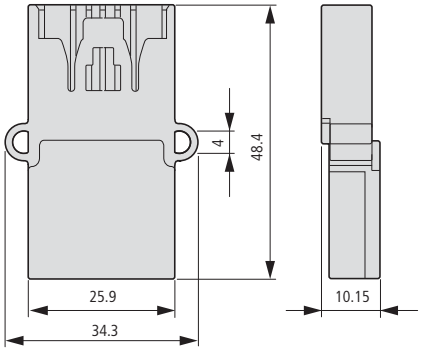
Device plug

SWD4-8SF2-5



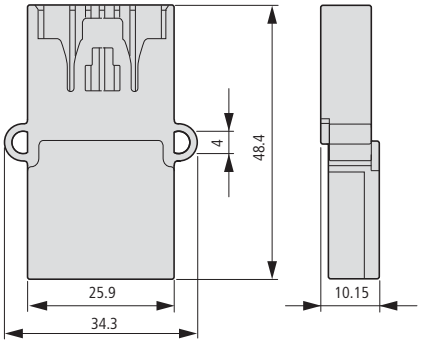
Network terminator

SWD4-RC8-10



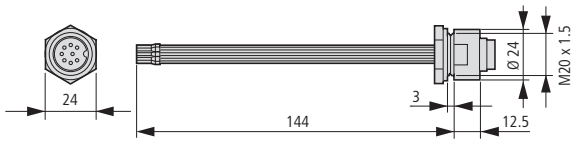
Coupler

SWD4-8SFF2-5



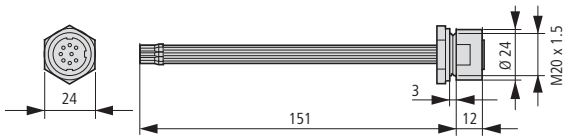
Housing bushing plug

SWD4-SM8-20



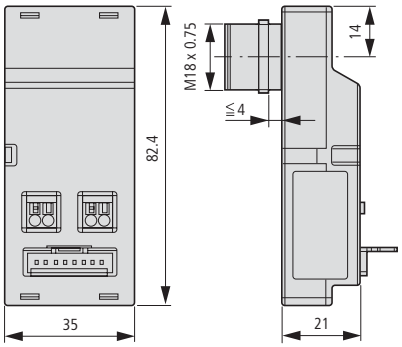
Housing bushing socket

SWD4-SF8-20



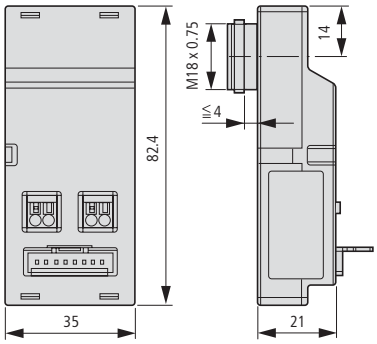
Switch cabinet bushing plug

SWD4-SM8-20



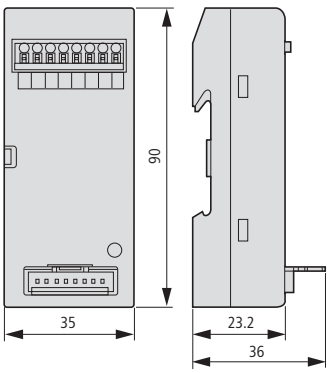
Switch cabinet bushing socket

SWD4-SFL8-20



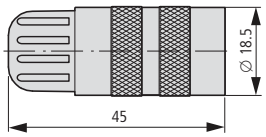
Adapter for blade terminal to round cable

SWD4-8FRF-10

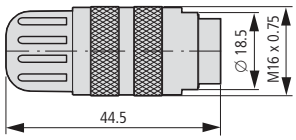


Plug connector for SWD round cables, straight

SWD4-SF8-67

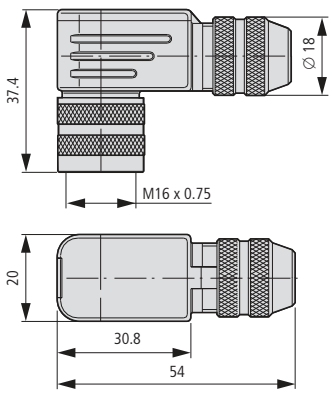


SWD4-SM8-67

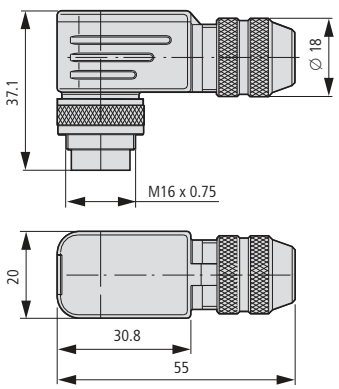


Plug connector for SWD round cables, angled

SWD4-SF8-67W



SWD4-SM8-67W





RMQ pilot devices
FAK palm switches
SL signal towers

ATEX

LED

Darwin Technology

IEC UL CSA

The Eaton range of pilot devices combine state-of-the-art design with optimum functionality. Indicator lights and signal towers with LED technology ensure reliable indication of machine states.
The RMQ Titan product range offers contact elements which can be connected to the SmartWire-Darwin communication system.

Pilot devices with 22.5 mm hole diameter - RMQ-Titan
Modern, ergonomically molded design +++ 100,000 hours LED-illumination +++ Customized laser inscription +++ ATEX-versions possible

Pilot devices with 16 mm hole diameter - RMQ16
Extremely compact +++ Installation in smallest space +++ Customized laser inscription

Emergency stop pushbuttons/ Emergency switching off pushbuttons
Mushroom form +++ Palm form 45 mm, 60 mm +++ With illuminated ring +++ Mechanical switch position indicator +++ Security standards up to SIL3 (EN 62061) or Performance Level e (ISO 13849-1)

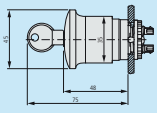
FAK foot and palm switches
High protection type IP69 +++ Suitable for use in rough environments +++ Extremely robust

SL signal towers
Optical and acoustic machine state display +++ Flexibly combinable +++ Simple mounting









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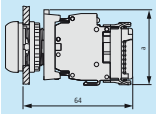







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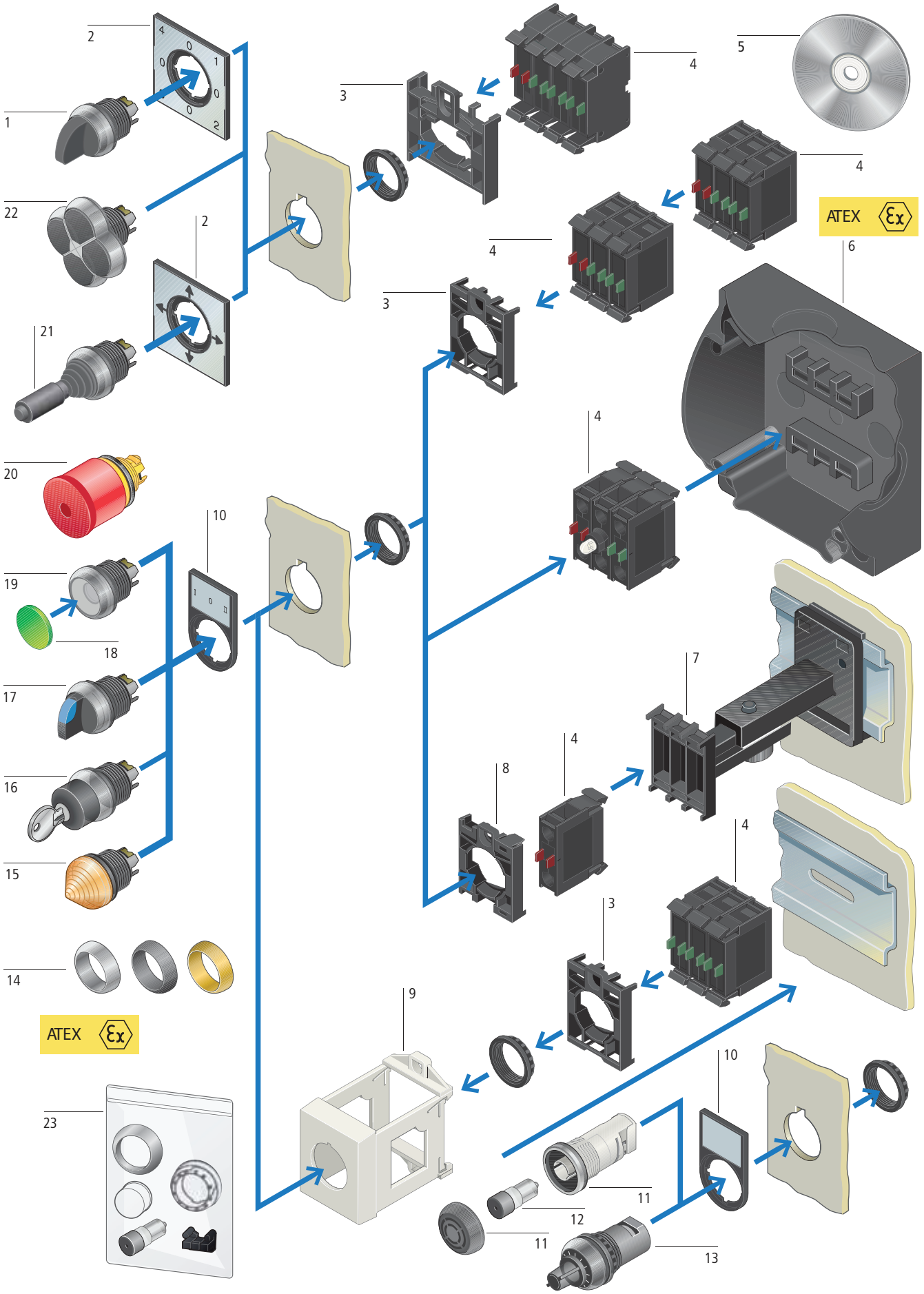
SL signal towers 2/109

System overview



4-way selector switch actuators 1
4 positions
With rotary head or thumb-grip
Maintained function 0-1-0-2-0-3-0-4
→ Page 2/20

Labels with label mounts 2
Colour: aluminium-coloured
Labels: inscribed,
can be inscribed individually, blank
→ Page 2/25

Fixing adapters 3
For flush mounting plates
for contact and LED elements, M22-A...
for contact elements, M22-A4
→ Page 2/31

(Double) contact elements 4
Normally closed contact (NC) and normally open contact (N/O)
Universalcontacts suitable for use with electronic devices
Positive opening safety function according to IEC/EN 60947-5-1
Maximum 2 levels, each with 3 contact elements
→ Page 2/31

LED elements 4
Voltage range:
12 – 30 V AC/DC
85 – 264 V AC
→ Page 2/33

Labeling with convenience 5
All button plates, indicator lights and additional button labels from the RMQ-Titan range can be laser inscribed with any inscription and symbol as required.
Download:
www.moeller.net/de/support,
Keyword: “Labeleditor”

Surface mounting enclosure 6
Surface mounting enclosures IP67 up to 6 mounting locations
Surface mounting enclosures IP55 up to 12 mounting locations
Flush mounting panel, IP54, up to 6 mounting locations
Shrouds IP40 for flush mounting panels
→ Page 2/45

Telescopic clip 7
For mounting depth compensation when rear mounting devices in CI enclosures, CI-K enclosures and cabinets
→ Page 2/48

Centring adapter 8
For centring of actuator and indicator elements when using telescopic clip
→ Page 2/48

IVS top-hat rail adapter 9
for fitting directly onto IEC/EN 60175 mounting rail
→ Page 2/49

Label mounts 10
For insert labels
Colour: black
Insert labels, aluminium-colored, with and without inscription, can be engraved
→ Page 2/35

Acoustic device 11
Protection type IP40
without buzzer
→ Page 2/27

Buzzer 12
Continuous tone, pulsed tone
18 - 30 V AC/DC
→ Page 2/27

Potentiometer 13
Resistance values
from 470 kΩ - 1 MΩ
3 individual connections
With screw terminals
→ Page 2/27

Bezels 14
- Silver
- Black
- 24 carat gold can only be ordered via M22-Combination

→ Page 2/48

Indicator lights 15
Flat and conical designs
Colours: white, green, red, yellow, blue
→ Page 2/26

Key-operated buttons 16
2 and 3 positions
Programmable maintained/momentary function and key withdraw
Suitable for master key systems
→ Page 2/21

Selector switch actuators 17
2 and 3 positions
With rotary head, thumb-grip
Programmable maintained/momentary function
Illuminated selector switch actuators with transparent thumb-grip
Colours: white, green, red, yellow, blue
→ Page 2/20

Button plates/Button lenses 18
Laser inscription for pushbutton actuators and mushroom-headed pushbutton
Button lenses for illuminated pushbutton actuators and indicator lights, flat
With standard texts and symbols or with custom labelling
→ Page 2/36

Pushbutton actuators 19
Momentary and maintained
Flat and extended
with and without guard ring
Mushroom-headed pushbutton
Double actuators
Colours: white, green, red, yellow, blue, black
Illuminated pushbutton actuators
Colours: white, green, red, yellow, blue
→ Page 2/17

Emergency stop pushbuttons/ Emergency switching off pushbuttons 20
Tamper-proof according to ISO 13850/EN 418
Can be secured by sealable shroud
Additional labels, with and without inscription
→ Page 2/8

Joystick 21
4 positions
→ Page 2/24

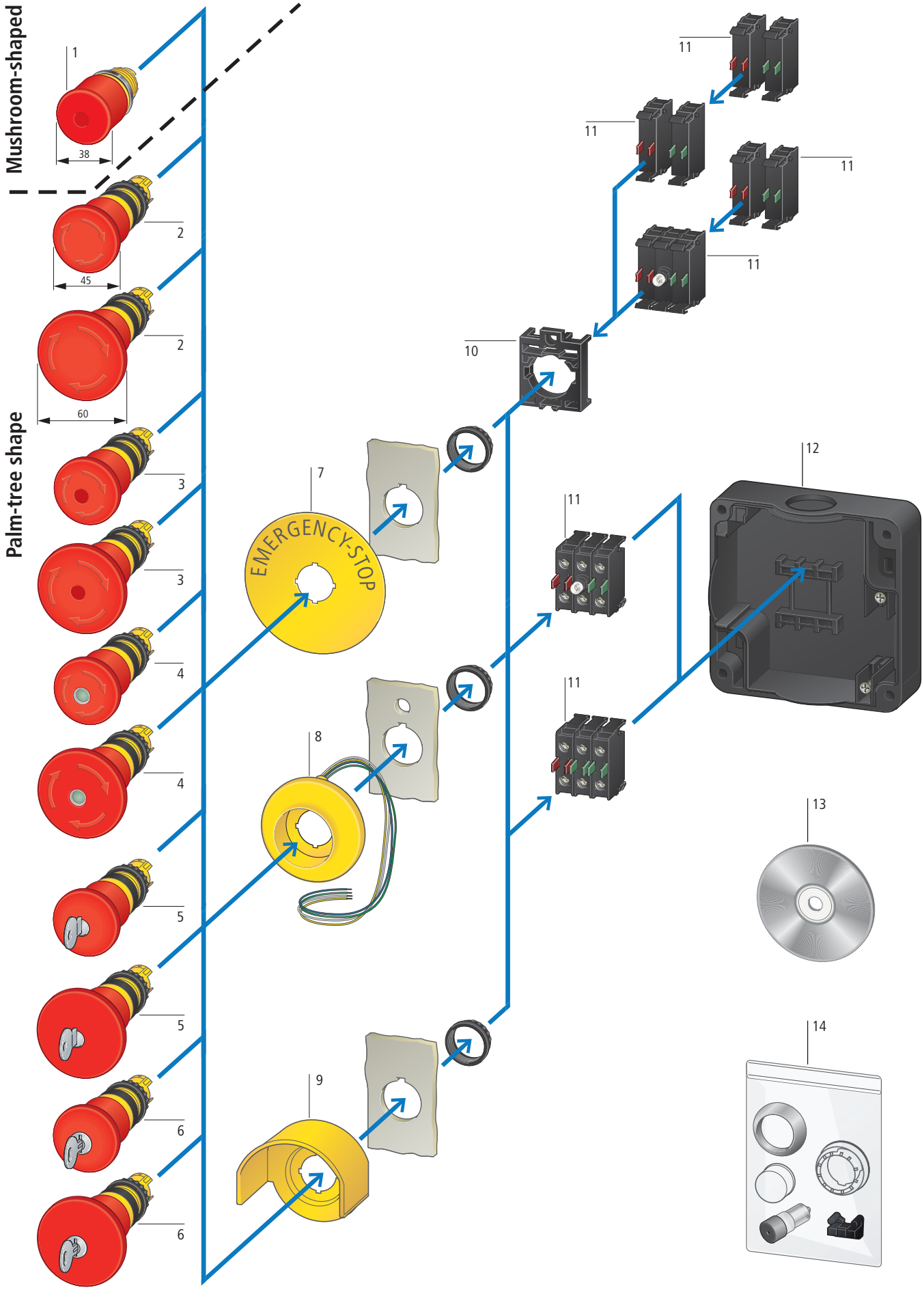
4-way pushbutton 22
4 positions
Pushbutton actuators, momentary
→ Page 2/24

Accessories devices 23
→ Page 2/48

Product Features

- Order with the designation M22-COMBINATION → Page 2/6 and the suffix M22-ATEX or FAK-COMBINATION- → Page 2/78 with the suffix FAK-ATEX → Page 2/45
- Snap-fitting modular system
- bezel silver, black or gold
- Mounting diameter: 22.3 mm
- Minimum grid dimension: 30 x 40 mm
- Protection type: minimum IP66
- Up to 6 contacts per mounting location
- For switching differing potentials
- Approved throughout the world

System overview





Emergency stop pushbuttons Emergency switching off pushbuttons 1

Mushroom-shaped

- Non-illuminated
- Illuminated with LED
- with Lock mechanism MS1–MS20
- with lock mechanism for master key system
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Can be secured by sealable shroud
- Additional labels, with and without inscription
- Release by turning

→ Page 2/7

Emergency stop pushbuttons Emergency switching off label 2

Palm-tree shape

- Non-illuminated
- Diameter 45 mm and 60 mm
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Additional labels, with and without inscription
- Release by turning

→ Page 2/8

Emergency stop pushbuttons Emergency switching off pushbuttons 3

Palm-tree shape

- Illuminated with LED
- Diameter 45 mm and 60 mm
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Additional labels, with and without inscription
- Release by turning

→ Page 2/8

Emergency stop pushbuttons Emergency switching off pushbuttons 4

Palm-tree shape

- with mechanical operated indicator
- Diameter 45 mm and 60 mm
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Additional labels, with and without inscription
- Release by turning

→ Page 2/9

Emergency stop pushbuttons Emergency switching off pushbuttons 5

Palm-tree shape

- with lock mechanism MS1–MS20
- Diameter 45 mm and 60 mm
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Additional labels, with and without inscription
- Release by turning

→ Page 2/8

Emergency stop pushbuttons Emergency switching off pushbuttons 6

Palm-tree shape

- with Ronis 455 lock mechanism
- Diameter 45 mm and 60 mm
- Tamper-proof according to ISO 13850/EN 418
- European Machinery Safety Directive 2006/42/EC
- Can be secured by sealable shroud
- Additional labels, with and without inscription
- Release by turning or pulling

→ Page 2/9

Emergency stop labels Emergency switching off label 7

- Round, square, and rectangular types
- Single-language, multi-language, can be individually labeled

→ Page 2/11

Illuminated ring 8

- Versions: 24 V AC/DC, 120 V AC, 230 V AC
- Continuous light
- Flashing light with separate actuation
- Continuous light with separate actuation, 24 V AC/DC
- can be actuated separately with three LED rows

→ Page 2/10

Guardring 9

- against accidental actuation
- for 38 mm and 45 mm designs

→ Page 2/10

Mounting adapter 10

- For flush mounting plates
- for contact and LED elements, M22-A...
- for contact elements, M22-A4

→ Page 2/31

Contact elements, indicator lights 11

- Normally open contact and normally closed contact
- Universalcontacts suitable for use with electronic devices
- Positive opening safety function according to IEC/EN 60947-5-1
- Up to 2 levels with 3 contact elements each

→ Page 2/31

Surface mounting enclosure 12

- Surface mounting enclosures IP67 up to 6 mounting locations
- Surface mounting enclosures IP55 up to 12 mounting locations
- Flush mounting plate, IP54, up to 6 mounting locations
- Shrouds IP40 for flush mounting

→ Page 2/45

Labeling with convenience 13

All button plates, indicator lights and additional button labels from the RMQ-Titan range can be laser inscribed with any inscription and symbol as required.
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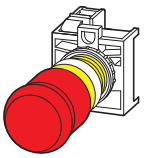
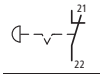
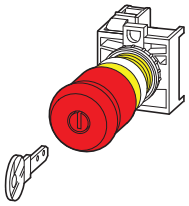
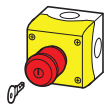
Keyword: “Labeleditor”

Accessories 14

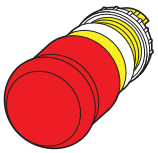
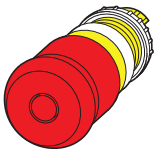
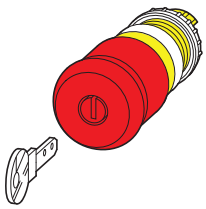
→ Page 2/48

Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		Circuit symbol	Protection type	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Emergency switching-off actuators							
Tamper-proof according to ISO 13850/EN 418 Pull to release Max. contacts to be fitted together: 4 x M22-(C)K… Red mushroom head (RAL 3000), yellow base							
	–	1 NC ⊖		IP66, IP69K	**M22-PV/K01** 216515		5 off	
	1 N/O	1 NC ⊖		IP66, IP69K	**M22-PV/K11** 216516		5 off	
Emergency switching-off key-release mushroom							
Tamper-proof according to ISO 13850/EN 418 with one key, individual lock mechanism MS1, not suitable for master key systems Release by using the key Red mushroom head (RAL 3000), yellow base							
	–	1 NC ⊖		IP66, IP69K	**M22-PVS/K01** 216514		5 off	

	Number of locations Number	Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open	 NC = normally closed	Circuit symbol	Enclosure top	RAL value	Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
Emergency switching-off actuators										
Tamper-proof according to ISO 13850/EN 418 Pull to release	–	–	2 NC ⊖			RAL 1004	IP66, IP69K	**M22-PV/KC02/IY** 216524		1 off
	–	1 N/O	1 NC ⊖			RAL 1004	IP66, IP69K	**M22-PV/KC11/IY** 216525		1 off
Emergency switching-off key-release mushroom										
with 1 key Lock mechanism MS1	1	1 N/O				RAL 1004	IP67, IP69K	**M22-PVS/KC11/IY** 216523		1 off
										
customized complete unit										
To order use form F0315 → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; max. 10 characters.								**M22-COMBINATION-*** 228298		1 off

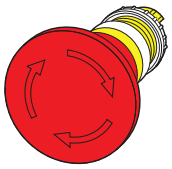
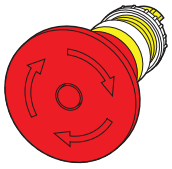
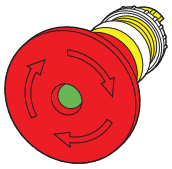
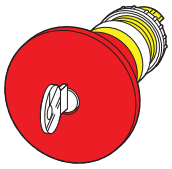
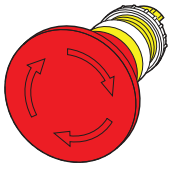
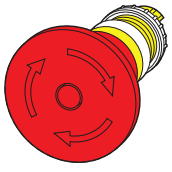
Notes **Information relevant for export to North America**

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

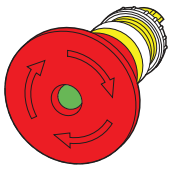
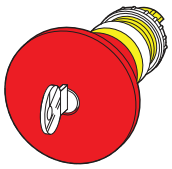
	Illumination		Colour mushroom head	RAL no.	Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
Emergency stop pushbutton/Emergency switch-off actuators								
Release by pulling Mushroom button diameter 38 mm ATEX → Engineering								
	Non-illuminated	Pull to release	●	RAL 3000	IP66, IP69K	**M22-PV** 216876		5 off
	Non-illuminated	Pull to release	●	RAL 3000	IP66, IP69K	**M22-PV-GVP** 216877		50 off
	Illuminated with LED element	Pull to release	●	RAL 3000	IP66, IP69K	**M22-PVL** 216878		5 off
Emergency stop pushbutton/Emergency switch-off actuators								
Release by turning Mushroom button diameter 38 mm ATEX → Engineering								
	Non-illuminated	Turn to release	●	RAL 3000	IP67, IP69K	**M22-PVT** 263467		5 off
	Illuminated with LED element	Turn to release	●	RAL 3000	IP67, IP69K	**M22-PVLT** 263469		5 off
Emergency stop pushbutton/Emergency switch-off actuators								
Release by turning with key Mushroombutton diameter 38 mm With 1 key ATEX → Engineering								
	Non-illuminated	Individual lock mechanism MS1 Not suitable for master key systems	●	RAL 3000	IP67, IP69K	**M22-PVS** 216879		5 off
	Non-illuminated	Individual lock mechanism MS1 - MS20 not suitable for master key systems *→1, 2, 3, ...20	●	RAL 3000	IP67, IP69K	**M22-PVS-MS*** 216880		1 off
	Non-illuminated	suitable for master key systems To order use form F0276 → Data sheet in Online Catalog Delivery time about 4 to 6 weeks For master key systems see → Page 2/23	●	RAL 3000	IP67, IP69K	**M22-PVS-SA(*)-*** 104826		1 off

Information relevant for export to North America

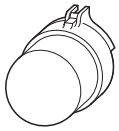
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Illumination		Colour mushroom head	RAL no.	Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
Emergency stop pushbutton actuators Release by turning Palm-shaped, diameter 45 mm								
	Non-illuminated	–	●	RAL 3000	IP67, IP69K	**M22-PVT45P** 121462		1 off
	Illuminated with LED element	–	●	RAL 3000	IP67, IP69K	**M22-PVLT45P** 121460		1 off
Emergency stop pushbutton actuators with mechanical switch position indication Release by turning Palm-shaped, diameter 45 mm								
	Non-illuminated	Switch position indication green → pushbutton released Switch position indicator red → pushbutton actuated	●	RAL 3000	IP67, IP69K	**M22-PVT45P-MPI** 121463		1 off
Emergency stop pushbutton actuators Release by turning with key Palm-shaped, diameter 45 mm With 1 key								
	Non-illuminated	Individual lock mechanism MS1 Not suitable for master key systems	●	RAL 3000	IP67, IP69K	**M22-PVS45P-MS1** 121468		1 off
	Non-illuminated	Individual lock mechanisms MS1 - MS20 Not suitable for master key systems *→1, 2, 3, ...20	●	RAL 3000	IP67, IP69K	**M22-PVS45P-MS*** 121470		1 off
	Non-illuminated	Individual lock mechanism Ronis 455 Not suitable for master key systems	●	RAL 3000	IP67, IP69K	**M22-PVS45P-RS** 121466		1 off
Emergency stop pushbutton actuators Release by turning Palm-shaped, diameter 60 mm								
	Non-illuminated	–	●	RAL 3000	IP67, IP69K	**M22-PVT60P** 121464		1 off
	Illuminated with LED element	–	●	RAL 3000	IP67, IP69K	**M22-PVLT60P** 121461		1 off

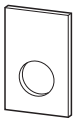
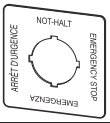
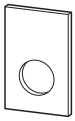
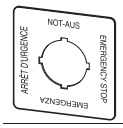
Information relevant for export to North America NA Certification Request filed for UL and CSA

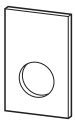
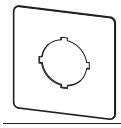
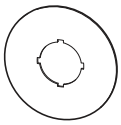
	Illumination		Colour mushroom head	RAL no.	Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
Emergency stop pushbutton actuators								
with mechanical switch position indication Release by turning Palm-shaped, diameter 60 mm								
	Non-illuminated	Switch position indication green → pushbutton released Switch position indication red → pushbutton actuated	●	RAL 3000	IP67, IP69K	**M22-PVT60P-MPI** 121465		1 off
Emergency stop pushbutton/Emergency switching-off pushbuttons								
Release by turning with key Palm-shaped, diameter 60 mm With 1 key								
	Non-illuminated	Individual lock mechanism MS1 Not suitable for master key systems	●	RAL 3000	IP67, IP69K	**M22-PVS60P-MS1** 121469		1 off
	Non-illuminated	Individual lock mechanisms MS1 - MS20 Not suitable for master key systems *→1, 2, 3, ...20	●	RAL 3000	IP67, IP69K	**M22-PVS60P-MS*** 121471		1 off
	Non-illuminated	Individual lock mechanism Ronis 455 not suitable for master key systems	●	RAL 3000	IP67, IP69K	**M22-PVS60P-RS** 121467		1 off

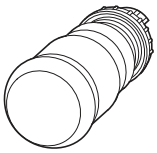
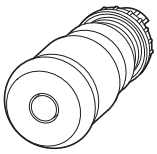
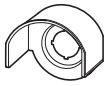
Information relevant for export to North America NA Certification Request filed for UL and CSA

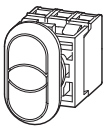
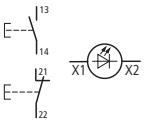
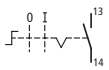
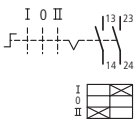
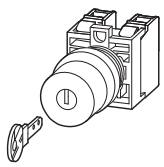
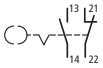
	RAL value	Protection type	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Guard-ring						
Protection against accidental actuation						
	RAL 1004	IP65	**M22-XGPV** 231273		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
Sealable shroud						
For devices with mushroom diameter 38 mm transparent with collapse point, can be reused after Emergency Stop/ switching off in a 30 × 50 grid, adjacent drilling dimensions must be closed with blanking plugs M22(S)-B						
	–	IP65	**M22-PL-PV** 216397		2 off	UL/CSA certification not required
LED-Illuminated ring						
Yellow with yellow LEDs → Engineering (circuit diagrams)						
60 mm diameter 24 V AC/DC Three groups of 4 LEDs each (in series), can be actuated separately (e.g. for run light)			**M22-XPV60-Y-24** 121477		1 off	NA Certification: Request filed for UL and CSA
60 mm diameter 120 V AC One group of 8 LEDs (in series)			**M22-XPV60-Y-120** 121476		1 off	
60 mm diameter 230 V AC One group of 8 LEDs (in series)			**M22-XPV60-Y-230** 138280		1 off	
Customized complete unit						
→ Engineering To order use form F0315 → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; max. 10 characters.						
			M22-COMBINATION-* 228298		1 off	

Note: Contact elements → Page 2/32

	Inscription	Language		RAL value	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Emergency-stop labels, IP66								
ATEX → Engineering								
Lettering black								
	Emergency-stop	en	●	RAL 1004	**M22-XZK1-D99** 121089		10 off	UL/CSA certification not required
	Arresto di emergenza	it	●	RAL 1004	**M22-XZK1-I99** 121370			
	HÄTÄPYSÄYTYS	fi	●	RAL 1004	**M22-XZK1-SF99** 121371			
	Quadrilingual	de, en, fr, it	●	RAL 1004	**M22-XYK11** 121373			
	Quadrilingual	de, en, fr, it	●	RAL 1004	**M22-XAK11** 121085			
	Quadrilingual	de, en, es, pt	●	RAL 1004	**M22-XAK12** 121086			
	Quadrilingual	de, en, nl, fr	●	RAL 1004	**M22-XAK13** 121087			
	Quadrilingual	en, sv, fi, da	●	RAL 1004	**M22-XAK14** 121088			
	Quadrilingual	de, en, fr, it	●	RAL 1004	**M22-XBK11** 121372			
Emergency switching off label								
ATEX → Engineering								
Lettering black								
	NOT-AUS	de	●	RAL 1004	**M22-XZK-D99** 216471		10 off	UL/CSA certification not required
	Emergency-Stop	en	●	RAL 1004	**M22-XZK-GB99** 216472			
	Arrêt d'urgence	fr	●	RAL 1004	**M22-XZK-F99** 216473			
	EMERGENZA	it	●	RAL 1004	**M22-XZK-I99** 216474			
	NOODSTOP	nl	●	RAL 1004	**M22-XZK-NL99** 216475			
	NÖDSTOPP	sv	●	RAL 1004	**M22-XZK-S99** 216476			
	HÄTÄ-SEIS	fi	●	RAL 1004	**M22-XZK-SF99** 216477			
	NØDSTOP	da	●	RAL 1004	**M22-XZK-DK99** 216478			
	–	de, en, fr, it	●	RAL 1004	**M22-XYK1** 216484			
	–	de, en, fr, it	●	RAL 1004	**M22-XAK1** 216465			
	–	de, en, es, pt	●	RAL 1004	**M22-XAK2** 216466			
	–	de, en, nl, fr	●	RAL 1004	**M22-XAK3** 216467			
	–	en, sv, fi, da	●	RAL 1004	**M22-XAK4** 216468			
	Quadrilingual	de, en, fr, it	●	RAL 1004	**M22-XBK1** 216483			

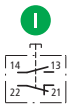
	Inscription	Language		RAL value	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Emergency-Stop labels								
	–	–		RAL 1004	**M22-XZK-*** 216479		10 off	UL/CSA certification not required
	Blank	–		RAL 1004	**M22-XZK** 216470			
	With custom inscription via Labeleditor, →Engineering	–		RAL 1004	**M22-XYK-*** 231181			
	With custom inscription via Labeleditor, →Engineering	–		RAL 1004	**M22-XAK-*** 216469			
	Blank	–		RAL 1004	**M22-XAK** 216464			
	With custom inscription via Labeleditor, →Engineering	–		RAL 1004	**M22-XBK-*** 231762			
	Blank	–		RAL 1004	**M22-XBK** 269580			

		Colour mushroom head	RAL no.	Protec-tion type	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Stop pushbuttons								
ATEX → Engineering								
	Non-illuminated, pull to release	●	RAL 9005	IP66, 69K	**M22S-PV** 225528		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	Non-illuminated, turn to release	●	RAL 9005	IP67, 69K	**M22S-PVT** 271499			
	Illuminated, pull to release	●	RAL 9005	IP66, 69K	**M22S-PVL** 230962			
	Illuminated, turn to release	●	RAL 9005	IP67, 69K	**M22S-PVLT** 271540			
Guard-ring for Stop pushbutton								
	–	–	–	IP67, 69K	**M22G-XGPV** 271610		1 off	UL/CSA certification not required

	Button plate	Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact	NC = normally closed	Circuit Symbol	Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
Pushbutton actuator								
Flat actuator								
		–	1 NC ⊖		IP67, IP69K	**M22-D-R-X0/K01** 216510		5 off
	I	1 N/O	–		IP67, IP69K	**M22-D-G-X1/K10** 216512		5 off
Double actuator with LED element ancilliary lens white								
85 - 264 V AC								
	I 0	1 N/O	1 NC ⊖		IP66	**M22-DDL-GR-X1/X0/K11/230-W** 216509		5 off
Selector switch actuators								
Thumb-grip, black Maintained/momentary function, can be changed with coding adapters M22-XC-Y → Engineering Switch positions 0, I and II correspond with the position of the actuator as viewed from the front. Bezel gold-plated → Page 2/48								
	2 positions, maintained	–	1 N/O	–		IP66	**M22-WRK/K10** 216518		5 off
	3 positions, maintained	–	2 N/O	–		IP66	**M22-WRK3/K20** 216520		5 off
Key-operated button								
Maintained/momentary function and key withdraw convertible with coding adapters M22-XC → Engineering 2 positions, maintained MS1 lock mechanism, with 1 key								
	–	–	1 NC ⊖	1 NC ⊖		IP66	**M22-WRS/K11** 216517		5 off

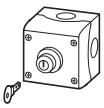
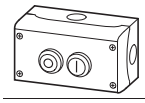
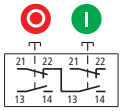
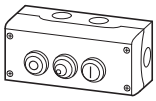
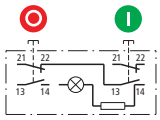
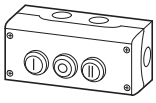
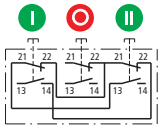
Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Number of locations	Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1		Circuit symbol	Color enclosure top		Protection type	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack
	Number	N/O = normally open contact	NC = normally closed contact			RAL no.				
Pushbutton actuator										
Flush actuator										
	1	1 N/O	1 NC ⊖			RAL 7035	IP67, IP69K	**M22-D-G-X1/KC11/I** 216522		1 off
	1	1 N/O	1 NC ⊖			RAL 7035	IP67, IP69K	**M22-D-R-X0/KC11/I** 216521		1 off

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

Key-operated button										
Maintained/momentary function and key withdraw convertible with coding adapters M22-XC → Engineering with 1 key 2 positions, maintained Lock mechanism MS1										
	1	1 N/O	1 NC ⊖			RAL 7035	IP66	**M22-WRS/KC11/I** 216526		1 off
Two-way pushbutton station										
Without indicator light										
Without indicator light 	2	2 N/O	2 NC ⊖			RAL 7035	IP67, IP69K	**M22-I2-M1** 216529		1 off
With indicator light, white LED element 85 - 264 V AC 	2	2 N/O	2 NC ⊖			RAL 7035	IP67, IP69K	**M22-I3-M2** 216533		1 off
Three-way pushbutton station										
	3	3 N/O	3 NC ⊖			RAL 7035	IP67, IP69K	**M22-I3-M1** 216532		1 off
ustomized complete unit										
→ Engineering To order use form FO315 → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; max. 10 characters.								**M22-COMBINATION-*** 228298		1 off

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

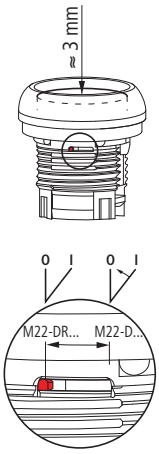
Construction type	Button plate	Bezel: silver **Part no.** Article no.	**Price** See price list	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Double pushbutton actuators with indicator light, IP66 ATEX → Engineering White acillary lens Momentary Bezel gold-plated → Page 2/48 							
Pushbuttons and indicator lights protruding		**M22-DDL-GR** 216698		**M22S-DDL-GR** 216699		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	I 0	**M22-DDL-GR-X1/X0** 216700		**M22S-DDL-GR-X1/X0** 216701			
	START STOP	**M22-DDL-GR-GB1/GB0** 216702		**M22S-DDL-GR-GB1/GB0** 216703			
		M22-DDL-WS 216704		**M22S-DDL-WS** 216705			
	I 0	**M22-DDL-WS-X1/X0** 216706		**M22S-DDL-WS-X1/X0** 216707			
	START STOP	**M22-DDL-WS-GB1/GB0** 216708		**M22S-DDL-WS-GB1/GB0** 216709			
	↑ ↓	**M22-DDL-S-X7/X7** 216710		**M22S-DDL-S-X7/X7** 216711			
	+ –	**M22-DDL-S-X4/X5** 218145		**M22S-DDL-S-X4/X5** 218146			
	With customized inscription to order via Labeleditor → Notes	**M22-DDL-*-*-*** 226770		**M22S-DDL-*-*-*** 230350			
Pushbuttons and indicator lights flat	I 0	**M22-DDLF-GR-X1/X0** 284814		**M22S-DDLF-GR-X1/X0** 284815		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking NA Certification: Request filed for UL and CSA Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	I 0	**M22-DDLF-WS-X1/X0** 284816		**M22S-DDLF-WS-X1/X0** 284817			
	With customized inscription to order via Labeleditor → Notes	**M22-DDLF-*-*-*** 284818		**M22S-DDLF-*-*-*** 284819			
Pushbutton I and indicator light flat, pushbutton 0 protruding	I 0	**M22-DDLM-GR-X1/X0** 284830		**M22S-DDLM-GR-X1/X0** 284831		5 off	
	I 0	**M22-DDLM-WS-X1/X0** 284832		**M22S-DDLM-WS-X1/X0** 284833			
	With customized inscription to order via Labeleditor → Notes	**M22-DDLM-*-*-*** 107062					

Notes

1st wildcard (*) = Colour of button plate

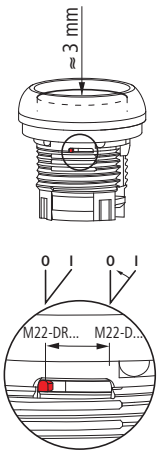
B = blue, G = green, R = red, B = black
B/S = top blue/bottom black
G/R = top green/bottom red
G/S = top green/bottom black
W/S = top white/bottom black.

Wildcard 2 and 3 (*) = File name assigned by Labeleditor (enter twice), for further color combinations please enquire → Engineering

	Button plate	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Pushbutton actuators IP67, IP69K								
ATEX → Engineering								
Bezel gold-plated → Page 2/48								
Actuator flat momentary 	●	**M22-D-S** 216590		10 off	**M22S-D-S** 216591		10 off	–
	○	**M22-D-W** 216592			**M22S-D-W** 216593			–
	●	**M22-D-R** 216594			**M22S-D-R** 216595			–
	●	**M22-D-G** 216596			**M22S-D-G** 216597			–
	●	**M22-D-Y** 216598			**M22S-D-Y** 216599			–
	●	**M22-D-B** 216600			**M22S-D-B** 216601			–
	●	**M22-D-GR** 132671			**M22S-D-GR** 132672			–
	–	**M22-D-X** 216602			**M22S-D-X** 216604			–
	–	**M22-D-X-GVP** 216603		50 off				–
	◎	**M22-D-R-X0** 216605		10 off	**M22S-D-R-X0** 216606		10 off	–
	I	**M22-D-G-X1** 216607			**M22S-D-G-X1** 216608			–
	◎	**M22-D-S-X0** 216609			**M22S-D-S-X0** 216610			–
	I	**M22-D-W-X1** 216611			**M22S-D-W-X1** 216612			–
Actuator flat, maintained 	●	**M22-DR-S** 216613		5 off	**M22S-DR-S** 216614		5 off	**Programmable maintained/momentary pushbutton function** 
	○	**M22-DR-W** 216615			**M22S-DR-W** 216616			
	●	**M22-DR-R** 216617			**M22S-DR-R** 216618			
	●	**M22-DR-G** 216619			**M22S-DR-G** 216620			
	●	**M22-DR-Y** 216621			**M22S-DR-Y** 216622			
	●	**M22-DR-B** 216623			**M22S-DR-B** 216624			
	–	**M22-DR-X** 216625			**M22S-DR-X** 216627			
	–	**M22-DR-X-GVP** 216626		50 off				
	◎	**M22-DR-R-X0** 216628		5 off	**M22S-DR-R-X0** 216629		5 off	
	I	**M22-DR-G-X1** 216630			**M22S-DR-G-X1** 216631			
	◎	**M22-DR-S-X0** 216632			**M22S-DR-S-X0** 216633			
	I	**M22-DR-W-X1** 216634			**M22S-DR-W-X1** 216635			

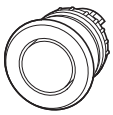
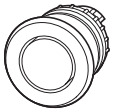
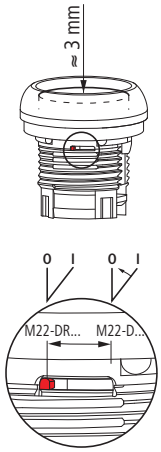
Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Button plate	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Pushbutton actuators IP67, IP69K ATEX → Engineering Bezel gold-plated → Page 2/48								
Actuator extended, momentary 	●	**M22-DH-S** 216636		5 off	**M22S-DH-S** 216637		5 off	–
	○	**M22-DH-W** 216638			**M22S-DH-W** 216639			–
	●	**M22-DH-G** 216643			**M22S-DH-G** 216645			–
	●	**M22-DH-R** 216641			**M22S-DH-R** 216642			–
	●	**M22-DH-Y** 216646			**M22S-DH-Y** 216647			–
	●	**M22-DH-B** 216649			**M22S-DH-B** 216650			–
	◎	**M22-DH-R-X0** 216655			**M22S-DH-R-X0** 216656			–
	I	**M22-DH-G-X1** 216657			**M22S-DH-G-X1** 216658			–
	◎	**M22-DH-S-X0** 216659			**M22S-DH-S-X0** 216660			–
	I	**M22-DH-W-X1** 216661			**M22S-DH-W-X1** 216662			–
Actuator extended, maintained 	●	**M22-DRH-S** 216663		5 off	**M22S-DRH-S** 216664		5 off	**Programmable maintained/momentary pushbutton function** 
	○	**M22-DRH-W** 216665			**M22S-DRH-W** 216666			
	●	**M22-DRH-R** 216667			**M22S-DRH-R** 216668			
	●	**M22-DRH-G** 216669			**M22S-DRH-G** 216670			
	●	**M22-DRH-Y** 216671			**M22S-DRH-Y** 216672			
	●	**M22-DRH-B** 216673			**M22S-DRH-B** 216674			
	◎	**M22-DRH-R-X0** 216675			**M22S-DRH-R-X0** 216676			
	I	**M22-DRH-G-X1** 216677			**M22S-DRH-G-X1** 216678			
	◎	**M22-DRH-S-X0** 216679			**M22S-DRH-S-X0** 216680			
	I	**M22-DRH-W-X1** 216681			**M22S-DRH-W-X1** 216682			
Pushbuttons with guard ring, momentary, IP66, IP69K ATEX → Engineering Bezel gold-plated → Page 2/48								
	–	**M22-DG-X** 220921		5 off				–

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Button plate	Colour of mushroom head	Bezel: silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Mushroom-headed pushbuttons, IP67, IP69K									
ATEX → Engineering									
Bezel gold-plated → Page 2/48									
Momentary 	●	●	**M22-DP-S** 216712		5 off	**M22S-DP-S** 216713		5 off	–
	●	●	**M22-DP-R** 216714			**M22S-DP-R** 216715			–
	●	●	**M22-DP-G** 216716			**M22S-DP-G** 216717			–
	●	●	**M22-DP-Y** 216718			**M22S-DP-Y** 216719			–
	◎	●	**M22-DP-R-X0** 216720			**M22S-DP-R-X0** 216721			–
	I	●	**M22-DP-G-X1** 216722			**M22S-DP-G-X1** 216723			–
	◎	●	**M22-DP-S-X0** 216724			**M22S-DP-S-X0** 216725			–
	I	●	**M22-DP-W-X1** 216726			**M22S-DP-W-X1** 216727			–
	–	●	**M22-DP-S-X** 216728			**M22S-DP-S-X** 216730			–
	–	●	**M22-DP-R-X** 216731			**M22S-DP-R-X** 216733			–
	–	●	**M22-DP-G-X** 216734			**M22S-DP-G-X** 216736			–
	–	●	**M22-DP-Y-X** 216737			**M22S-DP-Y-X** 216739			–
Maintained 	●	●	**M22-DRP-S** 216743		5 off	**M22S-DRP-S** 216744		5 off	**Programmable maintained/ momentary pushbutton function** 
	●	●	**M22-DRP-R** 216745			**M22S-DRP-R** 216746			
	●	●	**M22-DRP-G** 216747			**M22S-DRP-G** 216748			
	●	●	**M22-DRP-Y** 216749			**M22S-DRP-Y** 216750			
	◎	●	**M22-DRP-R-X0** 216751			**M22S-DRP-R-X0** 216752			
	I	●	**M22-DRP-G-X1** 216753			**M22S-DRP-G-X1** 216754			
	◎	●	**M22-DRP-S-X0** 216755			**M22S-DRP-S-X0** 216756			
	I	●	**M22-DRP-W-X1** 216757			**M22S-DRP-W-X1** 216758			
	–	●	**M22-DRP-S-X** 216759			**M22S-DRP-S-X** 216761			
	–	●	**M22-DRP-R-X** 216762			**M22S-DRP-R-X** 216764			
	–	●	**M22-DRP-G-X** 216765			**M22S-DRP-G-X** 216767			
	–	●	**M22-DRP-Y-X** 216768			**M22S-DRP-Y-X** 216770			

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13





Function: ▷ = Momentary ▽ = Maintained	Button plate	Inscription	Function	Bezel: Silver Part no. Article no.	Price See price list	Std. pack	Bezel: black Part no. Article no.	Price See price list	Std. pack
Selector switch actuators, IP66									
ATEX Ex → Engineering; Bezel gold-plated → Page 2/48									
Maintained/momentary, can be changed with coding adapter kit → Page 2/23									
Two positions									
With rotary knob									
▷ 40°		–	–	**M22-W** 216853		5 off	**M22S-W** 216854		5 off
▽ 60°		–	–	**M22-WR** 216855			**M22S-WR** 216856		
▽ 60°		–	–	**M22-WR-X92** 216857			**M22S-WR-X92** 216858		
▽ 60°		AUTO HAND	–	**M22-WR-X91** 216859			**M22S-WR-X91** 216860		
▽ 60°		* = with customized inscription through Labeleditor → Engineering	–	**M22-WR-*** 226836			**M22S-WR-*** 226837		
With thumb-grip									
▷ 40°	–	–	–	**M22-WK** 216865		5 off	**M22S-WK** 216866		5 off
▽ 60°	–	–	–	**M22-WRK** 216867		10 off	**M22S-WRK** 216869		10 off
▽ 60°	–	–	–	**M22-WRK-GVP** 216868		50 off			off
With thumb-grip, V position									
∨ 60°	–	–	–	**M22-WKV** 216874		5 off	**M22S-WKV** 216875		5 off
3 positions (with plunger bridge → engineering)									
With rotary knob									
40° ⇓ 40°		–	–	**M22-W3** 216861		5 off	**M22S-W3** 216862		5 off
60° ⇓ 60°		–	–	**M22-WR3** 216863			**M22S-WR3** 216864		
60° ⇓ 60°		AUTO 0 MAN.	–	**M22-WR3-X94** 226838			**M22S-WR3-X94** 226839		
60° ⇓ 60°		* = with customized inscription through Labeleditor → Engineering	–	**M22-WR3-*** 226840			**M22S-WR3-*** 226841		
With thumb-grip									
40° ⇓ 40°	–	–	–	**M22-WK3** 216870		5 off	**M22S-WK3** 216871		5 off
60° ⇓ 60°	–	–	–	**M22-WRK3** 216872			**M22S-WRK3** 216873		
	–	–	–	**M22-WRK3-*1)** 217436			**M22S-WRK3-*1)** 217437		
4 positions									
Not suitable for coding adapters									
Use fixing adapter M22-A4 → Page 2/31,labels → Page 2/25									
With rotary knob									
45°		–		**M22-WR4** 279419		5 off	**M22S-WR4** 279430		5 off
With thumb-grip									
45°		–		**M22-WRK4** 279431		5 off	**M22S-WRK4** 279432		5 off















Notes

1) The * wildcard can represent values 1 or 2:
* = 1: for 60° ⇓ 40°
* = 2: for 40° ⇓ 60°

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Function: ⊳ = Momentary, ⊻ = Maintained	Key withdrawable in position			Bezel: Silver Part no. Article no.	Price See price list	Std. pack	Bezel: black Part no. Article no.	Price See price list	Std. pack
Key-operated buttons for individual lock mechanisms, IP66. ATEX Ex → Engineering Bezel gold-plated → Page 2/48 Not suitable for master key systems With 1 key Convertible maintained/momentary function and key withdraw → Page 2/23										
Two positions										
Lock mechanism MS1	⊳ 40°	–	0	–	**M22-WS** 216881		1 off	**M22S-WS** 216882		1 off
	⊻ 60°	–	0	I	**M22-WRS** 216887		5 off	**M22S-WRS** 216889		5 off
	⊻ 60°	–	0	I	**M22-WRS-GVP** 216888		25 off			
	⊻ 60°	–	0	–	**M22-WRS-A1** 229092		5 off	**M22S-WRS-A1** 229093		5 off
Lock mechanism MS2 – MS20 (Lock mechanism number in the type designation)	⊳ 40°	–	0	–	**M22-WS-MS*1)** 216883		1 off	**M22S-WS-MS*1)** 216884		1 off
	⊻ 60°	–	0	I	**M22-WRS-MS*1)** 216890		1 off	**M22S-WRS-MS*1)** 216891		1 off
	⊻ 50°	–	0	–	**M22-WRS-MS*-A1 1)** 217440		5 off	**M22S-WRS-MS*-A1 1)** 217441		5 off
3 positions (with plunger bridge → Engineering)										
Lock mechanism MS1	40° ⇓ 40°	–	0	–	**M22-WS3** 216894		1 off	**M22S-WS3** 216895		1 off
	60° ⇓ 60°	I	0	II	**M22-WRS3** 216900		5 off	**M22S-WRS3** 216901		5 off
	60° ⇓ 60°	I	0	II	**M22-WRS3-GVP** 216902		25 off			
	⇓	Selectable 2)	–	–	**M22-WRS3-A*1)4)** 229094		5 off	**M22S-WRS3-A*1)4)** 229095		5 off
Lock mechanism MS1 – MS20 (Lock mechanism number in the type designation)	Selectable	Selectable 2)	–	–	**M22-WRS3-MS*-A*1)2)** 217442		5 off	**M22S-WRS3-MS*-A*1)2)** 217443		5 off
	40° ⇓ 40°	–	0	–	**M22-WS3-MS*1)** 216896		1 off	**M22S-WS3-MS*1)** 216897		1 off
	60° ⇓ 60°	I	0	II	**M22-WRS3-MS*1)** 216903		1 off	**M22S-WRS3-MS*1)** 216904		1 off
2 or 3 positions										
Lock mechanism MS1 – MS20 (Lock mechanism number in the type designation)	Selectable	Selectable	–	–	**M22-WRS*-MS*-*1)3)** 262521		1 off			

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

Function: ▷ = Momentary, ⌊ = Maintained	Key withdrawable in position	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack
Individual keys							
Replacement key for keyswitch AUTO - OFF/RESET - MANUAL 							
For lock mechanism MS1		**M22-ES-MS1** 216416		5 off			
For lock mechanism MS2 – MS20		**M22-ES-MS*** 216417		1 off			

Notes

[1] Delivery: 4 weeks from receipt of order by the factory
[2] Example: M22(S)-WRS3-MS*-A*

MS*: * = MS1- MS20 (number of individual lock mechanisms)

A*:
- * = 1, function ⇓, withdrawable in switch position 0
- * = 2, function ⇓, withdrawable in switch position I, 0
- * = 3, function ⇓, withdrawable in switch position 0, II
- * = 4, function ⇓▷, withdrawable in switch position I, 0
- * = 5, function ⇓▷, withdrawable in switch position 0
- * = 6, function ◁⇓, withdrawable in switch position 0, II
- * = 7, function ◁⇓, withdrawable in switch position 0
- * = 10, function ⇓, withdrawable in switch position I, II

[3] Example: M22(S)-WRS*-MS*-*

WRS*: * = 2 or 3 positions (function and key withdrawability as M22-WRS or M22-WRS3)

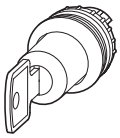
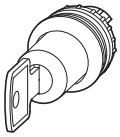
MS*: * = MS1- MS20 (number of individual lock mechanism)

-*: * = Customized inscription using Labeleditor; For * enter the automatically generated file name (→ Engineering) or "blank" if no inscription required

[4] Version A10 can not be selected.

Information relevant for export to North America

UL/CSA certification not required

	Function: ▷ = Momentary, ⌊ = Maintained	Key withdrawable in position	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack
Key-operated button actuators for master key systems IP66								
ATEX → Engineering Bezel gold-plated → Page 2/48 With two keys								
Two positions 	▷ 40°	0	**M22-WS-SA(*)-*** 216885		5 off	**M22S-WS-SA(*)-*** 216886		5 off
	⌊ 60°	0	**M22-WRS-SA(*)-*** 216892			**M22S-WRS-SA(*)-*** 216893		
	60° ⌊	0 I	**M22-WRS-SA(*)-*-A8** 285537			**M22S-WRS-SA(*)-*-A8** 285538		
3 positions 	60° ⌊▷ 60°	I 0 II	**M22-WRS3-SA(*)-*-A9** 285539			**M22S-WRS3-SA(*)-*-A9** 285581		
	40° ◁▷ 40°	0	**M22-WS3-SA(*)-*** 216898			**M22S-WS3-SA(*)-*** 216899		
	60° ⌊▷ 60°	0	**M22-WRS3-SA(*)-*** 216905			**M22S-WRS3-SA(*)-*** 216906		

Information relevant for export to North America

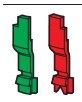
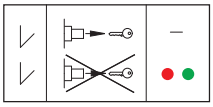
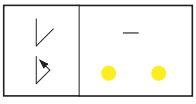
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

Individual key for master key systems								
ATEX → Engineering								
		0	**M22-ES-SA(*)-*** 217444		10 off			

Notes Master key systems: Delivery time 4 to 6 weeks after receipt of order
To order use form FO276 → Data sheet in Online Catalog

Information relevant for export to North America

UL/CSA certification not required

		Function		**Part no.** Article no.	**Price** See price list	Std. pack
Coding kit						
Not for key-operated button for master key systems						
To change key withdraw functionality → Engineering			50°	**M22-XC-R** 216406		10 off
To change maintained/ momentary functionality → Engineering			40°	**M22-XC-Y** 216407		10 off

Information relevant for export to North America

UL/CSA certification not required

HPL02024EN

	Inscrip-tion	Function: = Momentary = Maintained	For use with	Bezel: Silver Part no. Article no.	Price See price list	Std. pack	Bezel: black Part no. Article no.	Price See price list	Std. pack
Joystick, IP66									
ATEX → Engineering									
Bezel gold-plated → Page 2/48, use adapter M22-A4 → Page 1/11 With one operating point per operating direction									
 2 positions			–	**M22-WJ2H** 289195		1 off	**M22S-WJ2H** 289197		1 off
			–	**M22-WRJ2H** 289199			**M22S-WRJ2H** 289241		
			–	**M22-WJ2V** 289196			**M22S-WJ2V** 289198		
			–	**M22-WRJ2V** 289240			**M22S-WRJ2V** 289242		
4 positions			–	**M22-WRJ4** 279415		5 off	**M22S-WRJ4** 279416		5 off
4 positions			–	**M22-WJ4** 279417		5 off	**M22S-WJ4** 279418		5 off

Information relevant for export to North America

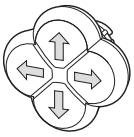
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

With two operating points per operating direction
These joysticks are combined with normal normally open contacts M22-K10 and normally open contacts M22-K10P.

 2 positions			–	**M22-WJ2H-2P** 111508		1 off			
2 positions			–	**M22-WJ2V-2P** 111507		1 off			
4 positions			–	**M22-WJ4-2P** 110836		1 off			

Information relevant for export to North America

NA Certification	Request filed for UL and CSA

Pushbuttons, IP66, 4-way									
ATEX → Engineering									
Pushbuttons not mechanically interlocked 	No inscription, push-button color black		–	**M22-D4-S** 279411		5 off	**M22S-D4-S** 279412		5 off
	Custom pushbutton color and inscription, → Notes		–	**M22-D4-*-*** 279413		5 off	**M22S-D4-*-*** 279414		5 off
	Arrows white, push-button color black		–	**M22-D4-S-X7** 286336		5 off	**M22S-D4-S-X7** 286337		5 off
Opposite pushbutton mechanically inter-locked 	Arrows white, push-button color black		–	**M22-DI4-S-X7** 286338		5 off	**M22S-DI4-S-X7** 286339		5 off
	Custom pushbutton color and inscription, → Notes		–	**M22-DI4-*-*** 286340		5 off	**M22S-DI4-*-*** 286341		5 off

Notes

-*-*: * B = blue, G = green, R = red, B = black, W = white, Y = yellow
State colors clockwise, starting at 12:00 o'clock

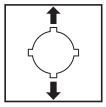


-*-*: * = File name generated by Labeleditor
→ Engineering

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

HPL02025EN

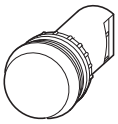
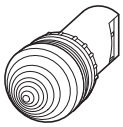
	Inscription	For use with	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Labels						
	No inscription	Joystick 4-way selector switch actuators	**M22-XCK** 279433		10 off	UL/CSA certification not required
	4 direction arrows	Joystick 4-way selector switch actuators	**M22-XCK1** 279434			
	2 direction arrows, can be turned through 90°	Joystick 2 positions	**M22-XCK3** 290260			
	0-1-0-2-0-3-0-4	4-way selector switch actuators	**M22-XCK2** 279435			
	With customized inscription to order via Labeleditor → Engineering	Joystick 4-way selector switch actuators	**M22-XCK-*** 279436			

Notes

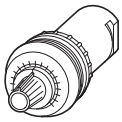
-*-*: * B = blue, G = green, R = red, B = black, W = white, Y = yellow
State colors clockwise, starting at 12:00 o'clock,



-*-*: * = File name generated by Labeleditor
→ Engineering

	Color	Construction	Protection	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Indicator lights							
LEDs for indicator lights → Page 2/33 and following							
	○ White	Flat	IP67, IP69K	**M22-L-W** 216771		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	Red	Flat	IP67, IP69K	**M22-L-R** 216772			
	Green	Flat	IP67, IP69K	**M22-L-G** 216773			
	Yellow	Flat	IP67, IP69K	**M22-L-Y** 216774			
	Blue	Flat	IP67, IP69K	**M22-L-B** 216775			
	– Without lens[1)]	Flat	IP67, IP69K	**M22-L-X** 216776			
	–	Flat	IP67, IP69K	**M22-L-X-GVP** 216777		50 off	
ATEX → Engineering 	○ White	Extended, conical	IP67, IP69K	**M22-LH-W** 216778		10 off	
	Red	Extended, conical	IP67, IP69K	**M22-LH-R** 216779			
	Green	Extended, conical	IP67, IP69K	**M22-LH-G** 216780			
	Yellow	Extended, conical	IP67, IP69K	**M22-LH-Y** 216781			
	Blue	Extended, conical	IP67, IP69K	**M22-LH-B** 216782			
Indicator lights conical, BA 9s							
can be fitted in M20/M25 knockout in base For filament and neon bulbs up to 2.4 W							
	Red	Conical	IP67, IP69K	**L-R** 208689		1 off	NA Certification: Request filed for UL and CSA Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	Green	Conical	IP67, IP69K	**L-G** 208690			
	Yellow	Conical	IP67, IP69K	**L-Y** 208691			
	○ White	Conical	IP67, IP69K	**L-W** 208692			
Compact indicator lights							
Without light elements For filament bulbs, neon bulbs and LEDs up to 2.4 W with BA 9s lamp socket							
	○ White	Flat	IP67, IP69K	**M22-LC-W** 216907		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	Red	Flat	IP67, IP69K	**M22-LC-R** 216908			
	Green	Flat	IP67, IP69K	**M22-LC-G** 216909			
	Yellow	Flat	IP67, IP69K	**M22-LC-Y** 216910			
	Blue	Flat	IP67, IP69K	**M22-LC-B** 216911			
	– Without lens[1)]	Flat	IP67, IP69K	**M22-LC-X** 216912			
ATEX → Engineering 	○ White	Extended, conical	IP67, IP69K	**M22-LCH-W** 216914			
	Red	Extended, conical	IP67, IP69K	**M22-LCH-R** 216915			
	Green	Extended, conical	IP67, IP69K	**M22-LCH-G** 216916			
	Yellow	Extended, conical	IP67, IP69K	**M22-LCH-Y** 216917			
	Blue	Extended, conical	IP67, IP69K	**M22-LCH-B** 216918			

Notes [1)] Lenses for indicator lights → Page 2/40

	Circuit Symbol	Resistance R kΩ	Bezel: Silver Part no. Article no.	Price See price list	Std. pack	Bezel: black Part no. Article no.	Price See price list	Std. pack
Potentiometer, IP66								
ATEX → Engineering Bezel gold-plated → Page 2/48 Three separate screw connections, P_{max} = 0.5 W Accuracy of resistance value: ± 10% (linear) M22…RH with large operating head 		1	**M22-R1K**[2] 229489		1 off	**M22S-R1K**[2] 232231		1 off
		4.7	**M22-R4K7**[2] 229490			**M22S-R4K7**[2] 232232		
		10	**M22-R10K**[3] 229491			**M22S-R10K**[3] 232233		
		47	**M22-R47K**[2] 229492			**M22S-R47K**[2] 232234		
		100	**M22-R100K**[2] 229493			**M22S-R100K**[2] 232235		
		470	**M22-R470K**[2] 229494			**M22S-R470K**[2] 232236		
		Selectable + Notes[1]	**M22-R*-*** [2] 263371			**M22S-R*-*** [2] 263372		
		Selectable + Notes[1]	**M22-R*-*-RH**[2] 288863					

Notes

[1] When ordering, the type reference must include the following details:
First wildcard ≙ Resistance
2nd wildcard ≙ Standard scale/inscription

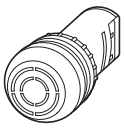
* – *: * = Available resistance value:
1K = 1 kΩ
2K2 = 2.2 kΩ
4K7 = 4.7 kΩ
10K = 10 kΩ
22K = 22 kΩ
47K = 47 kΩ
100K = 100 kΩ
470K = 470 kΩ
1M = 1 MΩ

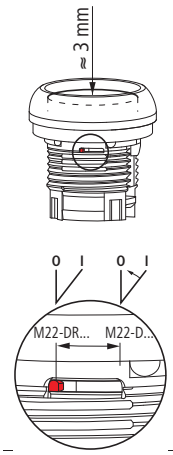
* – *: * = Standard scale/inscription: X1000
No scale/label: „blank"

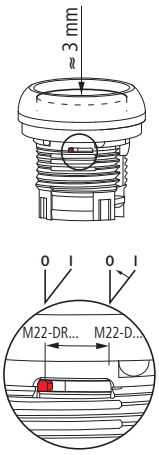
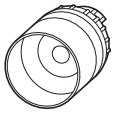
Information relevant for export to North America

[2] Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.: E29184
UL CCN: NKCR
CSA File No.: 012528
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Degree of Protection: UL/CSA Type 3R, 4X, 12, 13

[3] Product Standards: IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.: E29184
UL CCN: NKCR
CSA File No.: 012528
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Degree of Protection: IEC: IP 66; UL/CSA Type: 3R, 4X, 12, 13

		Bezel: Silver Part no. Article no.	Price See price list	Std. pack	Bezel: black Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Compact acoustic device, IP40								
	Front black, without buzzer, BA 9s lamp socket	**M22-AMC** 229015		1 off				Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
Buzzer for acoustic device								
for BA 9s base 83 dB/10 cm, 18 - 30 mA, positive pole at X1, f = 2300 Hz 	Continuous tone, 18 – 30 V AC/DC	**M22-XAM** 229025		1 off				Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	Pulsed tone, 24 V DC (+10 %/-15 %)	**M22-XAMP** 229028		1 off				

	Color Button plate	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Illuminated pushbutton actuators, IP67, IP69K ATEX → Engineering								
Bezel gold-plated → Page 2/48 Flat Momentary 	○	**M22-DL-W** 216922		10 off	**M22S-DL-W** 216924		10 off	–
	●	**M22-DL-R** 216925			**M22S-DL-R** 216926			
	●	**M22-DL-G** 216927			**M22S-DL-G** 216928			
	●	**M22-DL-Y** 216929			**M22S-DL-Y** 216930			
	●	**M22-DL-B** 216931			**M22S-DL-B** 216932			
	–	**M22-DL-X** 216933			**M22S-DL-X** 216935			
	–	**M22-DL-X-GVP** 216934		50 off				
	◎	**M22-DL-R-X0** 216936		10 off	**M22S-DL-R-X0** 216937		10 off	
	I	**M22-DL-G-X1** 216938			**M22S-DL-G-X1** 216939			
	◎	**M22-DL-W-X0** 216940			**M22S-DL-W-X0** 216941			
	I	**M22-DL-W-X1** 216942			**M22S-DL-W-X1** 216943			
Bezel gold-plated → Page 2/48 Flat Maintained 	○	**M22-DRL-W** 216944		5 off	**M22S-DRL-W** 216945		5 off	**Programmable maintained/momentary pushbutton function** 
	●	**M22-DRL-R** 216946			**M22S-DRL-R** 216947			
	●	**M22-DRL-G** 216948			**M22S-DRL-G** 216949			
	●	**M22-DRL-Y** 216950			**M22S-DRL-Y** 216951			
	●	**M22-DRL-B** 216952			**M22S-DRL-B** 216953			
	–	**M22-DRL-X** 216954			**M22S-DRL-X** 216956			
	–	**M22-DRL-X-GVP** 216955		50 off				
	◎	**M22-DRL-R-X0** 216957		5 off	**M22S-DRL-R-X0** 216958		5 off	
	I	**M22-DRL-G-X1** 216959			**M22S-DRL-G-X1** 216960			
	◎	**M22-DRL-W-X0** 216961			**M22S-DRL-W-X0** 216962			
	I	**M22-DRL-W-X1** 216963			**M22S-DRL-W-X1** 216964			
Bezel gold-plated → Page 2/48 Extended Momentary 	○	**M22-DLH-W** 216965		5 off	**M22S-DLH-W** 216966		5 off	
	●	**M22-DLH-R** 216967			**M22S-DLH-R** 216968			
	●	**M22-DLH-G** 216969			**M22S-DLH-G** 216970			
	●	**M22-DLH-Y** 216971			**M22S-DLH-Y** 216972			
	●	**M22-DLH-B** 216973			**M22S-DLH-B** 216974			
	◎	**M22-DLH-R-X0** 216975			**M22S-DLH-R-X0** 216976			
	I	**M22-DLH-G-X1** 216977			**M22S-DLH-G-X1** 216978			
	◎	**M22-DLH-W-X0** 216979			**M22S-DLH-W-X0** 216980			
	I	**M22-DLH-W-X1** 216981			**M22S-DLH-W-X1** 216982			

	Color Button plate	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ATEX → Engineering								
Bezel gold-plated → Page 2/48 Extended Maintained 	○	**M22-DRLH-W** 216788		5 off	**M22S-DRLH-W** 216791		5 off	**Programmable maintained/momentary pushbutton function** 
	●	**M22-DRLH-R** 216789			**M22S-DRLH-R** 216792			
	●	**M22-DRLH-G** 216796			**M22S-DRLH-G** 216798			
	●	**M22-DRLH-Y** 216799			**M22S-DRLH-Y** 216801			
	●	**M22-DRLH-B** 216802			**M22S-DRLH-B** 216803			
	○	**M22-DRLH-R-X0** 216804			**M22S-DRLH-R-X0** 216808			
	I	**M22-DRLH-G-X1** 216805			**M22S-DRLH-G-X1** 216809			
	○	**M22-DRLH-W-X0** 216806			**M22S-DRLH-W-X0** 216810			
	I	**M22-DRLH-W-X1** 216807			**M22S-DRLH-W-X1** 216811			
Bezel gold-plated → Page 2/48 with guardring Momentary 	–	**M22-DGL-X** 230961		5 off				

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

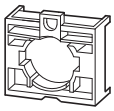
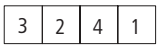
	Function: ▷ = Momentary, ↓ = Maintained	Color	Bezel: Silver **Part no.** Article no.	**Price** See price list	Std. pack	Bezel: black **Part no.** Article no.	**Price** See price list	Std. pack
Illuminated selector switch actuators, thumb-grip, IP66								
ATEX → Engineering Bezel gold-plated → Page 2/48 Maintained/momentary function, can be changed with coding adapter M22-XC-Y → Engineering								
Momentary 	▷ 40°	White	**M22-WLK-W** 216812		5 off	**M22S-WLK-W** 216813		5 off
	▷ 40°	Red	**M22-WLK-R** 216814			**M22S-WLK-R** 216815		
	▷ 40°	Green	**M22-WLK-G** 216816			**M22S-WLK-G** 216817		
	▷ 40°	Yellow	**M22-WLK-Y** 216818			**M22S-WLK-Y** 216819		
	▷ 40°	Blue	**M22-WLK-B** 216820			**M22S-WLK-B** 216821		
Maintained 	↓ 60°	White	**M22-WRLK-W** 216823			**M22S-WRLK-W** 216824		
	↓ 60°	Red	**M22-WRLK-R** 216825			**M22S-WRLK-R** 216826		
	↓ 60°	Green	**M22-WRLK-G** 216827			**M22S-WRLK-G** 216828		
	↓ 60°	Yellow	**M22-WRLK-Y** 216829			**M22S-WRLK-Y** 216830		
	↓ 60°	Blue	**M22-WRLK-B** 216831			**M22S-WRLK-B** 216832		
3 positions								
Momentary 	40° ◁▷ 40°	White	**M22-WLK3-W** 216833		5 off	**M22S-WLK3-W** 216834		5 off
	40° ◁▷ 40°	Red	**M22-WLK3-R** 216835			**M22S-WLK3-R** 216836		
	40° ◁▷ 40°	Green	**M22-WLK3-G** 216837			**M22S-WLK3-G** 216838		
	40° ◁▷ 40°	Yellow	**M22-WLK3-Y** 216839			**M22S-WLK3-Y** 216840		
	40° ◁▷ 40°	Blue	**M22-WLK3-B** 216841			**M22S-WLK3-B** 216842		
Maintained 	60° ↓↓ 60°	White	**M22-WRLK3-W** 216843			**M22S-WRLK3-W** 216844		
	60° ↓↓ 60°	Red	**M22-WRLK3-R** 216845			**M22S-WRLK3-R** 216846		
	60° ↓↓ 60°	Green	**M22-WRLK3-G** 216847			**M22S-WRLK3-G** 216848		
	60° ↓↓ 60°	Yellow	**M22-WRLK3-Y** 216849			**M22S-WRLK3-Y** 216850		
	60° ↓↓ 60°	Blue	**M22-WRLK3-B** 216851			**M22S-WRLK3-B** 216852		
	Selectable	Selectable → Notes	**M22-WRLK3-*/*** 217438			**M22S-WRLK3-*/*** 217439		
V position								
	∨ 60°	White	**M22-WLKV-W** 284393		5 off	**M22S-WLKV-W** 284398		5 off
	∨ 60°	Red	**M22-WLKV-R** 284394			**M22S-WLKV-R** 284399		
	∨ 60°	Green	**M22-WLKV-G** 284395			**M22S-WLKV-G** 284540		
	∨ 60°	Yellow	**M22-WLKV-Y** 284396			**M22S-WLKV-Y** 284543		
	∨ 60°	Blue	**M22-WLKV-B** 284397			**M22S-WLKV-B** 284544		

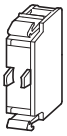
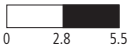
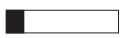
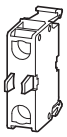
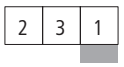
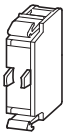
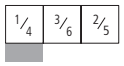
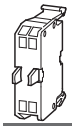
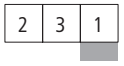
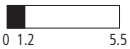
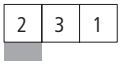
Notes

Example: M22-WRLK3-*/*
/: *= 1 for ▷ or 2 for ◁▷
/: *= Color

Information relevant for export to North America

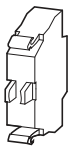
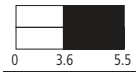
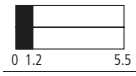
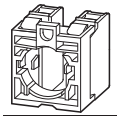
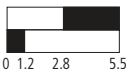
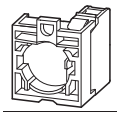
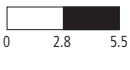
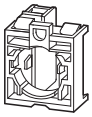
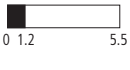
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

Configuration		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Fixing adapters					
Fixing adapter (front fixing) for 3contact LED elements For M22-(C)K... contact elements and M22-(C)LED... LED elements. Sequence numbers on fixing adapter					
		**M22-A** 216374		50 off	UL/CSA certification not required
		M22-A-GVP 216375		500 off	
Fixing adapter (front fixing) for 4 contact elements, can be used with M22-WR4, -D4, -WJ..., -WRJ… For M22-(C)K contact elements					
		**M22-A4** 279437		10 off	Product Standards IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-03 NA Certification UL Listed, CSA certified

	Terminal type	Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1	Circuit symbol	Contact travel diagram, hub in connection with front element	Configuration	Part no. Article no.	Price See price list	Std. pack
Contact elements								
Front fixing 	Screw terminals	1 N/O				**M22-K10** 216376		20 off
		1 N/O				**M22-K10-GVP** 216377		500 off
		1 N/O				**M22-K10P** 110835		20 off
		1 NC ⊖				**M22-K01** 216378		20 off
		1 NC ⊖				**M22-K01-GVP** 216379		500 off
		1 NC ⊖				**M22-K01D** 262165		20 off
Base fixing 	Screw terminals	1 N/O				**M22-KC10** 216380		20 off
		1 N/O				**M22-KC10-GVP** 216381		200 off
		1 NC ⊖				**M22-KC01** 216382		20 off
		1 NC ⊖				**M22-KC01-GVP** 216383		200 off
Front mounting 	Spring-cage terminals	1 N/O				**M22-CK10** 216384		20 off
		1 NC ⊖				**M22-CK01** 216385		
		1 NC ⊖				**M22-CK01D** 262510		
Base fixing 	Spring-cage terminals	1 N/O				**M22-CKC10** 216386		20 off
		1 NC ⊖				**M22-CKC01** 216387		20 off

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type: -

	Terminal type	Contact configuration: ⊖ = Safety function through positive opening according to IEC/EN 60947-5-1	Circuit symbol	Contact travel diagram, hub in connection with front element	Configuration	**Part no.** Article no.	**Price** See price list	Std. pack
Double contact elements								
Front fixing. When using M22-PV emergency switching-off pushbuttons… max. 2 contact elements = 4 normally closed contacts / normally open contacts								
	Cage clamp	2 N/O			–	**M22-CK20** 107898		20 off
		2 NC ⊖			–	**M22-CK02** 107899		
		1 N/O 1 NC ⊖			–	**M22-CK11** 107940		
Complete modules								
Assembly of contact element with screw terminals and mounting clamp, front fixing								
	Screw terminals	1 N/O 1 NC ⊖				**M22-AK11** 216505		5 off
		1 N/O				**M22-AK10** 216504		
		1 NC ⊖				**M22-AK01** 216503		

Notes

Configuration of fixing adapter with sequence numbers to EN 50013
x = Sequence number on fixing adapter



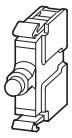
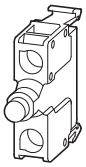
y = Function number on contact element

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type: -

LED elements with screw terminals

→ Engineering

	Rated operational voltage U_e V	Rated operational current I_e mA	Power consumption P W	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Front mounting 	12-30 V AC/DC	8 - 15	0.26 at 24 V	○	**M22-LED-W** 216557		20 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type: -
				red	**M22-LED-R** 216558			
				green	**M22-LED-G** 216559			
				blue	**M22-LED-B** 218057			
	85 - 264 V AC, 50/60 Hz	5 - 15	0.33 at 230 V	○	**M22-LED230-W** 216563		20 off	
				red	**M22-LED230-R** 216564			
				green	**M22-LED230-G** 216565			
				blue	**M22-LED230-B** 218059			
	207 - 264 V AC, 50/60 Hz	12 - 15	0.33 at 230 V	–	**M22-LED230H-*** [1] 106521		20 off	
Base fixing 	12-30 V AC/DC	8 - 15	0.26 at 24 V	○	**M22-LEDC-W** 216560		20 off	
				red	**M22-LEDC-R** 216561			
				green	**M22-LEDC-G** 216562			
				blue	**M22-LEDC-B** 218058			
	85 - 264 V AC, 50/60 Hz	5 - 15	0.33 at 230 V	○	**M22-LEDC230-W** 216566		20 off	
				red	**M22-LEDC230-R** 216567			
				green	**M22-LEDC230-G** 216568			
				blue	**M22-LEDC230-B** 218060			
	207 - 264 V AC, 50/60 Hz	12 - 15	0.33 at 230 V	–	**M22-LEDC230H-*** [1] 106522		20 off	

Notes

[1] Enter color at: *
W = white, R = red, G = green, B = blue

For pushbutton actuators, indicator lights, illuminated pushbutton actuators and illuminated selector switch actuators, the following applies:

M22...-R only in combination with M22-LED...-R
M22...-G only in combination with M22-LED...-G
M22...-W only in combination with M22-LED...-W
M22...-Y only in combination with M22-LED...-W
M22...-B in combination with M22-LED…-W or M22-LED…-B

	Rated operational voltage U_e V	Rated operational current I_e mA	Power consumption P W	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
LED elements with Cage Clamp								
→ Engineering Cage Clamp is a registered trademark of Wago Kontakttechnik GmbH/Minden, Germany								
Front mounting	12-30 V AC/DC	8 - 15	0.26 at 24 V	○	**M22-CLED-W** 216569		20 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type: -
				●	**M22-CLED-R** 216570			
				●	**M22-CLED-G** 216571			
				●	**M22-CLED-B** 218061			
	85 - 264 V AC, 50/60 Hz	5 - 15	0.33 at 230 V	○	**M22-CLED230-W** 216575		20 off	
				●	**M22-CLED230-R** 216576			
				●	**M22-CLED230-G** 216577			
				●	**M22-CLED230-B** 218063			
Base fixing	12-30 V AC/DC	8 - 15	0.26 at 24 V	○	**M22-CLEDC-W** 216572		20 off	
				●	**M22-CLEDC-R** 216573			
				●	**M22-CLEDC-G** 216574			
				●	**M22-CLEDC-B** 218062			
	85 - 264 V AC, 50/60 Hz	5 - 15	0.33 at 230 V	○	**M22-CLEDC230-W** 216578		20 off	
				●	**M22-CLEDC230-R** 216579			
				●	**M22-CLEDC230-G** 216580			
				●	**M22-CLEDC230-B** 218064			
LED series elements with screw terminals								
Front and base fixing → Engineering								
LED resistor element For connecting 12-30 V LED elements			42-60 V AC/DC		**M22-XLED60** 231078		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type: -
			220 V AC/DC		**M22-XLED220**[1] 271541			
LED test element For de-coupled function test (lamp test)			12-240 V AC/DC		**M22-XLED-T** 231079			
			85 - 264 V AC		**M22-XLED230-T** 231080			

Notes

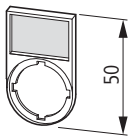
For pushbutton actuators, indicator lights, illuminated pushbutton actuators and illuminated selector switch actuators, the following applies:

M22...-R only in combination with M22-LED...-R
M22...-G only in combination with M22-LED...-G
M22...-W only in combination with M22-LED...-W
M22...-Y only in combination with M22-LED...-W
M22...-B in combination with M22-LED…-W or M22-LED…-B

[1] Maximum ambient temperature: -25 °C to +55 °C
The LED brightness is reduced.

Legend plates, complete

IP66
30 × 50 mm, round, black (RAL 9005)



Inscription	Part no. Article no.	Price See price list	Std. pack	Inscription	Part no. Article no.	Price See price list	Std. pack
0 - I	**M22S-ST-X88** 216485		10 off	FAULT	**M22S-ST-GB8** 216498		10 off
0 - I	**M22S-ST-X89** 218147			DÉFAUT	**M22S-ST-F67** 256795		
I 0 II	**M22S-ST-X93** 216486			BETRIEB	**M22S-ST-D7** 216488		
1	**M22S-ST-X52** 256797			RUN	**M22S-ST-GB7** 216497		
2	**M22S-ST-X53** 256798			EN SERVICE	**M22S-ST-F7** 256793		
STOP	**M22S-ST-GB0** 216494			HAND AUTO	**M22S-ST-D11** 216492		
START	**M22S-ST-GB1** 216495			MAN. AUTO	**M22S-ST-GB11** 216500		
AUS	**M22S-ST-D5** 218299			AUS EIN	**M22S-ST-D10** 216490		
OFF	**M22S-ST-GB5** 218300			OFF ON	**M22S-ST-GB10** 216499		
ARRÊT	**M22S-ST-F0** 256791			ARRÊT MARCHE	**M22S-ST-F10** 256794		
EIN	**M22S-ST-D6** 216487			HAND 0 AUTO	**M22S-ST-D12** 216493		
ON	**M22S-ST-GB6** 216496			MAN. 0 AUTO	**M22S-ST-GB12** 216501		
MARCHE	**M22S-ST-F1** 256792			SOUS TENSION	**M22S-ST-F68** 256796		
STÖRUNG	**M22S-ST-D8** 216489						

Information relevant for export to North America UL/CSA certification not required

Inscription	Color	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Legend plates without label						
ATEX → Engineering						
IP66						
Round, black (RAL 9005), 30 mm wide						
–	●	**M22S-ST-X** 216392		25 off	Cannot be used for M22(S)-PV…	UL/CSA certification not required
–	●	**M22S-ST-X-GVP** 216393		500 off		
For double actuators	●	**M22S-STDD-X** 216394		10 off	–	
Insert labels for legends						
ATEX → Engineering						
18 x 27 mm						
Aluminum-colored, no inscription	–	**M22-XST** 216480		100 off	–	UL/CSA certification not required
Aluminum-colored, no inscription	–	**M22-XST-GVP** 216481		500 off	–	
* = With customized inscription to order via Labeleditor → Engineering	–	**M22-XST-*** 216482		1 off	Letter height 3 mm, max. 3 lines, max. 12 characters per line Letter height 5 mm, max. 2 lines, max. 8 characters per line	

Inscription or explanation	For use with	Color	Style Flat **Part no.** Article no.	**Price** See price list	Style extended **Part no.** Article no.	**Price** See price list	Std. pack
Selection aid for pushbuttons							
≦ 5 characters: letter height 5 mm, > 5 characters: letter height 3 mm							
–	M22(S)-D-X M22(S)-DR-X M22-DG-X	●	**M22-XD-S** 216421		**M22-XDH-S** 216428		10 off
–		○	**M22-XD-W** 216422		**M22-XDH-W** 216429		
–		●	**M22-XD-R** 216423		**M22-XDH-R** 216430		
–		●	**M22-XD-G** 216424		**M22-XDH-G** 216431		
–		●	**M22-XD-Y** 216425		**M22-XDH-Y** 216432		
–		●	**M22-XD-B** 216426		**M22-XDH-B** 216433		
–		●	**M22-XD-GR** 132670				
with customized inscription via Labeleditor → Note		–	**M22-XD-*-*** 216427		**M22-XDH-*-*** 216434		
Zu		●	**M22-XD-S-D2** 218184		**M22-XDH-S-D2** 218229		
Auf		●	**M22-XD-S-D3** 218185		**M22-XDH-S-D3** 218230		
Ab		●	**M22-XD-S-D4** 218186		**M22-XDH-S-D4** 218231		
Aus		●	**M22-XD-R-D5** 218187		**M22-XDH-R-D5** 218232		
Ein		●	**M22-XD-S-D6** 218188		**M22-XDH-S-D6** 218233		
Entsperren		●	**M22-XD-B-D14** 218189		**M22-XDH-B-D14** 218234		
Vorwärts		●	**M22-XD-S-D15** 218190		**M22-XDH-S-D15** 218235		
Rückwärts		●	**M22-XD-S-D16** 218191		**M22-XDH-S-D16** 218236		
Heben		●	**M22-XD-S-D17** 218192		**M22-XDH-S-D17** 218237		
Senken		●	**M22-XD-S-D18** 218193		**M22-XDH-S-D18** 218238		
STOP		●	**M22-XD-R-GB0** 218194		**M22-XDH-R-GB0** 218239		
STOP		●	**M22-XD-S-GB0** 218195		**M22-XDH-S-GB0** 218240		
START		●	**M22-XD-G-GB1** 218196		**M22-XDH-G-GB1** 218241		
START		○	**M22-XD-W-GB1** 218197		**M22-XDH-W-GB1** 218242		
CLOSE		●	**M22-XD-S-GB2** 218198		**M22-XDH-S-GB2** 218243		
UP		●	**M22-XD-S-GB3** 218199		**M22-XDH-S-GB3** 218244		
DOWN		●	**M22-XD-S-GB4** 218200		**M22-XDH-S-GB4** 218245		
TEST		●	**M22-XD-S-GB9** 218201		**M22-XDH-S-GB9** 218246		
OFF		●	**M22-XD-R-GB5** 218202		**M22-XDH-R-GB5** 218247		
ON		●	**M22-XD-S-GB6** 218203		**M22-XDH-S-GB6** 218248		

Notes

When ordering, state complete part no. M22-XD(H)-*-*:
1st wildcard ≙ color: -R, -G, -B, -W, -Y, -S -GR
2nd wildcard ≙ file name generated by Labeleditor → Engineering

Text size 3 mm:

max. 8 characters in 1st line,
10 characters in 2nd line,
8 characters in 3rd line



Text size 5 mm:

Max. 5 characters per line



Information relevant for export to North America

UL/CSA certification not required

Inscription or explanation	For use with	Color, symbol	Style Flat **Part no.** Article no.	**Price** See price list	Style extended **Part no.** Article no.	**Price** See price list	Std. pack
Selection aid for pushbuttons ≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm							
RESET	M22(S)-D-X M22(S)-DR-X M22-DG-X		**M22-XD-B-GB14** 218204		**M22-XDH-B-GB14** 218249		10 off
FORWARD			**M22-XD-S-GB15** 218205		**M22-XDH-S-GB15** 218250		
REVERSE			**M22-XD-S-GB16** 218206		**M22-XDH-S-GB16** 218251		
RAISE			**M22-XD-S-GB17** 218208		**M22-XDH-S-GB17** 218252		
LOWER			**M22-XD-S-GB18** 218209		**M22-XDH-S-GB18** 218253		
Stopp			**M22-XD-R-X0** 218153		**M22-XDH-R-X0** 218155		
Stopp			**M22-XD-S-X0** 218154		**M22-XDH-S-X0** 218156		
Start			**M22-XD-G-X1** 218165		**M22-XDH-G-X1** 218210		
Start			**M22-XD-S-X1** 218166		**M22-XDH-S-X1** 218211		
Start			**M22-XD-W-X1** 218167		**M22-XDH-W-X1** 218212		
Start			**M22-XD-G-X2** 218168		**M22-XDH-G-X2** 218213		
Start			**M22-XD-S-X2** 218169		**M22-XDH-S-X2** 218214		
Increase			**M22-XD-S-X4** 218170		**M22-XDH-S-X4** 218215		
Acceptance			**M22-XD-S-X5** 218171		**M22-XDH-S-X5** 218216		
Reset			**M22-XD-B-X6** 218172		**M22-XDH-B-X6** 218217		
Direction of movement			**M22-XD-S-X7** 218173		**M22-XDH-S-X7** 218218		
Direction of movement			**M22-XD-S-X8** 218174		**M22-XDH-S-X8** 218219		
Hand			**M22-XD-S-X9** 218175		**M22-XDH-S-X9** 218220		
Automatic			**M22-XD-S-X10** 218176		**M22-XDH-S-X10** 218221		
Inch			**M22-XD-S-X11** 218177		**M22-XDH-S-X11** 218222		
Unlock			**M22-XD-S-X12** 218178		**M22-XDH-S-X12** 218223		
Loosen			**M22-XD-S-X13** 218179		**M22-XDH-S-X13** 218224		
Clamp			**M22-XD-S-X14** 218180		**M22-XDH-S-X14** 218225		
Release			**M22-XD-S-X15** 218181		**M22-XDH-S-X15** 218226		
Liquid			**M22-XD-S-X16** 218182		**M22-XDH-S-X16** 218227		
Horn			**M22-XD-S-X17** 218183		**M22-XDH-S-X17** 218228		

Notes

Information relevant for export to North America

UL/CSA certification not required

Inscription or explanation	For use with	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Button plates for mushroom-headed pushbuttons						
≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm						
–	M22(S)-D(R)P-...	●	**M22-XDP-S** 216435		10 off	UL/CSA certification not required
–		○	**M22-XDP-W** 216436			
–		●	**M22-XDP-R** 216437			
–		●	**M22-XDP-G** 216438			
–		●	**M22-XDP-Y** 216439			
with customized inscription via Labeleditor → Note		–	**M22-XDP-*-***[1)] 216440			
Zu		●	**M22-XDP-S-D2** 218272			
Auf		●	**M22-XDP-S-D3** 218273			
Ab		●	**M22-XDP-S-D4** 218274			
Aus		●	**M22-XDP-R-D5** 218275			
Ein		●	**M22-XDP-S-D6** 218276			
Vorwärts		●	**M22-XDP-S-D15** 218277			
Rückwärts		●	**M22-XDP-S-D16** 218278			
Heben		●	**M22-XDP-S-D17** 218279			
Senken		●	**M22-XDP-S-D18** 218280			
STOP		●	**M22-XDP-R-GB0** 218281			
STOP		●	**M22-XDP-S-GB0** 218282			
START		●	**M22-XDP-G-GB1** 218283			
START		○	**M22-XDP-W-GB1** 218284			
CLOSE		●	**M22-XDP-S-GB2** 218285			
UP		●	**M22-XDP-S-GB3** 218286			
DOWN		●	**M22-XDP-S-GB4** 218287			
OFF		●	**M22-XDP-R-GB5** 218289			
ON		●	**M22-XDP-S-GB6** 218290			
TEST		●	**M22-XDP-S-GB9** 218288			
FORWARD		●	**M22-XDP-S-GB15** 218291			
REVERSE		●	**M22-XDP-S-GB16** 218292			

Notes

[1)] When ordering, the part no must include the following details:
1st wildcard * ≙ color: -R, -G, -B, -W, -Y, -S, -GR
2nd wildcard * ≙ file name generated by Labeleditor → Engineering

Text size 3 mm:
max. 8 characters in first line,
10 characters in second line,
8 characters in third line



Text size 5 mm:
Max. 5 characters per line



Inscription or explanation	For use with	Color	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Button plates for mushroom-headed pushbuttons						
≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm						
RAISE	M22(S)-D(R)P-...		**M22-XDP-S-GB17** 218293		10 off	UL/CSA certification not required
LOWER			**M22-XDP-S-GB18** 218294			
Stopp			**M22-XDP-R-X0** 218157			
Stopp			**M22-XDP-S-X0** 218158			
Start			**M22-XDP-G-X1** 218254			
Start			**M22-XDP-S-X1** 218255			
Start			**M22-XDP-W-X1** 218256			
Start			**M22-XDP-G-X2** 218257			
Start			**M22-XDP-S-X2** 218258			
Increase			**M22-XDP-S-X4** 218259			
Acceptance			**M22-XDP-S-X5** 218260			
Direction of movement			**M22-XDP-S-X7** 218261			
Direction of movement			**M22-XDP-S-X8** 218262			
Hand			**M22-XDP-S-X9** 218263			
Automatic			**M22-XDP-S-X10** 218264			
Inch			**M22-XDP-S-X11** 218265			
Unlock			**M22-XDP-S-X12** 218266			
Loosen			**M22-XDP-S-X13** 218267			
Clamp			**M22-XDP-S-X14** 218268			
Release			**M22-XDP-S-X15** 218269			
Liquid			**M22-XDP-S-X16** 218270			
Horn			**M22-XDP-S-X17** 218271			

Inscription or explanation	For use with	Color	Style flat **Part no.** Article no.	**Price** See price list	Std. pack	Style extended **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Lenses for indicator lights									
≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm									
–	M22-L-X M22-LC-X	○	**M22-XL-W** 216453		10 off	**M22-XLH-W** 216459		10 off	UL/CSA certification not required
–		●	**M22-XL-R** 216454			**M22-XLH-R** 216460			
–		●	**M22-XL-G** 216455			**M22-XLH-G** 216461			
–		●	**M22-XL-Y** 216456			**M22-XLH-Y** 216462			
–		●	**M22-XL-B** 216457			**M22-XLH-B** 216463			
With customized inscription via Labeleditor → Note		–	**M22-XL-*-*** [1] 216458						
Zu		●	**M22-XL-W-D2** 218403						
Auf		●	**M22-XL-W-D3** 218404						
Ab		●	**M22-XL-W-D4** 218405						
Aus		●	**M22-XL-R-D5** 218406						
Ein		●	**M22-XL-W-D6** 218407						
Vorwärts		●	**M22-XL-W-D15** 218408						
Rückwärts		●	**M22-XL-W-D16** 218409						
Heben		●	**M22-XL-W-D17** 218410						
Senken		●	**M22-XL-W-D18** 218411						
STOP		●	**M22-XL-R-GB0** 218412						
STOP		●	**M22-XL-W-GB0** 218413						
START		●	**M22-XL-G-GB1** 218414						
START		●	**M22-XL-W-GB1** 218415						
CLOSE		●	**M22-XL-W-GB2** 218416						
UP		●	**M22-XL-W-GB3** 218417						
DOWN		●	**M22-XL-W-GB4** 218418						
TEST		●	**M22-XL-W-GB9** 218419						
OFF		●	**M22-XL-R-GB5** 218420						
ON		●	**M22-XL-W-GB6** 218421						
FORWARD		●	**M22-XL-W-GB15** 218422						

Notes

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1st wildcard ≙ color: -R, -G, -B, -W, -Y, -S
2nd wildcard ≙ file name generated by Labeleditor → Engineering

Text size 3 mm:
max. 8 characters in first line,
10 characters in second line,
8 characters in third line



Text size 5 mm:
Max. 5 characters per line



Lenses for indicator lights

≦ 5 characters: letter height 5 mm
> 5 characters: letter height 3 mm

Inscription or explanation	For use with	Color, symbol	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
REVERSE	M22-L-X M22-LC-X		**M22-XL-W-GB16** 218423		10 off	UL/CSA certification not required
RAISE			**M22-XL-W-GB17** 218424			
LOWER			**M22-XL-W-GB18** 218425			
Stopp			**M22-XL-R-X0** 218163			
Stopp			**M22-XL-W-X0** 218164			
Start			**M22-XL-G-X1** 218384			
Start			**M22-XL-W-X1** 218385			
Start			**M22-XL-G-X2** 218386			
Start			**M22-XL-W-X2** 218387			
Increase			**M22-XL-W-X4** 218388			
Acceptance			**M22-XL-W-X5** 218389			
Direction of movement			**M22-XL-W-X7** 218390			
Direction of movement			**M22-XL-W-X8** 218391			
Hand			**M22-XL-W-X9** 218392			
Automatic			**M22-XL-W-X10** 218393			
Inch			**M22-XL-W-X11** 218394			
Unlock			**M22-XL-W-X12** 218395			
Loosen			**M22-XL-W-X13** 218396			
Clamp			**M22-XL-W-X14** 218399			
Release			**M22-XL-W-X15** 218400			
Liquid			**M22-XL-W-X16** 218401			
Horn			**M22-XL-W-X17** 218402			

Inscription or explanation	For use with	Color	Style flat **Part no.** Article no.	**Price** See price list	Std. pack	Style extended **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Lenses for illuminated pushbutton actuators									
≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm									
–	M22(S)-DL-X M22(S)-DRL-X M22S-DGL-X		**M22-XDL-W** 216441		10 off	**M22-XDLH-W** 216447		10 off	UL/CSA certification not required
–			**M22-XDL-R** 216442			**M22-XDLH-R** 216448			
–			**M22-XDL-G** 216443			**M22-XDLH-G** 216449			
–			**M22-XDL-Y** 216444			**M22-XDLH-Y** 216450			
–			**M22-XDL-B** 216445			**M22-XDLH-B** 216451			
with customized inscription to order via Labeleditor → Note		–	**M22-XDL-*-***[1] 216446			**M22-XDLH-*-***[1] 216452			
Zu			**M22-XDL-W-D2** 218316			**M22-XDLH-W-D2** 218359			
Auf			**M22-XDL-W-D3** 218317			**M22-XDLH-W-D3** 218360			
Ab			**M22-XDL-W-D4** 218318			**M22-XDLH-W-D4** 218361			
Aus			**M22-XDL-R-D5** 218319			**M22-XDLH-R-D5** 218362			
Ein			**M22-XDL-W-D6** 218320			**M22-XDLH-W-D6** 218363			
Entsperren			**M22-XDL-B-D14** 218321			**M22-XDLH-B-D14** 218364			
Vorwärts			**M22-XDL-W-D15** 218322			**M22-XDLH-W-D15** 218365			
Rückwärts			**M22-XDL-W-D16** 218323			**M22-XDLH-W-D16** 218366			
Heben			**M22-XDL-W-D17** 218324			**M22-XDLH-W-D17** 218367			
Senken			**M22-XDL-W-D18** 218325			**M22-XDLH-W-D18** 218368			
STOP			**M22-XDL-R-GB0** 218326			**M22-XDLH-R-GB0** 218369			
STOP			**M22-XDL-W-GB0** 218327			**M22-XDLH-W-GB0** 218370			
START			**M22-XDL-G-GB1** 218328			**M22-XDLH-G-GB1** 218371			
START			**M22-XDL-W-GB1** 218329			**M22-XDLH-W-GB1** 218372			
CLOSE			**M22-XDL-W-GB2** 218330			**M22-XDLH-W-GB2** 218373			
UP			**M22-XDL-W-GB3** 218331			**M22-XDLH-W-GB3** 218374			
DOWN			**M22-XDL-W-GB4** 218332			**M22-XDLH-W-GB4** 218375			
TEST			**M22-XDL-W-GB9** 218333			**M22-XDLH-W-GB9** 218376			
OFF			**M22-XDL-R-GB5** 218334			**M22-XDLH-R-GB5** 218377			
ON			**M22-XDL-W-GB6** 218335			**M22-XDLH-W-GB6** 218378			

Notes

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2nd wildcard * ≙ File name generated by Labeleditor → Engineering

Text size 3 mm:

max. 8 characters in first line,
10 characters in second line,
8 characters in third line

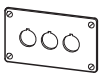
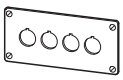
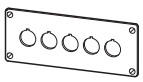
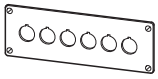
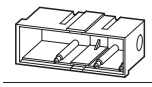
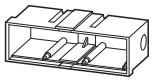
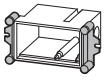


Text size 5 mm:

Max. 5 characters per line



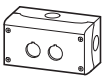
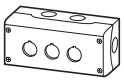
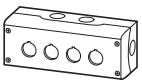
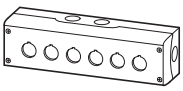
Inscription or explanation	For use with	Color, symbol	Style flat **Part no.** Article no.	**Price** See price list	Std. pack	Style extended **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Lenses for illuminated pushbutton actuators									
≦ 5 characters: letter height 5 mm > 5 characters: letter height 3 mm									
RESET	M22(S)-DL-X M22(S)-DRL-X M22S-DGL-X		**M22-XDL-B-GB14** 218336		10 off	**M22-XDLH-B-GB14** 218379		10 off	UL/CSA certification not required
FORWARD			**M22-XDL-W-GB15** 218337			**M22-XDLH-W-GB15** 218380			
REVERSE			**M22-XDL-W-GB16** 218338			**M22-XDLH-W-GB16** 218381			
RAISE			**M22-XDL-W-GB17** 218339			**M22-XDLH-W-GB17** 218382			
LOWER			**M22-XDL-W-GB18** 218340			**M22-XDLH-W-GB18** 218383			
Stopp			**M22-XDL-R-X0** 218159			**M22-XDLH-R-X0** 218161			
Stopp			**M22-XDL-W-X0** 218160			**M22-XDLH-W-X0** 218162			
Start			**M22-XDL-G-X1** 218295			**M22-XDLH-G-X1** 218341			
Start			**M22-XDL-W-X1** 218296			**M22-XDLH-W-X1** 218342			
Start			**M22-XDL-G-X2** 218297			**M22-XDLH-G-X2** 218343			
Start			**M22-XDL-W-X2** 218301			**M22-XDLH-W-X2** 218344			
Increase			**M22-XDL-W-X4** 218302			**M22-XDLH-W-X4** 218345			
Acceptance			**M22-XDL-W-X5** 218303			**M22-XDLH-W-X5** 218346			
Reset			**M22-XDL-B-X6** 218304			**M22-XDLH-B-X6** 218347			
Directions			**M22-XDL-W-X7** 218305			**M22-XDLH-W-X7** 218348			
Directions			**M22-XDL-W-X8** 218306			**M22-XDLH-W-X8** 218349			
Hand			**M22-XDL-W-X9** 218307			**M22-XDLH-W-X9** 218350			
Automatic			**M22-XDL-W-X10** 218308			**M22-XDLH-W-X10** 218351			
Inch			**M22-XDL-W-X11** 218309			**M22-XDLH-W-X11** 218352			
Unlock			**M22-XDL-W-X12** 218310			**M22-XDLH-W-X12** 218353			
Loosen			**M22-XDL-W-X13** 218311			**M22-XDLH-W-X13** 218354			
Clamp			**M22-XDL-W-X14** 218312			**M22-XDLH-W-X14** 218355			
Release			**M22-XDL-W-X15** 218313			**M22-XDLH-W-X15** 218356			
Liquid			**M22-XDL-W-X16** 218314			**M22-XDLH-W-X16** 218357			
Horn			**M22-XDL-W-X17** 218315			**M22-XDLH-W-X17** 218358			

		Protection type	Mounting locations Number	Color	RAL value	Knock-out cable entries Number × M20	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Flush mounting panels										
No legend plates possible with vertical arrangements Protection type only in conjunction with a suitable enclosure and correct mounting.										
Aluminium with yellow paint finish for Emergency switching off		IP65	1		RAL 1004	–	**M22-EY1** 216542		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
Aluminium light anodized, including M22-XE...			1		RAL 7035	–	**M22-E1** 216541			
			2			–	**M22-E2** 216543			
			3			–	**M22-E3** 216544			
			4			–	**M22-E4** 216545		1 off	
			5			–	**M22-E5** 216546			
		IP40	6			–	**M22-E6** 216547			
Shrouds										
Plastic, light grey Protection type only in combination with flush mounting plates M22-E…										
		IP55	1		RAL 7035	3	**M22-H1** 216548		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
			2			4	**M22-H2** 216549			
			3			4	**M22-H3** 216550			
		IP40	4			4	**M22-H4** 216551			
			5			5	**M22-H5** 216552			
			6			6	**M22-H6** 216553			
Set of plaster keys										
Comprising two plaster keys as mounting aids For plastering of shrouds										
		-	–	–	–	–	**M22-UPE** 216554		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13

Surface mounting enclosures

With high-grade steel screws
Enclosure base: anthracite

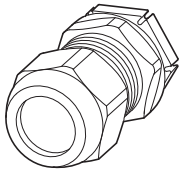
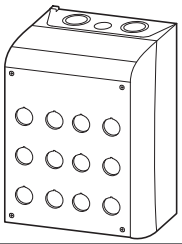
ATEX ATEX part numbers for use in dust-laden areas, Zone 22, Category 3
→ Engineering
totally insulated

	Mounting locations	Cable entry knockouts		Color	RAL value	Protection type	**Part no.** Article no.	**Price** See price list	Std. pack
		Floor	Pages						
	Number	Number × M…	Number × M…						
For emergency-switching-off pushbuttons	1	2 x 16	1 x 20 2 x 25/20		RAL 1004	IP67, IP69K	**M22-IY1** 216536		1 off
	1	2 x 16	1 x 20 2 x 25/20		RAL 1004	IP67, IP69K	**M22-IY1-ATEX** 104370		1 off
	1	2 x 16	1 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I1** 216535		1 off
	1	2 x 16	1 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I1-ATEX** 104371		1 off
	2	2 x 20	1 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I2** 216537		1 off
	2	2 x 20	1 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I2-ATEX** 104372		1 off
	3	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I3** 216538		1 off
	3	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I3-ATEX** 104373		1 off
	4	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I4** 216539		1 off
	4	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP67, IP69K	**M22-I4-ATEX** 104374		1 off
	6	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP66	**M22-I6** 216540		1 off
	6	2 x 20	2 x 20 2 x 25/20		RAL 7035	IP66	**M22-I6-ATEX** 104375		1 off

Notes

Information relevant for export to North America

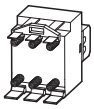
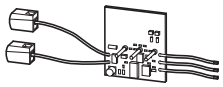
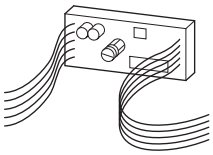
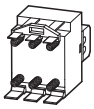
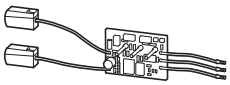
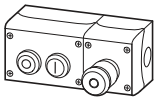
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

	Mounting locations	Cable entry knockouts		Color	RAL value	Protection type	**Part no.** Article no.	**Price** See price list	Std. pack
		Floor	Pages						
	Number	Number × M…	Number × M…						
M20 connecting screw									
For connection of any M22-I... surface mounting enclosures Mounting by M20 cable entry from the side									
	–	–	–	–	–	IP67	**M22-XI** 229162		25 off
M20 metric cable glands according to EN 50262									
With lock nut and built-in strain relief Polyamide, halogen free External diameter of cable 6 - 13 mm									
	–	–	–	–	–	IP68, IP69K	**V-M20** 206910		20 off
Surface mounting enclosures									
Including mounting plate for base fixing Enclosure base: anthracite totally insulated									
	12	2 x 32/25	2 x 20 4 x 32/25		RAL 7035	IP55	**M22-I12** 222688		1 off

Notes

Information relevant for export to North America

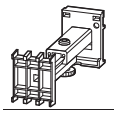
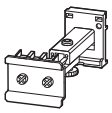
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 3R, 4X, 12, 13

		Description	Part no. Article no.	Price See price list	Std. pack
AS-Interface connection for RMQ-Titan					
	For front mounting (RMQ-Titan)	AS-Interface slave Adapter element for RMQ-Titan AS-Interface information: 2 input bits, 1 output bit Module enclosure for snap fitting on the contact and LED elements: Inputs for 2 contact elements: M22-K01 (normally closed contact), M22-K10 (normally open contact) Output for 1 LED element: M22-LED-... Including AS-Interface connector as insulation piercing terminal	**M22-ASI** 231269		1 off
	for base fixing (RMQ-Titan)	Adapter element for RMQ-Titan AS-Interface information: 2 input bits, 1 output bit Inputs for two contacts Output for 1 LED element: M22-LED-...	**M22-ASI-C** 231271		1 off
	For surface mounting enclosures (RMQ-Titan)	External connections: 4 inputs/4 outputs For contact and lamp socket elements. RMQ-Titan surface mounting enclosures: M22-I3, M22-I4, M22-I6	**RMQ-M1C-ASI** 032314		1 off
Emergency switching off connections for AS-Interface for safety monitor					
For front fixing 		AS-Interface slave Adapter element for RMQ-Titan AS-Interface information: 1 dual-channel input, 1 output Module enclosure for snap fitting on the contact and LED elements: Inputs for 2 contact elements: M22-K01 (NC) Output for 1 LED element: M22-LED-... Including AS-Interface connector as insulation piercing terminal	**M22-ASI-S** 231270		1 off
For base fixing 		AS-Interface slave Adapter element for RMQ-Titan or FAK AS-Interface information: 1 dual-channel input, 1 output For the following RMQ-Titan contact and LED elements: Inputs for 2 contact elements: M22-K01 (NC), M22-K01 (NC) Output for 1 LED element: M22-LED-...	**M22-ASI-CS** 231272		1 off
AS-Interface complete unit					
		M22-I2 and M22-I2Y surface mounting enclosures M22-PVL emergency-off button actuator and ON-OFF pushbutton actuator; ON illuminated 1 × M22-AS-Interface-CS and 1 × M22-AS-Interface-C 1 x M12A connector Addressing M22-PVL → 0; ON-OFF 1 A	**M22-I1/2-M1-ASI** 107405		1 off

Information relevant for export to North America

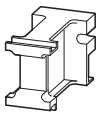
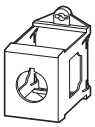
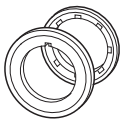
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

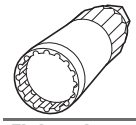
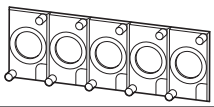
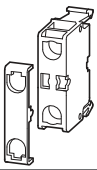
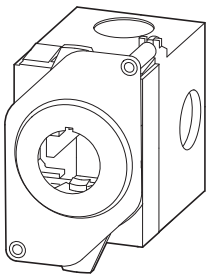
	For use with	Color	RAL value	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Bezel gold (24 karat)							
Bezel not available individually: Can be ordered only through Eaton sales office as M22-COMBINATION-* (customer-specific complete devices)							
	–	–	–	**M22-FR-AU** 274150		1 off	UL/CSA certification not required
Blanking plugs							
ATEX → Engineering round design, IP67, IP69K For closing off of spare mounting locations							
	–		RAL 7035	**M22-B** 216388		50 off	NA Certification: Request filed for UL and CSA Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	–		RAL 7035	**M22-B-GVP** 216389		250 off	
	–		RAL 9005	**M22S-B** 216390		50 off	
	–		RAL 9005	**M22S-B-GVP** 216391		250 off	
Pushbutton diaphragm for IP67, IP69K, silicone							
ATEX → Engineering Transparent diaphragms for severe environmental conditions and use in the food industry. Do not use with legend plate mount M22S-ST since degree of protection is not guaranteed							
	M22(N/O)-D-(R)-... M22(N/O)-DL-..., M22(N/O)-DRL-... M22(N/O)-L(C)-...	–	–	**M22-T-D** 216395		10 off	NA Certification: Request filed for UL and CSA Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
	M22(N/O)-DDL...	–	–	**M22-T-DD** 216396		10 off	

	For use with	Color	RAL value	**Part no.** Article no.	**Price** See price list	Std. pack
Protective diaphragm, silicone						
ATEX → Engineering Prevents ingress of dirt and dust into the key opening						
	M22-WS...	–	–	**M22-XWS** 231275		5 off
Telescopic clip						
For adjusting mounting depth for mounting in enclosures CI and panels with mounting depths from 115 to 155 mm. Infinitely adjustable, screw- and snap-on mounting (mounting rail IEC/EN 60715) up to 10 × M22-TC per enclosure permissible, of which 5 with maintained buttons. Do not use in combination with emergency switching-off pushbuttons						
Three contact/LED elements with base fixing, Including centring adapter						
	–	–	–	**M22-TC** 216398		10 off
With top-hat rail IEC/EN 60715, width 44 mm For mounting of EASY, FAZ, PKZ, DIL etc. weighing ≦ 0.3 kg						
	EASY200, EASY500, EASY700, EASY800, MFD-CP8, EC4P Infinitely adjustable via scale from 75 to 115 mm	–	–	**M22-TA** 226161		1 off

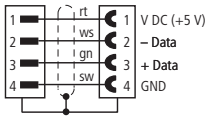
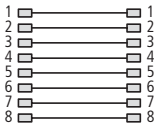
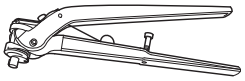
Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Extension					
	Telescopic clip for mounting depth 205 mm	**M22-TCV** 225527		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
IVS top-hat rail adapter					
	Top-hat rail to IEC/EN 60715 for front fixing	**M22-IVS** 216400		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Plunger bridge					
For actuating the middle contact element of the M22-W...3 non-illuminated 3-position selector switch actuator → Engineering					
	Middle contact of 3-position selector switch non-illuminated, (1 off) black	**M22-XW** 216405		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Guardring					
ATEX → Engineering To protect against accidental operation, IP66					
	For pushbutton and selector switch actuators (button plates cannot be used)	**M22-XGWK** 231274		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA no. 3R, 4X, 12, 13
Threaded ring					
M22 x 1.5 mm					
	6.0 mm thick	**M22-GR** 216401		50 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	4.8 mm thick	**M22-GR7** 288852		50 off	
	6.0 mm thick	**M22-GR-GVP** 216404		500 off	
Set of adapter rings, 30/22.3 mm					
Black, consisting of adapter ring and fixing nut, IP67, IP69K					
	Mounting of ∅ 22.3 devices in ∅ 30.5 drilling dimensions Protection type is determined by the front element.	**M22S-R30** 216408		10 off	UL/CSA certification not required

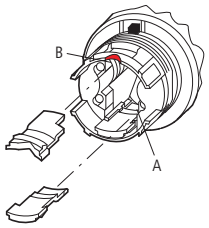
	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Mounting ring tool					
	Threaded ring, can be fitted on to electric screwdriver	**M22-MS** 216402		5 off	UL/CSA certification not required
Fixing plate					
	M22-H… shrouds to the M22-E… flush mounting panel for up to 5 mounting locations	**M22-XE5** 218945		1 off	UL/CSA certification not required
Dust cover					
	for M22-K-… contacts (front fixing)	**M22-XKDP** 100647		50 off	UL/CSA certification not required
Dust cover and mechanical fixing for M22... 5 x M20 knockouts					
	Max. 3 contacts	**M22-ADC** 106523		1 off	
	Max. 4 contacts	**M22-ADC4** 106524			
	Mechanical fixing	**M22-XADC** 107918			

	Model	Lifespan at t_a = +25 °C $t_{average}$ (AC) h	Color		Part no. Article no.	Price See price list	Std. pack
BA 9s filament bulbs for compact indicator lights High-grade versions from selected manufacturers							
	110 - 130 V/2.4 W	2000	–	–	**A22-GL130** 261361		100 off
	24 V/2.0 W	5000	–	–	**A22-GL24** 261360		100 off
BA 9s single-chip LEDs for compact indicator lights For AC and DC (positive pole connected to X1), protected against polarity reversal, integral suppressor circuit-breaker up to 1500 V							
	12 - 30 V AC/DC/15 mA	100000	○	White	**A22-LED-W** 261362		10 off
	12 - 30 V AC/DC/15 mA	100000	●	Red	**A22-LED-R** 261364		
	12 - 30 V AC/DC/15 mA	100000	●	Green	**A22-LED-G** 261363		
	12 - 30 V AC/DC/15 mA	100000	●	Yellow	**A22-LED-Y** 261365		

	For use with	Color	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Built-in 2.0 A/A USB socket with connection cable							
IP65 with closed cover IP20 with plug connected							
	Front mounting prefabricated cable (60 cm) with permanently connected USB 2.0 A type	–	**M22-USB-SA** 107412		1 off		NA Certification: Request filed for UL and CSA
Built-in RJ45 socket							
IP65 with closed cover IP20 with plug connected							
	Front mounting RJ45, 8/8	–	**M22-RJ45-SA** 107413		1 off		NA Certification: Request filed for UL and CSA
Pushbuttons							
For enclosed overload relays Mounting diameter: 22.3 mm							
	ZW7... ZB12 ZB32 ZB65 ZB150	●	**M22-DZ-B** 254833		10 off	Blue button plate	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
		●	**M22-DZ-B-GB14** 254834			Blue button plate Inscription: RESET	
		–	**M22-DZ-X** 254835			Without button plate, add button plate.	
	M22-DZ-X M22(S)-D-X M22(S)-DR-X M22-D6-X	●	**M22-XD-R** 216423		10 off	Red button plate	UL/CSA certification not required
		◎	**M22-XD-R-X0** 218153			Red button plate with white circle	
		●	**M22-XD-R-GB0** 218194			Red button plate Inscription: STOP	
Bulb extractor							
With compact indicator light M22-LC(H)...							
	A22-GL... A22-LED...	–	**M22-LG** 216403		5 off	–	UL/CSA certification not required
Notching tool							
Punching tool to produce the cutout for the anti-rotation lug to IEC/EN 60947-5-1 St 37 sheet steel, max. 3 mm thickness VA high-grade steel max. 1.5 mm thickness							
		–	**BA/C-NZ-22** 028144		1 off	Price not eligible for discount	UL/CSA certification not required
ATEX (only in conjunction with M22-COMBINATION-*)							
For use in accordance with the ATEX directive in dust-laden areas, Zone 22, Category 3 → Engineering							
–	–	–	**M22-ATEX** 104380		1 off	–	
Customized complete unit							
→ Engineering To order use form FO315 → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; max. 10 characters.							
–	–	–	**M22-COMBINATION-*** 228298		1 off	–	

Engineering

For converting the maintained/momentary function and the key withdraw for 3 positions selector switch actuators



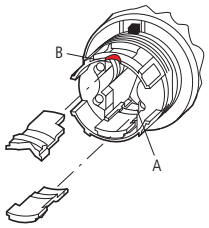
	I	O	II
	A		B
60° ⇓ 60°	– ✔	✔	– ✔
50° ⇓ 50°	✔ ×	✔	✔ ×
60° ⇓ 50°	– ✔	✔	✔ ×
50° ⇓ 60°	✔ ×	✔	– ✔
40° ⇔ 40°	✔ ×	✔	✔ ×
60° ⇓ 40°	– ✔	✔	✔ ×
50° ⇓ 40°	✔ ×	✔	✔ ×
40° ⇔ 60°	✔ ×	✔	– ✔
40° ⇔ 50°	✔ ×	✔	✔ ×

✓ = key withdrawable
x = key not withdrawable

Coding adapters

2x M22-XC-Y → Page 2/23
1x M22-XC-R, → Page 2/23
1x

For converting between maintained/momentary function and key withdraw for 2 positions selector switch actuators



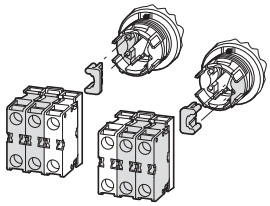
	O	I
		B
⇓ 60°	✔	– ✔
⇓ 50°	✔	✔ ×
⇒ 40°	✔	✔ ×

✓ = key withdrawable
x = key not withdrawable

Coding adapters

2x M22-XC-Y, → Page 2/23
1x M22-XC-R, → Page 2/23
1x

Plunger bridge for the middle contact on 3-position selector switches M22(S)-W…3-…



Customized inscription of devices using the Labeleditor software

Individually inscribe your device in 4 stages:
- Download the inscription software: www.moeller.net/support, keyword: “Labeleditor”
- Create label template (menu-guided in the software)
- Send the label template to the factory by email. The email address is automatically set for the selected product by the program. When your template is sent, the Labeleditor issues a file name such as “RMQ_Silver_12345.zip”. This file name is part of the article to be ordered (see Ordering examples).
- Send order to the Eaton office or the electrical wholesalers.

Ordering examples

- M22-XST insert plate for M22S-ST-X legend plate mount with special inscription

Basic type: M22-XST-*
* = File name generated by Labeleditor
Please order: 1 x M22-XST-RMQ_Silver_xxxxxx.zip

- Button plate in green with special inscription

Basic type: M22-XDH-*
1. * = Colour (here “G” for green), 2.* = File name generated by Labeleditor* = File name generated by Labeleditor
Please order: 1 x M22-XDH-G-RMQ_Silver_xxxxx.zip

- Double pushbutton actuator with white button plates and special symbols

Basic type: M22-DDL-*-*-*
1. * = Colour (here “W” for white), 2. and 3. * = File name assigned by Labeleditor; must be stated here 2 x
Please order: 1 x M22-DDL-W-RMQ_Silver_xxxxx.zip-RMQ_Silver_xxxxx.zip

- Key-operated button, 2 positions, Individual lock mechanism no. MS1, individual symbol

Basic type: M22-WRS*-MS*-*
WRS*: * = Number of positions,
MS*: * = number of individual lock mechanism
-*: * = File name assigned by Labeleditor
Please order: 1 x M22-WRS2-MS1-RMQ_Silver_xxxxxx.zip

ATEX Ex

ATEX = ATmosphere Explosible (explosive atmosphere)
Eaton supplies devices from the RMQ-Titan and FAK range in compliance with **ATEX Directive 94/9/EC** (binding as of 06/2003). The switches are approved for device group II, the application “everything, except for mining” and for category 3 (normal safety). The approval has the test number BVS 06 ATEX E023U, BVS 06 ATEX E024X. The housings, pushbutton actuators, indicator lights, and foot and palm switches have the equipment code II3D IP5X T85°C.
According to **Directive 1999/92/EC** for the operator (binding as of 06/2006), approved devices with test number BVS 06 ATEX E023U, and BVS 06ATEX E024 may be used in dust-laden areas, Zone 22, Category 3. The devices with surface-mounting enclosures with ATEX approval are used in dust-laden/hazardous areas, such as the following: mills, metal grinding works, wood processing works, cement works, aluminum industry, foodstuffs industry, grain storage and processing, and agriculture.

ATEX ordering examples:

- M22 complete unit

M22-COMBINATION-*	User-definable customer ID; up to 10 characters → Page 2/6
M22-I1-ATEX	ATEX housing → Page 2/45
M22-D-S	Pushbutton actuator → Page 2/17
M22-KC10	Contact (N/O) → Page 2/31
M22-KC01	Contact (NC) → Page 2/31

- M22 front element

M22-COMBINATION-*	User-definable customer ID; up to 10 characters → Page 2/6
M22-D-S	Pushbutton actuator → Page 2/17
M22-ATEX	ATEX complement suffix → Page 2/51

- FAK complete unit

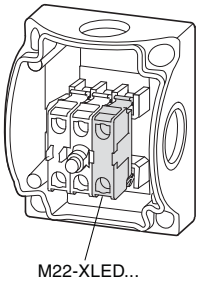
FAK-COMBINATION-*	User-definable customer ID; up to 10 characters → Page 2/78
FAK-ATEX	ATEX accessory → Page 2/78
FAK-IU	Enclosure base → Page 2/78
FAK-S	Enclosure top → Page 2/78
M22-KC10	Normally open contact (N/O) → Page 2/31
M22-KC10	Normally closed contact → Page 2/31

Engineering

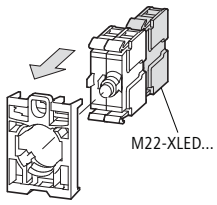
LED series resistor elements

M22-XLED

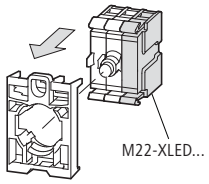
Surface mounting enclosure



Flush mounting at the rear

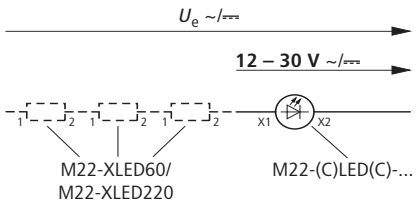


Flush mounting at the side



LED resistor element

M22-XLED60/M22-XLED220

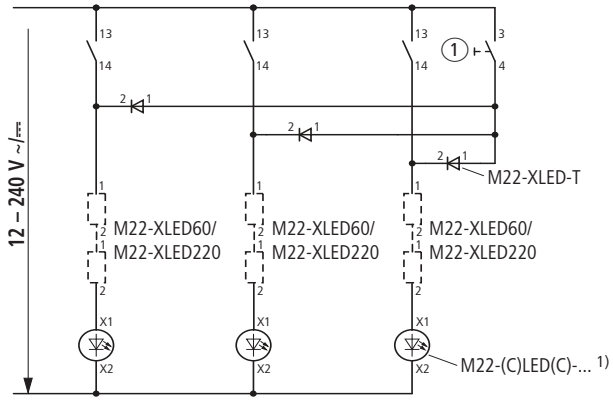


M22-XLED60	1 x	2 x	3 x	4 x	5 x	6 x	7 x
$U_{e\ [AC/DC]}$ ≦	60 V	90 V	120 V	150 V	180 V	210 V	240 V

M22-XLED220	1 x
$U_{e\ [AC/DC]}$ ≦	220 V

LED test element

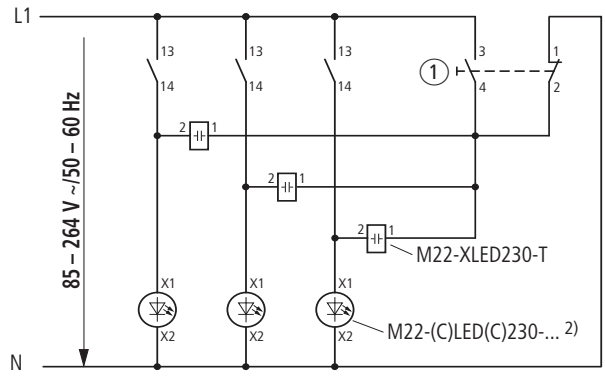
M22-XLED-T

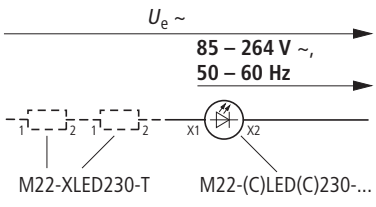


① Test button

1) Only for 12 - 30 V elements

M22-XLED230-T

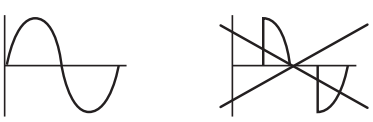




M22-XLED230-T	1 ×	2 ×
U_e ≦	400 V~	500 V~

① Test button

2) Only for 85 - 264 V elements



Technical data

				Contact elements	Double-contact elements	LED-elements	Illuminated pushbutton actuators, Pushbutton , Mushroom-headed pushbuttons momentary	Double actuators	Selector switch actuators, Illuminated selector switch actuators
General									
Standards				IEC/EN 60947 VDE 0660					
Lifespan, mechanical		Switch operations	x 10^6	5	–	–	5	0.2	0.1
Operating frequency		Switch operations/h		≦ 3600	≦ 3600	–	≦ 3600	≦ 3600	≦ 2000
Actuating force			N	5	10	–	5	5	–
Operating torque (screw terminals)			Nm	0.8	–	0.8	–	–	0.3
Protection type (IEC/EN 60529)				IP20	IP20	IP20	IP67, IP69K	IP66	IP66
Climatic proofing				Damp heat, constant as per IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30					
Ambient temperature									
Open			°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Mounting position				Any	Any	Any	Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal			g	30	30	30	30	30	30
Terminal capacity									
Solid			mm^2	0.75 - 2.5	0.5 - 1.5	0.75 - 2.5	–	–	–
Stranded			mm^2	0.5 - 2.5	0.5 - 1.5	0.5 - 2.5	–	–	–
Flexible with ferrule			mm^2		0.5 - 1.0	–	–	–	–
Contacts									
Rated impulse withstand voltage		U_{imp}	V AC	6000	4000	6000	–	–	–
Rated insulation voltage		U_i	V	500	250	500	–	–	–
Overvoltage category/degree of pollution				III/3	III/3	III/3	–	–	–
Control circuit reliability									
At 24 V DC/5 mA		H_F	Fault probability	< 10^{-7} (i.e. 1 failure to 10^7operations)	–	–	–	–	–
At 5 V DC/1 mA		H_F	Fault probability	< 5 × 10^{-6} (i.e. 1 failure to 5 × 10^6operations)	–	–	–	–	–
Max. short-circuit protective device									
Fuseless			Part no.	PKZM0–10/FAZ-B6/1	PKZM0–10/FAZ-B6/1	–	–	–	–
Fuse		gG/gL	A	10	10	–	–	–	–
Switching capacity									
Rated operation current									
AC-15									
	115 V	I_e	A	6	6	–	–	–	–
	230 V	I_e	A	6	6	–	–	–	–
	400 V	I_e	A	4	–	–	–	–	–
	500 V	I_e	A	2	–	–	–	–	–
DC-13									
	24 V	I_e	A	3	3	–	–	–	–
	42 V	I_e	A	1.7	–	–	–	–	–
	60 V	I_e	A	1.2	–	–	–	–	–
	110 V	I_e	A	0.8	0.6	–	–	–	–
	220 V	I_e	A	0.3	0.3	–	–	–	–
Lifespan, electrical									
AC-15									
	230 V/0.5 A	Switch operations	x 10^6	1.6	–	–	–	–	–
	230 V/1.0 A	Switch operations	x 10^6	1	–	–	–	–	–
	230 V/3.0 A	Switch operations	x 10^6	0.7	–	–	–	–	–
DC-13									
	12 V/2.8 A	Switch operations	x 10^6	1.2	–	–	–	–	–

			Key-operated buttons	Indicator light, Compact acoustic device, Compact indicator light, Potentiometer	Illuminated push-button actuators, Pushbutton actuators, Mushroom-headed pushbuttons maintained	Emergency stop pushbuttons, emergency switching-off pushbuttons actuators
General						
Standards			IEC/EN 60947 VDE 0660	IEC/EN 60947 VDE 0660	IEC/EN 60947 VDE 0660	IEC/EN 60947 VDE 0660
Lifespan, mechanical	Operations	x 10^6	0.1	–	1	0.1
Operating frequency	Operations/h		≦ 100	–	≦ 1800	≦ 600
Actuating force		N	–	–	5	50
Operating torque		Nm	0.5	–	–	–
Protection type (IEC/EN 60529)			IP66	Indicator light compact: IP67, IP69K Acoustic device, compact: IP40 Potentiometer: IP66	IP67, IP69K	IP67, IP69K
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Mounting position			Any	Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal		g	30	30	30	50
Terminal capacity						
Solid		mm^2	–	0.5 - 1.5	–	–
Stranded		mm^2	–	0.5 - 1.5	–	–
Contacts						
Rated impulse withstand voltage	U_{imp}	V AC	–	4000	–	–
Rated insulation voltage	U_i	V	–	250	–	–
Overvoltage category/pollution degree			–	III/3	–	–

M22-AS-Interface..., RMQ-..., AS-Interface

		AS-Interface connection for RMQ-Titan RMQ-M1C-ASI	Adapter element for RMQ-Titan M22-ASI	 M22-ASI-C
General				
Standards		EN 50081-1 EN 50082-1	IEC/EN 60947, DIN EN 50 295	IEC/EN 60947, DIN EN 50 295
Radio interference suppression		EN 55011, EN 55022	EN 55011, EN 55022	EN 55011, EN 55022
Limit value class		A	–	–
Protection type		IP20	IP20	IP00
Climatic proofing		Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature				
Open	°C	+25 - +55	+25 - +55	+25 - +55
Shock resistance, shock duration 11 ms	g	> 30	> 30	> 30
Vibrations IEC 60068-2-27 (amplitude 1 mm)	Hz	10 - 55	–	–
Dimensions	mm	92 x 46 x 30	–	–
Weight	kg	0.1	–	–
Fixing		Front fixing for RMQ-Titan	Front fixing for RMQ-Titan	Base fixing for RMQ-Titan
Mounting position		Any	Any	Any
Power supply				
Rated voltage to AS-Interface Specification	V DC	26.5 - 31.6	26.5 - 31.6	26.5 - 31.6
Terminal type		–	Yellow plug-in terminal as insulation piercing terminal	2 cables on board
Current supply		Completely from the AS-Interface cable	Completely from the AS-Interface cable	Completely from the AS-Interface cable
Addressing		Via AS-Interface line connection	Via AS-Interface line connection	Via AS-Interface line connection
Total power consumption of the AS interface	mA	–	≦ 40	≦ 40
AS-Interface		Protected against polarity reversal	Protected against polarity reversal	Protected against polarity reversal
Rated operational current at full load	mA	120	–	–
Rated operational current when idle (no I, Ω set)	mA	normally 30	–	–
LED status indication		AS-Interface voltage: green LED	AS-Interface power line: green LED on element back AS-Interface ERROR, failure of AS-Interface master: red LED on element back	AS-Interface line POWER: green LED on card AS-Interface ERROR, failure of AS-Interface master: red LED on card
Inputs				
Inputs, protected against short-circuit	Number	4 (1 internal + 3 external)	2 (normally 22 V/5 mA)	2 (normally 22 V/5 mA)
Voltage range	V DC	24 - 30	–	–
Rated current per input	mA	normally 3.5	–	–
Switching level, high signal	V	≧ 15	–	–
Low signal	mA	–	–	–
Length of connecting cables	cm	≦ 200	–	–
Outputs				
Outputs, protected against short-circuit	Number	4 (1 internal + 3 external)	1 (normally 19 V/8 mA)	1 (normally 19 V/8 mA)
Voltage range	V DC	24 V DC (+10/-15%)	–	–
Max. current carrying capacity				
All outputs		–	–	–
Σ 3 external outputs		60	–	–
Length of connecting cables	cm	≦ 200	–	–
Profile		S-7.0	S-3.A.E	S-3.A.E
Specification		2.0	2.1	2.1
Addresses	Number	31	62	62

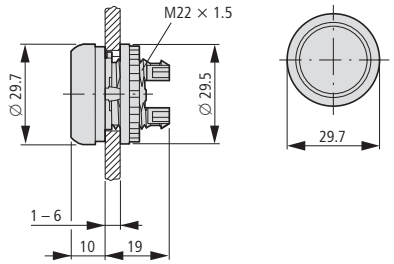
		M22-ASI-S	M22-ASI-CS
Emergency-stop connections			
Connection to AS-Interface cable		Yellow plug-in terminal as insulation piercing terminal	2 cables on board
Energy supply		Completely from the AS-Interface cable 26.5 - 31.6 V DC	Completely from the AS-Interface, cable 26.5 - 31.6 V DC
Fixing		RMQ-Titan front fixing	RMQ-Titan base fixing
Addressing		Via AS-Interface cable	Via AS-Interface cable
Max. total current	mA	45	45
Ambient temperature	°C	-25 – +55	-25 – +55
Mechanical shock resistance		30 g/11 ms to IEC 60068-2-27	30 g/11 ms to IEC 60068-2-27
Protection type		IP20	IP00
Climatic proofing		Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30
Mounting position		Any	Any
Standards		EN 50178 EN 50295	EN 50178 EN 50295
Inputs		Dual-channel input (22 V/5 mA) (modulated with code sequence) (2 RMQ-Titan M22-K01 NC contact elements)	Dual-channel input (22 V/5 mA) (modulated with code sequence) (2 RMQ-Titan M22-K01 NC contact elements)
Outputs		1 output, normally 19 V/ 8 mA, protected against short-circuit	1 output, normally 19 V/ 8 mA, protected against short-circuit
Status indicators			
Power AS-Interface cable		Green LED on rear	Green LED on rear
Error AS-Interface, failure of AS-Interface master		Red LED on rear	Red LED on rear
Profile		S -7.B.E	S -7.B.E

UL-File No. 29184	**Pilot Duty**	**General Use**	**Terminal capacity**
Rating data for approved types to UL/CSA [1)]			
RMQ16 contact elements			
E10	C 300, Q 300		Cu cable min. AWG 18, max. AWG 14
E 01	C 300, R 300		
RMQ-Titan contact elements			
M22-K... M22-CK...	A 600, Q 300, > 300 V AC same polarity	10 A –600 V AC 1 A –250 V DC	2 x 14 - 18 AWG 2 x 12 - 22 AWG
RMQ-Titan LED elements			
M22-LED... M22-CLED...			2 x 14 - 18 AWG 2 x 12 - 22 AWG
M22-LC(H) M22-AMC			2 x 16 - 20 AWG 2 x 16 - 20 AWG

		UL 508 requirements **UL 4X**	**NEMA recommendation** **NEMA 13**
Protection types, RMQ-Titan			
All front elements	M22(S)-...	●	●
Legend plates	M22S-ST...	●	●
Emergency switching off labels	M22-XAK... M22-XZK... M22-XBK... M22-XYK...	● ● ● ●	● ● ● ●
Foot and palm switches	FAK-...	●	●
Signal towers	SL-...	●	–

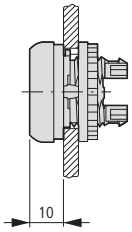
Dimensions

Actuating and indicator elements

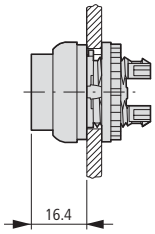


RMQ-Titan pushbutton actuators

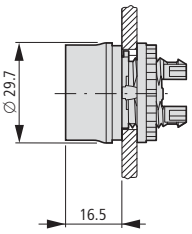
M22...-D-...



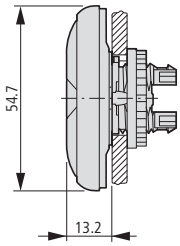
M22...-DH...



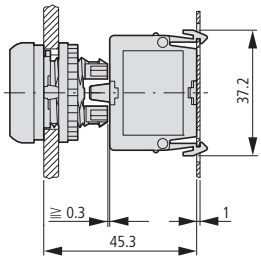
M22-DG(L)...



M22...-DD...

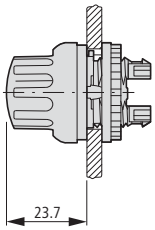


M22-D pushbuttons in base fixing

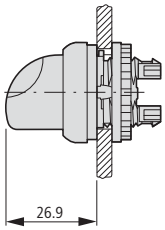


RMQ-Titan selector switch actuators

M22-W...



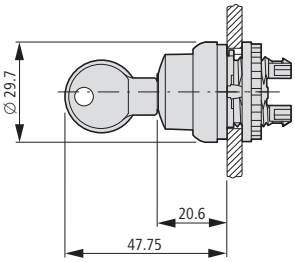
M22...-WL...



RMQ-Titan key-operated button

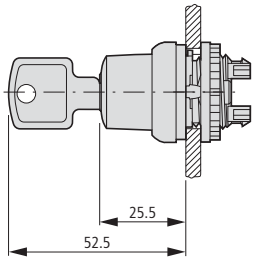
Individual lock mechanism

M22...-W(R)S...



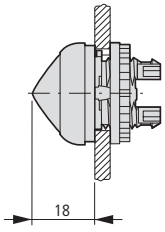
Master key systems

M22…-W…S-SA…

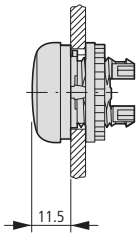


RMQ-Titan indicator light

M22-LH-...

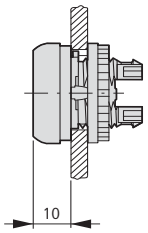


M22-L...

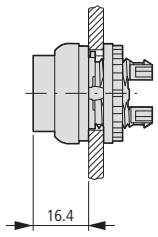


RMQ-Titan illuminated pushbutton actuators

M22...-DL-...

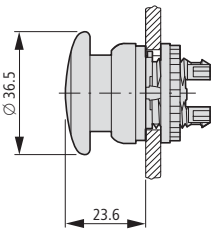


M22...-DLH...



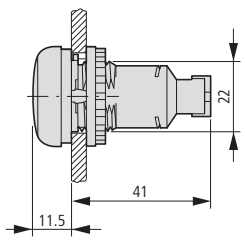
RMQ-Titan mushroom-headed pushbutton

M22...-DP-...

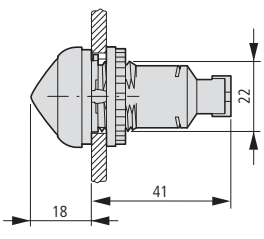


Indicator light, compact acoustic device, compact

M22-LC-...
M22-AM…

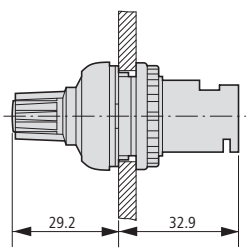


M22-LCH-...



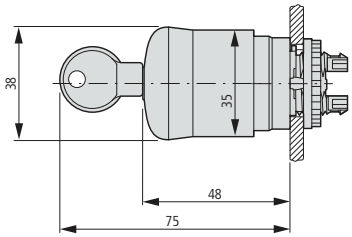
Potentiometer

M22...-R...K

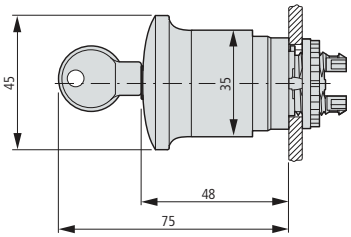


Emergency stop pushbuttons/ emergency switching off pushbutton actuators

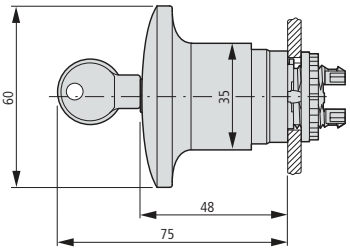
Mushroom-shaped
M22-PV...
M22S-PV...
M22-PVL...
M22-PVS...



Palm-shaped
M22-PV...

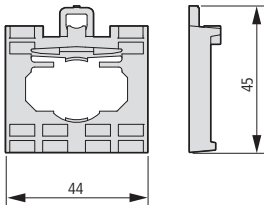


M22-PV...60...

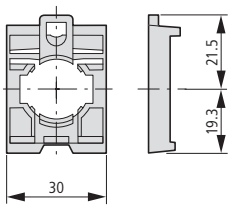


Front fixing (Construction type: Style Flat)

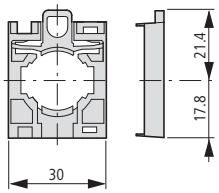
Fixing adapters
M22-A…



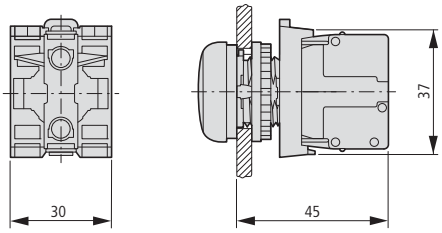
M22-A



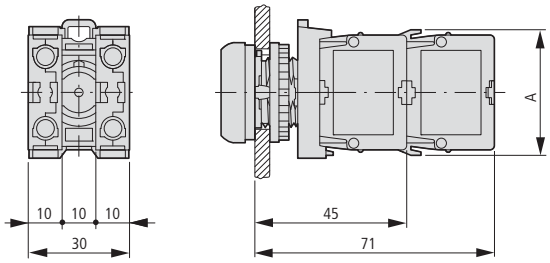
Centring adapter
M22-ZA



RMQ-Titan indicator light

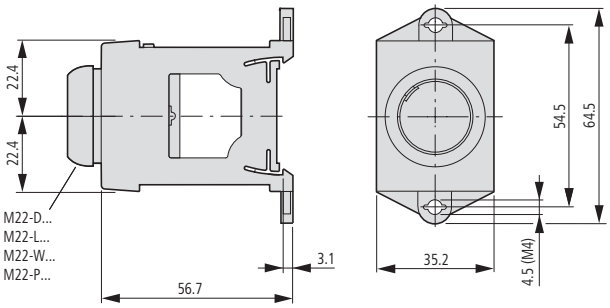


Pushbutton with M22-(C)K…
Pushbutton with M22-(C) LED... + M22-XLED...

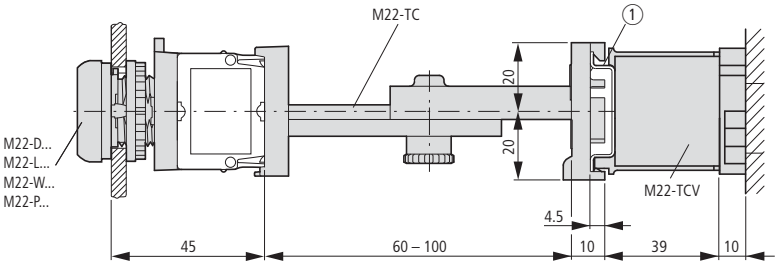


	1 x M22-K...	2 x M22-K...	1 x M22-CK...	2 x M22-CK...
A	37.2	37.2	39	39

IVS top-hat rail adapter



Pushbuttons, indicator lights with M22-TC telescopic clip and M22-TCV extension

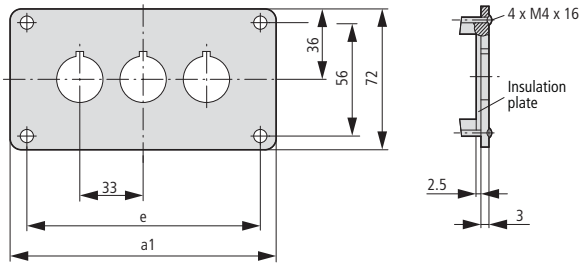


① Top-hat rail to IEC/EN 60715

Front fixing (Style Flat)

RMQ-Titan mounting panel

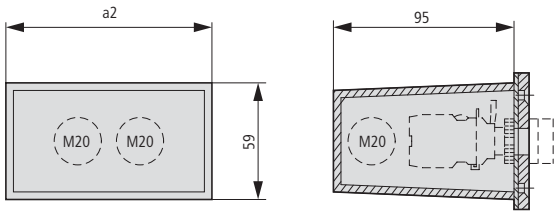
M22-E...



Part no.	a1	e
M22-E(Y)1	72	56
M22-E2	105	89
M22-E3	138	122
M22-E4	171	155
M22-E5	204	188
M22-E6	237	221

Shrouds

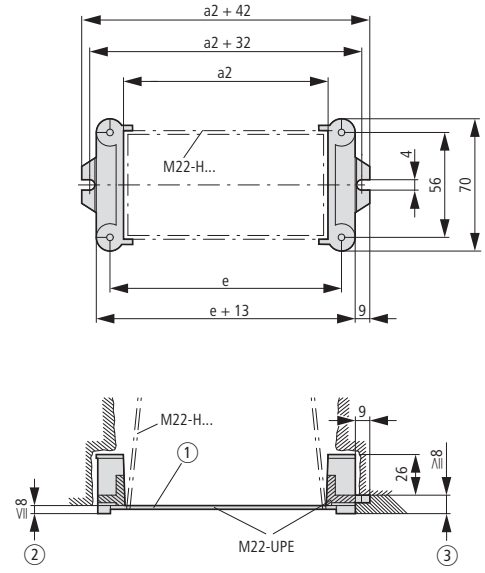
M22-H...



Part no.	a2	Cable entries	Construction type
M22-H1	42	3 × M20	One-piece
M22-H2	75	4 × M20	
M22-H3	108	4 × M20	
M22-H4	141	4 × M20	Split
M22-H5	174	5 × M20	
M22-HE6	207	6 × M20	

Shroud with plaster keys

M22-UPE

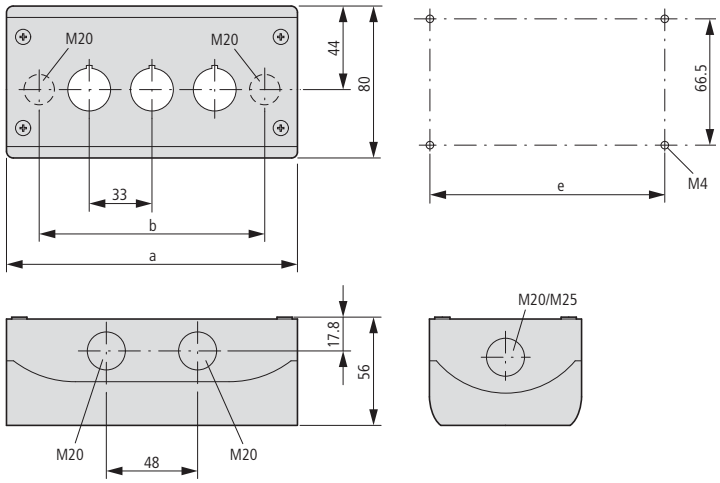


① Box for closing off when plastering
② Plaster thickness less than 8 mm
③ Plaster thickness more than 8 mm

Base fixing (Construction type: Style mounting)

RMQ-Titan surface mounting enclosure

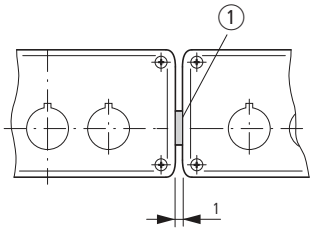
M22-I...



Part no.	Mounting locations	a	b	e	Cable entries		
M22-I(Y)1	1	72	42.6	58.5	2 × M16	3 × M20	2 × M25
M22-I2	2	120	85.6	106.5	2 × M20	3 × M20	2 × M25
M22-I3	3	153	118.6	139.5	2 × M20	2 × M25	4 × M20
M22-I4	4	186	151.6	172.5	2 × M20	2 × M25	4 × M20
M22-I6	6	252	217.6	238.5	2 × M20	2 × M25	4 × M20

Combination of surface mounting enclosures

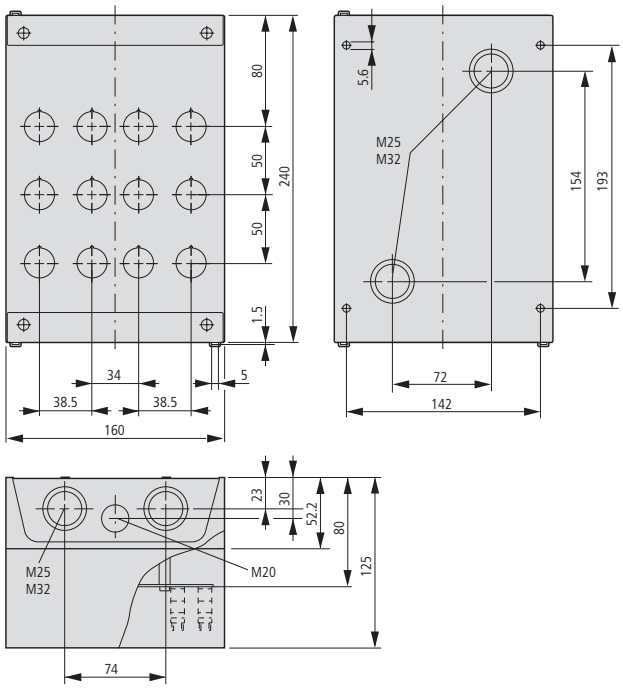
M22-XI



a Gasket

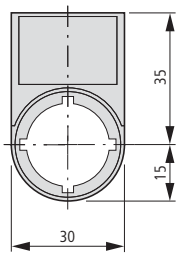
Surface mounting enclosure for 12 mounting locations

M22-I12

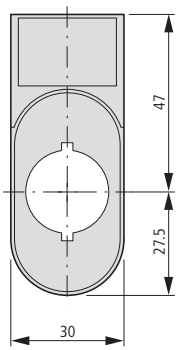


Label mounts

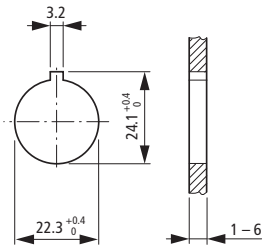
M22S-ST...



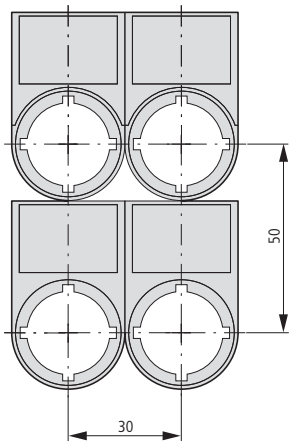
M22S-STDD-X



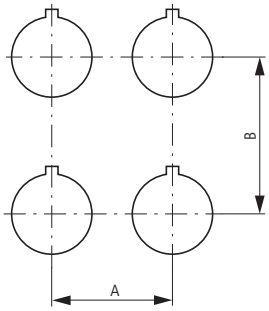
Mounting hole with lug slot



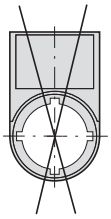
Grid dimension to IEC/EN 60947



Grid dimension for various combinations

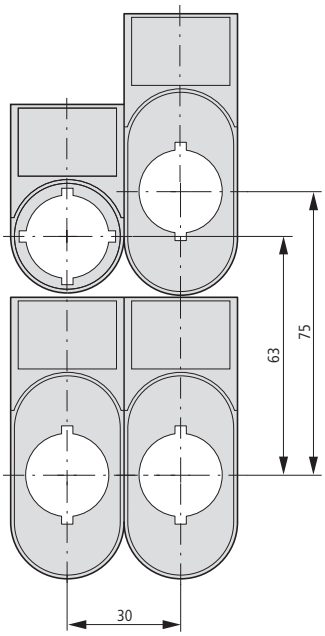


Actuator diaphragm cannot be combined with label mount

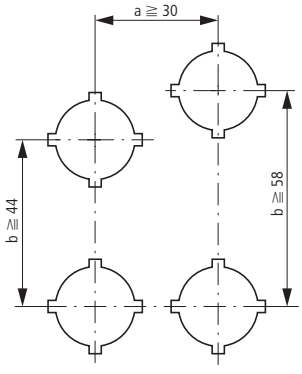


Part no.	A ≧ mm	B ≧ mm
M22(N/O)-…(IEC/EN 60947)	30	50
RMQ-Silver min.	30	40
M22-D... + M22-T-D	33	40
M22-D(R)P…	38	40
M22-PV...	45	45
M22-PV...45	55	55
M22-PV...60	70	70
M22-PV(L) + M22-PL-PV	48	56
M22-PV(L)(N/O…) + M22-D…	33	40
M22-DDL...	30	55
M22-DDL... + M22-T-DD	33	58
M22-ST...	30	50
M22-STDD...	30	75
M22-CK...	30	45
M22-CLED...	30	45
M22-XAK...	90	90
M22-XZK...	33	52
M22-XBK...	60	60
M22-XYK...	50	50
M22-D4	60	60
M22-WR...4	50	50
M22-W…J4	100	100

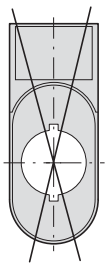
Grid dimension for M22-DD…



Grid dimension for M22-DDL

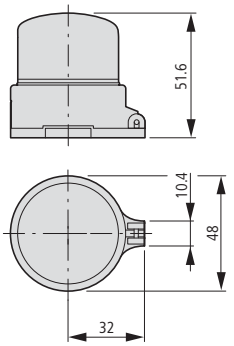


Pushbutton diaphragm M22-T-DD
Actuator diaphragm cannot be combined with label mount



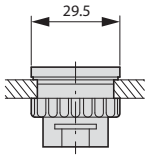
Emergency switching off sealable shroud

M22-PL-PV



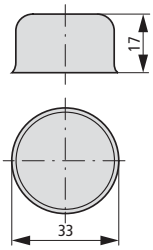
Blanking plugs

M22...B-...

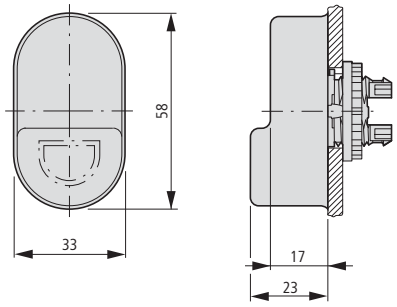


Pushbutton diaphragm

M22-T-D

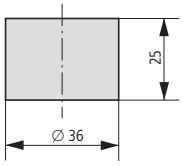


M22-T-D

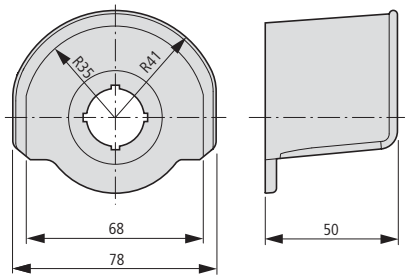


Guard-ring

M22-XGWK

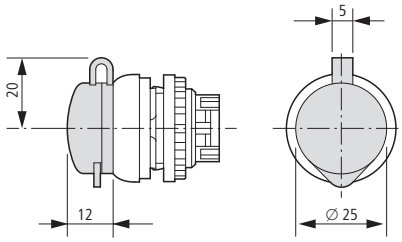


M22-XGPV



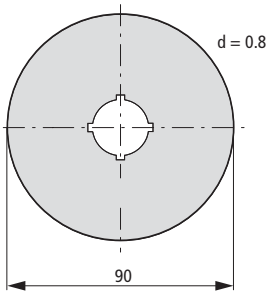
Protective diaphragm

M22-XWS

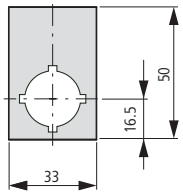


Emergency stop labels

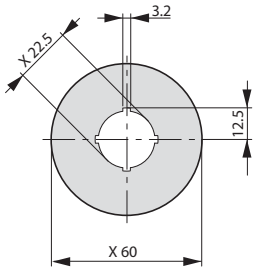
M22-XAK...



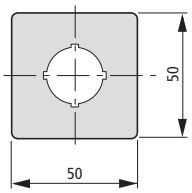
M22-X(Y)ZK...



M22-XBK-...

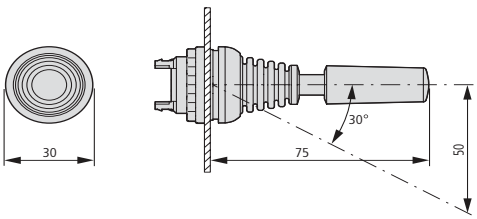


M22-XYK-...



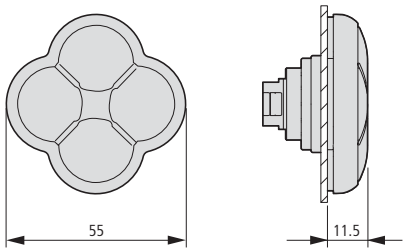
Joystick

M22…-W...J...



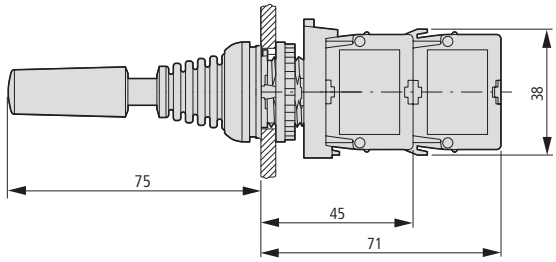
4-way pushbutton

M22-D...4-...



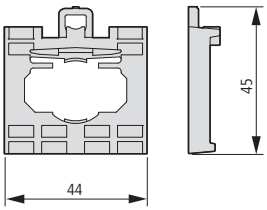
Joystick

M22-WJ…, M22-WRJ…

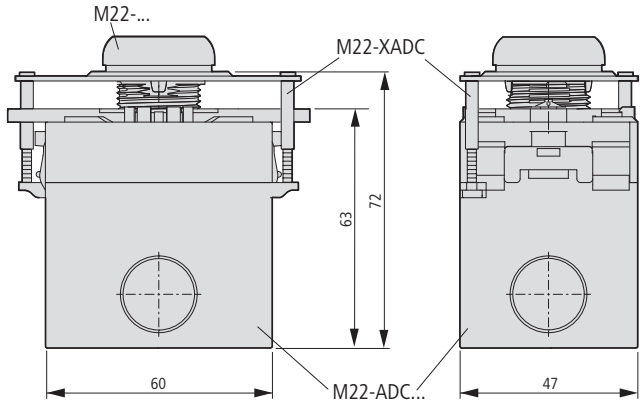


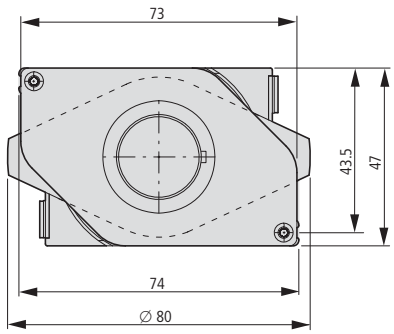
Fixing adapter

M22-A4

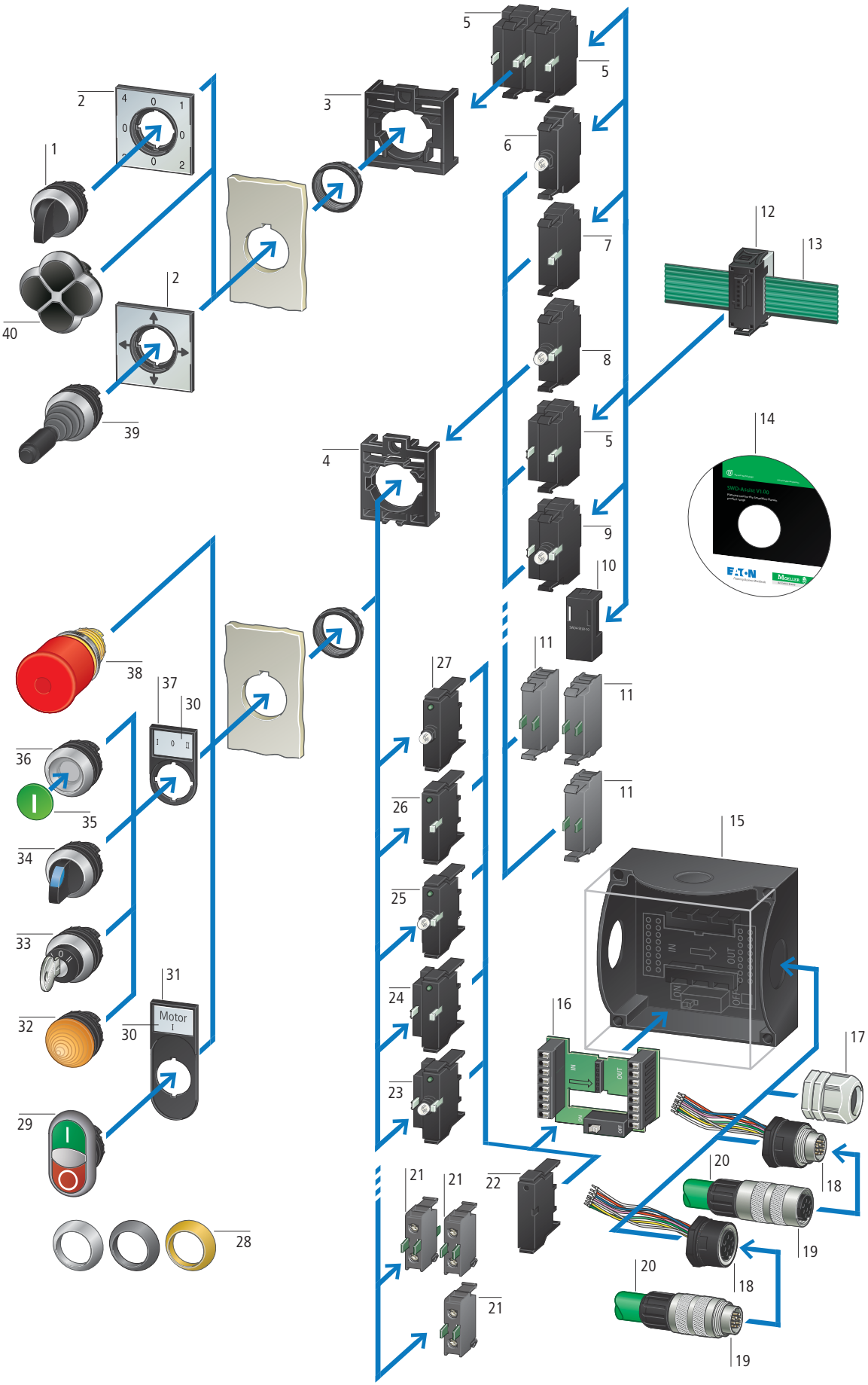


Dust cover





System overview



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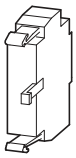
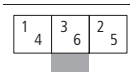
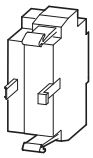
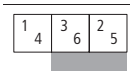
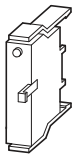
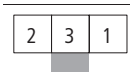
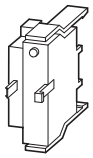
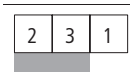
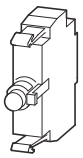
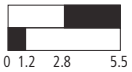
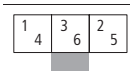
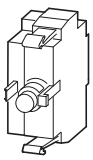
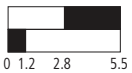
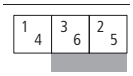
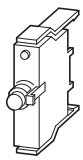
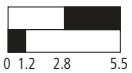
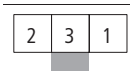
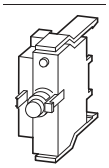
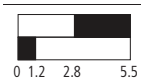
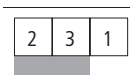
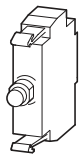
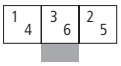
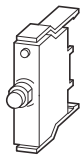
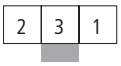
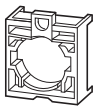
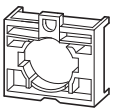
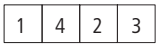
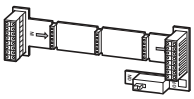
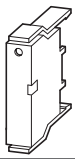
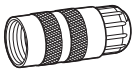
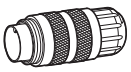
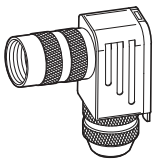
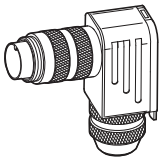
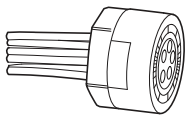
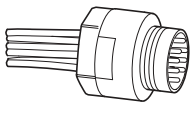
Features

- SWD-RMQ connection for front fixing → Page 1/10
  - Adaption with standard adapter M22-A or M22-SWD-A4 for 4-way pushbutton
  - Combination with standard pilot devices of the M22 series.
  - Types with one or two change-over contacts and with/without integrated LED element
  - SmartWire-Darwin diagnostics LED for signalling the communication status of the function element
  - Connection to SmartWire-Darwin flat band cable via external device plug.
- Link for external device plug → Page 1/11
  - Connection to SmartWire-Darwin external device plug.
  - Suitable for the bridging of already adapted SmartWire-Darwin external device plugs (e.g. as a placeholder)
- Planning and ordering help (SWD-Assist)
  - Free download at: http://downloadcenter.moeller.net.
  - Easy generation of applications with the system SmartWire-Darwin.
  - Integrated function for the generation of ordering lists.
  - Integrated validity check.
- Surface mounting enclosure with PCB → Page 1/11
  - Connection of SmartWire-Darwin RMQ elements for base fixing.
  - Type with 1, 2, 3, 4 and 6 slots
  - Bridging of free slots with links for base fixing.
  - Integrated switchable terminating resistor.
- Housing bushing socket → Page 1/18
  - Use for M22 surface mounting enclosure or control panel.
  - Type plug/socket.
  - Prefabricated signal cable with ferrules for connection to PCB for surface mounting enclosure.
- SWD-RMQ connection for base fixing → Page 1/10
  - Use with surface mounting enclosure for M22 control circuit devices.
  - Combination with standard pilot devices of the M22 series.
  - Types with one or two change-over contacts and with/without integrated LED element
  - SmartWire-Darwin diagnostics LED for signalling of the communication status of the function element.
  - Connection to SmartWire-Darwin via PCB for built-in enclosure.

	Number of contacts	Circuit symbol	Contact travel diagram, stroke in connection with front element	Configuration	Colour LED		**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Function elements										
Front fixing										
	1				without LED	–	**M22-SWD-K11** 115964		20 off	NA Certification Request filed for UL and CSA
	2				without LED	–	**M22-SWD-K22** 115965		10 off	
Base fixing										
	1				without LED	–	**M22-SWD-KC11** 115995		20 off	
	2				without LED	–	**M22-SWD-KC22** 115996		10 off	
Front fixing										
	1				–		**M22-SWD-K11LED-W** 115972		20 off	
	1				–		**M22-SWD-K11LED-B** 115973			
	1				–		**M22-SWD-K11LED-G** 115974			
	1				–		**M22-SWD-K11LED-R** 115975			
	2				–		**M22-SWD-K22LED-W** 115978		10 off	
	2				–		**M22-SWD-K22LED-B** 115979			
	2				–		**M22-SWD-K22LED-G** 115980			
	2				–		**M22-SWD-K22LED-R** 115981			
Base fixing										
	1				–		**M22-SWD-K11LEDC-W** 116003		20 off	
	1				–		**M22-SWD-K11LEDC-B** 116004			
	1				–		**M22-SWD-K11LEDC-G** 116005			
	1				–		**M22-SWD-K11LEDC-R** 116006			
	2				–		**M22-SWD-K22LEDC-W** 116009		10 off	
	2				–		**M22-SWD-K22LEDC-B** 116010			
	2				–		**M22-SWD-K22LEDC-G** 116011			
	2				–		**M22-SWD-K22LEDC-R** 116012			

		Configuration	Colour LED	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
LED elements							
Front fixing							
			○	**M22-SWD-LED-W** 115966		20 off	NA Certification: Request filed for UL and CSA
			●	**M22-SWD-LED-B** 115967			
			●	**M22-SWD-LED-G** 115968			
			●	**M22-SWD-LED-R** 115969			
Base fixing							
			○	**M22-SWD-LEDC-W** 115997		20 off	NA Certification: Request filed for UL and CSA
			●	**M22-SWD-LEDC-B** 115998			
			●	**M22-SWD-LEDC-G** 115999			
			●	**M22-SWD-LEDC-R** 116000			
Fixing adapters							
Front fixing							
	For 1 function element M22-SWD-K… or LED element M22-SWD-LED… In addition 1 or 2 contact elements M22-K... possible Sequence number on fixing adapter		–	**M22-A** 216374		50 off	UL/CSA certification not required
	For 2 function elements M22-SWD-K22… For use with M22-WR4, -WRJ4, -D4 in conjunction with M22-(SWD)-K		–	**M22-SWD-A4** 116016		10 off	NA Certification: Request filed for UL and CSA

	Mounting locations Number	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
Printed circuit boards						
PCBs for surface mounting enclosure M22-I.. for mounting base function elements M22-SWD...K Integrated, connectable SWD network terminator.						
	Number of mounting locations : 1	**M22-SWD-I1-LP01** 115990		1 off	NA Certification	Request filed for UL and CSA
	Number of mounting locations : 2	**M22-SWD-I2-LP01** 115991				
	Number of mounting locations : 3	**M22-SWD-I3-LP01** 115992				
	Number of mounting locations : 4	**M22-SWD-I4-LP01** 115993				
	Number of mounting locations : 6	**M22-SWD-I6-LP01** 115994				
Bridge						
Bridging of open mounting locations of device plug or M22-SWD-I PCB						
	Link for unused mounting locations of M22-SWD-I...LP (base fixing)	**M22-SWD-SEL8-10** 116698		5 off	NA Certification	Request filed for UL and CSA
Connectors for SWD round cables						
	8-pole socket, straight	**SWD4-SF8-67** 116033		1 off	NA Certification	Request filed for UL and CSA
	8-pole plug, straight	**SWD4-SM8-67** 116034				
	8-pole socket, 90° angled	**SWD4-SF8-67W** 116035				
	8-pole plug, 90° angled	**SWD4-SM8-67W** 116036				
Housing bushing socket						
For flushmounting in surface mounting enclosure M22-I... 8-pole socket/ plug, IP67, for connection to SWD4-S(M,F)-67... 8 prefabricated cables for connection to PCB M22-SWD-I...						
	8-pole socket, M20	**SWD4-SF8-20** 116031		1 off	NA Certification	Request filed for UL and CSA
	8-pole plug, M20	**SWD4-SM8-20** 116032		1 off		

Technical data

			M22-SWD-K11	M22-SWD-KC11	M22-SWD-LED-...
General					
Standards			IEC/EN 61131-2 EN 50178		
Dimensions (W x H x D)		mm	12 X 42 X 39	12 X 45 X 37	10 X 42 X 45
Weight		g	10	10	10
Mounting position			Any		
Ambient mechanical conditions					
Protection type (IEC/EN 60529)			IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)					
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27)		Shocks	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	0.3	0.3
Electromagnetic compatibility (EMC)					
Overvoltage category			Not applicable		
Pollution degree			2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)					
Air discharge (Level 3)		kV	8	8	8
Contact discharge (Level 2)		kV	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)					
80-1000 MHz		V/m	10	10	10
1.4 - 2 GHz		V/m	3	3	3
2 - 2.7 GHz		V/m	1	1	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A		
Burst (IEC/EN 61131-2:2008, Level 3)					
Supply cables		kV	2	2	2
SmartWire-Darwin cables		kV	1	1	1
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	10	10
Ambient climatic conditions					
Operating ambient temperature (IEC 60068-2)		°C	–30 … +55	–30 … +55	–30 … +55
Condensation			Prevent with suitable measures		
Storage		°C	–40…80	–40…80	–40…80
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	9 … 95	9 … 95	9 … 95
SmartWire-Darwin network					
Station type			SmartWire-Darwin station (slave)		
Baud rate setting			Automatic		
SmartWire-Darwin status LED			Green		
Connections			Plug, 8-pole		
Plug connectors			SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5
Number of mating cycles			50	50	50
Function element					
Contacts			1 change-over contact	1 change-over contact	–
Lifespan mechanical/electrical	Operations		1×10^6	1×10^6	–
LED display			No	No	Yes
Diagnostics			Yes	Yes	No
Fixing			Front fixing	Base fixing	Front fixing

Notes Maximum current consumption of SWD stations → chapter SmartWire-Darwin, page 19

M22-SWD-LEDC-...	M22-SWD-K11-LED...	M22-SWD-K11LEDC-...	M22-SWD-K22	M22-SWD-KC22	M22-SWD-K22-LED...	M22-SWD-K22LEDC-...
IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
10 X 45 X 42	12 X 42 X 45	12 X 45 X 42	17 X 42 X 39	17 X 45 X 37	17 X 42 X 45	17 X 45 X 42
10	10	10	14	14	14	14
Any						
IP20	IP20	IP20	IP20	IP20	IP20	IP20
5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4	5 … 8.4
8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150	8.4 … 150
9	9	9	9	9	9	9
50	50	50	50	50	50	50
0.3	0.3	0.3	0.3	0.3	0.3	0.3
Not applicable						
2	2	2	2	2	2	2
8	8	8	8	8	8	8
4	4	4	4	4	4	4
10	10	10	10	10	10	10
3	3	3	3	3	3	3
1	1	1	1	1	1	1
EN 55011 Class A						
2	2	2	2	2	2	2
1	1	1	1	1	1	1
10	10	10	10	10	10	10
–30 … +55	–30 … +55	–30 … +55	–30 … +55	–30 … +55	–30 … +55	–30 … +55
Prevent with suitable measures						
–40…80	–40…80	–40…80	–40…80	–40…80	–40…80	–40…80
9 … 95	9 … 95	9 … 95	5 … 95	5 … 95	5 … 95	5 … 95
SmartWire-Darwin station (slave)						
Automatic						
Green						
Plug, 8-pole						
M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP	SWD4-8SF2-5	M22-SWD-I…LP
50	50	50	50	50	50	50
–	1 change-over contact	1 change-over contact	2 change-over contacts	2 change-over contacts	2 change-over contacts	2 change-over contacts
–	1×10^6	1×10^6	1×10^6	1×10^6	1×10^6	1×10^6
Yes	Yes	Yes	No	No	Yes	Yes
No	Yes	Yes	Yes	Yes	Yes	Yes
Base fixing	Front fixing	Base fixing	Front fixing	Base fixing	Front fixing	Base fixing

			SWD4-RC8-10	SWD4-8SF2-5	SWD4-8SFF2-5
General					
Standards			IEC/EN 61131-2 EN 50178		
Dimensions (W x H x D)		mm	48.5 x 34.5 x 10	15 x 36.5 x 17.5	48.5 x 34.5 x 10
Weight		g	10	5.5	4.5
Mounting position			Any	Any	Any
Ambient mechanical conditions					
Protection type (IEC/EN 60529)			IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)					
Constant amplitude 3.5 mm		Hz	5 … 8.4	5 … 8.4	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150	8.4 … 150	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9	9	9
Drop to IEC/EN 60068-2-31	Drop height	mm	50	–	–
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3	–	–
Electromagnetic compatibility (EMC)					
Overvoltage category			II	–	–
Pollution degree			2	–	–
Electrostatic discharge (IEC/EN 61131-2:2008)					
Air discharge (Level 3)		kV	8	–	8
Contact discharge (Level 2)		kV	4	–	4
Electromagnetic fields (IEC/EN 61131-2:2008)					
80-1000 MHz		V/m	10	–	–
1.4 - 2 GHz		V/m	3	–	–
2 - 2.7 GHz		V/m	1	–	–
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A	–	–
Burst (IEC/EN 61131-2:2008, Level 3)					
SmartWire-Darwin cables		kV	1	–	–
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10	–	–
Ambient climatic conditions					
Operating ambient temperature (IEC 60068-2)		°C	–25 … +55	–25 … +55	–25 … +55
Condensation			Prevent with suitable measures		
Storage		°C	–40…70	–40…70	–40…70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95	5 … 95	5 … 95
Connection options					
SWD-In			Plug, 8-pole	Plug connector	Plug, 8-pole
Number of mating cycles			≥200	1	[3] 200
SWD-Out			–	Socket, 8-pole	Plug, 8-pole
Number of mating cycles			–	≥200	≥200

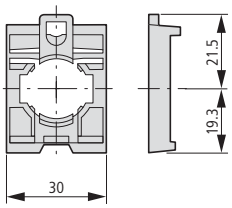
Notes Maximum current consumption of SWD stations → chapter SmartWire-Darwin, page 19

SWD4-SF8-20	SWD4-SM8-20	SWD4-8FRF-10	SWD4-SFL8-20	SWD4-SML8-20
IEC/EN 61131-2 EN 50178				
24 x 26 x 162	24 x 26 x 170	35 x 90 x 35	35 x 83 x 40	35 x 83 x 46
20	22.5	42	50	50
Any	Any	Any	Any	Any
IP67	IP67	IP20	IP67	IP67
		5 … 8.4	5 … 8.4	5 … 8.4
		8.4 … 150	8.4 … 150	8.4 … 150
–	–	9	9	9
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	8	8	8
–	–	4	4	4
–	–	–	10	10
–	–	–	3	3
–	–	–	1	1
–	–	–	–	–
–	–	–	–	–
–	–	–	10	10
–25 … +55	–25 … +55	–25 … +55	–25 … +55	–25 … +55
Prevent with suitable measures				
–40…70	–40…70	–40…70	–40…70	–40…70
5 … 95	5 … 95	5 … 95	5 … 95	5 … 95
–	Plug, 8-pole	Plug, 8-pole	Plug, 8-pole	Plug, 8-pole
–	≥500	≥200	≥200	≥500
Socket, 8-pole	–	Push in terminals	Socket, 8-pole	Plug, 8-pole
≥500	–	–	≥500	≥200

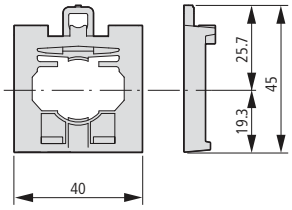
Dimensions

Fixing adapter (front fixing) for 3-contact LED elements

M22-A

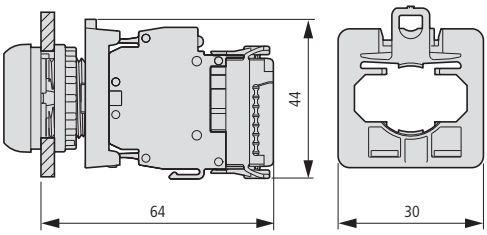


M22-SWD-A4



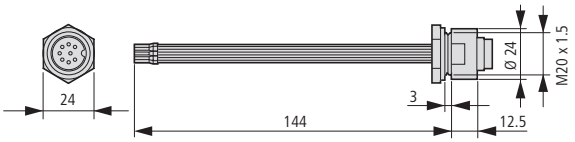
Function elements

M22-SWD-K...
M22-SWD-LED...



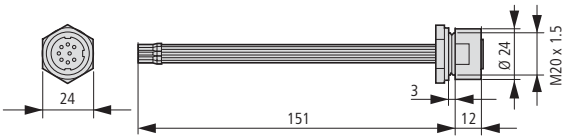
Housing bushing plug

SWD4-SM8-20



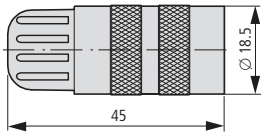
Housing bushing socket

SWD4-SF8-20

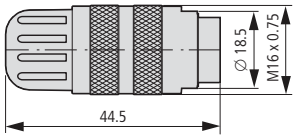


Plug connector for SWD round cable, straight

SWD4-SF8-67

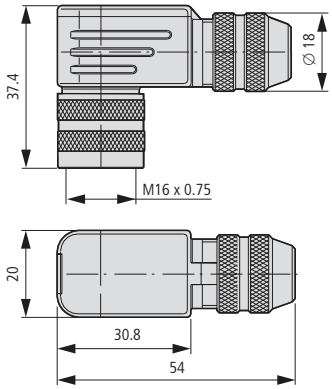


SWD4-SM8-67

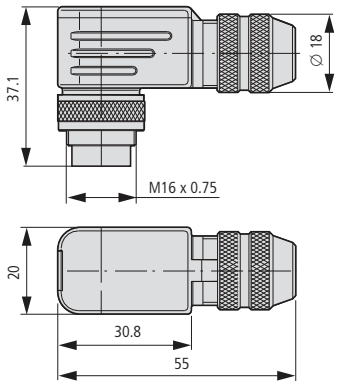


Plug connector for SWD round cable, angled

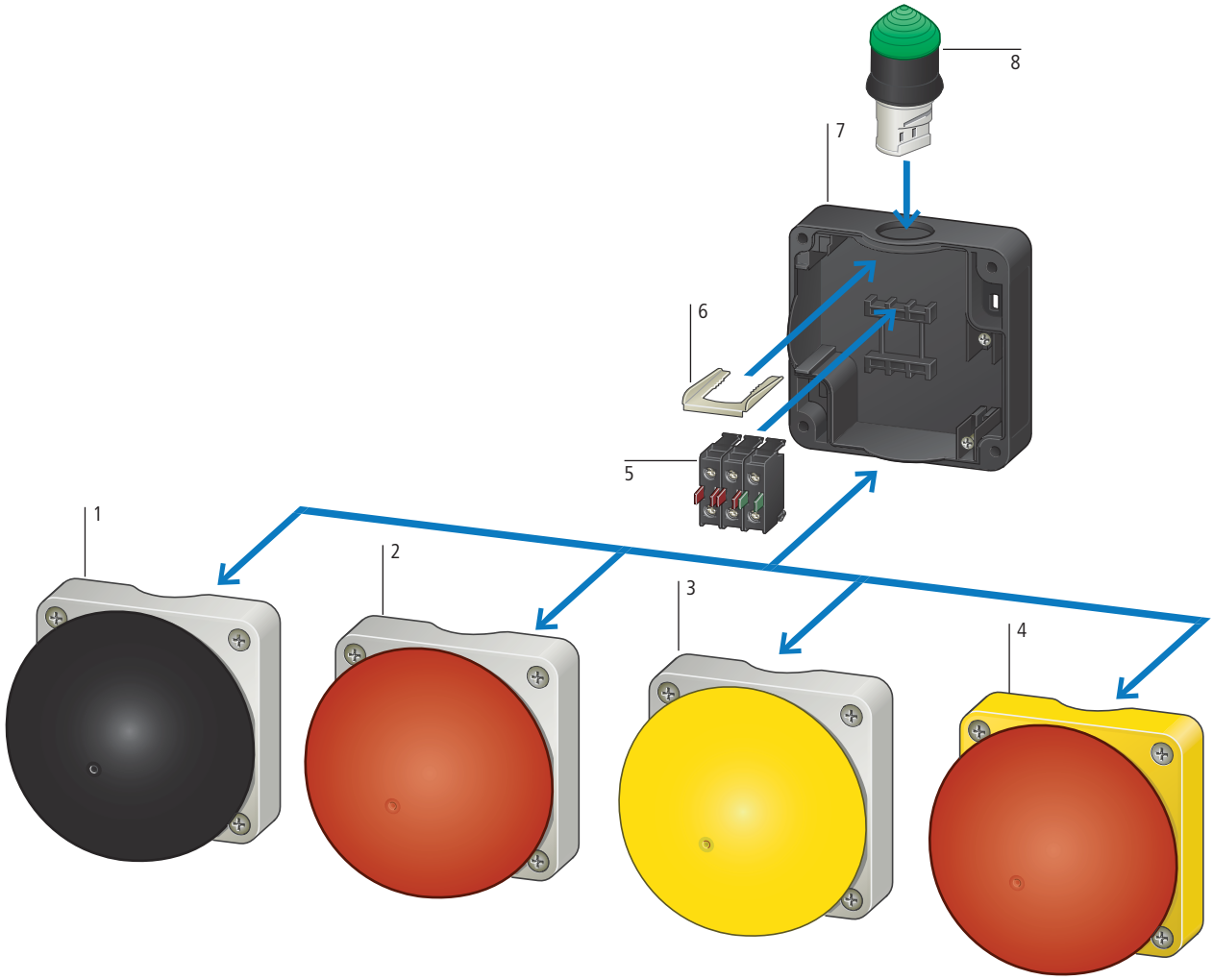
SWD4-SF8-67W



SWD4-SM8-67W



System overview

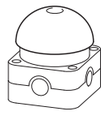
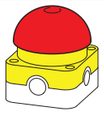
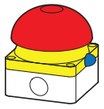
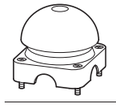
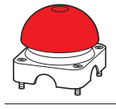
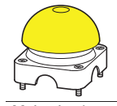
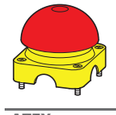


Enclosure base	7
Prepared for contact elements	
Base fixing (not for ...SMC... contacts)	
→ Page 2/78	

Operator only with mushroom head	1, 2, 3, 4
Various color combinations	
Yellow/red for Emergency stop or emergency switching off applications	
European Machinery Safety Directive 2006/42/EC	
For foot or hand operation	
→ Page 2/78	

Contact elements	5
Base fixing	
→ Page 2/31	

Indicator lights	6, 8
Conical	
BA9s base	
→ Page 2/26	

		Equipping with contacts: ⊖ = Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact	NC = normally closed contact	Circuit symbol	Color of mushroom head	Indicator lights	Degree of protection
FAK foot and palm switches							
Momentary							
	Enclosure base: black (RAL 9005) Enclosure top: only light gray (RAL 7035)	1 N/O	1 NC		Black	●	IP67, IP69K
		1 N/O	1 NC		Red	●	IP67, IP69K
Maintained							
	Pull to release Emergency stop pushbutton tamper-proof to ISO 13850/EN 418 Enclosure base: black (RAL 9005) Enclosure top: yellow (RAL 1004)	–	1 NC		Red	●	IP67, IP69K
		1 N/O	1 NC		Red	●	IP67, IP69K
		–	2 NC	–	Red	●	IP67, IP69K
	Enclosure base: gray Enclosure top: yellow Button, red Release by button on the side For Emergency-Stop applications according to ISO 13850 Can also be used as emergency switching off device	1 N/O	1 NC		Red	●	IP65
Customized complete unit							
* = Freely selectable customer identification or stock no.: max. 10 characters An order consists of: enclosure base, enclosure top, contact elements for base fixing (→ Page 2/31) ATEX Ex → Engineering							
Enclosure base							
For max. 3 contact elements							IP67, IP69K
					Black		IP67, IP69K
Enclosure top							
Momentary							
				–	Gray	Black	IP67, IP69K
				–	Gray	Red	IP67, IP69K
				–	Gray	Yellow	IP67, IP69K
Maintained							
				–	Yellow	Red	IP67, IP69K
ATEX							
ATEX Ex → Engineering Only in conjunction with FAK-COMBINATION-* For use in accordance with the ATEX directive in dust-laden areas, Zone 22, Category 3 Ordering examples → Engineering							IP67, IP69K

Part no. Article no.	Price See price list	Std. pack	Approval mark	Information relevant for export to North America
FAK-S/KC11/I 229749		1 off	INDUSTRIE FORUM DESIGN HANNOVER TÜV Rheinland Product Safety – BAUART GEPRÜFT TYPE APPROVED totally insulated ATEX Ex → Engineering	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
FAK-R/KC11/I 229746		1 off		
FAK-R/V/KC01/IY 229747		1 off		
FAK-R/V/KC11/IY 229748				
FAK-R/V/KC02/IY 256790				
FAK-R/V/KC11A/I 001475		1 off		
FAK-COMBINATION-* 229758		1 off		
FAK-IU 229753		1 off		
FAK-S 095540		1 off		Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 3R, 4X, 12, 13
FAK-R 071810				
FAK-Y 229754				
FAK-R/V/Y 229755				
FAK-ATEX 104381		1 off		

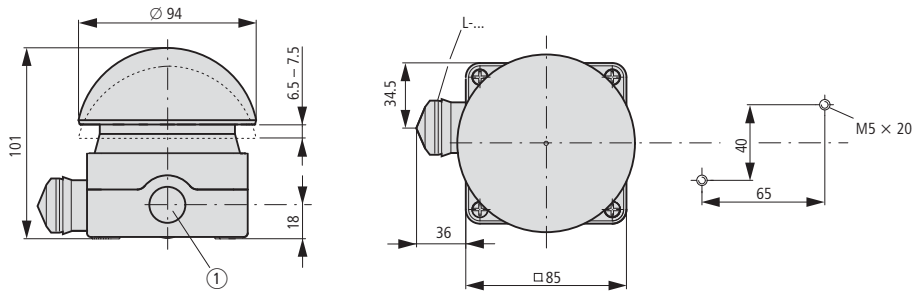
Technical data

			FAK foot and palm switch		FAK-R/V/KC11A/I
			Momentary	Maintained	Maintained
General					
Standards			IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 0660
Lifespan, mechanical	Operations	x 10^6	1	0.1	0.1
Operating frequency	Operations/h		≦ 3600	≦ 600	≦ 600
Actuating force		N	20 - 40	40 - 60	15 - 25
Operating torque		Nm	–	–	–
Protection type, IEC/EN 60529			IP67, IP69K	IP67, IP69K	IP65
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature					
Open		°C	-25 - +40	-25 - +40	-25 - +40
Mounting position			Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal		g	> 15	> 15	> 15

Dimensions

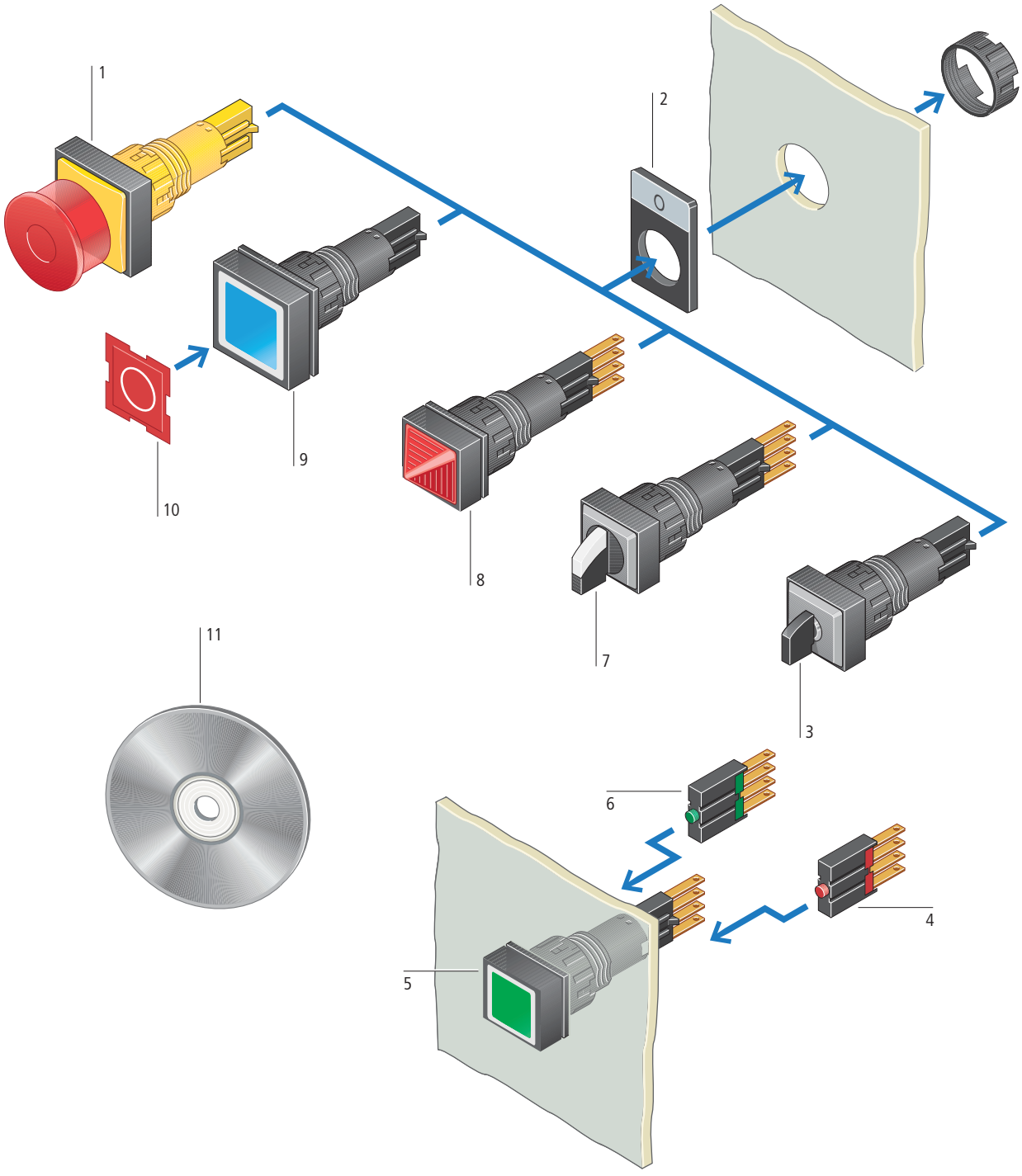
Foot and palm switch RMQ-Titan

FAK...



3 × M20 (Pg 13.5) lateral
1 ×M16 in the base

System overview



Emergency stop pushbuttons 1
Can also be used as emergency switching-off devices
Tamper-proof according to ISO 13850/EN 418
Illuminated and non-illuminated
Additional labels, with and without inscription
European Machinery Safety Directive 2006/42/EC
→ Page 2/90

Label mounts 2
For insert labels
Color: light gray, black, yellow
Insert labels, with inscription and blank
→ Page 2/94

Key-operated buttons 3
2 and 3 positions
Switching angle 45°
Momentary and maintained
Various lock mechanisms
→ Page 2/88

Contact element NC (red) 4
With blade terminal
Universal contacts suitable for use with electronic devices
Positive opening safety function according to IEC/EN 60947-5-1
→ Page 2/84

Illuminated pushbutton actuators 5
Momentary and maintained
Replaceable insert labels
Colors: white, green, red, yellow, blue Custom laser labeling
→ Page 2/85

Contact element N/O (green) 6
With blade terminal
Universal contacts suitable for use with electronic devices
→ Page 2/84

Selector switch actuators 7
2 and 3 positions
Switching angle 45°
Momentary and maintained
Illuminated selector switch actuators with built-in lamp socket
Colors: white, green, red
→ Page 2/86

Indicator lights 8
Flat and conical designs
Built-in lamp socket
For filament bulbs and LEDs
Colors: white, green, red, yellow, blue Custom laser labeling
→ Page 2/89

Pushbutton actuators 9
Momentary and maintained
Replaceable button plates
Colors: white, green, red, yellow, blue, black
→ Page 2/84

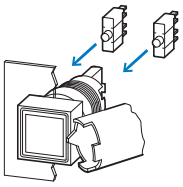
Button plates/insert labels 10
Wear-resistant button plates for pushbutton actuators
Transparent insert plates for illuminated pushbuttons and indicator lights
With and without inscription
With standard texts and symbols or with custom laser labeling
→ Page 2/91

Labeling with convenience 11
All button plates, indicator lights and additional button labels from the RMQ-Titan range can be laser inscribed with any inscription and symbol as required.
Download: www.moeller.net/de/support, Keyword: “Labeleditor”

Product Features

- Front dimension and minimum grid dimensions 18 x 18 mm or 25 x 25 mm
- Mounting diameter 16.2 mm to EN 50007
- Protection type IP65
- For switching differing potentials
- Suitable for use with electronic devices to IEC/EN 61131-2
- Technical data to IEC/EN 60947-5-1
- Approved throughout the world

Color Button plate	Front dimensions 18 x 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Pushbutton actuators, IP65					
Momentary					
Green	**Q18D-11** 086332	**Q25D-11** 090471		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No.°14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
Red	**Q18D-10** 086299	**Q25D-10** 090421			
White	**Q18D-20** 054041	**Q25D-20** 054038			
Black	**Q18D-19** 054040	**Q25D-19** 054039			
Black	**Q18D-SW** 086788	**Q25D-SW** 087230			
White	**Q18D-WS** 086752	**Q25D-WS** 086808			
Green	**Q18D-GN** 086450	**Q25D-GN** 086409			
Red	**Q18D-RT** 086713	**Q25D-RT** 086444			
Yellow	**Q18D-GE** 086417	**Q25D-GE** 086343			
Blue	**Q18D-BL** 086384	**Q25D-BL** 086328			
None	**Q18D-X** 093623	**Q25D-X** 093624			
Maintained					
Black	**Q18DR-SW** 086269	**Q25DR-SW** 088739		10 off	
White	**Q18DR-WS** 086243	**Q25DR-WS** 088701			
Green	**Q18DR-GN** 086176	**Q25DR-GN** 088531			
Red	**Q18DR-RT** 086209	**Q25DR-RT** 088627			
Yellow	**Q18DR-GE** 090482	**Q25DR-GE** 088404			
Blue	**Q18DR-BL** 090241	**Q25DR-BL** 088110			
None	**Q18DR-X** 093625	**Q25DR-X** 093626			



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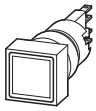
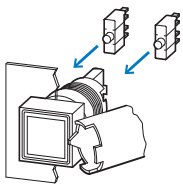
⊖ = Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact	NC = normally closed contact	Circuit symbol	Contact sequence	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Contact elements								
Admissible operating voltage: 5 – 250 V								
1 N/O	–	13 14	0 2.2 3.7 mm		**E10** 090351		50 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE°marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
–	1 NC ⊖	L1 L2	0 1 3.7 mm		**E01** 090401		50 off	

Notes xy = x = Sequence number on front element; y = Function number on contact element

	Color Lens		Front dimensions 18 x 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Illuminated pushbutton actuators, IP65							
Momentary Without filament bulb 		–	**Q18LT-WS** 089202	**Q25LT-WS** 086262		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		–	**Q18LT-GN** 089067	**Q25LT-GN** 086206			
		–	**Q18LT-RT** 089776	**Q25LT-RT** 086238			
		–	**Q18LT-GE** 088808	**Q25LT-GE** 086173			
		–	**Q18LT-BL** 088764	**Q25LT-BL** 090479			
	–	Without lens	**Q18LT-X** 051745	**Q25LT-X** 051746		10 off	
With filament bulb, 24 V		–	**Q18LT-WS/WB** 088561	**Q25LT-WS/WB** 090226		10 off	
		–	**Q18LT-GN/WB** 088509	**Q25LT-GN/WB** 089190			
		–	**Q18LT-RT/WB** 088537	**Q25LT-RT/WB** 089998			
		–	**Q18LT-GE/WB** 088449	**Q25LT-GE/WB** 089137			
		–	**Q18LT-BL/WB** 088338	**Q25LT-BL/WB** 089102			
Maintained Without filament bulb		–	**Q18LTR-WS** 088123	**Q25LTR-WS** 087232		10 off	
		–	**Q18LTR-GN** 087831	**Q25LTR-GN** 086812			
		–	**Q18LTR-RT** 087918	**Q25LTR-RT** 086840			
		–	**Q18LTR-GE** 087764	**Q25LTR-GE** 086784			
		–	**Q18LTR-BL** 086813	**Q25LTR-BL** 086739			
	–	Without lens	**Q18LTR-X** 051735	**Q25LTR-X** 051736		10 off	
With filament bulb, 24 V		–	**Q18LTR-WS/WB** 086708	**Q25LTR-WS/WB** 086447		10 off	
		–	**Q18LTR-GN/WB** 086413	**Q25LTR-GN/WB** 086380			
		–	**Q18LTR-RT/WB** 086448	**Q25LTR-RT/WB** 086412			
		–	**Q18LTR-GE/WB** 086382	**Q25LTR-GE/WB** 086346			
		–	**Q18LTR-BL/WB** 086348	**Q25LTR-BL/WB** 086330			



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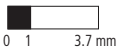
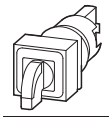
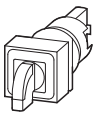
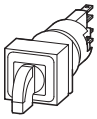
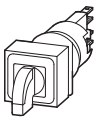
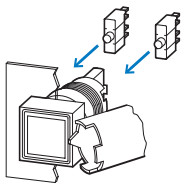
	Contact configuration: ⊖ = Safety function via positive opening to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact	Circuit symbol	Contact sequence	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Contact elements								
Admissible operating voltage: 5 – 250 V								
	1 N/O –				**E10** 090351		50 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	– 1 NC ⊖				**E01** 090401		50 off	

Notes


x = Sequence number on front element
y = Function number on contact element

Function: ▷ = Momentary, ⌊ = Maintained	Color	Front dimensions 18 x 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Selector switch actuators, IP65						
With VS anti-rotation feature						
Two positions						
						
▷ 45°	○	**Q18WK1** 036515	**Q25WK1** 036599		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
⌊ 45°	○	**Q18WK1R** 036598	**Q25WK1R** 036600			
Three positions						
						
45° ◁▷ 45°	○	**Q18WK3** 072308	**Q25WK3** 072372		5 off	
45° ▽ 45°	○	**Q18WK3R** 072309	**Q25WK3R** 072373			
45° ▷▽ 45°	○	**Q18WK3R1** 072310	**Q25WK3R1** 072374			
45° ◁▽ 45°	○	**Q18WK3R2** 072311	**Q25WK3R2** 072375			
Illuminated selector switch actuators, IP65						
With VS anti-rotation feature						
Without filament bulb Two positions						
						
▷ 45°	○	**Q18LWK1-WS** 040349	**Q25LWK1-WS** 040658		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
▷ 45°	●	**Q18LWK1-RT** 039337	**Q25LWK1-RT** 040657			
▷ 45°	●	**Q18LWK1-GN** 039336	**Q25LWK1-GN** 040656			
⌊ 45°	○	**Q18LWK1R-WS** 040376	**Q25LWK1R-WS** 040661			
⌊ 45°	●	**Q18LWK1R-RT** 040351	**Q25LWK1R-RT** 040660			
⌊ 45°	●	**Q18LWK1R-GN** 040350	**Q25LWK1R-GN** 040659			
With filament bulb Two positions						
						
▷ 45°	○	**Q18LWK1-WS/WB** 038978	**Q25LWK1-WS/WB** 040379		5 off	
▷ 45°	●	**Q18LWK1-RT/WB** 038930	**Q25LWK1-RT/WB** 040378			
▷ 45°	●	**Q18LWK1-GN/WB** 038883	**Q25LWK1-GN/WB** 040377			
⌊ 45°	○	**Q18LWK1R-WS/WB** 039335	**Q25LWK1R-WS/WB** 040476			
⌊ 45°	●	**Q18LWK1R-RT/WB** 039248	**Q25LWK1R-RT/WB** 040381			
⌊ 45°	●	**Q18LWK1R-GN/WB** 039247	**Q25LWK1R-GN/WB** 040380			



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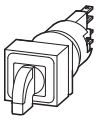
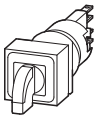
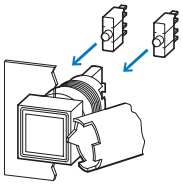
Function: = Momentary, = Maintained	Color	Front dimensions 18 x 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Illuminated selector switch actuators, IP65						
With VS anti-rotation feature						
Without filament bulb Three positions						
 45° 45°	○	**Q18LWK3-WS** 072322	**Q25LWK3-WS** 072358		5 off	
45° 45°	●	**Q18LWK3-RT** 072323	**Q25LWK3-RT** 072359			
45° 45°	●	**Q18LWK3-GN** 072324	**Q25LWK3-GN** 072360			
45° 45°	○	**Q18LWK3R-WS** 072325	**Q25LWK3R-WS** 072361			
45° 45°	●	**Q18LWK3R-RT** 072326	**Q25LWK3R-RT** 072362			
45° 45°	●	**Q18LWK3R-GN** 072327	**Q25LWK3R-GN** 072363			
45° 45°	○	**Q18LWK3R1-WS** 072328	**Q25LWK3R1-WS** 072364			
45° 45°	●	**Q18LWK3R1-RT** 072329	**Q25LWK3R1-RT** 072365			
45° 45°	●	**Q18LWK3R1-GN** 072330	**Q25LWK3R1-GN** 072366			
45° 45°	○	**Q18LWK3R2-WS** 072331	**Q25LWK3R2-WS** 072367			
45° 45°	●	**Q18LWK3R2-RT** 072332	**Q25LWK3R2-RT** 072368			
45° 45°	●	**Q18LWK3R2-GN** 072333	**Q25LWK3R2-GN** 072369			
With filament bulb Three positions						
 45° 45°	○	**Q18LWK3-WS/WB** 072334	**Q25LWK3-WS/WB** 072346		5 off	
45° 45°	●	**Q18LWK3-RT/WB** 072335	**Q25LWK3-RT/WB** 072347			
45° 45°	●	**Q18LWK3-GN/WB** 072336	**Q25LWK3-GN/WB** 072348			
45° 45°	○	**Q18LWK3R-WS/WB** 072337	**Q25LWK3R-WS/WB** 072349			
45° 45°	●	**Q18LWK3R-RT/WB** 072338	**Q25LWK3R-RT/WB** 072350			
45° 45°	●	**Q18LWK3R-GN/WB** 072339	**Q25LWK3R-GN/WB** 072351			
45° 45°	○	**Q18LWK3R1-WS/WB** 072340	**Q25LWK3R1-WS/WB** 072352			
45° 45°	●	**Q18LWK3R1-RT/WB** 072341	**Q25LWK3R1-RT/WB** 072353			
45° 45°	●	**Q18LWK3R1-GN/WB** 072342	**Q25LWK3R1-GN/WB** 072354			
45° 45°	○	**Q18LWK3R2-WS/WB** 072343	**Q25LWK3R2-WS/WB** 072355			
45° 45°	●	**Q18LWK3R2-RT/WB** 072344	**Q25LWK3R2-RT/WB** 072356			
45° 45°	●	**Q18LWK3R2-GN/WB** 072345	**Q25LWK3R2-GN/WB** 072357			

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	46552
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Type 1



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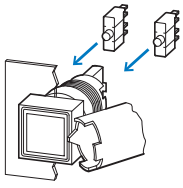
Function:	Key withdrawable in position			Color	Front dimensions 18 × 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack
⊳ = Momentary ⊲ = Maintained								
IP65, key-operated button actuators								
With 1 key and VS anti-rotation feature								
Two positions								
⊳ 45°	–	0	–	●	**Q18S1** 038806	**Q25S1** 038773		5 off
⊲ 45°	I	0	–	●	**Q18S1R** 038805	**Q25S1R** 038772		
⊲ 45°	–	0	–	●	**Q18S1R-A1** 072312	**Q25S1R-A1** 072376		
⊳ 45°	–	0	–	●	**Q18S1-GN** 062148	**Q25S1-GN** 062150		
⊲ 45°	I	0	–	●	**Q18S1R-GN** 062151	**Q25S1R-GN** 062108		
⊳ 45°	–	0	–	●	**Q18S1-RT** 046841	**Q25S1-RT** 046843		
⊲ 45°	I	0	–	●	**Q18S1R-RT** 046837	**Q25S1R-RT** 046839		
⊳ 45°	–	0	–	○	**Q18S1-WS** 046849	**Q25S1-WS** 046851		
⊲ 45°	I	0	–	○	**Q18S1R-WS** 046845	**Q25S1R-WS** 046847		
⊳ 45°	–	0	–	●	**Q18S1-BL** 045959	**Q25S1-BL** 046835		
⊲ 45°	I	0	–	●	**Q18S1R-BL** 062814	**Q25S1R-BL** 045502		
Three positions								
45° ⇔ 45°	–	0	–	●	**Q18S3** 072313	**Q25S3** 072377		5 off
45° ⇓ 45°	I	0	II	●	**Q18S3R** 072314	**Q25S3R** 072378		
45° ⇓ 45°	–	0	–	●	**Q18S3R-A1** 072315	**Q25S3R-A1** 072379		
45° ⇓ 45°	I	0	–	●	**Q18S3R-A2** 072316	**Q25S3R-A2** 072380		
45° ⇓ 45°	–	0	II	●	**Q18S3R-A3** 072317	**Q25S3R-A3** 072381		
45° ⇓ 45°	I	0	–	●	**Q18S3R-A4** 072318	**Q25S3R-A4** 072382		
45° ⇓ 45°	–	0	–	●	**Q18S3R-A5** 072319	**Q25S3R-A5** 072383		
45° ⇓ 45°	–	0	II	●	**Q18S3R-A6** 072320	**Q25S3R-A6** 072384		
45° ⇓ 45°	–	0	–	●	**Q18S3R-A7** 072321	**Q25S3R-A7** 072385		
45° ⇔ 45°	–	0	–	●	**Q18S3-GN** 062149	**Q25S3-GN** 062153		
45° ⇓ 45°	I	0	II	●	**Q18S3R-GN** 062152	**Q25S3R-GN** 062147		
45° ⇔ 45°	–	0	–	●	**Q18S3-RT** 046842	**Q25S3-RT** 046844		
45° ⇓ 45°	I	0	II	●	**Q18S3R-RT** 046838	**Q25S3R-RT** 046840		
45° ⇔ 45°	–	0	–	○	**Q18S3-WS** 046850	**Q25S3-WS** 046852		
45° ⇓ 45°	I	0	II	○	**Q18S3R-WS** 046846	**Q25S3R-WS** 046848		
45° ⇔ 45°	–	0	–	●	**Q18S3-BL** 046368	**Q25S3-BL** 046836		
45° ⇓ 45°	I	0	II	●	**Q18S3R-BL** 064430	**Q25S3R-BL** 045646		

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	46552
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	UL/CSA Part no. 1



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Notes For each color there is a corresponding key.
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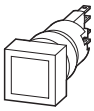
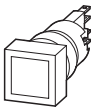
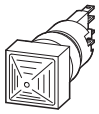
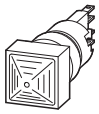
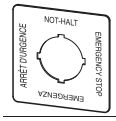
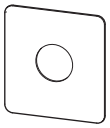
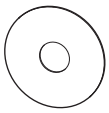
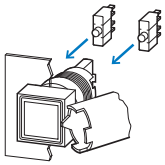
	Color	Front dimensions 18 x 18 mm **Part no.** Article no.	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Indicator lights, IP65						
Flat						
Without filament bulb						
		**Q18LF-WS** 088406	**Q25LF-WS** 090228		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		Q18LF-GN 088337	**Q25LF-GN** 090000			
		Q18LF-RT 088387	**Q25LF-RT** 090198			
		Q18LF-GE 088303	**Q25LF-GE** 089252			
		Q18LF-BL 088270	**Q25LF-BL** 089229			
Without lens	–	**Q18LX** 051739	**Q25LX** 051740		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
With filament bulb, 24 V						
		**Q18LF-WS/WB** 088059	**Q25LF-WS/WB** 089151		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		Q18LF-GN/WB 087947	**Q25LF-GN/WB** 088828			
		Q18LF-RT/WB 088001	**Q25LF-RT/WB** 089104			
		Q18LF-GE/WB 087915	**Q25LF-GE/WB** 088798			
		Q18LF-BL/WB 087860	**Q25LF-BL/WB** 088761			
Conical						
Without filament bulb						
		**Q18LH-WS** 088705	**Q25LH-WS** 086263		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		Q18LH-GN 088629	**Q25LH-GN** 086207			
		Q18LH-RT 088655	**Q25LH-RT** 086241			
		Q18LH-GE 088585	**Q25LH-GE** 090481			
		Q18LH-BL 088560	**Q25LH-BL** 090428			
With filament bulb, 24 V						
		**Q18LH-WS/WB** 088535	**Q25LH-WS/WB** 090405		10 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		Q18LH-GN/WB 088483	**Q25LH-GN/WB** 090312			
		Q18LH-RT/WB 088507	**Q25LH-RT/WB** 090354			
		Q18LH-GE/WB 088448	**Q25LH-GE/WB** 090285			
		Q18LH-BL/WB 088424	**Q25LH-BL/WB** 090240			

		Color	Protection	Front dimensions 25 x 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Emergency stop pushbuttons							
Overload-protected to ISO 13850, EN 418 Pushbutton remains in pushed position; pull to release Can also be used as emergency switching off pushbutton actuator							
Non-illuminated		●	IP65	**Q25PV** 072370		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
Illuminated With built-in multiple LED, 24 V DC, I_e = 15 mA Positive pole at X1 No bulb replacement required.		●	IP65	**Q25LPV** 072371		2 off	
Emergency stop pushbuttons							
Overload-protected to ISO 13850, EN 418 Pushbutton remains in pushed position; pull to release							
Non-illuminated		●	IP65	**Q25PV-S** 257063		5 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
Illuminated With built-in multiple LED, 24 V DC, I_e = 15 mA Positive pole at X1 No bulb replacement required.		●	IP65	**Q25LPV-S** 257064		5 off	
Emergency stop labels							
Yellow, black lettering		Square 50 × 50 mm de, en, fr, it		IP65	**SQT11** 121375		5 off	UL/CSA certification not required
		Round ø 60 mm de, en, fr, it		IP65	**SRT11** 121374		5 off	
Emergency-stop labels							
Yellow, black lettering		Square 50 × 50 mm de, en, fr, it		IP65	**SQT1** 058874		5 off	UL/CSA certification not required
		Round ø 60 mm de, en, fr, it		IP65	**SRT1** 058873		5 off	
Emergency-stop labels							
Blank, yellow Not suitable for engraving		Square 50 × 50 mm		IP65	**SQ-GE** 063263		5 off	UL/CSA certification not required
		Round ø 60 mm		IP65	**SR-GE** 063264		5 off	



Accessories **Page**

Assembly aids and accessories → 2/96

Contact elements

N/O → 2/84

NC → 2/84

Inscription	Symbol	Button plates for pushbutton actuators 18 x 18 mm **Part no.** Article no.	25 × 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Marking plates						
–		**01TQ18** 086816	**01TQ25** 091121		20 off	UL/CSA certification not required
–		**02TQ18** 086859	**02TQ25** 091149			
–		**03TQ18** 087766	**03TQ25** 091184			
–		**04TQ18** 087834	**04TQ25** 091442			
–		**05TQ18** 087867	**05TQ25** 091471			
–		**06TQ18** 087920	**06TQ25** 091506			
With customized inscription via Labeleditor → Notes		**XQ18D-*-*[1)]** 285286	**XQ25D-*-*[1)]** 285287		1 off	
OFF		**10TQ18** 087951	**10TQ25** 091536		20 off	
STOP or OFF		**19TQ18** 054510	**19TQ25** 054508			
ON		**11TQ18** 088007	**11TQ25** 091562			
START or ON		**20TQ18** 054509	**20TQ25** 054507			
START or ON		**21TQ18** 088061	**21TQ25** 091586			
Direction of movement		**32TQ18** 088125	**32TQ25** 091618			
Direction of movement		**36TQ18** 088275	**36TQ25** 092592			
Electr. voltage		**34TQ18** 095386	**34TQ25** 092563			
Increase		**37TQ18** 088315	**37TQ25** 092608			
Decrease		**38TQ18** 088340	**38TQ25** 092645			
Manual actuation		**40TQ18** 088389	**40TQ25** 092709			
Automatic		**41TQ18** 088412	**41TQ25** 092774			
ON–OFF, momentary		**43TQ18** 088426	**43TQ25** 092791			
Unlock		**52TQ18** 088452	**52TQ25** 092825			
Lock		**53TQ18** 088487	**53TQ25** 092874			
Loosen		**54TQ18** 088512	**54TQ25** 093013			
Clamp		**55TQ18** 088545	**55TQ25** 093032			
Liquid START			**921TQ25** 047426			
Liquid STOP		**63TQ18** 088566	**63TQ25** 093060			
Horn		**66TQ18** 088590	**66TQ25** 093092			
Spindle START			**811TQ25** 053898			
Spindle STOP			**814TQ25** 047425			
ON–OFF, maintained		**899TQ18** 089232	**899TQ25** 093063			

Notes

[1)] When ordering, complete part no. XQ18D-*-* or XQ25D-*-*:
1st wildcard * ≙ Color, e.g.: -R, -G, -B, -W, -Y, -S
2nd wildcard * ≙ File name generated by Labeleditor → Engineering

Illuminated pushbutton actuator, Indicator light, laser inscription → Page 2/97

Inscription	Symbol	Button plates for pushbutton actuators 18 x 18 mm **Part no.** Article no.	25 × 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Marking plates						
Direction of movement		**911TQ18** 089778	**911TQ25** 093100		20 off	UL/CSA certification not required
Direction of movement		**912TQ18** 090181	**912TQ25** 093135			
	0	**80TQ18** 088631	**80TQ25** 093134			
	1	**81TQ18** 088663	**81TQ25** 093158			
	2	**82TQ18** 088715	**82TQ25** 093178			
	3	**83TQ18** 088744	**83TQ25** 093197			
	4	**84TQ18** 088766	**84TQ25** 093224			
	5	**85TQ18** 088811	**85TQ25** 093241			
	6	**86TQ18** 089069	**86TQ25** 093257			
	7	**87TQ18** 089107	**87TQ25** 093288			
	8	**88TQ18** 089165	**88TQ25** 093305			
	9	**89TQ18** 089205	**89TQ25** 093329			
STOP			**110TQ25** 093363			
STOP			**112TQ25** 063748			
ARRET			**310TQ25** 091446			
START			**111TQ25** 093399			
START			**122TQ25** 063746			
MARCHE			**311TQ25** 091475			
AUS			**117TQ25** 093434			
AUS			**113TQ25** 063749			
OFF			**217TQ25** 090911			
ARRET			**317TQ25** 091508			
EIN			**121TQ25** 093461			
EIN			**123TQ25** 063747			
ON			**221TQ25** 090934			
MARCHE			**321TQ25** 091563			

Notes Illuminated pushbutton actuators, Indicator lights, Laser inscription → Page 2/97

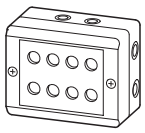
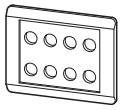
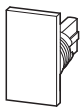
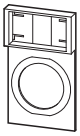
Inscription	Symbol	Button plates for pushbutton actuators 25 × 25 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Marking plates					
LINKS		**134TQ25** 093494		20 off	UL/CSA certification not required
LEFT		**234TQ25** 090987			
GAUCHE		**334TQ25** 092567			
RECHTS		**135TQ25** 093527			
RIGHT		**235TQ25** 091009			
DROITE		**335TQ25** 092594			
ZU		**153TQ25** 090632			
CLOSE		**253TQ25** 091089			
FERME		**353TQ25** 092609			
AUF		**172TQ25** 090732			
UP		**272TQ25** 091124			
MONTEE		**372TQ25** 092711			
AB		**173TQ25** 090822			
DOWN		**273TQ25** 091152			
DESCENTE		**373TQ25** 092775			
RESET		**287TQ25** 091185			
VOR		**190TQ25** 090852			
ZURÜCK		**191TQ25** 090866			

Notes Illuminated pushbutton actuators, Indicator lights, Laser inscription → Page 2/97

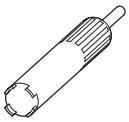
Inscription		Label mounts Q25T... with insert label Part no. Article no.	Price See price list	Insert labels for Q25T...-X label mount Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Blank, black, can be engraved		**Q25TS-01** 046184		**01SQ25** 037986		20 off	UL/CSA certification not required
Blank, aluminum-colored, can be engraved		**Q25TS-02** 046185		**02SQ25** 038074			
Blank, yellow, not for engraving		**Q25TGE-05** 063259		**05SQ25** 063201			
AUS		**Q25TS-117** 046194					
EIN		**Q25TS-121** 046196					
ON		**Q25TS-221** 046197					
STOP		**Q25TS-110** 046190		**110SQ25** 038507			
START		**Q25TS-111** 046192					
Störung		**Q25TS-150** 046198					
FAULT		**Q25TS-250** 046199					
DÉFAUT		**Q25TS-386** 072306		**386SQ25** 072302			
Betrieb		**Q25TS-183** 046201					
EN SERVICE		**Q25TS-383** 046204					
HAND 0 AUTO		**Q25TS-197** 072305					
MAN. 0 AUTO		**Q25TS-397** 072307					
NOT-AUS		**Q25TGE-199** 063260		**199SQ25** 063200			
EMERGENCY STOP		**Q25TGE-299** 063261		**299SQ25** 063199			
RUN				**283SQ25** 038767			
EN SERVICE				**383SQ25** 038771			
ARRET D'URGENCE				**399SQ25** 048638			
–	0	**Q25TS-10** 046186		**10SQ25** 038268			
–	I	**Q25TS-11** 046187					
–	→	**Q25TS-32** 046188					
–	0 I	**Q25TS-90** 046189		**90SQ25** 038271			
–	I 0 II	**Q25TS-93** 072304		**93SQ25** 072300			
With customized inscription through Labeleditor → Notes	–	**XQ25TS-*-*** 109773				1 off	UL/CSA certification not required

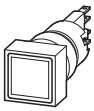
Notes

When ordering, complete part no. XQ25TS-*-*:
1st wildcard * ≙ Color: AL = aluminum, B = black, Y = yellow
2nd wildcard * ≙ File extension

	Color	RAL value	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Surface mounting enclosures, IP65[1)]						
For conventional wiring or for mounting ILP1 printed circuit boards With plastic cover fixing screws Enclosure base: black (RAL 9005) 8 mounting locations Knockout cable entries Bottom: 4 × M20 Sides: 7 × M20						
		RAL 7035	**I8** 046299		2 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
Flush mounting plate, IP65[1)]						
For conventional wiring or for mounting ELP 1 printed circuit boards 8 mounting locations						
		RAL 7035	**E8** 054423		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 46552 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 1
		RAL 9005	**E8-SW** 065212		1 off	
Customized complete unit						
To order use form FO315 → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; max. 10 characters.						
–	–	Configurable	**M16-COMBINATION-*** 232189		1 off	
Blanking plates, IP65						
For closing off of spare mounting locations in surface mounting enclosures or flush mounting panels in grid dimension 25 × 37.5 mm						
		RAL 9005	**Q25AS** 036602		10 off	UL/CSA certification not required
		RAL 7035	**Q25AGR** 048641			
		RAL 1004	**Q25AGE** 048640			
Label mounts without insert label						
For additional marking of mounting locations in surface mounting enclosures or flush mounting panels in grid dimension 25 × 37.5 mm Suitable insert labels → 2/94						
		RAL 9005	**Q25TS-X** 036601		20 off	UL/CSA certification not required
		RAL 7035	**Q25TGR-X** 063257			
		RAL 1004	**Q25TGE-X** 063258			

Notes Unused mounting locations must be closed off with blanking plates.
Each used mounting location must be fitted with a label mount.

	Model	Durability EN 60064 at t_a = +25 °C $t_{average}$ (AC) h	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Filament lamp W 2 × 4.6 d							
	6 V/1.0 W	10000	–	**WBGL6** 090223		50 off	UL/CSA certification not required
	12 V/1.0 W	15000	–	**WBGL12** 089968		50 off	
	24 - 28 V/1.0 W	7000	–	**WBGL24** 089247		100 off	
Multiple LEDs W 2 × 4.6 d							
For AC/DC 	6 V/45 mA	60000		**WBLED-GE6** 055711		10 off	UL/CSA certification not required
				WBLED-GN6 055712			
				WBLED-RT6 055713			
	12 V/24 mA	60000		**WBLED-GE12** 055714			
				WBLED-GN12 055715			
				WBLED-RT12 055716			
Single-chip LED W 2 × 4.6 d							
Positive pole to X1, Integral suppressor circuit up to 1000 V 	18 - 30 V DC/7 - 12.5 mA	100000		**LEDWB-Y** 208724		10 off	UL/CSA certification not required
				LEDWB-G 208725			
				LEDWB-R 208726			
				LEDWB-W 208728			
				LEDWB-B 208727			
Combination box spanner							
For lock nut with bulb extractor 	–	–	–	**R16-MS** 090297		10 off	UL/CSA certification not required
Insulated ferrule							
For fast-on connector 2.8 × 0.8 mm, connected from front U_e > 50 V AC, U_e > 120 V DC 	–	–	–	**ISH2,8** 090267		100 off	UL/CSA certification not required
Flat pin bushing							
2.8 × 0.8 mm for conductor cross-section 0.5 - 1 mm² 	–	–	–	**LT306.022.3** 058863		100 off	UL/CSA certification not required
Blanking plugs, IP65							
For closing off of spare mounting locations 	For grid dimension 18 × 18 mm	–		**Q18BS** 037985		10 off	UL/CSA certification not required
	For grid dimension 25 × 25 mm	–		**Q25BS** 036976		10 off	
Anti-rotation feature							
Guard-ring as anti-rotation feature for all RMQ16 pushbutton 	–	–	–	**VS** 046301		50 off	UL/CSA certification not required

	For use with	Color	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
IP20, screw adapter						
Conductor cross-sections 1 × 1.5 mm², 2 × 0.75 mm²						
	For NC		**SRA01** 028101		20 off	UL/CSA certification not required
	For N/O		**SRA10** 028100			
	For lamp socket		**SRAL** 028099			
Individual keys						
Standard lock mechanism, black, each colour corresponds to a specific lock mechanism						
	–		**ES16** 065190		10 off	UL/CSA certification not required
	–		**ES16-GN** 030742		5 off	
	–		**ES16-RT** 030741			
	–		**ES16-WS** 030743			
	–		**ES16-BL** 030744			
Transparent insert plates						
For better light diffusion						
–	For grid dimension 18 × 18 mm		**01LQ18** 090231		20 off	UL/CSA certification not required
–	For grid dimension 25 × 25 mm		**01LQ25** 093180			
Lenses for illuminated pushbutton actuators						
With customized inscription to order via Labeleditor → Notes						
	For grid dimension 18 × 18 mm	–	**XQ18LT-*-*** 285288		1 off	UL/CSA certification not required
	For grid dimension 25 × 25 mm	–	**XQ25LT-*-*** 285289			
Lenses for indicator lights, flush						
With customized inscription to order via Labeleditor → Notes						
–	For grid dimension 18 × 18 mm	–	**XQ18LF-*-*** 285310		1 off	UL/CSA certification not required
–	For grid dimension 25 × 25 mm	–	**XQ25LF-*-*** 285311			
Insert labels for label mounts						
For laser inscription with Labeleditor → Notes						
–	For Q25TS-...	–	**XQ25TS-*-*** 109773		1 off	

Notes

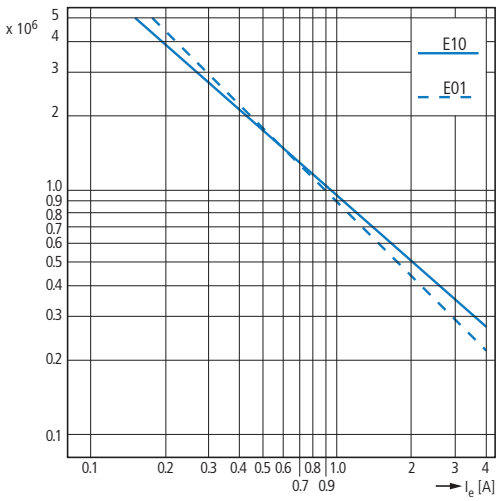
When ordering, complete part no. XQ...-*-*:
1st wildcard * ≙ Color, e.g.: -R, -G, -B, -W, -Y, -S
2nd wildcard * ≙ file name generated by Labeleditor → Engineering

Technical data

				Contact elements	Illuminated pushbuttons (maintained)	Illuminated selector pushbuttons	Indicator lights
General							
Standards				IEC/EN 60947, VDE 0660			
Lifespan, mechanical		Operations	x 10^6	> 100	> 30	> 3	–
Operating frequency		Operations/h		≦ 3600	≦ 1800	≦ 1800	–
Actuating force			N	3	4	–	–
Operating torque			Nm	–	–	≦ 0.2	–
Protection type, IEC/EN 60529				IP20 with ISH2.8	IP65	IP65	IP65
Climatic proofing				Damp heat, constant as per IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature							
Open			°C	-25 - +60	-25 - +60	-25 - +60	-25 - +60
Encapsulated			°C	-25 - +40	-25 - +40	-25 - +40	-25 - +40
Mounting position				Any	Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal			g	> 40	> 40	> 40	> 40
Terminal capacity			mm^2	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
Blade terminal				2.8 × 0.8 mm to DIN 46244			
Flat pin bushing				2.8 × 0.8 mm to DIN 46247 and IEC 60760			
Contacts							
Rated impulse withstand voltage		U_{imp}	V AC	4000	800	800	800
Rated insulation voltage		U_i	V	250	250	250	250
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operational voltage		U_e	V AC	250	24	24	24
Control circuit reliability							
At 24 V DC/5 mA		H_F	Fault probability	< 10^{-7} (i.e. 1 failure to 10^7operations)			–
At 5 V DC/1 mA		H_F	Fault probability	< 5 × 10^{-6} (i.e. 1 failure to 5 × 10^6operations)			–
Use of ISH insulated ferrule 2.8				On >24 V AC/DC recommended On >50 V AC or 120 V DC mandatory, also on unoccupied blade terminals			
Max. short-circuit protective device							
Fuseless			Part no.	FAZ-B6/1	–	–	–
Fuse		gG/gL	A	10	–	–	–
Switching capacity							
Rated operation current							
AC-15							
	24 V	I_e	A	4	–	–	–
	48 V	I_e	A	4	–	–	–
	110 V	I_e	A	4	–	–	–
	230 V	I_e	A	4	–	–	–
DC-13							
	24 V	I_e	A	3	–	–	–
	42 V	I_e	A	1	–	–	–
	60 V	I_e	A	0.8	–	–	–
	110 V	I_e	A	0.5	–	–	–
	220 V	I_e	A	0.2	–	–	–

HPL02099EN

			Pushbutton actuators (maintained)	Selector switch actuators	Key-operated pushbutton actuators	Emergency switching-off pushbutton actuatorss
General						
Standards			IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 0660	IEC/EN 60947, VDE 0660
Lifespan, mechanical	Operations	x 10^6	> 3	> 3	> 3	> 0.1
Operating frequency	Operations/h		≦ 1800	≦ 1800	≦ 1800	≦ 600
Actuating force		N	4	–	–	25
Operating torque		Nm	–	0.2	0.4	–
Protection type, IEC/EN 60529			IP65	IP65	IP65	IP65
Climatic proofing			Damp heat, constant as per IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25 - +60	-25 - +60	-25 - +60	-25 - +60
Encapsulated		°C	-25 - +40	-25 - +40	-25 - +40	-25 - +40
Mounting position			Any	Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal		g	> 40	> 40	> 40	> 40
Terminal capacity		mm^2	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
Blade terminal			2.8 × 0.8 mm to DIN 46244			
Flat pin bushing			2.8 × 0.8 mm to DIN 46247 and IEC 60760			

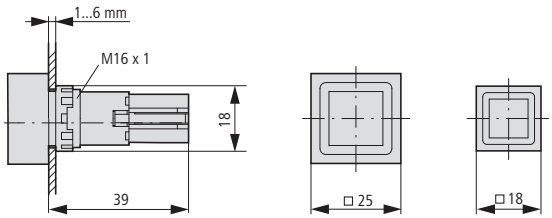


Durability, electrical AC-15 to IEC/EN 60947-5-1 at 230 V
I_e = rated operational current

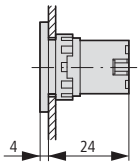
Dimensions

Actuating and indicator elements

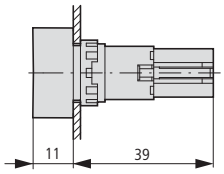
Square style



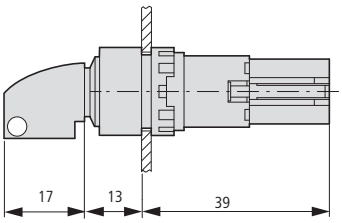
Q...BS



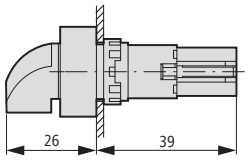
Q...D-...
Q...DR-...



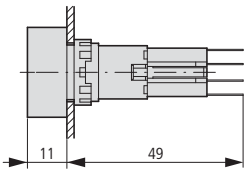
Q...S...



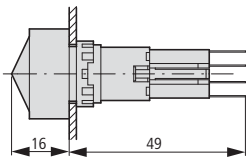
Q...WK...



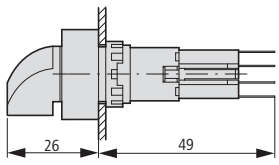
Q...LT-...
Q...LTR-...
Q...LF-...



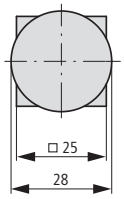
Q...LH-...

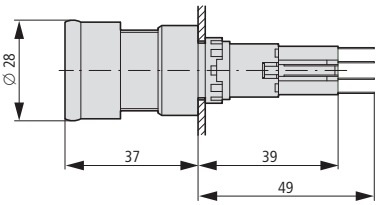


Q...LWK...



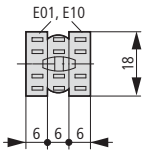
Q25PV...
Q25LPV...

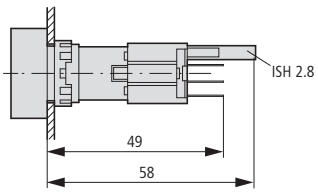




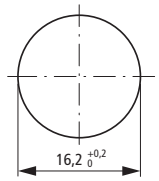
Front fixing

Q18, Q25, E89, SRA, VS, M16



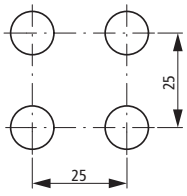


Drilling dimensions



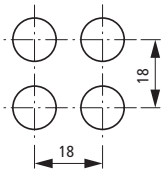
Grid dimension to IEC/EN 60947

Q25

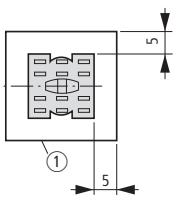


Minimum grid spacing dimension

Q18



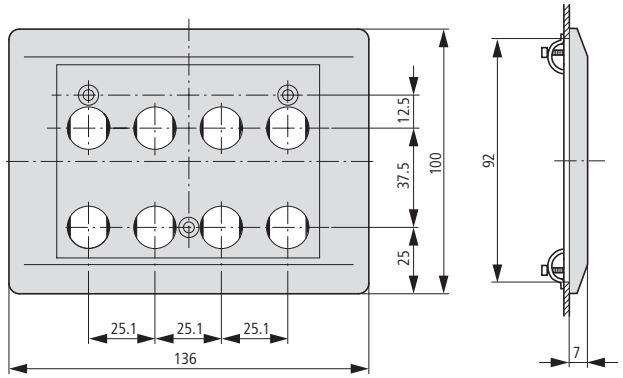
Mounting distance



① Exposed conductive part (metal)

Flush mounting panel

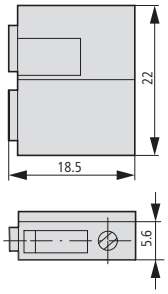
E8...



Size of cutout: 92 × 94

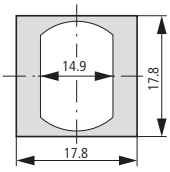
RMQ16 screw adapter

SRA...



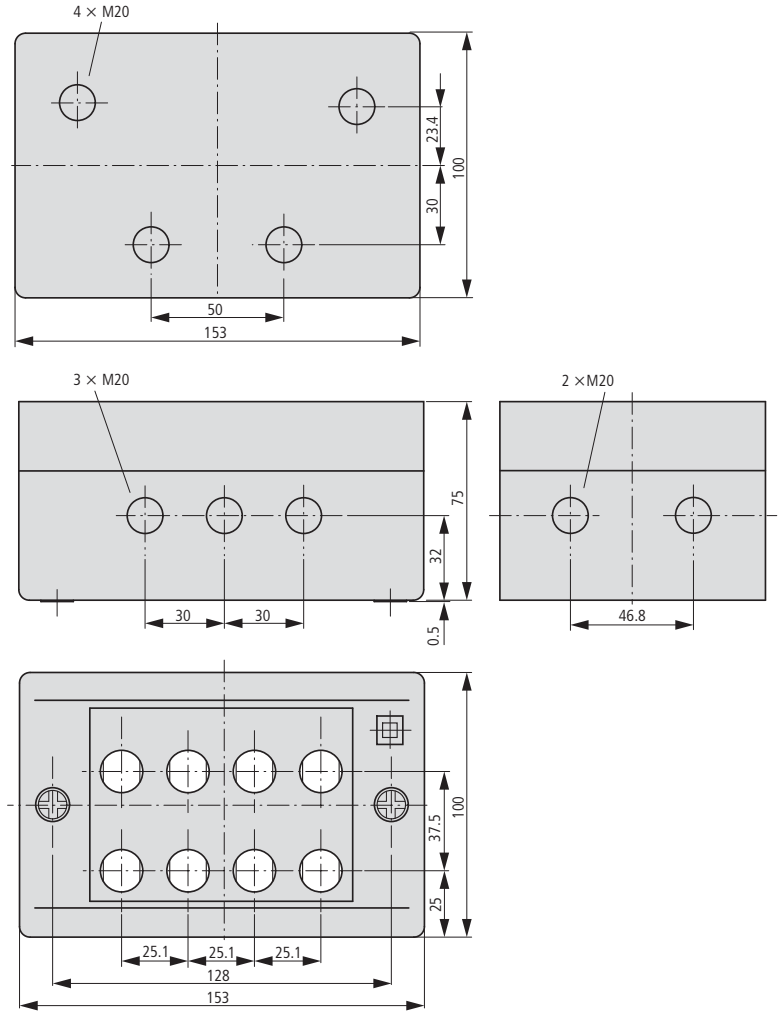
Anti-rotation feature

VS



RMQ16 housing extension

I8...

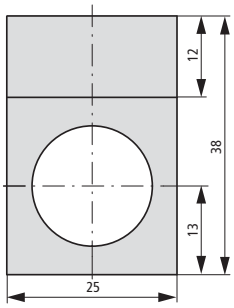


Fixing hole: 2 x ∅ 4.5 mm

Distance: 128 mm

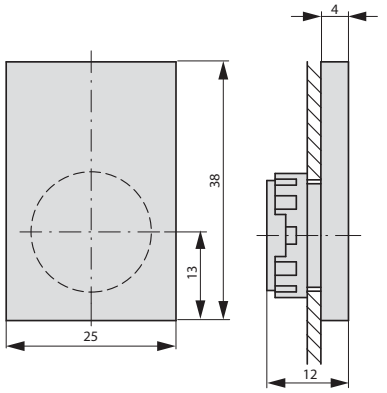
RMQ16 label mount

Q25TS-...

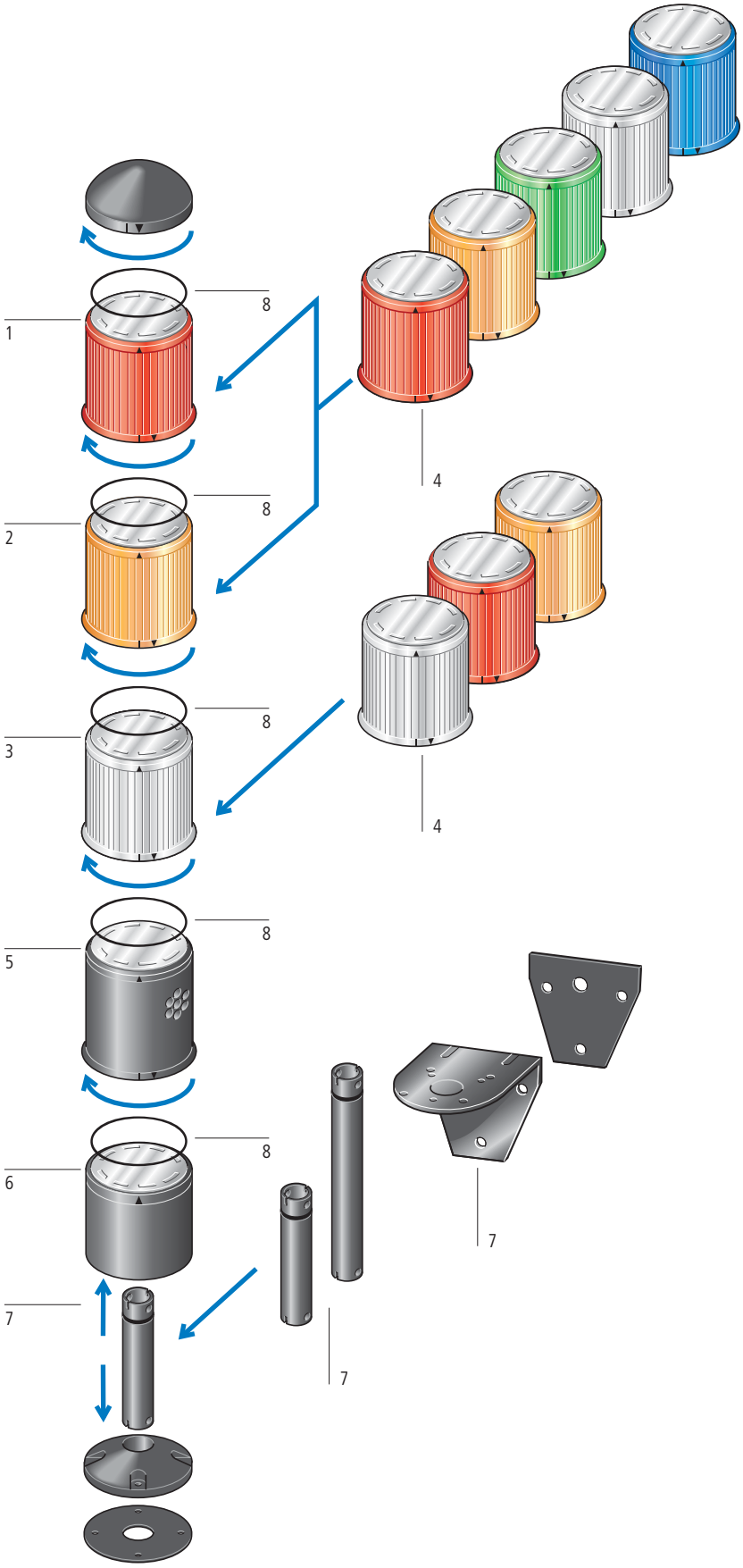


Blanking plates

Q25AS



System overview



Continuous light	1
Easy mounting with bayonet fitting	
Modules can be arranged in any order	
Protection type IP54	
Up to five levels can be actuated independently	
Operating mode: 100 % DF	
Without light elements	
→ Page 2/104	

Flashing light	2
Easy mounting with bayonet fitting	
Modules can be arranged in any order	
Protection type IP54	
Up to five levels can be actuated independently	
Operating mode: 100 % DF	
With filament bulb	
Flashing frequency: approx. 1 Hz	
→ Page 2/105	

Strobe light	3
Easy mounting with bayonet fitting	
Modules can be arranged in any order	
Protection type IP54	
Up to five levels can be actuated independently	
Operating mode: 100 % DF	
Flash power 1 Ws	
Flashing frequency: approx. 1 Hz	
→ Page 2/106	

Caps	4
Color: red, yellow, green, white, blue	
Fresnel grooves ensure even light distribution	

Acoustic device	5
Easy mounting with bayonet fitting	
Modules can be arranged in any order	
Protection type IP20	
Operating mode: 100 % DF	
Continuous tone or pulsed tone	
Sound pressure: about 90 dB at 60 cm	
Frequency: 2750 Hz	
→ Page 2/105	

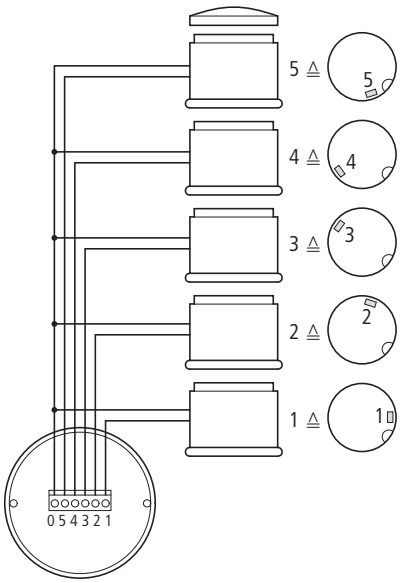
Base module	6
Easy mounting with bayonet fitting	
Protection type IP54	
For bottom mounting or in tubular column	
Terminal connection capacity 6 × 1.5 mm²	
With top cover	
→ Page 2/104	

Accessories	7
Spacer available in four lengths Filament bulbs, LEDs 90° wall mounting with commercial four-hole fixing	
→ Page 2/107	

Gaskets	8
For increasing the degree of protection type to IP65	
→ Page 2/107	

Product feature of SL

- Individual programming by jumper: max. 5 modules and base module
- Customized combinations → Page 2/104

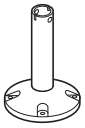


Rated operational voltage U_e V	Modules Number	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Complete units						
Base module with foot and 100 mm tube including filament lamp Continuous light, IP54						
24 V AC/DC	3		**SL-100-L-RYG/24** 205352		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 12, with additional SL-IP65: part no. 4X
24 V AC/DC	2		**SL-100-L-RG/24** 205354		1 off	
Customized complete unit						
To order use form FO315, → Data sheet in Online Catalog * = Freely selectable customer identification or stock no.; Maximum 10 characters						
–	–	–	**SL-COMBINATION-*** 229655		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified

		Terminal type	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Base module							
Black, with cover							
	Screw terminals		**SL-B** 205311		1 off	–	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	Cage clamp Cage clamp is a registered trade-mark of Wago Kontakttechnik GmbH, Minden,		**SL-CB** 218483		1 off		Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	Connection to AS-Interface		**SL-B-ASI** 222174		1 off	Base module (printed circuit board in base enclosure with 3 outputs): • Total power supply from AS-Interface (max. 250 mA) using 2-way screw terminal • Combination of 3 surface mounting modules with different functions (continuous, flashing, strobe light and acoustic indication) • Status indication via LEDs • Order stacking modules separately	
Continuous light module							
Without light elements, filament lamps → Page 2/107, LED → Page 2/107							
			SL-L-W 205312		1 off		Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
			SL-L-R 205313				
			SL-L-G 205314				
			SL-L-Y 205315				
			SL-L-B 205316				

	Rated operational voltage U_e V	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Flashing light module						
Without light element, f ≈ 1 Hz						
	24 V AC/DC (+10 %/-15 %)		**SL-BL24-W** 205317		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
			SL-BL24-R 205318			
			SL-BL24-Y 205320			
			SL-BL24-G 205319			
			SL-BL24-B 205321			
	110 - 130 V AC		**SL-BL130-W** 205322			
			SL-BL130-R 205323			
			SL-BL130-G 205324			
			SL-BL130-Y 205325			
			SL-BL130-B 205326			
	230 V AC		**SL-BL230-W** 205327			
			SL-BL230-R 205328			
			SL-BL230-G 205329			
			SL-BL230-Y 205330			
			SL-BL230-B 205331			
Acoustic module						
IP20						
	Continuous tone f = 2750 Hz In 60 cm spacing 12 V: 77 dB 24 V: 83 dB 36 V: 90 dB	12 - 36 V AC/DC 8 - 12 mA	**SL-A24** 205341		1 off	Product Standards: IEC/EN 60947-5; UL°508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	Continuous tone f = 2750 Hz In 60 cm spacing 110 V: 72 dB 230 V: 78 dB	110-230 V AC/DC 4 - 8 mA	**SL-A110-230** 205342			
	Pulsed tone 5 Hz with f = 2750 Hz In 60 cm spacing 12 V: 61 dB 24 V: 66 dB 36 V: 77 dB	12 - 36 V AC/DC 8 - 12 mA	**SL-AP24** 205343			
	Pulsed tone 5 Hz with f = 2750 Hz In 60 cm spacing 110 V: 67 dB 230 V: 73 dB	110-230 V AC/DC 4 - 8 mA	**SL-AP110-230** 205344			

	Rated operational voltage U_e V	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Strobe light module With flash tube, 1 Ws, f ≈ 1 Hz						
	24 V AC/DC (+10 … –15 %) I_{emax} = 190 mA		**SL-FL24-W** 205332		1 off	Product Standards: IEC/EN 60947-5; UL°508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
			SL-FL24-R 205333			
			SL-FL24-Y 205334			
	110 - 130 V AC I_{emax} = 31 mA		**SL-FL130-W** 205335			
			SL-FL130-R 205336			
			SL-FL130-Y 205337			
	230 V AC I_{emax} = 28 mA		**SL-FL230-W** 205338			
			SL-FL230-R 205339			
			SL-FL230-Y 205340			

		Lifespan EN 60064 at t_a = +25 °C $t_{average}$ (AC) h	Rated operational voltage U_e V	Color	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Accessories								
Stand with spacer								
	100 mm, plastic, black	–	–	–	**SL-F100** 205345		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	100 mm, metal	–	–	–	**SL-F100M** 265359			
	250 mm, plastic, black	–	–	–	**SL-F250** 205346			
	250 mm, metal	–	–	–	**SL-F250M** 268925			
	400 mm, metal	–	–	–	**SL-F400** 215275			
	800 mm, metal	–	–	–	**SL-F800** 215276			
Fixing bracket 90°, for wall mounting								
	Metal	–	–	–	**SL-FW** 205347		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Filament bulb BA 15d, 5 - 7 W								
		2000	24 V	–	**SL-L24** 205348		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
		5000	110 - 130 V	–	**SL-L130** 205349			
		5000	200 - 260 V	–	**SL-L230** 205350			
Multiple LED BA 15d								
		100000	18 - 30 V AC/DC 50/60 Hz 13 - 50 mA	○	**SL-LED-W** 215278		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
				red	**SL-LED-R** 215279			
				green	**SL-LED-G** 215280			
				yellow	**SL-LED-Y** 215281			
				blue	**SL-LED-B** 215282			
		100000	110 - 230 V AC, 50/60 Hz 9 - 17 mA	○	**SL-LED230-W** 285532			
				red	**SL-LED230-R** 285533			
				green	**SL-LED230-G** 285534			
				yellow	**SL-LED230-Y** 285535			
				blue	**SL-LED230-B** 285536			
Gasket set For increasing the degree of protection type to IP65 (Not for the acoustic device) for 3 modules ≙ 4 units								
	–	–	–	–	**SL-IP65** 215277		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Degree of Protection: UL/CSA Type 4X

Technical data

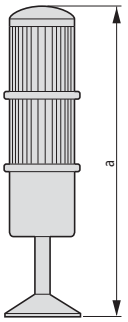
			SL signal towers
General			
Standards			IEC/EN 60947, VDE 0660
Protection type, IEC/EN 60529			IP54, IP65 with SL-IP65 gasket, IP20 with acoustic module SL-A
Climatic proofing			Damp heat, constant as per IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Mounting position			Any
Mechanical shock resistance to IEC 60068-2-27 Shock duration 11 ms, half-sinusoidal		g	> 15
Terminal capacity			
Solid		mm^2	0.75 - 2.5
Stranded		mm^2	0.5 - 2.5
Contacts			
Rated impulse withstand voltage	U_{imp}	V AC	4000
Rated insulation voltage	U_i	V	250
Overvoltage category/pollution degree			III/3

			SL-B-ASI base module for signal towers
General			
Connection to AS-Interface cable			Screw terminal on printed circuit board
Addressing			Via connection to AS-Interface cable
Maximum total current		mA	≤ 250
Energy supply			Completely from the AS-Interface cable
Ambient temperature		°C	-25 - +55
Status LEDs on the printed circuit board			Status. Output Q0/function module position 1: green Status. Output Q1/function module position 2: green Status. Output Q2/function module position 3: green AS-Interface power line: green AS-Interface error, AS-Interface master failure: red
Profile			S-9.A.E

Dimensions

Signal towers

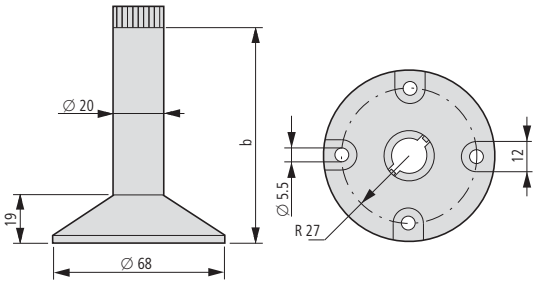
SL-100-...



Number of modules	a
1	227
2	289
3	351
4	413
5	475

Stand with spacer

SL-F...



	b
SL-F100	85
SL-F250	235
SL-F400	402
SL-F800	802

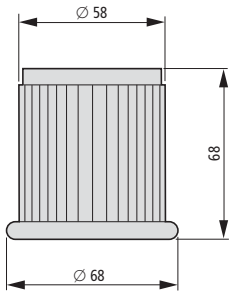
Modules

SL-L-...

SL-BL...

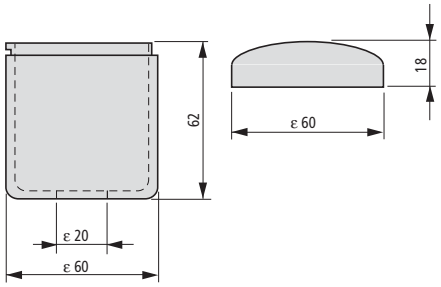
SL-A...

SL-FL...



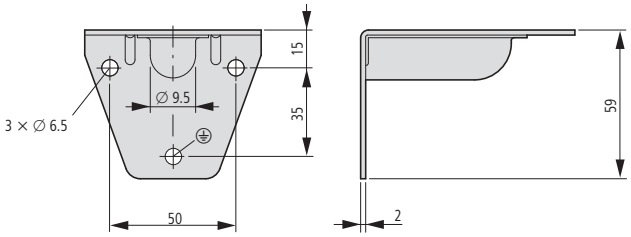
Basic modules with cover

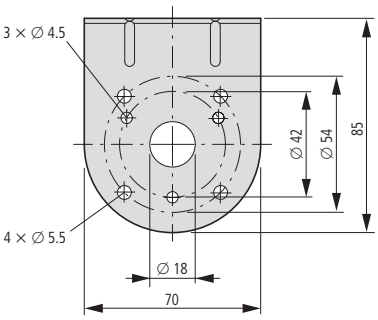
SL-(C)B...



Fixing bracket

SL-FW







LS position switches
MCS pressure switches, sensors

Eaton safety and position switches are used wherever positions must be determined precisely. Available in various construction types, the sensors and proximity switches are non-contact for reliable switching. A wide spectrum of inductive, capacitive, optoelectronic and mechanical sensors with a multitude of connection variants for direct and alternating voltage with two or three conductors covers nearly every application.

Safety / position switches LS-Titan
Determine positions reliably +++ Cage clamp and screw terminal technology +++ Metal or insulated versions +++ Positive opening contacts +++ Easy mounting of the various operating heads → Page 3/2

Safety door switch, safety / position switches
Safety for personnel and processes +++ Secures and locks protective doors +++ Switches off safely in case of emergencies +++ Prevents unwanted manipulation → Page 3/12

MCS pressure switches
Pressure monitoring of fluid and gaseous media, i.e air pressure +++ Two adjustable operating points (ON/OFF operating point) +++ 1-pole or 3-pole, to control auxiliary circuits or switch loads → Page 3/31

Sensors, proximity switches
Inductive, capacitive and optical object recognition +++ Cylindrical construction types from 4 – 30 mm +++ Cubical construction types +++ AC and DC variants → Page 3/36











System overview

LS-Titan 3/2

Ordering

LS-Titan safety position switch 3/3

LS-Titan position switch without positive opening 3/8

Operating heads 3/9

Accessories 3/10

System overview

Safety position switches LS...ZBZ, LS...ZB, LSR... 3/12

Description

Safety position switches LS...ZBZ, LS...ZB, LSR... 3/14

Ordering

Safety position switches LS…ZBZ 3/16

Actuators LS…ZBZ 3/17

Safety position switches LSR…, LS…ZB 3/18

Engineering

Contact travel diagrams for LS-Titan position switches 3/19

Technical data

(Safety) position switch LS-Titan 3/22

Safety position switches LS...ZBZ 3/24

Dimensions

(Safety) position switch LS-Titan. 3/25

Safety position switches LS...ZBZ, LS...ZB, LSR... 3/27

Safety position switches LSR…, LS…ZB 3/29

Safety position switches LS4…ZB 3/30

Ordering

Pressure switch 3/31

Accessories 3/33

Pressure switches for North America 3/34

Dimensions

Pressure switches 3/34

Technical data

Pressure switches 3/35















Inductive Sensors

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Capacitive sensors

E53-Series 3/77

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Optical sensors

Comet series 3/83

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Technical data 3/92

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E58-Series 3/97

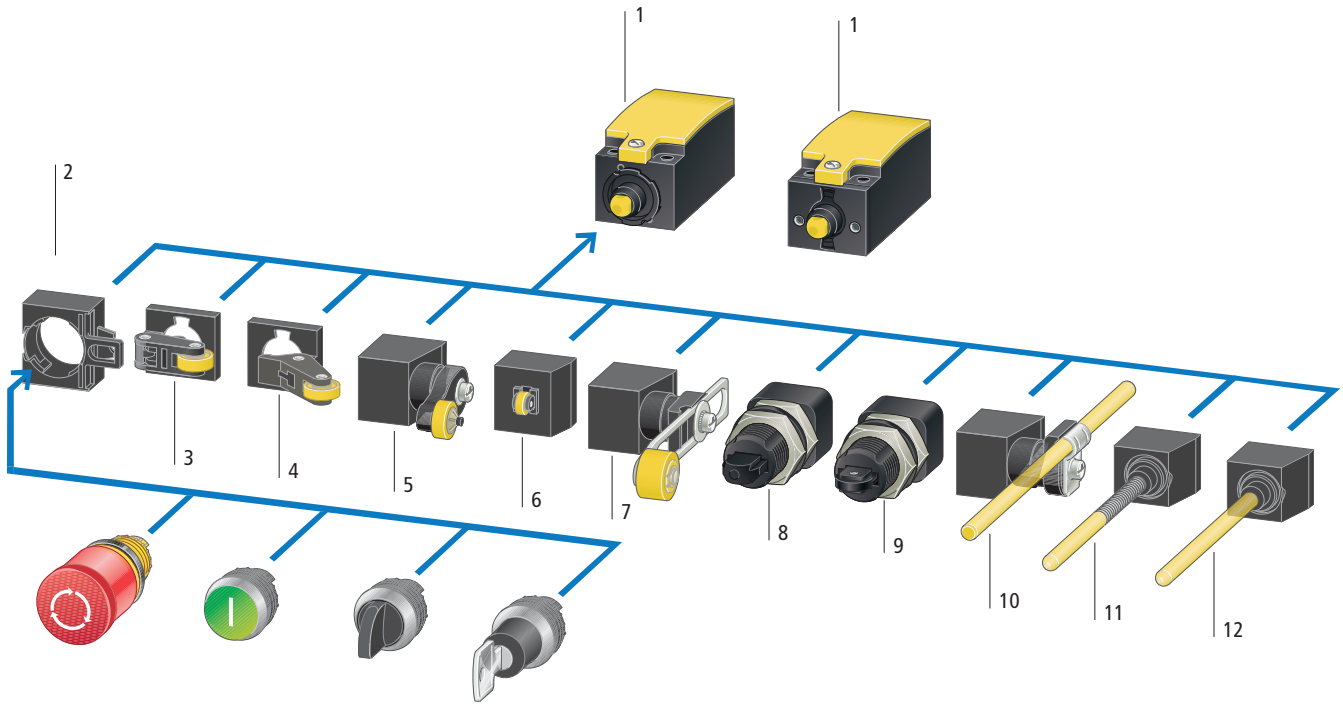
E65-SM-Series 3/101

Accessories

Ordering 3/105

Dimensions 3/108

System overview



LS, LSM

Basic units

Basic Unit	1
According to EN 50047	
With screw-on cover	
Contact configuration: 1N/O / 1NC, 2N/O, 2NC	
Cage Clamp, Screw terminals technology	
As snap-action or standard-action switch	
As electronic snap-action switch,(individually adjustable)	
As 4-20 mA analog signal encoder	
As 0-10 VDC analog signal encoder	
→ Page 3/3	

Operating heads
Can be rotated by 90°

Fixing adapters	2
Actuation through front element RMQ-Titan®	
Roller lever	3
For one-sided operation with higher operating speed	
Angled roller lever	4
For actuation along the unit axis	
Rotary lever	5
For transverse actuation, for pendulum movements	
→ Page 3/5	

Operating heads
Can be rotated by 90°

Roller plunger	6
For transverse actuation with low actuating force	
Adjustable roller lever	7
For length adjustment as required	
Rounded plunger, center fixing	8
For mounting in enclosure wall or mounting plate drilling M18 x 1	
Roller plunger, center fixing	9
For mounting in enclosure wall or mounting plate drilling M18 x 1	
Actuating rod	10
On conveyor belts for lightweight goods	
Spring rod	11
For flexible actuation from all sides	
Actuating rod	12
Withdrawable mechanism from front	
→ Page 3/5	

LS, LSM product features

- Modular system
- IP65 and IP66 protection type (except LSM)

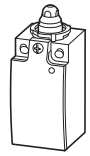
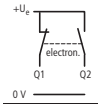
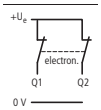
totally insulated

- Personnel protection
- Positive operation
- Safety function with positively opening contacts to IEC/EN 60947-5-1 up to Category 4 to EN 954-1

- Suitable for use with electronic units to IEC/EN 61131-2
- Devices for world markets

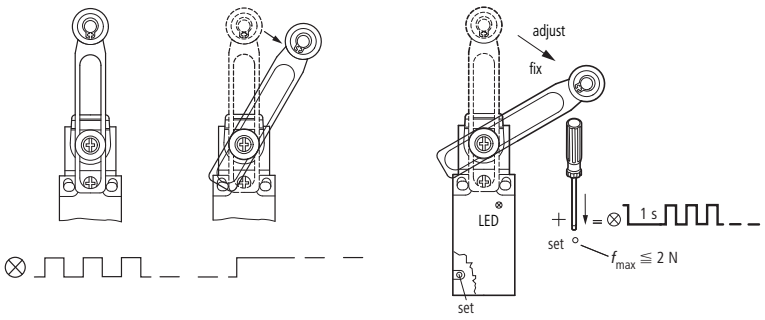
HPL03003EN

Ordering

	Contact configuration ⊖ Safety function safety function to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact	Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure cover	**Part no.** Article no.	**Price** See price list	Std. pack	
Basic unit, expandable								
Operating point electronically adjustable, IP66, IP67								
Basic unit Visible status display, comparable with positive opening function Partly short-circuit-proof, restart after reset								
	1 N/O	1 NC			**LSE-11** 266121		2 off	1)
	–	2 NC			**LSE-02** 266122		2 off	1)

Notes

LSE-11 and LSE-02: Individual operating point adjustment:

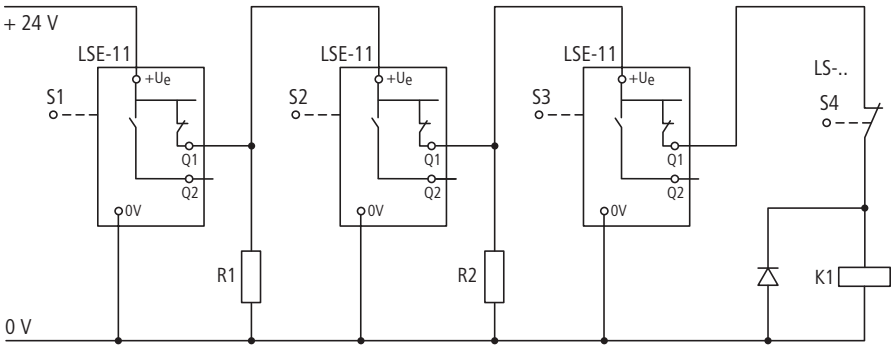


The following applies to LSE-11 and LSE-02: ensure that the power supply operates correctly when setting the operating point.

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Circuit example of series connection:
LSE-11 and LSE-02 can be used in safety-oriented circuits.



S1 is connected to 24 V DC
S2, S3 each switch with a delay of 0.7 s
R1, R2 e.g. series resistor element M22-XLED60 (2820 Ω/0.5 W)

1) Operating heads → Page 3/9

Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open	NC = normally closed contact	Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure covers	Enclosure	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack	
Basic unit, expandable										
Rounded plunger, IP66, IP67										
–	2 NC ⊖				plastic	Cage Clamp	**LS-02** 266107		10 off	1) 2)
–	2 NC ⊖					Cage Clamp	**LS-02-SW** 272009		10 off	1) 2)
–	2 NC ⊖					Screwed terminal	**LS-S02** 106729		10 off	2)
–	2 NC ⊖					Screwed terminal	**LS-S02-SW** 106782		10 off	2)
–	2 NC ⊖				metal	Cage Clamp	**LSM-02** 266142		2 off	1) 2)
–	2 NC ⊖		0 2.0 6.1 11-12 NC 21-22 NC 4.0 Zw (11-12) = 3.3 mm Zw (21-22) = 5.3 mm		plastic EN 50047 Form B	Cage Clamp	**LS-02A** 116702		10 off	1) 2)
–	2 NC ⊖					Screwed terminal	**LS-S02A** 116703		10 off	2)
1 N/O	1 NC ⊖	13 21 14 22	0 4.3 6.1 13-14 NO 21-22 NC 3.0 Zw = 4.5 mm		plastic	Cage Clamp	**LS-11** 266109		10 off	1) 2)
1 N/O	1 NC ⊖					Cage Clamp	**LS-11-SW** 272006		10 off	1) 2)
1 N/O	1 NC ⊖					Screwed terminal	**LS-S11** 106783		10 off	2)
1 N/O	1 NC ⊖					Screwed terminal	**LS-S11-SW** 106807		10 off	2)
1 N/O	1 NC ⊖				metal EN 50047 Form B	Cage Clamp	**LSM-11** 266144		2 off	1) 2)
1 N/O	1 NC ⊖		0 3.0 6.1 13-14 NO 21-22 NC 1.0 Zw = 2,3 mm		plastic EN 50047 Form B	Cage Clamp	**LS-11A** 116704		10 off	1) 2)
1 N/O	1 NC ⊖					Screwed terminal	**LS-S11A** 116705		10 off	2)
1 N/O	1 NC ⊖	27 15 28 16	0 3.0 6.1 15-16 NC 27-28 NO 2.1 Zw = 4.5 mm		plastic	Cage Clamp	**LS-11D** 266114		10 off	1) 2)
1 N/O	1 NC ⊖					Cage Clamp	**LS-11D-SW** 272007		10 off	1) 2)
1 N/O	1 NC ⊖					Screwed terminal	**LS-S11D** 106791		10 off	2)
1 N/O	1 NC ⊖					Screwed terminal	**LS-S11D-SW** 106797		10 off	2)
1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11D** 266149		2 off	1) 2)
1 N/O	1 NC ⊖	15 27 16 28	0 4.0 6.1 15-16 NC 27-28 NO 2.1 ZW = 5.5 mm		plastic	Cage Clamp	**LS-11DA** 292361		10 off	1) 2)
1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11DA** 106795		1 off	2)
1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11DA** 292363		1 off	1) 2)
1 N/O	1 NC ⊖	13 21 14 22	0 3.0 6.1 21-22 → 13-14 21-22 ← 13-14 1.6 Zw = 5.5 mm		plastic EN 50047 Form B	Cage Clamp	**LS-11S** 266105		10 off	1) 2)
1 N/O	1 NC ⊖				plastic EN 50047 Form B	Cage Clamp	**LS-11S-SW** 272020		10 off	1) 2)
1 N/O	1 NC ⊖				plastic EN 50047 Form B	Screwed terminal	**LS-S11S** 106798		10 off	2)
1 N/O	1 NC ⊖				plastic EN 50047 Form B	Screwed terminal	**LS-S11S-SW** 106806		10 off	2)
1 N/O	1 NC ⊖				metal EN 50047 Form B	Cage Clamp	**LSM-11S** 266140		2 off	1) 2)

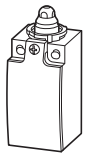
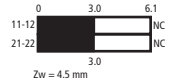
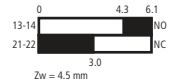
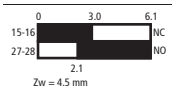
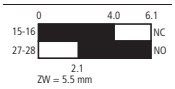
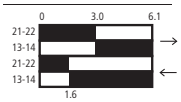
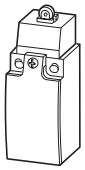
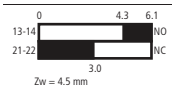
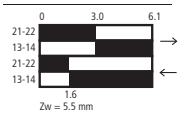
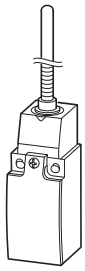
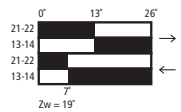
Notes

1) Cage Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden, Germany. Accessories for the Cage Clamp terminals from Wago: Jumper insert, grey, Wago article no. 264-402

2) Operating heads → Page 3/9

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure covers	Enclosure	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack	
Complete units										
Rounded plunger, IP66, IP67 (front fixing)										
	–	2 NC ⊖			●	plastic	Cage Clamp	**LS-02/F** 292365		1 off	1) 2)
	–	2 NC ⊖			●	plastic	Screwed terminal	**LS-S02/F** 106780		1 off	2)
	–	2 NC ⊖			●	metal	Cage Clamp	**LSM-02/F** 292371		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Cage Clamp	**LS-11/F** 290176		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Screwed terminal	**LS-S11/F** 106784		1 off	2)
	1 N/O	1 NC ⊖			●	metal	Cage Clamp	**LSM-11/F** 292372		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Screwed terminal	**LS-S11D/F** 106792		1 off	2)
	1 N/O	1 NC ⊖			●	plastic	Cage Clamp	**LS-11D/F** 292366		1 off	1) 2)
	1 N/O	1 NC ⊖			●	metal	Cage Clamp	**LSM-11D/F** 292373		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Cage Clamp	**LS-11DA/F** 292369		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Screwed terminal	**LS-S11DA/F** 106796		1 off	2)
	1 N/O	1 NC ⊖			●	metal	Cage Clamp	**LSM-11DA/F** 292376		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Cage Clamp	**LS-11S/F** 292367		1 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Screwed terminal	**LS-S11S/F** 106799		1 off	2)
	1 N/O	1 NC ⊖			●	metal	Cage Clamp	**LSM-11S/F** 292374		1 off	1) 2)
Roller plungers, IP66, IP67										
	1 N/O	1 NC ⊖			●	plastic EN 50047 Form C	Cage Clamp	**LS-11/P** 266112		2 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic EN 50047 Form C	Screwed terminal	**LS-S11/P** 106788		2 off	2)
	1 N/O	1 NC ⊖			●	metal EN 50047 Form C	Cage Clamp	**LSM-11/P** 266147		2 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic EN 50047 Form C	Cage Clamp	**LS-11S/P** 266118		2 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic EN 50047 Form C	Screwed terminal	**LS-S11S/P** 106801		2 off	2)
	1 N/O	1 NC ⊖			●	metal EN 50047 Form C	Cage Clamp	**LSM-11S/P** 266153		2 off	1) 2)
Spring rod actuator IP66, IP67										
Do not use spring-rod actuator as a safety position switch; admissible only with snap-action contact.										
	1 N/O	1 NC ⊖			●	plastic	Cage Clamp	**LS-11S/S** 266104		2 off	1) 2)
	1 N/O	1 NC ⊖			●	plastic	Screwed terminal	**LS-S11S/S** 106805		2 off	2)
	1 N/O	1 NC ⊖			●	metal	Cage Clamp	**LSM-11S/S** 266139		2 off	1) 2)

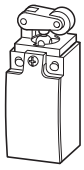
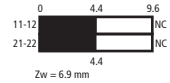
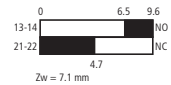
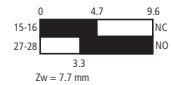
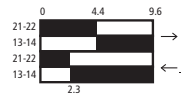
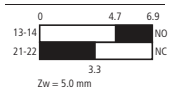
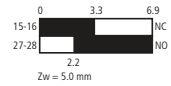
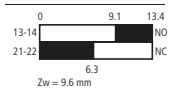
Notes

1) Cage Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden. Accessories for the Cage Clamp terminals from Wago: Jumper insert, grey, Wago article no. 264-402

2) The operating head can be rotated at 90° intervals to adapt to the specified operating direction.

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure cover	Enclosure	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack	
Complete units										
Roller lever IP66, IP67										
Long										
	–	2 NC ⊖				plastic	Cage Clamp	**LS-02/L** 266108		2 off	1) 2)
	–	2 NC ⊖				plastic	Screwed terminal	**LS-S02/L** 106781		2 off	2)
	–	2 NC ⊖				metal	Cage Clamp	**LSM-02/L** 266143		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form E	Cage Clamp	**LS-11/L** 266110		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form E	Screwed terminal	**LS-S11/L** 106785		2 off	2)
	1 N/O	1 NC ⊖				metal EN 50047 Form E	Cage Clamp	**LSM-11/L** 266145		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11D/L** 266115		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11D/L** 106793		2 off	2)
	1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11D/L** 266150		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form E	Cage Clamp	**LS-11S/L** 266116		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form E	Screwed terminal	**LS-S11S/L** 106800		2 off	2)
	1 N/O	1 NC ⊖				metal EN 50047 Form E	Cage Clamp	**LSM-11S/L** 266151		2 off	1) 2)
Short										
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11/LS** 290173		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11/LS** 106787		1 off	2)
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11D/LS** 290174		1 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11D/LS** 106794		1 off	2)
Large										
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11/LB** 290175		1 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11/LB** 106786		1 off	2)

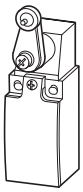
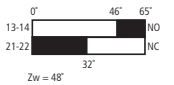
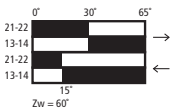
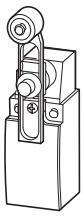
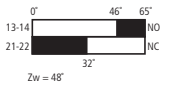
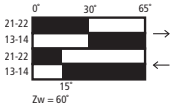
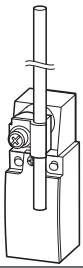
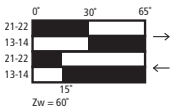
Notes

1) Cage Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden.
Accessories for the Cage Clamp terminals from Wago:
Jumper insert, grey, Wago article no. 264-402

2) The operating head can be rotated at 90° intervals to adapt to the specified operating direction.

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure covers	Enclosure	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack	
Complete units										
Rotary lever, IP66, IP67										
	1 N/O	1 NC ⊖				plastic EN 50047 Form A	Cage Clamp	**LS-11/RL** 266111		2 off	1) 2)
	1 N/O	1 NC ⊖				metal EN 50047 Form A	Cage Clamp	**LSM-11/RL** 266146		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form A	Screwed terminal	**LS-S11/RL** 106789		2 off	2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form A	Cage Clamp	**LS-11S/RL** 266117		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic EN 50047 Form A	Screwed terminal	**LS-S11S/RL** 106802		2 off	2)
	1 N/O	1 NC ⊖				metal EN 50047 Form A	Cage Clamp	**LSM-11S/RL** 266152		2 off	1) 2)
Adjustable roller levers, IP66, IP67										
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11/RLA** 266113		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11/RLA** 106790		2 off	2)
	1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11/RLA** 266148		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11S/RLA** 266119		2 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11S/RLA** 106803		2 off	2)
	1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11S/RLA** 266154		2 off	1) 2)
Actuating rodIP66, IP67										
	1 N/O	1 NC ⊖				plastic	Cage Clamp	**LS-11S/RR** 266106		4 off	1) 2)
	1 N/O	1 NC ⊖				plastic	Screwed terminal	**LS-S11S/RR** 106804		4 off	2)
	1 N/O	1 NC ⊖				metal	Cage Clamp	**LSM-11S/RR** 266141		4 off	1) 2)
Customer specific complete units IP66, IP67										
(*) Use-definable customer ID or stock no.: up to 10 characters										
						plastic	–	**LS-COMBINATION-*** 266168		1 off	1) 2)

Notes

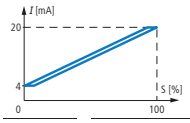
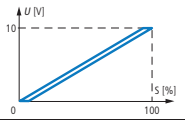
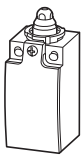
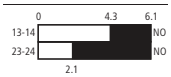
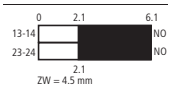
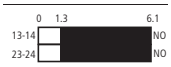
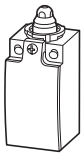
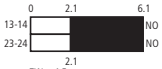
1) Cage Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden, Germany.
Accessories for the Cage Clamp terminals from Wago:
Jumper insert, grey, Wago article no. 264-402

2) The operating head can be rotated at 90° intervals to adapt to the specified operating direction.

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

HPL03008EN

Contact configuration	Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Color Enclosure cover	Enclosure	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack	
⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact									
Basic unit, expandable									
Analog electronic position switches IP66, IP67									
Basic unit Visual status indication Q1 = Analog output Q2 = Diagnostics output (the diagnostics output has a 0 V signal in the event of a fault.) Functional Safety TÜV FS TÜV Rheinland Group Type Approved			yellow	plastic	Cage Clamp	**LSE-AI** 269461		2 off	2)
			yellow	plastic	Cage Clamp	**LSE-AU** 274096		2 off	2)
Rounded plunger, IP66, IP67									
	2 N/O	–			yellow	plastic	Cage Clamp	**LS-20** 266120		10 off	1) 2)
	2 N/O	–			black		Cage Clamp	**LS-20-SW** 272008		10 off	1) 2)
	2 N/O	–			yellow		Screwed terminal	**LS-S20** 106808		1 off	2)
	2 N/O	–			black		Screwed terminal	**LS-S20-SW** 106812		10 off	2)
	2 N/O	–			yellow	metal	Cage Clamp	**LSM-20** 266155		2 off	1) 2)
	2 N/O	–			yellow	plastic	Cage Clamp	**LS-20A** 292362		1 off	1) 2)
	2 N/O	–			yellow	plastic	Screwed terminal	**LS-S20A** 106810		10 off	2)
	2 N/O	–			yellow	metal	Cage Clamp	**LSM-20A** 100051		2 off	1) 2)
	2 N/O	–			yellow	plastic EN 50047 Form B	Cage Clamp	**LS-20B** 116706		10 off	1) 2)
	2 N/O	–			yellow	plastic EN 50047 Form B	Screwed terminal	**LS-S20B** 116707		10 off	2)
Basic unit, not expandable									
Rounded plunger, IP66, IP67 (front fixing)									
	2 N/O	–			yellow	plastic	Cage Clamp	**LS-20/F** 292368		1 off	1)
	2 N/O	–			yellow	plastic	Screwed terminal	**LS-S20/F** 106809		1 off	
	2 N/O	–			yellow	metal	Cage Clamp	**LSM-20/F** 292375		1 off	1)
	2 N/O	–			yellow	plastic	Cage Clamp	**LS-20A/F** 292370		1 off	1)
	2 N/O	–			yellow	plastic	Screwed terminal	**LS-S20A/F** 106811		1 off	
	2 N/O	–			yellow	metal	Cage Clamp	**LSM-20A/F** 292377		1 off	1)

Notes

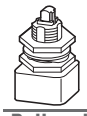
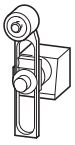
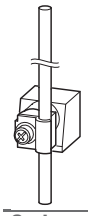
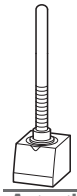
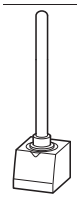
1) Cage Clamp is a registered trademark of Wago Kontakttechnik, 32432 Minden.
Accessories for the Cage Clamp terminals from Wago:
Jumper insert, grey, Wago article no. 264-402

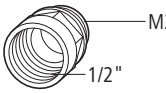
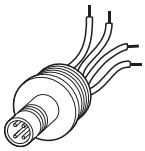
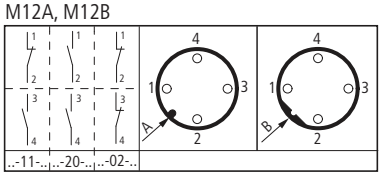
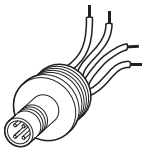
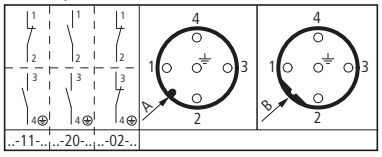
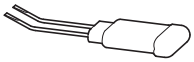
2) Operating heads → Page 3/9

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, 67, UL/CSA Type 3R, 4X (indoor use only), 12, 13

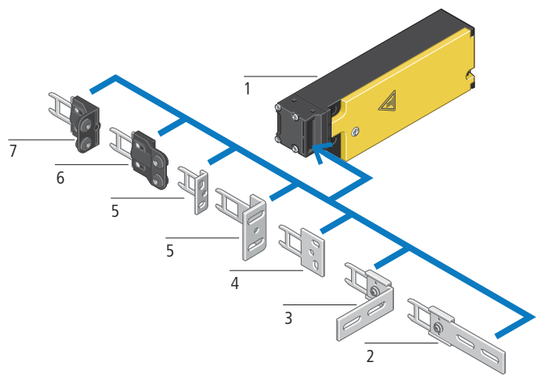
HPL03009EN

		plastic **Part no.** Article no.	**Price** See price list	Std. pack	metal **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Rounded plunger, center fixing								
	For installation in M18 × 1 enclosure wall or mounting plate drilling	**LS-XZS** 114024					1 off	The operating head can be rotated at 90° intervals to adapt to the specified operating direction.
Roller plunger, center fixing								
	For installation in M18 × 1 enclosure wall or mounting plate drilling	**LS-XZRS** 114025					1 off	**Information relevant for export to North America**
Roller plunger								Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified
	–	**LS-XP** 266125		10 off	**LSM-XP** 266158		10 off	
Roller lever								
	Large	**LS-XLB** 290178		5 off				
	Short	**LS-XLS** 290177		1 off				
	Long	**LS-XL** 266123		10 off	**LSM-XL** 266156		10 off	
Angled roller lever								
	–	**LS-XLA** 266124		10 off	**LSM-XLA** 266157		10 off	
Rotary lever								
	–	**LS-XRL** 266126		5 off	**LSM-XRL** 266159		5 off	
Adjustable roller lever								
	D = 18 mm	**LS-XRLA** 266127		4 off	**LSM-XRLA** 266160		4 off	
	D = 30 mm	**LS-XRLA30** 266128		5 off				
	D = 40 mm (rubber)	**LS-XRLA40R** 266130		5 off				
	D = 40 mm	**LS-XRLA40** 266129		5 off				
Actuating rod								
	Rod from insulated material	**LS-XRR** 266131		4 off	**LSM-XRR** 266161		4 off	
	Metal rod	**LS-XRRM** 266132		4 off	**LSM-XRRM** 266162		4 off	
Spring rod								
	Not to be used as a safety position switch Use only in conjunction with snap-action contact.	**LS-XS** 266133		5 off	**LSM-XS** 266163		5 off	
Actuating rod								
	–	**LS-XOR** 290190		1 off				
Fixing adapters								UL/CSA certification not required
	Actuation through front element RMQ-Titan®	**M22-LS** 266137		10/1 off				

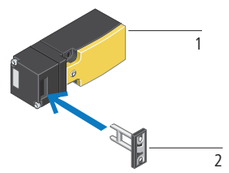
	Description	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Screw connection to fit M20 to ½"						
	Screw connector for American pipe thread Metal	**V1/2"/M20-NA** 225269		10 off	The screw connection is for grounding; no total insulation For connection thread lengths up to 9 mm	Product Standards: UL 508; CSA-C22.2 No. 14 UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified Specially designed for NA✓
	Screw connector for American pipe thread Molded material	**V1/2"/M20** 225270		10 off	For connection thread lengths up to 9 mm	UL/CSA certification not required
M20 diaphragm bolt, IP65						
	With built in push-through diaphragm External diameter of cable up to 13 mm IP65 with cable inserted	**EMS20** 225271		25 off	–	
Screw closure M20						
	(self-sealing grommet) For tightening/loosening using a standard spanner for sealing grommet plugs	**LS-X20** 266134		25 off	–	
Plug connector M12x1, IP66 Molded material I_{th} = 4 A Fuse: 6 A gG/gL						
4-pole U_e = 250 V	For use with					
	LS "A" coded  Standard to IEC/EN 60947-5-2	**M12A** 266135		10 off	M12A, M12B 	
	LS "B"-coded 	**M12B** 266136		10 off		
5-pole U_e = 125 V						
	LSM "A" coded  Standard to IEC/EN 60947-5-2	**M12A5** 272202		10 off	M12A5, M12B5 	
	LSM "B"-coded 	**M12B5** 272203		10 off		
Cage clamp twin NC contacts						
	–	For opening two terminals simultaneously **LS-XTW** 290179		1 off	–	UL/CSA certification not required
Adapter plate, thickness 2.5 mm						
	For additional fixing with sideways operation, together with locating plate FS-AT (order separately) **LS-XAP** 114026			1 off		
Locating plate						
	For fixing with side motion **FS-AT** 019610			20 off	–	

System overview

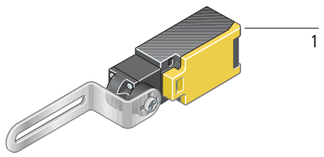
LS-...ZBZ



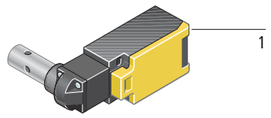
LS-...ZB



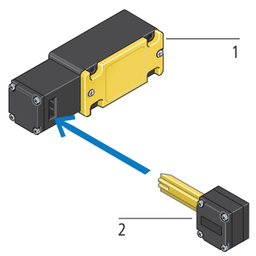
LSR-...TKG



LSR-...TS



LS4...ZB



LS-...ZBZ

Basic Unit	1
Spring or magnet-powered interlock
For increased personnel and process protection
Tamper-proof
Multiple coded actuators
Contact configuration: 1 N/O / 1 NC or 2 NC
→ Page 3/16

Flat flexible actuator	2
For doors that do not close precisely
→ Page 3/17

Angled flexible actuator	3
For doors that do not close precisely
→ Page 3/17

Flat actuator	4
For sliding doors
→ Page 3/17

Angled actuator	5
For swing doors
→ Page 3/17

Flat compensating actuator	6
For increased tolerance compensation in the direction of door closure
→ Page 3/17

Angled compensating actuator	7
For increased tolerance compensation in the direction of door closure
→ Page 3/17

LS-...ZB

Complete unit	1
For personnel protection
Contact configuration: 1 NC, 1 N/O / 1 NC or 2 NC
5 directions of operation possible
→ Page 3/18

Actuator	2
Multiple coding protection against tampering

LSR-...TKG, LSR-...TS

Complete unit	1
For personnel protection
Contact configuration: 1 N/O / 1 NC or 2 NC
For swing doors with fixed connection to the door/hinge pin
Multiple coded actuators
Contact configuration: 1 N/O / 1 NC or 2 NC
LSR-...TKG → Page 3/18
LSR-...TS → Page 3/18

LS4.../ZB

Complete unit	1
Narrow enclosure version
For personnel protection
Contact configuration: 1 NC, 1 N/O / 1 NC
→ Page 3/16

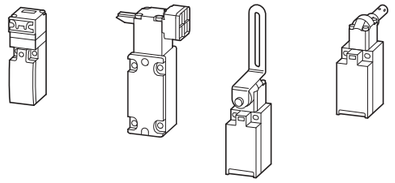
Actuator	2
Multiple coding
For horizontal or vertical operation

Product features

Interlocking unit to EN 1088
- For use in safety circuits
- Ⓘ Positive opening safety function according to IEC/EN 60947-5-1
- Protection type IP65
- Operating head can be turned 4 x 90°
- With M20 x 1.5 connecting thread

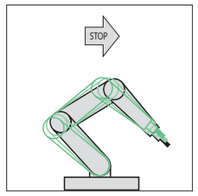
totally insulated

LS-...ZB **LS4/ZB** **LSR-...TKG** **LSR-...TS**

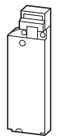


"Personnel protection" by monitoring of the protective mechanism

- Door open
- LS...-ZB disconnects power
- No danger

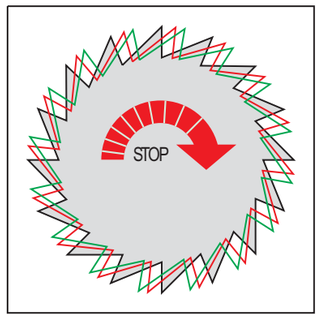


LS/ZBZ

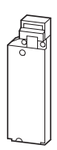


"Increased personnel protection" by monitoring and interlocking the protective mechanism

- Stop command
- Waiting time
- Machine is stopped
- Protective mechanism open
- No danger

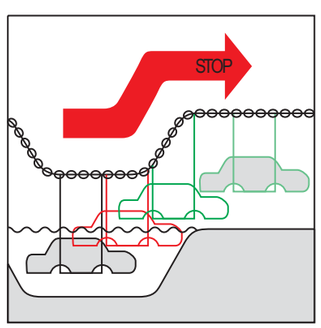


LS/ZBZ



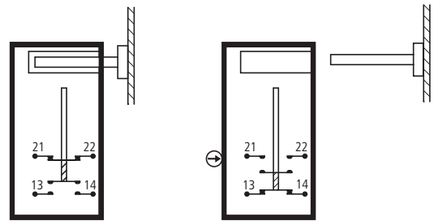
"Increased personnel protection" by monitoring and interlocking the protective mechanism

- Stop command
- Waiting time
- Process sequence halted
- Protective mechanism open
- Product OK



LS-...ZB

Closed Open



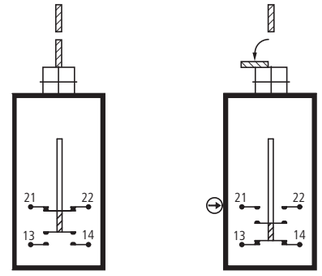
→ Personnel protection

Door open	→ Enabling contact (21-22) opening positively
Door open	→ Enabling contact safely open; tamperproof against simple tools
Door close	→ Triple coded actuator closes the enabling contact

Switch must never be used as a mechanical stop!

LSR-...TKG
LSR-...TS

Closed Open

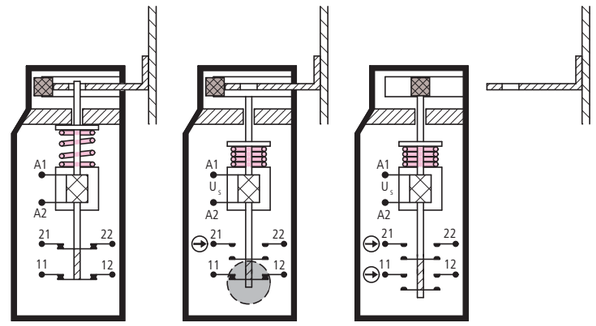


→ Personnel protection

Open of guard mechanism	→ Enabling contact (21-22) opening positively
Guard mechanism open	→ Enabling contact safely open; tamperproof against simple tools
Closing of guard mechanism	→ Closes enabling contact (21–22)

LS-S02-...FT-ZBZ, spring-powered interlock (closed-circuit current principle)

Interlocked Released Open



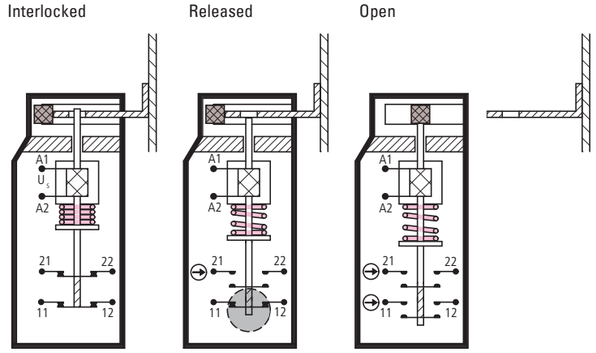
→ Increased personnel protection with separate signal for door position

Door closed and interlocked	→ De-energized: even with mains failure or wire breakage: door interlocked = safe state Enabling contact (21-22)
To unlock door	→ Applies voltage to coil (A1, A2) e.g. via zero-speed monitor, enabling contact (21-22) opens
Door open	→ Both contacts blocked in the open position, even with tampering with simple tools
Door close	→ Triple-coded actuator cancels enabling contact inhibit; door position contact (11-12) closes
Interlock door	→ Disconnect coil voltage: 1st actuator interlocked 2nd enabling contact closed → Enable only when door locked

Switch must never be used as a mechanical stop!

LS-S02-...MT-ZBZ, magnet-powered interlock (operating current principle)

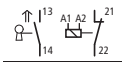
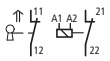
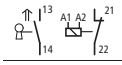
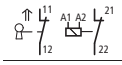
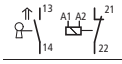
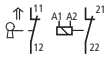
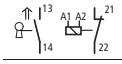
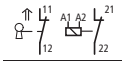
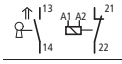
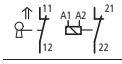
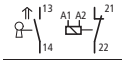
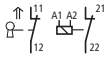
Interlocked Released Open



→ Process protection + increased personnel protection with separate signal for door position

Door closed and interlocked	→ Energized: Enables immediate access in the event of mains failure and wire breakage. Both contacts closed
To unlock door	→ Applies voltage to coil (A1, A2) e.g. via zero-speed monitor, enabling contact (21-22) opens
Door open	→ Only possible once it is released, door position contact (11-12) opens
Door close	→ Triple-coded actuator cancels enabling contact inhibit; door position contact (11-12) closes
Interlock door	→ Disconnect coil voltage: 1st actuator interlocked 2nd enabling contact closed → Enable only when door locked

Switch must never be used as a mechanical stop!

Contact configuration ⊖ Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact	NC = normally closed contact	Circuit symbol	Rated control voltage for magnet drive U_s V	**Part no.** Article no.	**Price** See price list	Std. pack
Basic units with spring-powered interlock (closed-circuit principle) IP65						
• With interlock monitoring and auxiliary release mechanism • Monitoring of door position: continuous						
1 N/O	1 NC ⊖		24 V DC	**LS-S11-24DFT-ZBZ/X** 106829		1 off
–	2 NC ⊖		24 V DC	**LS-S02-24DFT-ZBZ/X** 106823		
1 N/O	1 NC ⊖		120 V 50/60 Hz	**LS-S11-120AFT-ZBZ/X** 106825		
–	2 NC ⊖		120 V 50/60 Hz	**LS-S02-120AFT-ZBZ/X** 106778		
1 N/O	1 NC ⊖		230 V 50/60 Hz	**LS-S11-230AFT-ZBZ/X** 106827		
–	2 NC ⊖		230 V 50/60 Hz	**LS-S02-230AFT-ZBZ/X** 106821		
Basic units with magnet-powered interlock (open-circuit principle) IP65[1]						
• With interlock monitoring • Monitoring of door position: continuous						
1 N/O	1 NC ⊖		24 V DC	**LS-S11-24DMT-ZBZ/X** 106830		1 off
–	2 NC ⊖		24 V DC	**LS-S02-24DMT-ZBZ/X** 106824		
1 N/O	1 NC ⊖		120 V 50/60 Hz	**LS-S11-120AMT-ZBZ/X** 106826		
–	2 NC ⊖		120 V 50/60 Hz	**LS-S02-120AMT-ZBZ/X** 106820		
1 N/O	1 NC ⊖		230 V 50/60 Hz	**LS-S11-230AMT-ZBZ/X** 106828		
–	2 NC ⊖		230 V 50/60 Hz	**LS-S02-230AMT-ZBZ/X** 106822		

Notes

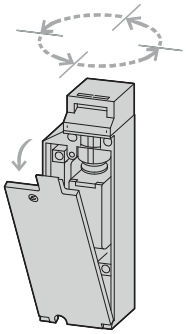
Electric circuitry with DIL contactors and ESR5 safety relay
→ Safety manual TB02000-009, Article no. 119906

With the actuator inserted, the N/O contact is open and the NC contact is closed.

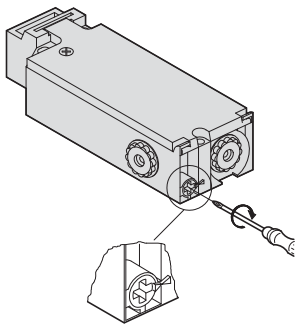
Switch must never be used as a mechanical stop!

[1] Time control of the release operation possible using ESR5-NV30-30

The operating head can be rotated manually in 90° steps to suit the specified level of actuation.



In the event of a loss of voltage, (e.g. during commissioning), the spring-powered LS-..-...FT-ZBZ can be released with a screwdriver.
The auxiliary release mechanism must be sealed!
→ Instructional leaflet AWA 1310-2354



For protection type IP65, use V-M20 cable glands with max 9 mm long thread.

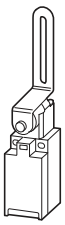
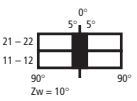
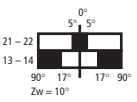
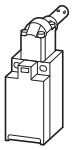
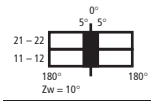
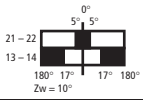
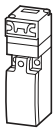
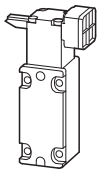
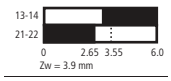
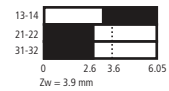
Cable gland V-M20 → Page 2/46

Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA Certified
Degree of Protection	IEC: IP65, UL/CSA Type 3R, 4X (indoor use only), 12, 13

		Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Actuators						
For combination with LS-...ZBZ/X basic units Stainless steel						
Flat actuator For sliding doors		**LS-XG-ZBZ** 106833		10 off	–	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified
Angled actuator For swing doors above 250 mm width	Short	**LS-XW-ZBZ** 106839		10 off	From width: 350 mm	
	Long	**LS-XWA-ZBZ** 106838		10 off	From width: 550 mm	
Angled, flexible actuator For doors that do not close precisely		**LS-XF-ZBZ** 106832		10 off	–	
Flat, flexible compensating actuator For doors that do not close precisely		**LS-XFG-ZBZ** 106831		10 off	–	
Flat, compensating actuator With increased tolerance in closing direction for door that does not close precisely.		**LS-XNG-ZBZ** 106834		1 off	–	
Angled compensating actuator With increased tolerance in closing direction for door that does not close precisely.		**LS-XNW-ZBZ** 106835		10 off	–	
Accessories						
Dust protection cap Prevents ingress of foreign matter into the unit head		**LS-XSK-ZBZ** 106837		10 off	–	UL/CSA certification not required

HPL03018EN

	Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		Circuit symbol	Contact travel ■ = Contact closed □ = Contact open	Approval mark	Connection type	**Part no.** Article no.	**Price** See price list	Std. pack
Hasp-operated safety switch LSR-…/TKG, IP65									
	–	2 NC ⊖				Screwed terminal	**LSR-S02-1-I/TKG** 106848		1 off
	1 N/O	1 NC ⊖				Screwed terminal	**LSR-S11-1-I/TKG** 106847		1 off
Hinge-operated switch LSR-…/TS, IP65									
	–	2 NC ⊖				Screwed terminal	**LSR-S02-1-I/TS** 106852		1 off
	1 N/O	1 NC ⊖				Screwed terminal	**LSR-S11-1-I/TS** 106851		1 off
Safety position switches LS-…-ZB, IP65									
	–	2 NC ⊖				Cage Clamp	**LS-02-ZB**[1] 106817		2 off
	–	2 NC ⊖				Screwed terminal	**LS-S02-ZB**[1] 106874		2 off
	1 N/O	1 NC ⊖				Cage Clamp	**LS-11-ZB**[1] 106819		2 off
	1 N/O	1 NC ⊖				Screwed terminal	**LS-S11-ZB**[1] 106876		2 off
	1 N/O	1 NC ⊖				Cage Clamp	**LS-11S-ZB**[1] 106870		2 off
	1 N/O	1 NC ⊖				Screwed terminal	**LS-S11S-ZB**[1] 106877		2 off
Safety position switches LS4…/ZB, IP65									
	1 N/O	1 NC ⊖				Screwed terminal	**LS4/S11-1/I/ZB**[2] 106857		1 off
	1 N/O	1 NC ⊖				Screwed terminal	**LS4/S11-1/IA/ZB**[2] 106858		1 off
	1 N/O	2 NC ⊖				Screwed terminal	**LS4/S12-7/IB/ZB**[2] 106859		1 off

Notes

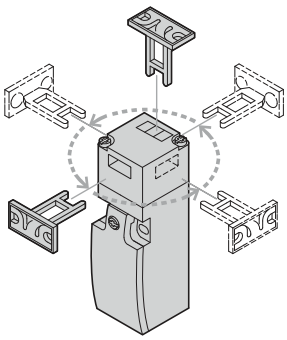
Electric circuitry with contactors DIL and safety relay ESR5
→ Safety manual TB02000-009, Article no. 119906

Switch must never be used as a mechanical stop!

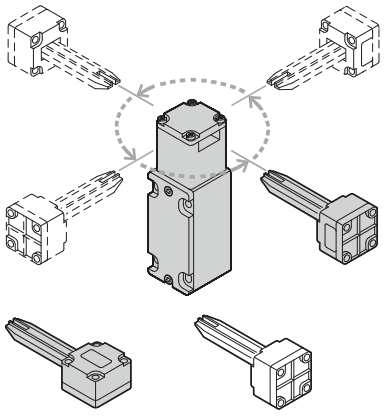
For protection type IP65 use cable glands V-M20 with max. 9 mm connection thread length.
Cable gland V-M20
→ Page 2/46

With the actuator inserted, the N/O contact is open and the NC contact is closed.

1)



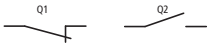
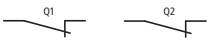
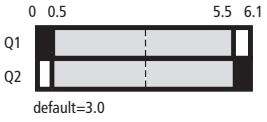
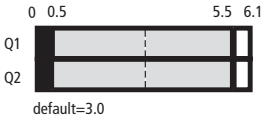
2) Actuator can be repositioned for horizontal or vertical installation. The operating heads can be rotated manually in 90° steps to suit the specified level of actuation.



Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA Certified
Degree of Protection	IEC: IP65, UL/CSA Type 3R, 4X (indoor use only), 12, 13

Engineering

	LSE-11	LSE-02
		
Basic units		
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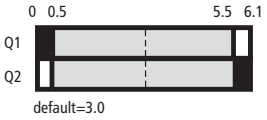
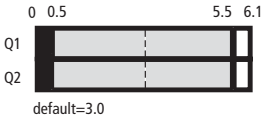
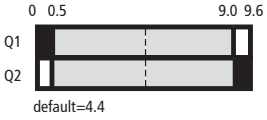
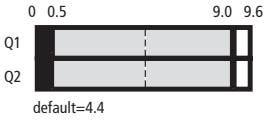
Roller plunger		
LS-XP LSM-XP LS-XOR		
Roller lever		
LS-XL LSM-XL LS-XLS LS-XLB		
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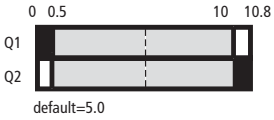
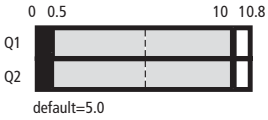
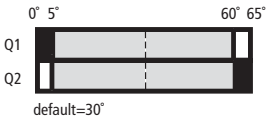
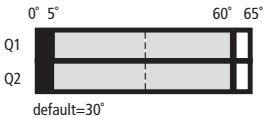
LS-XLA LSM-XLA		
Rotary lever		
LS-XRL LSM-XRL		
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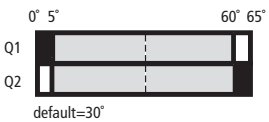
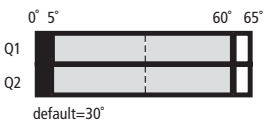
LS-XRLA LSM-XRLA LS-XRLA30 LS-XRLA40 LS-XRLA40R		
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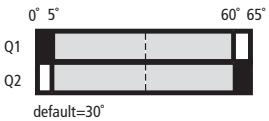
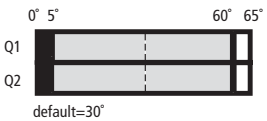
LS-XRR LSM-XRR LS-XRRM LSM-XRRM		
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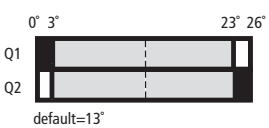
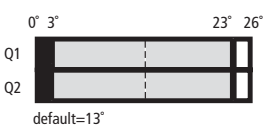
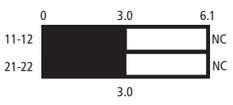
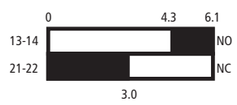
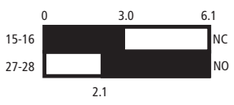
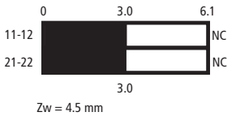
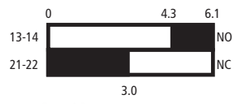
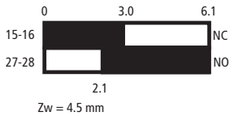
LS-XS LSM-XS		

Notes: LS-(S)02A,
LS-(S)11A → Page 3/4
LS-(S)20B → Page 3/8

	LS-02 LS-S02 LSM-02	LS-11 LS-S11 LSM-11	LS-11D LS-S11D LSM-11D
			
Basic units			
Operating heads			
Roller plunger			
LS-XP LSM-XP			
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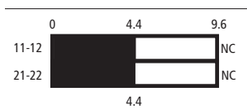
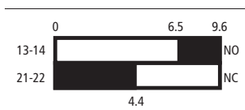
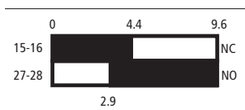
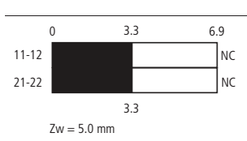
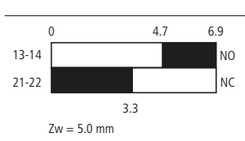
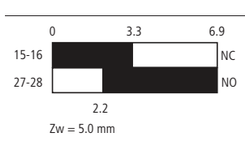
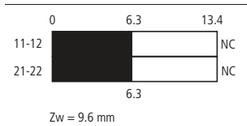
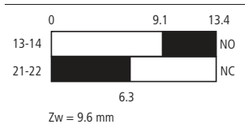
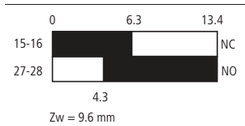
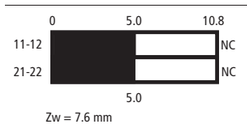
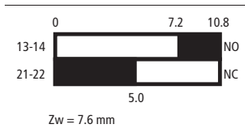
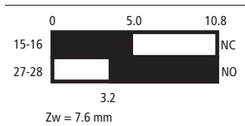
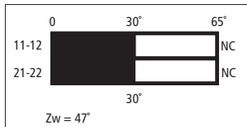
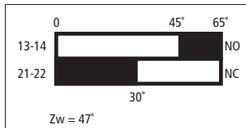
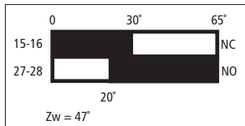
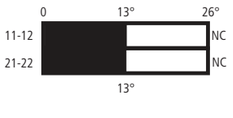
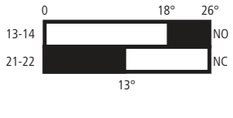
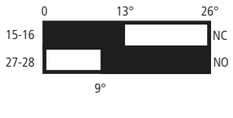
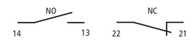
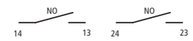
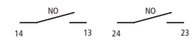
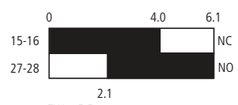
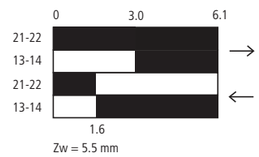
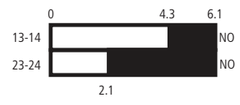
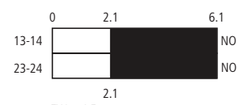
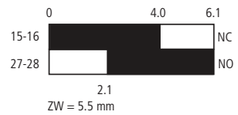
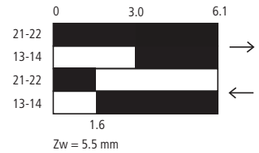
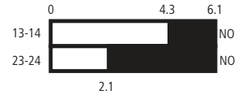
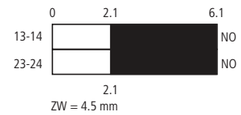
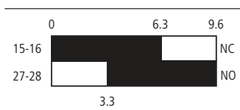
LS-XL, LSM-XL			
Roller lever, short LS-XLS			
Roller lever, large LS-XLB			
Angled roller lever			
LS-XLA, LSM-XLA			
Rotary lever			
LS-XRL, LSM-XRL			
Adjustable roller lever LS-XRLA, LSM-XRLA, LS-XRLA30, LS-XRLA40, LS-XRLA40R			
Actuating rod LS-XRR, LSM-XRR, LS-XRRM, LSM-XRRM			
Spring rod actuator			
LS-XS, LSM-XS			

	LS-11DA LS-S11DA LSM-11DA	LS-11S LS-S11S LSM-11S	LS-20 LS-S20 LSM-20	LS-20A LS-S20A LSM-20A
				
				
				
				

Technical data

				Complete units IP66, IP67			
				LS, LSM	LSE11 LSE02	LSE-AI	LSE-AU
General							
Standards			IEC/EN 60947	IEC/EN 60947 EN 61000-4	IEC/EN 60947 EN 61000-4	IEC/EN 60947 EN 61000-4
Climatic proofing			Damp heat, constant, to IEC 60068-2-78, Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Mounting position			Any	Any	Any	Any
Protection type			IP66, IP67	IP66, IP67	IP66, IP67	IP66, IP67
Terminal capacity of screw terminal and Cage Clamp						
Solid		mm^2	1 x (0.5 - 2.5)	1 x (0.5 - 2.5)	1 x (0.5 - 2.5)	1 x (0.5 - 2.5)
Flexible with ferrule to DIN 46228		mm^2	1 x (0.5 - 1.5)	1 x (0.5 - 1.5)	1 x (0.5 - 1.5)	1 x (0.5 - 1.5)
Power supply						
Rated voltage	U_e	V DC	–	12…30	24 (-15…+20 %)	24 (-15…+20 %)
Rated operational current						
12 V	I_e	mA	–	15	–	–
24 V	/	mA	–	18	28…45	24
30 V	I	mA	–	19	–	–
Contacts/switching capacity						
Rated impulse withstand voltage	U_{imp}	V AC	4000	–	–	–
Rated insulation voltage	U_i	V	400	–	–	–
Overvoltage category/pollution degree			III/3	III/3	–	–
Rated operational current						
AC-15 24 V	I_e	A	6	–	–	–
AC-15 230 V/240 V	I_e	A	6	–	–	–
AC-15 400 V/415 V	I_e	A	4	–	–	–
DC-13 24 V	I_e	A	3	0.2	–	–
DC-13 110 V	I_e	A	0.8	–	–	–
DC-13 220 V	I_e	A	0.3	–	–	–
Analog output Q1						
Output voltage (max. 10 mA)		V DC	–	–	–	0…10
Output current		mA	–	–	4 - 20	–
Fault scenario		V	–	–	0	0
Resolution		Steps	–	–	100	100
Step tolerance		Steps	–	–	<1	<1
Shunt resistor, resistive load		Ω	–	–	< 400	> 1000
Digital diagnostics output Q2 (positive switching PNP)						
Response threshold		V	–	–	approx. U_e	approx. U_e
		mA	–	–	< 200	< 200
Fault scenario		V	–	–	0	0
Control circuit reliability						
At 24 V DC/5 mA	H_F	Fault frequency	< 10^{-7}, < 1 fault in 10^7 operations	–	–	–
At 5 V DC/1 mA	H_F	Fault frequency	< 10^{-6}, < 1 fault in 5 x 10^6 operations	–	–	–
Mains frequency		Hz	max. 400	–	–	–
Short-circuit rating to IEC/EN 60947-5-1						
Max. fuse		A gG/gL	6	–	–	–
Repetition accuracy		mm	± 0.02	± 0.02	± 0.02	± 0.02
UL-File No. E29184						
Rating data for approved types to UL/CSA						
Pilot Duty						
AC operated			A300	–	–	–
DC operated			Q300 (1 A, 250 V DC)	Q300 (0.2 A, 24 V DC)	–	–
UL-approved degrees of protection			NEMA 4, 12, 13	NEMA 4, 12, 13	NEMA 4, 12, 13	NEMA 4, 12, 13

			Complete units IP66, IP67		
			LS, LSM	LSE11 LSE02	LSE-AI LSE-AU
Mechanical data					
Lifespan					
Standard action contact	Operations	x 10^6	8	–	3
Snap-action contact	Operations	x 10^6	8	3 (electronic)	–
Contact temperature of roller head		°C	≦ 100	≦ 100	≦ 100
Mechanical shock resistance (half-sinusoidal shock, 20 ms)					
Standard action contact		g	25	–	–
Snap-action contact		g	–	–	–
Basic Unit		g	–	30	30
Operating frequency	Operations/h		≦ 6000	≦ 3000	≦ 3000
Switching point			–	0.5 - 5.5 mm, freely adjustable	–
Hysteresis		mm	–	0.4	0.4
Resolution		mm	–	0.04	0.06
Drive					
Mechanical					
Actuating force at beginning/end of stroke					
Basic units		N	1.0/8.0	3.5/8.0	3.5/8.0
LS(M)-XP		N	1.0/8.0	1.0/8.0	1.0/8.0
LS(M)-XL		N	1.0/8.0	1.0/8.0	1.0/8.0
LS(M)-XLA		N	1.0/8.0	1.0/8.0	1.0/8.0
Actuating torque of rotary drives		Nm	0.2	0.2	0.2
Max. operating speed with DIN cam					
Basic unit for angle of actuation	α = 0°/30°	m/s	1/0.5	1/0.5	1/0.5
LS(M)-XRL for angle of actuation	α = 0°	m/s	1.5	1.5	1.5
LS(M)-XRLA for angle of actuation	α = 30°, L = 125 mm	m/s	1.5	1.5	1.5
LS(M)-XRR for	L = 130 mm	m/s	1.5	1.5	1.5
LS(M)-XL for angle of actuation	α = 30°/45°	m/s	1	1	1
LS(M)-XLA for angle of actuation	α = 30°/45°	m/s	1	1	1
LS(M)-XP for angle of actuation	α = 0°/30°	m/s	1/1	1/1	1/1
Electromagnetic compatibility (EMC)					
Electrostatic discharge (ESD), to IEC EN 61000-4-2					
Air discharge		kV	–	8	8
Contact discharge		kV	–	4	4
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	–	10	10
Burst, to IEC/EN 61000-4-4					
Supply cables		kV	–	2	2
Signal cables		kV	–	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5)		kV	–	0.5	0.5
Radiated RFI, to IEC/EN 61000-4-6		V	–	10	10

Notes Accessories for the Cage Clamp terminals from Wago:
Power comb, gray, Wago Article No. 264-402

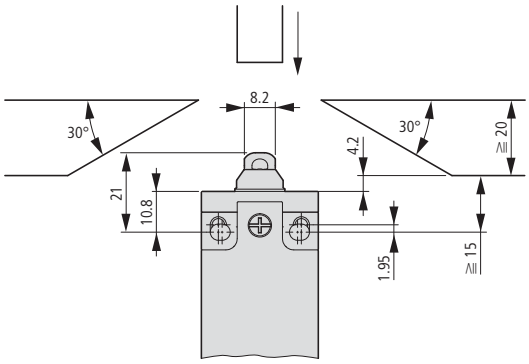
			plug connectors	
			M12A(B)	M12A(B)
General				
Pole			4	5
Protection type			IP66	IP66
Lifespan, mechanical	Operations		> 500	> 500
Characteristic values				
Rated operating voltage	U_e	V AC	250	125
Rated operational current	I_e	A	1	1
Overvoltage category/pollution degree			II/3	II/3

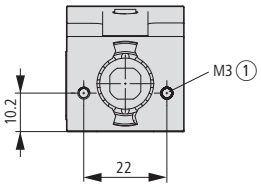
				Safety position switches			
				LS-…ZBZ	LS-…ZB	LS4…ZB	LSR...
General							
Standards				IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
Climatic proofing				Damp heat, constant, to IEC 60068-2-78, Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature			°C	-25 - +40	-25 - +70	-25 - +70	-25 - +70
Mounting position				Any	Any	Any	Any
Protection type				IP65	IP65	IP65	IP65
Terminal capacity							
Solid			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)
Flexible with ferrule to DIN 46228			mm^2	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)
Terminal screw				PH1	PH1	PH1	PH1
Terminal screw tightening torque			Nm	0.9	0.4	0.9	0.9
Contacts/switching capacity							
Rated impulse withstand voltage		U_{imp}	V AC	4000	6000	6000	6000
Rated insulation voltage		U_i	V	400	500	500	500
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operational current							
AC-15	24 V	I_e	A	6	6	10	10
	230 V/240 V	I_e	A	6	6	6	6
	400 V/415 V	I_e	A	4	4	4	4
DC-13	24 V	I_e	A	3	3	3	3
	110 V	I_e	A	0.8	0.8	0.8	1
	220 V	I_e	A	0.3	0.3	0.3	0.5
Mains frequency			Hz	max. 400	max. 400	max. 400	max. 400
Short-circuit rating to IEC/EN 60947-5-1							
Max. fuse			A gG/gL	6	6	6	6
Repetition accuracy			mm	± 0.02	± 0.02	± 0.02	± 0.02
Mechanical data							
Lifespan							
Standard action contact		Operations	x 10^6	1	10	10	20
Snap-action contact		Operations	x 10^6	–	–	–	20
Mechanical shock resistance (half-sinusoidal shock, 20 ms)							
Standard action contact			g	10	25	5	25
Snap-action contact			g	–	2	–	2
Operating frequency		Operations/h		≦ 800	≦ 1800	≦ 1800	≦ 1800
Drive							
Mechanical							
Actuating force at beginning/end of stroke							
ZB/ZBZ (push-in/pull-out)			N	25/15	10/5	15/20	
Mechanical holding force acc. to GS-ET-19 (04/2004)							
XG, XW, XNG			N	1700	–	–	
XWA, XFG, XF			N	1600	–	–	
XNW			N	1200	–	–	
Electro mechanical							
For magnet							
Power consumption							
At 120 V AC			VA	8	–	–	
At 230 V AC			VA	11	–	–	
At 24 V DC			W	8	–	–	
Voltage tolerance			x U_s	0.85 - 1.1			
Magnet duty factor			% DF	100	–	–	
UL-File No. E29184							
Rating data for approved types to UL/CSA 1)							
General Use							
AC operated			V	300	–	–	
AC operated			A	10	–	–	
Pilot Duty							
AC operated				A300	A300	A300	
DC operated				Q300	Q300 (1 A, 250 V DC)	Q300	
UL-approved degrees of protection				NEMA 4, 12, 13	NEMA 12, 13	–	

Dimensions

Basic units, non expandable (front fixing)

LS(M)-…/F

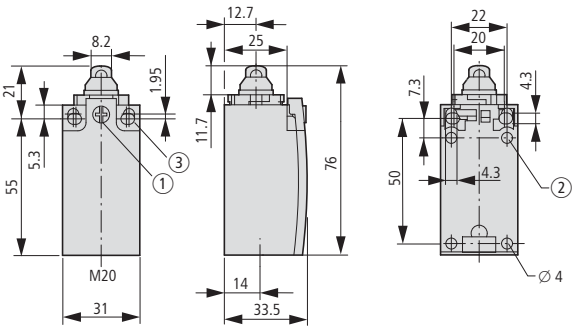


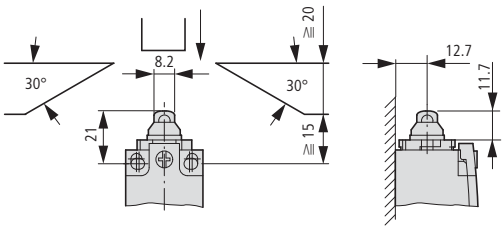


① Screw-in depth max. 12 mm

Basic units, expandable,

LS-…, LSM-…, LSE-…

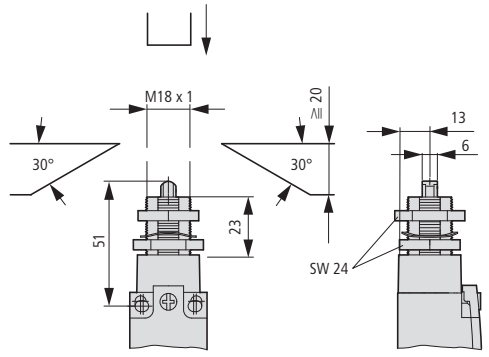




① Tightening torque of cover screw: 0.8 Nm ±0.2 Nm
② Only with LS (insulated version)
③ Fixing screw 2 x M4 ≧ 30
M_A = 1.5 Nm

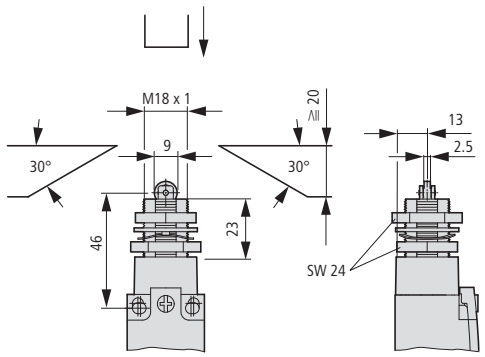
Rounded plunger, center fixing

LS-XZS



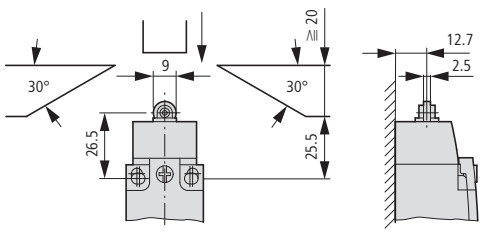
Roller plunger, center fixing

LS-XZRS



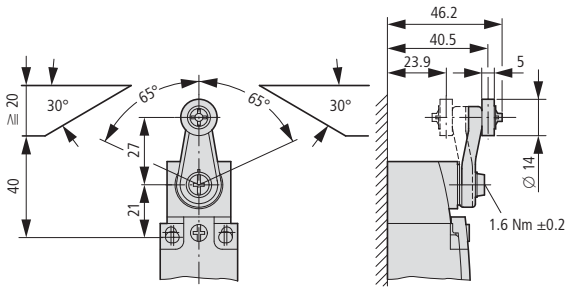
Roller plunger

LS(M)-…/P

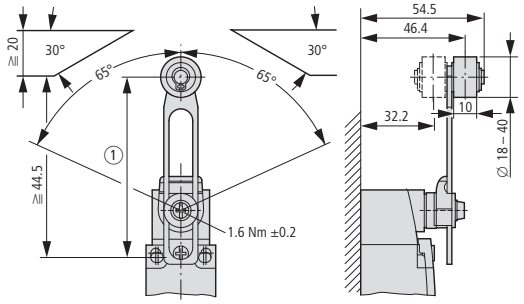


Rotary lever

LS(M)-…/RL

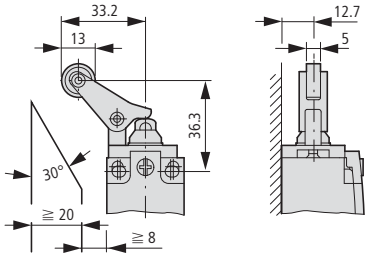


Adjustable roller lever
LS(M)-…/RLA

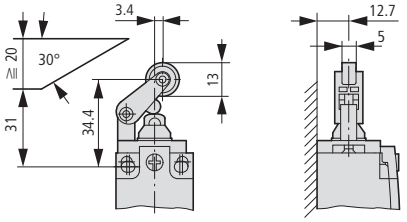


① Setting range from 54.5 to 97

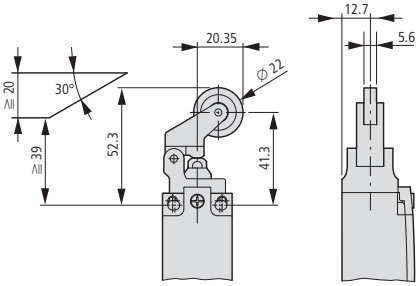
Angled roller lever
LS(M)-XLA



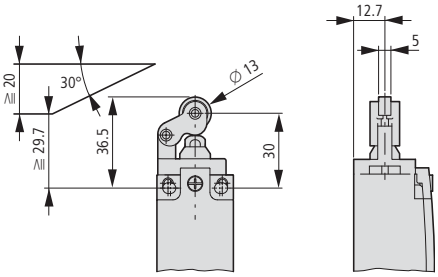
Roller lever
LS(M)-…/L



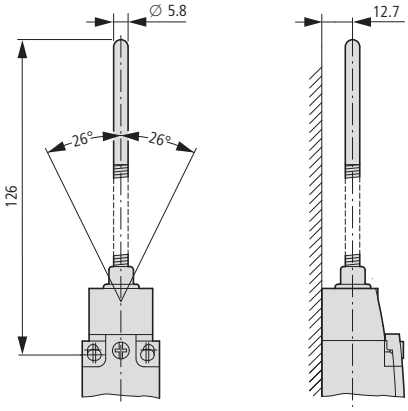
Roller lever
LS(M)-…/LB



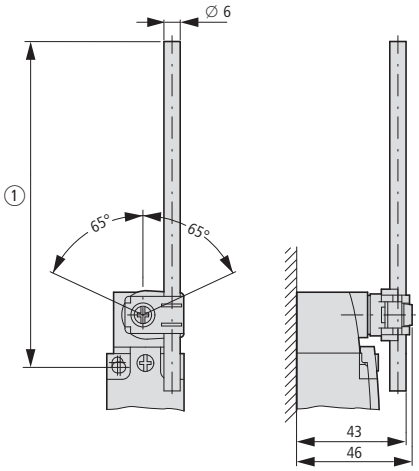
Roller lever
LS(M)-…/LS



Spring rod
LS(M)-…/S

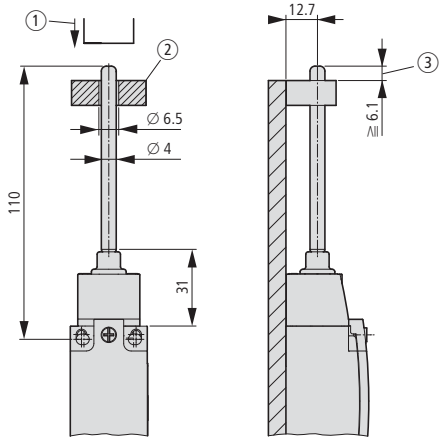


Actuating rod
LS(M)-…/RR



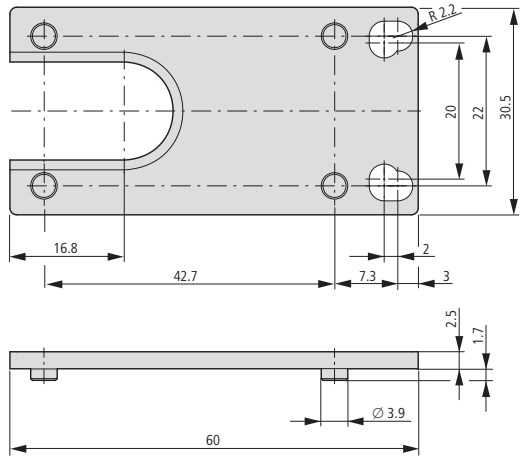
① LS…/RR ≦ 150
LS…/RRM ≦ 210

Actuating rod
LS(M)-…/OR

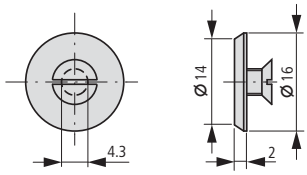


① Approach direction, vertical
② Guide is done by customer, not included
③ Max. push-through

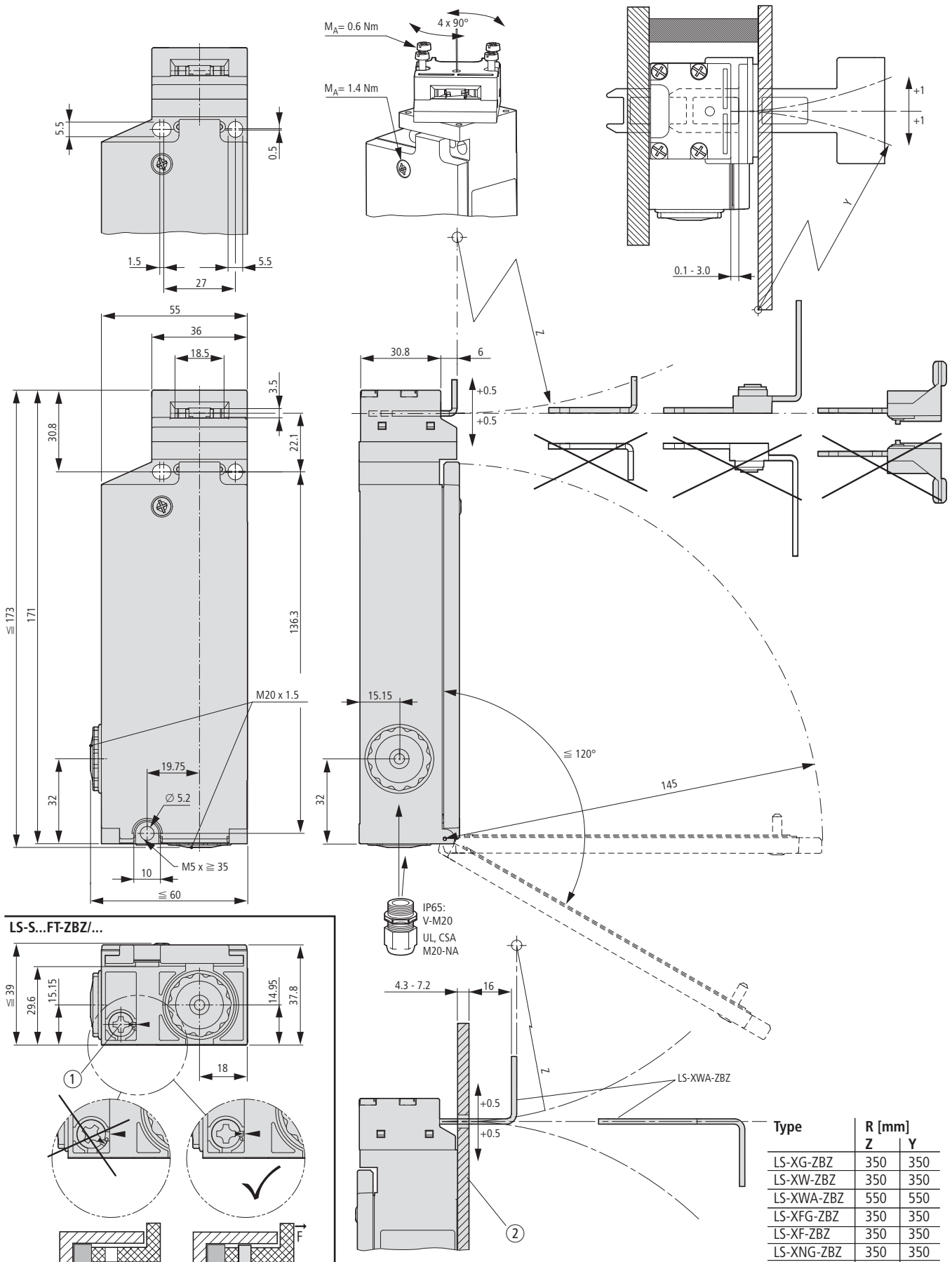
Adapter plate
LS-XAP



Locating plate
FS-AT



Safety position switches LS...ZBZ

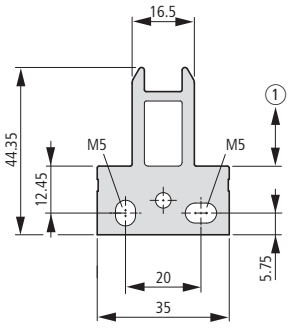


Type	R [mm]	
	Z	Y
LS-XG-ZBZ	350	350
LS-XW-ZBZ	350	350
LS-XWA-ZBZ	550	550
LS-XFG-ZBZ	350	350
LS-XF-ZBZ	350	350
LS-XNG-ZBZ	350	350
LS-XNW-ZBZ	150	250

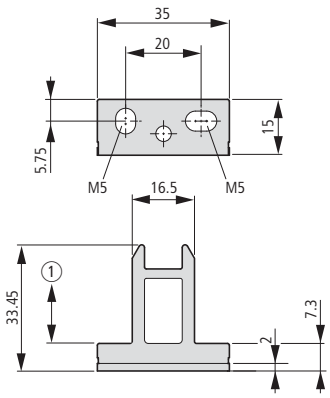
Switch must not be used as a mechanical stop.
① The auxiliary release mechanism must be sealed for proper operation!
② Can be used as stop with the corresponding material selection and design.

Actuating element

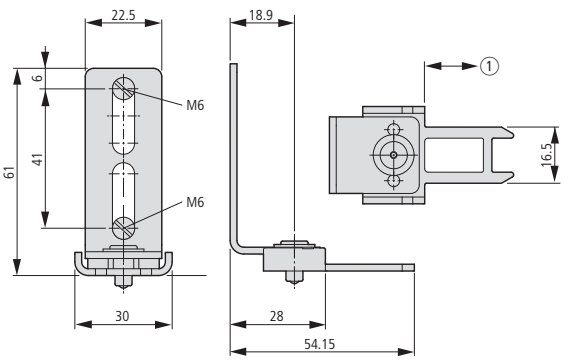
LS-XG-ZBZ



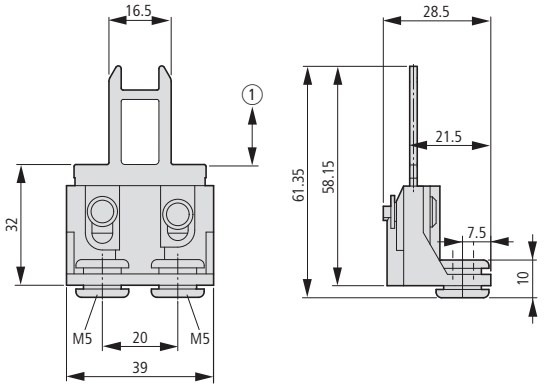
LS-XW-ZBZ



LS-XF-ZBZ

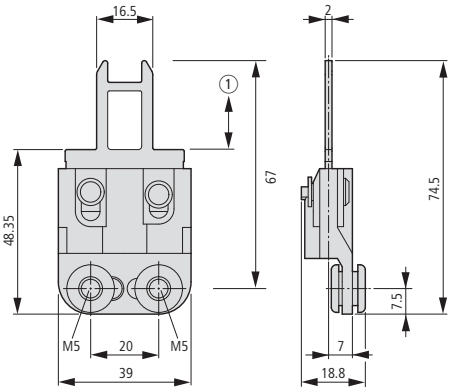


LS-XNW-ZBZ



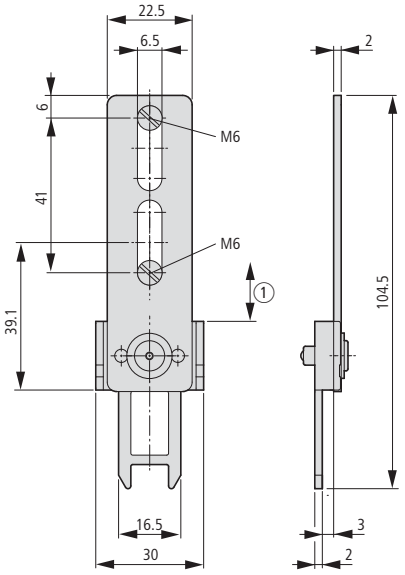
Fixing only allowed with M5 fixing screw and washer according to DIN EN ISO 7093

LS-XNG-ZBZ



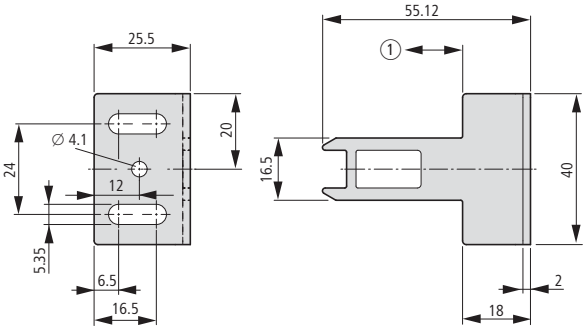
Fixing only allowed with M5 fixing screw and washer according to DIN EN ISO 7093

LS-XFG-ZBZ

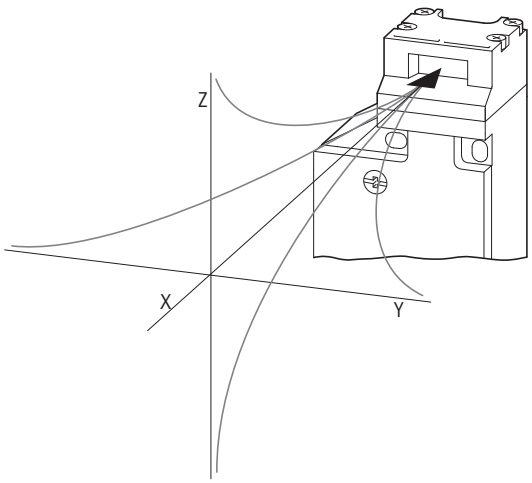


Part no.	R [mm]		
	F [N]	Z	Y
LS-XG-ZBZ	1700	350	350
LS-XW-ZBZ	1700	350	350
LS-XWA-ZBZ	1600	550	550
LS-XFG-ZBZ	1600	350	350
LS-XF-ZBZ	1600	350	350
LS-XNG-ZBZ	1700	350	350
LS-XNW-ZBZ	1200	150	250

LS-XWA-ZBZ



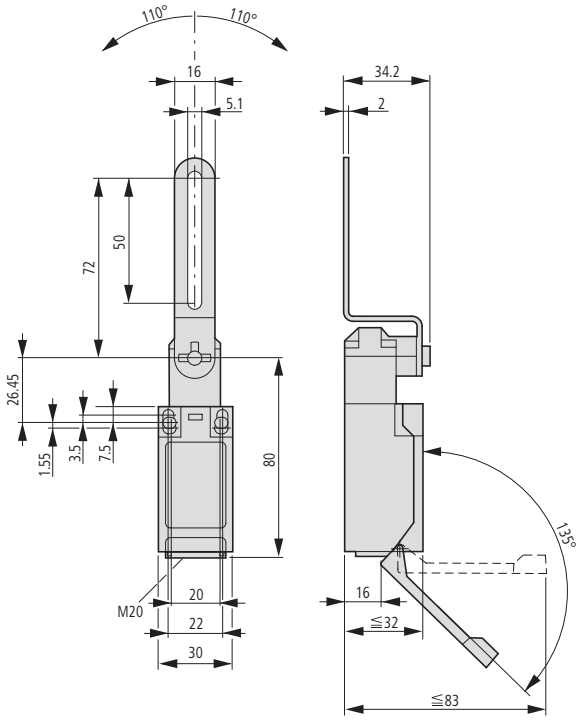
Pin with a 4 mm pin after mounting



① Distance to unit head = 0.1 … 3.0 mm

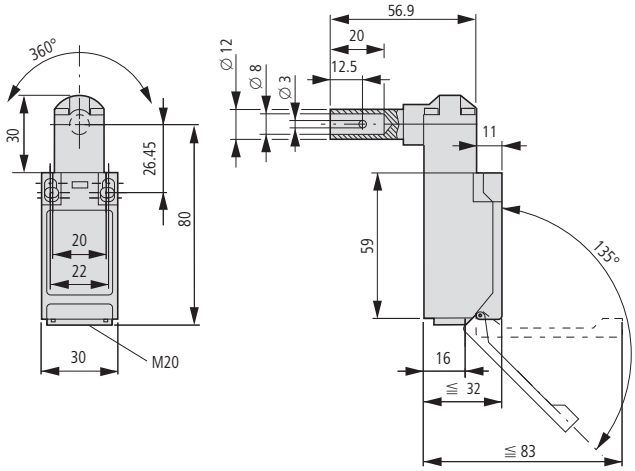
Hasp-operated safety switches

LSR-.../TKG



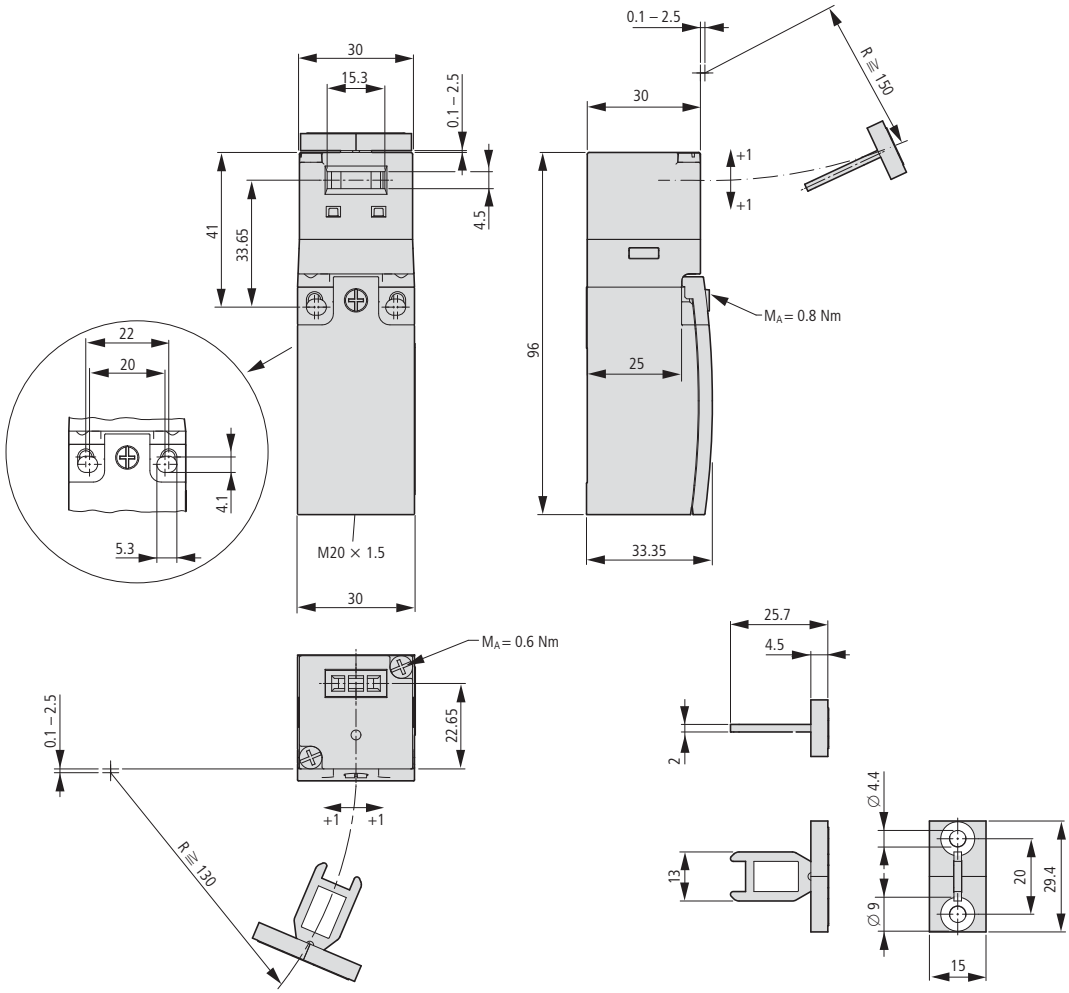
Safety hinge switches

LSR-.../TS



Safety position switches

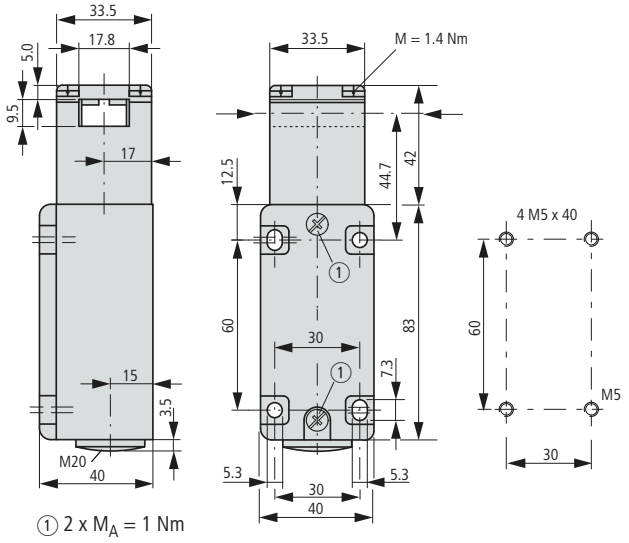
LS...-ZB



Switch must not be used as a mechanical stop.

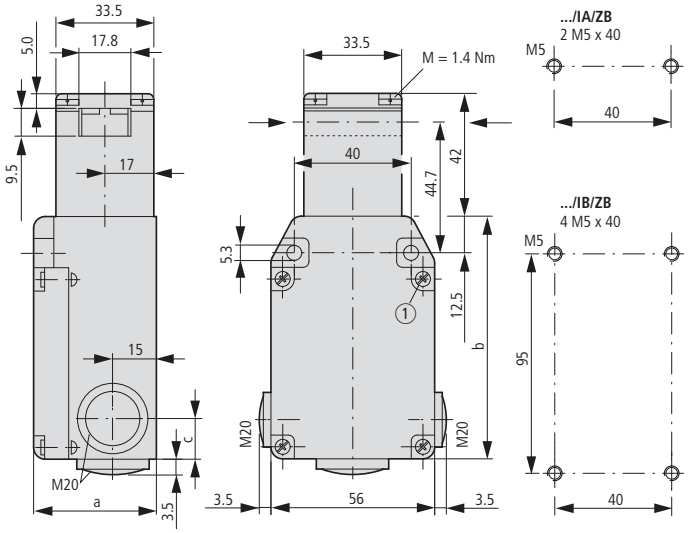
Safety position switches

LS4…ZB



① 2 x M_A = 1 Nm

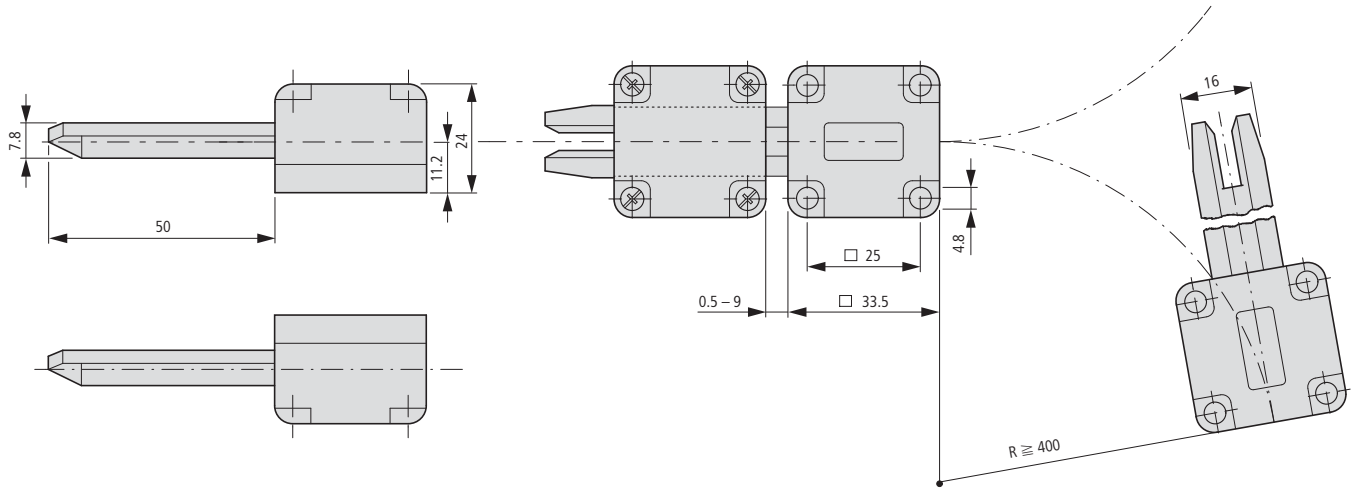
LS4/.../IA/ZB
LS4/.../IB/ZB

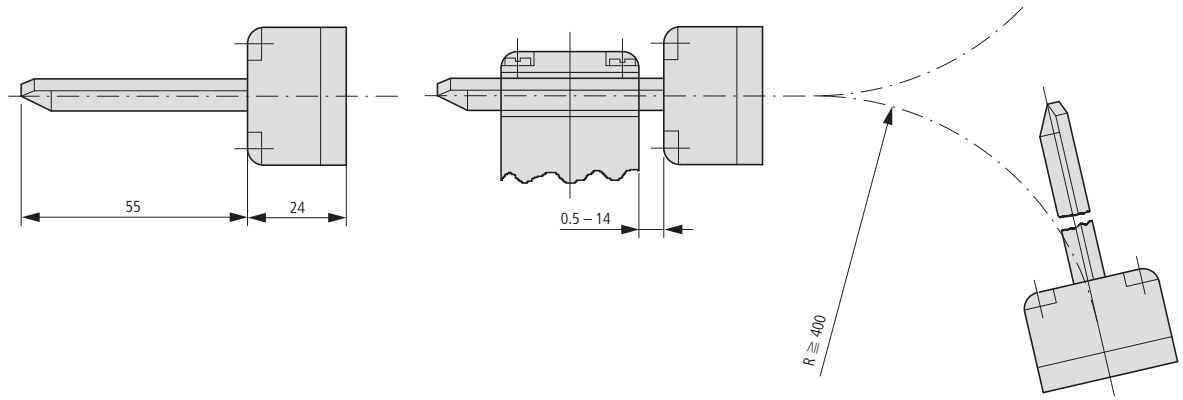


① 4 x M_A = 1 Nm

	a	b	c
LS4/S…/IA/ZB	41.5	83	16.7
LS4/S…/IB/ZB	43	115	29.5

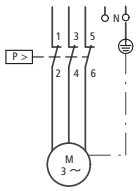
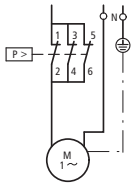
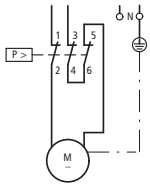
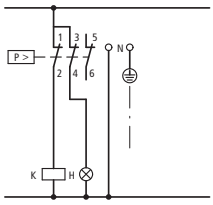
Actuators

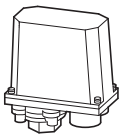


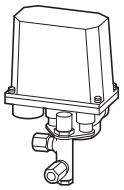


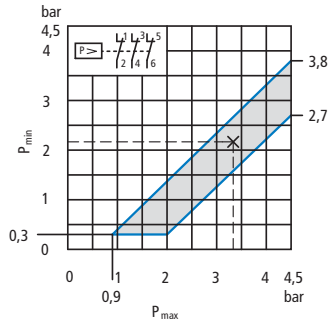
Switch must not be used as a mechanical stop.

Make and break pressure:
Separately infinitely adjustable.
Pressures can be set to any point within the area of the pressure diagram for the appropriate switch.

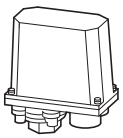
	Max. operating pressure bar	Part no. Article no.	Price See price list	Std. pack	Notes
Pressure switches with main contacts IP65, 3 pole					
Variable switching differential	7	**MCSN4** 057679		1 off	Features: • With terminal cover as standard • 1 insulated protective wire terminal ⏚ • 1 insulated N terminal • 2 cable entry knockouts for M20, without cable gland • IP65 in conjunction with V-M20 cable gland • Pressure pipe flange R ½" • Please enquire: Pressure pipe flange R ¼" • Neoprene diaphragm R ¼" corresponds to G ¼ R ½" corresponds to G ½ to ISO 228-1 For use as a motor load switch to IEC/EN 60947-4-1 for: **Three-phase current AC-3**  **Single-phase current**  **Direct current DC-3**  **For use as control switch:**  Factory setting of cut-in and cut-out pressure via type suffix: → Page 3/33
With relief valve for 6 mm compression fitting	7	**MCSN4-V** 062425			
Variable switching differential	15	**MCSN11** 029203			
With relief valve for 6 mm compression fitting	15	**MCSN11-V** 033949			
Variable switching differential	25	**MCSN16** 038695			
With relief valve for 6 mm compression fitting	25	**MCSN16-V** 043441			
Variable switching differential	25	**MCSN22** 048187			
With relief valve for 6 mm compression fitting	25	**MCSN22-V** 052933			

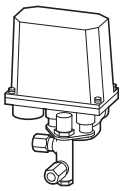


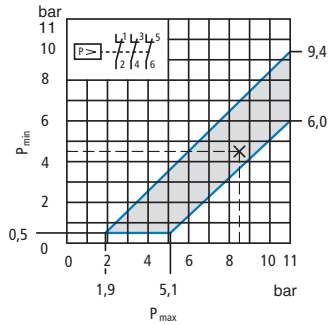




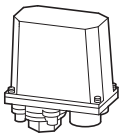
Min. switching differential: 0.6 bar
Example:
Cut-out pressure 3.3 bar
Cut-in pressure 2.2 bar

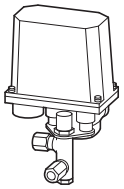


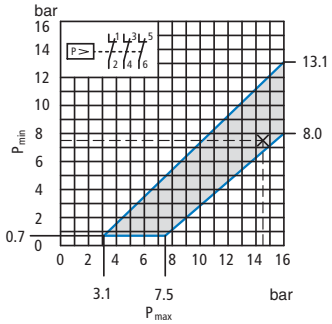




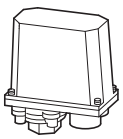
Min. switching differential: 1.4 bar
Example:
Cut-out pressure 8.5 bar
Cut-in pressure 4.5 bar

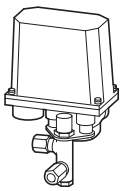


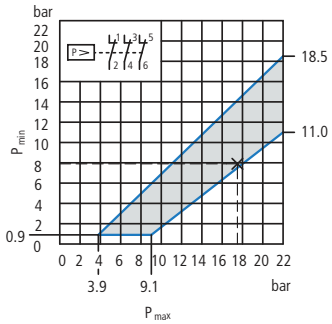




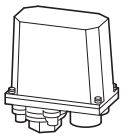
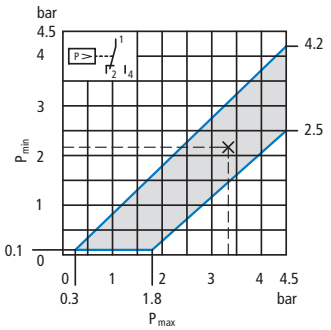
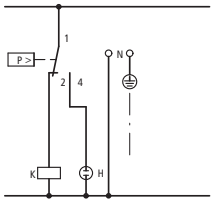
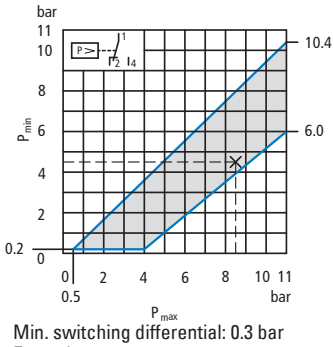
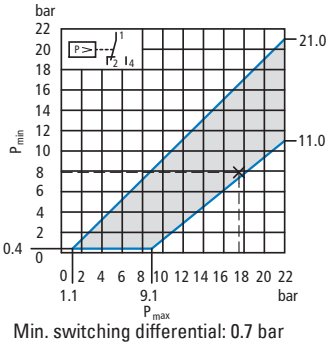
Min. switching differential: 2.4 bar
Example:
Cut-out pressure 14.5 bar
Cut-in pressure 7.5 bar



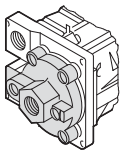
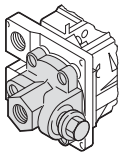
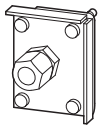
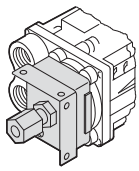
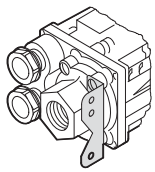
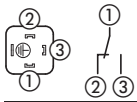
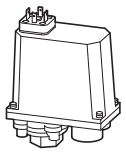




Min. switching differential: 3.0 bar
Example:
Cut-out pressure 17.5 bar
Cut-in pressure 7.8 bar

Contacts	Max. operating pressure	Make and break pressure: **separately** infinitely adjustable. Pressures can be set to any point within the area of the pressure diagram for the appropriate switch.	Variable switching differential **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Number	bar					
Pressure switch with auxiliary contacts, IP65						
						
1 changeover contact	7	 Min. switching differential: 0.2 bar Example: Cut-out pressure 3.3 bar Cut-in pressure 2.2 bar	**MCS4** 019711		1 off	 **Features:** • Pressure pipe flange R ¼" • If required: pressure pipe flange R ½" • IP65 in conjunction with V-M20 cable gland • 1 Insulated protective wire terminal ⏚ • 2 cable entry knockouts for M20 • Neoprene diaphragm, resistant to aging, air, engine oil, and water min. -25 °C, max. +80 °C Factory setting of cut-in and cut-out pressure via type suffix: → Page 3/33 R ¼" corresponds to G ¼ R ½" corresponds to G ½ to ISO 228-1 Auxiliary contact to IEC/EN 60947-1 1) Gold contacts are specially suitable for switching small voltages and currents from 12 V AC/DC, 0.1 A.
1 changeover contact with gold-plated	7		**MCS4-G**[1] 058693			
2 changeover contacts with gold-plated contacts	7		**MCS4-SOND910-G**[1] 087792			
1 changeover contact	15	 Min. switching differential: 0.3 bar Example: Cut-out pressure 8.5 bar Cut-in pressure 4.5 bar	**MCS11** 088527			
1 changeover contact with gold-plated	15		**MCS11-G**[1] 058692			
2 changeover contact with gold-plated contacts	15		**MCS11-SOND910-G**[1] 087793			
1 changeover contact	25	 Min. switching differential: 0.7 bar Example: Cut-out pressure 17.5 bar Cut-in pressure 7.8 bar	**MCS22** 098019			
1 changeover contact with gold-plated	25		**MCS22-G**[1] 058691			
2 changeover contact with gold-plated contacts	25		**MCS22-SOND910-G**[1] 087794			

HPL03033EN

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	
Pressure pipe flange						
	MCS with R ½"	**+R1/2"-MCS** 001627		1 off	Order no. when ordering basic unit	
	MCS with R ½"	**R1/2"-MCS** 031617			Order no. when ordering separately	
	MCSN(-V) with R ¼"	**+R1/4"-MCSN** 001628			Order no. when ordering basic unit	
	MCSN(-V) with R ¼"	**R1/4"-MCSN** 033990			Order no. when ordering separately	
Pressure pipe flange with pressure gauge connection						
	MCS, MCSN(-V)	**+M-MCS** 001625		1 off	Order no. when ordering basic unit	 Pressure gauge connection R ¼", Pressure pipe flange always R ½" also with MCS
	MCS, MCSN(-V)	**M-MCS** 071913			Order no. when ordering separately	
Compression fitting						
	MCS, MCSN	**+E8-MCS** 001624		1 off	Order no. when ordering basic unit	 External diameter of pipe coupling 8 mm Wall fixing bracket integrated can be rotated in 180° stages
	MCS, MCSN	**E8-MCS** 040949			Order no. when ordering separately	
Wall fixing bracket						
	MCS, MCSN	**+W-MCS** 001631		1 off	Order no. when ordering basic unit	 Wall fixing bracket can be rotated to right or left by 90° stages
	MCS, MCSN	**W-MCS** 050665		10 off	Order no. when ordering separately	
External unit plug, IP65 3 poles plus earth for socket adapters to DIN 43650-A/ISO 4400 Plug configuration: 						
	MCS MCS…-G Not for use with MCS…SOND910-G	**+S3-MCS** 201854		1 off	Order no. when ordering basic unit	–
Pressure setting Standard setting of the cut-in and cut-out pressures When ordering, the type reference must include the following details: 1st wildcard ≙ cut-in pressure in bar 2nd wildcard ≙ cut-out pressure in bar						
	MCS, MCSN	**+PMIN(*)/PMAX(*)** 203948		1 off	Order no. when ordering basic unit	

Notes

Ordering example

- Desired part no.: MCS4
- Required cut-in pressure in bar: 2.2
- Required cut-out pressure in bar: 3.3

A maximum or one decimal place after the comma is possible with the pressure definition.
The correct part no. is:
MCS4 + **PMIN(2.2)/PMAX(3,3)**

HPL03034EN

Rating data for approved types to UL/CSA [1]	Max. pressure	Rated insulation voltage to UL/CSA	Maximum motor rating HP = PS 115 V	200 V	230 V	460 V	575 V	Rated operational current	Part no. Article no.	Price See price list	Std. pack
	psi[2]	V AC	HP	HP	HP	HP	HP	I_e A			
MCS(N) pressure switches, IP55											
With transparent hood											
1 pole only for single-phase motors[4]	65	300	0.25[3]	0.5[3]	–	–	–	10	**MCS4FORMCDN** 024457		1 off
	160		0.25[3]	0.5[3]	–	–	–	10	**MCS11FORMCDN** 093273		
	315		0.25[3]	0.5[3]	–	–	–	10	**MCS22FORMCDN** 014965		
3 pole[4]	65	600	–	3	3	5	7.5	10	**MCSN4FORMCDN** 064798		1 off
	160		–	3	3	5	7.5	10	**MCSN11FORMCDN** 036322		
	230		–	3	3	5	7.5	10	**MCSN16FORMCDN** 045814		

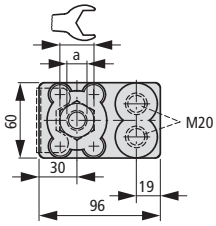
Notes

[1] Devices for world markets IEC ≙ UL/CSA
[2] In North America, pressure is stated in pounds/inch (psi) (1 bar = 14.5 psi)
[3] Heavy Pilot Duty = High switching duty
[4] Selection data and application notes → 3/32

Dimensions

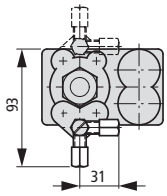
Pressure switches

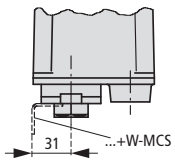
MCS…, MCSN…

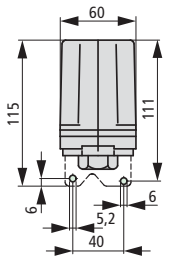


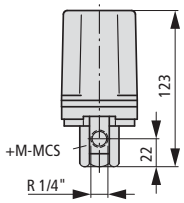
Part no.	Pipe in-lead	a	
MSC…	2 x M20	R 1/4“	27
MSCN…	2 x M20	R 1/2“	36

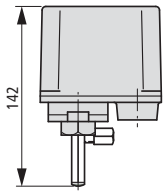
MCSN…V
With relief valve

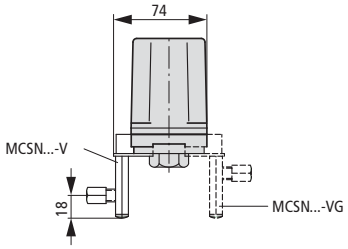


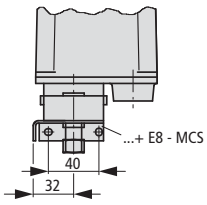


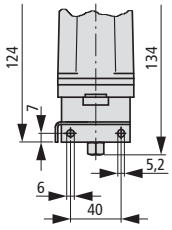












			Pressure switches		
			MCS	**MCS...SOND910-G**	**MCSN**
General					
Standards			IEC/EN 60947-5-1		
Test pressure		bar	32	32	32
Bursting pressure		bar	90	90	90
Operating frequency	Operations/h		≦ 3000	≦ 3000	≦ 1500
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature		°C	-25 - 70	-25 - 70	-25 - 70
Protection type			IP65	IP65	IP65
Mounting position			Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27	Half-sinusoidal shock 20 ms	g	> 10	> 10	> 10
Vibration resistance acc. to IEC/EN 60068-2-6	Amplitude 1 mm	Hz	36	36	36
Lifespan at 50 % - 12 % pressure differential	Operations	x 10^6	1…2	1…2	0.5
Terminal capacity					
Solid		mm^2	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Flexible with ferrule to DIN 46228		mm^2	1 x (0.5 - 1.5)	1 x (0.5 - 1.5)	1 x (0.5 - 1.5) 2 x (0.5 - 1.5)
Terminations			Tunnel-type screw terminal	Tunnel-type screw terminal	Flat terminal with clamping washer
Terminal screw			M3	M3	M4
Terminal screw tightening torque		Nm	0.5	0.5	1.2
Contacts/switching capacity					
Rated impulse withstand voltage	U_{imp}	V AC	4000	4000	4000
Rated insulation voltage	U_i	V	400	400	400
Overvoltage category/pollution degree			III/3	III/3	III/3
Max. short-circuit protective unit					
Fuseless		Part no.	PKZ2/ZM6	PKZ2/ZM6	PKZ2/ZM16
Fuse	gG/gL	A	10	10	20
Type of coordination			–	–	1
AC-15					
Rated operational current					
230 V		A	2	–	–
AC-3					
Rated operational current					
230 V		A	–	–	15
400 V		A	–	–	11.5
Motor rating P					
230 V		kW	–	–	4
400 V		kW	–	–	5.5
DC-13					
Rated operational current					
24 V		A	2	0.8	–
110 V		A	0.25	0.25	–
DC-3					
Rated operational current					
24 V		A	–	–	16
110 V		A	–	–	12.5
250 V		A	–	–	2
Rated frequency	*f*	Hz	50	50	50

Description



① Outputs with function display on all models.
② All models with M12 plug connector or cable (2 m).
③ Versions for flush or non-flush mounting available.

Short description

Eaton's proximity sensors of the Global series have been developed specially for OEM series production. The sensors feature only the functions required for reliable operation. This means that you do not pay for additional, unnecessary functions but get the performance and features you expect from a sensor. Our DC versions feature a short-circuit protective unit and a rating of up to 2000 measuring cycles per second. The outputs of all models are equipped with a function display. The Global series includes models with various diameters from 8 to 30 mm, making it truly versatile in installation. Versions with various ranges are also available. The Global proximity sensors are DC or AC units with a 2- or 3-wire, NPN or PNP configuration. Versions for hard-wiring or with M12 plug connector are available. The DC versions have a rated load current of 100 mA, the AC versions 200 mA.

Product features

- The Global Proximity Line features solid performance and a basic feature set for reliable, cost-effective sensing.
- Available in a variety of sizes to fit in all of your applications: 8 mm, 12 mm, 18 mm und 30 mm diameters.
- The input voltage of the DC versions is 10 – 30 V DC with a 2- and 3-wire configuration (PNP and NPN).
- The input voltage of the AC versions is 2-AC 20...250 V.
- The operating frequency of the DC versions is 2 kHz.
- Versions for flush or non-flush installation available.
- Connection through cable (2 meters) or M12 plug connector.
- The DC versions feature short-circuit protection.

Approvals

CE
cCSAus

HPL03037EN

Ordering

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Global series										
2-wire										
M12 x 1										
	10 - 30 V DC	2	Flush	–	2 m connection cable	1 N/O	Metal	**E57-12GS02-D** 135883		1 off
		2	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-12GS02-DDB** 135884		
		4	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-12GU04-D** 135891		
		4	Non-flush	–	2 m connection cable	1 NC	Metal	**E57-12GU04-D1** 135892		
		4	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-12GU04-DDB** 135893		
		8	Non-flush	–	2 m connection cable	1 NC	Metal	**E57-12GE08-D1** 135872		
		8	Non-flush	–	plug connector M12 x 1	1 NC	Metal	**E57-12GE08-D1DB** 135873		
		8	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-12GE08-DDB** 135874		
		8	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-12GE08-D** 135871		
	20 - 250 V AC	2	Flush	–	2 m connection cable	1 N/O	Metal	**E57-12GS02-A** 135879		
		2	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-12GS02-AAB** 135880		
		4	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-12GU04-A** 135887		
		4	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-12GU04-AAB** 135888		
M18 x 1										
	10 - 30 V DC	5	Flush	–	2 m connection cable	1 N/O	Metal	**E57-18GS05-D** 135929		1 off
		5	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GS05-DDB** 135930		
		8	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-18GU08-D** 135937		
		8	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GU08-DDB** 135938		
		16	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-18GE16-D** 135917		
		16	Non-flush	–	2 m connection cable	1 NC	Metal	**E57-18GE16-D1** 135918		
		16	Non-flush	–	plug connector M12 x 1	1 NC	Metal	**E57-18GE16-D1DB** 135919		
		16	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GE16-DDB** 135920		
	20 - 250 V AC	5	Flush	–	2 m connection cable	1 N/O	Metal	**E57-18GS05-A** 135925		
		5	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GS05-AAB** 135926		
		8	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-18GU08-A** 135933		
		8	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GU08-AAB** 135934		
		16	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-18GE16-AAB** 135916		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	CSA report applies to both Canada and US
UL CCN	–
CSA File No.	224447
CSA Class No.	4652-84
NA Certification	CSA certified
Max. Voltage Rating	250 V AC, 30 V DC
Degree of Protection	IEC: IP67; UL/CSA Type: -

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Global series										
2-wire										
M30 x 1.5										
	10 - 30 V DC	10	Flush	–	2 m connection cable	1 N/O	Metal	**E57-30GS10-D** 135973		1 off
		10	Flush	–	2 m connection cable	1 NC	Metal	**E57-30GS10-D1** 135974		
		10	Flush	–	plug connector M12 x 1	1 NC	Metal	**E57-30GS10-D1DB** 135975		
		10	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-30GS10-DDB** 135976		
		15	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-30GU15-D** 135983		
		15	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-30GU15-DDB** 135984		
		25	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-30GE25-D** 135961		
		25	Non-flush	–	2 m connection cable	1 NC	Metal	**E57-30GE25-D1** 135962		
		25	Non-flush	–	plug connector M12 x 1	1 NC	Metal	**E57-30GE25-D1DB** 135963		
		25	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-30GE25-DDB** 135964		
	20 - 250 V AC	10	Flush	–	2 m connection cable	1 N/O	Metal	**E57-30GS10-A** 135969		
		10	Flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-30GS10-AAB** 135970		
		15	Non-flush	–	2 m connection cable	1 N/O	Metal	**E57-30GU15-A** 135979		
		15	Non-flush	–	plug connector M12 x 1	1 N/O	Metal	**E57-30GU15-AAB** 135980		
3-wire										
M8 x 1										
	10 - 30 V DC	1	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57-08GS01-C** 135859		1 off
		1	Flush	NPN	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GS01-CDB** 135860		
		1	Flush	PNP	2 m connection cable	1 N/O	Stainless steel	**E57-08GS01-G** 135861		
		1	Flush	PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GS01-GDB** 135862		
		2	Non-flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57-08GU02-C** 135863		
		2	Non-flush	NPN	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GU02-CDB** 135864		
		2	Non-flush	PNP	2 m connection cable	1 N/O	Stainless steel	**E57-08GU02-G** 135865		
		2	Non-flush	PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GU02-GDB** 135866		
		3	Flush	NPN	2 m connection cable	1 NC	Stainless steel	**E57-08GBE03-C** 135850		
		3	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57-08GE03-C** 135851		
		3	Flush	NPN	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GE03-CDB** 135852		
		3	Flush	PNP	2 m connection cable	1 N/O	Stainless steel	**E57-08GE03-G** 135853		
		3	Flush	PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GE03-GDB** 135854		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	CSA report applies to both Canada and US
UL CCN	–
CSA File No.	224447
CSA Class No.	4652-84
NA Certification	CSA certified
Max. Voltage Rating	250 V AC, 30 V DC
Degree of Protection	IEC: IP67; UL/CSA Type: -

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	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Global series										
3-wire										
M8 x 1										
	10 - 30 V DC	6	Non-flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57-08GE06-C** 135855		1 off
		6	Non-flush	NPN	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GE06-CDB** 135856		
		6	Non-flush	PNP	2 m connection cable	1 N/O	Stainless steel	**E57-08GE06-G** 135857		
		6	Non-flush	PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E57-08GE06-GDB** 135858		
M12 x 1										
	10 - 30 V DC	2	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-12GS02-C** 135881		1 off
		2	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-12GS02-CDB** 135882		
		2	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-12GS02-G** 135885		
		2	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-12GS02-GDB** 135886		
		4	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-12GU04-C** 135889		
		4	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-12GU04-CDB** 135890		
		4	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-12GU04-G** 135894		
		4	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-12GU04-GDB** 135895		
		5	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-12GE05-C** 135867		
		5	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-12GE05-CDB** 135868		
		5	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-12GE05-G** 135869		
		5	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-12GE05-GDB** 135870		
		10	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-12GE10-C** 135875		
		10	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-12GE10-CDB** 135876		
		10	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-12GE10-G** 135877		
		10	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-12GE10-GDB** 135878		
M18 x 1										
	10 - 30 V DC	5	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-18GS05-C** 135927		1 off
		5	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-18GS05-CDB** 135928		
		5	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-18GS05-G** 135931		
		5	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-18GS05-GDB** 135932		
		8	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-18GE08-C** 135912		
		8	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-18GE08-CDB** 135913		
		8	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-18GE08-G** 135914		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	CSA report applies to both Canada and US
UL CCN	–
CSA File No.	224447
CSA Class No.	4652-84
NA Certification	CSA certified
Max. Voltage Rating	250 V AC, 30 V DC
Degree of Protection	IEC: IP67; UL/CSA Type: -

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Global series										
3-wire										
M18 x 1										
	10 - 30 V DC	8	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-18GE08-GDB** 135915		1 off
		8	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-18GU08-C** 135935		
		8	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-18GU08-CDB** 135936		
		8	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-18GU08-G** 135939		
		8	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-18GU08-GDB** 135940		
		18	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-18GE18-C** 135921		
		18	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-18GE18-CDB** 135922		
		18	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-18GE18-G** 135923		
		18	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-18GE18-GDB** 135924		
3-wire										
M30 x 1.5										
	10 - 30 V DC	10	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-30GS10-C** 135971		1 off
		10	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-30GS10-CDB** 135972		
		10	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-30GS10-G** 135977		
		10	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-30GS10-GDB** 135978		
		15	Flush	NPN	2 m connection cable	1 N/O	Metal	**E57-30GE15-C** 135957		
		15	Flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-30GE15-CDB** 135958		
		15	Flush	PNP	2 m connection cable	1 N/O	Metal	**E57-30GE15-G** 135959		
		15	Flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-30GE15-GDB** 135960		
		15	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-30GU15-C** 135981		
		15	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-30GU15-CDB** 135982		
		15	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-30GU15-G** 135985		
		15	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-30GU15-GDB** 135986		
		29	Non-flush	NPN	2 m connection cable	1 N/O	Metal	**E57-30GE29-C** 135965		
		29	Non-flush	NPN	plug connector M12 x 1	1 N/O	Metal	**E57-30GE29-CDB** 135966		
		29	Non-flush	PNP	2 m connection cable	1 N/O	Metal	**E57-30GE29-G** 135967		
		29	Non-flush	PNP	plug connector M12 x 1	1 N/O	Metal	**E57-30GE29-GDB** 135968		

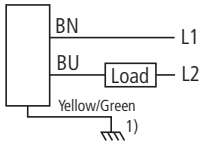
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	CSA report applies to both Canada and US
UL CCN	–
CSA File No.	224447
CSA Class No.	4652-84
NA Certification	CSA certified
Max. Voltage Rating	250 V AC, 30 V DC
Degree of Protection	IEC: IP67; UL/CSA Type: -

Engineering

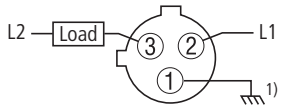
Circuit diagram

E57...-A



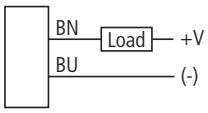
1) Internally connected to enclosure (wiring optional)

E57...-AAB

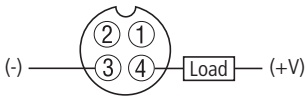


1) Internally connected to enclosure (wiring optional)

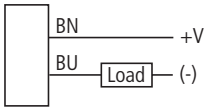
E57...-D
E57...-D1



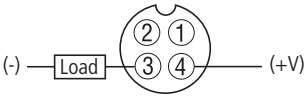
E57...-DDB
E57...-D1DB



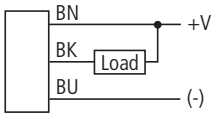
E57...-D
E57...-D1



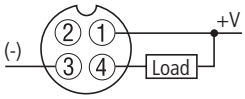
E57...-DDB
E57...-D1DB



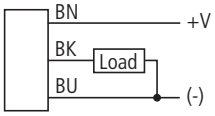
E57...-C



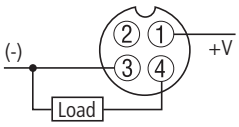
E57...-CDB



E57...-G



E57...-GDB



Technical data

			E57-...(2-wire)			
			E57-12GS...A	**E57-12GU...A**	**E57-18GS...A**	**E57-18GU...A**
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms			
Characteristic values						
Repetition accuracy of S_n		%	1	3	1	3
Temperature drift of S_n		%	10	10	10	10
Switching hysteresis of S_n		%	15	15	15	15
Rated operating voltage			20 - 250 V AC	20 - 250 V AC	20 - 250 V AC	20 - 250 V AC
Operating current in the switched state at 24 V DC	I_b	mA	1.8	1.8	1.8	1.8
Rated operational current	I_e	mA	200	200	200	200
Voltage drop at I_e	U_d	V	8	8	8	8
Switching frequency		Hz	25	25	25	25
Min. load current	I_e	mA	5	5	5	5
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.01	0.01	0.01	0.01
Switching state indication		LED	Red	Red	Red	Red
Function			2-wire	2-wire	2-wire	2-wire
Construction type						
Design (outer dimensions)			M12 x 1	M12 x 1	M18 x 1	M18 x 1
Material			Metal	Metal	Metal	Metal

			E57-...(2-wire)		
			E57-18GE...A	**E57-30GS...A**	**E57-30GU...A**
General					
Standards			IEC/EN 60947-5-2		
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms		
Characteristic values					
Repetition accuracy of S_n		%	1	1	3
Temperature drift of S_n		%	10	10	10
Switching hysteresis of S_n		%	15	15	15
Rated operating voltage			20 - 250 V AC	20 - 250 V AC	20 - 250 V AC
Operating current in the switched state at 24 V DC	I_b	mA	1.8	1.8	1.8
Rated operational current	I_e	mA	200	200	200
Voltage drop at I_e	U_d	V	8	8	8
Switching frequency		Hz	25	25	25
Min. load current	I_e	mA	5	5	5
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.01	0.01	0.01
Switching state indication		LED	Red	Red	Red
Function			2-wire	2-wire	2-wire
Construction type					
Design (outer dimensions)			M18 x 1	M30 x 1.5	M30 x 1.5
Material			Metal	Metal	Metal

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

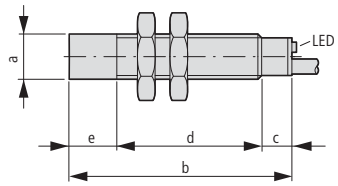
			E57-...(3-wire)				
			E57-08...	E57-12...			E57-18...
				E57-12GE...	E57-12GS...	E57-12GU...	E57-18GE...
General							
Standards			IEC/EN 60947-5-2				
Ambient temperature		°C	-0 - +60	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms				
Characteristic values							
Repetition accuracy of S_n		%	1	1	1	1	1
Temperature drift of S_n		%	10	10	10	10	10
Switching hysteresis of S_n		%	15	15	15	15	15
Rated operating voltage			10 - 30 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC
Residual ripple of U_e		%	10	10	10	10	10
Operating current in the switched state at 24 V DC	I_b	mA	10	10	10	20	10
Rated operational current	I_e	mA	100	100	100	100	100
Voltage drop at I_e	U_d	V	1.5	1.5	1.5	1.5	1.5
Switching frequency		Hz	2000	2000	2000	1000	1000
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.01	0.01	0.01	0.01	0.01
Switching state indication		LED	Red	Red	Red	Red	Red
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage				
Function			3-wire	3-wire	3-wire	3-wire	3-wire
Construction type							
Design (outer dimensions)			M8 x 1	M12 x 1	M12 x 1	M12 x 1	M18 x 1
Material			Stainless steel	Metal	Metal	Metal	Metal

			E57-18...		E57-30...		
			E57-18GS...	E57-18GU...	E57-30GE...	E57-30GS...	E57-30GU...
General							
Standards			IEC/EN 60947-5-2				
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms				
Characteristic values							
Repetition accuracy of S_n		%	1	1	1	1	1
Temperature drift of S_n		%	10	10	10	10	10
Switching hysteresis of S_n		%	15	15	15	15	15
Rated operating voltage			10 - 30 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC
Residual ripple of U_e		%	10	10	10	10	10
Operating current in the switched state at 24 V DC	I_b	mA	10	20	10	10	20
Rated operational current	I_e	mA	100	100	100	100	100
Voltage drop at I_e	U_d	V	1.5	1.5	1.5	1.5	1.5
Switching frequency		Hz	1000	500	500	500	200
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.01	0.01	0.01	0.01	0.01
Switching state indication		LED	Red	Red	Red	Red	Red
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage				
Function			3-wire	3-wire	3-wire	3-wire	3-wire
Construction type							
Design (outer dimensions)			M18 x 1	M18 x 1	M30 x 1.5	M30 x 1.5	M30 x 1.5
Material			Metal	Metal	Metal	Metal	Metal

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Dimensions

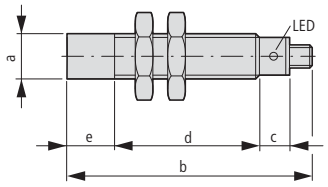
2 m connection cable



		a	b	c	d	e
2-wire						
20-250 V AC	E57-12GS02-A	M12x1	65	15	50	–
	E57-12GU04-A	M12x1	60	15	42	8
	E57-18GS05-A	M18x1	80	20	60	–
	E57-18GU08-A	M18x1	80	20	48	12
	E57-30GS10-A	M30	80	20	60	–
	E57-30GU15-A	M30	80	20	45	15
10-30 V DC	E57-12GS02-D	M12x1	50	–	50	–
	E57-12GU04-D	M12x1	50	–	42	8
	E57-12GU04-D1	M12x1	50	–	42	8
	E57-12GE08-D	M12x1	50	–	42	8
	E57-12GE08-D1	M12x1	50	–	42	8
	E57-18GS05-D	M18x1	55	5	50	–
	E57-18GU08-D	M18x1	55	5	38	12
	E57-18GE16-D	M18x1	55	5	38	12
	E57-18GE16-D1	M18x1	55	5	38	12
	E57-30GS10-D	M30	55	5	50	–
	E57-30GU15-D	M30	55	5	35	15
	E57-30GE25-D	M30	55	5	35	15
	E57-30GE25-D1	M30	55	5	35	15

		a	b	c	d	e
3-wire						
10-30 V DC	E57-08GE03-C	M8x1	46	6	40	–
	E57-08GE06-C	M8x1	46	1	41	4
	E57-08GE03-G	M8x1	46	6	40	–
	E57-08GE06-G	M8x1	46	1	41	4
	E57-08GS01-C	M8x1	45	–	45	–
	E57-08GS01-G	M8x1	45	–	45	–
	E57-08GU02-C	M8x1	45	–	41	4
	E57-08GU02-G	M8x1	45	–	41	4
	E57-12GE05-C	M12x1	51	2	49	–
	E57-12GE05-G	M12x1	51	2	49	–
	E57-12GE10-C	M12x1	50.5	1.7	41	7.8
	E57-12GE10-G	M12x1	50.5	1.7	41	7.8
	E57-12GS02-C	M12x1	50	–	50	–
	E57-12GS02-G	M12x1	50	–	50	–
	E57-12GU04-C	M12x1	50	–	42	8
	E57-12GU04-G	M12x1	50	–	42	8
	E57-18GE08-C	M18x1	67.5	2.5	65	–
	E57-18GE08-G	M18x1	65.5	2.5	65	–
	E57-18GE18-C	M18x1	66	2.5	52	11.5
	E57-18GE18-G	M18x1	66	2.5	52	11.5
	E57-18GS05-C	M18x1	55	5	50	–
	E57-18GS05-G	M18x1	55	5	50	–
	E57-18GU08-C	M18x1	55	5	38	12
	E57-18GU08-G	M18x1	55	5	38	12
	E57-30GE15-C	M30	69	5	64	–
	E57-30GE15-G	M30	69	5	64	–
	E57-30GE29-C	M30	83	5	64	15
	E57-30GE29-G	M30	83	5	64	15
	E57-30GS10-C	M30	55	5	50	–
	E57-30GS10-G	M30	55	5	50	–
	E57-30GU15-C	M30	55	5	35	15
	E57-30GU15-G	M30	55	5	35	15

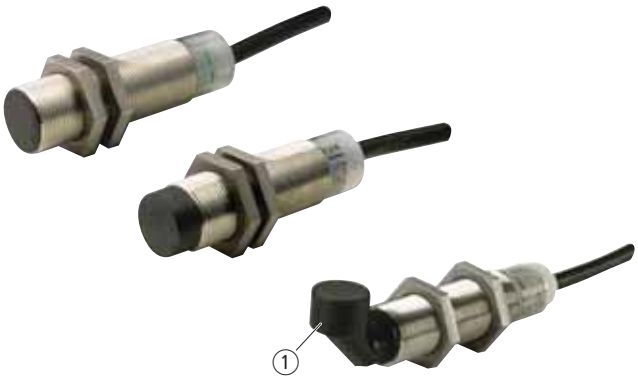
M12 plug connector



		a	b	c	d	e
2-wire						
20-250 V AC	E57-12GS02-AAB	M12x1	68	16	42	–
	E57-12GU04-AAB	M12x1	68	16	34	8
	E57-18GE16-AAB	M18x1	94	20	48	12
	E57-18GS05-AAB	M18x1	91	20	60	–
	E57-18GU08-AAB	M18x1	91	20	48	12
	E57-30GS10-AAB	M30	80	20	60	–
	E57-30GU15-AAB	M30	91	20	45	15
10-30 V DC	E57-12GS02-DDB	M12x1	69	16	42	–
	E57-12GU04-DDB	M12x1	68	16	34	8
	E57-12GE08-DDB	M12x1	68	16	34	8
	E57-12GE08-D1DB	M12x1	68	10	50	8
	E57-18GS05-DDB	M18x1	76	15	61	–
	E57-18GU08-DDB	M18x1	80	15	49	12
	E57-18GE16-DDB	M18x1	79	15	52	12
	E57-18GE16-D1DB	M18x1	79	15	52	12
	E57-30GS10-DDB	M30	75	15	60	–
	E57-30GU15-DDB	M30	79	15	45	15
	E57-30GE25-DDB	M30	78	15	48	15
	E57-30GE25-D1DB	M30	78	15	48	15

		a	b	c	d	e
3-wire						
10-30 V DC	E57-08GE03-CDB	M8x1	71	26	36	–
	E57-08GE03-CNB	M8x1	61	19	42	–
	E57-08GE03-GDB	M8x1	71	26	35	–
	E57-08GE03-GNB	M8x1	61	19	42	–
	E57-08GE06-CDB	M8x1	71	25	31	4
	E57-08GE06-GDB	M8x1	71	25	31	4
	E57-08GS01-CDB	M8x1	70	21	49	–
	E57-08GS01-GDB	M8x1	70	21	49	–
	E57-08GU02-CDB	M8x1	70	21	45	4
	E57-08GU02-GDB	M8x1	70	21	45	4
	E57-12GE05-CDB	M12x1	69	24	45	–
	E57-12GE05-GDB	M12x1	69	24	45	–
	E57-12GE10-CDB	M12x1	68.5	10.3	36	7.8
	E57-12GE10-GDB	M12x1	68.5	10.3	36	7.8
	E57-12GS02-CDB	M12x1	68	16	52	–
	E57-12GS02-GDB	M12x1	68	16	52	–
	E57-12GU04-CDB	M12x1	68	20	31	8
	E57-12GU04-GDB	M12x1	68	20	31	8
	E57-18GE08-CDB	M18x1	80	6	49	–
	E57-18GE08-GDB	M18x1	80	16	49	–
	E57-18GE18-CDB	M18x1	79	6	37	12
	E57-18GE18-GDB	M18x1	79	6	37	12
	E57-18GS05-CDB	M18x1	76	15	61	–
	E57-18GS05-GDB	M18x1	76	15	61	–
	E57-18GU08-CDB	M18x1	76	15	49	12
	E57-18GU08-GDB	M18x1	80	15	49	12
	E57-30GS10-CDB	M30	79	15	60	–
	E57-30GS10-GDB	M30	75	15	60	–
	E57-30GE15-CDB	M30	80	16	49	–
	E57-30GE15-GDB	M30	80	16	49	–
	E57-30GE29-CDB	M30	95	16	49	15
	E57-30GE29-GDB	M30	95	16	49	15
	E57-30GU15-CDB	M30	75	15	45	15
	E57-30GU15-GDB	M30	75	15	45	15

Description



① Measuring head angled 90° for difficult measuring tasks



Short description

Eaton's inductive proximity sensors of the Premium+ series feature an enhanced measuring performance, durability and selection. Unlike the standard sensors, the Premium+ models feature a rugged stainless steel enclosure, impact-resistant front caps and an impact-absorbing sealant. The sensors are now available in versions for AC, AC/DC and DC-only operation, with enclosure diameters of 12, 18 and 30 mm. Their interference immunity is unsurpassed at more than 20 volts/meter.
The Premium+ series includes sensors with a specially short, cylindrical enclosure. Despite their small size, they feature the same measuring range as the longer standard sizes. This allows the sensors to be used in applications where mounting space is limited. All sen-sors are equipped with a LED with 360° visibility.

Product features

- New, wider product range – models with two-wire, three-wire, AC, DC and AC/DC connection.
- Resistant against mechanical and environmental strain.
- Designed with stainless steel barrel and new potting compound for robust, high temperature, high pressure washdown, as well as intense shock and vibration applications.
- Unmatched high noise immunity eliminates problems associated with electrical noise (all models > 20 Volt/meter).
- Output status lamp is visible through 360° from any direction and at all light conditions.
- AC/DC and DC models have resettable short-circuit and polarity reversal protection.
- Models with 90° measuring head offer unique problem-solving capabilities.
- Large temperature range (-25 to 70 °C).
- Small sizes for space-saving installation available.
- Versions with cable for with cable for hard wiring or M12 plug connector for fast installation and simple replacement.

Approvals

c UL us LISTED

CE

HPL03047EN

Ordering

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus										
2-wire										
M12 x 1										
	20 - 250 V AC	2	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57LAL12A2**[1] 135995		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E57LAL12A2SA**[1] 135998		
			Flush	–	2 m connection cable	1 NC		**E57LBL12A2**[1] 136030		
			Flush	–	plug connector M12 x 1	1 NC		**E57LBL12A2SA**[1] 136033		
		4	Non-flush	–	2 m connection cable	1 N/O		**E57LAL12A2E**[1] 135996		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57LAL12A2EA**[1] 135997		
			Non-flush	–	2 m connection cable	1 NC		**E57LBL12A2E**[1] 136031		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57LBL12A2EA**[1] 136032		
M18 x 1										
	20 - 250 V AC	5	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57LAL18A2**[1] 136007		
			Flush	–	2 m connection cable	1 NC		**E57LBL18A2**[1] 136042		
			Flush	–	M12 plug connector x 1	1 NC		**E57LBL18A2SA**[1] 136045		
	20 - 250 V AC	5	Flush	–	2 m connection cable	1 N/O		**E57RAL18A2**[2] 136066		
		5	Flush	–	2 m connection cable	1 NC		**E57RBL18A2**[2] 136078		
		8	Non-flush	–	2 m connection cable	1 N/O		**E57RAL18A2E**[2] 136067		
		8	Non-flush	–	2 m connection cable	1 NC		**E57RBL18A2E**[2] 136079		
	20 - 250 V AC	8	Non-flush	–	2 m connection cable	1 N/O		**E57LAL18A2E**[1] 136008		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57LAL18A2EA**[1] 136009		
			Non-flush	–	2 m connection cable	1 NC		**E57LBL18A2E**[1] 136043		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57LBL18A2EA**[1] 136044		
	20 - 250 V AC	5	Flush	–	plug connector M12 x 1	1 N/O		**E57RAL18A2SA**[2] 136069		
		5	Flush	–	plug connector M12 x 1	1 NC		**E57RBL18A2SA**[2] 136081		
		8	Non-flush	–	plug connector M12 x 1	1 N/O		**E57RAL18A2EA**[2] 136068		
		8	Non-flush	–	plug connector M12 x 1	1 NC		**E57RBL18A2EA**[2] 136080		

Information relevant for export to North America

[1] Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
CSA File No.: 50513
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Max. Voltage Rating: 250 V AC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: -

[2] Product Standards: UL 508; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
NA Certification: UL Listed
Max. Voltage Rating: 250 V AC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: 4, 4x, 6, 6P, 12, 13

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus										
2-wire										
M30 x 1.5										
	20 - 250 V AC	10	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57LAL30A2**[1] 136018		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E57LAL30A2SA**[1] 136021		
			Flush	–	2 m connection cable	1 NC		**E57LBL30A2**[1] 136054		
			Flush	–	plug connector M12 x 1	1 NC		**E57LBL30A2SA**[1] 136057		
		15	Non-flush	–	2 m connection cable	1 N/O		**E57LAL30A2E**[1] 136019		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57LAL30A2EA**[1] 136020		
			Non-flush	–	2 m connection cable	1 NC		**E57LBL30A2E**[1] 136055		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57LBL30A2EA**[1] 136056		
3-wire										
M12 x 1										
	6 - 48 V DC	2	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57LAL12T110**[2] 135999		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL12T110SD**[2] 136002		
			Flush	PNP	2 m connection cable	1 N/O		**E57LAL12T111**[2] 136003		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL12T111SD**[2] 136006		
			Flush	NPN	2 m connection cable	1 NC		**E57LBL12T110**[2] 136034		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57LBL12T110SD**[2] 136037		
			Flush	PNP	2 m connection cable	1 NC		**E57LBL12T111**[2] 136038		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57LBL12T111SD**[2] 136041		
		4	Non-flush	NPN	2 m connection cable	1 N/O		**E57LAL12T110E**[2] 136000		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL12T110ED**[2] 136001		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57LAL12T111E**[2] 136004		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL12T111ED**[2] 136005		
			Non-flush	NPN	2 m connection cable	1 NC		**E57LBL12T110E**[2] 136035		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57LBL12T110ED**[2] 136036		
			Non-flush	PNP	2 m connection cable	1 NC		**E57LBL12T111E**[2] 136039		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57LBL12T111ED**[2] 136040		

Information relevant for export to North America

[1] Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	250 V AC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: -
[2] Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	48 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: -

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Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus										
3-wire										
M18 x 1										
	6 - 48 V DC	5	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57RAL18T110** [1] 136070		1 off
			Flush	PNP	2 m connection cable	1 N/O		**E57RAL18T111** [1] 136074		
			Flush	NPN	2 m connection cable	1 NC		**E57RBL18T110** [1] 136082		
			Flush	PNP	2 m connection cable	1 NC		**E57RBL18T111** [1] 136086		
		5	Flush	NPN	2 m connection cable	1 N/O		**E57LAL18T110** [2] 136010		
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL18T110SD** [2] 136013		
			Flush	PNP	2 m connection cable	1 N/O		**E57LAL18T111** [2] 136014		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL18T111SD** [2] 136017		
			Flush	NPN	2 m connection cable	1 NC		**E57LBL18T110** [2] 136046		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57LBL18T110SD** [2] 136049		
			Flush	PNP	2 m connection cable	1 NC		**E57LBL18T111** [2] 136050		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57LBL18T111SD** [2] 136053		
		8	Non-flush	NPN	2 m connection cable	1 N/O		**E57RAL18T110E** [1] 136071		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57RAL18T111E** [1] 136075		
			Non-flush	NPN	2 m connection cable	1 NC		**E57RBL18T110E** [1] 136083		
			Non-flush	PNP	2 m connection cable	1 NC		**E57RBL18T111E** [1] 136087		
			Non-flush	NPN	2 m connection cable	1 N/O		**E57LAL18T110E** [2] 136011		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL18T110ED** [2] 136012		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57LAL18T111E** [2] 136015		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL18T111ED** [2] 136016		
			Non-flush	NPN	2 m connection cable	1 NC		**E57LBL18T110E** [2] 136047		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57LBL18T110ED** [2] 136048		
			Non-flush	PNP	2 m connection cable	1 NC		**E57LBL18T111E** [2] 136051		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57LBL18T111ED** [2] 136052		

Information relevant for export to North America

[1] Product Standards: UL 508; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
NA Certification: UL Listed
Max. Voltage Rating: 48 V DC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: -

[2] Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
CSA File No.: 50513
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Max. Voltage Rating: 48 V DC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: -

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus										
3-wire										
M18 x 1										
	6 - 48 V DC	5	Flush	NPN	plug connector M12 x 1	1 N/O	Stainless steel	**E57RAL18T110SD**[1] 136073		1 off
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57RAL18T111SD**[1] 136077		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57RBL18T110SD**[1] 136085		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57RBL18T111SD**[1] 136089		
		8	Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57RAL18T110ED**[1] 136072		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57RAL18T111ED**[1] 136076		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57RBL18T110ED**[1] 136084		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57RBL18T111ED**[1] 136088		
3-wire										
M30 x 1.5										
	6 - 48 V DC	10	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57LAL30T110**[2] 136022		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL30T110SD**[2] 136025		
			Flush	PNP	2 m connection cable	1 N/O		**E57LAL30T111**[2] 136026		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL30T111SD**[2] 136029		
			Flush	NPN	2 m connection cable	1 NC		**E57LBL30T110**[2] 136058		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57LBL30T110SD**[2] 136061		
			Flush	PNP	2 m connection cable	1 NC		**E57LBL30T111**[2] 136062		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57LBL30T111SD**[2] 136065		
		15	Non-flush	NPN	2 m connection cable	1 N/O		**E57LAL30T110E**[2] 136023		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57LAL30T110ED**[2] 136024		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57LAL30T111E**[2] 136027		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57LAL30T111ED**[2] 136028		
			Non-flush	NPN	2 m connection cable	1 NC		**E57LBL30T110E**[2] 136059		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57LBL30T110ED**[2] 136060		
			Non-flush	PNP	2 m connection cable	1 NC		**E57LBL30T111E**[2] 136063		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57LBL30T111ED**[2] 136064		

Information relevant for export to North America

[1] Product Standards: UL 508; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
NA Certification: UL Listed
Max. Voltage Rating: 48 V DC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: -

[2] Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.: E166051
UL CCN: NRKH, NRKH7
CSA File No.: 50513
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Max. Voltage Rating: 48 V DC
Degree of Protection: IEC: IP67, IP69K; UL/CSA Type: -

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus Short Series										
2-wire										
M12 x 1										
	20 - 250 V DC 40 - 250 V AC	2	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57SAL12A2** 136090		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL12A2SA** 136093		
			Flush	–	2 m connection cable	1 NC		**E57SBL12A2** 136138		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL12A2SA** 136141		
	20 - 250 V AC		Flush	–	2 m connection cable	1 N/O		**E57SAL12A4** 136094		
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL12A4SA** 136097		
			Flush	–	2 m connection cable	1 NC		**E57SBL12A4** 136142		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL12A4SA** 136145		
	20 - 250 V DC 40 - 250 V AC	4	Non-flush	–	2 m connection cable	1 N/O		**E57SAL12A2E** 136091		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL12A2EA** 136092		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL12A2E** 136139		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL12A2EA** 136140		
	20 - 250 V AC		Non-flush	–	2 m connection cable	1 N/O		**E57SAL12A4E** 136095		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL12A4EA** 136096		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL12A4E** 136143		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL12A4EA** 136144		
M18 x 1										
	20 - 250 V DC 40 - 250 V AC	5	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57SAL18A2** 136106		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL18A2SA** 136109		
			Flush	–	2 m connection cable	1 NC		**E57SBL18A2** 136152		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL18A2SA** 136155		
	20 - 250 V AC		Flush	–	2 m connection cable	1 N/O		**E57SAL18A4** 136110		
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL18A4SA** 136113		
			Flush	–	2 m connection cable	1 NC		**E57SBL18A4** 136156		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL18A4SA** 136159		
	20 - 250 V DC 40 - 250 V AC	8	Non-flush	–	2 m connection cable	1 N/O		**E57SAL18A2E** 136107		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL18A2EA** 136108		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL18A2E** 136153		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL18A2EA** 136154		
	20 - 250 V AC		Non-flush	–	2 m connection cable	1 N/O		**E57SAL18A4E** 136111		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL18A4EA** 136112		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL18A4E** 136157		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL18A4EA** 136158		

Information relevant for export to North America

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Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus Short Series										
2-wire										
M30 x 1.5										
	20 - 250 V DC 40 - 250 V AC	10	Flush	–	2 m connection cable	1 N/O	Stainless steel	**E57SAL30A2** 136122		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL30A2SA** 136125		
			Flush	–	2 m connection cable	1 NC		**E57SBL30A2** 136168		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL30A2SA** 136171		
	20 - 250 V AC		Flush	–	2 m connection cable	1 N/O		**E57SAL30A4** 136126		
			Flush	–	plug connector M12 x 1	1 N/O		**E57SAL30A4SA** 136129		
			Flush	–	2 m connection cable	1 NC		**E57SBL30A4** 136172		
			Flush	–	plug connector M12 x 1	1 NC		**E57SBL30A4SA** 136175		
	20 - 250 V DC 40 - 250 V AC	15	Non-flush	–	2 m connection cable	1 N/O		**E57SAL30A2E** 136123		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL30A2EA** 136124		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL30A2E** 136169		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL30A2EA** 136170		
	20 - 250 V AC		Non-flush	–	2 m connection cable	1 N/O		**E57SAL30A4E** 136127		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E57SAL30A4EA** 136128		
			Non-flush	–	2 m connection cable	1 NC		**E57SBL30A4E** 136173		
			Non-flush	–	plug connector M12 x 1	1 NC		**E57SBL30A4EA** 136174		
3-wire										
M12 x 1										
	6 - 48 V DC	2	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57SAL12T110** 136098		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL12T110SD** 136101		
			Flush	PNP	2 m connection cable	1 N/O		**E57SAL12T111** 136102		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL12T111SD** 136105		
			Flush	PNP	2 m connection cable	1 NC		**E57SBL12T111** 136148		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57SBL12T111SD** 136151		
		4	Non-flush	NPN	2 m connection cable	1 N/O		**E57SAL12T110E** 136099		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL12T110ED** 136100		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	250 V AC, 250 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: 4, 4x, 6, 6P, 12, 13

HPL03053EN

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus Short Series										
3-wire										
M12 x 1										
	6 - 48 V DC	4	Non-flush	PNP	2 m connection cable	1 N/O	Stain-less steel	**E57SAL12T111E** 136103		1 off
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL12T111ED** 136104		
			Non-flush	NPN	2 m connection cable	1 NC		**E57SBL12T110E** 136146		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57SBL12T110ED** 136147		
			Non-flush	PNP	2 m connection cable	1 NC		**E57SBL12T111E** 136149		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57SBL12T111ED** 136150		
3-wire										
M18 x 1										
	6 - 48 V DC	5	Flush	NPN	2 m connection cable	1 N/O	Stain-less steel	**E57SAL18T110** 136114		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL18T110SD** 136117		
			Flush	PNP	2 m connection cable	1 N/O		**E57SAL18T111** 136118		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL18T111SD** 136121		
			Flush	NPN	2 m connection cable	1 NC		**E57SBL18T110** 136160		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57SBL18T110SD** 136163		
			Flush	PNP	2 m connection cable	1 NC		**E57SBL18T111** 136164		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57SBL18T111SD** 136167		
		8	Non-flush	NPN	2 m connection cable	1 N/O		**E57SAL18T110E** 136115		
			Non-flush	NPN	2 m connection cable	1 NC		**E57SBL18T110E** 136161		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL18T110ED** 136116		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57SAL18T111E** 136119		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL18T111ED** 136120		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57SBL18T110ED** 136162		
			Non-flush	PNP	2 m connection cable	1 NC		**E57SBL18T111E** 136165		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57SBL18T111ED** 136166		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	250 V AC, 250 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: -

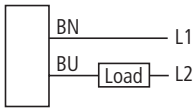
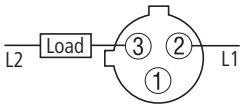
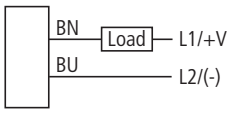
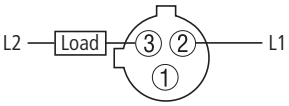
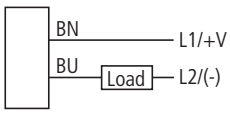
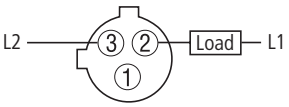
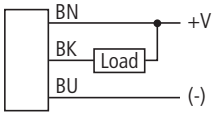
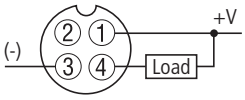
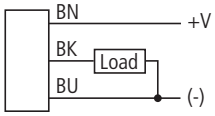
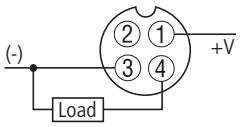
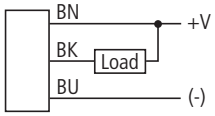
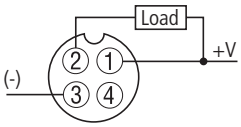
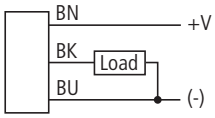
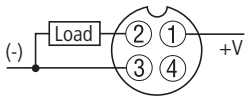
HPL03054EN

Function	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options:	Contact configuration N/O = normally open contact NC = normally closed contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Premium Plus Short Series										
3-wire										
M30 x 1.5										
	6 - 48 V DC	10	Flush	NPN	2 m connection cable	1 N/O	Stain-less steel	**E57SAL30T110** 136130		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL30T110SD** 136133		
			Flush	PNP	2 m connection cable	1 N/O		**E57SAL30T111** 136134		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL30T111SD** 136137		
			Flush	NPN	2 m connection cable	1 NC		**E57SBL30T110** 136176		
			Flush	NPN	plug connector M12 x 1	1 NC		**E57SBL30T110SD** 136179		
			Flush	PNP	2 m connection cable	1 NC		**E57SBL30T111** 136180		
			Flush	PNP	plug connector M12 x 1	1 NC		**E57SBL30T111SD** 136183		
		15	Non-flush	NPN	2 m connection cable	1 N/O		**E57SAL30T110E** 136131		
			Non-flush	NPN	2 m connection cable	1 NC		**E57SBL30T110E** 136177		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57SAL30T110ED** 136132		
			Non-flush	PNP	2 m connection cable	1 N/O		**E57SAL30T111E** 136135		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57SAL30T111ED** 136136		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E57SBL30T110ED** 136178		
			Non-flush	PNP	2 m connection cable	1 NC		**E57SBL30T111E** 136181		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E57SBL30T111ED** 136182		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	250 V AC, 250 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: -

Engineering

Circuit diagram Rated operating voltage	Contacts	2 m connection cable	M12 plug connector (front view plug)
2-wire sensors			
20–250 V AC/DC and AC-only Example AC connection	N/O and NC		
20–250 V AC/DC Example DC connection	N/O and NC (NPN)		
	N/O and NC (PNP)		
3-wire sensors			
6–48 V DC	N/O (NPN)		
	N/O (PNP)		
	NC (NPN)		
	NC (PNP)		

Technical data

			E57-L...L12A	E57-L...L12T	E57-S...L12A	E57-S...L12T
General						
Standards			IEC/EN 60947-5-2	IEC/EN 60947-5-2	IEC/EN 60947-5-2	IEC/EN 60947-5-2
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms	30 Shock duration 11 ms	30 Shock duration 11 ms	30 Shock duration 11 ms
Characteristic values						
Temperature drift of S_n		%	10	10	10	10
Switching hysteresis of S_n		%	20	15	20	15
Rated operating voltage			20 - 250 V AC	6 - 48 V DC	40 - 250 V AC 20 - 250 V DC	6 - 48 V DC
Rated operational current		I_e	250	500	500	500
Switching frequency		Hz	20	800	20	800
Switching state indication		LED	Red	Red	Red	Red
Function			2-wire	3-wire	2-wire	3-wire
Construction type						
Design (outer dimensions)			M12 x 1	M12 x 1	M12 x 1	M12 x 1
Material			Stainless steel	Stainless steel	Stainless steel	Stainless steel

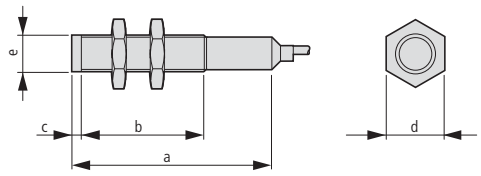
			E57-L...L18A	E57-L...L18T	E57-S...L18A	E57-S...L18T	E57-R...L18A	E57-R...L18T
General								
Standards			IEC/EN 60947-5-2					
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms					
Characteristic values								
Temperature drift of S_n		%	10	10	10	10	10	10
Switching hysteresis of S_n		%	20	15	20	15	20	15
Rated operating voltage			40 - 250 V AC 20 - 250 V DC	6 - 48 V DC	40 - 250 V AC 20 - 250 V DC	6 - 48 V DC	20 - 250 V AC	6 - 48 V DC
Rated operational current		I_e	250	500	500	500	500	500
Switching frequency		Hz	20	500	20	500	20	500
Switching state indication		LED	Red	Red	Red	Red	Red	Red
Function			2-wire	3-wire	2-wire	3-wire	2-wire	3-wire
Construction type								
Design (outer dimensions)			M18 x 1	M18 x 1	M18 x 1	M18 x 1	M18 x 1	M18 x 1
Material			Stainless steel					

			E57-L...L30A	E57-L...L30T	E57-S...L30A	E57-S...L30T
General						
Standards			IEC/EN 60947-5-2	IEC/EN 60947-5-2	IEC/EN 60947-5-2	IEC/EN 60947-5-2
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms	30 Shock duration 11 ms	30 Shock duration 11 ms	30 Shock duration 11 ms
Characteristic values						
Temperature drift of S_n		%	10	10	10	10
Switching hysteresis of S_n		%	20	15	20	15
Rated operating voltage			20 - 250 V AC	6 - 48 V DC	40 - 250 V AC 20 - 250 V DC	6 - 48 V DC
Rated operational current		I_e	250	500	500	500
Switching frequency		Hz	20	300	20	300
Switching state indication		LED	Red	Red	Red	Red
Function			2-wire	3-wire	2-wire	3-wire
Construction type						
Design (outer dimensions)			M30 x 1.5	M30 x 1.5	M30 x 1.5	M30 x 1.5
Material			Stainless steel	Stainless steel	Stainless steel	Stainless steel

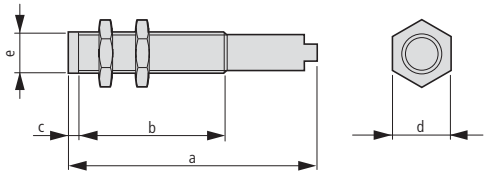
Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Dimensions

2 m connection cable

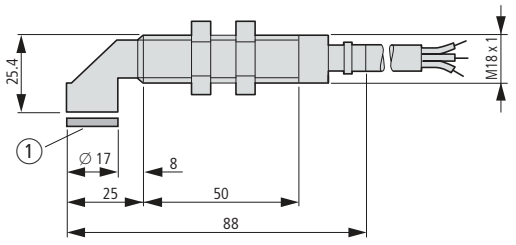


M12 plug connector

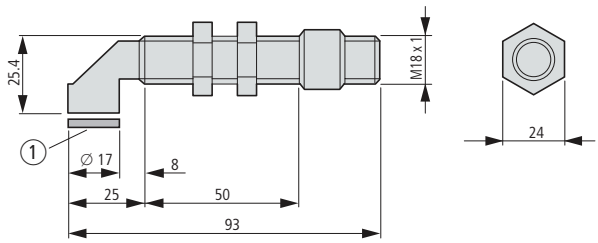


Construction type	Installation type	Dimensions in (mm)				
		a	b	c	d	e
2-wire, 2 m connection cable						
12 mm	Flush	62.4	50.3	-	16.8	M12x1
	Non-flush	72.7	50.3	9.14	16.8	M12x1
18 mm	Flush	64.5	50.9	-	23.8	M18x1
	Non-flush	66.0	37.2	14.1	23.8	M18x1
30 mm	Flush	69.3	50.3	-	35.9	M30x1.5
	Non-flush	69.3	37.8	13.26	35.9	M30x1.5
2-wire, M12 plug connector						
12 mm	Flush	68.4	50.3	-	16.8	M12x1
	Non-flush	77.7	50.3	9.14	9.14	M12x1
18 mm	Flush	69.06	50.9	-	23.8	M18x1
	Non-flush	69.4	37.2	14.1	23.8	M18x1
30 mm	Flush	73.8	50.3	-	35.9	M30x1.5
	Non-flush	73.8	37.8	13.26	35.9	M30x1.5
3-wire, 2 m connection cable						
12 mm	Flush	62.4	50.3	-	16.8	M12x1
	Non-flush	72.7	50.3	9.14	16.8	M12x1
18 mm	Flush	64.5	50.9	-	23.8	M18x1
	Non-flush	66.0	37.2	14.1	23.8	M18x1
30 mm	Flush	69.3	50.3	-	35.9	M30x1.5
	Non-flush	69.3	37.8	13.26	35.9	M30x1.5
3-wire, M12 plug connector						
12 mm	Flush	68.7	50.3	-	16.8	M12x1
	Non-flush	77.7	50.3	9.14	16.8	M12x1
18 mm	Flush	69.3	50.9	-	23.8	M18x1
	Non-flush	69.4	37.2	14.1	23.8	M18x1
30 mm	Flush	74.1	50.3	-	35.9	M30x1.5
	Non-flush	74.1	37.8	13.26	35.9	M30x1.5

E57R...A2...
E57R...110...
E57R...111...

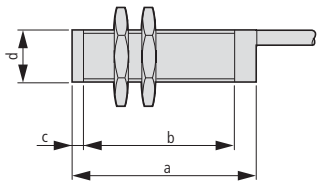


E57R...SA
E57R...EA
E57R...SD
E57R...ED

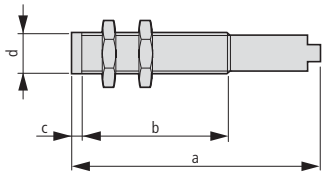


① Sensor surface

2 m connection cable

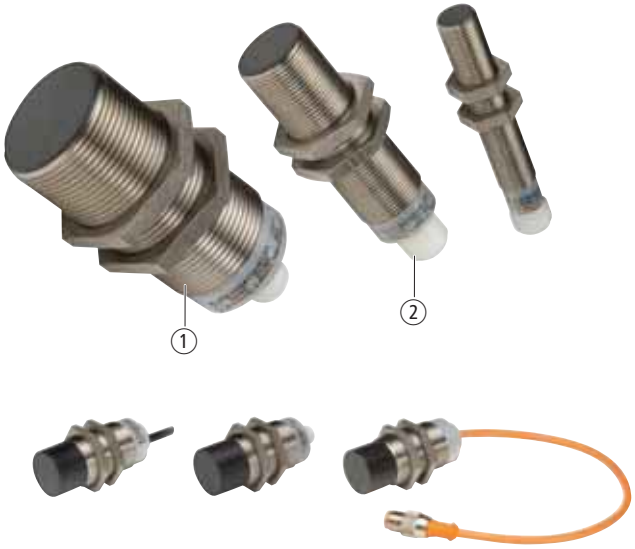


M12 plug connector



		a	b	c	d
2-wire, AC, 2 m connection cable					
12 mm	Flush	51.7	39.6	0.5	M12x1
	Non-flush	51.7	35.1	5	M12x1
18 mm	Flush	35.4	21.82	0.5	M18x1
	Non-flush	35.4	15.32	7	M18x1
30 mm	Flush	40.2	25.15	0.8	M30x1.5
	Non-flush	44.9	17.27	13.26	M30x1.5
2-wire, AC, M12 plug connector					
12 mm	Flush	57.8	39.6	0.5	M12x1
	Non-flush	57.8	35.1	5	M12x1
18 mm	Flush	40.0	21.82	0.5	M18x1
	Non-flush	40.0	15.32	7	M18x1
30 mm	Flush	44.8	25.15	0.8	M30x1.5
	Non-flush	49.5	17.27	13.26	M30x1.5
2-wire, AC/DC, 2 m connection cable					
12 mm	Flush	62.4	50.27	-	M12x1
	Non-flush	62.4	45.77	5	M12x1
18 mm	Flush	64.5	50.9	-	M18x1
	Non-flush	64.5	44.4	7	M18x1
30 mm	Flush	69.3	53.8	-	M30x1.5
	Non-flush	69.3	41.4	13.26	M30x1.5
2-wire, AC/DC, M12 plug connector					
12 mm	Flush	68.4	50.27	-	M12x1
	Non-flush	68.4	45.77	5	M12x1
18 mm	Flush	69.06	50.9	-	M18x1
	Non-flush	69.06	44.4	7	M18x1
30 mm	Flush	73.8	53.8	-	M30x1.5
	Non-flush	73.8	41.4	13.26	M30x1.5
3-wire, DC, 2 m connection cable					
12 mm	Flush	35.2	23.9	0.5	M12x1
	Non-flush	35.2	18.59	5	M12x1
18 mm	Flush	35.4	21.82	0.5	M18x1
	Non-flush	35.4	15.32	7	M18x1
30 mm	Flush	40.2	21.26	0.8	M30x1.5
	Non-flush	44.9	13.46	13.26	M30x1.5
3-wire, DC, M12 plug connector					
12 mm	Flush	41.5	23.9	0.5	M12x1
	Non-flush	41.5	18.59	5	M12x1
18 mm	Flush	40.3	21.82	0.5	M18x1
	Non-flush	40.3	15.32	7	M18x1
30 mm	Flush	45.0	21.26	0.8	M30x1.5
	Non-flush	49.7	13.46	13.26	M30x1.5

Description



① Two-color 360° output signal lamp
② Shock absorbing Ryton face cap material®

Brief description

The iProx is Eaton's most powerful and versatile inductive, cylindrical sensor. With its mounting microprocessor and unique Smart-SenseTM technology this sensor has three times the range of other sensors in its class and offers unmatched configurability. Both shielded and unshielded versions of the sensor have an extended range so that the sensor can be positioned further away from the target object. This reduces the risk of a collision with the target object and increases operational reliability. The iProx also has many additional functions, which can be activated through the optionally available programming tools. With Windows software ProxView the sensor can be programmed for any application. Sensor characteristics such as range can be set to the nearest tenth of a millimeter. The outputs can be configured as N/O or NC. Even interference immunity and response time can be adjusted. In addition the iProx features a mounting logic for timing delays and speed detection – without complex PLC programming. With its large range, high quality, sophisticated design, and adaptability to its environment, iProx is the ideal choice for demanding applications.

Product features

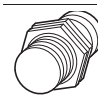
- Available as DC 3-wire version.
- Reliably detect metal targets at up to three times the range of conventional shielded or unshielded tubular inductive sensors
- Quality construction using a stainless steel barrel, 360° degree dual-color LED indicator, Ryton impact-resistant face cap® and vibration-absorbing potting compound.
- The automatic configuration automatically detects NPN and PNP connections and switches the sensor accordingly and without user intervention.
- Configurable range, band detection, background (metal) object detection, timing delays and speed detection thanks to the microprocessor-based Smart-Sense™ technology.
- Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors.
- Resistant to high interference levels (up to 20 V/m).
- Resistant to extreme temperatures (-40 °C).

Approvals

c UL us LISTED

CE

Ordering

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
iProx series										
3-wire										
M12 x 1										
	6 - 48 V DC	4	Flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M12A105C02-D1** 136205		1 off
			Flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M12A105C02-D2** 136206		
			Flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M12A105D01-D1** 136207		
			Flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M12A105D01-D2** 136208		
	6 - 48 V DC	10	Non-flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M12C110C02-D1** 136209		
			Non-flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M12C110C02-D2** 136210		
			Non-flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M12C110D01-D1** 136211		
			Non-flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M12C110D01-D2** 136212		
M18 x 1										
	6 - 48 V DC	8	Flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M18A108C02-D1** 136213		1 off
			Flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M18A108C02-D2** 136214		
			Flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M18A108D01-D1** 136215		
			Flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M18A108D01-D2** 136216		
		18	Non-flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M18C116C02-D1** 136217		1 off
			Non-flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M18C116C02-D2** 136218		
			Non-flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M18C116D01-D1** 136219		
			Non-flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M18C116D01-D2** 136220		
M30 x 1.5										
	6 - 48 V DC	15	Flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M30A115C02-D1** 136221		1 off
			Flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M30A115C02-D2** 136222		
			Flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M30A115D01-D1** 136223		
			Flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M30A115D01-D2** 136224		
		29	Non-flush	NPN PNP	2 m connection cable	1 N/O	Stainless steel	**E59-M30C129C02-D1** 136225		
			Non-flush	NPN PNP	2 m connection cable	1 NC	Stainless steel	**E59-M30C129C02-D2** 136226		
			Non-flush	NPN PNP	plug connector M12 x 1	1 N/O	Stainless steel	**E59-M30C129D01-D1** 136227		
			Non-flush	NPN PNP	plug connector M12 x 1	1 NC	Stainless steel	**E59-M30C129D01-D2** 136228		
Programming cable RS232		–	–	–	–		–	**E59RP1** 136229		1 off
Programming software CD		–	–	–	–		–	**E59SW1** 136230		1 off

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	48 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: 4, 4x, 6, 6P, 12, 13

Technical data

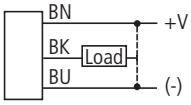
			E59-M12A105	E59-M18A108	E59-M12C110	E59-M30A115	E59-M18C116	E59-M30C129
General								
Standards			IEC/EN 60947-5-2					
Ambient temperature		°C	-40 - +70					
Protection type			IP67	IP69K	IP67	IP69K	IP69K	IP69K
Mechanical shock resistance			30 Shock duration 11 ms					
Characteristic values								
Rated switching distance								
Rated switching distance	S_n	mm	4	8	10	15	18	29
Repetition accuracy of S_n		%	1	1	3	1	3	3
Temperature drift of S_n		%	10	10	10	10	10	10
Switching hysteresis of S_n		%	15	15	15	15	15	15
Sensing range		mm	–	–	–	–	–	–
Rated operating voltage			6 - 48 V DC	6 - 48 V DC	6 - 48 V DC	6 - 48 V DC	6 - 48 V DC	6 - 48 V DC
Mains frequency								
Residual ripple of U_e		%	–	–	–	–	–	–
Operating current in the switched state at 24 V DC	I_b	mA	15	15	15	15	15	15
Rated operational current	I_e	mA	300	300	300	300	300	300
Voltage drop at I_e	U_d	V	2.5	2.5	2.5	2.5	2.5	2.5
Switching frequency		Hz	580	390	300	240	150	145
Min. load current	I_e	mA	1	1	1	1	1	1
Short-time current (10 ms, 5 Hz)		A	–	–	–	–	–	–
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.15	0.15	0.15	0.15	0.15	0.15
Switching state indication		LED	Red	Red	Red	Red	Red	Red
Operating voltage display		LED	Red	Red	Red	Red	Red	Red
Boundary gain			–	–	–	–	–	–
Protective functions			Short-circuit protection, protection against polarity reversal, wire breakage protection					
Function			3-wire	3-wire	3-wire	3-wire	3-wire	3-wire
Construction type								
Design (outer dimensions)			M12 x 1	M18 x 1	M12 x 1	M30 x 1.5	M18 x 1	M30 x 1.5
Material			Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

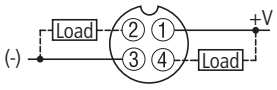
Engineering

Circuit diagram

59...CO2-D1
E59...CO2-D2



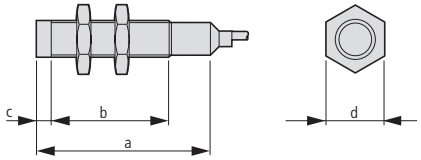
E59...DO1-D1
E59...DO1-D2



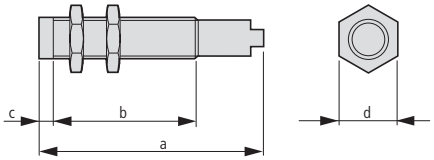
Pins 2 and 4 internally interconnected.

Dimensions

2 m connection cable



M12 plug connector



Construction type	Installation type	a	b	c	d
12 mm	Flush	62.4	50.3	0.5	17
	Non-flush	62.4	41.6	9	17
18 mm	Flush	64.5	50.9	0.5	24
	Non-flush	64.5	37.4	14	24
30 mm	Flush	69.6	54.1	0.75	36
	Non-flush	69.6	35.8	19	36

Construction type	Installation type	a	b	c	d
12 mm	Flush	68.7	50.3	0.5	17
	Non-flush	68.7	41.6	9	17
18 mm	Flush	69.3	50.9	0.5	24
	Non-flush	69.3	37.4	14	24
30 mm	Flush	74.1	54.1	0.75	36
	Non-flush	74.1	35.8	19	36

Description



① High quality stainless steel enclosures.
② M12 plug connector available for sizes 6.5 and 8 mm.
③ Sizes 5 mm and 8 mm with thread; 4 mm and 6.5 mm without thread.
④ Size 6.5 mm supplied complete with mounting bracket.

Short description

Eaton's unique inductive proximity have been developed specially for use in extremely small spaces. The wide range of available models with enclosure diameters from 8 mm down to 4 mm covers a multitude of application scenarios. The sensors feature three-wire connections with an input voltage of 10 to 30 V DC. Both shielded and unshielded versions are available.

Product features

- Small 4, 5, 6.5 and 8 mm diameters for use in applications with limited space for mounting sensors
- Stainless steel enclosure.
- All models have an output status display.
- Short-circuit and reverse polarity protection.
- High degree of protection IP67.

Approvals

CE

HPL03063EN

Ordering

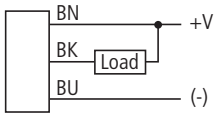
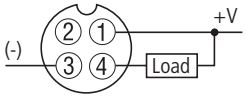
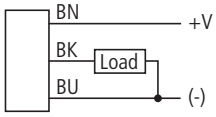
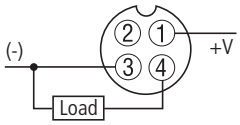
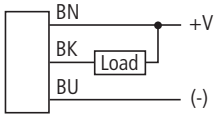
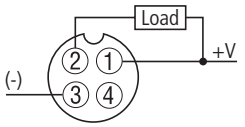
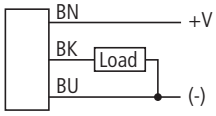
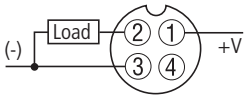
	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E57 Miniature Series										
3-wire										
4 mm ∅										
	10 - 30 V DC	0.8	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57EAL4T110SP** 136238		1 off
		0.8	Flush	PNP	2 m connection cable	1 N/O		**E57EAL4T111SP** 136239		
M5 x 1										
	10 - 30 V DC	0.8	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57EAL5T110SP** 136240		1 off
		0.8	Flush	PNP	2 m connection cable	1 N/O		**E57EAL5T111SP** 136241		
6.5 mm ∅										
	10 - 30 V DC	1	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57EAL6T110SP** 136243		1 off
		2	Non-flush	NPN	2 m connection cable	1 N/O		**E57EAL6T110EP** 136242		
		1	Flush	PNP	2 m connection cable	1 N/O		**E57EAL6T111SP** 136245		
		2	Non-flush	PNP	2 m connection cable	1 N/O		**E57EAL6T111EP** 136244		
M8 x 1										
	10 - 30 V DC	1	Flush	NPN	2 m connection cable	1 N/O	Stainless steel	**E57EAL8T110SP** 136249		1 off
		1	Flush	NPN	2 m connection cable	1 NC		**E57EBL8T110SP** 136257		
		1	Flush	NPN	plug connector M12 x 1	1 N/O		**E57EAL8T110SD** 136248		
		1	Flush	NPN	plug connector M12 x 1	1 NC		**E57EBL8T110SD** 136256		
		1	Flush	PNP	2 m connection cable	1 N/O		**E57EAL8T111SP** 136253		
		1	Flush	PNP	2 m connection cable	1 NC		**E57EBL8T111SP** 136261		
		1	Flush	PNP	plug connector M12 x 1	1 N/O		**E57EAL8T111SD** 136252		
		1	Flush	PNP	plug connector M12 x 1	1 NC		**E57EBL8T111SD** 136260		
		2	Non-flush	NPN	2 m connection cable	1 N/O		**E57EAL8T110EP** 136247		
		2	Non-flush	NPN	2 m connection cable	1 NC		**E57EBL8T110EP** 136255		
		2	Non-flush	NPN	plug connector M12 x 1	1 N/O		**E57EAL8T110ED** 136246		
		2	Non-flush	NPN	plug connector M12 x 1	1 NC		**E57EBL8T110ED** 136254		
		2	Non-flush	PNP	2 m connection cable	1 N/O		**E57EAL8T111EP** 136251		
		2	Non-flush	PNP	2 m connection cable	1 NC		**E57EBL8T111EP** 136259		
		2	Non-flush	PNP	plug connector M12 x 1	1 N/O		**E57EAL8T111ED** 136250		
		2	Non-flush	PNP	plug connector M12 x 1	1 NC		**E57EBL8T111ED** 136258		

Technical data

			E57-EAL..., E57-EBL...
General			
Standards			IEC/EN 60947-5
Ambient temperature		°C	-25 - +70
Protection type			IP67
Mechanical shock resistance		g	30 Shock duration 11 ms
Characteristic values			
Repetition accuracy of S_n		%	1
Temperature drift of S_n		%	10
Switching hysteresis of S_n		%	15
Rated operating voltage			10 - 30 V DC
Operating current in the switched state at 24 V DC	I_b	mA	10
Rated operational current	I_e	mA	200
Voltage drop at I_e	U_d	V	1.5
Switching frequency		Hz	2000
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.01
Switching state indication		LED	Red
Protective functions			Short-circuit protection
Function			3-wire
Material			Stainless steel
Notes			Further technical data can be found in the Online Catalogue at www.moeller.net

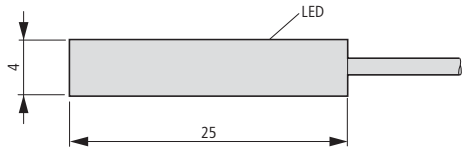
Engineering

Circuit diagram

Rated operating voltage	Contacts	2 m connection cable	M12 plug connector (front view plug)
3-wire sensors			
10 - 30 V DC	N/O (NPN)		
	N/O (PNP)		
	NC (NPN)		
	NC (PNP)		

Dimensions

E57EAL4T...



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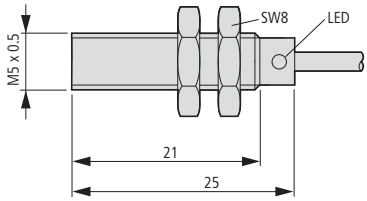

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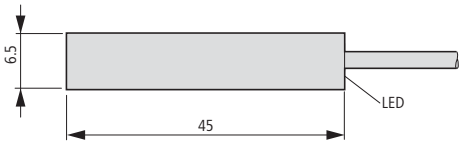
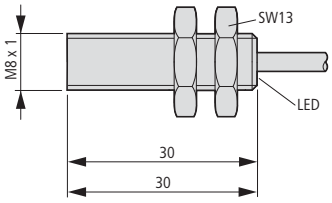
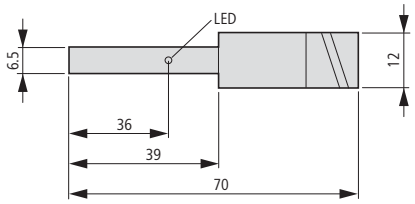


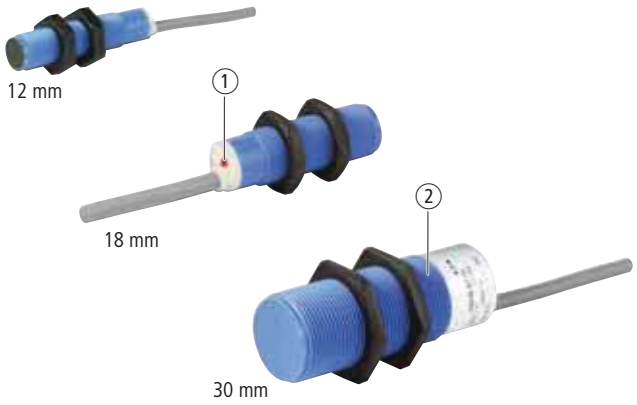
E57...8T...SP
E57...8T...EP



E57...8T...SD
E57...8T...ED



Description



① LED for output status.
② Corrosion-resistant PBT enclosure



① Sensor head fitted for lateral detection. Can be rotated 90°.
② Non-metal enclosure is corrosion-resistant.

Short description
Cylinder design
Tubular Inductive Proximity Sensors by Eaton's electrical business are constructed of corrosion resistant PBT plastic. They are ideally suited for wash down applications such as those found in food processing plants. They are available in 12 mm, 18 mm and 30 mm diameters. Shielded sensors can be embedded in metallic surfaces.

Approvals

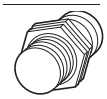
CE

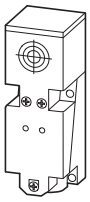
Product features
Cylinder design
- Versions for 2-wire AC voltage or 3-wire DC voltage.
- Threaded tubular enclosures in three diameters allow easy integration into new and existing applications
- Nonmetallic construction offers excellent resistance to corrosion
- All models feature an output signal indicator light.

Short description
Rectangular design
These sensors from Eaton's electrical business feature PBT resin enclosures for high resistance to corrosion.
The enclosure is sized to offer a direct replacement for standard limit switches. The unique sensing head is factory assembled for top sensing, but can be easily converted in the field to any one of four side sensing positions. Models are available with sensing ranges from 15 mm to 40 mm. The sensors can be configured for N/O or NC operation.

Product features
Rectangular design
- Nonmetallic enclosure offers excellent resistance to corrosion.
- Same form factor and mounting as standard limit switches for easy retrofit.
- Sensor head features five sensing positions (top and all four sides) that can be easily changed in the field.
- Long sensing ranges up to 40 mm.

HPL03067EN

	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection option	Contact configuration NC = Normally closed contact N/O = Normally open contact P = Normally closed contact/ Normally open closed programmable	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E55 Series											
2-wire											
	M12 x 1	20 - 250 V AC	2	Flush	–	2 m connection cable	1 N/O	plastic	**E55CAL12A2** 135816		1 off
			2	Flush	–		1 NC		**E55CBL12A2** 135834		
			4	Non-flush	–		1 N/O		**E55CAL12A2E** 135817		
			4	Non-flush	–		1 NC		**E55CBL12A2E** 135835		
	M18 x 1		5	Flush	–		1 N/O		**E55CAL18A2** 135822		
			5	Flush	–		1 NC		**E55CBL18A2** 135839		
			8	Non-flush	–		1 N/O		**E55CAL18A2E** 135823		
			8	Non-flush	–		1 NC		**E55CBL18A2E** 135840		
	M30 x 1.5		10	Flush	–		1 N/O		**E55CAL30A2** 135828		
			10	Flush	–		1 NC		**E55CBL30A2** 135844		
			15	Non-flush	–		1 N/O		**E55CAL30A2E** 135829		
			15	Non-flush	–		1 NC		**E55CBL30A2E** 135845		
3-wire											
	M12 x 1	10 - 30 V DC	2	Flush	NPN	2 m connection cable	1 N/O	plastic	**E55CAL12T110** 135818		1 off
			2	Flush	PNP		1 N/O		**E55CAL12T111** 135820		
			2	Flush	PNP		1 NC		**E55CBL12T111** 135837		
			4	Non-flush	NPN		1 N/O		**E55CAL12T110E** 135819		
			4	Non-flush	PNP		1 N/O		**E55CAL12T111E** 135821		
			4	Non-flush	NPN		1 NC		**E55CBL12T110E** 135836		
			4	Non-flush	PNP		1 NC		**E55CBL12T111E** 135838		
	M18 x 1		5	Flush	NPN		1 N/O		**E55CAL18T110** 135824		
			5	Flush	PNP		1 N/O		**E55CAL18T111** 135826		
			5	Flush	NPN		1 NC		**E55CBL18T110** 135841		
			8	Non-flush	NPN		1 N/O		**E55CAL18T110E** 135825		
			8	Non-flush	PNP		1 N/O		**E55CAL18T111E** 135827		
			8	Non-flush	NPN		1 NC		**E55CBL18T110E** 135842		
			8	Non-flush	PNP		1 NC		**E55CBL18T111E** 135843		

	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection option	Contact configuration NC = Normally closed contact N/O = Normally open contact P = Normally closed contact/ Normally open closed programmable	Material	**Part no.** Article no.	**Price** See price list	Std. pack
3-wire											
	M30 x 1.5	10 - 30 V DC	10	Flush	NPN	2 m connection cable	1 N/O	plastic	**E55CAL30T110** 135830		1 off
			10	Flush	PNP		1 N/O		**E55CAL30T111** 135832		
			10	Flush	NPN		1 NC		**E55CBL30T110** 135846		
			10	Flush	PNP		1 NC		**E55CBL30T111** 135848		
			15	Non-flush	NPN		1 N/O		**E55CAL30T110E** 135831		
			15	Non-flush	PNP		1 N/O		**E55CAL30T111E** 135833		
			15	Non-flush	NPN		1 NC		**E55CBL30T110E** 135847		
			15	Non-flush	PNP		1 NC		**E55CBL30T111E** 135849		
2-wire											
	40 x 40 x 118	20 - 250 V AC	15	Flush	–	Screwed terminal	1 P	plastic	**E55BLT1C** 135812		1 off
			20	Non-flush	–		1 P		**E55BLT1D** 135813		
			30	Non-flush	–		1 P		**E55BLT1E** 135814		
			40	Non-flush	–		1 P		**E55BLT1F** 135815		

Technical data

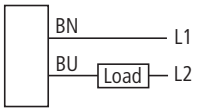
			E55C...L12A	E55C...L12T	E55C...L12T...E	E55C...L18A	E55C...L18T
General							
Standards			IEC/EN 60947-5-2				
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP66	IP66	IP66	IP66	IP66
Mechanical shock resistance		g	30 Shock duration 11 ms				
Characteristic values							
Repetition accuracy of S_n		%	10	10	10	10	10
Temperature drift of S_n		%	10	10	10	10	10
Switching hysteresis of S_n		%	20	20	20	20	20
Rated operating voltage			20 - 250 V AC	10 - 30 V DC	10 - 30 V DC	20 - 250 V AC	10 - 30 V DC
Residual ripple of U_e		%	10	10	10	10	10
Operating current in the switched state at 24 V DC	I_b	mA	3	–	3	3	–
Rated operational current	I_e	mA	150	200	200	150	200
Voltage drop at I_e	U_d	V	10	8	8	10	8
Switching frequency		Hz	25	2000	1000	25	1000
Switching state indication		LED	Red	Red	Red	Red	Red
Protective functions				Short-circuit protection Protection against polarity reversal	Short-circuit protection Protection against polarity reversal		Short-circuit protection Protection against polarity reversal
Function			2-wire	3-wire	3-wire	2-wire	3-wire
Construction type							
Design outer dimensions)			M12 x 1	M12 x 1	M12 x 1	M18 x 1	M18 x 1
Connection options			Cable open 2 m connection cable				
Material			plastic				

			E55C...L18T...E	E55C...L30T	E55C...L30A	E55C...L30T...E	E55BLT...
General							
Standards			IEC/EN 60947-5-2				
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP66	IP66	IP66	IP66	IP67
Mechanical shock resistance		g	30 Shock duration 11 ms				
Characteristic values							
Repetition accuracy of S_n		%	10	10	10	10	10
Temperature drift of S_n		%	10	10	10	10	10
Switching hysteresis of S_n		%	20	20	20	20	20
Rated operating voltage			10 - 30 V DC	10 - 30 V DC	20 - 250 V AC	10 - 30 V DC	20 - 264 V AC
Residual ripple of U_e		%	10	10	10	10	10
Operating current in the switched state at 24 V DC	I_b	mA	3	–	3	3	3
Rated operational current	I_e	mA	200	200	150	200	400
Voltage drop at I_e	U_d	V	8	8	10	8	8
Switching frequency		Hz	500	300	25	150	25
Switching state indication		LED	Red	Red	Red	Red	Red
Protective functions			Short-circuit protection Protection against polarity reversal	Short-circuit protection Protection against polarity reversal		Short-circuit protection Protection against polarity reversal	Short-circuit protection Protection against polarity reversal Protection against wire breakage
Function			3-wire	3-wire	2-wire	3-wire	2-wire
Construction type							
Design (outer Dimensions)			M18 x 1	M30 x 1.5	M30 x 1.5	M30 x 1.5	40 x 40 x 118
Connection options							
Material							

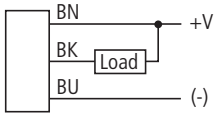
Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Engineering

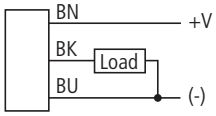
E55CAL...AZ, E55CBL...A2
E55CAL...A2E, E55CBL...A2E



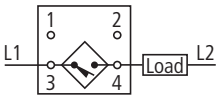
E55CAL...110, E55CBL...110
E55CAL...110E, E55CBL...110E



E55CAL...111, E55CBL...111E
E55CAL...111, E55CBL...111E



E55BL...



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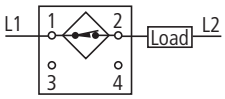
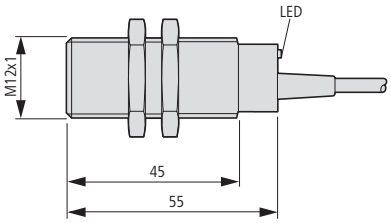


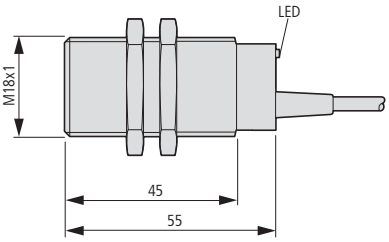
Note:
Switches are supplied configured as N/O. Can be switched internally to NC.

Dimensions

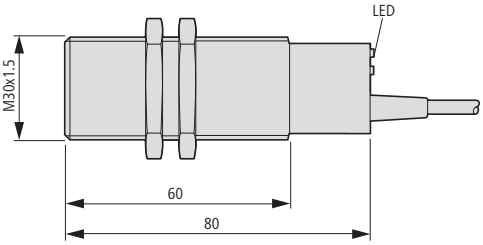
E55CAL12...
E55CBL12...



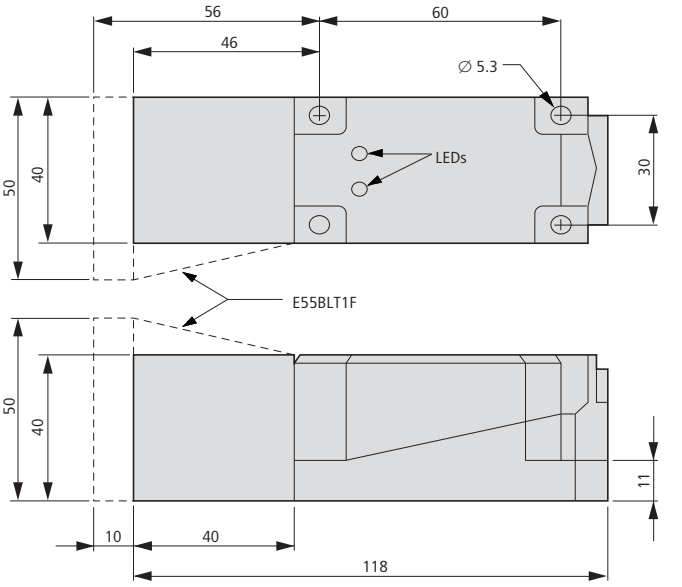
E55CAL18...
E55CBL18...



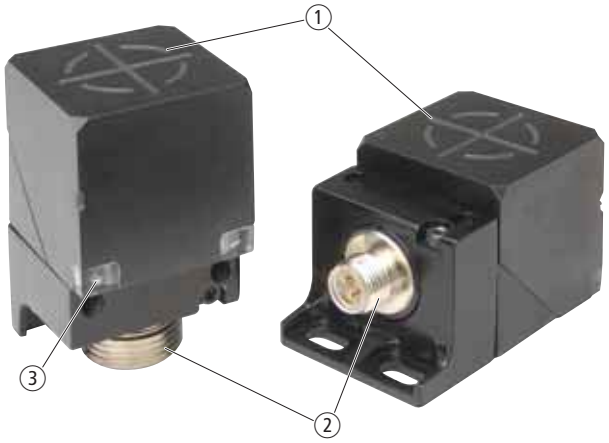
E55CAL30...
E55CBL30...



E55BL...



Description



① Adjustable sensing head for top- and side-sensing.
② M12 Plug connector.
③ Two LEDs status indication.

Short description

The E52 Cube sensor from Eaton is a powerful inductive proximity sensor. It provides a long sensing range in a compact, standard-conformant enclosure. The outputs of this series are self-configuring as PNP or NPN, without the need for user intervention. The E52 features additional outputs for various connection types to cover many applications with just a few models. Separate indicator lights for voltage and output signal simplify installation and troubleshooting. Five different mounting methods make these sensors exceptionally versatile. The E52 Cube has been developed specially for demanding applications, for example in car production, in bulk material plants and in metal-processing industries.

Product features

- Large measuring range up to 40 mm.
- Four-wire models feature additional outputs (1 × NC, 1 × N/O).
- Four-wire DC models feature an automatic configuration function for independent NPN/PNP selection.
- Robust design featuring vibration and impact-absorbing potting compound.
- Ideal for extreme temperatures or high pressure washdown environments.

Approvals

CE

Ordering

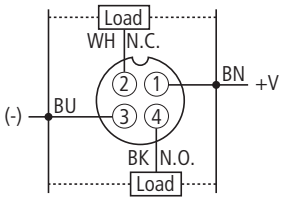
	Function	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection option	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E52-Serie												
	4-wire	40 x 40 x 40 Rectangular enclosure	6 - 48 V DC	15	Flush	NPN PNP	M12, "A"-coded plug connectors	1 NC/1 N/O	Zinc/ plastic	**E52Q-DL15SAD01** 135804		1 off
			6 - 48 V DC	15	Non-flush			1 NC/1 N/O		**E52Q-DL15UAD01** 135805		
			6 - 48 V DC	20	Flush			1 NC/1 N/O		**E52Q-DL20SAD01** 135806		
			6 - 48 V DC	20	Non-flush			1 NC/1 N/O		**E52Q-DL20UAD01** 135807		
			6 - 48 V DC	25	Non-flush			1 NC/1 N/O		**E52Q-DL25UAD01** 135808		
			6 - 48 V DC	30	Non-flush			1 NC/1 N/O		**E52Q-DL30UAD01** 135809		
			6 - 48 V DC	35	Non-flush			1 NC/1 N/O		**E52Q-DL35UAD01** 135810		
			6 - 48 V DC	40	Non-flush			1 NC/1 N/O		**E52Q-DL40UAD01** 135811		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	48 V DC
Degree of Protection	IEC: IP68; UL Type 4, 4X, 6, 6P, 12, 13

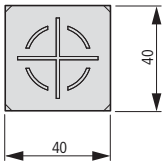
Engineering

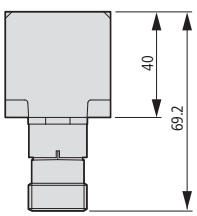
E52...



Through autoconfiguration connectable to both +V or (-).

Dimensions





Technical data

			E52-Series
General			
Standards			IEC/EN 60947-5-2
Ambient temperature		°C	-40 - +70
Protection type			IP67
Mechanical shock resistance		g	30 Shock duration 11 ms
Characteristic values			
Repetition accuracy of S_n		%	2
Temperature drift of S_n		%	10
Switching hysteresis of S_n		%	15
Rated operating voltage			6 - 48 V DC
Operating current in the switched state at 24 V DC	I_b	mA	25
Rated operational current	I_e	mA	300
Voltage drop at I_e	U_d	V	2.5
Switching frequency		Hz	100
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.15
Switching state indication		LED	Red
Operating voltage display		LED	Green
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage
Function			4-wire
Design (outer dimensions)			40 x 40 x 40 Rectangular enclosure
Connection options			M12, "A"-coded plug connectors
Material			plastic
Surface			Zinc alloy
Notes			Further technical data can be found in the Online-Catalogue at www.moeller.net

Description



① Indicator lights for current and output status.

Short description

Eaton's E56 sensors are powerful inductive proximity sensors. The E56 Pancake provides greater sensing ranges than other inductive sensor package types. They are easy to wire and feature self-configuring complementary outputs, which automatically detect an NPN or PNP connection and configure the sensor accordingly without the need for user intervention. Indicator lights for power and output state simplify trouble-shooting compared to sensors with only an output indicator.
These convenience features and their high performance make the E56 Pancake sensors ideal for applications in which a rugged design and a long range are required.

Product features

- Longest measuring range on the market – up to 100 mm.
- Three sizes for all application scenarios; max. range 50, 70 or 100 mm.
- Complementary outputs (1 × NC, 1 × N/O) on models with four-wire connection.
- Models with DC voltage four-wire connection feature an automatic configuration function for independent switchover between NPN and PNP.
- Robust design featuring vibration and impact-absorbing potting compound.
- Ideal for extreme temperatures or high pressure washdown environments.

Approvals

CE

HPL03075EN

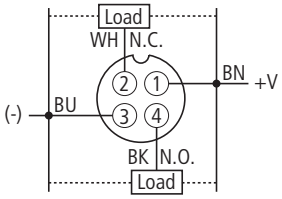
Ordering

	Function	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection option	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E56 Series												
	4-wire	79 x 79 x 39	6 - 48 V DC	40	Flush	NPN PNP	plug connectors	1 NC/1 N/O	plastic	**E56ADL40SAD01** 136234		1 off
		79 x 79 x 39		50	Non-flush	NPN PNP		1 NC/1 N/O		**E56ADL40UAD01** 136235		
		109 x 110 x 41		70	Non-flush	NPN PNP		1 NC/1 N/O		**E56BDL70UAD01** 136236		
		171.5 x 171.5 x 67.4		100	Non-flush	NPN PNP		1 NC/1 N/O		**E56CDL100UAD01** 136237		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	48 V DC
Degree of Protection	IEC: IP67, IP69K; UL/CSA Type: 4, 4x, 6, 6P, 12, 13

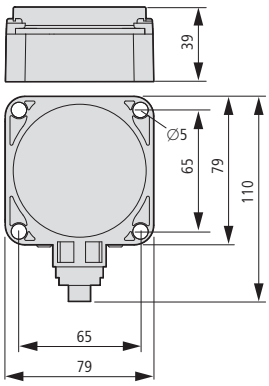
Engineering



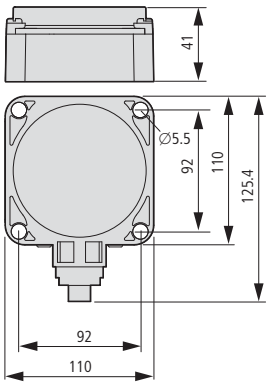
Through autoconfiguration connectable to both +V or (-).

Dimensions

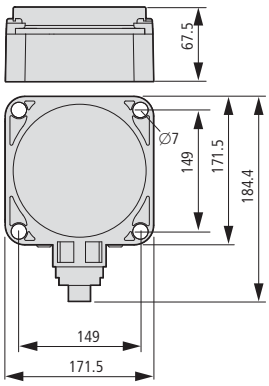
E56ADL40...



E56BDL70...



E56CDL100...



Technical data

			E56ADL40S	E56ADL40U	E56BDL70U	E56CDL100U
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Protection type			IP67	IP67	IP67	IP67
Characteristic values						
Repetition accuracy of S_n		%	2	2	2	2
Temperature drift of S_n		%	10	10	10	10
Switching hysteresis of S_n		%	15	15	15	15
Rated operating voltage			6 - 48 V DC	6 - 48 V DC	6 - 48 V DC	6 - 48 V DC
Operating current in the switched state at 24 V DC	I_b	mA	25	25	25	25
Rated operational current	I_e	mA	300	300	300	300
Voltage drop at I_e	U_d	V	2.5	2.5	2.5	2.5
Switching frequency		Hz	100	100	20	20
Min. load current	I_e	mA	1	1	1	1
Residual current due to the load in locked state at 230 V AC or 24 V DC	I_r	mA	0.15	0.15	0.15	0.15
Switching state indication		LED	Red	Red	Red	Red
Operating voltage display		LED	Red	Red	Red	Red
Protective functions			Short-circuit protection Protection against polarity reversal			
Function			4-wire	4-wire	4-wire	4-wire
Construction type						
Design (outer dimensions)			79 x 79 x 39	79 x 79 x 39	109 x 110 x 41	171.5 x 171.5 x 67.4
Connection options			M12, "A"-coded plug connectors			
Material			plastic	plastic	plastic	plastic
Surface			PPS	PPS	PPS	PPS

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Description



① Models with cable or plug connectors available.
② All models feature an output signal indicator light.



① With mounting bracket.

Short description

The capacitive proximity sensors from Eaton's electrical business are self-contained units designed to detect both metallic and nonmetallic targets. They are ideally suited for liquid level control and for sensing powdered or granulated material. For best operation, they should be used in an environment having relatively constant temperature and humidity.

Product features

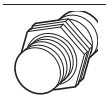
- Detect liquids, powders and other materials that are difficult or impossible with other sensor types.
- Corrosion-resistant insulated enclosure.

Adjustable sensitivity.

Approvals

CE

Ordering

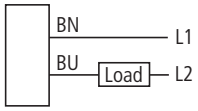
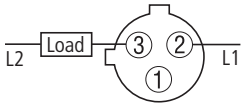
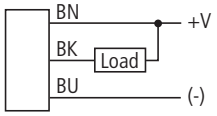
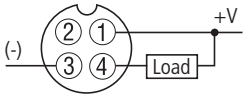
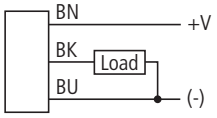
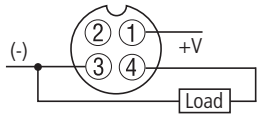
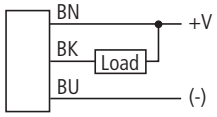
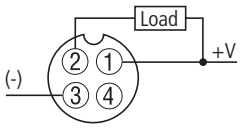
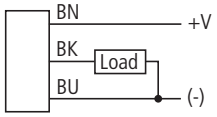
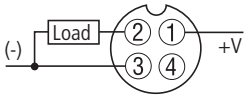
	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
E53 Series										
2-wire										
M18 x 1										
	20 - 250 V AC	8	Flush	–	2 m connection cable	1 N/O	plastic	**E53KAL18A2** 134517		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E53KAL18A2SA** 134760		
			Flush	–	2 m connection cable	1 NC		**E53KBL18A2** 134791		
			Flush	–	plug connector M12 x 1	1 NC		**E53KBL18A2SA** 134794		
		15	Non-flush	–	2 m connection cable	1 N/O		**E53KAL18A2E** 134518		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E53KAL18A2EA** 134519		
			Non-flush	–	2 m connection cable	1 NC		**E53KBL18A2E** 134792		
			Non-flush	–	plug connector M12 x 1	1 NC		**E53KBL18A2EA** 134793		
M30 x 1.5										
	20 - 250 V AC	20	Flush	–	2 m connection cable	1 N/O	plastic	**E53KAL30A2** 134769		1 off
			Flush	–	plug connector M12 x 1	1 N/O		**E53KAL30A2SA** 134772		
			Flush	–	2 m connection cable	1 NC		**E53KBL30A2** 134803		
			Flush	–	plug connector M12 x 1	1 NC		**E53KBL30A2SA** 134806		
		25	Non-flush	–	2 m connection cable	1 N/O		**E53KAL30A2E** 134770		
			Non-flush	–	plug connector M12 x 1	1 N/O		**E53KAL30A2EA** 134771		
			Non-flush	–	2 m connection cable	1 NC		**E53KBL30A2E** 134804		
			Non-flush	–	plug connector M12 x 1	1 NC		**E53KBL30A2EA** 134805		
3-wire										
M18 x 1										
	10 - 30 V DC	8	Flush	NPN	2 m connection cable	1 N/O	plastic	**E53KAL18T110** 134761		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL18T110SD** 134764		
			Flush	PNP	2 m connection cable	1 N/O		**E53KAL18T111** 134765		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL18T111SD** 134768		
			Flush	NPN	2 m connection cable	1 NC		**E53KBL18T110** 134795		
			Flush	NPN	plug connector M12 x 1	1 NC		**E53KBL18T110SD** 134798		
			Flush	PNP	2 m connection cable	1 NC		**E53KBL18T111** 134799		
			Flush	PNP	plug connector M12 x 1	1 NC		**E53KBL18T111SD** 134802		

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
3-wire										
M18 x 1										
	10 - 30 V DC	15	Non-flush	NPN	2 m connection cable	1 N/O	plastic	**E53KAL18T110E** 134762		1 off
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL18T110ED** 134763		
			Non-flush	PNP	2 m connection cable	1 N/O		**E53KAL18T111E** 134766		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL18T111ED** 134767		
			Non-flush	NPN	2 m connection cable	1 NC		**E53KBL18T110E** 134796		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E53KBL18T110ED** 134797		
			Non-flush	PNP	2 m connection cable	1 NC		**E53KBL18T111E** 134800		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E53KBL18T111ED** 134801		
M30 x 1.5										
	10 - 30 V DC	20	Flush	NPN	2 m connection cable	1 N/O	plastic	**E53KAL30T110** 134773		1 off
			Flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL30T110SD** 134776		
			Flush	PNP	2 m connection cable	1 N/O		**E53KAL30T111** 134777		
			Flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL30T111SD** 134780		
			Flush	NPN	2 m connection cable	1 NC		**E53KBL30T110** 134807		
			Flush	NPN	plug connector M12 x 1	1 NC		**E53KBL30T110SD** 134810		
			Flush	PNP	2 m connection cable	1 NC		**E53KBL30T111** 134811		
			Flush	PNP	plug connector M12 x 1	1 NC		**E53KBL30T111SD** 134814		
	10 - 30 V DC	25	Non-flush	NPN	2 m connection cable	1 N/O		**E53KAL30T110E** 134774		
			Non-flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL30T110ED** 134775		
			Non-flush	PNP	2 m connection cable	1 N/O		**E53KAL30T111E** 134778		
			Non-flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL30T111ED** 134779		
			Non-flush	NPN	2 m connection cable	1 NC		**E53KBL30T110E** 134808		
			Non-flush	NPN	plug connector M12 x 1	1 NC		**E53KBL30T110ED** 134809		
			Non-flush	PNP	2 m connection cable	1 NC		**E53KBL30T111E** 134812		
			Non-flush	PNP	plug connector M12 x 1	1 NC		**E53KBL30T111ED** 134813		

	Rated operational voltage	Rated switching distance S_n mm	Installation type	Switching type	Connection options	Contact configuration NC = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.	**Price** See price list	Std. pack
2-wire										
34 ∅										
	20 - 250 V AC	35	Non-flush	–	2 m connection cable	1 N/O	plastic	**E53KAL34A2E** 134781		1 off
		35	Non-flush	–	plug connector M12 x 1	1 N/O		**E53KAL34A2EA** 134782		
		35	Non-flush	–	2 m connection cable	1 NC		**E53KBL34A2E** 134815		
		35	Non-flush	–	plug connector M12 x 1	1 NC		**E53KBL34A2EA** 134816		
3-wire										
34 ∅										
	10 - 30 V DC	25	Flush	NPN	2 m connection cable	1 N/O	plastic	**E53KAL34T110** 134783		1 off
		25	Flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL34T110SD** 134786		
		25	Flush	PNP	2 m connection cable	1 N/O		**E53KAL34T111** 134787		
		25	Flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL34T111SD** 134790		
		25	Flush	NPN	2 m connection cable	1 NC		**E53KBL34T110** 134817		
		25	Flush	NPN	plug connector M12 x 1	1 NC		**E53KBL34T110SD** 134820		
		25	Flush	PNP	2 m connection cable	1 NC		**E53KBL34T111** 134821		
		25	Flush	PNP	plug connector M12 x 1	1 NC		**E53KBL34T111SD** 134824		
		35	Non-flush	NPN	2 m connection cable	1 N/O		**E53KAL34T110E** 134784		
		35	Non-flush	NPN	plug connector M12 x 1	1 N/O		**E53KAL34T110ED** 134785		
		35	Non-flush	PNP	2 m connection cable	1 N/O		**E53KAL34T111E** 134788		
		35	Non-flush	PNP	plug connector M12 x 1	1 N/O		**E53KAL34T111ED** 134789		
		35	Non-flush	NPN	2 m connection cable	1 NC		**E53KBL34T110E** 134818		
		35	Non-flush	NPN	plug connector M12 x 1	1 NC		**E53KBL34T110ED** 134819		
		35	Non-flush	PNP	2 m connection cable	1 NC		**E53KBL34T111E** 134822		
		35	Non-flush	PNP	plug connector M12 x 1	1 NC		**E53KBL34T111ED** 134823		

Engineering

Circuit diagram

Rated operating voltage	Contacts	2 m connection cable	M12 plug connector (front view plug)
2-wire sensors			
20–250 V AC/DC	N/O and NC		
3-wire sensors			
10–30 V DC	N/O (NPN)		
	N/O (PNP)		
	NC (NPN)		
	NC (PNP)		

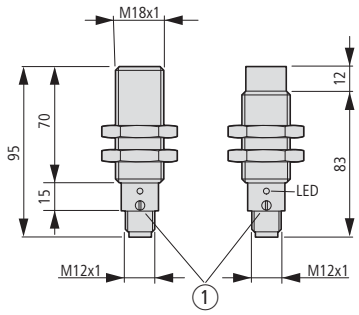
Technical data

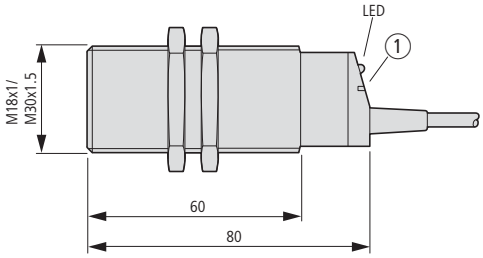
			E53...A...	E53...T..
General				
Standards			IEC/EN 60947-5-2	
Ambient temperature		°C	-25 - +70	-25 - +70
Protection type			IP65	IP65
Mechanical shock resistance		g	30 Shock duration 11 ms	
Characteristic values				
Repetition accuracy of S_n		%	10	10
Temperature drift of S_n		%	10	10
Switching hysteresis of S_n		%	20	20
Rated operating voltage			20 - 250 V AC	10 - 30 V DC
Residual ripple of U_e		%	10	10
Rated operational current	I_e	mA	300	300
Voltage drop at I_e	U_d	V	9	2
Switching frequency		Hz	15	250
Min. load current	I_e	mA	5	5
Switching state indication		LED	Red	Red
Function			2-wire	3-wire
Material			plastic	plastic

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Dimensions

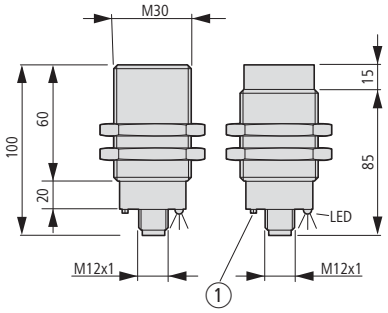
E53KAL18...
E53KBL18...

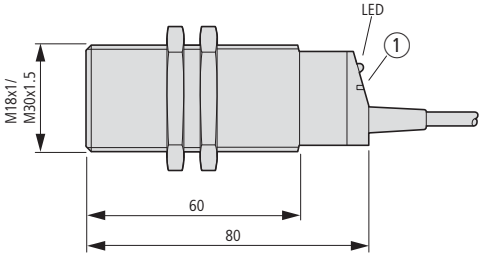




1 Sensitivity setting

E53KAL30...
E53KBL30...

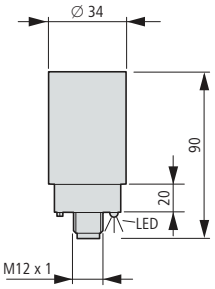




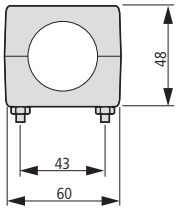
1 Sensitivity setting

E53KAL34...
E53KBL34...

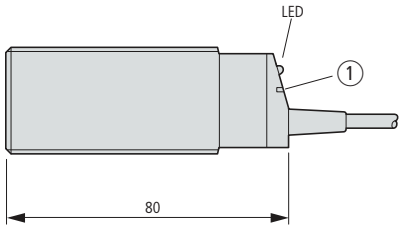
M12 plug connector



Fixing bracket (included as standard)

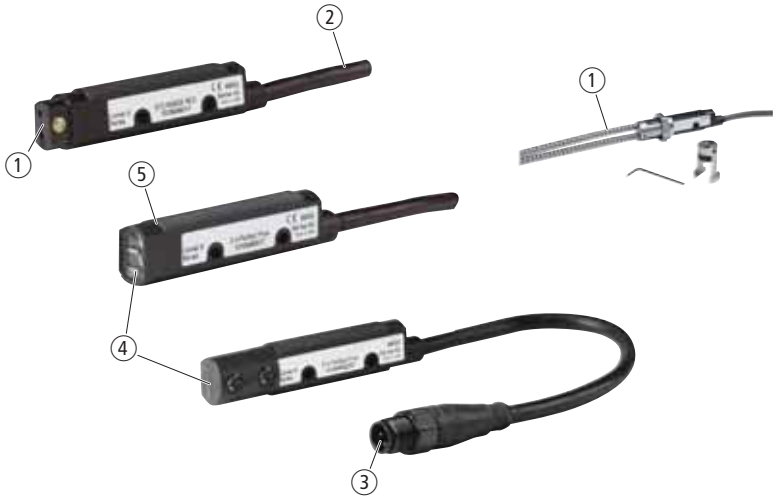


2 m connection cable



1 Sensitivity setting

Description



① FO cable versions possible.
② Light/dark operation selector switch on all models.
③ Models with M12 plug connector.
④ Sensing beam 0° or 90°.
⑤ Solid polyurethane body for rugged use.

Short description

Eaton's high-performance photo-electric sensors feature a tubular enclosure with a diameter of 18 mm and are available in a range of versions to solve virtually any sensing problem. The sensors are available in thru-beam, reflex, polarized reflex, diffuse reflective, focused diffuse reflective, wide-angle diffuse reflective, Perfect Prox®, Fine Spot Perfect Prox® and fiber optic sensing versions.
The Perfect Prox® sensors are among the most powerful on the market. These sensors reliably detect targets of different color, reflectance, contrast or surface shape at the same range, while ignoring background objects just a fraction of an inch away. The Comet Series includes AC/DC and DC-only models with 2-, 3- and 4-wire circuitry, and with cable or M 12 micro-connector.
Each sensor features a Light/ Dark Operation switch and a gain control to provide for quick adjustment to peak optical performance. The unique threaded body with flat sides allows quick mounting in a 19 mm hole or against any flat surface. Internal components are rigidly sealed in a solid encapsulated package for excellent performance in high vibration and high-shock applications.

Product features

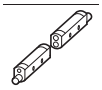
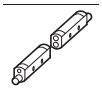
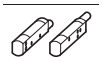
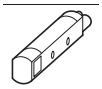
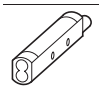
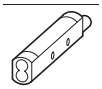
- Industry standard 18 mm diameter threaded body has flat sides allowing it to be mounted like a tubular sensor or against any flat surface
- Models with a 90° measurement direction can be installed in holes with a depth of only 152 mm.
- Perfect Prox® technology provides exceptional background rejection and application problem-solving.
- Visible sensing beams let you see where the light barrier is aimed for quick flush mounting and alignment.
- Solid polyurethane enclosure completely encapsulates internal circuits for high resistance to shock and vibration.
- Adaptable modulation circuit provides immunity to cross talk from other closely mounted sensors.
- Models available with both AC and DC operation in a single unit – up to 264 volts AC.
- 4-wire DC sensors offer both NPN and PNP outputs.
- Output status indicator visible from a wide 270° angle.

Approvals

CE

c UL us LISTED

Ordering

	Rated operating voltage	Switching type	Rated switching distance S_n mm	Connection options	Description	Type of light	**Part no.** Article no.	**Price** See price list	Std. pack
Comet series									
M18 x 1, light switching, dark switching, programmable, plastic									
3-wire									
Thru-beam sensor (detector), forward viewing									
	20 - 264 V AC 15 - 30 V DC	NPN	6000	2 m connection cable	–	Visible red	**12100A6513** 135566		1 off
			6000	plug connector M12 x 1			**12100AQD03** 135568		
			24000	2 m connection cable			**12102A6513** 135574		
			24000	plug connector M12 x 1			**12102AQD03** 135576		
Thru-beam sensor (source), forward viewing									
	20 - 264 V AC 15 - 30 V DC	NPN	6000	2 m connection cable	–	Visible red	**11100A6513** 135554		1 off
			6000	plug connector M12 x 1			**11100AQD03** 135556		
			24000	2 m connection cable			**11102A6513** 135562		
			24000	plug connector M12 x 1			**11102AQD03** 135564		
Thru-beam sensor (detector), right-angle									
	20 - 264 V AC 15 - 30 V DC	NPN	6000	2 m connection cable	–	Visible red	**12100R6513** 135570		1 off
			6000	plug connector M12 x 1			**12100RQD03** 135572		
Thru-beam sensor (source), right-angle									
	20 - 264 V AC 15 - 30 V DC	NPN	6000	2 m connection cable	–	Visible red	**11100R6513** 135558		1 off
			6000	plug connector M12 x 1			**11100RQD03** 135560		
Diffuse reflective sensor, right-angle									
	20 - 264 V AC 15 - 30 V DC	NPN	3000	2 m connection cable	For combination with reflector with polarisation filter	Visible red	**14101R6513** 135650		1 off
			3000	plug connector M12 x 1			**14101RQD03** 135652		
			4500	2 m connection cable	For combination with reflector		**14102R6513** 135658		
			4500	plug connector M12 x 1			**14102RQD03** 135660		
Diffuse reflective sensor, forward viewing									
	20 - 264 V AC 15 - 30 V DC	NPN	4500	2 m connection cable	For combination with reflector with polarisation filter	Visible red	**14101A6513** 135646		1 off
			4500	plug connector M12 x 1			**14101AQD03** 135648		
			7600	2 m connection cable	For combination with reflector	Infrared	**14100A6513** 135642		
				plug connector M12 x 1			**14100AQD03** 135644		
				2 m connection cable		Visible red	**14102A6513** 135654		
				plug connector M12 x 1			**14102AQD03** 135656		
Diffuse reflective sensor, focused, forward viewing									
	20 - 264 V AC 15 - 30 V DC	NPN	40	2 m connection cable	–	Visible red	**13102A6513** 135590		1 off
			40	plug connector M12 x 1			**13102AQD03** 135592		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	264 V AC, 30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: 1, 2, 3, 4, 4x, 6, 12, 13

HPL03085EN

	Rated operating voltage	Switching type	Rated switching distance S_n mm	Connection options	Description	Type of light	**Part no.** Article no.	**Price** See price list	Std. pack
Diffuse reflective sensor, forward viewing									
	20 - 264 V AC 15 - 30 V DC	NPN	50	2 m connection cable	With background suppression (Perfect Prox)	Visible red	**13104A6513** 135602		1 off
				plug connector M12 x 1			**13104AQD03** 135604		
				2 m connection cable			**13105A6513** 135614		
				plug connector M12 x 1			**13105AQD03** 135616		
			100	2 m connection cable		Infrared	**13101A6513** 135586		
			100	plug connector M12 x 1			**13101AQD03** 135588		
			150	2 m connection cable	–		**13107AS6513** 135626		
				plug connector M12 x 1			**13107ASQD03** 135628		
				2 m connection cable	With background suppression (Perfect Prox)		**13108A6513** 135634		
				plug connector M12 x 1			**13108AQD03** 135636		
			200	2 m connection cable	–		**13106A6513** 135618		
			200	plug connector M12 x 1			**13106AQD03** 135620		
			225	2 m connection cable	With background suppression (Perfect Prox)		**13103A6513** 135594		
			225	plug connector M12 x 1			**13103AQD03** 135596		
			610	2 m connection cable	–		**13100A6513** 135578		
			610	plug connector M12 x 1			**13100AQD03** 135580		
Diffuse reflective sensor, right-angle									
	20 - 264 V AC 15 - 30 V DC	NPN	50	2 m connection cable	With background suppression (Perfect Prox)	Visible red	**13104R6513** 135606		1 off
			50	plug connector M12 x 1			**13104RQD03** 135608		
			100	plug connector M12 x 1			**13104RS5003** 135610		
			100	2 m connection cable			**13104RS5013** 135612		
			150	2 m connection cable	–	Infrared	**13107RS6513** 135630		
				plug connector M12 x 1			**13107RSQD03** 135632		
				2 m connection cable	With background suppression (Perfect Prox)		**13108R6513** 135638		
				plug connector M12 x 1			**13108RQD03** 135640		
			200	2 m connection cable	–		**13106R6513** 135622		
			200	plug connector M12 x 1			**13106RQD03** 135624		
			225	2 m connection cable	With background suppression (Perfect Prox)		**13103R6513** 135598		
			225	plug connector M12 x 1			**13103RQD03** 135600		
			610	2 m connection cable	–		**13100R6513** 135582		
			610	plug connector M12 x 1			**13100RQD03** 135584		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	264 V AC, 30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: -

	Rated operating voltage	Switching type	Rated switching distance S_n mm	Connection options	Description	Type of light	**Part no.** Article no.	**Price** See price list	Std. pack
Comet series									
M18 x 1, light switching, dark switching, programmable, plastic									
4-wire									
Thru-beam sensor (detector), forward viewing									
	10 - 30 V DC	NPN PNP	6000	2 m connection cable	–	Visible red	**12100A6517**[1] 135567		1 off
			6000	plug connector M12 x 1			**12100AQD07**[1] 135569		
			24000	2 m connection cable			**12102A6517**[1] 135575		
			24000	plug connector M12 x 1			**12102AQD07**[1] 135577		
Thru-beam sensor (source), forward viewing									
	10 - 30 V DC	NPN PNP	6000	2 m connection cable	–	Visible red	**11100A6517**[1] 135555		1 off
			6000	plug connector M12 x 1			**11100AQD07**[1] 135557		
			24000	2 m connection cable			**11102A6517**[1] 135563		
			24000	plug connector M12 x 1			**11102AQD07**[1] 135565		
Thru-beam sensor (detector), right-angle									
	10 - 30 V DC	NPN PNP	6000	2 m connection cable	–	Visible red	**12100R6517**[1] 135571		1 off
			6000	plug connector M12 x 1			**12100RQD07**[1] 135573		
Thru-beam sensor (source), right-angle									
	10 - 30 V DC	NPN PNP	6000	2 m connection cable	–	Visible red	**11100R6517**[1] 135559		1 off
			6000	plug connector M12 x 1			**11100RQD07**[1] 135561		
Diffuse reflective sensor, right-angle									
	10 - 30 V DC	NPN PNP	3000	2 m connection cable	For combination with reflector with polarisation filter	Visible red	**14101R6517**[1] 135651		1 off
			3000	plug connector M12 x 1			**14101RQD07**[1] 135653		
			4500	2 m connection cable	For combination with reflector		**14102R6517**[1] 135659		
			4500	plug connector M12 x 1			**14102RQD07**[1] 135661		
Diffuse reflective sensor, forward viewing									
	10 - 30 V DC	NPN PNP	4500	2 m connection cable	For combination with reflectorwith polarisation filter	Visible red	**14101A6517**[1] 135647		1 off
			4500	plug connector M12 x 1			**14101AQD07**[1] 135649		
			7600	2 m connection cable	For combination with reflector	Infrared	**14100A6517**[1] 135643		
				plug connector M12 x 1			**14100AQD07**[1] 135645		
				2 m connection cable		Visible red	**14102A6517**[1] 135655		
				plug connector M12 x 1			**14102AQD07**[1] 135657		
Diffuse reflective sensor, focused, forward viewing									
	10 - 30 V DC	NPN PNP	40	2 m connection cable	–	Visible red	**13102A6517**[1] 135591		1 off
			40	plug connector M12 x 1			**13102AQD07**[1] 135593		

[1] **Information relevant for export to North America**

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: -

HPL03087EN

	Rated operating voltage	Switching type	Rated switching distance S_n mm	Connection options	Description	Type of light	**Part no.** Article no.	**Price** See price list	Std. pack
Comet series									
M18 x 1, light switching, dark switching, programmable, plastic									
Diffuse reflective sensor, forward viewing									
	10 - 30 V DC	NPN PNP	50	2 m connection cable	With background suppression (Perfect Prox)	Visible red	**13104A6517**[1] 135603		1 off
				plug connector M12 x 1			**13104AQD07**[1] 135605		
				2 m connection cable			**13105A6517**[1] 135615		
				plug connector M12 x 1			**13105AQD07**[1] 135617		
			100	2 m connection cable		Infrared	**13101A6517**[1] 135587		
			100	plug connector M12 x 1			**13101AQD07**[1] 135589		
			150	2 m connection cable	–		**13107AS6517**[1] 135627		
				plug connector M12 x 1			**13107ASQD07**[1] 135629		
				2 m connection cable	With background suppression (Perfect Prox)		**13108A6517**[1] 135635		
				plug connector M12 x 1			**13108AQD07**[1] 135637		
			200	2 m connection cable	–		**13106A6517**[1] 135619		
			200	plug connector M12 x 1			**13106AQD07**[1] 135621		
			225	2 m connection cable	With background suppression (Perfect Prox)		**13103A6517**[1] 135595		
			225	plug connector M12 x 1			**13103AQD07**[1] 135597		
			610	2 m connection cable	–		**13100A6517**[1] 135579		
			610	plug connector M12 x 1			**13100AQD07**[1] 135581		
Diffuse reflective sensor, right-angle									
	10 - 30 V DC	NPN PNP	50	2 m connection cable	With background suppression (Perfect Prox)	Visible red	**13104R6517** 135607		1 off
			50	plug connector M12 x 1			**13104RQD07** 135609		
			100	plug connector M12 x 1			**13104RS5007** 135611		
			100	2 m connection cable			**13104RS5020** 135613		
			150	2 m connection cable	–	Infrared	**13107RS6517** 135631		
				plug connector M12 x 1			**13107RSQD07** 135633		
				2 m connection cable	With background suppression (Perfect Prox)		**13108R6517** 135639		
				plug connector M12 x 1			**13108RQD07** 135641		
			200	2 m connection cable	–		**13106R6517** 135623		
			200	plug connector M12 x 1			**13106RQD07** 135625		
			225	2 m connection cable	With background suppression (Perfect Prox)		**13103R6517** 135599		
			225	plug connector M12 x 1			**13103RQD07** 135601		
			610	2 m connection cable	–		**13100R6517** 135583		
			610	plug connector M12 x 1			**13100RQD07** 135585		

[1] **Information relevant for export to North America**

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	50513
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: -

Ordering

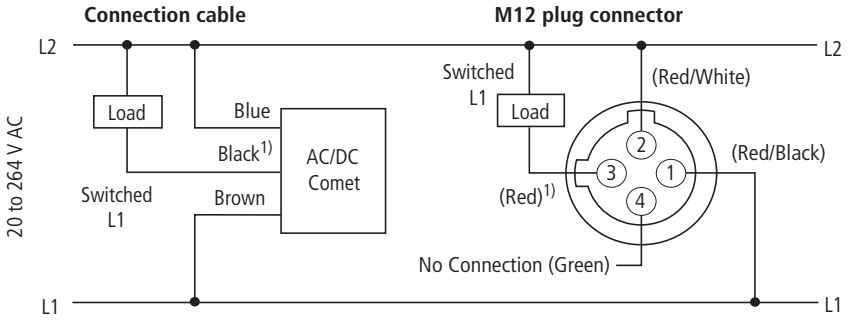
	Design (outer dimensions)	Material	Part no. Article no.	Price See price list	Std. pack
Glass fiber adapter					
In combination with reflex sensors 13106A... or 13100A... and E51KF fiber optic					
	–	Metal	**6235A-6501** 135759		1 off
Glass fiber duplex cable					
	2.4 ∅ x 914	PVC	**E51KF163** 135761		1 off
	2.4 ∅ x 914	Stainless steel	**E51KF563** 135783		1 off
	1.6 ∅ x 914	PVC	**E51KF183** 135763		1 off
	1.6 ∅ x 914	Stainless steel	**E51KF583** 135785		1 off
	0.5 x 3.9 ∅ x 914	PVC	**E51KF193** 135764		1 off
	0.5 x 3.9 ∅ x 914	Stainless steel	**E51KF593** 135786		1 off
	3.2 ∅ x 914	PVC	**E51KF323** 135771		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF723** 135793		1 off
	3.2 ∅ x 914	PVC	**E51KF313** 135770		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF713** 135792		1 off
	0.8 x 9.7 ∅ x 914	PVC	**E51KF343** 135773		1 off
	0.8 x 9.7 ∅ x 914	Stainless steel	**E51KF743** 135795		1 off
	0.5 x 3.9 ∅ x 914	Stainless steel	**E51KF553** 135782		1 off
	0.5 x 3.9 ∅ x 914	PVC	**E51KF153** 135760		1 off
	1.6 ∅ x 914	Stainless steel	**E51KF573** 135784		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF733** 135794		1 off
	1.6 ∅ x 914	PVC	**E51KF173** 135762		1 off
	3.2 ∅ x 914	PVC	**E51KF333** 135772		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF7A3** 135796		1 off
	3.2 ∅ x 914	PVC	**E51KF3A3** 135774		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF7B3** 135797		1 off
	3.2 ∅ x 914	PVC	**E51KF3B3** 135775		1 off
Glass fiber simplex cable					
	2.4 ∅ x 914	Stainless steel	**E51KF663** 135788		1 off
	2.4 ∅ x 914	PVC	**E51KF263** 135766		1 off
	1.6 ∅ x 914	Stainless steel	**E51KF683** 135790		1 off
	1.6 ∅ x 914	PVC	**E51KF283** 135768		1 off
	0.5 x 3.9 ∅ x 914	Stainless steel	**E51KF693** 135791		1 off

	Design (outer dimensions)	Material	**Part no.** Article no.	**Price** See price list	Std. pack
	3.2 ∅ x 914	Stainless steel	**E51KF823** 135799		1 off
	3.2 ∅ x 914	PVC	**E51KF423** 135777		1 off
	0.5 x 3.9 ∅ x 914	PVC	**E51KF293** 135769		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF813** 135798		1 off
	3.2 ∅ x 914	PVC	**E51KF413** 135776		1 off
	0.8 x 9.7 ∅ x 914	Stainless steel	**E51KF843** 135801		1 off
	0.8 x 9.7 ∅ x 914	PVC	**E51KF443** 135779		1 off
	0.5 x 3.9 ∅ x 914	Stainless steel	**E51KF653** 135787		1 off
	0.5 x 3.9 ∅ x 914	PVC	**E51KF253** 135765		1 off
	1.6 ∅ x 914	Stainless steel	**E51KF673** 135789		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF833** 135800		1 off
	1.6 ∅ x 914	PVC	**E51KF273** 135767		1 off
	3.2 ∅ x 914	PVC	**E51KF433** 135778		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF8A3** 135802		1 off
	3.2 ∅ x 914	PVC	**E51KF4A3** 135780		1 off
	3.2 ∅ x 914	Stainless steel	**E51KF8B3** 135803		1 off
	3.2 ∅ x 914	PVC	**E51KF4B3** 135781		1 off
Protective bracket					
	–	Metal	**E58KS5200** 135757		1 off
Fixing brackets					
	53 x 44	Stainless steel	**6161AS5296** 135738		1 off
	53 x 44	Stainless steel	**6161AS5297** 135739		1 off

Engineering

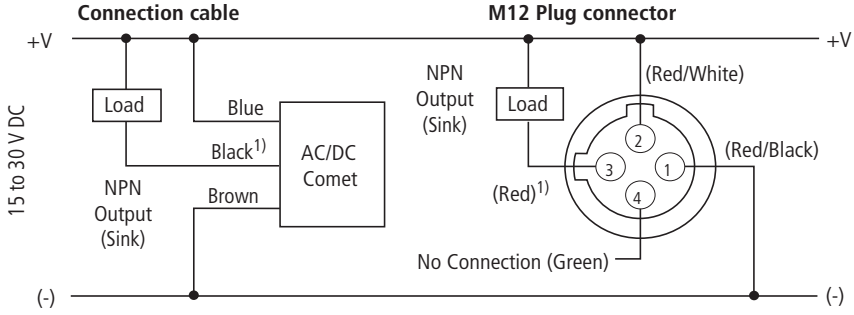
Circuit diagram

AC/DC connection (AC units)



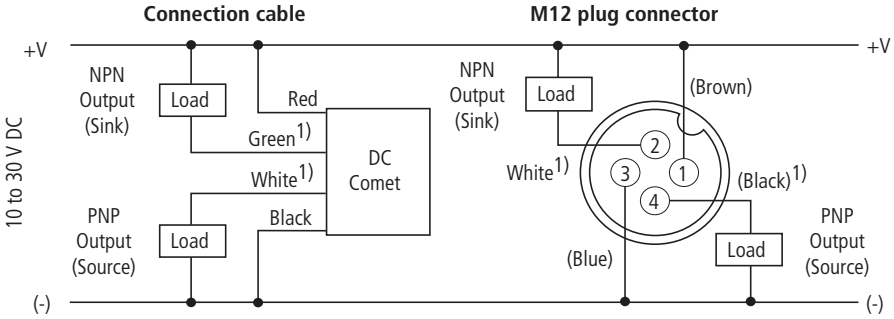
1) Note: Cable not connected on source of thru-beam sensors.

AC/DC connection (DC units)



1) Note: Cable not connected on source of thru-beam sensors.

DC connection (DC units)

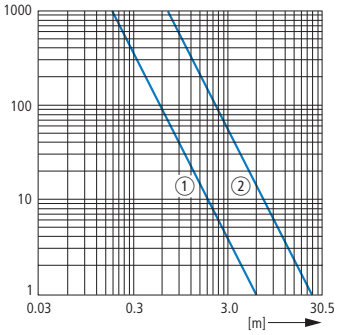


1) Note: Cable not connected on source of thru-beam sensors.

Note: AC/DC sensors have AC plug connectors. Take into account when using with DC voltage.

Excess gain chart

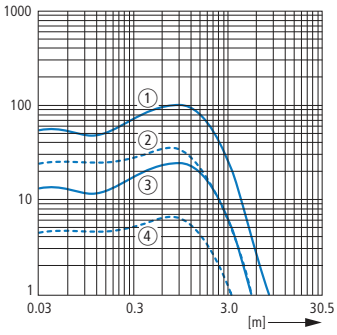
Thru-beam sensor
① Detector 12100A and 12100R with source 11100A or 11100R
② Detector 12102A with source 11102A

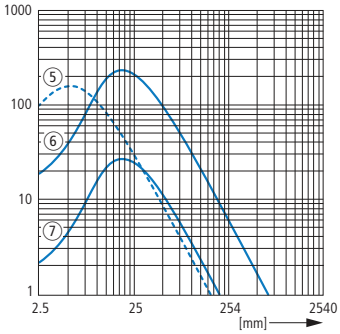


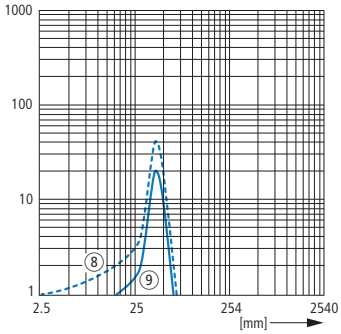
Reflex sensor
(84 mm reflector)
① 14100A/14102A
② 14102R
③ 14101A
④ 14101R

Diffuse reflective sensor
(90 % reflective test card)
⑤ 13107
⑥ 13100
⑦ 13106

Focused diffuse reflective sensors
(90 % reflective test card)
⑧ 13102A typ.
⑨ 13102A minimum



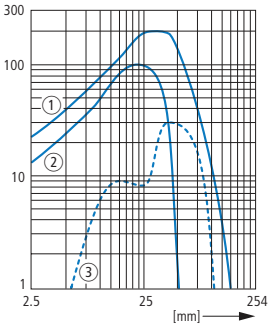


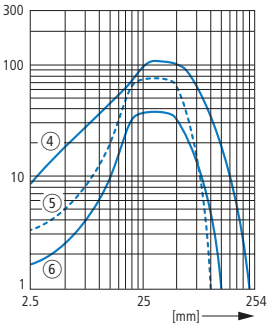


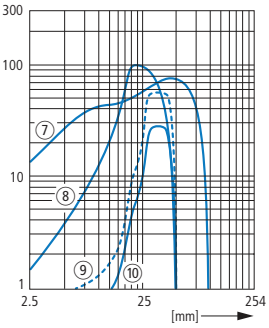
Perfect Prox®
① 13108A/13108R
② 13104A
③ 14104RS

④ 13103A/13103R
⑤ 13101A typ.
⑥ 13101A minimum

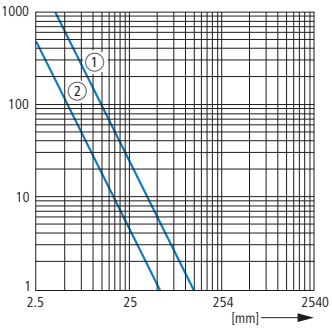
⑦ 13101AS
⑧ 13104R
⑨ 13105A typ.
⑩ 13105A minimum



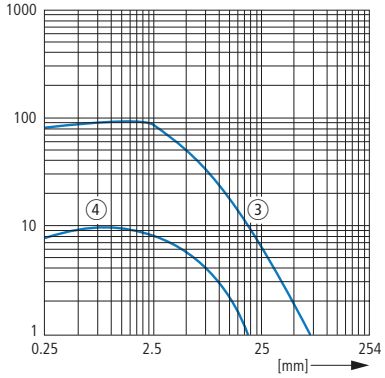




Thru-beam sensor
With single FO cable E51KF823
① 13100A Comet
② 13106A Comet



Diffuse reflective sensors
With duplex FO cable E51KF723
③ 13100A Comet
④ 13106A Comet



Technical data

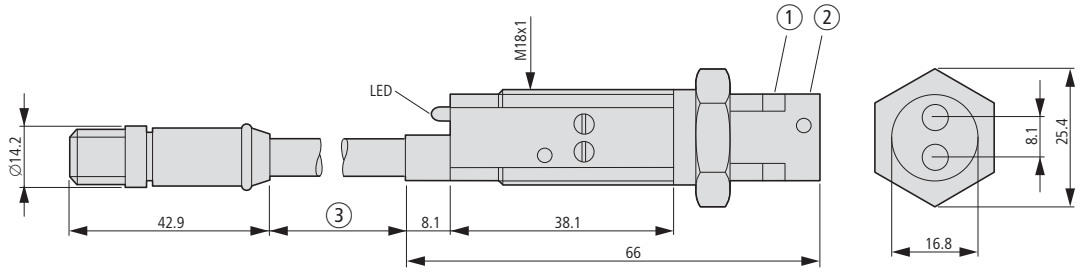
			3-wire 111 Types	121 Types	131 Types	141 Types
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-20 - +70	-40 - +70	-40 - +70	-40 - +70
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	100 Shock duration 3 ms			
Characteristic values						
Rated operating voltage			20 - 264 V AC 15 - 30 V DC	20 - 264 V AC 15 - 30 V DC	20 - 264 V AC 15 - 30 V DC	20 - 264 V AC 15 - 30 V DC
Operating current in the switched state at 24 V DC	I_b	mA	25	30	30	30
Rated operational current	I_e	mA	300	300	300	300
Switching frequency		Hz	–	50	50	50
Switching state indication		LED	–	Red	Red	Red
Operating voltage indication		LED	Red	–	–	–
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage			
Function			3-wire	3-wire	3-wire	3-wire
Construction type						
Design (outer dimensions)			M18 x 1	M18 x 1	M18 x 1	M18 x 1
Connection options			Cable open 2 m connection cable			
Material			plastic			

			4-wire 111 Types	121 Types	131 Types	141 Types
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-20 - +70	-40 - +70	-40 - +70	-40 - +70
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	100 Shock duration 3 ms			
Characteristic values						
Rated operating voltage			10 - 30 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC
Operating current in the switched state at 24 V DC	I_b	mA	25	30	30	30
Rated operational current	I_e	mA	100	100	100	100
Switching frequency		Hz	–	142	500	500
Switching state indication		LED	–	Red	Red	Red
Operating voltage indication		LED	Red	–	–	–
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage			
Function			4-wire	4-wire	4-wire	4-wire
Construction type						
Design (outer dimensions)			M18 x 1	M18 x 1	M18 x 1	M18 x 1
Connection options			Cable open 2 m connection cable			
Material			plastic			

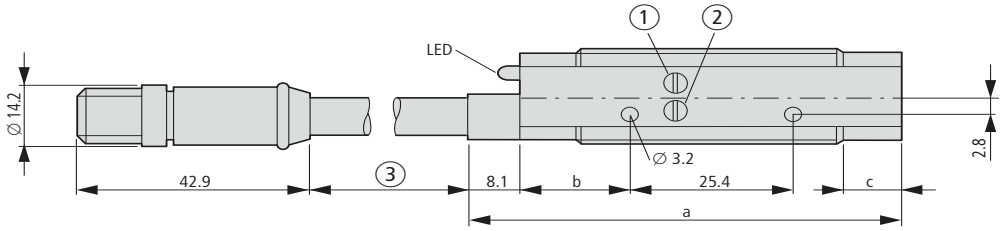
Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Dimensions

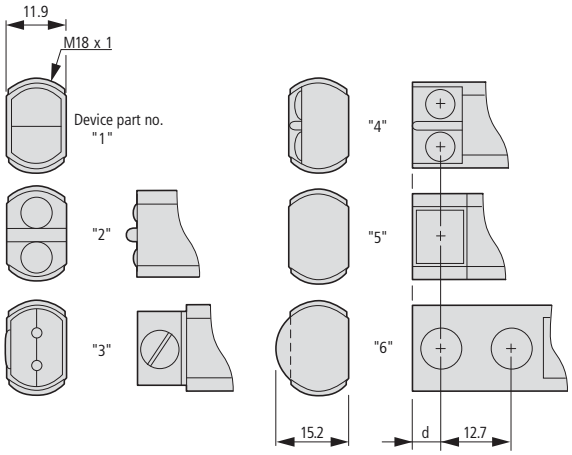
Sensor with installed adapter



① Seal
② Adapter
③ Cable length



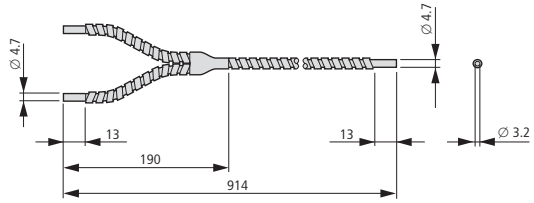
① Brightness setting
② Gain adjustment
③ Cable length



	Dimensions in (mm)				Settings		Housing type
	a	b	c	d	Light/dark	Gain	
11100A...	56	17	6	-	No	No	2
11100R...	65	17	15	5	No	No	4
11102A...	70	17	28	-	No	No	1
12100A...	56	17	6	-	Yes	Yes	2
12100R...	65	17	15	5	Yes	Yes	4
12102A...	66	15	7	-	Yes	Yes	1
13100A..., 13106A...	56	17	6	-	Yes	Yes	2
13100R..., 13106R...	65	17	15	5	Yes	Yes	4
13101A..., 13104A...	66	15	6	-	Yes	No	1
13102A..., 13103A..., 13105A..., 13108A...	66	15	6	-	Yes	Yes	1
13104R...	77	15	28	5	Yes	No	6
14100A..., 14102A...	66	15	7	-	Yes	Yes	1
14101R..., 14102R...	76	15	18	5	Yes	Yes	5
14101A...	67	15	7	-	Yes	Yes	1
15100A..., 15101A...	73	15	15	-	Yes	Yes	3

Glass fiber duplex cable

E51KF313
E51KF713



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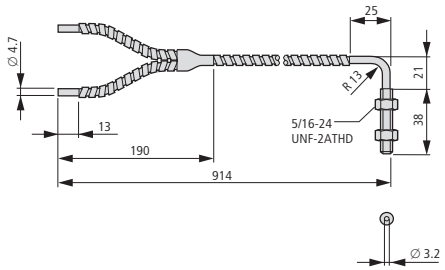
E51KF7B3



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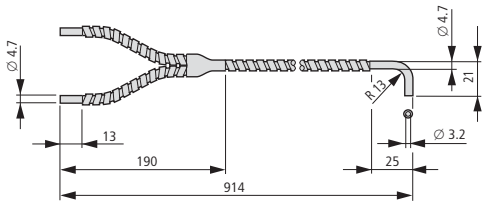
E51KF733



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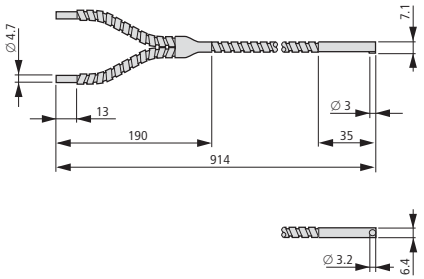

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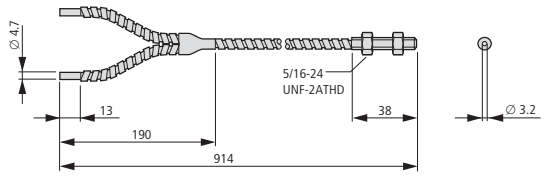

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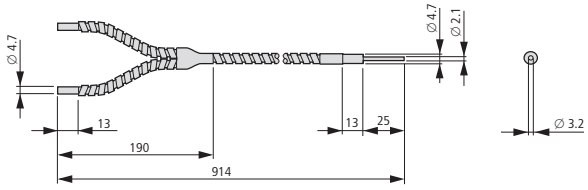

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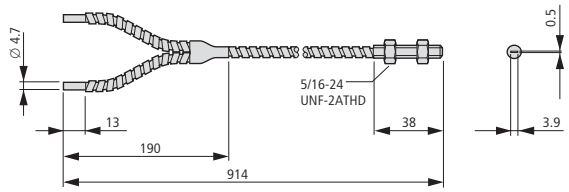

E51KF173
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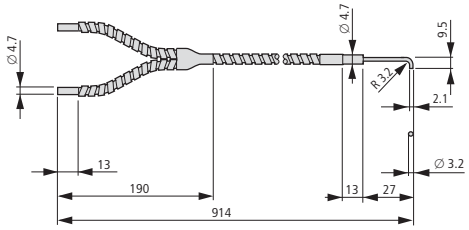

E51KF3A3
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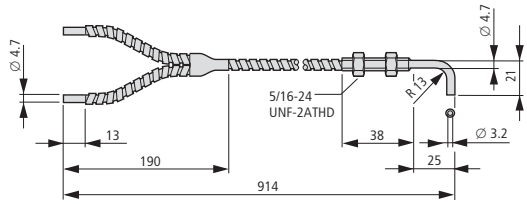

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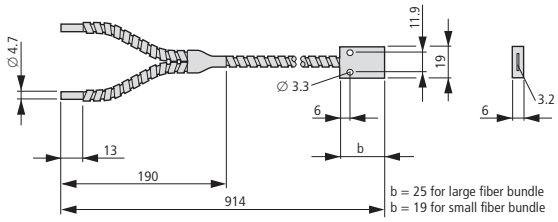

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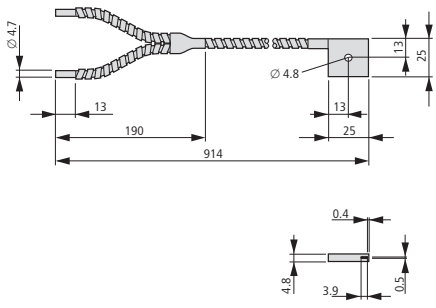
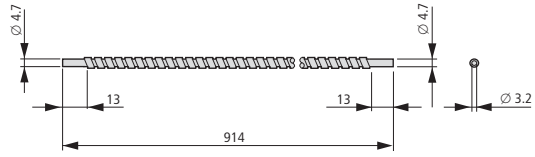


Glass fiber simplex cable

E51KF413
E51KF813



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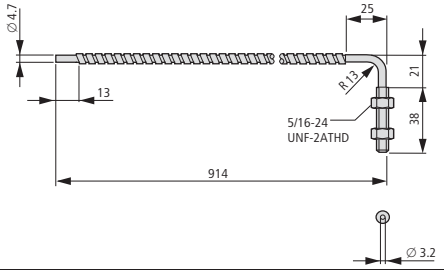

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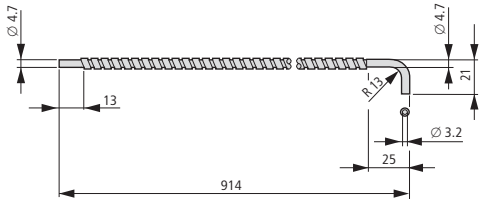
E51KF833



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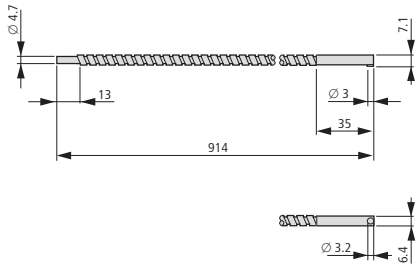

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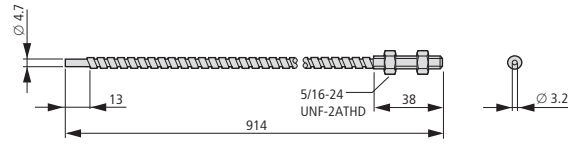
E51KF823



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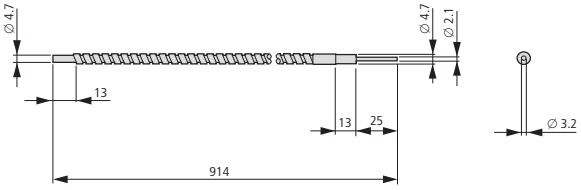

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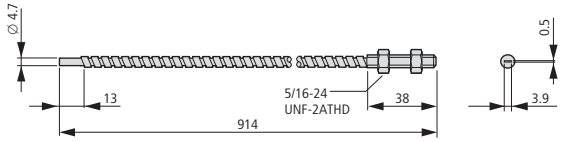

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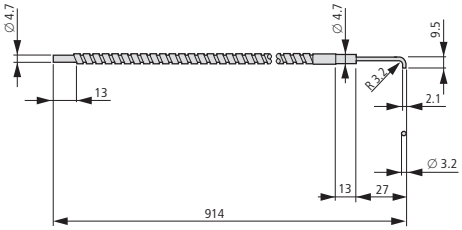
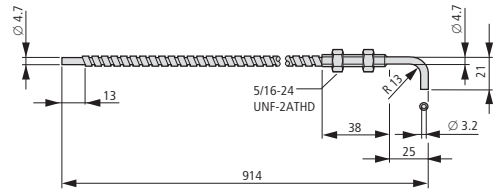


E51KF4A3
E51KF8A3



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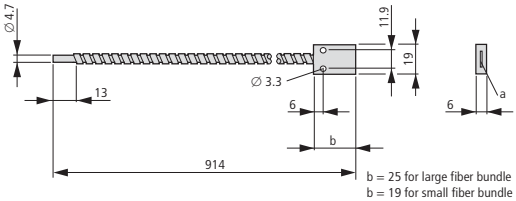

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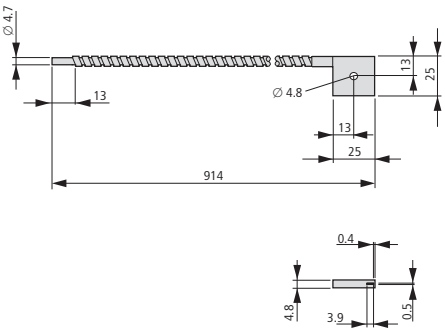
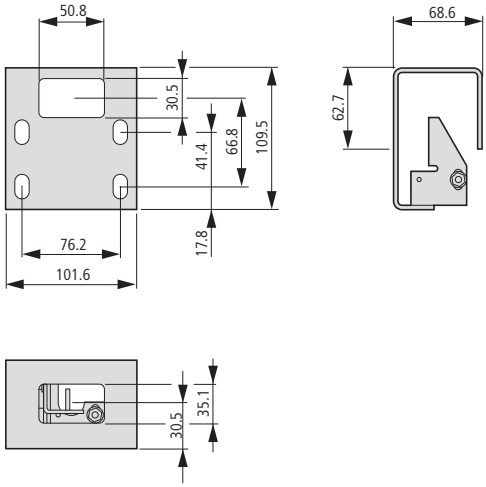
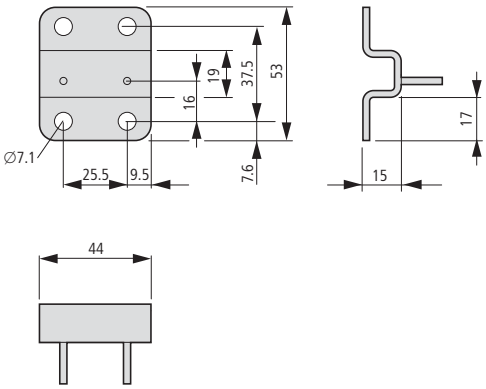


Dimensions

Protective bracket, adjustable



Clip-type fixing bracket, raised



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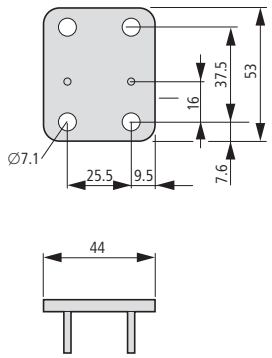


Description



① Tempered glass lens cover protects against abrasion.
② Bright 360° function indicator.
③ All models with Visible red light.
④ All models available in versions with M12 (micro) plug connector.

Short description

Eaton's E58 series was designed to withstand the harshest physical, chemical and optical environments. Stainless steel, PVDF and tempered glass components are mechanically assembled using Viton® seals to ensure complete sealing and resistance to industry chemicals. All adhesives and potting subject to failure from chemical attack have been eliminated from the design. The result is a sensor highly resistant to chemical attack and moisture intrusion, that can withstand heavy shock and vibration in almost any application. E58 Harsh Duty sensors feature unparalleled optical performance. They are ideal for automotive applications where exposure to lubricants, cutting fluids, coolants and glycols is common. For food processing applications, a smooth enclosure version simplifies high-pressure chemical washdowns, and withstands the use of sanitizers, surfactants, and cleaning agents including diluted bases and acids.

Product features

- Sensor with a diameter of 18 mm and 30 mm.
- Highly refined optics for long sensing ranges and to see through high levels of contamination – unmatched optical performance
- Perfect Prox® technology provides exceptional background rejection and extremely high excess gain.
- Resistant to the wide range of chemicals used in the automotive, food processing and forest products industries
- Suitable for high temperature, high pressure washdown (82 bar).
- Mechanical Viton seals hold up to extreme temperature variations.
- Visible sensing beam on all models lets you see where the beam is aimed for quick flush mounting and alignment.
- Output status indicator is the brightest available and is visible from any angle and in any illumination condition
- The industry's only background rejection sensors with a 2-wire circuit design
- Four-wire DC sensors feature an NPN and a PNP output

Approvals

CE

c UL us LISTED

UL

	Function	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Switching type	Connection option	Material	Type of light	Switching principle	**Part no.** Article no.	**Price** See price list	Std. pack
E58 Series												
Reflex sensor With background suppression (Perfect Prox)												
	2-wire	M18 x 1	18 - 50 V DC	50	–	plug connector M12 x 1	Stainless steel	Visible red	Dark switching	**E58-18DP50-DDP** 135668		1 off
				50	–				Light switching	**E58-18DP50-DLP** 135669		
				100	–				Dark switching	**E58-18DP100-DDP** 135662		
				100	–				Light switching	**E58-18DP100-DLP** 135663		
		M30 x 1.5		150	–				Dark switching	**E58-30DP150-DDP** 135674		
				150	–				Light switching	**E58-30DP150-DLP** 135675		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	50 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: 1, 2, 3, 3R, 3S, 4, 4X, 6, 6P, 12, 12K, 13

	Function	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Switching type	Connection option	Material	Type of light	Switching principle	**Part no.** Article no.	**Price** See price list	Std. pack
E58 Series												
Reflex sensor With background suppression (Perfect Prox)												
	4-wire	M18 x 1	10 - 30 V DC	50	NPN PNP	2 m connection cable	Stainless steel	Visible red	Dark switching	**E58-18DP50-HD** 135670		1 off
				50	NPN PNP	plug connector M12 x 1			Dark switching	**E58-18DP50-HDP** 135671		
				50	NPN PNP	2 m connection cable			Light switching	**E58-18DP50-HL** 135672		
				50	NPN PNP	plug connector M12 x 1			Light switching	**E58-18DP50-HLP** 135673		
				100	NPN PNP	2 m connection cable			Dark switching	**E58-18DP100-HD** 135664		
				100	NPN PNP	plug connector M12 x 1			Dark switching	**E58-18DP100-HDP** 135665		
				100	NPN PNP	2 m connection cable			Light switching	**E58-18DP100-HL** 135666		
				100	NPN PNP	plug connector M12 x 1			Light switching	**E58-18DP100-HLP** 135667		
		M30 x 1.5	10 - 30 V DC	150	NPN PNP	2 m connection cable			Dark switching	**E58-30DP150-HD** 135676		
				150	NPN PNP	plug connector M12 x 1			Dark switching	**E58-30DP150-HDP** 135677		
				150	NPN PNP	2 m connection cable			Light switching	**E58-30DP150-HL** 135678		
				150	NPN PNP	plug connector M12 x 1			Light switching	**E58-30DP150-HLP** 135679		
				280	NPN PNP	2 m connection cable			Dark switching	**E58-30DPS280-HD** 135680		
				280	NPN PNP	plug connector M12 x 1			Dark switching	**E58-30DPS280-HDP** 135681		
				280	NPN PNP	2 m connection cable			Light switching	**E58-30DPS280-HL** 135682		
				280	NPN PNP	plug connector M12 x 1			Light switching	**E58-30DPS280-HLP** 135683		

HPL03099EN

	Function	Design (outer dimensions)	Rated operational voltage	Rated switching distance S_n mm	Switching type	Connection option	Material	Type of light	Switching principle	**Part no.** Article no.	**Price** See price list	Std. pack
E58 Series												
Polarized reflexsensor For combination with reflector												
	4-wire	M30 x 1.5	10 - 30 V DC	10000	NPN PNP	2 m connection cable	Stainless steel	Visible red	Dark switching	**E58-30RP10-HD** 135684		1 off
		M30 x 1.5	10 - 30 V DC	10000	NPN PNP	plug connector M12 x 1			Dark switching	**E58-30RP10-HDP** 135685		
		M30 x 1.5	10 - 30 V DC	10000	NPN PNP	2 m connection cable			Light switching	**E58-30RP10-HL** 135686		
		M30 x 1.5	10 - 30 V DC	10000	NPN PNP	plug connector M12 x 1			Light switching	**E58-30RP10-HLP** 135687		
Reflex sensor For combination with reflector												
	4-wire	M30 x 1.5	10 - 30 V DC	18000	NPN PNP	2 m connection cable	Stainless steel	Visible red	Dark switching	**E58-30RS18-HD** 135688		1 off
		M30 x 1.5	10 - 30 V DC	18000	NPN PNP	plug connector M12 x 1			Dark switching	**E58-30RS18-HDP** 135689		
		M30 x 1.5	10 - 30 V DC	18000	NPN PNP	2 m connection cable			Light switching	**E58-30RS18-HL** 135690		
		M30 x 1.5	10 - 30 V DC	18000	NPN PNP	plug connector M12 x 1			Light switching	**E58-30RS18-HLP** 135691		
Thru-beam sensor (detector), forward viewing												1 off
	4-wire	M30 x 1.5	10 - 30 V DC	250000	NPN PNP	2 m connection cable	Stainless steel	–	Dark switching	**E58-30TD250-HD** 135692		
		M30 x 1.5	10 - 30 V DC	250000	NPN PNP	plug connector M12 x 1			Dark switching	**E58-30TD250-HDP** 135693		
		M30 x 1.5	10 - 30 V DC	250000	NPN PNP	2 m connection cable			Light switching	**E58-30TD250-HL** 135694		
		M30 x 1.5	10 - 30 V DC	250000	NPN PNP	plug connector M12 x 1			Light switching	**E58-30TD250-HLP** 135695		
Thru-beam sensor (source), forward viewing												
	4-wire	M30 x 1.5	10 - 30 V DC	250000	NPN PNP	2 m connection cable	Stainless steel	Visible red	–	**E58-30TS250-HA** 135696		1 off
		M30 x 1.5	10 - 30 V DC	250000	NPN PNP	plug connector M12 x 1			–	**E58-30TS250-HAP** 135697		

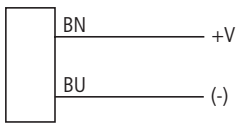
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: -

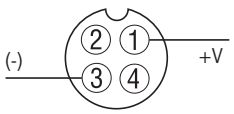
Engineering

Circuit diagram

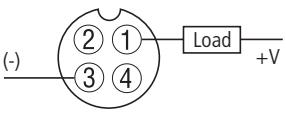
E58...HA



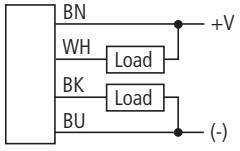
E58...HAP



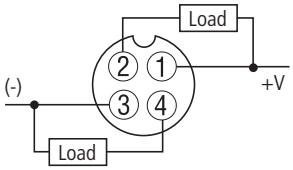
E58...DDP
E58...DLP



E58...HD
E58...HL

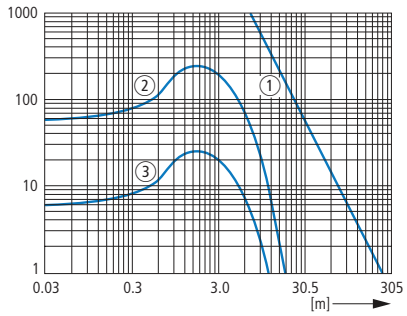


E58...HDP
E58...HLP

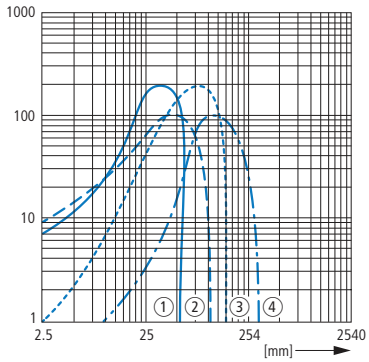


Excess gain chart

Thru-beam
① Thru-beam
Reflex
② 84 mm-reflector
Polarized reflex
③ 84 mm-reflector



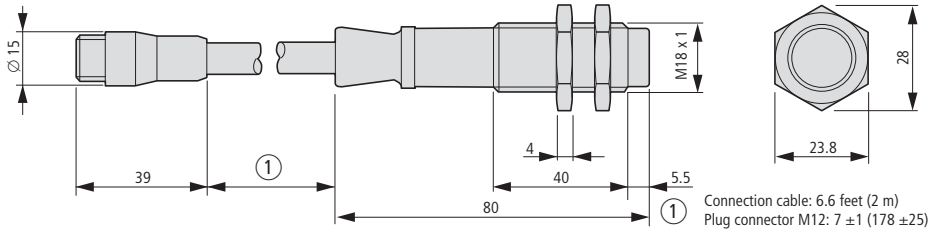
Perfect Prox®
① 18 mm diameter, 50 mm-designs
② 18 mm diameter, 100 mm-designs
③ 30 mm diameter, 150 mm-designs
④ 30 mm diameter, 280 mm-Design



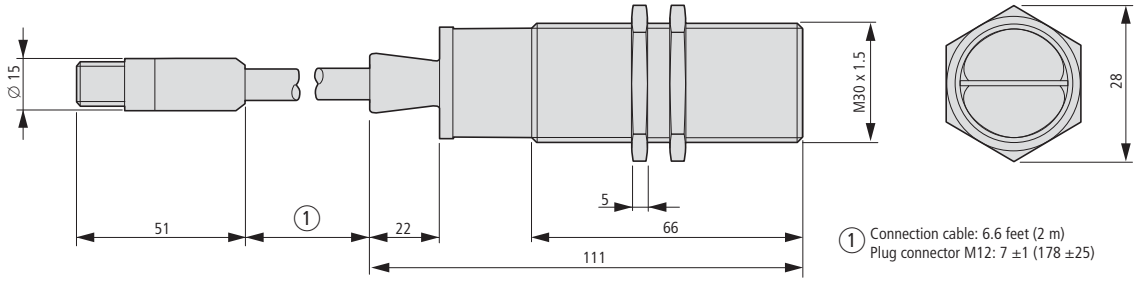
Dimensions

E58 Series

E58-18...



E58-30...



Technical data

			2-wire		4-wire	
			E58-18...	**E58-30...**	**E58-18...**	**E58-30...**
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-40 - +70	-25 - +55	-40 - +55	-40 - +55
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance			100 Shock duration 3 ms			
Characteristic values						
Rated operating voltage			18 - 50 V DC	18 - 50 V DC	10 - 30 V DC	10 - 30 V DC
Operating current in the switched state at 24 V DC	I_b	mA	1.7	1.7	–	–
Rated operational current	I_e	mA	100	100	100	100
Switching frequency		Hz	14	14	500	312
Switching state indication		LED	Red	Red	Red	Red
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage			
Function			2-wire	2-wire	4-wire	4-wire
Construction type						
Design (outer dimensions)			M18 x 1	M30 x 1.5	M18 x 1	M30 x 1.5
Material			Stainless steel	Stainless steel	Stainless steel	Stainless steel

Notes Further technical data can be found in the Online Catalogue at www.moeller.net

Description



① 18 mm thread
② Power lamp (green)
③ Output lamp (red)
④ Targetlock™ lamp (orange)
⑤ Gain adjustment

Short description

Eaton's SM series photoelectric sensors offer a high performance and simple use in a compact, cost-effective design. Regardless how good a sensor's performance just a slight maladjustment or incorrectly positioned target will sooner or later impact reliability.
In addition to simplifying sensor setup, TargetLock™ provides visual confirmation of the correct mounting position for optimum reliability.
In addition TargetLock™ outputs diagnostic information during operation, which provides an early warning about potential problems to help prevent costly downtimes. No other sensor is easier to use.
The SM sensors offer numerous performance features that simplify their use. A visible sensing beam shows you exactly where the sensor is pointing. The durable enclosure features multiple fixing possibilities to easily fit on your equipment in the tightest of spaces. Full protection from overvoltage, reverse polarity and short circuits reduces the chance of damage. Bright 360° LED indicators clearly show sensor status.

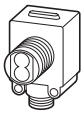
Product features

- Bright indicators for power, output, and TargetLock™.
- TargetLock™ simplifies setup and ensures a high operational reliability.
- The Perfect Prox® models detect targets with different colors at the same range while ignoring background objects.
- AC/DC models work with 18 – 264 V AC or 18 – 50 V DC.
- DC-only models feature PNP and NPN outputs.
- Visible sensing beam on all models lets you see where the beam is aimed for quick flush mounting and alignment.
- Compact design for space-saving flush mounting.
- Range of fixing possibilities, including standard 18 mm thread.
- Short-circuit, overload and protection against polarity reversal.
- Full family includes thru-beam, polarized reflex, diffuse reflective and Perfect Prox® background rejection.

Approvals

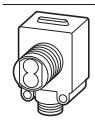
CE
c UL us LISTED
UL

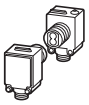
Ordering

	Rated operational voltage	Function	Switching principle	Rated switching distance S_n mm	Switching type	Connection options	**Part no.** Article no.	**Price** See price list	Std. pack
E65 SM Series									
3-conductors, insulated material									
	18 - 264 V AC 18 - 50 V DC	Reflex sensor With background suppression (Perfect Prox)	Dark switching	50	NPN (DC)	2 m connection cable	**E65-SMPP050-GD** 135698		1 off
			Dark switching	50	NPN (DC)	plug connector M12 x 1	**E65-SMPP050-GDD** 135699		
			Light switching	50	NPN (DC)	2 m connection cable	**E65-SMPP050-GL** 135700		
			Light switching	50	NPN (DC)	plug connector M12 x 1	**E65-SMPP050-GLD** 135701		
			Dark switching	100	NPN (DC)	2 m connection cable	**E65-SMPP100-GD** 135706		
			Dark switching	100	NPN (DC)	plug connector M12 x 1	**E65-SMPP100-GDD** 135707		
			Light switching	100	NPN (DC)	2 m connection cable	**E65-SMPP100-GL** 135708		
			Light switching	100	NPN (DC)	plug connector M12 x 1	**E65-SMPP100-GLD** 135709		
		Diffuse reflective sensor	Dark switching	200	NPN (DC)	2 m connection cable	**E65-SMSD200-GD** 135722		
			Dark switching	200	NPN (DC)	plug connector M12 x 1	**E65-SMSD200-GDD** 135723		
			Light switching	200	NPN (DC)	2 m connection cable	**E65-SMSD200-GL** 135724		
			Light switching	200	NPN (DC)	plug connector M12 x 1	**E65-SMSD200-GLD** 135725		
		Polarized reflex For combination with reflector	Dark switching	3000	NPN (DC)	2 m connection cable	**E65-SMPR3-GD** 135714		
			Dark switching	3000	NPN (DC)	plug connector M12 x 1	**E65-SMPR3-GDD** 135715		
			Light switching	3000	NPN (DC)	2 m connection cable	**E65-SMPR3-GL** 135716		
			Light switching	3000	NPN (DC)	plug connector M12 x 1	**E65-SMPR3-GLD** 135717		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
UL File No.	E166051
UL CCN	NRKH, NRKH7
CSA File No.	UL report applies to both Canada and US
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Max. Voltage Rating	132 V AC, 30 V DC
Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: 1, 3, 4, 4X, 6, 6P, 12, 13

	Rated operational voltage	Function	Switching principle	Rated switching distance S_n mm	Switching type	Connection options	**Part no.** Article no.	**Price** See price list	Std. pack
E65 SM Series									
4-conductors, insulated material									
	10 - 30 V DC	Reflex sensor With background suppression (Perfect Prox)	Dark switching	50	NPN PNP	2 m connection cable	**E65-SMPP050-HD** 135702		1 off
			Dark switching	50	NPN PNP	plug connector M12 x 1	**E65-SMPP050-HDD** 135703		
			Light switching	50	NPN PNP	2 m connection cable	**E65-SMPP050-HL** 135704		
			Light switching	50	NPN PNP	plug connector M12 x 1	**E65-SMPP050-HLD** 135705		
			Dark switching	100	NPN PNP	2 m connection cable	**E65-SMPP100-HD** 135710		
			Dark switching	100	NPN PNP	plug connector M12 x 1	**E65-SMPP100-HDD** 135711		
			Light switching	100	NPN PNP	2 m connection cable	**E65-SMPP100-HL** 135712		
			Light switching	100	NPN PNP	plug connector M12 x 1	**E65-SMPP100-HLD** 135713		

	Rated operational voltage	Function	Switching principle	Rated switching distance S_n mm	Switching type	Connection options	**Part no.** Article no.	**Price** See price list	Std. pack
E65 SM Series									
4-conductors, insulated material									
	10 - 30 V DC	Diffuse reflective sensor	Dark switching	200	NPN PNP	2 m connection cable	**E65-SMSD200-HD** 135726		1 off
			Dark switching	200	NPN PNP	plug connector M12 x 1	**E65-SMSD200-HDD** 135727		
			Light switching	200	NPN PNP	2 m connection cable	**E65-SMSD200-HL** 135728		
			Light switching	200	NPN PNP	plug connector M12 x 1	**E65-SMSD200-HLD** 135729		
		Polarized reflex photoelectric sensor For combination with reflector	Dark switching	3000	NPN PNP	2 m connection cable	**E65-SMPR3-HD** 135718		
			Dark switching	3000	NPN PNP	plug connector M12 x 1	**E65-SMPR3-HDD** 135719		
			Light switching	3000	NPN PNP	2 m connection cable	**E65-SMPR3-HL** 135720		
			Light switching	3000	NPN PNP	plug connector M12 x 1	**E65-SMPR3-HLD** 135721		
	10 - 30 V DC	Thru-beam sensor (detector) For combination with sounce	Dark switching	15000	NPN PNP	2 m connection cable	**E65-SMTD15-HD** 135730		1 off
			Dark switching	15000	NPN PNP	plug connector M12 x 1	**E65-SMTD15-HDD** 135731		
			Light switching	15000	NPN PNP	2 m connection cable	**E65-SMTD15-HL** 135732		
			Light switching	15000	NPN PNP	plug connector M12 x 1	**E65-SMTD15-HLD** 135733		
		Thru-beam sensor (source) For combination with detector	–	15000	NPN PNP	2 m connection cable	**E65-SMTS15-HA** 135734		
			–	15000	NPN PNP	plug connector M12 x 1	**E65-SMTS15-HAD** 135735		

Information relevant for export to North America	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-5-2; CE marking
	UL File No.	E166051
	UL CCN	NRKH, NRKH7
	CSA File No.	UL report applies to both Canada and US
	CSA Class No.	–
	NA Certification	UL Listed, certified by UL for use in Canada
	Max. Voltage Rating	30 V DC
	Degree of Protection	IEC: IP68, IP69K; UL/CSA Type: -

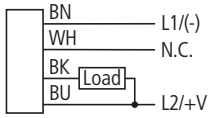
Technical data

			E65...-G...	**E65...-H...**	**E65...15-H...**	**E65...-HA...**
General						
Standards			IEC/EN 60947-5-2			
Ambient temperature		°C	-25 - +55	-25 - +55	-25 - +55	-25 - +55
Protection type			IP67	IP67	IP67	IP67
Mechanical shock resistance		g	50 Shock duration 10 ms			
Characteristic values						
Rated operating voltage			18 - 264 V AC 18 - 50 V DC	10 - 30 V DC	10 - 30 V DC	10 - 30 V DC
Operating current in the switched state at 24 V DC	I_b	mA	20	20	20	40
Rated operational current	I_e	mA	200	100	100	–
Switching frequency		Hz	31	500	–	–
Switching state indication		LED	Red	Red	Red	Red
Operating voltage display		LED	Green	Green	Green	Green
Boundary gain			Yellow	Yellow	Yellow	Yellow
Protective functions			Short-circuit protection Protection against polarity reversal Protection against wire breakage			
Function			3-wire	4-wire	4-wire	4-wire
Construction type						
Design (outer dimensions)			33 x 41 x 43	33 x 41 x 37	33 x 41 x 37	33 x 41 x 37
Material			plastic	plastic	plastic	plastic
Notes			Further technical data can be found in the Online Catalogue at www.moeller.net			

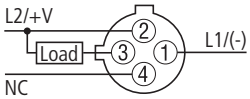
Engineering

Circuit diagram

E65...GD
E65...GL



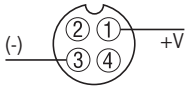
E65...GDD
E65...GLD



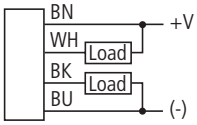
E65...HA



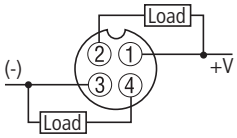
E65...HAD



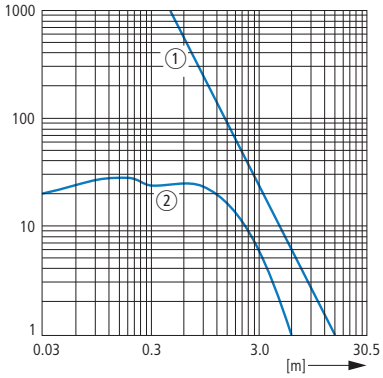
E65...HD
E65...HL



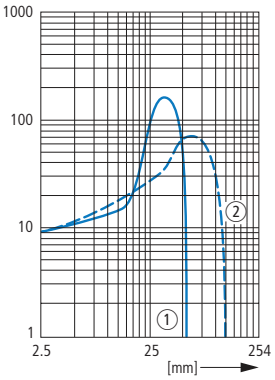
E65...HDD
E65...HLD



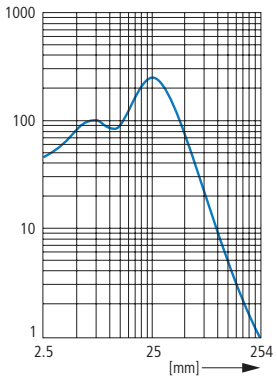
Excess gain chart



① Thru-beam sensor
② Reflex sensor with polarizing filter



① 50 mm Perfect Prox®
② 100 mm Perfect Prox®

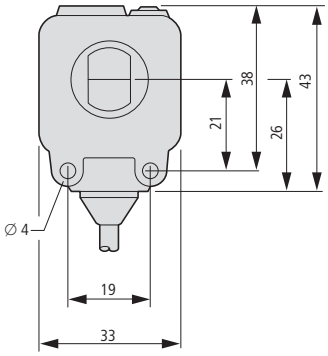


Photoelectric sensors
(90 % reflective test card)

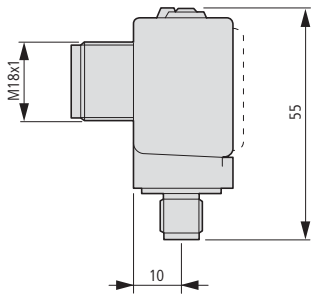
Dimensions

E65 SM Series

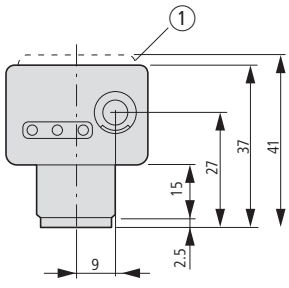
E65...-GD
E65...-GL
E65...-HD
E65...-HL
E65...-HA

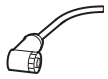


E65...-HDD
E65...-HLD
E65...-HAD

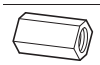


E65...-GDD
E65...-GLD

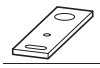
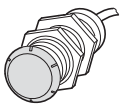


	Design, input end	Design output end		Pole	Length mm	**Part no.** Article no.	**Price** See price list	Std. pack
Connecting cables								
	Coupling, straight	Cable end open	AC	3-pole	2000	**CSAS3F3CY2202** 136265		1 off
					5000	**CSAS3F3CY2205** 136266		
					10000	**CSAS3F3CY2210** 136267		
				4-pole	2000	**CSAS4A4CY2202** 136268		
					5000	**CSAS4A4CY2205** 136269		
					10000	**CSAS4A4CY2210** 136312		
			DC	4-pole, 3-wire	2000	**CSDS4A3CY2202** 136287		
					5000	**CSDS4A3CY2205** 136288		
					10000	**CSDS4A3CY2210** 136289		
				4-pole	2000	**CSDS4A4CY2202** 136292		
					5000	**CSDS4A4CY2205** 136294		
					10000	**CSDS4A4CY2210** 136296		
	Coupling, straight	Plug, straight	DC	4-pole	1000	**CSDS4A4CY2201-D** 136291		
					3000	**CSDS4A4CY2203-D** 136293		
					5000	**CSDS4A4CY2205-D** 136295		
					1500	**CSDS4A4CY2201.5-D** 136316		
	Coupling, straight	Plug, angled		4-pole	1000	**CSDR4A4CY2201-D** 136278		
					5000	**CSDR4A4CY2205-D** 136283		
					1500	**CSDR4A4CY2201.5-D** 136313		
					2000	**CSDR4A4CY2202-D** 136314		
					3000	**CSDR4A4CY2203-D** 136315		
	Coupling, angled	Cable end open	AC	3-pole	2000	**CSAR3F3CY2202** 136262		
					5000	**CSAR3F3CY2205** 136263		
					10000	**CSAR3F3CY2210** 136264		
			DC		2000	**CSDR4A3CY2202** 136272		
					5000	**CSDR4A3CY2205** 136273		
					5000	**CSDR4A3CY2205-LN**[1)] 136274		
					5000	**CSDR4A3CY2205-LP**[2)] 136275		
					10000	**CSDR4A3CY2210** 136276		
				4-pole	2000	**CSDR4A4CY2202** 136279		
					5000	**CSDR4A4CY2205** 136282		
					10000	**CSDR4A4CY2210** 136284		

Notes [1)] With LED (NPN) [2)] With LED (PNP)

	Description	Length mm		Switching type	Pole	**Part no.** Article no.	**Price** See price list	Std. pack
Coupler								
	Angled	–	–	–	4-pole	**CSDR4** 136271		1 off
	Straight	–	–	–	4-pole	**CSDS4** 136286		1 off
Plug								
	Angled	–	–	–	4-pole	**CSDRM4** 136285		1 off
	Straight	–	–	–	4-pole	**CSDSM4** 136297		1 off
M12 (micro) multi-connector block								
	Cable	10000	DC	PNP	4-pole	**CBDR4P10** 136318		1 off
	Cable	5000		PNP		**CBDR4P05** 136301		
	Spring cage	–		NPN		**CBDR4NSC** 136300		
	Spring cage	–		PNP		**CBDR4PSC** 136303		
	Cable	10000		PNP	6-pole	**CBDR6P10** 136319		
	Cable	5000		PNP		**CBDR6P05** 136305		
	Spring cage	–		NPN		**CBDR6NSC** 136304		
	Spring cage	–		PNP		**CBDR6PSC** 136320		
	Cable	10000		PNP	8-pole	**CBDR8P10** 136322		
	Cable	5000		PNP		**CBDR8P05** 136309		
	Spring cage	–		NPN		**CBDR8NSC** 136321		
	Spring cage	–		PNP		**CBDR8PSC** 136311		
Protection cap								
	Plug	–	–	–	–	**CBMCAP** 136298		1 off
	Coupling	–	–	–	–	**CBCAP** 136317		
	M12 sensors	–	–	–	–	**E57KP12** 136202		
	M18 sensors	–	–	–	–	**E57KP18** 136203		
	M30 sensors	–	–	–	–	**E57KP30** 136204		
Cable adapters								
	M12 sensors, metal	–	–	–	–	**E57KC12** 136184		1 off
	M18 sensors, metal	–	–	–	–	**E57KC18** 136185		
	M30 sensors, metal	–	–	–	–	**E57KC30** 136186		
	M8 sensors, metal	–	–	–	–	**E57KC8** 136187		
	M30 sensors, stainless steel	–	–	–	–	**E58KC30** 135754		

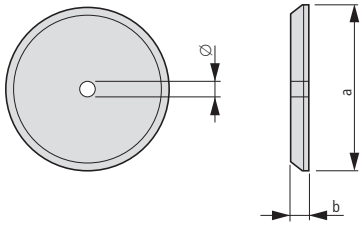
HPL03107EN

	Description	For use with	Material	Part no. Article no.	Price See price list	Std. pack
Fixing brackets						
		M8 sensors	Stainless steel	**E57KM8** 136191		1 off
		M12 sensors		**E57KM12** 136188		
		M18 sensors		**E57KM18** 136189		
		M30 sensors		**E57KM30** 136190		
		M18 sensors	Aluminium	**6161A-6501** 135736		2 off
				**6161AS5295** 135737		1 off
				**6161AS7050** 135741		
			Metal	**6167A-6501** 135742		
	Adjustable, insulated	M18 sensors	Stainless steel	**E58KAM18** 135749		
	Adjustable, not insulated	M18 sensors		**E58KAM18U** 135751		
	Adjustable, insulated	M30 sensors		**E58KAM30** 135752		
	Adjustable, not insulated	M30 sensors		**E58KAM30U** 135753		
	with ball joint	M18 sensors	Plastic	**E58KAM18B** 135750		
Spare nuts						
		M8 sensors	Metal	**E57KNM8** 136194		2 off
		M12 sensors		**E57KNM12** 136193		
		M12 sensors		**E57KNS12** 136195		
		M18 sensors	Plastic	**E57KNC18** 136192		
		M18 sensors	Metal	**E57KNS18** 136196		
		M30 sensors	Metal	**E57KNS30** 136197		
		M18 sensors	Stainless steel	**E58KNS18** 135755		1 off
		M30 sensors	Stainless steel	**E58KNS30** 135756		1 off
Sensor fixing						
		M8 sensors	–	**E57KNZ8** 136201		1 off
		M12 sensors	–	**E57KNZ12** 136198		1 off
		M18 sensors	–	**E57KNZ18** 136199		1 off
		M30 sensors	–	**E57KNZ30** 136200		1 off

	Design (outer dimensions)	Material	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Retro-reflector						
	84 mm ∅	Plastic	**6200A-6501** 135743		2 off	
	61 mm ∅	Plastic	**6200A-6502** 135744		1 off	
	33 mm ∅	Plastic	**6200A-6504** 135745		1 off	
	61 mm ∅	Plastic	**6200A-6505** 135746		1 off	
	84 mm ∅	Plastic/metal	**6200A-6506** 135747		1 off	
	38 x 81	Plastic	**6200A-6507** 135748		1 off	
	63 mm ∅	Plastic	**E65KR55** 135758		1 off	

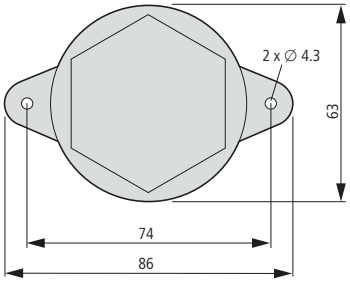
Dimensions

Retro-reflector



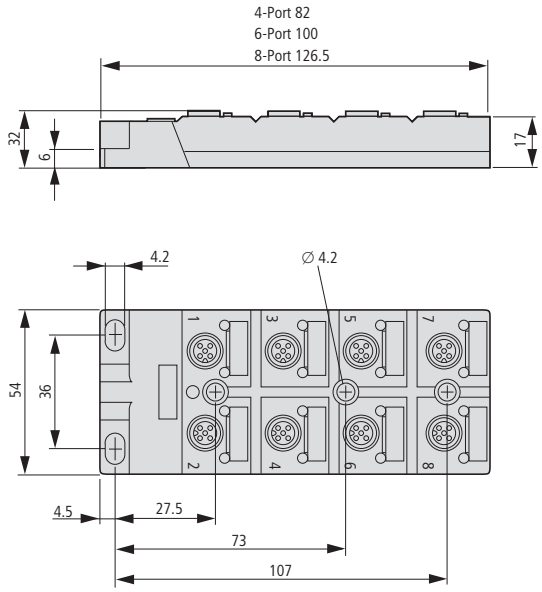
	a	b	∅
6200A-6501	84	9	5
6200A-6502	61	7.5	-
6200A-6504	33	6	-
6200A-6505	61	7.5	6
6200A-6506	84	7.5	5

E65KR55

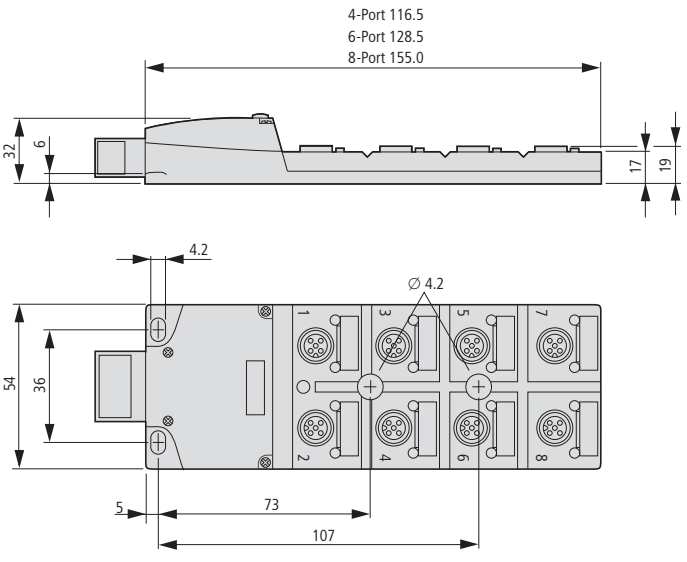


Multi-connection blocks

Cable



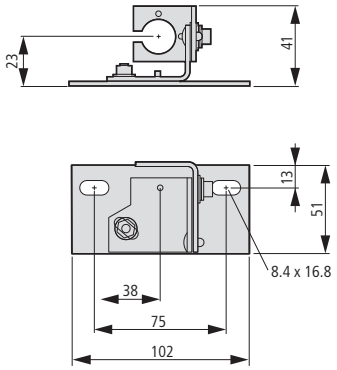
Spring cage



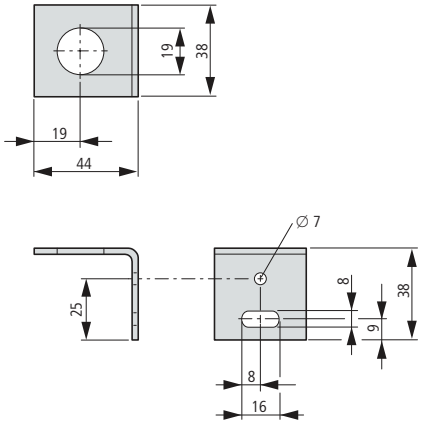
Dimensions

Fixing brackets

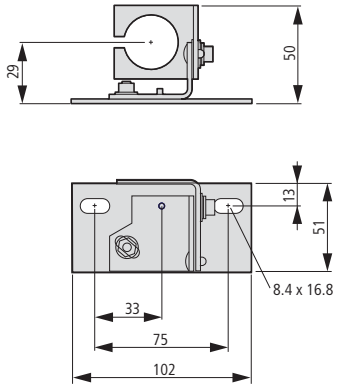
E58KAM18
E58KAM18U



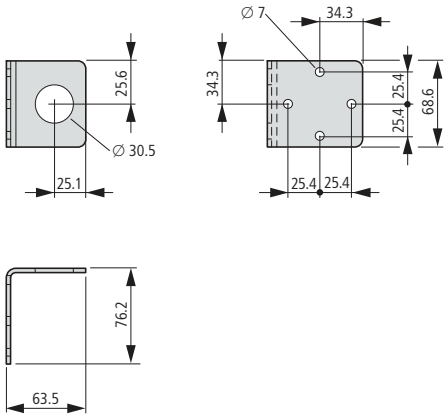
6161A-6501
6161AS-6501



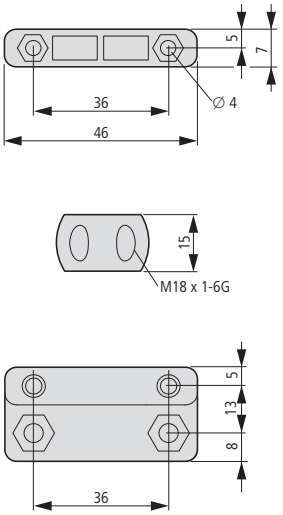
E58KAM30
E58KAM30U



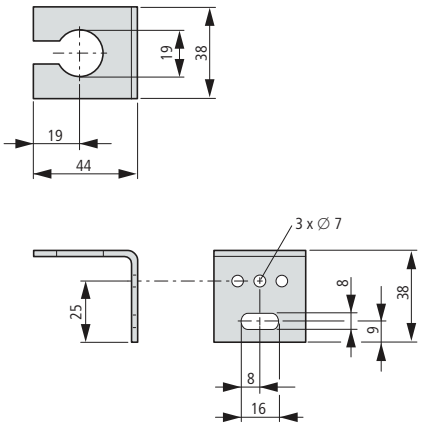
6167A-6501



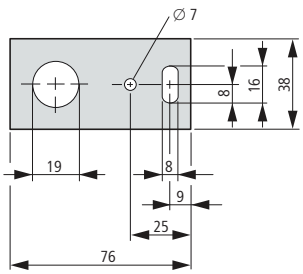
E58KAM18B



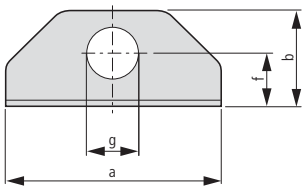
6161AS-7050



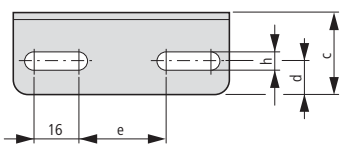
6161AS-5295



E57KM...

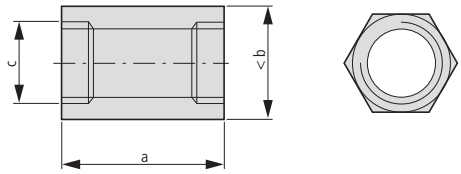


	a	b	c	d	e	f	g	h
8 mm	76	34	29	17	31	19	8	6
12 mm	76	34	29	17	31	19	12	6
18 mm	76	34	29	17	31	19	18	6
30 mm	108	55	45	25	51	29	30	7



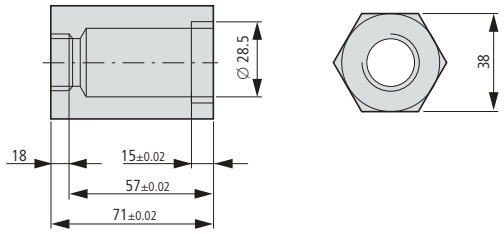
Cable adapters

E57KC...



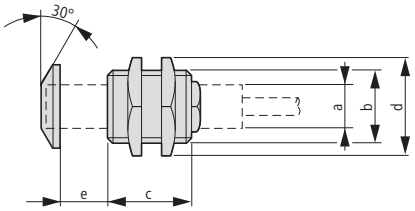
	a	b	c
8 mm	25	25	M8x1
12 mm	38	25	M12x1
18 mm	38	25	M18x1
30 mm	48	38	M30x1.5

E58KC30



Sensor fixing

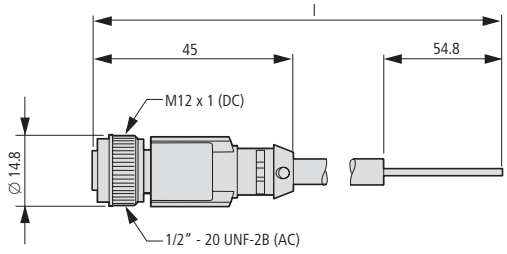
E57KNZ



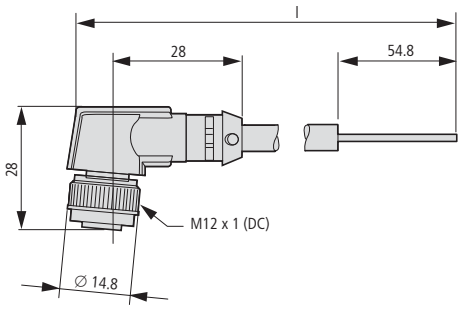
	a	b	c	d	e
8 mm	M8x1	M16x1.5	22	22	9
12 mm	M12x1	M22x1.5	22	29	10
18 mm	M18x1	M30x1.5	30	36	12
30 mm	M30x1.5	M47x1.5	37	51	15

Connecting cables

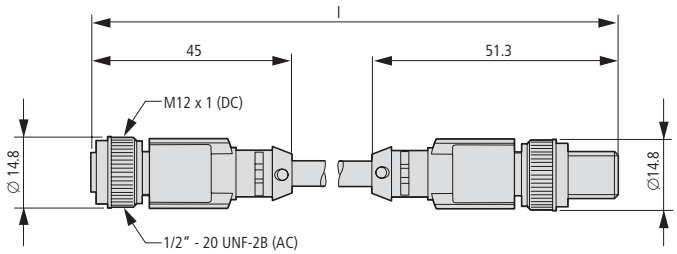
Coupling straight, cable end open



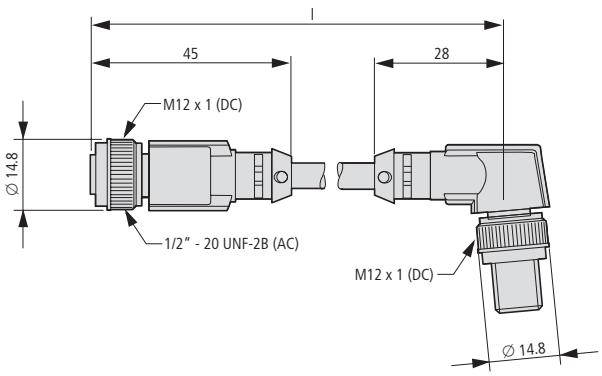
Coupling angled, cable end open

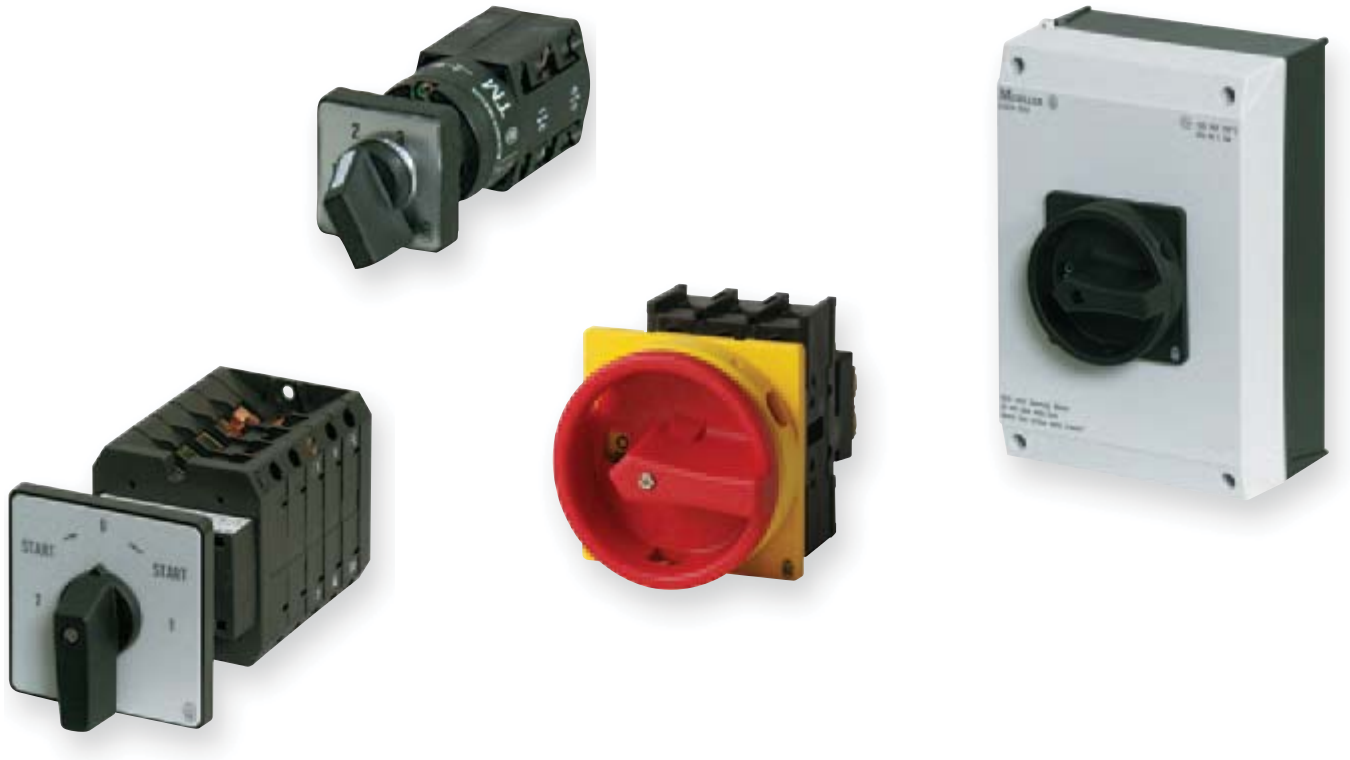


Straight coupling, straight plug



Coupling angled, angled





T Cam switches
P Switch-disconnectors up to 315 A

The high performance and robust cam switch and switch-disconnector are used in industry, manual applications and building services management. Ten basic switch types in four different construction types can be selected in a multitude of standard contact sequences and a wide performance range.

ATEX

T/TM Cam switches
Performance up to 10/132 kW +++ Non-standard switches possible (see Online Catalog) +++ Several construction types

P switch-disconnectors
Performance up to 110 kW and 315 A +++ Switches up to 100 A (P1, P3) in housing IP65 +++ Four construction types

Switch for ATEX Zone 22
T Cam switches +++ Switch-disconnector up to 100 A (P1, P3) +++ IP65 Protection type

Cam switches, switch-disconnectors up to 315 A



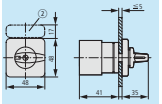












Cam switches, switch-disconnectors

Technical overview

- Cam switches, switch-disconnectors 4/2

System overview

- Cam switches 4/4
- Switch-disconnectors 4/6

Description

- Key to part numbers, modular system 4/8

Ordering

- Switch-disconnectors, main switches maintenance/manual override switches 4/10
- Switch-disconnectors – On-Off switches 4/22
- Switch-disconnectors – safety switches 4/30
- Switch-disconnectors – changeover switches 4/32
- Switch-disconnectors – reversing switches 4/38
- Switch-disconnector - (reversing) star-delta switches, reversing multi-speed switch 4/38
- Switch-disconnectors – multi-speed switches 4/40
- Control switches - step switches 4/42
- Control switches - On-Off switches 4/46
- Control switches - changeover switches, manual/automatic switches 4/48
- Control switches – On switches 4/50
- Universal control switches 4/52
- Control switches - instrument switches 4/54
- Switch with locking mechanism 4/56
- Main switch assembly kits, thumb-grips, maintenance key 4/58
- Front plates 4/59
- Add-on front plates 4/60
- Key operation, locking interlock 4/62
- Neutral conductor, auxiliary contact, centre mounting accessories, service distribution board mounting accessories 4/64
- Coupling drive, interlock parts, shaft extension 4/65
- Shrouds, keys 4/66
- Accessories 4/67
- Non-standard switches 4/79

Technical data

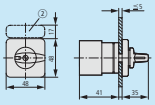
- Switch-disconnectors 4/89
- Switch-disconnectors, auxiliary contacts 4/92
- Cam switch 4/94

Dimensions

- Cam switches, switch-disconnectors 4/100









Mini rotary switches

Technical overview

- Mini rotary switches 4/2

Description

- Key to part numbers, modular system 4/9

System overview

- Mini rotary switches 4/68

Ordering

- Control circuit isolator, ON/OFF switches 4/60
- Changeover switches 4/71
- Hand/Auto switches 4/72
- Control switch - step switch 4/72
- Control switches - group switches, ON/ OFF switches, reversing switches, coding switches 4/75
- Locks, front plates 4/77
- Non-standard switches 4/83

Technical data

- Mini rotary switches 4/99

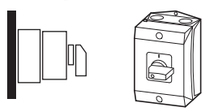
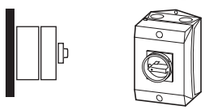
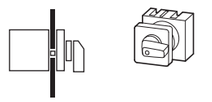
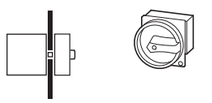
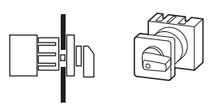
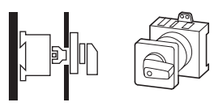
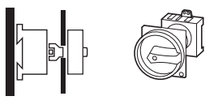
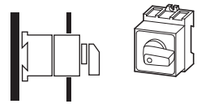
Dimensions

- Mini rotary switches 4/111

CI-K and CI basic enclosures and small enclosures 20/92

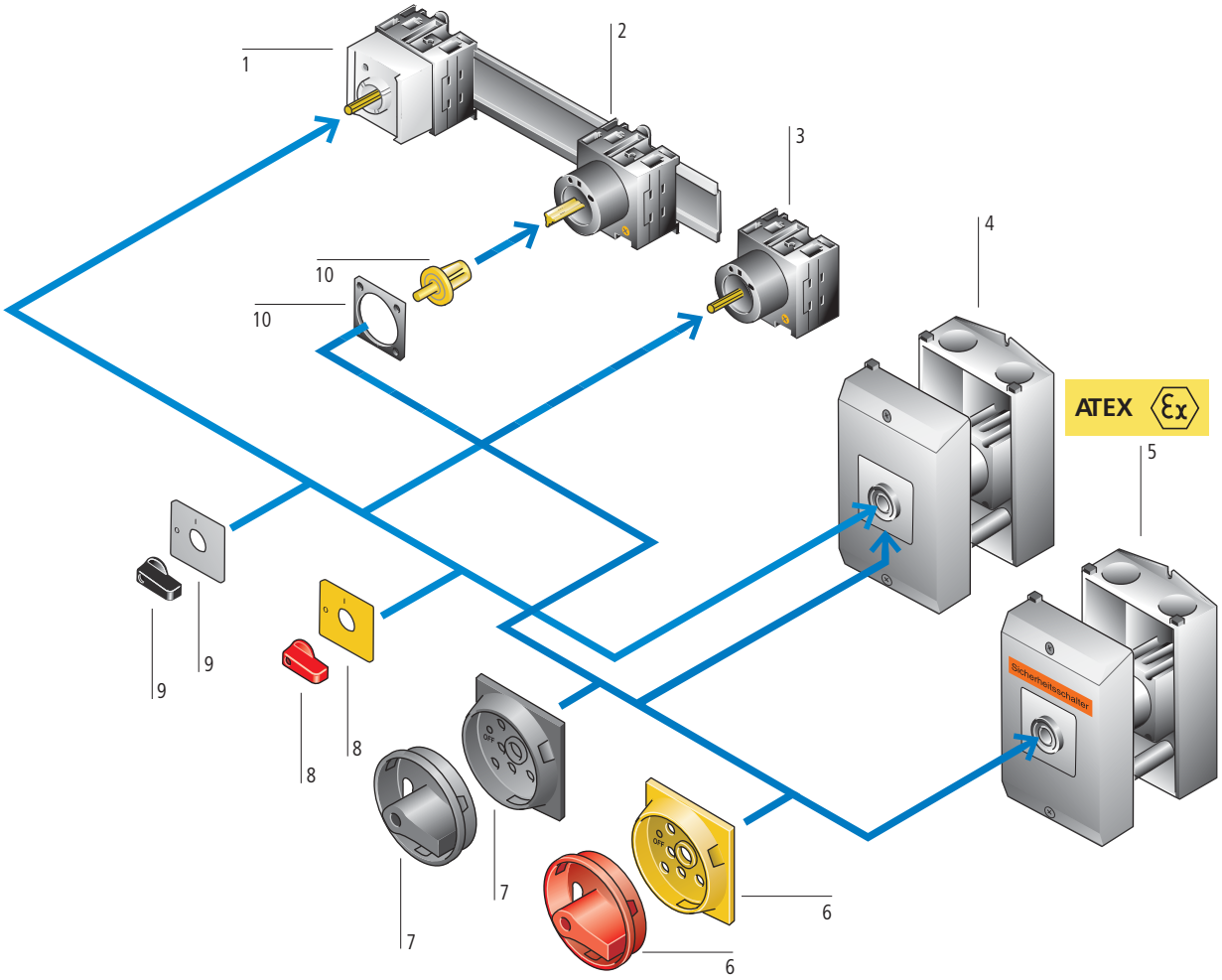
T, P, TM

T, P, TM

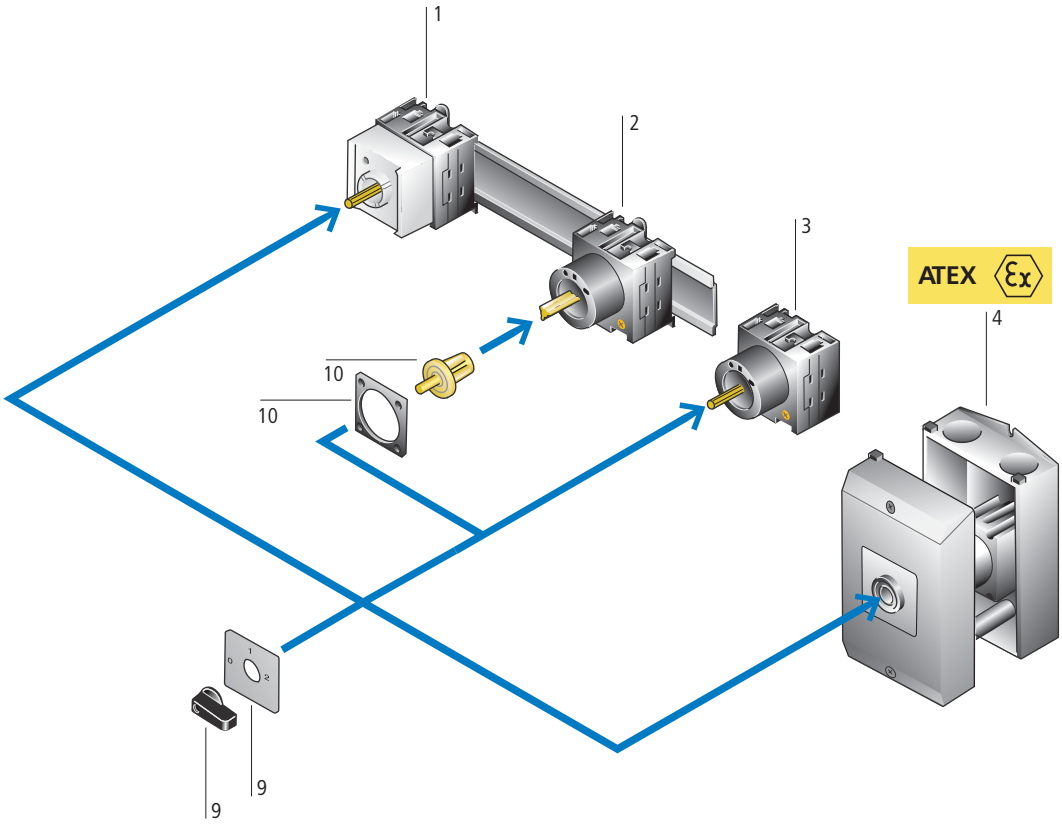
	Switch, basic type Max. motor rating AC-23 A, 400/415 V, 50/60 Hz Max. rated operational current I_u	Part no.	TM 3.0 kW ≦ 10 A	T0 6.5 kW 20 A	T3 13 kW 32 A	T5B 22 kW 63 A	T5 30 kW 100 A	T6 55 kW 160 A	T8 132 kW 315 A	P1-25 13 kW 25 A	P1-32 15 kW 32 A	P3-63 37 kW 63 A	P3-100 50 kW 100 A	P5-125 45 kW 125 A	P5-160 55 kW 160 A	P5-250 90 kW 250 A	P5-315 110 kW 315 A
Switch-disconnectors																	
	Main switches, maintenance/manual override switches		–	→ 4/10	→ 4/10	→ 4/10	→ 4/12	→ 4/14	→ 4/14	→ 4/10	→ 4/10	→ 4/10	→ 4/10	→ 4/10	→ 4/10	→ 4/10	→ 4/10
	On-Off switches		→ 4/70	→ 4/22	→ 4/22	→ 4/22	→ 4/26	–	–	→ 4/28	→ 4/22	→ 4/22	→ 4/22	→ 4/22	→ 4/22	→ 4/22	→ 4/22
	Safety switches with warning label		–	–	–	→ 4/30	→ 4/30	–	–	→ 4/30	→ 4/30	→ 4/30	→ 4/30	–	–	–	–
	Changeover switches		–	→ 4/32	→ 4/32	→ 4/32	→ 4/32	→ 4/32	→ 4/32	–	–	–	–	–	–	–	–
	Reversing switch with 0 position		–	→ 4/38	→ 4/38	→ 4/38	–	–	–	–	–	–	–	–	–	–	–
	Star-delta switches		–	→ 4/38	→ 4/38	→ 4/38	–	–	–	–	–	–	–	–	–	–	–
	Reversing star-delta switches		–	→ 4/38	→ 4/38	→ 4/38	–	–	–	–	–	–	–	–	–	–	–
	Multi-speed switch		–	→ 4/40	→ 4/40	→ 4/40	–	–	–	–	–	–	–	–	–	–	–
	Reversing multi-speed switches		–	→ 4/40	→ 4/40	→ 4/40	–	–	–	–	–	–	–	–	–	–	–
Control switch																	
	Step switch		→ 4/72	→ 4/42		–	–	–	–	–	–	–	–	–	–	–	–
	On-Off switches		–	→ 4/46	–	–	–	–	–	–	–	–	–	–	–	–	–
	Changeover switches		→ 4/71	→ 4/48	–	–	–	–	–	–	–	–	–	–	–	–	–
	Manual/Auto switches		→ 4/72	→ 4/48	–	–	–	–	–	–	–	–	–	–	–	–	–
	Push button switch		–	→ 4/50	–	–	–	–	–	–	–	–	–	–	–	–	–
	Universal control switches		–	→ 4/52	–	–	–	–	–	–	–	–	–	–	–	–	–
	Coding switches		→ 4/76	→ 4/52	–	–	–	–	–	–	–	–	–	–	–	–	–
	Series switches		–	→ 4/52	–	–	–	–	–	–	–	–	–	–	–	–	–
	Instrument selector switches		–	→ 4/54	–	–	–	–	–	–	–	–	–	–	–	–	–
	Group switches		→ 4/75	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	ON OFF button		→ 4/75	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Reversing switch		→ 4/76	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Switches with interlocks																	
	Panic switches without emergency switching off function		–	→ 4/56	–	–	–	–	–	→ 4/56	→ 4/56	–	–	–	–	–	–
	On-Off switches without Emergency-Stop function		–	→ 4/56	–	–	–	–	–	→ 4/56	→ 4/56	–	–	–	–	–	–
Non-standard switches			→ 4/83	→ 4/79	→ 4/80	→ 4/81	→ 4/82	–	–	–	–	–	–	–	–	–	–
Mounting form																	
	Surface mounting	…/I…	–	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	–
		ATEX	–	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	–
	Surface mounting main switches	…/I…/SVB…	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
		ATEX	–	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	–
	Mounting	.../E…	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Flush mounting main switch	…/E(A)/SVB…	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	✓	✓	✓
	Center mounting	…/EZ…	✓	✓	✓	–	–	–	–	✓	✓	–	–	–	–	–	–
	Rear mounting	…/Z…	–	✓	✓	✓	✓	–	–	✓	✓	✓	✓	–	–	–	–
	Rear mounting main switches	…/V/SVB…	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Service distribution board mounting	…/IVS…	✓	✓	–	–	–	–	–	✓	✓	✓	✓	–	–	–	–

System overview

ON-OFF switches T0, T3, T5B, T5



Control switches T0, T3, T5B, T5



Service distribution board mounting (…/IVS) 1

Front IP30

Can be snapped onto top-hat rail as per IEC/EN 60715 (only T0 and T3)

Mounting

- In service distribution board up to 3 contact units (45 mm mounting depth)
- In control panel up to 11 contact units

→ Page 4/22

Rear mounting (.../Z) 2

Front IP65

Fixing: optionally with screw fixing or snap fitting, only T0 und T3

For snap fitting to IEC/EN 60715 top-hat rail

Drive coupling in door or cover

Connection from front

→ Page 4/22

Rear mounting main switch (...V/SVB) 2

Front IP65

To IEC/EN 60204, VDE 0113 and IEC/EN 60947-3

For T0…: up to 8 contacts; For T3…: up to 12 contacts

With door interlock in "I" position

→ Page 4/10

Flush mounting (.../E) 3

Front IP65

Flush mounting and connection from rear

Terminals:

Crosshead screwdriver Pozidrive

T8 always with extension terminals

→ Page 4/22

Flush mounting main switch (.../EA/SVB) 3

Front IP65

To IEC/EN 60204, VDE 0113 and IEC/EN 60947-3,

For T0…: up to 8 contacts; For T3…: up to 12 contacts

N and PE terminal

→ Page 4/10

Center mounting (.../EZ) 3

Front IP65

Mounted in ∅ 22.3 fixing hole to IEC/EN 60947-5-1

"One man mounting" by center fixing

→ Page 4/22

Surface mounting (.../I...) 4

IP65

totally insulated

With an additional terminal

Enclosures for metric cable glands to EN 50262

→ Page 4/22

Surface mounting main switch (.../I...) 4

IP65

totally insulated

To IEC/EN 60204, VDE 0113 and IEC/EN 60947-3,

For T0…: up to 8 contacts; For T3…: up to 10 contacts

Position 0 lockable with 3 padlocks

Enclosures for metric cable glands to EN 50262

With an additional terminal

→ Page 4/10

ATEX

→ Page 4/58

Safety switch (.../I...) 5

IP65

totally insulated

With an additional terminal

With cover fixing in 0 position

Position 0 lockable with 3 padlocks

Enclosures for metric cable glands to EN 50262

"Safety Switch" label; color: orange

→ Page 4/30

ATEX

→ Page 4/58

Main switch (kit) for use as emergency switching off device 6

To IEC/EN 60204-1,VDE 0113 part 1

With red rotary handle and yellow locking collar

Lockable in the 0 (Off) position

→ Page 4/58

Main switch (kit) 7

Black rotary handle and locking collar

Lockable in the 0 position

→ Page 4/58

Thumb-grip, for use as emergency switching off device 8

To IEC/EN 60204-1, VDE 0113 part 1

Red thumb-grip and yellow front plate

→ Page 4/58

Thumb-grip 9

Black thumb-grip with front plate

→ Page 4/58

Coupling drive 10

Including push-fit shaft

For the retrofitting of switch T0(T3)-.../XZ as rear mounting, spare part for T0(T3)/(P1)-.../Z

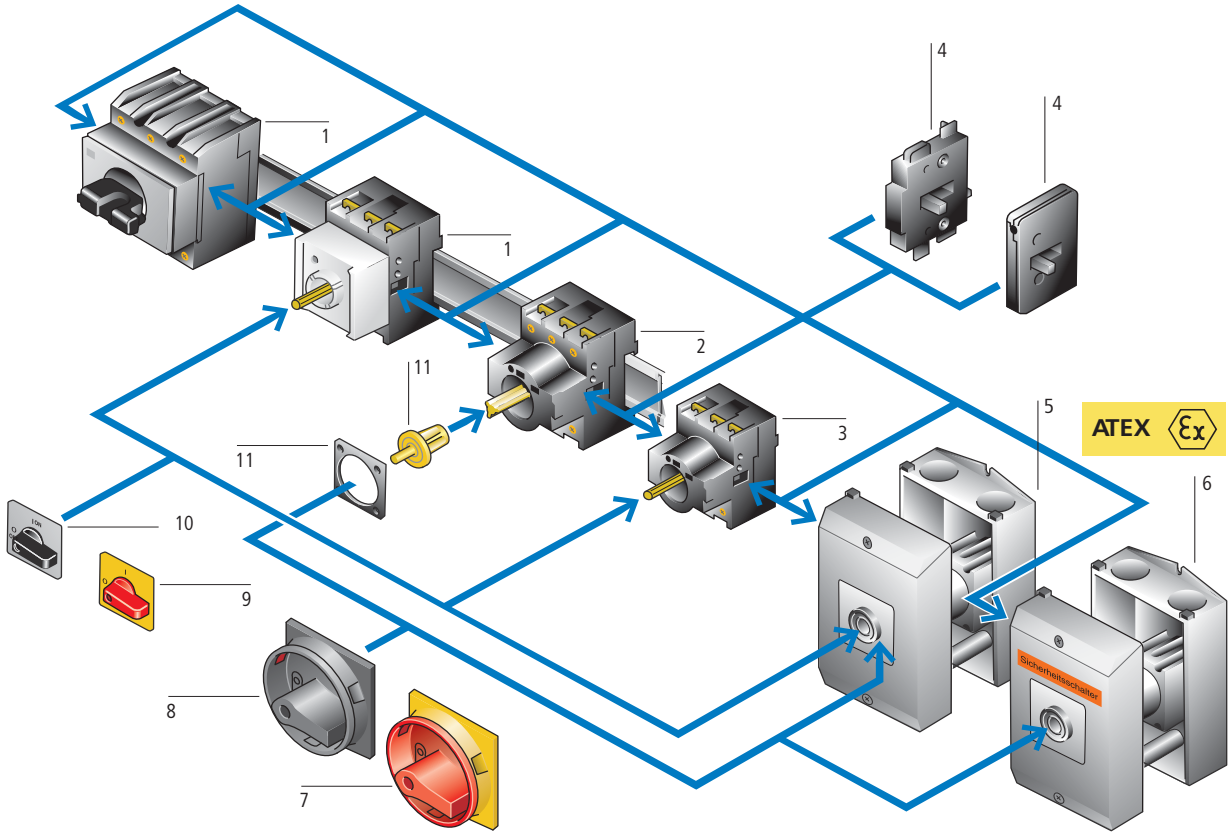
For the conversion of T5(B)-.../E flush mounting switch to rear mounting, spare part for T5(B)/(P3)-...Z

→ Page 4/65

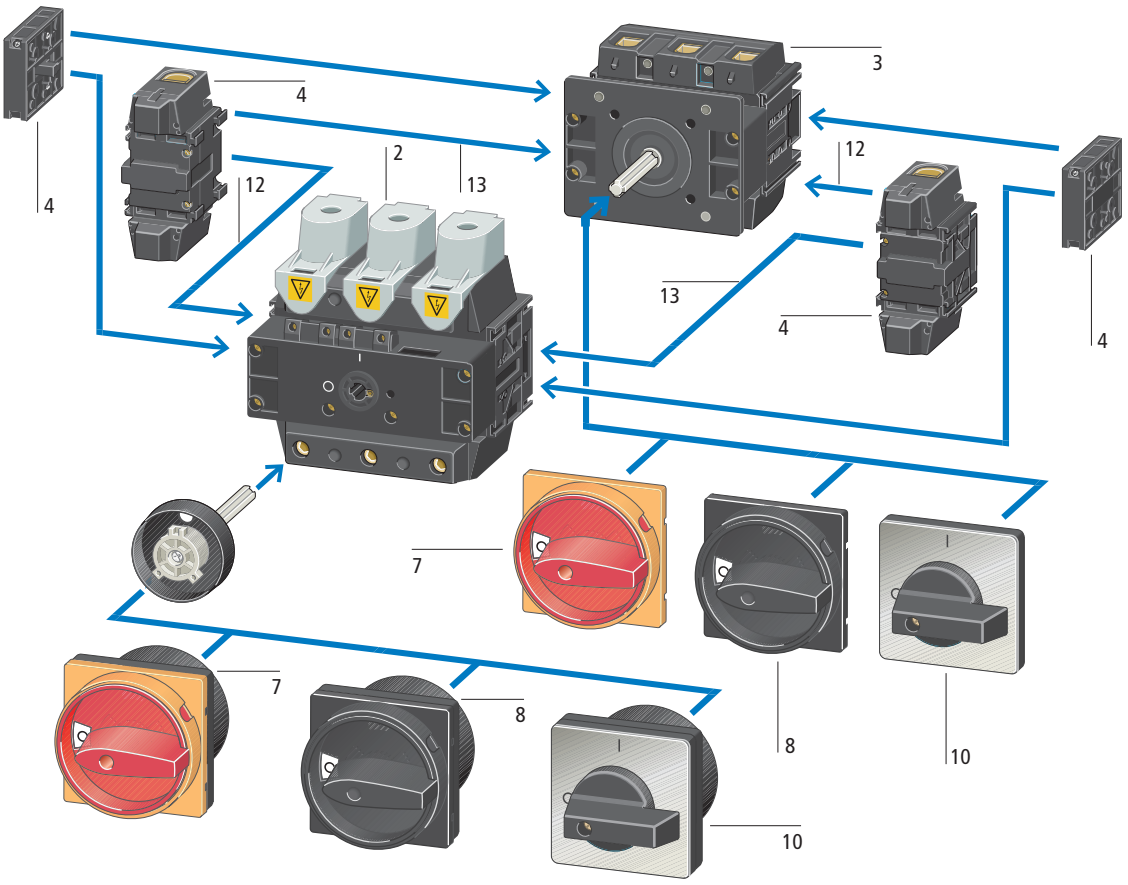
Note:

Cam switches T5 and T5B are only available with screw connections for fixing on a mounting plate.

ON-OFF switches P1, P3



ON OFF switches P5



Service distribution board mounting (…/IVS) 1
Front IP30
Fitting dimensions according to DIN 43880
For snap fitting to top-hat rail according to IEC/EN 60715
Space requirement
P1, 3 pole: 3 space units
P3, 3 pole: 4 space units
P3-…/IVS lockable with padlock in "0" position
→ Page 4/22

Rear mounting (…/Z) 2
Front IP65
Fixing either by snap-on or screw fixing
For snap fitting to top-hat rail according to IEC/EN 60715
Drive coupling in door or cover
Connection from front
2 add-on modules can be retrofitted
→ Page 4/22

Rear mounting main switch (…V/SVB) 2
Front IP65
To IEC/ENEN 60204, VDE 0113 and IEC/EN 60947-3
With door interlock in "I" position
Maintenance key for commissioning or fault-finding
Position 0 lockable with 3 padlocks
2 add-on modules can be retrofitted
→ Page 4/10

Flush mounting (…/E) 3
Front IP65
Flush mounting and connection from rear
Terminals: Crosshead screwdriver Pozidrive
Back-of-hand proof
2 add-on modules can be retrofitted
→ Page 4/22

Flush mounting main switch (…/EA/SVB) 3
Front IP65
To IEC/ENEN 60204, VDE 0113 and IEC/EN 60947-3
N and PE terminal
Position 0 lockable with 3 padlocks
2 add-on modules can be retrofitted
→ Page 4/10

Center mounting (…/EZ) 3
Front IP65
Mounted in ∅ 22.3 fixing hole to IEC/EN 60947-5-1
"One man mounting" by center fixing
→ Page 4/22

Add-on modules 4
Switchable N conductor (early-make N/O contact)
Auxiliary contacts
Finger proof
Auxiliary N/O contact: Always connected as a load-shedding contact (late-make on, late-break off)
→ Page 4/64

Surface mounting (…/I…) 5
IP65
totally insulated
With an additional terminal
Installable add-on modules:
P1: HI 11-P1/P3 or N-P1…, P3: HI 11-P1/P3 and/or N-P5
Enclosures for metric cable glands to EN 50262
→ Page 4/22

Surface mounting main switch (…/I…) 5
IP65
totally insulated
With an additional terminal
To IEC/ENEN 60204, VDE 0113 and IEC/EN 60947-3
Position 0 lockable with 3 padlocks
Installable add-on modules:
P1: HI 11-P1/P3 or N-P1…, P3: HI 11-P1/P3 and/or N-P5
Enclosures for metric cable glands to EN 50262
→ Page 4/10

ATEX

→ Page 4/58

Safety switch (…/I…-SI) 6
IP65
totally insulated
With an additional terminal
With cover fixing in 0 position
Position 0 lockable with 3 padlocks
"Safety Switch" label; color: orange
Enclosures for metric cable glands to EN 50262
→ Page 4/30

ATEX

→ Page 4/58

Main switch (kit) for use as emergency switching off device 7
To IEC/EN 60204-1, VDE 0113 Part 1
With red rotary handle and yellow locking collar
Lockable in the 0 (Off) position
→ Page 4/58

Main switch (kit) 8
Black rotary handle and locking collar
Lockable in the 0 position
→ Page 4/58

Thumb-grip, for use as emergency switching off device 9
To IEC/EN 60204-1, VDE 0113 Part 1
Red thumb-grip and yellow front plate
→ Page 4/58

Thumb-grip 10
Black thumb-grip with front plate
→ Page 4/58

Coupling drive 11
Including push-fit shaft
For retrofitting mounting switches T0(T3)-…/XZ as rear mounting design spare part for T0(T3)/(P1)-…/Z
For converting flush mounting switches T5(B)-…/E into rear mounting switch spare part for T5(B)/(P3)-…Z
→ Page 4/65

Ground terminal 12
Front mounting, right
Service distribution board mounting, left

Neutral terminal 13
Front mounting, left
Service distribution board mounting, right
→ Page 4/64

T0, T3, T5, T5B

Description

Cam switches can be used for many switching and control applications. For example as ON-OFF switches, main switches, main/control switches, instrument switches.

The switches consist of a hand actuator, the switch unit and the mounting accessories.

The contact chamber (contact unit = BE) contains 1 or 2 contacts.

Our "T Cam Switches" catalog has over 800 popular standard contact sequences (please request under K115D/F/GB, article no. 077643).

The following pages feature a selection of our standard contact sequences.

T cam switches and P switch-disconnectors are manufactured without PCB, CFC, asbestos and silicon.The contacts are cadmium free.

The CI-K... insulated enclosures are silicon and halogen free.

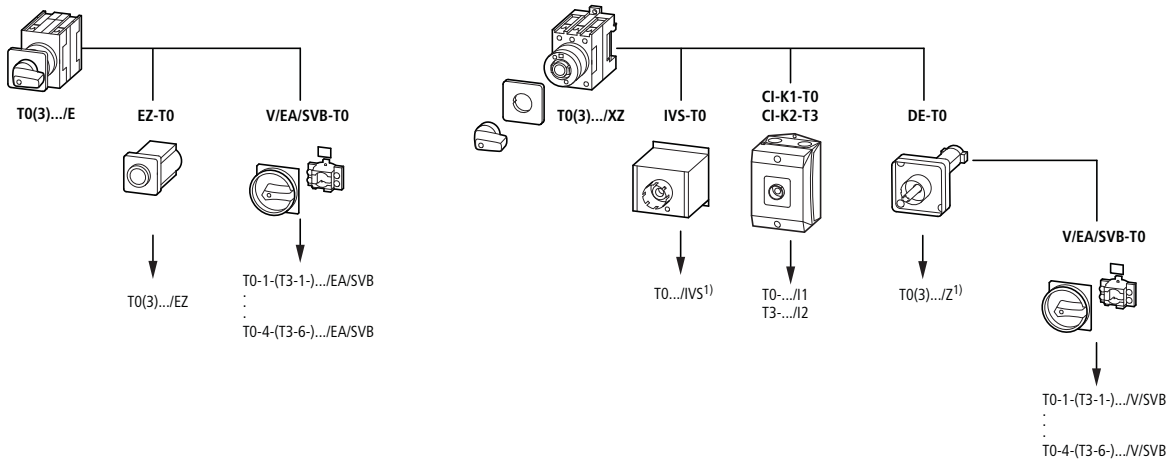
Cam switches T0 and T3

Key to part numbers

T..... ... - .....- ..../ ....

↑	↑	↑	↑
Switch size T0 or T3	**Number of contact chambers** = contact units	**Contact sequence number**	**Mounting form** → Page 4/2

Using the modular system to convert the mounting form



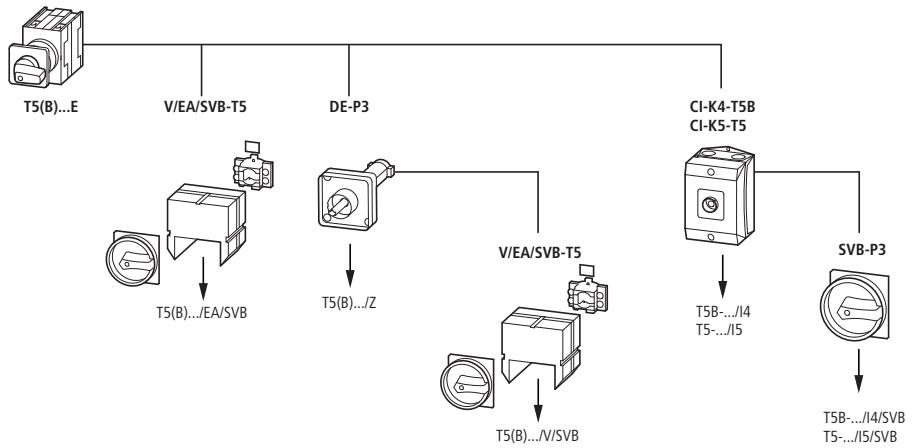
Cam switch TB5

Key to part numbers

T..... ... - .....- ..../ ....

↑	↑	↑	↑
Switch size T5(B)	**Number of contact chambers** = contact units	**Contact sequence number**	**Mounting form** → Page 4/2

Using the modular system to convert the mounting form T5(B)



Note 1) Including shaft

P1, P3, TM

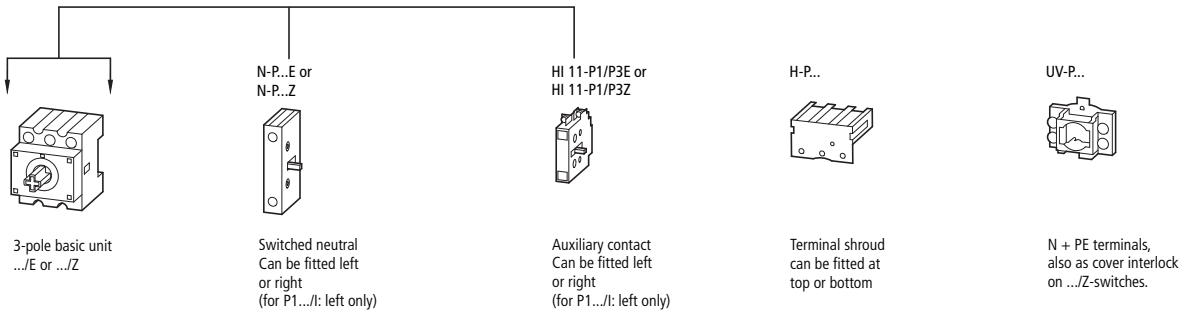
Switch-disconnectors P1 and P3

Key to part numbers

P. . . . . - . . . . . / . . . . - . . . . . / . . . . . .

↑	↑	↑	↑	↑
Switch size P1 or P3	**Rated uninterrupted current**	**Mounting form** → Page 4/2	**Part no. suffix** (if required)	**Accessories** from → Page 7/47

Add-on functions due to modular system



TM mini cam switches

The TM mini cam switch is a particularly small switch with a small space requirement. It is ideally suited for small voltages and currents such as electronic controls. For greater safety the contacts are gold plated.

TM switches have consecutive terminal markings starting with 1.

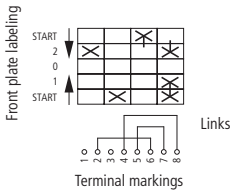
Selection pages: Starting on → Page7/54

Key to part numbers

TM-. . . . . - . . . . / . . . . + ...

↑	↑	↑	↑
Number of contact chambers = contact units	**Contact sequence number**	**Mounting form** → Page 4/2	**Accessories** → Page 7/59

Circuit representation



(see also ordering example in the electronic catalogue)

Switch from 0 to 1 Contact 1 – 2 open, Contact 3 – 4 open, Contact 5 – 6 open, Contact 7 – 8 closed	Switch from 1 to START with automatic return to 1 Contact 1 – 2 open, Contact 3 – 4 closed, Contact 5 – 6 open, Contact 7 – 8 remains closed	Switch from 1 to 0 Contact 1 – 2 open, Contact 3 – 4 open, Contact 5 – 6 open, Contact 7 – 8 open
Switch from 0 to 2 Contact 1 – 2 closed, Contact 3 – 4 open, Contact 5 – 6 open, Contact 7 – 8 closed	Switch from 2 to START with automatic return to 2 Contact 1 – 2 open, Contact 3 – 4 open, Contact 5 – 6 closes with early make, Contact 7 – 8 opens with late break	Switch from 2 to 0 Contact 1 – 2 open, Contact 3 – 4 open, Contact 5 – 6 open, Contact 7 – 8 open

Ordering

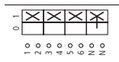
Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65**		Surface mounting **IP65** totally insulated		Rear mounting **Front IP65**		Std. pack	Information relevant for export to North America
		Pole			400 V		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
	FS 908	N/O	N/O	N/C	P kW	I_u A								
Main switch as emergency switching off/emergency stop device														
With red rotary handle and yellow locking collar To IEC/EN 60204-1, VDE 0113 Part 1 Lockable in the 0 (Off) position														
Without auxiliary contacts														
1 0 2 0	1	0	0	6.5	20	**T0-1-8200/EA/SVB** 053110		**T0-1-8200/I1/SVB** 207145		**T0-1-8200/V/SVB** 057856		1 Off	1)
				13	32	**T3-1-8200/EA/SVB**[1] 066576		**T3-1-8200/I2/SVB**[2] 207200	1 Off	**T3-1-8200/V/SVB**[1] 007255			Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits, suitable as motor disconnect Degree of Protection: IEC: IP65; UL/CSA Type 3R, 12
				22	63	**T5B-1-8200/EA/SVB**[3] 094279		**T5B-1-8200/I4/SVB**[3] 207240	1 Off	**T5B-1-8200/V/SVB**[3] 094273			
1 0 2 0 3 0 4 0	2	0	0	6.5	20	**T0-1-102/EA/SVB**[1] 091078		**T0-1-102/I1/SVB** 207143	1 Off	**T0-1-102/V/SVB**[1] 095824			
				13	32	**T3-1-102/EA/SVB**[1] 014374		**T3-1-102/I2/SVB**[2] 207198	1 Off	**T3-1-102/V/SVB**[1] 019120			
				22	63	**T5B-1-102/EA/SVB**[3] 094469		**T5B-1-102/I4/SVB**[3] 207238	1 Off	**T5B-1-102/V/SVB**[3] 094463			
				30	100	**T5-1-102/EA/SVB** 098808		**T5-1-102/I5/SVB** 207273	1 Off			1 Off	
1 0 2 0 3 0 4 0 5 0 6 0	3	0	0	6.5	20	**T0-2-1/EA/SVB**[1] 038873		**T0-2-1/I1/SVB** 207147	1 Off	**T0-2-1/V/SVB**[1] 043619		1 Off	2)
				13	25	**P1-25/EA/SVB**[1] 041097		**P1-25/I2/SVB**[2] 207293	1 Off	**P1-25/V/SVB**[2] 055335			Product Standards: UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits, suitable as motor disconnect Degree of Protection: IEC: IP65; UL/CSA Type 3R, 12
				13	25			**P1-25/I2H/SVB** 226900	1 Off				
				15	32	**P1-32/EA/SVB**[1] 081438		**P1-32/I2/SVB**[2] 207314	1 Off	**P1-32/V/SVB**[1] 095676			
				37	63	**P3-63/EA/SVB**[1] 031607		**P3-63/I4/SVB**[1] 207343	1 Off	**P3-63/V/SVB**[1] 048218			
				45	125	**P5-125/EA/SVB**[4] 280898				**P5-125/V/SVB**[4] 280914			
				50	100	**P3-100/EA/SVB**[1] 074320		**P3-100/I5/SVB**[1] 207373	1 Off	**P3-100/V/SVB**[1] 088558			
				55	160	**P5-160/EA/SVB**[4] 280922				**P5-160/V/SVB**[4] 280928			
				90	250	**P5-250/EA/SVB**[4] 280936				**P5-250/V/SVB**[4] 280942			
				110	315	**P5-315/EA/SVB**[4] 280950				**P5-315/V/SVB**[4] 280956			
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0	3 + N	0	0	6.5	20	**T0-2-8900/EA/SVB**[1] 207400		**T0-2-8900/I1/SVB** 207151	1 Off	**T0-2-8900/V/SVB**[1] 207405		1 Off	3)
1 0 2 0 3 0 4 0 5 0 6 0 N 0				13	25	**P1-25/EA/SVB/N**[1] 081587		**P1-25/I2/SVB/N**[2] 207298	1 Off	**P1-25/V/SVB/N**[2] 086333			Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking UL File No.: E36332 UL CCN: NLRV7 CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits, suitable as motor disconnect Degree of Protection: IEC: IP65; UL/CSA Type 1, 3R, 12, 13
				13	25			**P1-25/I2H/SVB/N** 227860	1 Off				
				15	32	**P1-32/EA/SVB/N**[1] 091079		**P1-32/I2/SVB/N**[2] 207319	1 Off	**P1-32/V/SVB/N**[1] 095825			
				15	32			**P1-32/I2H/SVB/N** 227871	1 Off				
				37	63	**P3-63/EA/SVB/N**[1] 010398		**P3-63/I4/SVB/N**[1] 207349	1 Off	**P3-63/V/SVB/N**[1] 015144			
				45	125	**P5-125/EA/SVB/N**[4] 280910				**P5-125/V/SVB/N**[4] 280916			
				50	100	**P3-100/EA/SVB/N**[1] 019890		**P3-100/I5/SVB/N**[1] 207379	1 Off	**P3-100/V/SVB/N**[1] 024636			
				55	160	**P5-160/EA/SVB/N**[4] 280924				**P5-160/V/SVB/N**[4] 280930			

Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65**			Surface mounting **IP65** totally insulated			Rear mounting **Front IP65**			
		Pole			400 V		**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
	FS 908	N/O	N/O	N/C	P kW	I_u A										
Main switch as emergency switching off/emergency stop device																
With red rotary handle and yellow locking collar To IEC/EN 60204-1, VDE 0113 Part 1 Lockable in the 0 (Off) position																
Without auxiliary contacts																
	3 + N	0	0	90	250	**P5-250/EA/SVB/N**[4] 280938		1 Off				**P5-250/V/SVB/N**[4] 280944		1 Off	1)	
	3 + N	0	0	110	315	**P5-315/EA/SVB/N**[4] 280952						**P5-315/V/SVB/N**[4] 280958			Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
	6	0	0	6.5	20	**T0-3-8342/EA/SVB**[1] 029382			**T0-3-8342/I1/SVB** 207159		1 Off	**T0-3-8342/V/SVB**[1] 034128			UL File No.	E36332
				13	32	**T3-3-8342/EA/SVB**[1] 071326			**T3-3-8342/I2/SVB**[2] 207208		1 Off	**T3-3-8342/V/SVB**[1] 076072			UL CCN	NLRV
				22	63	**T5B-3-8342/EA/SVB**[3] 092308			**T5B-3-8342/I4/SVB**[3] 207242		1 Off	**T5B-3-8342/V/SVB**[3] 092300			CSA File No.	12528
				30	100	**T5-3-8342/EA/SVB** 096383		1 Off	**T5-3-8342/I5/SVB** 207279		1 Off	**T5-3-8342/V/SVB** 096381		1 Off	CSA Class No.	3211-05
	8	0	0	6.5	20	**T0-4-8344/EA/SVB**[1] 008267		1 Off	**T0-4-8344/I1/SVB** 207163		1 Off	**T0-4-8344/V/SVB**[1] 014007		1 Off	NA Certification	UL Listed, CSA certified
				13	32	**T3-4-8344/EA/SVB**[1] 008964			**T3-4-8344/I2/SVB**[2] 207212		1 Off	**T3-4-8344/V/SVB**[1] 020598			Suitable for	Branch circuits, suitable as motor disconnect
				22	63	**T5B-4-8344/EA/SVB**[3] 092062			**T5B-4-8344/I4/SVB**[3] 207248		1 Off	**T5B-4-8344/V/SVB**[3] 092056			Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12
				30	95				**T5-4-8344/I5/SVB** 207283		1 Off					
				30	100	**T5-4-8344/EA/SVB** 095961		1 Off				**T5-4-8344/V/SVB** 095959		1 Off		
With auxiliary contacts																
	3	1	0	6.5	20	**T0-2-15679/EA/SVB**[1] 081588		1 Off	**T0-2-15679/I1/SVB** 207149		1 Off	**T0-2-15679/V/SVB**[1] 086334		1 Off	2)	
	3	1	1	13	25	**P1-25/EA/SVB/HI11**[1] 091080			**P1-25/I2/SVB/HI11**[2] 207297		1 Off	**P1-25/V/SVB/HI11**[1] 095826			Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
				13	25				**P1-25/I2H/SVB/HI11** 226902		1 Off				UL File No.	E36332
				15	32	**P1-32/EA/SVB/HI11**[1] 072567			**P1-32/I2/SVB/HI11**[1] 207318		1 Off	**P1-32/V/SVB/HI11**[1] 015145			UL CCN	NLRV
				15	32				**P1-32/I2H/SVB/HI11** 227870		1 Off				CSA File No.	12528
				37	63	**P3-63/EA/SVB/HI11**[1] 019891			**P3-63/I4/SVB/HI11**[1] 207348		1 Off	**P3-63/V/SVB/HI11**[1] 024637			CSA Class No.	3211-05
				50	100	**P3-100/EA/SVB/HI11**[1] 029383			**P3-100/I5/SVB/HI11**[1] 207378		1 Off	**P3-100/V/SVB/HI11**[1] 034129			NA Certification	UL Listed, CSA certified
	3	1	0	45	125	**P5-125/EA/SVB/HI10**[4] 280899		1 Off				**P5-125/V/SVB/HI10**[4] 280915		1 Off	Suitable for	Branch circuits, suitable as motor disconnect
				55	160	**P5-160/EA/SVB/HI10**[4] 280923						**P5-160/V/SVB/HI10**[4] 280929			Degree of Protection	IEC: IP65; UL/CSA Type 1, 3R, 12, 13
				90	250	**P5-250/EA/SVB/HI10**[4] 280937						**P5-250/V/SVB/HI10**[4] 280943				
				110	315	**P5-315/EA/SVB/HI10**[4] 280951						**P5-315/V/SVB/HI10**[4] 280957			4)	
															Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
															UL File No.	E36332
															UL CCN	NLRV, NLRV7
															CSA File No.	223805
															CSA Class No.	3211-05
															NA Certification	UL Listed, CSA certified
															Suitable for	Branch circuits, suitable as motor disconnect
															Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65**		Surface mounting **IP65** totally insulated		Rear mounting **Front IP65**		Std. pack	**Information relevant for export to North America**
		Pole			400 V		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
	FS 908	N/O	N/O	N/C	P kW	I_u A								
Main switch as emergency switching off/emergency stop device														
With red rotary handle and yellow locking collar To IEC/EN 60204-1, VDE 0113 Part 1 Lockable in the 0 (Off) position														
With auxiliary contacts														
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0		3	2	1	6.5	20	**T0-3-15683/EA/SVB**[1] 015571		**T0-3-15683/I1/SVB** 207157		**T0-3-15683/V/SVB**[1] 015634		1 Off	1)
		3	2	1	13	32	**T3-3-15683/EA/SVB**[1] 040478		**T3-3-15683/I2/SVB**[2] 207206		**T3-3-15683/V/SVB**[1] 045224			Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0		3 + N	1	1	6.5	20	**T0-3-15680/EA/SVB**[1] 038875		**T0-3-15680/I1/SVB** 207153		**T0-3-15680/V/SVB**[1] 043621			UL File No.: E36332
					13	32	**P1-25/EA/SVB/N/HI11**[1] 048367				**P1-25/V/SVB/N/HI11**[1] 053113			UL CCN: NLRV
					13	32	**T3-3-15680/EA/SVB**[1] 012002		**T3-3-15680/I2/SVB**[2] 207202		**T3-3-15680/V/SVB**[1] 016748			CSA File No.: 12528
1 0 2 0 3 0 4 0 5 0 6 0 NO 13 0 14 0 21 0 22 0		3 + N	1	1	15	32	**P1-32/EA/SVB/N/HI11**[1] 057859				**P1-32/V/SVB/N/HI11**[1] 062605			CSA Class No.: 3211-05
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0		3 + N	1	1	6.5	20	**T0-3-8901/EA/SVB**[1] 231932		**T0-3-8901/I1/SVB** 231934				1 Off	NA Certification: UL Listed, CSA certified
					13	32	**T3-3-8901/EA/SVB**[1] 231945		**T3-3-8901/I2/SVB**[2] 218987					Suitable for: Branch circuits, suitable as motor disconnect
					22	63	**T5B-3-8901/EA/SVB**[3] 207420		**T5B-3-8901/I4/SVB**[3] 207244		**T5B-3-8901/V/SVB**[3] 207422		1 Off	Degree of Protection: IEC: IP65; UL/CSA Type 3R, 12
					30	100	**T5-3-8901/EA/SVB** 207408		**T5-3-8901/I5/SVB** 207277				1 Off	
1 0 2 0 3 0 4 0 5 0 6 0 NO 13 0 14 0 21 0 22 0		3 + N	1	1	37	63	**P3-63/EA/SVB/N/HI11**[1] 067351		**P3-63/I4/SVB/N/HI11**[1] 207350		**P3-63/V/SVB/N/HI11**[1] 072097		1 Off	2)
		3 + N	1	1	50	100	**P3-100/EA/SVB/N/HI11**[1] 076843		**P3-100/I5/SVB/N/HI11**[1] 207380		**P3-100/V/SVB/N/HI11**[1] 081589			Product Standards: UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0 13 0 14 0 15 0 16 0		6	1	1	6.5	20	**T0-4-15682/EA/SVB**[1] 019892		**T0-4-15682/I1/SVB** 207161		**T0-4-15682/V/SVB**[1] 024638			UL File No.: E36332
					13	32	**T3-4-15682/EA/SVB**[1] 054716		**T3-4-15682/I2/SVB**[2] 207210		**T3-4-15682/V/SVB**[1] 059462			UL CCN: NLRV
					22	63	**T5B-4-15682/EA/SVB**[3] 207425		**T5B-4-15682/I4/SVB**[3] 207246		**T5B-4-15682/V/SVB**[3] 207427			CSA File No.: 12528
					30	100	**T5-4-15682/EA/SVB** 207413		**T5-4-15682/I5/SVB** 207281		**T5-4-15682/V/SVB** 207415		1 Off	CSA Class No.: 3211-05
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0 13 0 14 0 15 0 16 0		6	1	1	55	160			**T6-160-6/I45/SVB/HI11**[5] 201448		**T6-160-6/V/SVB/HI11** 200619			NA Certification: UL Listed, CSA certified
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0 13 0 14 0 15 0 16 0		6	1	1	132	275			**T8-3-8342/I48/SVB/HI11**[6] 201450		**T8-3-8342/V/SVB/HI11** 200620			Suitable for: Branch circuits, suitable as motor disconnect
														Degree of Protection: IEC: IP65; UL/CSA Type 1, 3R, 12, 13

3)

Notes
5) Enclosure without flanges with K95/1N/BR
6) With KS4-CI and K150/1/BR: Ingress protection IP64

Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65** **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting **IP65** totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting **Front IP65** **Part no.** Article no.	**Price** See price list	Std. pack
		Pole			400 V										
	 FS 908	N/O	N/O	N/C	P kW	I_u A									
Main switch without emergency switching off/emergency stop function															
With black rotary handle and locking collar Lockable in the 0 (Off) position															
Without auxiliary contacts															
	1	0	0	6.5	20	**T0-1-8200/EA/SVB-SW**[1] 055483		1 Off	**T0-1-8200/I1/SVB-SW** 207146		1 Off	**T0-1-8200/V/SVB-SW**[1] 060229		1 Off
				13	32	**T3-1-8200/EA/SVB-SW**[1] 068949			**T3-1-8200/I2/SVB-SW**[2] 207201		1 Off	**T3-1-8200/V/SVB-SW**[1] 004882		
				22	63	**T5B-1-8200/EA/SVB-SW**[3] 094278			**T5B-1-8200/I4/SVB-SW**[3] 207241		1 Off			
	2	0	0	6.5	20	**T0-1-102/EA/SVB-SW**[1] 093451			**T0-1-102/I1/SVB-SW** 207144		1 Off	**T0-1-102/V/SVB-SW**[1] 022330		
				13	32	**T3-1-102/EA/SVB-SW**[1] 016747			**T3-1-102/I2/SVB-SW**[2] 207199		1 Off	**T3-1-102/V/SVB-SW**[1] 021493		
				22	63	**T5B-1-102/EA/SVB-SW**[3] 094468			**T5B-1-102/I4/SVB-SW**[3] 207239		1 Off	**T5B-1-102/V/SVB-SW**[3] 094462		
				30	100	**T5-1-102/EA/SVB-SW** 098807		1 Off						
	3	0	0	6.5	20	**T0-2-1/EA/SVB-SW**[1] 041246		1 Off	**T0-2-1/I1/SVB-SW** 207148		1 Off	**T0-2-1/V/SVB-SW**[1] 045992		1 Off
				13	25	**P1-25/EA/SVB-SW**[1] 048365			**P1-25/I2/SVB-SW**[2] 207294		1 Off	**P1-25/V/SVB-SW**[2] 050738		
				13	25				**P1-25/I2H/SVB-SW** 227861		1 Off			
				15	32	**P1-32/EA/SVB-SW**[1] 053111			**P1-32/I2/SVB-SW**[2] 207315		1 Off	**P1-32/V/SVB-SW**[1] 055484		
				15	32				**P1-32/I2H/SVB-SW** 227872		1 Off			
				37	63	**P3-63/EA/SVB-SW**[1] 057857			**P3-63/I4/SVB-SW**[1] 207344		1 Off	**P3-63/V/SVB-SW**[1] 060230		
				50	100	**P3-100/EA/SVB-SW**[1] 062603			**P3-100/I5/SVB-SW**[1] 207374		1 Off	**P3-100/V/SVB-SW**[1] 064976		
				45	125	**P5-125/EA/SVB-SW**[4] 280911						**P5-125/V/SVB-SW**[4] 280917		
				55	160	**P5-160/EA/SVB-SW**[4] 280925						**P5-160/V/SVB-SW**[4] 280931		
				90	250	**P5-250/EA/SVB-SW**[4] 280939						**P5-250/V/SVB-SW**[4] 280945		
				110	315	**P5-315/EA/SVB-SW**[4] 280953						**P5-315/V/SVB-SW**[4] 280959		
	3 + N	0	0	6.5	20	**T0-2-8900/EA/SVB-SW**[1] 207401		1 Off	**T0-2-8900/I1/SVB-SW** 207152		1 Off	**T0-2-8900/V/SVB-SW**[1] 207406		1 Off
				13	25	**P1-25/EA/SVB-SW/N**[1] 083960			**P1-25/I2/SVB-SW/N**[2] 207296		1 Off	**P1-25/V/SVB-SW/N**[1] 088706		
				13	25				**P1-25/I2H/SVB-SW/N** 227863		1 Off			
				15	32	**P1-32/EA/SVB-SW/N**[1] 093452			**P1-32/I2/SVB-SW/N**[2] 207317		1 Off	**P1-32/V/SVB-SW/N**[1] 098198		
				15	32				**P1-32/I2H/SVB-SW/N** 227874		1 Off			
				15	32				**P1-32/I2H/N** 227869		1 Off			
				37	63	**P3-63/EA/SVB-SW/N**[1] 012771			**P3-63/I4/SVB-SW/N**[1] 207346		1 Off	**P3-63/V/SVB-SW/N**[1] 017517		
				50	100	**P3-100/EA/SVB-SW/N**[1] 022263			**P3-100/I5/SVB-SW/N**[1] 207376		1 Off	**P3-100/V/SVB-SW/N**[1] 027009		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1, 3R, 12, 13

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV, NLRV7
CSA File No.	223805
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65**		Surface mounting **IP65** totally insulated		Rear mounting **Front IP65**		Std. pack	**Information relevant for export to North America**
		Pole			400 V		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
	FS 908	N/O	N/O	N/C	P kW	I_u A								
Main switch without emergency switching off/emergency stop function														
With black rotary handle and locking collar Lockable in the 0 (Off) position														
Without auxiliary contacts														
1 0 2 0 3 0 4 0 5 0 6 0 N 0		3 + N	0	0	45	125	**P5-125/EA/SVB-SW/N**[4] 280913				**P5-125/V/SVB-SW/N**[4] 280919		1 Off	
					55	160	**P5-160/EA/SVB-SW/N**[4] 280927				**P5-160/V/SVB-SW/N**[4] 280933			
					90	250	**P5-250/EA/SVB-SW/N**[4] 280941				**P5-250/V/SVB-SW/N**[4] 280947			
					110	315	**P5-315/EA/SVB-SW/N**[4] 280955				**P5-315/V/SVB-SW/N**[4] 280961			
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0		6	0	0	6.5	20	**T0-3-8342/EA/SVB-SW**[1] 031755		**T0-3-8342/I1/SVB-SW** 207160		**T0-3-8342/V/SVB-SW**[1] 036501		1 Off	
					13	32	**T3-3-8342/EA/SVB-SW**[1] 073699		**T3-3-8342/I2/SVB-SW**[2] 207209		**T3-3-8342/V/SVB-SW**[1] 078445			
					22	63	**T5B-3-8342/EA/SVB-SW**[3] 092307		**T5B-3-8342/I4/SVB-SW**[3] 207243		**T5B-3-8342/V/SVB-SW**[3] 092299			
					30	100	**T5-3-8342/EA/SVB-SW** 096382		**T5-3-8342/I5/SVB-SW** 207280		**T5-3-8342/V/SVB-SW** 096380		1 Off	
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0 13 0 14 0 15 0 16 0		8	0	0	6.5	20	**T0-4-8344/EA/SVB-SW**[1] 008268		**T0-4-8344/I1/SVB-SW** 207164		**T0-4-8344/V/SVB-SW**[1] 008272		1 Off	
					13	32	**T3-4-8344/EA/SVB-SW**[1] 008965		**T3-4-8344/I2/SVB-SW**[2] 207213		**T3-4-8344/V/SVB-SW**[1] 008967			
					22	63	**T5B-4-8344/EA/SVB-SW**[3] 092061		**T5B-4-8344/I4/SVB-SW**[3] 207249		**T5B-4-8344/V/SVB-SW**[3] 092055			
					30	95			**T5-4-8344/I5/SVB-SW** 207284					
					30	100	**T5-4-8344/EA/SVB-SW** 095960				**T5-4-8344/V/SVB-SW** 095958		1 Off	
With auxiliary contacts														
1 0 2 0 3 0 4 0 5 0 6 0 13 0 14 0		3	1	0	6.5	20	**T0-2-15679/EA/SVB-SW**[1] 083961		**T0-2-15679/I1/SVB-SW** 207150		**T0-2-15679/V/SVB-SW**[1] 088707		1 Off	
1 0 2 0 3 0 4 0 5 0 6 0 13 0 14 0 21 0 22 0		3	1	1	13	25	**P1-25/EA/SVB-SW/HI11**[1] 070194		**P1-25/I2/SVB-SW/HI11**[2] 207295		**P1-25/V/SVB-SW/HI11**[1] 098199			
				1	13	25			**P1-25/I2H/SVB-SW/HI11** 227862					
				1	13	25			**P1-25/I2H/SVB/HI11** 226902					
				1	15	32	**P1-32/EA/SVB-SW/HI11**[1] 012772		**P1-32/I2/SVB-SW/HI11**[1] 207316		**P1-32/V/SVB-SW/HI11**[1] 017518			
				1	15	32			**P1-32/I2H/SVB-SW/HI11** 227873					
				1	37	63	**P3-63/EA/SVB-SW/HI11**[1] 022264		**P3-63/I4/SVB-SW/HI11**[1] 207345		**P3-63/V/SVB-SW/HI11**[1] 027010			
				1	50	100	**P3-100/EA/SVB-SW/HI11**[1] 031756		**P3-100/I5/SVB-SW/HI11**[1] 207375		**P3-100/V/SVB-SW/HI11**[1] 036502			
1 0 2 0 3 0 4 0 5 0 6 0 13 0 14 0		3	1	0	45	125	**P5-125/EA/SVB-SW/HI10**[4] 280912				**P5-125/V/SVB-SW/HI10**[4] 280918		1 Off	
				0	55	160	**P5-160/EA/SVB-SW/HI10**[4] 280926				**P5-160/V/SVB-SW/HI10**[4] 280932			
				0	90	250	**P5-250/EA/SVB-SW/HI10**[4] 280940				**P5-250/V/SVB-SW/HI10**[4] 280946			
				0	110	315	**P5-315/EA/SVB-SW/HI10**[4] 280954				**P5-315/V/SVB-SW/HI10**[4] 280960			
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0		3	2	1	6.5	20	**T0-3-15683/EA/SVB-SW**[1] 015600		**T0-3-15683/I1/SVB-SW** 207158		**T0-3-15683/V/SVB-SW**[1] 015664		1 Off	
		3	2	1	13	32	**T3-3-15683/EA/SVB-SW**[1] 042851		**T3-3-15683/I2/SVB-SW**[2] 207207				1 Off	

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

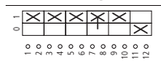
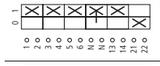
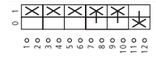
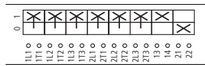
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1, 3R, 12, 13

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV, NLRV7
CSA File No.	223805
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

Contact sequence	Front plate no.	Main contacts	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting **Front IP65** **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting **IP65** totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting **Front IP65** **Part no.** Article no.	**Price** See price list	Std. pack
		Pole			400 V										
	FS 908	N/O	N/O	N/C	P	I_u									
					kW	A									
Main switch without emergency switching off/emergency stop function															
With black rotary handle and locking collar Lockable in the 0 (Off) position															
With auxiliary contacts															
		3 + N	1	1	6.5	20	**T0-3-15680/EA/SVB-SW**[1] 041248		1 Off	**T0-3-15680/I1/SVB-SW** 207154		1 Off	**T0-3-15680/V/SVB-SW**[1] 045994		1 Off
					13	32	**P1-25/EA/SVB-SW/N/HI11**[1] 050740			**T3-3-15680/I2/SVB-SW**[4] 207203		1 Off	**T3-3-15680/V/SVB-SW**[1] 019121		
					13	32	**T3-3-8901/EA/SVB-SW**[1] 231946								
					15	32	**P1-32/EA/SVB-SW/N/HI11**[1] 060232						**P1-32/V/SVB-SW/N/HI11**[1] 064978		
		3 + N	1	1	6.5	20	**T0-3-8901/EA/SVB-SW**[1] 231933		1 Off	**T0-3-8901/I1/SVB-SW** 231935		1 Off			1 Off
					13	32	**T3-3-15680/EA/SVB-SW**[1] 014375			**T3-3-8901/I2/SVB-SW**[2] 218988		1 Off	**P1-25/V/SVB-SW/N/HI11**[1] 055486		
					22	63	**T5B-3-8901/EA/SVB-SW**[3] 207421			**T5B-3-8901/I4/SVB-SW**[3] 207245		1 Off	**T5B-3-8901/V/SVB-SW**[3] 207423		
					30	100	**T5-3-8901/EA/SVB-SW** 207409		1 Off	**T5-3-8901/I5/SVB-SW** 207278		1 Off			
		3 + N	1	1	37	63	**P3-63/EA/SVB-SW/N/HI11**[1] 069724		1 Off	**P3-63/I4/SVB-SW/N/HI11**[1] 207347		1 Off	**P3-63/V/SVB-SW/N/HI11**[1] 074470		
		3 + N	1	1	50	100	**P3-100/EA/SVB-SW/N/HI11**[1] 079216		1 Off	**P3-100/I5/SVB-SW/N/HI11**[1] 207377		1 Off	**P3-100/V/SVB-SW/N/HI11**[1] 083962		
		6	1	1	6.5	20	**T0-4-15682/EA/SVB-SW**[1] 022265		1 Off	**T0-4-15682/I1/SVB-SW** 207162		1 Off	**T0-4-15682/V/SVB-SW**[1] 027011		
					13	32	**T3-4-15682/EA/SVB-SW**[1] 057089			**T3-4-15682/I2/SVB-SW**[2] 207211		1 Off	**T3-4-15682/V/SVB-SW**[1] 061835		
					22	63	**T5B-4-15682/EA/SVB-SW**[3] 207426			**T5B-4-15682/I4/SVB-SW**[3] 207247		1 Off	**T5B-4-15682/V/SVB-SW**[3] 207428		
					30	100	**T5-4-15682/EA/SVB-SW** 207414		1 Off	**T5-4-15682/I5/SVB-SW** 207282		1 Off	**T5-4-15682/V/SVB-SW** 207416		1 Off
		6	1	1	55	160				**T6-160-6/I45/SVB-SW/HI11**[5] 201447		1 Off	**T6-160-6/V/SVB-SW/HI11** 200127		
					132	275				**T8-3-8342/I48/SVB-SW/HI11**[6] 201449		1 Off			
					132	315							**T8-3-8342/V/SVB-SW/HI11** 200128		

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1, 3R, 12, 13

Notes
[5] Enclosure without flanges with K95/1N/BR
[6] With KS4-CI and K150/1/BR: Ingress protection IP64

Contact sequence	Front plate no.	Main contacts Pole	Auxiliary contacts		Max. motor rating: AC-23A 400/415 V 50/60 Hz	Rated uninterrupted current	Flush mounting Front IP65		Center mounting Front IP65		Surface mounting IP65 totally insulated		Std. pack	Distribution board - mounting Front IP30		Rear mounting Front IP65		Std. pack	Information relevant for export to North America
							Part no. Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
	FS 908	N/O	N/O	N/C	P kW	I_u A													
On-Off switches																			
Without auxiliary contacts With black thumb-grip and front plate																			
0 1 1 0 2 0		1	0	0	6.5	20	**T0-1-8200/E**[1] 067352		**T0-1-8200/EZ**[2] 069725		**T0-1-8200/I1** 207074		1 Off	**T0-1-8200/IVS**[3] 074471		**T0-1-8200/Z**[1] 076844		1 Off	1) → Page 4/24
		1	0	0	6.5	20										**T0-1-15401/Z**[1] 048346			2) → Page 4/24
		1	0	0	13	32	**T3-1-8200/E**[4] 064208		**T3-1-8200/EZ**[4] 066581		**T3-1-8200/I2**[4] 207167		1 Off			**T3-1-8200/Z**[4] 071327			3) → Page 4/24
		1	0	0	22	63	**T5B-1-8200/E**[6] 094281				**T5B-1-8200/I4**[5] 207218		1 Off			**T5B-1-8200/Z**[6] 094270			4) → Page 4/24
0 1 1 0 2 0 3 0 4 0		2	0	0	6.5	20	**T0-1-102/E**[1] 088709		**T0-1-102/EZ**[2] 091082		**T0-1-102/I1** 207061		1 Off	**T0-1-102/IVS**[3] 015147		**T0-1-102/Z**[1] 095828			5) → Page 4/24
		2	0	0	6.5	20										**T0-1-15402/Z**[1] 062584			6) → Page 4/24
		2	0	0	13	32	**T3-1-102/E**[1] 076073		**T3-1-102/EZ**[1] 078446		**T3-1-102/I2**[4] 207165		1 Off			**T3-1-102/Z**[4] 083192			7) → Page 4/24
		2	0	0	22	63	**T5B-1-102/E**[6] 094471				**T5B-1-102/I4**[5] 207215		1 Off			**T5B-1-102/Z**[6] 094460			8) → Page 4/24
0 1 1 0 2 0 3 0 4 0 5 0 6 0		3	0	0	6.5	20	**T0-2-1/E**[1] 024639		**T0-2-1/EZ**[1] 027012		**T0-2-1/I1** 207081		1 Off	**T0-2-1/IVS**[3] 031758		**T0-2-1/Z**[1] 036504			9) → Page 4/24
		3	0	0	6.5	20					**T0-2-15403/I1** 207088		1 Off			**T0-2-15403/Z**[1] 076822			
		3	0	0	13	25	**P1-25/E**[1] 038724		**P1-25/EZ**[1] 041250		**P1-25/I2**[8] 207299		1 Off	**P1-25/IVS**[7] 052962		**P1-25/Z**[8] 057708			
		3	0	0	13	25					**P1-25/I2H** 226898		1 Off						
		3	0	0	15	32	**P1-32/E**[1] 079065		**P1-32/EZ**[1] 048369		**P1-32/I2**[8] 207320		1 Off	**P1-32/IVS**[7] 093303		**P1-32/Z**[8] 098049			
		3	0	0	15	32					**P1-32/I2H** 227866		1 Off						
		3	0	0	37	63	**P3-63/E**[8] 026861				**P3-63/I4**[8] 207356		1 Off	**P3-63/IVS**[7] 041099		**P3-63/Z**[8] 050591			
		3	0	0	45	125	**P5-125/E**[9] 280897									**P5-125/Z**[9] 280920			
		3	0	0	50	100	**P3-100/E**[8] 067201				**P3-100/I5**[8] 207381		1 Off	**P3-100/IVS**[7] 081439		**P3-100/Z**[8] 090931			
		3	0	0	55	160	**P5-160/E**[9] 280921									**P5-160/Z**[9] 280934			
		3	0	0	90	250	**P5-250/E**[9] 280935									**P5-250/Z**[9] 280948			
		3	0	0	110	315	**P5-315/E**[9] 280949									**P5-315/Z**[9] 280962			
0 1 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0		3 + N	0	0	6.5	20	**T0-2-8900/E**[1] 207398		**T0-2-8900/EZ**[1] 207402		**T0-2-8900/I1** 207109		1 Off	**T0-2-8900/IVS**[3] 207403		**T0-2-8900/Z**[1] 207407			
		3 + N	0	0	13	25	**P1-25/E/N**[1] 076845		**P1-25/EZ/N**[1] 079218		**P1-25/I2/N**[8] 207303		1 Off	**P1-25/IVS/N**[7] 083964		**P1-25/Z/N**[8] 088710			
		3 + N	0	0	13	25					**P1-25/I2H/N** 226901		1 Off						
		3 + N	0	0	15	32	**P1-32/E/N**[1] 093456		**P1-32/EZ/N**[1] 095829		**P1-32/I2/N**[8] 207324		1 Off	**P1-32/IVS/N**[7] 010402		**P1-32/Z/N**[8] 015148			
		3 + N	0	0	15	32					**P1-32/I2H/N** 227869		1 Off						
		3 + N	0	0	37	63	**P3-63/E/N**[8] 019894				**P3-63/I4/N**[8] 207360		1 Off	**P3-63/IVS/N**[7] 022267		**P3-63/Z/N**[8] 027013			
		3 + N	0	0	50	100	**P3-100/E/N**[8] 031759				**P3-100/I5/N**[8] 207385		1 Off	**P3-100/IVS/N**[7] 034132		**P3-100/Z/N**[8] 038878			
0 1 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0		4	0	0	6.5	20					**T0-2-15404/I1** 207089		1 Off	**T0-2-15404/IVS**[3] 088687		**T0-2-15404/Z**[1] 091060			

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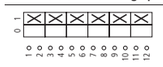
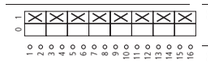
Contact sequence	Front plate no.	Main contacts Pole	Auxiliary contacts		Max. motor rating: AC-23A 400/415 V 50/60 Hz	Rated uninterrupted current	Flush mounting Front IP65		Center mounting Front IP65		Std. pack
	 FS 908						**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
		N/O	N/O	N/C	P	I_u					
			I	I	L	kW	A				
On-Off switches											
Without auxiliary contacts With black thumb-grip and front plate											
		6	0	0	6.5	20	**T0-3-8342/E**[1] 043624		**T0-3-8342/EZ**[1] 045997		1 Off
		6	0	0	13	32	**T3-3-8342/E**[4] 045225				
		6	0	0	22	63	**T5B-3-8342/E**[6] 092310				
		8	0	0	6.5	20	**T0-4-8344/E**[1] 014000		**T0-4-8344/EZ**[1] 014002		
		8	0	0	13	32	**T3-4-8344/E**[4] 020593		**T3-4-8344/EZ**[4] 020595		
		8	0	0	22	63	**T5B-4-8344/E**[6] 092064				

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

6)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1

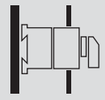
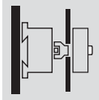
7)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

8)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

HPL04025EN

Surface mounting IP65 totally insulated		Std. pack	Distribution board - mounting Front IP30		Rear mounting Front IP65		Std. pack	Information relevant for export to North America
								
Part no. Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
T0-3-8342/I1 207131		1 Off	**T0-3-8342/IVS**[3] 050743		**T0-3-8342/Z**[1] 055489		1 Off	
T3-3-8342/I2[4] 207187		1 Off			**T3-3-8342/Z**[4] 052344			
T5B-3-8342/I4[5] 207226		1 Off			**T5B-3-8342/Z**[6] 092297			
T0-4-8344/I1 207139		1 Off	**T0-4-8344/IVS**[3] 014006		**T0-4-8344/Z**[1] 014009			
T3-4-8344/I2[4] 207194		1 Off			**T3-4-8344/Z**[4] 020600			
T5B-4-8344/I4[5] 207233		1 Off						

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

9)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	223805
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

Contact sequence	Front plate no. FS 908	Main contacts Pole N/O	Auxiliary contacts N/O	Auxiliary contacts N/C	Max. motor rating: AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board - mounting Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
On-Off switches without emergency switching off/emergency stop function																					
With auxiliary contacts With black thumb-grip and front plate																					
10 20 30 40 50 60 70 80		3	1	0	6.5	20	**T0-2-15679/E**[1] 029387		1 Off	**T0-2-15679/EZ**[1] 031760		1 Off	**T0-2-15679/I1** 207094		1 Off	**T0-2-15679/IVS**[2] 036506		1 Off	**T0-2-15679/Z**[1] 041252		1 Off
10 20 30 40 50 60 130 140 210 220		3	1	1	13	25							**P1-25/I2H/HI11** 226899								
		3	1	1	15	32							**P1-32/I2H/HI11** 227867								
10 20 30 40 50 60 70 80 90 100 110 120		3	2	1	6.5	20	**T0-3-15683/E**[1] 016619			**T0-3-15683/EZ**[1] 016658			**T0-3-15683/I1** 207118			**T0-3-15683/IVS**[2] 016722					
		3	2	1	13	32	**T3-3-15683/E**[3] 014377						**T3-3-15683/I2**[3] 207182		1 Off						
10 20 30 40 50 60 70 80 90 100 110 120		3 + N	1	1	6.5	20	**T0-3-8901/E**[1] 231938			**T0-3-8901/EZ**[1] 231939			**T0-3-8901/I1** 231941		1 Off	**T0-3-8901/IVS**[2] 231940					
		3 + N	1	1	13	32	**T3-3-8901/E**[3] 231949			**T3-3-8901/EZ**[3] 231950			**T3-3-8901/I2**[3] 231951		1 Off				**T3-3-8901/Z**[3] 231952		
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160		6	1	1	6.5	20	**T0-4-15682/E**[1] 010405			**T0-4-15682/EZ**[1] 012778			**T0-4-15682/I1** 207135		1 Off	**T0-4-15682/IVS**[2] 017524			**T0-4-15682/Z**[1] 022270		
					13	32	**T3-4-15682/E**[3] 023869						**T3-4-15682/I2**[3] 207190		1 Off				**T3-4-15682/Z**[3] 030988		
					22	63	**T5B-4-15682/E**[4] 207424						**T5B-4-15682/I4**[5] 207229		1 Off				**T5B-4-15682/Z**[4] 207429		
					30	100	**T5-4-15682/E** 207412						**T5-4-15682/I5** 207269		1 Off				**T5-4-15682/Z** 207417		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

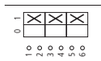
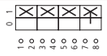
6)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

7)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

HPL04028EN

Contact sequence	Front plate no.	Main contacts Pole	Auxiliary contacts		Max. motor rating: AC-23A 400/415 V 50/60 Hz	Rated uninterrupted current	Flush mounting Front IP65		
	 FS 908	N/O	N/O	N/C	400 V P kW	I_u A	**Part no.** Article no.	**Price** See price list	Std. pack
On-Off switches as an emergency switching off/emergency stop device									
With red thumb-grip and yellow front plate To IEC/EN 60204-1, VDE 113 Part 1									
		1	0	0	6.5	20	**T0-1-8200/E-RT**[1] 009474		1 Off
					13	32	**T3-1-8200/E-RT**[3] 017025		
					22	63	**T5B-1-8200/E-RT**[4] 094280		
					30	100	**T5-1-8200/E-RT** 097225		1 Off
		2	0	0	6.5	20	**T0-1-102/E-RT**[1] 009046		1 Off
					13	32	**T3-1-102/E-RT**[1] 016318		
					22	63	**T5B-1-102/E-RT**[4] 094470		
		3	0	0	6.5	20	**T0-2-1/E-RT**[1] 011082		
					13	25	**P1-25/E-RT**[1] 002388		
					15	32	**P1-32/E-RT**[1] 003197		
					37	63	**P3-63/E-RT**[7] 005743		
					50	100	**P3-100/E-RT**[7] 007189		
		3 + N	0	0	6.5	20	**T0-2-8900/E-RT**[1] 207399		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

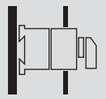
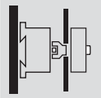
6)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

7)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

HPL04029EN

Center mounting Front IP65			Surface mounting IP65 totally insulated			Distribution board - mounting Front IP30			Rear mounting Front IP65		
											
Part no. Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack
			T0-1-8200/I1-RT 207075		1 Off	**T0-1-8200/IVS-RT**[2] 081956		1 Off			
			T0-1-102/I1-RT 207062		1 Off	**T0-1-102/IVS-RT**[2] 079583					
			T3-1-102/I2-RT[3] 207166		1 Off						
			T0-2-1/I1-RT 207082		1 Off	**T0-2-1/IVS-RT**[2] 084329					
			P1-25/I2-RT[7] 207300		1 Off	**P1-25/IVS-RT**[6] 013140					
			P1-32/I2-RT[7] 207321		1 Off	**P1-32/IVS-RT**[6] 022632					
			P3-63/I4-RT[7] 207357		1 Off	**P3-63/IVS-RT**[6] 045845					
			P3-100/I5-RT[7] 207382		1 Off	**P3-100/IVS-RT**[6] 086185					
			T0-2-8900/I1-RT 207110		1 Off	**T0-2-8900/IVS-RT**[2] 207404					

3)

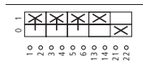
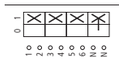
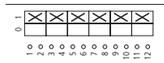
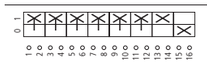
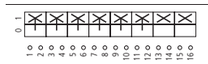
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 1

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole	Auxiliary contacts		Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	As an emergency switching off/ emergency stop device[1] Surface mounting IP65 totally insulated		Without emergency switching off/ emergency stop function[2] Surface mounting IP65 totally insulated		Std. pack	Notes
	FS 908	N/O I	N/O I	N/C	400 V P kW	I_u A	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		
Safety switches with warning label												
		3	0	0	13	25	**P1-25/I2-SI**[3] 207308		**P1-25/I2-SI-SW**[3] 207309		1 Off	
					15	32	**P1-32/I2-SI**[3] 207329		**P1-32/I2-SI-SW**[3] 207330			
					37	63	**P3-63/I4-SI**[3] 207361		**P3-63/I4-SI-SW**[3] 207362			
					50	100	**P3-100/I5-SI**[3] 207386		**P3-100/I5-SI-SW**[3] 207387			
		3	1	1	13	25	**P1-25/I2-SI/HI11**[3] 207310		**P1-25/I2-SI/HI11-SW**[3] 207311			
					15	32	**P1-32/I2-SI/HI11**[3] 207331		**P1-32/I2-SI/HI11-SW**[3] 207332			
					37	63	**P3-63/I4-SI/HI11**[3] 207363		**P3-63/I4-SI/HI11-SW**[3] 207364			
					50	100	**P3-100/I5-SI/HI11**[3] 207388		**P3-100/I5-SI/HI11-SW**[3] 207389			
		3 + N	0	0	13	25	**P1-25/I2-SI/N**[3] 207312		**P1-25/I2-SI/N-SW**[3] 207313			
					15	32	**P1-32/I2-SI/N**[3] 207333		**P1-32/I2-SI/N-SW**[3] 207334			
					37	63	**P3-63/I4-SI/N**[3] 207365		**P3-63/I4-SI/N-SW**[3] 207366			
					50	100	**P3-100/I5-SI/N**[3] 207390		**P3-100/I5-SI/N-SW**[3] 207391			
		6	0	0	22	63	**T5B-3-8342/I4-SI**[4] 207250		**T5B-3-8342/I4-SI-SW**[4] 207251			
		6	0	0	30	100	**T5-3-8342/I5-SI**[4] 207447		**T5-3-8342/I5-SI-SW**[4] 207448			
		6	1	1	22	63	**T5B-4-15682/I4-SI**[4] 207254		**T5B-4-15682/I4-SI-SW**[4] 207255			
		6	1	1	30	100	**T5-4-15682/I5-SI**[4] 207285		**T5-4-15682/I5-SI-SW**[4] 207286			
		6	2	0	22	63	**T5B-4-8903/I4-SI**[4] 207258		**T5B-4-8903/I4-SI-SW**[4] 207259			
		6	2	0	30	100	**T5-4-8903/I5-SI**[4] 207289		**T5-4-8903/I5-SI-SW**[4] 207290			

Notes

[1] Surface mounting IP65 : With red rotary handle and yellow locking collar with auxiliary contacts , lockable in position 0 with cover interlock, according to IEC/EN 60204-1, VDE 0113 Part 1

[2] Surface mounting IP65 : With black rotary handle and locking collar with auxiliary contacts Lockable in position 0 with cover interlock

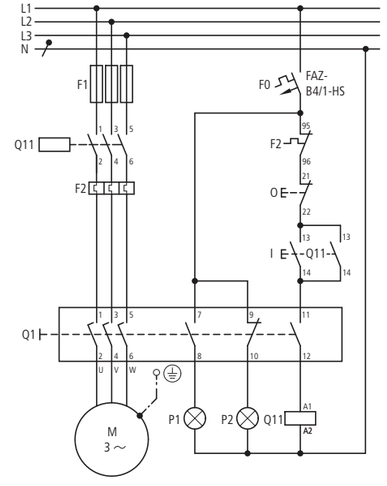
Engineering
Maintenance, repair and safety switches all have the same electrical function. They are designed to safely isolate electrical installations (loads) from mains power during maintenance and repair work and to ensure that a hazard does not arise which endangers personnel, machinery and production materials.
A safety switch is an additional enclosed main switch = isolator dedicated to an individual electrical load and mounted in the immediate vicinity of the motor or the electrical load.
This is particularly important if there is any danger of the main switch being inadvertently operated.

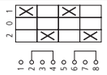
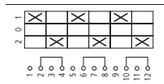
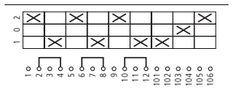
Application
By using his padlock (up to 3), each fitter/electrician involved can protect themselves by preventing unauthorized personnel from switching the unit on. Maintenance/manual override switches are simply additional enclosed main switches with a padlocking feature.
Enclosed main switch with padlocking facility

Features
- Safety switches are always housed in insulated enclosures and have an inscription saying "Safety Switch" on a bright orange label.
- Switches to be used for emergency stop switching have a red handle and yellow locking collar in accordance with STOP category 0 (as per IEC/EN 60204/VDE 0113).
- If the switch is not approved for emergency stop switching, both parts will be black ("SW" part no. suffix).
- The cover and handle are interlocked by fitting a padlock.

Selection
The switches must be selected according to the following performance specifications:
1) According to motor switching capacity, when the switch is fitted in such a way that the operator may use it for operational ON and OFF switching.
2) The rating data always applies to 3 poles. When the motor rating is divided between 6 poles, such as for star-delta switching, a 6 pole switch can be used to control 1.73 times the rated power.
3) If the switch has a load-shedding Contact (LA), you can select the appropriate switch according to the uninterrupted current. The load-shedding contact is an auxiliary contact, which is closed in the ON position and opens early when switching off, so that a contactor located in the circuit takes over the switching duty and the maintenance/safety switch operates at zero load. When switching on, the load-shedding contact closes later than or at the same time as the main contacts. With P and T switches this is the N/O auxiliary contact.
4)The "ON" position can be locked with a padlock (by altering the handle).
This is not permissible for switches with a red/yellow handle.

Safety switch with load shedding and signaling



Contact sequence	Front plate no.	Main contacts Pole N/O	Max. operating power AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting IP65 totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Distribution board mounting Front IP30 **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Changeover switches																			
With black thumb-grip and front plate without emergency switching off/emergency stop function																			
	 FS 684	1	6.5	20	**T0-1-8210/E**[1] 012742		1 Off	**T0-1-8210/EZ**[1] 048337		1 Off	**T0-1-8210/I1** 207076		1 Off	**T0-1-8210/IVS**[2] 074440		1 Off	**T0-1-8210/Z**[1] 019862		1 Off
			13	32	**T3-1-8210/E**[1] 054718			**T3-1-8210/EZ**[1] 003072			**T3-1-8210/I2**[3] 207169		1 Off				**T3-1-8210/Z**[1] 057091		
			22	63	**T5B-1-8210/E**[5] 094261						**T5B-1-8210/I4**[4] 207432		1 Off				**T5B-1-8210/Z**[5] 094258		
	 FS 4011	1	6.5	20				**T0-1-8214/EZ**[1] 076815									**T0-1-8214/Z**[1] 050720		
	 FS 684	2	6.5	20	**T0-2-8211/E**[1] 022234			**T0-2-8211/EZ**[1] 053083			**T0-2-8211/I1** 207102		1 Off	**T0-2-8211/IVS**[2] 076813			**T0-2-8211/Z**[1] 029354		
			13	32	**T3-2-8211/E**[1] 061837			**T3-2-8211/EZ**[1] 003075			**T3-2-8211/I2**[3] 207178		1 Off				**T3-2-8211/Z**[1] 064210		
			22	63	**T5B-2-8211/E**[5] 093094						**T5B-2-8211/I4**[4] 207220		1 Off				**T5B-2-8211/Z**[5] 093082		
		3	6.5	20	**T0-3-8212/E**[1] 029353			**T0-3-8212/EZ**[1] 057829			**T0-3-8212/I1** 207123		1 Off	**T0-3-8212/IVS**[2] 079186			**T0-3-8212/Z**[1] 036473		
			13	32	**T3-3-8212/E**[1] 068956			**T3-3-8212/EZ**[1] 003080			**T3-3-8212/I2**[3] 207183		1 Off				**T3-3-8212/Z**[1] 071329		
			22	63	**T5B-3-8212/E**[5] 092386						**T5B-3-8212/I4**[4] 207223		1 Off				**T5B-3-8212/Z**[5] 092383		
			30	100	**T5-3-8212/E** 096466		1 Off				**T5-3-8212/I5** 207266		1 Off				**T5-3-8212/Z** 096464		1 Off
		3	55	160	**T6-3-8212/E/HI12** 214781		1 Off												
		3	132	315	**T8-3-8212/E/HI12** 214782		1 Off												

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

3)

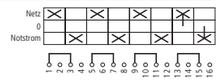
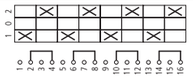
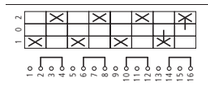
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type: –

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 1

Contact sequence	Front plate no.	Main contacts Pole N/O	Max. operating power AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting IP65 totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Distribution board mounting Front IP30 **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Changeover switches																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
	FS 161629	4	13	32	**T3-4-8902/E**[1] 215222		1 Off	**T3-4-8902/EZ**[1] 215223		1 Off	**T3-4-8902/I2**[3] 215224		1 Off				**T3-4-8902/Z**[1] 215225		1 Off
			22	63	**T5B-4-8902/E**[5] 207430						**T5B-4-8902/I4**[4] 207237		1 Off				**T5B-4-8902/Z**[5] 207431		1 Off
			30	100	**T5-4-8902/E** 207418						**T5-4-8902/I5** 207214		1 Off				**T5-4-8902/Z** 207419		1 Off
	FS 684	4	6.5	20	**T0-4-8213/E**[1] 031726			**T0-4-8213/EZ**[1] 062575		1 Off	**T0-4-8213/I1** 207136		1 Off	**T0-4-8213/IVS**[2] 081559		1 Off	**T0-4-8213/Z**[1] 043592		1 Off
			13	32	**T3-4-8213/E**[1] 076075			**T3-4-8213/EZ**[1] 003079		1 Off	**T3-4-8213/I2**[3] 207191		1 Off				**T3-4-8213/Z**[1] 078448		
			22	63	**T5B-4-8213/E**[5] 092112						**T5B-4-8213/I4**[4] 207230		1 Off				**T5B-4-8213/Z**[5] 092109		
			30	100	**T5-4-8213/E** 096014						**T5-4-8213/I5** 207270		1 Off				**T5-4-8213/Z** 096012		1 Off
	FS 953	4	6.5	20	**T0-4-8294/E**[1] 010371			**T0-4-8294/EZ**[1] 072069		1 Off	**T0-4-8294/I1** 207138		1 Off	**T0-4-8294/IVS**[2] 043594		1 Off			
			13	32	**T3-4-8294/E**[1] 002513						**T3-4-8294/I2**[3] 207193		1 Off				**T3-4-8294/Z**[1] 004886		1 Off
			22	63	**T5B-4-8294/E**[5] 092084						**T5B-4-8294/I4**[4] 207232		1 Off				**T5B-4-8294/Z**[5] 092081		1 Off
			30	100	**T5-4-8294/E** 095986		1 Off				**T5-4-8294/I5** 207433		1 Off				**T5-4-8294/Z** 095984		1 Off

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

3)

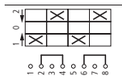
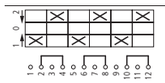
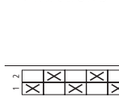
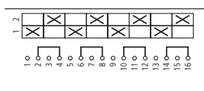
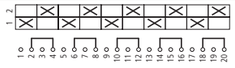
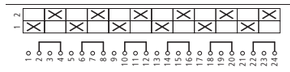
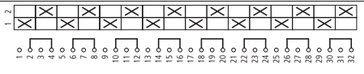
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type: –

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 1

Contact sequence	Front plate no.	Main contacts Pole N/O	Max. motor rating AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
Changeover switches with 0 position																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
with momentary from both directions to 0																			
	 FS 4011	1	6.5	20	**T0-1-8214/E**[2] 019863		1 Off	**T0-1-8214/EZ** 076815			**T0-1-8214/I1** 207077		1 Off	**T0-1-8214/IVS**[1] 045967		1 Off	**T0-1-8214/Z** 050720		
		1	13	32	**T3-1-8214/E**[2] 009632														
		2	6.5	20	**T0-2-8215/E**[2] 022236			**T0-2-8215/EZ**[2] 081561		1 Off	**T0-2-8215/I1** 207103		1 Off	**T0-2-8215/IVS**[1] 048340		1 Off			
		2	13	32	**T3-2-8215/E**[2] 016751						**T3-2-8215/I2**[3] 207179		1 Off						
		3	6.5	20	**T0-3-8216/E**[2] 024609			**T0-3-8216/EZ**[2] 086307		1 Off	**T0-3-8216/I1** 207434		1 Off	**T0-3-8216/IVS**[1] 050713		1 Off	**T0-3-8216/Z**[2] 055466		1 Off
		3	13	32	**T3-3-8216/E**[2] 023870						**T3-3-8216/I2**[3] 207184		1 Off						
Changeover switches without 0 position																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
Two-way switch																			
	 FS 943	1	6.5	20	**T0-1-8220/E**[2] 031728		1 Off	**T0-1-8220/EZ**[2] 095799		1 Off	**T0-1-8220/I1** 207078		1 Off	**T0-1-8220/IVS**[1] 055459		1 Off	**T0-1-8220/Z**[2] 086312		1 Off
		2	6.5	20	**T0-2-8221/E**[2] 038847			**T0-2-8221/EZ**[2] 010372		1 Off	**T0-2-8221/I1** 207104		1 Off	**T0-2-8221/IVS**[1] 057832		1 Off	**T0-2-8221/Z**[2] 074450		1 Off
			13	32	**T3-2-8221/E**[2] 045227			**T3-2-8221/EZ**[2] 001025		1 Off	**T3-2-8221/I2**[3] 207180		1 Off				**T3-2-8221/Z**[2] 047600		1 Off
			22	63	**T5B-2-8221/E**[4] 093047						**T5B-2-8221/I4**[5] 207221		1 Off				**T5B-2-8221/Z**[4] 093044		1 Off
		3	6.5	20	**T0-3-8222/E**[2] 048339			**T0-3-8222/EZ**[2] 015118		1 Off	**T0-3-8222/I1** 207124		1 Off	**T0-3-8222/IVS**[1] 060205		1 Off	**T0-3-8222/Z**[2] 088686		1 Off
			13	32	**T3-3-8222/E**[2] 052346			**T3-3-8222/EZ**[2] 001069		1 Off	**T3-3-8222/I2**[3] 207185		1 Off				**T3-3-8222/Z**[2] 057092		1 Off
			22	63	**T5B-3-8222/E**[4] 092378						**T5B-3-8222/I4**[5] 207224		1 Off				**T5B-3-8222/Z**[4] 092375		1 Off
		4	6.5	20	**T0-4-8223/E**[2] 050712			**T0-4-8223/EZ**[2] 019864		1 Off	**T0-4-8223/I1** 207137		1 Off	**T0-4-8223/IVS**[1] 062578		1 Off	**T0-4-8223/Z**[2] 086315		1 Off
			13	32	**T3-4-8223/E**[2] 059465						**T3-4-8223/I2**[3] 207192		1 Off				**T3-4-8223/Z**[2] 061838		1 Off
			22	63	**T5B-4-8223/E**[4] 092108						**T5B-4-8223/I4**[5] 207231		1 Off				**T5B-4-8223/Z**[4] 092105		1 Off
		5	6.5	20	**T0-5-8369/E**[2] 060204			**T0-5-8369/EZ**[2] 024610		1 Off				**T0-5-8369/IVS**[1] 064951		1 Off			
		5	13	32	**T3-5-8369/E**[2] 066584						**T3-5-8369/I2**[3] 207536		1 Off				**T3-5-8369/Z**[2] 068957		1 Off
		6	6.5	20	**T0-6-8370/E**[2] 062577			**T0-6-8370/EZ**[2] 029356		1 Off				**T0-6-8370/IVS**[1] 067324		1 Off	**T0-6-8370/Z**[2] 010380		1 Off
		6	13	32	**T3-6-8370/E**[2] 073703			**T3-6-8370/EZ**[2] 004506		1 Off									
		8	6.5	20	**T0-8-8372/E**[2] 064950			**T0-8-8372/EZ**[2] 034102		1 Off				**T0-8-8372/IVS**[1] 069697		1 Off	**T0-8-8372/Z**[2] 012753		1 Off
		8	13	32	**T3-8-8372/E**[2] 080822												**T3-8-8372/Z**[2] 083195		1 Off

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

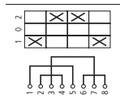
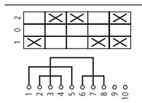
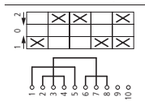
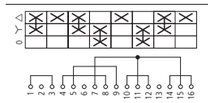
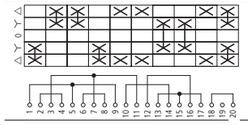
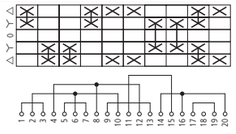
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 1

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole S I	Max. operating power AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
Reversing switch with 0 (Off) position																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
Without momentary																			
	 FS 684	2	6.5	20	**T0-2-8400/E**[1] 053079		1 Off	**T0-2-8400/EZ**[1] 055452		1 Off	**T0-2-8400/I1** 207111		1 Off	**T0-2-8400/IVS**[4] 060198		1 Off	**T0-2-8400/Z**[1] 062571		1 Off
			13	32	**T3-2-8400/E**[1] 073695			**T3-2-8400/EZ**[1] 000687			**T3-2-8400/I2**[3] 207181						**T3-2-8400/Z**[1] 095060	
			22	63	**T5B-2-8400/E**[2] 092918						**T5B-2-8400/I4**[2] 207222							
		3	6.5	20	**T0-3-8401/E**[1] 091047			**T0-3-8401/EZ**[1] 093420			**T0-3-8401/I1** 207132		1 Off	**T0-3-8401/IVS**[4] 098166		1 Off	**T0-3-8401/Z**[1] 010366		
			13	32	**T3-3-8401/E**[1] 030992			**T3-3-8401/EZ**[1] 000694			**T3-3-8401/I2**[3] 207188						**T3-3-8401/Z**[1] 035739	
			22	63	**T5B-3-8401/E**[2] 092296						**T5B-3-8401/I4**[2] 207227						**T5B-3-8401/Z**[2] 092293	
With momentary from both directions to 0																			
	 FS 4011	3	6.5	20	**T0-3-8228/E**[1] 015112		1 Off	**T0-3-8228/EZ**[1] 048334		1 Off	**T0-3-8228/I1** 207125		1 Off	**T0-3-8228/IVS**[4] 062572		1 Off	**T0-3-8228/Z**[1] 074437		1 Off
			13	32	**T3-3-8228/E**[1] 002538			**T3-3-8228/EZ**[1] 000695		1 Off	**T3-3-8228/I2**[3] 207186		1 Off				**T3-3-8228/Z**[1] 004911	
			22	63	**T5B-3-8228/E**[2] 092374						**T5B-3-8228/I4**[2] 207225		1 Off					
Star-delta switches																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
	 FS 635	3	6.5	20	**T0-4-8410/E**[1] 024604		1 Off	**T0-4-8410/EZ**[1] 053080		1 Off	**T0-4-8410/I1** 207140		1 Off	**T0-4-8410/IVS**[5] 064945		1 Off	**T0-4-8410/Z**[1] 083929		1 Off
			13	32	**T3-4-8410/E**[1] 009657			**T3-4-8410/EZ**[1] 000721		1 Off	**T3-4-8410/I2**[3] 207195		1 Off				**T3-4-8410/Z**[1] 012030	
			22	63	**T5B-4-8410/E**[1] 092052						**T5B-4-8410/I4**[1] 207234		1 Off				**T5B-4-8410/Z**[1] 092049	
Reversing star-delta switches																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
Two-way operating direction																			
	 FS 638	3	6.5	20	**T0-5-15876/E**[1] 000893		1 Off	**T0-5-15876/EZ**[1] 000900		1 Off				**T0-5-15876/IVS**[4] 000902		1 Off	**T0-5-15876/Z**[1] 000942		1 Off
			13	32	**T3-5-15876/E**[1] 016776			**T3-5-15876/EZ**[1] 000797		1 Off	**T3-5-15876/I2**[3] 207537		1 Off				**T3-5-15876/Z**[1] 019149		1 Off
	 FS 4017		22	63	**T5B-5-15876/E**[2] 214785												**T5B-5-15876/Z**[2] 214786		1 Off

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

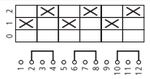
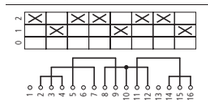
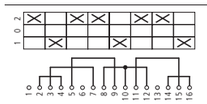
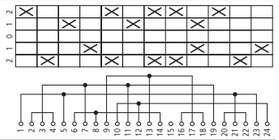
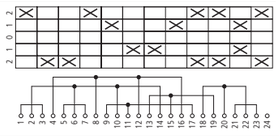
Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

5)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O	Max. motor rating: AC-23A 400/415 V 50/60 Hz 400 V P kW	Rated uninterrupted current I_u A	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting IP65 totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Distribution board mounting Front IP30 **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Multi-speed switches																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
Two-speed, non reversing, for 2 separate windings																			
	FS 644	6	6.5	20	**T0-3-8451/E**[2] 038849		1 Off	**T0-3-8451/EZ**[2] 083936		1 Off	**T0-3-8451/I1** 207133		1 Off	**T0-3-8451/IVS**[1] 026985		1 Off	**T0-3-8451/Z**[2] 043596		1 Off
			13	32	**T3-3-8451/E**[2] 028641			**T3-3-8451/EZ**[2] 000956		1 Off	**T3-3-8451/I2**[3] 207189		1 Off				**T3-3-8451/Z**[2] 031014		1 Off
			22	63	**T5B-3-8451/E**[4] 092288						**T5B-3-8451/I4**[4] 207228		1 Off						
2-speed, 2 directions, for one tapped winding																			
	FS 644	3	6.5	20	**T0-4-8440/E**[2] 041222		1 Off	**T0-4-8440/EZ**[2] 088682		1 Off	**T0-4-8440/I1** 207141		1 Off	**T0-4-8440/IVS**[1] 029358		1 Off	**T0-4-8440/Z**[2] 048342		1 Off
			13	32	**T3-4-8440/E**[2] 035760			**T3-4-8440/EZ**[2] 000959			**T3-4-8440/I2**[3] 207196		1 Off				**T3-4-8440/Z**[2] 038133		
			22	63	**T5B-4-8440/E**[4] 092032						**T5B-4-8440/I4**[4] 207235		1 Off				**T5B-4-8440/Z**[4] 092029		
	FS 684	3	6.5	20	**T0-4-8441/E**[2] 043595			**T0-4-8441/EZ**[2] 093428			**T0-4-8441/I1** 207142		1 Off	**T0-4-8441/IVS**[1] 031731		1 Off	**T0-4-8441/Z**[2] 053088		
			13	32	**T3-4-8441/E**[2] 042879						**T3-4-8441/I2**[3] 207197		1 Off				**T3-4-8441/Z**[2] 045252		
			22	63	**T5B-4-8441/E**[4] 092028						**T5B-4-8441/I4**[4] 207236		1 Off				**T5B-4-8441/Z**[4] 092025		
Reversing multi-speed switches																			
With black thumb-grip and front plate Without emergency switching off/emergency stop function																			
2-speed, 2 directions, for one tapped winding																			
	FS 629	–	6.5	20	**T0-6-15866/E**[2] 055460		1 Off	**T0-6-15866/EZ**[2] 012747		1 Off				**T0-6-15866/IVS**[1] 036477		1 Off	**T0-6-15866/Z**[2] 067326		1 Off
		–	13	32	**T3-6-15866/E**[2] 054744												**T3-6-15866/Z**[2] 057117		1 Off
	FS 441	–	22	63	**T5B-7-15866/E**[4] 214788														

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

2)

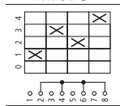
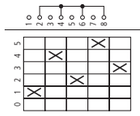
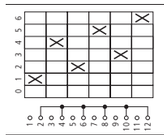
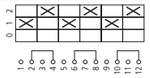
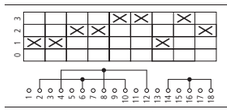
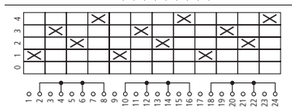
Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

Contact sequence	Front plate no.	Main contacts Pole N/O	Flush mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting[2] Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting[2] Front IP65 Part no. Article no.	Price See price list	Std. pack
Step switches																	
With black thumb-grip and front plate One contact closed per step Without overlap																	
With 0 (Off) position																	
	 FS 418	1	**T0-1-8240/E** 034105		1 Off	**T0-1-8240/EZ** 043597		1 Off	**T0-1-8240/I1** 207079		1 Off	**T0-1-8240/IVS** 027076		1 Off	**T0-1-8240/Z** 060208		1 Off
	 FS 420	1	**T0-2-8241/E** 050716			**T0-2-8241/EZ** 053089			**T0-2-8241/I1** 207107			**T0-2-8241/IVS** 057835			**T0-2-8241/Z** 062581		
	 FS 422	1	**T0-2-8242/E** 067327			**T0-2-8242/EZ** 069700			**T0-2-8242/I1** 207108			**T0-2-8242/IVS** 074446			**T0-2-8242/Z** 076819		
	 FS 424	1	**T0-3-8243/E** 081565			**T0-3-8243/EZ** 083938			**T0-3-8243/I1** 207128			**T0-3-8243/IVS** 088684			**T0-3-8243/Z** 091057		
	 FS 426	1	**T0-3-8244/E** 095803			**T0-3-8244/EZ** 098176			**T0-3-8244/I1** 207129			**T0-3-8244/IVS** 012749			**T0-3-8244/Z** 015122		
	 FS 418	3	**T0-3-8280/E** 034106			**T0-3-8280/EZ** 036479			**T0-3-8280/I1** 207130			**T0-3-8280/IVS** 041225			**T0-3-8280/Z** 043598		
	 FS 420	3	**T0-5-8281/E** 048344			**T0-5-8281/EZ** 050717						**T0-5-8281/IVS** 055463			**T0-5-8281/Z** 057836		
	 FS 422	3	**T0-6-8282/E** 062582			**T0-6-8282/EZ** 064955						**T0-6-8282/IVS** 069701			**T0-6-8282/Z** 072074		

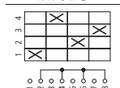
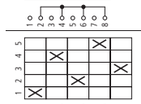
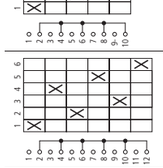
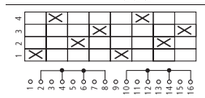
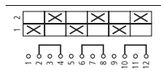
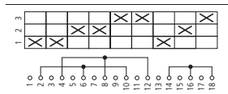
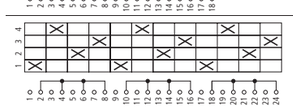
Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O	Flush mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting[2] Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack
Step switches																	
With black thumb-grip and front plate One contact closed per step Without overlap																	
without 0 (Off) position																	
	 FS 943	1	**T0-1-8220/E** 031728		1 Off	**T0-1-8220/EZ** 095799		1 Off	**T0-1-8220/I1** 207078		1 Off	**T0-1-8220/IVS** 055459		1 Off	**T0-1-8220/Z** 086312		1 Off
	 FS 404	1	**T0-2-8230/E** 088685			**T0-2-8230/EZ** 091058			**T0-2-8230/I1** 207105			**T0-2-8230/IVS** 095804			**T0-2-8230/Z** 098177		
	 FS 606	1	**T0-2-8231/E** 012750			**T0-2-8231/EZ** 015123			**T0-2-8231/I1** 207106			**T0-2-8231/IVS** 019869			**T0-2-8231/Z** 022242		
	 FS 408	1	**T0-3-8232/E** 026988			**T0-3-8232/EZ** 029361			**T0-3-8232/I1** 207126			**T0-3-8232/IVS** 034107			**T0-3-8232/Z** 036480		
	 FS 410	1	**T0-3-8233/E** 041226			**T0-3-8233/EZ** 043599			**T0-3-8233/I1** 207127			**T0-3-8233/IVS** 048345			**T0-3-8233/Z** 050718		
	 FS 406	2	**T0-4-8251/E** 013971			**T0-4-8251/EZ** 013972			**T0-4-8251/I1** 218984			**T0-4-8251/IVS** 013974			**T0-4-8251/Z** 013976		
	 FS 943	3	**T0-3-8222/E** 048339			**T0-3-8222/EZ** 015118			**T0-3-8222/I1** 207124			**T0-3-8222/IVS** 060205					
	 FS 404	3	**T0-5-8270/E** 091059			**T0-5-8270/EZ** 093432						**T0-5-8270/IVS** 098178			**T0-5-8270/Z** 010378		
	 FS 406	3	**T0-6-8271/E** 015124			**T0-6-8271/EZ** 017497						**T0-6-8271/IVS** 022243			**T0-6-8271/Z** 024616		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O	Flush mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting[2] Front IP65 Part no. Article no.	Price See price list	Std. pack
On-Off switches								
With black thumb-grip and front plate								
1 0 2 0	FS 415	1	**T0-1-15401/E** 038854		1 Off	**T0-1-15401/EZ** 041227		1 Off
1 0 2 0 3 0 4 0		2	**T0-1-15402/E** 053092			**T0-1-15402/EZ** 055465		
1 0 2 0 3 0 4 0 5 0 6 0		3	**T0-2-15403/E** 067330			**T0-2-15403/EZ** 069703		
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0		4	**T0-2-15404/E** 081568			**T0-2-15404/EZ** 083941		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

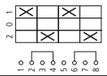
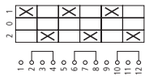
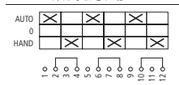
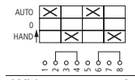
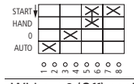
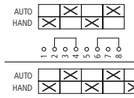
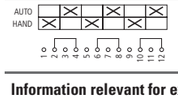
Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting[3] Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
T0-1-15401/I1 207067		1 Off	**T0-1-15401/ IVS** 045973		1 Off			
T0-1-15402/I1 207068		1 Off	**T0-1-15402/ IVS** 060211					
			T0-2-15403/ IVS 074449					

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP65; UL/CSA Type: –

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits, suitable as motor disconnect
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O	Flush mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting[2] Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack
Changeover switches																	
With black thumb-grip and front plate																	
	 FS 429	1	**T0-1-15421/E** 095806		1 Off	**T0-1-15421/EZ** 098179		1 Off	**T0-1-15421/I1** 207069		1 Off	**T0-1-15421/IVS** 012752		1 Off	**T0-1-15421/Z** 015125		1 Off
		2	**T0-2-15422/E** 019871			**T0-2-15422/EZ** 022244			**T0-2-15422/I1** 207090			**T0-2-15422/IVS** 026990			**T0-2-15422/Z** 029363		
		3	**T0-3-15423/E** 034109			**T0-3-15423/EZ** 036482			**T0-3-15423/I1** 207114			**T0-3-15423/IVS** 041228			**T0-3-15423/Z** 043601		
Manual/Auto switches																	
With 0 (Off) position																	
	 FS 1401	1	**T0-1-15431/E** 019872		1 Off	**T0-1-15431/EZ** 022245		1 Off	**T0-1-15431/I1** 207070		1 Off	**T0-1-15431/IVS** 026991		1 Off	**T0-1-15431/Z** 029364		1 Off
		2	**T0-2-15432/E** 034110			**T0-2-15432/EZ** 036483			**T0-2-15432/I1** 207091			**T0-2-15432/IVS** 041229			**T0-2-15432/Z** 043602		
		3	**T0-3-15433/E** 048348			**T0-3-15433/EZ** 050721			**T0-3-15433/I1** 207115			**T0-3-15433/IVS** 055467			**T0-3-15433/Z** 057840		
With momentary from HAND																	
	 FS 1414000	1	**T0-1-15434/E** 062586		1 Off	**T0-1-15434/EZ** 018053		1 Off	**T0-1-15434/I1** 207071		1 Off	**T0-1-15434/IVS** 069705		1 Off	**T0-1-15434/Z** 072078		1 Off
		2	**T0-2-15435/E** 003191		1 Off	**T0-2-15435/EZ** 003192		1 Off	**T0-2-15435/I1** 218971		1 Off	**T0-2-15435/IVS** 003195		1 Off	**T0-2-15435/Z** 003196		1 Off
With momentary from START																	
	 FS 1413890	2	**T0-2-15907/E** 066931		1 Off	**T0-2-15907/EZ** 069304		1 Off	**T0-2-15907/I1** 207095		1 Off	**T0-2-15907/IVS** 076423		1 Off	**T0-2-15907/Z** 078796		1 Off
Without 0 (Off) position																	
	 FS 19334	1	**T0-1-15451/E** 076824		1 Off	**T0-1-15451/EZ** 079197		1 Off	**T0-1-15451/I1** 207072		1 Off	**T0-1-15451/IVS** 083943		1 Off	**T0-1-15451/Z** 086316		1 Off
		2	**T0-2-15452/E** 091062			**T0-2-15452/EZ** 093435			**T0-2-15452/I1** 207092			**T0-2-15452/IVS** 098181			**T0-2-15452/Z** 010381		
		3	**T0-3-15453/E** 015127			**T0-3-15453/EZ** 017500			**T0-3-15453/I1** 207116			**T0-3-15453/IVS** 022246			**T0-3-15453/Z** 024619		

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O	Flush mounting Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
On switch (N/O)								
With black thumb-grip and front plate Momentary from position 1								
	FS 4721	1	**T0-1-15321/E** 086317		1 Off	**T0-1-15321/EZ** 088690		1 Off
		2	**T0-1-15322/E** 010382			**T0-1-15322/EZ** 012755		
		3	**T0-2-15323/E** 024620			**T0-2-15323/EZ** 026993		
	FS 456		**T0-1-15366/E** 081572			**T0-1-15366/EZ** 083945		
ON-OFF momentary switches								
With black thumb-grip and front plate Momentary from START position								
START 1 0	FS 147767	1	**T0-1-15511/E** 019875		1 Off	**T0-1-15511/EZ** 022248		1 Off
START 1 0		2	**T0-2-15512/E** 034113			**T0-2-15512/EZ** 036486		
START 1 0		3	**T0-3-15513/E** 048351			**T0-3-15513/EZ** 050724		
START 2 0 1 START	FS 140660	see K 115	**T0-2-8177/E** 015130			**T0-2-8177/EZ** 017503		

Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting Front IP65 Part no. Article no.	Price See price list	Std. pack
T0-1-15321/I1 207064		1 Off	**T0-1-15321/IVS** 093436		1 Off	**T0-1-15321/Z** 095809		1 Off
T0-1-15322/I1 207065			**T0-1-15322/IVS** 017501					
T0-2-15323/I1 207087			**T0-2-15323/IVS** 031739					
T0-1-15511/I1 207073		1 Off	**T0-1-15511/IVS** 026994		1 Off	**T0-1-15511/Z** 029367		1 Off
T0-2-15512/I1 207093						**T0-2-15512/Z** 043605		1 Off
T0-3-15513/I1 207117								
T0-2-8177/I1 207101			**T0-2-8177/IVS** 022249		1 Off	**T0-2-8177/Z** 024622		1 Off

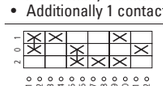
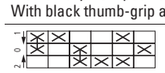
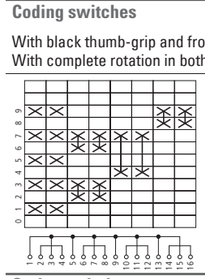
Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Main contacts Pole N/O |	Flush mounting[1] Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting[1] Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Surface mounting IP65 totally insulated **Part no.** Article no.	**Price** See price list	Std. pack	Distribution board mounting[2] Front IP30 **Part no.** Article no.	**Price** See price list	Std. pack	Rear mounting[1] Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Universal control switches																		
With black thumb-grip and front plate																		
Maintained switches with 3 positions 1 contact closed in each position • Additionally 1 contact closed in position 0 and 1 • Additionally 1 contact closed in position 0 and 2 • Additionally 1 contact closed in position 0 and 3																		
	 FS 429		**T0-3-15391/E** 029365		1 Off	**T0-3-15391/EZ** 031738		1 Off	**T0-3-15391/I1** 207112		1 Off	**T0-3-15391/IVS** 036484		1 Off			
Momentary from positions 1 and 2 With black thumb-grip and front plate																		
	 FS 458		**T0-3-15394/E** 072079		1 Off	**T0-3-15394/EZ** 074452		1 Off	**T0-3-15394/I1** 207113		1 Off	**T0-3-15394/IVS** 079198		1 Off	**T0-3-15394/Z** 081571		1 Off
Coding switches																		
With black thumb-grip and front plate With complete rotation in both directions.																		
	 FS 312	Binary BCD code	**T0-4-15602/E** 029368		1 Off	**T0-4-15602/EZ** 031741		1 Off	**T0-4-15602/I1** 207134		1 Off	**T0-4-15602/IVS** 036487		1 Off	**T0-4-15602/Z** 038860		1 Off
Series switches																		
With black thumb-grip and front plate With 0 (Off) position (heater switches)																		
	 FS 614	1	**T0-1-91/E** 072082		1 Off	**T0-1-91/EZ** 074455		1 Off	**T0-1-91/I1** 207080		1 Off	**T0-1-91/IVS** 079201		1 Off	**T0-1-91/Z** 081574		1 Off

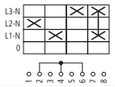
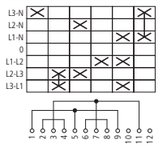
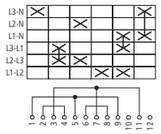
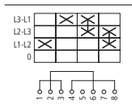
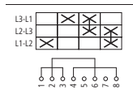
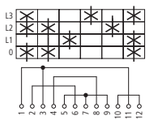
Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

Contact sequence	Front plate no.	Pole	Main contacts	Flush mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack	Center mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack
			Pole N/O						
Voltmeter selector switch									
With black thumb-grip and front plate									
	 FS 1410757	3 x phase-N with 0 position	3 + N	**T0-2-15921/E** 067337		1 Off	**T0-2-15921/EZ** 069710		1 Off
	 FS 1410759	3 x phase-phase 3 x phase-N with 0 position	3 + N	**T0-3-8007/E** 095813			**T0-3-8007/EZ** 098186		
	 FS 164721	3 x phase-phase 3 x phase-N without 0 position with complete rotation in both directions	3 + N	**T0-3-15924/E** 019878			**T0-3-15924/EZ** 022251		
	 FS 1410755	3 x phase-phase with 0 position	3	**T0-2-15920/E** 038861			**T0-2-15920/EZ** 041234		
	 FS 164854	3 x phase-phase without 0 position	3	**T0-2-15922/E** 053099			**T0-2-15922/EZ** 055472		
Ammeter selector switch									
With black thumb-grip and front plate With complete rotation in both directions. Measurement via current transformer With 0 (Off) position									
	 FS 9440			**T0-3-8048/E** 034116		1 Off	**T0-3-8048/EZ** 036489		1 Off

Contact sequence	Front plate no.	Pole	Main contacts	Surface mounting IP65 totally insulated Part no. Article no.	Price See price list	Std. pack	Distribution board mounting[2] Front IP30 Part no. Article no.	Price See price list	Std. pack	Rear mounting[1] Front IP65 Part no. Article no.	Price See price list	Std. pack
			Pole N/O									
							T0-2-15921/IVS 074456		1 Off	**T0-2-15921/Z** 076829		1 Off
				T0-3-8007/I1 207120		1 Off	**T0-3-8007/IVS** 012759			**T0-3-8007/Z** 015132		
				T0-3-15924/I1 207119		1 Off	**T0-3-15924/IVS** 026997			**T0-3-15924/Z** 029370		
							T0-2-15920/IVS 029452			**T0-2-15920/Z** 048353		
							T0-2-15922/IVS 060218			**T0-2-15922/Z** 062591		
							T0-3-8048/IVS 041235		1 Off	**T0-3-8048/Z** 043608		1 Off

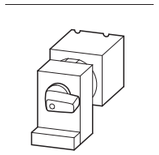
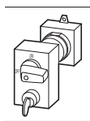
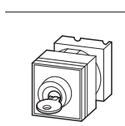
Information relevant for export to North America

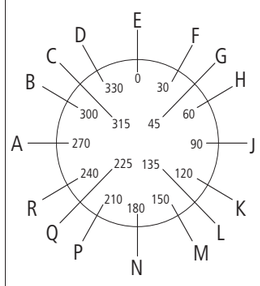
1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Degree of Protection	IEC: IP30; UL/CSA Type: –

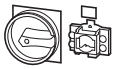
Contact sequence	Front plate no.	Main contacts	Max. motor rating AC-23 A, 400/415 V, 50/60 Hz	Rated uninterrupted current	Flush mounting IP65		Surface mounting IP65 totally insulated		Rear mounting IP65		Std. pack	Notes
					Part no. Article no.	Price See price list	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
		Pole	400 V	I_u								
		N/O	P	A								
			kW									
Panic switch												
Cylinder lock SVA Without emergency switching off/emergency stop function, with two keys With black thumb-grip and front plate If the key is withdrawn in position 1 the switch can be switched off but not on again without the key.												
	 FS 908	3	6.5	20	 **T0-2-1/E/SVA(S)** 050977		 **T0-2-1/I1/SVA(S)** 207084		1 Off			
		3	13	25	**P1-25/E/SVA(S)** 050966		**P1-25/I2/SVA(S)** 207305					
		3	15	32	**P1-32/E/SVA(S)** 044977		**P1-32/I2/SVA(S)** 207326					
As an emergency switching off/emergency stop device To IEC/EN 60204-1, VDE 0113 Part 1 With two keys With red thumb-grip and yellow front plate												
	 FS 908 GE	3	6.5	20	 **T0-2-1/E/SVA(S)-RT** 228291		 **T0-2-1/I1/SVA(S)-RT** 207085		1 Off			
		3	13	25	**P1-25/E/SVA(S)-RT** 050967		**P1-25/I2/SVA(S)-RT** 207306		1 Off			
		3	15	32	**P1-32/E/SVA(S)-RT** 050971							
Padlocking feature SVC As an emergency switching off/emergency stop device To IEC/EN 60204-1, VDE 0113 Part 1, with two keys With red thumb-grip and yellow front plate If the locking slide is padlocked in position 1 the switch can be switched off but not on again without removing the padlock. Lockable with max. 3 padlocks.												
	 FS 908 GE	3	6.5	20	 **T0-2-1/E/SVC(S)-RT** 044973		 **T0-2-1/I1/SVC(S)-RT** 207086		1 Off			
		3	13	25	**P1-25/E/SVC(S)-RT** 044974		**P1-25/I2/SVC(S)-RT** 207307					
		3	15	32	**P1-32/E/SVC(S)-RT** 044975		**P1-32/I2/SVC(S)RT** 207328					
On-Off switches												
Without emergency switching off/emergency stop function With black thumb-grip and front plate Key can only be withdrawn in position 0 (Pos A)												
	 FS 908	3	6.5	20	 **T0-2-1/E/SVA(A)** 050976		 **T0-2-1/I1/SVA(A)** 207083		1 Off	 **T0-2-1/Z/SVA(A)** 050978		1 Off
		3	13	25	**P1-25/E/SVA(A)** 050965		**P1-25/I2/SVA(A)** 207304			**P1-25/Z/SVA(A)** 050969		1 Off
		3	15	32	**P1-32/E/SVA(A)** 050970		**P1-32/I2/SVA(A)** 207325					
Key operation lock mechanism ST-0 Without emergency switching off/emergency stop function With black thumb-grip and front plate Key can only be withdrawn in position 0 (Pos A)												
	 FS 908	2	6.5	20	 **T0-1-102/EZ/S** 014933		 **T0-1-102/I1/S** 207063		1 Off	 **T0-1-102/Z/S** 014971		1 Off



Code letters for lockable switch positions
Letter S for panic lock with FS908GE

SVB-...-T0(P3), KNB-...-T0(P3)

HPL04058EN

		Emergency switching off/emergency stop	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Main switch assembly kits							
Padlocking feature only for main switch Permissible with T0 with up to max. 4 contact units Permissible with T3 with up to max. 6 contact units							
	With red rotary handle and yellow locking collar	As an emergency switching off/emergency stop device To IEC/EN 60204-1, VDE 0113 Part 1	T0-.../E, .../Z, .../I1 T3-.../E, .../Z, .../I2 P1-.../E, .../Z, .../I2	**SVB-T0** 057892		1 off	• For locking the 0 position • For switches with positions 0 -I at 90° • Switching angle as front plate FS908 • Lockable with max. 3 padlocks
			T5B-.../E, .../Z, .../I4 T5-.../E, .../Z, .../I5 P3-63/E, .../Z, .../I4 P3-100/E, .../Z, .../I5	**SVB-P3** 052999		1 off	
	With black rotary handle and black locking collar	Without emergency switching off/emergency stop function	T0-.../E, .../Z, .../I1 T3-.../E, .../Z, .../I2 P1-.../E, .../Z, .../I2	**SVB-SW-T0** 060265		1 off	• For locking the 0 position • For locking the I position when required • Lockable with max. 3 padlocks
			T5B-.../E, .../Z, .../I4 T5-.../E, .../Z, .../I5 P3-63/E, .../Z, .../I4 P3-100/E, .../Z, .../I5	**SVB-SW-P3** 062491		1 off	
Main switch assembly kits with PE terminal and N terminal							
Padlocking feature only for main switch Permissible with T0 with up to max. 4 contact units Permissible with T3 with up to max. 6 contact units							
	With red rotary handle and yellow locking collar	As an emergency switching off/emergency stop device To IEC/EN 60204-1, VDE 0113 Part 1	T0-.../E, .../Z T3-.../E, .../Z	**V/EA/SVB-T0** 062638		1 off	• For converting flush mounting switch T.../E into flush mounting main switch T.../EA/SVB... • For converting rear mounting switch T.../Z (with FS908 front plate) into interlocked rear mounting main switch T.../V/SVB
			T5(B)-.../E, .../Z	**V/EA/SVB-T5** 045065		1 off	
	With black rotary handle and black locking collar	Without emergency switching off/emergency stop function	T0-.../E, .../Z T3-.../E, .../Z	**V/EA/SVB-SW-T0** 065011		1 off	
			T5(B)-.../E, .../Z	**V/EA/SVB-SW-T5** 045064		1 off	
Thumb-grips							
	Black	–	T0-.../E, .../EZ, .../IVS, .../Z, .../I1 T3-.../E, .../EZ, .../IVS, .../Z, .../I2 P1-.../E, .../EZ, .../IVS, .../Z, .../I2	**KNB-T0** 038909		10 off	–
	Red	Only for emergency switching off/emergency stop switches To IEC/EN 60204-1, VDE 0113 Part 1	T0-.../E, .../IVS, .../Z, .../I1 T3-.../E, .../IVS, .../Z, .../I2 P1-.../E, .../IVS, .../Z, .../I2	**KNB-RT-T0** 043655		10 off	• Order yellow FS908GE-T0 front plate additionally
	Black	–	T5(B)-.../E, .../Z, .../I4 P3-63/E, .../Z, .../I4 P3-100/E, .../Z, .../I5	**KNB-P3** 041282		10 off	–
	Red	Only for emergency switching off/emergency stop switches To IEC/EN 60204-1, VDE 0113 Part 1	T5(B)-.../E, .../Z, .../I4 P3-63/E, .../Z, .../I4 P3-100/E, .../Z, .../I5	**KNB-RT-P3** 046028		10 off	• Order additional yellow front plate FS908GE-P3
Maintenance key for interlocked main switches							
			T0... P1...	**KNK-T0** 000650		5 off	Special devices for electricians: interlocked main switches can be switched on and off for repairs with the maintenance key while the door is open (as per IEC/EN 60204-1, Section 5.1.1.1)
			P3...	**KNK-P3** 000649		5 off	
ATEX type							
According to 94/9EG Test Certificate BVS04E106X							
	With metric knock-outs M20		T0-.../I1	**+ATEX-I1** 237513		1 off	Only available together with basic unit
	With solid side walls		T3-.../I2 P1-.../I2	**+ATEX-I2** 237514			
			T5B-.../I4 P3-.../I4	**+ATEX-I4** 237516			
			T5-.../I5 P3-.../I5	**+ATEX-I5** 237517			

Information relevant for export to North America

UL/CSA certification not required

Switch size	Dimensions (W x H x D) mm	For use with	Blank plate Can be engraved **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Standard front plate						
Suitable for laser inscription						
T0, T3, P1	45 x 45	(for frame 48 x 48)	**FS(*)-T0** 231893		10 off	UL/CSA certification not required
P3, T5, T5B	84 x 84	(for frame 88 x 88)	**FS(*)-P3** 231895		10 off	
Emergency switching off/emergency stop front plates						
T0, T3, P1	45 x 45	(for frame 48 x 48)	**FS908GE-T0** 003198		5 off	
P3, T5, T5B	84 x 84	(for frame 88 x 88)	**FS908GE-P3** 031475		5 off	
Blank plate						
Can be engraved						
P3, T5, T5B	84 x 84	(for frame 88 x 88)	**FS-ALU980-P3** 266906		10 off	
T0, T3, P1	45 x 45	(for frame 48 x 48)	**FS-ALU980-T0** 266905		50 off	

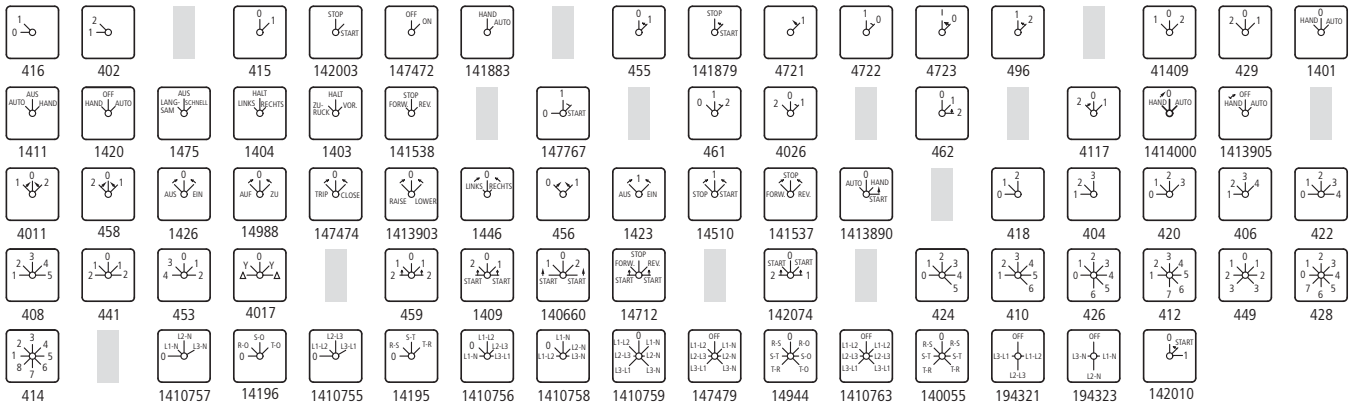
Notes

Standard front plate
For standard switches the normal front plate can be replaced if required with the front plate shown here (not with T6, T8 and TM).
This is provided the switching angle, number of positions and the position of the 0 position are the same.

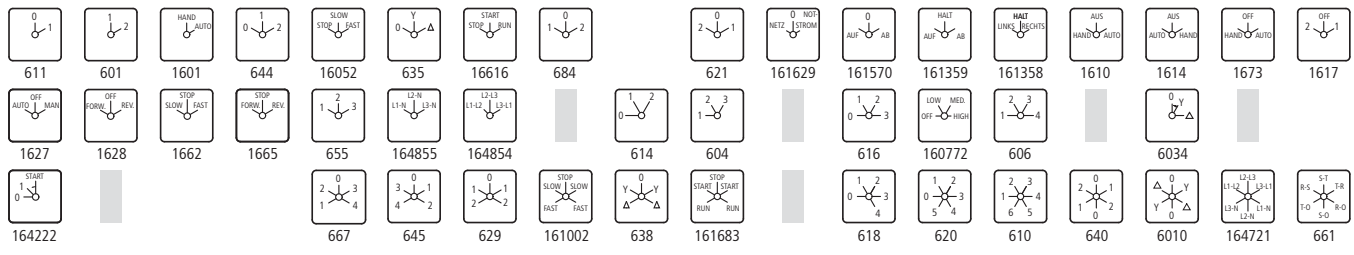
Switching angle 30°



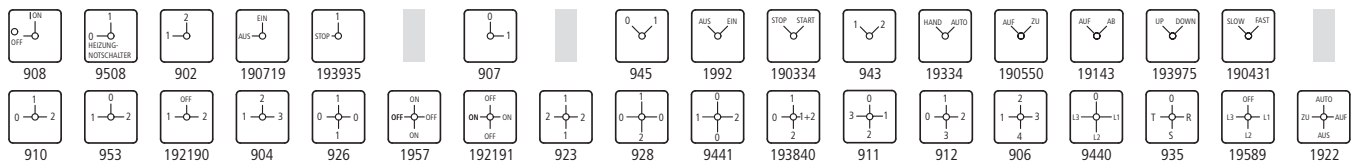
Switching angle 45°

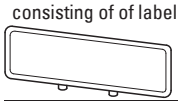
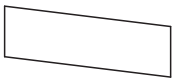
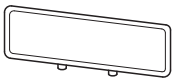


Switching angle 60°



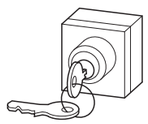
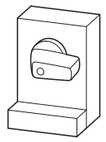
Switching angle 90°

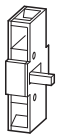
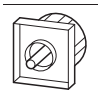


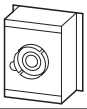
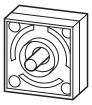
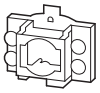
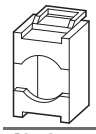
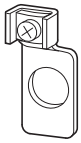
	Language	Cam switches T0, T3, P1 **Part no.** Article no.	**Price** See price list	Std. pack	Switch-disconnectors T5(B), P3 **Part no.** Article no.	**Price** See price list	Std. pack
Add-on front plate, clip-on, complete							
For padlocking features consisting of of label mount and insert label							
							
• Inscribed with standard text "Main switch - Open only in 0 position" in various languages • Front plates are already included as a standard with: T…/EA/SVB, P…/EA/SVB main switches for flush mounting T…/V/SVB, P…/V/SVB main switches for rear mounting							
• Inscribed with standard text	German/English	**ZFS61/62-T0** 030170		25 off	**ZFS61/62-P3** 065739		25 off
	French	**ZFS63-T0** 047424			**ZFS63-P3** 047423		25 off
	Italian	**ZFS68-T0** 065751					
	Portuguese	**ZFS72-T0** 205541					
	Swedish	**ZFS75-T0** 205544					
	Spanish	**ZFS77-T0** 065752			**ZFS77-P3** 047422		25 off
	Hungarian	**ZFS80-T0** 205548			**ZFS80-P3** 205565		
Blank, can be engraved	none	**ZFS60-T0** 019924			**ZFS60-P3** 022297		
Label mounts, black, clip-on							
		**ZFSX-T0** 024670		25 off	**ZFSX-P3** 027043		25 off
Insert label							
		**BS45X14-T0** 029416		25 off	**BS84X24-P3** 031789		25 off
P5 switch-disconnector add-on front plate							
Clip-on Enter country reference when ordering: D = German GB = English F = French I = Italian E = Spanish							
	P5-…/EA/SVB P5-…/V/SVB	**ZFS(*)-P5** 105225		1 off			

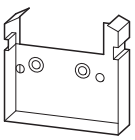
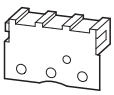
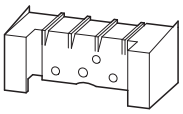
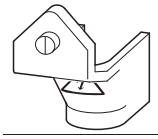
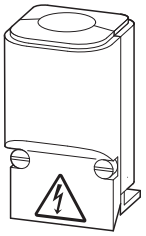
Information relevant for export to North America

UL/CSA certification not required

		For use with	Withdrawability	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
S-T0 key operated lock mechanism, front IP53							
With two keys							
	KMS 1 lock mechanism: individual lock mechanism, not suitable for master key systems Key withdrawable in all positions	T0-1.../I1 to T0-4.../I1 T0-1.../E to T0-6.../E T0-1.../Z to T0-6.../Z T3-1.../E to T3-5.../E T3-1.../Z to T3-5.../Z T3-1.../I2 to T3-4.../I2 P1-.../E P1-.../I2 P1-.../Z	Withdrawable positions can be programmed by user	**S-T0** 086709		1 off	The key replaces the thumb-grip, cannot be switched without key. The switch position indication is on the lock. Normally the key is withdrawable in every position. On cam switches ordered with front plate FS908 together with key operation, the key is only withdrawable in the 0 position. The key withdraw can be changed (also retrospectively) with the locking cam "VR-T0". When retrofitting the key operation, the existing front plate of the cam switch must be used. Keys → Page 4/66
	KMS 2-10, KMS 201-400 lock mechanisms: individual lock mechanisms, not suitable for master key systems Key withdrawable in all positions			**S-SOND-KMS(*)-T0** 231957		1 off	
	Lock KMS1: Switches with FS908 are possible as main switch. Key can be withdrawn in positions as specified		Withdrawable positions programmed at factory as ordered	**S(*)-T0** 231959		1 off	
	SA(...) = master key system (master-key facility) with security certificate. Ordering only with lock plan filled out with the **full configuration of the envisaged lock system**. When reordering state item number from the lock plan, e.g (A 6294-1.2). Key can be withdrawn in positions as specified			**S(*)-SOND-SA(*)-T0** 231965		1 off	
SVA-T3 cylinder lock, front IP65							
With two keys							
	KMS 1 lock mechanism: individual lock mechanism, not suitable for master key systems Key withdrawable in all positions	T0-…/E, T0-…/I1, T0-…/Z T3-…/E, T3-…/I2, T3-…/Z P1-…/E, P1-…/I2, P1-…/Z	Withdrawable positions can be programmed by user	**SVA-T3** 050974		1 off	
	KMS 2-10, KMS 201-400 lock mechanisms: individual lock mechanisms, not suitable for master key systems Key withdrawable in all positions			**SVA-SOND-KMS(*)-T3** 231967		1 off	
	Lock KMS1: Switches with FS908 are possible as main switch. Key can be withdrawn in positions as specified	T0-1-… to T0-4-…/I1 T0-1-.../E to T0-4-.../E T3-1-... to T3-5-.../I2 T3-1-... to T3-6-.../E P1-.../I2, P1-.../E	Withdrawable positions programmed at factory as ordered	**SVA(*)-T3** 907745		1 off	
	SA(...) = master key system (master-key facility) with security certificate. Ordering only with lock plan filled out with the **full configuration of the envisaged lock system**. When reordering state item number from the lock plan, e.g (A 6294-1.2). Key can be withdrawn in positions as specified			**SVA(*)-SOND-SA(*)-T3** 231971		1 off	
SVC-T3 padlocking feature, front IP65							
The locking slide can be locked with a max. of 3 padlocks when in its pressed, interlocked position							
	All positions can be locked	T0-…/E, T0-…/I1, T0-…/Z T3-…/E, T3-…/I2, T3-…/Z P1-…/E, P1-…/I2, P1-…/Z	The positions that can be locked can be programmed by the user	**SVC-T3** 050975		1 off	
	Specific positions or ranges can be locked	Switches with FS908 can be used as main switches for: T0-1-... to T0-4-.../I1, .../E T3-1-... to T3-5-.../I2 T3-1-... to T3-6-.../E P1-.../I2, P1-.../E	The positions that can be locked are programmable at the factory as ordered	**SVC(*)-T3** 907748		1 off	

		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Neutral conductor						
Early-make on switching, late-break off switching The N contact always behaves as an early-make contact when switching on and as a late-break contact when switching off. N-P1(P3)… switching capacity same as for contacts P1(P3)-…						
	For left or right side mounting	P1-…/E, …/EA, …/EZ	**N-P1E** 000651		5 off	Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking UL File No.: CSA report applies to both Canada and US UL CCN: – CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	For P1-…/I2: optionally, N-P1Z or HI11-P1/P3Z, can only be fitted on the left	P1-…/Z, …/V, …/I2, …/IVS	**N-P1Z** 000652			Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
		P3-…/E, …/EA…	**N-P3E** 062432			
		P3-…/Z, …/V, …/IVS P3-63…/Z, …/I4 P3-100…/Z, …/I5	**N-P3Z** 064805			
Neutral terminal						
Front mounting, left Service distribution board mounting, right						
		P5-125(160)/E(EA)	**N-P5-125/160E** 280969		1 off	
		P5-125(160)/Z(V)	**N-P5-125/160Z** 280970			
		P5-250(315)/E(EA)	**N-P5-250/315E** 280971			
		P5-250(315)/Z(V)	**N-P5-250/315Z** 280972			
Ground terminal						
Front mounting, right Service distribution board mounting, left						
		P5-125(160)/E(EA)	**PE-P5-125/160E** 280973		1 off	
		P5-125(160)/Z(V)	**PE-P5-125/160Z** 280974			
		P5-250(315)/E(EA)	**PE-P5-250/315E** 280975			
		P5-250(315)/Z(V)	**PE-P5-250/315Z** 280976			
Auxiliary contacts						
1 normally open (N/O), 1 normally close contact (N/C) Late-break on switching, early-make off switching. The N/O is always connected as a load-shedding contact.						
	For left and/or right side mounting	P1-…/E, …/EA…, …/EZ P3-…/E, …/EA	**HI11-P1/P3E** 061813		5 off	Product Standards: UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-5; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	For P1…/I2: optionally, HI11-P1/P3Z or N-P1Z, can only be fitted on the left	P1-…/Z, …/V, …/I2, …/IVS P3-63/Z, …/V, …/I4, …/IVS P3-100/Z, …/V, …/I5, …/IVS	**HI11-P1/P3Z** 062031		5 off	
2 normally open (N/O), 1 normally close contact (N/C)						
	For left and/or right side mounting	P5-125(160)/E(EA)	**HI21-P5-125/160E** 280963		1 off	
		P5-125(160)/Z(V)	**HI21-P5-125/160Z** 280964			
		P5-250(315)/E(EA)	**HI21-P5-250/315E** 280965			
		P5-250(315)/Z(V)	**HI21-P5-250/315Z** 280966			
Center mounting accessories						
For single-hole fitting 22.3 mm						
	For cam switches with existing front plate - quick installation with snap fitting system	T0-…/E T3-…/E	**EZ-T0** 081622		1 off	UL/CSA certification not required
	Mounting diameter 22.3 mm, one man mounting with screw fixing	T0-…/E T3-…/E P1-…/E	**EZ-P1** 091455		1 off	

		For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Service distribution board mounting accessories							
Including push-fit shaft							
	For retrofitting in service distribution board mounting T0-…/IVS design. Use the basic switch's front plate.	T0-…/XZ	**IVS-T0** 091114		1 off		UL/CSA certification not required
Coupling drive							
Including push-fit shaft							
	For the retrofitting of switch T0(T3)-.../XZ as rear mounting, spare part for T0(T3)/(P1)-.../Z	–	**DE-T0** 093487		1 off		UL/CSA certification not required
	For the conversion of T5(B)-.../E flush mounting switch to rear mounting, spare part for T5(B)/(P3)-...Z	–	**DE-P3** 093972		3 off		
Interlock sections							
With PE and neutral conductor connection Mounting on the back of flush mounting switch, with interlock function in rear mounting switches.							
		T0-…/E, …EZ, …Z T3-…/E, …EZ, …Z P1-…/E, …EZ, …Z	**UV-T0** 019925		1 off	Mounting on the back of flush mounting switch	UL/CSA certification not required
		T5(B)-…/E, …Z P3-…/E, …Z	**UV-P3** 048289		1 off	With interlock function for rear mounting switches	
Interlock extensions							
A max. of 4 units can be plugged on the interlock section every 25 mm (an equal number of shaft extensions is required for this)							
	Use only with T0/T3-… and P3-…/Z designs	UV-T0	**ZVV-T0** 022298		10 off	–	UL/CSA certification not required
	Use only with T5(B)-…/Z and P3-…/Z designs	UV-P3	**ZVV-P3** 024671		10 off	–	
Shaft extensions							
A max. of 4 units can be put on the switch shaft every 25 mm							
		T0-…/Z, T0-…/V T3-…/Z, T3-…/V P1-…/Z, P1-…/V	**ZAV-T0** 027044		10 off	–	UL/CSA certification not required
		T5(B)-…/Z P3-…/Z P3-…/V	**ZAV-P3** 029417		10 off	–	
Shaft							
	Aluminum, length: 480 mm	P5-…/V… P5-…/Z	**ZAV-P5** 280979		1 off		UL/CSA certification not required
Interlock extensions und shaft extensions, complete							
	Extension to 25 mm When ordering with basic unit		**+ZAV(X1)+ZVV(X1)-T0/P3** 254546		1 off		UL/CSA certification not required
Control cable terminal							
		P5-250/315	**ST-P5-250/315** 280978		1 off	Terminal capacity: • Solid or stranded: 4 mm² • Flexible with ferrules to DIN 46228: 4 mm²	UL/CSA certification not required

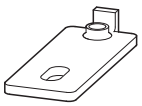
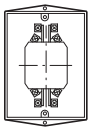
		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Shrouds[1]						
	For flush mounting switches with up to 4 contact units	T0-…/E T3-…/E	**H3-T0** 093828		1 off	Cable entries Quantity: 2 x ∅ 20 mm + 2 x ∅ 15 mm Cross-section: 5 x 6 mm² 5 x 2.5 mm²
	For covering the connection terminals of up to 2 contact units	T5(B)-…/E, …/Z	**H1-T5** 045062		1 off	Can be optionally used for input wiring and/or outgoer
	Extension for H1-T5 protective shroud on 3 - 8 contact units	H1-T5	**HZ-T5** 045063		10 off	One HZ-T5 required per contact unit
	For covering the connection terminals on 3 pole switch-disconnectors	P1-…/E, …/EZ, …/Z, …/EA, …/V	**H-P1** 017253		5 off	Can be optionally used for input wiring and/or outgoer
	For covering the connection terminals on 4 pole switch-disconnectors	P1-…N, …HI11, …N…HI11	**H-P14** 019626		5 off	Can be optionally used for input wiring and/or outgoer
	For covering the connection terminals on 3 pole open switch-disconnectors with N neutral conductor and/or HI11 auxiliary contact	P3-…/E, …/Z, …/EA, …/V P3-…N, …HI11, …N…HI11	**H-P3** 021999		5 off	The protective shroud is designed for mounting on the switch-disconnector on both sides; non-required parts can be broken off.
	For covering the terminals	P5	**H-P5-125/160** 293977		1 off	
	For covering the terminals	P5	**H-P5-250/315** 293978		1 off	
	Set (6 units) for covering the connection terminals	T8-3-8342/…	**H-T8** 200184		6 off	
Key						
	For KMS 1 individual lock mechanism	–	**ES-KMS1-T0** 231972		10 off	
	For KMS 2 - 10 or KMS 201 - 400 individual lock mechanism	–	**ES-KMS(*)-T0** 231973		1 off	
	Individual key, stainless, for master key system and stored individual lock mechanisms, state lock plan no. and key.	–	**HS-SA(*)-T0** 256151		1 off	Master key must be ordered additionally. The security certificate must be sent when reordering. **Ordering example:** HS-SA(A6294-1.2)-T0
Locking cams (2 cams per set)						
	For later change of key withdrawability in the engagement positions	S-T0 for all switching angles	**VR-T0** 089082		1 off	
	For changing the blocked positions/ranges	SVA-T3 SVC-T3	**VR-T3** 050987		1 off	
Mounting plate shield[2]						
To connect the shielding	CI-K2		**MBS-I2** 290191		1 off	
To connect the shielding	CI-K4		**MBS-I4** 118742		1 off	

Information relevant for export to North America

1)
UL/CSA certification not required

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified

			For use with	Part no. Article no.	Price See price list	Std. pack	Notes
IP65 insulated enclosures							
	1 - 2 contact units	With push-through cable entry diaphragm.	T0-…/Z	**CI-K1-T0-2** 207435		1 off	The diaphragm can be pierced with the cable Main current/control current: 12 mm/- 16 mm/8 mm 1 contact unit = 2 contacts
	3 - 4 contact units		T0-…/Z	**CI-K1-T0-4** 207436		1 off	
	1 - 2 contact units		T3-…/Z	**CI-K2-T3-2**[1] 207437		1 off	
	3 - 4 contact units		T3-…/Z	**CI-K2-T3-4**[1] 225325			
	5 contact units		T3-…/Z	**CI-K2-T3-5**[1] 207438			
	1 - 2 contact units	With metric knockouts	T0-…/Z	**CI-K1H-T0-2** 105854		1 off	
	3 - 4 contact units		T0-…/Z	**CI-K1H-T0-4** 105855			
	1 - 2 contact units		T3-…/Z	**CI-K2H-T3-2** 269462			
	3 - 4 contact units		T3-…/Z	**CI-K2H-T3-4** 105859			
	5 contact units		T3-…/Z	**CI-K2H-T3-5** 105860			
	1 - 2 contact units		T5B-…/E	**CI-K4-T5B-2** 207439		1 off	For converting T5-…/Z into T5-…/I5 and T5B-…/E into T5B…/I4: Order AW-T5-… extension terminal additionally 1 contact unit = 2 contacts
	3 - 4 contact units		T5B-…/Z	**CI-K4-T5B-4** 207440			
	1 - 2 contact units		T5-…/Z	**CI-K5-T5-2** 207441			
	3 - 4 contact units		T5-…/Z	**CI-K5-T5-4** 207442			
	Only available together with basic unit		T0-…/I1	**+I1H** 105870		1 off	
	Only available together with basic unit		T3-…/I2 P1-…/I2	**+I2H** 105871		1 off	
Neutral terminals							
For connection of a 5th conductor							
			CI-K2-PKZ0-...	**K-CI-K1/2**[2] 207451		20 off	
			T5B-…/I4, CI-K4-T5B-… P3-…/I4, CI-K4	**K-CI-K4**[2] 206916			
			T5-…/I5, CI-K5-T5-… P3-…/I5, CI-K5	**K-CI-K5**[2] 218488			
Set of external fixing brackets							
			T5B-…/I4, T5-…/I5, P3-63/I4, P3-100/I5	**AB-CI-K4/5**[2] 206914		1 off	For fixing CI-K4 and CI-K5 directly on walls. One set contains 4 brackets.
Set of extension terminals							
For retrofitting for connection inside enclosure							
	For the bottom contact unit		T5B-…/I4 T5-…/I5	**AW-T5-1/2**[2] 032601		10 off	Already included in equipment supplied with T5B-…/I4 and T5-…/I5.
	For the second contact unit from the bottom		T5-…/I5	**AW-T5-3/4**[2] 032602		1 off	Already included in equipment supplied with T5B-…/I4 and T5-…/I5.

Notes

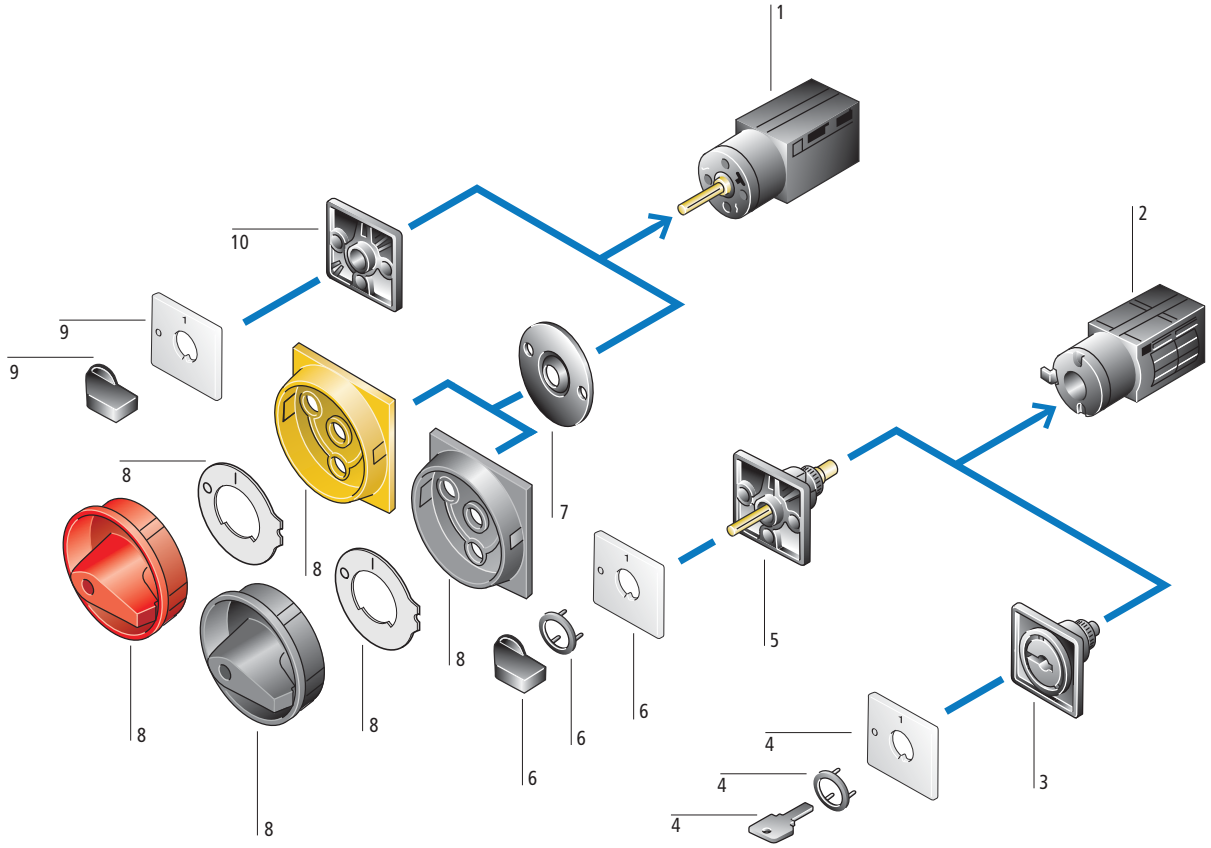
Information relevant for export to North America

[1] Product Standards: UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.: E54120
UL CCN: MITW2
CSA File No.: 12528
CSA Class No.: 3211-07
NA Certification: UL Listed, CSA certified
Degree of Protection: IEC: IP65; UL/CSA Type 1, 3R, 4X, 12, 13 – indoor and outdoor use

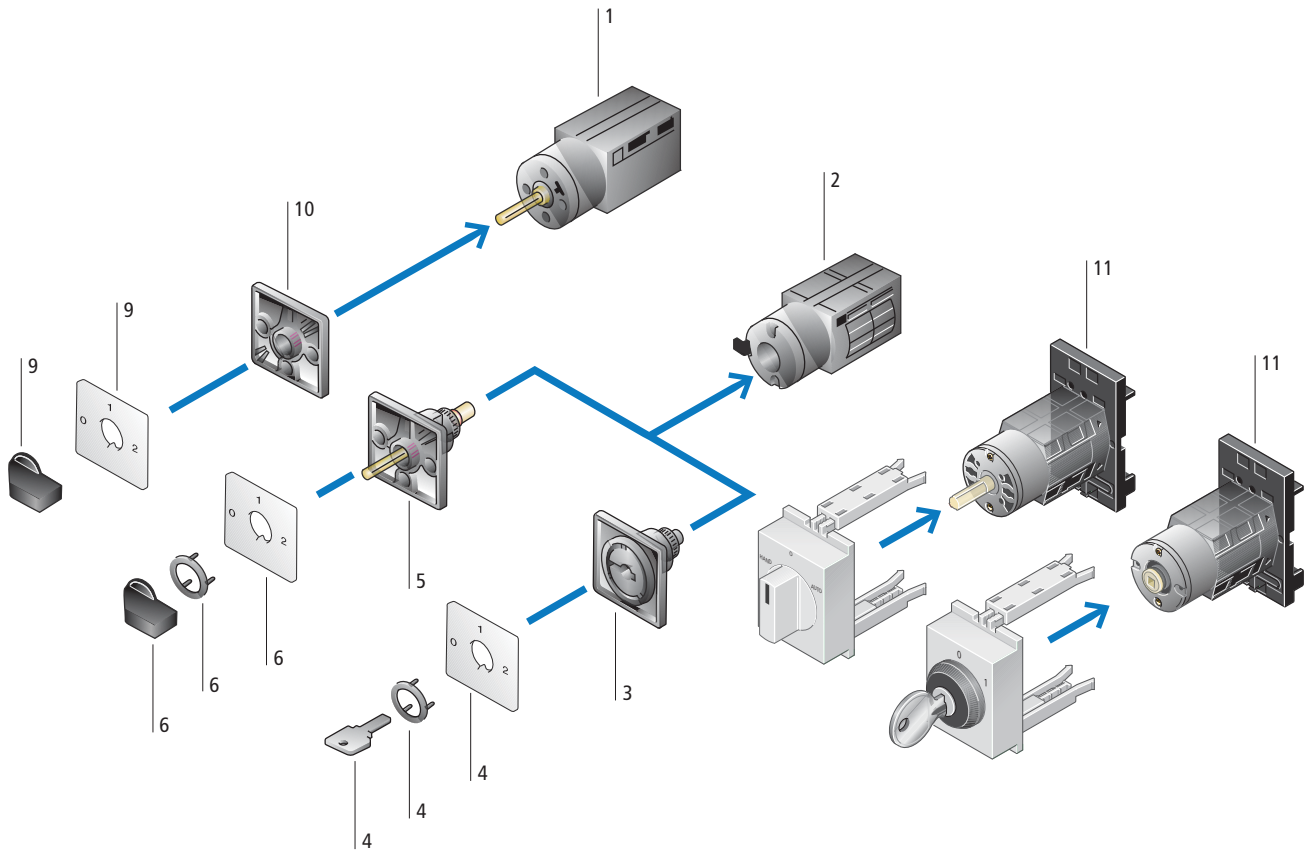
[2] UL/CSA certification not required

System overview

TM ON-OFF switches



TM control switch



Flush mounting (.../E)	1
Front IP65	
Mounting from rear in panel sides, plates or doors	
Terminals	
Crosshead screwdriver Pozidriv	
Finger proof	
→ Page 4/70	

Flush mounting control circuit isolator (.../E/SVB)	1
Front IP65	
TO IEC/EN 60 947-5, VDE 0660	
0 position lockable with 2 padlocks 4 mm ∅ or 1 padlock 6 mm ∅	
Can be used with up to 250 V AC per contact	
Maximum 6 contacts permissible	
→ Page 4/70	

Center mounting (.../EZ)	2
Front IP65	
Mounted in 16.2 ∅ or 22.3 ∅ fixing hole, as specified in IEC/EN 60 947-5-1, after the included adapter is removed	
→ Page 4/70	

Key operation for center mounting	3, 4
2 keys are supplied	
Key withdrawable 90°	
Key withdrawable 60° with RONIS lock cylinder.	
→ Page 4/77	

Standard switches for center mounting	5, 6
Black thumb-grip	
→ Page 4/70	

Control circuit isolators	7, 8
Red rotary handle and yellow locking collar	
Black rotary handle and black locking collar	
Lockable in the 0 position	
→ Page 4/70	

Standard switches for flush mounting	9, 10
Black thumb-grip	
→ Page 4/71	

Standard switches for IVS distribution board mounting	11
Mounting in installation distribution board	
Overall width: 2 space units (45 mm mounting depth)	
Up to 2 contact units	

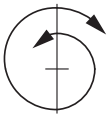
Product features

Contact chamber

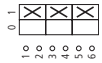
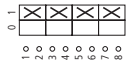
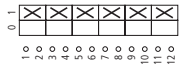
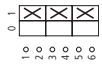
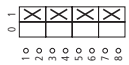
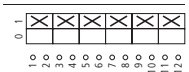
- Rated uninterrupted current 10 A
- Positively opening contacts
- 1 – 2 contacts per contact chamber, up to 16 contacts per switch
- For switching unequal potentials
- Control circuit reliability

Switch position

- Safety due to indexing
- Switching angles 30°, 45°, 60°, 90°
- Spring action with automatic return with max. 6 contacts, switching angle ≧ 60°
- Complete rotation
- If the total switching angle is 360°, complete rotation possible in both operating directions

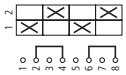
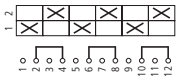
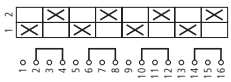
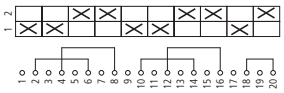
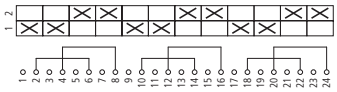
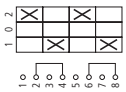
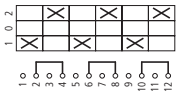
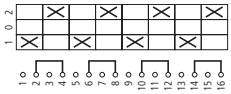
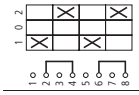
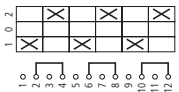




Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Control circuit isolators, 90°								
with padlocking feature Lockable in the 0 (Off) position Up to 250 V AC per contact								
		1	**TM-1-8290/E/SVB** 045477		1 off			
		1	**TM-1-8290/E/SVB-SW** 215351					
		2	**TM-1-8291/E/SVB** 045478					
		2	**TM-1-8291/E/SVB-SW** 215352					
		3	**TM-2-8292/E/SVB** 045484					
		3	**TM-2-8292/E/SVB-SW** 210955					
		3 + N	**TM-2-8293/E/SVB** 045485					
		6	**TM-3-8326/E/SVB** 045498					
On-Off switches, 90°								
	 F 056	1	**TM-1-8290/E** 070131		1 off	**TM-1-8290/EZ** 000693		1 off
		2	**TM-1-8291/E** 072504			**TM-1-8291/EZ** 015073		
		3	**TM-2-8292/E** 074877			**TM-2-8292/EZ** 015096		
		3 + N	**TM-2-8293/E** 077250			**TM-2-8293/EZ** 045486		
		6	**TM-3-8326/E** 079623					

Information relevant for export to North America

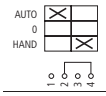
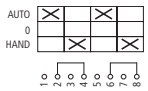
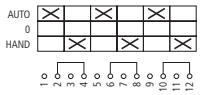
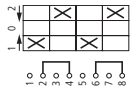
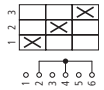
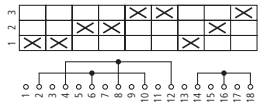
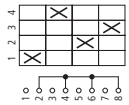
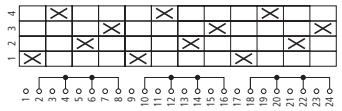
Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Changeover switches without 0 (Off) position 60°								
	 F 072	1	**TM-1-8220/E** 081996		1 off	**TM-1-8220/EZ** 000692		1 off
		2	**TM-2-8221/E** 084369			**TM-2-8221/EZ** 015197		
		3	**TM-3-8222/E** 086742			**TM-3-8222/EZ** 045493		
		4	**TM-4-8223/E** 089115			**TM-4-8223/EZ** 046119		
		5	**TM-5-8369/E** 091488			**TM-5-8369/EZ** 046126		
		6	**TM-6-8370/E** 093861					
Changeover switches with 0 (Off) position 60°								
	 F 071	1	**TM-1-8210/E** 096234		1 off	**TM-1-8210/EZ** 015137		1 off
		2	**TM-2-8211/E** 098607			**TM-2-8211/EZ** 015166		
		3	**TM-3-8212/E** 010807			**TM-3-8212/EZ** 045491		
		4	**TM-4-8213/E** 013180			**TM-4-8213/EZ** 045847		
Changeover switches with 0 (Off) position 90°								
	 F 057	2	**TM-2-8219/E** 017926		1 off			
	 F 071	3	**TM-3-8299/E** 020299		1 off			

Information relevant for export to North America

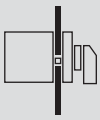
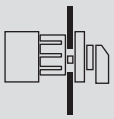
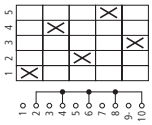
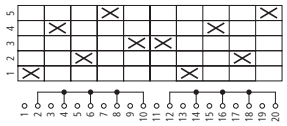
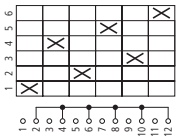
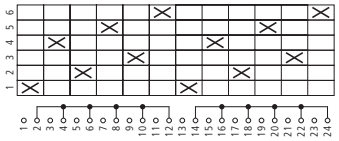
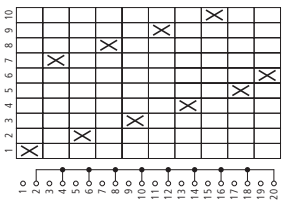
Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

HPL04072EN

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Distribution board - mounting Front IP30 **Part no.** Article no.	**Price** See price list	Std. pack
Manual/auto switch 60°									
	 F 288	1			**TM-1-8220F288/EZ** 016925				1 off
	 F 085	1	**TM-1-15431/E** 025045		**TM-1-15431/EZ** 000691		**TM-1-15431/IVS** 225342		1 off
		2	**TM-2-15432/E** 027418		**TM-2-15432/EZ** 016878				1 off
		3	**TM-3-15433/E** 029791		**TM-3-15433/EZ** 045490				1 off
Changeover switches with spring-return from both directions, 30°									
	 F 025	1	**TM-1-8214/E** 032164						1 off
		2	**TM-2-8215/E** 034537						1 off
Step switches without 0 (Off) position									
3 steps, 60°									
	 F 076	1	**TM-2-8230/E** 039283		**TM-2-8230/EZ** 000701				1 off
		3	**TM-5-8270/E** 041656		**TM-5-8270/EZ** 046124				1 off
4 steps, 60°									
	 F 077	1	**TM-2-8231/E** 044029		**TM-2-8231/EZ** 000700				1 off
		3	**TM-6-8271/E** 046402		**TM-6-8271/EZ** 046128				1 off

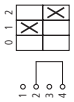
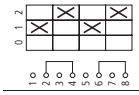
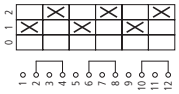
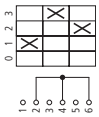
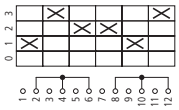
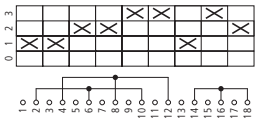
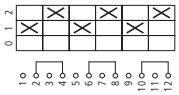
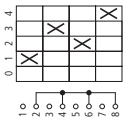
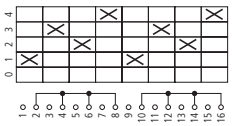
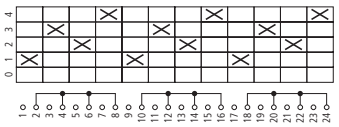
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65  **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65  **Part no.** Article no.	**Price** See price list	Std. pack
Step switches without 0 (Off) position								
5 steps, 60°								
	 F 078	1	**TM-3-8232/E** 039298		1 off	**TM-3-8232/EZ** 015592		1 off
		2	**TM-5-8252/E** 041671		1 off	**TM-5-8252/EZ** 046123		1 off
6 steps 60°, no full rotation								
	 F 079	1	**TM-3-8233/E** 053521		1 off	**TM-3-8233/EZ** 015630		1 off
		2	**TM-6-8253/E** 055894		1 off	**TM-6-8253/EZ** 046127		1 off
10 steps, 30°								
	 F 011	1	**TM-5-8237/E** 069150		1 off	**TM-5-8237/EZ** 015661		1 off

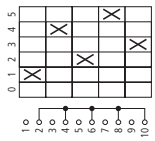
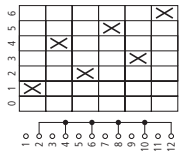
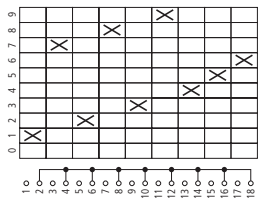
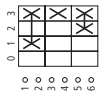
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Step switches								
With 0 (Off) position								
2 steps, 60°								
	 F 075	1	**TM-1-8240/E** 058267		1 off	**TM-1-8240/EZ** 015226		1 off
		2	**TM-2-8260/E** 060640		1 off	**TM-2-8260/EZ** 045483		
		3				**TM-3-8280/EZ** 045496		
3 steps, 45°								
	 F 109	1	**TM-2-8241/E** 065386		1 off	**TM-2-8241/EZ** 015256		1 off
		2	**TM-3-8261/E** 067759			**TM-3-8261/EZ** 000698		
		3	**TM-5-8281/E** 070132			**TM-5-8281/EZ** 046125		
3 steps, 60°								
	 F 075	3	**TM-3-8280/E** 063013		1 off			
4 steps, 30°								
	 F 002	1	**TM-2-8242/E** 072505		1 off	**TM-2-8242/EZ** 015506		1 off
		2	**TM-4-8262/E** 074878			**TM-4-8262/EZ** 046120		1 off
		3	**TM-6-8282/E** 077251					

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Step switches								
With 0 (Off) position								
5 steps, 30°								
	 F 003	1	**TM-3-8243/E** 079624		1 off	**TM-3-8243/EZ** 015537		1 off
6 steps, 30°								
	 F 004	1	**TM-3-8244/E** 081997		1 off	**TM-3-8244/EZ** 045495		1 off
9 steps, 30°								
	 F 007	1	**TM-5-8247/E** 009741		1 off	**TM-5-8247/EZ** 015565		1 off
Group switches								
2 groups, 60°								
	 F 075	1	**TM-1-8310/E** 084370		1 off	**TM-1-8310/EZ** 045479		1 off
3 groups, 30°								
	 F 001	1				**TM-2-8311/EZ** 045487		1 off
ON OFF switches								
ON switch 30°								
	 F 023	1				**TM-1-8175/EZ** 015690		1 off
ON OFF switches 90°/30° With spring-return from start to 1								
	 F 119	1	**TM-1-8178/E** 098608		1 off	**TM-1-8178/EZ** 016786		1 off

Information relevant for export to North America

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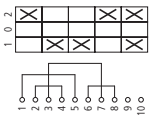
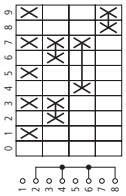
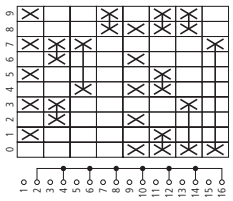
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada

Contact sequence	Front plate no.	Pole	Flush mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack	Center mounting Front IP65 **Part no.** Article no.	**Price** See price list	Std. pack
Reversing switches, 60°								
	 F 071	3	**TM-3-8401/E** 015554		1 off			
Coding switches								
BCD code 0-9, 30°								
	 F 007	1	**TM-2-8550/E** 020300		1 off	**TM-2-8550/EZ** 000699		1 off
BCD code 0-9 + complement, 30°								
	 F 007	1	**TM-4-8552/E** 025046		1 off			

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	UL report applies to both US and Canada
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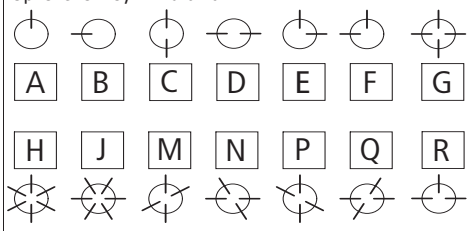
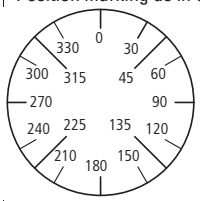
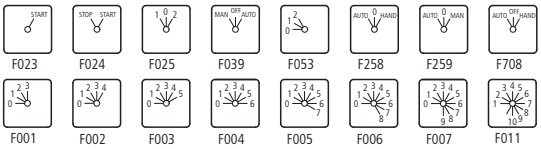
HPL04077EN

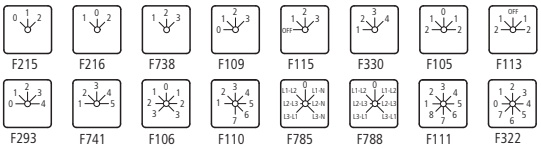
	For mounting form EZ With two keys When ordering with basic unit **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Key operated lock mechanism				
KABA lock 90° switch angle				
Protection type IP65 With two keys When ordering with basic unit				
0°	**+EZ/S-A** 045458		1 off	Key operation lock mechanism, incl. 2 keys. The key can only be removed in certain positions; see diagram below. The KABA lock for 90° can be used for other switching angles as well if the key withdrawability characteristics match the type of switch. Example: +EZ/S-B can be used with a step switch with a switching angle of 30° if the key is only to be withdrawable in the 0 position at 270°. Options for key withdrawal  Position marking as in example 
270°	**+EZ/S-B** 045459			
270 + 0°	**+EZ/S-F** 045463			
RONIS lock 60° switching angle				
Protection type IP55 With two keys When ordering with basic unit				
270 + 90°	**+EZ/S-D** 045461		1 off	
300 + 0 + 60 + 120 + 180 + 240°	**+EZ/S-H** 045465			
270 + 330 + 30 + 90 + 150 + 210°	**+EZ/S-J** 045466			
270 + 330 + 90 + 150°	**+EZ/S-N** 045468			

Size	Dimensions (W x H x D) mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Front plates						
Blank plate Can be engraved						
TM	29 x 29	(for frame 30 x 30)	**FS980-TM-E** 071438		10 off	**Standard front plates for separate order** For standard switches the normal front plate can be replaced if required with the front plate shown here. This is provided the switching angle, number of positions and the position of the 0 position are the same.
TM	29 x 29	(for frame 30 x 30)	**FS980-TM-EZ** 073811		50 off	
Standard front plates						
TM…/E	29 x 29	(for frame 30 x 30)	**TM/E-FRONTSCHILD-NR(*)** 239021		1 off	
TM…/EZ	29 x 29	(for frame 30 x 30)	**TM/EZ-FRONTSCHILD-NR(*)** 239022		1 off	

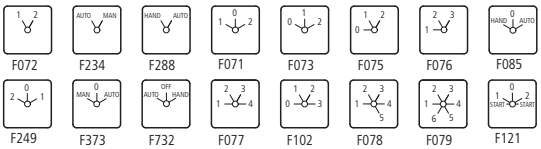
Switching angles 30°



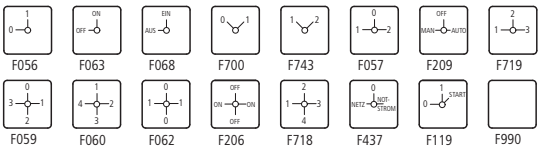
Switching angle 45°



Switching angle 60°



Switching angle 90°



Information relevant for export to North America

UL/CSA certification not required

	Part no.	Article no.		Price See price list	Part no.	Article no.		Price See price list	Std. pack
T0 cam switches									1 off
	T0-1-SOND*/E[1]	907765			**T0-5-SOND*/E**[1]	907769			
	T0-1-SOND*/EA/SVB[2]	907776			**T0-5-SOND*/EZ**[3]	907791			
	T0-1-SOND*/EA/SVB-SW[2]	908043			**T0-5-SOND*/IVS**[4]	907810			
	T0-1-SOND*/EZ[3]	907787			**T0-5-SOND*/Z**[2]	907843			
	T0-1-SOND*/I1	207480							
	T0-1-SOND*/I1/SVB	207481			**T0-6-SOND*/E**[1]	907770			
	T0-1-SOND*/I1/SVB-SW	207482			**T0-6-SOND*/EZ**[3]	907792			
	T0-1-SOND*/IVS[4]	907806			**T0-6-SOND*/IVS**[4]	907811			
	T0-1-SOND*/V/SVB[2]	907817			**T0-6-SOND*/Z**[2]	907844			
	T0-1-SOND*/V/SVB-SW[2]	908054							
	T0-1-SOND*/Z[2]	907839			**T0-7-SOND*/E**[1]	907771			
					T0-7-SOND*/EZ[3]	907793			
	T0-2-SOND*/E[1]	907766			**T0-7-SOND*/IVS**[4]	907812			
	T0-2-SOND*/EA/SVB[2]	907777			**T0-7-SOND*/Z**[2]	907845			
	T0-2-SOND*/EA/SVB-SW[2]	908044							
	T0-2-SOND*/EZ[3]	907788			**T0-8-SOND*/E**[1]	907772			
	T0-2-SOND*/I1	207483			**T0-8-SOND*/EZ**[3]	907794			
	T0-2-SOND*/I1/SVB	207484			**T0-8-SOND*/IVS**[4]	907813			
	T0-2-SOND*/I1/SVB-SW	207485			**T0-8-SOND*/Z**[2]	907846			
	T0-2-SOND*/IVS[4]	907807							
	T0-2-SOND*/V/SVB[2]	907818			**T0-9-SOND*/E**[1]	907773			
	T0-2-SOND*/V/SVB-SW[2]	908055			**T0-9-SOND*/EZ**[3]	907795			
	T0-2-SOND*/Z[2]	907840			**T0-9-SOND*/IVS**[4]	907814			
					T0-9-SOND*/Z[2]	907847			
	T0-3-SOND*/E[1]	907767							
	T0-3-SOND*/EA/SVB[2]	907778			**T0-10-SOND*/E**[1]	907774			
	T0-3-SOND*/EA/SVB-SW[2]	908045			**T0-10-SOND*/EZ**[3]	907796			
	T0-3-SOND*/EZ[3]	907789			**T0-10-SOND*/IVS**[4]	907815			
	T0-3-SOND*/I1	207486			**T0-10-SOND*/Z**[2]	907848			
	T0-3-SOND*/I1/SVB	207487							
	T0-3-SOND*/I1/SVB-SW	207488			**T0-11-SOND*/E**[1]	907775			
	T0-3-SOND*/IVS[4]	907808			**T0-11-SOND*/EZ**[3]	907797			
	T0-3-SOND*/V/SVB[2]	907819			**T0-11-SOND*/IVS**[4]	907816			
	T0-3-SOND*/V/SVB-SW[2]	908056			**T0-11-SOND*/Z**[2]	907849			
	T0-3-SOND*/Z[2]	907841							
	T0-4-SOND*/E[1]	907768							
	T0-4-SOND*/EA/SVB[2]	907779							
	T0-4-SOND*/EA/SVB-SW[2]	908046							
	T0-4-SOND*/EZ[3]	907790							
	T0-4-SOND*/I1	207489							
	T0-4-SOND*/I1/SVB	207490							
	T0-4-SOND*/I1/SVB-SW	207491							
	T0-4-SOND*/IVS[4]	907809							
	T0-4-SOND*/V/SVB[2]	907820							
	T0-4-SOND*/V/SVB-SW[2]	908057							
	T0-4-SOND*/Z[2]	907842							

Notes The prices apply to T cam switches with non-standard contact sequences.
Please use the "Ordering Non-Standard Contact Sequences" order form when ordering for the first time.
When placing repeat orders, specify the contact sequence number together with the country identifier (e.g. 4711D).

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

3)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP65; UL/CSA Type: -

4)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP30; UL/CSA Type: -

	Part no.	Article no.		Price See price list	Part no.	Article no.		Price See price list	Std. pack
T3 cam switches									
	T3-1-SOND*/E[1]	907850			**T3-5-SOND*/E**[1]	907854			1 off
	T3-1-SOND*/EA/SVB[1]	907861			**T3-5-SOND*/EA/SVB**[1]	907865			
	T3-1-SOND*/EA/SVB-SW[1]	908080			**T3-5-SOND*/EA/SVB-SW**[1]	908084			
	T3-1-SOND*/EZ[1]	907872			**T3-5-SOND*/EZ**[1]	907876			
	T3-1-SOND*/I2[2]	207492			**T3-5-SOND*/I2**[2]	207504			
	T3-1-SOND*/I2/SVB[2]	207493			**T3-5-SOND*/I2/SVB**[2]	207506			
	T3-1-SOND*/I2/SVB-SW[2]	207494			**T3-5-SOND*/I2/SVB-SW**[2]	207507			
	T3-1-SOND*/V/SVB[1]	907891			**T3-5-SOND*/V/SVB**[1]	907895			
	T3-1-SOND*/V/SVB-SW[1]	908091			**T3-5-SOND*/V/SVB-SW**[1]	908095			
	T3-1-SOND*/Z[1]	907913			**T3-5-SOND*/Z**[1]	907917			
	T3-2-SOND*/E[1]	907851			**T3-6-SOND*/E**[1]	907855			
	T3-2-SOND*/EA/SVB[1]	907862			**T3-6-SOND*/EA/SVB**[1]	907866			
	T3-2-SOND*/EA/SVB-SW[1]	908081			**T3-6-SOND*/EA/SVB-SW**[1]	908085			
	T3-2-SOND*/EZ[1]	907873			**T3-6-SOND*/EZ**[1]	907877			
	T3-2-SOND*/I2[2]	207495			**T3-6-SOND*/V/SVB**[1]	907896			
	T3-2-SOND*/I2/SVB[2]	207496			**T3-6-SOND*/V/SVB-SW**[1]	908096			
	T3-2-SOND*/I2/SVB-SW[2]	207497			**T3-6-SOND*/Z**[1]	907918			
	T3-2-SOND*/V/SVB[1]	907892							
	T3-2-SOND*/V/SVB-SW[1]	908092			**T3-7-SOND*/E**[1]	907856			
	T3-2-SOND*/Z[1]	907914			**T3-7-SOND*/EZ**[1]	907878			
					T3-7-SOND*/Z[1]	907919			
	T3-3-SOND*/E[1]	907852							
	T3-3-SOND*/EA/SVB[1]	907863			**T3-8-SOND*/E**[1]	907857			
	T3-3-SOND*/EA/SVB-SW[1]	908082			**T3-8-SOND*/EZ**[1]	907879			
	T3-3-SOND*/EZ[1]	907874			**T3-8-SOND*/Z**[1]	907920			
	T3-3-SOND*/I2[2]	207498							
	T3-3-SOND*/I2/SVB[2]	207499			**T3-9-SOND*/E**[1]	907858			
	T3-3-SOND*/I2/SVB-SW[2]	207500			**T3-9-SOND*/EZ**[1]	907880			
	T3-3-SOND*/V/SVB[1]	907893			**T3-9-SOND*/Z**[1]	907921			
	T3-3-SOND*/V/SVB-SW[1]	908093							
	T3-3-SOND*/Z[1]	907915			**T3-10-SOND*/E**[1]	907859			
					T3-10-SOND*/EZ[1]	907881			
	T3-4-SOND*/E[1]	907853			**T3-10-SOND*/Z**[1]	907922			
	T3-4-SOND*/EA/SVB[1]	907864							
	T3-4-SOND*/EA/SVB-SW[1]	908083			**T3-11-SOND*/E**[1]	907860			
	T3-4-SOND*/EZ[1]	907875			**T3-11-SOND*/EZ**[1]	907882			
	T3-4-SOND*/I2[2]	207501			**T3-11-SOND*/Z**[1]	907923			
	T3-4-SOND*/I2/SVB[2]	207502							
	T3-4-SOND*/I2/SVB-SW[2]	207503							
	T3-4-SOND*/V/SVB[1]	907894							
	T3-4-SOND*/V/SVB-SW[1]	908094							
	T3-4-SOND*/Z[1]	907916							

Notes The prices apply to T cam switches with non-standard contact sequences.
Please use the "Ordering Non-Standard Contact Sequences" order form when ordering for the first time.
When placing repeat orders, specify the contact sequence number together with the country identifier (e.g. 4711D).

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

2)

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP65; UL/CSA Type 3R, 12

	Part no.	Article no.		Price See price list	Part no.	Article no.		Price See price list	Std. pack
T5B cam switches									
	T5B-1-SOND*/E	907924			**T5B-5-SOND*/E**	907928			1 off
	T5B-1-SOND*/EA/SVB	907934			**T5B-5-SOND*/EA/SVB**	907938			
	T5B-1-SOND*/EA/SVB-SW	908106			**T5B-5-SOND*/EA/SVB-SW**	908110			
	T5B-1-SOND*/I4	207510			**T5B-5-SOND*/V/SVB**	907954			
	T5B-1-SOND*/I4/SVB	207511			**T5B-5-SOND*/V/SVB-SW**	908118			
	T5B-1-SOND*/I4/SVB-SW	207512			**T5B-5-SOND*/Z**	907972			
	T5B-1-SOND*/V/SVB	907950							
	T5B-1-SOND*/V/SVB-SW	908114			**T5B-6-SOND*/E**	907929			
	T5B-1-SOND*/Z	907968			**T5B-6-SOND*/EA/SVB**	907939			
					T5B-6-SOND*/EA/SVB-SW	908111			
	T5B-2-SOND*/E	907925			**T5B-6-SOND*/V/SVB**	907955			
	T5B-2-SOND*/EA/SVB	907935			**T5B-6-SOND*/V/SVB-SW**	908119			
	T5B-2-SOND*/EA/SVB-SW	908107			**T5B-6-SOND*/Z**	907973			
	T5B-2-SOND*/I4	207514							
	T5B-2-SOND*/I4/SVB	207515			**T5B-7-SOND*/E**	907930			
	T5B-2-SOND*/I4/SVB-SW	207516			**T5B-7-SOND*/EA/SVB**	907940			
	T5B-2-SOND*/V/SVB	907951			**T5B-7-SOND*/EA/SVB-SW**	908112			
	T5B-2-SOND*/V/SVB-SW	908115			**T5B-7-SOND*/V/SVB**	907956			
	T5B-2-SOND*/Z	907969			**T5B-7-SOND*/V/SVB-SW**	908120			
					T5B-7-SOND*/Z	907974			
	T5B-3-SOND*/E	907926							
	T5B-3-SOND*/EA/SVB	907936			**T5B-8-SOND*/E**	907931			
	T5B-3-SOND*/EA/SVB-SW	908108			**T5B-8-SOND*/EA/SVB**	907941			
	T5B-3-SOND*/I4	207518			**T5B-8-SOND*/EA/SVB-SW**	908113			
	T5B-3-SOND*/I4/SVB	207519			**T5B-8-SOND*/V/SVB**	907957			
	T5B-3-SOND*/I4/SVB-SW	207520			**T5B-8-SOND*/V/SVB-SW**	908121			
	T5B-3-SOND*/V/SVB	907952			**T5B-8-SOND*/Z**	907975			
	T5B-3-SOND*/V/SVB-SW	908116							
	T5B-3-SOND*/Z	907970			**T5B-9-SOND*/E**	907932			
					T5B-9-SOND*/Z	907976			
	T5B-4-SOND*/E	907927							
	T5B-4-SOND*/EA/SVB	907937			**T5B-10-SOND*/E**	907933			
	T5B-4-SOND*/EA/SVB-SW	908109			**T5B-10-SOND*/Z**	907977			
	T5B-4-SOND*/I4	207521							
	T5B-4-SOND*/I4/SVB	207522							
	T5B-4-SOND*/I4/SVB-SW	207523							
	T5B-4-SOND*/V/SVB	907953							
	T5B-4-SOND*/V/SVB-SW	908117							
	T5B-4-SOND*/Z	907971							

Notes
The prices apply to T cam switches with non-standard contact sequences.
Please use the "Ordering Non-Standard Contact Sequences" order form when ordering for the first time.
When placing repeat orders, specify the contact sequence number together with the country identifier (e.g. 4711D).

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified



	Part no.	Article no.		Price See price list	Part no.	Article no.		Price See price list	Std. pack
T5 cam switches									
	T5-1-SOND*/E	907978			**T5-5-SOND*/E**	907982			1 off
	T5-1-SOND*/EA/SVB	908031			**T5-5-SOND*/EA/SVB**	907991			
	T5-1-SOND*/EA/SVB-SW	908126			**T5-5-SOND*/EA/SVB-SW**	908130			
	T5-1-SOND*/I5	207524			**T5-5-SOND*/V/SVB**	908007			
	T5-1-SOND*/I5/SVB	207525			**T5-5-SOND*/V/SVB-SW**	908138			
	T5-1-SOND*/I5/SVB-SW	207526			**T5-5-SOND*/Z**	908025			
	T5-1-SOND*/V/SVB	908003							
	T5-1-SOND*/V/SVB-SW	908134			**T5-6-SOND*/E**	907983			
	T5-1-SOND*/Z	908021			**T5-6-SOND*/EA/SVB**	907992			
					T5-6-SOND*/EA/SVB-SW	908131			
	T5-2-SOND*/E	907979			**T5-6-SOND*/V/SVB**	908008			
	T5-2-SOND*/EA/SVB	907988			**T5-6-SOND*/V/SVB-SW**	908139			
	T5-2-SOND*/EA/SVB-SW	908127			**T5-6-SOND*/Z**	908026			
	T5-2-SOND*/I5	207527							
	T5-2-SOND*/I5/SVB	207528			**T5-7-SOND*/E**	907984			
	T5-2-SOND*/I5/SVB-SW	207529			**T5-7-SOND*/EA/SVB**	907993			
	T5-2-SOND*/V/SVB	908004			**T5-7-SOND*/EA/SVB-SW**	908132			
	T5-2-SOND*/V/SVB-SW	908135			**T5-7-SOND*/V/SVB**	908009			
	T5-2-SOND*/Z	908022			**T5-7-SOND*/V/SVB-SW**	908140			
					T5-7-SOND*/Z	908027			
	T5-3-SOND*/E	907980							
	T5-3-SOND*/EA/SVB	907989			**T5-8-SOND*/E**	907985			
	T5-3-SOND*/EA/SVB-SW	908128			**T5-8-SOND*/EA/SVB**	907994			
	T5-3-SOND*/I5	207530			**T5-8-SOND*/EA/SVB-SW**	908133			
	T5-3-SOND*/I5/SVB	207531			**T5-8-SOND*/V/SVB**	908010			
	T5-3-SOND*/I5/SVB-SW	207532			**T5-8-SOND*/V/SVB-SW**	908141			
	T5-3-SOND*/V/SVB	908005			**T5-8-SOND*/Z**	908028			
	T5-3-SOND*/V/SVB-SW	908136							
	T5-3-SOND*/Z	908023			**T5-9-SOND*/E**	907986			
					T5-9-SOND*/Z	908029			
	T5-4-SOND*/E	907981			**T5-10-SOND*/E**	907987			
	T5-4-SOND*/EA/SVB	907990			**T5-10-SOND*/Z**	908030			
	T5-4-SOND*/EA/SVB-SW	908129							
	T5-4-SOND*/I5	207533							
	T5-4-SOND*/I5/SVB	207534							
	T5-4-SOND*/I5/SVB-SW	207535							
	T5-4-SOND*/V/SVB	908006							
	T5-4-SOND*/V/SVB-SW	908137							

Notes
The prices apply to T cam switches with non-standard contact sequences.
Please use the "Ordering Non-Standard Contact Sequences" order form when ordering for the first time.
When placing repeat orders, specify the contact sequence number together with the country identifier (e.g. 4711D).

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV7
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch Circuits

	Part no.[1]	Article no.		Price See price list	Part no.[2]	Article no.		Price See price list	Std. pack
TM non-standard switches									
	TM-1-SOND*/E	907749			**TM-1-SOND-ERSTBESTELLUNG/E**	208261			1 off
	TM-3-SOND*/E	907750			**TM-1-SOND-ERSTBESTELLUNG/EZ**	208262			
	TM-2-SOND*/E	907763			**TM-1-SOND-ERSTBESTELLUNG/IVS**	225347			
	TM-4-SOND*/E	907751			**TM-2-SOND-ERSTBESTELLUNG/E**	208263			
	TM-6-SOND*/E	907752			**TM-2-SOND-ERSTBESTELLUNG/EZ**	208264			
	TM-5-SOND*/E	907764			**TM-2-SOND-ERSTBESTELLUNG/IVS**	225349			
	TM-7-SOND*/E	907753			**TM-3-SOND-ERSTBESTELLUNG/E**	208265			
	TM-8-SOND*/E	907754			**TM-3-SOND-ERSTBESTELLUNG/EZ**	208266			
	TM-1-SOND*/EZ	907755			**TM-4-SOND-ERSTBESTELLUNG/E**	208267			
	TM-2-SOND*/EZ	907756			**TM-4-SOND-ERSTBESTELLUNG/EZ**	208268			
	TM-3-SOND*/EZ	907757			**TM-5-SOND-ERSTBESTELLUNG/E**	208269			
	TM-4-SOND*/EZ	907758			**TM-5-SOND-ERSTBESTELLUNG/EZ**	208270			
	TM-5-SOND*/EZ	907759			**TM-6-SOND-ERSTBESTELLUNG/E**	208271			
	TM-6-SOND*/EZ	907760			**TM-6-SOND-ERSTBESTELLUNG/EZ**	208272			
	TM-7-SOND*/EZ	907761			**TM-7-SOND-ERSTBESTELLUNG/E**	208273			
	TM-8-SOND*/EZ	907762			**TM-7-SOND-ERSTBESTELLUNG/EZ**	208274			
	TM-1-SOND*/IVS	225346			**TM-8-SOND-ERSTBESTELLUNG/E**	208275			
	TM-2-SOND*/IVS	225348			**TM-8-SOND-ERSTBESTELLUNG/EZ**	208276			

Notes

1)

TM-…-SOND…/…:
For repeat orders for which the design number is already known. Form FO2 is **not** required for this purpose.
The design number is a six-digit number and must always be greater than 200000.

2)

TM-…-SOND-ERSTBESTELLUNG/…:
For new orders with a completed form.

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; IEC/EN 60947-3; CE marking
UL File No.	E36332
UL CCN	NLRV, NLRV7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Degree of Protection	IEC: IP65; UL/CSA Type: -

T, TM

Ordering of non-standard contact sequences

T..... - .....- ...../ ....+ .....

Switch size

	Max. units	Contacts max.
T0	11	22
T3	11	22
T5B	10	20
T5	10	20
TM	8	16

Number of contact units
(2 contacts per contact unit)

Contact sequence number
With country ID corresponding to the country of manufacture.
Send completed form (as shown on the right) if ordering for the first time. The contact sequence number is specified by the supplying factory. Specifying the part no. is enough when placing repeat orders.

Mounting form
- Mounting form /E
- Center mounting /EZ (for T0, T3)
- Surface mounting /I...[1)]
- Service distribution board mounting / IVS (for T0)
- Rear mounting /Z
- Flush mounting main switch /EA/SVB[2)]
- Surface mounting main switch /I.../SVB
- Rear mounting main switch /V/SVB[2)]
- Designs for TM: /E, /EZ, or /IVS

Accessories
Always specify completely for every order!
For TM.../EZ: only +EZ/S... possible

Engineering notes for non-standard contact sequences

Contact sequence
The adjacent form makes it easier to specify the contact sequence.
Master copy

Switching angle
30, 45, 60, 90°
Preferred angle: 60°
For On-Off switches: 90°
For main switches: 90° as FS 908
Changeover with interruption between 2 positions (ON-OFF-ON) not permissible for T0; T3, and TM = 30°, 45°; for T5(T5B) = 30°

Star-delta switch only with switching angle ≧ 60°

Terminal marking
TM switches have consecutive terminal markings starting with 1.

Spring-return
The switching action is limited by a stop. The switch returns under spring pressure to the last position. Where a switch has spring-return from both directions, a maximum of max. 3 positions can be traversed.
The spring-return angle is < ½ switching angle.
A max. of 6 contacts can be returned at the same time.
The switching angle of spring-return TM mini rotary switch must be ≧ 60°.

Fleeting contacts
The duration of the fleeting contact depends primarily on the actuation speed. In order to actuate a contactor with a fleeting pulse, the switching angle of the cam switch must not be less than 60°, since the pulse time can be too short if the switching angle is smaller. Fleeting contact elements always operate in **both** operating directions.

Complete rotation
Only possible with a total switching angle of 360°. The direction of switching can be in either operating direction. The number of switch positions multiplied by the switching angle must be 360°. TM with 12 positions (one every 30°) only available with complete rotation, not with stop.

Front plates
Front plates are part of the equipment supplied with a "first order of rotary switch" and therefore do **not** need to be ordered separately.

Number of contact units

$$\frac{\text{Number of contacts}}{2} = \text{Round up to nearest whole number}$$

The contact chamber = contact unit (BE) has 1 or 2 contacts, each of which is actuated by a cam.
In T5(B), there is a common cam for both contacts. Because of this, the following applies for T5(B): If the total switching angle is **less than 180°,** the contacts can be switched **independently** of each other. With switching angles greater than or equal to 180°, there can only be 2 contacts in the same chamber if their switching sequences are the same but are offset by 180° (e.g. T5B-4-8235 step switch).

Standard features
Same as cam switch with standard contact sequence.

Notes
It is possible that the order of the contacts is altered due to technical reasons.

For special switches bridges are only possible between a even or uneven number.
Other connections must be made by the user at installation.

[1)] For T0-.../I1: max. 4 contact units
For T3-.../I2: max. 5 contact units
[2)] For T0: up to a max. of 8 contacts = 4 BE,
For T3: up to a max. of 12 contacts = 6 BE

Non-standard contact sequence ordering example

MOELLER

Binding document for ordering T cam switch combinations for the first time

Order No.:	Item:	Office:	Author:
123456	7	Cologne	HWS

Customer:	Customer no.:	Date:
Sample Company	A4711/2004	29.2.2004

Quantity: 3

Euros/unit:

Switching angle:
- ☐ 30
- ☐ 45
- ☐ 60
- ☐ 90

Part no.:
- ☐ TM
- ☐ T0
- ☐ T3
- ☐ T5B
- ☐ T5

Number of contacts:
- ☐ 1 ☐ 12
- ☐ 2 ☐ 13
- ☐ 3 ☐ 14
- ☐ 4 ☐ 15
- ☐ 5 ☐ 16
- ☐ 6 ☐ 17
- ☐ 7 ☐ 18
- ☐ 8 ☐ 19
- ☐ 9 ☐ 20
- ☐ 10 ☐ 21
- ☐ 11 ☐ 22

Mounting form:
- ☐ E
- ☐ EA/SVB ☐ EA/SVB-SW
- ☐ EZ
- ☐ I...
- ☐ I.../SVB ☐ I.../SVB-SW
- ☐ IVS
- ☐ V/SVB ☐ V/SVB-SW
- ☐ Z
- ☐ + ST-0
- ☐ +_____

Max. characters per position

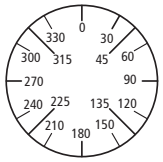
Degrees	TM-E	TM-EZ	TM-IVS	T0(3)	T5(B)
0.18	5	5	6	13	13
30, 210, 330	8	7	4	8	8
45, 135, 225, 315	6	5	4	6	7
60, 120, 240, 300	5	5	3	5	7
90, 270	5	4	1	4	7
150	4	4	4	8	8

Front plate no.

FS_____

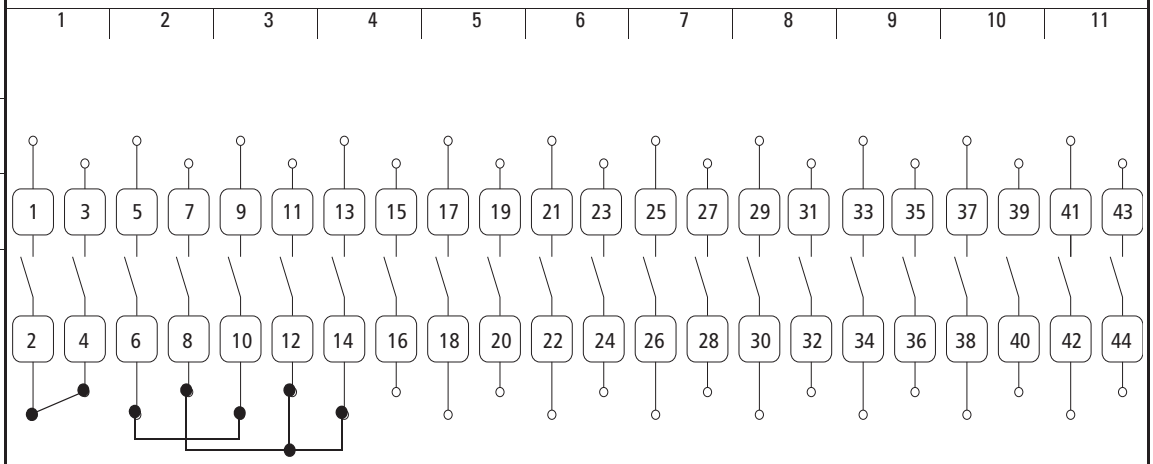
○ Complete rotation

○ Automatic spring-return



Inscription

Contact units



Degrees			1 2	3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18	19 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44
270	1	X	X	X	X	X	X		X															
300																								
315																								
330	2	X		X	X					X														
0								X																
30	3	X				X	X																	
45																								
60	4										X													
90																								
120																								
135																								
150																								
180																								
210																								
225																								
240																								
			Contact only closed in position 1	Switching with interruption of contact	Switching without interruption of contact	Contact closed in positions 1 + 3	Contact closed in positions 1 to 3	Fleeting contact (only with 60° or 90°)	Late-break contact	Early-make contact	Contact with automatic spring-return													

Key withdrawability for ..S-T0 and SVA-T3:

Pos. 1: Key withdrawable
Pos. 2: Key withdrawable
Pos. 3: Key withdrawable
Pos. 4: Key not withdrawable

} In the case of SVA-T3, the unit can still be switched between positions 1 and 2 if the key has been removed..

Key withdrawable X

Part no. for repeat orders (to be filled in by factory) T_____

T, TM

MOELLER

Binding document for ordering T cam switch combinations for the first time

Order No.:	Item:	Office:	Name:
Customer:		Customer no.:	Date:

Notes:

The number of possible contacts, as well as the possible combinations with mounting forms are shown in the Main Catalogue.

Quantity:

Euros/unit:

Switching angle:
- ☐ 30
- ☐ 45
- ☐ 60
- ☐ 90

Part no.:
- ☐ TM
- ☐ T0
- ☐ T3
- ☐ T5B
- ☐ T5

Number of contacts:

☐ 1	☐ 12
☐ 2	☐ 13
☐ 3	☐ 14
☐ 4	☐ 15
☐ 5	☐ 16
☐ 6	☐ 17
☐ 7	☐ 18
☐ 8	☐ 19
☐ 9	☐ 20
☐ 10	☐ 21
☐ 11	☐ 22

Mounting form:
- ☐ E
- ☐ EA/SVB ☐ EA/SVB-SW
- ☐ EZ
- ☐ I...
- ☐ I.../SVB ☐ I.../SVB-SW
- ☐ IVS
- ☐ V/SVB ☐ V/SVB-SW
- ☐ Z
- ☐ +_____
- ☐ +_____

Max. characters per position

Degrees	TM-E	TM-EZ	TM-IVS	T0(3)	T5(B)
0.18	5	5	6	13	13
30, 210, 330	8	7	4	8	8
45, 135, 225, 315	6	5	4	6	7
60, 120, 240, 300	5	5	3	5	7
90, 270	5	4	1	4	7
150	4	4	4	8	8

Front plate no.

FS _____

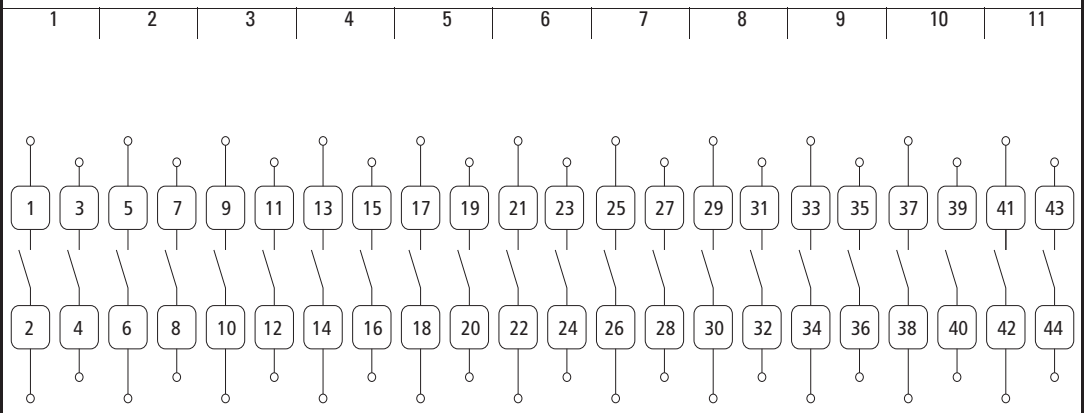
○ **Complete rotation**

○ **Automatic Spring-return**



Inscription

Contact units



Degrees		1 2	3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18	19 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44
270																							
300																							
315																							
330																							
0																							
30																							
45																							
60																							
90																							
120																							
135																							
150																							
180																							
210																							
225																							
240																							

Key withdrawable	X	Part no. for repeat orders (to be filled in by factory)	T_____

FS-SOND

Ordering non-standard front plates

MOELLER

Binding document for ordering non-standard front plates for the first time

Order No.:		Item:
Office:		Name:
Customer:		Customer no.:
Quantity:	Euros/unit:	Date:

The text is always centered in the text block

Non-standard front plates

Inscription:
Front plate with black lettering

Insert text

Note the maximum number of characters allowed outside the marked areas!

Part no.

☐ **FS-SOND-T0 (T3, P1)**

Letter height

≤ 2 Characters	4 mm
≥ 2 Characters	3 mm

☐ **FS-SOND-P3 (T5B, T5)**

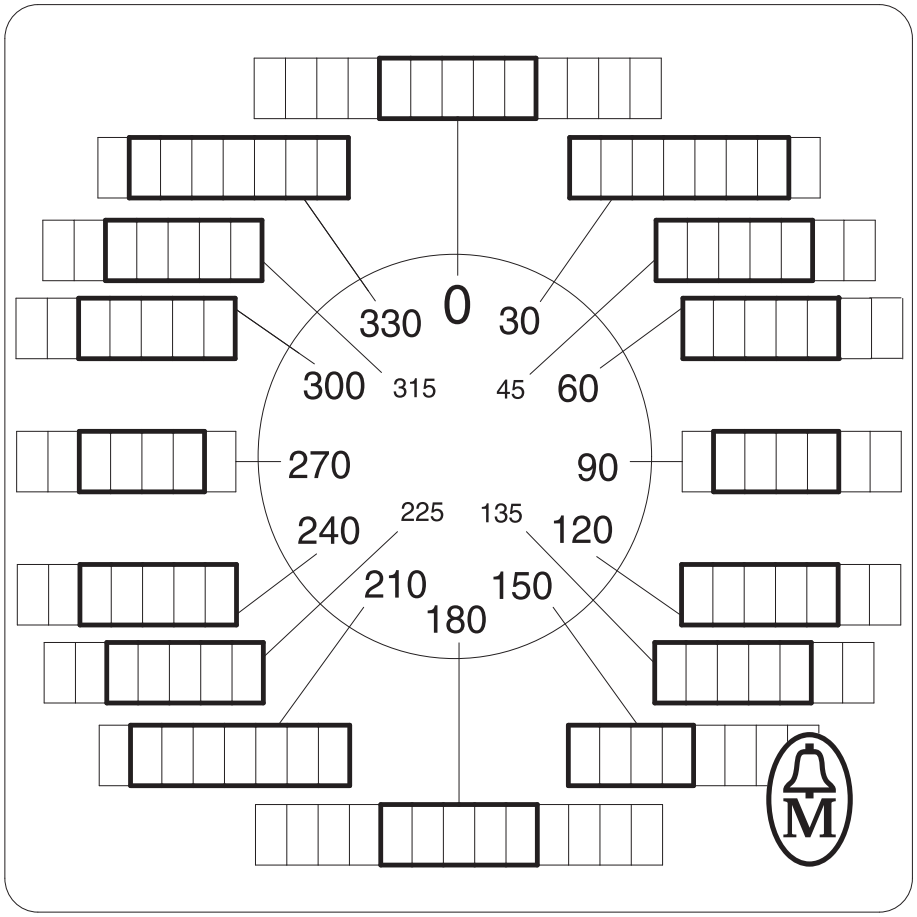
Letter height

≤ 2 Characters	8 mm
≥ 2 Characters	5 mm

☐ **FS-SOND-TM-E**

☐ **FS-SOND-TM-EZ**

≤ 2 Characters approx.	3.5 mm
≥ 2 Characters	3 mm



For P1 and P3, fill out positions 270° and 0° only

Max. possible number of characters

Position

Degrees	TM-E	TM-EZ	T0/P1	T5/P3
0, 180	5	5	13	13
30, 210, 330	8	7	8	8
45, 135, 225, 315	6	5	6	7
60, 120, 240, 300	5	5	5	7
90, 270	5	4	4	7
150	4	4	8	8

Dimensions

Part no.	Front plate size
TM-.../E	29 x 29 mm (for frame 30 x 30)
TM-.../EZ(-...)	29 x 29 mm (for frame 30 x 30)
T0, T3, P1	45 x 45 mm (for frame 48 x 48)
P3, T5, T5B	84 x 84 mm (for frame 88 x 88)

Part no. for repeat orders (to be filled in by factory)

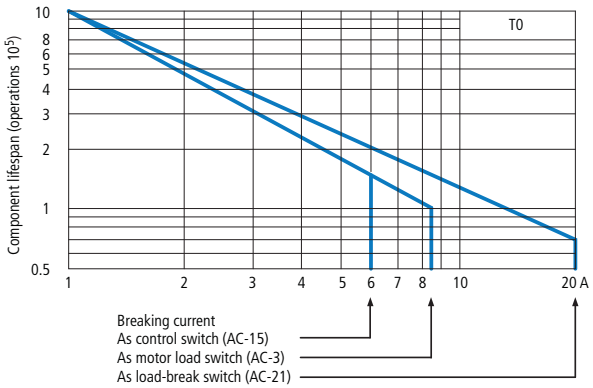
FS.....

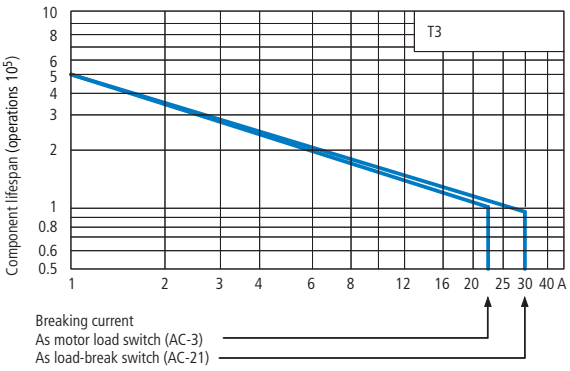
T, P

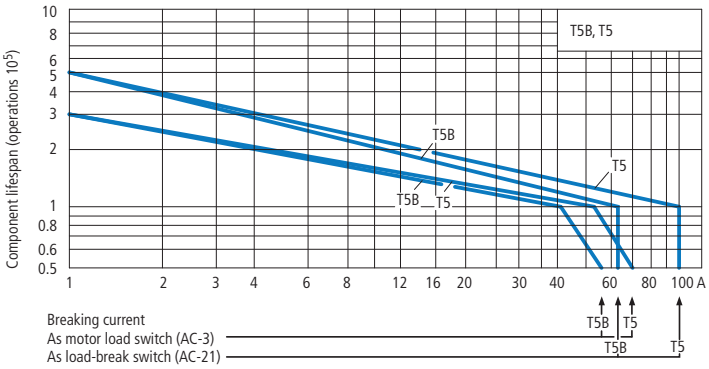
Characteristic curves

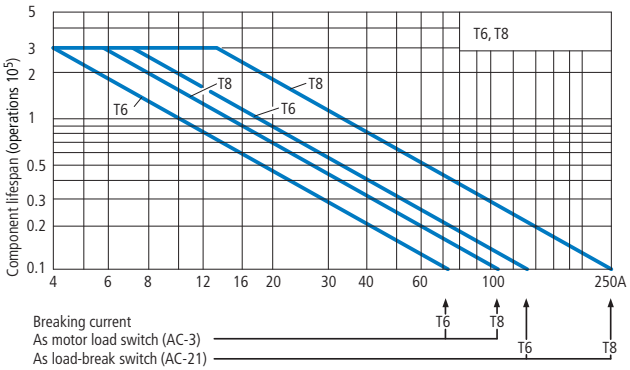
Component lifespan based on breaking current and utilization category [1)]

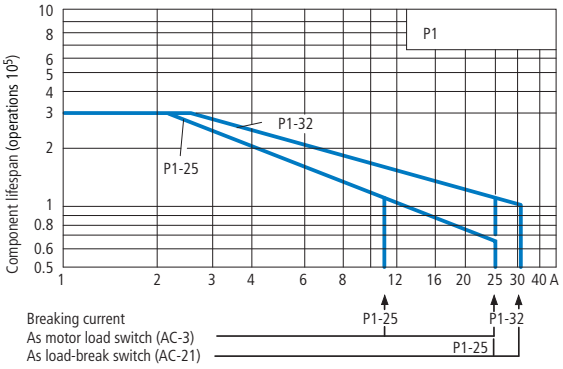
To ensure a reasonable service life in utilization category AC-4 (extreme load: 100 % inching, reversing, or plug braking), the motor's standstill current must not exceed the rated operational current of the switch for AC-21A.

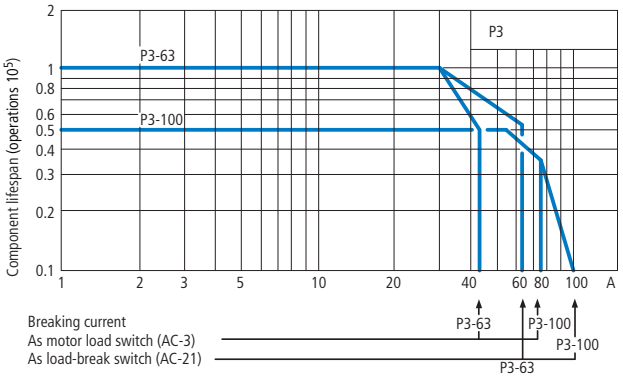












Notes [1)] AC-3 and AC-21 at 400 V, AC-15 at 230 V

Technical data

					P1-25	P1-32	P3-63	P3-100
General								
Standards					IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL switch-disconnector to IEC/EN 60947-3			
Lifespan, mechanical			Operations	x 10^6	0.3	0.3	0.1	0.1
Maximum operating frequency			Operations/h		50	50	50	50
Climatic proofing					Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30			
Ambient temperature	Open			°C	-25 - 50	-25 - 50	-25 - 50	-25 - 50
	Enclosed			°C	-25 - 40	-25 - 40	-25 - 40	-25 - 40
Mounting position					Any	Any	Any	Any
Mechanical shock resistance (IEC/EN60068-2-27)	Half-sinusoidal shock 20 ms			g	15	15	15	15
Contacts								
Rated operational voltage			U_e	V AC	690	690	690	690
Rated impulse withstand voltage			U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree					III/3	III/3	III/3	III/3
Rated uninterrupted current			I_u	A	25	32	63	100
Load rating with intermittent operation, class 12	AB 60 % DF			x I_e	1.3	1.3	1.3	1.3
	AB 40 % DF			x I_e	1.6	1.6	1.6	1.6
	AB 25 % DF			x I_e	2	2	2	2
Short-circuit rating	Fuse			A gG/gL	25	50	80	100
Rated short-time withstand current (1 s current)			I_{cw}	A_{rms}	640	640	1260	2000
Isolating characteristics to IEC/EN 60947				V AC	≦ 690	≦ 690	≦ 690	≦ 690
Safe isolation according to EN 61140								
Safe isolation to VDE 0106 Part 101 and Part 101 A1 between the auxiliary contacts and main circuits				V AC	440	440	440	440
Switching angle				°	90	90	90	90
Contacts				Number	Max. 3 (+N)	Max. 3 (+N)	Max. 3 (+N)	Max. 3 (+N)
Current heat loss per contact at I_e				W	1.1	1.8	4.5	7.5
Terminal capacity								
Solid or stranded				mm^2	1 x (1.5 - 6) 2 x (1.5 - 6)	1 x (1.5 - 6) 2 x (1.5 - 6)	1 x (2.5 - 35) 2 x (2.5 - 10)	1 x (2.5 - 35) 2 x (2.5 - 10)
Flexible with ferrule to DIN 46228				mm^2	1 x (1 - 4) 2 x (1 - 4)	1 x (1 - 4) 2 x (1 - 4)	1 x (1.5 - 25) 2 x (1.5 - 6)	1 x (1.5 - 25) 2 x (1.5 - 6)
Terminal screw					M4	M4	M5	M5
Tightening torque				Nm	1.6	1.6	3	3
Switching capacity								
AC voltage								
Rated making capacity cos φ = 0.35				A	240	320	800	950
Rated breaking capacity, motor load switch cos φ = 0.35	230 V			A	190	260	640	760
	400/415 V			A	150	300	600	740
	500 V			A	170	290	590	880
	690 V			A	150	250	340	520
Rated operational current 440 V, load-break switch AC-21A			I_e	A	25	32	63	100
AC-3 motor load switch motor rating	230 V		P	kW	5.5	7.5	15	22
	400/415 V		P	kW	7.5	13	30	37
	500 V		P	kW	7.5	18.5	30	45
	690 V		P	kW	7.5	15	30	37
AC-23A motor load switch motor rating	230 V		P	kW	7	8.5	18.5	30
	400/415 V		P	kW	13	15	30	50
	500 V		P	kW	11	18.5	37	65
	690 V		P	kW	11	18.5	30	45
DC voltage								
DC-1, load switch L/R = 1 ms		Rated operational current	I_e	A	25	32	63	100
		Voltage per contact connected in series		V	60	60	60	60
DC-23A, motor load switch L/R = 15 ms	24 V	Rated operational current	I_e	A	25	25	50	50
		Contacts		Number	1	1	1	1
	48 V	Rated operational current	I_e	A	25	25	50	50
		Contacts		Number	2	2	2	2
	60 V	Rated operational current	I_e	A	25	25	50	50
		Contacts		Number	3	3	3	3
	120 V	Rated operational current	I_e	A	12	12	25	25
		Contacts		Number	3	3	3	3

Notes Main switch characteristics to IEC/EN 60204; positive opening of contacts, operator element positively located on shaft.
Rated uninterrupted current I_u is specified for max. cross-section.
For terminal capacity solid, stranded and flexible: Max. 2 cross-section sizes difference admissible when using 2 conductors.

P1, P3

Rating data for approved types[1)] UL File No. E36332			P1-25	P1-32	P3-63	P3-100
Contacts						
Rated operational voltage U_e		V AC	600	600	600	600
Rated uninterrupted current I_u						
Current rating		A	20	30	60	100
Pilot Duty			A 600P 600	A 600P 600	–	–
Switching capacity						
AC-3; max. rated power 40 – 60 Hz AC motors						
3-phase	200 V AC	HP	5	7½	15	20
	230 V AC	HP	5	10	15	25
	460 V AC	HP	10	20	40	60
	575 V AC	HP	15	25	50	75
Single-phase	120 V AC	HP	1½	2	3	5
	200 V AC	HP	3	3	7½	10
	230 V AC	HP	3	5	10	15
Short-circuit rating						
Standard	600 V AC	kA	5	5	10	10
With back-up fuse		A	110	110	150	150
With circuit-breakers		Part no.	NZMH6	NZMH6	NZMH6	NZMH9
Current setting		A	125	125	125	125
Disconnect in motor circuits	600 V AC	kA	10	10	10	–
With back-up fuse		Class	50 A/J	50 A/J	100 A	100 A
Terminal capacity						
Terminal capacity						
Cu cable	Min./	AWG	14	14	14	14
	Max.	AWG	8	8	2	2
Tightening torque	Max.	in-lb	14.1	14.1	26.5	26.5

	HI 11
Auxiliary contacts (1 N/O + 1 N/C)	
Pilot Duty	P 600
Heavy Pilot Duty	A 600
General Use	10 A – 600 V AC

Notes [1)] Devices for world markets IEC ≙ UL/CSA

UL File No.: E36332	UL approved protection types UL/NEMA 3R[1)]	UL/NEMA 12	UL/NEMA 13
Switch-disconnectors			
P1-.../EA/SVB	•	•	–
P1-.../V/SVB	•	•	–
P3-.../EA/SVB	•	•	•
P3-.../V/SVB	•	•	•

Notes Details of protection types
[1)] NEMA recommendation

Part no.:	P1	P3-63	P3-100
Mounting form			
/E; /EA; /EZ /Z; /V; /IVS			
/I2	+NA-I2 105866		
/I4		+NA-I4 105868	
/I5			+NA-I5 105869

				P5-125	P5-160	P5-250	P5-315
General							
Standards				IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL Switch-disconnectors to IEC/EN 60947-3			
Lifespan, mechanical		Operations	x 10^6	0.1	0.1	0.08	0.08
Maximum operating frequency		Operations/h		50	50	50	50
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30			
Ambient temperature	Open		°C	-25 - 50	-25 - 50	-25 - 50	-25 - 50
	Enclosed		°C	-25 - 40	-25 - 40	-25 - 40	-25 - 40
Mounting position				Any	Any	Any	Any
Contacts							
Rated operational voltage		U_e	V AC	690	690	690	690
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000	8000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated uninterrupted current		I_u	A	125	160	250	315
Load rating with intermittent operation, class 12	AB 60 % DF		x I_e	1.3	1.3	1.3	1.3
	AB 40 % DF		x I_e	1.6	1.6	1.6	1.6
	AB 25 % DF		x I_e	2	2	2	2
Short-circuit rating	Fuse		A gG/gL	125	160	250	315
Rated short-time withstand current (1 s current)		I_{cw}	A_{rms}	2500	3000	4600	5800
Isolating characteristics to IEC/EN 60947			V AC	≦ 690	≦ 690	≦ 690	≦ 690
Safe isolation according to EN 61140							
Safe isolation to VDE 0106 Part 101 and Part 101 A1 between the auxiliary contacts and main circuits			V AC	440	440	440	440
Switching angle			°	90	90	90	90
Contacts			Number	Max. 3 (+N)	Max. 3 (+N)	Max. 3 (+N)	Max. 3 (+N)
Current heat loss per contact at I_e			W	8	10	13	16
Terminal capacity							
Solid or stranded			mm^2	1 x (10 - 95) 2 x (10 - 35)	1 x (10 - 95) 2 x (10 - 35)	1 x (16 - 185) 2 x (16 - 70)	1 x (16 - 185) 2 x (16 - 70)
Copper strip, 1 flat conductor		Number of layers x width x thickness	mm	6 x 9 x 0.8	–	6 x 20 x 1	–
Copper strip, 2 flat conductors			mm	–	6 x 9 x 0.8	–	6 x 20 x 1
Flexible with ferrule to DIN 46228			mm^2	1 x (16 - 70) 2 x (16 - 25)	1 x (16 - 70) 2 x (16 - 25)	1 x (25 - 120) 2 x (25 - 50)	1 x (25 - 120) 2 x (25 - 50)
Terminal screw				Hexagon screw 5	Hexagon screw 5	Hexagon screw 6	Hexagon screw 6
Tightening torque			Nm	14	14	16	16

Notes Main switch characteristics to IEC/EN 60204; positive opening of contacts, operator element positively located on shaft
Rated uninterrupted current I_u is specified for max. cross-section.
For terminal capacity solid, stranded, and flexible:
Max. 2 cross-section sizes difference admissible when using 2 conductores.

						P5-125	P5-160	P5-250	P5-315
Switching capacity									
AC voltage									
Rated making capacity cos φ = 0.35					A	850	1050	1700	2050
Rated breaking capacity, motor load switch cos φ = 0.35		230 V			A	800	900	1600	1800
		400 V			A	750	850	1380	1650
		500 V			A	650	850	1250	1550
		690 V			A	340	340	400	400
Rated operational current 440 V, load-break switch AC-21A			I_e		A	125	160	250	315
Motor rating motor load switch AC-3		230 V	P		kW	22	30	37	45
		400 V	P		kW	37	45	55	75
		690 V	P		kW	30	37	45	45
Motor rating motor load switch AC-23 A		230 V	P		kW	30	30	37	55
		400 V	P		kW	45	55	90	110
		690 V	P		kW	37	37	45	45
DC voltage									
DC-1, load switch L/R = 1 ms DC-1, load switch L/R = 1 ms		Rated operational current	I_e		A	125	160	250	315
		Voltage per contact connected in series			V	42	42	42	42
DC-23A, motor load switch L/R = 15 ms	24 V	Rated operational current	I_e		A	125	160	250	315
		Contacts			Number	3	3	3	3
	48 V	Rated operational current	I_e		A	125	160	250	315
		Contacts			Number	3	3	3	3
	60 V	Rated operational current	I_e		A	125	160	250	315
		Contacts			Number	3	3	3	3
	120 V	Rated operational current	I_e		A	40	50	80	100
		Contacts			Number	3	3	3	3

Notes Main switch characteristics to IEC/EN 60204; positive opening of contacts, operator element positively located on shaft
Rated uninterrupted current I_u is specified for max. cross-section.
For terminal capacity solid, stranded, and flexible:
Max. 2 cross-section sizes difference admissible when using 2 conductores.

				HI...-P1(P3)...	HI...-P5...
Auxiliary contacts					
Standards				Control circuit isolator to IEC/EN 60947-5	
Rated insulation voltage	U_i		V AC	500	500
Rated uninterrupted current	I_u		A	10	10
Rated operational current					
AC-15 at 230 V	I_e		A	6	6
400 V/415 V	I_e		A	–	3
DC-13					
125 V	I_e		A	1.1	0.23
250 V	I_e		A	0.55	0.1
Short-circuit rating					
Max. fuse			A gG/gL	10	10
Terminal capacity					
Solid			mm^2	1 × 0.75 - 2.5 2 × 0.75 - 1.5	1 × 0.75 - 2.5 2 × 0.75 - 1.5
Flexible with ferrule to DIN 46228			mm^2	1 × 0.5 - 1.5 2 × 0.5 - 1.5	1 × 0.5 - 1.5 2 × 0.5 - 1.5
Tightening torque			Nm	0.6	0.8
Control circuit reliability at 24 V DC, 10 mA		Fault probability	H_F	< 10^{-5}, < 1 failure for 100 000 switching operations	

P5

Rating data for approved types UL File No. E36332				P5-125	P5-160	P5-250	P5-315
Contacts							
Rated operational voltage		U_e	V	600	600	600	600
Rated impulse withstand voltage[1]		U_{imp}	V AC	8000	8000	8000	8000
Rated uninterrupted current[2]		I_u	A	125	160	250	300
Rated operational current							
Ampere rating	Off switch	I_e	A	125[2]	160[2]	250[2]	300[2]
	Changeover switches	I_e	A	125[2]	160[2]	–	–
Non inductive and slightly inductive loads							
Rated switching duty							
DOL rating (similar to AC-3)							
3-phase, 3 pole							
	120 V		HP	15	20	30	40
	240 V		HP	30	40	60	75
	480 V		HP	60	60	75	100
	600 V		HP	60	60	75	100
Short-circuit rating							
Max. back-up fuse, gL characteristic			A	125	160	250	315
Rated short-time withstand current (1 s current)			A	2500	3000	4600	5800
Terminal capacity							
Cu cable							
Solid or stranded for box terminal			AWG	3/0	3/0	–	–
			MCM	–	–	350	350
Flexible without ferrule			AWG	2/0	2/0	–	–
			MCM	–	–	300	300
Connection with cable lug or busbar				M10 x	M10 x	M12 x	M12 x
Terminal screw			mm	20	20	20	20
Max. width			mm	20	20	25	25
Max. width with terminal cover			mm	25	25	34	34
Ambient temperature	Open on 100 % I_u/I_{th}			50 °C over 24 hours with peaks up to 55 °C			
	Enclosed on 100% I_{the}			35 °C over 24 hours with peaks up to 40 °C			

Notes
[1] Valid for mains with grounded star point, overvoltage category III, pollution degree 3
[2] Valid for connection with cables for 75°C

			HI11	HI21-P5-125(160)	HI21-P5-250(315)
Auxiliary contacts					
Standards					
Rated insulation voltage	U_i	V AC		600	600
Rated uninterrupted current	I_u	A		10	10
Rated operational current	I_e				
Pilot Duty			P600	P600	P600
Heavy Pilot Duty			A600	A600	A600
General Use			10 A – 600 V AC	–	–
Ampere rating					
Non inductive and slightly inductive loads			–	10	10
Short-circuit rating					
Max. fuse	gL characteristic	A	–	16	16
Terminal capacity					
Solid or stranded		AWG	–	12	12
Flexible without ferrule		AWG	–	14	14

Notes
[1] Devices for world markets IEC ≙ UL/CSA

			T0-...	T3-...	T5B-...	T5-...	T6-3-8212/E/HI12	T6-160-...	T8-...
General									
Standards			IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL, Switch-disconnectors to IEC/EN 60947-3 Load-break switch according to IEC/EN 60947-3		IEC/EN 60947, VDE 0660, IEC/EN 60204, CSA, UL, Switch-disconnectors to IEC/EN 60947-3 Load-break switch according to IEC/EN 60947-3				
Lifespan, mechanical	Operations	x 10^6	0.5	0.5	0.5	0.5	0.1	0.1	0.1
Maximum operating frequency	Operations/h		3000	3000	3000	3000	50	50	50
Climatic proofing			Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic to IEC 60068-2-30		Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30				
Ambient temperature									
Open		°C	-25 - 50	-25 - 50	-25 - 50	-25 - 50	-25 - 50	-25 - 50	-25 - 50
Enclosed		°C	-25 - 40	-25 - 40	-25 - 40	-25 - 40	-25 - 40	-25 - 40	-25 - 40
Mounting position			Any	Any	Any	Any	Any	Any	Any
Mechanical shock resistance to IEC 60068-2-27	Half-sinusoidal shock 20 ms	g	> 15	> 15	> 15	> 15			
Contacts									
Rated operational voltage	U_e	V AC	690	690	690	690	690	690	690
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000	6000	8000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated uninterrupted current									
Open	I_u	A	20	32	63	100	125	160	315
Enclosed	I_u	A	20	32	63	100	125	160	275
Load rating with intermittent operation, class 12									
AB 25 % DF		x I_e	2	2	2	2	2	2	2
AB 40 % DF		x I_e	1.6	1.6	1.6	1.6	1.6	1.6	1.6
AB 60 % DF		x I_e	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Short-circuit rating									
Fuse		A gG/gL	20	35	80	100	200	160	315
Rated short-time withstand current (1 s current)	I_{cw}	A_{rms}	320	650	1300	1850	2000	3000	4200
Safe isolation according to EN 61140									
Between the contacts		V AC	440	440	440	440			
Switching angle		°	90 60 45 30	90 60 45 30	90 60 45 30	90 60 45 30	90 60	90 60	90 60
Contact units			Max. 11	Max. 11	Max. 10	Max. 10	Max. 3	Max. 3	Max. 3
Contacts with double-break			Max. 22	Max. 22	Max. 20	Max. 20	Max. 6	Max. 6	Max. 6
Current heat loss per contact at I_e		W	0.6	1.1	4.5	7.5	11	11	11
Terminal capacity									
Solid or stranded		mm^2	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 6) 2 x (1 - 6)	1 x (2.5 - 35) 2 x (2.5 - 16)	1 x (2.5 - 35) 2 x (2.5 - 16)	1 x 70 2 x 25	1 x 95 2 x 25	150
Flexible with ferrule to DIN 46228		mm^2	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 4) 2 x (0.75 - 4)	1 x (1.5 - 25) 2 x (1.5 - 10)	1 x (1.5 - 25) 2 x (1.5 - 10)	1 x 50 2 x 16	1 x 50 2 x 16	120
Flat terminal for rails		mm^2							1 x (25 x 5) 2 x (20 x 3)
Terminal screw			M3.5	M4	M6	M6	M6	M5, hexagon screw	M12
Tightening torque		Nm	1	2	4	4	5.6	14	25

Notes
The following applies for mechanical shock resistance: T3.../I... >12g
Applies to T0(3).../SVB: isolating characteristics to IEC/EN 60947 for rated operational voltage U_e up to 500 VAC
The following applies to rated uninterrupted current $I_u$of contacts: max. 95 A with T5-4-8344/I5
The following applies for solid, stranded and flexible terminal capacities:
T0(3), (6), (8)...: if 2 conductors are used, a max. difference of 2 cross-section sizes is permissible
T5(B)-...: if 2 conductors are used, a max. difference of one cross-section sizes is permissible
The following applies for part no. T8-3-8342/...: switching angle = 90° and flat conductor connection = 1 flat conductor, 25 x 5, or 2 flat conductors, 20 x 3

					T0-...	T3-...	T5B-...	T5-...	T6-3-8212/E/HI12	T6-160-...	T8-...
Switching capacity											
AC voltage											
Rated making capacity cos φ = 0.35				A	130	320	800	950	1600	1600	2390
Rated breaking capacity, Motor load switch cos φ = 0.35	230 V			A	100	260	520	760	1280	1280	1910
	400 V			A	110	260	600	740	900	900	1800
	500 V			A	80	240	480	590	880	880	1200
	690 V			A	60	170	340	420	340	340	420
Rated operational current load break switch AC-21A	440 V		I_e	A	20	32	63	100	125	160	315
Motor rating Motor load switch AC-3	230 V		P	kW	3	6.5	15	22	22	22	22
	230 V star-delta		P	kW	4	11	22	30	22	22	37
	400/415 V		P	kW	4	12	22	30	37	45	55
	400 V star-delta		P	kW	5.5	18.5	37	45	37	45	55
	500 V		P	kW	5.5	15	22	37	37	37	37
	500 V star-delta		P	kW	7.5	22	37	55	37	37	37
	690 V		P	kW	4	15	22	30	22	22	37
	690 V star-delta		P	kW	5.5	22	37	45	22	22	37
Motor rating Motor load switch AC-23A	230 V		P	kW	3.5	7.5	15	18.5	37	37	75
	400/415 V		P	kW	6.5	13	22	30	45	55	132
	500 V		P	kW	7.5	15	22	37	55	75	132
	690 V		P	kW	6.5	15	22	30	30	30	37
Rated operational current Control switch AC-15	230 V		I_e	A	6	10	16	16	–	–	–
	400/415 V		I_e	A	4	6	6	6	–	–	–
	500 V		I_e	A	2	4	4	4	–	–	–
DC voltage											
DC-1, load switch L/R = 1 ms		Rated operational current	I_e	A	10	25	63	80	125	125	315
		Voltage per contact connected in series		V	60	60	60	60	42	42	42
DC-21A		Rated operational current 240 V	I_e	A	1	1					
		240 V contacts		Number	1	1					
DC-23A, motor load switch L/R = 15 ms	24 V	Rated operational current	I_e	A	10	25	50	–	125	125	250
		Contacts		Number	1	1	1	–	1	1	1
	48 V	Rated operational current	I_e	A	10	25	50	–	125	125	250
		Contacts		Number	2	2	2	–	2	2	2
	60 V	Rated operational current	I_e	A	10	25	50	–	125	125	125
		Contacts		Number	3	3	3	–	3	3	3
	120 V	Rated operational current	I_e	A	5	12	25	–	50	50	50
		Contacts		Number	3	3	3	–	3	3	3
	240 V	Rated operational current	I_e	A	5	5	20	–	–	–	–
		Contacts		Number	5	5	6	–	–	–	–
DC-13, control switch L/R = 50 ms		Rated operational current	I_e	A	10	20	25	–	125	125	250
		Voltage per contact connected in series		V	32	32	24	–	24	24	
Control circuit reliability at 24 V DC, 10 mA			Fault probability	H_F	< 10 $^{-5}$, < 1 failure for 100000 switching operations		< 10 $^{-5}$, < 1 failure for 100000 switching operations				
Auxiliary contacts											
Standards									Control circuit isolator to IEC/EN 60947-5 f	Control circuit isolator to IEC/EN 60947-5 f	
Rated insulation voltage			U_i	V AC	–	–	–	–	500	500	–
Rated uninterrupted current			I_u	A	–	–	–	–	10	10	–
Rated operational current											
AC-15 at 230 V			I_e	A	–	–	–	–	6	6	–
400 V/415 V			I_e	A	–	–	–	–	4	4	–
Short-circuit rating											
Max. fuse				A gG/gL	–	–	–	–	10	10	–
Terminal capacity											
Solid				mm^2	–	–	–	–	0.75 - 2.5	0.75 - 2.5	–
Flexible with ferrule to DIN 46228				mm^2	–	–	–	–	0.5 - 1.5	0.5 - 1.5	–
Tightening torque				Nm					0.35	0.35	
Control circuit reliability at 24 V DC, 10 mA			Fault probability	H_F	–	–	–	–	< 10^{-5}, < 1 failure for 100 000 switching operations		

Approvals for North America

Rating data for approved types[1)] UL File No. E36332			T0-...	T3-...	T5B-...
Contacts					
Rated operational voltage U_e		V AC	600	600	600
Rated uninterrupted current I_u					
Current rating		A	16	25	65
Pilot Duty			A 600 P 600	A 600	
Switching capacity					
AC-3; max. rated power 40 – 60 Hz AC motors					
3-phase	200 V AC	HP	3	5	15
	230 V AC	HP	3	7½	15
	460 V AC	HP	10	15	40
	575 V AC	HP	10	15	50
Single-phase	115 V AC	HP	1	1½	3
	200 V AC	HP	2	3	7½
	230 V AC	HP	2	3	10
Short-circuit rating					
Standard	600 V AC	kA	5	5	5
With back-up fuse		A	50	80	CLASS J
With circuit-breakers		Part no.	NZMH6	NZMH6	–
Current setting		A	50	125	–
Disconnect in motor circuits	600 V AC	kA	10	10	–
With back-up fuse		Class	20 A/J	40 A/J	–
Terminal capacity					
Terminal capacity					
Cu cable	Min.	AWG	18	14	12
	Max.	AWG	14	10	4
Tightening torque	Max.	in-lb	8.8	17.6	35.3

Notes

[1)] Devices for world markets IEC ≙ UL/CSA.

Accessories → Cam switches for the German market.
If required, order English language front plate from the German market product range.
Do not use AW extension terminals where UL/CSA approval is required.

	UL approved protection types		
	UL/NEMA 1	UL/NEMA 3R	UL/NEMA 12
Cam switches			
T0-.../E; /Z; /SVB	•	•	•
T3-.../E; /Z; /SVB	•	•	•
T5B-.../E;/Z;/SVB	•	•	•

Notes

Protection type explanations → Chapter 23, Enclosure protection types as defined in NEC (NFPA 70), UL, CSA, NEMA

T cam switches in NA version

In its NA version, the cam switch features a terminal inscription in English and/or a terminal inscription deviating from the IEC standard. Switches in mounting types I2 to I4 feature an additional inscription on the enclosure's front (e.g. part no. and protection type). Not possible in combination with key operation lock mechanism S-T0; SVA-T3, and SVC-T3.

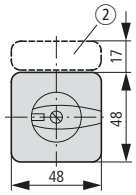
An overview of these cam switches can be found in the instructional leaflet AWA 1150-2327.

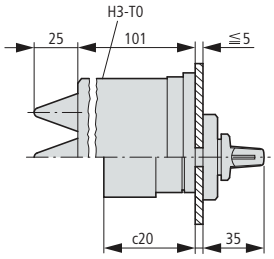
Catalog No.:	T0	T3	T5B
Mounting type			
/E; /EA; /EZ /Z; /V; /IVS	+NA 105864	+NA 105864	
/I2		+NA-I2 105866	
/I4			
/I5			+NA-I5 105869

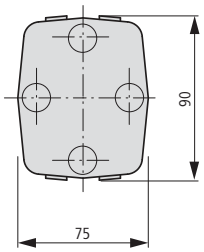
				TM
General				
Standards				IEC/EN 60947, VDE 0660 UL, CSA Control switch to IEC/EN 60947-5-1 Control circuit isolators to IEC/EN 60947-5-1
Control circuit isolator (IEC/EN 60947-5-1)				Max. 6 contacts; switching angle: 90°
Lifespan, mechanical		Operations	x 10^6	> 1
Maximum operating frequency		Operations/h		3000
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30
Ambient temperature				
Open			°C	-25….50
Enclosed			°C	-25….40
Mounting position				Any
Terminal capacity				
Solid			mm^2	1 x 1.5 2 x 1.5
Flexible without ferrule			mm^2	1 x 1.5 2 x 1.5
Solid or stranded			AWG	1 x 14 2 x 14
Flexible			AWG	1 x 16 2 x 16
Terminal screw				M2.5
Tightening torque			Nm	0.35
Contacts				
Mechanical data				
Contacts			Number	Max. 16
Contact units (BE)				Max. 8
Switching angle			°	90 60 45 30
Smallest switching angle for ON-OFF-ON			°	60
Max. switch position				≦ 12
Electrical characteristics				
Rated operational voltage		U_e	V AC	500
Rated impulse withstand voltage		U_{imp}	V AC	4000
Overvoltage category/pollution degree				III/3
Rated insulation voltage		U_i	V AC	500
Rated insulation voltage to UL/CSA			V AC	300
Rated uninterrupted current		I_u	A	10
Switching capacity				
AC-23 motor load switch	230 V AC, 3 pole		kW	1.8
	440 V AC, 3 pole		kW	3
	230 V AC, 1 pole		kW	0.75
	440 V AC, 1 pole		kW	1.1
AC-15 control switch	230 V AC, 1 pole		A	2.5
	400 V AC, 1 pole		A	1.5
	440 V AC, 1 pole		A	1
DC-13, control switch L/R = 50 ms	Rated operational current	I_e	A	3
	Voltage per contact connected in series		V	32
Switching capacity (UL489, CSA 22.2 No. 5.1)	240 V AC, 3 pole		HP	1
	277 V AC, 1 pole		HP	¾
	300 V AC Heavy duty		A	10
Max. short-circuit protective device				
Fuse			A gG/gL	10
Control circuit reliability at 24 V DC, 10 mA		Fault probability	H_F	< 10^{-5}, < 1 failure for 100000 switching cycles

Dimensions

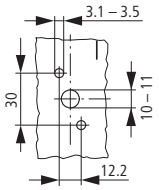
Flush mounting
T0.../E (+ H3-T0)
T3.../E (+ H3-T0)



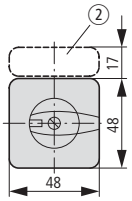


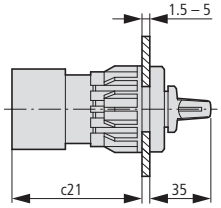


Drilling dimensions

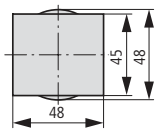


Center mounting
T0.../EZ
T3.../EZ

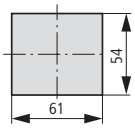




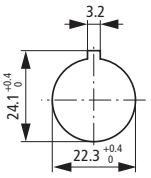
T0



T3



Drilling dimensions



Part no.	c20	c21
T0-1...	41	61
T0-2...	50	70
T0-3...	60	80
T0-4...	69	89
T0-5...	79	99
T0-6...	88	108
T0-7...	98	118
T0-8...	107	127
T0-9...	117	137
T0-10...	126	146
T0-11...	136	156

Depth of one contact unit: 9.5 mm

Part no.	c20	c21
T3-1...	44	64
T3-2...	56	76
T3-3...	67	87
T3-4...	79	99
T3-5...	90	110
T3-6...	102	122
T3-7...	113	133
T3-8...	125	145
T3-9...	136	156
T3-10...	148	168
T3-11...	159	179

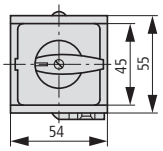
Depth of one contact unit: 11.5 mm

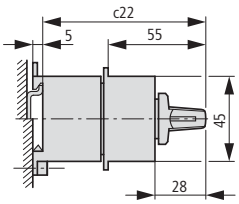
② Not included as standard

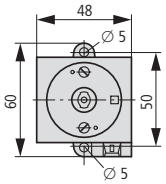
Service distribution board mounting

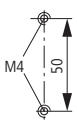
T0.../IVS

Drilling dimensions
base







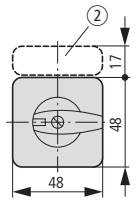


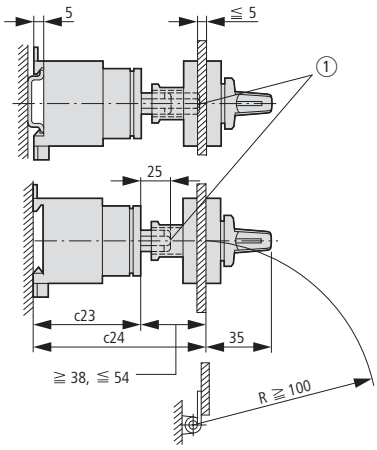
Rear mounting
T0.../Z
T3.../Z

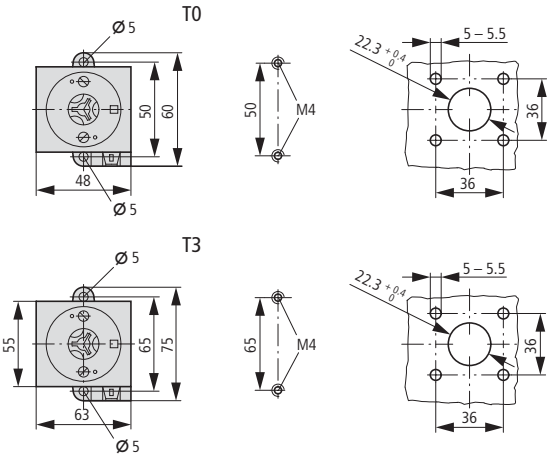
Drilling dimensions base

Drilling dimensions door

① Extension with







ZAV-T0 possible,
≦ 4 x 25 = 100 mm

Part no.	c20	c21	c22	c23	c24 ≧/≦	c24 with ≦ 4 ZAV	c25
T0-1...	41	61	77	48	86 – 102	202	72
T0-2...	50	70	87	57	96 – 112	212	72
T0-3...	60	80	96	67	105 – 121	221	91
T0-4...	69	89	106	76	115 – 131	231	91
T0-5...	79	99	115	86	124 – 140	240	–
T0-6...	88	108	125	95	134 – 150	250	–
T0-7...	98	118	134	105	143 – 159	259	–
T0-8...	107	127	144	114	153 – 169	269	–
T0-9...	117	137	154	124	162 – 178	278	–
T0-10...	126	146	163	133	172 – 188	288	–
T0-11...	136	156	173	143	181 – 197	297	–

Depth of one contact unit: 9.5 mm

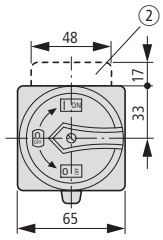
Part no.	c20	c21	c22	c23	c24 ≧/≦	c24 with ≦ 4 ZAV	c25
T3-1...	44	64	80	51	86 – 105	205	79
T3-2...	56	76	92	63	101 – 115	216	79
T3-3...	67	87	103	74	112 – 128	228	101
T3-4...	79	99	115	86	124 – 139	239	101
T3-5...	90	110	126	97	135 – 151	251	–
T3-6...	102	122	138	109	147 – 162	262	–
T3-7...	113	133	149	120	158 – 174	274	–
T3-8...	125	145	161	132	170 – 185	285	–
T3-9...	136	156	172	143	181 – 196	296	–
T3-10...	148	168	184	155	193 – 208	308	–
T3-11...	159	179	195	166	204 – 219	319	–

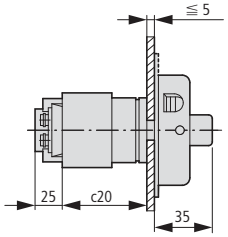
Depth of one contact unit: 11.5 mm

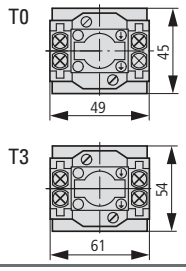
② Not included as standard

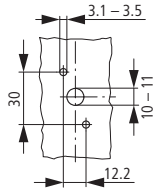
Flush mounting main switch
T0.../EA/SVB
T3.../EA/SVB

Drilling dimensions door





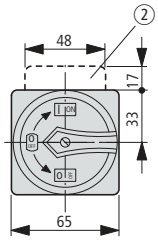


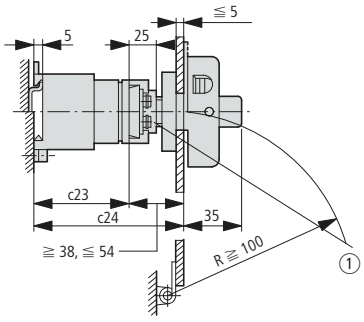


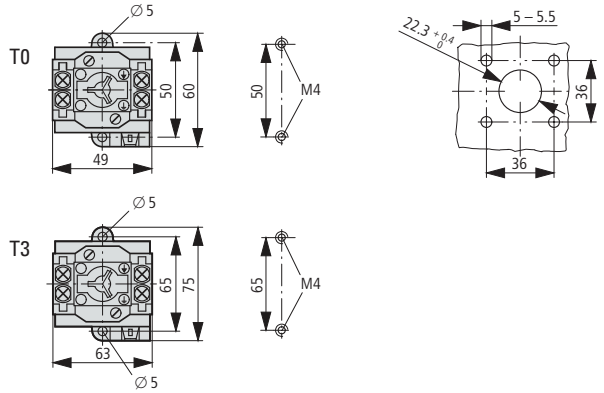
Rear mounting main switches
T0.../V/SVB
T3.../V/SVB

Drilling dimensions base

Drilling dimensions door



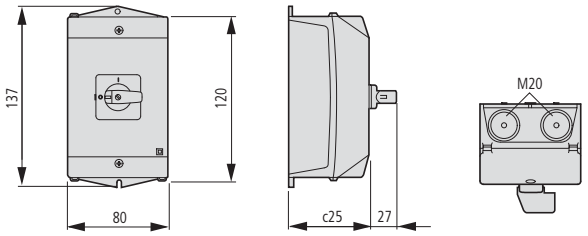




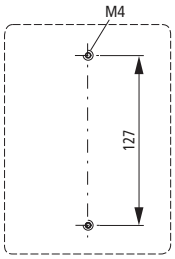
① Interlock extension possible with ZVV-T0 + ZAV-T0, F 4 x 25 = 100 mm
② Not included as standard

Surface mounting

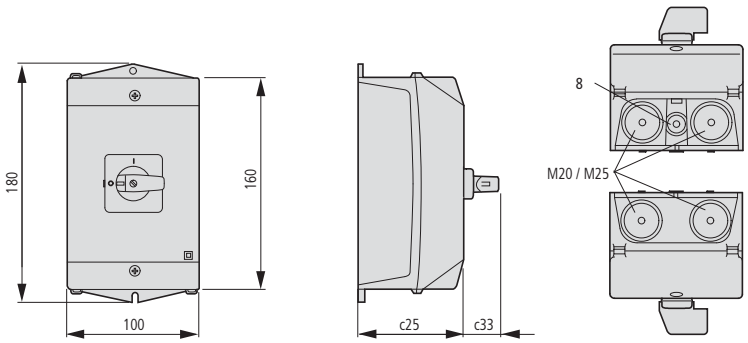
T0.../I1



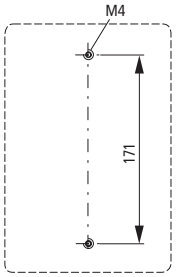
Drilling dimensions base



T3.../I2

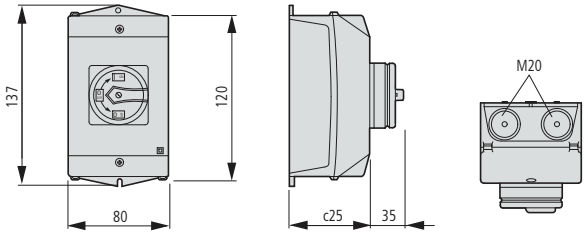


Drilling dimensions base

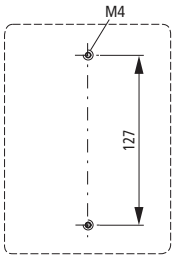


Surface mounting main switches

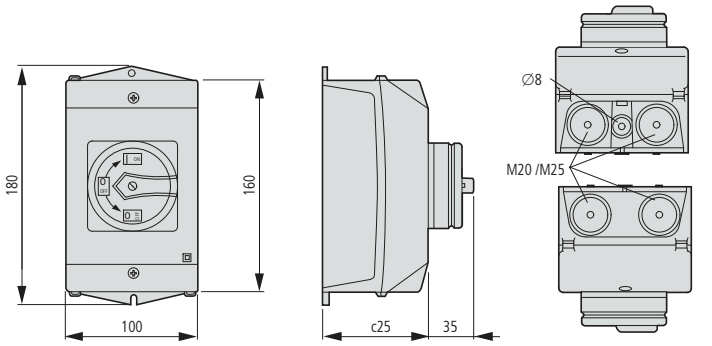
T0.../I1/padlock facility



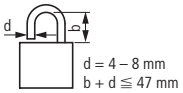
Drilling dimensions base



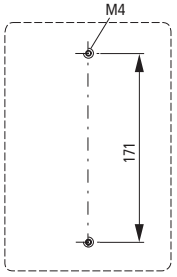
T3.../I2/SVB



≦ 3 padlocks



Drilling dimensions base

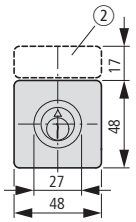


Part no.	c25
T0-1...	75
T0-2...	75
T0-3...	95
T0-4...	95

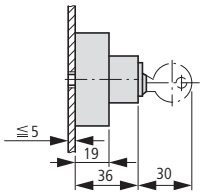
Part no.	c25	c33
T3-1...	80	27
T3-2...	80	27
T3-3...	100	35
T3-4...	100	35
T3-5...	145	35

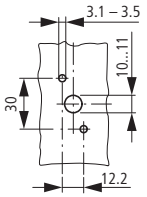
Key operated lock mechanism

S-T0
S-SOND...-T0

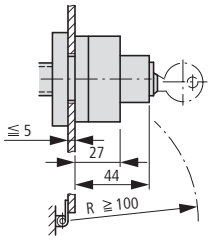


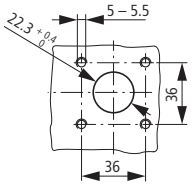
T0.../E(I1) + S-(SOND-)T0
T3.../E(I2) + S-(SOND-)T0



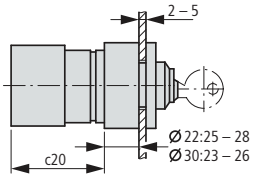


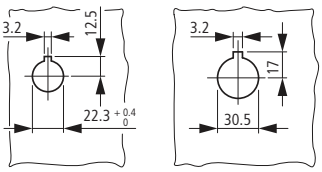
T0.../Z + S-(SOND-)T0
T3.../Z + S-(SOND-)T0





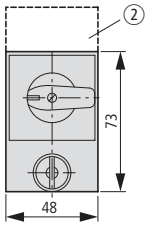
T0.../EZ = T0../E + EZ-T0 + S-(SOND-)T0
T3.../EZ = T3../E + EZ-T0 + S-(SOND-)T0



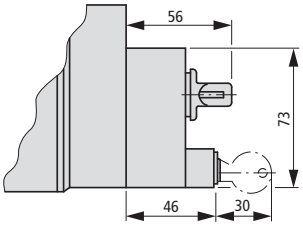


Cylinder lock

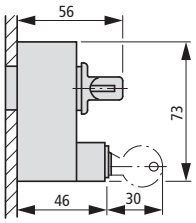
SVA-T3



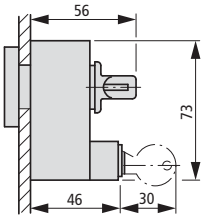
T0.../I1/SVA
T3.../I2/SVA
P1.../12/SVA



T0.../E/SVA...
T3.../E/SVA...
P1.../E/SVA

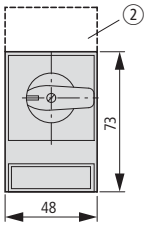


T0.../Z/SVA...
T3.../Z/SVA...
P1.../Z/SVA

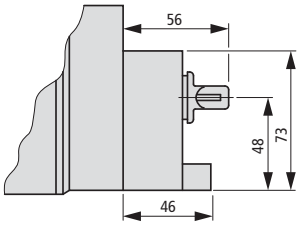


Padlocking feature

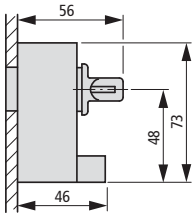
SVC-T3



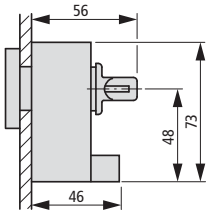
T0.../I1/SVC
T3.../I2/SVC
P1.../12/SVC



T0.../E/SVC...
T3.../E/SVC...
P1.../E/SVC

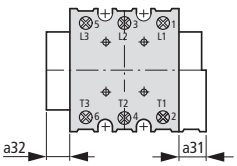


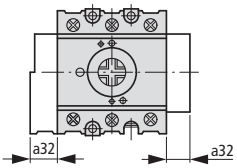
T0.../Z/SVC...
T3.../Z/SVC...
P1.../Z/SVC

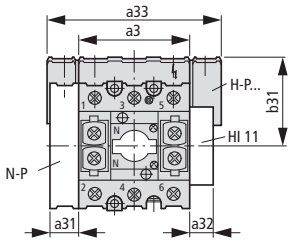


Modules

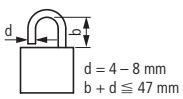
Switched neutral conductor N-P...
Auxiliary contacts HI 11-P1/P3







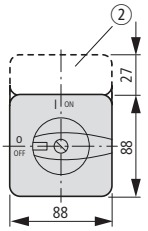
≦ 3 padlocks

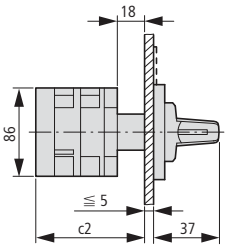


Part no.	a3	a31	a32	a33	b31
P1-...	49	15	15	83	49
P3-..	72	18	15	114	60

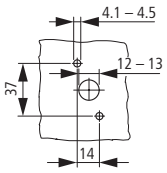
② Not included as standard

Flush mounting
T5(B).../E

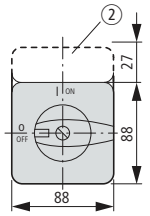


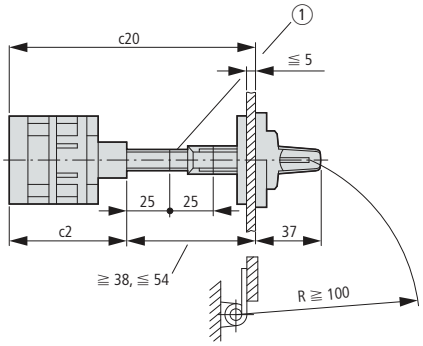


Drilling dimensions door

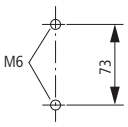


Rear mounting
T5(B).../Z

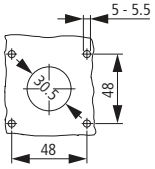




Drilling dimensions base

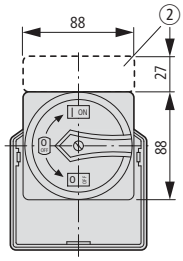


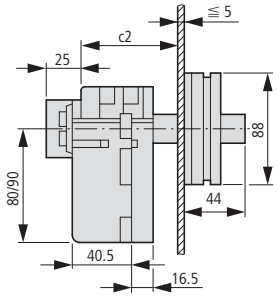
Drilling dimensions door



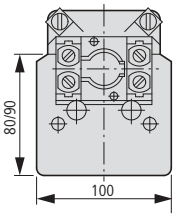
① Shaft extension possible with ZAV-P3 F 4 x 25 = 100 mm

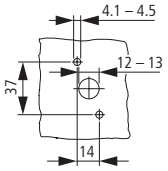
Flush mounting main switches
T5(B).../EA/SVB



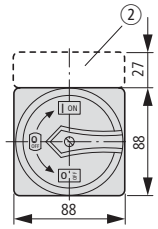


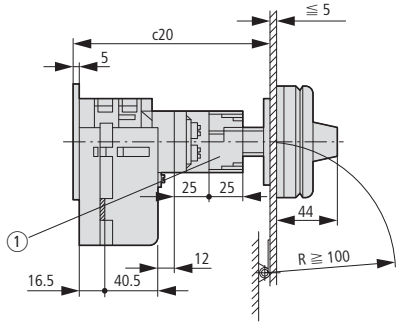
Drilling dimensions door



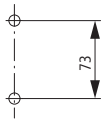


Rear mounting main switches
T5(B).../V/SVB

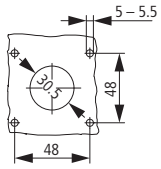




Drilling dimensions base



Drilling dimensions door



Part no.	c2	c20 ≧/≦	c20 with ≦ 4 ZAV	c21	c22
T5(B)-1...	54	92 – 107	207	90	125 (95)
T5(B)-2...	71	109 – 124	224	90	125 (95)
T5(B)-3...	87	125 – 140	240	123	160 (160)
T5(B)-4...	104	142 – 157	257	123	160 (160)
T5(B)-5...	120	158 – 173	273	–	–
T5(B)-6...	137	175 – 190	290	–	–
T5(B)-7...	153	191 – 206	306	–	–
T5(B)-8...	170	208 – 223	323	–	–
T5(B)-9...	186	224 – 239	339	–	–
T5(B)-10...	203	240 – 356	356	–	–

Depth of one contact unit: 16.5 mm

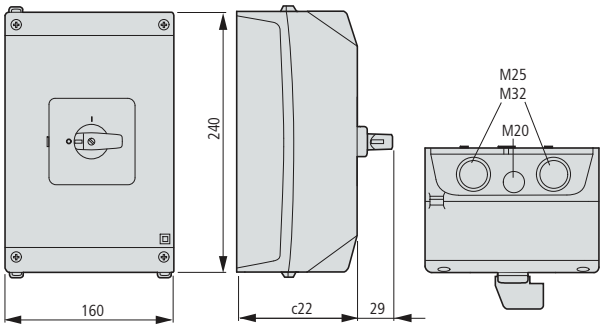
Cam switches T5B and T5 have identical designs, only their contacts are different

① Extension possible with ZVV-P3, ≦ 4 x 25 = 100 mm

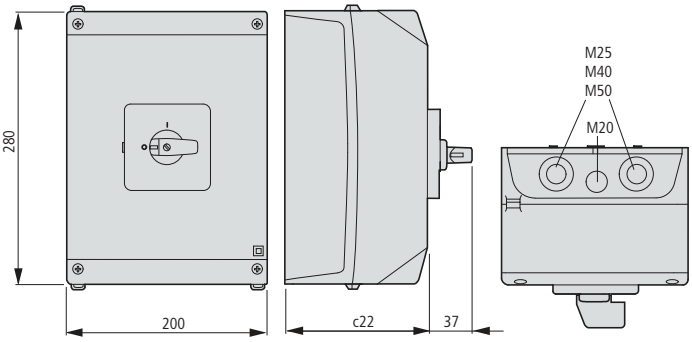
② Not included as standard

Surface mounting

T5B.../I4

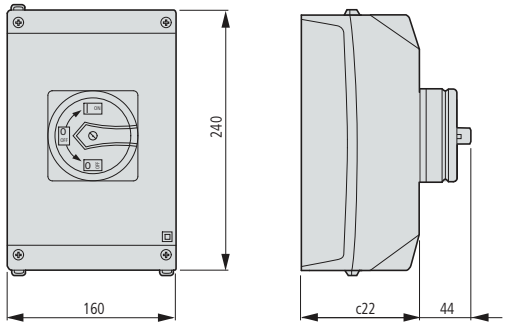


T5.../I5

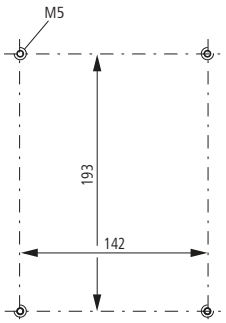


Surface mounting main switches

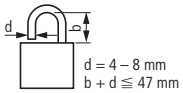
T5B.../I4/SVB



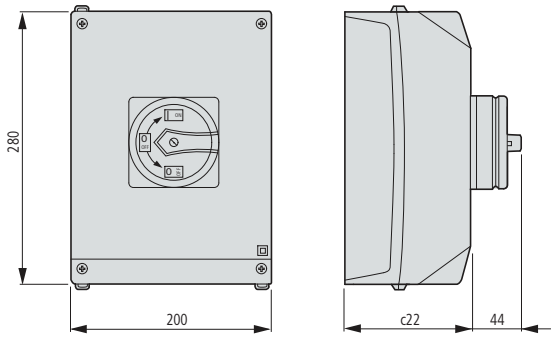
Drilling dimensions



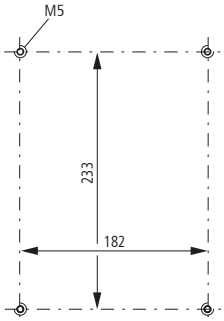
≦ 3 padlocks



T5.../I5/SVB

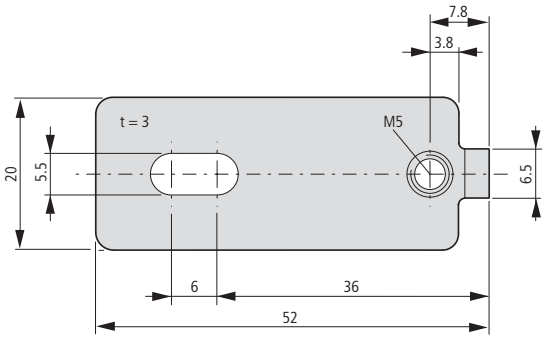


Drilling dimensions



External fixing brackets

AB-CI-K415



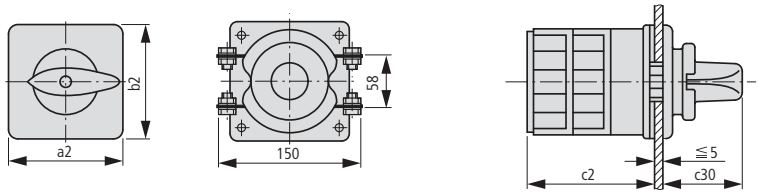
Part no.	c22
T5(B)-1...	125
T5(B)-2...	125
T5(B)-3...	160
T5(B)-4...	160

Depth of one contact unit: 16.5 mm

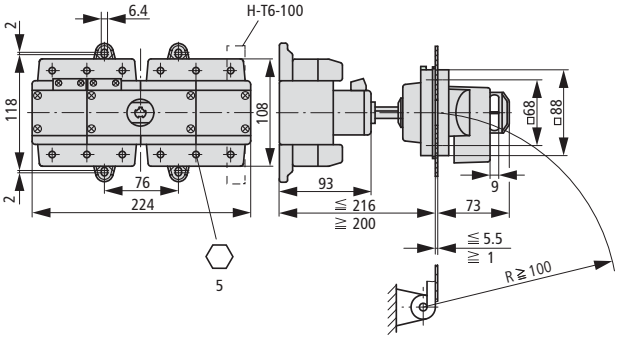
Cam switches T5B and T5 have identical designs, only their contacts are different

Flush mounting

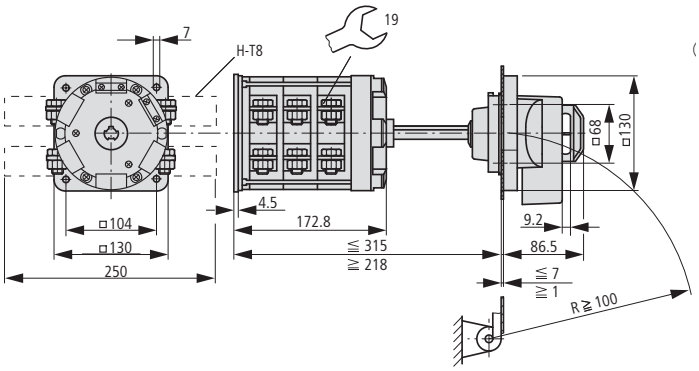
T6-3-8212/E/HI12
T8-3-8212/E/HI12



T6-160-6/V/SVB-SW/HI11

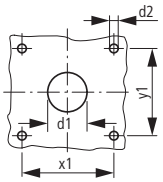


T8-3-8342/V/SVB-(SW)/HI11



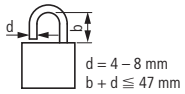
Part no.	a2	b2	c2	c30	d1	d2	x1	y1
T6-3-8212/E/HI12	88	88	152	44	∅ 26 – 30	∅ 6.0	68	68
T8-3-8212/E/HI12	130	130	173	62	∅ 22 – 25	∅ 7.0	104	104
T8-3-8342/V/SVB-(SW)/HI11	–	–		–	∅ 26 – 30	∅ 7.0	68	68

Drilling dimensions door



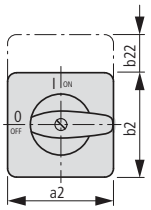
T6: 4 M5 x 20
T8: 4 M6 x 20

≦ 3 padlocks for T.../SVB



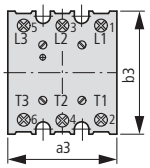
Flush mounting

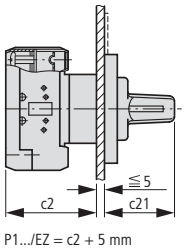
P.../E



Center mounting

P1.../EZ

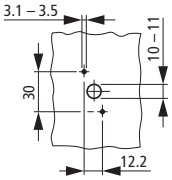




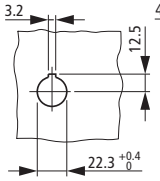
P1.../EZ = c2 + 5 mm

Drilling dimensions door

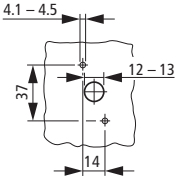
P1-.../E



P1-.../EZ

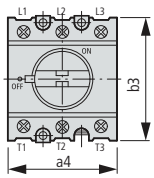


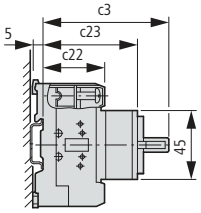
P3-.../E

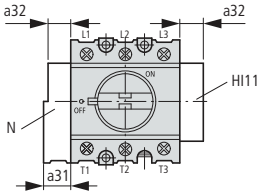


Service distribution board flush mounting

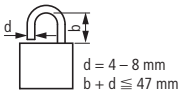
P3.../IVS



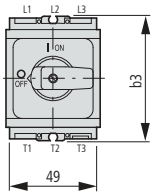


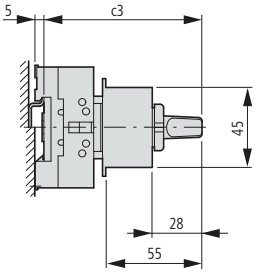


≦ 3 padlocks



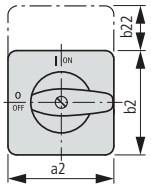
P1.../IVS

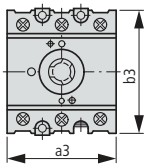


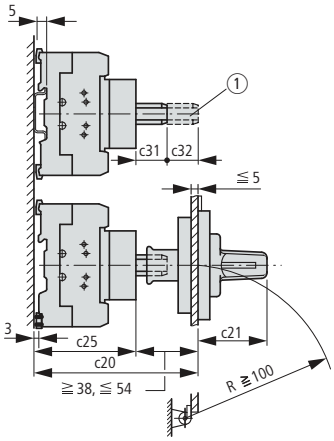


Rear mounting

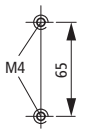
P.../Z



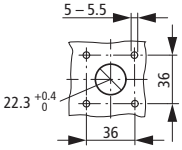




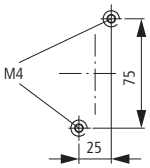
Drilling dimensions base P1.../Z

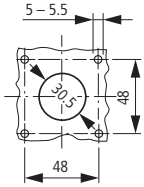


Drilling dimensions door



P3.../Z





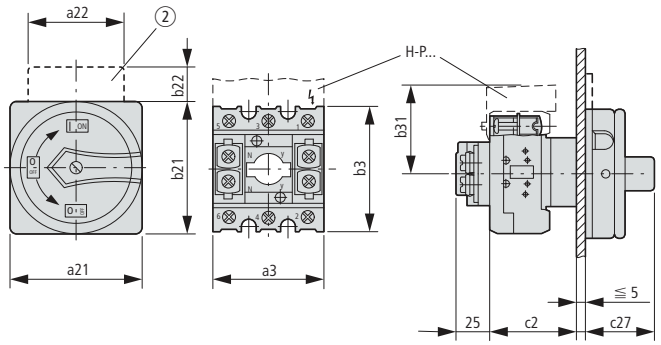
① Shaft extension with ZAV-... possible ≦ 4 x 25 = 100 mm

Part no.	a2	a3	a4	a21	a22	a23	a31	a32	a33	b2	b3	b21	b22	b23	b24	b31
P1	48	49	53.5	65	48	87	15	15	83	48	70	65	17	180	32	49
P3	87	72	71.5	87	87	125	18	15	114	87	83	87	27	175	–	60

Part no.	c2	c3	c20 ≧/≦	c20 with ≦ 4 ZAV/ZVV	c21	c22	c23	c24	c25	c27	c28	c31	c32	c33
P1	59	86	96 – 112	212	35	32	65	68	58	35	77	25	25	27
P3	59	82	103 – 118	218	37	41	63	81	65	44	90	25	25	29

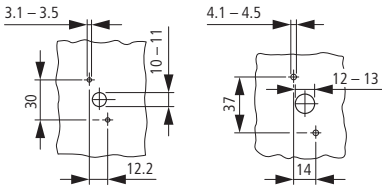
Flush mounting main switches

P.../EA/SVB



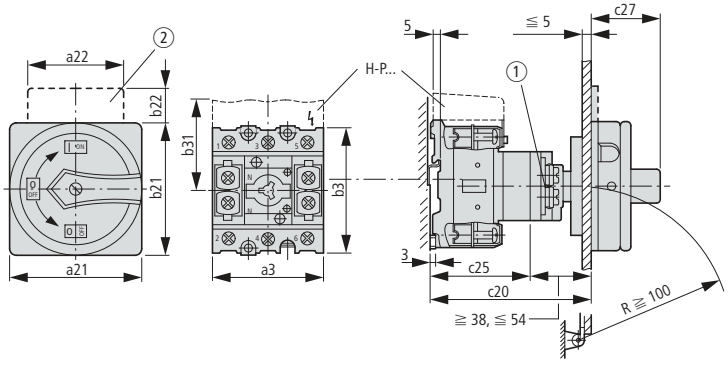
Drilling dimensions door

P1... P3



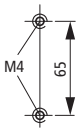
Rear mounting main switches

P.../V/SVB

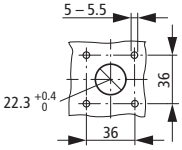


Drilling dimensions base

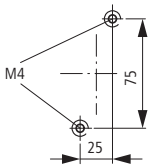
P1/V/SVB

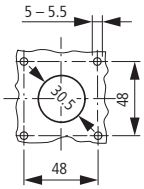


Drilling dimensions door



P3/V/SVB

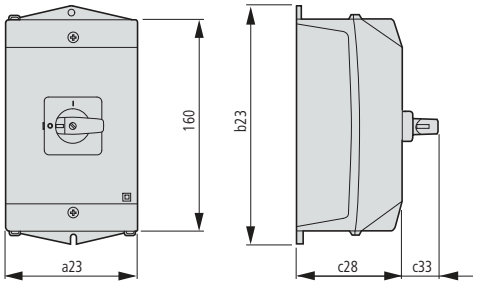




① Interlock extension with ZVV-...+ZAV... possible ≦ 4 x 25 = 100 mm
② Not included as standard

Surface mounting

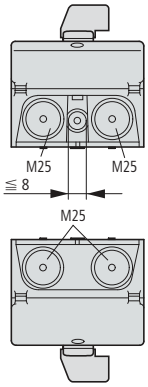
P1.../I2

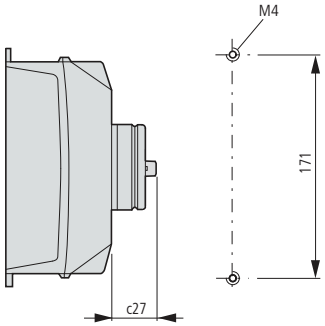


Surface mounting main switches/ safety switches

Drilling dimensions

P1.../I2/SVB
P1.../I2/SI



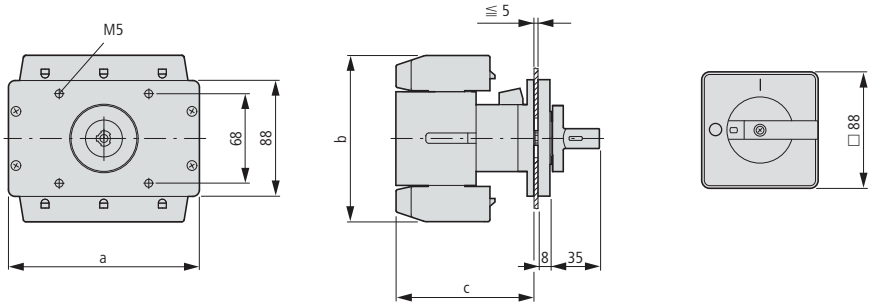


Part no.	a2	a3	a4	a21	a22	a23	a31	a32	a33	b2	b3	b21	b22	b23	b24	b31
P1.../I2	48	49	53.5	65	48	100	15	15	83	48	70	65	17	180	35.5	49

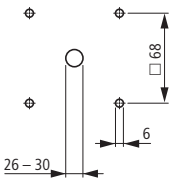
Part no.	c2	c3	c20 ≧/≦	c20 with ≦ 4 ZAV/ZVV	c21	c22	c23	c24	c25	c27	c28	c31	c32	c33
P1...	59	86	96 – 112	212	35	32	65	68	58	35	80	25	25	27

Flush mounting

P5.../E

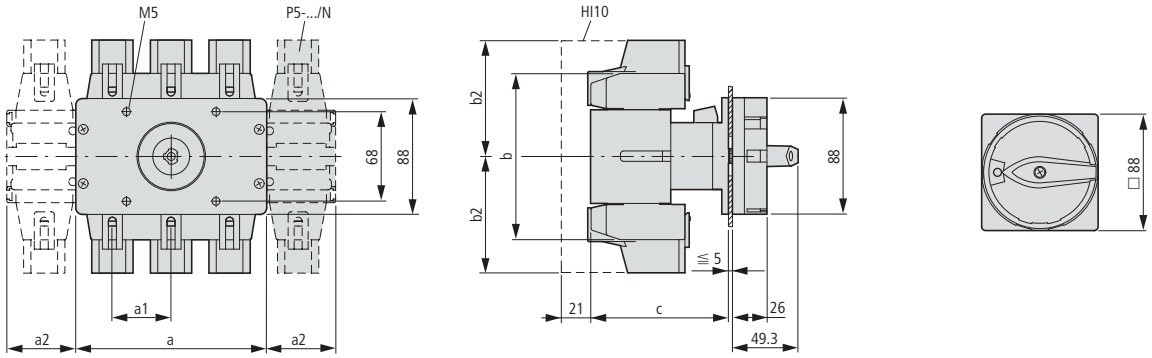


Drilling dimensions



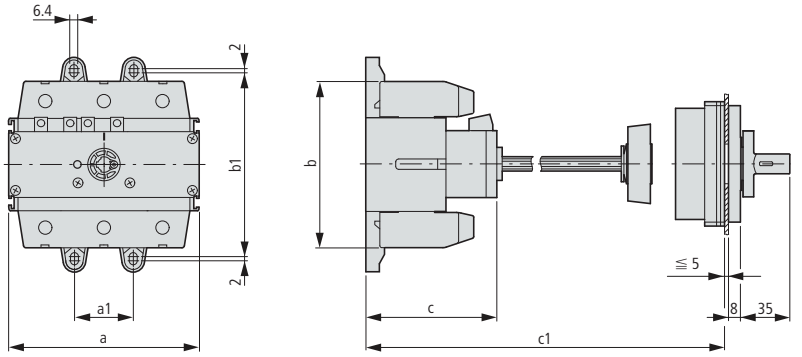
Flush mounting main switches

P5-.../EA/SVB-(SW)

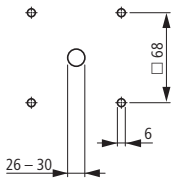


Rear mounting

P5.../Z

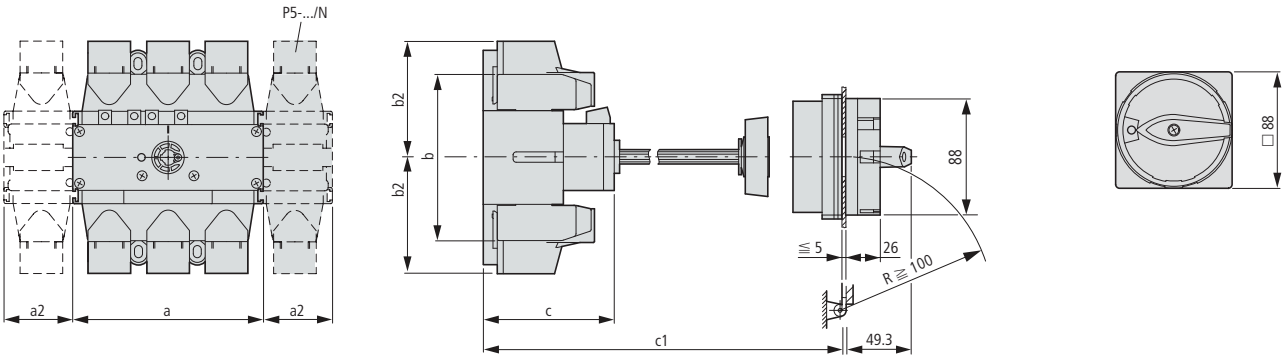


Drilling dimensions



Rear mounting main switches

P5-.../SVB-(SW)

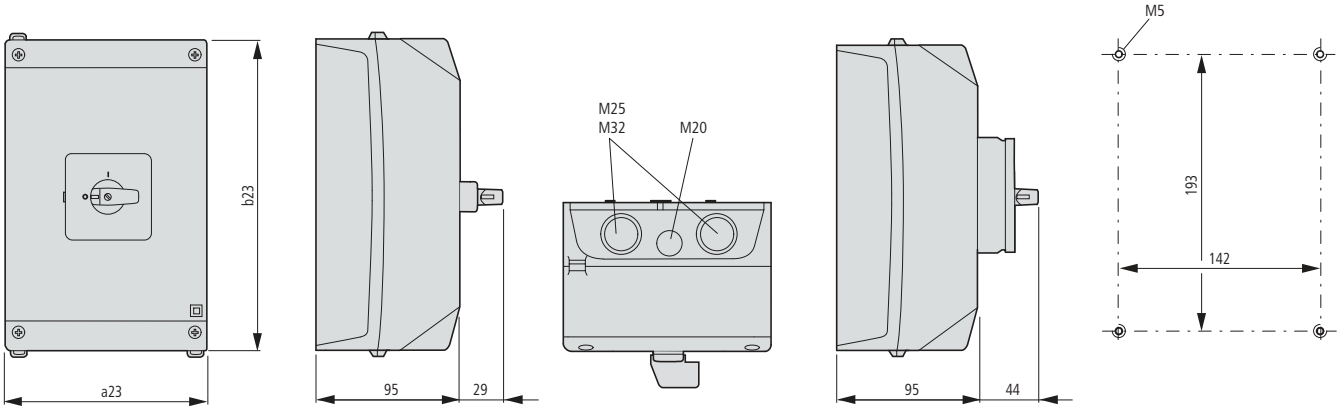


Part no.	a	a1	a2	b	b1	b2	c	c1	
P5-125/160	112	36	38	108	120	76	91	≧ 130	≦ 287
P5-250/315	145	44	52.5	126	144	88	98	≧ 140	≦ 280

Surface mounting
P3-63/I4

Surface mounting main switches/safety switches
P3-63/I4/SVB
P3-63/I4/SI
T5B-.../I4/SI

Drilling dimensions

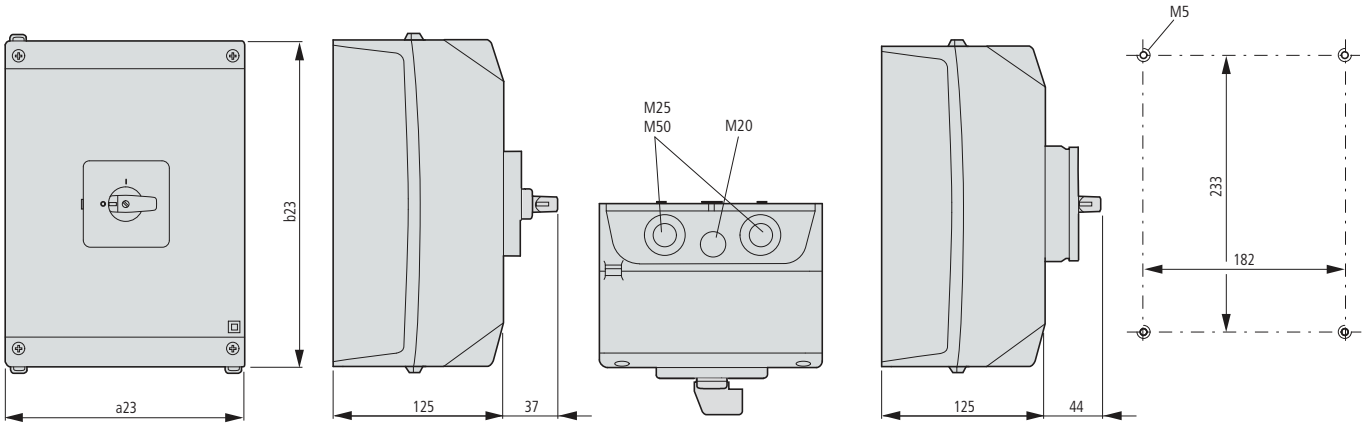


Surface mounting

P3-100/I5

Surface mounting main switches/safety switches
P3-100/I5/SVB
P3-100/I5/SI
T5-.../I5/SI

Drilling dimensions

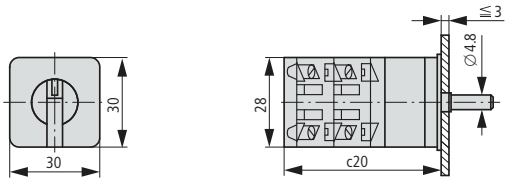


Part no.	a2	a3	a4	a21	a22	a23	a31	a32	a33	b2	b3	b21	b22	b23	b24	b31
P3-63/I4	87	72	71.5	87	87	160	18	15	114	87	83	87	27	240	35.5	60
P3-100/I5	87	72	71.5	87	87	200	18	15	114	87	83	87	27	280	35.5	60

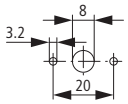
Part no.	c2	c3	c20 ≧/≦	c20 with ≦ 4 ZAV/ZVV	c21	c22	c23	c24	c25	c27	c28	c31	c32	c33
P3-63	59	82	103 – 118	218	37	41	63	81	65	44	125	25	25	37
P3-100	59	82	103 – 118	218	37	41	63	81	65	44	125	25	25	37

Flush mounting

TM.../E



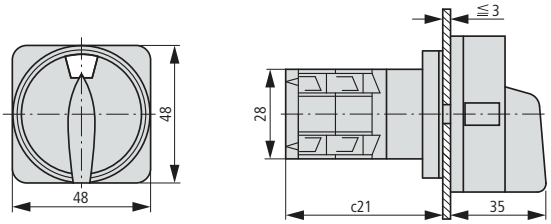
Drilling dimensions



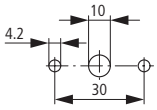
Control circuit isolators

for 2 padlocks ∅ 4 mm or 1 padlock ∅ 6 mm

TM-.../E/SVB-(SW)

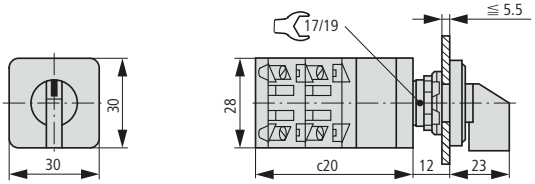


Drilling dimensions

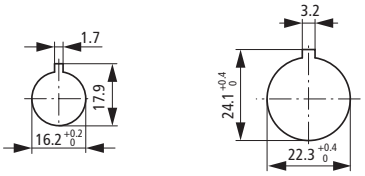


Center mounting

TM-.../EZ

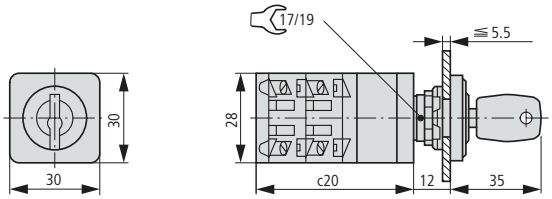


Drilling dimensions[1)]

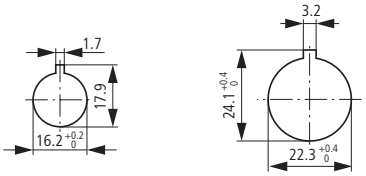


Center mounting with key operation

TM-...+EZ/S-..



Drilling dimensions[1)]

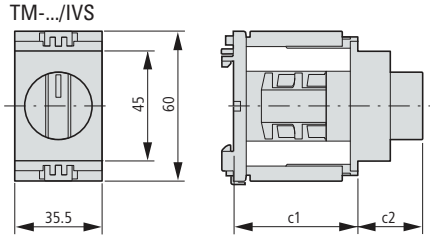


Part no.	c20	c21
TM-1	39	42
TM-2	51	54
TM-3	63	66
TM-4	75	
TM-5	87	
TM-6	99	
TM-7	111	
TM-8	123	

Depth of one contact unit: 12 mm

Service distribution board mounting

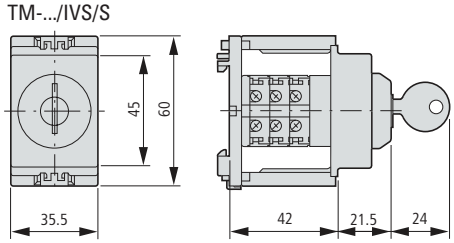
TM-.../IVS



Part no.	c1	c2
TM-1	44	21
TM-2	46	26.5

Depth of one contact unit 12 mm

TM-.../IVS/S



Notes [1)] Drilling dimensions optionally: 16.2 mm = without reduction ≙ RMQ16; 22.3 mm = with reduction ≙ RMQ Titan



Mini contactor relays, contactor relay, contactors

Continual operation requires high operational reliability in the components used. The DILM contactor achieves the best lifespan values in AC-3 applications and is ideal for heavy AC-4 jogging.

Mini contactor relay DILE…,contactor relays, contactors up to 12 A AC-3 at 400 V
Compact dimensions for the highest packing densities +++ Extended performance range up to 5.5 kW at 400 V

AC and DC contactor system DILM…, contactor relays, 3 pole contactors up to 170 A AC-3 at 400 V, 4 pole contactors up to 200 A AC-1
Easier engineering through identical construction sizes for AC- and DC-operated contactors +++ Energy savings and higher packing density in control panel due to minimized heat dissipation +++ High wiring security through doubled box terminals +++ Less coupler relays: direct actuation from the PLC for contactors up to 32 A +++ Easy engineering through integrated suppressor circuits for DC +++ Uniform accessories for 3- and 4-pole contactors +++ Mechanical interlock double conductor run mountable without additional separation gap +++ Direct fieldbus connection through the communication system SmartWire-Darwin, through plug-in type protective module

High rated contactors - contactors up to 1600 A AC-3 at 400 V, contactors up to 2600 A AC-1
Compact dimensions with high switching power +++ Direct actuation from the PLC saves coupler relays +++ Easy engineering through wide range coils +++ Cost and energy savings for control panel ventilation due to reduced heat dissipation +++ Long lifespan through vacuum technology from 580 A

SmartWire-Darwin
The DIL product range offers contact elements which can be connected to the SmartWire-Darwin communication system. → Protective modules, Page 5/62



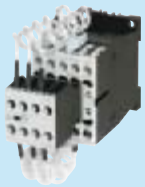
Eaton After Sales Service
Testing switching devices in compliance with regulations applicable to this technology
→ Chapter 22

















Ordering

Mini contactor relays DILER, DILEEM, DILEM

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DILA contactor relays

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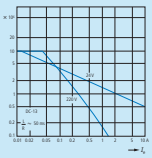
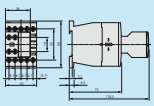
Ordering

CMD contactor monitoring device	5/68









Ordering

DILM contactor relays, DILM, DILH contactors

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Ordering

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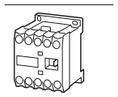
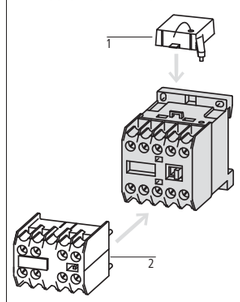
Ordering

Rated operational current AC-15 220 V 230 V 240 V	Rated operational current AC-15 380 V 400 V 415 V	Conventional free air thermal current	Contact N/O = normally open contact NC = normally closed contact		Distinctive number	Circuit symbol	For use with
I_e A	I_e A	I_{th} A					
DILER mini contactor relays							
Screw terminals							
	6	3	10	4 N/O	–	40E		DILE…
				3 N/O	1 NC	31E		DILE…
				2 N/O	2 NC	22E		DILE…

Notes	Coil terminal marking as specified in EN 50005 Contact numbers to EN 50011 The following applies to DC-operated contactors: • Integrated diode-resistor combination • Coil rating 2.6 W

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

AC operation **Part no.** Article no.	**Price** See price list	**DC operation** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILER-40(230V50HZ) 051759		**DILER-40-G(24VDC)** 010223		5 off	**With screw terminals:** 
DILER-31(230V50HZ) 051768		**DILER-31-G(24VDC)** 010157			
DILER-22(230V50HZ) 051777		**DILER-22-G(24VDC)** 010042			

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1 Suppressor	→ 5/8
2 Auxiliary contact modules	→ 5/6
Further actuating voltages	→ 5/70

Rated operational current	Max. motor rating for three-phase motors, 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 50 °C		Contact		Circuit symbol	For use with
AC-3	AC-3			AC-4								
380 V 400 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	Open	Enclosed	N/O = normally open contact NC = normally closed contact			
I_e	P	**P**	P	P	**P**	P	$I_{th} = I_e$	$I_{th} = I_e$				
A	kW	**kW**	kW	kW	**kW**	kW	A	A				
DILEM contactors												
3 pole with auxiliary contact												
Screw terminals												
6.6	1.5	**3**	3	1.1	**2.2**	2.2	20	16	1 N/O	–		…DILEM DILE…
6.6	1.5	**3**	3	1.1	**2.2**	2.2	20	16	–	1 NC		DILE…
9	2.2	**4**	4	1.5	**3**	3	20	16	1 N/O	–		…DILEM DILE…
9	2.2	**4**	4	1.5	**3**	3	20	16	–	1 NC		DILE…
12	3.5	**5.5**	6.5	2	**3**	2.2	20	16	1 N/O	–		…DILEM DILE…
12	3.5	**5.5**	6.5	2	**3**	2.2	20	16	–	1 NC		DILE…
4 pole												
Screw terminals												
9	2.2	**4**	4	1.5	**3**	3	20	16	–	–		…DILEM DILE…

1)

Information relevant for export to North America

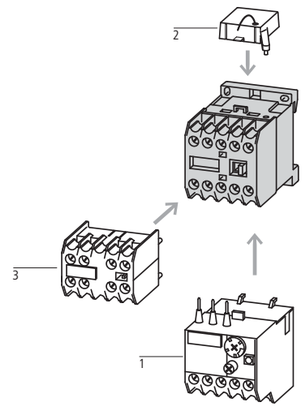
Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.: E29096
UL CCN: NLDX
CSA File No.: 012528
CSA Class No.: 3211-04
NA Certification: UL Listed, CSA certified
See also → Page 5/84

2)

Information relevant for export to North America

Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.: E29096
UL CCN: NLDX
CSA File No.: 012528
CSA Class No.: 2411-03, 3211-04
NA Certification: UL Listed, request filed for CSA

AC operation **Part no.** Article no.	**Price** See price list	DC operation **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILEEM-10(230V50HZ)[1] 051608		**DILEEM-10-G(24VDC)**[1] 051643		5 off	**With screw terminals:**
DILEEM-01(230V50HZ)[1] 051633		**DILEEM-01-G(24VDC)**[1] 051650			
DILEM-10(230V50HZ)[1] 051786		**DILEM-10-G(24VDC)**[1] 010213			
DILEM-01(230V50HZ)[1] 051795		**DILEM-01-G(24VDC)**[1] 010343			
DILEM12-10(230V50HZ)[2] 127075		**DILEM12-10-G(24VDC)**[2] 127132			
DILEM12-01(230V50HZ)[2] 127091		**DILEM12-01-G(24VDC)**[2] 127137			
DILEM4(230V50HZ)[1] 051804		**DILEM4-G(24VDC)**[1] 012701		5 off	



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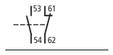
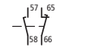
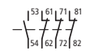
1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/8
3 Auxiliary contact module	→ 5/6
Enclosures totally insulated	
Further actuating voltages	→ 5/70
Accessories	→ 5/8

Contact N/O = normally open contact S_F = NO early-make NC = normally closed contact $Ö_S$ = NC late-break					Rated operational current AC-15 220 V 230 V 240 V I_e A		Conventional thermal current I_{th} A	Distinctive number/type of combinations with basic device DILER-40(-G)	 DILER-31(-G)	 DILER-22
Auxiliary contact modules										
Screw terminals										
2 pole	–	–	2 NC	–	4	2	10	–	–	–
	1 N/O	–	1 NC	–	4	2	10	–	–	–
4 pole	2 N/O	–	2 NC	–	4	2	10	–	–	–
2 pole	–	–	2 NC	–	4	2	10	42E	33	24
	1 N/O	–	1 NC	–	4	2	10	51E	42	33
	2 N/O	–	–	–	4	2	10	60E	51	42
	–	1 S_F	–	1 $Ö_S$	4	2	10	51	42	33
4 pole	–	–	4 NC	–	4	2	10	44E	35	26
	1 N/O	–	3 NC	–	4	2	10	53E	44	35
	2 N/O	–	2 NC	–	4	2	10	62E	53	44
	3 N/O	–	1 NC	–	4	2	10	71E	62	53
	4 N/O	–	–	–	4	2	10	80E	71	62
	1 N/O	1 S_F	1 NC	1 $Ö_S$	4	2	10	62	53	44

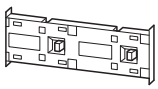
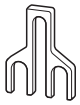
Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

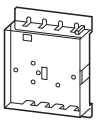
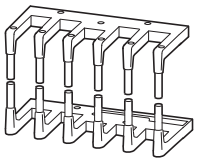
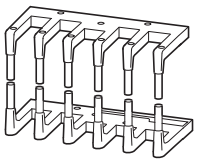
Circuit symbol	Can be combined with contactor	**Part no.** Article no.	**Price** See price list	Std. pack		**Notes**
	DILEM-10(-G)(…) DILEM-4(-G)(…) DILEEM-10(-G)(…) DILEM12-10(-G)(…)	**02DILEM** 010064		5 off	With interlocked opposing contacts	The following applies to ...DILEM auxiliary contacts: • Contacts to EN 50012 The following applies to ...DILE auxiliary contacts: • Contacts to EN 50005 Contacts according to EN50012 are to be prefered. Type E combinations compy with EN 50011 and are to be given preference. No interlocked opposing contacts in NO early-makes and NC late-breaks.
		**11DILEM** 010080				
		**22DILEM** 010112				
	DILEM-10(-G)(…) DILEM-01(-G)(…) DILEM-4(-G)(…) DILER40(-G) DILER31(-G) DILER22 DILEEM-10(-G)(…) DILEEM-01(-G)(…) DILEM12-10(-G)(…) DILEM12-01(-G)(…)	**02DILE** 010240				
		**11DILE** 010224				
		**20DILE** 010208				
		**11DDILE** 049824			–	
		**04DILE** 010256			With interlocked opposing contacts	
		**13DILE** 002397				
		**22DILE** 010288				
		**31DILE** 048912				
		**40DILE** 010304				
		**22DDILE** 049823			–	

	Actuating voltage U_s V AC	Circuit symbol	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Suppressor circuits							
Varistor suppressor							
	24 - 48 AC		DILE...	**VGDILE48** 010320		10 off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	110 - 250 AC			**VGDILE250** 010336			
	380 - 415 AC			**VGDILE415** 010463			
RC-Suppressor							
	24 - 48 AC		DILE...	**RCDILE48** 044264		10 off 10 off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR2 CSA File No.: - NA Certification: UL Recognized
	110 - 250 AC			**RCDILE250** 046320			

Notes For AC operated contactors 50 - 60 Hz.
DC operated contactor relays have an integrated suppressor.
Note drop-out delay.

	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Mechanical interlocks					
For mechanical connection of contactor and timing relays in combinations. 0 mm distance between contactors.					
	DILE… DILET…	**V0DILE** 026634		50 off	UL/CSA certification not required
Mechanical interlock					
For contactors with the same or different magnet system. 0 mm distance between contactors. Mechanical lifespan 2.5 x 10^6 operations. Additional auxiliary contact modules possible.					
 –	DILE…	**MVDILE** 010113		5 off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR2 CSA File No.: 012528 CSA Class No.: 3211-07 NA Certification: UL Recognized, CSA certified
Paralleling link					
For parallel connection of contacts					
 –	DILE… DILE…	**BT480**[2] 052785		100 off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 3211-07 NA Certification: UL Listed, CSA certified
Consisting of two four-pole paralleling links.					
 	DILEEM DILEM12 DILEM	**P1DILEM**[2] 019095		5 off	

Notes
[1] Not protected against accidental contact as specified in VDE 0106 Part 100.
[2] 4th pole can be broken off
4 pole: I_{th} = 60 A open
3 pole: I_{th} = 50 A open
AC-1 current carrying capacity of the open contactor increases by a factor of 2.5
Protected against accidental contact in accordance with VDE 0106 Part 100

	Contact sequence	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
Sealable shrouds							
Transparent Snap-fitting on contactor. Can be used with open installation or on service distribution board. Protection type: IP40 front Can be drilled to accommodate timing relay setting dials.							
		DILE… DILET…	**HDILE** 010482		1 off	UL/CSA certification not required	
Start-point bridge							
 		DILEEM DILEM12 DILEM	**S1DILEM**[1] 220218		20 off		
Reversing starter wiring kit							
Main current wiring for reversing combinations							
		DILEEM (+MVDILEM) DILEM12 (+MVDILEM) DILEM (+MVDILEM)	**MVS-WB-EM**[2] 220209		1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV7 012528 3211-06 UL Listed, CSA certified
Star-delta wiring kit							
Main current wiring for star-delta combination incl. star-point bridge							
		DILE(E)M (+MVDILEM) DILE(E)M12 (+MVDILEM) DILE(E)M star contactor	**MVS-SB-EM**[3] 220213		1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV7 012528 3211-06 UL Listed, CSA certified

Notes

[1] Protected against accidental contact in accordance with VDE 0106 Part 100

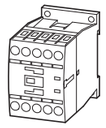
[2] The following control cables are integrated in addition to electrical interlock:
- Q11: A1 -Q12: 21
- Q11: 21 - Q12: A1
- Q11: A2 - Q12: A2

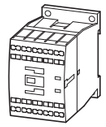
For use with overload relay separate mounting.

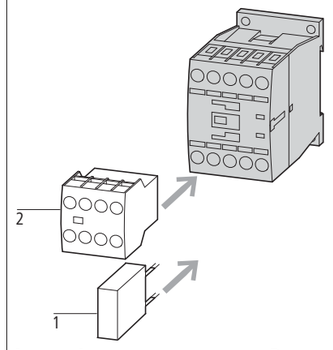
[3] The following control cables are integrated in addition to electrical interlock:
- Q13: A1 -Q15: 21
- Q13: 21 - Q15: A1
- Q13: A2 - Q15: A2

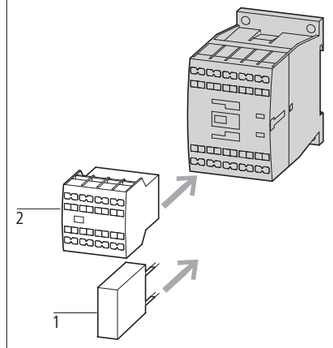
For use with overload relay separate mounting.

Contact		Rated operational current		Conventional thermal current	Distinctive number	Can be combined with auxiliary contact	Circuit symbol	**AC operation**		Std. pack	Circuit symbol	**DC operation**		Std. pack	**Notes**
N/O = normally open contact	NC = normally closed contact	AC-15		I_{th}				**Part no.** Article no.	**Price** See price list			**Part no.** Article no.	**Price** See price list		
		220 V 230 V 240 V	380 V 400 V 415 V	A											
		I_e A	I_e A												
Basic devices with positively driven contacts															
Screw terminals															
4 N/O	–	4	4	16	40E	DILA-XHI(V)…		**DILA-40(230V50HZ)** 276329		1 off		**DILA-40(24VDC)** 276344		1 off	**With screw terminals:**
3 N/O	1 NC				31E	DILA-XHI(V)…		**DILA-31(230V50HZ)** 276364				**DILA-31(24VDC)** 276379			
2 N/O	2 NC				22E	DILA-XHI(V)…		**DILA-22(230V50HZ)** 276399				**DILA-22(24VDC)** 276414			
Spring-loaded terminals															
4 N/O	–	4	4	16	40E	DILA-XHIC(V)…		**DILAC-40(230V50HZ)** 276441		1 off		**DILAC-40(24VDC)** 276456		1 off	**With spring-loaded terminals:**
3 N/O	1 NC				31E	DILA-XHIC(V)…		**DILAC-31(230V50HZ)** 276473				**DILAC-31(24VDC)** 276488			
2 N/O	2 NC				22E	DILA-XHIC(V)…		**DILAC-22(230V50HZ)** 276505				**DILAC-22(24VDC)** 276520			









Accessories **Page**
1 Suppressor → 5/54
2 Auxiliary contact modules → 5/38
Further actuating voltages → 5/72

Notes
Contact numbers to EN 50011
Coil terminal markings to EN 50005
The following applies to DC-operated contactors:
- Integrated suppressor circuit

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

Contact					Rated operational current		Conventional thermal current	Circuit symbol	Distinctive number/type of combinations			**Part no.** Article no.	**Price** See price list	Std. pack	Description	**Notes**
N/O = normally open contact S_F = NO early-make NC = normally closed contact $Ö_S$ = NC late-break					AC-15											
					220 V 230 V 240 V	380 V 400 V 415 V	I_{th}									
					I_e A	I_e A	A		DILA(C)-40	DILA(C)-31	DILA(C)-22					
DILA auxiliary contact modules																
Screw terminals																
	2 pole	–	–	2 NC	–	4	4	16		42E	33	24	**DILA-XHI02** 276420		5 off	With interlocked opposing contacts	Type E combinations comply with EN 50011 and must be given preference. The other combinations comply with EN 50005 The DC operated contactor DILA(C)-22 must only be combined with 2 pole auxiliary contacts.
		1 N/O	–	1 NC	–	4	4	16		51E	42	33	**DILA-XHI11** 276421				
		2 N/O	–	–	–	4	4	16		60E	51	42	**DILA-XHI20** 276422				
		–	1 S_F	–	1 $Ö_S$	4	4	16		51	42	33	**DILA-XHIV11** 276423			–	
	4 pole	–	–	4 NC	–	4	4	16		44E	35	26	**DILA-XHI04** 276424			With interlocked opposing contacts	
		1 N/O	–	3 NC	–	4	4	16		53E	44	35	**DILA-XHI13** 276425				
		2 N/O	–	2 NC	–	4	4	16		62E	53	44	**DILA-XHI22** 276426				
		3 N/O	–	1 NC	–	4	4	16		71E	62	53	**DILA-XHI31** 276427				
		4 N/O	–	–	–	4	4	16		80E	71	62	**DILA-XHI40** 276428				
		1 N/O	1 S_F	1 NC	1 $Ö_S$	4	4	16		62	53	44	**DILA-XHIV22** 276429			–	
Spring-loaded terminals																
	2 pole	–	–	2 NC	–	4	4	16		42E	33	24	**DILA-XHIC02** 276526		5 off	With interlocked opposing contacts	Type E combinations comply with EN 50011 and must be given preference. The other combinations comply with EN 50005 The DC operated contactor DILA(C)-22 must only be combined with 2 pole auxiliary contacts.
		1 N/O	–	1 NC	–	4	4	16		51E	42	33	**DILA-XHIC11** 276527				
		2 N/O	–	–	–	4	4	16		60E	51	42	**DILA-XHIC20** 276528				
		–	1 S_F	–	1 $Ö_S$	4	4	16		51	42	33	**DILA-XHICV11** 276529			–	
	4 pole	–	–	4 NC	–	4	4	16		44E	35	26	**DILA-XHIC04** 276530			With interlocked opposing contacts	
		1 N/O	–	3 NC	–	4	4	16		53E	44	35	**DILA-XHIC13** 276531				
		2 N/O	–	2 NC	–	4	4	16		62E	53	44	**DILA-XHIC22** 276532				
		3 N/O	–	1 NC	–	4	4	16		71E	62	53	**DILA-XHIC31** 276533				
		4 N/O	–	–	–	4	4	16		80E	71	62	**DILA-XHIC40** 276534				
		1 N/O	1 S_F	1 NC	1 $Ö_S$	4	4	16		62	53	44	**DILA-XHICV22** 276535			–	

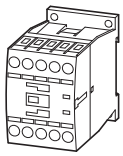
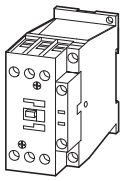
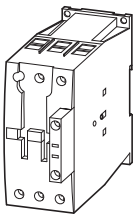
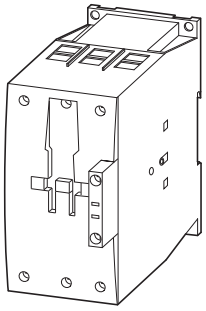
Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

DILM, DILE(E)M, DILMP

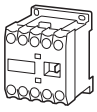
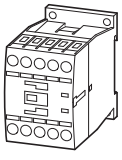
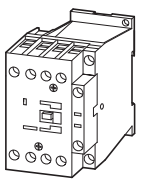
Technical overview

Contactors
3 pole

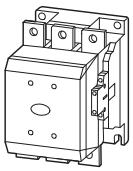
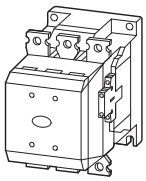
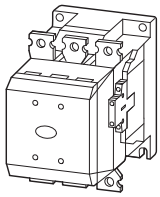
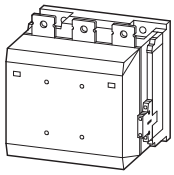
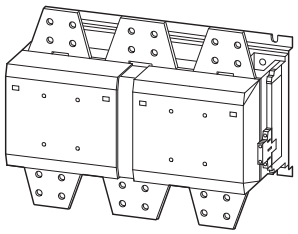
DIL		EEM	EM	EM12	M7	M9	M12	M15	M17	M25	M32	M38	M40	M50	M65	M80	M95	M115	M150	M170
Basic devices	Page	→ 5/4			→ 5/18				→ 5/18				→ 5/20			→ 5/50				
Complete units	Page		–		→ Page 5/24			–	→ Page 5/24				→ Page 5/26			→ Page 5/26				
Rated-operational voltage		kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
AC-3 Rated operational power for 3-phase motors 50 – 60 Hz																				
220 V – 230 V		1.5	2.2	3	2.2	2.5	3.5	4	5	7.5	10	11	12.5	15.5	20	25	30	37	48	52
380 V – 400 V		**3**	**4**	**5.5**	**3**	**4**	**5.5**	**7.5**	**7.5**	**11**	**15**	**18.5**	**18.5**	**22**	**30**	**37**	**45**	**55**	**75**	**90**
440 V		3.3	4.6	5.5	4.5	5.5	7.5	8.4	10.5	15.5	20	21	25	32	41	51	60	75	95	105
500 V		3	4	5.5	3.5	4.5	7	7.5	12	17.5	23	24	28	36	47	58	70	85	110	120
660 V/690 V		3	4	4	3.5	4.5	6.5	7	11	14	17	21	23	30	35	63	75	90	96	140
1000 V		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AC-4 Rated operational power for 3-phase motors 50 – 60 Hz		⚠ Increase in life span for DILM7 – DILM150 to 200000 operations																		
220 V – 230 V		1.1	1.5	1.5	1	1.5	2	2	2.5	3.5	4	4	5	6	7	12	16	17	20	20
380 V – 400 V		**2.2**	**3**	**3**	**2.2**	**2.5**	**3**	**3**	**4.5**	**6**	**7**	**7**	**9**	**10**	**12**	**20**	**26**	**28**	**33**	**33**
440 V		2.4	3.3	3.3	2.4	3	3.6	3.6	5.5	7	8	8	10	12	14	25	32	35	41	41
500 V		2.2	3	3	2.5	2.8	3.5	3.5	6	8	9	9	11	13	16	29	36	40	47	47
660 V/690 V		2.2	3	3	2.9	3.6	4.4	4.4	6.5	8.5	10	10	12	14	17	26	35	43	48	48
1000 V		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AC-1 Rated operational power under resistive load, 40 °C																				
220 V – 230 V		8	8	8	8	8	8	8	15	17	17	17	22	30	37	42	49	61	72	85
380 V – 400 V		**13**	**13**	**13**	**14**	**14**	**14**	**14**	**26**	**29**	**29**	**29**	**39**	**53**	**65**	**72**	**85**	**105**	**125**	**150**
440 V		15	15	15	16	16	16	16	30	34	34	34	45	58	71	80	94	116	138	170
500 V		18	18	18	19	19	19	19	34	38	38	38	51	66	81	90	107	132	156	194
660 V/690 V		23	23	23	25	25	25	25	45	51	51	51	68	91	111	125	148	182	216	268
1000 V		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Conventional thermal Current $I_{th} = I_e$ open at 40 °C		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
		22	22	22	22	22	22	22	40	45	45	45	60	80	98	110	130	160	190	225

Contactors
4 pole

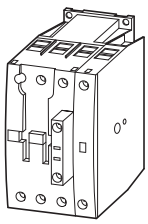
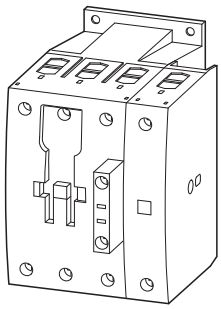
DIL		EM4	MP20	MP32
Rated operational voltage	Page	→ 5/4	→ Page 5/36	→ Page 5/36
AC-1 Conventional free air thermal current $I_{th} = I_e$ open, at 40 °C		A	A	A
up to 690 V		22	22	32

Contactors
3 pole

M185A	M225A	M250	M300A	M400	M500	M580	M650	M750	M820	M1000	M1600	H1400	H2000	H2200	H2600
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
→ Page 5/32			→ Page 5/32			→ Page 5/32		→ Page 5/32			→ Page 5/34				
kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
55	70	75	90	125	155	185	205	240	260	315	500	–	–	–	–
90	**110**	**132**	**160**	**200**	**250**	**315**	**355**	**400**	**450**	**560**	**900**	–	–	–	–
115	142	157	190	255	345	370	420	480	525	650	1000	–	–	–	–
132	160	180	215	290	360	420	470	550	600	730	1180	–	–	–	–
175	215	240	286	344	344	560	630	720	750	1000	1600	–	–	–	–
108	108	108	132	132	132	600	600	800	800	1000	1770	–	–	–	–
41	51	62	75	92	112	143	161	181	209	260	430	–	–	–	–
75	**90**	**110**	**132**	**160**	**200**	**250**	**280**	**315**	**355**	**450**	**750**	–	–	–	–
85	102	125	140	186	229	290	326	367	418	520	830	–	–	–	–
96	116	143	172	214	260	330	370	417	474	590	940	–	–	–	–
127	155	189	229	283	344	440	494	556	633	780	1300	–	–	–	–
108	108	108	132	132	132	509	509	678	678	1000	1650	–	–	–	–
121	139	155	177	221	310	354	376	398	443	443	717	620	886	1075	1269
210	**241**	**268**	**306**	**382**	**535**	**612**	**650**	**689**	**766**	**766**	**1247**	**1071**	**1531**	**1870**	**2207**
243	279	310	354	443	620	709	753	797	886	886	1371	1240	1773	2058	2427
277	317	352	403	503	705	806	856	906	1007	1007	1558	1410	2015	2338	2758
365	419	465	532	664	930	1064	1130	1196	1330	1330	2151	1861	2660	3227	3806
554	635	705	806	1007	1410	1612	1712	1813	2015	2015	2420	2417	3223	4676	5516
A	A	A	A	A	A	A	A	A	A	A	A	A	A		
337	356	400	430	612	857	980	1041	1102	1225	1225	2200	1714	2450	2700	3185

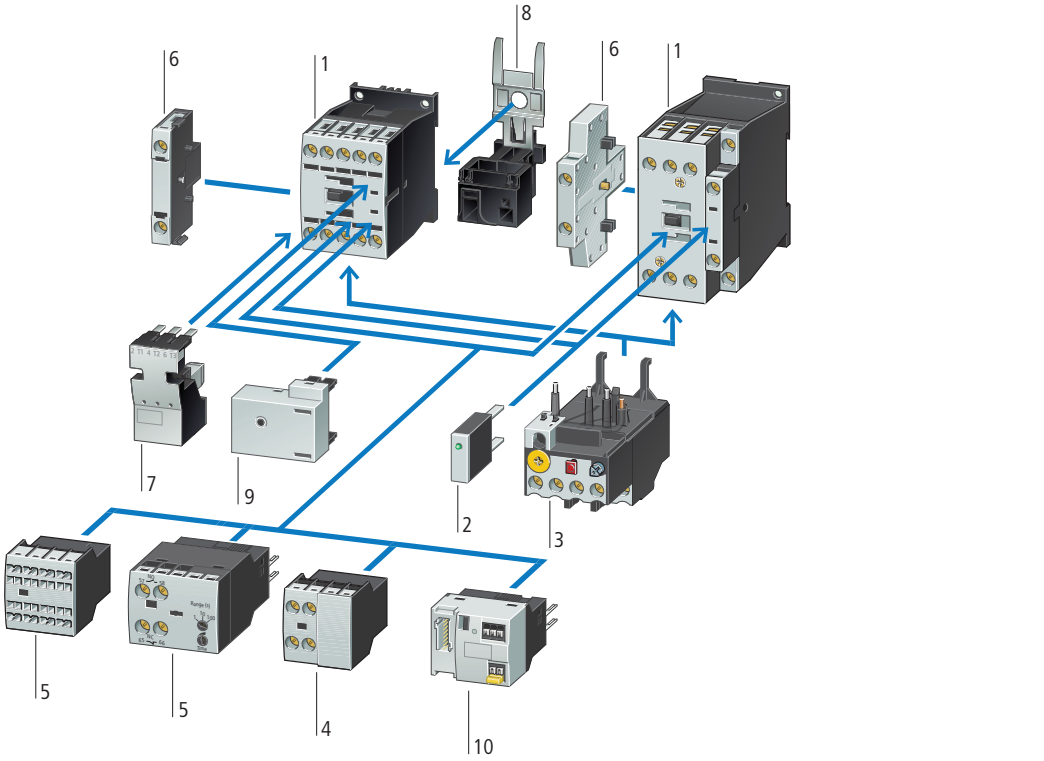
Contactors
4 pole

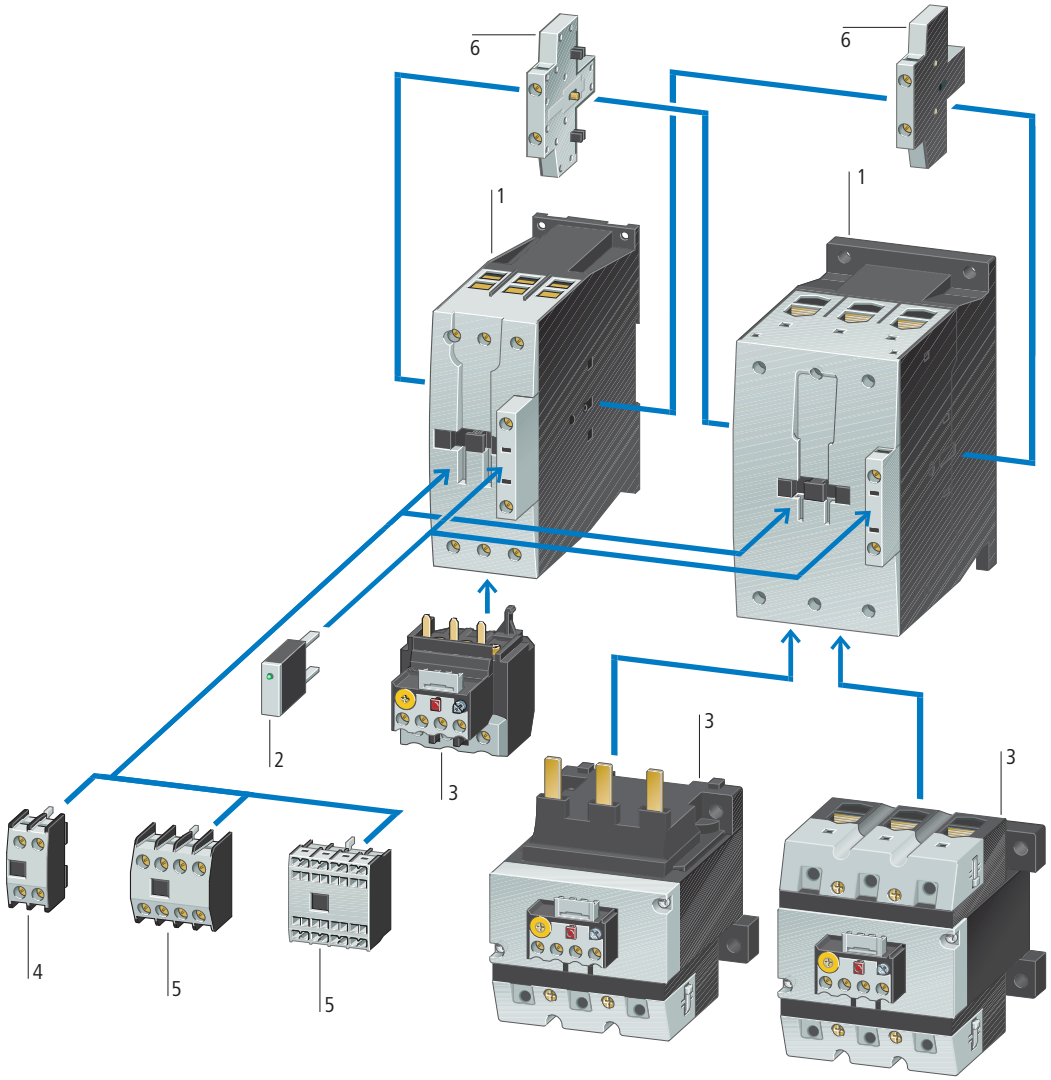



MP45	MP63	MP80	MP125	MP160	MP200
→ Page 5/36	→ Page 5/36		→ Page 5/36		
A	A	A	A	A	A
45	63	80	125	160	200

DILM7...DILM170

System overview





Contactors up to 90 kW (AC-3/400 V) 1

3 pole
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4 pole
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Suppressor circuits 2
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Overload relays 3
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Auxiliary contact modules 4
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Auxiliary contact modules 5
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Auxiliary contact modules 6
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Motor feeder plug 7
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PE module with contact plate 8
→ Page 5/62

Motor suppressor module
→ Page 5/63

SmartWire-Darwin contactor module 10
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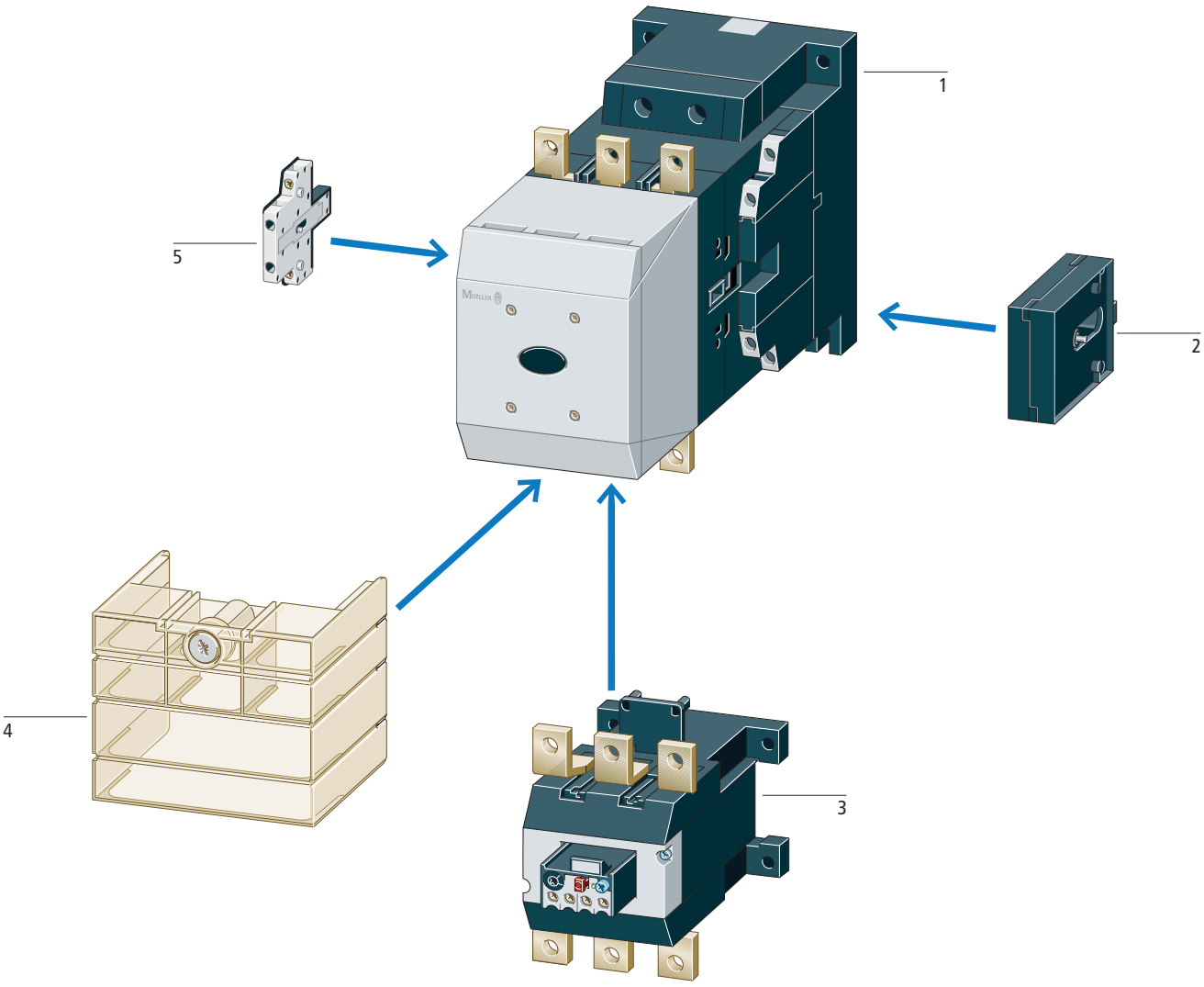
DILM185... DILH2600



Contactors 90 – 900 kW (AC-3/400 V) Comfort series 1

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Standard range 90 – 250 kW 1

→ Page 5/30

Mechanical interlock 2

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Overload relays 3

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Terminal shroud 4

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Auxiliary contact modules 5

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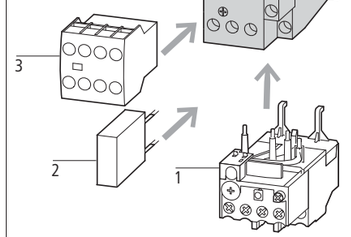
Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz							Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration		Circuit symbol
AC-3	AC-3				AC-4				N/O = normally open contact NC = normally closed contact		
380 V **400 V**	220 V 230 V	**380 V** **400 V**	660 V 690 V		220 V 230 V	**380 V** **400 V**	660 V 690 V	Open			
I_e	P	**P**	P		P	**P**	P	$I_{th} = I_e$			
A	kW	**kW**	kW		kW	**kW**	kW	A			
Basic device											
Screw terminals											
3 pole											
7	2.2	**3**	3.5		1	**2.2**	2.9	20	1 N/O	–	
7	2.2	**3**	3.5		1	**2.2**	2.9	20	–	1 NC	
9	2.5	**4**	4.5		1.5	**2.5**	3.6	20	1 N/O	–	
9	2.5	**4**	4.5		1.5	**2.5**	3.6	20	–	1 NC	
12	3.5	**5.5**	6.5		2	**3**	4.4	20	1 N/O	–	
12	3.5	**5.5**	6.5		2	**3**	4.4	20	–	1 NC	
15.5	4	**7.5**	7		2	**3**	4.4	20	1 N/O	–	
15.5	4	**7.5**	7		2	**3**	4.4	20	–	1 NC	
18	5	**7.5**	11		2.5	**4.5**	6.5	35	1 N/O	–	
18	5	**7.5**	11		2.5	**4.5**	6.5	35	–	1 NC	
25	7.5	**11**	14		3.5	**6**	8.5	40	1 N/O	–	
25	7.5	**11**	14		3.5	**6**	8.5	40	–	1 NC	
32	10	**15**	17		4	**7**	10	40	1 N/O	–	
32	10	**15**	17		4	**7**	10	40	–	1 NC	
38	11	**18.5**	21		4	**7**	10	40	1 N/O	–	
38	11	**18.5**	21		4	**7**	10	40	–	1 NC	

Can be combined with auxiliary contact	AC operation **Part no.** Article no.	**Price** See price list	DC operation **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILM32-XHI.. DILA-XHI(V)..	**DILM7-10(230V50HZ)** 276550		**DILM7-10(24VDC)** 276565		1 off	Contacts to EN 50 012. For all DC operated contactors DILM7 - DILM15 the following applies: • Integrated varistor-suppressor circuit. For DC operated contactors DILM17 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For AC operated contactors DILM115 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For DILM7-01 – DILM38-01 the following applies: • With mirror contact. [1] Electrical lifespan → 5/91
DILA-XHI(V)..	**DILM7-01(230V50HZ)** 276585		**DILM7-01(24VDC)** 276600			
DILM32-XHI.. DILA-XHI(V)..	**DILM9-10(230V50HZ)** 276690		**DILM9-10(24VDC)** 276705			
DILA-XHI(V)..	**DILM9-01(230V50HZ)** 276725		**DILM9-01(24VDC)** 276740			
DILM32-XHI.. DILA-XHI(V)..	**DILM12-10(230V50HZ)** 276830		**DILM12-10(24VDC)** 276845			
DILA-XHI(V)..	**DILM12-01(230V50HZ)** 276865		**DILM12-01(24VDC)** 276880			
DILM32-XHI.. DILA-XHI(V)..	**DILM15-10(230V50HZ)**[1] 290058		**DILM15-10(24VDC)**[1] 290073			
DILA-XHI(V)..	**DILM15-01(230V50HZ)**[1] 290093		**DILM15-01(24VDC)**[1] 290108			
DILM32-XHI.. DILA-XHI(V).. DILM32-XHI11-S	**DILM17-10(230V50HZ)** 277004		**DILM17-10(RDC24)** 277018			
DILA-XHI(V).. DILM32-XHI11-S	**DILM17-01(230V50HZ)** 277036		**DILM17-01(RDC24)** 277050			
DILM32-XHI.. DILA-XHI(V).. DILM32-XHI11-S	**DILM25-10(230V50HZ)** 277132		**DILM25-10(RDC24)** 277146			
DILA-XHI(V).. DILM32-XHI11-S	**DILM25-01(230V50HZ)** 277164		**DILM25-01(RDC24)** 277178			
DILM32-XHI.. DILA-XHI(V).. DILM32-XHI11-S	**DILM32-10(230V50HZ)** 277260		**DILM32-10(RDC24)** 277274			
DILA-XHI(V).. DILM32-XHI11-S	**DILM32-01(230V50HZ)** 277292		**DILM32-01(RDC24)** 277306			
DILM32-XHI.. DILA-XHI(V).. DILM32-XHI11-S	**DILM38-10(230V50HZ)**[1] 112428		**DILM38-10(RDC24)**[1] 112442			
DILA-XHI(V).. DILM32-XHI11-S	**DILM38-01(230V50HZ)**[1] 112456		**DILM38-01(RDC24)**[1] 112470			

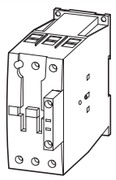


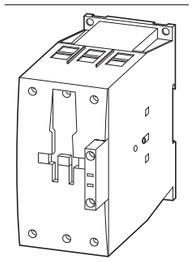
Accessories	**Page**
1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/54
3 Auxiliary contact module	→ 5/38
Further actuating voltages	→ 5/73
Accessories	→ 5/56

Information relevant for export to North America

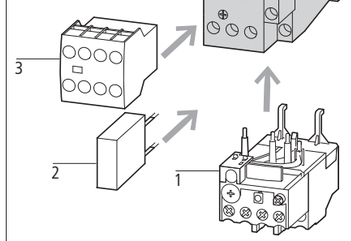
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz							Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration	Circuit symbol
AC-3	AC-3			AC-4						
380 V **400 V**	220 V 230 V	**380 V** **400 V**	660 V 690 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	Open		N/O = normally open contact NC = normally closed contact	
I_e **A**	P kW	**P** **kW**	P kW	P kW	**P** **kW**	P kW	$I_{th} = I_e$ A			
Basic device										
Screw terminals										
3 pole										
40	12.5	**18.5**	23	5	**9**	12	50	–	–	
50	15.5	**22**	30	6	**10**	14	65	–	–	
65	20	**30**	35	7	**12**	17	80	–	–	
72	25	**37**	35	7	**12**	17	80	–	–	
80	25	**37**	63	12	**20**	26	90	–	–	
95	30	**45**	75	16	**26**	35	110	–	–	
115	37	**55**	90	17	**28**	43	130	–	–	
150	48	**75**	96	20	**33**	48	160	–	–	
170	52	**90**	140	20	**33**	48	185	–	–	





Can be combined with auxiliary contact	AC operation **Part no.** Article no.	**Price** See price list	DC operation **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM40(230V50HZ)** 277766		**DILM40(RDC24)** 277780		1 off	Contacts to EN 50012. For all DC operated contactors DILM7 - DILM15 the following applies: • Integrated varistor-suppressor circuit. For DC operated contactors DILM17 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For AC operated contactors DILM115 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For DILM7-01 – DILM38-01 the following applies: • With mirror contact. [1] Electrical lifespan → 5/91
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM50(230V50HZ)** 277830		**DILM50(RDC24)** 277844			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM65(230V50HZ** 277894		**DILM65(RDC24)** 277908			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM72(230V50HZ)**[1] 107670		**DILM72(RDC24)**[1] 107671			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM80(230V50HZ)** 239402		**DILM80(RDC24)** 239416			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM95(230V50HZ)** 239480		**DILM95(RDC24)** 239510			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM115(RAC240)** 239548		**DILM115(RDC24)** 239555			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM150(RAC240)** 239588		**DILM150(RDC24)** 239591			
DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM170(RAC240)**[1] 107013		**DILM170(RDC24)**[1] 107016			



Accessories	**Page**
1 Overload relay	→ Chapter 6
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3 Auxiliary contact module	→ 5/38
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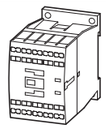
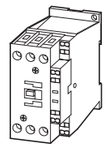
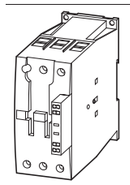
Information relevant for export to North America

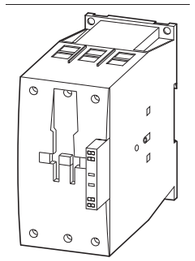
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

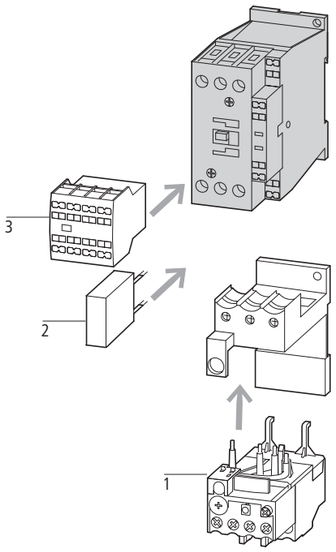
Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz AC-3			AC-4			Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration N/O = normally open contact NC = normally closed contact		Circuit symbol	Can be combined with auxiliary contact	AC operation Part no. Article no.	Price See price list	DC operation Part no. Article no.	Price See price list	Std. pack	Notes
380 V 400 V	220 V 230 V	**380 V 400 V**	660 V 690 V	220 V 230 V	**380 V 400 V**	660 V 690 V	Open										
I_e	P	**P**	P	P	**P**	P	$I_{th} = I_e$										
A	kW	**kW**	kW	kW	**kW**	kW	A										
Basic device																	
Spring-loaded terminals 3 pole																	
7	2.2	**3**	3.5	1	**2.2**	2.9	20	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC7-10(230V50HZ)** 277389		**DILMC7-10(24VDC)** 277404		1 off	Contacts to EN 50 012. For DILMC7 – DILMC15 the following applies: • Auxiliary coil, and main current terminals with spring-loaded terminals. For DILMC17 – DILMC150 the following applies: • Auxiliary connections, coil connections with spring-loaded connection terminals. • Main current connections with screw terminals. For DC operated contactors DILMC7 - DILMC15 the following applies: • Integrated varistor-suppressor circuit. For DC operated contactors DILMC17 - DILMC150 the following applies: • Integrated suppressor circuit in actuating electronics For AC operated contactors DILMC115 - DILMC150 the following applies: • Integrated suppressor circuit in actuating electronics For DILMC7-01 – DILMC32-01 the following applies: • With mirror contact.
7	2.2	**3**	3.5	1	**2.2**	2.9	20	–	1 NC		DILA-XHIC(V)..	**DILMC7-01(230V50HZ)** 277421		**DILMC7-01(24VDC)** 277436			
9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC9-10(230V50HZ)** 277453		**DILMC9-10(24VDC)** 277468			
9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	–	1 NC		DILA-XHIC(V)..	**DILMC9-01(230V50HZ)** 277485		**DILMC9-01(24VDC)** 277500			
12	3.5	**5.5**	6.5	2	**3**	4.4	20	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC12-10(230V50HZ)** 277517		**DILMC12-10(24VDC)** 277532			
12	3.5	**5.5**	6.5	2	**3**	4.4	20	–	1 NC		DILA-XHIC(V)..	**DILMC12-01(230V50HZ)** 277549		**DILMC12-01(24VDC)** 277564			
15.5	4	**7.5**	7	2	**3**	4.4	20	1 N/O	–		DILM32-XHIC… DILA-XHIC(V)…	**DILMC15-10(230V50HZ)** 293911		**DILMC15-10(24VDC)** 293926			
15.5	4	**7.5**	7	2	**3**	4.4	20	–	1 NC		DILA-XHIC(V)…	**DILMC15-01(230V50HZ)** 293946		**DILMC15-01(24VDC)** 293961			
Spring-loaded terminals on auxiliary and control circuit terminals 3 pole																	
18	5	**7.5**	11	2.5	**4.5**	6.5	35	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC17-10(230V50HZ)** 277581		**DILMC17-10(RDC24)** 277595		1 off	
18	5	**7.5**	11	2.5	**4.5**	6.5	35	–	1 NC		DILA-XHIC(V)..	**DILMC17-01(230V50HZ** 277611		**DILMC17-01(RDC24)** 277625			
25	7.5	**11**	14	3.5	**6**	8.5	40	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC25-10(230V50HZ)** 277641		**DILMC25-10(RDC24)** 277655			
25	7.5	**11**	14	3.5	**6**	8.5	40	–	1 NC		DILA-XHIC(V)..	**DILMC25-01(230V50HZ)** 277671		**DILMC25-01(RDC24)** 277685			
32	10	**15**	17	4	**7**	10	40	1 N/O	–		DILM32-XHIC.. DILA-XHIC(V)..	**DILMC32-10(230V50HZ)** 277701		**DILMC32-10(RDC24)** 277715			
32	10	**15**	17	4	**7**	10	40	–	1 NC		DILA-XHIC(V)..	**DILMC32-01(230V50HZ)** 277731		**DILMC32-01(RDC24)** 277745			
40	12.5	**18.5**	23	5	**9**	12	50	–	–		DILM150-XHIC(V).. DILM1000-XHIC..	**DILMC40(230V50HZ)** 277965		**DILMC40(RDC24)** 277979			
50	15.5	**22**	30	6	**10**	14	65	–	–			**DILMC50(230V50HZ)** 277995		**DILMC50(RDC24)** 278009			
65	20	**30**	35	7	**12**	17	80	–	–			**DILMC65(230V50HZ)** 278025		**DILMC65(RDC24)** 278039			
80	25	**37**	63	12	**20**	26	90	–	–			**DILMC80(230V50HZ)** 239618		**DILMC80(RDC24)** 239652			
95	30	**45**	75	16	**26**	35	110	–	–			**DILMC95(230V50HZ)** 239685		**DILMC95(RDC24)** 239715			
115	37	**55**	90	17	**28**	43	130	–	–			**DILMC115(RAC240)** 239736		**DILMC115(RDC24)** 239741			
150	48	**75**	96	20	**33**	48	160	–	–			**DILMC150(RAC240)** 239751		**DILMC150(RDC24)** 239765			







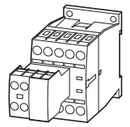
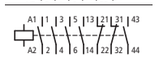
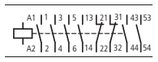
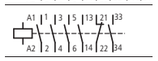
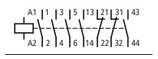
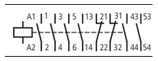
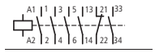
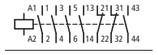
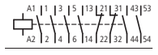
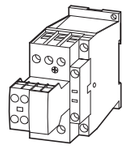
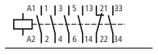
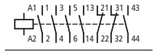
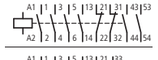
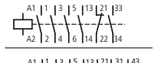
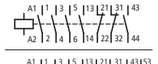
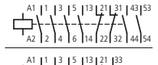
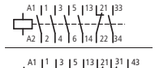
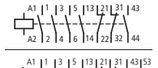
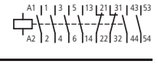




Accessories	Page
1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/54
3 Auxiliary contact module	→ 5/38
Further actuating voltages	→ 5/77
Accessories	→ 5/56

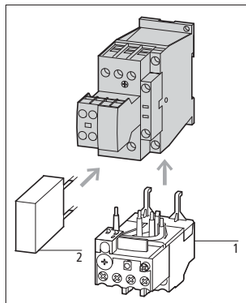
Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 5080; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz AC-3			AC-4			Conventional free air thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1		Circuit symbol
380 V **400 V**	220 V 230 V	**380 V** **400 V**	660 V 690 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	Open	N/O = normally open contact	NC = normally closed contact	
I_e	P	**P**	P	P	**P**	P	$I_{th} = I_e$			
A	kW	**kW**	kW	kW	**kW**	kW	A			
DILM complete device										
Screw terminals										
	**7**	2.2	**3**	3.5	1	**2.2**	2.9	20	2 N/O	1 NC	
	7	2.2	**3**	3.5	1	**2.2**	2.9	20	2 N/O	1 NC	
	7	2.2	**3**	3.5	1	**2.2**	2.9	20	3 N/O	2 NC	
	9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	2 N/O	1 NC	
	9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	2 N/O	1 NC	
	9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	3 N/O	2 NC	
	12	3.5	**5.5**	6.5	2	**3**	4.4	20	2 N/O	1 NC	
	12	3.5	**5.5**	6.5	2	**3**	4.4	20	2 N/O	1 NC	
	12	3.5	**5.5**	6.5	2	**3**	4.4	20	3 N/O	2 NC	
	15.5	4	**7.5**	7	2	**3**	4.4	20	2 N/O	2 NC	
	**18**	5	**7.5**	11	2.5	**4.5**	6.5	35	2 N/O	1 NC	
	18	5	**7.5**	11	2.5	**4.5**	6.5	35	2 N/O	1 NC	
	18	5	**7.5**	11	2.5	**4.5**	6.5	35	3 N/O	2 NC	
	25	7.5	**11**	14	3.5	**6**	8.5	40	2 N/O	1 NC	
	25	7.5	**11**	14	3.5	**6**	8.5	40	2 N/O	1 NC	
	25	7.5	**11**	14	3.5	**6**	8.5	40	3 N/O	2 NC	
	32	10	**15**	17	4	**7**	10	40	2 N/O	1 NC	
	32	10	**15**	17	4	**7**	10	40	2 N/O	1 NC	
	32	10	**15**	17	4	**7**	10	40	3 N/O	2 NC	

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

AC operation **Part no.** Article no.	**Price** See price list	**DC operation** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILM7-21(230V50HZ) 276620		**DILM7-21(24VDC)** 276635		1 off	 **Accessories** **Page** 1 Overload relay → Chapter 6 2 Suppressor → 5/54 Accessories → 5/56
DILM7-22(230V50HZ) 106360		**DILM7-22(24VDC)** 106367			
DILM7-32(230V50HZ) 276655		**DILM7-32(24VDC)** 276670			
DILM9-21(230V50HZ) 276760		**DILM9-21(24VDC)** 276775			
DILM9-22(230V50HZ) 106361		**DILM9-22(24VDC)** 106368			
DILM9-32(230V50HZ) 276795		**DILM9-32(24VDC)** 276810			
DILM12-21(230V50HZ) 276900		**DILM12-21(24VDC)** 276915			
DILM12-22(230V50HZ) 106362		**DILM12-22(24VDC)** 106369			
DILM12-32(230V50HZ) 276935		**DILM12-32(24VDC)** 276950			
DILM15-22(230V50HZ) 106363		**DILM15-22(24VDC)** 106370			
DILM17-21(230V50HZ) 277068		**DILM17-21(RDC24)** 277082			
DILM17-22(230V50HZ) 106364		**DILM17-22(RDC24)** 106371			
DILM17-32(230V50HZ) 277100		**DILM17-32(RDC24)** 277114			
DILM25-21(230V50HZ) 277196		**DILM25-21(RDC24)** 277210			
DILM25-22(230V50HZ) 106365		**DILM25-22(RDC24)** 106372			
DILM25-32(230V50HZ) 277228		**DILM25-32(RDC24)** 277242			
DILM32-21(230V50HZ) 277324		**DILM32-21(RDC24)** 277338			
DILM32-22(230V50HZ) 106366		**DILM32-22(RDC24)** 106373			
DILM32-32(230V50HZ) 277356		**DILM32-32(RDC24)** 277370			

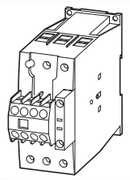
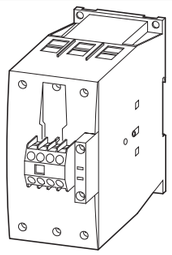
For all DC operated contactors DILM7 - DILM15 the following applies:
- Integrated varistor suppressor circuit.

For DC operated contactors DILM17 - DILM170 the following applies:
- Integrated suppressor circuit in actuating electronics

For AC operated contactors DILM115 - DILM170 the following applies:
- Integrated suppressor circuit in actuating electronics

For DILM7 - DILM150 the following applies:
- With mirror contact.

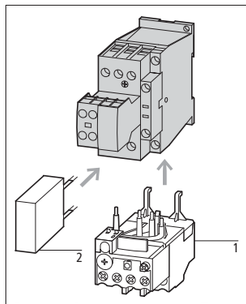
Contacts to EN 50012

Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz AC-3			AC-4			Conventional free air thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1		Circuit symbol
380 V **400 V**	220 V 230 V	**380 V** **400 V**	660 V 690 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	Open	N/O = normally open contact	NC = normally closed contact	
I_e	P	**P**	P	P	**P**	P	$I_{th} = I_e$			
A	kW	**kW**	kW	kW	**kW**	kW	A			
DILM complete device										
Screw terminals										
	**40**	12.5	**18.5**	23	5	**9**	12	50	2 N/O	2 NC
	50	15.5	**22**	30	6	**10**	14	65	2 N/O	2 NC
	65	20	**30**	35	7	**12**	17	80	2 N/O	2 NC
	**80**	25	**37**	63	12	**20**	26	90	2 N/O	2 NC
	95	30	**45**	75	16	**26**	35	110	2 N/O	2 NC
	115	37	**55**	90	17	**28**	43	130	2 N/O	2 NC
	150	48	**75**	96	20	**34**	48	160	2 N/O	2 NC

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

AC operation **Part no.** Article no.	**Price** See price list	**DC operation** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
DILM40-22(230V50HZ) 277798		**DILM40-22(RDC24)** 277812		1 off	
DILM50-22(230V50HZ) 277862		**DILM50-22(RDC24)** 277876			
DILM65-22(230V50HZ) 277926		**DILM65-22(RDC24)** 277940			
DILM80-22(230V50HZ) 239449		**DILM80-22(RDC24)** 239463			
DILM95-22(230V50HZ) 239527		**DILM95-22(RDC24)** 239541			
DILM115-22(RAC240) 239578		**DILM115-22(RDC24)** 239581			
DILM150-22(RAC240) 239598		**DILM150-22(RDC24)** 239601			



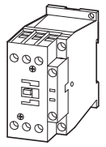
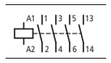
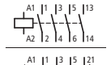
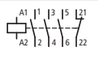
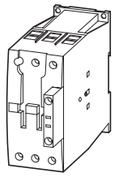
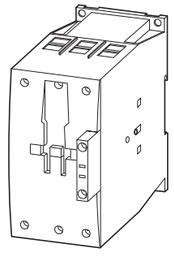
Accessories	**Page**
1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/54
Accessories	→ 5/56

For DC operated contactors DILM17 - DILM170 the following applies:
- Integrated suppressor circuit in actuating electronics

For AC operated contactors DILM115 - DILM170 the following applies:
- Integrated suppressor circuit in actuating electronics

For DILM7 - DILM150 the following applies:
- With mirror contact.

Contacts to EN 50012

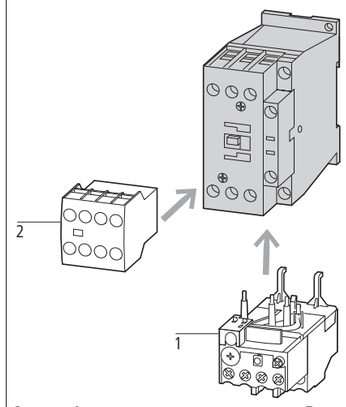
	Pole	Rated operational current	Max. motor rating, three-phase motors, 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact		Circuit symbol
		AC-3	AC-3			AC-4				Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1		
		380 V 400 V	220 V 230 V	**380 V 400 V**	660 V 690 V	220 V 230 V	**380 V 400 V**	660 V 690 V	Open			
		I_e	P	**P**	P	P	**P**	P	$I_{th} = I_e$	N/O = normally open contact	NC = normally closed contact	
		A	kW	**kW**	kW	kW	**kW**	kW	A			
Basic device												
Screw terminals												
	3 pole	**7**	2.2	**3**	3.5	1	**2.2**	2.9	20	1 N/O	–	
		7	2.2	**3**	3.5	1	**2.2**	2.9	20	–	1 NC	
		9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	1 N/O	–	
		9	2.5	**4**	4.5	1.5	**2.5**	3.6	20	–	1 NC	
		12	3.5	**5.5**	6.5	2	**3**	4.4	20	1 N/O	–	
		12	3.5	**5.5**	6.5	2	**3**	4.4	20	–	1 NC	
		18	5	**7.5**	11	2.5	**4.5**	6.5	35	1 N/O	–	
		18	5	**7.5**	11	2.5	**4.5**	6.5	35	–	1 NC	
		25	7.5	**11**	14	3.5	**6**	8.5	40	–	1 NC	
		25	7.5	**11**	14	3.5	**6**	8.5	40	1 N/O	–	
		32	10	**15**	17	4	**7**	10	40	1 N/O	–	
		32	10	**15**	17	4	**7**	10	40	–	1 NC	
	3 pole	**40**	12.5	**18.5**	23	5	**9**	12	50	–	–	
		50	15.5	**22**	30	6	**10**	14	65	–	–	
		65	20	**30**	35	7	**12**	17	80	–	–	
	3 pole	**80**	25	**37**	63	12	**20**	26	90	–	–	
		95	30	**45**	75	16	**26**	35	110	–	–	
		115	37	**55**	90	17	**28**	43	130	–	–	
		150	48	**75**	96	20	**33**	48	160	–	–	

[2] **Information relevant for export to North America**

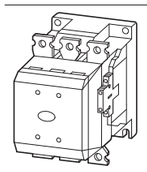
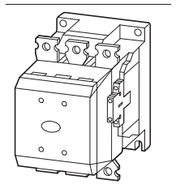
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

AC operation

Part no. Article no.	**Price** See price list	Std. pack	**Notes**
DILMF8-10(RAC240) 104413		1 off	Contactors suitable for semi-conductor industry according to SEMI F47. Contactors hum-free, suitable for building services automation. Operating mechanism adjustable from 50 Hz to 400 Hz. For all contactors the following applies: • Integrated suppressor circuit For DILMF8-01 – DILMF32-01 the following applies: • With mirror contact. Contacts to EN 50 012.
DILMF8-01(RAC240) 104417			
DILMF11-10(RAC240) 104421			
DILMF11-01(RAC240) 104425			
DILMF14-10(RAC240) 104429			
DILMF14-01(RAC240) 104433			
DILMF17-10(RAC240) 104437			
DILMF17-01(RAC240) 104441			
DILMF25-01(RAC240) 104449			
DILMF25-10(RAC240) 104445			
DILMF32-10(RAC240) 104453			
DILMF32-01(RAC240) 104457			
DILMF40(RAC240) 104461			
DILMF50(RAC240) 104465			
DILMF65(RAC240) 104469			
DILMF80(RAC240) 104473			
DILMF95(RAC240) 104477			
DILMF115(RAC240) 104481			
DILMF150(RAC240) 104485			



Accessories	**Page**
1 Overload relay	→ Chapter 6
2 Auxiliary contact modules	→ 5/38
Further actuating voltages	→ 5/80
Accessories	→ 5/56

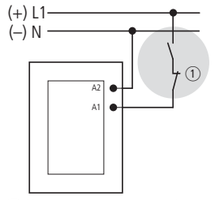
	Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 40 °C	Circuit symbol	For use with
	AC-3	AC-3			AC-4			Open		
	380 V **400 V**	220 V 230 V	**380 V** **400 V**	660 V 690 V	220 V 230 V	**380 V** **400 V**	660 V 690 V	$I_{th} = I_e$		
	I_e	P	**P**	P	P	**P**	P	A		
	A	kW	**kW**	kW	kW	**kW**	kW			
Standard device for currents greater than 150 A										
DILM complete device										
	**250**	75	**132**	240	62	**110**	189	400		DILM820-XHI...
	300	90	**160**	195	75	**132**	160	430		DILM820-XHI...
	**400**	125	**200**	344	92	**160**	283	612		DILM820-XHI...
	500	155	**250**	344	112	**200**	344	857		DILM820-XHI...
	580	185	**315**	344	112	**200**	344	920		DILM820-XHI...

Notes

[1] Availability from August 2010.
Previous DILM300/22, see Online Catalog at http://ecat.moeller.net

For all contactors the following applies:
- 660 V, 690 V or 1000 V: do not reverse directly
- Integrated suppressor circuit in actuating electronics.

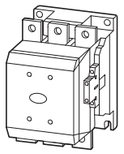
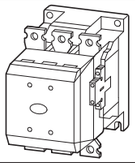
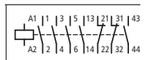
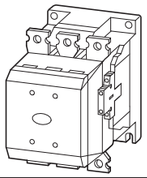
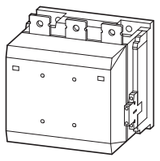
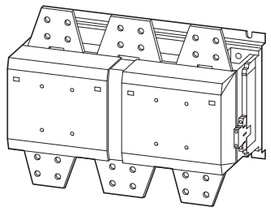
DILM...-S contactors are actuated conventionally



① Stopping in the event of an emergency (emergency switching off)

Accessories	**Page**
Auxiliary contact modules	→ 5/40
Enclosures totally insulated	
Further actuating voltages	→ 5/81

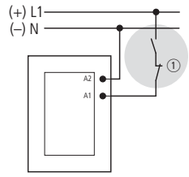
Part no. Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
DILM250-S/22(220-240V50/60HZ) 274190		1 off	Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
			UL File No.	E29096
			UL CCN	NLDX
			CSA File No.	1017510
			CSA Class No.	3211-04
			NA Certification	UL Listed, CSA certified
DILM300A-S/22(220-240V50/60HZ)[1] 139559		1 off	Request filed for UL and CSA	
DILM400-S/22(220-240V50/60HZ) 274196		1 off	Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
			UL File No.	E29096
			UL CCN	NLDX
			CSA File No.	012528
			CSA Class No.	3211-04
			NA Certification	UL Listed, CSA certified
			See also	Additional approvals, → Page 5/86
DILM500-S/22(220-240V50/60HZ) 274199				
DILM570-S/22(220-240V50/60HZ) 110744				

	Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz								Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Circuit symbol
	AC-3	AC-3				AC-4				Open	
	380 V 400 V	220 V 230 V	**380 V 400 V**	660 V 690 V	1000 V	220 V 230 V	**380 V 400 V**	660 V 690 V	1000 V	$I_{th} = I_e$	
	Ie	P	**P**	P	P	P	**P**	P	P	A	
	A	kW	**kW**	kW	kW	kW	**kW**	kW	kW		
Contactors, comfort DILM											
	**185**	55	**90**	140	108	41	**75**	102	77	275	
	225	70	**110**	150	108	51	**90**	110	77	315	
	**250**	75	**132**	195	108	62	**110**	160	109	330	
	300	90	**160**	195	132	75	**132**	160	109	350	
	**400**	125	**200**	344	132	92	**160**	283	132	500	
	500	155	**250**	344	132	112	**200**	344	132	700	
	**580**	185	**315**	560	600	143	**250**	440	509	800	
	650	205	**355**	630	600	161	**280**	494	509	850	
	750	240	**400**	720	800	181	**315**	556	678	900	
	820	260	**450**	750	800	209	**355**	633	678	1000	
	1000	315	**560**	1000	1100	260	**450**	780	1000	1000	
	**1600**	500	**900**	1600	1770	430	**750**	1300	1650	1800	

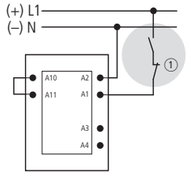
Part no.	**Price** See price list	Std. pack	Notes
DILM185A/22(RAC240)[1] 139537		1 off	
DILM225A/22(RAC240)[1] 139547			
DILM250/22(RA250)[2] 208201			
DILM300A/22(RA250)[1] [2] 139556			
DILM400/22(RA250)[3] 208209			
DILM500/22(RA250)[3] 208213			
DILM580/22(RA250)[3] 208216			
DILM650/22(RA250)[3] 208219			
DILM750/22(RA250)[3] 208222			
DILM820/22(RA250)[3] 208225			
DILM1000/22(RA250)[3] 267214			
DILM1600/22(RAW250)[3] 106727			

Conventional
A1/A2 are attached to power supply as normal

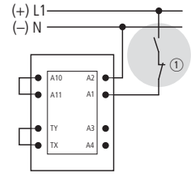
DILM 185 A, DILM 225 A



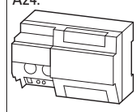
DILM250 to DILM1000, DILH1400

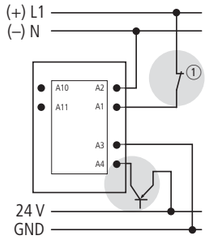


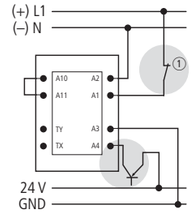
DILM1600 to DILH 2600



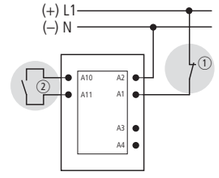
Directly from the PLC
A 24 V output from the PLC can be directly connected to the terminals A4/ A24.

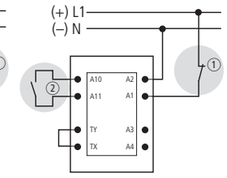






From a low-power command device
Low-power actuating devices such as PCB relays, pilot devices or position switches can be directly connected to A10/ A11.





① Stopping in the event of an emergency (emergency switching off)
② Max. cable capacitance 6 nF

Notes

[1] Availability from August 2010.
Previous DILM185/22 to DILM300/22, see Online Catalog at http://ecat.moeller.net

For all contactors the following applies:
- 660 V, 690 V or 1000 V: do not reverse directly
- Integrated suppressor circuit in actuating electronics.

When operating contactors DILM580 to DILM1600 behind a frequency inverter or mains with strong harmonic loads, the suppressor circuit on the load side must be removed.

During high-voltage tests, the suppressor circuit on the load-side for DILM580 to DILH2600 contactors must be disconnected (see instructional leaflet).

Control voltages

RA250 ≙ 110 V - 250 V AC/DC

RAW250 ≙ 230 V - 250 V AC/DC

Accessories	**Page**
Auxiliary contact modules	→ 5/40
Suppressor circuits on load side	→ 5/65
Enclosures	totally insulated
Further actuating voltages	→ 5/76

Information relevant for export to North America

[1]

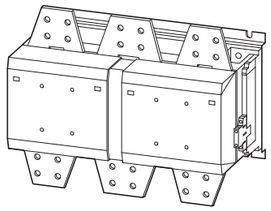
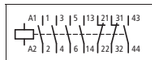
NA Certification	Request filed for UL and CSA

[2]

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	1017510
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

[3]

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified
See also	Additional approvals → Page 5/86

	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Circuit symbol	**Part no.**	**Price** See price list	Std. pack
DILH comfort devices AC-1					
	1400		**DILH1400/22(RAW250)**[1] 272441		1 off
	2000		**DILH2000/22(RAW250)**[1] 272442		
	2200		**DILH2200/22(RAW250)**[1] 111793		
	2600		**DILH2600/22(RAW250)**[2] 125945		

Notes

For all contactors the following applies:
- 660 V, 690 V or 1000 V: do not reverse directly
- Integrated suppressor circuit in actuating electronics.

When operating contactors DILM580 to DILM1600 behind a frequency inverter or mains with strong harmonic loads, the suppressor circuit on the load side must be removed.

During high-voltage tests, the suppressor circuit on the load-side for DILM580 to DILH2600 contactors must be disconnected (see instructional leaflet).

Control voltages

RAW250 ≙ 230 V - 250 V AC/DC

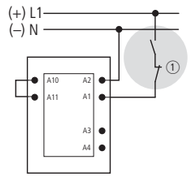
Accessories	**Page**
Auxiliary contact modules	→ 5/40
Suppressor circuits on load side	→ 5/65
Enclosures	totally insulated

Notes

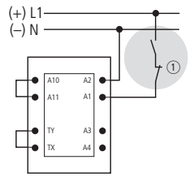
Conventional

A1/A2 are attached to power supply as normal

DILH1400



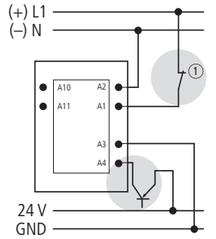
DILM1600 to DILH 2600

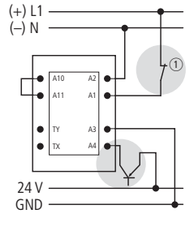


Directly from the PLC

A 24 V output from the PLC can be directly connected to the terminals A4/A24.

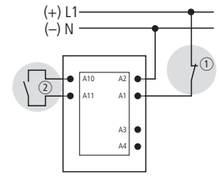


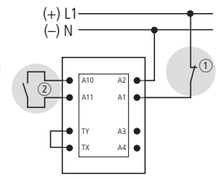




From a low-power command device

Low-power actuating devices such as PCB relays, pilot devices or position switches can be directly connected to A10/A11.





① Stopping in case of emergency (Emergency-stop)
② Max. cable capacitance 6 nF

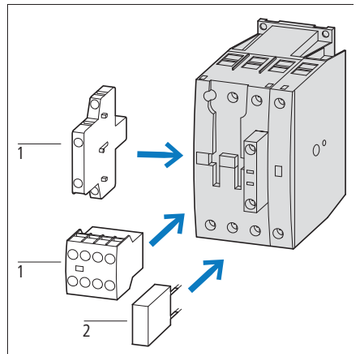
Information relevant for export to North America

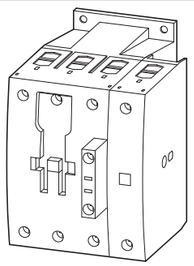
1)

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

2)

NA Certification	Request filed for UL and CSA

Rated operational current open AC-1 40 °C A	55 °C A	70 °C A	Conventional thermal current $I_{th} = I_e$ AC-1 at 50 °C Open $I_{th} = I_e$ A	Circuit symbol	For use with	AC operation Part no. Article no.	Price See price list	Std. pack	DC operation Part no. Article no.	Price See price list	Std. pack	Notes
Contactors up to 200 A												
4 pole												
22	21	20	20		DILM32-XHI(C)… DILA-XHI(V)(C)…	**DILMP20(230V50HZ,240V60HZ)** 276970		1 off	**DILMP20(24VDC)** 276985		1 off	
32	30	28	32		DILM32-XHI(C)… DILA-XHI(V)(C)…	**DILMP32-01(230V50HZ,240V60HZ)** 118911			**DILMP32-01(RDC24)** 118913			
32	30	28	32			**DILMP32-10(230V50HZ,240V60HZ)** 109797			**DILMP32-10(RDC24)** 109811			
45	41	39	45			**DILMP45-01(230V50HZ,240V60HZ)** 118914			**DILMP45-10(RDC24)** 109840			
45	41	39	45			**DILMP45-10(230V50HZ,240V60HZ)** 109826						
63	60	54	63		DILM150-XHI(A)(V)… or DILM1000-XHI11-SA[1] or DILM1000-XHI(V)11-SI[1]	**DILMP63(230V50HZ,240V60HZ)** 109855			**DILMP63(RDC24)** 109869			
80	76	69	80			**DILMP80(230V50HZ,240V60HZ)** 109884			**DILMP80(RDC24)** 109898			
125	116	108	125		DILM150-XHI(A)(V)… DILM1000-XHI(V)…[1]	**DILMP125(RAC240)** 109905			**DILMP125(RDC24)** 109910			
160	150	138	160			**DILMP160(RAC240)** 109915			**DILMP160(RDC24)** 109920			
200	188	172	200			**DILMP200(RAC240)** 109925			**DILMP200(RDC24)** 109930			



Accessories **Page**
1 Auxiliary contact module → 5/38
2 Suppressor → 5/54
Further actuating voltages → 5/78
Accessories → 5/56

Notes

[1] DILM1000-XHI…can only be fitted on the left of DILMP.

Contacts to EN 50012.
For DC operated contactors DILMP20 the following applies:
- Integrated varistor suppressor circuit.

For DC operated contactors DILMP32 - DILMP200 the following applies:
- Integrated suppressor circuit in actuating electronics.

For AC operated contactors DILMP125 - DILMP200 the following applies:
- Integrated suppressor circuit in actuating electronics.

For DILMP32-01 and DILMP45-01 the following applies:
- With mirror contact.

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/85

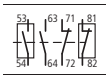
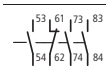
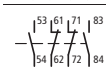
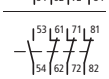
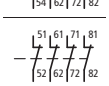
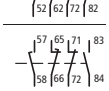
	Terminal type	Pole	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact S_F = N/O early-make NC = normally closed contact $Ö_S$ = NC late-break		Circuit symbol	For use with	**Part no.**	**Price** See price list	Std. pack
Auxiliary contact modules										
With interlocked opposing contacts, except ...XHI(C)V										
Top mounting auxiliary contacts										
	Screw terminals	2 pole	16	1 N/O	1 NC		DILM(C)7-10… DILM(C)9-10… DILM(C)12-10… DILM(C)15-10… DILM(C)17-10… DILM(C)25-10… DILM(C)32-10… DILM38-…10 DILMP20… DILMP32-10… DILMP45-10… DILL…	**DILM32-XHI11** 277376		5 off
				–	2 NC			**DILM32-XHI02** 277375		
		4 pole		2 N/O	2 NC			**DILM32-XHI22** 277377		
				3 N/O	1 NC			**DILM32-XHI31** 106112		
	Spring-loaded terminals	2 pole	16	1 N/O	1 NC			**DILM32-XHIC11** 277751		
				–	2 NC			**DILM32-XHIC02** 277750		
		4 pole		2 N/O	2 NC			**DILM32-XHIC22** 277752		
	Screw terminals	2 pole	16	2 N/O	–		DILM(C)7… DILM(C)9… DILM(C)12… DILM(C)15… DILM(C)17… DILM(C)25… DILM(C)32… DILM38… DILMP20… DILMP32… DILMP45… DILL…	**DILA-XHI20** 276422		
				1 N/O	1 NC			**DILA-XHI11** 276421		
				–	2 NC			**DILA-XHI02** 276420		
				1 S_F	1 $Ö_S$			**DILA-XHIV11** 276423		
		4 pole	16	4 N/O	–			**DILA-XHI40** 276428		
				3 N/O	1 NC			**DILA-XHI31** 276427		
				2 N/O	2 NC			**DILA-XHI22** 276426		
				1 N/O	3 NC			**DILA-XHI13** 276425		
				–	4 NC			**DILA-XHI04** 276424		
				1 N/O 1 S_F	1 NC 1 $Ö_S$			**DILA-XHIV22** 276429		

Notes

- Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules, also for the integrated auxiliary contacts of the DILM 7 - DILM32

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

	Terminal type	Pole	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact S_F = N/O early-make NC = normally closed contact $Ö_S$ = NC late-break		Circuit symbol	For use with	**Part no.**	**Price** See price list	Std. pack
Auxiliary contact modules										
With interlocked opposing contacts, except ...XHI(C)V										
Top mounting auxiliary contacts										
	Spring-loaded terminals	2 pole	16	2 N/O	–		DILM(C)7… DILM(C)9… DILM(C)12… DILM(C)15… DILM(C)17… DILM(C)25… DILM(C)32… DILM38… DILMP20… DILMP32… DILMP45… DILL…	**DILA-XHIC20** 276528		5 off
				1 N/O	1 NC			**DILA-XHIC11** 276527		
				–	2 NC			**DILA-XHIC02** 276526		
				1 S_F	1 $Ö_S$			**DILA-XHICV11** 276529		
	Screw terminals	2 pole	16	2 N/O	2 NC			**DILA-XHIR22**[1] 139580		
			16	1 N/O	1 NC			**DILA-XHIR11** 110140		
	Spring-loaded terminals	4 pole	16	4 N/O	–		DILM(C)7… DILM(C)9… DILM(C)12… DILM(C)15… DILM(C)17… DILM(C)25… DILM(C)32…	**DILA-XHIC40** 276534		
				3 N/O	1 NC			**DILA-XHIC31** 276533		
				2 N/O	2 NC			**DILA-XHIC22** 276532		
				1 N/O	3 NC			**DILA-XHIC13** 276531		
				–	4 NC			**DILA-XHIC04** 276530		
				1 N/O 1 S_F	1 NC 1 $Ö_S$			**DILA-XHICV22** 276535		

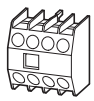
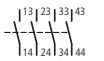
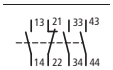
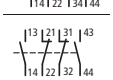
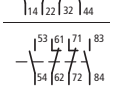
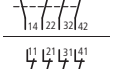
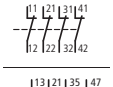
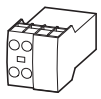
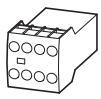
Notes

- Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules, also for the integrated auxiliary contacts of the DILM 7 - DILM32

[1] 1 N/C + 1 N/O above microswitch for electronic applications

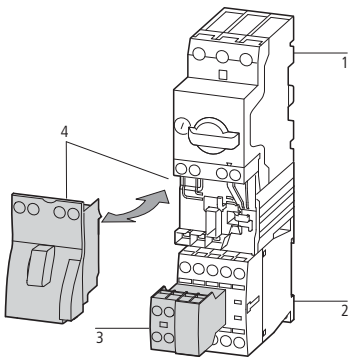
Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
[1] NA Certification	Request filed for UL and CSA

	Connection type	Pole	conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact SF = N/O early make NC = normally closed contact ÖS = NC late-break		Circuit symbol	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	Notes
Auxiliary contact modules											
With interlocked opposing contacts											
Top mounting auxiliary contacts											
	Screw terminals	2 pole	16	2 N/O	–		DILM40… DILM50… DILM65… DILM72… DILM80… DILM95… DILM115… DILM150… DILM170… DILMP63… DILMP80… DILMP125… DILMP160… DILMP200…	**DILM150-XHI20** 277945		5 off	Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
				1 N/O	1 NC			**DILM150-XHI11** 277946			
				1 N/O	1 NC			**DILM150-XHIA11** 283463			
				–	2 NC			**DILM150-XHI02** 277947			
	Screw terminals	4 pole	16	4 N/O	–			**DILM150-XHI40** 277948			
				3 N/O	1 NC			**DILM150-XHI31** 277949			
				2 N/O	2 NC			**DILM150-XHI22** 277950			
				2 N/O	2 NC			**DILM150-XHIA22** 283464			
				1 N/O	3 NC			**DILM150-XHI13** 277951			
				–	4 NC			**DILM150-XHI04** 277952			
				1 N/O 1 S_F	1 NC 1 $Ö_S$			**DILM150-XHIV22** 277953			–
High version[1]											
	Screw terminals	2 pole	16	2 N/O	–		DILM7… DILM9… DILM12… DILM15… DILL…	**DILA-XHIT20** 101042		5 off	Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
				1 N/O	1 NC			**DILA-XHIT11** 101043			
				–	2 NC			**DILA-XHIT02** 101041			
		4 pole		2 N/O	2 NC			**DILA-XHIT22** 101044			

Notes

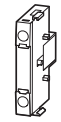
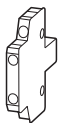
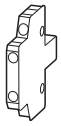
[1] Suitable for the combination with electrical wiringlinks in tool-less plug connection usable with:
DILM12-XSL
DILM12-XRL
DILM12-XS1
PKZM0-XDM12
PKZM0-XRM12
PKZM0-XSM12



1 PKZM0
2 DILM7 - DILM15
3 DILA-XHIT
4 PKZM0-XDM12

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

	Connection type	Pole	conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact SF = N/O early make NC = normally closed contact ÖS = NC late-break		Circuit symbol	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	Notes
Side-mounting auxiliary contacts											
	Screw terminals	1 pole	10	1 N/O	–		DILM(C)7… DILM(C)9… DILM(C)12… DILM(C)15… DILMP20… DILA(C)…	**DILA-XHI10-S** 115948		1 off	1)
				–	1 NC			**DILA-XHI01-S** 115949			
	Spring-loaded terminals	1 pole		1 N/O	–			**DILA-XHIC10-S** 115950			
				–	1 NC			**DILA-XHIC01-S** 115951			
	Screw terminals	2 pole		1 N/O	1 NC		DILM17… DILM25… DILM32… DILM38…	**DILM32-XHI11-S** 101371			Can only be left on the contactor. Cannot be combined with mechanical interlock
Side-mounting auxiliary contacts											
	Screw terminals	2 pole	10	1 N/O	1 NC		DILM250 - DILH2600	**DILM820-XHI11-SI** 208281		1 off	1)
			10	1 N/O	1 NC			**DILM820-XHI11-SA** 208282			
			10	$1\ S_F$	$1\ Ö_S$			**DILM820-XHI11V-SI** 208283			
			10	1 N/O	1 NC		DILM40 - DILM225A DILMP63 - DILMP200	**DILM1000-XHI11-SI** 278425			
			10	$1\ S_F$	$1\ Ö_S$			**DILM1000-XHIV11-SI** 278426			
			10	1 N/O	1 NC			**DILM1000-XHI11-SA** 278427			

Notes

1)

- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact module, also for the integrated auxiliary contacts of the DILM7 – DILM32 (not NO early-make and NC late-break)
- Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F (no NC late-breaks)
- No auxiliary contact is possible between 2 contactors with mechanical interlock.

Information relevant for export to North America

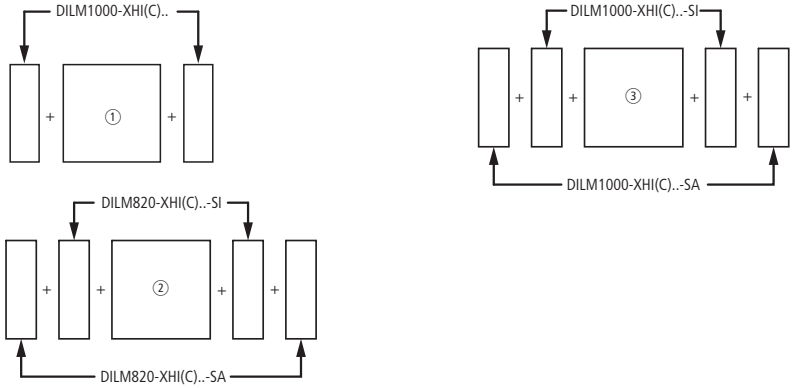
2)

Product StandardsIEC/EN 60947-4-1;
UL 508; CSA-C22.2 No. 14-05;
CE marking
UL File No.E29184
UL CCNNKCR
CSA File No.012528
CSA Class No.3211-03, 3211-04
NA CertificationUL Listed,
CSA certified

Engineering

	 DILM1000-XHI(V)11-SI	 DILM820-XHI(V)11-SI	 DILM1000-XHI(V)11-SA	 DILM820-XHI(V)11-SA	 DILM150-XHI20 DILM150-XHI11 DILM150-XHI02	 DILM150-XHI40 DILM150-XHI31 DILM150-XHI(V)22 DILM150-XHI13 DILM150-XHI04	 DILM150-XHIA11	 DILM150-XHIA22
DILM40 ... DILM72	2 x	–	–	–	–	–	1 x	–
	–	–	2 x	–	1 x	–	–	–
	1 x	–	–	–	–	–	–	1 x
	–	–	1 x	–	–	1 x	–	–
DILM80 ... DILM170	2 x	–	2 x	–	–	–	–	–
	2 x	–	–	–	–	–	–	1 x
	2 x	–	–	–	–	–	1 x	–
	–	–	2 x	–	–	1 x	–	–
	–	–	2 x	–	1 x	–	–	–
DILM185A	2 x	–	2 x	–	–	–	–	–
DILM222A	2 x	–	–	–	–	–	–	–
DILM250 DILM1600	–	2 x	–	2 x	–	–	–	–
DILH1400 ... DILH2600	–	2 x	–	2 x	–	–	–	–

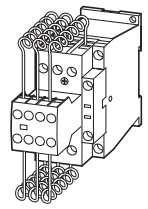
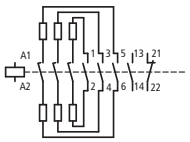
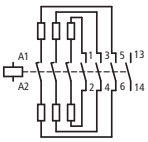
Notes **Side mounting auxiliary contacts**



① DILM40 – DILM72
② DILM250 – DILH2600
③ DILM80-DILM225A

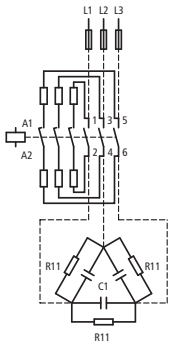
- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact module (not N/O early close and N/C late open)
- Auxiliary contacts can be used as mirror contacts according to IEC/EN 60947-4-1, Annex F (not N/C late open)
- No auxiliary contact is possible between two contactors with mechanical interlock.
- 2 auxiliary contacts DILM820-XHI11-SI are already built into the contactors DILM250 to DILH2600/22.
- 2 DILM1000-XHI11-SI auxiliary contacts are already installed in DILM185A and DILH225A contactors.

Ordering

	Three-phase capacitors 50 – 60 Hz, Open				Circuit symbol	**Part no.** Article no.	**Price** See price list	Std. pack
	230 V kvar	400 V kvar	525 V kvar	690 V kvar				
With series resistors, Basic Units								
	7.5	12.5	16.7	20		**DILK12-11(230V50HZ,240V60HZ)** 293988		1 Off
	11	20	25	33.3		**DILK20-11(230V50HZ,240V60HZ)** 294010		
	15	25	33.3	40		**DILK25-11(230V50HZ,240V60HZ)** 294032		
	20	33.3	40	55		**DILK33-10(230V50HZ,240V60HZ)** 294054		
	25	50	65	85		**DILK50-10(230V50HZ,240V60HZ)** 294076		

Notes

Weld-resistant for capacitors with inrush current peaks up to 180 x I_N
With group compensation multi-stage capacitor banks are connected to the mains as required. This can cause, transient currents of up to 180 x I_e to flow between the capacitors.
The capacitors are pre-charged via the early-make auxiliary contacts and the fitted wire resistors, thereby reducing the inrush current. The main contacts then close after a time lag and carry the continuous current.
The contactors for capacitors are weld-resistant with inrush current peaks up to 180 x I_e due to their special contacts.
DILK… cannot be combined with other auxiliary contacts.
For the switching of reactive-power compensation equipment please see Engineering notes on power factor correction → page 5/35.

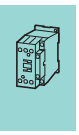


Accessories	**Page**
Enclosures totally insulated	
Accessories	→ 5/56
Further actuating voltages	→ 5/80

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified
See also	Further approvals → page 5/70

Engineering



Part no.	Ordering data Page	Switching power 230 V kvar	400 V 420 V 440 V kvar	525 V kvar	690 V kvar
		Individual compensation, open version			
DILM7-…(…)	→ 5/18	1.5	3	3.5	5
DILM9-…(…)	→ 5/18	2	4	4.5	6
DILM12-…(…)	→ 5/18	2.5	4.5	5.5	7
DILM15-…(…)	→ 5/18	2.5	4.5	5.5	7
DILM17-…(…)	→ 5/18	6.5	12	14.5	19
DILM25-…(…)	→ 5/18	7	13.5	16	21
DILM32-…(…)	→ 5/18	7.5	14.5	17	22.5
DILM40(…)	→ 5/20	11	20.5	24.5	32
DILM50(…)	→ 5/20	11.5	22	26	34.5
DILM65(…)	→ 5/20	12.5	23.5	28	37
DILM80(…)	→ 5/20	16	30.5	36.5	48
DILM95(…)	→ 5/20	18	34	41	54
DILM115(…)	→ 5/20	24	46	54.5	72
DILM150(…)	→ 5/20	28	53	63.5	83.5
DILM185A(…)	→ 5/32	87	150	190	150
DILM300A(…)	→ 5/32	115	200	265	200
DILM580(…)	→ 5/32	175	300	400	300
		Group compensation, with choke, open version			
DILM7-…(…)	→ 5/18	4	7	7.5	12
DILM9-…(…)	→ 5/18	5	8	10	14
DILM12-…(…)	→ 5/18	5.5	10	12	16
DILM15-…(…)	→ 5/18	5.5	10	12	16
DILM17-…(…)	→ 5/18	7.5	18	20	28
DILM25-…(…)	→ 5/18	10	20	23	30
DILM32-…(…)	→ 5/18	12.5	25	25	32
DILM40(…)	→ 5/20	15	30	30	40
DILM50(…)	→ 5/20	20	40	40	48
DILM65(…)	→ 5/20	25	50	50	57
DILM80(…)	→ 5/20	30	60	70	90
DILM95(…)	→ 5/20	35	70	80	104
DILM115(…)	→ 5/20	50	95	100	125
DILM150(…)	→ 5/20	55	115	115	152
DILM185A(…)	→ 5/32	80	150	200	260
DILM225A(…)	→ 5/32	100	175	230	300
DILM250(…)	→ 5/32	110	190	260	340
DILM300A(…)	→ 5/32	130	225	290	390
DILM400(…)	→ 5/32	160	280	370	480
DILM500(…)	→ 5/32	220	390	500	680
		Group compensation, without choke, open version			
DILK12-…(…)	→ 5/43	7.5	12.5	16.7	20
DILK20-…(…)	→ 5/43	11	20	25	33.3
DILK25-…(…)	→ 5/43	15	25	33.3	40
DILK33-…(…)	→ 5/43	20	33.3	40	55
DILK50-…(…)	→ 5/43	25	50	65	85
DILM185A(…)	→ 5/32	66	115	145	115
DILM300A(…)	→ 5/32	85	150	195	150
DILM580(…)	→ 5/32	145	250	333	250

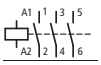
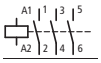
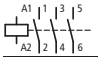
Notes

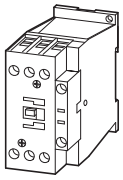
Use of the contactors DILM without series resistor for group compensation
When using the contactors for group compensation in a system without chokes each capacitor must have a minimum induction of approx. 6 µH to limit the peak inrush current. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately ∅ 140 mm. The conductor cross section must correspond to the rated operational current.

HPL05045EN

DILL

Ordering

Rated operational current				Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Circuit symbol	**Part no.** Article no.	**Price** See price list	Std. pack
AC-5a operation		AC-5b operation		Open				
230 V	400 V	230 V	400 V	$I_{th} = I_e$				
I_e	I_e	I_e	I_e	A				
A	A	A	A					
Illumination contactors DILL								
12	12	14	14	24		**DILL12(230V50HZ,240V60HZ)** 104402		1 Off
12	12	14	14	24		**DILL12(24V50HZ)** 104401		
12	12	14	14	24		**DILL12(400V50HZ,440V60HZ)** 104403		
18	18	21	21	35		**DILL18(230V50HZ,240V60HZ)** 104405		
18	18	21	21	35		**DILL18(24V50HZ)** 104404		
18	18	21	21	35		**DILL18(400V50HZ,440V60HZ)** 104406		
20	20	27	27	40		**DILL20(230V50HZ,240V60HZ)** 104408		
20	20	27	27	40		**DILL20(24V50HZ)** 104407		
20	20	27	27	40		**DILL20(400V50HZ,440V60HZ)** 104409		



Notes

DILL do not have an integrated auxiliary contact.
They can be combined with DILM32-XHI… and DILA-XHI… auxiliary contacts.
Switchgear for illumination systems → page 5/46

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

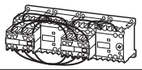
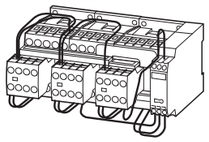
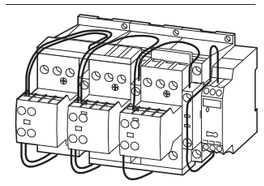
Engineering

	DIL	L12	L18	L20	M7	M9	M12	M17	M25	M32	M40	M50
Permissible compensation capacitance	C_{max} [mF]	470	470	470	47	80	100	220	330	470	470	500
Filament bulbs	I_e [A]	14	21	27	6	7.5	10	14	21	27	33	42
Mercury blended lamps	I_e [A]	12	16	23	5	6.5	8.5	12	16	23	30	38
Fluorescent lamps, conventional reactor – starter – connection	I_e [A]	20	26	35	9	10	15	20	26	35	41	45
Fluorescent lamps, duo circuit (series compensated)	I_e [A]	20	26	35	5.5	8	13	15	22.5	29	36	47
Electronic upstream devices	I_e [A]	12	18	20	5	6.5	8.5	12	17.5	22.5	28	35
High-pressure mercury vapour lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
Metal-halide lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
High-pressure sodium lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
Low-pressure sodium lamps	I_e [A]	7.5	10	12	3	4	6	7.5	10	12	15	22

	DIL	M65	M80	M95	M115	M150	M185A	M225A	M250	M300A	M400	M500
Permissible compensation capacitance	C_{max} [mF]	500	550	620	830	970	2055	2300	2600	3000	3250	3500
Filament bulbs	I_e [A]	55	67	79	95	125	153	187	208	249	332	415
Mercury blended lamps	I_e [A]	45	65	67	80	110	123	150	167	200	266	332
Fluorescent lamps, conventional reactor – starter – connection	I_e [A]	55	95	100	125	145	207	237	263	300	375	525
Fluorescent lamps, duo circuit (series compensated)	I_e [A]	59	71	95	100	138	186	213	236	270	338	473
Electronic upstream devices	I_e [A]	45.5	56	66.5	80.5	105	130	158	175	210	280	350
High-pressure mercury vapour lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
Metal-halide lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
High-pressure sodium lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
Low-pressure sodium lamps	I_e [A]	25	35	40	50	70	100	111	123	140	175	245

In compensated lamps, the sum of the capacitances must not exceed the contactors' max. permissible capacitor load (C_{max})!
The values in the table are for each individual contactor contact.

Ordering

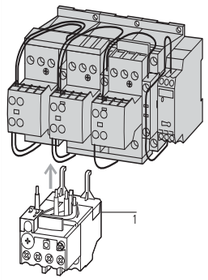
	Rated operational current AC-3	Max. rated operational power for three-phase motors, 50 - 60 Hz AC-3				Max. change-over time	**Part no.** Article no.	**Price** See price list	Std. pack
	400 V I_e A	230 V P kW	400 V P kW	500 V P kW	690 V P kW	s			
Star-delta combinations SDAINL									
Operating frequency: maximum 30 starts per hour									
	12	4	5.5	5.5	–	< 30	**SDAINLEM(230V50HZ)** 051840		1 Off
	12	3	5.5	5.5	5.5	< 20	**SDAINLM12(230V50HZ)** 278286		
	12	3	5.5	5.5	5.5	< 20	**SDAINLM12(400V50HZ)** 101380		
	12	3	5.5	5.5	5.5	< 20	**SDAINLM12(24VDC)** 100416		
	16	4	7.5	7.5	7.5	< 20	**SDAINLM16(230V50HZ)** 278311		
	16	4	7.5	7.5	7.5	< 20	**SDAINLM16(400V50HZ)** 101381		
	16	4	7.5	7.5	7.5	< 20	**SDAINLM16(24VDC)** 100417		
	22	5.5	11	11	11	< 20	**SDAINLM22(230V50HZ)** 278336		
	22	5.5	11	11	11	< 20	**SDAINLM22(400V50HZ)** 101382		
	22	5.5	11	11	11	< 20	**SDAINLM22(24VDC)** 100418		
	30	7.5	15	18.5	18.5	< 20	**SDAINLM30(230V50HZ)** 278361		
	30	7.5	15	18.5	18.5	< 20	**SDAINLM30(400V50HZ)** 101383		
	30	7.5	15	18.5	18.5	< 20	**SDAINLM30(RDC24)** 100419		
	45	11	22	30	22	< 20	**SDAINLM45(230V50HZ)** 278386		
	45	11	22	30	22	< 20	**SDAINLM45(400V50HZ)** 101384		
	45	11	22	30	22	< 20	**SDAINLM45(RDC24)** 100420		
	55	15	30	37	30	< 20	**SDAINLM55(230V50HZ)** 278411		
	55	15	30	37	30	< 20	**SDAINLM55(400V50HZ)** 101385		
	55	15	30	37	30	< 20	**SDAINLM55(RDC24)** 100421		
	70	18.5	37	45	37	< 20	**SDAINLM70(230V50HZ)** 239895		
	70	18.5	37	45	37	< 20	**SDAINLM70(400V50HZ)** 101386		
	90	22	45	55	45	< 20	**SDAINLM90(230V50HZ)** 239937		
	115	30	55	75	55	< 20	**SDAINLM115(230V50HZ)** 239963		
	140	37	75	90	90	< 20	**SDAINLM140(230V50HZ)** 240009		
	165	45	90	110	132	< 20	**SDAINLM165(230V50HZ)** 240035		
	200	55	110	132	160	< 20	**SDAINLM200(230V50HZ)** 101010		
	260	75	132	160	160	< 20	**SDAINLM260(230V50HZ)** 101031		

Individual components of the combination				Spare auxiliary contacts			**Notes**
Mains contactor Q11 Part no.	Delta contactor Q15 Part no.	Star contactor Q13 Part no.	Timing relays K1 Part no.	Q11	Q13	Q15	
DILEM-10 + 22DILEM	DILEM-01	DILEM-10 + 02DILEM	DILET	21 31 53 / 22 32 54	–	–	
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51	63 / 64	63 / 64	63 / 64	
DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM50 + DILM150-XHI31	DILM50 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM65 + DILM150-XHI31	DILM65 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM80 + DILM150-XHI31	DILM80 + DILM150-XHI11	DILM50 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM95 + DILM150-XHI31	DILM95 + DILM150-XHI11	DILM65 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM115 + DILM150-XHI31	DILM115 + DILM150-XHI11	DILM80 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	
DILM150 + DILM150-XHI31	DILM150 + DILM150-XHI11	DILM95 + DILM150-XHI11	ETR4-51	21 33 / 22 34	–	–	

Main circuit:
Depending on the type of coordination required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

The following applies for SDAINLM 140 – SDAINLM 260:
- On the mounting plate.

Circuit diagrams, Star-delta combinations → page 5/50

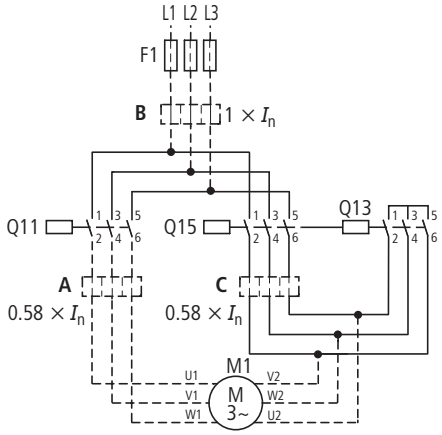


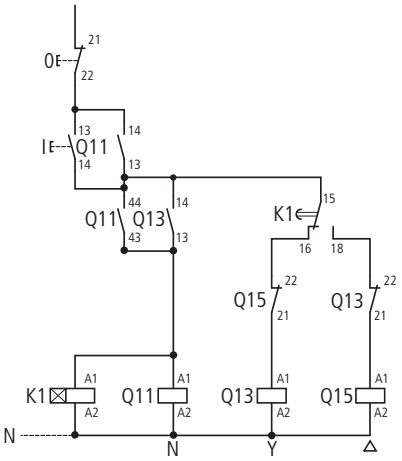
Accessories	**Page**
1 Overload relay	→ 6/8
Accessories	→ 5/56

Engineering

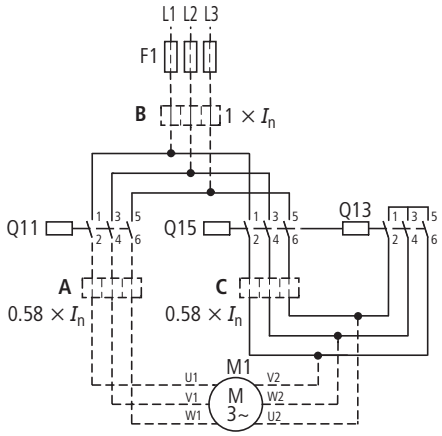
Circuit diagrams, Star-delta combinations

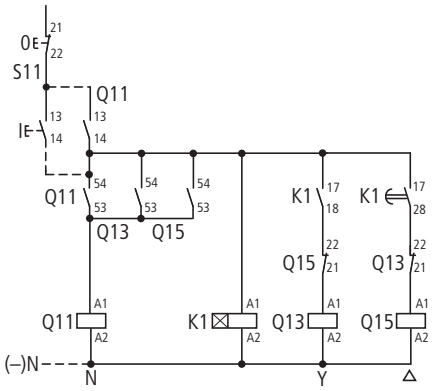
SDAINLEM



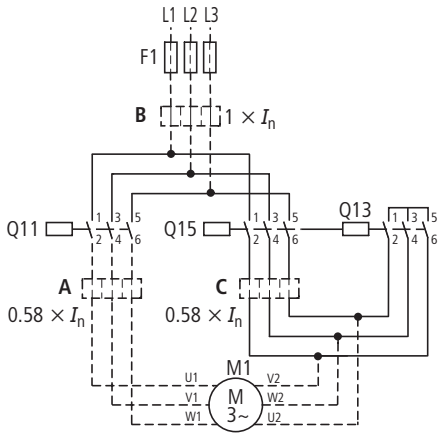


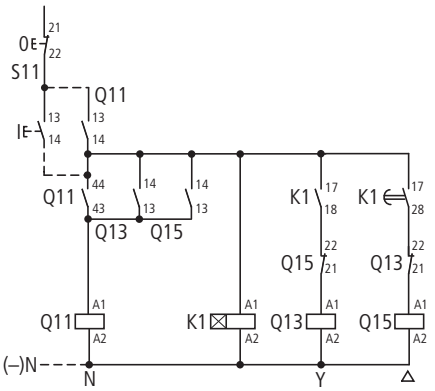
SDAINLM12…SDAINLM55





SDAINLM70…SDAINLM260





Overload relay settings	Starting
A: I_N x 0.58 Motor protected in Y and △- positions	F 15 s
B: I_N x 1 Only partial motor protection in Y position	15 – 40 s
C: I_N x 0.58 Motor not protected in Y position	> 40 s

Timing relay set to approx. 10 s

Main circuit:

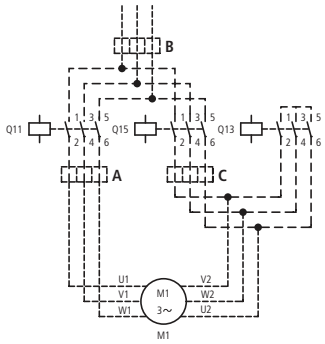
Depending on the type of coordination required (i.e. Type “1” or Type “2”) it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

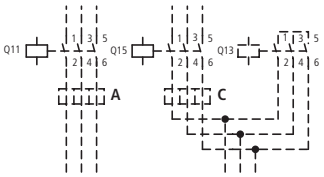
Components for self-assembly of star-delta combinations

Maximum operational rating of AC motors 50 - 60 Hz					Changeover time [1]			**Individual components of the combination**				Spare auxiliary contacts		
AC-3								**Coil** to EN 50005 **Switching element** to EN 50005 and EN 50012						
230 V	400 V	500 V	690 V	1000 V				Mains contactor Q11	Delta contactor Q15	Star contactor Q13	Timing relay K1	Q11	Q15	Q13
kW	kW	kW	kW	kW	up to 12 s	up to 20 s	up to 30 s	Part no. DIL	Part no. DIL	Part no. DIL	Part no.			
90	160	200	250	132	●	●	●	M185A/22	M185A/22	M115/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
110	200	250	315	160	●	●	–	M225A/22	M225A/22	M150/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
132	250	315	400	200	●	●	●	M250/22	M250/22	M185A/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
160	300	355	450	200	●	●	●	M300A/22	M300A/22	M185A/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
200	355	450	560	220	●	●	–	M400/22	M400/22	M250/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
250	450	560	600	220	●	●	●	M500/22	M500/22	M300A/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
300	560	710	900	355	●	●	●	M580/22	M580/22	M400/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
350	630	750	950	355	●	●	●	M650/22	M650/22	M400/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
400	710	900	1200	1400	●	●	●	M750/22	M750/22	M580/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
450	800	950	1300	1400	●	●	●	M820/22	M820/22	M580/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44
560	1000	1200	1700	1700	●	●	–	M1000/22	M1000/22	M650/22	ETR4-51	21 31 22 32	31 43 32 44	31 43 32 44

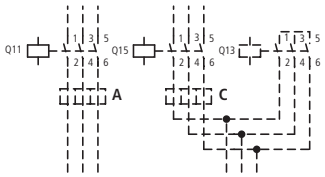
Notes [1] Longer changeover times please enquire

Components for self-assembly





Notes



Overload relay settings

I_N	**Starting**
A x 0.58 Motor protection in Y and △ positions	≦ 15 s
B x 1 In Y position only limited motor protection	15 – 40 s
C x 0.58 Motor not protected in Y position	> 40 s

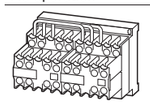
Timing relay set to approx. 10 s

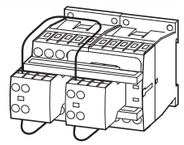
Main circuit:
Depending on the coordination type required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

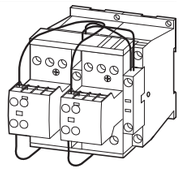
Control circuit:
If the combinations are to be used within the scope of IEC/EN 60 204 Part 1, VDE 0113 Part 1, then Point 9.1.1 regarding the supply of control circuits, must be observed.

Ordering

Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz							Part no.	Price See price list	Std. pack
AC-3	AC-3			AC-4						
400 V	220 V 230 V	380 V 400 V	660 V 690 V	220 V 230 V	380 V 400 V	660 V 690 V				
I_e	P	P	P	P	P	P				
A	kW	kW	kW	kW	kW	kW				
DIUL reversing combinations										
AC operation										
9	2.2	4	4	1.5	3	3		**DIULEM/21/MV(230V50HZ)**[1] 051849		1 Off
9	2.2	4	4	1.5	3	3		**DIULEM/21/MV-G(24VDC)**[2] 214655		
7	2.2	3	3.5	1	2.2	2.9		**DIULM7/21(230V50HZ)**[2] 278061		
7	2.2	3	3.5	1	2.2	2.9		**DIULM7/21(24VDC)**[2] 107021		
9	2.5	4	4.5	1.5	2.5	3.6		**DIULM9/21(230V50HZ)**[2] 278086		
9	2.5	4	4.5	1.5	2.5	3.6		**DIULM9/21(24VDC)**[2] 107022		
12	3.5	5.5	6.5	2	3	4.4		**DIULM12/21(230V50HZ)**[2] 278111		
12	3.5	5.5	6.5	2	3	4.4		**DIULM12/21(24VDC)**[2] 107023		
18	5	7.5	11	2.5	4.5	6.5		**DIULM17/21(230V50HZ)**[2] 278136		
18	5	7.5	11	2.5	4.5	6.5		**DIULM17/21(RDC24)**[2] 107024		
25	7.5	11	14	3.5	6	8.5		**DIULM25/21(230V50HZ)**[2] 278161		
25	7.5	11	14	3.5	6	8.5		**DIULM25/21(RDC24)**[2] 107025		
32	10	15	17	4	7	10		**DIULM32/21(230V50HZ)**[2] 278186		
32	10	15	17	4	7	10		**DIULM32/21(RDC24)**[2] 107026		
40	12.5	18.5	23	5	9	12		**DIULM40/11(230V50HZ)**[2] 278211		
50	15.5	22	30	6	10	14		**DIULM50/11(230V50HZ)**[2] 278236		
65	20	30	35	7	12	17		**DIULM65/11(230V50HZ)**[2] 278261		







Information relevant for export to North America

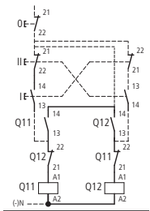
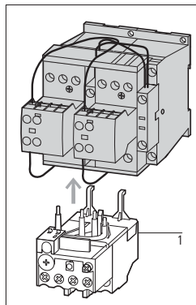
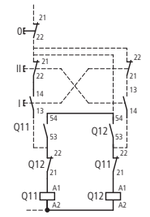
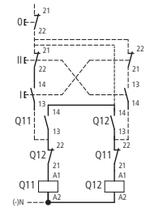
1)

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

Information relevant for export to North America

2)

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified

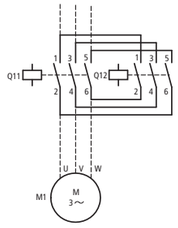
Individual components of the combination		Spare auxiliary contacts			Circuit diagram	Notes
Contactor Q11	Contactor Q12	Q11	Q12	Mechanical interlock		
Part no.	Part no.					
DILEM-10 + 11DILEM	DILEM-10 + 11DILEM	33 34	33 34	+		
DILEM-10-G + 11DILEM	DILEM-10-G + 11DILEM	33 34	33 34	+		
DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	63 64	63 64	+		
DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	63 64	63 64	+		
DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	63 64	63 64	+		
DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	63 64	63 64	+		
DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	63 64	63 64	+		
DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	63 64	63 64	+		
DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	63 64	63 64	+		
DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	63 64	63 64	+		
DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	63 64	63 64	+		
DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	63 64	63 64	+		
DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20	63 64	63 64	+		
DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20	63 64	63 64	+		
DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	–	–	+		
DILM50 + DILM150-XHI11	DILM50 + DILM150-XHI11	–	–	+		
DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI11	–	–	+		

Accessories **Page**

1 Overload relay → 6/8

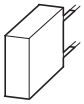
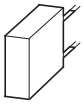
Accessories → 5/56

Reversing contactors



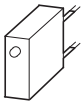
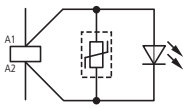
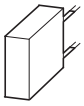
DIULM7/21 to DIULM65/11 with mechanical interlock

Ordering

	Voltage U_s V	For use with	Circuit symbol	**Part no.** Article no.	**Price** See price list	Std. pack	Notes
Suppressor circuits							
RC suppressors							
	24 - 48 AC	DILM7 - DILM15 DILMP20 DILA		**DILM12-XSPR48** 281199		10 Off	For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.
	110 - 240 AC			**DILM12-XSPR240** 281200			
	240 - 500 AC			**DILM12-XSPR500** 281201			
	24 - 48 AC	DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45		**DILM32-XSPR48** 281202			
	110 - 240 AC			**DILM32-XSPR240** 281203			
	240 - 500 AC			**DILM32-XSPR500** 281204			
	24 - 48 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200		**DILM95-XSPR48** 281205			
	110 - 240 AC			**DILM95-XSPR240** 281206			
	240 - 500 AC			**DILM95-XSPR500** 281207			
Varistor suppressors							
	24 - 48 AC	DILM7 - DILM15 DILMP20 DILA		**DILM12-XSPV48** 281208		10 Off	For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.
	48 - 130 AC			**DILM12-XSPV130** 281209			
	130 - 240 AC			**DILM12-XSPV240** 281210			
	240 - 500 AC			**DILM12-XSPV500** 281211			
	24 - 48 AC	DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45		**DILM32-XSPV48** 281212			
	48 - 130 AC			**DILM32-XSPV130** 281213			
	130 - 240 AC			**DILM32-XSPV240** 281214			
	240 - 500 AC			**DILM32-XSPV500** 281215			
	24 - 48 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200		**DILM95-XSPV48** 281216			
	48 - 130 AC			**DILM95-XSPV130** 281217			
	130 - 240 AC			**DILM95-XSPV240** 281218			
	240 - 500 AC			**DILM95-XSPV500** 281219			

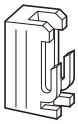
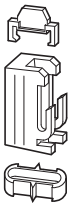
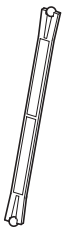
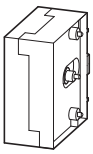
Information relevant for export to North America

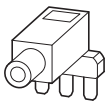
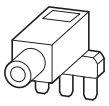
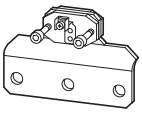
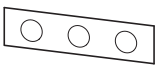
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	227038
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified

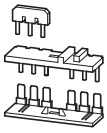
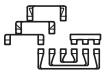
	Voltage U_s V	For use with	Circuit symbol	**Part no.** Article no.	**Price** See price list	Std. pack	Notes
Varistor suppressors with integrated LED							
	24 - 48 AC	DILM7 - DILM15 DILMP20 DILA		**DILM12-XSPVL48** 281220		10 Off	For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.
	130 - 240 AC			**DILM12-XSPVL240** 281221			
	24 - 48 AC	DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45		**DILM32-XSPVL48** 281222			
	130 - 240 AC			**DILM32-XSPVL240** 281223			
	24 - 48 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200		**DILM95-XSPVL48** 281224			
	130 - 240 AC			**DILM95-XSPVL240** 281225			
Diode suppressor							
	12 - 250 DC	DILM7 - DILM15 DILMP20 DILA		**DILM12-XSPD** 101672		10 Off	Additional for integrated suppressor with DC operated contactors. Prevention of negative switch-off voltage when the contactor is used together with a safety PLC.

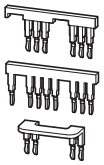
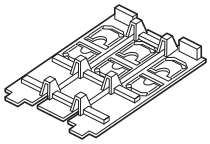
Information relevant for export to North America

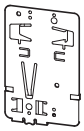
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	227038
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified

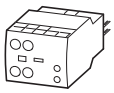
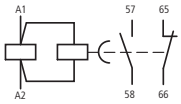
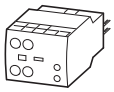
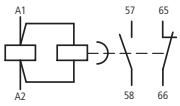
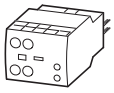
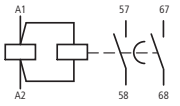
	For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Mechanical interlocks						
For mechanically linking contactors in combinations 0 mm distance between contactors.						
	DILM7 - DILM72 DILA	**DILM32-XVB** 281227		50 Off	–	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-05 NA Certification: UL Recognized, CSA certified
	DILM80 - DILM170	**DILM150-XVB** 281226		10 Off	–	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Mechanical interlocks						
	DILM7 - DILM15 DILMP20 DILA	**DILM12-XMV** 281196		1 Off	For two contactors with AC or DC operation arranged vertically or horizontally. Distance between contactors 0 mm, including contactor connector Mechanical lifespan 2.5 x 10^6 operations. DILM 150-XMV including mounting plate for contactors. Additional auxiliary contact modules possible. → 5/38	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 2411-03 NA Certification: UL Listed, CSA certified
	DILM17 - DILM38	**DILM32-XMV** 281197				
	DILM40 - DILM72	**DILM65-XMV** 281198				Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 2411-03, 3211-04 NA Certification: UL Listed, CSA certified
	DILM80 - DILM170	**DILM150-XMV** 240081				Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 2411-03 NA Certification: UL Listed, CSA certified
	DILM185A, DILM225A, DILM250, DILM300A, DILM400, DILM500, DILM570	**DILM500-XMV** 208289			For contactors with the same or different magnet systems mounted horizontally or vertically, mechanical lifespan 5 x 10^6 operations. **No** auxiliary contact permitted between mechanical interlock and contactor. Combination only with consecutive installation sizes or DILM185A - DILM570.	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-04 NA Certification: UL Listed, CSA certified
	DILM580, DILM650 DILM750, DILM820 DILM1000	**DILM820-XMV** 208288			For contactors with the same or different magnet systems mounted horizontally or vertically, mechanical lifespan 5 x 10^6 operations. **No** auxiliary contact permitted between mechanical interlock and contactor. DILM820-XMV consists of interlock element and mounting plate.	
Set of spare parts for mechanical interlock						
Ball for mechanical interlock, incl. contactor connector.						
–	DILM80 - DILM170	**DILM150-XMVE** 107020		1 Off		UL/CSA certification not required

	For use with	Circuit symbol	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Paralleling links for main contacts							
Consisting of 2 paralleling links							
	DILM7 - DILM15		**DILM12-XP1** 281193		5 Off	4th pole can be broken off AC-1 current carrying capacity of the open contactor increases by a factor of 2.5 Protected against accidental contact in accordance with VDE 0106 Part 100 A cover is included with DILM185-XP1 for protection against accidental contact. Connection cross section for DILM..-XP1 Technical data	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	DILM17 - DILM32		**DILM32-XP1** 281194				
	DILM40 - DILM72		**DILM65-XP1** 281195		1 Off		
	DILM80 - DILM170		**DILM150-XP1** 284769				
	DILM185A		**DILM185-XP1** 208292		1 Off		–
Star-point bridges							
	DILM7 - DILM15		**DILM12-XS1** 281190		20 Off	• Designed as tool-less plug connection • Use as DILA-XHIT... contactor auxiliary contact → 5/40	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	DILM17 - DILM32		**DILM32-XS1** 281191			• Use as DILA-XHIT... contactor auxiliary contact → 5/40	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
	DILM40 - DILM72		**DILM65-XS1** 281192		10 Off	–	UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-04 NA Certification: UL Listed, CSA certified
	DILM80 - DILM170		**DILM150-XS1** 284768		5 Off	–	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
	DILM185A - DILM400		**DILM400-XS1** 208291		1 Off	A cover is included for protection against accidental contact.	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-04 NA Certification: UL Listed
	DILM500		**DILM500-XS1** 208290			A cover is included for protection against accidental contact.	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29096 UL CCN: NLDX NA Certification: UL Listed

	For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Star-delta wiring kit Main current wiring for star-delta combination Including star-point bridge							
	DILM7/9/12/15 mains contactors DILM7/9/12/15 delta contactors DILM7/9/12/15 star contactors	**DILM12-XSL** 283130		1 Off	• Designed for tool-less plug connection • Use as DILA-XHIT... contactor auxiliary contact → 5/40 The following control cables are integrated in addition to electrical interlock: • Q13: A1 - Q15: 21 • Q13: 21 - Q15: A1 • Q13: A2 - Q15: A2	Product Standards CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking 012528 3211-05 CSA certified
	DILM17/25/32 mains contactors DILM17/25/32 delta contactors DILM17/25/32 star contactors	**DILM32-XSL** 283131			Consists of the following connection bridges: • Mains - delta contactors • Delta - star contactors • Star-point bridge	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 3211-04 UL Listed, CSA certified
	DILM40/50/65 mains contactors DILM40/50/65 delta contactors DILM40/50/65 star contactors	**DILM65-XSL** 101058					
	DILM 80/95 mains contactors DILM80/95 delta contactors DILM50/65 star contactors	**DILM95-XSL** 101486		1 Off		–	
	DILM 115/150 mains contactors DILM115/150 delta contactors DILM80/95/115 star contactors	**DILM150-XSL** 101487		1 Off		Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 2411-03, 3211-04 UL Listed, CSA certified
	DILM 185/225 mains contactors DILM185/225 delta contactors DILM115/150 star contactors	**DILM225-XSL** 101488		1 Off		–	

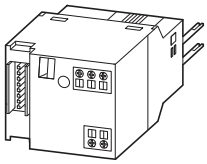
	For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Reversing starter wiring kits						
Main current wiring for reversing combinations						
	DILM7 DILM9 DILM12	**DILM12-XRL** 283108		1 Off	• Designed for tool-less plug connection • As auxiliary contact DILA-XHIT...use → 5/40 The following control cables are integrated in addition to electrical interlock: • Q11: A1 - Q12: 21 • Q11: 21 - Q12: A1 • Q11: A2 - Q12: A2	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	DILM17 DILM25 DILM32	**DILM32-XRL** 283109			–	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 3211-04 NA Certification: UL Listed, CSA certified
	DILM40 DILM50 DILM65	**DILM65-XRL** 101057			–	
	DILM80 DILM95 DILM115 DILM150	**DILM150-XRL** 101681			–	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 2411-03, 3211-04 NA Certification: UL Listed, CSA certified
IP2X cover set						
	DILM17 DILM25 DILM32 DILM38 DILMP32 DILMP45	**DILM32-XIP2X** 118855		1 Off	Each cover set consists of two three-pole and two single-pole covers.	UL/CSA certification not required
	DILM40 DILM50 DILM65 DILM72 DILMP63 DILMP80	**DILM65-XIP2X** 106491		8 Off	2 covers are required per phase The cover set consists of 8 covers	UL/CSA certification not required
	DILM80 DILM95 DILM115 DILM150 DILM170 DILMP125 DILMP160 DILMP200 ZB150	**DILM150-XIP2X** 106492				UL/CSA certification not required

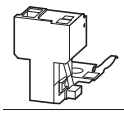
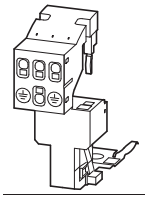
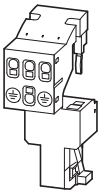
	For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Three-phase commoning links							
Protected against accidental contact, short-circuit proof, U_e = 690 V, I_u = 35 A Can be extended by rotating by mounting							
	DILM7 DILM9 DILM12 DILM15	**DILM12-XDSB0/3** 240084		5 Off	Suitable for 3 contactors. Length 112 mm	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 2411-03 UL Listed, CSA certified
	DILM7 DILM9 DILM12 DILM15	**DILM12-XDSB0/4** 240085			Suitable for 4 contactors. Length 157 mm		
	DILM7 DILM9 DILM12 DILM15	**DILM12-XDSB0/5** 240086			Suitable for 5 contactors. Length 202 mm		
Incoming connection block							
–	DILM7 DILM9 DILM12 DILM15	**DILM12-XEK** 240083		5 Off	For three-phase commoning link, protected against accidental contact, U_e = 690 V, I_u = 35 A. Terminal capacities: Stranded 2.5…16 mm² Flexible with ferrule 2.5…16 mm² AWG14…8	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 2411-03 UL Listed, CSA certified
Adapter plate							
Enables clipping on of switches on to DIN rails							
	DILM80 DILM95 DILM115 DILM150 DILM170	**NZM2-XC75** 260215		1 Off	For top-hat rail 75 mm	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E140305 DIHS 022086 1437-01 UL Listed, CSA certified

		For use with	Circuit symbol	Part no. Article no.	Price See price list	Std. pack	Notes
Electronic timer modules							
On-delayed Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits							
	24 V AC/DC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		**DILM32-XTEE11(RA24)** 101440		1 Off	Time range can be selected 0.05 s...1 s 0.5 s...10 s 5 s...100 s
	100 … 130 V AC			**DILM32-XTEE11(RAC130)** 101441			
	200 … 240 V AC			**DILM32-XTEE11(RAC240)** 101442			
Off-delayed, auxiliary voltage-free Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits							
	24 V AC/DC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		**DILM32-XTED11-1(RA24)** 105210		1 Off	Time range 0.05 s...1 s
				DILM32-XTED11-10(RA24) 104943			Time range 0.5 s...10 s
				DILM32-XTED11-100(RA24) 104946			Time range 5 s...100 s
	100 … 130 V AC			**DILM32-XTED11-1(RAC130)** 105211			Time range 0.05 s...1 s
				DILM32-XTED11-10(RAC130) 104944			Time range 0.5 s...10 s
				DILM32-XTED11-100(RAC130) 104947			Time range 5 s...100 s
	200 … 240 V AC			**DILM32-XTED11-1(RAC240)** 105212			Time range 0.05 s...1 s
				DILM32-XTED11-10(RAC240) 104945			Time range 0.5 s...10 s
				DILM32-XTED11-100(RAC240) 104948			Time range 5 s...100 s
For star-delta applications Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits							
	24 V AC/DC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		**DILM32-XTEY20(RA24)** 101446		1 Off	Changeover time 1...30 s 50 ms changeover delay Sample circuit → Page 5/96
	100 … 130 V AC			**DILM32-XTEY20(RAC130)** 101447			
	200 … 240 V AC			**DILM32-XTEY20(RAC240)** 101448			

Information relevant for export to North America

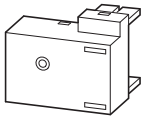
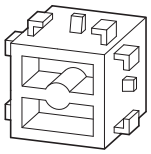
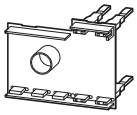
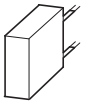
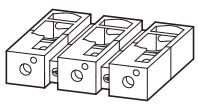
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
SWD contactor modules						
SmartWire-Darwin module for installation on contactors. One module per contactor						
	Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. Messages: Contactor switch status, status of the digital inputs 1 and 2. Commands: Contactor actuation	DILM(C)7… - DILM(C)32 DILM38 DILA	**DIL-SWD-32-001**[1] 118560		5 Off	• Take into account the max. current consumption of the contactor coils per SmartWire-Darwin line. • A2 terminals must not be bridged. • Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used. • Connection terminals for electrical interlocking are not suitable for safety technology.
	Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Messages: contactor switching position, status of the digital inputs 1 and 2, 1-0-A switch position. Commands: Contactor actuation	DILM(C)7… - DILM(C)32 DILM38 DILA	**DIL-SWD-32-002**[1] 118561		5 Off	

	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Wiring set for motor feeder plug					
PE module with contact plate 	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	**DILM12-XMCE**[2] 121764		5 Off	35x7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: PE 0.75 – 4 mm²
Motor plate with PE module and contact plate 	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	**DILM12-XMCP/E**[2] 121769		1 Off	35x7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: L1, L2, L3, PE 0.75 – 2.5 mm²
	PKZM0/PKE + DILM(C)7 PKZM0/PKE + DILM(C)9 PKZM0/PKE + DILM(C)12 PKZM0/PKE + DILM(C)15 MSC-D(E)-…-M7… MSC-D(E)-…-M9… MSC-D(E)-…-M15…	**DILM12-XMCP/T**[2] 121770		1 Off	For connection of: L1, L2, L3, PE 0.75 – 2.5 mm²

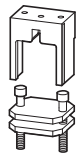
Information relevant for export to North America

1) NA Certification Request filed for UL and CSA
2) Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
NA Certification Request filed for UL and CSA

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Motor suppressor module							
Can be used at 380…575 V 50/60 Hz.							
	DILM7 - DILM15	**DILM12-XMSM** 109399		4 Off	• Tool-less version using tool-less plug connection • RC suppressor • Ambient temperature -25…+60 °C, open. • Insulated material, difficult to ignite according to UL 94. • Weight = 0.05 kg. • UL/CSA approval applied for	Product Standards UL File No. UL CCN NA Certification	IEC/EN 60947-4-1; UL 508; CE marking E300273 NMTR2 UL Recognized
Test block							
Suitable for switching on contactor off-load							
	DILM7 - DILM38 DILA	**DILM32-XMAN** 110955		1 Off	–	UL/CSA certification not required	
Printed board contact							
For the adaption of a control circuit on a printed-circuit board							
	DILM7 - DILM15 DILA	**DILM12-XPBC** 109400		4 Off	–	–	
Load resistor							
For DC contactors in order to increase power consumption							
	DILM17 DILM25 DILM32 DILM38 DILMP32 DILMP45	**DILM32-XSPLW24** 112419		1 Off	Installed in a suppressor circuit enclosure. Required when using special PLC outputs for actuation, e.g.: Beckhoff safety controllers.	Product Standards CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; CSA-C22.2 No. 14-05; CE marking 225135 3211-07 CSA certified
Extension terminals							
	DILM80 DILM95 DILM115 DILM150 DILM170	**DILM150-XZK** 104486		10 Off	Can be fitted on every main terminal of the contactor. Connection options: maximum 2 x 4 mm² solid maximum 2 x 2.5 mm² flexible with ferrule	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 NKCR 012528 2411-03, 2411-04 UL Listed, CSA certified
Cable terminal block							
With control circuit terminal Consisting of three flat ribbon terminals							
	DILM250 DILM300A DILM400	**DILM400-XKU-S** 208293		1 Off	Connection options: round conductors, flexible and stranded, ribbon cables.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 NKCR 012528 3211-04 UL Listed, CSA certified

Flat strip conductor terminal kit

With control cable connection

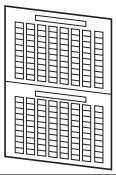
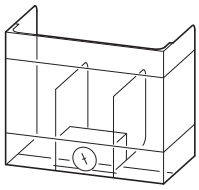
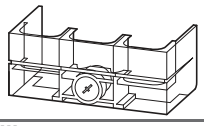
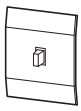
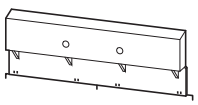


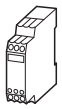
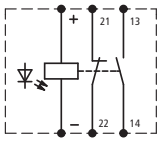
For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
DILM580 DILM650 DILM750 DILM820	**DILM820-XKB-S** 208295		1 Off	Connection options: ribbon cables	

Connection terminal sets for North America

Consist of three individual terminals

Conductor material	Cross-section X number of cores mm²	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Copper, aluminum	2 x (AWG4 … MCM500)	DILM500/22	**DILM500-XK-CNA** 232192		1 Off	Including cover With control cable connection	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-04 NA Certification: UL Listed, CSA certified
Copper, aluminum	4 x (AWG2 … MCM500)	DILM580/22 DILM650/22 DILM750/22 DILM820/22	**DILM820-XK-CNA** 232194				

Description	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Sealable shrouds						
Transparent						
	DILM32-XTE…	**DILM32-XTEPLH** 101449		1 Off	–	–
Device labelling, label sheet						
7.5 x 17 mm Colour: yellow HKS 3 (≈RAL 1018)						
	Labelling with laser printer, plotter, film plotter, copier	**XGKE-GE** 207517		25 Off	1 off = 1 sheet 240 labels per sheet 1 sheet = DIN A4, Can be split into two DIN A5 sheets	UL/CSA certification not required
Covers						
Terminal cover						
	DILM185A DILM225A	**DILM225A-XHB** 139560		1 Off	To provide terminals with protection against accidental contact vertical from the front	UL/CSA certification not required
	DILM250 DILM300A DILM400	**DILM400-XHB** 208287				
	DILM500	**DILM500-XHB** 208286				
	DILM580 DILM650	**DILM650-XHB** 208285				
	DILM750 DILM820, DILM1000	**DILM820-XHB** 208284				
Shroud for star-point bridge						
	DILM400-XS1	**DILM400-XHBS1** 101687		1 Off	Can be combined with star-delta wiring kits DILM250-XSL and DILM400-XSL.	UL/CSA certification not required
Auxiliary contact seat cover						
	DILM7 - DILM38 DILMP32 DILMP45 DILA DILL	**DILM32-XAB** 129538		10 Off	For preventing manual actuation. Cannot be combined with additional surface mounting accessories.	UL/CSA certification not required
	DILM40 - DILM170 DILMP63 - DILMP200	**DILM150-XAB** 121712				
Suppressor circuits for vacuum contactors (on load side)						
	DILM580 DILM650 DILM750 DILM820 DILM1000	**DILM1000-XSM** 125947		1 Off	For damping the cutout overvoltage when switching off inductive loads.	NA Certification Request filed for UL and CSA
	DILH2000 DILH2200 DILH2600	**DILH2600-XSM** 125946				

Rated operational current AC-15 230 V I_e A	Rated operational current AC-15 400 V I_e A	Rated operational current DC 220 V I_e A	Actuating voltage U_s V DC	Actuating current I mA	Circuit symbol	For use with	**Part no.**	**Price** See price list	Std. pack	**Information relevant for export to North America**
Amplifier module for separate mounting										
Input with integrated suppressor circuit for overvoltage limitation										
 2	2	0.03	24	25		...DILM DIMLP... DILL... DILK...	**ETS4-VS3** 083094		1 Off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 2411-03, 3211-04 NA Certification: UL Listed, CSA certified

Notes Contactor coils with rated operational current > 2 A must be actuated via the DILER-G mini contactor relay.
Rated operational current DC:
Making and breaking conditions DC-13, time L/R 300ms

For use with	DC voltage **Part no.** Article no.	**Prices** See price list	AC voltage **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Individual coils						
 DILM17 DILM25 DILM32 DILM38	**DILM32-XSP(RDC24)**[1] 281155		**DILM32-XSP(230V50HZ,240V60HZ)** 281141		1 Off	For additional actuating voltages → Page 5/79
DILM40 DILM50 DILM65 DILM72	**DILM65-XSP(RDC24)**[1] 281185		**DILM65-XSP(230V50HZ,240V60HZ)** 281171			
DILM80 DILM95	**DILM95-XSP(RDC24)**[1] 230080		**DILM95-XSP(230V50HZ,240V60HZ)** 230062			
DILM115 DILM150 DILM170	**DILM150-XSP(RDC24)**[1] 230115		**DILM150-XSP(RAC240)**[1] 230112			
DILM185A DILM225A	**DILM225A-XSP(RDC24)**[1] 139568		**DILM225A-XSP(RAC240)**[1] 139565			

Notes [1] Incl. electronic module

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified

	For use with	DC voltage **Part no.** Article no.	**Price** See price list	AC voltage **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Electronic modules including coils							
	DILM250 DILM300A	**DILM250-XSP/E(RA250)**[1] 208252		**DILM250-XSP/E(RA250)**[1] 208252		1 Off	For additional actuating voltages → Page 5/81
	DILM400 DILM500	**DILM500-XSP/E(RA250)**[1] 208256		**DILM500-XSP/E(RA250)**[1] 208256			
	DILM580 DILM650 DILM750 DILM820 DILM1000	**DILM1000-XSP/E(RA250)**[1] 289145		**DILM1000-XSP/E(RA250)**[1] 289145			
	DILH1400	–		**DILH1400-XSP/E(RAW250)**[2] 289161			
	DILM250-S DILM300A-S	–		**DILM250-S-XSP/E(220-240V50/60HZ)**[2] 274202			
	DILM400-S DILM500-S	–		**DILM500-S-XSP/E(220-240V50/60HZ)**[2] 274205			

1)

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	1017510
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

2)

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

CMD HPL05068EN

Description, ordering



General

For safety-related off switching to safety category 3 and 4 according to EN 954-1, at present two contactors must be used in series. Especially with larger contactors this is an expensive solution.

Application

This is where the CMD can be used. The function of the CMD is to monitor the main contacts of a contactor against welding. For this the control voltage of the contactor is compared with the state of the main contacts which is reliably monitored using a mirror contact (IEC EN 60947-4-1 Annex F). If the coil is de-energized and the contactor does not drop out the CMD trips the upstream circuit-breaker/motor protective circuit breaker/switch-disconnector via a shunt release.

Safety

The CMD has a safety-compliant design so that in safety combinations with a circuit-breaker/motor protective circuit breaker/switch disconnector the reliable switch off in the case of a "welded contactor" can be guaranteed. In this application it replaces the series connection of a second contactor. As a component it conforms to safety category 3 according to EN 954-1 and EN ISO 13849.

Mounting

The CMD can be combined with the following Eaton components:

- Contactors:
  - DILEM
  - DILM7 to DILM150
  - DILM185(-S) to DILM500(-S):
  - DILM580 to DILM1600
  - DILH1400 … DILH2000
  - SE-1A-PKZ2 and S-PKZ2

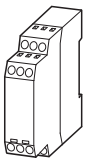
For the wiring of the CMD the auxiliary N/C contact, mirror contact must be according to IEC/EN 60947-4-1 and the auxiliary N/O contact must be interlocked and opposing according to IEC/EN 60947-5-1. Also the auxiliary N/C contact for the feedback circuit must have a mirror contact function according to IEC/EN 60947-4-1.

- Motor-protective circuit-breakers/ circuit-breakers:
  - PKZ2 + U-PKZ2(18VDC)
  - NZM1 + NZM1-XUVL
  - NZM2 + NZM2/3-XUV
  - NZM3 + NZM2/3-XUV
  - NZM4 + NZM4-XUV
  - N1 + NZM1-XUVL
  - N2 + NZM2/3-XUV
  - N3 + NZM2/3-XUV
  - N4 + NZM4-XUV

Auxiliary contact requirements per contactor:

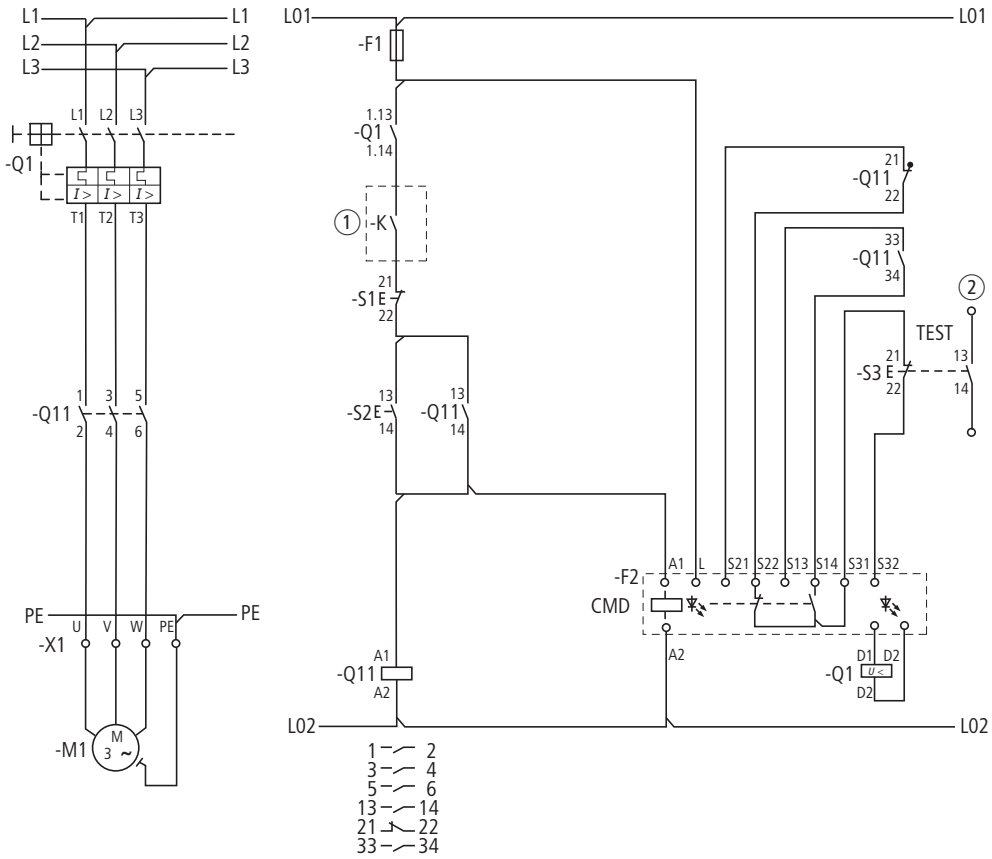
	CMD	Self maintaining	Feedback circuit	Electrical interlock
DOL starter	1 N/O + 1 N/C	1S	1 B	
Reversing starter	1 N/O + 1 N/C	1S	1 B	1 B

Ordering

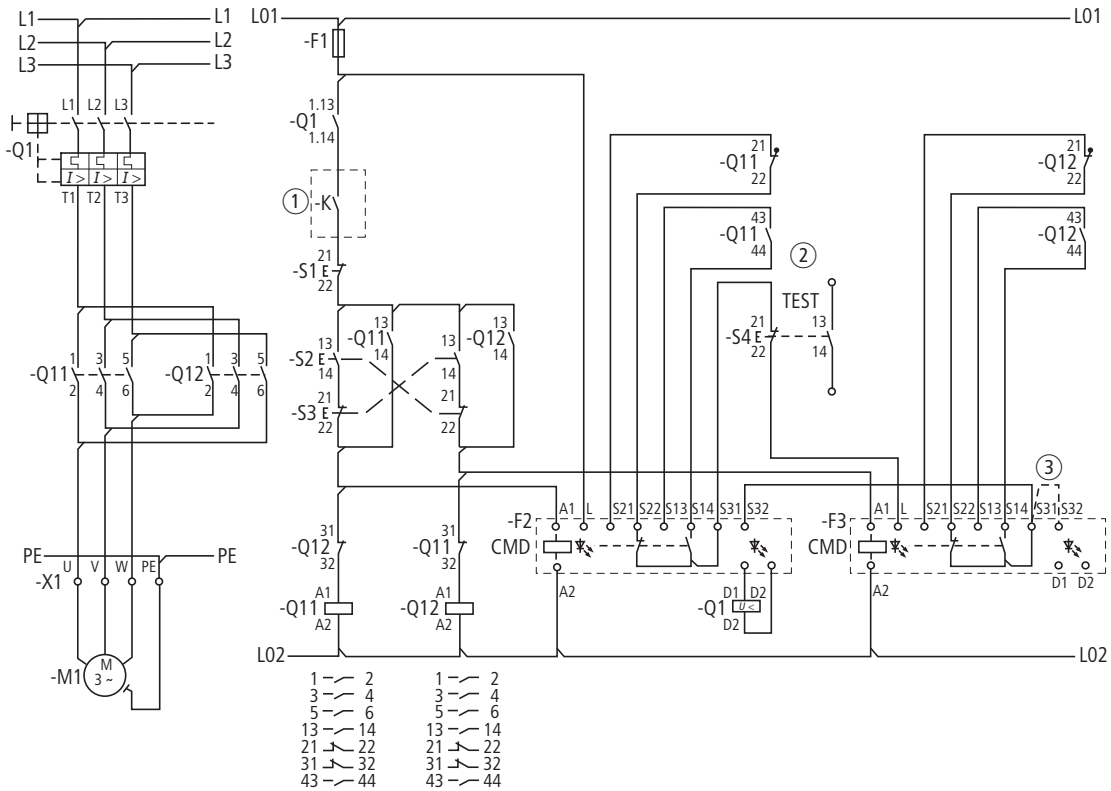
	Part no. Article no.	Price See Price List	Std. pack
CMD contactor monitoring device			
	**CMD(24VDC)** 106170		1 Off
	CMD(220-240VAC) 106172		1 Off

Engineering

DOL starter



Reversing starter



① Switching by safety relay of safety PLC
② Signal contact to PLC evaluation
③ CMD (24VDC)

Ordering

AC	DILER-40(...)	DILER-31(...)	DILER-22(...)	DILEEM-10(...)	DILEEM-01(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list
24V 50Hz	010094	010251	010344	051604	051629
48V 50Hz	010190	010044	010201	051603	051628
240V 50Hz	010478	010300	010138	051602	051627
115V 60Hz	010270	010204	010211	051598	051624
42V 50Hz, 48V 60Hz	–	–	–	051612	051637
110V 50Hz, 120V 60Hz	051756	051765	051774	051611	051636
190V 50Hz, 220V 60Hz	051757	051766	051775	051610	051635
220V 50Hz, 240V 60Hz	051758	051767	051776	051609	051634
230V 50Hz, 240V 60Hz	051759	051768	051777	051608	051633
380V 50Hz, 440V 60Hz	051760	051769	051778	051607	051632
400V 50Hz, 440V 60Hz	051761	051770	051779	051606	051631
415V 50Hz, 480V 60Hz	051762	051771	051780	051605	051630
24V 50/60Hz	021924	021594	021704	051596	051621
42V 50/60Hz	033459	029869	029433	051595	051620
110V 50/60Hz	021961	021624	021871	051592	051618
230V 50/60Hz	052725	052509	052508	056674	058771
DC	**DILER-40-G(...)**	**DILER-31-G(...)**	**DILER-22-G(...)**	**DILEEM-10-G(...)**	**DILEEM-01-G(...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list
12V DC	079711	079761	080728	051644	051649
24V DC	010223	010157	010042	051643	051650
48V DC	010255	010205	010346	051642	051648
110V DC	010287	010253	010043	051640	051646
220V DC	010303	010269	010091	051639	051645

Notes [1] To obtain the article number for ordering, read under selected part number and actuating voltage from the table. Devices with dual-voltage coils are to be ordered under a single article number.

AC		**DILEM-10(...)**	**DILEM-01(...)**	**DILEM12-10(...)**	**DILEM12-01(...)**	**DILEM4(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list
24V 50Hz		010005	010086	127067	127083	014754
48V 50Hz		010020	010294	–	–	–
240V 50Hz		010032	010151	–	–	014305
115V 60Hz		010024	010470	–	–	–
42V 50Hz, 48V 60Hz		051782	051791	–	–	–
110V 50Hz, 120V 60Hz		051783	051792	127072	127088	051801
190V 50Hz, 220V 60Hz		051784	051793	–	–	–
220V 50Hz, 240V 60Hz		051785	051794	–	–	051803
230V 50Hz, 240V 60Hz		051786	051795	–	–	051804
380V 50Hz, 440V 60Hz		051787	051796	–	–	–
400V 50Hz, 440V 60Hz		051788	051797	–	–	051806
415V 50Hz, 480V 60Hz		051789	–	–	–	–
24V 50/60Hz		021417	020402	127079	127095	022044
42V 50/60Hz		032174	033233	–	–	–
110V 50/60Hz		021455	020436	127081	127097	–
230V 50/60Hz		052302	051114	127082	127098	052506
DC		**DILEM-10-G(...)**	**DILEM-01-G(...)**	**DILEM12-10-G(...)**	**DILEEM12-01-G(...)**	**DILEM4-G(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list
12V DC		079594	079642	–	–	079680
24V DC		010213	010343	127132	127137	012701
48V DC		010245	010496	–	–	–
110V DC		010309	010136	–	–	–
220V DC		010325	010168	–	–	–

Notes

[1] To obtain the article number for ordering, read under selected part number and actuating voltage from the table. Devices with **dual-voltage coils** are to be ordered under a **single** article number.



AC	With screw terminals			With Spring-loaded terminals		
	DILA-40(...)	**DILA-31(...)**	**DILA-22(...)**	**DILAC-40(...)**	**DILAC-31(...)**	**DILAC-22(...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz	276316	276351	276386	276431	276463	276495
240V 50Hz	276318	276353	276388	–	–	–
110V 50Hz 120V 60Hz	276326	276361	276396	276438	276470	276502
190V 50Hz 220V 60Hz	276327	276362	276397	–	–	–
220V 50Hz 240V 60Hz	276328	276363	276398	–	–	–
230V 50Hz 240V 60Hz	276329	276364	276399	276441	276473	276505
380V 50Hz 440V 60Hz	276330	276365	276400	–	–	–
400V 50Hz 440V 60Hz	276331	276366	276401	–	–	–
24V 50Hz/60Hz	276333	276368	276403	276445	276477	276509
42V 50Hz/60Hz	276334	276369	276404	–	–	–
110V 50Hz/60Hz	276335	276370	276405	–	–	–
220V 50Hz/60Hz	276336	276371	276406	–	–	–
230V 50Hz/60Hz	276337	276372	276407	276449	276481	276513
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz(12-500V)[3]	276341	276376	276411	276453	276485	276517
...V 60Hz(12-600V)[3]	276342	276377	276412	276454	276486	276518
DC	**With screw terminals**			**With Spring-loaded terminals**		
	DILA-40(...)	**DILA-31(...)**	**DILA-22(...)**	**DILAC-40(...)**	**DILAC-31(...)**	**DILAC-22(...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276344	276379	276414	276456	276488	276520
48V DC	276345	276380	276415	–	–	–
110V DC	276347	276382	276417	276459	276491	276523
220V DC	276348	276383	276418	276460	276492	276524
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list	See price list	See price list	See price list
...V DC(12-250V)[3]	276349	276384	276419	276461	276493	276525

Notes

[1] The article number is a combination of part no. and operating voltage devices with dual-voltage coils can be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] Minimum order quantity 10 units

AC	**DILM7-10 (...)**	**DILM7-01 (...)**	**DILM9-10 (...)**	**DILM9-01 (...)**	**DILM12-10 (...)**	**DILM12-01 (...)**	**DILM15-10 (...)**	**DILM15-01 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz	276537	276572	276677	276712	276817	276852	290045	290080
240V 50Hz	276539	276574	276679	276714	276819	276854	–	–
42V 50Hz 48V 60Hz	276546	–	276686	–	276826	–	–	–
110V 50Hz 120V 60Hz	276547	276582	276687	276722	276827	276862	290055	290090
190V 50Hz 220V 60Hz	276548	276583	276688	276723	276828	276863	–	–
220V 50Hz 240V 60Hz	276549	276584	276689	276724	276829	276864	–	–
230V 50Hz 240V 60Hz	276550	276585	276690	276725	276830	276865	290058	290093
380V 50Hz 440V 60Hz	276551	276586	276691	276726	276831	276866	–	–
400V 50Hz 440V 60Hz	276552	276587	276692	276727	276832	276867	–	–
415V 50Hz 480V 60Hz	276553	–	276693	–	276833	–	–	–
24V 50Hz/60Hz	276554	276589	276694	276729	276834	276869	290062	290097
42V 50Hz/60Hz	276555	276590	276695	276730	276835	276870	–	–
110V 50Hz/60Hz	276556	276591	276696	276731	276836	276871	–	–
220V 50Hz/60Hz	276557	276592	276697	276732	276837	276872	–	–
230V 50Hz/60Hz	276558	276593	276698	276733	276838	276873	290066	290101
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (12 – 600V) [3]	276562	276597	276702	276737	276842	276877	290070	290105
...V 60Hz (12 – 600V) [3]	276563	276598	276703	276738	276843	276878	290071	290106

DC	**DILM7-10 (...)**	**DILM7-01 (...)**	**DILM9-10 (...)**	**DILM9-01 (...)**	**DILM12-10 (...)**	**DILM12-01 (...)**	**DILM15-10 (...)**	**DILM15-01 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276565	276600	276705	276740	276845	276880	290073	290108
48V DC	276566	276601	276706	276741	276846	276881	–	–
110V DC	276568	276603	276708	276743	276848	276883	–	–
220V DC	276569	276604	276709	276744	276849	276884	–	–
Special voltages other than the already shown normal voltages[2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V DC (12-250V) [3]	276570	276605	276710	276745	276850	276885	290078	290113

Notes

[1] To obtain the article number for ordering, read under selected part number and actuating voltage from the table. devices with dual-voltage coils can be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] Minimum order quantity 10 units



AC		**DILM17-10 (...)**	**DILM17-01 (...)**	**DILM25-10 (...)**	**DILM25-01 (...)**	**DILM32-10 (...)**	**DILM32-01 (...)**	**DILM38-10(...)**	**DILM38-01(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz		276991	277023	277119	277151	277247	277279	112378	112446
240V 50Hz		276993	–	277121	–	277249	–	112420	–
42V 50Hz 48V 60Hz		277000	–	277128	–	277256	–	112424	–
110V 50Hz 120V 60Hz		277001	277033	277129	277161	277257	277289	112425	112454
190V 50Hz 220V 60Hz		277002	–	277130	–	277258	–	112426	–
220V 50Hz 240V 60Hz		277003	–	277131	–	277259	–	112427	–
230V 50Hz 240V 60Hz		277004	277036	277132	277164	277260	277292	112428	112457
380V 50Hz 440V 60Hz		277005	–	277133	–	277261	–	112429	–
400V 50Hz 440V 60Hz		277006	277038	277134	277166	277262	277294	112430	112459
415V 50Hz 480V 60Hz		277007	–	277135	–	277263	–	112431	–
24V 50Hz/60Hz		277008	277040	277136	277168	277264	277296	112432	112461
42V 50Hz/60Hz		277009	–	277137	–	277265	–	112433	–
110V 50Hz/60Hz		277010	277042	277138	277170	277266	277298	112434	112463
220V 50Hz/60Hz		277011	277043	277139	277171	277267	277299	112435	112464
230V 50Hz/60Hz		277012	277044	277140	277172	277268	277300	112436	112465
Special voltages other than the already shown normal voltages [2]		See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (24 – 600V)		277016 [7]	277048 [7]	277144 [7]	277176 [7]	277272 [7]	277304 [8]	112440 [7]	112468 [7]
...V 60Hz (24 – 600V)		277017 [7]	277049 [7]	277145 [7]	277177 [7]	277273 [7]	277305 [8]	112441 [7]	112469 [7]
DC		**DILM17-10(...)**	**DILM17-01(...)**	**DILM25-10(...)**	**DILM25-01(...)**	**DILM32-10(...)**	**DILM32-01(...)**	**DILM38-10(...)**	**DILM38-01(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RDC 24 [3]		277018	277050	277146	277178	277274	277306	112442	112470
RDC 60 [4]		277019	277051	277147	277179	277275	277307	112443	112471
RDC 130 [5]		277020	277052	277148	277180	277276	277308	112444	112472
RDC 240 [6]		277021	277053	277149	277181	277277	277309	112445	112473

Notes

[1] To obtain the article number for ordering, read under selected part number and actuating voltage from the table. devices with dual-voltage coils can be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] 24 – 27 V DC
[4] 48 – 60 V DC
[5] 110 – 130 V DC
[6] 200 – 240 V DC
[7] Minimum order quantity 10 units
[8] Minimum order quantity 5 units

AC		**DILM40(...)**	**DILM50(...)**	**DILM65(...)**	**DILM72(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list
24V 50Hz		277753	277817	277881	–
240V 50Hz		277755	277819	277883	109183
42V 50Hz **48V 60Hz**		277762	277826	277890	–
110V 50Hz **120V 60Hz**		277763	277827	277891	109191
190V 50Hz **220V 60Hz**		277764	277828	277892	–
220V 50Hz **240V 60Hz**		277765	277829	277893	–
230V 50Hz **240V 60Hz**		277766	277830	277894	107670
380V 50Hz **440V 60Hz**		277767	277831	277895	–
400V 50Hz **440V 60Hz**		277768	277832	277896	109195
415V 50Hz **480V 60Hz**		277769	277833	277897	–
24V 50Hz/60Hz		277770	277834	277898	109197
42V 50Hz/60Hz		277771	277835	277899	–
110V 50Hz/60Hz		277772	277836	277900	109199
220V 50Hz/60Hz		277773	277837	277901	109200
230V 50Hz/60Hz		277774	277838	277902	109201
Special voltages other than the already shown normal voltages [2]		See price list	See price list	See price list	See price list
...V 50Hz (24 – 600V)		277778 [8]	277842 [8]	277906 [8]	109205 [7]
...V 60Hz (24 – 600V)		277779 [8]	277843 [8]	277907 [8]	109206 [7]
DC		**DILM40(...)**	**DILM50(...)**	**DILM65(...)**	**DILM72(...)**
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list
RDC 24 [3]		277780	277844	277908	107671
RDC 60 [4]		277781	277845	277909	–
RDC 130 [5]		277782	277846	277910	–
RDC 240 [6]		277783	277847	277911	109209

Notes

[1] To obtain the article number for ordering, read under selected part number and actuating voltage from the table.
devices with dual-voltage coils can be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] 24 – 27 V DC
[4] 48 – 60 V DC
[5] 110 – 130 V DC
[6] 200 – 240 V DC
[7] Minimum order quantity 10 units

DILM

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AC		DILM80 (...)	DILM95 (...)
		Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list
24 V 50 Hz		235904	239467
240V 50Hz		235910	239469
42V 50Hz 48V 60Hz		239394	239476
110V 50Hz 120V 60Hz		239399	239477
190V 50Hz 220V 60Hz		239400	239478
220V 50Hz 240V 60Hz		239401	239479
230V 50Hz 240V 60Hz		239402	239480
380V 50Hz 440V 60Hz		239403	239481
400V 50Hz 440V 60Hz		239404	239482
415V 50Hz 480V 60Hz		239405	239483
24V 50Hz/60Hz		239406	239484
42V 50Hz/60Hz		239407	239485
110V 50Hz/60Hz		239408	239486
220V 50Hz/60Hz		239409	239487
230V 50Hz/60Hz		239410	239488
Special voltages other than the already shown normal voltages [2]		See price list	See price list
...V 50Hz (24 – 600V) [13]		239414	239504
...V 60Hz (24 – 600V) [13]		239415	239509

DC		DILM80 (...)	DILM95 (...)
		Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list
RDC 24[3]		239416	239510
RDC 60[4]		239417	239511
RDC 130[5]		239418	239512
RDC 240[6]		239419	239513

AC		DILM115 (...)	DILM150 (...)	DILM170 (...)	DILM185A/22(...)	DILM225A/22(...)
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list
RAC 24[7]		239545	239585	107010	139534	139544
RAC 48[8]		239546	239586	107011	139535	139545
RAC 120[9]		239547	239587	107012	139536	139546
RAC 240[10]		239548	239588	107013	139537	139547
RAC 440[11]		239549	239589	107014	139538	139548
RAC 500[12]		239550	239590	107015	139539	139549

DC		DILM115 (...)	DILM150 (...)	DILM170 (...)	DILM185A/22(...)	DILM225A/22(...)
		Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages		See price list	See price list	See price list	See price list	See price list
RDC 24[3]		239555	239591	107016	139540	139550
RDC 60[4]		239560	239592	107017	139541	139551
RDC 130[5]		239567	239593	107018	139542	139552
RDC 240[6]		239572	239594	107019	139543	139553

Notes

1) The article no. results from combining the part no. and the actuating voltage.
Devices with dual-voltage coils must be ordered under a single article no.
2) With non-standard voltages the required actuating voltage from the defined range
(...–...V) must be stated.
3) 24 - 27 V DC
4) 48 – 60 V DC
5) 110 - 130 V DC
6) 200 - 240 V DC
7) 24 V 50/60 Hz
8) 42 – 48 V 50/60 Hz
9) 100 – 120 V 50/60 Hz
10) 190 – 240 V 50/60 Hz
11) 380 – 440 V 50/60 Hz
12) 480 – 500 V 50/60 Hz
13) Minimum order quantity 5 units

AC	DILMC7-10 (...)	DILMC7-01 (...)	DILMC9-10 (...)	DILMC9-01 (...)	DILMC12-10 (...)	DILMC12-01 (...)	DILMC15-10 (...)	DILMC15-01 (...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24 V 50 Hz	277379	277411	277443	277475	277507	277539	293938	293933
110V 50Hz 120V 60Hz	277386	277418	277450	277482	277514	277546	293908	293943
230V 50Hz 240V 60Hz	277389	277421	277453	277485	277517	277549	293911	293946
24V 50Hz/60Hz	277393	277425	277457	277489	277521	277553	293915	293950
230V 50Hz/60Hz	277397	277429	277461	277493	277525	277557	293919	293954
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (12 – 600V)[6]	277401	277433	277465	277497	277529	277561	293923	293958
...V 60Hz (12 – 600V)[6]	277402	277434	277466	277498	277530	277562	293924	293959

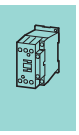
DC	DILMC7-10 (...)	DILMC7-01 (...)	DILMC9-10 (...)	DILMC9-01 (...)	DILMC12-10 (...)	DILMC12-01 (...)	DILMC15-10 (...)	DILMC15-01 (...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	277404	277436	277468	277500	277532	277564	293926	293961
110V DC	277407	277439	277471	277503	277535	277567	293929	293964
220V DC	277408	277440	277472	277504	277536	277568	293930	293965
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...VDC (12 – 250V)[6]	277409	277441	277473	277505	277537	277569	293931	293966

AC	DILMC17-10 (...)	DILMC17-01(...)	DILMC25-10 (...)	DILMC25-01 (...)	DILMC32-10 (...)	DILMC32-01 (...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
24 V 50 Hz	277570	277600	277630	277660	277690	277720
110V 50Hz 120V 60Hz	277578	277608	277638	277668	277698	277728
230V 50Hz 240V 60Hz	277581	277611	277641	277671	277701	277731
24V 50Hz/60Hz	277585	277615	277645	277675	277705	277735
220V 50Hz/60Hz	277588	277618	277648	277678	277708	277738
230V 50Hz/60Hz	277589	277619	277649	277679	277709	277739
Special voltages other than the already shown normal voltages[2]	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (24 – 600V)[6]	277593	277623	277653	277683	277713	277743
...V 60Hz (24 – 600V)[6]	277594	277624	277654	277684	277714	277744

DC	DILMC17-10 (...)	DILMC17-01 (...)	DILMC25-10 (...)	DILMC25-01 (...)	DILMC32-10 (...)	DILMC32-01 (...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
RDC 24[3]	277595	277625	277655	277685	277715	277745
RDC 130[4]	277597	277627	277657	277687	277717	277747
RDC 240[5]	277598	277628	277658	277688	277718	277748

Notes

[1] The article no. results from combining the part no. and the actuating voltage. Devices with dual-voltage coils must be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] 24 - 27 V DC
[4] 110 - 130 V DC
[5] 200 - 240 V DC
[6] Minimum order quantity 10 units



AC	**DILMP20 (…)**	**DILMP32-10**	**DILMP32-01**	**DILMP45-10**	**DILMP45-01**	**DILMP63 (…)**	**DILMP80 (…)**	**DILMP125 (…)**	**DILMP160 (…)**	**DILMP200 (…)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
240V 50Hz	–	109798	–	109827	–	109856	109885	–	–	–
110V 50Hz 120V 60Hz	276967	109790	118912	109819	118915	109848	109877	–	–	–
230 V 50Hz 240V 60Hz	276970	109797	118911	109826	118914	109855	109884	–	–	–
24V 50/60Hz	276974	109799	–	109828	–	109857	109886	–	–	–
230V 50/60Hz	276978	109796	–	109825	–	109883	109883	–	–	–
AC	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24[4]	–	–	–	–	–	–	–	109904	109914	109924
RAC 120[5]	–	–	–	–	–	–	–	109903	109913	109923
RAC 240[6]	–	–	–	–	–	–	–	109905	109915	109925
AC	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Non-standard voltages[2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
…V 50Hz (12 – 600V)[3]	276982	109787	109787	109816	109816	109845	109874	–	–	–
…V 60Hz (12 – 600V)[3]	276983	109788	109788	109817	109817	109846	109875	–	–	–
DC	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276985	–	–	–	–	–	–	–	–	–
RDC 24[7]	–	109811	118913	109840	118916	109869	109898	109910	109920	109930
DC	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Non-standard voltages[2]	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
…V DC (12 – 250V)[3]	276990	–	–	–	–	–	–	–	–	–

Notes

[1] The article number is a combination of part no. and actuating voltage
[2] For non-standard voltages, state the actuating voltage selected from the range (…–…V) shown.
[3] Minimum order quantity: 10 units
[4] 24 V 50/60 Hz
[5] 100 – 120 V 50/60 Hz
[6] 190 – 240 V 50/60 Hz
[7] 24 – 27 V DC

AC	DILM32-XSP (...)	DILM65-XSP (...)	DILM95-XSP
	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list
24V 50Hz	281130	281160	229984
240V 50Hz	281132	281162	229986
24V 60Hz	281134	281164	229988
115V 60Hz	281136	281166	229990
42V 50Hz 48V 60Hz	281137	281167	229994
110V 50Hz 120V 60Hz	281138	281168	230058
190V 50Hz 220V 60Hz	281139	281169	230059
220V 50Hz 240V 60Hz	281140	281170	230061
230V 50Hz 240V 60Hz	281141	281171	230062
380V 50Hz 440V 60Hz	281142	281172	230063
400V 50Hz 440V 60Hz	281143	281173	230064
415V 50Hz 480V 60Hz	281144	281174	230065
24V 50Hz/60Hz	281145	281175	230066
42V 50Hz/60Hz	281146	281176	230067
110V 50Hz/60Hz	281147	281177	230068
220V 50Hz/60Hz	281148	281178	230073
230V 50Hz/60Hz	281149	281179	230074
Special voltages other than the already shown normal-voltages [2]	See price list	See price list	See price list
...V 50Hz (24 – 600V)	281153 [13]	281183 [14]	230078 [14]
...V 60Hz (24 – 600V)	281154 [13]	281184 [14]	230079 [14]

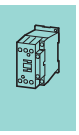
DC	DILM32-XSP (...)	DILM65-XSP (...)	DILM95-XSP
	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list
RDC 24[3]	281155	281185	230080
RDC 60[4]	281156	281186	230081
RDC 130[5]	281157	281187	230082
RDC 240[6]	281158	281188	230107

AC	DILM150-XSP (...)	DILM225A-XSP (...)
	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list
RAC 24[7]	230109	139562
RAC 48[8]	230110	139563
RAC 120[9]	230111	139564
RAC 240[10]	230112	139565
RAC 440[11]	230113	139566
RAC 500[12]	230114	139567

DC	DILM150-XSP (...)	DILM225A-XSP (...)
	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list
RDC 24[3]	230115	139568
RDC 60[4]	230116	139569
RDC 130[5]	230117	139570
RDC 240[6]	230122	139571

Notes

1) To obtain the article number for ordering, read under selected part number and actuating voltage from the table.
Devices with dual-voltage coils are to be ordered under a single article number.
2) With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
3) 24 – 27 V DC
4) 48 – 60 V DC
5) 110 – 130 V DC
6) 200 – 240 V DC
7) 24 V 50/60 Hz
8) 42 – 48 V 50/60 Hz
9) 100 – 120 V 50/60 Hz
10) 190 – 240 V 50/60 Hz
11) 380 – 440 V 50/60 Hz
12) 480 – 500 V 50/60 Hz
13) Minimum order quantity 10 units
14) Minimum order quantity 5 units



AC	**DILK12-11 (...)**	**DILK20-11 (...)**	**DILK25-11 (...)**	**DILK33-10 (...)**	**DILK50-10 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list
110V 50Hz, 120V 60Hz	293985	294007	294029	294051	294073
190V 50Hz, 220V 60Hz	293986	294008	294030	294052	294074
230V 50Hz, 240V 60Hz	293988	294010	294032	294054	294076
400V 50Hz, 440V 60Hz	293990	294012	294034	294056	294078
Special voltages other than the already shown normal voltages [2]	See price list	See price list	See price list		
...V 50Hz (24 – 600V) [3]	293997	294019	294041	–	–
...V 60Hz (24 – 600V) [3]	293998	294020	294042	–	–

Notes
[1] The article no. results from combining the part no. and the actuating voltage.
Devices with dual-voltage coils must be ordered under a single article no.
[2] With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
[3] Minimum order quantity 10 units

Contactors up to 150 A with electronic actuation

AC	**DILMF8-10 (...)**	**DILMF8-01 (...)**	**DILMF11-10 (...)**	**DILMF11-01 (...)**	**DILMF14-10 (...)**	**DILMF14-01 (...)**	**DILMF17-10 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24[1]	104410	104414	104418	104422	104426	104430	104434
RAC 48[3]	104411	104415	104419	104423	104427	104431	104435
RAC 120[4]	104412	104416	104420	104424	104428	104432	104436
RAC 240[5]	104413	104417	104421	104425	104429	104433	104437

AC	**DILMF17-01 (...)**	**DILMF25-10 (...)**	**DILMF25-01 (...)**	**DILMF32-10 (...)**	**DILMF32-01 (...)**	**DILMF40 (...)**	**DILMF50 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24[2]	104438	104442	104446	104450	104454	104458	104462
RAC 48[3]	104439	104443	104447	104451	104455	104459	104463
RAC 120[4]	104440	104444	104448	104452	104456	104460	104464
RAC 240[5]	104441	104445	104449	104453	104457	104461	104465

AC	**DILMF65 (...)**	**DILMF80 (...)**	**DILMF95 (...)**	**DILMF115 (...)**	**DILMF150 (...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltages	See price list	See price list	See price list	See price list	See price list
RAC 24[2]	104466	104470	104474	104478	104482
RAC 48[3]	104467	104471	104475	104479	104483
RAC 120[4]	104468	104472	104476	104480	104484
RAC 240[5]	104469	104473	104477	104481	104485

Notes
[1] The article no. results from combining the part no. and the actuating voltage.
[2] 24 - 24 V
[3] 42 - 48
[4] 100 - 120
[5] 190 - 240

Complete comfort devices	DILM250 /22(...)	DILM300A /22(...)	DILM400 /22(...)	DILM500 /22(...)	DILM580 /22(...)	DILM650 /22(...)	DILM750 /22(...)	DILM820 /22(...)	DILM1000 /22(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Voltage variants	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RDC 48 [2]	208199	139554	208207	208211	–	–	–	–	–
RA 110 [3]	208200	139555	208208	208212	208215	208218	208221	208224	–
RA 250 [4]	208201	139556	208209	208213	208216	208219	208222	208225	267214
RAC 500 [5] [6]	208202	139557	208210	208214	208217	208220	208223	208226	–

Complete units Standard	DILM250 -S/22(...)	DILM300A -S/22(...)	DILM400 -S/22(...)	DILM500 -S/22(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Voltage variants	See price list	See price list	See price list	See price list
110-120V 50/60Hz	274189	139558	274195	274198
220-240V 50/60Hz	274190	139559	274196	274199

Electronic module, incl. coil, for comfort model	DILM250-XSP/E(...)	DILM500-XSP/E(...)	DILM1000-XSP/E(...)
	Article no.[1]	Article no.[1]	Article no.[1]
Voltage variants	See price list	See price list	See price list
RDC 48 [2]	208250	208254	–
RA 110 [3]	208251	208255	289146
RA 250 [4]	208252	208256	289145
RAC 500 [5] [6]	208253	208257	289147

Electronic module, incl. coil, for standard model	DILM250-S-XSP/E(...)	DILM500-S-XSP/E(...)
	Article no.[1]	Article no.[1]
Voltage variants	See price list	See price list
110-120V 50/60Hz	274201	274204
220-240V 50/60Hz	274202	274205

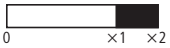
Notes

[1] The article no. results from combining the part no. and the voltage variant.
[2] 24 – 48 V DC
[3] 48 – 110 V 40 – 60 Hz/48 – 110 V DC
[4] 110 – 250 V 40 – 60 Hz/110 – 250 V DC
[5] 250 – 500 V 40 – 60 Hz
[6] DC on request

Engineering

The diagrams show the closing and opening travel of the contacts at no load.

N/O



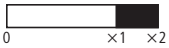
NC



		x1	x2
DILE AC	N/O	1.9	2.8
	NC	0.95	2.8
…DILE	N/O	1.9	2.8
	NC	0.9	2.8
…DDILE	NO early-make	1.06	2.9
	Late-break N/C contact	1.86	2.9
	N/O	1.9	2.8
	NC	0.9	2.8
DILE DC	N/O	1.9	2.85
	NC	0.95	2.85
DILE…	N/O	1.9	2.8
	NC	0.9	2.8
…DDILE	NO early-make	1.06	2.9
	Late-break N/C contact	1.86	2.9
	N/O	1.9	2.8
	NC	0.9	2.8
DILA-AC	N/O	3.3	4.5
	NC	1.0	4.5
DILA-XHI	N/O	3.2	4.5
	NC	1.6	4.5
DILA-XHIV	NO early-make	2.0	4.5
	Late-break N/C contact	2.8	4.5
	N/O	3.2	4.5
	NC	1.6	4.5
DILA-DC	N/O	2.1	2.9
	NC	0.7	2.9
DILA-XHI	N/O	2.3	2.9
	NC	0.7	2.9
DILA-XHIV	NO early-make	1.1	2.9
	Late-break N/C contact	1.9	2.9
	N/O	2.3	2.9
	NC	0.7	2.9
DILM7/9 AC	N/O	3.3	4.5
	NC	1.0	4.5
DILM32-XHI, DILA-XHI	N/O	3.2	4.5
	NC	1.6	4.5
DILA-XHIV	NO early-make	2.0	4.5
	Late-break N/C contact	2.8	4.5
	N/O	3.2	4.5
	NC	1.6	4.5
DILM7/9 DC	N/O	2.1	2.9
	NC	0.7	2.9
DILM32-XHI, DILA-XHI	N/O	2.3	2.9
	NC	0.7	2.9
DILA-XHIV	NO early-make	1.1	2.9
	Late-break N/C contact	1.9	2.9
	N/O	2.3	2.9
	NC	0.7	2.9
DILM12/15/P20 AC	N/O	3.3	4.5
	NC	1.0	4.5
DILM32-XHI, DILA-XHI	N/O	3.2	4.5
	NC	1.6	4.5
DILA-XHIV	NO early-make	2.0	4.5
	Late-break N/C contact	2.8	4.5
	N/O	3.2	4.5
	NC	1.6	4.5
DILM12/15/P20 DC	N/O	3.3	4.4
	NC	1.0	4.4
DILM32-XHI, DILA-XHI	N/O	3.2	4.4
	NC	1.6	4.4

The diagrams show the closing and opening travel of the contacts at no load.

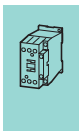
N/O



NC



		x1	x2
DILA-XHIV	NO early-make	2.0	4.4
	Late-break N/C contact	2.8	4.4
	N/O	3.2	4.4
	NC	1.6	4.4
DILM17/25/32/P32/P45	N/O	4.0	6.0
	Auxiliary N/C	1.8	6.0
	Auxiliary N/O	3.2	6.0
DILM32-XHI, DILA-XHI	N/O	3.2	6.0
	NC	1.6	6.0
DILA-XHIV	NO early-make	2.0	6.0
	Late-break N/C contact	2.8	6.0
	N/O	3.2	6.0
	NC	1.6	6.0
DILM40/50/65/P63/P80	N/O	5.1	7.5
DILM150-XHI	N/O	5.7	7.5
	NC	3.9	7.5
DILM150-XHIV	NO early-make	3.8	7.5
	Late-break N/C contact	5.4	7.5
	N/O	5.7	7.5
	NC	3.9	7.5
DILM1000-XHI	N/O	5.5	7.5
	NC	3.6	7.5
DILM1000-XHIV	NO early-make	4.1	7.5
	Late-break N/C contact	5.0	7.5
DILM80/95/115/150/170/P125/P160/P200	N/O	8.0	11
DILM150-XHI	N/O	9.2	11
	NC	7.4	11
DILM150-XHIV	NO early-make	7.3	11
	Late-break N/C contact	8.9	11
	N/O	9.2	11
	NC	7.4	11
DILM1000-XHI	N/O	9.0	11
	NC	7.1	11
DILM1000-XHIV	NO early-make	7.6	11
	Late-break N/C contact	8.5	11
DILM185A/225A	N/O	10.0	13.0
DILM1000-XHI	N/O	10.0	13.0
	NC	8.1	13.0
DILM1000-XHIV	NO early-make	8.4	13.0
	Late-break N/C contact	9.5	13.0
DILM250/300A	N/O	10.1	13.1
DILM820-XHI	N/O	10.3	13.1
	NC	8.4	13.1
DILM820-XHIV	NO early-make	8.7	13.1
	Late-break N/C contact	9.8	13.1
DILM400/500/570	N/O	8.9	13.1
DILM820-XHI	N/O	10.3	13.1
	NC	8.4	13.1
DILM820-XHIV	NO early-make	8.7	13.1
	Late-break N/C contact	9.8	13.1
DILM580/650/750/820	N/O	2.0	4.1
DILM820-XHI	N/O	7.4	10.5
	NC	5.5	10.5
DILM820-XHIV	NO early-make	6.0	10.5
	Late-break N/C contact	6.8	10.5
DILM1000/1600, DILH1400/2000/2200/2600	N/O	2.0	4.1
DILM820-XHI	N/O	7.4	10.5
	NC	5.5	10.5
DILM820-XHIV	NO early-make	6.0	10.5
	Late-break N/C contact	6.8	10.5



Components

Part no.	Contactor selection With top mounting auxiliary contacts	With side mounting auxiliary contacts	With overload relay	With parallel connector	**Insulated enclosures**
DILE...(-G)(-C)	–	–	–	–	CI-K1-95-TS
DILE...(-G)(-C)	●	–	–	–	CI-K2-145-TS
DILE...(-G)	●	–	●	–	CI-K2-145-AD
DILE...(-G)	–	–	–	●	CI-K2-100-TS
DILE...(-G)	●	–	–	●	CI-K2-145-TS
DILM7 to DILM15	●	–	–	–	CI-K2-145-TS
DILM7 to DILM15	●	–	●	–	CI-K3-160-TS
DILM17 to DILM32	–	–	–	–	CI-K2-145-TS
DILM17 to DILM32	●	–	●	–	CI23E-150
DILM40 to DILM65	–	●	–	–	CI-K3-160-TS
DILM40 to DILM65	●	●	●	–	CI43E-150
DILM80 to DILM170	●	●	–	–	CI43E-200
DILM80 to DILM170	●	●	●	–	CI44E-200
DILM185A	–	●	–	–	CI48-250
DILM225A	–	●	–	–	CI48-250
DILM250	–	●	–	–	CI48-250
DILM300A	–	●	–	–	CI48-250
DILM400	–	●	–	–	CI48-250
DILM500	–	●	–	–	CI48-250
DILM580	–	●	–	–	CI48-250
DILM650	–	●	–	–	CI48-250
DILM750	–	●	–	–	CI48-250
DILM820	–	●	–	–	CI48-250
DIULE...	●	–	–	–	CI-K3-125-TS
DIULE...	●	–	●	–	CI-K3-125-TS
DIULM7 to DIULM12	●	–	–	–	CI-K4-160-TS
DIULM17 to DIULM32	●	–	–	–	CI23E-150
DIULM40 to DIULM65	●	–	–	–	CI43E-200
SDAINLEM...	●	–	–	–	CI-K5-125-TS CI-K5-125-M
SDAINLM12 to SDAINLM22	●	–	–	–	CI-K5-160-TS
SDAINLM30 to SDAINLM65	●	–	–	–	CI23E-150
SDAINLM70 to SDAINLM115	●	–	–	–	CI43E-200

Notes

CI-K small enclosure → Chapter 20

Terminal for CI-K enclosure → Chapter 20

CI enclosure → Chapter 20

Insulated PE, N or PEN terminal for enclosure CI-K → Chapter 20

UL/CSA-approved rating data

DILE, DILA, DILM

Rating data for approved types						GENERAL USE	**Contactors**	
Maximum alternating current-motor rating Single-phase		3-phase				Maximum motor-rated current I_{th} Open/enclosed		NEMA size
115 V 120 V HP	230 V 240 V HP	200 V 208 V HP	230 V 240 V HP	460 V 480 V HP	575 V 600 V HP	A	**Part no.**	
½	1½	2	3	5	5	15/13.5	**DILEM(4)**	00
¼	1	1½	2	3	5	20	**DILM7-...(...)**	00
½	1½	3	3	5	7½	20	**DILM9-...(...)**	00
1	2	3	3	10	10	20	**DILM12-...(...)**	0
1	3		5	10	10	20	**DILM15-...(...)**	0
2	3	5	7½	10	15	35	**DILM17-...(...)**	0
2	5	7½	7½	15	20	35	**DILM25-...(...)**	1
3	5	10	10	20	25	40	**DILM32-...(...), DILM38-...(...)**	1
3	7½	10	15	30	40	55	**DILM40(...)**	2
3	10	15	20	40	50	65	**DILM50(...)**	2
5	15	20	25	40	60	80	**DILM65(...), DILM70(...)**	2
7½	15	25	30	60	75	125	**DILM80(...)**	3
7½	15	25	40	75	100	125	**DILM95(...)**	3
10	25	40	50	100	125	160	**DILM115(...)**	4
15	30	40	60	125	125	160	**DILM150(...), DILM170(...)**	4
–	–	50	60	125	150	225	**DILM185(...)**	4
–	–	60	75	150	200	250	**DILM225(...)**	4
–	–	75	100	200	250	350	**DILM250(...)**	5
–	–	100	125	250	300	350	**DILM300(...)**	5
–	–	125	150	300	400	450	**DILM400(...)**	5
–	–	150	200	400	500	550	**DILM500(...)**	6
–	–	200	200	400	600	630	**DILM580(...)**	6
–	–	200	250	500	600	700	**DILM650(...)**	6
–	–	250	300	600	700	800	**DILM750(...)**	6
–	–	290	350	700	860	850	**DILM820(...)**	6
–	–	350	400	800	1000	1000	**DILM1000(...)**	7
–	–	560	640	1200	1300	1600	**DILM1600(...)**	8

Further approvals → 5/85

- Elevator control
- Refrigeration control
- Resistance air heating
- Incandescent lamps
- Electrical discharge lamps
- Capacitive switching

Approved rating data UL -File No. E29184 for auxiliary contacts	Pilot Duty		General Use			
	AC	DC	AC		DC	
Part no.			V	A	V	A
DIL(E)EM-10(-01) DILER-40(31)(22) ...(D)DILE	A600	P300	600	10	250	0.5
DILM7-10(-01) To DILM32-10(-01) DILA...	A600	P300	600	15	250	1
DILA-XHI... DILM32-XHI...	A600	P300	600	15	250	1
DILM...-XHI11-SI DILM...-XHI11-SA DILM...-XHI11V-SI	A600	P600	600	10	–	–

Special purpose rating

	DIL	M7	M9	M12	M15	M17	M25 MP32 MP45	M32	M40 MP63	M50 MP80	M65 M72	M80 MP125	M95 MP160	M115	M150 M170 MP200
Electrical discharge lamps (ballast)															
480V 60Hz 3phase, 277V 60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	85	100	136	160
600V 60Hz 3phase, 347V 60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	85	100	136	160
Incandescent lamps (Tungsten)															
480V 60Hz 3phase, 277V 60Hz 1phase	A	8	11	14	14	23	32	40	55	74	88	85	100	136	160
600V 60Hz 3phase, 347V 60Hz 1phase	A	8	11	14	14	23	32	40	55	74	88	85	100	136	160
Resistance air heating															
480V60Hz 3phase, 277V60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	94	110	136	160
600V60Hz 3phase, 347V60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	94	110	136	160
Refrigeration control (CSA only)															
LRA 480V 60Hz 3phase	A	60	60	60	60	240	240	240	270	270	270	540	540	540	540
LRA 600V 60Hz 3phase	A	60	60	60	60	180	180	180	270	270	270	420	420	540	540
480V 60Hz 3phase	A	6	7.5	10	10	23	32	40	26	36	45	63	70	84	90
600V 60Hz 3phase	A	6	7.5	10	10	17	24	30	26	36	45	63	70	84	90
Elevator control															
200V 60Hz 3phase	HP (A)	¾ (3.7)	2 (7.8)	2 (7.8)	2 (7.8)	3 (11)	3 (11)	7½ (25.3)	7½ (25.3)	10 (32.2)	10 (32.2)	20 (62.1)	20 (62.1)	30 (92)	30 (92)
240V 60Hz 3phase	HP (A)	1½ (6.0)	2 (6.8)	2 (6.8)	3 (9.6)	3 (9.6)	5 (15.2)	7½ (22)	10 (28)	15 (42)	15 (42)	25 (68)	30 (80)	40 (104)	40 (104)
480V 60Hz 3phase	HP (A)	2 (3.4)	3 (4.8)	7½ (11)	7½ (11)	7½ (11)	10 (14)	20 (27)	25 (34)	30 (40)	30 (40)	50 (65)	60 (77)	75 (96)	75 (96)
600V 60Hz 3phase	HP (A)	3 (3.9)	5 (6.1)	7½ (9.6)	7½ (9.6)	10 (11)	15 (17)	20 (22)	30 (32)	40 (41)	40 (41)	60 (62)	75 (77)	100 (99)	100 (99)

	DIL	K12	K20	K25	K33	K50
Capacitor Switching						
240V 60Hz 3phase	A	18	28	36	48	72
480V 60Hz 3phase	A	18	28	36	48	72
600V 60Hz 3phase	A	14.4	28	38.4	48	72
240V 60Hz 3phase	kvar	7.5	12	15	20	30
480V 60Hz 3phase	kvar	15	20	30	40	60
600V 60Hz 3phase	kvar	15	30	40	50	75

UL/CSA Short circuit current rating

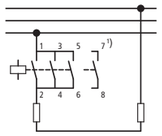
DILM

Short circuit current rating (SCCR)

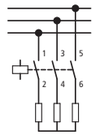
Contactor	Basic Rating			480 V High Fault				600 V High Fault			
		Max. fuse	Max. CB		Max. fuse		Max. CB		Max. fuse		Max. CB
	kA	A	A	kA	A	kA	A	kA	A	kA	A
DILM7-…(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM9-…(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM12-…(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM15-…(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM17-…(…)	5	125	125	100	70 Class J	10	50	10	125	10	50
DILM25-…(…)	5	125	125	100	100 Class J	10	50	10	125	10	50
DILM32-…(…)	5	125	125	100	125 Class J	10	50	10	125	10	50
DILM38-…(…)	5	125	125	100	125 Class J	10	50	10	125	10	50
DILM40(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM50(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM65(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM72(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM80(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM95(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM115(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM150(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM170(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM185(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM225(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM250(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM300(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM400(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM500(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM570(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM580(…)	30	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM650(…)	30	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM750(…)	42	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM820(…)	42	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM1000(…)	85	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM1600(…)	85	2000	-	85	2000	-	-	85	2000	85	-

Rating data

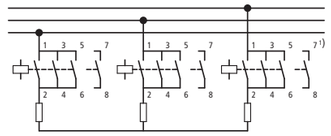
Single-phase rating AC-1



Three-phase rating AC-1



Three-phase rating AC-1



Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}	Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}	Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}
220 230 240	380 400 440	660 690			220 230 240	380 400 440	660 690			220 230 240	380 400 440	660 690		
kW	kW	kW	A	A	kW	kW	kW	A	A	kW	kW	kW	A	A
Open version														
10	18	31	50	50	7	13	20	20	20	18	31	54	50	50
10	18	31	50	50	7	13	20	20	20	18	31	54	50	50
12	21	37	63	60	–	–	–	–	–	21	37	65	63	60
10	18	31	–	50	7	13	22	–	20	18	31	54	–	50
13	22	38	–	60	–	–	–	–	–	22	38	65	–	60
18	32	55	–	88	13	22	38	–	35	32	55	95	–	88
21	36	63	–	100	14	25	43	–	40	36	63	109	–	100
26	45	78	–	125	18	31	54	–	50	45	78	136	–	125
34	59	102	–	163	24	41	71	–	65	59	102	176	–	163
42	72	125	–	200	29	50	87	–	80	72	125	217	–	200
47	81	141	–	225	33	56	98	–	90	81	141	244	–	225
57	99	172	–	275	40	69	119	–	110	100	172	299	–	275
68	117	204	–	325	47	81	141	–	130	118	203	353	–	325
84	144	251	–	400	58	100	174	–	160	145	250	434	–	400
101	175	317	–	460	70	120	220	–	185	175	302	549	–	460
144	248	431	800	688	100	172	299	315	275	262	453	786	–	688
165	284	494	800	788	114	197	342	315	315	300	519	900	–	788
172	297	516	1000	825	120	206	357	400	330	333	576	1000	–	875
183	316	548	1000	875	126	219	380	400	350	381	658	1143	–	1000
261	451	784	1250	1250	181	313	543	500	500	476	825	1429	–	1250
366	632	1097	–	1750	253	438	760	800	700	667	1152	2000	–	1750
418	722	1254	–	2000	290	500	869	800	800	762	1316	2286	–	2000
444	767	1332	–	2125	308	531	923	1000	850	810	1400	2429	–	2125
470	812	1411	–	2250	326	563	977	1000	900	857	1480	2572	–	2250
523	903	1568	–	2500	362	625	1086	1000	1000	953	1646	2858	–	2500
732	1264	2195	–	3500	507	875	1520	–	1400	1334	2300	4000	–	3500
1045	1805	3135	–	5000	724	1251	2172	–	2000	1905	3290	5716	–	5000
1150	1985	3449	–	5500	796	1376	2389	–	2200	2095	3619	6288	–	5500
1358	2346	4075	–	6500	941	1626	2827	–	2600	2476	4277	7430	–	6500

Notes

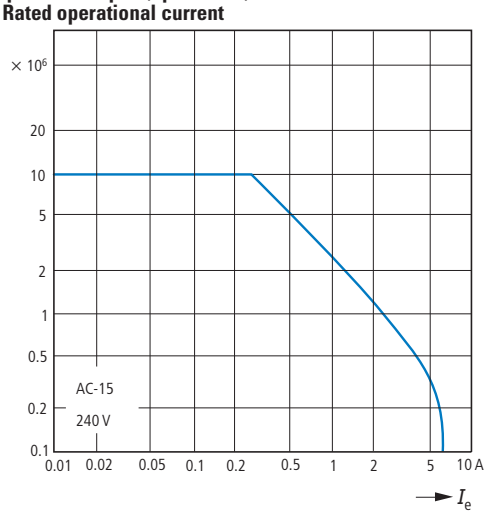
1) Contact 7 – 8 only with DILEM4(-G), DILMP20...

Part no.	Ordering data	Required accessories: **Paralleling links**	**Notes**
AC operated	**Page**	**Part no.**	
DILEM-10(...)	→ 5/4	P1DILEM	
DILEM-01(...)	→ 5/4	P1DILEM	
DILEM4(...)	→ 5/4	P1DILEM	
DILM7-...(...)	→ 5/18	DILM12-XP1	
DILMP20(...)	→ 5/36	DILM12-XP1	
DILM17-...(...)	→ 5/18	DILM32-XP1	
DILM25-...(...)	→ 5/18	DILM32-XP1	
DILM40(...)	→ 5/20	DILM65-XP1	
DILM50(...)	→ 5/20	DILM65-XP1	
DILM65(...)	→ 5/20	DILM65-XP1	
DILM80(...)	→ 5/20	DILM150-XP1	
DILM95(...)	→ 5/20	DILM150-XP1	
DILM115(...)	→ 5/20	DILM150-XP1	
DILM150(...)	→ 5/20	DILM150-XP1	
DILM170(...)	→ 5/20	DILM150-KP1	
DILM185A(...)	→ 5/32	DILM185-XP1	
DILM225A(...)	→ 5/32	DILM185-XP1	
DILM250(...)	→ 5/32	–	
DILM300A(...)	→ 5/32	–	
DILM400(...)	→ 5/32	–	
DILM500(...)	→ 5/32	–	
DILM580(...)	→ 5/32	–	
DILM650(...)	→ 5/32	–	
DILM750(...)	→ 5/32	–	
DILM820(...)	→ 5/32	–	
DILH1400(...)	→ 5/34	–	
DILH2000(...)	→ 5/34	–	
DILH2200(...)	→ 5/34	–	
DILH2600(...)	→ 5/34	–	

Accessories	**Page**
Auxiliary contact modules	→ 5/6 → 5/38
Set of paralleling links	→ 5/57
Enclosure	→ 5/67
Accessories	→ 5/56

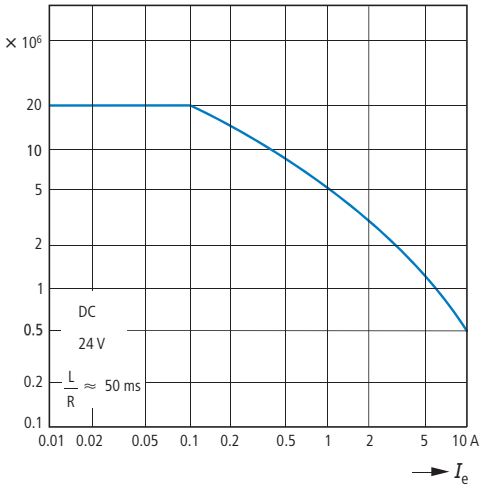
DILA (AC-15)

Component lifespan (operations)
I_e = Rated operational current



DILA DC[1)]

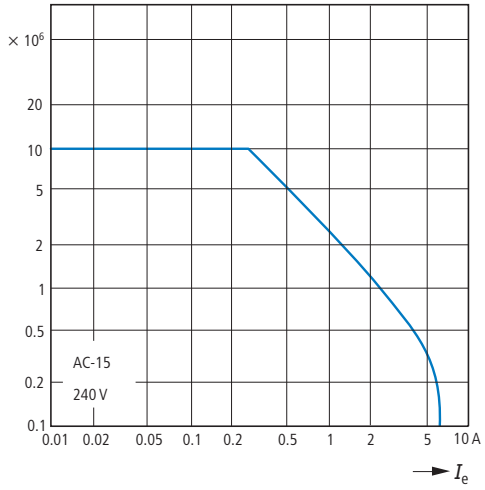
Component lifespan (operations)
I_e = Rated operational current



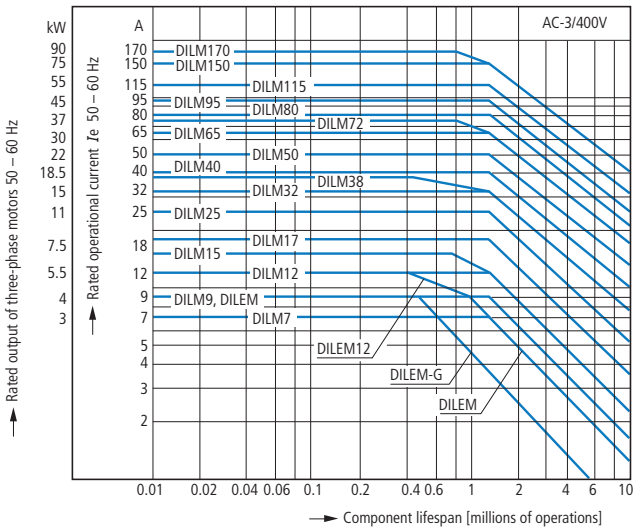
[1)] Three contacts in series

DILER (AC-15)

Component lifespan (operations)
I_e = Rated operational current



Normal switching duty



Normal AC induction motor

Operating characteristics
- Make: from stop
- Break: during run

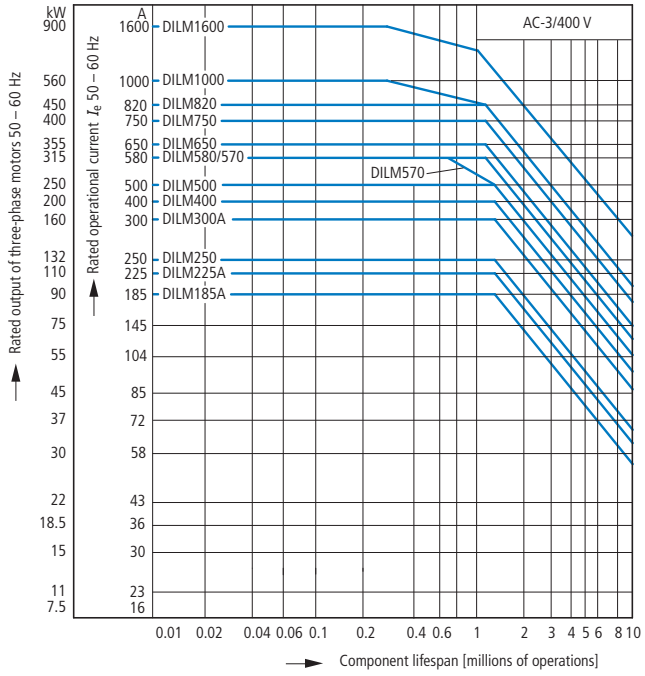
Electrical characteristics:
- Make: up to 6 X rated motor current
- Break: 1 X rated motor current

Utilization category
- 100 % AC-3

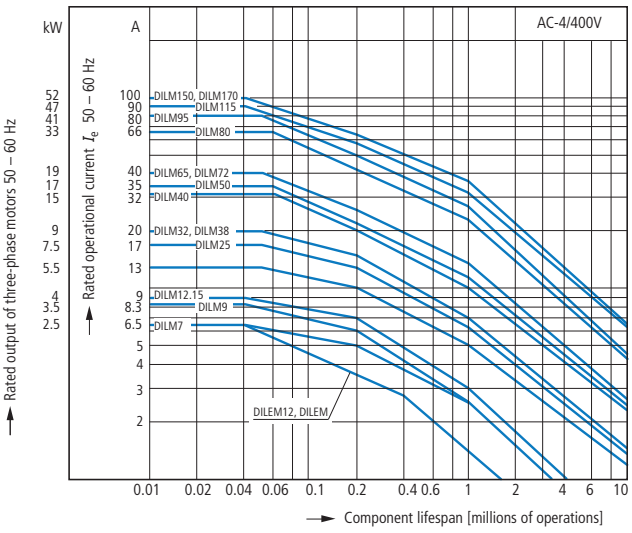
Typical applications:

Compressors	Lifts	Mixers
Pumps	Escalators	Agitators
Fan	Conveyor belts	Centrifuges
Hinged flaps	Bucket-elevator	Air conditioning sys-

General drives for manufacturing and processing machines



Extreme switching duty



Normal AC induction motor

Operating characteristics
- Inching, plugging, reversing

Electrical characteristics:
- Make: up to 6 X rated motor current
- Break: 6 X rated motor current

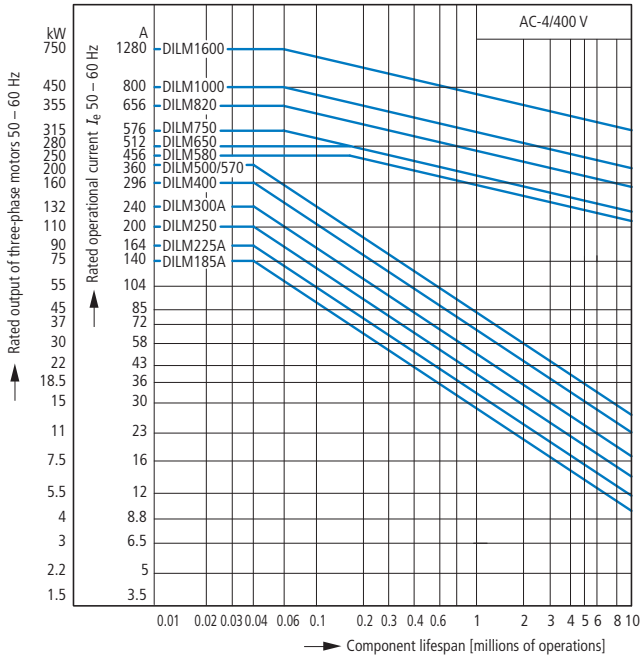
Utilization category
- 100 % AC-4

Typical applications:

Printing machines	Wire-drawing	Centrifuges

Special drives on manufacturing and processing machines

Extreme switching duty



Normal AC induction motor

Operating characteristics

Inching, plugging, reversing

Electrical characteristics:

Make:up to 6 X rated motor current

Break: 6 X rated motor current

Utilization category

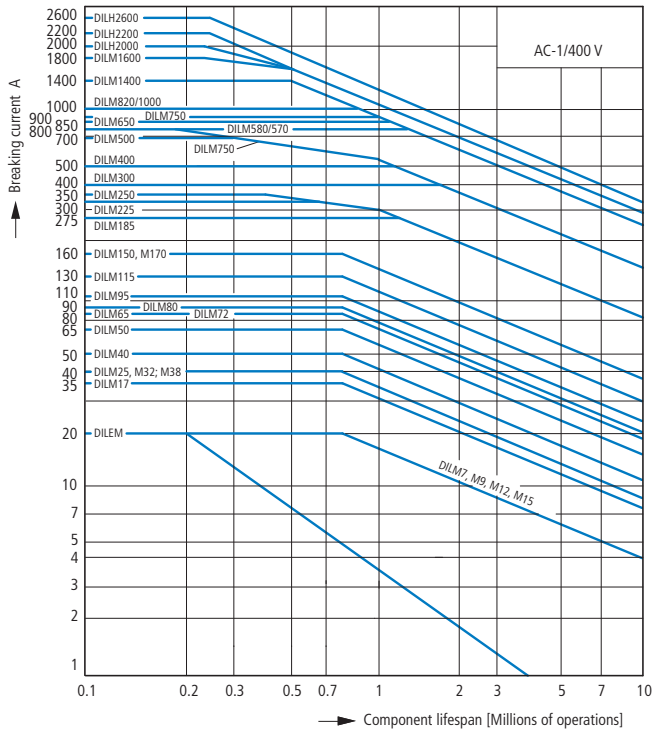
100 % AC-4

Typical applications:

Printing machines | Wire-drawing machines | Centrifuges

Special drives on manufacturing and processing machines

Switching conditions for 3 pole, non-motor loads



Operating characteristics

Non inductive and slightly inductive loads

Electrical characteristics:

Make: 1 X rated operational current
Break:1 X rated operational current

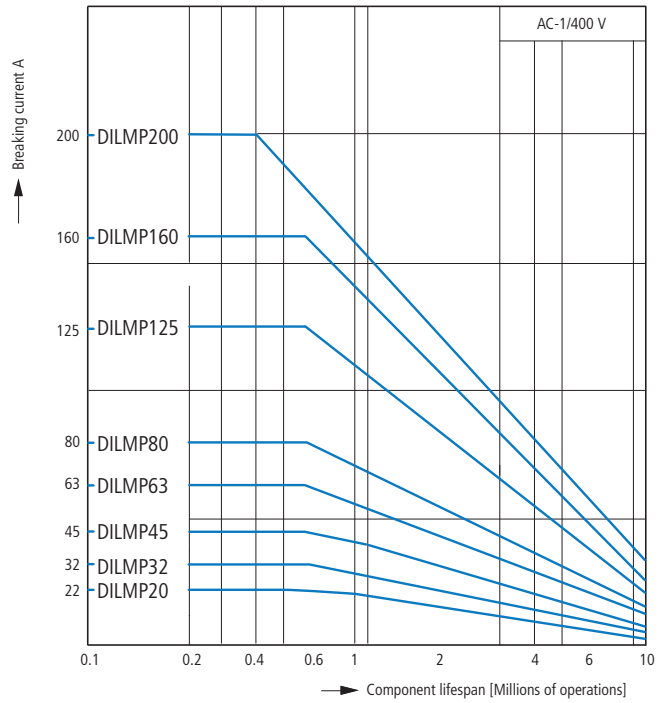
Utilization category

100 % AC-1

Typical applications:

Electric heat

Switching conditions for 4 pole, non-motor loads



Operating characteristics

Non inductive and slightly inductive loads

Electrical characteristics:

Make: 1 X rated operational current
Break:1 X rated operational current

Utilization category

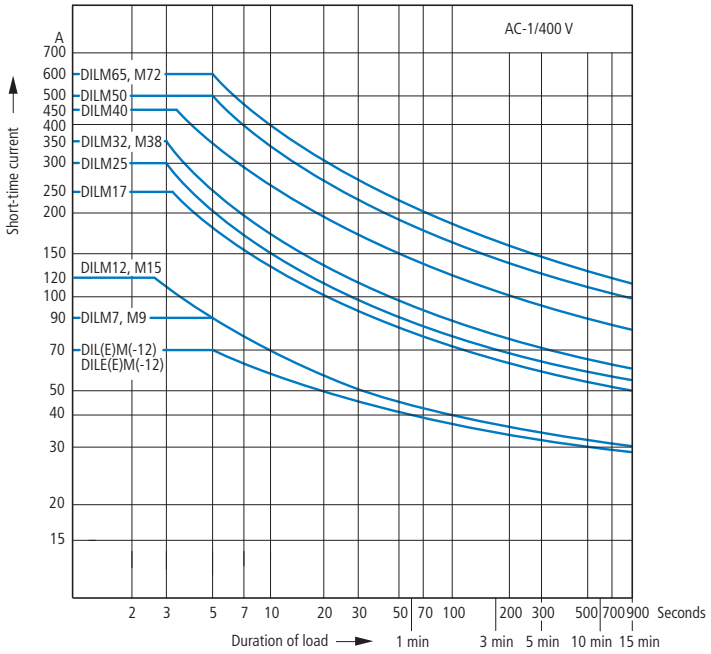
100 % AC-1

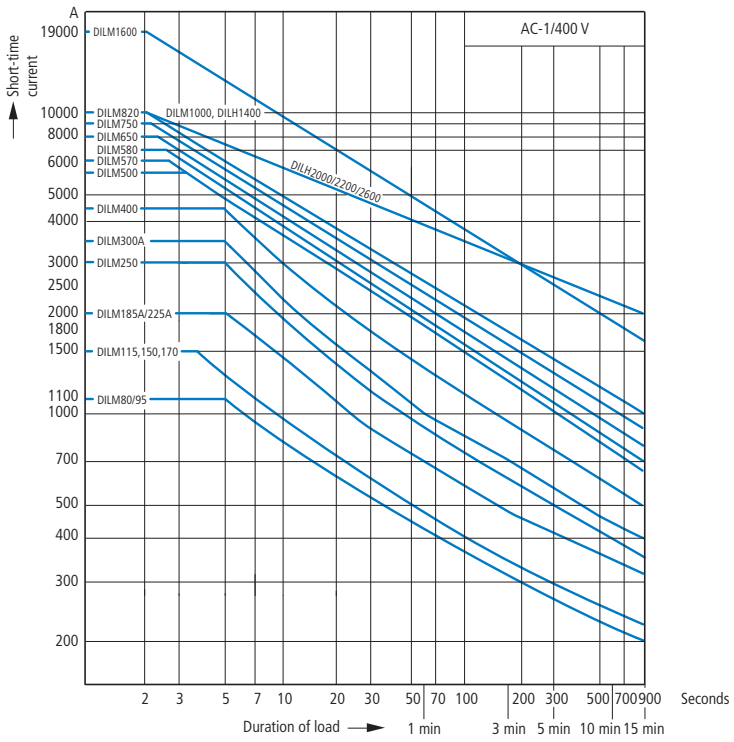
Typical applications:

Electric heat

Short-time loading 3 pole

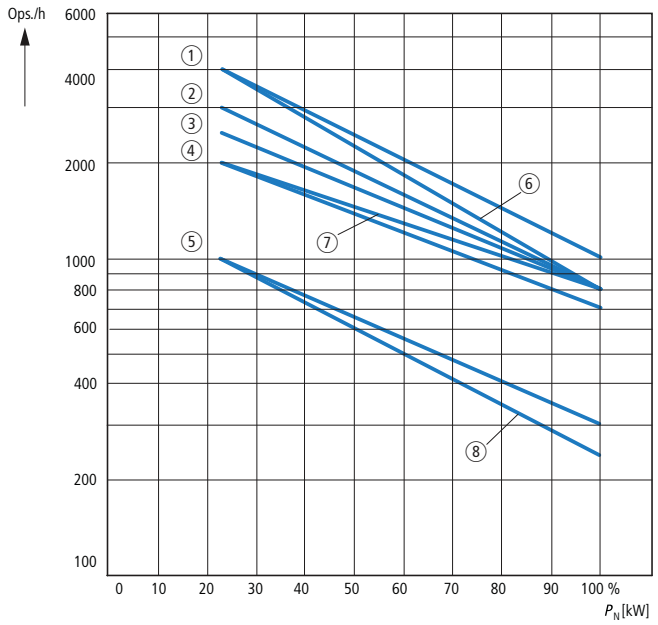
Time interval between two loads: 15 minutes





Determination of the maximum operating frequency dependent on the rating and utilization category (recommended values) for 400 V

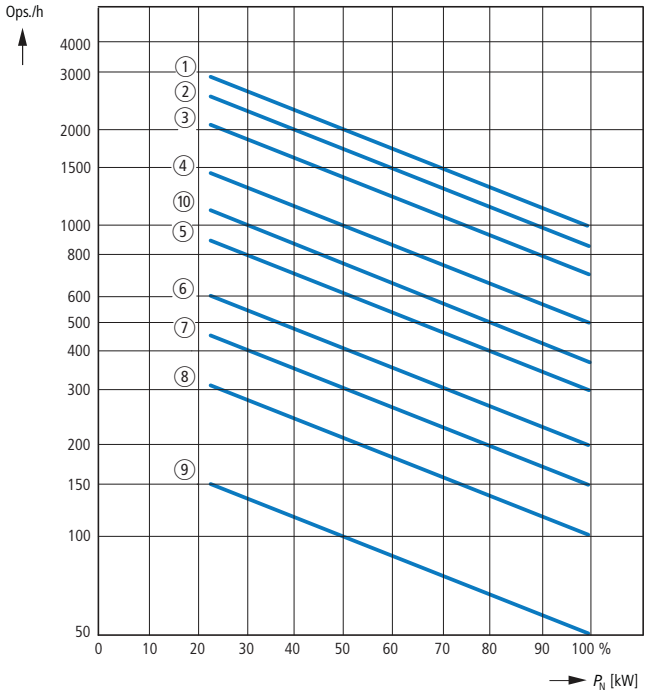
P_N = max. rated motor output (kW) of respective contactor according to → Page 5/18 and → Page 5/4
S/h = max. operation per hour



Part no.	Characteristic AC-1	AC-3	AC-2 AC-4
DILE(E)M(-12)	7	6	8
DILM7, 9, 12, 15	3	1	5
DILM17, 25, 32, 38	3	2	5
DILM40, 50, 65, 72	3	2	5
DILM80, 95, 115, 150, 170	3	4	5

Determination of the maximum operating frequency dependent on the rating and utilization category (recommended values)

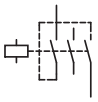
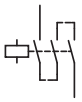
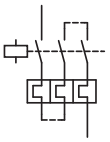
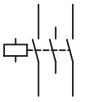
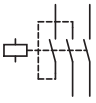
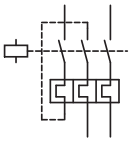
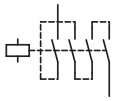
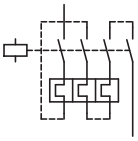
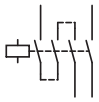
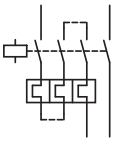
P_N = max. rated motor output (kW) of respective contactor according to → Page 5/30 and → Page 5/34
S/h = max. operation per hour



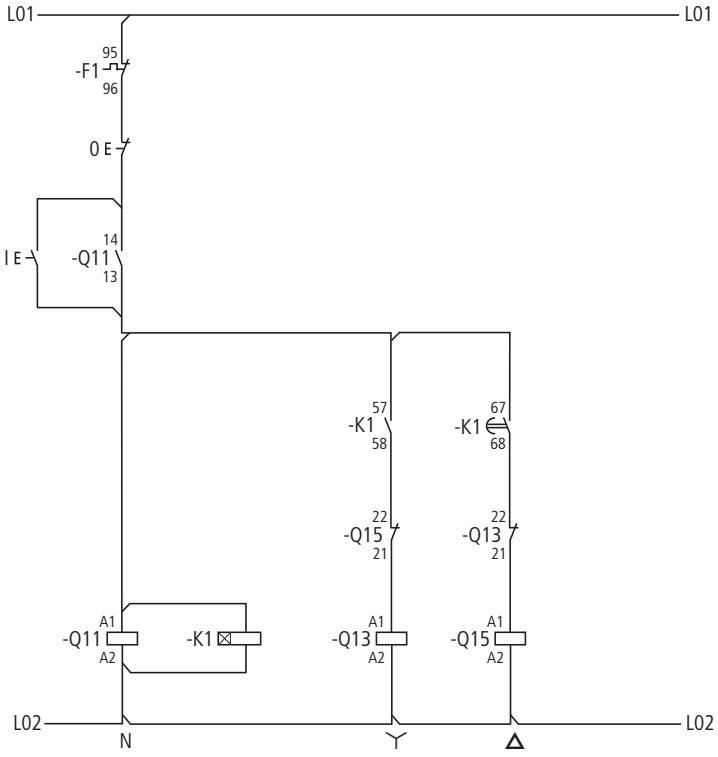
Part no.	Characteristic AC-1	AC-3	AC-4
DILM185A	2	1	8
DILM225A	2	1	8
DILM250	2	1	8
DILM300A	3	2	9
DILM400	3	2	9
DILM500	3	2	9
DILM580	3	4	7
DILM650	3	4	7
DILM750	3	4	7
DILM820	3	4	7
DILM1000	3	4	7
DILM1600	10	10	7
DILH1400	10	–	–
DILH2000	10	–	–
DILH2200	10	–	–
DILH2600	10	–	–

DC current switching

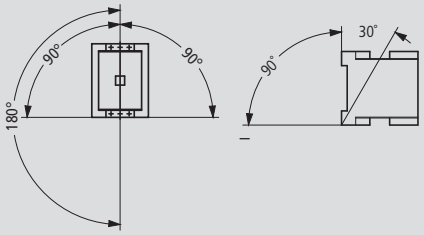
– – – – – when necessary conductor to be supplied by customer

	Without overload relay ≤ 60 V DC	> 60 V DC	With overload relay > 60 V DC
DILEEM ... DILM700			
1 pole			
2 pole			
DILEM4 **DILMP...**			
1 pole			
2 pole			

Wiring, star-delta combination with DILM32-XTEY20



Technical data

			DILA	DILA…XHI	DILER	DILE…
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, mechanical						
AC operated	Operations	x 10^6	20	10	10	10
DC operated	Operations	x 10^6	20	10	20	20
Maximum operating frequency						
Maximum operating frequency	Operations/h		9000	9000	9000	9000
Climatic proofing			Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25…60	-25…60	-25…50	-25…50
Enclosed		°C	-25…40	-25…40	-25…40	-25…40
Ambient temperature for storage		°C	-40 - 80	-40 - 80		
Mounting position					Any, except vertically with terminals A1/A2 below	
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Basic devices with auxiliary contact module						
N/O		g	7	7	10	10
NC		g	5	5	8	8
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Weight						
AC operated		kg	0.23	0.05	0.17	–
DC operated		kg	0.28	0.05	0.2	–
Terminal capacity						
Screw terminals						
Solid		mm^2	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Flexible with ferrule		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14
Terminal screw			M3.5	M3.5	M3.5	M3.5
Pozidriv screwdriver		Size	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Max. tightening torque		Nm	1.2	1.2	1.2	1.2
Spring-loaded terminals						
Solid		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)
Flexible with ferrule		mm^2	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)
Flexible without ferrule DIN 46228		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	–	–
Solid or stranded		AWG	18 - 14	18 - 14	1 x (16 - 14) 2 x (16 - 14)	1 x (16 - 14) 2 x (16 - 14)
Flat-blade screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5

DILER, DILA

			DILA	DILA…XHI	DILER	DILE…
Contacts						
Interlocked opposing contacts to EN 60947-4-1, Annex L, including auxiliary contact module			Yes	Yes	Yes	Yes
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/degree of pollution			III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	690	690	690	690
Rated operating voltage	U_e	V AC	690	500	600	600
Safe isolation according to EN 61140						
Between coil and auxiliary contacts		V AC	400	400	300	300
Between the auxiliary contacts		V AC	400	400	300	300
Rated operational current						
AC-15						
220/240 V	I_e	A	4	4	6	4
380/415 V	I_e	A	4	4	3	2
500 V	I_e	A	1.5	1.5	1.5	1.5
DC[1]						
L/R ≦ 15 ms						
Contacts in series:						
1	24 V	A	10	10	2.5	2.5
1	60 V	A	6	6	–	–
2	60 V	A	10	10	2.5	2.5
1	110 V	A	3	3	–	–
3	110 V	A	6	6	1.5	1.5
1	220 V	A	1	1	–	–
3	220 V	A	5	5	0.5	0.5
L/R ≦ 50 ms						
Contacts in series:						
3	24 V	A	4	2.5	–	–
3	60 V	A	4	1	–	–
3	110 V	A	2	0.5	–	–
3	220 V	A	1	0.25	–	–
DC-13 (6xP)						
Contacts in series:						
3	24 V	A	2.5	2.5	–	–
3	60 V	A	1	1	–	–
3	110 V	A	0.5	0.5	–	–
3	220 V	A	0.25	0.25	–	–
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)	Fault probability	λ	$<10^{-8}$, < one failure in 100 million operations			
Conventional thermal current	I_{th}	A	16	16	10	10
Short-circuit strength without welding						
Maximum overcurrent protection device						
220/240 V		PKZM 0	4	–	4	4
380/415 V		PKZM 0	4	–	4	4
Short-circuit protection rating maximum fuse[2]						
500 V		A gG/gL	10	10	6	6
500 V		A fast	–	–	10	10
Current heat loss at load of I_{th}						
AC operated		W	0.3	0.3	0.2	0.2
DC operated		W	0.3	0.3	0.3	0.3

Notes

[1] Switch-on and switch-off conditions based on DC-13, time constant as specified

[2] See characteristic curve "Fuses" for time/current characteristics (please enquire)

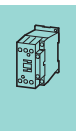
DILER, DILA

			DILA	DILA…XHI	DILER	DILE…
Magnet systems						
Voltage tolerance						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	x U_c	0.8…1.1	–	0.8…1.1	–
Dual-frequency coil 50/60 Hz	Pick-up	x U_c	0.8…1.1	–	0.85…1.1	–
DC operated[1)]						
Starting voltage	Pick-up	x U_c	0.8…1.1	–	0.85…1.3	–
At 24 V: without auxiliary contact module (40 °C)	Pick-up	x U_c	0.7 - 1.3	–	0.7 - 1.3	–
Power consumption						
50 Hz	Pick-up	VA	24	–	25	–
50 Hz	Sealing	VA	3.4	–	4.6	–
50 Hz	Sealing	W	1.2	–	1.3	–
60 Hz	Pick-up	VA	30	–	25	–
60 Hz	Sealing	VA	4.4	–	4.6	–
60 Hz	Sealing	W	1.4	–	1.3	–
50/60 Hz	Pick-up	VA	27 25	–	30 29	–
50/60 Hz	Sealing	VA	4.2 3.3	–	5.4 3.9	–
50/60 Hz	Sealing	W	1.4 1.2	–	1.6 1.1	–
DC operated	Pick-up = sealing	W	3	–	2.6	–
Duty factor		% DF	100	–	100	–
Changeover times at 100 % U_c (recommended values)						
AC operated closing delay		ms	15 - 21	–	14 - 21	–
AC operated normally open contact opening delay		ms	9 - 18	–	8 - 18	–
AC operated with auxiliary contact module, max. closing delay		ms	–	–	45	45
DC operated closing delay		ms	31	–	26 - 35	–
DC operated normally open contact opening delay		ms	12	–	15 - 25	–
DC operated with auxiliary contact module, max. closing delay		ms	–	–	70	70

Notes [1)] Smoothed DC, three-phase bridge rectifier or smoothed two-phase bridge rectifier

Amplifier modules, electronic timer module, contactor monitoring device

ETS-VS3, DILM, CMD



				ETS4-VS3	DILM32-XTE	CMD(24VDC) CMD(220-240VAC)
General						
Standards				IEC/EN 60947, VDE 0660, UL, CSA	DIN EN 61812, IEC/EN 60947, VDE 0660, UL, CSA	IEC/EN 60947 UL CSA
Lifespan, mechanical						
AC operated		c (contacts)	x 10^6	–	3	10
DC operated		c (contacts)	x 10^6	30	3	3
Maximum operating frequency						
DC operated		c (contacts)	x 10^6	72000	–	9000
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature						
Storage			°C	–	-40 - 80	-40 - 80
Open			°C	-25 - 60	-25 - 60	-25 - 50
Enclosed			°C	-25 - 45	-25 - 40	–
Mounting position				Any	As required, except suspended	Any
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 20 ms						
N/O			g	10	–	–
Half-sinusoidal shock 10 ms						
N/O			g	–	6	4
NC			g	–	6	4
Protection type				IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof		
Weight			kg	0.09	0.08	0.1
Terminal capacity						
Solid			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)[1]	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.75…2.5) 2 x (0.75…1.5)
Flexible with ferrule			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)[1]	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75…1.5) 2 x (0.75…1.5)
Solid or stranded			AWG	16 - 14	18 - 14	18…14
Terminal screw				M3.5	M3.5	M3.5
Pozidriv screwdriver			Size	2	2	2
Flat-blade screwdriver			mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Max. tightening torque			Nm	1.2	1.2	1.2

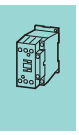
Notes

[1] Use equal cross-sections only

			ETS4-VS3	DILM32-XTE	CMD(24VDC)	CMD(220-240VAC)
Contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	8000	4000
Overvoltage category/degree of pollution			III/2	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	440	600	100	250
Rated operating voltage	U_e	V	440 AC	400 AC	24 DC	250 AC
Rated operational current						
AC-15						
220/240 V	I_e	A	2	3	–	–
380/415 V	I_e	A	2	–	–	–
DC-13 [1]						
DC-13 L/R ≦ 15 ms						
Contacts in series:						
1	24 V	A	2.6	1	–	–
1	60 V	A	1	0.2	–	–
1	110 V	A	0.6	0.2	–	–
1	220 V	A	0.2	0.1	–	–
DC-13 L/R ≦ 50 ms						
Contacts in series:						
1	24 V	A	2	1	–	–
1	60 V	A	0.6	0.2	–	–
1	110 V	A	0.08	0.2	–	–
1	220 V	A	0.08	0.1	–	–
DC-13 L/R ≦ 300 ms						
Contacts in series:						
1	24 V	A	0.6	1	–	–
1	60 V	A	0.2	0.2	–	–
1	110 V	A	0.08	0.2	–	–
1	220 V	A	0.03	0.1	–	–
Safe isolation according to EN 61140						
Between coil and auxiliary contacts		V AC	–	250	–	–
Between the auxiliary contacts		V AC	–	250	–	–
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)	Fault probability	λ	$<10^{-8}$, < one failure in 100 million operations	–	–	–
Conventional thermal current	I_{th}	A	6	4	–	–
Component lifespan						
AC-15						
230 V, I_e = 0.1 A	Switch operations	x 10^6	7	–	–	–
230 V, I_e = 1.2 A	Switch operations	x 10^6	1	–	–	–
Short-circuit rating without welding						
Short-circuit protection rating maximum fuse [2]						
500 V		A gG/gL	–	4	2	2
500 V		A fast	4	–	–	–

Notes

[1] Switch-on and switch-off conditions based on DC-13, time constant as specified
[2] See transparent overlay "Fuses" for time/current characteristics (please enquire)



			ETS4-VS3	DILM32-XTE	CMD(24VDC) CMD(220-240VAC)
Magnet systems					
Voltage tolerance					
Starting voltage					
AC operated					
	Pick-up	x U_c	–	0.85 - 1.1	0.85 - 1.1
DC operated[1]					
	Pick-up	x U_c	0.85 - 1.2	0.7 - 1.2	0.85 - 1.1
Power consumption					
AC operated	Sealing	VA	–	2	4
AC operated	Sealing	W	–	1.8	4
DC operated	Pick-up = sealing	W	0.6	–	4
Duty factor		% DF	100	100	100
Changeover times at 100 % U_c (recommended values)					
DC operated closing delay		ms	7	–	–
DC operated opening delay		ms	3	–	–
Maximum operating frequency					
Max. operating frequency		Ops/h	–	3600	–
6 A/250 V		Ops/h	–	360	–
Minimum on duration					
On-delayed		ms	–	< 50	–
Off-delayed		ms	–	< 200	–
Repetition accuracy (with constant parameters)	Deviation	%	–	< 5	–
Recovery time (after 100% time delay)		ms	–	70	–
Contact changeover time					
DILM32-XTEE11/DILM32-XTED11	t_u	ms	–	10	–
DILM32-XTEY20	t_u	ms	–	50	–
CMD	t_u	ms	–	–	100 ± 20%

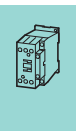
Notes

[1] Smoothed DC, three-phase bridge rectifier or smoothed two-phase bridge rectifier

DILEEM, DILEM

			DILEEM DILEM DILEM12	DILEEM-G DILEM-G DILEM12-G	DILEM4	DILEM4-G
General						
Standards			IEC/EN 60947, VDE 0660, CSA, UL			
Lifespan, mechanical; Coil 50/60 Hz	at 50 Hz		7	–	7	–
Lifespan, mechanical	c (contacts)	x 10^6	10	20	20	–
Maximum operating frequency						
Mechanical		Ops/h	9000			
Electrical (Contactor without overload relay)			→ Characteristic curves Page 5/95			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25 - 50			
Enclosed		°C	-25 - 40			
Mounting position			Any, except for vertically with terminals A1/A2 below 			
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Basic device without auxiliary contact module						
Main circuit normally open contact		g	10			
Auxiliary contacts NC/Normally open contact		g	10/8	10/8	–	–
Basic devices with auxiliary contact module						
Main circuit normally open contact		g	10			
Auxiliary contacts Normally open contact/NC		g	20/20			
Protection type			IP20			
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Weight		kg	0.2	0.17	0.2	0.17
Terminal capacity: main and auxiliary contacts						
Solid		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)			
Flexible with ferrule		mm^2	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)			
Solid or stranded		AWG	18 - 14			
Terminal screw			M3.5			
Pozidriv screwdriver		Size	2			
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6			
Max. tightening torque		Nm	1.2			
Terminal capacity springloaded terminals main and control circuits						
Solid		mm^2	1 x (1 - 2.5) 2 x (1 - 2.5)			
Flexible with ferrule		mm^2	1 x (1 - 2.5) 2 x (1 - 2.5)			
Flat-blade screwdriver		mm	0.6 x 3.5			

DILEEM, DILEM



					DILEEM DILEEM-G	DILEM DILEM-G	DILEM4	DILEM4-G	DILEM12 DILEM12-G
Main contacts									
Rated impulse withstand voltage			U_{imp}	V AC	6000	6000	6000	6000	6000
Overvoltage category/pollution degree					III/3	III/3	III/3	III/3	III/3
Rated insulation voltage			U_i	V AC	690	690	690	690	690
Rated operating voltage			U_e	V AC	690	690	690	690	690
Safe isolation according to EN 61140									
Between coil and contacts				V AC	300	300	300	300	300
Between the contacts				V AC	300	300	300	300	300
Making capacity of up to 440 V (cos φ as specified in IEC/EN 60947)				A	110	110	110	110	120
Breaking capacity	220/230 V			A	90	90	90	90	96
	380/400 V			A	90	90	90	90	96
	500 V			A	64	64	64	64	72
	660/690 V			A	42	42	42	42	42
Devices lifespan	AC-1				→ Engineering Page 5/92				
	AC-3				→ Engineering Page 5/91				
	AC-4				→ Engineering Page 5/91				
Short-circuit protection rating maximum fuse									
	Type "2" coordination 500 V		gL/gG	A	10	10	10	10	20
	Type "1" coordination 500 V		gL/gG	A	20	20	20	20	35
AC voltage									
AC-1 operation									
Conventional thermal current 3 pole 50 - 60 Hz									
	Open	at 40 °C	I_{th}	A	22	22	22	22	22
		at 50 °C	I_{th}	A	20	20	20	20	20
		at 55 °C	I_{th}	A	19	19	19	19	19
	Enclosed[1)]		I_{th}	A	16	16	16	16	16
Conventional thermal current, 1-pole									
	Open[1)]		I_{th}	A	50	50	60	60	50
	Enclosed[1)]		I_{th}	A	40	40	50	50	40
AC-3 operation									
Rated operational current AC-3 open, 50 - 60 Hz, 3-pole1)	220/230 V		I_e	A	6.6	9	9	9	12
	240 V		I_e	A	6.6	9	9	9	12
	380/400 V		I_e	A	6.6	9	9	9	12
	415 V		I_e	A	6.6	9	9	9	12
	440 V		I_e	A	6.6	9	9	9	10.5
	500 V		I_e	A	5	6.4	6.4	6.4	9
	660/690 V		I_e	A	3.5	4.8	4.8	4.8	5.2
Motor rating	220/230 V		P	kW	1.5	2.2	2.2	2.2	3.5
	240 V		P	kW	1.8	2.5	2.5	2.5	3
	380/400 V		P	kW	3	4	4	4	5.5
	415 V		P	kW	3.1	4.3	4.3	4.3	5.5
	440 V		P	kW	3.3	4.6	4.6	4.6	5.5
	500 V		P	kW	3	4	4	4	5.5
	660/690 V		P	kW	3	4	4	4	4
AC-4 operation									
Rated operational current AC-4 open, 50 - 60 Hz, 3-pole1)	220/230 V		I_e	A	5	6.6	6.6	6.6	6.6
	240 V		I_e	A	5	6.6	6.6	6.6	6.6
	380/400 V		I_e	A	5	6.6	6.6	6.6	6.6
	415 V		I_e	A	5	6.6	6.6	6.6	6.6
	440 V		I_e	A	5	6.6	6.6	6.6	6.6
	500 V		I_e	A	3.7	5	5	5	5
	660/690 V		I_e	A	2.9	3.4	3.4	3.4	3.4
Rated operational power	220/230 V		P	kW	1.1	1.5	1.5	1.5	1.5
	240 V		P	kW	1.3	1.8	1.8	1.8	1.8
	380/400 V		P	kW	2.2	3	3	3	3
	415 V		P	kW	2.3	3.1	3.1	3.1	3.1
	440 V		P	kW	2.4	3.3	3.3	3.3	3.3
	500 V		P	kW	2.2	3	3	3	2.2
	660/690 V		P	kW	2.2	3	3	3	2.2

Notes

[1)] At maximum permissible ambient air temperature

DILEEM, DILEM

					DILEEM	DILEEM-G	DILEM	DILEM-G	DILEM4	DILEM4-G	DILEM12	DILEM12-G
DC voltage												
Operations					→ Engineering Page 5/96							
Rated operational current open												
DC-1	12 V		I_e	A	20	20	20	20	20	20	20	20
	24 V		I_e	A	20	20	20	20	20	20	20	20
	60 V		I_e	A	20	20	20	20	20	20	20	20
	110 V		I_e	A	20	20	20	20	20	20	20	20
	220 V		I_e	A	20	20	20	20	20	20	20	20
DC-3	12 V		I_e	A	6	6	8	8	8	8	8	8
	24 V		I_e	A	6	6	8	8	8	8	6	8
	60 V		I_e	A	3	3	4	4	4	4	4	4
	110 V		I_e	A	2	2	3	3	3	3	3	3
	220 V		I_e	A	–	–	–	–	1	1	–	–
DC-5	12 V		I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	24 V		I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	60 V		I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	110 V		I_e	A	1.8	1.8	1.5	1.5	2.5	2.5	1.5	1.5
	220 V		I_e	A	0.2	0.2	0.3	0.3	1	1	0.3	0.3
Current heat loss (3-pole or 4-pole)												
At I_{th}				W	2	3.5	2	3.5	2.7	4.7	2	3.5
At I_e to AC-3/400 V				W	0.5	0.7	0.5	0.7	–	–	0.5	0.7
Magnet systems												
Voltage tolerance												
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz			Pick-up	x U_c	0.8 - 1.1	–	0.8 - 1.1	–	0.8 - 1.1	–	0.8 - 1.1	–
Dual-frequency coil 50/60 Hz			Pick-up	x U_c	0.8 - 1.1	–	0.85 - 1.1	–	0.85 - 1.1	–	0.8 - 1.1	–
DC operated			Pick-up	x U_c	–	0.8 - 1.1	–	0.8 - 1.1	–	0.85 - 1.1	–	0.8 - 1.1
Power consumption												
AC operation	Single-voltage coil, 50 Hz, and dual-voltage coil, 50 Hz, 60 Hz		Pick-up	VA	25	–	25	–	25	–	25	–
			Pick-up	W	22	–	22	–	22	–	22	–
			Sealing	VA	4.6	–	4.6	–	4.6	–	4.6	–
			Sealing	W	1.3	–	1.3	–	1.3	–	1.3	–
	Dual-frequency coil 50/60 Hz at 50 Hz		Pick-up	VA	30	–	30	–	30	–	30	–
			Pick-up	W	26	–	26	–	26	–	26	–
			Sealing	VA	5.4	–	5.4	–	5.4	–	5.4	–
			Sealing	W	1.6	–	1.6	–	1.6	–	1.6	–
	Dual-frequency coil 50/60 Hz at 60 Hz		Pick-up	VA	29	–	29	–	29	–	29	–
			Pick-up	W	24	–	24	–	24	–	24	–
			Sealing	VA	3.9	–	3.9	–	3.9	–	3.9	–
			Sealing	W	1.1	–	1.1	–	1.1	–	1.1	–
	Single-voltage coil, 50 Hz, and dual-voltage coil, 50 Hz, 60 Hz		Pick-up	VA	25	–	25	–	25	–	25	–
	Dual-frequency coil 50/60 Hz at 50 Hz		Pick-up	VA	30	–	30	–	30	–	30	–
	Dual-frequency coil 50/60 Hz at 60 Hz		Pick-up	VA	29	–	29	–	29	–	29	–
DC operation[1]	Power consumption pick-up = sealing			VA/W	–	2.6	–	2.6	–	2.6	–	2.6
Duty factor				% DF	100	100	100	100	100	100	100	100
Switching times at 100 % U_c												
N/O	Closing delay min.			ms	14	26	14	26	14	26	14	26
	Closing delay max.			ms	21	35	21	35	21	35	21	35
	Opening delay min.			ms	8	15	8	15	8	15	8	15
	Opening delay max.			ms	18	25	18	25	18	25	18	25
	Closing delay with top mounting auxiliary contact			ms	Max. 45	Max. 70	Max. 45	Max. 70	Max. 45	Max. 70	Max. 45	Max. 70
Reversing contactors	Changeover time at 110 % U_c											
		Changeover time min.		ms	16	40	16	40	16	40	16	40
		Changeover time max.		ms	21	50	21	50	21	50	21	50
	Arcing time at 690 V AC			ms	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12
Coil	Lifespan, mechanical; Coil 50/60 Hz		c (contacts)	x 10^6	7	–	7	–	7	–	7	–

Notes

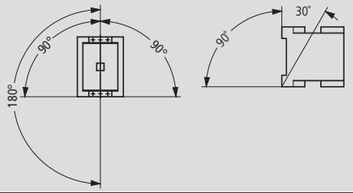
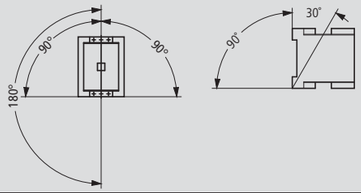
[1] Smoothed DC or three-phase bridge rectifier

DILEEM, DILEM

				DILE(E)M(-12)...	…DILEM
Auxiliary contact					
Interlocked opposing contacts to EN 60947-5-1 Annex L, including auxiliary contact module				Yes	Yes
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000
Overvoltage category/pollution degree				III/3	III/3
Rated insulation voltage		U_i	V AC	690	690
Rated operating voltage		U_e	V AC	600	600
Safe isolation according to EN 61140					
Between coil and auxiliary contacts			V AC	300	300
Between the auxiliary contacts			V AC	300	300
Rated operational current					
AC-15					
	220/240 V	I_e	A	6	4
	380/415 V	I_e	A	3	2
	500 V	I_e	A	1.5	1.5
DC	L/R ≦ 15 ms				
	Contacts in series:				
	1	24 V	A	2.5	2.5
	2	60 V	A	2.5	2.5
	3	100 V	A	1.5	1.5
	3	220 V	A	0.5	0.5
Conventional thermal current		I_{th}	A	10	10
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)		Fault probability	λ	$<10^{-8}$, < one failure in 100 million operations	
Component lifespan at U_e = 240 V					
AC-15		c (contacts)	x 10^6	0.2	0.2
DC[1)]					
	L/R = 50 ms: 2 contacts in series at I_e = 0.5 A	c (contacts)	x 10^6	0.15	0.15
Short-circuit rating without welding					
Maximum overcurrent protective device				PKZM0-4	PKZM0-4
Short-circuit protection rating maximum fuse					
	500 V		A gG/gL	6	6
	500 V		A fast	10	10
Current heat loss at load of I_{th}					
Per contact			W	0.2	0.2

Notes

[1)] Switch-on and switch-off conditions based on DC-13, time constant as specified

				DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
General																				
Standards				IEC/EN 60947, VDE 0660, UL, CSA						IEC/EN 60947, VDE 0660, UL, CSA										
Lifespan, mechanical																				
AC operated	c (contacts)	x 10^6		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
DC operated	c (contacts)	x 10^6		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Operating frequency, mechanical																				
Mechanical, AC operated	Operations/h			9000	9000	9000	5000	5000	5000	5000	5000	5000	5000	5000	5000	3600	3600	3600	3600	3000
DC operated	Operations/h			9000	9000	9000	5000	5000	5000	5000	5000	5000	5000	5000	5000	3600	3600	3600	3600	3000
Maximum operating frequency																				
Electrical (Contactor without overload relay)				→ Characteristic curves Page 5/78						→ Characteristic curves Page 5/78										
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30						Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30										
Ambient temperature																				
Open			°C	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60
Enclosed			°C	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40
Storage			°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Mounting position AC- and DC operated																				
Mechanical shock resistance (IEC/EN 60068-2-27)																				
Half-sinusoidal shock 10 ms																				
Main contacts																				
N/O			g	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Auxiliary contacts																				
N/O			g	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
NC			g	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mechanical shock resistance (IEC/EN 60068-2-27) with table mounting																				
Half-sinusoidal shock 10 ms																				
Main contacts																				
N/O			g	5.7	5.7	5.7	5.7	6.9	6.9	6.9	6.9	10	10	10	10	10	10	10	10	10
Auxiliary contacts																				
N/O			g	3.4	3.4	3.4	3.4	5.3	5.3	5.3	5.3	7	7	7	7	7	7	7	7	7
NC			g	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.5	5	5	5	5	5	5	5	5	5
Protection type				IP20	IP20	IP20	IP20	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof						Finger- and back-of-hand proof										
Weight																				
AC operated			kg	0.23	0.23	0.23	0.23	0.42	0.42	0.42	0.42	0.9	0.9	0.9	0.9	2	2	2	2	2
DC operated			kg	0.28	0.28	0.28	0.28	0.48	0.48	0.48	0.48	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1	2.1
Terminal type, screw connection																				
Terminal capacity of main cable																				
Solid			mm²	1 x (0.75 - 4) 2 x (0.75 - 2.5)				1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 16) 2 x (0.75 - 16)				–	–	–	–	–
Flexible with ferrule			mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)[1]				1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 35) 2 x (0.75 - 25)				1 x (10 - 95) 2 x (10 - 70)				
Stranded			mm²	–	–	–	–	1 x 16	1 x 16	1 x 16	1 x 16	1 x (16 - 50) 2 x (16 - 35)				1 x (16 - 95) 2 x (16 - 70)				
Solid or stranded			AWG	18 - 10	18 - 10	18 - 10	18 - 10	18 - 6	18 - 6	18 - 6	18 - 6	12 - 2	12 - 2	12 - 2	12 - 2	8…3/0	8…3/0	8…3/0	8…3/0	8…3/0
Flat conductor	Number of layers x width x thickness		mm	–	–	–	–	–	–	–	–	2 x (6 x 9 x 0.8)				2 x (6 x 16 x 0.8)				
Terminal capacity of control circuit cable																				
Solid			mm²	1 x (0.75 - 4) 2 x (0.75 - 2.5)				1 x (0.75 - 4) 2 x (0.75 - 4)		1 x (0.75 - 4) 2 x (0.75 - 4)										
Flexible with ferrule			mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)			1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
Solid or stranded			AWG	18 - 10	18 - 10	18 - 10	18 - 10	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14

Notes

[1] Also without ferrule.

			DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
General																			
Main cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5	M5	M5	M5	M5	M6	M6	M6	M6	M10	M10	M10	M10	M10
Tightening torque		Nm	1.2	1.2	1.2	1.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.3	14	14	14	14	14
Control circuit cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Tools																			
Main conductors																			
Pozidriv screwdriver		Size	2	2	2	2	2	2	2	2	2	2	2	2	–	–	–	–	–
Internal hexagon	SW	mm	–	–	–	–	–	–	–	–	–	–	–	–	5	5	5	5	5
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	–	–	–	–	–
Auxiliary conductors																			
Pozidriv screwdriver		Size	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Terminal type spring-cage terminal																			
Terminal capacity of main cable																			
Solid		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–	–	–	–	–	–	–	–	–	–	–	–
Flexible		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–	–	–	–	–	–	–	–	–	–	–	–
Flexible with ferrule		mm²	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)				–	–	–	–	–	–	–	–	–	–	–	–	–
Flexible without ferrule		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–	–	–	–	–	–	–	–	–	–	–	–
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14	–	–	–	–	–	–	–	–	–	–	–	–	–
Terminal capacity of control circuit cable																			
Solid		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)						1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
Flexible		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)						1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
Flexible with ferrule		mm²	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)						1 x (0.75 - 1.5) 2 x (0.75 - 1.5)										
Flexible without ferrule		mm²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–	–	–	–	–	–	–	–	–	–	–	–
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14
Tools																			
Strip length		mm	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Screwdriver blade width		mm	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Main contacts																			
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690
Rated operating voltage	U_e	V AC	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690
Safe isolation according to EN 61140																			
Between coil and contacts		V AC	400	400	400	400	440	440	440	440	440	440	440	440	690	690	690	690	690
Between the contacts		V AC	400	400	400	400	440	440	440	440	440	440	440	440	690	690	690	690	690
Making capacity (cos φ to IEC/EN 60947)	To 690 V	A	112	112	144	155	238	350	384	384	560	700	910	910	1120	1330	1610	2100	2100
Breaking capacity																			
230 V		A	70	90	120	124	170	250	320	320	400	500	650	650	800	950	1150	1500	1500
380/400 V		A	70	90	120	124	170	250	320	320	400	500	650	650	800	950	1150	1500	1500
500 V		A	50	70	100	100	170	250	320	320	400	500	650	650	800	950	1150	1500	1500
660/690 V		A	40	50	70	70	120	150	180	180	250	320	370	370	650	800	1100	1200	1320
Short-circuit rating																			
Short-circuit protection rating maximum fuse																			
Type “2” coordination																			
400 V	gG/gL 500 V	A	20	20	20	20	35	35	63	63	63	80	125	125	160	160	250	250	250
690 V	gG/gL 690 V	A	16	16	20	20	35	35	35	35	50	63	80	80	160	160	250	250	250
Type “1” coordination																			
400 V	gG/gL 500 V	A	35	35	35	63	63	100	125	125	125	160	250	250	250	250	250	250	250
690 V	gG/gL 690 V	A	20	20	25	50	50	50	63	63	80	80	100	100	200	200	250	250	250

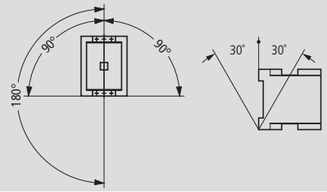
					DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
AC voltage																					
AC-1 operation																					
Conventional free air thermal current 3 pole 50 - 60 Hz	Open	at 40 °C	I_{th}	A	22	22	22	22	40	45	45	45	60	80	98	98	110	130	160	190	225
		at 50 °C	I_{th}	A	21	21	21	21	38	43	43	43	57	71	88	88	98	125	142	180	200
		at 55 °C	I_{th}	A	21	21	21	21	37	42	42	42	55	68	83	83	94	115	135	170	190
		at 60 °C	I_{th}	A	20	20	20	20	35	40	40	40	50	65	80	80	90	110	130	160	185
	Enclosed		I_{th}	A	18	18	18	18	32	36	36	36	45	58	72	72	80	100	115	144	166
Conventional free air thermal current 1 pole	Open		I_{th}	A	50	50	50	50	88	100	100	100	125	162	200	200	225	275	325	400	460
	Enclosed		I_{th}	A	45	45	45	45	80	90	90	90	112	145	180	180	200	250	285	360	415
AC-3 operation																					
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole	220/230 V		I_e	A	7	9	12	15.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	240 V		I_e	A	7	9	12	15.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	380/400 V		I_e	A	7	9	12	15.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	415 V		I_e	A	7	9	12	15.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	440 V		I_e	A	7	9	12	15.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	500 V		I_e	A	5	7	10	12.5	18	25	32	38	40	50	65	72	80	95	115	150	170
	660/690 V		I_e	A	4	5	7	9	12	15	18	22.5	25	32	37	37	65	80	93	100	150
Rated operational power	220/230 V		P	kW	2.2	2.5	3.5	4	5	7.5	10	11	12.5	15.5	20	22	25	30	37	48	52
	240 V		P	kW	2.2	3	4	4.6	5.5	8.5	11	12	13.5	17	22	25	27.5	32	40	52	57
	380/400 V		P	kW	3	4	5.5	7.5	7.5	11	15	18.5	18.5	22	30	37	37	45	55	75	90
	415 V		P	kW	4	5.5	7	8	10	14.5	19	20	24	30	39	41	48	57	70	91	100
	440 V		P	kW	4.5	5.5	7.5	8.4	10.5	15.5	20	21	25	32	41	44	51	60	75	95	105
	500 V		P	kW	3.5	4.5	7	7.5	12	17.5	23	24	28	36	47	50	58	70	85	110	120
	660/690 V		P	kW	3.5	4.5	6.5	7	11	14	17	21	23	30	35	35	63	75	90	96	140
AC-4 operation																					
Rated operational current AC-4 open, 50 - 60 Hz, 3 pole	220/230 V		I_e	A	5	6	7	7	10	13	15	15	18	21	25	25	40	50	55	65	65
	240 V		I_e	A	5	6	7	7	10	13	15	15	18	21	25	25	40	50	55	65	65
	380/400 V		I_e	A	5	6	7	7	10	13	15	15	18	21	25	25	40	50	55	65	65
	415 V		I_e	A	5	6	7	7	10	13	15	15	18	21	25	25	40	50	55	65	65
	440 V		I_e	A	5	6	7	7	10	13	15	15	18	21	25	25	40	50	55	65	65
	500 V		I_e	A	4.5	5	6	6	10	13	15	15	18	21	25	25	40	50	55	65	65
	660/690 V		I_e	A	4	4.5	5	5	8	10	12	12	14	17	20	20	27	37	45	50	50
Rated operational power	220/230 V		P	kW	1	1.5	2	2	2.5	3.5	4	4	5	6	7	7	12	16	17	20	20
	240 V		P	kW	1.5	1.6	2.2	2.2	3	4	4.5	4.5	5.5	6.5	7.5	7.5	13	17	19	22	22
	380/400 V		P	kW	2.2	2.5	3	3	4.5	6	7	7	9	10	12	12	20	26	28	33	33
	415 V		P	kW	2.3	2.8	3.4	3.4	5	6.5	7.5	7.5	9.5	11	13	13	24	30	33	39	39
	440 V		P	kW	2.4	3	3.6	3.6	5.5	7	8	8	10	12	14	14	25	32	35	41	41
	500 V		P	kW	2.5	2.8	3.5	3.5	6	8	9	9	11	13	16	16	29	36	40	47	47
	660/690 V		P	kW	2.9	3.6	4.4	4.4	6.5	8.5	10	10	12	14	17	17	26	35	43	48	48
DC voltage																					
Operations					→ Switching of DC current Page 5/96																
Rated operational current I_e open																					
DC-1 operation	60 V		I_e	A	20	20	20	20	35	40	40	40	50	60	72	72	110	110	160	160	160
	110 V		I_e	A	20	20	20	20	35	40	40	40	50	50	72	72	110	110	160	160	160
	220 V		I_e	A	15	15	15	15	35	40	40	40	45	45	65	65	70	70	90	90	90
	440 V		I_e	A	1	1.3	1.3	1.3	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	4.5	4.5	4.5	4.5	4.5
DC-3 operation	60 V		I_e	A	20	20	20	20	35	35	40	40	50	60	72	72	110	110	160	160	160
	110 V		I_e	A	20	20	20	20	35	35	40	40	50	50	72	72	110	110	160	160	160
	220 V		I_e	A	1.5	1.5	1.5	1.5	10	10	25	25	25	25	35	35	35	35	40	40	40
	440 V		I_e	A	0.2	0.2	0.2	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1	1	1	1	1
DC-5 operation	60 V		I_e	A	20	20	20	20	35	35	40	40	50	60	72	72	110	110	160	160	160
	110 V		I_e	A	20	20	20	20	35	35	40	40	50	50	72	72	110	110	160	160	160
	220 V		I_e	A	1.5	1.5	1.5	1.5	10	10	10	10	25	25	35	35	35	35	40	40	40
	440 V		I_e	A	0.2	0.2	0.2	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1	1	1	1	1

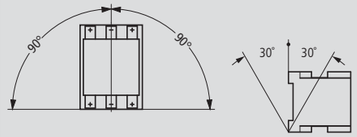
				DILM7	DILM9	DILM12	DILM15	DILM17	DILM25
Current heat loss (3 pole)									
Current heat loss at I_{th}			W	3	3	3	3	7.3	9.6
Current heat loss at I_e to AC-3/400 V			W	0.37	0.6	1.1	1.8	1.9	3.8
Impedance per pole			mΩ	2.5	2.5	2.5	2.5	2	2
Magnet systems									
Voltage tolerance									
AC operated		Pick-up	x U_c	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
AC operated		Drop-out	x U_c	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6
DC operated[3]		Pick-up	x U_c	0.8 - 1.1	0.8 - 1.1[1]	0.8 - 1.1[1]	0.8 - 1.1[1]	0.7 - 1.2[2]	0.7 - 1.2[2]
DC operated[3]		Drop-out	x U_c	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6
Power consumption of the coil in a cold state and 1.0 x U_c									
50 Hz		Pick-up	VA	24	24	24	24	52	52
50 Hz		Sealing	VA	3.4	3.4	3.4	3.4	7.1	7.1
50 Hz		Sealing	W	1.2	1.2	1.2	1.2	2.1	2.1
60 Hz		Pick-up	VA	30	30	30	30	67	67
60 Hz		Sealing	VA	4.4	4.4	4.4	4.4	8.7	8.7
60 Hz		Sealing	W	1.4	1.4	1.4	1.4	2.6	2.6
50/60 Hz		Pick-up	VA	27 25	27 25	27 25	27 25	62 58	62 58
50/60 Hz		Sealing	VA	4.2 3.3	4.2 3.3	4.2 3.3	4.2 3.3	9.1 6.5	9.1 6.5
50/60 Hz		Sealing	W	1.4 1.2	1.4 1.2	1.4 1.2	1.4 1.2	2.5 2	2.5 2
DC operated		Pick-up	W	3	3	4.5	4.5	12	12
DC operated		Sealing	W	3	3	4.5	4.5	0.5	0.5
Duty factor			% DF	100	100	100	100	100	100
Changeover times at 100 % U_c (recommended values)									
Main contacts									
AC operated	Closing delay		ms	15…21	15…21	15…21	15…21	16…22	16…22
	Opening delay		ms	9…18	9…18	9…18	9…18	8…14	8…14
DC operated	Closing delay		ms	31	31	31	31	47	47
	Opening delay		ms	12	12	12	12	30	30
Arcing time			ms	10	10	10	10	10	10
Permissible residual current when A1 - A2 are actuated from the electronic system (with 0 signal)			mA	–	–	–	–	–	–
Lifespan, mechanical; Coil 50/60 Hz		At 50 Hz		Mechanical lifespan at 50 Hz approx. 30% lower than under → Technical data general					
Electromagnetic compatibility (EMC)									
Emitted interference				To EN 60947-1					
Interference immunity				To EN 60947-1					

DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
12.1	12.1	11.3	19	28.8	28.8	12.2	18.2	20.3	30.7	41.1
6.1	6.1	7.2	11.3	19	23	9.6	13.5	15.9	27	34.7
2	2	1.5	1.5	1.5	1.5	0.5	0.5	0.4	0.4	0.4
0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15
0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.25 - 0.6	0.25 - 0.6	0.25 - 0.6
0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]	0.7 - 1.2[2]
0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6
52	52	149	149	149	149	310	310	180	180	180
7.1	7.1	16	16	16	16	26	26	3.1	3.1	3.1
2.1	2.1	4.3	4.3	4.3	4.3	5.8	5.8	2.1	2.1	2.1
67	67	178	178	178	178	345	345	170	170	170
8.7	8.7	19	19	19	19	30	30	3.1	3.1	3.1
2.6	2.6	5.3	5.3	5.3	5.3	7.1	7.1	2.1	2.1	2.1
62 58	62 58	168 154	168 154	168 154	168 154	372 328	372 328	170 170	170 170	170 170
9.1 6.5	9.1 6.5	22 14	22 14	22 14	22 14	37.1 22.6	37.1 22.6	3.1 3.1	3.1 3.1	3.1 3.1
2.5 2	2.5 2	5.3 4.3	5.3 4.3	5.3 4.3	5.3 4.3	7.5 6.1	7.5 6.1	2.1 2.1	2.1 2.1	2.1 2.1
12	12	24	24	24	24	90	90	149	149	149
0.5	0.5	0.5	0.5	0.5	0.5	1.3	1.3	2.1	2.1	2.1
100	100	100	100	100	100	100	100	100	100	100
16…22	16…22	12…18	12…18	12…18	12…18	14…20	14…20	28…33	28…33	28…33
8…14	8…14	8…13	8…13	8…13	8…13	9…14	9…14	35…41	35…41	35…41
47	47	54	54	54	54	45	45	35	35	35
30	30	24	24	24	24	34	34	30	30	30
10	10	10	10	10	10	15	15	15	15	15
–	–	–	–	–	–	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1
Mechanical lifespan at 50 Hz approx. 30% lower than under → Technical data general										
To EN 60947-1										
To EN 60947-1										

Notes

[1] At 24 V DC: 0.7 – 1.3 without auxiliary contact module and at ambient temperature + 40 °C
[2] RDC 24 (Umin 24 V DC/Umax 27 V DC)
RDC 60 (Umin 48 V DC/Umax 60 V DC)
RDC 130 (Umin 110 V DC/Umax 130 V DC)
RDC 240 (Umin 200 V DC/Umax 240 V DC)
Example: Uc = 0.7 x Umin - 1.2 x Umax / Uc = 0.7 x 24 V - 1.2 x 27 V DC
[3] At least: smoothed two-phase bridge rectifier or three-phase rectifier

			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
General									
Standards			IEC/EN 60947, VDE 0660, UL, CSA						
Lifespan, mechanical									
AC operated	c (contacts)	x 10^6	10	10	10	10	7	7	7
DC operated	c (contacts)	x 10^6	10	10	10	10	7	7	7
Operating frequency, mechanical									
AC operated	Operations/h		3000	3000	3000	3000	2000	2000	2000
DC operated	Operations/h		3000	3000	3000	3000	2000	2000	2000
Maximum operating frequency									
Electrical (Contactor without overload relay)			→ Engineering Page 5/95						
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30						
Ambient temperature									
Open		°C	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60
Enclosed		°C	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40
Storage		°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Mounting position: AC and DC-actuated									
Mechanical shock resistance (IEC/EN 60068-2-27)									
Half-sinusoidal shock 10 ms									
Main contacts									
N/O		g	10	10	10	10	10	10	10
Auxiliary contacts									
N/O		g	10	10	10	10	10	10	10
NC		g	8	8	8	8	8	8	8
Protection type			IP00	IP00	IP00	IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (EN 90274)			Finger- and back-of-hand proof with cover or terminal block						
Weight									
Weight		kg	3.2	3.2	6.5	6.5	8	8	8
Terminal capacity of main cable									
Flexible with cable lug		mm^2	50 - 185	50 - 185	50 - 240	50 - 240	50 - 240	50 - 240	50 - 240
Stranded with cable lug		mm^2	50 - 185	70 - 185	70 - 240	70 - 240	70 - 240	70 - 240	70 - 240
Solid or stranded		AWG	1/0 - 350 MCM	2/0 - 250 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM
Busbar	Width	mm	32	32	25	25	25	30	30
Main cable connection screw/bolt			M10	M10	M10	M10	M10	M10	M10
Tightening torque		Nm	24	24	24	24	24	24	24
Terminal capacity of control circuit cable									
Solid		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)						
Flexible with ferrule		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)						
Solid or stranded		AWG	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
Control circuit cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Tools									
Main conductors									
Wrench		mm	16	16	16	16	16	16	16
Auxiliary conductors									
Pozidriv screwdriver		Size	2	2	2	2	2	2	2

DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
IEC/EN 60947, VDE 0660, UL, CSA									
5	5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5	5
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
→ Engineering Page 5/95									
Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30									
-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60	-25…60
-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40
-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
									
10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10	10
8	8	8	8	8	8	8	8	8	8
IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00
Finger- and back-of-hand proof with cover or terminal block									
15	15	15	15	15	32	15	32	32	32
50 - 240	50 - 240	50 - 240	50 - 240	50 - 240	–	–	–	–	–
70 - 240	70 - 240	70 - 240	70 - 240	70 - 240	–	–	–	–	–
2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	–	–	–	–	–
50	50	60	60	60	100	80	100	100	100
M10	M10	M12	M12	M12	M12	M12	M12	M12	M12
24	24	35	35	35	35	35	35	35	35
1 x (0.75 - 2.5) 2 x (0.75 - 2.5)									
1 x (0.75 - 2.5) 2 x (0.75 - 2.5)									
2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18…12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
16	16	18	18	18	18	18	18	18	18
2	2	2	2	2	2	2	2	2	2

			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
Main contacts									
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	1000	1000	1000	1000	1000	1000	1000
Rated operating voltage	U_e	V AC	1000	1000	1000	1000	1000	1000	1000
Safe isolation according to EN 61140									
Between coil and contacts		V AC	500	500	500	500	500	500	500
Between the contacts		V AC	500	500	500	500	500	500	500
Making capacity (cos φ to IEC/EN 60947)		A	2700	2700	3000	3600	5500	5500	6000
Breaking capacity									
220/230 V		A	2250	2250	2500	3000	5000	5000	5800
380/400 V		A	2250	2250	2500	3000	5000	5000	5800
500 V		A	2250	2250	2500	3000	5000	5000	5800
660/690 V		A	2250	2250	2500	3000	5000	5000	5800
1000 V		A	760	760	760	950	950	950	950
Component lifespan			→ Page 5/91						
Short-circuit rating									
Short-circuit protection rating maximum fuse									
Type "2" coordination									
400 V	gG/gL 500 V	A	250	250	315	315	500	500	500
690 V	gG/gL 690 V	A	250	250	315	315	500	500	500
1000 V	gG/gL 1000 V	A	160	160	160	160	200	200	200
Type "1" coordination									
400 V	gG/gL 500 V	A	400	400	400	400	630	630	800
690 V	gG/gL 690 V	A	315	315	400	400	630	630	630
1000 V	gG/gL 1000 V	A	200	200	200	200	250	250	250
AC voltage									
AC-1 operation									
Conventional thermal current 3 pole 50 - 60 Hz									
Open									
at 40 °C	I_{th}	A	337	356	400	430	612	857	920
at 50 °C	I_{th}	A	301	310	360	385	548	767	821
at 55 °C	I_{th}	A	287	295	340	365	522	731	783
at 60 °C	I_{th}	A	275	285	330	350	500	700	750
Enclosed[1)]	I_{th}	A	245	275	300	315	450	650	–
Conventional thermal current, 1-pole									
Open[1)]	I_{th}	A	685	707	825	875	1250	1750	1875
Enclosed[1)]	I_{th}	A	625	636	742	785	1125	1600	–
AC-3 operation									
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole									
220/230 V	I_e	A	185	225	250	300	400	500	580
240 V	I_e	A	185	225	250	300	400	500	580
380/400 V	I_e	A	185	225	250	300	400	500	580
415 V	I_e	A	185	225	250	300	400	500	580
440 V	I_e	A	185	225	250	300	400	500	580
500 V	I_e	A	185	225	250	300	400	500	500
660/690 V	I_e	A	150	160	250	210	360	360	360
1000 V	I_e	A	76	76	76	95	95	95	95
Rated operational power									
220/230 V	P	kW	55	70	75	90	125	155	185
240 V	P	kW	62	75	85	100	132	170	200
380/400 V	P	kW	90	110	132	160	200	250	315
415 V	P	kW	110	132	148	180	240	300	348
440 V	P	kW	115	138	132	185	200	250	370
500 V	P	kW	132	160	180	215	290	360	360
660/690 V	P	kW	140	150	240	195	344	344	344
1000 V	P	kW	108	108	108	132	132	132	132

DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
500	500	500	500	500	500	500	500	500	500
500	500	500	500	500	500	500	500	500	500
7800	7800	9840	9840	9840	19000	9840	9840	9840	9840
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
4350	4350	5800	5800	5800	5800	5800	5800	5800	5800
→ Page 5/91									
630	630	630	630	630	–	–	–	–	–
630	630	630	630	630	–	–	–	–	–
500	500	630	630	630	–	–	–	–	–
1000	1000	1200	1200	1200	–	–	–	–	–
1000	1000	1200	1200	1200	–	–	–	–	–
630	630	800	800	800	–	–	–	–	–
980	1041	1102	1225	1225	2200[2)]	1714[2)]	2450[2)]	2700[2)]	3185[2)]
876	931	986	1095	1095	1970[2)]	1533[2)]	2190[2)]	2400[2)]	2847[2)]
836	888	940	1044	1044	1880[2)]	1462[2)]	2089[2)]	2300[2)]	2716[2)]
800	850	900	1000	1000	1800[2)]	1400[2)]	2000[2)]	2200[2)]	2600[2)]
–	–	–	–	–	–	–	–	–	–
2000	2125	2250	2500	2500	4500	3500	5000	5500	6500[2)]
–	–	–	–	–	–	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
580	650	750	820	1000	1600	–	–	–	–
435	435	580	580	750	1200	–	–	–	–
185	205	240	260	315	500	–	–	–	–
200	225	260	285	340	550	–	–	–	–
315	355	400	450	560	900	–	–	–	–
348	390	455	500	610	930	–	–	–	–
370	420	480	450	650	1000	–	–	–	–
420	470	550	600	730	1180	–	–	–	–
560	630	720	750	1000	1600	–	–	–	–
600	600	800	800	1100	1770	–	–	–	–

Notes

[1)] At maximum permissible ambient air temperature
[2)] To 690 V

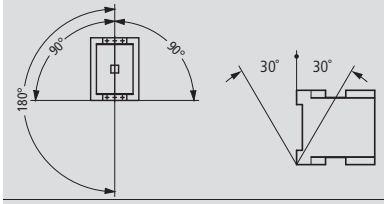
			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
AC voltage									
AC-4 operation									
Rated operational current AC -4 open, 50 – 60 Hz, 3 pole									
220/230 V	I_e	A	136	164	200	240	296	360	360
240 V	I_e	A	136	164	200	240	296	360	360
380/400 V	I_e	A	136	164	200	240	296	360	360
415 V	I_e	A	136	164	200	240	296	360	360
440 V	I_e	A	136	164	200	240	296	360	360
500 V	I_e	A	136	164	200	240	296	360	360
660/690 V	I_e	A	110	120	200	170	296	296	296
1000 V	I_e	A	55	55	76	76	95	95	95
Rated operational power									
220/230 V	P	kW	41	51	62	75	92	112	112
240 V	P	kW	45	54	68	82	101	122	122
380/400 V	P	kW	75	90	110	132	160	200	200
415 V	P	kW	80	96	117	142	176	216	216
440 V	P	kW	85	102	125	150	186	229	229
500 V	P	kW	96	116	143	172	214	260	260
660/690 V	P	kW	102	110	189	160	283	344	344
1000 V	P	kW	77	77	108	109	132	132	132
Capacitor operation									
Individual compensation rated operational current I_e of alternating current capacitor									
Open									
To 525 V		A	220	220	220	307	307	307	307
690 V		A	133	133	133	177	177	177	177
Max. peak inrush current		x I_e	30	30	30	30	30	30	30
Component lifespan	c (contacts)	x 10^6	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max. operating frequency		Ops/h	200	200	200	200	200	200	200
DC voltage									
Operations			→ Engineering Page 5/96						
Rated operational current I_e open									
DC-1 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
440 V	I_e	A	11	11	11	11	11	11	11
DC-3 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
DC-5 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
Current heat loss (3 pole)									
Current heat loss at I_{th}		W	34	45	55	37	58	113	130
Current heat loss at I_e to AC-3/400 V		W	16	23	28	21	37	58	78

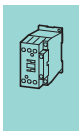
			DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
AC voltage												
AC-4 operation												
Rated operational current AC -4 open, 50 – 60 Hz, 3 pole												
220/230 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
240 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
380/400 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
415 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
440 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
500 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
660/690 V	I_e	A	456	512	576	656	800	1280	–	–	–	–
1000 V	I_e	A	348	348	464	464	700	1120	–	–	–	–
Rated operational power												
220/230 V	P	kW	143	161	181	209	260	430	–	–	–	–
240 V	P	kW	156	176	200	228	280	450	–	–	–	–
380/400 V	P	kW	250	280	315	355	450	750	–	–	–	–
415 V	P	kW	274	307	346	394	490	770	–	–	–	–
440 V	P	kW	290	326	367	418	520	830	–	–	–	–
500 V	P	kW	330	370	417	474	590	940	–	–	–	–
660/690 V	P	kW	440	494	556	633	780	1300	–	–	–	–
1000 V	P	kW	509	509	678	678	1000	1650	–	–	–	–
Capacitor operation												
Individual compensation rated operational current I_e of alternating current capacitor												
Open												
To 525 V		A	463	463	463	463	463	–	–	–	–	–
690 V		A	265	265	265	265	265	–	–	–	–	–
Max. peak inrush current		x I_e	30	30	30	30	30	–	–	–	–	–
Component lifespan	c (contacts)	x 10^6	0.1	0.1	0.1	0.1	0.1	–	–	–	–	–
Max. operating frequency		Ops/h	200	200	200	200	200	–	–	–	–	–
DC voltage												
Operations			–									
Rated operational current I_e open												
DC-1 operation												
60 V	I_e	A	–	–	–	–	–	–	–	–	–	–
110 V	I_e	A	–	–	–	–	–	–	–	–	–	–
220 V	I_e	A	–	–	–	–	–	–	–	–	–	–
440 V	I_e	A	–	–	–	–	–	–	–	–	–	–
DC-3 operation												
60 V	I_e	A	–	–	–	–	–	–	–	–	–	–
110 V	I_e	A	–	–	–	–	–	–	–	–	–	–
220 V	I_e	A	–	–	–	–	–	–	–	–	–	–
DC-5 operation												
60 V	I_e	A	–	–	–	–	–	–	–	–	–	–
110 V	I_e	A	–	–	–	–	–	–	–	–	–	–
220 V	I_e	A	–	–	–	–	–	–	–	–	–	–
Current heat loss (3 pole)												
Current heat loss at I_{th}		W	61	69	78	96	96	155	188	192	232	250
Current heat loss at I_e to AC-3/400 V		W	32	41	54	65	96	123	–	–	–	–

				Contactors																
				DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570	DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
Magnet systems																				
Voltage tolerance[1]	AC operated	Pick-up	x U_c	0.8 - 1.15	0.8 - 1.15															
	AC operated	Drop-out	x U_c	0.25 - 0.6	0.25 - 0.6															
	DC operated	Pick-up	x U_c	0.7 - 1.2	0.7 - 1.2															
	DC operated	Drop-out	x U_c	0.15 - 0.6	0.15 - 0.6															
Power consumption of the coil in a cold state and 1.0 x U_c	50/60 Hz	Pick-up	VA	210	210	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	50/60 Hz	Sealing	VA	2.6	2.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	50/60 Hz	Sealing	W	2.6	2.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	DC operated	Pick-up	W	180	180	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	DC operated	Sealing	W	2.1	2.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Voltage tolerance	Comfort series DILM…	Pick-up	x U_c	–	–	0.7 x $U_{c\ min}$ - 1.15 x $U_{c\ max}$					0.7 x $U_{c\ min}$ - 1.15 x $U_{c\ max}$									
	Standard range DILM…-S	Pick-up	x U_c	–	–	0.85 x $U_{c\ min}$ - 1.1 x $U_{c\ max}$					0.85 x $U_{c\ min}$ - 1.1 x $U_{c\ max}$									
	Comfort series DILM…	Drop-out	x U_c	–	–	0.2 x $U_{c\ min}$ - 0.6 x $U_{c\ min}$					0.2 x $U_{c\ min}$ - 0.6 x $U_{c\ min}$									
	Standard range DILM…-S	Drop-out	x U_c	–	–	0.2 x $U_{c\ min}$ - 0.4 x $U_{c\ min}$					0.2 x $U_{c\ min}$ - 0.4 x $U_{c\ min}$									
Power consumption of the coil in a cold state and 1.0 x U_c	Comfort series DILM…	Pick-up	VA	–	–	380[2]	380[2]	450[2]	450[2]	450[2]	800[3]	800[3]	800[3]	800[3]	800[3]	1600[3]	800[3]	1600[3]	1600[3]	–
	Comfort series DILM…	Pick-up	W	–	–	250	250	350	350	350	700	700	700	700	700	1400	700	1400	1400	–
	Comfort series DILM…	Sealing	VA	–	–	4.3	4.3	4.3	4.3	4.3	7.5	7.5	7.5	7.5	7.5	15	7.5	15	15	–
	Comfort series DILM…	Sealing	W	–	–	3.3	3.3	3.3	3.3	3.3	6.5	6.5	6.5	6.5	6.5	13	6.5	13	13	–
	Standard range DILM…-S	Pick-up	VA	–	–	360[4]	360[4]	715[4]	715[4]	715[4]	–	–	–	–	–	–	–	–	–	–
	Standard range DILM…-S	Pick-up	W	–	–	325	625	645	645	645	–	–	–	–	–	–	–	–	–	–
	Standard range DILM…-S	Sealing	VA	–	–	4.3	4.3	4.3	4.3	4.3	–	–	–	–	–	–	–	–	–	–
	Standard range DILM…-S	Sealing	W	–	–	3.3	3.3	3.3	3.3	3.3	–	–	–	–	–	–	–	–	–	–
Duty factor			% DF	–	–	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Changeover time at 100 % U_c (recommended values), main circuit																				
Comfort series DILM…	Closing delay		ms	–	–	< 100	< 80	< 80	< 80	< 80	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	–
	Opening delay		ms	–	–	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 40	< 40	< 40	< 40	–
Standard range DILM…-S	Closing delay		ms	< 60	< 60	< 55	< 55	< 55	< 55	< 55	–	–	–	–	–	–	–	–	–	–
	Opening delay		ms	< 40	< 40	< 40	< 40	< 50	< 50	< 50	–	–	–	–	–	–	–	–	–	–
Behavior in limit range and transition area, hold state																				
Voltage interruption	(0 - 0.2 x $U_{c\ min}$) ≦ 10 ms			–	–	Targeted bridging during this time					Targeted bridging during this time									
	(0 - 0.2 x $U_{c\ min}$) > 10 ms					Drop-out of the contactor					Drop-out of the contactor									
Voltage drops	(0.2 - 0.6 x $U_{c\ min}$) ≦ 12 ms					Targeted bridging during this time					Targeted bridging during this time									
	(0.2 - 0.6 x $U_{c\ min}$) > 12 ms					Drop-out of the contactor					Drop-out of the contactor									
	(0.6 - 0.7 x $U_{c\ min}$)					Contactor remains switched on					Contactor remains switched on									
Excess voltage	(1.15 - 1.3 x $U_{c\ max}$)					Contactor remains switched on					Contactor remains switched on									
	(> 1.3 x $U_{c\ max}$) ≦ 3 s					Contactor remains switched on					Contactor remains switched on									
	(> 1.3 x $U_{c\ max}$) > 3 s					Drop-out of the contactor					Drop-out of the contactor									
Pick-up phase	(0 - 0.7 x $U_{c\ min}$)					Contactor does not switch on					Contactor does not switch on									
	(0.7 x $U_{c\ min}$ - 1.15 x $U_{c\ max}$)					Contactor switches on safely					Contactor switches on safely									
	(> 1.15 x $U_{c\ max}$)					Contactor switches on safely					Contactor switches on safely									
Permissible transitional contact resistance (of external control unit when A11 is actuated)			mΩ	–	–	≦ 500	≦ 500	≦ 500	≦ 500	–	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500	≦ 500
Permissible residual current (when A11 is actuated from the electronic system in the event of a 0 signal)			mA	–	–	≦ 1	≦ 1	≦ 1	≦ 1	–	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1	≦ 1
PLC signal level (A3 - A4) to IEC/EN 61131-2 (part no. 2)																				
High			V	15	15	15	15	15	15	–	15	15	15	15	15	15	15	15	15	15
Low			V	5	5	5	5	5	5	–	5	5	5	5	5	5	5	5	5	5
Electromagnetic compatibility (EMC)																				
Electromagnetic compatibility				This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned.							This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned.									

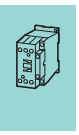
Notes

[1] U_c min, U_c max,
[2] Control transformer with u_k ≦ 0.6
[3] Control transformer with u_k ≦ 0.7
[4] u_k ≦ 10 %

			DILMP20	DILMP32 DILMP45	DILMP63 DILMP80	DILMP125 DILMP160 DILMP200
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, mechanical						
AC operated	c (contacts)	x 10^6	10			
DC operated	c (contacts)	x 10^6	10			
Operating frequency, mechanical						
Mechanical, AC operated	Operations/h		5000			3600
DC operated	Operations/h		5000			3600
Maximum operating frequency						
Electrical (Contactor without overload relay)			600			
Climatic proofing			Damp heat, constant, to IEC 60068-2-3 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25…60			
Enclosed		°C	-25…40			
Storage		°C	-40 - 80			
Mounting position AC- and DC operated						
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Main contacts						
N/O		g	10			
Auxiliary contacts						
N/O		g	7			
NC		g	5			
Protection type			IP20	IP00		
With accessories			–	IP20		
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Terminal type, screw connection						
Terminal capacity of main cable						
Solid		mm^2	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 16) 2 x (0.75 - 10)	1 x (2.5 - 16) 2 x (2.5 - 16)	–
Flexible with ferrule		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 16) 2 x (0.75 - 10)	1 x (2.5 - 35) 2 x (2.5 - 25)	1 x (10 - 95) 2 x (10 - 70)
Stranded		mm^2	–	1 x 16	1 x (16 - 50) 2 x (16 - 35)	1 x (16 - 120) 2 x (16 - 95)
Solid or stranded		AWG	18 - 14	18 - 6	12 - 2	8 - 250MCM
Flat conductor	Number of layers x width x thickness	mm	–	–	2 x (6 x 9 x 0.8)	2 x (6 x 16 x 0.8)
Terminal capacity of control circuit cable						
Solid		mm^2	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 4)	1 x (0.75 - 4) 2 x (0.75 - 4)
Flexible with ferrule		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14
Main cable connection screw/bolt			M3.5	M5	M6	M10
Tightening torque		Nm	1.2	3	3.3	14
Control circuit cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	1.2	1.2	1.2	1.2
Tools						
Main conductors						
Pozidriv screwdriver		Size	2	2	2	–
Internal hexagon	SW	mm	–	–	–	5
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	–
Auxiliary conductors						
Pozidriv screwdriver		Size	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6



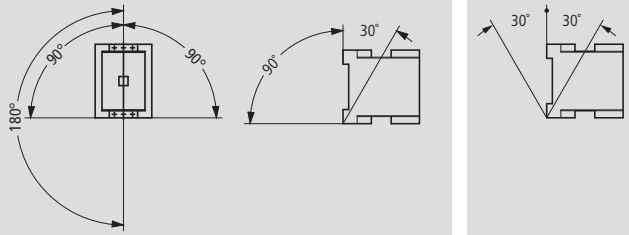
			DILMP20	DILMP32	DILMP45	DILMP63	DILMP80	DILMP125	DILMP160	DILMP200
Main contacts										
Rated impulse withstand voltage	U_{imp}	V AC	8000							
Overvoltage category/pollution degree			III/3							
Rated insulation voltage	U_i	V AC	690							
Rated operating voltage	U_e	V AC	690							
Safe isolation according to EN 61140										
Between coil and contacts		V AC	400	440						
Between the contacts		V AC	400	440						
Making capacity (cos φ to IEC/EN 60947)	To 690 V	A	144	238	350	560	700	1120	1330	1800
Breaking capacity										
220/230 V		A	120	180	250	400	500	800	950	1150
380/400 V		A	120	180	250	400	500	800	950	1150
500 V		A	100	180	250	400	500	800	950	1150
660/690 V		A	70	120	144	250	296	650	750	800
Short-circuit rating										
Short-circuit protection rating maximum fuse										
Type "2" coordination										
400 V	gG/gL 500 V	A	20	35	35	63	80	160	160	250
690 V	gG/gL 690 V	A	20	35	35	50	63	160	160	200
Type "1" coordination										
400 V	gG/gL 500 V	A	35	63	100	125	160	250	250	250
690 V	gG/gL 690 V	A	25	50	50	80	80	200	200	200
AC voltage										
AC-1 operation										
Conventional thermal current 3 pole 50 - 60 Hz										
Open										
at 40 °C	I_{th}	A	22	32	45	63	80	125	160	200
at 50 °C	I_{th}	A	21	30	41	60	76	116	150	188
at 60 °C	I_{th}	A	20	28	39	54	69	108	138	172
Enclosed	I_{th}	A	18	27	36	50	64	100	128	160
Conventional thermal current, 1 pole										
Open	I_{th}	A	60	84	117	162	207	325	415	516
Enclosed	I_{th}	A	54	76	105	146	186	292	373	464
Rated operational power										
220/230 V	P	kW	8	12	16	23	29	45	58	72
240 V	P	kW	9	13	18	25	32	49	63	79
380/400 V	P	kW	14	20	28	39	50	78	100	125
415 V	P	kW	15	22	31	43	55	85	109	137
440 V	P	kW	16	23	33	46	58	90	116	145
500 V	P	kW	18	26	37	52	66	103	132	165
690 V	P	kW	24	35	49	68	87	136	174	217
AC-3 operation										
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole										
220/230 V	I_e	A	12	18	25	40	50	80	95	115
240 V	I_e	A	12	18	25	40	50	80	95	115
380/400 V	I_e	A	12	18	25	40	50	80	95	115
415 V	I_e	A	12	18	25	40	50	80	95	115
440 V	I_e	A	12	18	25	40	50	80	95	115
500 V	I_e	A	10	18	25	40	50	80	95	115
660/690 V	I_e	A	7	12	15	25	32	65	80	93
Rated operational power										
220/230 V	P	kW	3.5	5	7.5	12.5	15.5	25	30	37
240 V	P	kW	4	5.5	8.5	13.5	17	27.5	33	40
380/400 V	P	kW	5.5	7.5	11	18.5	22	37	45	55
415 V	P	kW	7	10	14.5	24	30	48	57	70
440 V	P	kW	7.5	10.5	15.5	25	32	51	60	75
500 V	P	kW	7	12	17.5	28	36	58	70	85
660/690 V	P	kW	6.5	11	14	23	30	63	75	90

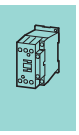


			DILMP20	DILMP32	DILMP45	DILMP63	DILMP80	DILMP125	DILMP160	DILMP200
DC voltage										
Rated operational current I_e open										
DC-1 operation										
60 V	I_e	A	22	32	45	63	80	125	160	200
110 V	I_e	A	22	32	45	63	80	125	160	200
220 V	I_e	A	6	32	45	63	80	125	160	200
440 V	I_e	A	1.3	3	3	5	5	10	10	10
DC-3 operation										
60 V	I_e	A	20	32	45	63	80	125	160	200
110 V	I_e	A	20	32	45	63	80	125	160	200
220 V	I_e	A	1.5	32	45	63	80	125	160	200
440 V	I_e	A	0.2	6	6	8	8	9	9	9
DC-5 operation										
60 V	I_e	A	20	32	45	63	80	125	160	200
110 V	I_e	A	20	25	32	50	80	125	160	200
220 V	I_e	A	1.5	15	22	38	70	100	125	150
440 V	I_e	A	0.2	4	4	8	8	8	8	8
Current heat loss (3 pole)										
Current heat loss at I_{th}		W	4.7	8.2	12	16	23	29	46	60
Impedance per pole		mΩ	2.5	2	1.5	1	0.7	0.6	0.6	0.5
Magnet systems										
Voltage tolerance										
AC operated 50 Hz	Pick-up	x U_c	0.8 - 1.1	0.8 - 1.1		0.8 - 1.1		0.8 - 1.1		
AC operated 50/60 Hz		x U_c	0.8 - 1.1	0.85 - 1.1		0.85 - 1.1		0.8 - 1.1		
AC operated	Drop-out	x U_c	0.4 - 0.6	0.4 - 0.6		0.4 - 0.6		0.4 - 0.6		
DC operated[1)]	Pick-up	x U_c	0.8 - 1.1	0.7 - 1.2		0.7 - 1.2		0.7 - 1.2		
DC operated[1)]	Drop-out	x U_c	0.2 - 0.6	0.2 - 0.6		0.2 - 0.6		0.2 - 0.6		
Power consumption of the coil in a cold state and 1.0 x U_c										
AC operated 50/60 Hz	Pick-up	VA	24	50		150		180		
AC operated 50/60 Hz	Pick-up	W	19	40		95		150		
AC operated 50/60 Hz	Sealing	VA	4	8		16		3.1		
AC operated 50/60 Hz	Sealing	W	1.2	2.4		4		2.1		
DC operated[1)]	Pick-up	W	4.5	12		24		149		
DC operated[1)]	Sealing	W	4.5	0.5		0.5		2.1		
Duty factor		% DF	100	100		100		100		
Changeover times at 100 % U_c (recommended values)										
Main contacts										
AC operated										
Closing delay		ms	15…21	16…22		12…18		28…33		
Opening delay		ms	9…18	8…14		8…13		35…41		
DC operated[1)]										
Closing delay		ms	31	47		54		35		
Opening delay		ms	12	30		24		30		
Arcing time		ms	10	10		10		15		
Permissible residual current when A1 - A2 are actuated from the electronic system (with 0 signal)		mA	≦ 1	≦ 1		≦ 1		≦ 1		

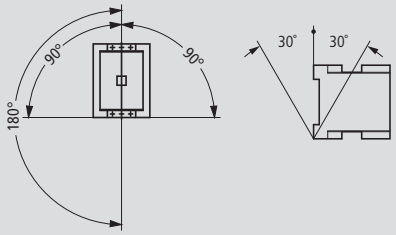
Notes

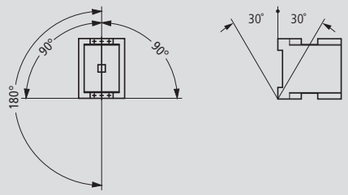
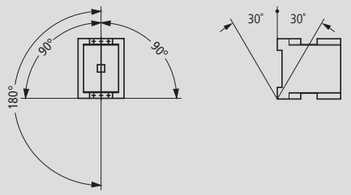
[1)] At least double-pulse bridge rectifier

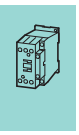
				DILK12	DILK20	DILK25	DILK33	DILK50
General								
Standards				IEC/EN 60947, VDE 0660				
Ambient temperature								
Open			°C	-25…60	-25…60	-25…60	-25…60	-25…60
Enclosed			°C	-25…40	-25…40	-25…40	-25…40	-25…40
Mounting position								
Protection type				IP00	IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof				
Weight basic device								
AC operated			kg	0.55	0.55	0.55	1	1
Terminal capacity of main cable								
Solid			mm^2	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (2.5 - 16)	1 x (2.5 - 16)
Flexible with ferrule			mm^2	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (2.5 - 35)	1 x (2.5 - 35)
Stranded			mm^2	1 x 16	1 x 16	1 x 16	1 x (16 - 50)	1 x (16 - 50)
Solid or stranded			AWG	18 - 16	18 - 6	18 - 6	12 - 2	12 - 2
Flat conductor		Number of layers x width x thickness	mm	-	-	-	1 x (6 x 9 x 0.8)	1 x (6 x 9 x 0.8)
Group compensation								
60 Hz								
230 V			kvar	7.5	11	15	20	25
400 V			kvar	12.5	20	25	33.3	50
525 V			kvar	16.7	25	33.3	40	65
690 V			kvar	20	33.3	40	55	85
50/60 Hz								
Open								
	230 V	I_e	A	18	29	38	50	72
	400 V	I_e	A	18	29	38	50	72
	525 V	I_e	A	18	29	38	50	72
	690 V	I_e	A	18	29	38	50	72
Enclosed								
	230 V	I_e	A	16	26	34	45	65
	400 V	I_e	A	16	26	34	45	65
	525 V	I_e	A	16	26	34	45	65
	690 V	I_e	A	16	26	34	45	65
Making capacity (i-peak value) without damping			x I_e	180	180	180	180	180
Component lifespan		c (contacts)	x 10^6	0.15	0.15	0.15	0.15	0.15
Maximum operating frequency			Ops/h	120	120	120	120	120



			DILK12	DILK20	DILK25	DILK33	DILK50
Magnet systems							
Voltage tolerance							
AC operated	Pick-up	x U_c	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.15	0.8 - 1.15
AC operated	Drop-out	x U_c	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6
Power consumption of the coil in a cold state and 1.0 x U_c							
50 Hz	Pick-up	VA	58	58	58	45	45
50 Hz	Sealing	VA	7.6	7.6	7.6	1.5	1.5
50 Hz	Sealing	W	2.3	2.3	2.3	1.5	1.5
60 Hz	Pick-up	VA	71	71	71	45	45
60 Hz	Sealing	VA	9.3	9.3	9.3	1.5	1.5
60 Hz	Sealing	W	2.8	2.8	2.8	1.5	1.5
50/60 Hz	Pick-up	VA	65 59	65 59	65 59	45 45	45 45
50/60 Hz	Sealing	VA	9.6 7	9.6 7	9.6 7	1.5 1.5	1.5 1.5
50/60 Hz	Sealing	W	2.7 2.2	2.7 2.2	2.7 2.2	1.5 1.5	1.5 1.5
Duty factor		% DF	100	100	100	100	100
Changeover times at 100 % U_c (recommended values)							
Main contacts							
AC operated							
Closing delay		ms	16…22	16…22	16…22	50	50
Opening delay		ms	8…14	8…14	8…14	40	40
Arcing time		ms	10	10	10	10	10
Electromagnetic compatibility (EMC)							
Emitted interference			To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1
Interference immunity			To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1
Further technical data							
As per contactor	DIL		M17	M25	M32	M50	M65

				DILL12	DILL18	DILL20
General						
Standards				IEC/EN 60947, VDE 0660, UL, CSA		
Lifespan, mechanical						
AC operated		c (contacts)	x 10^6	1	1	1
Operating frequency, mechanical						
Mechanical, AC operated		Operations/h		60	60	60
Maximum operating frequency						
Electrical		Operations/h		60	60	60
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature	Open		°C	-25…60	-25…60	-25…60
	Enclosed		°C	-25…40	-25…40	-25…40
	Storage		°C	-40 - 80	-40 - 80	-40 - 80
Mounting position						
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms				6.9	6.9	6.9
Protection type				IP00	IP00	IP00
Weight						
AC operated			kg	0.42	0.42	0.42
Main contacts						
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000
Overvoltage category/pollution degree				III/3	III/3	III/3
Rated insulation voltage		U_i	V AC	690	690	690
Rated operating voltage		U_e	V AC	690	690	690
Making capacity			A	238	350	550
Breaking capacity		380/400 V	A	170	250	320
Lifespan, electrical		c (contacts)		10000	10000	10000
Short-circuit protection rating maximum fuse						
400 V		gG/gL 500 V	A	63	100	125
AC voltage						
AC-1 operation						
Conventional thermal current						
	at 40 °C	I_{th}	A	27	40	45
	at 60 °C	I_{th}	A	24	35	40
230 V		I_e	A	12	18	20
400 V		I_e	A	12	18	20
AC-1 operation						
220/230 V		I_e	A	14	21	27
400 V		I_e	A	14	21	27
Electric lamps						
Filament bulbs			A	14	21	27
Mercury blended lamps			A	12	16	23
Fluorescent lamp load						
	Conventional reactor starter connection		A	20	26	35
	Duo circuit		A	20	26	35
Electronic upstream devices			A	12	18	20
High-pressure mercury vapour lamps			A	12	18	20
Metal-halide lamps			A	12	18	20
High-pressure sodium lamps			A	12	18	20
Low-pressure sodium lamps			A	7.5	10	12
Maximum permissible compensation capacitance			µF	470	470	470
Further technical data						
As per contactor		DIL		M17	M25	M32

					DILMF8	DILMF11	DILMF14	DILMF17	DILMF25	DILMF32	DILMF40	DILMF50	DILMF65	DILMF80	DILMF95	DILMF115	DILMF150
General																	
Mounting position																	
AC voltage																	
AC-3 operation																	
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole	220/230 V	I_e	A		7	9	12	18	25	32	40	50	65	80	95	115	150
	240 V	I_e	A		7	9	12	18	25	32	40	50	65	80	95	115	150
	380/400 V	I_e	A		7	9	12	18	25	32	40	50	65	80	95	115	150
	415 V	I_e	A		7	9	12	18	25	32	40	50	65	80	95	115	150
	440 V	I_e	A		7	9	12	18	25	32	40	50	65	80	95	115	150
	500 V	I_e	A		5	7	10	18	25	32	40	50	65	80	95	115	150
	660/690 V	I_e	A		4	5	7	12	15	18	25	32	37	65	80	93	100
Rated operational power	220/230 V	P	kW		2.2	2.5	3.5	5	7.5	10	12.5	15.5	20	25	30	37	48
	240 V	P	kW		2.2	3	4	5.5	8.5	11	13.5	17	22	27.5	4	40	52
	380/400 V	P	kW		3	4	5.5	7.5	11	15	18.5	22	30	37	45	55	75
	415 V	P	kW		4	5.5	7	10	14.5	19	24	30	39	48	57	70	91
	440 V	P	kW		4.5	5.5	7.5	10.5	15.5	20	25	32	41	51	60	75	95
	500 V	P	kW		3.5	4.5	7	12	17.5	23	28	36	47	58	70	85	110
	660/690 V	P	kW		3.5	4.5	6.5	11	14	17	23	30	35	63	75	90	96
AC-4 operation																	
Rated operational current AC-4 open, 50 - 60 Hz, 3 pole	220/230 V	I_e	A		5	6	7	10	13	15	18	21	25	40	50	55	65
	240 V	I_e	A		5	6	7	10	13	15	18	21	25	40	50	55	65
	380/400 V	I_e	A		5	6	7	10	13	15	18	21	25	40	50	55	65
	415 V	I_e	A		5	6	7	10	13	15	18	21	25	40	50	55	65
	440 V	I_e	A		5	6	7	10	13	15	18	21	25	40	50	55	65
	500 V	I_e	A		4.5	5	6	10	13	15	18	21	25	40	50	55	65
	660/690 V	I_e	A		4	4.5	5	8	10	12	14	17	20	27	37	45	50
Rated operational power	220/230 V	P	kW		1	1.5	2	2.5	3.5	4	5	6	7	12	16	17	20
	240 V	P	kW		1.5	1.6	2.2	3	4	4.5	5.5	6.5	7.5	13	17	19	22
	380/400 V	P	kW		2.2	2.5	3	4.5	6	7	9	10	12	20	26	28	33
	415 V	P	kW		2.3	2.8	3.4	5	6.5	7.5	9.5	11	13	24	30	33	39
	440 V	P	kW		2.4	3	3.6	5.5	7	8	10	12	14	25	32	35	41
	500 V	P	kW		2.5	2.8	3.5	6	8	9	11	13	16	29	36	40	47
	660/690 V	P	kW		2.9	3.6	4.4	6.5	8.5	10	12	14	17	26	35	43	48
Current heat loss (3 pole)																	
Current heat loss at I_{th}				W	2.4	2.4	2.4	7.3	9.6	12.1	11.3	19	28.8	14.6	21.8	30.4	46.1
Current heat loss at I_e to AC-3/400 V				W	0.3	0.6	1	1.9	3.8	6.1	7.2	11.3	19	11.5	16.2	23.8	40.5
Magnet systems																	
Voltage tolerance	AC operated	Pick-up	x U_c		0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15
	AC operated	Drop-out	x U_c		0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5
Power consumption of the coil in a cold state and 1.0 x U_c	Electronic actuation	Pick-up	VA		14	14	14	14	14	14	45	45	45	75	75	180	180
	Electronic actuation	Sealing	VA		0.7	0.7	0.7	0.7	0.7	0.7	1.5	1.5	1.5	2	2	3.1	3.1
	Electronic actuation	Sealing	W		0.7	0.7	0.7	0.7	0.7	0.7	1.5	1.5	1.5	2	2	2.1	2.1
Duty factor			% DF		100	100	100	100	100	100	100	100	100	100	100	100	100
Switching times	Closing delay		ms		40	40	40	40	40	40	50	50	50	55	55	40	40
	Opening delay		ms		45	45	45	45	45	45	45	45	45	40	40	40	40
suitable according to					SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47
Electromagnetic compatibility (EMC)																	
Emitted interference					To EN 60947-1				To EN 60947-1								
Interference immunity					To EN 60947-1				To EN 60947-1								
Further technical data																	
As per contactor		DIL			M7	M9	M12	M17	M25	M32	M40	M50	M65	M80	M95	M115	M150
Terminal type																	
As per contactor		DIL			M17	M17	M17	M17	M25	M32	M40	M50	M65	M80	M95	M115	M150



				DILM7-... - DILM38-...	DILA-XHI(C)...(-S)	DILM32-XHI(C)...(-S)	DILM150-XHI...	DILM1000-XHI... DILM820-XHI...
Auxiliary contact								
Interlocked opposing contacts within an auxiliary contact module (to IEC 60947-5-1 Annex L) [1]				-	Yes	Yes	Yes	Yes
Normally closed (not late-normally closed) suitable as a mirror contact (to IEC/EN 60947-4-1, Annex F)				DILM7 - DILM38	DILM7 - DILM38	DILM7 - DILM38	DILM40 - DILM170	DILM40 - DILM225A DILM250 - DILM1000
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000	6000	6000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V AC	690	690	690	690	690
Rated operating voltage		U_e	V AC	500	500	500	500	500
Safe isolation according to EN 61140								
Between coil and auxiliary contacts			V AC	400	400	400	440	440
Between the auxiliary contacts			V AC	400	400	400	440	440
Rated operational current								
AC-15								
230 V		I_e	A	4	4	4	4	4
380/415 V		I_e	A	4	4	4	4	4
500 V		I_e	A	1.5	–	1.5	1.5	1.5
DC L/R ≦ 15 ms [2]								
24 V		I_e	A	10	10	10	10	10
60 V		I_e	A	6	6	6	6	6
110 V		I_e	A	3	3	3	3	3
220 V		I_e	A	1	1	1	1	1
DC-13 (6xP)								
Contacts in series:								
3		24 V	A	2.5	2.5	2.5	–	–
3		60 V	A	1	1	1	–	–
3		110 V	A	0.5	0.5	0.5	–	–
3		220 V	A	0.25	0.25	0.25	–	–
Conventional thermal current		I_{th}	A	10	16	16	16	10
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)		Fault probability	λ	< 10^{-8}, < 1 one failure in 100 million operations				
Component lifespan								
at U_e = 230 V, AC-15, 3 A		c (contacts)	x 10^6	1.3	1.3	1.3	1.3	1.3
Short-circuit rating without welding								
Max. fuse			A gG/gL	10	10	10	16	16

Notes

[1] Not with DIL...-XHIV and DIL...-XHICV.
[2] Switch-on and switch-off conditions based on DC-13, time constant as specified.

				P1DILEM DILM12-XP1	DILM32-XP1	DILM65-XP1	DILM150-XP1	DILM185-XP1
Parallel connector								
Terminal capacity								
Solid			mm^2	1 - 16	16	16	–	–
Flexible with ferrule			mm^2	1 x (0.5 - 25) 2 x (0.5 - 16)	1 x (16 - 35)	1 x (16 - 120)	–	–
Stranded			mm^2	1 x (0.5 - 25) 2 x (0.5 - 16)	1 x (16 - 50)	1 x (16 - 120)	1 x (35 - 300) 2 x (35 - 120)	–
Flat conductor		Number of layers x width x thickness	mm	6 x 9 x 0.8	–	–	2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)
Tightening torque			Nm	4	4	14	14	6
Terminal capacity of control circuit cable								
Solid			mm^2	–	–	–	–	1 x (0.75 - 4) 2 x (0.75 - 4)
Flexible with ferrule			mm^2	–	–	–	–	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Tools								
Pozidriv screwdriver			Size	2	2	–	–	–
Internal hexagon		SW	mm	–	–	5	6	5
Conventional thermal current								
3 pole		I_{th}	A	50	100	180	400	700
4 pole		I_{th}	A	60	–	–	–	–

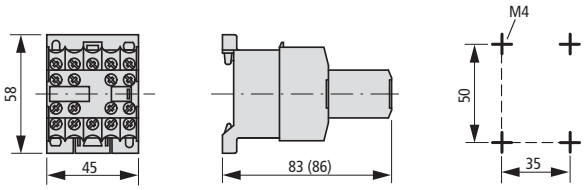
Dimensions

Mini contactor relays

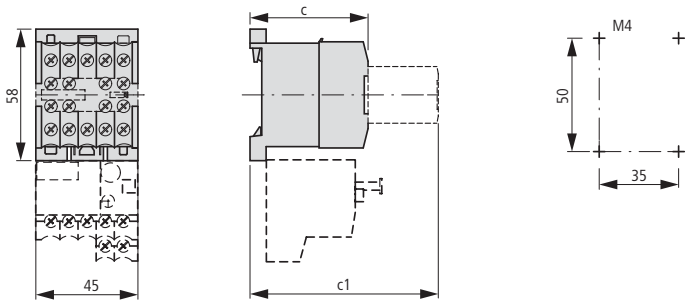
DILER-...(-C)
DILER-...-G(-C)



DILER-...(-C) + ...DILE(-C)
DILER-...-G(-C) + ...DILE(-C)

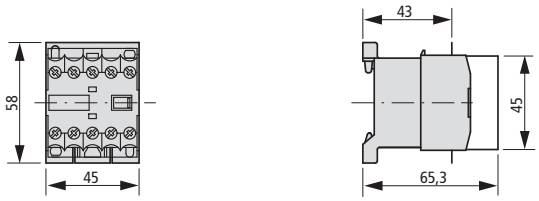


DILEEM-..., DILEM-...(-C), DILEM-12-...
DILEEM-...-G, DILEM-...-G(-C), DILEM-12-...-G



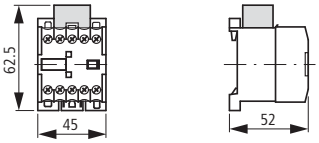
Part no.	c	c1
DILE(E)M-...(-G)	52	83
DILE(E)M-...-G(-C)	54	86

DILER-... + HDILE
DILER-...-...G + HDILE

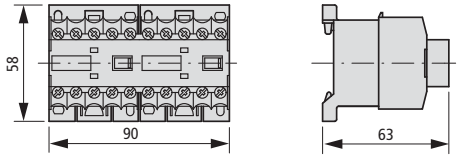


Suppressor circuit

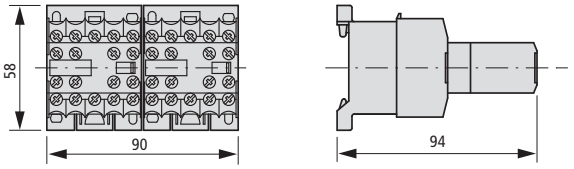
RCDILE...
VGDILE



2DILE-... + MVDILE
2DILE-...-G + MVDILE

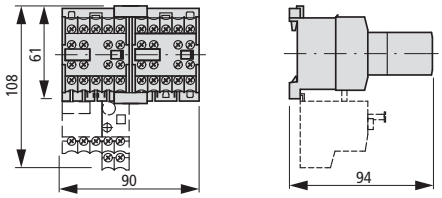


2DILE-... + MVDILE + ...DILE
2DILE-...-G + MVDILE + ...DILE



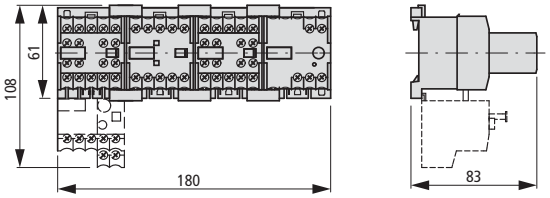
Reversing contactors

DIULEM

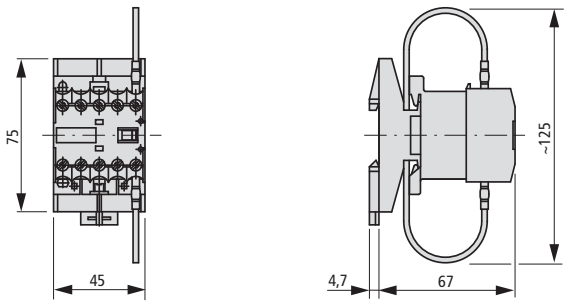


Star-delta contactors

SDAINLEM

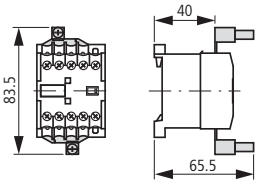


DILER-... + TDDILE24



Parallel connector

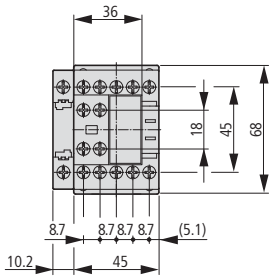
P1DILEM

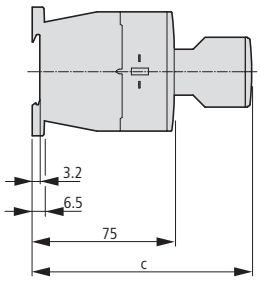


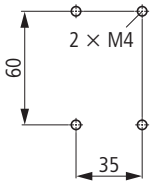
Contactor with auxiliary contact module

DILM7...DILM15

DILA...





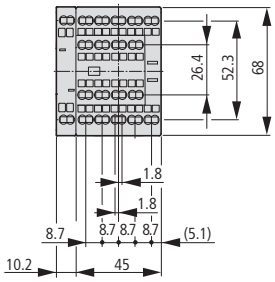


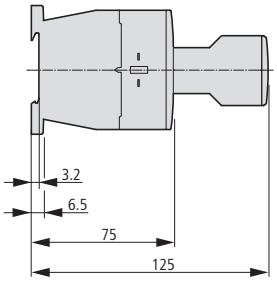
Part no.	c
DILM32-XHI	117
DILA-XHI	117
DILA-XHI...T	125

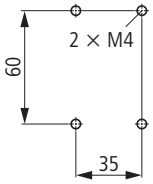
DILMC7...DILMC15

DILAC...

DILA-XHIC...



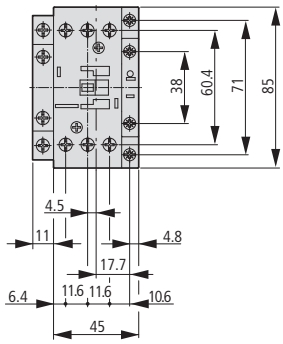


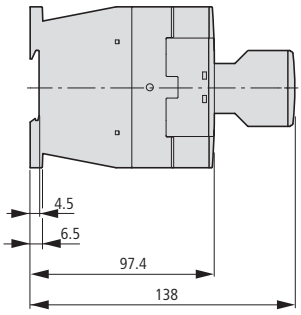


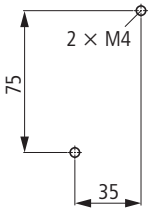
DILM17...DILM38

DILMC17...DILMC32

DILMF8...DILMF32



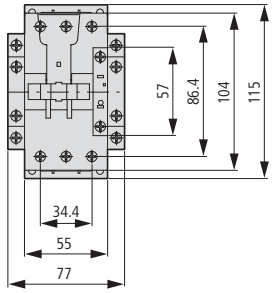


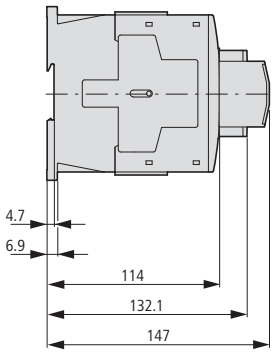


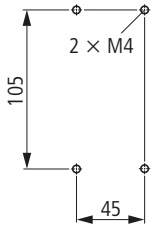
Clearance at side to grounded parts: 6 mm

Contactors

DILM40...DILM72
DILMC40...DILMC65
DILMF40...DILMF65

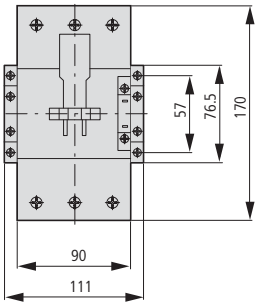


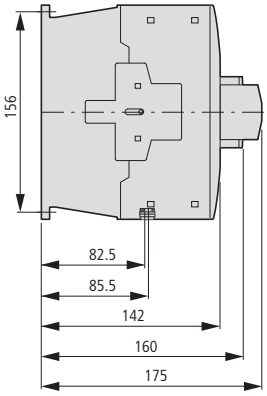


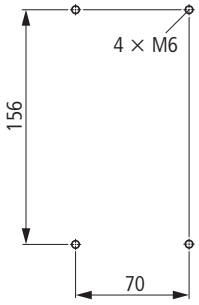


Clearance at side to grounded parts: 6 mm

DILM80...DILM170
DILMC80...DILMC150
DILMF80...DILMF150



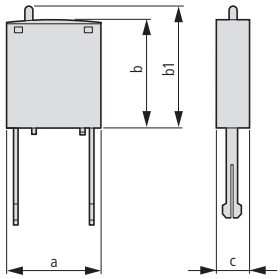




Clearance at side to grounded parts: 10 mm

Suppressor circuits

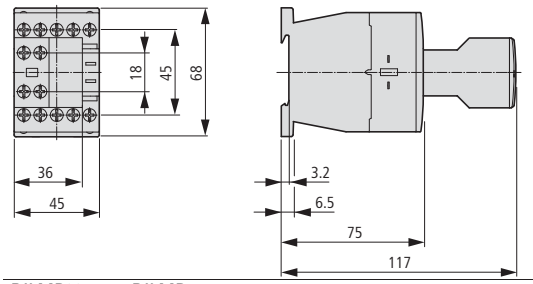
DILM...XSP...

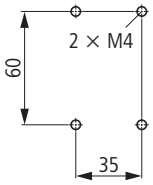


Part no.	a	b	b1	c
DILM12-XSP...	25	28	≈32	9
DILM32-XSP...	25	28	≈32	9
DILM95-XSP...	25	28	≈32	9

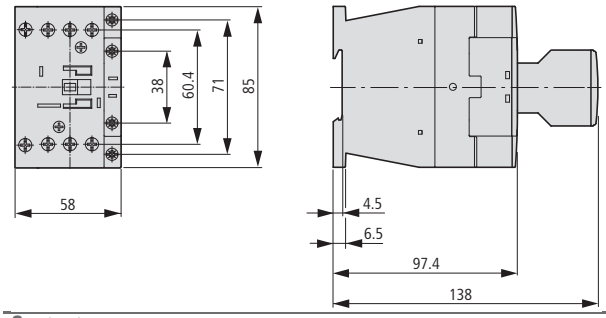
Contactor with auxiliary contact module

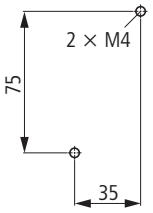
DILMP20





DILMP32 DILMP45

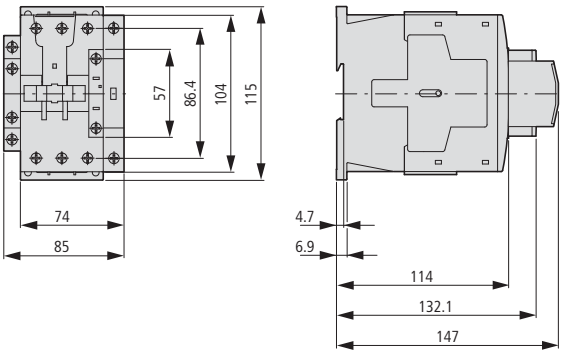


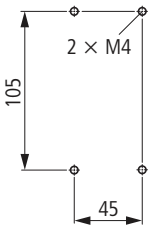


Distance at side to grounded parts: 6 mm

Contactors

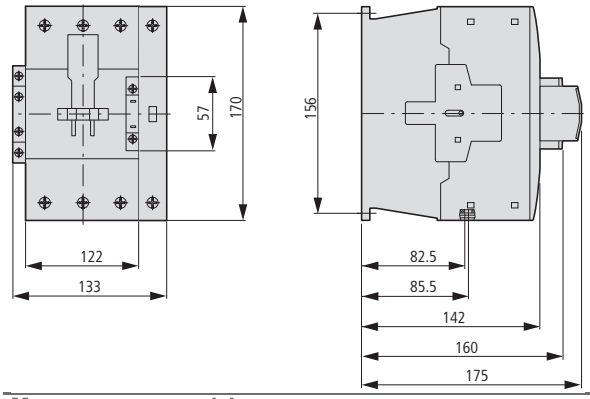
DILMP63 DILMP80

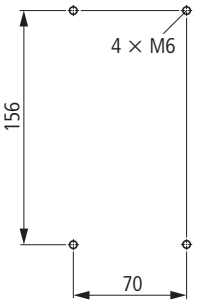




Distance at side to grounded parts: 6 mm

DILMP125 DILMP160 DILMP200

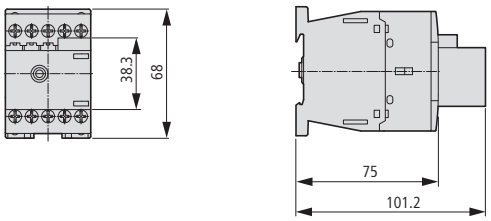




Clearance at side to earthed parts: 10 mm

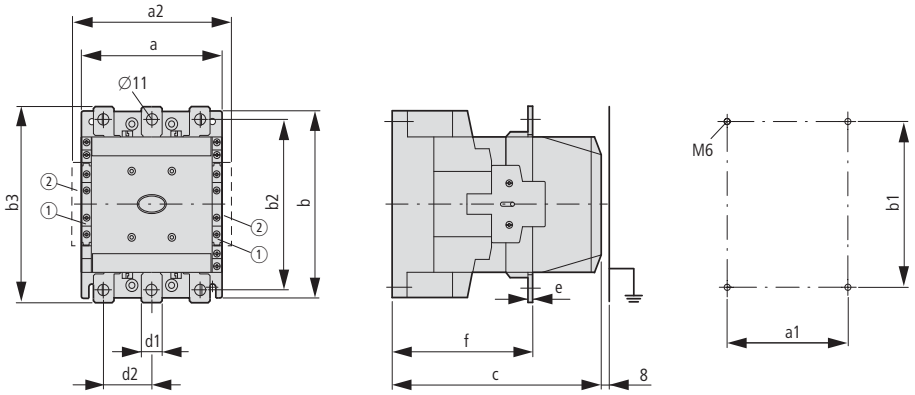
Motor suppressor module

DILM12-XMSM



Complete units

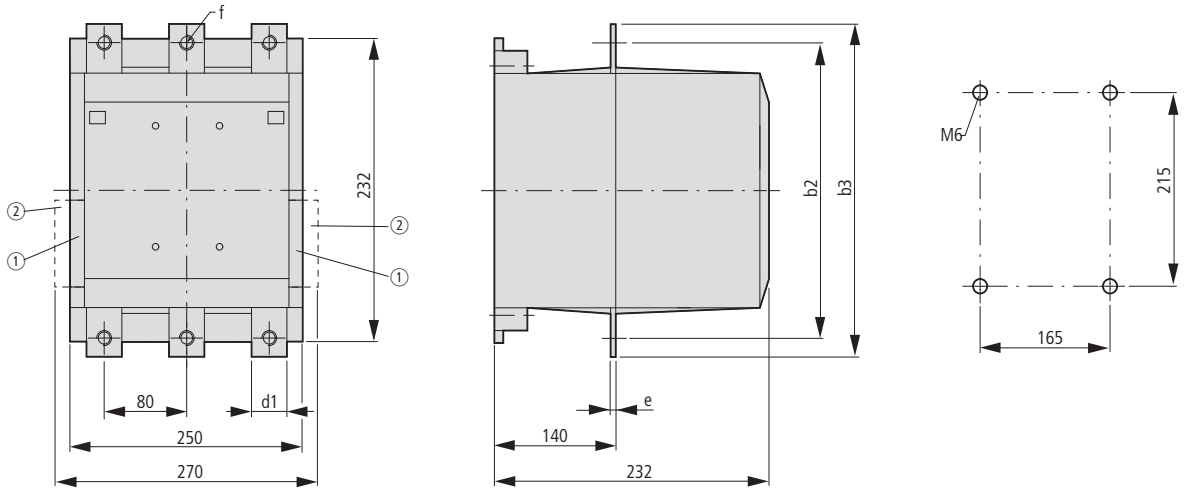
DILM185A...DILM500
DILM250-S...DILM570-S



① DILM1000-XHI...-SI
② DILM1000-XHI11-SA

Part no.	a	a1	a2	b	b1	b2	b3	d1	d2	e	c	f
DILM185A	140	120	160	180	160	165	190	20	41	5	158	83
DILM225A	140	120	160	180	160	165	190	20	41	5	158	83
DILM250	140	120	160	180	160	164	189	25	48	5	208	140
DILM300A	140	120	160	180	160	164	189	25	48	5	208	140
DILM400	160	130	180	200	180	184	209	25	48	6	216	140
DILM500	160	130	180	200	180	189	219	38	57	6	216	140
DILM570	160	130	180	200	180	189	219	38	57	6	216	140

DILM580...DILM1000

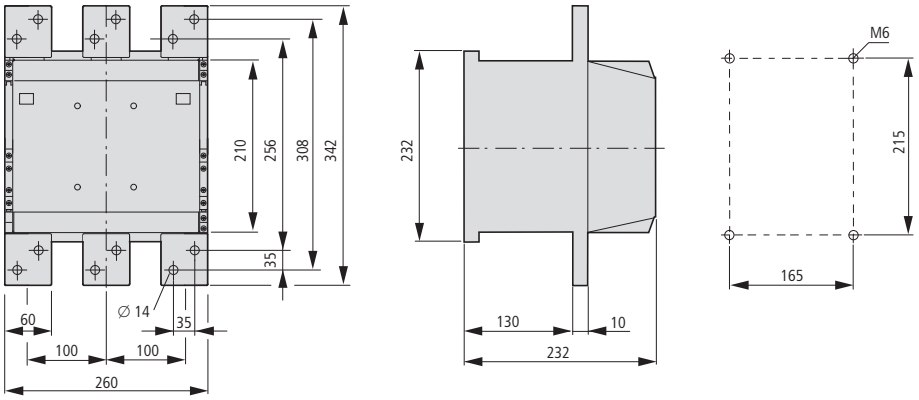


① DILM820-XHI...-SI
② DILM820-XHI11-SA

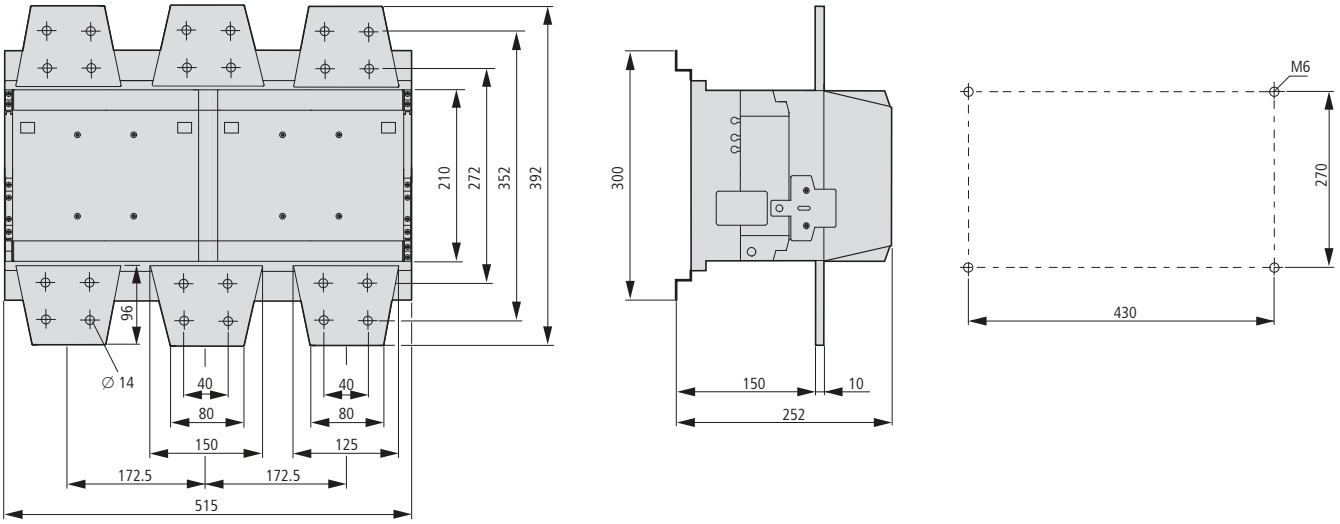
Part no.	b2	b3	d1	e	f
DILM580	256	296	45	6	13.5
DILM650	256	296	45	6	13.5
DILM750	256	296	45	6	13.5
DILM820	256	296	45	6	13.5
DILM1000	256	296	45	10	13.5

AC -1 contactors greater than 1000 A

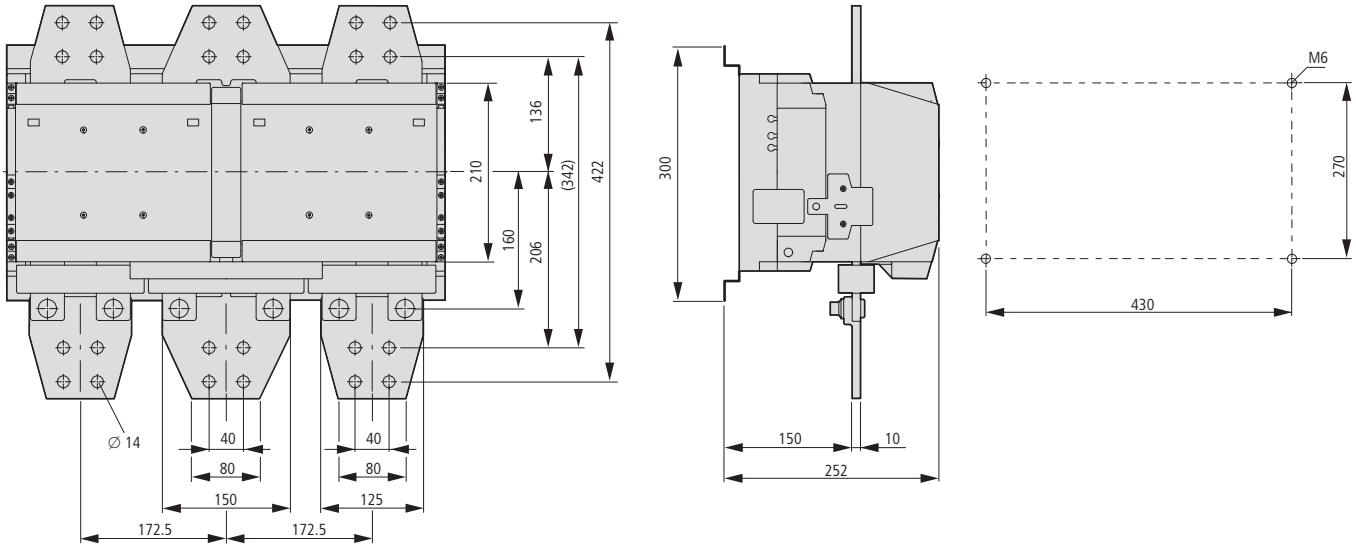
DILH1400



DILM1600
DILH2000
DILH2200

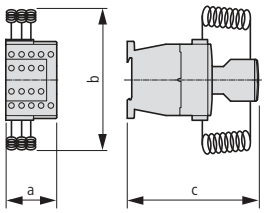


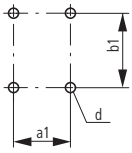
DILH2600



Contactor for capacitors

DILK…

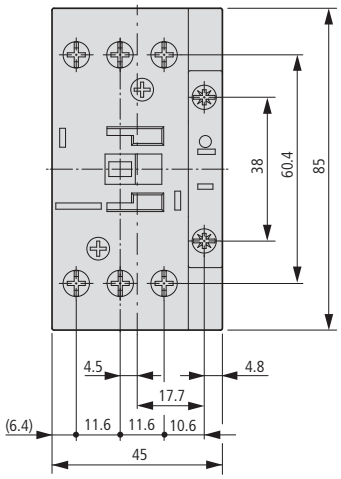


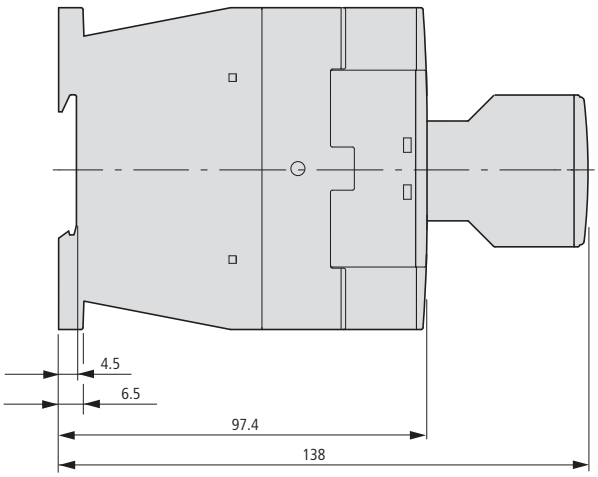


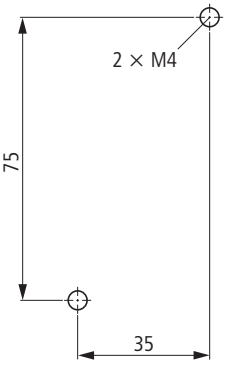
Part no.	a	b	c	a1	b1	d
DILK12	45	135	138	35	75	2 x M4
DILK20	45	135	138	35	75	2 x M4
DILK25	45	135	138	35	75	2 x M4
DILK33	55	190	147	45	105	2 x M4
DILK50	55	190	147	45	105	2 x M4

Illumination contactors

DILL…



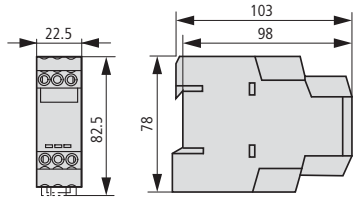




Clearance at side to grounded parts: 6 mm

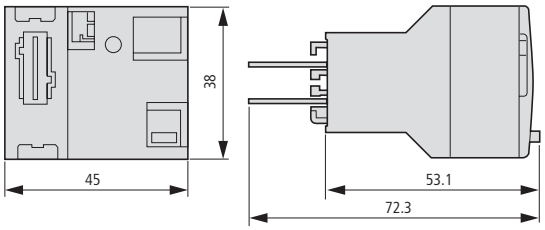
Contactor monitoring devices

CMD(...)



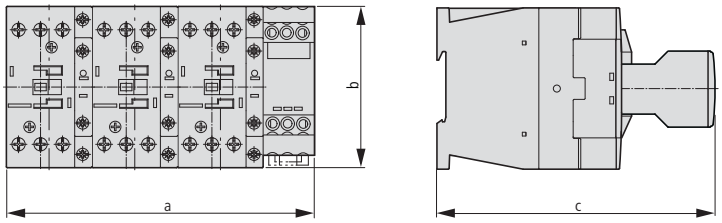
SWD contactor modules

DIL-SWD-32-...



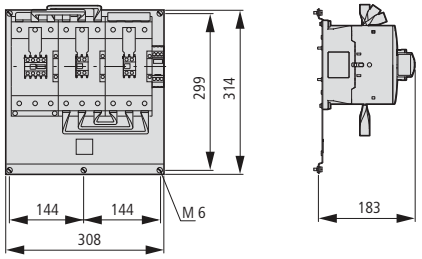
Star-delta contactors

SDAINLM12...SDAINLM115



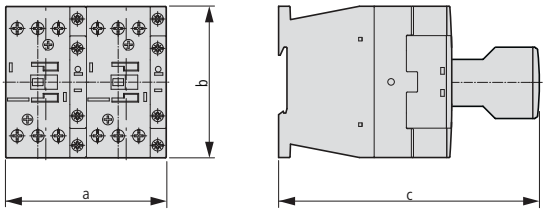
Part no.	a	b	c
SDAINLM12...22	158	68	117
SDAINLM30...55	158	85	138
SDAINLM70...115	188	115	147

SDAINLM140...SDAINLM260



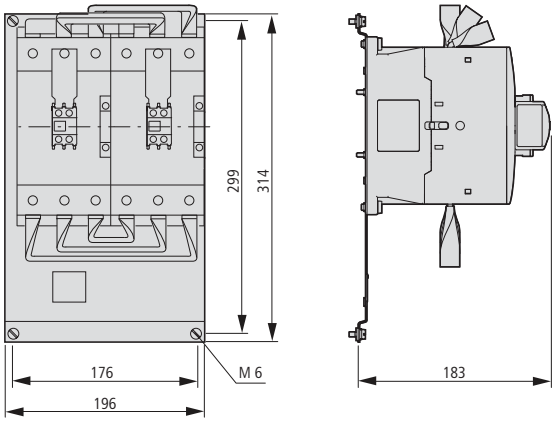
Reversing contactors

DIULM7...DIULM65



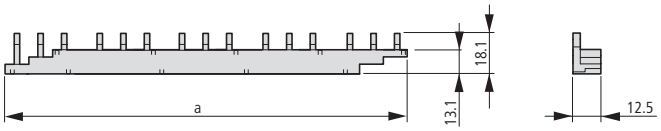
Part no.	a	b	c
DIULM7/21...12/21	90	68	117
DIULM17/21...32/21	90	85	138
DIULM40/11...65/11	110	115	147

DIULM80…DIULM150



Three-phase commoning links

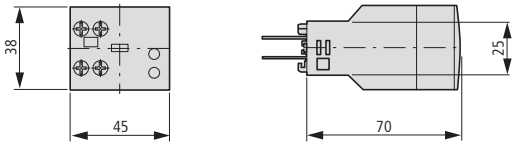
DILM12-XDSB...



Part no.	a
DILM12-XDSB0/3	112
DILM12-XDSB0/4	157
DILM12-XDSB0/5	202

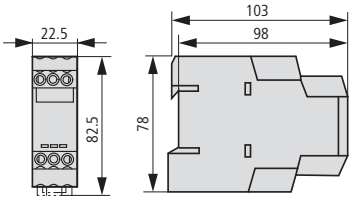
Electronic timer modules

DILM…XTE



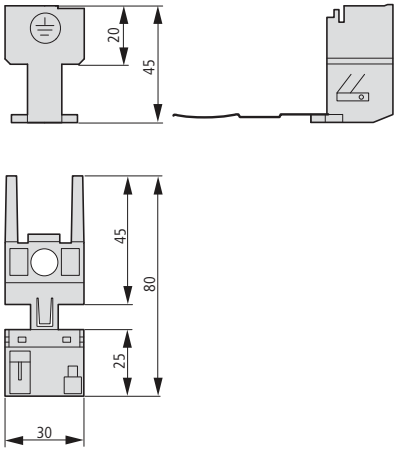
Amplifier module

ETS4-VS3

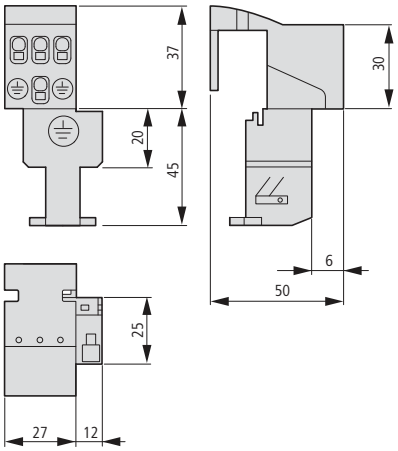


Wiring set for motor feeder plug

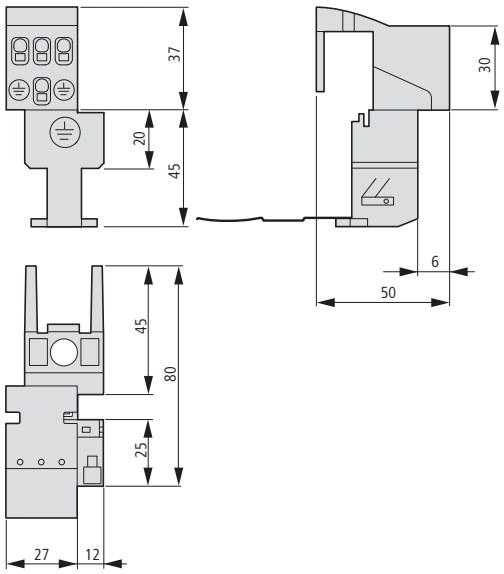
DILM12-XMCE



DILM12-XMCP/T

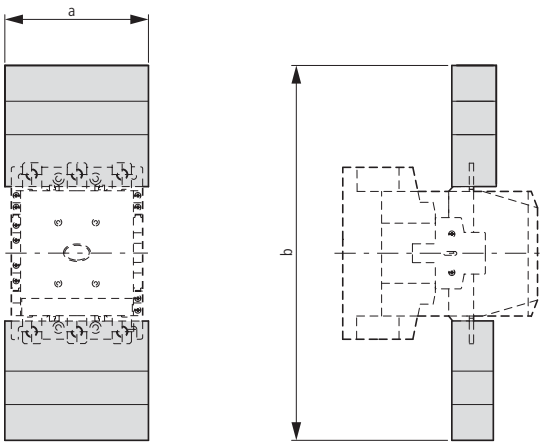


DILM12-XMCP/E



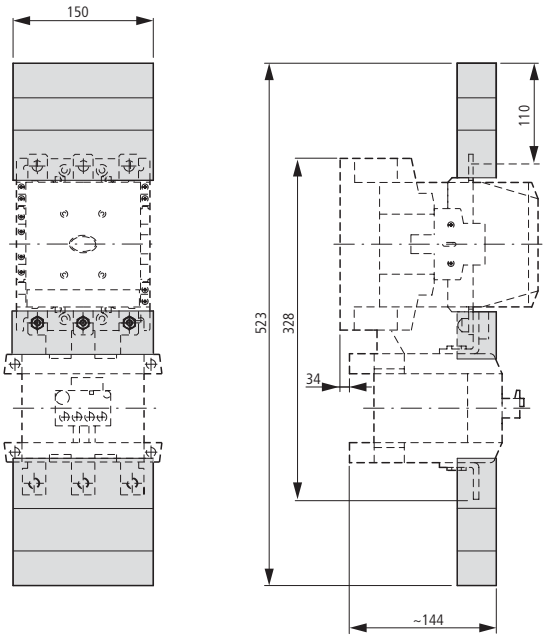
Contactors with terminal shrouds

DILM250...DILM1000 + DILM...-XHB

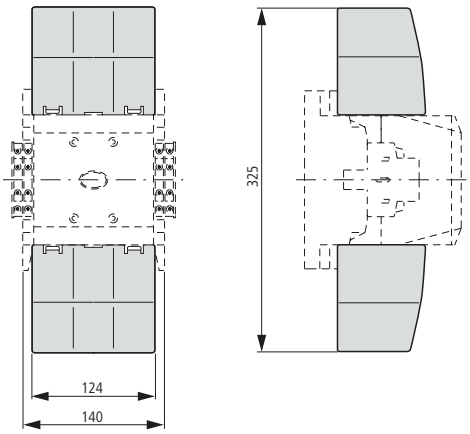


for part no.	a	b
DILM250, DILM300A	150	384
DILM400	150	404
DILM500	174	426
DILM580...1000	236	506

DILM250 + Z5-.../FF250

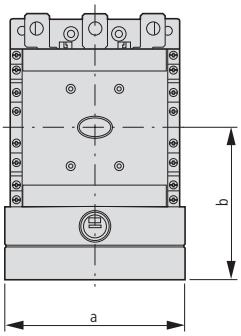


DILM185A...DILM225A + DILM225A-XHB



Contactor with star-point bridge and terminal shroud

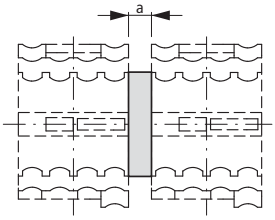
DILM...XS1



for part no.	a	b
DILM185...250	150	127
DILM300...400	150	137
DILM500	176	146

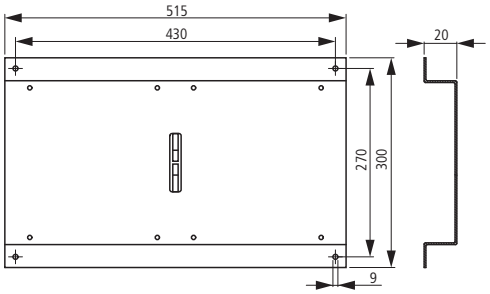
Mechanical interlock

DILM500-XMV



for part no.	a
DILM185...500	15

DILM820-XMV





Overload relay

Motor protection is a central task of electrical equipment for machinery. From cost-effective bimetal solutions to demanding full motor protection with cross-linkage - we offer the right solution for each application.

Bimetal relay - overload relay up to 630 A
Direct mounting on contactor saves mounting time +++ ATEX approval for the protection of EEx e motors up to 250 A +++ Comprehensive motor protection through phase failure sensitivity +++ Integrated test pushbutton facilitates high safety → Page 6/6

ZEB electronic overload relay - overload relay up to 1500 A
ATEX approval for protection of EEx e motors up to 1500 A +++ Adjustable tripping classes +++ Phase failure and unbalance protection +++ Optional earth fault detection +++ Additional current setting range (5:1) → Page 6/14

ZEV electronic overload relay - overload relay up to 820 A
Flexible mounting with Rogowski transformer +++ Simple paramerization reduces commissioning time +++ ATEX approval for protection of EEx e motors up to 820 A +++ Error messages in display shorten downtime +++ Adjustable tripping classes +++ Optional earth fault detection +++ Full motor protection through additional thermistor evaluation → Page 6/19

EMT6 thermistor overload relay for machine protection
Overload protection through direct evaluation of winding temperature +++ Quick detection of operating state through LED display +++ Suitable for overload monitoring of motors in EEx e range +++ Wide range power supply reduces amount of types → Page 6/24







Technical overview

Bimetal relay ZE, ZB, Z5 6/2
Overload relay ZW7 6/2
Electronic overload relays ZEB, ZEV 6/4
EMT6 thermistor overload relay for machine protection 6/4

Ordering

Bimetal relays for mini-contactor relays 6/6
Bimetal relays up to 150A 6/8
Bimetal relay greater than 150 A 6/12
Overload relays 6/12
Bimetal relay accessories 6/26
ZEB Electronic overload relay 6/14

Description

ZEV electronic overload relay 6/19

Ordering

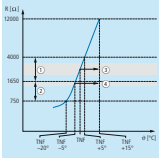
ZEV electronic overload relay 6/20

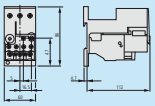
Engineering

ZEV, ZEB electronic overload relays 6/22

Ordering

EMT6 thermistor overload relay for machine protection 6/24





Engineering

EMT6 thermistor overload relay for machine protection 6/25
Selection criteria ZE, ZB, Z5, ZW7 6/28
Characteristic curve ZB, Z5, ZW7 6/28
UL/CSA short-circuit strength ZE, ZB, Z5, ZEV 6/29

Technical data

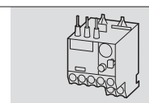
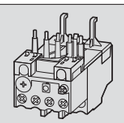
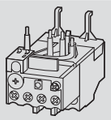
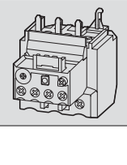
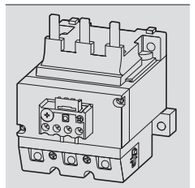
Bimetal relay for mini-contactor relays 6/30
Bimetal relays up to 150A 6/30
Overload relays greater than 150 A 6/31
Overload relays 6/31
ZEB electronic overload relay 6/33
ZEV electronic overload relay 6/34
EMT6 thermistor overload relay for machine protection 6/36

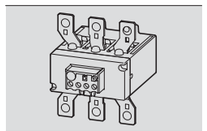
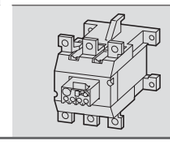
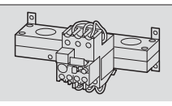
Dimensions

Bimetal relays for mini-contactor relays 6/37
Bimetal relays up to 150A 6/37
Bimetal relays greater than 150 A 6/39
Overload relay 6/39
ZEB electronic overload relay 6/40
ZEV electronic overload relay 6/43
EMT6 thermistor overload relay for machine protection 6/42

Technical overview

Setting ranges (A)
(note max. current of the contactor)

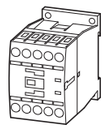
	DILEM	DILM7 DILM12 DILM9 DILM15	DILM17 DILM32 DILM25 DILM38	DILM40 DILM65 DILM50 DILM72	DILM80 DILM150 DILM95 DILM170 DILM115
Overload relays					
ZE 0.1-12					
ZB12 0.1-16					
ZB32 0.1-38					
ZB65 6-75					
ZB150 35-175					
Z5-.../FF225A 70-250					
Z5-.../FF250 50-300					
Current transformer-operated overload relay					
ZW7-... 42-630					

DILM185A DILM225A	DILM250 DILM300	DILM400 DILM580 DILM500	DILM650
			
			
			

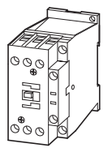
Setting ranges (A)
(note max. current of the contactor)



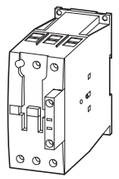
DILEM



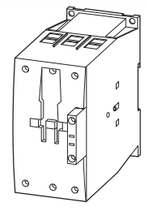
DILM7 DILM12
DILM9 DILM15



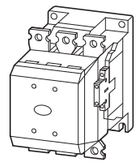
DILM17 DILM32
DILM25 DILM38



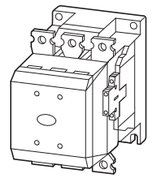
DILM40 DILM65
DILM50 DILM72



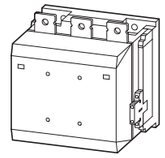
DILM80 DILM150
DILM95 DILM170
DILM115



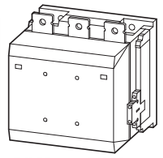
DILM185A
DILM225A



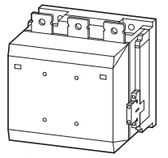
DILM250
DILM300



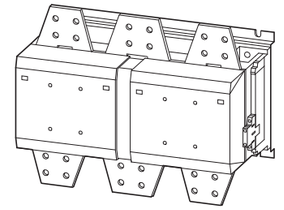
DILM400 DILM580
DILM500 DILM650



DILM750 DILM820



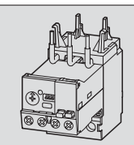
DILM1000



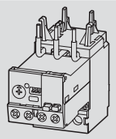
DILM1600

Electronic overload relays

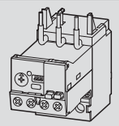
ZEB12
0.33-20



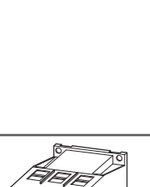
ZEB32
0.33-45



ZEB65
9-100



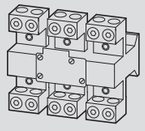
ZEB150
20-100



ZEB32-5-(GF)/KK combined with

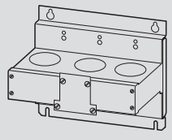
ZEB-XCT300
60-300

ZEB-XCT600
120-600

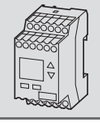


ZEB-XCT1000
200-1000

ZEB-XCT1500
300-1500

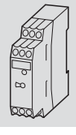


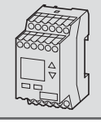
ZEV
1-820



Thermistor overload relay for machine protection

EMT6((DB)K)



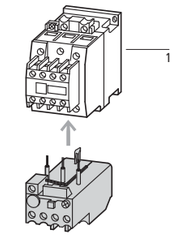




Ordering

Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	Short-circuit protection Type "1" coordination gG/gL A	Short-circuit protection Type "2" coordination gG/gL A	Part no. Article no.	Price See price list	Std. pack	Notes
ZE overload relays for mini contactor relays										
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting										
		1 N/O	1 NC	DILEM DILUEM/21/MV SDAINLEM	20	0.5	**ZE-0.16** 014263		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors II (2) GD PTB 01 ATEX 3331 Observe manual AWB2300-1425D/GB.
0.1 – 0.16						0.5				
0.16 – 0.24						1	**ZE-0.24** 014285			
0.24 – 0.4						2	**ZE-0.4** 014300			
0.4 – 0.6						2	**ZE-0.6** 014333			
0.6 – 1						4	**ZE-1.0** 014376			
1 – 1.6						6	**ZE-1.6** 014432			
1.6 – 2.4						6	**ZE-2.4** 014479			
2.4 – 4						10	**ZE-4** 014518			
4 – 6							**ZE-6** 014565			
6 – 9							**ZE-9** 014708			
9 – 12							**ZE-12** 014752			

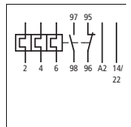
With side-by-side mounting, there must be a minimum clearance of 5 mm between overload relays.

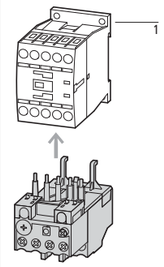
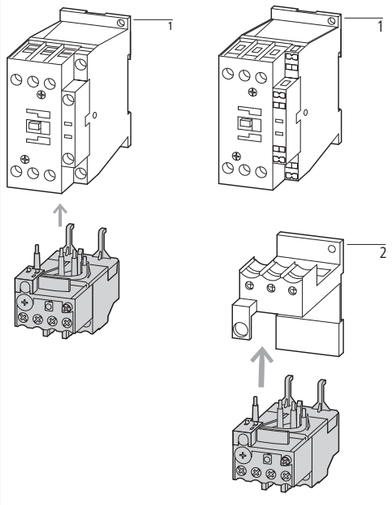


1 Contactor → Chapter 5
Accessories → Page 6/26
Manual → Page 6/26

Information relevant for export to North America

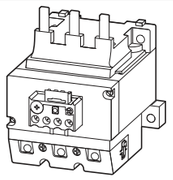
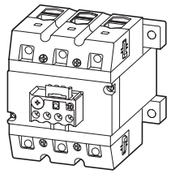
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -
See also	→ Page 6/29

Setting range of overload releases	Circuit symbol	Auxiliary contact		For use with		Short-circuit protection	
		N/O = normally open contact NC = normally closed contact		Contactors	Soft starters	Type "1" coordination gG/gL	Type "2" coordination gG/gL
I_r A						A	A
ZB12 overload relay							
0.1 – 0.16		1 N/O	1 NC	DILM7, DILM9, DILM12, DILM15, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	–	25	0.5
0.16 – 0.24							1
0.24 – 0.4							2
0.4 – 0.6							4
0.6 – 1							4
1 – 1.6							6
1.6 – 2.4							10
2.4 – 4					DS7-34…SX004…		16
4 – 6					DS7-34…SX005…		20
6 – 10					DS7-34…SX007… DS7-34…SX009…	50	25
9 – 12					DS7-34…SX012…		
12 – 16					–		
ZB32 overload relay							
0.1 – 0.16		1 N/O	1 NC	DILM17, DILM25, DILM32, DILM38, DILMF8, DILMF11, DILMF14, DILMF17, DILMF25, DILMF32, DIULM17, DIULM25, DIULM32, SDAINLM30, SDAINLM45, SDAINLM55	–	25	0.5
0.16 – 0.24							1
0.24 – 0.4							2
0.4 – 0.6							4
0.6 – 1							4
1 – 1.6							6
1.6 – 2.4							10
2.4 – 4							16
4 – 6							20
6 – 10						50	25
10 – 16					DS7-34...SX016...	63	35
16 – 24					DS7-34...SX024...	100	35
24 – 32					DS7-34...SX032...	125	63
32 – 38					–	125	63

Part no. Article no.	**Price** See price list	Std. pack	**Notes**	
ZB12-0,16 278431		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1527D/GB. • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/26 Manual → Page 6/26
ZB12-0,24 278432				
ZB12-0,4 278433				
ZB12-0,6 278434				
ZB12-1 278435				
ZB12-1,6 278436				
ZB12-2,4 278437				
ZB12-4 278438				
ZB12-6 278439				
ZB12-10 278440				
ZB12-12 278441				
ZB12-16 290168				
ZB32-0,16 278442		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1527D/GB. • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting	Fitted directly to the contactor Separate mounting  1 Contactor → Chapter 5 2 Base → Page 6/26 Manual → Page 6/26
ZB32-0,24 278443				
ZB32-0,4 278444				
ZB32-0,6 278445				
ZB32-1 278446				
ZB32-1,6 278447				
ZB32-2,4 278448				
ZB32-4 278449				
ZB32-6 278450				
ZB32-10 278451				
ZB32-16 278452				
ZB32-24 278453				
ZB32-32 278454				
ZB32-38 112474				

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking	NA Certification	UL Listed, CSA certified
		Suitable for	Branch circuits
UL File No.	E29184	Max. voltage R	
UL CCN	NKCR	Rating	600 V AC
CSA File No.	12528	Degree of Protection	IEC: IP20, UL/CSA Type: -
CSA Class No.	3211-03	See also	→ Page 6/29

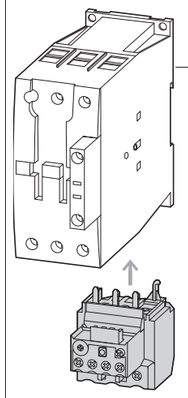
	Setting range of overload releases	Circuit symbol	Auxiliary contact		For use with	Short-circuit protection	
			N/O = normally open contact NC = normally closed contact			Type "1" coordination gG/gL	Type "2" coordination gG/gL
	I_r A					A	A
ZB65 overload relay							
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting							
	6 – 10		1 N/O	1 NC	DILM40, DILM50, DILM65, DILM72, DILMF40, DILMF50, DILMF65, DIULM40, DIULM50, DIULM65, SDAINLM70, SDAINLM90, SDAINLM115	50	25
	10 – 16					63	35
	16 – 24					63	50
	24 – 40					125	63
	40 – 57					160	80
	50 – 65					160	100
	65 – 75					250	160
ZB150 overload relay							
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting							
	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					315	250
ZB150 overload relay							
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Separate mounting							
	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					400	315

Information relevant for export to North America

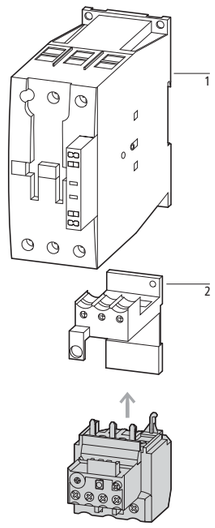
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -
See also	→ Page 6/29

Part no. Article no.	Price See price list	Std. pack	Notes
ZB65-10 278455		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EExe motors. Ⓔx II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB65-16 278456			
ZB65-24 278457			
ZB65-40 278458			
ZB65-57 278459			
ZB65-65 278460			
ZB65-75 108792			
ZB150-50 278462		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ⓔx II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB150-70 278463			
ZB150-100 278464			
ZB150-125 278465			
ZB150-150 278466			
ZB150-175 107316			
ZB150-50/KK 278468		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ⓔx II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB150-70/KK 278469			
ZB150-100/KK 278470			
ZB150-125/KK 278471			
ZB150-150/KK 278472			
ZB150-175/KK 107317			

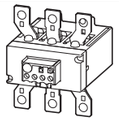
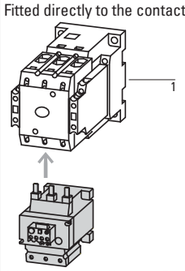
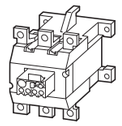
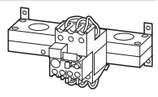
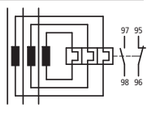
Fitted directly to the contactor

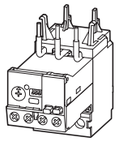
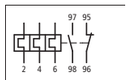
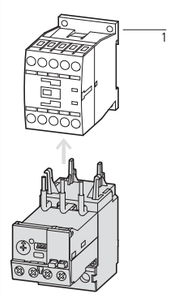
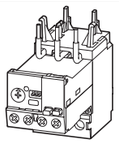
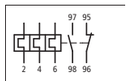
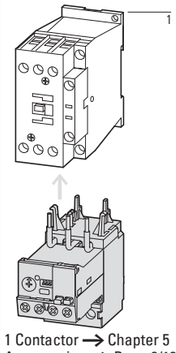
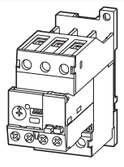
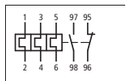


Separate mounting



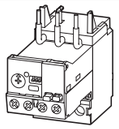
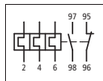
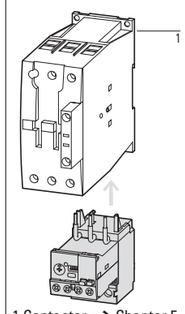
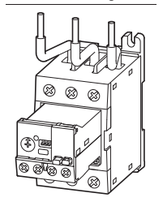
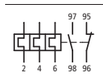
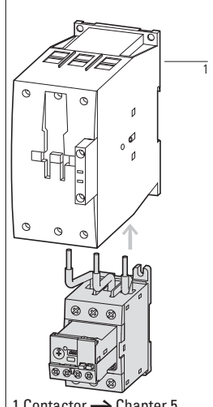
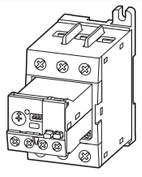
1 Contactor → Chapter 5
2 Base → Page 6/26
Manual → Page 6/26

Setting range of overload releases	Circuit symbol	Auxiliary contacts		For use with	Short-circuit protection		**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
		N/O = normally open contact NC = normally closed contact			Type "1" coordination gG/gL	Type "2" coordination gG/gL					
I_r A					A	A					
Z5 overload relays greater than 150A											
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release Direct mounting Separate mounting											
		1 N/O	1 NC	DILM185A DILM225A	250 250	160 160	**Z5-70/FF225A** 139572		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Z5-…/FF225A for protecting EEx electric motors in preparation. Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/27	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP00, UL/CSA Type: - See also: → Page 6/29
					315 315	200 200	**Z5-100/FF225A** 139573				
					315 315	250 250	**Z5-125/FF225A** 139574				
					400 400	250 250	**Z5-160/FF225A** 139575				
					400 500	315 400	**Z5-220/FF225A** 139576				
					400 500	315 400	**Z5-250/FF225A** 139577				
				DILM250	250 250	160 160	**Z5-70/FF250** 210070				
					315 315	200 200	**Z5-100/FF250** 210071				
					315 315	250 250	**Z5-125/FF250** 210072				
					400 400	250 250	**Z5-160/FF250** 210073				
					400 500	315 400	**Z5-220/FF250** 210074				
					400 500	315 400	**Z5-250/FF250** 210075				
				DILM300A	500 500	400 400	**Z5-300/FF250** 139578				
											Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP00, UL/CSA Type: - See also: → Page 6/29
ZW7 current transformer-operated overload relays											
• Test/off button • Reset pushbutton manual/auto • Trip-free release • Protection with heavy starting duty Separate mounting											
		1 N/O	1 NC	–	–	–	**ZW7-63** 000245		1 Off	The main current characteristic values are defined by the main current wiring being used. Adjustment for smaller rated motor currents → Page 6/28	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP00, UL/CSA Type: -
				–	–	–	**ZW7-90** 002618				
				–	–	–	**ZW7-125** 004991				
				–	–	–	**ZW7-160** 007364				
				–	–	–	**ZW7-240** 009737				
				–	–	–	**ZW7-290** 052448				
				–	–	–	**ZW7-400** 045329				
				–	–	–	**ZW7-540** 047702				
				–	–	–	**ZW7-630** 050075		1 Off		–

Ground fault detection	Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEB12 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM7 DILM9 DILM12 DILM15 DIULM7 DIULM9 DIULM12 SDAINLM12 SDAINLM16 SDAINLM22	**ZEB12-1,65** 136480		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	Without	1 – 5					**ZEB12-5** 136481			
	Without	4 – 20					**ZEB12-20** 136482			
	With	0.33 – 1.65					**ZEB12-1,65-GF** 136483			
	With	1 – 5					**ZEB12-5-GF** 136484			
	With	4 – 20					**ZEB12-20-GF** 136485			
ZEB32 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55	**ZEB32-1.65** 136486		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	Without	1 – 5					**ZEB32-5** 136487			
	Without	4 – 20					**ZEB32-20** 136488			
	Without	9 – 45					**ZEB32-45** 136489			
	With	0.33 – 1.65					**ZEB32-1,65-GF** 136490			
	With	1 – 5					**ZEB32-5-GF** 136491			
	With	4 – 20					**ZEB32-20-GF** 136492			
	With	9 – 45					**ZEB32-45-GF** 136493			
Separate mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55	**ZEB32-1,65/KK** 136494		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	
	Without	1 – 5					**ZEB32-5/KK** 136495			
	Without	4 – 20					**ZEB32-20/KK** 136496			
	Without	9 – 45					**ZEB32-45/KK** 136497			
	With	0.33 – 1.65					**ZEB32-1,65-GF/KK** 136498			
	With	1 – 5					**ZEB32-5-GF/KK** 136499			
	With	4 – 20					**ZEB32-20-GF/KK** 136500			
	With	9 – 45					**ZEB32-45-GF/KK** 136501			

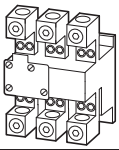
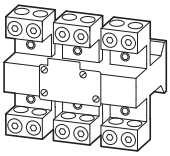
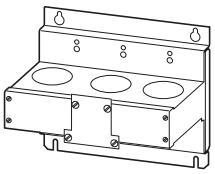
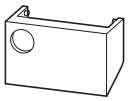
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

Ground fault detection	Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEB65 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	9 – 45		1 N/O	1 NC	DILM40 DILM50 DILM65 DILM72 DIULM40 DIULM50 DIULM65 SDAINLM70 SDAINLM90 SDAINLM115	**ZEB65-45** 136502		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	With	9 – 45					**ZEB65-45-GF** 136503				
	Without	20 – 100					**ZEB65-100** 136504				
	With	20 – 100					**ZEB65-100-GF** 136505				
ZEB150 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	20 – 100		1 N/O	1 NC	DILM80 DILM95 DILM115 DILM150 DIULM80 DIULM95 DIULM115 DIULM150 SDAINLM140 SDAINLM165 SDAINLM200 SDAINLM260	**ZEB150-100** 136506		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	With	20 – 100		1 N/O	1 NC		**ZEB150-100-GF** 136507				
Separate mounting									
	Without	20 – 100		1 N/O	1 NC	DILM80 DILM95 DILM115 DILM150 DIULM80 DIULM95 DIULM115 DIULM150 SDAINLM140 SDAINLM165 SDAINLM200 SDAINLM260	**ZEB150-100/KK** 136508		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	
	With	20 – 100		1 N/O	1 NC		**ZEB150-100-GF/KK** 136509				

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Setting range of overload releases I_r A	Language	Can be used with	**Part no.** Article no.	**Price** See price list	Std. pack
Current sensors						
	60 – 300	–	ZEB32-5-GF/KK ZEB32-5/KK	**ZEB-XCT300**[1] 136511		1off
	120 – 600	–		**ZEB-XCT600**[1] 136512		
	200 – 1000	–		**ZEB-XCT1000**[1] 136517		
	300 – 1500	–		**ZEB-XCT1500**[1] 136513		
Sealable shroud						
Cover to prevent adjustment of motor current (tamper-proof)						
	–	–	–	**ZEB-XSC**[2] 136514		1 off
Reset adapter						
Cover to prevent adjustment of motor current (tamper-proof)						
	–	–	–	**ZEB-XRB**[2] 136515		1 off
Documentation						
ZEB electronic overload relay Overload monitoring of EEx e motors						
	–	Deutsch English	ZEB12 ZEB32 ZEB65 ZEB150	**AWB2320-1633DE/EN** 136516		1 off

1)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

2)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

Description

ZEV – electronic overload relay for motor currents from 1 – 820 A



General

Technological advances require completely new approaches:
the application of newly developed sensor systems and tripping units has made motor protection considerably simpler and more cost-effective.
All Z overload relays perform the expected standard functions:
protection in the event of a phase failure, overload or current imbalance.
In addition to these tasks, the innovative ZEV motor protectionsystem can do much more today:

Application

Even the most severe starting situations can be dealt with by the ZEV motor-protective system. The enhanced tripping classes (up to CLASS40) provide reliable protection for motors with starting times of up to 1 second. Protection for any motor starting situation can be optimally set by preselecting one of the eight tripping classes between 5 and 40 seconds.
Ground faults are quickly detected with the external core-balance transformer. The integrated thermistor connection makes it possible to expand the relay into a motor protection system.

Handling

The LCD display guides users through setting menus and ensures easy, user-friendly operation.
In the event of an error, the display shows the cause of the error and allows for quick fault detection.
The 05-06 and 07-08 parameterizable auxiliary switches make it possible to implement additional signalling indications.
They can each be assigned one of the following functions:

- Early warning of overload
- Ground fault
- Thermistor tripping
- Internal fault

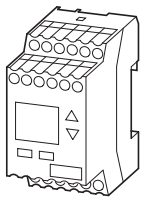
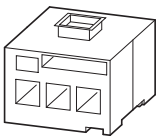
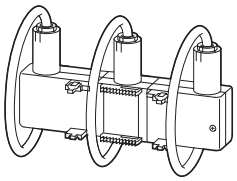
Engineering

The multi-voltage module adapts automatically to different voltages of 24 - 240 V, 50/60 Hz and 24 - 240 VDC, enabling its flexible use with all popular control voltages.

Mounting

Current sensors enable the innovative ZEV motor protection system to be used also for small motors. With large motor currents and cable cross-sections, the sensor cables are simply wound round the feeder cables.
This eliminates the need for main current wiring requiring the time-consuming adaption of cables to an additional device, as well as mounting plate drilling. Instead of this, the sensor is simply attached with a Velcro fastener.
This saves mounting time and expense. The volume of 58 times less than conventional transformers enables the saving of valuable mounting space in the control panel.

Ordering

	Length mm	Diameter ∅ mm	Overload release I_r A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEV electronic motor-protective relay • Protection in the event of a phase failure • Test/off button • Reset button manual/auto • Protection with heavy starting duty • Trip-free release								
	–	–	1 – 820	DILEM…DILM820	**ZEV**[1] 209634		1 off	Suitable for protection of EEx e motors. II (2) GD PTB 01 ATEX 3233 Observe manual AWB2300-1433.
Current sensors								
	–	6	1 – 25	DILEM DILM7…DILM25	**ZEV-XSW-25**[2] 209635		1 off	–
	–	13	3 – 65	DILM7…DILM65	**ZEV-XSW-65**[2] 209636			
	–	21	10 – 145	DILM12…DILM150	**ZEV-XSW-145**[2] 209637			
	–	110	40 – 820	DILM40…DILM820	**ZEV-XSW-820**[2] 209641			
Connecting cables								
	200	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-20**[1] 209643		1 off	–
	400	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-40**[1] 209644			
	800	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-80**[1] 209645			

1)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

2)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -
See also	→ Page 6/29

	Length mm	Diameter ∅ mm	Overload release I_r A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
SSW core-balance transformer								
For ground fault monitoring								
	–	40	–	–	**SSW40-0,3**[1] 028286		1 off	–
	–	40	–	–	**SSW40-0,5**[1] 028305			
	–	40	–	–	**SSW40-1**[1] 028306			
	–	65	–	–	**SSW65-0,5**[1] 028307			
	–	65	–	–	**SSW65-1**[1] 028316			
	–	120	–	–	**SSW120-0,5**[1] 028319			
	–	120	–	–	**SSW120-1**[1] 028321			
Mounting foot								
For screw fixing to mounting plate								
	–	–	–	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145	**ZB4-101-GF1**[2] 061360		9 off	–
Documentation								
ZEV motor protection system Overload monitoring of EEx e motors								
German	–	–	–	–	**AWB2300-1433D** 259711		1 off	
English	–	–	–	–	**AWB2300-1433GB** 267430		1 off	

1)

Information relevant for export to North America

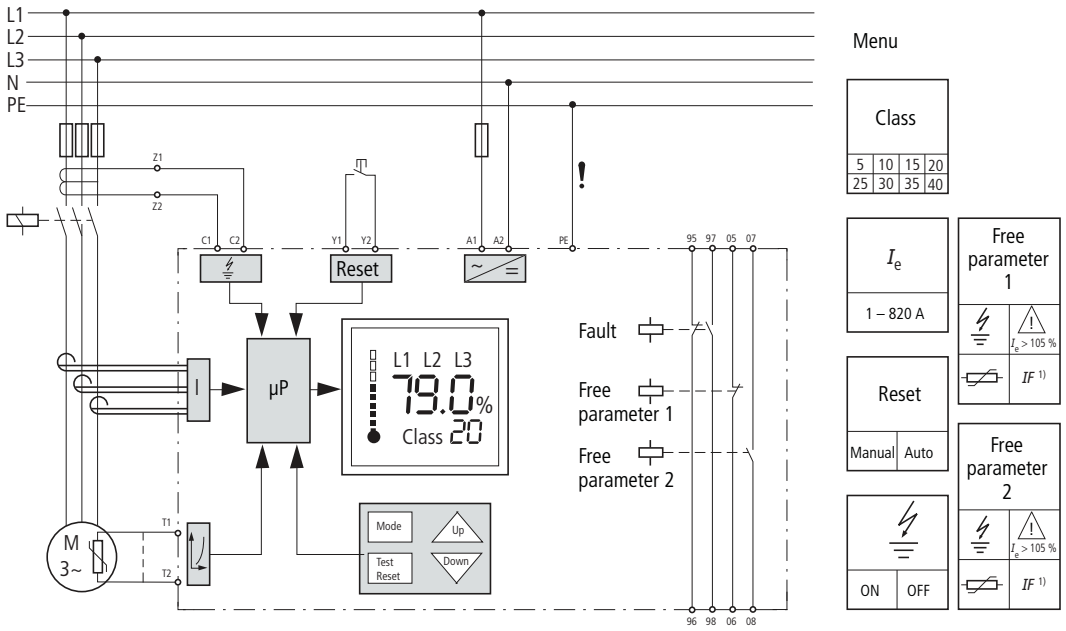
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

2)

Information relevant for export to North America

UL/CSA certification not required

Engineering



1) IF: Internal fault

Inputs	
A 1/A 2	Rated control voltage
T 1/T 2	Thermistor sensor
C 1/C 2	SSW core-balance transformer
Y 1/Y 2	Remote reset

Outputs	
95/96	NC overload/thermistor
97/98	N/O overload/thermistor
05/06	NC contact freely assignable
07/08	N/O contact freely assignable

Switchgear and cable sizing corresponding to the respective starting inertia (CLASS) for ZEV and ZEB

Switchgear is designed according to "CLASS 10" requirements for both normal and overload operation conditions. In order for the switchgear (circuit-breaker and contactor) and the cables not to be overloaded with long tripping times, they must be overdimensioned accordingly. The rated operational current, I_e, for switchgear and cables can be calculated with the following current factor taking the tripping class into account:

Trippling class	Class 5	Class 10	Class 15	Class 20	Class 25	Class 30	Class 35	Class 40
Current factor of rated operational current I_e	1.00	1.00	1.22	1.41	1.58	1.73	1.89	2.00

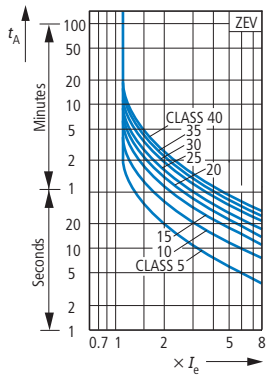
Rated motor currents < 1 A

When working with the ZEV-XSW-25 to ZEV-XSW-145 push-through sensors, the motor feeder cables for each phase are pushed through the corresponding-push-through openings. For motor currents smaller than 1 A, the motor feeder cables are placed in loops with the ZEV-XSW-25 unit. The specific number of loops depends on the rated motor current.

Number of loops n		4	3	2
Rated motor current I_N	A	0.25…0.32	0.33…0.49	0.5…0.99
Set current on the relay I_E between the lowest and highest values	A	1.00…1.28	1.00…1.47	1.00…1.98

The device's set current, I_E, is calculated as follows: $I_E = n \times I_N$

Tripping characteristics



With a phase failure or imbalance > 50 %, the ZEV will trip within 2.5 seconds.

Tripping times for ZEV electronic motor-protective relay

Tripping class, adjustable	**CLASS**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**
Tripping times in s (±20 %)		With 3-pole symmetric loading from cold state							
Current setting I_E	x 3	11.3	22.6	34	45.3	56.6	67.9	79.2	90.5
	x 4	8	15.9	23.9	31.8	39.8	47.7	55.7	63.6
	x 5	6.1	12.3	18.4	24.6	30.7	36.8	43	49.1
	x 6	5	10	15	20	25	30	35	40
	x 7.2	4.1	8.2	12.3	16.4	20.5	24.5	28.6	32.7
	x 8	3.6	7.3	10.9	14.6	18.2	21.9	25.5	29.2
	x 10	2.9	5.7	8.6	11.5	14.4	17.2	20.1	23

Reset time after overload trip

Overview of the reset time	**CLASS**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**
	t_{reset} min	5	6	7	8	9	10	11	12

Thermistor tripping

Rated trip resistance R = 3200 Ω ±15 %

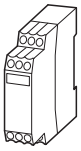
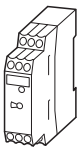
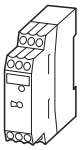
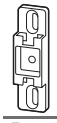
Reset resistance R = 1500 Ω +10 %

Total PTC thermistor resistance $\sum R_K \leq 1500\ \Omega$
at $R_K \leq 250\ \Omega$ per sensor: 6 sensors
at $R_K \leq 100\ \Omega$ per sensor: 9 sensors

Ready to respond after trip at 5 K under response temperature

Test button tripping time: 5 s

Ordering

	Function	Rated operational current AC-15 240 V I_e A	Rated operational current AC-14 400 V I_e A	Conventional thermal current I_{th} A	Rated control voltage U_s V	Part no. Article no.	Price See price list	Std. pack	Notes
EMT6 thermistor machine protection overload relays									
	Without automatic reset Mains and fault LED display	3	3	6	24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6**[1) 2)] 066166		1 off	Ⓔx II (2) G Ⓔx II (2) GD only for EMT6-K PTB 02 ATEX 3162 Observe the manual AWB 2327-1446 → Page 6/24 Can be snap fitted on a top-hat rail to IEC/EN 60715. Device clearance ≧ 3 mm.
					230 V 50/60 Hz	**EMT6(230V)**[1) 2)] 066400			
	Without automatic reset Mains and fault LED display Tripped in the event of a short-circuit in the sensor-cable				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-K**[2)] 269470			
	Selector switch with/without automatic reset For manual or remote resetting Test button Mains and fault LED display				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-DB**[1) 2)] 066167			
					230 V 50/60 Hz	**EMT6-DB(230V)**[1) 2)] 066401			
	Selector switch with/without automatic reset For manual or remote resetting Test button Mains and fault LED display Trip with short-circuit in the sensor cable				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-KDB**[2)] 269471			
	All-in-one device Selector switch with/without automatic reset Trip with short-circuit in the sensor cable Zero-voltage safe For manual or remote resetting Test button Short-circuit detection and retention can be deactivated Mains and fault LED display				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-DBK**[2)] 066168			
Accessories									
Screw adapters for screw fixing									
						**CS-TE**[3)] 095853		10 off	–
Documentation									
EMT6 thermistor overload relay Overload monitoring of machines in the EEx e area									
	German					**AWB2327-1446D** 264853		1 off	
	English					**AWB2327-1446GB** 267010		1 off	

Notes

[1)] For EMT6, EMT6(230V), EMT6-DB and EMT6-DB(230V) applies: Provide additional short-circuit protection in the sensor circuit with a current monitoring relay.

[2)]

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

[3)]

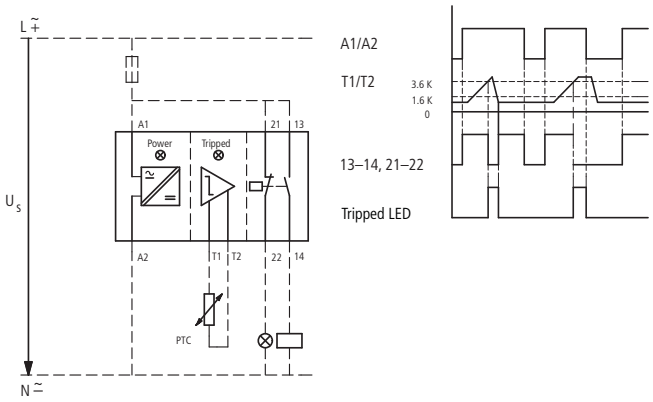
Information relevant for export to North America

UL/CSA certification not required

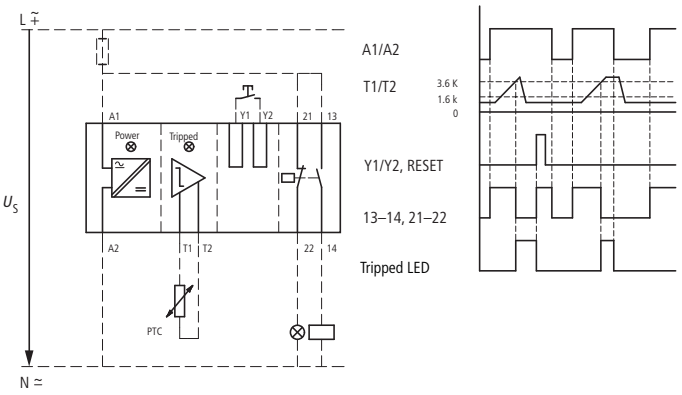
Engineering

Terminal marking according to EN 50005

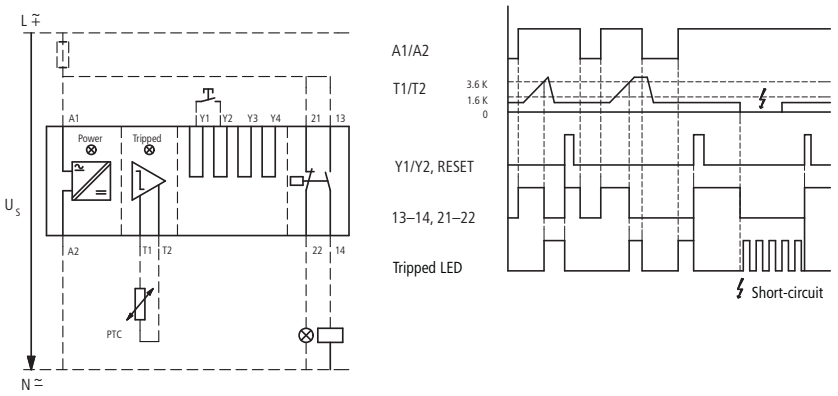
EMT6(-K), EMT6-(K)DB, EMT6-DBK
Auto



EMT6-(K)DB, EMT6-DBK
Manual



EMT6-DBK
Zero-voltage safe operation



LED display

- Supply voltage present
- Device has tripped
- Device has tripped/short-circuit in the sensor circuit

Sensor circuit

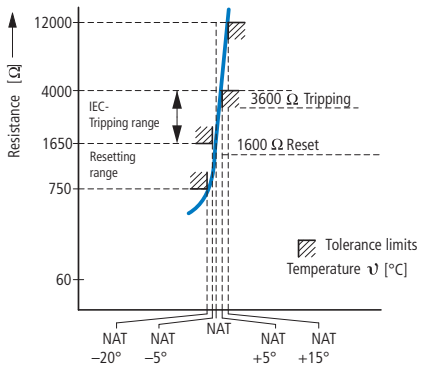
At R_K ≦ 250 Ω per sensor: 6 sensors, at R_K ≦ 100 Ω per sensor: 9 sensors in the winding (provided by user), max. cable length to sensor 250 m (not shielded);
Total PTC thermistor resistance ∑ R_K ≦ 1500 Ω

Sensor circuit characteristic values at U_s and +20 °C

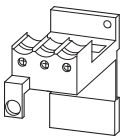
$R_{T1\text{-}T2}$	**EMT6…** $U_{T1\text{-}T2}$ V DC max.	$I_{T1\text{-}T2}$ mA max.
T1, T2 short-circuited	-	1.9
4 kΩ	3	0.8
T1-T2 open	5.1	-

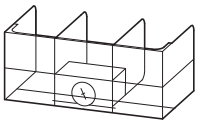
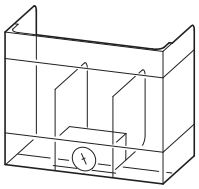
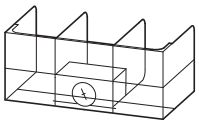
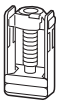
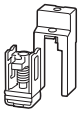
Functions that can be disconnected on the EMT6-DBK:

Function	Disconnection by link
Short-circuit monitoring	Y_1 - Y_3
Zero-voltage safety	Y_1 - Y_4



Ordering

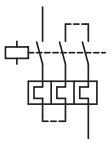
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Documentation							
Overload relays Overload monitoring of EEx e motors							
	ZE…	**AWB2300-1425D** 258704		1 off	German		
	ZB12… ZB32…	**AWB2300-1527D/GB** 284910			German/English		
	ZB65… ZB150…	**AWB2300-1545D/GB** 102065			German/English		
Bases							
For separate mounting							
	ZB32	**ZB32-XEZ** 278473		5 off	Can be snap fitted on a top-hat rail to IEC/EN 60715 or can be screw fitted. For ZB32-38, use BK25/3-PKZ0 additionally.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Max. Voltage Rating Degree of Protection	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking E29184 NKCR 12528 3211-03 UL Listed, CSA certified 600 V AC IEC: IP20, UL/CSA Type: -
	ZB65	**ZB65-XEZ** 278474		2 off			
Pushbuttons							
For enclosed Overload relay Mounting diameter: 22.3 mm							
External reset button, IP65							
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-B** 254833		10 off	Button plate, blue	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-B-GB14** 254834		10 off	Button plate, blue RESET		
Off button, IP65							
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-X** 254835		10 off	Without button plate, add button plate.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
Button plates							
	M22-DZ-X	**M22-XD-R** 216423		10 off	Button plate, red	UL/CSA certification not required	
	M22-DZ-X	**M22-XD-R-X0** 218153			Red button plate with white circle		
	M22-DZ-X	**M22-XD-R-GB0** 218194			Button plate red STOP		

	For use with		**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Covers						
	Direct mounting Z5-…/FF225 to DILM185A DILM225A		**Z5/FF225A-XHB-Z** 139579		1 off	Fitted directly to the contactor DILM400 -XHB DILM185A/ 225A Z5/FF225A -XHB-Z Z5-.../FF225A Z5/FF250 -XHB
	Z5-…/FF225A Z5-…/FF250		**Z5/FF250-XHB** 215217		1 off	Separate mounting Z5/FF250 -XHB Z5-.../FF250/ FF225A Z5/FF250 -XHB Fitted directly to the contactor DILM400 -XHB DILM250/ 300A Z5/FF250 -XHB-Z Z5-.../FF250 Z5/FF250 -XHB Fitted directly to the contactor DILM400 -XHB DILM185A/ 225A Z5/FF225A -XHB-Z Z5-.../FF225A Z5/FF250 -XHB
	Direct mounting Z5-…/FF250 to DILM250 DILM300A		**Z5/FF250-XHB-Z** 215218		1 off	Fitted directly to the contactor DILM400 -XHB DILM250/ 300A Z5/FF250 -XHB-Z Z5-.../FF250 Z5/FF250 -XHB
Box terminals kit Consisting of 3 individual clamps		For connection of copper flat strip max. W x H mm				
With protective cover						
	Z5-…/FF250	24 x 26	**K-B-DIL6AM** 064062		1 off	When using box terminals the protective covers must be used.
With control circuit terminal and protective cover						
	Z5-…/FF250	24 x 26	**KS-B-DIL6AM** 064063		1 off	When using box terminals the protective covers must be used.

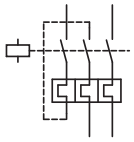
Engineering

Protection of single-phase and DC current motors:

1 pole

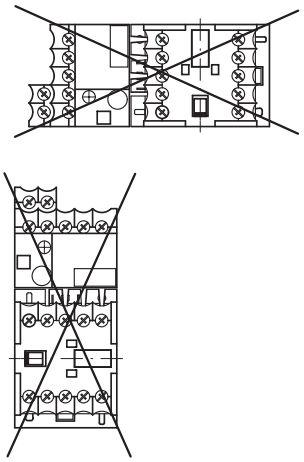


2 pole

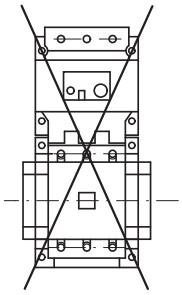


Mounting position:

ZE

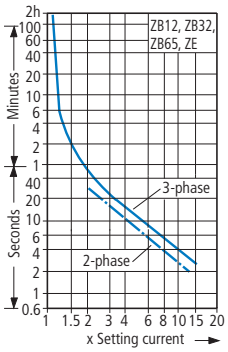


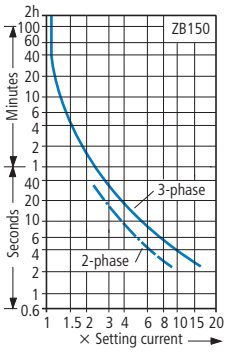
ZB12, ZB32, ZB65, ZB150, Z5

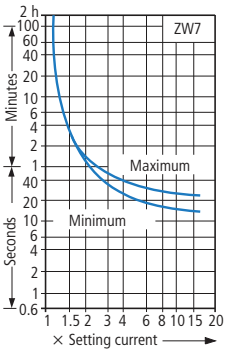


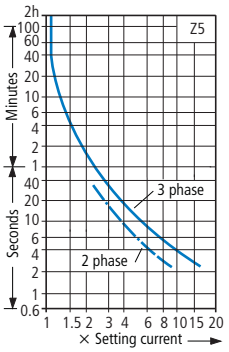
Tripping characteristics

These tripping characteristics are mean values of the spread at 20 °C ambient temperature in a cold state.
They show the tripping times in relation to the response current. When the devices are at operational temperature the tripping time of the overload relay drops to approx. 25 % of the value shown. Specific characteristics for each individual setting range can be found in the manual on → Page 6/26









Adaption of ZW7 to smaller rated motor currents

Number of loops	ZW7 -63	-90	-125	-160	-240	-290	-400	-540	-630
	Rated motor current I_N [A]								
1	42-63	60-90	85-125	110-160	160-240	190-290	270-400	360-540	420-630
2	21-31,5	30-45	42.5-62,5	55-80	80-120	95-145	135-200	180-270	210-315
3	14-21	20-30	28.3-41,7	36.7-53,3	53.3-80	63.3-96,7	90-133,3	120-180	140-210
4	10.5-15,8	15-22,5	21.3-31,3	27.5-40	40-60	47.5-72,5	67.5-100	90-135	105-157,5
5	8.4-12,6	12-18	17-25	22-32	32-48	38-58	54-80	72-108	84-126

Overload relay short-circuit strength

UL508, CSA-C22,2 No. 14/SCCR values

	Fuse acc. to NEC, CEC		CB	
	A	kA	A	kA
	600V AC		480V AC	
ZE-0,16	1	5	15	5
ZE-0.24	1	5	15	5
ZE-0.4	1	5	15	5
ZE-0.6	1	5	15	5
ZE-1,0	3	5	15	5
ZE-1.6	6	5	15	5
ZE-2.4	6	5	15	5
ZE-4	15	5	15	5
ZE-6	20	5	15	5
ZE-9	35	5	15	5
ZE-12	45	5	-	-
	600V AC			
ZB12(32)-0,16	1 CLASS J/CC	100	-	-
ZB12(32)-0,24	1 CLASS J/CC	100	-	-
ZB12(32)-0,4	1 CLASS J/CC	100	-	-
ZB12(32)-0,6	1 CLASS J/CC	100	-	-
ZB-12(32)-1,0	1 CLASS J/CC	100	-	-
ZB-12(32)-1,6	3 CLASS J/CC	100	-	-
ZB-12(32)-2,4	3 CLASS J/CC	100	-	-
ZB-12(32)-4	6 CLASS J/CC	100	-	-
ZB-12(32)-6	10 CLASS J/CC	100	-	-
ZB-12(32)-10	15 CLASS J/CC	100	-	-
ZB12-12	15 CLASS J/CC	100	-	-
ZB12-16	30 CLASS J/CC	100	-	-
ZB32-16	35 CLASS J	100	-	-
ZB32-24	45 CLASS J	100	-	-
ZB32-32	60 CLASS J	100	-	-
	600V AC		600V AC	
ZB65-10	15 CLASS J	100	40	5
ZB65-16	35 CLASS J	100	60	5
ZB65-24	45 CLASS J	100	90	5
ZB65-40	60 CLASS J	100	125	5
ZB65-57	110 CLASS J	100	150	10
ZB65-65	125 CLASS J	100	150	10
ZB65-75	125 CLASS J	100	150	10

	Fuse acc. to NEC, CEC		CB	
	A	kA	A	kA
	600V AC		600 V AC	
ZB150-50	225	5	200	5
ZB150-70	250	10	250	10
ZB150-100	400 CLASS J	10	400	10
ZB150-125	500 CLASS J	10	500	10
ZB150-150	600 CLASS J	10	600	10
ZB150-175	600 CLASS J	10	600	10
ZB150-50(KK)	110 CLASS J	100	200	5
ZB150-70(KK)	125 CLASS J	100	250	10
ZB150-100(KK)	200 CLASS J	100	400	10
ZB150-125(KK)	250 CLASS J	100	500	10
ZB150-150(KK)	300 CLASS J	100	600	10
ZB150-175(KK)	300 CLASS J	100	600	10
	600V AC		600V AC	
Z5-70/...	250	10	250	10
Z5-100/...	400 CLASS J	10	400	10
Z5-125/...	500 CLASS J	10	500	10
Z5-160/...	600 CLASS J	10	600	10
Z5-220/...	800 CLASS J	10	800	10
Z5-250/...	700 CLASS J	10	600	10
Z5-70/...	125 CLASS J	100	-	-
Z5-100/...	200 CLASS J	100	-	-
Z5-125/...	250 CLASS J	100	-	-
Z5-160/...	300 CLASS J	100	-	-
	600V AC		600V AC	
ZEV-XSW-25	-	5	-	5
ZEV-XSW-64	-	10	-	10
ZEV-XSW-145	-	10	-	10
ZEV-XSW-820	-	42	-	42

Technical data

			ZE	ZB12, ZB32	ZB65	ZB150(KK)
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open[1]		°C	-25…50	-25…55	-25…55	-25…55
Enclosed[1]		°C	-25…40	-25…40	-25…40	-25…40
Temperature compensation			Continuous			
Mounting position			→ Page 6/28			
Weight		kg	0.07	0.15	0.25	1.64
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	10	10	10	10
Protection type			IP20	IP20	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3
Rated insulation voltage						
AC	U_i	V AC	690	690	690	1000
Rated operating voltage	U_e	V AC	690	690	690	1000
Safe isolation according to EN 61140						
Between auxiliary contacts and main contacts		V AC	300	440	440	440
Between the main contacts		V AC	300	440	440	440
Overload relay setting range		A	0.1…12	0.1…38	6…75	25…175
Temperature compensation residual error > 40 °C		%/K	≦ 0.25	≦ 0.25	≦ 0.25	≦ 0.25
Short-circuit protection rating maximum fuse			→ Page 6/6	→ Page 6/8	→ Page 6/10	→ Page 6/10
Current heat loss (3 conductors)						
Lower value of setting range		W	2.5	2.5	3	16
Upper value of setting range		W	6	6	7.5	18
Terminal capacity						
Solid		mm^2	2 x (0.75 - 2.5)	2 x (1 - 6)[5]	2 x (1 - 16)[4]	2 x (4 - 16)
Flexible with ferrule		mm^2	2 x (0.5 - 1.5)	2 x (1 - 4)[5] 2 x (1 - 6)[3]	1 × (1…25) 2 x (1…10)[2]	1 x (4 - 70) 2 x (4 - 50)
Stranded		mm^2	–	–	1 x (16…25)	1 x (16…50) 2 x (16…50)
Solid or stranded		AWG	18 - 14	14 - 8[5]	14 - 2	3/0
Busbar	Width	mm	–	–	–	–
Terminal screw			M3.5	M4	M6	M10
Tightening torque		Nm	1.2	1.8[5]	3.5	10
Tools						
Pozidriv screwdriver		Size	2	2	2	–
Flat-blade screwdriver		mm	0.8 x 5.5	1 x 6	1 x 6	–
Hexagon socket	SW	mm	–	–	–	5

Notes

[1] Ambient temperature: Operating range to IEC/EN 60947, PTB: -5°C to +55°C
[2] Use identical cross-section when using two conductors
[3] 6 mm flexible with ferrules to DIN 46228
[4] With ZB65-XEZ max 1 x (1… 16)
[5] ZB32-38: solid and flexible with ferrule, 2.5 - 25 mm^2, 3 Nm tightening torque. AWG10-b, 27 lb-in tightening torque for solid or stranded conductors.

				Z5-…/FF225A(250)	ZW7
General					
Standards				IEC/EN 60947, VDE 0660, UL, CSA	IEC/EN 60947, VDE 0660, UL, CSA
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30	
Ambient temperature					
Open[1]			°C	-25…50	-25…50
Enclosed[1]			°C	-25…40	-25…40
Temperature compensation				Continuous	Continuous
Mounting position				→ Page 6/28	Any
Weight			kg	1.55	0.8
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27			g	10	10
Protection type				IP00	IP00
Protection against direct contact when actuated from front (EN 50274)				With terminal cover	Finger- and back-of-hand proof
Main contacts					
Rated impulse withstand voltage		U_{imp}	V AC	8000	6000
Overvoltage category/pollution degree				III/3	III/3
Rated insulation voltage					
AC		U_i	V AC	1000	690
Rated operating voltage		U_e	V AC	1000	690
Safe isolation according to EN 61140					
Between auxiliary contacts and main contacts			V AC	440	440
Between the main contacts			V AC	440	440
Overload relay setting range			A	50…300	42…630
Temperature compensation residual error > 40 °C			%/K	≦ 0.25	–
Short-circuit protection rating maximum fuse				→ Page 6/12	With overload relay in conjunction with a transformer as required for the contactor
Current heat loss (3 conductors)					
Lower value of setting range			W	16	3
Upper value of setting range			W	28	10
Terminal capacity					
Flexible with ferrule			mm^2	95	–
Stranded with ferrule			mm^2	120	–
Solid or stranded			AWG	250 MCM	–
Flat conductor.	Number of segments x width x thickness		mm	6 x 16 x 0.8[2]	–
Busbar		Width	mm	20 x 3	–
Push-through opening		∅	mm	–	27
Terminal screw				M8 x 25	–
Tightening torque			Nm	24	–
Tools					
Hexagonal socket		SW	mm	13	–

Notes

[1] Ambient temperature: Operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] Fixing with box terminals



			ZE	ZB12, ZB32	ZB65	ZB150(KK)	Z5-.../FF225 Z5-.../FF250	ZW7
Auxiliary and control circuits								
Rated impulse withstand voltage	U_{imp}	V	6000	6000	6000	6000	6000	6000
Overvoltage category/Pollution degree			III/3	III/3	III/3	III/3	III/3	III/3
Terminal capacity								
Solid		mm^2	2 x (0.75 - 2.5)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)
Flexible with ferrule		mm^2	2 x (0.5 - 1.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)
Solid or stranded		AWG	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
Terminal screw			M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
Tools								
Pozidriv screwdriver		Size	2	2	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5	1 x 6	1 x 6	1 x 6	1 x 6	1 x 6
Auxiliary circuit rated insulation voltage	U_i	V AC	690	500	500	500	500	500
Rated operating voltage	U_e	V AC	500	500	500	500	500	500
Safe isolation according to EN 61140								
Between the auxiliary contacts		V AC	300	240	240	240	240	240
Conventional thermal current	I_{th}	A	6	6	6	6	6	6
Rated operational current								
AC-15								
N/O								
120 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
415 V	I_e	A	0.5	0.5	0.5	0.5	0.5	0.5
500 V	I_e	A	0.3	0.5	0.5	0.5	0.5	0.5
NC								
120 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
415 V	I_e	A	0.7	0.9	0.9	0.9	0.9	0.9
500 V	I_e	A	0.5	0.8	0.8	0.8	0.8	0.8
DC-13 L/R ≦ 15 ms[1]								
24 V	I_e	A	0.9	0.9	0.9	0.9	0.9	0.9
60 V	I_e	A	0.75	0.75[3]	0.75[3]	0.75[3]	0.75[3]	0.75[3]
110 V	I_e	A	0.4	0.4	0.4	0.4	0.4	0.4
220 V	I_e	A	0.2	0.2	0.2	0.2	0.2	0.2
General Use								
AC operated		V	240 600	–	–	–	–	–
AC operated		A	1.5 0.6	–	–	–	–	–
DC operated		V	–	–	–	–	–	–
DC operated		A	–	–	–	–	–	–
Pilot Duty								
AC operated			D300	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]
DC operated			R300	R300	R300	R300	R300	R300
Short-circuit rating without welding								
Max. fuse[2]		A gG/gL	4	6	6	6	6	6

Notes

[1] Making and breaking conditions to DC-13, time constant as stated
[2] See transparent overlay "Fuses" for time/current characteristics (please enquire)
[3] Rated operational current DC-13, 60 V: N/O auxiliary contact 0.6 A
[4] With opposite polarity
[5] With same polarity

ZEB

			ZEB12, ZEB32	ZEB65-45	ZEB65-100	ZEB150
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	–25…65	–25…65	–25…65	–25…65
Enclosed		°C	–25…65	–25…40	–25…40	–25…40
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			Any	Any	Any	Any
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	15	15	15	15
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree			III / 3	III / 3	III / 3	III / 3
Rated insulation voltage						
AC	U_i	V AC	690	690	690	690
Rated operating voltage	U_e	V AC	690	690	690	690
Safe isolation according to EN 61140						
Between auxiliary contacts and main contacts		V AC	600	600	600	600
Between the main contacts		V AC	600	600	600	600
Overload relay setting range		A	0.3…45	9…45	20…100	20…100
Terminal capacity						
Solid		mm²	1 x 2.5 - 16	1 x 2.5 - 16	1 x 6 - 50	1 x 6 - 50
Solid or stranded		AWG	1 x 14 - 4	1 x 14 - 4	1 x 10 - 1	1 x 10 - 1
Auxiliary and control circuits						
Rated impulse withstand voltage	U_{imp}	V	6000	6000	6000	6000
Overvoltage category/pollution degree			III / 3	III / 3	III / 3	III / 3
Terminal capacity						
Solid		mm²	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)
Flexible with ferrule		mm²	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)
Solid or stranded		AWG	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
Terminal screw			M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
		lb-in	7 - 10.6	7 - 10.6	7 - 10.6	7 - 10.6
Tools						
Pozidriv screwdriver		Size	2	2	2	2
Flat-blade screwdriver		mm	1 x 6	1 x 6	1 x 6	1 x 6
Auxiliary circuit rated insulation voltage	U_i	V AC	500	500	500	500
Rated operating voltage	U_e	V AC	500	500	500	500
Safe isolation according to EN 61140						
Between the auxiliary contacts		V AC	240	240	240	240
Conventional thermal current	I_{th}	A	5	5	5	5
Rated operational current						
AC-15						
N/O						
120 V	I_e	A	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5
415 V	I_e	A	0.5	0.5	0.5	0.5
500 V	I_e	A	0.5	0.5	0.5	0.5
NC						
120 V	I_e	A	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5
415 V	I_e	A	0.9	0.9	0.9	0.9
500 V	I_e	A	0.8	0.8	0.8	0.8
DC-13 L/R ≦ 15 ms						
24 V	I_e	A	0.9	0.9	0.9	0.9
60 V	I_e	A	0.75	0.75	0.75	0.75
110 V	I_e	A	0	0.4	0.4	0.4
220 V	I_e	A	0.2	0.2	0.2	0.2
Short-circuit rating without welding						
Max. fuse		A gG/gL	6	6	6	6

ZEV

					ZEV
General					
Standards					IEC/EN 60947, VDE 0660, UL, CSA
Climatic proofing					Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature	Open[1]			°C	-25…60[8]
	Enclosed[1]			°C	-25…40[8]
	Storage			°C	-40 - 80
Temperature compensation					Continuous
Mounting position					Any
Weight				kg	0.257
Shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27				g	15
Protection type					IP20
Protection against direct contact when actuated from front (EN 50274)					Finger- and back-of-hand proof
Main contacts					
Overload relay setting range				A	1…820[7]
Temperature compensation residual error > 40 °C				%/K	–
Short-circuit protection rating maximum fuse[3]					With overload relay in conjunction with a transformer as required for contactor
Tools	Pozidriv screwdriver			Size	1
	Flat-blade screwdriver			mm	0.8 x 5.5
Auxiliary and control circuits					
Rated impulse withstand voltage			U_{imp}	V	4000
Overvoltage category/pollution degree					III/3
Terminal capacities	Solid			mm^2	1 x (0.5 - 2.5) 2 x (0.5 - 1.5)[4]
	Flexible with ferrule			mm^2	1 x (0.5 - 2.5) 2 x (0.5 - 1.5)[4]
	Solid or stranded			AWG	1 x (18 - 14)
Terminal screw					M3.5
Tightening torque				Nm	0.8
Tools	Pozidriv screwdriver			Size	1
	Flat-blade screwdriver			mm	0.8 x 5.5
Auxiliary circuit rated insulation voltage			U_i	V AC	250
Rated operating voltage			U_e	V AC	240
Safe isolation according to EN 61140					
	Between the auxiliary contacts			V AC	240[5]
Conventional thermal current			I_{th}	A	6
Rated operational current					
AC-15 N/O	120 V		I_e	A	3[6]
	240 V		I_e	A	3[6]
	415 V		I_e	A	–
	500 V		I_e	A	–
NC	120 V		I_e	A	3
	240 V		I_e	A	3
	415 V		I_e	A	–
	500 V		I_e	A	–
DC-13 L/R ≦ 15 ms[2]	24 V		I_e	A	1
	60 V		I_e	A	–
	110 V		I_e	A	–
	220 V		I_e	A	–
Power consumption			$P_{max.}$	W	2.5
Short-circuit rating without welding					
	Max. fuse[3]			A gG/gL	6
Voltage tolerance	AC operated			x U_c	0.85…1.1
	DC operated			x U_c	0.85…1.1
Thermistor protection					
Total resistance (cold)				Ω	1500
Response value				Ω	2720…3680
Reset range				Ω	1500…1650
Reset time	Overload				→ Page 6/23
	Thermistor tripping				5 K under response temperature
	Ground fault protection				Immediate

Notes

[1] Ambient air temperature: open and enclosed operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated
[3] See overlay "Fuses" for short-circuit rating time/current characteristic (please enquire)
[4] Terminal capacities auxiliary and control circuits, solid, flexible with ferrules: With connection of 2 conductors only the following combinations are permissible: 0.5 and 0.75 mm^2, 0.75 and 1 mm^2, 1 and 1.5 mm^2
[5] Safe isolation: Up to 240 V depending on contact assignment between mains and outputs no potential isolation to thermistor and summation current transformer input and current sensor (neighbouring contacts: U_s = 127 V)
[6] Rated operational current AC-15: contacts 95/96 and 97/98 3 A (contactor control), contacts 05/06 and 07/08 1.5 A (auxiliary contacts)
[7] Overload relay main contact setting range: setting range dependant on current sensor
[8] Main contacts terminal capacity solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section
Ambient temperature open and enclosed: limited readability of the LCD display at < -15°C

ZEV

			ZEV-XSW-25	ZEV-XSW-65	ZEV-XSW-145	ZEV-XSW-820
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature[1]						
Open		°C	-25…60	-25…60	-25…60	-25…60
Enclosed		°C	-25…40	-25…40	-25…40	-25…40
Storage		°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			Any	Any	Any	Any
Weight		kg	0.23	0.4	0.45	0.14
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	15	15	15	15
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V	[2]	[2]	[2]	8000
Overvoltage category/pollution degree			[2]	[2]	[2]	III/3
Rated insulation voltage						
AC	U_i	V AC	[2]	[2]	[2]	1000
Rated operational voltage	U_e	V AC	[2]	[2]	[2]	1000
Safe isolation according to EN 61140						
Between busbar and sensor		V AC	–	–	–	500
Overload relay setting range						
Min. overload relay setting range		A	1	3	10	40
Max. overload relay setting range		A	25	65	145	820
Short-circuit protection rating maximum fuse			With overload relay in conjunction with a transformer as required for contactor			
Diameter	∅	mm	6	13	21	110

Notes

[1] Operating range to IEC/EN 60947, PTB: -5°C to +50°C

[2] The main current parameters are defined by the main current wiring which is used.

EMT6

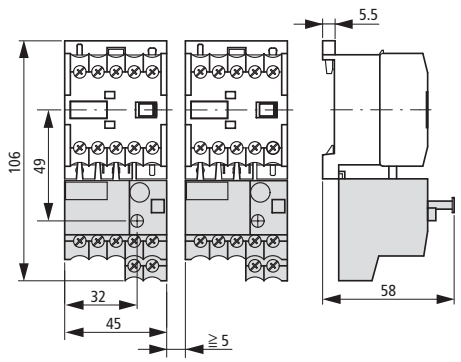
			EMT6
General			
Standards			IEC/EN 60947, VDE 0660, EN 55011
Climatic proofing			Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature			
Open		°C	-25…60
Enclosed		°C	-25…45
Storage		°C	-45 - 60
Mounting position			Any
Weight		kg	0.15
Shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	10
Protection type			IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof
Safe isolation according to EN 61140			
Between the contacts		V AC	250
Between contacts and supply voltage		V AC	250
Auxiliary and control circuits			
Rated impulse withstand voltage	U_{imp}	V AC	6000
Overvoltage category/pollution degree			III/3
Auxiliary and control circuit terminal capacity			
Solid		mm^2	1 x 2.5 2 x (0.5 - 1.5)
Flexible with ferrule		mm^2	1 x 2.5 2 x (0.5 - 1.5)
Solid or stranded		AWG	20 - 14
Terminal screw			M3.5
Tightening torque		Nm	1.2
Tools			
Pozidriv screwdriver		Size	2
Flat-blade screwdriver		mm	1 x 6
Auxiliary circuit			
Rated insulation voltage	U_i	V	400
Rated operational current			
AC-14			
N/O			
415 V	I_e	A	3
NC			
415 V	I_e	A	3
AC-15			
N/O			
240 V	I_e	A	3
415 V	I_e	A	1
NC			
240 V	I_e	A	3
415 V	I_e	A	1
Max. short-circuit protective device			
Fuse	gG/gL	A	6
Control circuit			
Rated insulation voltage	U_i	V	240
Rated operational voltage	U_e	V	240[1)]
Voltage tolerance		x U_e	0.85 - 1.1
Power consumption			
AC		VA	3.5
DC		W	2
Trip at approx.		Ω	≥3600
Reset at approx.		Ω	≤1600

Notes [1)] EMT6(-DB)230V: U_e = 230 V

Dimensions

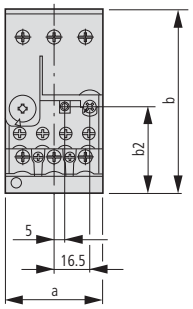
Overload relays

ZE-…

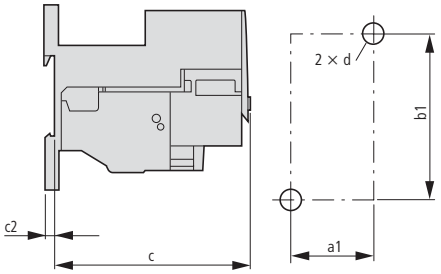


Base

ZB32-XEZ

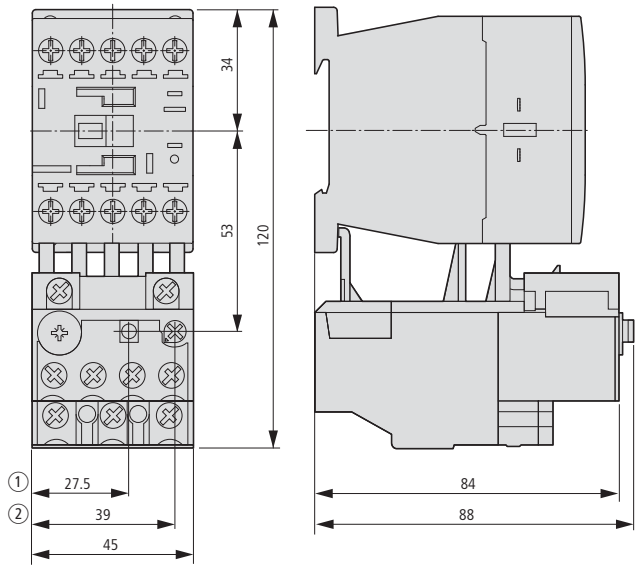


ZB65-XEZ



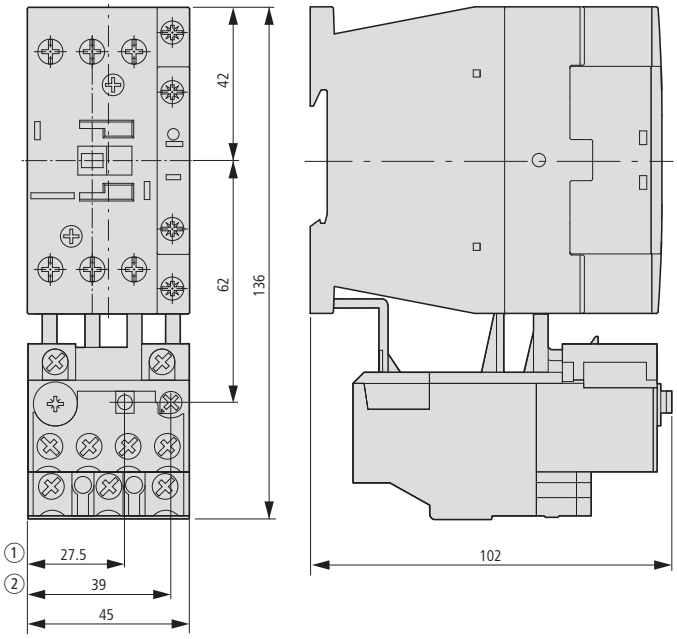
	ZB32	ZB65
a	45	60
b	85	86
c	90.5	112
c2	3.8	4.7
a1	35	50
b1	75	75
b2	40.5	47
d	M4	M5

ZB12

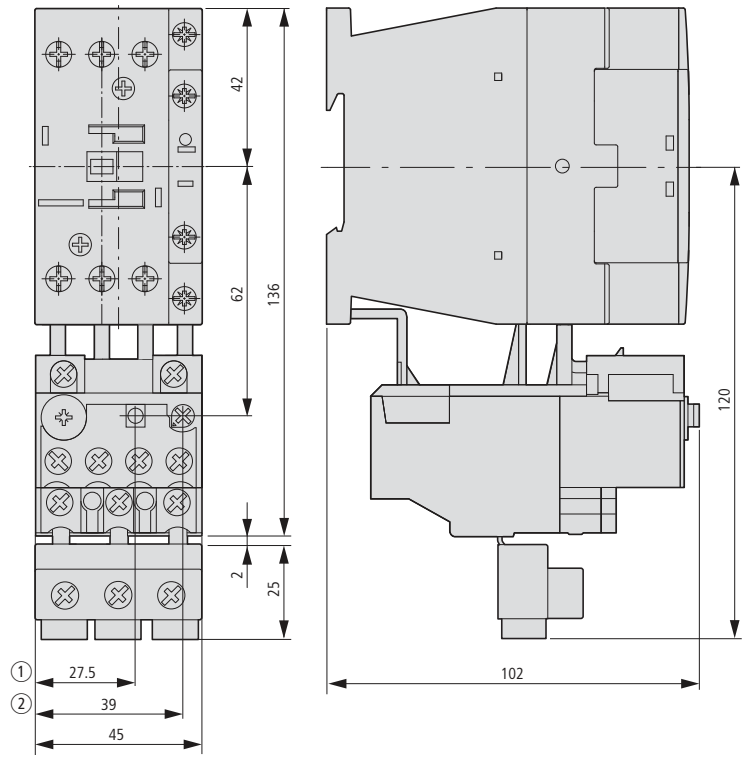


① OFF
② Reset/ON

ZB32



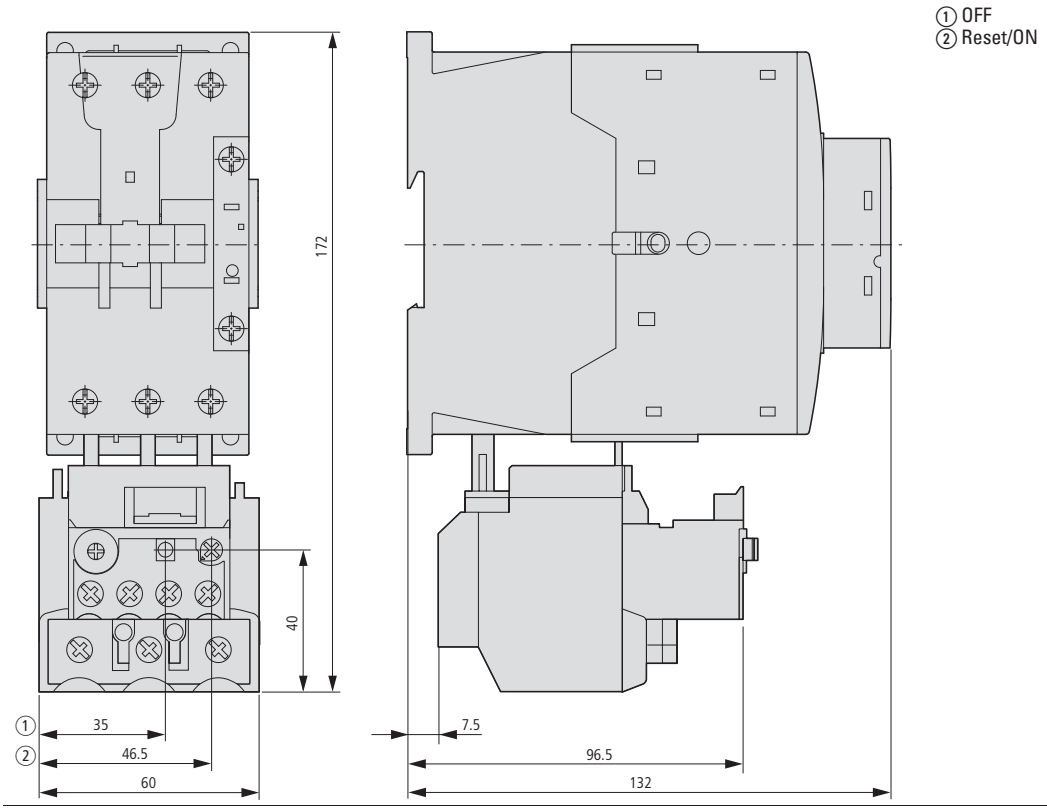
ZB32-38



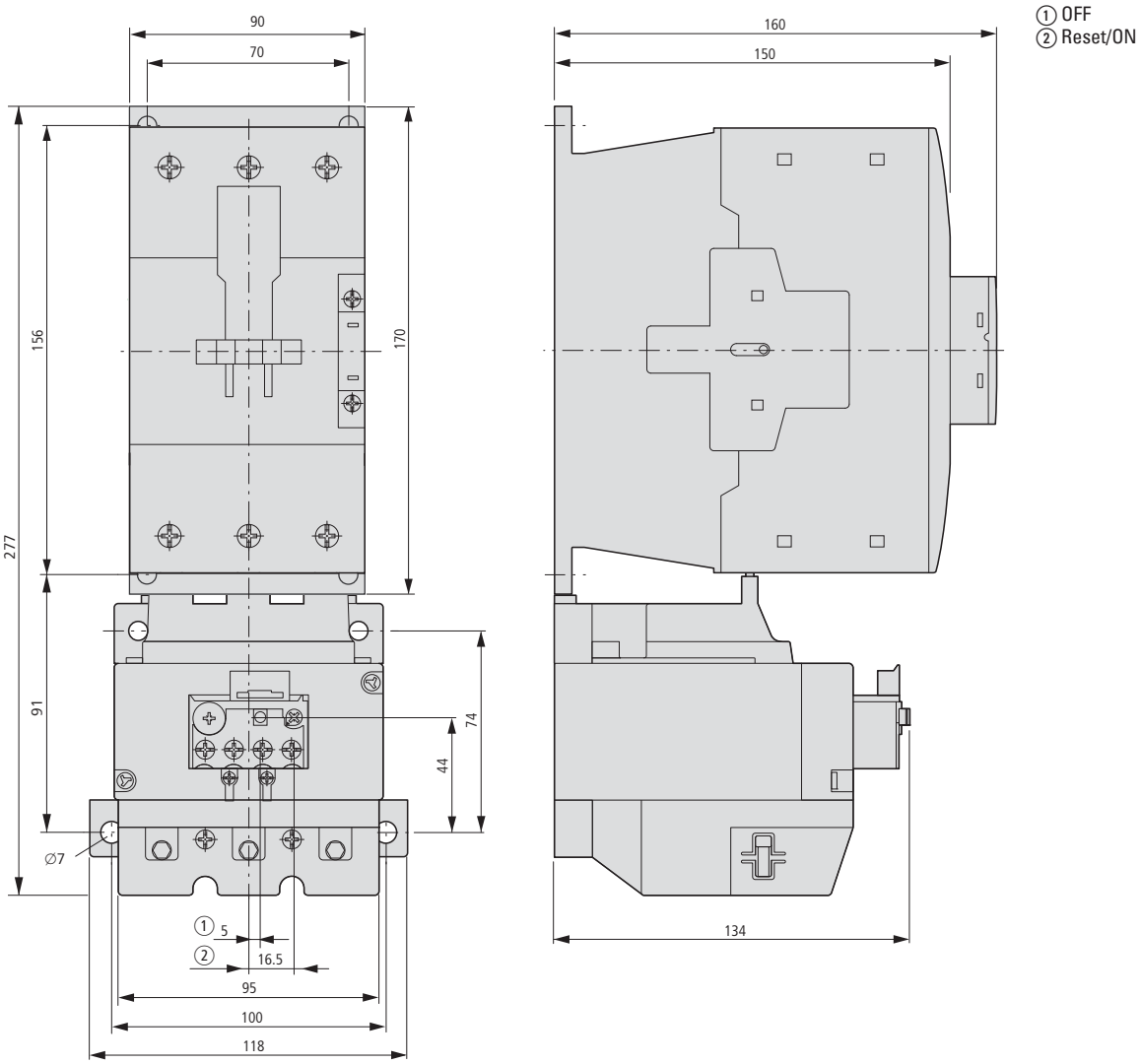
① OFF
② Reset/ON

Overload relays

ZB65

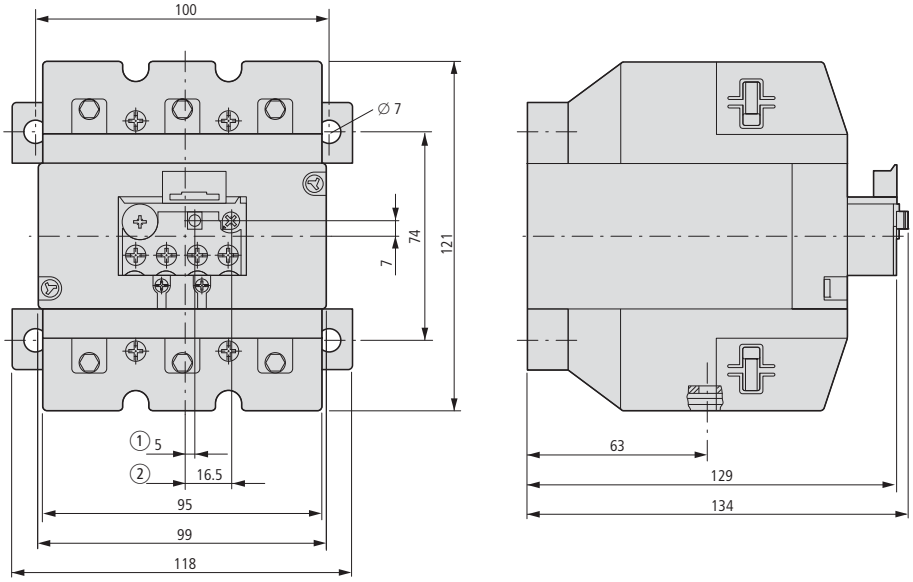


ZB150



Overload relays

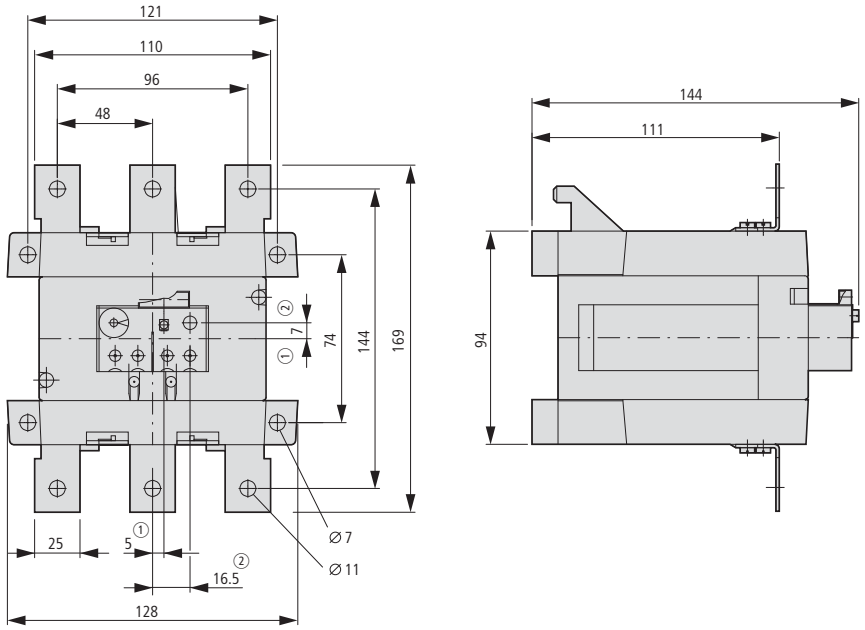
ZB150-50/KK



① OFF
② Reset/ON

Z5 overload relays greater than 150A

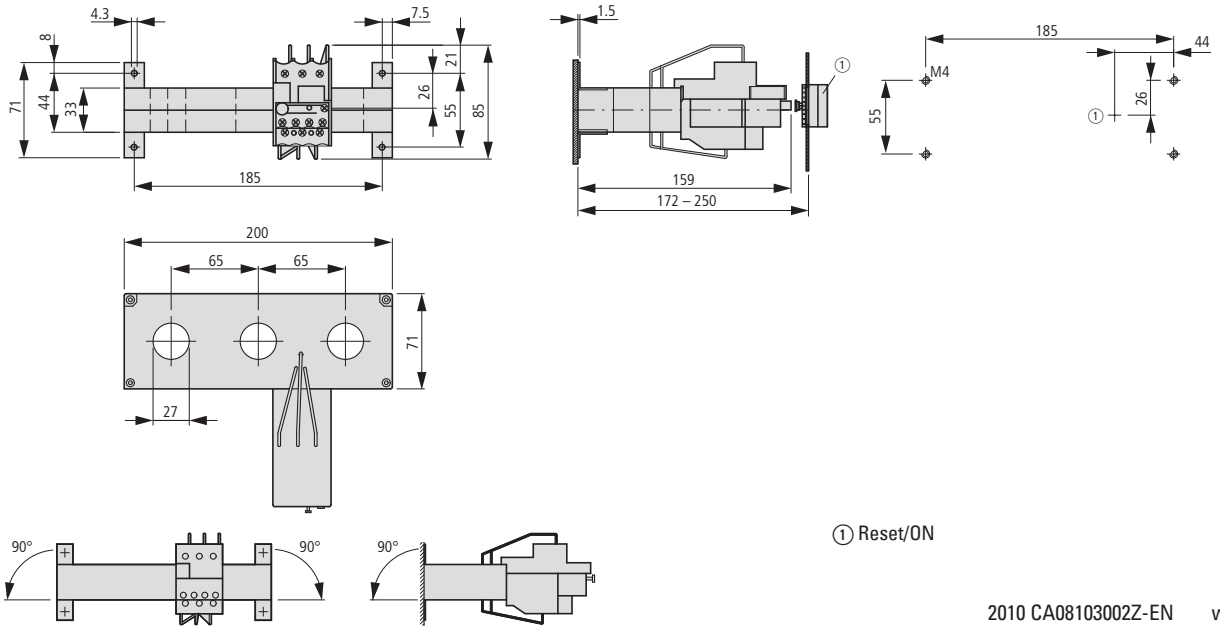
Z5-.../FF250



① OFF
② Reset/ON

Current transformer-operated overload relays

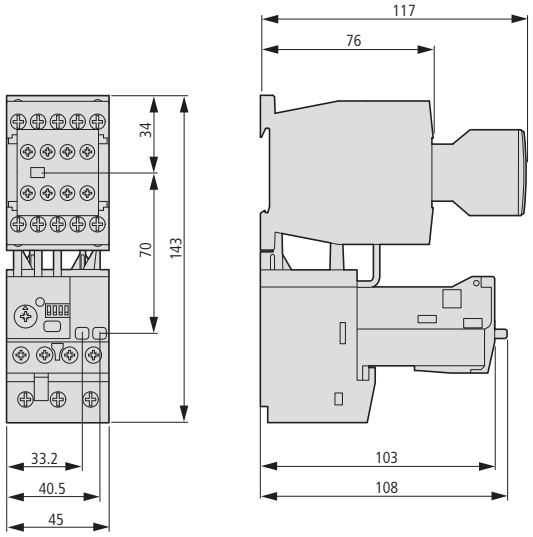
ZW7-…



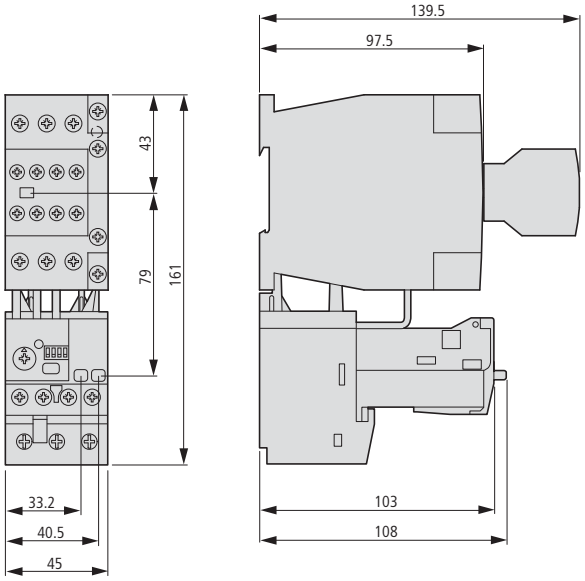
① Reset/ON

Electronic overload relays

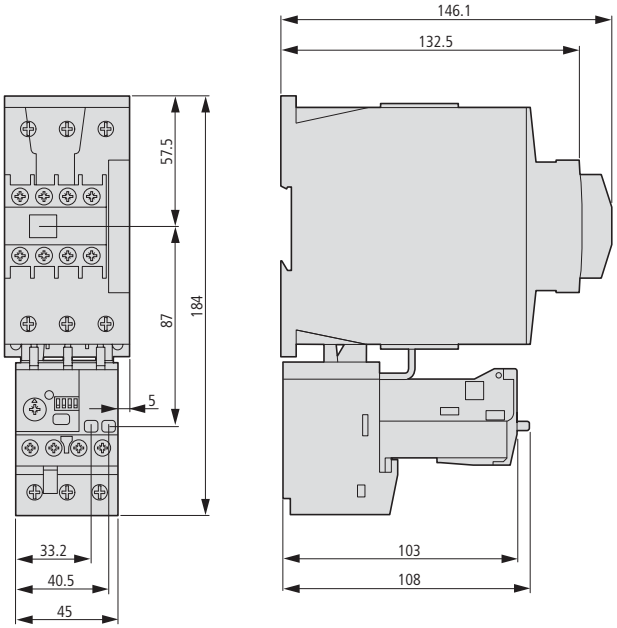
ZEB12



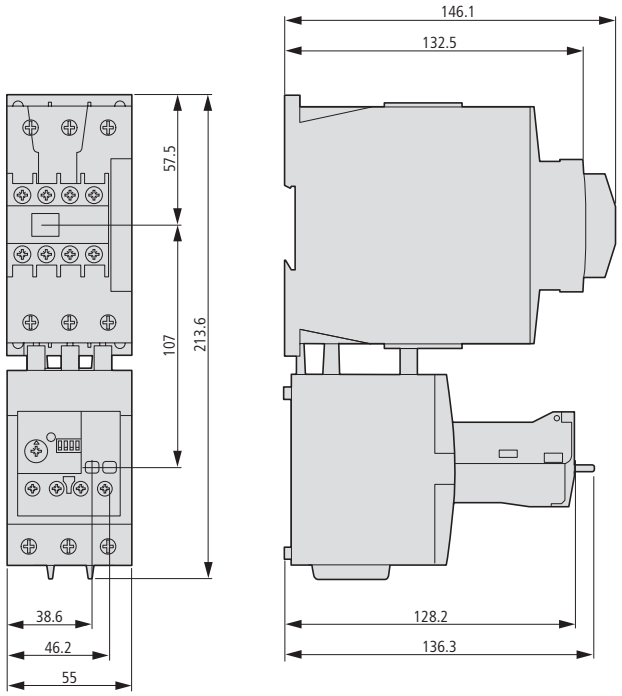
ZEB32



ZEB65-45

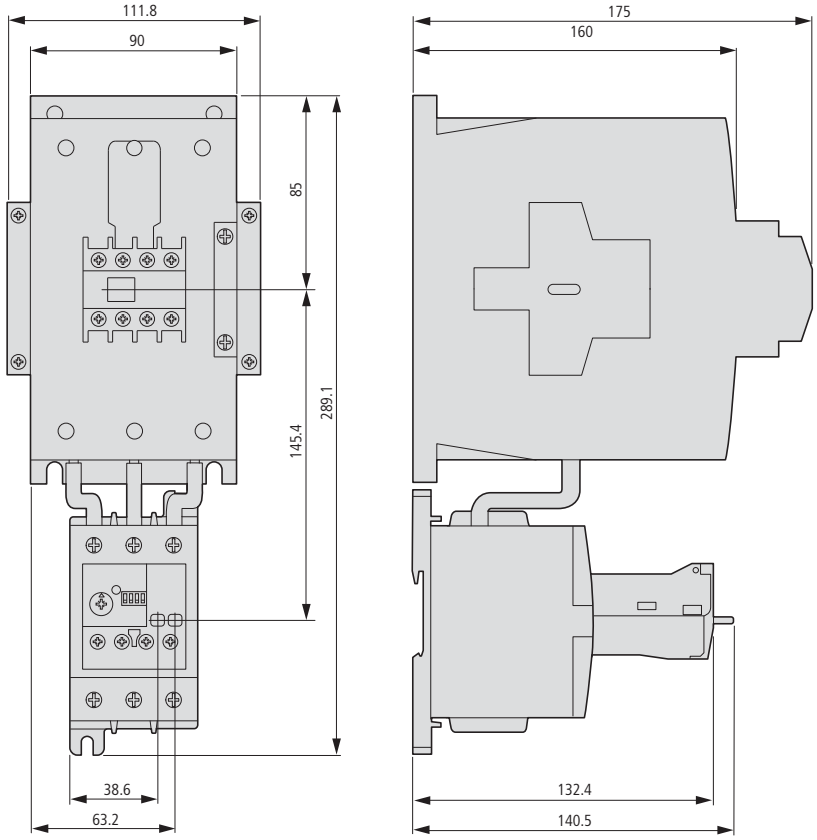


ZEB65-100

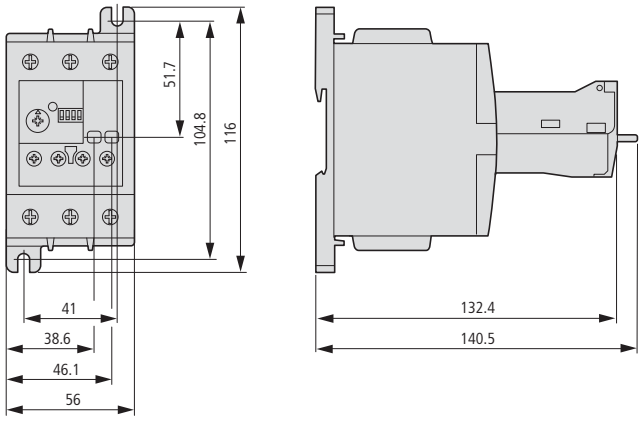


Electronic overload relays

ZEB150-100

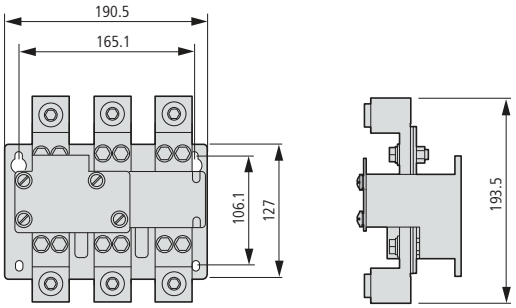


ZEB150-100/KK

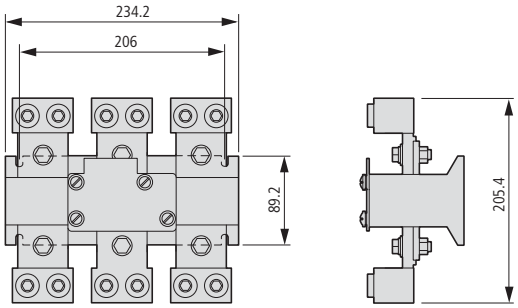


Current sensors

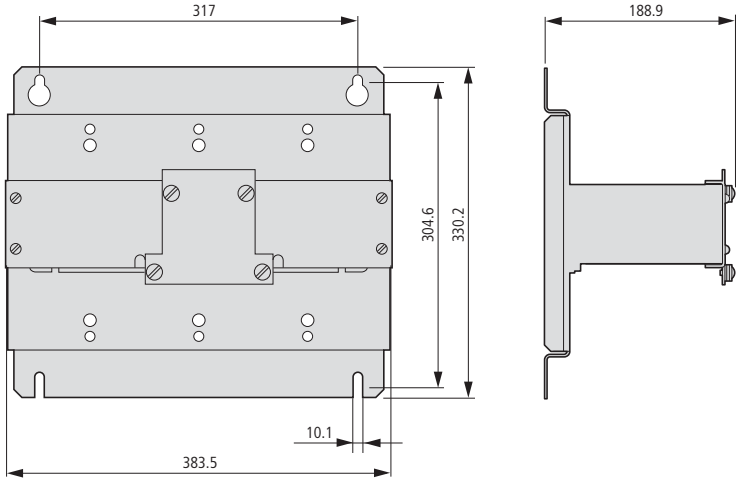
ZEB-XCT300

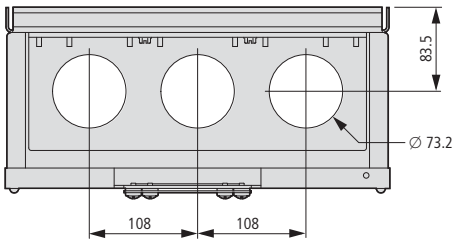


ZEB-XCT600



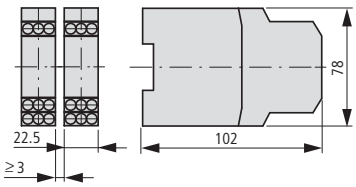
ZEB-XCT1000
ZEB-XCT1500





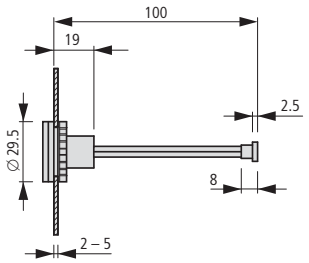
EMT6 thermistor overload relays for machine protection

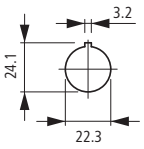
EMT6…



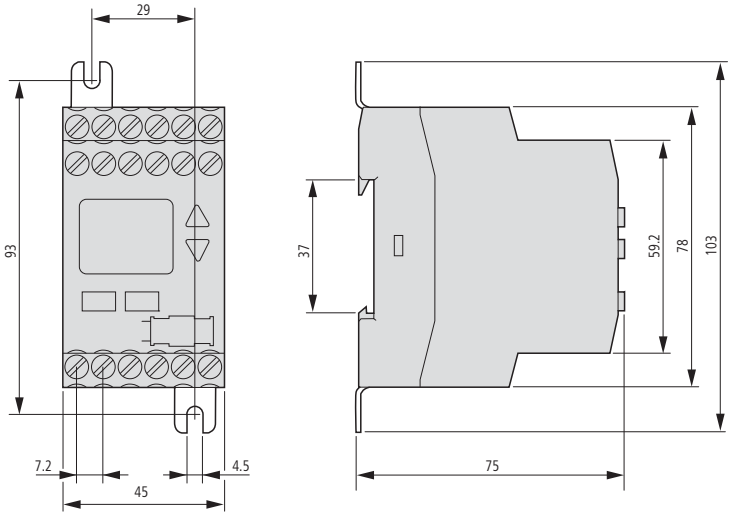
External reset button

M22-DZ-B
M22-DZ-X

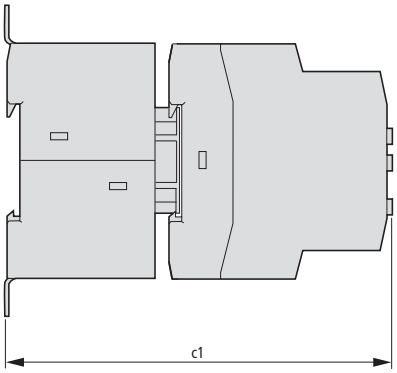




Electronic overload relays
ZEV

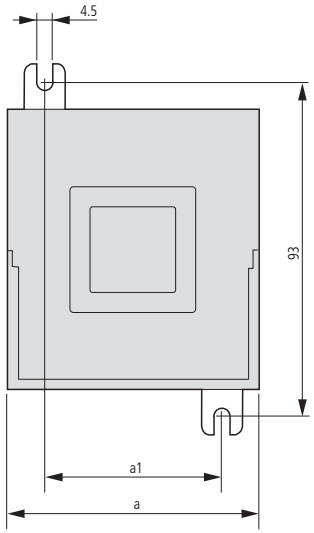


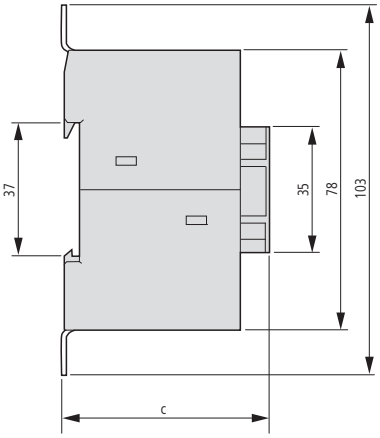
Electronic overload relays
ZEV + ZEV-XSW-...

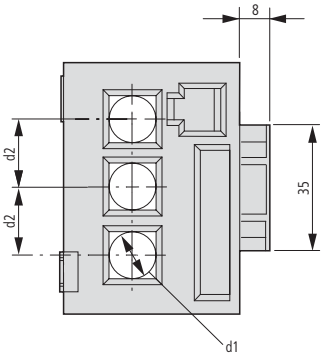


Part no.	c1
ZEV + ZEV-XSW-25	120
ZEV + ZEV-XSW-65	128
ZEV + ZEV-XSW-145	134

Current sensors
ZEV-XSW-...

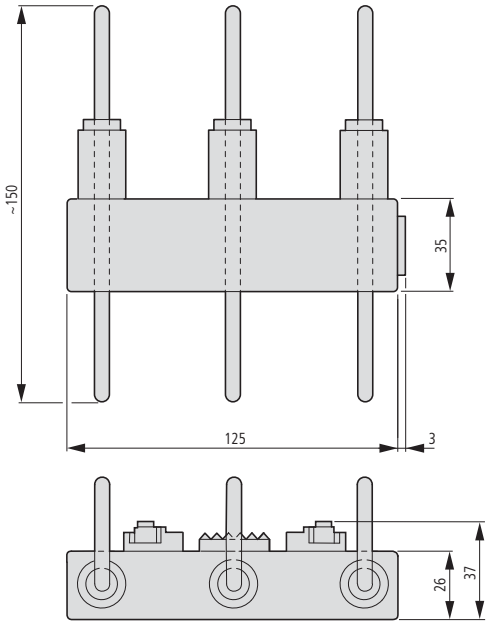






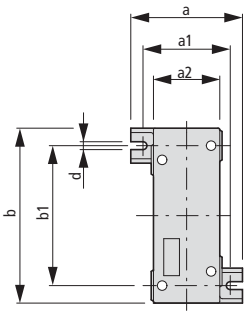
Part no.	a	a1	c	d1	d2
ZEV + ZEV-XSW-25	45	24	50	6	11.2
ZEV + ZEV-XSW-65	70	49	58	13	19
ZEV + ZEV-XSW-145	90	68	65	21	26

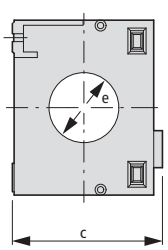
ZEV-XSW-820



Core-balance transformers
SSW…

Part no.	a	a1	a2	b	b1	c	d	e
SSW40-...	64	50	38	100	80	86	4.5	40
SSW65-...	75	60	43	124	100	112	4.5	65
SSW120-...	86.5	70	54.5	200	170	205	4.5	120











PKZ and PKE motor-protective circuit-breakers

Machinery and installation downtimes should be kept as short as possible. The PKZ fuseless motor-protective circuit-breakers combine short-circuit and overload protection in one device, allowing fast restart readiness. PKZM01, PKZM0, PKZM4 and PKE have the same accessories. Combines easily with DILM contactors and DS7 soft starters. Connecting PKE to SmartWire-Darwin facilitates high data transparency.

ATEX

PKZM01 (up to 16) motor-protective circuit-breaker with pushbuttons
Motor-protective circuit-breaker in housing for protection types IP40 and IP65 +++ Integrated EMERGENCY STOP and EMERGENCY OFF pushbuttons reduce wiring.

PKZM0 (up to 32 A) and PKZM4 (up to 65 A) motor-protective circuit-breakers with rotary handle
Short-circuit proof up to at least 50 kA for easy engineering +++ Trip-indicating auxiliary contact enables remote diagnosis +++ High safety through application as main switch or repair and maintenance switch +++ ATEX approval for protection of EEx e motors up to 65 A

Darwin Technology
The easy way to connect

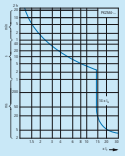
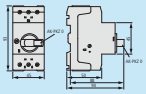
PKE (up to 65 A) motor-protective circuit-breakers with electronic wide-range overload protection
High flexibility through plug-in trip block +++ Wide current setting ranges enable only five trip blocks up to 65 A +++ Precise and extremely long-term stable characteristic curves +++
Individual supply through integrated current converter +++ ATEX approval for protection of EEx e motors up to 65 A +++ Adjustable tripping classes

IEC UL CSA

DC string circuit-breakers PKZ-SOL and DC switch-disconnectors P-SOL (up to 63 A) for installations
High string circuit-breaker flexibility due to wide current setting range +++ Enclosed switch-disconnector for external mounting (IP65) +++ Remote shutdown through optional secondary voltage and shunt trip +++ Voltage up to 1000 V DC +++ TÜV certified





Motor-protective circuit-breaker PKZM01, PKZM0, PKZM4, PKE

System overview

PKZM01, PKZM0, PKZM4 motor-protective circuit-breakers 7/2

Ordering

Motor-protective circuit-breakers 7/3

Motor-protective circuit-breakers for starter combinations 7/6

Transformer-protective circuit-breakers 7/6

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PKZM01, PKZM0 motor-protective circuit-breaker 7/39

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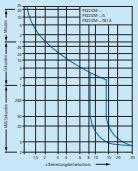
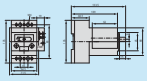

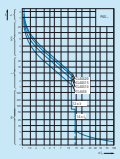
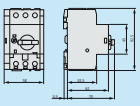

PKZ2 motor-protective circuit-breaker

System overview

PKZ2 motor-protective circuit-breakers 7/47

Ordering

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DC string circuit-breaker PKZ-SOL, DC switch-disconnectors P-SOL, SOL

Description

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DC switch-disconnector SOL, ready-to-install 7/85

DC switch-disconnector P-SOL, open 7/86

DC string circuit-breaker PKZ-SOL 7/86

Engineering

Circuit P-SOL, PKZ-SOL
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Technical data

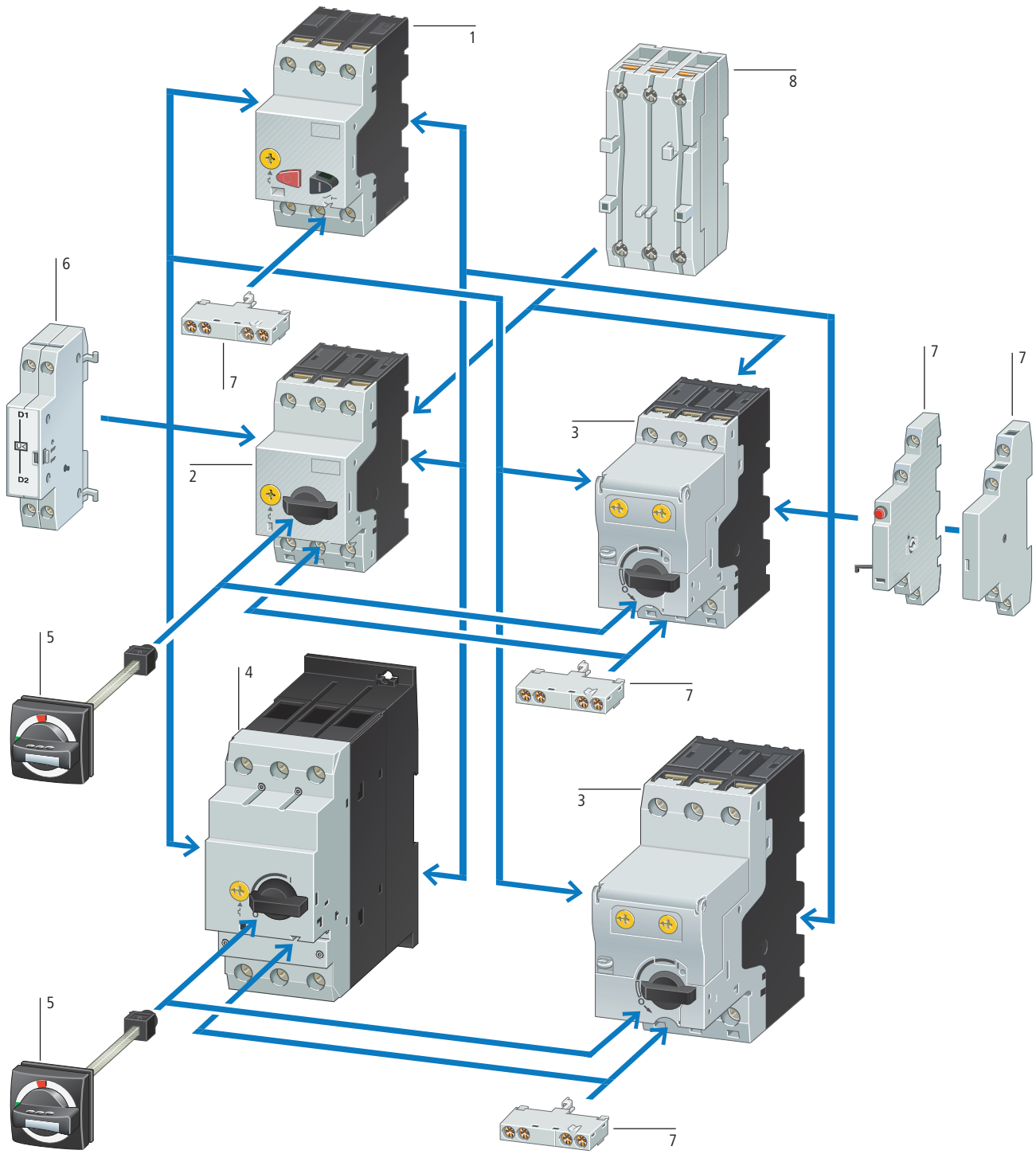
DC switch-disconnectors P-SOL,SOL 7/89

DC string circuit-breaker PKZ-SOL 7/90

Dimensions

DC switches P-SOL, PKZ-SOL, SOL 7/91

System overview



Basic devices

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Motor-protective circuit-breakerwith wide-range overload protection 3
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Motor-protective circuit-breaker PKZM4 4
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Add-on functions

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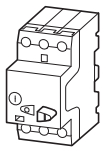
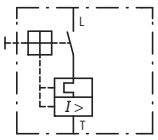
HLP07003EN **PKZM01**

Ordering

Max. motor rating AC-3 220 V 230 V 240 V P kW	Max. motor rating AC-3 380 V 400 V 415 V P kW	Max. motor rating AC-3 440 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Setting range Short-circuit releases I_{rm} A	Screw terminals Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Motor-protective circuit-breakers, type "1"; and type "2" coordination									
–	–	–	0.16	0.1…0.16	2.2	**PKZM01-0.16** 278475		1 off	Product Standards: UL508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Suitable for: Branch circuit, or suitable for group installations See also: → Page 7/34
–	0.06	0.06	0.25	0.16…0.25	3.5	**PKZM01-0.25** 278476			
0.06	0.09	0.12	0.4	0.25…0.4	5.6	**PKZM01-0.4** 278477			
0.09	0.12	0.18	0.63	0.4…0.63	8.8	**PKZM01-0.63** 278478			
0.12	0.25	0.25	1	0.63…1	14	**PKZM01-1** 278479			
0.25	0.55	0.55	1.6	1…1.6	22	**PKZM01-1.6** 278480			
0.37	0.75	1.1	2.5	1.6…2.5	35	**PKZM01-2.5** 278481			
0.75	1.5	1.5	4	2.5…4	56	**PKZM01-4** 278482			
1.1	2.2	3	6.3	4…6.3	88	**PKZM01-6.3** 278483			
2.2	4	4	10	6.3…10	140	**PKZM01-10** 278484			
3	5.5	5.5	12	8…12	168	**PKZM01-12** 278485			
4	7.5	9	16	10…16	224	**PKZM01-16** 283390			
5.5	9	11	20	16…20	280	**PKZM01-20** 283383			Product Standards: UL508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
5.5	12.5	12.5	25	20…25	350	**PKZM01-25** 288893			





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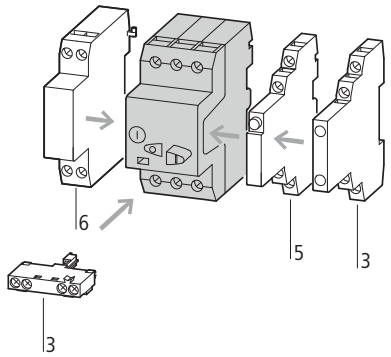


Accessories **Page**

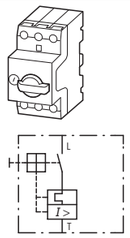
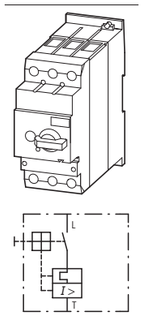
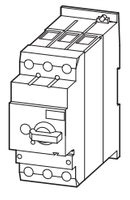
3 Standard auxiliary contacts → 7/10

5 Trip-indicating auxiliary contact → 7/12

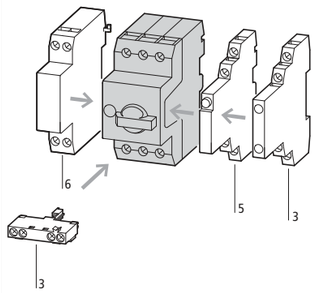
6 Shunt release, undervoltage release → 7/29

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

Circuit diagrams	Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Screw terminals Part no. Article no.	Price See price list	Screw terminals on feed side, spring-loaded terminals on output side Part no. Article no.	Price See price list
Motor-protective circuit-breakers, type "1" and type "2" coordination[1]												
	–	–	–	–	0.06	0.16	0.1…0.16	2.2	**PKZM0-0.16** 072730		**PKZM0-0,16-SC** 229828	
	–	0.06	0.06	0.06	0.12	0.25	0.16…0.25	3.5	**PKZM0-0.25** 072731		**PKZM0-0,25-SC** 229829	
	0.06	0.09	0.12	0.12	0.18	0.4	0.25…0.4	5.6	**PKZM0-0.4** 072732		**PKZM0-0,4-SC** 229830	
	0.09	0.12	0.18	0.25	0.25	0.63	0.4…0.63	8.8	**PKZM0-0.63** 072733		**PKZM0-0,63-SC** 229831	
	0.12	0.25	0.25	0.37	0.55	1	0.63…1	14	**PKZM0-1** 072734		**PKZM0-1-SC** 229832	
	0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	22	**PKZM0-1.6** 072735		**PKZM0-1,6-SC** 229833	
	0.37	0.75	1.1	1.1	1.5	2.5	1.6…2.5	35	**PKZM0-2.5** 072736		**PKZM0-2.5-SC** 229834	
	0.75	1.5	1.5	2.2	3	4	2.5…4	56	**PKZM0-4** 072737		**PKZM0-4-SC** 229835	
	1.1	2.2	3	3	4	6.3	4…6.3	88	**PKZM0-6.3** 072738		**PKZM0-6,3-SC** 229836	
	2.2	4	4	4	7.5	10	6.3…10	140	**PKZM0-10** 072739		**PKZM0-10-SC** 229837	
	3	5.5	5.5	5.5	11	12	8…12	168	**PKZM0-12** 278486		**PKZM0-12-SC** 278487	
	4	7.5	9	9	12.5	16	10…16	224	**PKZM0-16** 046938		**PKZM0-16-SC** 229838	
	5.5	9	11	12.5	15	20	16…20	280	**PKZM0-20** 046988			
	5.5	12.5	12.5	15	22	25	20…25	350	**PKZM0-25** 046989			
	7.5	15	15	22	30	32	25…32	448	**PKZM0-32** 278489			
Motor-protective circuit-breakers, type "1" and type "2" coordination[1]												
	4	7.5	9	9	12.5	16	10…16	224	**PKZM4-16** 222350			
	5.5	12.5	12.5	15	22	25	16…25	350	**PKZM4-25** 222352			
	7.5	15	17.5	22	22	32	25…32	448	**PKZM4-32** 222353			
	11	20	22	24	30	40	32…40	560	**PKZM4-40** 222354			
	14	25	30	30	45	50	40…50	700	**PKZM4-50** 222355			
	17	30	37	37	55	58	50…58	812	**PKZM4-58** 222394			
	18.5	34	37	45	55	65	55…65	882	**PKZM4-63** 222413			
Circuit-breakers[2] For line and cable protection												
	–	–	–	–	–	16	10…16	224	**PKZM4-16-CB** 132591			
	–	–	–	–	–	25	16…25	350	**PKZM4-25-CB** 132592			
	–	–	–	–	–	32	25…32	448	**PKZM4-32-CB** 132593			

Spring-loaded terminals Part no. Article no.	Price See price list	Std. pack	Notes
PKZM0-0,16-C 229669		1 off	
PKZM0-0,25-C 229670			
PKZM0-0,4-C 229671			
PKZM0-0,63-C 229672			
PKZM0-1-C 229673			
PKZM0-1,6-C 229674			
PKZM0-2.5-C 229675			
PKZM0-4-C 229676			
PKZM0-6,3-C 229677			
PKZM0-10-C 229678			
PKZM0-12-C 278488			
PKZM0-16-C 229679			

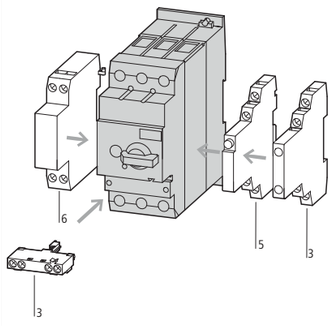


Accessories **Page**
3 Standard auxiliary contacts → 7/10
5 Trip-indicating auxiliary contact → 7/12
6 Shunt release, undervoltage release → 7/29

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
Ex PTB 02 ATEX 3151, see manual → 7/21

[1]
Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No. E36332
UL CCN NLRV
CSA File No. 12528
CSA Class No. 3211-05
NA Certification UL Listed, CSA certified
Suitable for Branch circuit: Manual type E if used with terminal, or suitable for group installations
See also → Page 7/34

1 off



Accessories **Page**
3 Standard auxiliary contacts → 7/10
5 Trip-indicating auxiliary contact → 7/12
6 Shunt release, undervoltage release → 7/29
Only motor-protective circuit-breaker:
Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102
Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
Ex PTB 02 ATEX 3153, see manual → 7/21

1 off

Not usable as a main switch

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

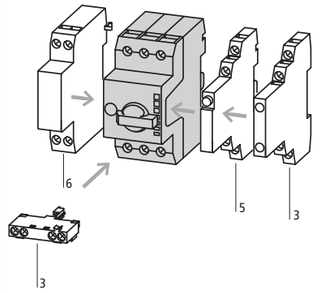
Switching capacity of SCCR
65 kA (480 Y/277 V)
22 kA (600 Y/347 V)

[2]
Product Standards UL 489; CSA-C22.2 no. 5-09; IEC60947-4-1; CE marking
NA Certification Request filed for UL and CSA
Specially designed for NA Yes
Suitable for Feeder and branch circuit as BCPD

Information relevant for export to North America

Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Screw terminals **Part no.** Article no.	**Price** See price list	Std. pack
Motor-protective circuit-breakers for starter combinations										
Short-circuit protective breakers without overload function										
–	–	–	–	0.06	0.16		2.2	**PKM0-0,16** 072720		1 off
–	0.06	0.06	0.06	0.12	0.25		3.5	**PKM0-0,25** 072721		
0.06	0.09	0.12	0.12	0.18	0.4		5.6	**PKM0-0,4** 072722		
0.09	0.12	0.18	0.25	0.25	0.63		8.8	**PKM0-0,63** 072723		
0.12	0.25	0.25	0.38	0.55	1		14	**PKM0-1** 072724		
0.25	0.37	0.55	0.75	1.1	1.6		22	**PKM0-1,6** 072725		
0.37	0.75	1.1	1.1	1.5	2.5		35	**PKM0-2.5** 072726		
0.75	1.5	1.5	2.2	3	4		56	**PKM0-4** 072727		
1.1	2.2	3	3	4	6.3		88	**PKM0-6,3** 072728		
2.2	4	4	4	7.5	10		140	**PKM0-10** 072729		
3	5.5	5.5	5.5	11	12		168	**PKM0-12** 278490		
4	7.5	9	9	12.5	16		224	**PKM0-16** 044502		
5.5	9	11	12.5	15	20		280	**PKM0-20** 203594		
5.5	12.5	12.5	15	22	25		350	**PKM0-25** 044503		
7.5	15	15	22	30	32		448	**PKM0-32** 278491		
Transformer-protective circuit-breakers										
–	–	–	–	–	0.16	0.1…0.16	2.4	**PKZM0-0,16-T** 088907		1 off
–	–	–	–	–	0.25	0.16…0.25	4.25	**PKZM0-0,25-T** 088908		
–	–	–	–	–	0.4	0.25…0.4	6.8	**PKZM0-0,4-T** 088909		
–	–	–	–	–	0.63	0.4…0.63	12	**PKZM0-0,63-T** 088910		
–	–	–	–	–	1	0.63…1	20	**PKZM0-1-T** 088911		
–	–	–	–	–	1.6	1…1.6	32	**PKZM0-1,6-T** 088912		
–	–	–	–	–	2.5	1.6…2.5	50	**PKZM0-2.5-T** 088913		
–	–	–	–	–	4	2.5…4	84	**PKZM0-4-T** 088914		
–	–	–	–	–	6.3	4…6.3	141	**PKZM0-6,3-T** 088915		
–	–	–	–	–	10	6.3…10	224	**PKZM0-10-T** 088916		
–	–	–	–	–	12	8…12	224	**PKZM0-12-T** 278492		
–	–	–	–	–	16	10…16	280	**PKZM0-16-T** 088917		
–	–	–	–	–	20	16…20	350	**PKZM0-20-T** 088918		
–	–	–	–	–	25	20…25	437	**PKZM0-25-T** 278493		

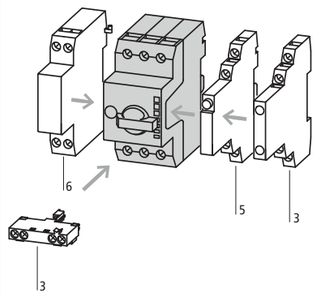
Notes



When using the PKM0 as short-circuit protection for motors with heavy starting duty, a device must be selected whose rated operational current I_e is higher by the following factors:
CLASS 5 = 1.0
CLASS 10 = 1.0
CLASS 15 = 1.22
CLASS 20 = 1.41
CLASS 25 = 1.58
CLASS 30 = 1.73
CLASS 35 = 1.89
CLASS 40 = 2.0

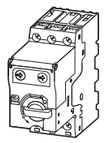
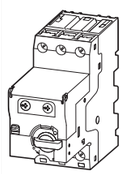
Accessories	**Page**
3 Standard auxiliary contacts	→ 7/10
5 Trip-indicating auxiliary contact	→ 7/12
6 Shunt release, undervoltage release	→ 7/29
Additional accessories	→ 2/46

Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
Assignment of the short-circuit protective breakers and contactors in “Fuseless motor-starter combinations” section.
An appropriate overload relay must be fitted to protect motors against overload.



Accessories	**Page**
3 Standard auxiliary contacts	→ 7/10
5 Trip-indicating auxiliary contact	→ 7/12
6 Shunt release, undervoltage release	→ 7/29

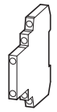
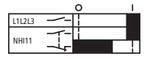
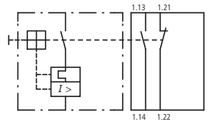
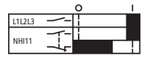
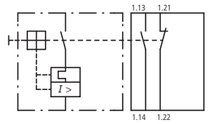
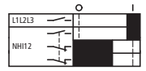
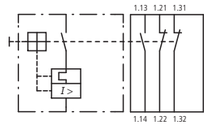
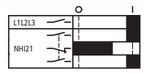
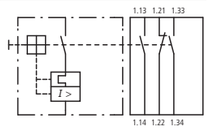
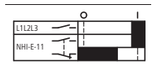
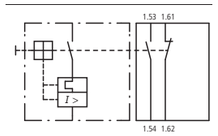
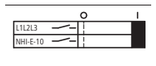
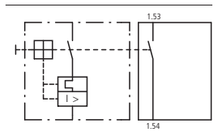
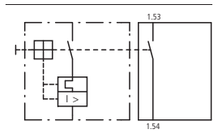
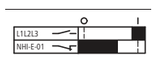
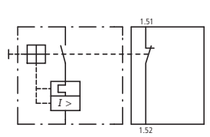
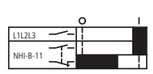
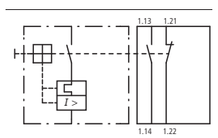
For the protection of transformers with a high inrush current
Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Motor rating		Motor full-load current AC-3 220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V	Setting range Overload releases	**Basic device** **Part no.** Article no.	See price list	Std. pack	**Trip module Standard** usable for	**Part no.** Article no.	See price list	Std. pack	**Trip module Expanded**[1] usable for	**Part no.** Article no.	See price list	Std. pack	**Motor-protective circuit-breakers Standard Complete device** **Part no.** Article no.	See price list	Std. pack
P		I	I	I	I	I															
kW		A	A	A	A	A															
Motor-protective circuit-breakers, type "1" and type "2" coordination																					
0.06		0.37	–	–	–	–	0.3...1.2 A	**PKE12** 121721		1off	**PKE12**	**PKE-XTU-1,2** 121723 Start of delivery 07/2010		1off	**PKE12**	**PKE-XTUA-1,2** 121727 Start of delivery 07/2010		1off	**PKE12/XTU-1,2** 121731 Start of delivery 07/2010		1off
0.09		0.54	0.31	–	–	–															
0.12		0.72	0.41	0.37	0.33	–															
0.18		1.04	0.6	0.54	0.48	0.35															
0.25		–	0.8	0.76	0.7	0.5															
0.37		–	1.1	1.02	0.9	0.7															
0.55		–	–	–	–	0.9															
0.75		–	–	–	–	1.1															
0.18		1.04	–	–	–	–	1...4 A	**PKE12** 121721		1off	**PKE12**	**PKE-XTU-4** 121724		1off	**PKE12**	**PKE-XTUA-4** 121728 Start of delivery 05/2010		1off	**PKE12/XTU-4** 121732		1off
0.25		1.4	–	–	–	–															
0.37		2	1.1	1.02	–	–															
0.55		2.7	1.5	1.39	1.2	–															
0.75		3.2	1.9	1.68	1.5	1.1															
1.1		–	2.6	2.41	2.1	1.5															
1.5		–	3.6	3.28	2.9	2.1															
2.2		–	–	–	4	2.9															
3		–	–	–	–	3.8															
0.75		3.2	–	–	–	–	3...12 A	**PKE12** 121721		1off	**PKE12** **PKE32**	**PKE-XTU-12** 121725		1off	**PKE12** **PKE32**	**PKE-XTUA-12** 121729 Start of delivery 05/2010		1off	**PKE12/XTU-12** 121733		1off
1.1		4.6	–	–	–	–															
1.5		6.3	3.6	3.3	–	–															
2.2		8.7	5	4.6	4	–															
3		11.5	6.6	6	5.3	3.8															
4		–	8.5	7.7	6.8	4.9															
5.5		–	11.3	10.2	9	6.5															
7.5		–	–	–	–	8.8															
2.2		8.7	–	–	–	–	8...32 A	**PKE32** 121722		1off	**PKE32**	**PKE-XTU-32** 121726		1off	**PKE32**	**PKE-XTUA-32** 121730 Start of delivery 05/2010		1off	**PKE32/XTU-32** 121734		1off
3		11.5	–	–	–	–															
4		14.8	8.5	–	–	–															
5.5		19.6	11.3	10.2	9	–															
7.5		26.4	15.2	13.8	12.1	8.8															
11		–	21.7	19.8	17.4	12.6															
15		–	29.3	26.6	23.4	17															
18.5		–	–	–	28.9	20.9															
22		–	–	–	–	23.8															
30		–	–	–	–	32															
5.5		19.6	–	–	–	–	16...65 A	**PKE65** 138258 Start of delivery 07/2010		1off	**PKE65**	**PKE-XTU-65** 138259 Start of delivery 10/2010		1off	**PKE65**	**PKE-XTUA-65** 138260 Start of delivery 10/2010		1off	**PKE65/XTU-65** 138516 Start of delivery 10/2010		1off
7.5		26.4	–	–	–	–															
11		38	21.7	19.7	17.4	–															
15		51	29.3	26.6	23.4	17															
18.5		63	36	32.9	28.9	20.9															
22		–	41	37.4	33	23.8															
30		–	55	50.3	44	32															
37		–	–	61.4	54	39															
45		–	–	–	65	47															
55		–	–	–	–	58															
2.2		8.7	–	–	–	–	8...32 A	**PKE65** 138258 Start of delivery 07/2010		1off	**PKE65**	**PKE-XTUW-32** 138261 Start of delivery 10/2010		1off	**PKE65**	**PKE-XTUWA-32** 138262 Start of delivery 10/2010		1off	**PKE65/XTUW-32** 138517 Start of delivery 10/2010		1 off
3		11.5	–	–	–	–															
4		14.8	8.5	–	–	–															
5.5		19.6	11.3	10.2	9	–															
7.5		26.4	15.2	13.8	12.1	8.8															
11		–	21.7	19.8	17.4	12.6															
15		–	29.3	26.6	23.4	17															
18.5		–	–	–	28.9	20.9															
22		–	–	–	–	23.8															
30		–	–	–	–	32															

Notes Select switchgear and cables according to Class as shown in the table on page 6/22.
[1] For communications, module PKE-SWD-32 for contactors is required in addition,, → Page 1/14.

Information relevant for export to North America

Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
NA Certification Request filed for UL and CSA

	Contact configuration N/O = normally open contact	NC = normally closed contact	Contact sequence	Circuit diagrams	Connection method	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Standard auxiliary contacts									
For motor-protective circuit-breakers									
	1 N/O	1 NC			Screw terminals	PKZM01 PKZM0 PKZM4 PKZM0-T PKM0 PKE[1)]	**NHI11-PKZ0** 072896		5 off
	1 N/O	1 NC			Spring-loaded terminals		**NHI11-PKZ0-C** 229680		
	1 N/O	2 NC			Screw terminals		**NHI12-PKZ0** 072895		
	2 N/O	1 NC			Screw terminals		**NHI21-PKZ0** 072894		
	1 N/O	1 NC			Screw terminals		**NHI-E-11-PKZ0** 082882		
	1 N/O	–			Screw terminals		**NHI-E-10-PKZ0** 082884		
	1 N/O	–			Spring-loaded terminals		**NHI-E-10-PKZ0-C** 229681		
	–	1 NC			Spring-loaded terminals		**NHI-E-01-PKZ0-C** 229682		5 off
	1 N/O	1 NC			Screw terminals		**NHI-B-11-PKZ0** 208277		5 off

Notes [1)] Only standard auxiliary contacts manufactured on or after CW 36/2009 are for use with PKE.

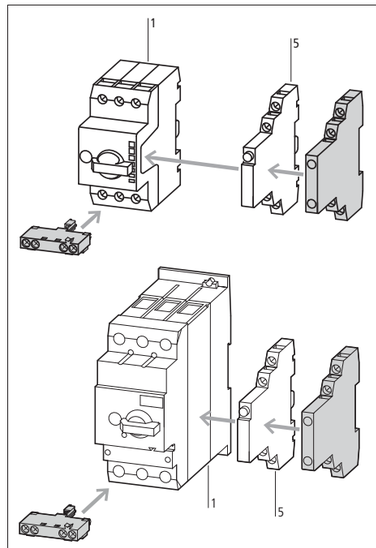
Notes

Can be fitted to the right side of: motor-protective circuit-breakers, transformer protective circuit breakers and motor-protective circuit-breakers for starter combinations

Can be combined with:
Trip-indicating auxiliary contact AGM, NHI-E-...

Can be fitted to motor-protective circuit-breakers, transformer-protective circuit-breakers and motor-protective circuit-breakers for starter combinations from serial number 01.
45 mm (PKZM0 and PKZM01) or 55 mm (PKZM4) widths of the motor-protective circuit-breakers remain unchanged.
NHI-E...-PKZ0-C not for use with MSC...-type motor starter combinations.

Notes

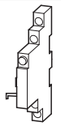
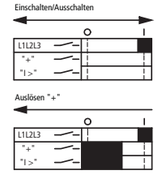
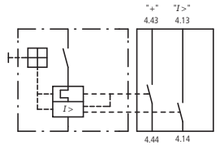
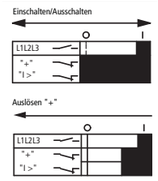
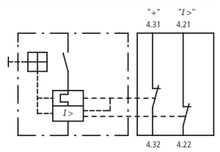
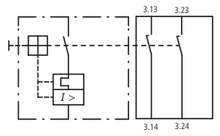
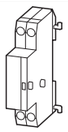
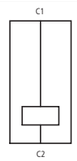
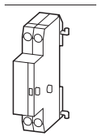
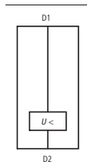
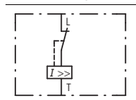


Accessories

1 Motor-protective circuit-breakers	→ 7/4
5 Trip-indicating auxiliary contact	→ 7/12
Additional accessories	→ 7/20

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

	Contact configuration N/O = normally open contact	 NC = normally closed contact	Contact sequence	Circuit diagrams	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Trip indicators								
For motor-protective circuit-breakers								
	2 x 1 N/O	–			PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE[1]	**AGM2-10-PKZ0** 072898		2 off
	–	2 x 1 NC			PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE[1]	**AGM2-01-PKZ0** 072899		2 off
Early-make auxiliary contacts								
For motor-protective circuit-breakers								
	2 N/O	–	–		PKZM0 PKZM0-T PKM0 PKZM4	**VHI20-PKZ0** 203595		2 off
	2 N/O	–	–		PKZM01	**VHI20-PKZ01** 278495		5 off
Shunt release (for power circuit-breakers)								
	–	–	–		PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE[2]	**A-PKZ0(230V50HZ)** 073187		2 off
	–	–	–		PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE[2]	**A-PKZ0(24VDC)** 073200		2 off
Undervoltage release								
	–	–	–		PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE[2]	**U-PKZ0(230V50HZ)** 073135		2 off
Current limiters								
For increasing switching capacity of motor-protective circuit-breakers without auto-protection								
–	–	–	–		PKZM0 PKZM4 PKE	**CL-PKZ0** 082881		1 off

Notes

[1] Only AGM2-...-PKZ0 manufactured on or after 06/2009 can be fitted.
[2] Only A(U)-PKZ0... with serial number 02 or higher can be fitted.

Notes

Can be fitted to the right side of motor-protective circuit-breakers

Can be combined with:
Standard auxiliary contacts
NHI11-PKZ0
NHI12-PKZ0
NHI21-PKZ0
NHI-E-...

Separate indication of:
a) General trip indication (overload)
b) Short-circuit trip

Local short-circuit indication by red indicator, manually resettable.

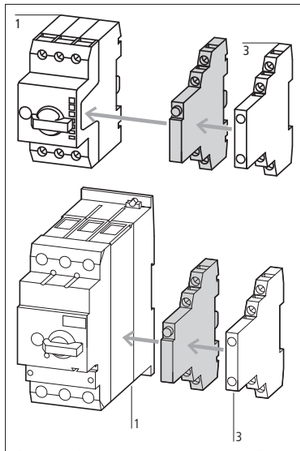
Can be fitted to front of motor-protective circuit-breaker, 45 mm width of the motor-protective circuit-breaker remains unchanged.
For early energization of undervoltage release, e.g. in emergency switching off circuits to EN 60204.
VHI20-PKZ0 cannot be used in combination with PKZ0-X(R).

Can be fitted to the left side of motor-protective circuit-breakers.
Cannot be combined with:
undervoltage release U-PKZ0
DC: Intermittent operation 5 s

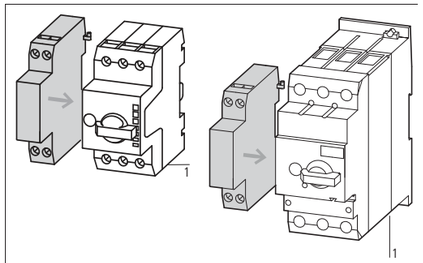
Can be fitted to the left side of motor-protective circuit-breakers.
Cannot be combined with:
A-PKZ0 shunt release
When combined with circuit-breaker, can be used as emergency switching off device to IEC/EN 60204.

Max. rated operating voltage U_e = 690 V, rated uninterrupted current I_u = 63 A
Can be used for individual and group protection.
For group protection and in combination with PKZM4, order additional BK25/3 incoming terminal if required.
Mounting next to or behind the motor-protective circuit-breaker.
PKZM4: 16 - 63 A: 100 kA/400 V
PKZM4: 16 - 63 A: 10 kA/690 V

Notes



Accessories	**Page**
1 Motor-protective circuit-breakers	→ 7/4
3 Standard auxiliary contacts	→ 7/10

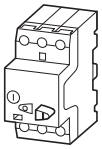
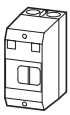
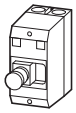
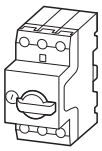
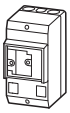
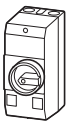
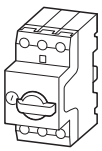
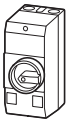


Accessories	**Page**
1 Motor-protective circuit-breakers	→ 7/4
Further actuating voltages	→ 7/29

Information relevant for export to North America

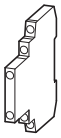
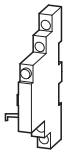
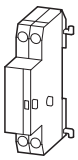
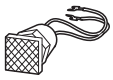
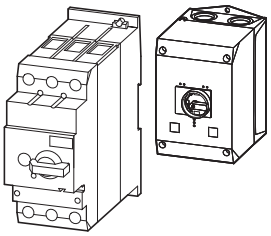
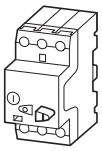
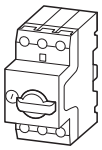
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Engineering

Part no.	Enclosure Part no.	Degree of protection	Handle color	Accessories NHI..-PKZ0	AGM2-..-PKZ0	NHI-E..-PKZ0	VHI..-PKZ0	VHI..-PKZ01	U-PKZ0 or A-PKZ0	L-PKZ0
Surface mounting enclosure										
Motor-protective circuit-breaker PKZM01										
 	**CI-PKZ01**	IP40	–	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
				●	–	●	–	–	–	●
				●	–	–	–	●	–	●
	**CI-PKZ01-G**	IP65	–	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
				●	–	●	–	–	–	●
				●	–	–	–	●	–	●
	**CI-PKZ01-PVT** **CI-PKZ01-PVS**	IP65	Red-yellow	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
	**CI-PKZ01-SVB**	IP65	–	–	–	●	–	–	●	●
	CI-PKZ01-SVB-V	IP65	–	–	–	–	–	●[1]	●	●
Motor-protective circuit-breaker PKZM0										
 	**CI-K2-PKZ0**	IP41	–	●	–	●	–	–	●	●
				–	●	●	–	–	●	●
	**CI-K2-PKZ0-G**	IP65	Black	●	–	●	–	–	●	●
				–	●	●	–	–	●	●
	CI-K2-PKZ0-GR	IP65	Red-yellow	●	–	●	–	–	●	●
				–	●	●	–	–	●	●
	**CI-PKZ0-M**	IP40	–	●	–	●	–	–	–	●
				–	–	●	–	–	●	●
	**CI-PKZ0-GM**	IP55	Black	●	–	●	–	–	–	●
				–	–	●	–	–	●	●
	CI-PKZ0-GRM	IP55	Red-yellow	●	–	●	–	–	–	●
				–	–	●	–	–	●	●
Motor-protective circuit-breaker PKZM0 + early-make auxiliary contact VHI-PKZ0										
 	**CI-K2-PKZ0-GV**	IP65	Black	●	–	–	●	–	●	●
				–	●	–	●	–	●	●
	CI-K2-PKZ0-GRV	IP65	Red-yellow	●	–	–	●	–	●	●
				–	●	–	●	–	●	●
	**CI-K2-PKZ0-GVM**	IP55	Black	●	–	–	●	–	–	●
				–	–	–	●	–	●	●
	CI-K2-PKZ0-GRVM	IP55	Red-yellow	●	–	–	●	–	–	●
				–	–	–	●	–	●	●

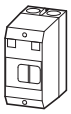
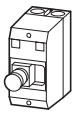
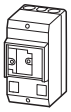
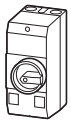
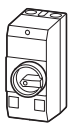
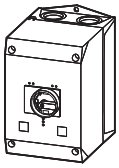
Notes The combination possibilities of circuit-breakers in an enclosure with accessory modules are identified by a ●
[1] Always required

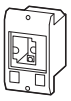
PKZM4, PKZM01, PKZM0

	Enclosure			Accessories						
										
Part no.	**Part no.**	Degree of protection	Handle color	**NHI..-PKZ0**	**AGM2-..-PKZ0**	**NHI-E..-PKZ0**	**VHI..-PKZ0**	**VHI..-PKZ01**	**U-PKZ0 or A-PKZ0**	**L-PKZ0**
Surface mounting enclosure										
Motor-protective circuit-breaker PKZM4										
	**CI-K4-PKZ4-G**	IP65	Black	●	●	●	–	–	●	●
				●	●	–	●	–	●	●
	CI-K4-PKZ4-GR	IP65	Red-yellow	●	●	●	–	–	●	●
				●	●	–	●	–	●	●
Installation enclosure										
Motor-protective circuit-breaker PKZM01										
	**E-PKZ01**	IP40	–	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
				●	–	●	–	–	–	●
				●	–	–	–	●	–	●
	E-PKZ01-G	IP65	–	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
				●	–	●	–	–	–	●
				●	–	–	–	●	–	●
	E-PKZ01-PVT **E-PKZ01-PVS**	IP65	Red-yellow	–	–	●	–	–	●	●
				–	–	–	–	●	●	●
	E-PKZ01-SVB	IP65	–	–	–	●	–	–	●	●
	E-PKZ01-SVB-V	IP65	–	–	–	–	–	●[1]	●	●
Motor-protective circuit-breaker PKZM0										
	**E-PKZ0**	IP40	–	●	–	–	–	–	–	●
				–	–	–	–	–	●	●
	E-PKZ0-G	IP55	Black	●	–	●	–	–	–	●
				–	–	●	–	–	●	●
	E-PKZ1-GR	IP55	Red-yellow	●	–	●	–	–	–	●
				–	–	●	–	–	●	●

Notes The combination possibilities of circuit-breakers in an enclosure with accessory modules are identified by a ●

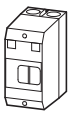
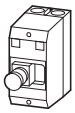
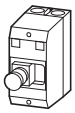
[1] Always required

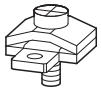
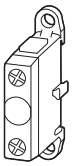
		Degree of protection	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Insulated enclosures for surface mounting							
For Motor-protective circuit-breaker PKZM01s							
	–	IP40	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	**CI-PKZ01** 281403		1 off	Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.
	With operating membrane	IP65		**CI-PKZ01-G** 281404			
	Lockable in Off position	IP65	PKZM01 +NHI-E or +U or A +L (2 off)	**CI-PKZ01-SVB** 281405			
	Lockable in Off position in combination with VHI-PKZ01	IP65		**CI-PKZ01-SVB-V** 281944			
	With emergency switching off mushroom button, maintained	IP65		**CI-PKZ01-PVT** 281406			
	With emergency switching off mushroom button, with key-release	IP65		**CI-PKZ01-PVS** 281407			
	For extension with inserts CI/E-PKZ01-X... unit	As insert	PKZM01	**CI-PKZ01-X** 289934			
For Motor-protective circuit-breakers PKZM0							
	Cover with aperture dimensioned to accommodate front of breaker. IP40, when mounted turned through 90° to left/right	IP41 with vertical mounting	PKZM0-… +NHI or AGM +U or A +NHI-E +L-PKZ0 (2 off)	**CI-K2-PKZ0** 219653		1 off	M25 metric cable entry knockout, top and bottom Cable push-through membrane top, bottom, in the back plate and as a control line entry. Insulated enclosure CI-K2 incl. N and PE terminal.
	With black-grey rotary knob	IP65		**CI-K2-PKZ0-G** 219654			
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65		**CI-K2-PKZ0-GR** 219655			
	Cover with aperture dimensioned to accommodate front of breaker	IP40	PKZM0-… +NHI or U or A +L-PKZ0 (2 off)	**CI-PKZ0-M** 267083			Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.
	With black-grey rotary knob	IP55	PKZM0-… +NHI-E +NHI or U or A +L-PKZ0 (2 off)	**CI-PKZ0-GM** 260089			
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		**CI-PKZ0-GRM** 260104			
For Motor-protective circuit-breakers PKZM0 with early-make VHI auxiliary contacts							
	With black-grey rotary knob	IP65	PKZM0-... and VHI +NHI or AGM +U or A +L (2 off)	**CI-K2-PKZ0-GV** 219657		1 off	M25 metric cable entry knockout, top and bottom Cable push-through membrane top, bottom, in the back plate and as a control line entry. Insulated enclosure CI-K2 incl. N and PE terminal.
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65		**CI-K2-PKZ0-GRV** 219656			
	With black-grey rotary knob	IP55	PKZM0-... and VHI +U or A (undervoltage or shunt release) +L-PKZ0 (2 off)	**CI-PKZ0-GVM** 263526			Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		**CI-PKZ0-GRVM** 263525			
For Motor-protective circuit-breakers PKZM4							
	With black-grey rotary knob	IP65	PKZM4-… +VHI or NHI-E +NHI and AGM +U or A +L-PKZ0 (2 off)	**CI-K4-PKZ4-G** 225524		1 off	Metric knockout: Top and bottom: M25/M32 In the back plate: M25/M32 Control cable entry: M20 CI-K4 insulated enclosure including insulated PE terminal
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65		**CI-K4-PKZ4-GR** 225525			

		Degree of protection	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Insulated enclosures for flush mounting							
For Motor-protective circuit-breaker PKZM01s Integrated terminal for PE(N) connection.							
		Front IP40	PKZM01 +NHI or U or A +NHI-E or VHI +L (2 off)	**E-PKZ01** 281633		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	With operating membrane	Front IP65		**E-PKZ01-G** 281634		1 off	
	Lockable in Off position	Front IP65	PKZM01 +U or A +NHI-E	**E-PKZ01-SVB** 281635		1 off	
	Lockable in Off position, in combination with VHI-PKZ01	Front IP65	PKZM01 +U or A +NHI-E or VHI	**E-PKZ01-SVB-V** 281943		1 off	
	With emergency switching off mushroom button, maintained	Front IP65		**E-PKZ01-PVT** 281636		1 off	
	With emergency switching off mushroom button, with key-release	Front IP65		**E-PKZ01-PVS** 281637		1 off	
	For extension with inserts CI/E-PKZ01-X... unit	As insert	PKZM01	**E-PKZ01-X** 289935		1 off	
For Motor-protective circuit-breakers PKZM0 Integrated terminal for PE(N) connection.							
	Cover with aperture dimensioned to accommodate front of breaker	Front IP40	PKZM0-... +NHI or U or A +L-PKZ0 (2 parts)	**E-PKZ0** 072906		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	With black-grey rotary knob	Front IP55	PKZM0-... +NHI or U or A +NHI-E +L-PKZ0 (2 parts)	**E-PKZ0-G** 072907		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: Front IP55, UL/CSA Type: 1, 12, 3R
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	Front IP55		**E-PKZ0-GR** 072908		1 off	

Insulated enclosure

CI-PKZ

		Degree of protection	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Insulated enclosures for surface mounting							
For Motor-protective circuit-breaker PKZM01s Integrated terminal for PE(N) connection.							
		IP41	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	**CI-PKZ01-NA** 281408		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Specially designed for NA: ✓ Degree of Protection: IEC: IP41, UL/CSA Type: -
	With operating membrane	IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	**CI-PKZ01-NA-G** 281409		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Specially designed for NA: ✓ Degree of Protection: IEC: IP65, UL/CSA Type: -
	Lockable in Off position	IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	**CI-PKZ01-NA-SVB** 281630		1 off	
	Lockable in Off position, in combination with VHI-PKZ01	IP65	PKZM01 +NHI-E +U or A +L (2 off)	**CI-PKZ01-NA-SVB-V** 281945		1 off	
	With emergency switching off mushroom button, maintained	IP65		**CI-PKZ01-NA-PVT** 281631		1 off	
	With emergency switching off mushroom button, with key-release	IP65		**CI-PKZ01-NA-PVS** 281632		1 off	
For Motor-protective circuit-breakers PKZM0 Integrated N and PE terminals; lower section without knockouts							
	With black-grey rotary knob	IP55	PKZM0-… +NHI or U or A +NHI-E +L-PKZ0 (2 parts)	**CI-K2-PKZ0-NA-G** 262680		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified Specially designed for NA: ✓ Degree of Protection: IEC: IP55, UL/CSA Type: 1, 12, 3R
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		**CI-K2-PKZ0-NA-GR** 262681		1 off	
For Motor-protective circuit-breakers PKZM0 with early-make auxiliary contacts Integrated N and PE terminals; lower section without knockouts							
	With black-grey rotary knob	IP55	PKZM0-… +VHI… + U… +L-PKZ0 (2 parts)	**CI-K2-PKZ0-NA-GV** 262682		1 off	
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		**CI-K2-PKZ0-NA-GRV** 262683		1 off	

		Degree of protection	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Insulated enclosures, accessories							
Padlocking feature For up to 3 padlocks with 3 – 6 mm hasp thickness, for use as main switch to IEC/EN 60204							
	Lockable in the 0-position of the PKZM0 or Motor-protective circuit-breaker PKZM4.	–	CI-K2-PKZ0-G(R)(V) CI-PKZ0-G(R)(V)M	**SVB-PKZ0-CI** 035129		3 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
	–	–	E-PKZ0-G(R)	**SVB-PKZ0-E** 035127		3 off	
	–	–	CI-K4-PKZ4-G(R)	**SVB-PKZ4-CI** 225526		1 off	
Neutral terminal For connection of a 5th conductor							
	Flexible, 1 - 4 mm²	–	CI-K2-PKZ0-...	**K-CI-K1/2** 207451		20 off	UL/CSA certification not required
	63 A, flexible, 6 - 16 mm²	–	CI-K4-PKZ4-G(R)	**K25/1** 096200		10 off	
	–	–	E-PKZ0(-G)(-GR) E-PKZ01(-G)	**N-PKZ0** 082160		20 off	
Units for insulated enclosures for PKZ01							
Combinable with CI-PKZ01-X and E-PKZ01-X.							
	With operating membrane	Front IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	**CI/E-PKZ01-XG** 289936		1 off	
	Lockable in Off position		PKZM01 +NHI-E +U or A +L (2 off)	**CI/E-PKZ01-XSVB** 289939			
	With emergency switching off mushroom button, maintained		PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	**CI/E-PKZ01-XPVT** 289937			
	With emergency switching off mushroom button, with key-release		PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	**CI/E-PKZ01-XPVS** 289938			
	Lockable in Off position, in combination with VHI-PKZ01		PKZM01 VHI-PKZ01 +U or A +L (2 off)	**CI/E-PKZ01-XSVB-V** 289980			

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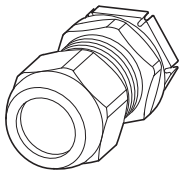
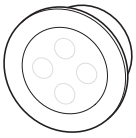
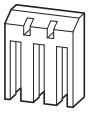
	Cable entry	Drilling dimensions mm	External cable diameter mm	**Part no.** Article no.	**Price** See price list	Std. pack
Metric cable glands to EN 50262						
• With lock nut and built-in strain relief • IP68 up to 5 bar, halogen free						
	M20	20.5	6 - 13	**V-M20** 206910		20 off
	M25	25.5	9 - 17	**V-M25** 206911		
	M32	32.5	13 - 21	**V-M32** 206912		10 off
	M32	32.5	18 - 25	**V-M32G** 226156		
Metric diaphragm grommets						
• IP66 • With integral push-through diaphragm						
	M20	20.5	1 - 13	**KT-M20** 207602		100 off
	M25	25.5	1 - 18	**KT-M25** 207603		
	M32	32.5	1 - 25	**KT-M32** 207604		

			For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Door coupling handles							
Degree of protection IP65, UL/CS Type 4X / Type12							
	For use as main switch to IEC/EN 60204	Black	PKZM0 PKZM4	**PKZ0-XH**[1] 106132		1 off	Pluggable PKZ0-XAH extension shaft, can be cut to any required length for installation depths of 100…240 mm. Follower included in delivery. With ON/OFF switch position and "+" (tripped), lockable With 3 padlocks, 4 – 8 mm hasp. Cannot be used in combination with VHI20-PKZ0.
	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	PKZM0 PKZM4	**PKZ0-XRH**[1] 106133			
	For use as a main switch to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°	Black	PKZM0 PKZM4	**PKZ0-XH-MCC**[1] 106136			
	For use as a main switch with emergency switching off function to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°	Red-yellow	PKZM0 PKZM4	**PKZ0-XRH-MCC**[1] 106137			
	For use as main switch to IEC/EN 60204	Black	PKE	**PKE-XH**[1] 142416		1 off	Pluggable PKZ0-XAH extension shaft, can be cut to any required length for installation depths of 100…240 mm. Follower included in delivery. With ON/OFF switch position and "+" (tripped), lockable With 3 padlocks, 4 – 8 mm hasp.
	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	PKE	**PKE-XRH**[1] 142417			
	For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°	Black	PKE	**PKE-XH-MCC**[1] 142418			
	For use as a main switch with emergency-switching off function to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°	Red-yellow	PKE	**PKE-XRH-MCC**[1] 142419			
Clamp cover							
	For increasing the degree of protection of the PKZM4 to IP2X	–	PKZM4	**HB-PKZ4**[2] 256581		1 off	Suitable for connecting cables with a max. external diameter of 9.5 mm
Pluggable extension shaft							
–	–	–	PKZM0 PKZM4	**PKZ0-XAH**[1] 106134		1 off	Follower not included

Information relevant for export to North America

[1] Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.: E36332
UL CCN: NLRV
CSA File No.: 12528
CSA Class No.: 3211-05
NA Certification: UL Listed, CSA certified
Degree of Protection: IEC: IP65, UL/CSA Type: 4X, 12

[2] Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.: E36332
UL CCN: NLRV
CSA File No.: 12528
CSA Class No.: 3211-06
NA Certification: UL Listed, CSA certified

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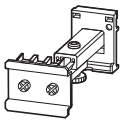
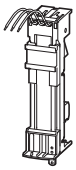
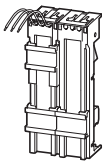
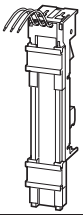
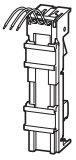
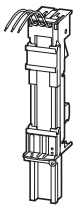
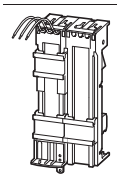
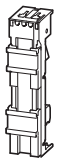
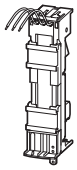
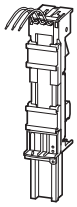
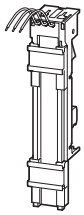
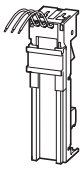
		Notes	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Telescopic adapters						
With 45 mm top-hat rail to IEC/EN 60715 for compensation of the mounting depth of rear-mounted devices enclosures CI-K and cabinets						
	Telescopic clip	Stepless adjustment via scale from 75 – 115 mm.	**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Lockable rotary handle						
	For locking motor-protective circuit-breakers PKZM0, PKZM4 and PKE as a main switch in compliance with EN 60204. Can be padlocked in the "0" position. Hasp thickness: 3 – 6.35 mm	Can not be combined with VHI-PKZ0.	**AK-PKZ0** 030851		5 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
Holding facility						
	To prevent tampering with the overload release and the test function, it can be sealed using industry standard sealing wire For use with motor-protective circuit-breakers PKZM0 and PKZM4	–	**PL-PKZ0** 203599		5 off	
Mounting angle bracket						
	For screw fixing to mounting plate	–	**PKE32-XMB** 134837		20 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking NA Certification: Request filed for UL and CSA
Documentation						
	Motor-protective circuit-breakers PKZM0, overload monitoring of EEx e motors	German/English	**AWB1210-1458D/GB** 266164		1 off	
	Motor-protective circuit-breakers PKZM4, overload monitoring of EEx e motors	German/English	**AWB1210-1457D/GB** 266165			
	Motor-protective circuit-breakers PKE, EEx electric motor overload monitoring	German/English	**AWB1210-1631DE/EN** 134836			

	For use with	Color	Voltage U_s V	Part no. Article no.	Price See price list	Std. pack
Indicator lights with glow lamp						
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	White	110 - 230	**L-PKZ0(230V)** 082151		10 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	White	230 - 400	**L-PKZ0(400V)** 082152		10 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	White	415 - 500	**L-PKZ0(500V)** 082153		5 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	Green	110 - 230	**L-PKZ0-GN(230V)** 082154		10 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	Green	230 - 400	**L-PKZ0-GN(400V)** 082155		10 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	Green	415 - 500	**L-PKZ0-GN(500V)** 082156		5 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	Red	110 - 230	**L-PKZ0-RT(230V)** 082157		10 off
	CI-K2-PKZ0-… , CI-K4-PKZ4 , CI-PKZ0(1) , E-PKZ0(1)	Red	230 - 400	**L-PKZ0-RT(400V)** 082158		10 off

	Rated operational voltage U_e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Busbar adapters for PKZ and PKE									
Approved to UL 508. For fitting to flat copper busbars with 60 mm between busbar centers, suitable for 5 mm and 10 mm busbar thickness.									
Rated operational current 16 A									
For starters with spring-loaded terminals									
	690	AWG 14 (2.5 mm²)	45	2	PKZM0-C + DILMC7 PKZM0-C + DILMC9 PKZM0-C + DILMC12	**BBA0C-16** 101455		4 off	According to UL 508: I_e = 12 A
Rated operational current 25 A									
For reversing starters									
	690	AWG 12 (4 mm²)	90	1	PKZM0, PKE + 2 x DILM7-01 PKZM0, PKE + 2 x DILM9-01 PKZM0, PKE + 2 x DILM12-01 MSC-R-0,25-M7… - MSC-R-12-M12…	**BBA0R-25** 101453		2 off	In combination with individual components PKZM0 and DILM, use reversing starter kit PKZM0-XRM12. Fully assembled and tested combination with MSC-R → Page 8/20 Only busbar adapters/wiring sets manufactured on or after CW35/ 2009 can be used for PKE.
Can be used universally									
	690	AWG 12 (4 mm²)	45	2	–	**BBA0-25/2TS** 101481		4 off	Mounting rails can be moved within 1.25 mm grid.
For DOL starters									
	690	AWG 12 (4 mm²)	45	1	PKZM0, PKE + 2 x DILM17-01 PKZM0, PKE + 2 x DILM25-01PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM32-01 MSC-R-16-M17… MSC-R-32-M32…	**BBA0-25** 101451		4 off	In combination with individual components PKZM0 and DILM, use DOL starter kit PKZM0-XRM12. Fully assembled and tested combination with MSC-D → Page 8/2 Only busbar adapters/wiring sets manufactured on or after CW35/ 2009 can be used for PKE.
For soft starters									
	690	AWG 12 (4 mm²)	45	1	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	**BBA0L-25** 142526		1 off	–
Rated operational current 32 A									
For reversing starters									
	690	AWG 10 (6 mm²)	90	3	PKZM0, PKE + 2 x DILM17-01 PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM32-01 MSC-R-16-M17… - MSC-R-32-M32…	**BBA0R-32** 101454		2 off	In combination with single components PKZM0 and DILM, wiring kit PKZM0-XM32DE and reversing starter wiring kit DILM32-XRL can be used. Fully assembled and tested combination with MSC-R → Page 8/20 Only busbaradapters/wiring sets manufactured on or after CW 35/ 2009 can be used for PKE.

Information relevant for export to North America	Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking	CSA File No.	232140
			CSA Class No.	3211-37
	UL File No.	E300273	NA Certification	UL Listed, CSA certified
	UL CCN	NMTR, NMTRZ	Max. Voltage Rating	600 V AC

	Rated operational voltage U_e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Rated operational current 32 A									
Can be used universally.									
	690	–	45	2	PKZM0…, PKE + DILM…	**BBA0-32/2TS-C**[2] 116708		4 off	Universal adapter 1-, 2- and 3-phase applications. Mounting rail can be moved within 1.25 mm grid. For conductor cross-sections, round conductors of up to 6 mm². Only busbaradapters/wiring sets manufactured on or after CW 35/ 2009 can be used for PKE.
For DOL starters.									
	690	AWG 10 (6 mm²)	45	2	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32 MSC-D-16-M17… - MSC-D-32-M32…	**BBA0-32**[1] 101452		4 off	In combination with individual components PKZM0 and DILM wiring kit PKZM0-XM32DE can be used. Fully assembled and tested combination with MSC-D → Page 8/2 Only busbar adapters/wiring sets manufactured on or after CW35/ 2009 can be used for PKE.
For soft starters									
	690	AWG 10 (6 mm²)	45	2	PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	**BBA0L-32** 142527		1 off	–
For 160 mm adapter system with motor-protective circuit-breakers									
–	690	AWG 10 (6 mm²)	45	1	PKZM0, PKE	**BBA0K-32** 142528		1 off	–
Rated operational current 63 A For DOL starters.									
	690	AWG 8 (10 mm²)	55	2	PKZM4 + DILM17 PKZM4 + DILM25 PKZM4 + DILM32 PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	**BBA4L-63**[1] 101459		4 off	The following can be used to establish an electrical connection: For PKZM4 + DILM17 to DILM32: MVS-LB0-0M-G For PKZM4 + DILM40 to DILM65: PKZM4-XM65DE.
	690	AWG 8 (10 mm²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM40	**BBA2L-63**[1] 101480		4 off	The following can be used to establish an electrical connection: For PKZ2 + DILM7 to DILM12: MVS-LB0-00M-G For PKZ2 + DILM15 to DILM32: MVS-LB0-0M-G.
For motor-protective circuit-breakers									
	690	AWG 8 (10 mm²)	54	1	PKZM4	**BBA4-63**[1] 101457		4 off	–
	690	AWG 8 (10 mm²)	72	1	PKZ2	**BBA2-63**[1] 101458		4 off	–

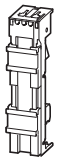
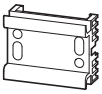
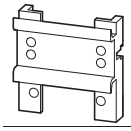
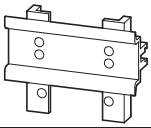
Information relevant for export to North America

1)

Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC

2)

Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC

	Rated operational voltage U_e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Without electrical contacts									
Empty module.									
	–	–	45	2	–	**BBA0/2TS-L**[1] 101482		4 off	Mounting rails can be moved within a 1.25 mm grid. Can be used to mount reversing and star-delta starters.
	–	–	54	2	–	**BBA4/2TS-L**[1] 101483		4 off	Mounting rails can be moved within a 1.25 mm grid. Can be used to mount reversing and star-delta starters.
Side-mounted module, can be attached on both sides.									
	–	–	9	–	–	**BBA-XSM**[1] 101484		10 off	Can be grouped with busbar adapters in order to extend the mounting width.
Busbar adapters accessories									
Mounting rails									
	–	–	45	–	BBA…	**PKZM0-XMR**[2] 239364		10 off	–
	–	–	54	–	BBA…	**PKZM0-XMR54**[2] 113911		10 off	–
	–	–	72	–	BBA…	**PKZM0-XMR72**[2] 113912		10 off	–
Connecting cable									
–	–	–	–	–	BBA…	**BBA-XLT-6-130**[3] 116902		30 off	–
–	–	–	–	–	BBA…	**BBA-XLT-16-142**[3] 116903		30 off	–

Information relevant for export to North America

1)

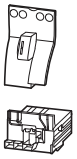
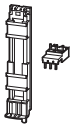
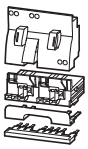
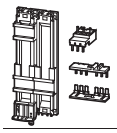
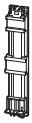
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC

2)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified

3)

Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	On request
UL CCN	On request
CSA File No.	On request
CSA Class No.	On request
NA Certification	UL Recognized, CSA certified

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Wiring set					
DOL starter					
	PKZM0, PKE + DILM7 PKZM0, PKE + DILM9 PKZM0, PKE + DILM12 PKZM0, PKE + DILM15 DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012…	**PKZM0-XDM12** 283149		1 off	Consists of: • Mechanical connection element for PKZM0 and contactor • Main supply wiring between PKZM0 and contactor with tool-less plug connection • Cable routing As auxiliary contact, use DILA-XHIT... → Page 5/40 Cannot be combined with NHI-E…PKZ0-C. $U_e \leq 415$ V [1]
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	**PKZM0-XDM32** 283153		1 off	Consists of: • Top-hat rail adapter plates • Power supply wiring between PKZ and contactor[1]
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	**PKZM4-XDM65** 101053		1 off	
Reversing starters					
	PKZM0, PKE + DILM7-01 PKZM0, PKE + DILM9-01 PKZM0, PKE + DILM12-01	**PKZM0-XRM12** 283185		1 off	Consists of: • Mechanical connection element for PKZM0 and contactor • Reversing starters main supply wiring with tool-less plug connection • Control cables for electrical interlocking in tool-less plug connection: – K1M: A1 -K2M: 21 – K1M: 21 -K2M: A1 – K1M: A2 -K2M: A2 • Cable routing As auxiliary contact DILA-XHIT...use → Page 5/40 Can not be combined with AGM-PKZ0. $U_e \leq 415$ V[1]
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	**PKZM0-XRM32** 283189		1 off	Consists of: • Top-hat rail adapter plates • Reversing starters supply wiring[1]
Wiring kit					
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32 DS7-34…SX016… DS7-34…SX024… DS7-34…SX032…	**PKZM0-XM32DE** 239349		5 off	• Main supply wiring between PKZM0 and contactor • Use only in combination with busbar adapter or mounting rail adapter plate
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	**PKZM4-XM65DE** 101056		5 off	• Main current supply between PKZM4 and contactor
Top-hat rail adapter plates					
	PKZM0-XDM12 PKZM0-XRM12	**PKZM0-XC45** 283132		4 off	Consists of: • 45 mm wide adapter plate • Connection element for side-by-side positioning of further plates[1]
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	**PKZM4-XC55/2** 101054		4 off	Consists of: • 55 mm wide adapter plate • Connection cam for additional plates • For use with reversing and start-delta starters[1]
Soft starters					
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	**PKZM0-XC45L** 142529		1 off	Consists of: • 45 mm wide adapter plate
	PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	**PKZM0-XC45L/2** 142570		1 off	Consists of: • 45 mm wide adapter plate

Notes

[1] Use only busbar adapters/wiring sets manufactured on or after CW35/2009 for PKE.

Information relevant for export to North America

[2]

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

[3]
UL/CSA certification not required

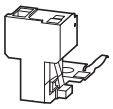
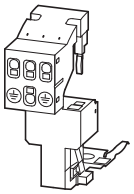
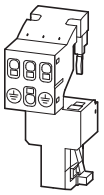
[4]

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E300273
UL CCN	NMTR
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified

Motor feeder plugs, three-phase commoning links

B3...PKZ0, B3...PKZ0-U

HPL07026EN

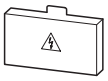
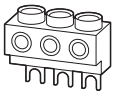
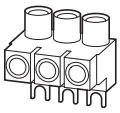
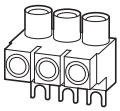
Description	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Motor feeder plug						
PE module with contact plate						
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	**DILM12-XMCE** 121764		5 off	35 x 7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: PE 0.75 – 4 mm²	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking NA Certification: Request filed for UL and CSA
Motor feeder plug with PE module andcontact plate						
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	**DILM12-XMCP/E** 121769		1 off	35 x 7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: L1, L2, L3, PE 0.75 – 2.5 mm²	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification: Request filed for UL and CSA
Motor feeder plug with PE module without contact plate						
	PKZM0/PKE + DILM(C)7 PKZM0/PKE + DILM(C)9 PKZM0/PKE + DILM(C)12 PKZM0/PKE + DILM(C)15 MSC-D(E)-...-M7... MSC-D(E)-...-M9... MSC-D(E)-...-M15...	**DILM12-XMCP/T** 121770		1 off	For connection of: L1, L2, L3, PE 0.75 – 2.5 mm²	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification: Request filed for UL and CSA

	Circuit-breakers Number	Length mm	Unit width mm	Part no. Article no.	Price See price list	Std. pack	Notes
Three-phase commoning links, incoming unit via terminals 1, 3, and 5							
Finger- and back-of-hand-proof, short-circuit proof, U_e=690 V, I_u=63 A Can be extended through rotated installation							
For PKZM0-... or PKE without side-mounted auxiliary contacts or voltage releases							
	2	90	45	**B3.0/2-PKZ0**[1)] 063961		10 off	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	3	135	45	**B3.0/3-PKZ0**[1)] 232289			
	4	180	45	**B3.0/4-PKZ0**[1)] 063960			
	5	225	45	**B3.0/5-PKZ0**[1)] 232290			
For motor-protective circuit-breakers with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side							
	2	99	45 + 9	**B3.1/2-PKZ0**[1)] 044945		10 off	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	3	153	45 + 9	**B3.1/3-PKZ0**[1)] 044946			
	4	207	45 + 9	**B3.1/4-PKZ0**[1)] 044947			
	5	261	45 + 9	**B3.1/5-PKZ0**[1)] 044948			
For PKZM0-... or PKE with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side, or one voltage release fitted on left side							
	2	108	45 + 18	**B3.2/2-PKZ0**[1)] 063963		10 off	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	4	234	45 + 18	**B3.2/4-PKZ0**[1)] 063959		10 off	

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	98494
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified

	Circuit-breakers	For use with	Unit width	Part no. Article no.	Price See price list	Std. pack	Notes
	Number		mm				
Shroud for unused terminals							
Protection against direct contact. For covering unused terminals on three-phase commoning link B3...-PKZ0							
	–	–	–	**H-B3-PKZ0**[1] 032721		20 off	–
Incoming terminals							
	–	PKZM0 PKE	–	**BK25/3-PKZ0**[2] 032720		5 off	For three-phase commoning link, protected against accidental contact, U_e = 690 V, I_u = 63 A For conductor cross-sections: 2.5 - 25 mm² stranded 2.5 - 16 mm² flexible with ferrule AWG 14 - 6, usable on terminals 1, 3, and 5
	–	PKZM0	–	**BK25/3-PKZ0-E**[3] 262518		5 off	For three-phase commoning link, protected against accidental contact, U_e = 690 V, I_u = 60 A For conductor cross-sections: 2.5 - 25 mm² stranded 2.5 - 16 mm² flexible with ferrule AWG 14 - 6 For assembly of Type E starters.
	–	PKZM4	–	**BK50/3-PKZ4-E**[4] 272165		1 off	Can be combined with three-phase commoning link B3…PKZ4. I_u = 120 A. For assembly of Type E starters.

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	98494
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified

2)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

3)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	98494
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified
Specially designed for NA	✓
Suitable for	PKZM0/PKE, line terminal required for Type E/F applications

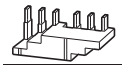
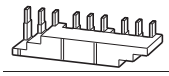
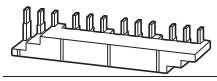
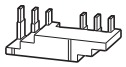
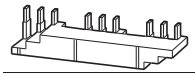
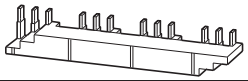
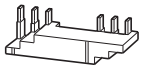
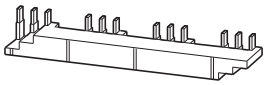
4)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified
Specially designed for NA	✓
Suitable for	PKZM4/PKE, line terminal required for Type E/F applications

Three-phase commoning links

B3...PKZ0-U, B3...-PKZ4

HPL07028EN

	Circuit-breakers Number	Length mm	Unit width mm	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Three-phase commoning links							
Finger- and back-of-hand-proof, short-circuit proof U_e= 690 V, I_u= 128 A							
For PKZM4 without side-mounted auxiliary contacts or voltage releases							
	2	110	55	**B3.0/2-PKZ4** 220220		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-06 NA Certification: UL Listed, CSA certified
	3	165		**B3.0/3-PKZ4** 220221			
	4	220		**B3.0/4-PKZ4** 220222			
For PKZM4 with one auxiliary contact or trip-indicating auxiliary contact each fitted on the right side							
	2	119	55 + 9	**B3.1/2-PKZ4** 220223		1 off	
	3	183		**B3.1/3-PKZ4** 220224			
	4	247		**B3.1/4-PKZ4** 220225			
For PKZM4 with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side, or one voltage release fitted to left side							
	2	128	55 + 18	**B3.2/2-PKZ4** 220226		1 off	
	4	274		**B3.2/4-PKZ4** 220227			
Shroud for unused terminals							
Protection against direct contact. To cover unused terminals on three-phase commoning link							
	–	–	–	**H-B3-PKZ4** 220228		10 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-06 NA Certification: UL Listed, CSA certified

Actuating voltage	**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Shunt release, undervoltage release							
AC							
Standard voltage							
24 V 50 Hz	**A-PKZ0(24V50HZ)**[1] 073181		2 off	**U-PKZ0(24V50HZ)**[1] 073129		2 off	
110 V 50 Hz	**A-PKZ0(110V50HZ)**[1] 073184		2 off	**U-PKZ0(110V50HZ)**[1] 073132		2 off	
220 V 50 Hz	**A-PKZ0(220V50HZ)**[1] 073186		2 off	**U-PKZ0(220V50HZ)**[1] 073134		2 off	
230 V 50 Hz	**A-PKZ0(230V50HZ)**[1] 073187		2 off	**U-PKZ0(230V50HZ)**[1] 073135		2 off	Only A(U)-PKZ0... with serial number 02 or higher can be fitted
240 V 50 Hz	**A-PKZ0(240V50HZ)**[1] 073188		2 off	**U-PKZ0(240V50HZ)**[1] 073136		2 off	
380 V 50 Hz	**A-PKZ0(380V50HZ)**[1] 073189		2 off	**U-PKZ0(380V50HZ)**[1] 073137		2 off	
400 V 50 Hz	**A-PKZ0(400V50HZ)**[1] 073190		2 off	**U-PKZ0(400V50HZ)**[1] 073138		2 off	
415 V 50 Hz	**A-PKZ0(415V50HZ)**[1] 073191		2 off	**U-PKZ0(415V50HZ)**[1] 073139		2 off	
120 V 60 Hz	**A-PKZ0(120V60HZ)**[1] 073195		2 off	**U-PKZ0(120V60HZ)**[1] 073143		2 off	
240 V 60 Hz	**A-PKZ0(240V60HZ)**[1] 073198		2 off	**U-PKZ0(240V60HZ)**[1] 073146		2 off	
440 V 60 Hz	**A-PKZ0(440V60HZ)**[1] 082164		2 off	**U-PKZ0(440V60HZ)**[1] 082161		2 off	
480 V 60 Hz	**A-PKZ0(480V60HZ)**[1] 073199		2 off	**U-PKZ0(480V60HZ)**[1] 073147		2 off	
Non-standard voltages not covered by above standard voltages							
…V 50 Hz (24 - 500 V)	**A-PKZ0(*V50HZ)**[1] 982165		2 off	**U-PKZ0(*V50HZ)** 982162			The part number for ordering consists of the basic part number and the actuating voltage. For non-standard voltages, specify the required actuating voltage within the indicated range (... - ... V). Minimum order quantity is 10 units
…V 60 Hz (24 – 600 V)	**A-PKZ0(*V60HZ)**[1] 982166		2 off	**U-PKZ0(*V60HZ)** 982163			
DC							
Standard voltage							
24 V DC	**A-PKZ0(24VDC)**[1] 073200		2 off				PKE can be fitted only with A(U)-PKZ0... with serial number 02 or higher.
110 V DC	**A-PKZ0(110VDC)**[1] 073203		2 off				

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

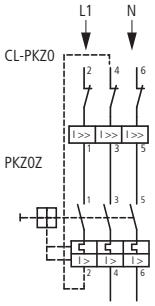
PKZ, PKZM

Engineering

1- and 2-pole-connected PKZM0, PKZM4 and PKZ2 with AC and DC



2-pole-connected PKZM0(1) and PKZM4 with CL-PKZ0



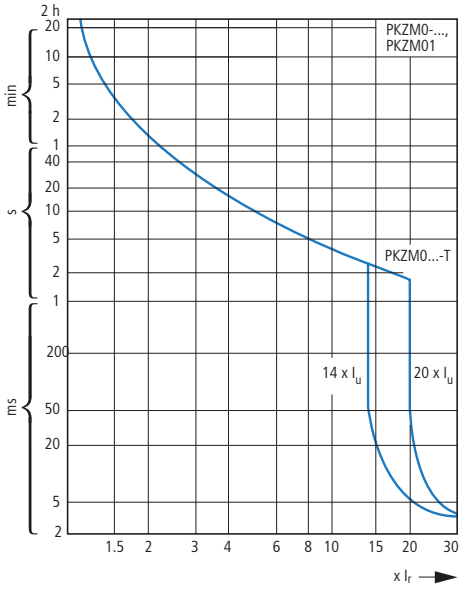
Protection of PVC-insulated cables against thermal overload on short-circuits

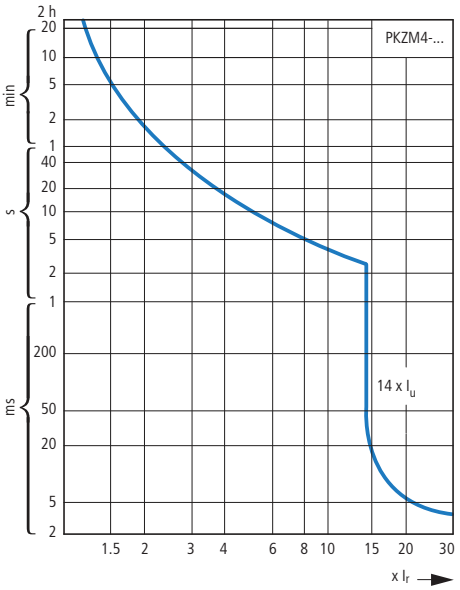
The table specifies which minimum conductor cross-sections are protected by motor-protective circuit-breaker PKZ(M) up to their rated conditional short-circuit current I_q.

Min. cross-section protected 380 – 415 V, 50 Hz, Cu mm²					Device Part no.
4	2.5	1.5	1	0.75	
					PKZM0-0,16
					⋮
					PKZM0-6.3
					PKZM0-10
					PKZM0-12
					PKZM0-16
					PKZM0-20
					PKZM0-25
					PKZM0-32
					PKZM4-16
					PKZM4-25
					PKZM4-32
					PKZM4-40
					PKZM4-50
					PKZM4-58
					PKZM4-63

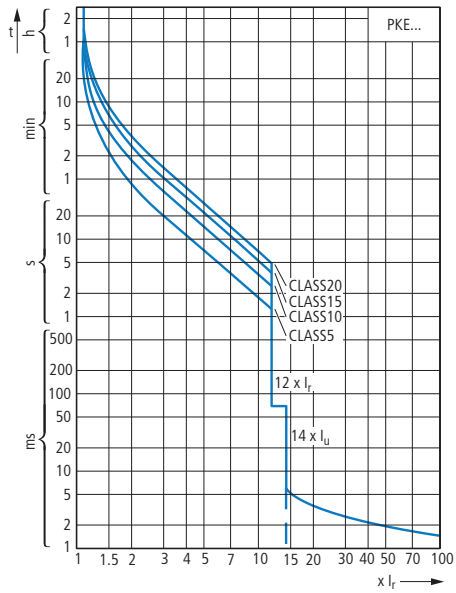
Min. cross-section protected 380 – 415 V, 50 Hz, Cu mm²	Device Part no.
	PKZ2/ZM-0.6
	⋮
	PKZ2/ZM-2.4
	PKZ2/ZM-4
	PKZ2/ZM-6
	PKZ2/ZM-10
	PKZ2/ZM-16
	PKZ2/ZM-25
	PKZ2/ZM-32
	PKZ2/ZM-40

PKZM0-...T tripping characteristics (not for PKM0-...), PKZM01

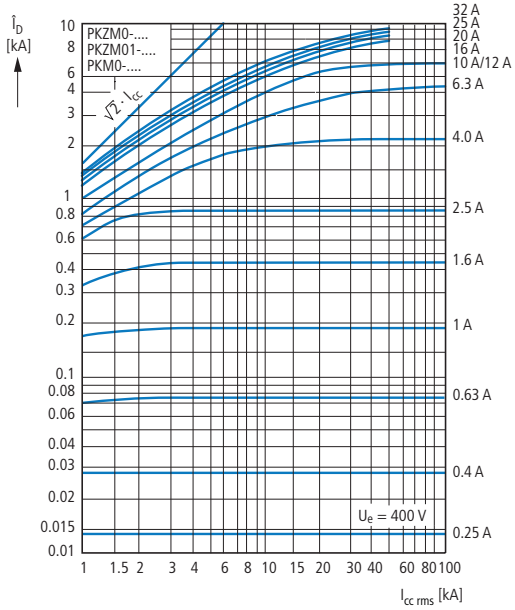


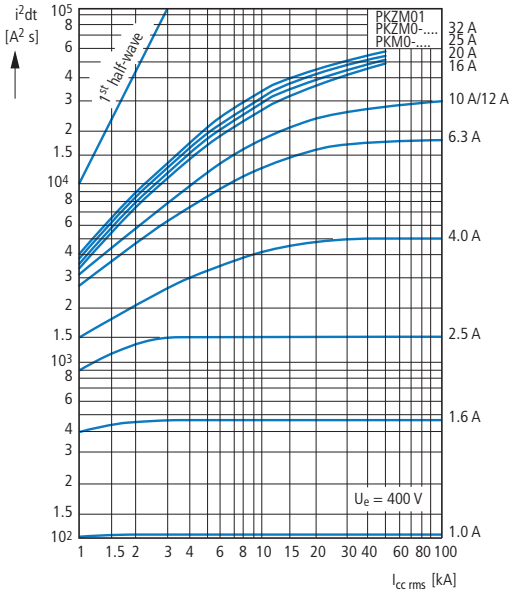


Tripping characteristic curves, wide-range circuit-breaker PKE

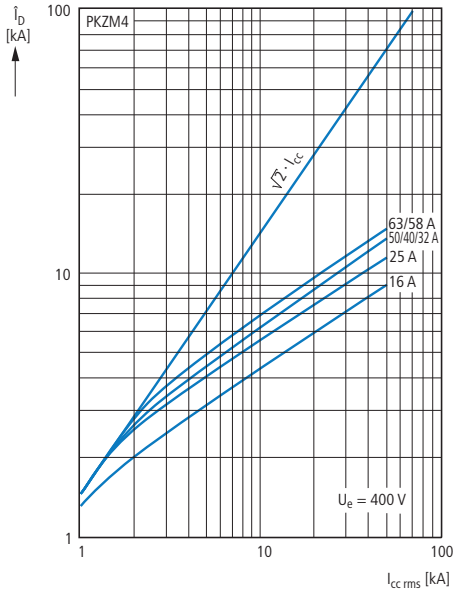


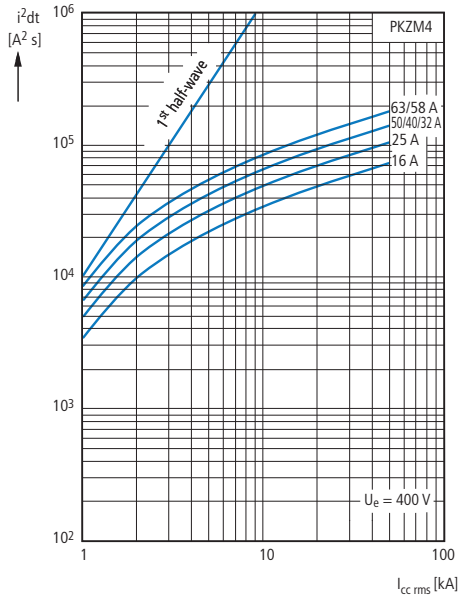
Let-through characteristics, motor-protective circuit-breaker, transformer-protective circuit-breakers, circuit-breaker for starter combinations





Motor-protective circuit-breaker let-through characteristics





Switching capacity

PKZM0

Circuit-breaker switching capacity from serial no. 04

Rated uninterrupted current I_u
Rated conditional short-circuit current I_q IEC/EN 60947-4-1
Rated ultimate short-circuit breaking capacity I_{cu} } IEC/EN 60947-2
Rated breaking capacity I_{cs}

	230 V				400 V				440 V				500 V				690 V			
I_u	I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}	
A	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]
PKZM0, PKZM0...-T, PKM0 with type “1” and “2” coordination																				
0.16 – 1	150	150	150	N	150	150	150	N				N				N				N
1.6	150	150	150	N	150	150	150	N				N				N				N
2.5	150	150	150	N	150	150	150	N				N				N	5	5	5	50
4	150	150	150	N	150	150	150	N				N				N	3	3	3	50
6.3	150	150	150	N	150	150	150	N				N	42	42	11	50	3	3	2	50
10	150	150	150	N	150	150	150	N	42	42	12	50	42	42	11	50	3	3	2	50
12	50	50	13	50	50	50	13	50	15	15	12	50	15	15	8	50	3	3	2	50
16	50	50	13	50	50	50	13	50	15	15	12	50	15	15	8	50	3	3	2	50
20	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50
25	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50
32	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50
PKZM0 (PKZM0...-T, PKM0) + CL-PKZ0																				
0.16 – 1				N				N				N				N			20	N
1.6				N				N				N				N			20	N
2.5				N				N				N				N	20	20	20	N
4				N				N				N				N	20	20	20	N
6.3				N				N				N			50	N	20	20	20	N
10				N				N				N			20	N	20	20	20	N
12				N				N				N			20	N	5	5	2.5	N
16				N				N				N			20	N	5	5	2.5	N
20				N				N				N	10	10	10	N	5	5	2.5	N
25				N				N				N	10	10	10	N	5	5	2.5	N
32				N				N				N	10	10	10	N	5	5	2.5	N
PKZM0 (PKZM0...-T, PKM0) + 2 CL-PKZ0																				
0.16 – 1				N				N				N				N			20	N
1.6				N				N				N				N			20	N
2.5				N				N				N				N	40	40	20	N
4				N				N				N				N	40	40	20	N
6.3				N				N				N			50	N	20	20	20	N
10				N				N				N			40	N	20	20	20	N
12				N				N				N			40	N	10	10	2.5	N
16				N				N				N			40	N	10	10	2.5	N
20				N				N				N	20	20	20	N	10	10	2.5	N
25				N				N				N	20	20	20	N	10	10	2.5	N
32				N				N				N	20	20	20	N	10	10	2.5	N

Notes

No upstream protective device required, as it is the auto-protected range (100/150 kA)

N Not necessary

[1] Required back-up fuse if the short-circuit current exceeds the device's rated conditional short-circuit current ($I_{cc} > I_q$).

Circuit-breaker switching capacity

Rated uninterrupted current I_u
Rated conditional short-circuit current I_q IEC/EN 60947-4-1
Rated maximum short-circuit breaking capacity I_{cu} } IEC/EN 60947-2
Rated breaking capacity I_{cs}

	230 V				400 V				440 V[2]				500 V[2]				690 V[2]			
I_u	I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}	
A	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]
PKZM01 with type “1” and “2” coordination																				
0.16 – 1	50	50	50	50	50	50	50	50	50	50	50	50								
1.6	50	50	50	50	50	50	50	50	50	50	50	50								
2.5	50	50	50	50	50	50	50	50	50	50	50	50								
4	50	50	50	50	50	50	50	50	50	50	50	50								
6.3	50	50	50	50	50	50	50	50	50	50	50	50								
10	50	50	50	50	50	50	50	50	42	42	10	50								
12	50	50	10	50	50	50	10	50	15	15	10	50								
16	50	50	10	50	50	50	10	50	15	15	10	50								
20, 25	50	50	10	50	50	50	10	50	10	10	3	50								
PKZM4 with type “1” and “2” coordination																				
16	150	150	25	N	150	150	25	N	45	45	25	100	15	15		100	8	8	2.5	100
25	150	150	25	N	150	150	25	N	45	45	25	100	15	15		100	8	8	2.5	100
32	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
40	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
50	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
58	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
63	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
PKE12...[2] with type of coordination „1“ and																				
0.3 - 1.2	100			50	100			50	50			50	10			50	3			50
1 - 4	100			50	100			50	50			50	10			50	3			50
3 - 12	100			50	100			50	15			50	10			50	3			50
PKE32...[2] with type of coordination „1“ and																				
3 - 12	100			50	100			50	15			50	6			50	3			50
8 - 32	100			50	100			50	25			50	6			50	3			50

Notes

No upstream protective device required,as it is the auto-protected range (150 kA)

N Not necessary

[1] Fuse (A gG/gL) for increasing the switching capacity of the motor-protective circuit-breaker to 100 kA

[2] Please enquire for additional information regarding voltages >400 V and device combinations with CL-PKZ0.

Motor-protective circuit-breaker internal resistances

	Impedance	Heat dissipation (3 pole at operating temperature)	Rated uninterrupted current I_u
	Ω	W	A
PKZM0-0,16	78	6	0.16
PKZM0-0.25	32	6	0.25
PKZM0-0.4	13	6	0.4
PKZM0-0.63	5	6	0.63
PKZM0-1	2	6	1
PKZM0-1.6	0.8	6	1.6
PKZM0-2.5	0.32	6	2.5
PKZM0-4	0.13	6	4
PKZM0-6.3	0.050	6	6.3
PKZM0-10	0.020	6	10
PKZM0-12	0.014	6	12
PKZM0-16	0.008	6	16
PKZM0-20	0.005	6	20
PKZM0-25	0.003	6	25
PKZM0-32	0.002	6	32

	Impedance	Heat dissipation (3 pole at operating temperature)	Rated uninterrupted current I_u
	Ω	W	A
PKZM4-16	0.029	22	16
PKZM4-25	0.012	22	25
PKZM4-32	0.007	22	32
PKZM4-40	0.005	22	40
PKZM4-50	0.003	22	50
PKZM4-58	0.002	22	58
PKZM4-63	0.002	22	65
PKZ2-ZM-0.6	13	14	0.6
PKZ2-ZM-1	5	14	1
PKZ2-ZM-1.6	2	14	1.6
PKZ2-ZM-2.4	0.8	14	2.4
PKZ2-ZM-4	0.29	14	4
PKZ2-ZM-6	0.13	14	6
PKZ2-ZM-10	0.05	14	10
PKZ2-ZM-16	0.018	14	16
PKZ2-ZM-25	0.007	14	25
PKZ2-ZM-32	0.005	14	32
PKZ2-ZM-40	0.003	14	40

Approvals for world markets

Rating data for approved types[1] UL 508/CSA C 22.2 No. 14	Maximum motor rating Three-phase current				Setting ranges		Maximum protective device to UL/CSA Group protection[2]					
					Overload releases	Short-circuit-releases	Up to max. short-circuit current		Maximum fuse rating		Maximum circuit breaker	
	200 V	230 V	460 V	575 V			600 V	with CL		with CL		with CL
	HP	HP	HP	HP	A	A	kA	kA	A	A	A	A
Motor-protective circuit-breakers PKZM01	"Manual Motor Starter with thermal and magnetic trip"											
PKZM01-0,16	[3]				0.1 – 0.16	2.2	50		600		600	
PKZM01-0.25					0.16 – 0.25	3.4	50		600		600	
PKZM01-0.4					0.25 – 0.4	5.6	50		600		600	
PKZM01-0,63					0.4 – 0.63	8.8	50		600		600	
PKZM01-1					0.63 – 1	14	50		600		600	
PKZM01-1,6			¾	¾	1 – 1.6	22	50		600		600	
PKZM01-2.5	½	½	1	1½	1.6 – 2,5	35	50		600		600	
PKZM01-4	¾	¾	2	3	2.5 – 4	56	50		600		600	
PKZM01-6,3	1	1½	3	5	4 – 6.3	88	50		600		600	
PKZM01-10	3	3	7½	10	6.3 – 11	140	22	50	150	600	125	600
PKZM01-12	3	3	7½	10	9 – 12	168	18	50	150	600	125	600
PKZM01-16	3	5	10	10	10 – 16	224	10	50	150	600	125	600
PKZM01-20	5	-	-	15	16 – 20	280	10	18	150	600	125	600
PKZM01-25	-	7½	15	20	20 – 25	350	10	18	150	600	125	600
Motor-protective circuit-breakers PKZM01	"Manual Motor Starter with thermal and magnetic trip"											
PKZM0-0,16	[3]				0.1 – 0.16	2.2	50		600		600	
PKZM0-0.25					0.16 – 0.25	3.4	50		600		600	
PKZM0-0.4					0.25 – 0.4	5.6	50		600		600	
PKZM0-0.63					0.4 – 0.63	8.8	50		600		600	
PKZM0-1					0.63 – 1	14	50		600		600	
PKZM0-1.6			¾	¾	1 – 1.6	22	50		600		600	
PKZM0-2.5	½	½	1	1½	1.6 – 2,5	35	50		600		600	
PKZM0-4	¾	¾	2	3	2.5 – 4	56	50		600		600	
PKZM0-6.3	1	1½	3	5	4 – 6.3	88	50		600		600	
PKZM0-10	3	3	7½	10	6.3 – 11	140	22	50	150	600	125	600
PKZM0-12	3	3	7½	10	9 – 12	168	18	50	150	600	125	600
PKZM0-16	3	5	10	10	10 – 16	224	10	50	150	600	125	600
PKZM0-20	5	-	-	15	16 – 20	280	10	18	150	600	125	600
PKZM0-25	-	7½	15	20	20 – 25	350	10	18	150	600	125	600
PKZM0-32	7½	10	20	25	24 – 32	448	10	18	150	600	125	600
Motor-protective circuit-breakers PKZM4												
PKZM4-16	3	5	10	15	10 – 16	224	50		600		600	
PKZM4-25	7½	7½	20	25	16 – 25	350	50		600		600	
PKZM4-32	10	10	25	30	25 – 34	448	50		600		600	
PKZM4-40	10	15	30	40	32 – 42	560	50		600		600	
PKZM4-50	10	15	30	40	40 – 52	700	10		600		600	
PKZM4-58	15	15	40	50	50 – 56	812	10		600		600	
PKZM4-63	15	15	40	50	52 – 58	882	10		600		600	

Notes

Service factor (SF)

Set value I_r, on the current scale, depending on the load factor
SF = 1.15 → $I_r = 1 \times I_{n\ mot}$
SF = 1 → $I_r = 0.9 \times I_{n\ mot}$

[1] Devices for world markets IEC ≙ UL/CSA

[2] Caution: Changed requirements for group protection

[3] Calculate motor output in this range according to rated operational current. Specified values as per NEC Table 430 – 150

Rating data for approved types[1] UL 508/CSA C 22.2 No. 14		For use with	Pilot Duty	General Use	
Accessories					
Standard auxiliary contacts	NHI11-PKZ0	PKZM0(-T) PKZM4	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–
	NHI12-PKZ0				
	NHI21-PKZ0				
	NHI2-11S-PKZ0				
	NHI-E-11-PKZ0		E150	0.5 A – 250 V AC	–
	NHI-E-10-PKZ0				
Early-make auxiliary contacts	VHI20-PKZ0	PKZM0(-T)	E150	0.5 A – 250 V AC	–
	VHI20-PKZ01	PKZM01			
Trip indicators	AGM2-10-PKZ0	PKZM0(-T) PKZM4	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–
	AGM2-01-PKZ0				
Shunt release	A-PKZ0(...)	PKZM0(-T) PKZM4	–	–	Actuating voltages and ordering information → Products for the German market
	U-PKZ0(...)				
Auxiliary contact for contact module	HI11-S/EZ-PKZ0	PKZM0	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–

Notes

[1] Devices for world markets IEC = UL/CSA

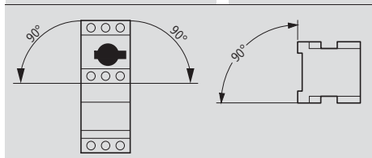
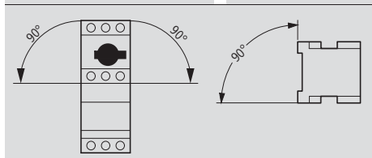
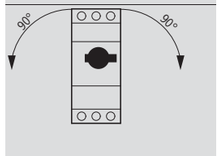
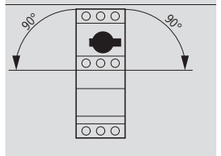
Motor-protective circuit-breakers PKZM0(4) used as "Manual self-protected Motor Starters" – UL 508 Type E

Maximum motor output AC				Setting ranges		Interrupting Capacity = Short Circuit Current (SCCR)			Components	
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V	Overload releases	Short-circuit releases	240 V	480Y/ 277 V[2]	600Y/ 347 V[2]	Motor Protector	Accessories
[HP]	[HP]	[HP]	[HP]	[A]	[A]	[kA]	[kA]	[kA]	Part no.	Part no.
[1]				0.1 – 0.16	2.2	65	65	50	**PKZM0-0.16**	**BK25/3-PKZ0-E**
				0.16 – 0.25	3.4	65	65	50	**PKZM0-0.25**	**BK25/3-PKZ0-E**
				0.25 – 0.4	5.6	65	65	50	**PKZM0-0.4**	**BK25/3-PKZ0-E**
				0.4 – 0.63	8.8	65	65	50	**PKZM0-0.63**	**BK25/3-PKZ0-E**
				0.63 – 1	14	65	65	50	**PKZM0-1**	**BK25/3-PKZ0-E**
		¾	¾	1 – 1.6	22	65	65	50	**PKZM0-1.6**	**BK25/3-PKZ0-E**
½	½	1	1½	1.6 – 2,5	35	65	65	50	**PKZM0-2.5**	**BK25/3-PKZ0-E**
¾	¾	2	3	2.5 – 4	56	65	65	50	**PKZM0-4**	**BK25/3-PKZ0-E**
1	1½	3	5	4 – 6.3	88	65	65	50	**PKZM0-6.3**	**BK25/3-PKZ0-E**
3	3	7½	10	6.3 – 11	140	65	65	50	**PKZM0-10**	**BK25/3-PKZ0-E**
3	3	7½	–	9 – 12	168	65	65	–	**PKZM0-12**	**BK25/3-PKZ0-E**
3	5	10	–	10 – 16	224	42	42	–	**PKZM0-16**	**BK25/3-PKZ0-E**
5	–	–	–	16 – 20	280	18	18	–	**PKZM0-20**	**BK25/3-PKZ0-E**
–	7½	15	–	20 – 25	350	18	18	–	**PKZM0-25**	**BK25/3-PKZ0-E**
7½	10	20	–	24 – 32	448	18	18	–	**PKZM0-32**	**BK25/3-PKZ0-E**
3	5	10	10	10 – 16	224	65	65	25	**PKZM4-16**	**BK50/3-PKZ4-E**
5	7½	15	20	16 – 27	350	65	65	25	**PKZM4-25**	**BK50/3-PKZ4-E**
7½	10	20	30	24 – 34	448	65	65	25	**PKZM4-32**	**BK50/3-PKZ4-E**
10	–	30	30	32 – 40	560	65	65	25	**PKZM4-40**	**BK50/3-PKZ4-E**
–	15	30	–	40 – 52	700	65	65	–	**PKZM4-50**	**BK50/3-PKZ4-E**
–	–	40	–	50 – 56	812	65	65	–	**PKZM4-58**	**BK50/3-PKZ4-E**
–	–	40	–	52 – 58	882	65	–	–	**PKZM4-63**	**BK50/3-PKZ4-E**

Notes

[1] Calculate motor power in this range according to the rated current. Stated values to NEC Table 430 -150
[2] Suitable for networks with grounded star-point

Technical data

				PKZM01…	PKZM0-…[1]	PKM0-…	PKZM0-…-T	PKZM4	PKE
General									
Standards				IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14					
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30					
Ambient temperature	Storage		°C	-25…80	-25 …80	-25…80	-25…80	-25…70	-25…80
	Open		°C	-25…55	-25…55	-25…55	-25…55	-25…55	-25…55
	Encapsulated		°C	-25…40	-25…40	-25…40	-25…40	-25…40	-25…40
Built-in position									
Direction of incoming supply				Any	Any	Any	Any	Any	Any
Degree of protection	Device			IP20	IP20	IP20	IP20	IP20	IP20
	Terminals			IP00	IP00	IP00	IP00	IP00	IP00
Contact protection to EN 50274				Finger- and back-of-hand proof					
Shock resistance, half-sinusoidal shock, 10 ms to IEC 60068-2-27			g	25	25	25	25	15	25
Installation altitude			m	max. 2000	max. 2000	max. 2000	max. 2000	max. 2000	max. 2000
Terminal capacity, screw terminals	Solid		mm²	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 50) 2 x (1 - 35)	1 x (1 - 6) 2 x (1 - 6)
	Flexible with ferrule to DIN 46228		mm²	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 35) 2 x (1 - 35)	1 x (1 - 6) 2 x (1 - 6)
	Solid or stranded		AWG	18 - 10	18 - 10	18 - 10	18 - 10	14 - 2	18 - 10
Terminal capacity, spring-loaded terminals	Solid		mm²	–	1 x (1…2.5) 2 x (1…2.5)	1 x (1…2.5) 2 x (1…2.5)	–	–	1 x (1…2.5) 2 x (1…2.5)
	Flexible with ferrule to DIN 46228		mm²	–	1 x (1…2.5) 2 x (1…2.5)	1 x (1…2.5) 2 x (1…2.5)	–	–	1 x (1…2.5) 2 x (1…2.5)
	Solid or stranded		AWG	–	18…14	18…14	–	–	18…14
Terminal screw tightening torque	Main conductors		Nm	1.7	1.7	1.7	1.7	3.3	1.7
	Auxiliary conductors		Nm	1	1	1	1	1	1
Main contacts									
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000	6000	6000	6000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3
Rated operational voltage		U_e	V AC	690	690	690	690	690	690
Rated uninterrupted current = rated operational current		$I_u = I_e$	A	16 or current setting of the overcurrent release	32 or current setting of the overcurrent release	32 or current setting of the overcurrent release	25 or current setting of the over-current release	65 Open 63 enclosed	32 A or set current of the overcurrent release
Rated frequency			Hz	40 - 60	40 - 60	40 - 60	40 - 60	40 - 60	40 - 60
Heat dissipation (3 pole at operating temperature)			W	6	6	6	6	22	6
Lifespan, mechanical		Operations	x 10^6	0.05	0.1	0.1	0.1	0.03	0.05
Lifespan, electrical (AC-3 at 400 V)		Operations	x 10^6	0.05	0.1	0.1	0.1	0.03	0.05
Maximum operating frequency		Operations/h	Ops/h	25	40	40	40	40	60
Short-circuit rating									
AC				→ Page 7/33	→ Page 7/32	→ Page 7/32	→ Page 7/32	→ Page 7/33	→ Page 7/33
DC			kA	60	60 (up to PKZM0-16) 40 (PKZM0-20 to PKZM0-32)	60 (up to PKM0-16) 40 (PKM0-20 to PKM0-32)	60 (up to PKZM0-16) 40 (PKZM0-20 to PKZM0-32)	60	–
Motor switching capacity									
AC-3 up to 690 V			A	16	32	32	25	65	32
DC-5 (up to 250 V)			A	16 (3 contacts in series)	25 (3 contacts in series)	25 (3 contacts in series)	25 (3 contacts in series)	63 (3 contacts in series)	–
Trip blocks									
Temperature compensation									
To IEC/EN 60947, VDE 0660			°C	-5…40	-5…40	-5…40	-5…40	-5…40	-5…40
Operating range			°C	-25…55	-25…55	-25…55	-25…55	-25…55	-25…55
Temperature compensation residual error for T > 40 °C			%/K	≦ 0.25	≦ 0.25	≦ 0.25	≦ 0.25	≦ 0.25	
Setting range of overload releases			x I_u	0.6 - 1	0.6 - 1		0.6 - 1	0.6 - 1	0.25 - 1
Short-circuit releases tolerance			%	± 20	± 20	± 20	± 20	± 20	± 20
Phase-failure sensitivity				IEC/EN 60947-4-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102	–	IEC/EN 60947-1-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102	Yes

Notes [1] Tested according to IEC/EN 60947-1 (isolating characteristics) and IEC/EN 60947-2

Auxiliary contacts

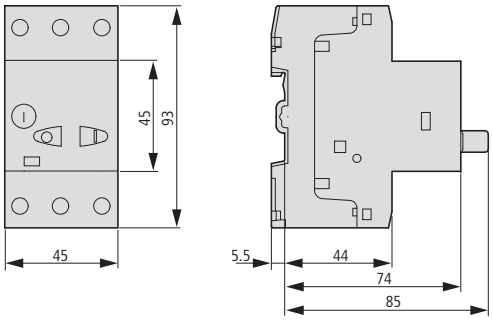
NHI...PKZ, AGM, U-PKZ, A-PKZ

				NHI…PKZ0	NHI-E-…PKZ0	VHI…PKZ0	AGM
Auxiliary contacts							
Rated impulse withstand voltage	U_{imp}	V AC		6000	4000	4000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operating voltage							
	U_e	V AC		500	440	440	500
	U_e	V DC		250	250	250	250
Safe isolation according to EN 61140							
Between auxiliary contacts and main contacts		V AC		690	690	690	690
Rated operational current							
AC-15							
	220 - 240 V	I_e	A	3.5	1	1	3.5
	380 - 415 V	I_e	A	2	–	–	2
	440 - 500 V	I_e	A	1	–	–	1
DC-13 L/R ≦ 100 ms							
	24 V	I_e	A	2	2	2	2
	60 V	I_e	A	1.5	–	–	1.5
	110 V	I_e	A	1	–	–	1
	220 V	I_e	A	0.25	–	–	0.25
Durability							
Lifespan, mechanical	Operations	x 10^6		> 0.1	> 0.1	> 0.1	> 0.01
Lifespan, electrical	Operations	x 10^6		> 0.05	> 0.1	> 0.1	> 0.05
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min}= 5.4 mA)	Fault probability	λ		< 10^{-8} < 1 failure in 1 x 10^8 operations			
Interlocked opposing contacts				Yes	–	–	–
Short-circuit rating without welding							
Fuseless				FAZ-B4/1-HI	–	–	FAZ-B4/1-HI
Fuse		A gG/gL		10	10	10	10
Terminal capacity							
Solid or flexible conductor with ferrule		mm^2		0.75 - 2.5	0.75 - 1.5	0.75 - 1.5	0.75 - 2.5
Solid or stranded		AWG		18 - 14	18 - 16	18 - 16	18 - 14

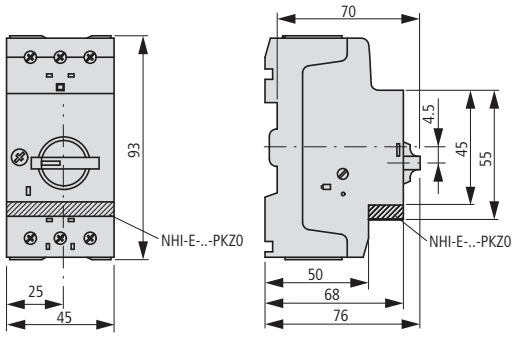
			Undervoltage release U-PKZ...	Shunt release A-PKZ...
General				
Terminal capacity				
Solid or flexible conductor with ferrule		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded		AWG	1 x (18 - 14) 2 x (18 - 14)	1 x (18 - 14) 2 x (18 - 14)
Main contacts				
Rated operating voltage	U_e	V AC	42 - 480	42 - 480
Rated operating voltage	U_e	V DC	24 - 250	24 - 250
Pick-up-/drop-out voltage				
Pick-up voltage	x U_s		0.85 - 1.1	
Drop-out voltage	x U_s		0.7 - 0.35	
Operating range				
AC voltage		x U_s		0.7…1.1
DC voltage (intermittent operation 5 s)		x U_s		0.7…1.1
Power consumption				
AC voltage				
AC pick-up rating	Pick-up	VA	5	5
AC consumption when closed	Holding	VA	3	3
DC voltage				
DC pick-up rating	Pick-up	W	–	3
DC consumption when closed	Holding	W	–	3

Dimensions

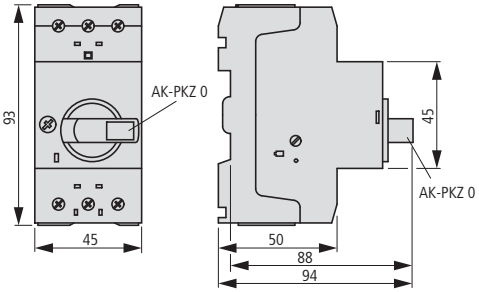
Motor-protective circuit-breaker
PKZM01…



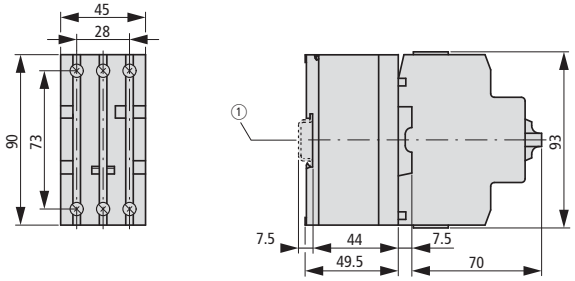
Motor-protective circuit-breaker
Transformer-protective circuit-breakers
Motor-protective circuit-breaker with standard auxiliary contacts
PKZM0-…(+NHI-E-…-PKZ0)
PKZM0-…-T(+NHI-E-…-PKZ0)
PKM0-…(+NHI-E-…-PKZ0)



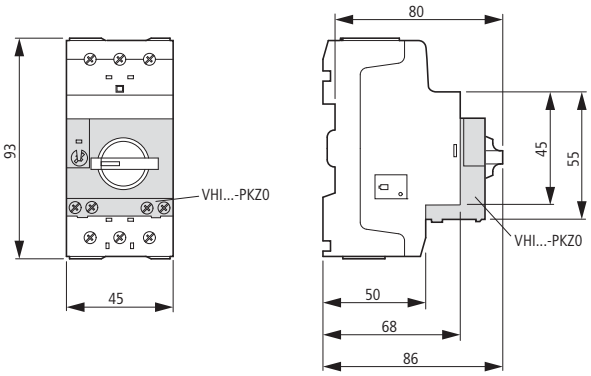
Motor-protective circuit-breakers with lockable rotary handles
PKZM0-…+AK-PKZ0



Current limiters
CL-PKZ…

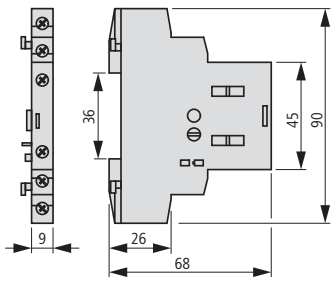


Motor-protective circuit-breakers with early-make auxiliary contacts
PKZM0-…+VHI-…-PKZ0

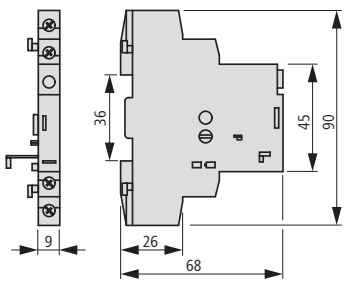


① Top-hat rail IEC/EN 60715

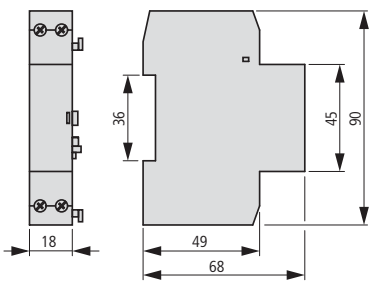
Standard auxiliary contacts
NHI…-PKZ0



Trip indicators
AGM2…-PKZ0

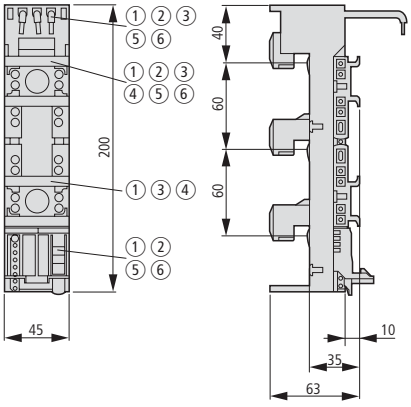


Shunt release
Undervoltage release
A-PKZ0…
U-PKZ0…



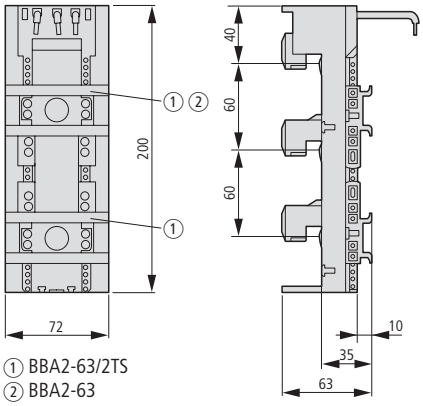
BBA

BBA0-25
BBA0-25/2TS
BBA0/2TS-L
BBA0-32
BBA0-32/2TS-C
BBA0C-16



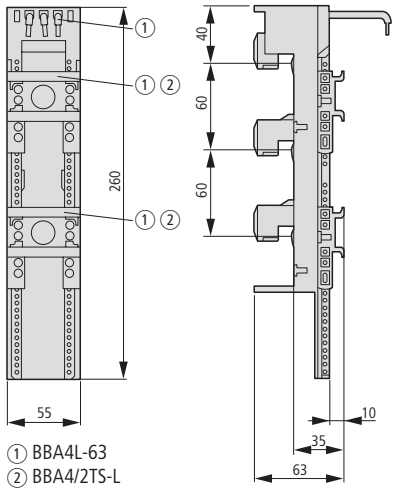
① BBA0-32/2TS-C
② BBA0-25/2TS
③ BBA0C-16
④ BBA0/2TS-L
⑤ BBA0-25
⑥ BBA0-32

BBA2-63
BBA2-63/2TS



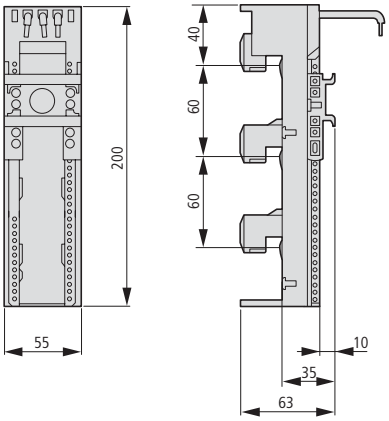
① BBA2-63/2TS
② BBA2-63

BBA4/2TS-L
BBA4L-63

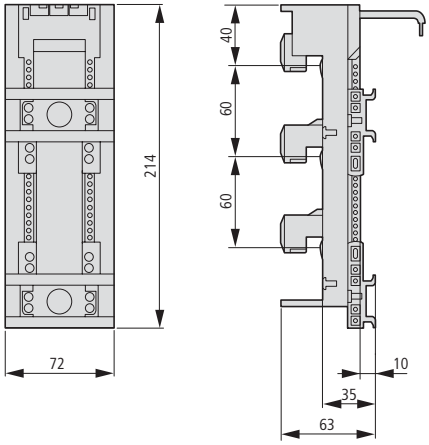


① BBA4L-63
② BBA4/2TS-L

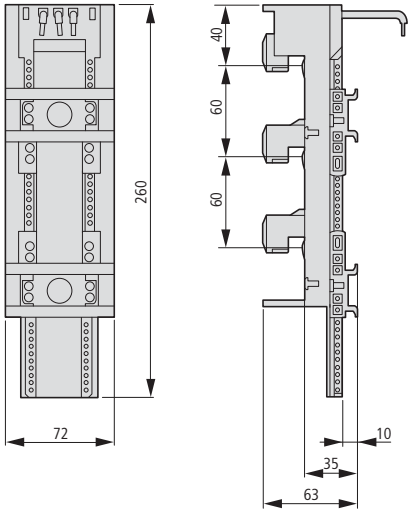
BBA4-63



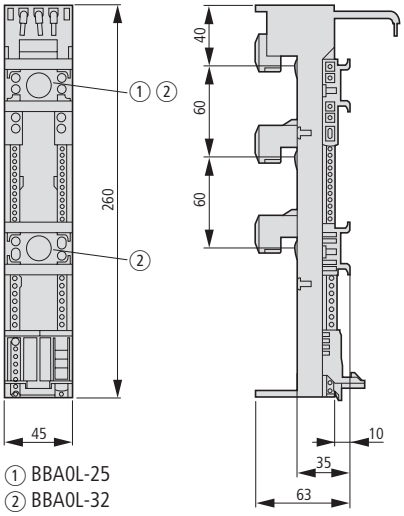
BBA2-80/2TS-S



BBA2L-63

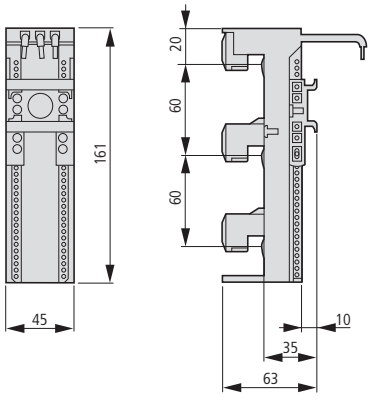


BBA0L-25
BBA0L-32

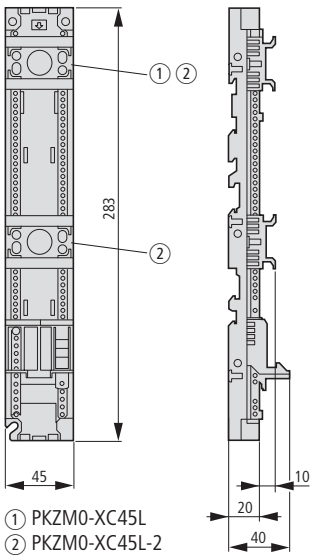


① BBA0L-25
② BBA0L-32

BBA0K-32



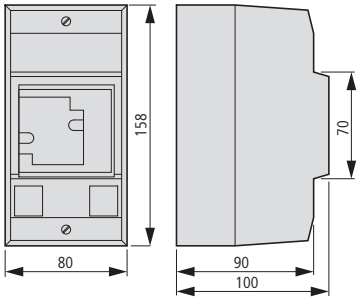
PKZM0-XC45L
PKZM0-XC45L-2



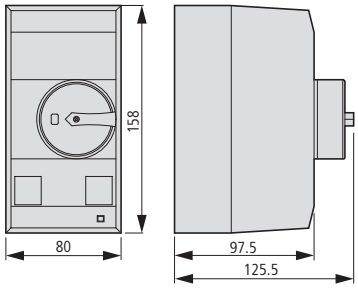
① PKZM0-XC45L
② PKZM0-XC45L-2

Insulated enclosures for surface mounting

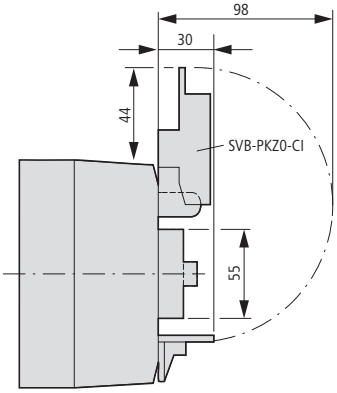
CI-PKZ0-M



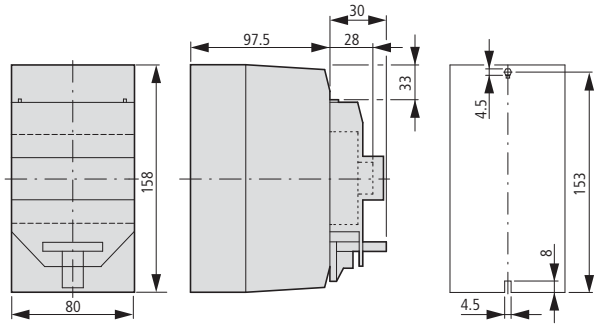
CI-PKZ10G...M



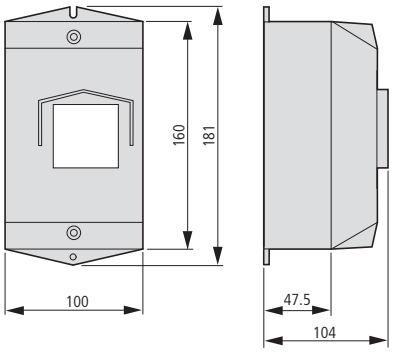
CI-PKZ0-…M
+ SVB-PKZ0-CI



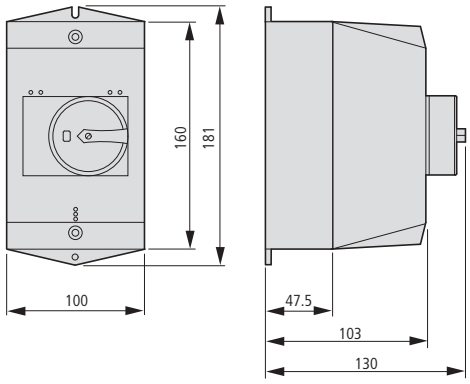
Drilling dimensions
CI-PKZ0-…M



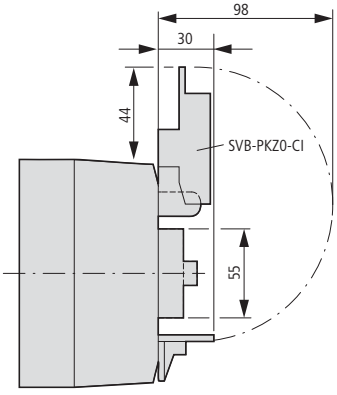
CI-K2-PKZ0



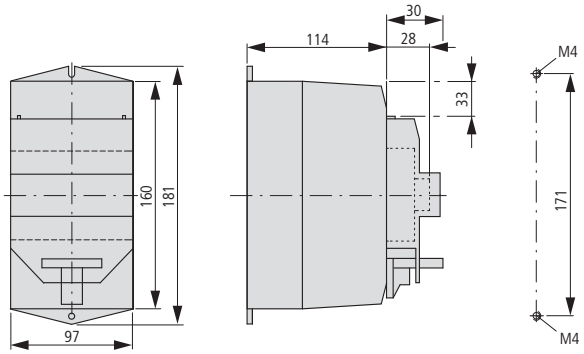
CI-K2-PKZ0G(R)(V)



CI-K2-PKZ0-G(R)(V)
+ SVB-PKZ0-CI

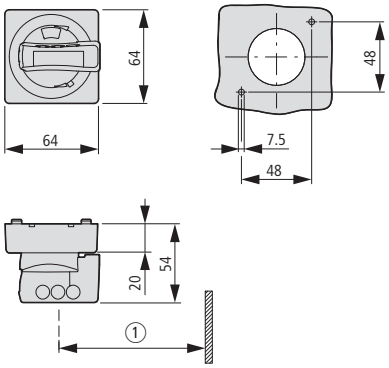


Drilling dimensions
CI-K2-PKZ0…



Door coupling handles

PKZ0-X(R)H…

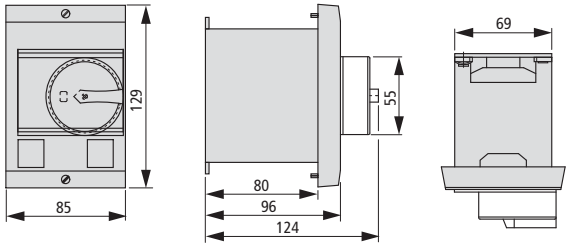


Mounting depth: 100 to 240 mm
from the top edge of the top-hat rail
to the front edge of the cabinet
door/cover
Distance between switch axis and
cover hinge: at least 100 mm

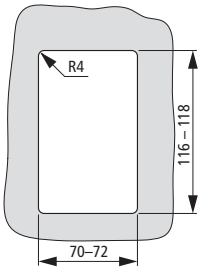
① At least 100 mm from cover hinge

Insulated enclosures for flush mounting

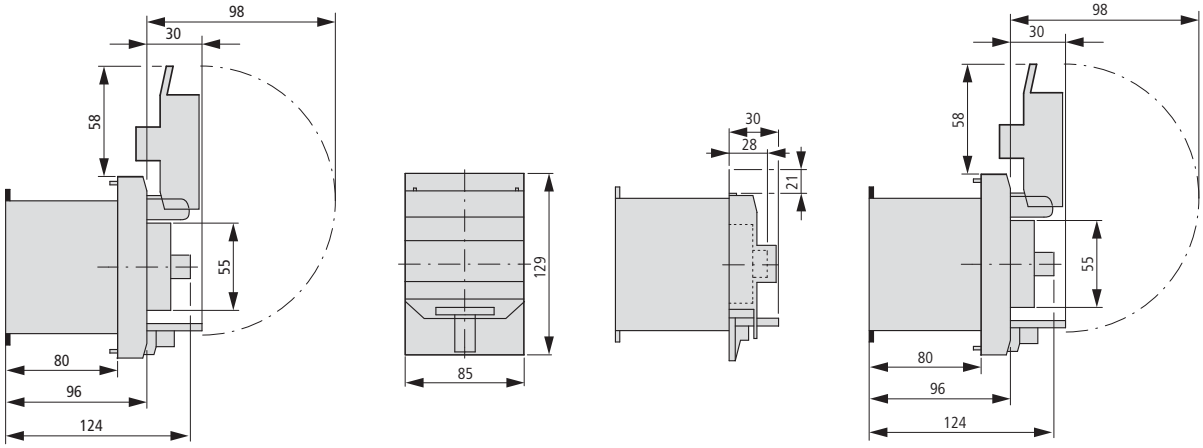
E-PKZ0 E-PKZ0-G…



Mounting aperture E-PKZ0…

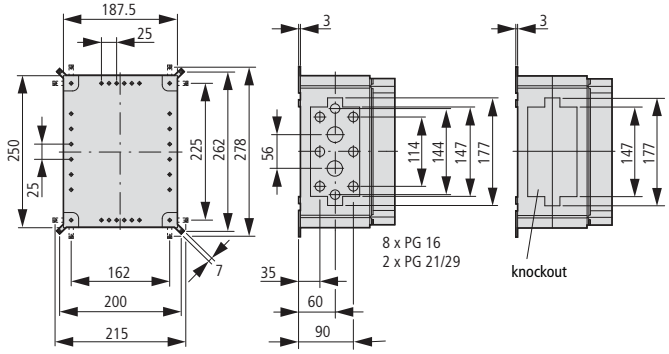


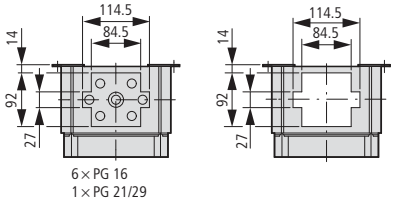
E-PKZ0-G… + SVB-PKZ0-E



Insulated enclosures for surface mounting

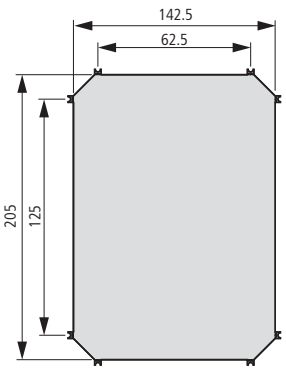
CI23E…





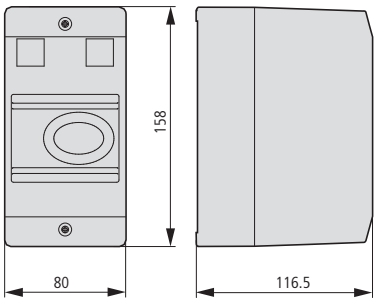
Mounting plates

M3-CI23

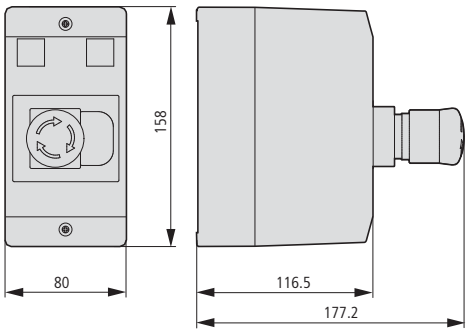


Insulated enclosures for surface mounting

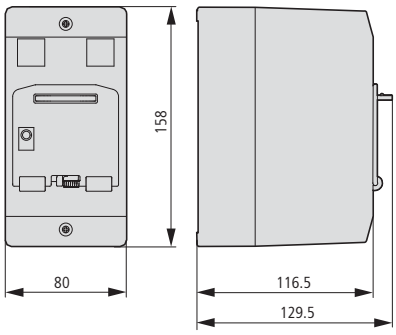
CI-PKZ01
CI-PKZ01-G



CI-PKZ01-PVT
CI-PKZ01-PVS

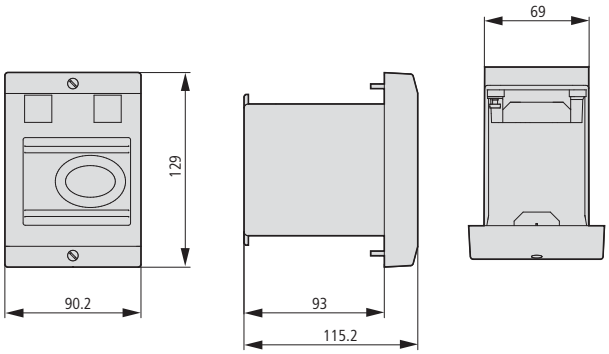


CI-PKZ01-SVB
CI-PKZ01-SVB-V

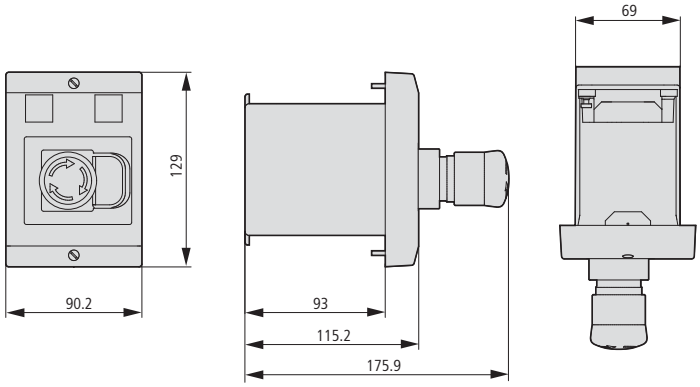


Insulated enclosures for flush mounting

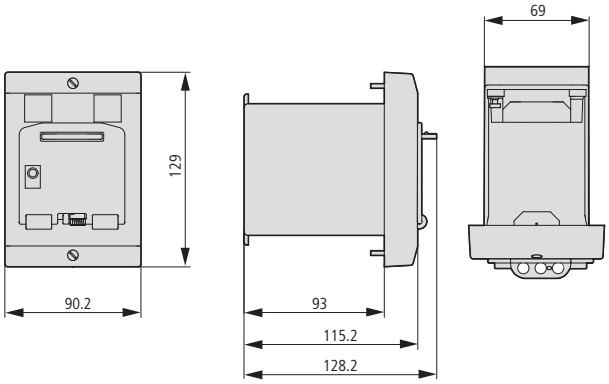
E-PKZ01
E-PKZ01-G



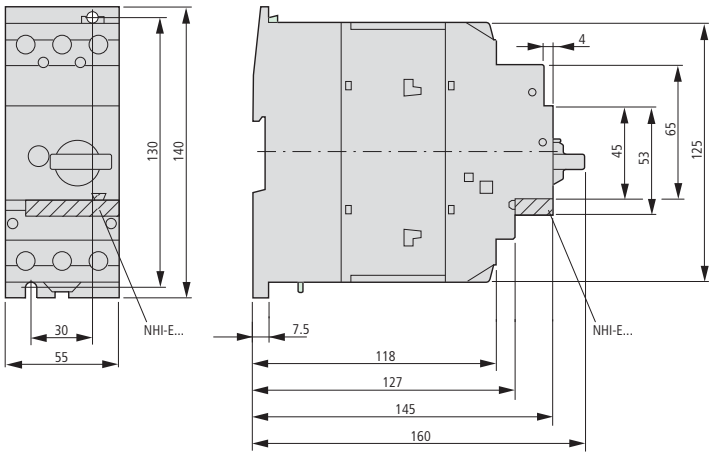
E-PKZ01-PVT
E-PKZ01-PVS



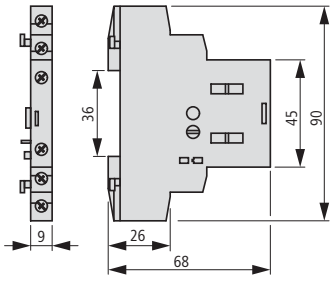
E-PKZ01-SVB
E-PKZ01-SVB-V



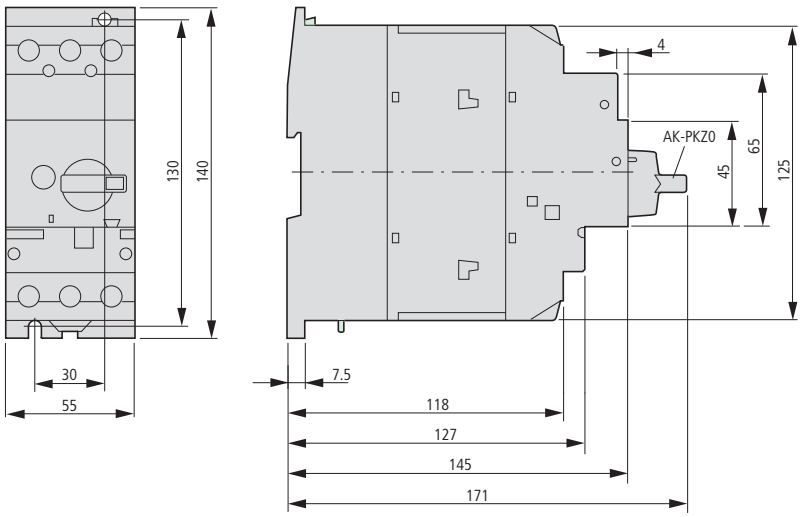
Motor-protective circuit-breaker
PKZM4-…



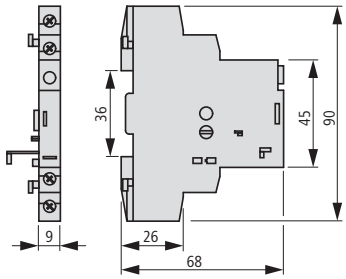
Standard auxiliary contacts
NHI…-PKZ…
NHI…-PKZ0



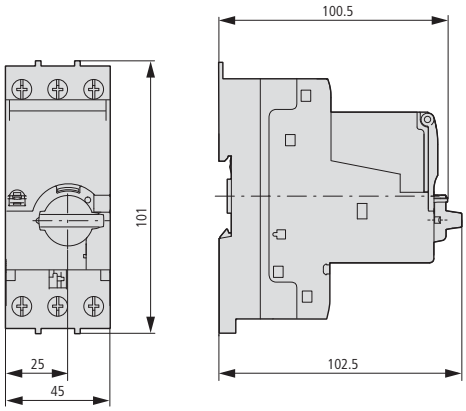
Motor-protective circuit-breakers with lockable cover
PKZM4-… +AK-PKZ0



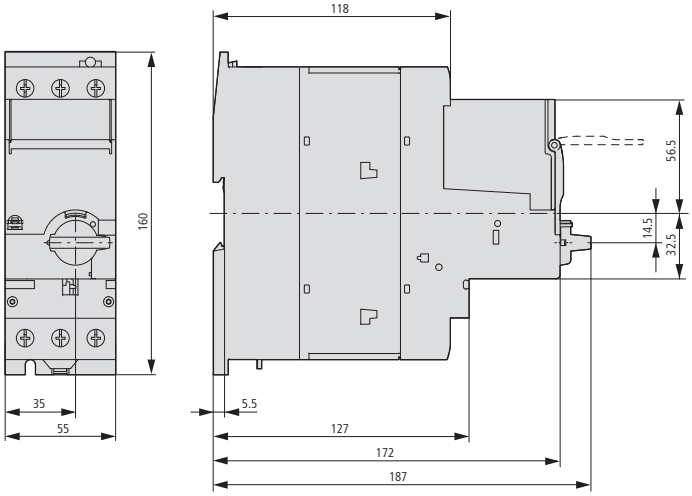
Trip indicators
AGM2…-PKZ…
AGM2…-PKZ0



PKE Motor-protective circuit-breakers
PKE12 , PKE32

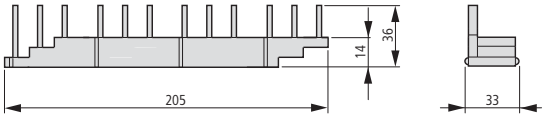


PKE65

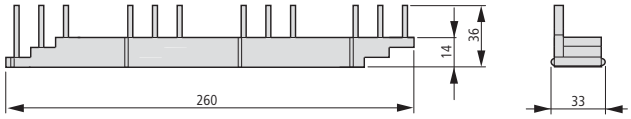


Three-phase commoning links

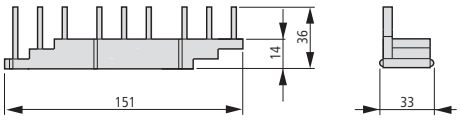
B3.0/4-PKZ4



B3.2/4-PKZ4



B3.0/3-PKZ4



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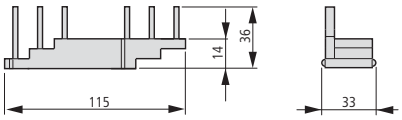
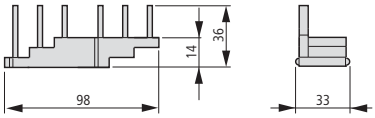
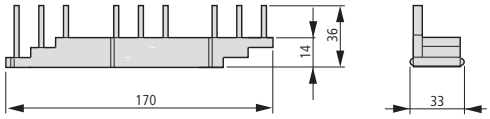


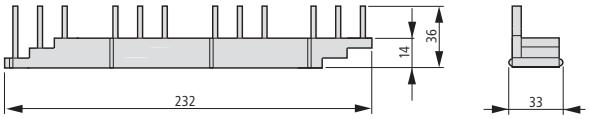
B3.0/2-PKZ4



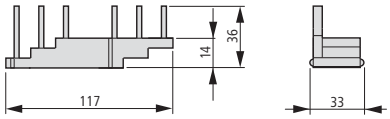
B3.1/3-PKZ4



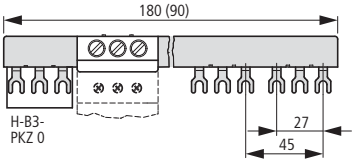
B3.1/4-PKZ4



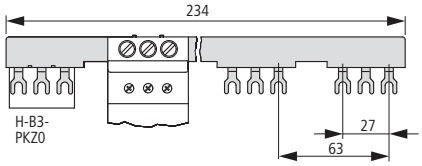
B3.1/2-PKZ4



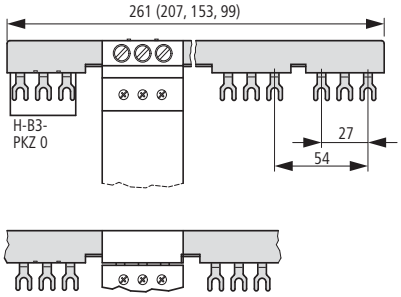
Three-phase commoning links
B3.0/4-PKZ0
B3.0/2-PKZ0



Three-phase commoning links
B3.2/4-PKZ0
B3.2/2-PKZ0

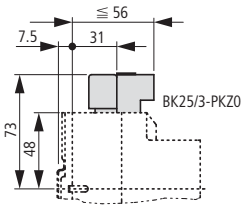


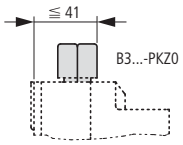
Three-phase commoning links
B3.1/5-PKZ0 B3.1/3-PKZ0
B3.1/4-PKZ0 B3.1/2-PKZ0



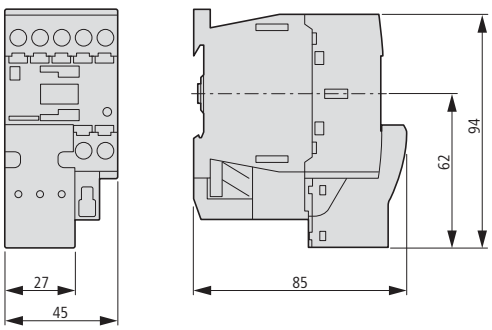
Incoming terminals
BK25/3-PKZ0

Overlapping mounting to extend the three-phase commoning link



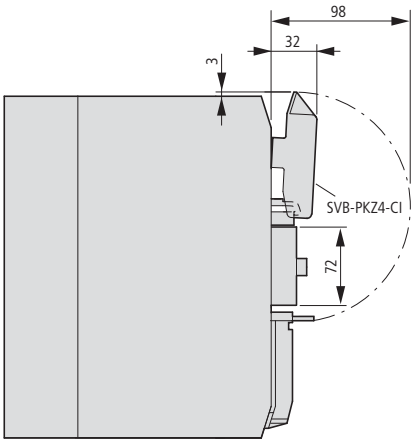


Motor plug DILM12-XMCP/T

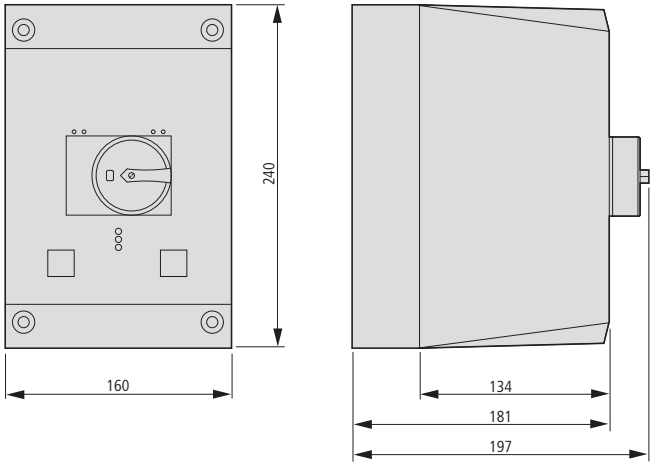


Insulated enclosures for surface mounting

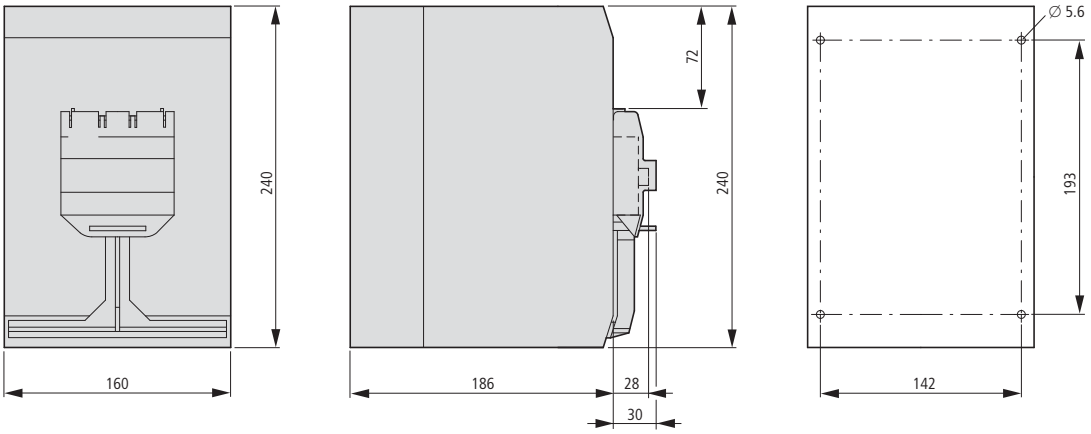
CI-K4-PKZ4-G(R)
+SVB-PKZ4-CI



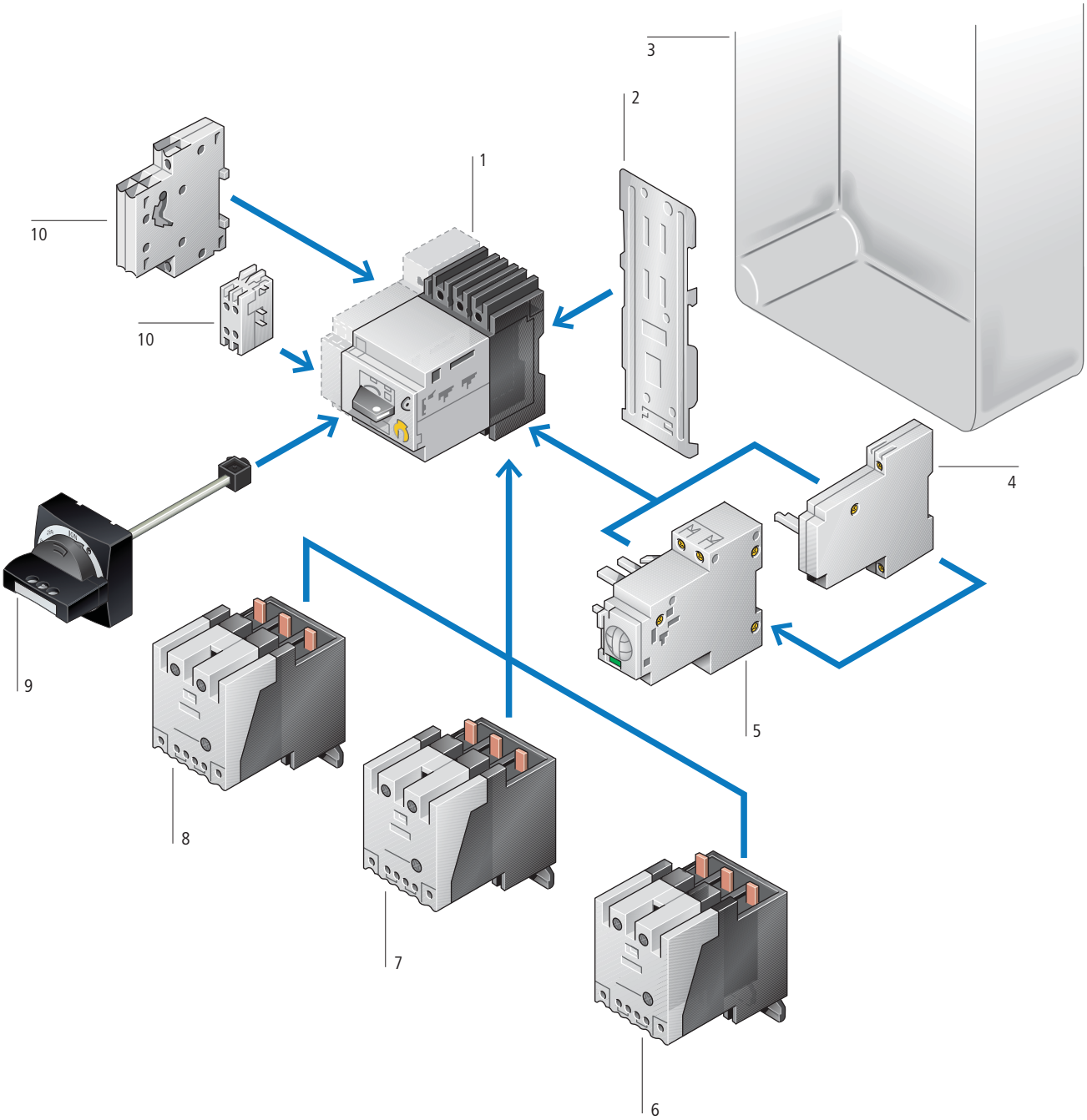
CI-K4-PKZ4-G



Drilling dimensions
CI-K4-PKZ-G(R)



System overview



Basic devices

Motor-protective circuit-breakers 1
→ Page 7/48

Circuit-breakers 1
→ Page 7/48

Add-on functions

Contact modules 6
→ Page 7/64

High-capacity contact modules 7
→ Page 7/64

Auxiliary contacts 10
→ Page 7/58

Current limiters 8
→ Page 7/58

Shunt release 4
→ Page 7/60

Remote operators 5
→ Page 7/62

Mounting accessories

Mounting/wiring 2
→ Page 7/69

Door coupling handles IP65 9
→ Page 7/57

Insulated enclosures 3
→ Page 7/56

Ordering

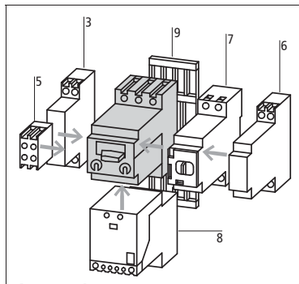
Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	690 V P kW	Rated uninterrupted current I_u A	**Setting range** Overload releases I_r A	Short-circuit releases I_{rm} A
Motor-protective circuit-breakers, type of coordination "1" and "2"							
0.09	0.12	0.18	0.25	0.25	0.6	0.4…0.6	5 …8
0.12	0.25	0.25	0.37	0.55	1	0.6…1	8 …14
0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	14 …22
0.37	0.75	1.1	1.1	1.5	2.4	1.6…2.4	20 …35
0.75	1.5	1.5	2.2	3	4	2.4…4	35 …55
1.1	2.2	3	3	4	6	4…6	50 …80
2.2	4	4	5.5	7.5	10	6…10	80 …140
4	7.5	9	9	12.5	16	10…16	130 …220
5.5	12.5	12.5	15	22	25	16…25	200 …350
7.5	15	17.5	22	22	32	24…32	275 …425
11	20	22	24	30	40	32…40	350 …500
Circuit-breakers							
For line and cable protection							
–	–	–	–	–	10	6…10	50 …80
–	–	–	–	–	16	10…16	80 …140
–	–	–	–	–	25	16…25	130 …210
–	–	–	–	–	32	24…32	160 …280
–	–	–	–	–	40	32…40	200 …350

Notes

Information relevant for export to North America

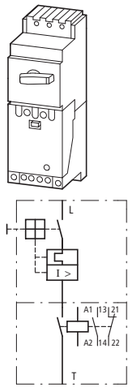
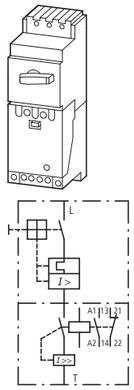
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuit: as manual controller suitable for group installations
See also	→ Page 7/75

Part no. Article no.	**Price** See price list	Std. pack	**Notes**	**Notes**	**Notes**
PKZ2/ZM-0.6 021859		1 off	Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102. Adjustable overload release I_r = 0.6 - 1.0 x I_u Adjustable short-circuit release I_{rm} = 8.5 - 14 x I_u factory-set to 12 x I_u Ex PTB 02 ATEX 3152 Observe manual.	Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height	
PKZ2/ZM-1 026605					
PKZ2/ZM-1.6 028978					
PKZ2/ZM-2.4 031351					
PKZ2/ZM-4 033724					
PKZ2/ZM-6 036097					
PKZ2/ZM-10 038470					
PKZ2/ZM-16 040843					
PKZ2/ZM-25 043216					
PKZ2/ZM-32 045589					
PKZ2/ZM-40 047962					
PKZ2/ZM-10-8 050335		1 off	Adjustable overload release I_r = 0.6 - 1.0 x I_u Adjustable short-circuit release I_{rm} = 5.0 - 8.5 x I_u factory-set to 5 x I_u	Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height	
PKZ2/ZM-16-8 052708					
PKZ2/ZM-25-8 055081					
PKZ2/ZM-32-8 057454					
PKZ2/ZM-40-8 059827					



Accessories	**Page**
3 Standard auxiliary contacts	→ 7/58
5 Trip-indicating auxiliary contact	→ 7/58
6 Shunt releases, undervoltage releases	→ 7/60
7 Remote operators	→ 7/62
8 Contact module, high-capacity contact modules, current limiters	→ 7/64
9 Clip plate	→ 7/69
Additional accessories	→ 7/56
Rated ultimate short-circuit breaking capacity	→ 7/78
Manual	→ 7/69

HPL07050EN

	Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A
Compact starters, type "1" coordination								
	0.12	0.25	0.25	0.37	0.55	1	0.6…1	8…14
	0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	14…22
	0.37	0.75	1.1	1.1	1.5	2.4	1.6…2.4	20…35
	0.75	1.5	1.5	2.2	3	4	2.4…4	35…55
	1.1	2.2	3	3	4	6	4…6	50…80
	2.2	4	4	5.5	7.5	10	6…10	80…140
	4	7.5	9	9	12.5	16	10…16	130…220
	5.5	12.5	12.5	15	22	25	16…25	200…350
	7.5	15	17.5	22	22	32	24…32	275…425
	11	18.5	22	24	30	36	32…40	350…500
High-capacity compact starters, type "2" coordination								
	0.12	0.25	0.25	0.37	0.55	1	0.6…1	8…14
	0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	14…22
	0.37	0.75	1.1	1.1	1.5	2.4	1.6…2.4	20…35
	0.75	1.5	1.5	2.2	3	4	2.4…4	35…55
	1.1	2.2	3	3	4	6	4…6	50…80
	2.2	4	4	5.5	7.5	10	6…10	80…140
	4	7.5	9	9	12.5	16	10…16	130…220
	5.5	12.5	12.5	15	22	25	16…25	200…350
	7.5	15	17.5	22	22	32	24…32	275…425
	11	18.5	22	24	30	36	32…40	350…500

Notes

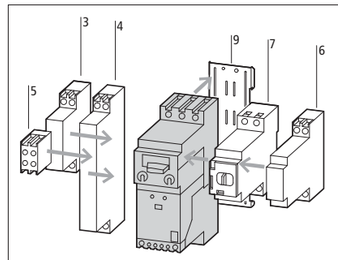
Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	012528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuit: as manual controller with contactor, suitable for group installations
See also	→ Page 7/75

HPL07051EN

PKZ2/ZM

Part no. Article no.	Price See price list	Std. pack	Notes	Notes
PKZ2/ZM-1/SE1A/11(230V50HZ,240V60HZ) 063364		1 off	1 NC and 1 N/O auxiliary contact built into the contact module.	
PKZ2/ZM-1.6/SE1A/11(230V50HZ,240V60HZ) 063372				
PKZ2/ZM-2.4/SE1A/11(230V50HZ,240V60HZ) 063382				
PKZ2/ZM-4/SE1A/11(230V50HZ,240V60HZ) 063392				
PKZ2/ZM-6/SE1A/11(230V50HZ,240V60HZ) 063402				
PKZ2/ZM-10/SE1A/11(230V50HZ,240V60HZ) 063412				
PKZ2/ZM-16/SE1A/11(230V50HZ,240V60HZ) 063422				
PKZ2/ZM-25/SE1A/11(230V50HZ,240V60HZ) 063432				
PKZ2/ZM-32/SE1A/11(230V50HZ,240V60HZ) 063442				
PKZ2/ZM-40/SE1A/11(230V50HZ,240V60HZ) 063452				
PKZ2/ZM-1/S(230V50HZ,240V60HZ) 063472		1 off	Rated short-circuit current I_q = 100 kA/400 V High-capacity contact module has built-in auxiliary contacts: 1 M/1 B	
PKZ2/ZM-1.6/S(230V50HZ,240V60HZ) 063482				
PKZ2/ZM-2.4/S(230V50HZ,240V60HZ) 063492				
PKZ2/ZM-4/S(230V50HZ,240V60HZ) 063502				
PKZ2/ZM-6/S(230V50HZ,240V60HZ) 063512				
PKZ2/ZM-10/S(230V50HZ,240V60HZ) 063522				
PKZ2/ZM-16/S(230V50HZ,240V60HZ) 063532				
PKZ2/ZM-25/S(230V50HZ,240V60HZ) 063542				
PKZ2/ZM-32/S(230V50HZ,240V60HZ) 063552				
PKZ2/ZM-40/S(230V50HZ,240V60HZ) 063562				



Accessories **Page**

3 Standard auxiliary contacts	→ 7/58
4 Standard auxiliary contacts	→ 7/58
5 Trip-indicating auxiliary contact	→ 7/58
6 Shunt release, undervoltage release	→ 7/60
7 Remote operators	→ 7/62
9 Clip plate	→ 7/69
Additional accessories	→ 7/56
Further actuating voltages	→ 7/70
Manual	→ 7/69

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102

Supplied ready mounted on clip plate C-PKZ2, can be snap-fitted to one or two IEC/EN 60715 top-hat rails, height 15 mm

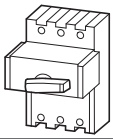
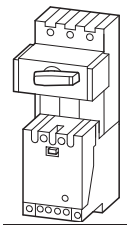
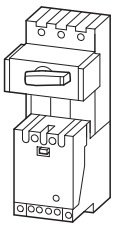
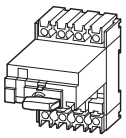
Overload releases adjustable I_r = 0.6 - 1.0 x I_u

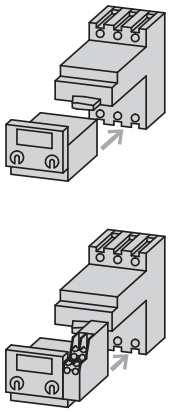
Adjustable short-circuit release I_{rm} = 8.5 - 14 x I_u factory-set to 12 x I_u

PTB 02 ATEX 3152

Observe manual.

The compact starters consist of a motor-protective circuit-breaker, which features a plug-in trip block and an attached contact module with the same matching profile. The devices are prefitted to a clip plate and can be snap-fitted, as a unit, centrally onto one or two top-hat rails to IEC/EN 60715 conform top-hat rails.
They conform with IEC/EN 60947-4-1, VDE 0660 Part 102.
I_q = Rated conditional short-circuit current

		Rated uninterrupted current I_u A	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Basic device, 3 poles, motor and system protection						
	–	40	**PKZ2** 026606		1 off	
Basic device,3 pole, motor protection						
	Basic device PKZ2 with high-capacity contact module fitted S-PKZ2 (1 NC, 1 N/O) supplied on C-PKZ2 clip plate. Cannot be combined with Z...-0.6-PKZ2..	40	**PKZ2/S(230V50HZ, 240V60HZ)** 063572		1 off	
	Basic device PKZ2 with SE1A/11-PKZ2 contact module fitted (1 NC, 1 N/O) supplied on C-PKZ2 clip plate. Cannot be combined with Z...-0.6-PKZ2.	40	**PKZ2/SE1A/ 11(230V50HZ, 240V60HZ)** 082142		1 off	
Basic device, 4 poles, system protection						
	-	40	**PKZ24** 004521		1 off	



Adjustable:

H ≙ manual position or

A ≙ automatic position

For EEx e applications the 95/96 break contact must always be used to de-energize the (high-capacity) contact module or contactor.

Motor-protective trip blocks ZMR-...-PKZ2 cannot be combined with U/A voltage releases and RE/RS remote operators.

Further actuating voltages → Page 7/70
Manual → Page 7/69

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Maximum motor rating AC				Rated short-circuit breaking capacity I_{cn}			**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
200 V HP	230 V HP	460 V HP	575 V HP	240 V AC kA	480 V AC kA	600 V AC kA				
Basic device										
In connection with motor-protective trip blocks ZM-...PKZ2 → Page 7/70 The values given are maximum values, depending on the trip block										
DOL starter										
10	15	30	25	100	65	42	**PKZ2/S-SP (110V50HZ,120V60HZ)** 050940		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E123500 UL CCN: NKJH NA Certification: UL Listed, CSA certified Suitable for: Branch circuit: as Type E self-protected combination motor controller See also: TB_PKZ2_PRO_Netze_NA
Reversing starters										
10	15	30	25	100	65	42	**PKZ2-SP-FVR(*V*HZ)** 925109		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E123500 UL CCN: NKJH CSA File No.: 12528 CSA Class No.: 3211-06 NA Certification: UL Listed, CSA certified Specially designed for NAYes Suitable for: Branch circuit: as Reversing Type E self-protected combination motor controller See also: TB_PKZ2_PRO_Netze_NA

Notes

Specify actuating voltage in the range 24 – 600 V 50 or 60 Hz.

Application: Mains supply	up to 27 A	600 Y/347 V AC
		480 Y/277 V AC
	27 – 42 A	480 Y/277 V AC

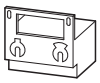
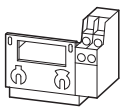
Service factor (SF)

Set value Ir on the current scale, depending on the load factor

SF = 1.15 → $I_r = 1 \times I_{n\ mot}$

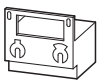
SF = 1 → $I_r = 0.9 \times I_{n\ mot}$

Terminal capacities, high-capacity compact starters PKZ2/ZM…/S
Main terminals
Cables Cu 75 °C, min. AWG 14, max. AWG 6
Torque 1.8 Nm
Control circuit terminals
Cables min. AWG 20, max. AWG 16 (0.5–1 mm²)
With insulated/uninsulated blade terminal, nominal size 2.8

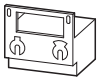
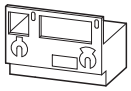
Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Part no. Article no.	Price See price list	Std. pack	Notes
Motor-protective trip blocks, 3 pole											
With overload release											
											
0.09	0.12	0.18	0.25	0.25	0.6	0.4…0.6	5…8	**ZM-1,6-PKZ2** 024232		1 off	Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102 Adjustable overload release I_r = 0.6 - 1.0 x I_u Adjustable short-circuit release I_{rm} = 8.5 - 14 x I_u Factory-set to 12 x I_u Ex PTB 02 ATEX 3152 Observe manual.
0.12	0.25	0.25	0.37	0.55	1	0.6…1	8…14	**ZM-1-PKZ2** 028979			
0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	14…22	**ZM-1,6-PKZ2** 031352			
0.37	0.75	1.1	1.1	1.5	2.4	1.6…2.4	20…35	**ZM-2.4-PKZ2** 033725			
0.75	1.5	1.5	2.2	3	4	2.4…4	35…55	**ZM-4-PKZ2** 036098			
1.1	2.2	3	3	4	6	4…6	50…80	**ZM-6-PKZ2** 038471			
2.2	4	4	5.5	7.5	10	6…10	80…140	**ZM-10-PKZ2** 040844			
4	7.5	9	9	12.5	16	10…16	130…220	**ZM-16-PKZ2** 043217			
5.5	12.5	12.5	15	22	25	16…25	200…350	**ZM-25-PKZ2** 045590			
7.5	15	17.5	22	22	32	24…32	275…425	**ZM-32-PKZ2** 047963			
11	20	22	24	30	40	32…40	350…500	**ZM-40-PKZ2** 050336			
With overload/relay function, with manual/automatic position											
											
0.09	0.12	0.18	0.25	0.25	0.6	0.4…0.6	5…8	**ZMR-0,6-PKZ2** 033943		1 off	Phase failure sensitivity, adjustability and Ex as ZM blocks. When using motor-protective trip blocks with overload relay function, an overload does not cause the motor-protective circuit-breakerto trip. The overload indication is provided by means of two auxiliary contacts.
0.12	0.25	0.25	0.37	0.55	1	0.6…1	8…14	**ZMR-1-PKZ2** 033950			
0.25	0.55	0.55	0.75	1.1	1.6	1…1.6	14…22	**ZMR-1,6-PKZ2** 033952			
0.37	0.75	1.1	1.1	1.5	2.4	1.6…2.4	20…35	**ZMR-2.4-PKZ2** 033955			
0.75	1.5	1.5	2.2	3	4	2.4…4	35…55	**ZMR-4-PKZ2** 033957			
1.1	2.2	3	3	4	6	4…6	50…80	**ZMR-6-PKZ2** 033966			
2.2	4	4	5.5	7.5	10	6…10	80…140	**ZMR-10-PKZ2** 033967			
4	7.5	9	9	12.5	16	10…16	130…220	**ZMR-16-PKZ2** 033968			
5.5	12.5	12.5	15	22	25	16…25	200…350	**ZMR-25-PKZ2** 033969			
7.5	15	17.5	22	22	32	24…32	275…425	**ZMR-32-PKZ2** 033973			
11	20	22	24	30	40	32…40	350…500	**ZMR-40-PKZ2** 033975			

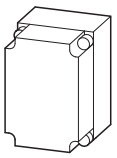
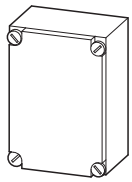
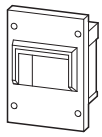
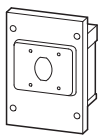
Notes **Information relevant for export to North America**

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
See also	HPL2007/2008_17/36

	Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Part no. Article no.	Price See price list	Std. pack	Notes
Without overload release												
	–	–	–	–	–	0.6		5…8	**M-0,6-PKZ2** 004537		1 off	Adjustable short-circuit release I_{rm} = 8.5 - 14 x I_u Factory set to 12 x I_u When using the M-…-PKZ2 as a short-circuit protective device for motors with heavy starting duty, rated operational current Ie must be overspecified with the following factors when designing the switchgear:
	–	–	–	–	–	1		8…14	**M-1-PKZ2** 004538			
	–	–	–	–	–	1.6		14…22	**M-1,6-PKZ2** 004539			
	–	–	–	–	–	2.4		20…35	**M-2.4-PKZ2** 004540			
	–	–	–	–	–	4		35…55	**M-4-PKZ2** 004541			
	–	–	–	–	–	6		50…80	**M-6-PKZ2** 004542			
	–	–	–	–	–	10		80…140	**M-10-PKZ2** 004543			
	–	–	–	–	–	16		130…220	**M-16-PKZ2** 004544			
	–	–	–	–	–	25		200…350	**M-25-PKZ2** 004545			
	–	–	–	–	–	32		275…425	**M-32-PKZ2** 004546			
	–	–	–	–	–	40		350…500	**M-40-PKZ2** 004547			

CLASS	Factor
5	1.0
10	1.0
15	1.22
20	1.41
25	1.58
30	1.73
35	1.89
40	2.0

	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Part no. Article no.	Price See price list	Std. pack	Notes
Trip blocks for system protection							
3 pole							
With overload release							
	10	6…10	50…80	**ZM-10-8-PKZ2** 062201		1 off	Adjustable overload release I_r = 0.6 - 1.0 x I_u Adjustable short-circuit release I_{rm} = 5 - 8.5 x I_u factory-set to 5 x I_u
	16	10…16	80…140	**ZM-16-8-PKZ2** 059828			
	25	16…25	130…210	**ZM-25-8-PKZ2** 057455			
	32	24…32	160…280	**ZM-32-8-PKZ2** 055082			
	40	32…40	200…350	**ZM-40-8-PKZ2** 052709			
4 pole							
With overload releases in all 4 poles							
	10	6…10	50…80	**ZM-10-8-PKZ24** 004526		1 off	Adjustable overload release I_r = 0.6 - 1.0 x I_u Adjustable short-circuit release I_{rm} = 5 - 8.5 x I_u factory-set to 5 x I_u Circuit-breakers PKZ24/ZM-…-8 protect 4 poles
	16	10…16	80…140	**ZM-16-8-PKZ24** 004525			
	25	16…25	130…210	**ZM-25-8-PKZ24** 004524			
	32	24…32	160…280	**ZM-32-8-PKZ24** 004523			
	40	32…40	200…350	**ZM-40-8-PKZ24** 004522			

		For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Insulated enclosures for surface mounting						
For motor-protective circuit-breakers, 3 or 4 pole circuit-breaker						
	Degree of protection IP40, cover with aperture dimensioned to accommodate front of breaker incl. blanking strip	PKZ2/ZM-… +NHI + AGM + U or A and RE or RS PKZ24/ZM-… + NHI + AGM + U or A	**CI19EA-PKZ2** 026234		1 off	Integrated IEC/EN 60715 top-hat rail, separate terminals for PE(N) and N connection Incl. cable entries 2 x PG 16/21/29 Indicator light L-PKZ0 be fitted
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ2/ZM-… + NHI + AGM + U or A + (R)H	**CI19EB-PKZ2** 028607		1 off	
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ24/ZM-… + NHI + AGM + U or A + (R)H	**CI19ED-PKZ24** 005145		1 off	
For 3 pole compact starter, high-capacity compact starter, combination circuit-breakers						
	Degree of protection IP40, cover with aperture dimensioned to accommodate front of breaker incl. blanking strip	PKZ2/ZM-…/S(E1A) + NHI + AGM + RE or RS and U or A	**CI23EA-PKZ2** 087936		1 off	Mounting plate L3/5-CI23 integrated Prepared for a compact starter or a High-capacity compact starters PKZ2/ZM-.../S without fitted clip plate
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ2/ZM-…/S + NHI + AGM + U or A + (R)H	**CI23EB-PKZ2** 090309		1 off	
Insulated enclosure for motor-protective circuit breakers PKZ2/ZM						
Degree of protection NEMA 12						
	Prepared for mounting a door coupling handle PKZ2-X(R)H	–	**CI19EE-PKZ2-NA**[1] 003183		1 off	Integrated IEC/EN 60715 top-hat rail, for connecting installation pipes and end-to-end earthing Not for use with PKZ2/ZM...S(-SP)
	With mounting plate without apertures	–	**CI19E-125/M-NA**[2] 033451		1 off	For connection of conduit and continuous earthing Not for use with PKZ2/ZM...S(-SP)
Insulated enclosures for flush mounting						
For motor-protective circuit-breakers, 3 or 4 pole circuit-breaker						
	IP41 degree of protection, grey front plate with retaining frame, integral PE(N) terminal	PKZ2/ZM-… + NHI + AGM PKZ2/ZM-… +U or A (undervoltage or shunt release) PKZ24/ZM-…	**E-PKZ2** 003218		1 off	For side-wall or door mounting Vertical mounting position Indicator light L-PKZ0 can be fitted
	For degree of protection IP54, door coupling rotary handle PKZ2-X(R)H always required in addition	PKZ2/ZM-… + NHI + AGM PKZ2/ZM-… +U or A (undervoltage or shunt release) PKZ24/ZM-…	**E54-PKZ2** 033939		1 off	For side-wall or door mounting Vertical mounting position Indicator light L-PKZ0 can be fitted

Information relevant for export to North America

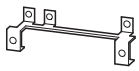
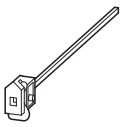
1)

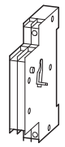
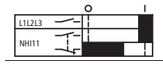
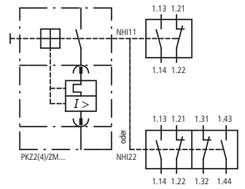
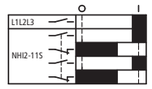
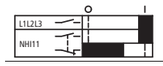
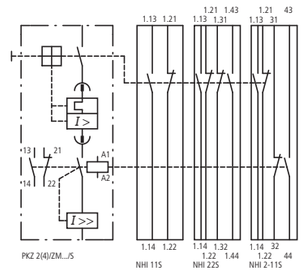
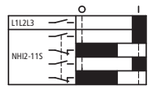
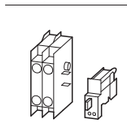
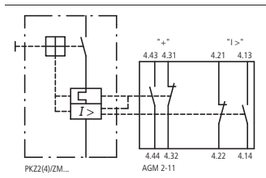
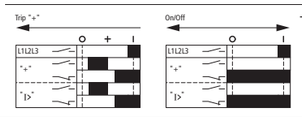
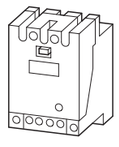
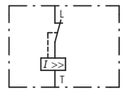
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Specially designed for NA	✓
Degree of Protection	IEC: -, UL/CSA Type: 12
See also	HPL2007/2008_17/36

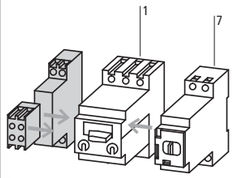
2)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	On request
UL CCN	On request
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Specially designed for NA	✓
Degree of Protection	IEC: -, UL/CSA Type: 12
See also	HPL2007/2008_17/36

HPL07057EN

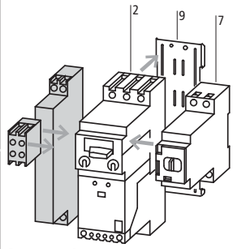
		Color	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Neutral terminal								
For connecting a 5th conductor in enclosure E-PKZ2, E54-PKZ2								
	–	–	**N-PKZ2** 003219		1 off	–		
Door coupling handles								
Degree of protection IP65 / UL/CSA Type 4X/Type 12								
	For use as main switch to EN 60204	Black	**PKZ2-XH** 106127		1 off	Lockable in 0-position Suitable for 3 padlocks with 4 – 8 mm hasp thickness	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV 12528 3211-05 UL Listed, CSA certified
	For use in MCC distribution boards with PKZ2 turned through 90°. For use as main switch according to EN 60204	Black	**PKZ2-XH-MCC** 106130		1 off			
	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	**PKZ2-XRH** 106128		1 off			
Plug-in extension shaft for door coupling handle								
Can be cut to any required length for mounting depths from 171 – 300 mm								
	–	–	**PKZ2-XAH** 106129		1 off	–	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV 12528 3211-05 UL Listed, CSA certified
Rotary handle for insulated enclosures CI19(23)...-PKZ2								
	–	Black	**PKZ2-XH-CI** 138580		1 off	–		
	–	Red-yellow	**PKZ2-XRH-CI** 138581		1 off	–		

	Contact configuration N/O = normally open contact	NC = normally closed contact	Contact sequence	Circuit diagrams	Part no. Article no.	Price See price list	Std. pack	Notes
Standard auxiliary contacts[1]								
For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters								
	1 N/O	1 NC			**NHI11-PKZ2** 090677		1 off	Can be fitted to circuit-breakers and (high-capacity) compact starters. Can be combined with trip-indicating auxiliary contacts AGM
	2 N/O	2 NC			**NHI22-PKZ2** 097796		1 off	
For compact starters								
	1 N/O	1 NC			**NHI11S-PKZ2** 007623		1 off	Can be fitted to starter combinations Can be combined with AGM trip-indicating auxiliary contacts
	2 N/O	2 NC			**NHI22S-PKZ2** 000504		1 off	
	2 x 1 N/O	2 x 1 NC			**NHI2-11S-PKZ2** 009996		1 off	
Trip indicating auxiliary contacts with short-circuit indicator[1]								
For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters								
	2 x 1 N/O	2 x 1 NC			**AGM2-11-PKZ2** 017115		1 off	Differential remote indication: a) General trip indication "+", overload, b) Short-circuit releases Can be fitted to circuit-breakers and (high-capacity) compact starters, Can be combined with standard auxiliary contacts NHI… or NHI…S
Short-circuit indicators[2]								
For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters								
	–	–			**K-AGM-PKZ2** 021861		5 off	Local short-circuit indication by indicator, can be reset. Can be used in circuit-breakers and (high-capacity) compact starters
Current limiters								
Increase the switching capacity of non auto-protected motor-protective circuit-breakers to 100 kA/500 V								
	–	–	–		**CL-PKZ2** 076439		1 off	Max. rated operating voltage U_e = 690 V Rated uninterrupted current I_u = 40 A Can be retrofitted to circuit-breaker or separately positioned with EZ base Can be used for individual protection When fitting to circuit-breaker, clip plate C-PKZ2 always required



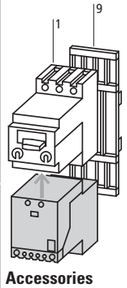
Accessories **Page**

1 Motor-protective circuit-breaker, circuit-breakers → 7/48
7 Remote operators → 7/62
Additional accessories → 7/56



Accessories **Page**

2 (High-capacity) compact starter → 7/51
7 Remote operators → 7/62
9 Clip plate → 7/69
Additional accessories → 7/56

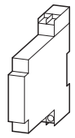
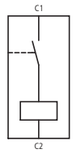
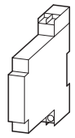
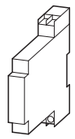
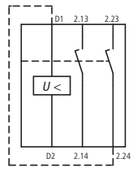
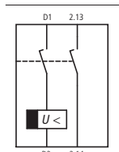


Accessories **Page**

1 Motor-protective circuit-breaker, circuit-breakers → 7/48
9 Clip plate → 7/69
Additional accessories → 7/56

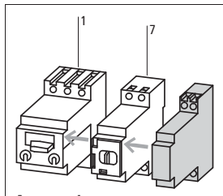
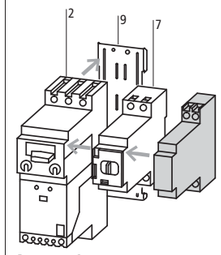
Information relevant for export to North America

1)		2)	
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E29184	CSA File No.	1017555
UL CCN	NKCR	CSA Class No.	3211-05
CSA File No.	12528	NA Certification	UL Listed, CSA certified
CSA Class No.	3211-05		
NA Certification	UL Listed, CSA certified		

	Circuit diagrams	Contact sequence	Actuating voltage Voltage and frequency combination that can be implemented with a voltage trigger coil		
Shunt release (for power circuit-breakers)					
For AC and DC voltage					
			24 V DC 24 V 50 Hz 24 V 60 Hz	48 V DC 48 V 50 Hz 48 V 60 Hz	60V DC
			110 V DC 110 V 50 Hz 230 V 50 Hz 110 V 60 Hz 220 V 60 Hz	125 V DC 127 V 50 Hz 240 V 50 Hz 120 V 60 Hz 240 V 60 Hz	250 V DC 220 V 50 Hz 208 V 60 Hz
			380 V 50 Hz 440 V 50 Hz 480 V 60 Hz	400 V 50 Hz 500 V 50Hz 600 V 60 Hz	415 V 50 Hz
Undervoltage releases, non-delayed					
Without auxiliary contacts					
		For AC	–		
		For DC	–		
With auxiliary contact for AC					
			–		
Undervoltage releases off-delayed, delay time 200 ms					
With auxiliary contact for AC					
			–		

Information relevant for export to North America

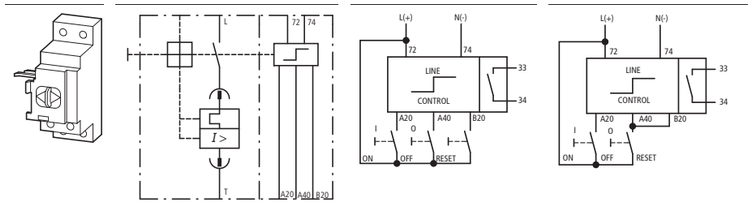
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Part no. Article no.	**Price** See price list	Std. pack	**Notes**	**Notes**
A-PKZ2-A 063967		1 off	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator.	 **Accessories** **Page** 1 Motor-protective circuit-breaker, circuit-breakers → 7/48 7 Remote operators → 7/62 Additional accessories → 7/56
A-PKZ2-B 063964		1 off		
A-PKZ2-C 063930		1 off		
U-PKZ2(230V50HZ,240V60HZ) 065766		1 off	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator. When combined with circuit-breaker can be used as emergency switching off device to IEC/EN 60204.	 **Accessories** **Page** 2 (High-capacity) compact starter → 7/51 7 Remote operators → 7/62 9 Clip plate → 7/69 Additional accessories → 7/56 Further actuating voltages → 7/70
U-PKZ2(24VDC) 014463		1 off		
U-HI20-PKZ2(230V50HZ,240V60HZ) 065768		1 off	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator. Two early-make N/O contacts built in. When combined with circuit-breaker, can be used as emergency switching off device to IEC/EN 60204. When the circuit-breaker is in the tripped position "+", the auxiliary contacts are closed. The undervoltage release can be energized early with an additional bridge (see circuit diagram). This function cannot be used in combination with RE/RS-PKZ2 (remote operator).	
UVHI-PKZ2(230V50HZ,240V60HZ) 065770		1 off	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator. Two early-make N/O contacts built in. Voltage drops ≦ 200 ms do not cause opening; contact time 200 ms when switching on. When the circuit-breaker is in the tripped position "+", the auxiliary contacts are closed.	

Circuit diagrams	Circuit diagram for pulsed operation	
	OFF and RESET separate	OFF equals RESET

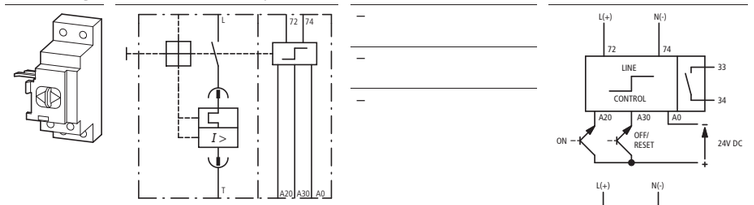
RE-PKZ2 remote operator

Actuation through auxiliary contact



Power and control sections (line and control) have the same reference potential. Pulsed actuation (≧ 2 VA/W, 15 ms) and two-wire control actuation are possible. Upon activation, the power section is supplied with power directly from the mains (700 VA/W, 30 ms). The control section can be actuated through NHI, AGM, ETS4-VS3, M22-(C)K…, PLC with floating contacts without RC suppressor circuit.

Actuation through PLC semiconductor outputs

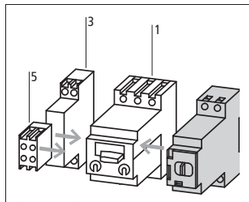


The power section and control section (line and control) are galvanically isolated from each other. Control section always 24 V. Safe isolation between the power section and control section is guaranteed. Pulsed (≧ 2 VA/W, 15 ms) and two-wire control activation are possible. The control section can be actuated directly through PLC electronic outputs (24 VDC). When actuated, the power section is supplied with power directly from the mains (700VA/W, 30 ms).

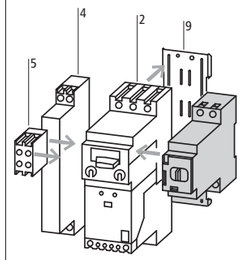
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Part no. Article no.	**Price** See price list	Std. pack	**Notes**
RE-PKZ2(220-240V50/60HZ,DC) 063676		1 off	Can be fitted to circuit-breakers and (high-power) compact starters. Switches circuit-breakers ON/OFF remotely (or OFF after tripping). Remote operator can be switched off locally and the thumb-grip locked with a 6 mm padlock. Suitable for AC or DC voltage. Can be combined with voltage release U, U-HI20, UVHI-PKZ2 or A-PKZ2. Standard auxiliary contact NHI is always required for the combination of circuit-breaker and Remote operator RE/RS-PKZ2. Cannot be combined with door coupling handle PKZ2-X(R)H. . Mounting possible in switch position. Internal electronic interlock always prioritizes “OFF”. Green slider position ≙ ,"Manual" position (33/34) open. Red slider position ≙ ,"Auto" position (33/34) closed. In “manual” position remote switching is not possible.
RE-PKZ2(110-120V50/60HZ,DC) 063673		1 off	
RE-PKZ2(24V50/60HZ,DC) 063670		1 off	
RS-PKZ2(220-240V50/60HZ,DC) 063688		1 off	
RS-PKZ2(380-415V50/60HZ) 063689		1 off	
RS-PKZ2(24V50/60HZ,DC) 063682		1 off	

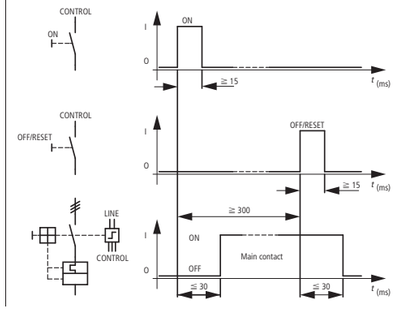


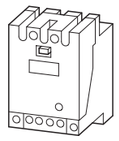
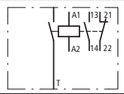
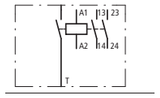
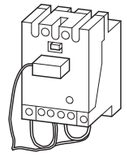
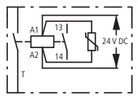
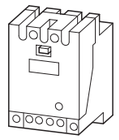
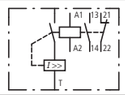
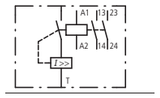
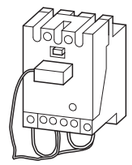
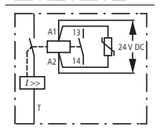
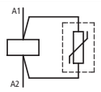
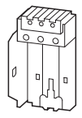
Accessories	**Page**
1 Motor-protective circuit-breaker, circuit-breakers	→ 7/48
3 Standard auxiliary contacts	→ 7/58
5 Trip-indicating auxiliary contact	→ 7/58
Additional accessories	→ 7/56



Accessories	**Page**
2 (High-capacity) compact starter	→ 7/51
4 Standard auxiliary contacts	→ 7/58
5 Trip-indicating auxiliary contact	→ 7/58
9 Clip plate	→ 7/69

Minimum command time:



	Circuit diagrams		Max. motor rating AC-3 220 V 230 V 240 V P kW	380 V 400 V 415 V P kW	440 V P kW	500 V P kW	660 V 690 V P kW	Auxiliary contacts N/O = normally open contact	NC = normally closed contact	For use with
Contact modules										
		–	11	20	22	24	30	1 N/O	1 NC	PKZ2(4)
		–	11	20	22	24	30	2 N/O	–	PKZ2(4)
		–	11	20	22	24	30	1 N/O	–	PKZ2(4)
High-capacity contact module, with current limiting contacts[1)]										
		–	11	20	22	24	30	1 N/O	1 NC	PKZ2(4)
		–	11	20	22	24	30	2 N/O	–	PKZ2(4)
		–	11	20	22	24	30	1 N/O	–	PKZ2(4)
Varistor suppressor										
		24 - 48 V AC	–	–	–	–	–	–	–	S(E1A)-...-PKZ2
		110 - 250 V AC	–	–	–	–	–	–	–	S(E1A)-...-PKZ2
Bases for separate mounting[2)]										
		–	–	–	–	–	–	–	–	S(E1A)-...-PKZ2 CL-PKZ2

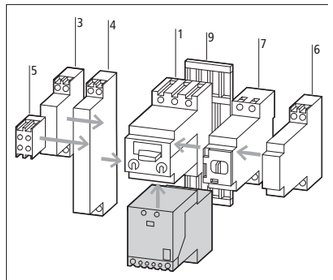
Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
See also	→ Page 7/75

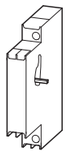
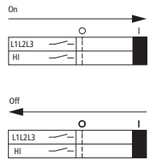
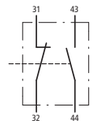
2)

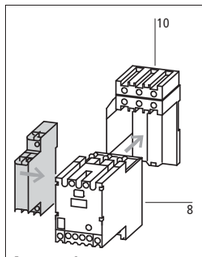
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

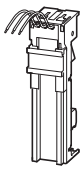
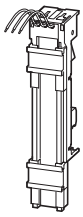
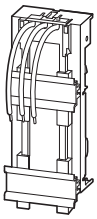
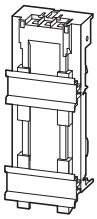
Part no. Article no.	**Price** See price list	Std. pack	**Notes**	**Notes**
SE1A/11-PKZ2(230V50HZ,240V60HZ) 063711		1 off	Order clip plate for snap-fitting the combination separately. Can be fitted to 3 or 4 pole circuit-breaker. When combined with a clip plate, can be snap-fitted to one or two IEC/EN 60715 top-hat rails with 15 mm height. Can be mounted separately using base (see below), RC suppressor on request. DC version: The coil cannot be changed. Built-in auxiliary contact HI10-S-PKZ2 can be switched freely. The auxiliary contact cannot be changed. DC version with suppressor circuit (varistor suppressor). High-capacity contact modules with serial no. 01 suitable for mounting with MV-PKZ2.	
SE1A/20-PKZ2(230V50HZ,240V60HZ) 063718		1 off		
SE1A-G-10-PKZ2(24VDC) 058856		1 off		
S-PKZ2(230V50HZ,240V60HZ) 063696		1 off	Order clip plate for snap-fitting the combination separately. Can be fitted to 3 or 4 pole circuit-breaker. When combined with a clip plate, can be snap-fitted to one or two IEC/EN 60715 top-hat rails with 15 mm height. Can be mounted separately using base (see below), RC suppressor on request. A coil change is not possible, the integrated HI10-S-PKZ2 auxiliary contact can be switched freely, an auxiliary contact change is not possible. With suppressor circuit (varistor suppressor). High-capacity contact modules with serial no. 01 suitable for mounting with MV-PKZ2.	
S/HI20-S-PKZ2(230V50HZ,240V60HZ) 063703		1 off		
S-G-PKZ2(24VDC) 070921		1 off		
VGSPKZ48 063974		10 off	For (high-power) contact modules with AC actuation, 50 - 60 Hz	
VGSPKZ250 063973		10 off		
EZ-PKZ2 028596		1 off	For retrofitting of (high-capacity) contact module or current limiter, separate mounting When mounting separately, also functions as mounting base for auxiliary contact HI11-S/EZ-PKZ2. Can be snap-fitted on IEC/EN 60715 top-hat rail, or optional M4 screw fixing	

Accessories **Page**

1 Motor-protective circuit-breaker, circuit-breakers → 7/48
3 Standard auxiliary contacts → 7/58
4 Standard auxiliary contacts → 7/58
5 Trip-indicating auxiliary contact → 7/58
6 Shunt releases, undervoltage releases → 7/60
7 Remote operators → 7/62
9 Clip plate → 7/69
Further actuation voltages → 7/71
Additional accessories → 7/56

	Contact configuration N/O = normally open contact	NC = normally closed contact	Contact sequence	Circuit diagrams
Control cable connection				
	–	–	–	–
Auxiliary contacts for (high-capacity) contact module, separate mounting				
Can be fitted on side of base for separate mounting				
	1 N/O	1 NC		
Auxiliary contacts for (high-capacity) contact module				
Auxiliary contacts for exchange of integrated auxiliary contact in (high-capacity) contact module Exchange not possible with contact module SE1A-G-10-PKZ2 or high-capacity contact module S-G-PKZ2				
	1 N/O	1 NC	–	–
	2 N/O	–	–	–
Mechanical interlock				
For mechanically interlocking two separately mounted (high-capacity) contact modules or two (high-capacity) compact starters. 4 end brackets are included Can be combined with high-capacity contact module S-PKZ2 with serial no. 01				
	–	–	–	–

Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
ST-PKZ2 010998		3 off	1 set = 2 off VDE/IEC and UL/CSA compliant Connection option for fast-on connectors (insulated/non-insulated) 2.8 mm Max. cross-section 0.5 - 1 mm², 20 - 16 AWG Max. current tap off 1 A or 15 % of the set value Increase setting of thermal release accordingly. Enables control circuit supply to be tapped off between motor-protective circuit-breaker or circuit-breaker and (high-capacity) contact module.	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
HI11-S/EZ-PKZ2 090305		1 off		Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
HI11-S-PKZ2 033936		1 off	**Accessories** — **Page** 8 High-capacity contact modules → 7/64 10 Base for separate mounting → 7/64	
HI20-S-PKZ2 033935		1 off	Further actuating voltages → 7/70	
MV-PKZ2 033938		1 off		Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified

	Rated operating voltage U_e V	Cable cross-section	Adapter width mm	Mounting rails Number	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Busbar adapters for PKZ									
Approved to UL 508. For fitting to flat copper busbar with 60 mm between busbar centers, suitable for 5 mm and 10 mm busbar thickness.									
Rated operational current 63 A									
For motor-protective circuit breakers.									
	690	AWG 8 (10 mm²)	72	1	PKZ2	**BBA2-63**[1] 101458		4 Off	–
	690	AWG 8 (10 mm²)	54	1	PKZM4	**BBA4-63**[1] 101457		4 Off	–
For DOL starters.									
	690	AWG 8 (10 mm²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM40	**BBA2L-63**[1] 101480		2 Off	–
	690	AWG 8 (10 mm²)	55	2	PKZM4 + DILM17 PKZM4 + DILM25 PKZM4 + DILM32 PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	**BBA4L-63**[1] 101459		4 Off	The following can be used for an electrical connection: PKZM4 + DILM40 bis DILM65: PKZM4-XM65DE usable.
	690	AWG 8 (10 mm²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM38 PKZ2 + DILM40 PKZ2 + DILM50 PKZ2 + DILM65 SE1A/…-PKZ2 + C-PKZ2 S-PKZ2 + C-PKZ2	**BBA2-63/2TS**[2] 116900		4 Off	For DOL starters.
Rated operational current 80 A									
Can be used universally.									
	690	–	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM38 PKZ2 + DILM40 PKZ2 + DILM50 PKZ2 + DILM65	**BBA2-80/2TS-S**[2] 116901		4 Off	Universal adapter for 1, 2 and 3-phase applications, not suitable without additional UL/CSA component. For conductor cross-section, round conductors up to 16 mm² or AWG6.

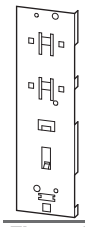
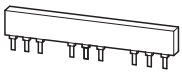
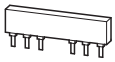
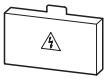
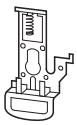
Notes
Information relevant for export to North America

1)

Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Max. Voltage Rating	600 V AC

2)

Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR
NA Certification	UL Recognized, CSA certified
Max. Voltage Rating	600 V AC

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Clip plate					
For optional snap-on and M4 screw fixing for circuit-breakers with (high-power) contact module or current limiter					
	Can be used with busbar adapter	**C-PKZ2** 052710		2 Off	Can be snap-fitted to one IEC/EN 60715 top-hat rails with 15 mm height or two top-hat rails exceeding 10 mm height UL/CSA certification not required
Three-phase commoning links					
	For wiring 3 PKZ2s, space is provided for either 2 auxiliary contacts or 2 voltage releases	**B3.1/3-PKZ2**[1] 033940		5 Off	Can be extended to several PKZ2s by rotated mounting, protected against accidental contact U_e = 690 V, I_u = 120 A, short-circuit proof
	For wiring of 2 PKZ2, space is provided for either 1 auxiliary contact or 1 shunt release	**B3.1/2-PKZ2**[1] 063969		5 Off	
Supply terminal					
For three-phase commoning link, protected against accidental contact U_e = 690 V, I_u = 120 A					
	–	**BK50/3-PKZ2**[2] 033941		2 Off	For connection of: max. 1 x 50 mm² or 2 x 35 mm² above one another; min. 1 x 1 mm² or 2 x 1 mm²
Shroud for unused terminals					
Protection against direct contact. To cover unused terminals on three-phase commoning link					
	–	**H-B3-PKZ2** 063968		10 Off	Snap-fitting option must be available on the three-phase commoning link
Padlocking feature					
For locking the circuit-breaker in the 0 position when the control panel door is open (rear-mounting type)					
	–	**SVB-PKZ2**[1] 050337		5 Off	Suitable for 3 padlocks with 5 – 8 mm hasp thickness
Coding pins					
For coding (in dual coding system) the devices assigned from trip block to PKZ2(4) basic device					
	–	**CS-PKZ2**[3] 055083		1 Off	–
Documentation					
PKZM2 motor-protective circuit breakers, overload monitoring of EEx e motors					
	German/English	**AWB1210-1485D/GB** 266166		1 Off	–

Information relevant for export to North America

1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

2)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	98494
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified

3)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	On request
NA Certification	UL Listed, CSA certified

Compact starters
Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-1/SE1A/11(...)	PKZ2/ZM-1.6/SE1A/11(...)	PKZ2/ZM-2.4/SE1A/11(...)	PKZ2/ZM-4/SE1A/11(...)	PKZ2/ZM-6/SE1A/11(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063364	063372	063382	063392	063402
110 V 50/60 Hz	–	–	–	–	063408
230 V 50/60 Hz	063369	063379	063389	063399	063409

Compact starters
Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-10/SE1A/11(...)	PKZ2/ZM-16/SE1A/11(...)	PKZ2/ZM-25/SE1A/11(...)	PKZ2/ZM-32/SE1A/11(...)	PKZ2/ZM-40/SE1A/11(...)	PKZ2/SE1A/11(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063412	063422	063432	063442	063452	082142
110 V 50/60 Hz	063418	063428	063438	063448	063458	–
230 V 50/60 Hz	063419	063429	063439	063449	063459	082148

High-capacity compact starters
Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-1/S(...)	PKZ2/ZM-1.6/S(...)	PKZ2/ZM-2.4/S(...)	PKZ2/ZM-4/S(...)	PKZ2/ZM-6/S(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063472	063482	063492	063502	063512
110 V 50/60 Hz	063478	063488	063498	063508	063518
230 V 50/60 Hz	063479	063489	063499	063509	063519

High-capacity compact starters
Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-10/S(...)	PKZ2/ZM-16/S(...)	PKZ2/ZM-25/S(...)	PKZ2/ZM-32/S(...)	PKZ2/ZM-40/S(...)	PKZ2/S(...)
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list	See price list	See price list	See price list
110 V 50 Hz, 120 V 60 Hz	–	–	–	–	–	063570
230 V 50 Hz, 240 V 60 Hz	063522	063532	063542	063552	063562	063572
24 V 50/60 Hz	–	–	–	–	–	063577
110 V 50/60 Hz	063528	063538	063548	063558	063568	–
230 V 50/60 Hz	063529	063539	063549	063559	063569	063579

Notes

[1] To obtain the complete part number, append the actuating voltage (...) to the part nos. given above. Devices with **dual-voltage coils** must be ordered with a **single** article no.

Undervoltage release

	When ordered separately		
AC	**U-PKZ2(...)**	**U-HI20-PKZ2(...)**	**UVHI-PKZ2(...)**
	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list
24 V 50 Hz	055085	-	–
110 V 50 Hz, 120 V 60 Hz	–	063655	–
220 V 50 Hz, 240 V 60 Hz	065685	063656	–
230 V 50 Hz, 240 V 60 Hz	065766	065768	065770
400 V 50 Hz, 440 V 60 Hz	065767	–	–
24 V 50/60 Hz	–	063659	–
Non-standard voltages with the exception of the shown standard voltages[2].	–	See price list	–
...V 50Hz (24 – 600 V)	–	907537[3]	–
...V 60Hz (24 – 600 V)	–	907538[3]	–
DC			
Standard voltage	See price list	–	–
24V DC	014463	–	–
48V DC	028701	–	–

Notes
1) To obtain the complete part number, append the actuating voltage (...) to the part nos. given above. Devices with **dual-voltage coils** must be ordered with a **single** article no.
2) For non-standard voltages, specify the required actuating voltage within the indicated range (... - ... V).
3) Minimum order quantity: 10 units.

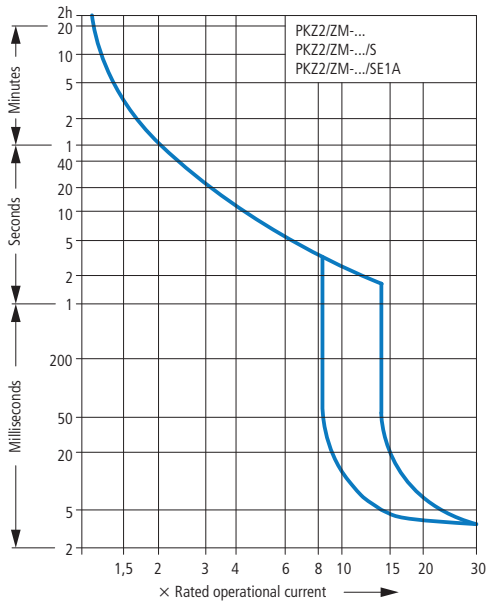
(High-capacity) contact modules

AC	**S-PKZ2(...)**	**S/HI20-S-PKZ2(...)**	**SE1A/11-PKZ2(...)**	**SE1A/20-PKZ2(...)**
	Article no.[1]	Article no.[1]	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list	See price list	See price list
24 V 50 Hz	026609	–	–	–
48 V 50 Hz	062651	056383	–	–
240 V 50 Hz	001882	057048	058716	058717
24 V 60 Hz	062501	–	–	–
110 V 50 Hz, 120 V 60 Hz	063694	063701	063709	063716
190 V 50 Hz, 220 V 60 Hz	063695	–	063710	063717
220 V 50 Hz, 240 V 60 Hz	063699	063706	–	–
230 V 50 Hz, 240 V 60 Hz	063696	063703	063711	063718
400 V 50 Hz, 440 V 60 Hz	063697	–	063712	063719
24 V 50/60 Hz	062500	–	058720	058721
110 V 50/60 Hz	–	–	058696	–
230 V 50/60 Hz	065103	056395	058712	058713

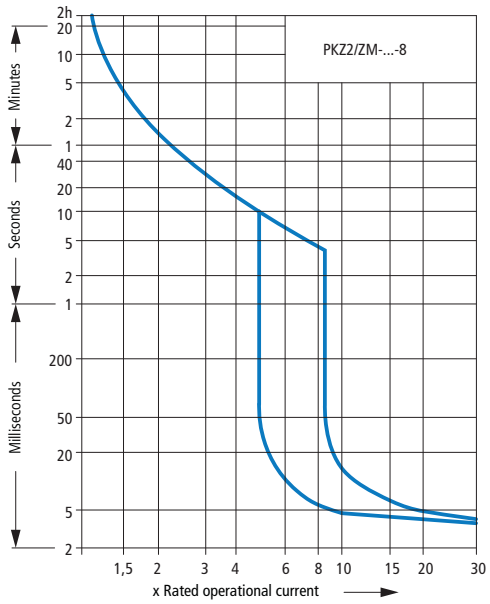
DC	**S-G-PKZ2(...)**	**SE1A-G-10-PKZ2(...)**
	Article no.[1]	Article no.[1]
Standard voltage	See price list	See price list
24 V DC	070921	058856

Notes
1) To obtain the complete part number, append the actuating voltage (...) to the part nos. given above. Devices with **dual-voltage coils** must be ordered with a **single** article no.

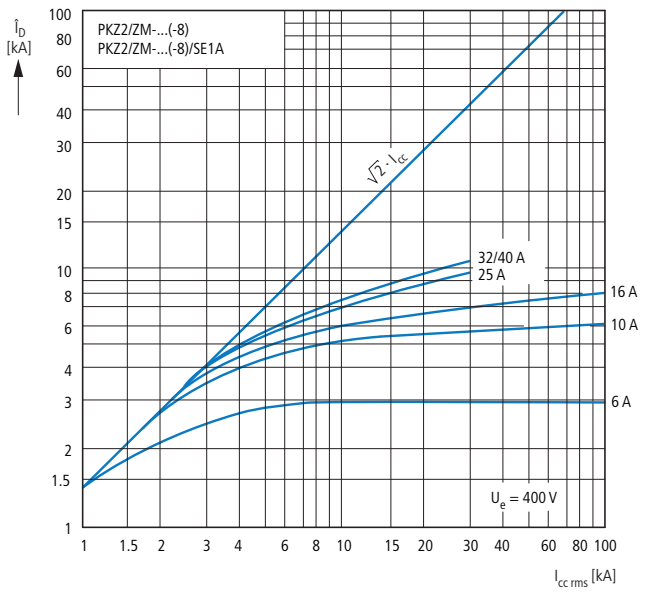
Tripping characteristic curves,motor-protective circuit-breakers, (high-power) compact starters

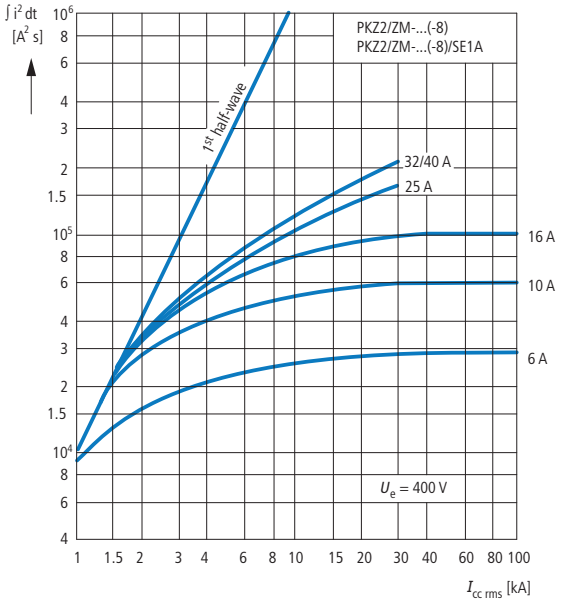


Tripping characteristic curves, line protection

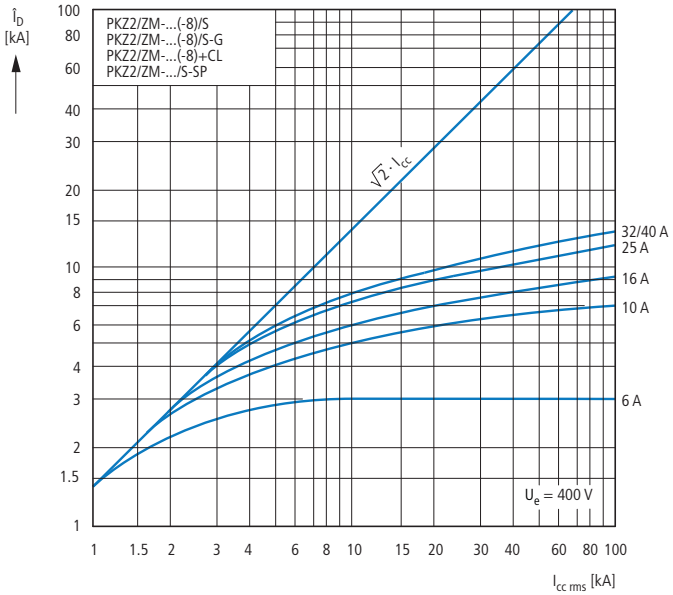


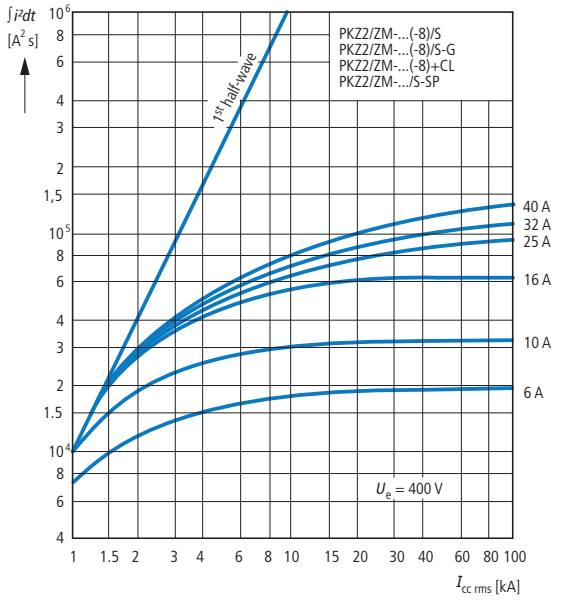
Let-through characteristics, circuit-breakers, compact starters





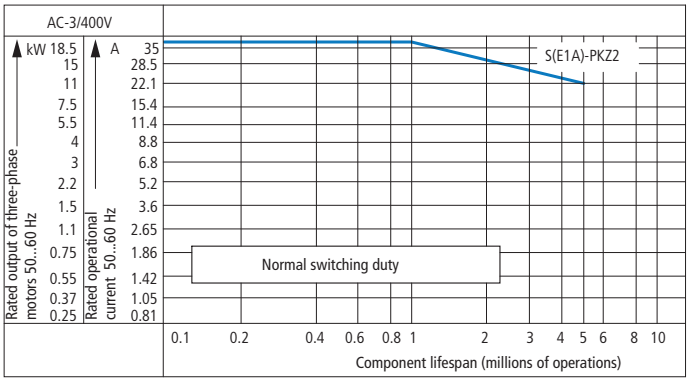
Let-through characteristics, high-capacity compact starters and circuit-breakers + current limiters CL





High-capacity contact module S-PKZ2, contact module SE1A-PKZ2

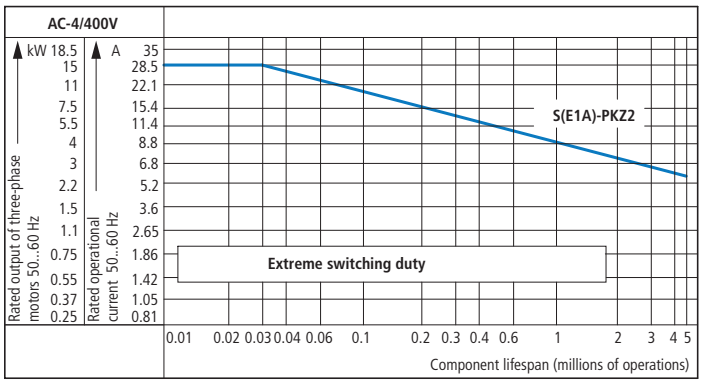
Normal switching duty



Squirrel-cage motor

Operating characteristics:	Switch on:	From standstill
	Switch off:	While running
Typical applications:	Compressors Pumps Fans Hinged flaps	Lifts Escalators Conveyor belts Bucket-elevator
	Mixers Agitators Centrifuges Air-conditioning system	
	General drives for manufacturing and processing machines	
Electrical Characteristic:	Switch on: Switch off:	Up to 6 x motor rated current 1 x motor rated current
Utilization category:	100 % AC-3	

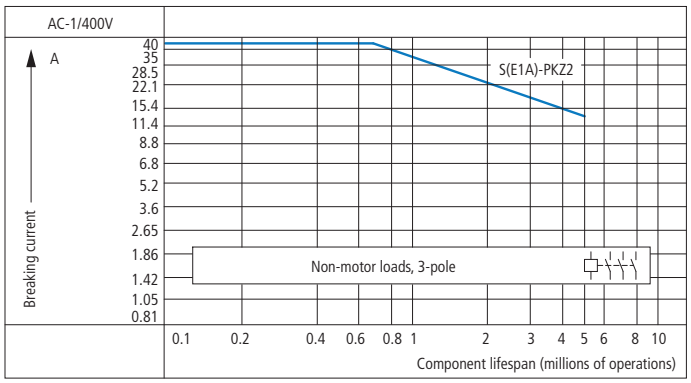
Extreme switching duty



Squirrel-cage motor

Operating characteristics:	Inching, DC braking, reversing	
Typical applications:	Printing machines Wire-drawing machines Centrifuges Special drives for machining centers and machine tools	
Electrical Characteristic:	Switch on: Switch off:	6 x motor rated current 6 x motor rated current
Utilization category:	100 % AC-4	

Light switching duty

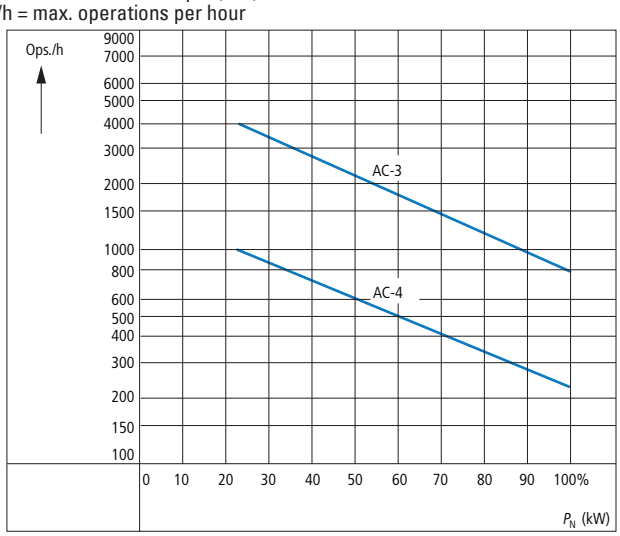


Non-motor loads

Operating characteristics:	Non inductive and slightly inductive loads	
Typical applications:	Electric heat	
Electrical Characteristic:	Switch on: Switch off:	Up to 1.5 x rated operational current
Utilization category:	100 % AC-1	

Determination of the maximum operating frequency dependant on the rating and utilization category (recommended values) for (high capacity) contact modules

PN = max. motor rated output (kW)
Ops/h = max. operations per hour



Motor-protective circuit-breakerswitching capacity and (high-capacity) compact starter

Rated uninterrupted current I_u
Rated conditional short-circuit current I_q IEC/EN 60947-4-1
Rated ultimate short-circuit breaking capacity I_{cu} } IEC/EN 60947-2
Rated breaking capacity I_{cs}

	230 V				400 V				440 V				500 V				690 V			
I_u	I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}		I_q	I_{cu}	I_{cs}	
A	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]	kA	kA	kA	A[1]
PKZ2/ZM with type “1” and “2” coordination																				
0.16 – 1.6				N				N				N				N				N
2.4				N				N				N				N				N
4				N				N				N				N	4.5	4.5	2.5	63
6				N				N				N				N	4.5	4.5	2.5	80
10			30	N			30	N	10	10	5	80	7	7	3.5	80	4.5	4.5	2.5	80
16			30	N			30	N	10	10	5	100	7	7	3.5	100	4.5	4.5	2.5	100
25	30	30	7.5	160	30	30	7.5	160	10	10	5	125	7	7	3.5	125	4.5	4.5	2.5	125
32	30	30	7.5	160	30	30	7.5	160	10	10	5	160	7	7	3.5	160	4.5	4.5	2.5	160
40	30	30	7.5	160	30	30	7.5	160	10	10	5	160	7	7	3.5	160	4.5	4.5	2.5	160
PKZ2/ZM + CL-PKZ2 type “1” and “2” coordination																				
0.16 – 1.6				N				N				N				N				N
2.4				N				N				N				N				N
4				N				N				N				N	10	4.5	2.5	N
6				N				N				N				N	10	4.5	2.5	N
10			30	N			30	N			5	N			3.5	N	10	4.5	2.5	N
16			30	N			30	N			5	N			3.5	N	10	4.5	2.5	N
25			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N
32			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N
40			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N
PKZ2/ZM(R)-.../SE1A(-G)... with type “1” of coordination																				
0.16 – 1.6		N	N	N		N	N	N		N	N	N		N	N	N		N	N	N
2.4		N	N	N		N	N	N		N	N	N		N	N	N		N	N	N
4		N	N	N		N	N	N		N	N	N		N	N	N	4.5	N	N	63
6		N	N	N		N	N	N		N	N	N		N	N	N	4.5	N	N	80
10		N	N	N		N	N	N	10	N	N	80	7	N	N	80	4.5	N	N	80
16		N	N	N		N	N	N	10	N	N	100	7	N	N	100	4.5	N	N	100
25	30	N	N	160	30	N	N	160	10	N	N	125	7	N	N	125	4.5	N	N	125
32	30	N	N	160	30	N	N	160	10	N	N	160	7	N	N	160	4.5	N	N	160
40	30	N	N	160	30	N	N	160	10	N	N	160	7	N	N	160	4.5	N	N	160
PKZ2/ZM-.../S(-G) with type “1” and “2” coordination																				
0.6 – 2.4		N	N			N	N			N	N			N	N			N	N	
4 – 6		N	N			N	N			N	N			N	N		10	N	N	80
10 – 16		N	N			N	N			N	N			N	N		10	N	N	100
25 – 40		N	N			N	N			N	N			N	N		10	N	N	160
PKZ2/ZM-..-8 and PKZ2/ZM-..-8/SE1A(-G)																				
0.16 – 1.6	N			N	N			N	N			N	N			N	N			N
2.4	N			N	N			N	N			N	N			N	N			N
4	N			N	N			N	N			N	N			N	N	4.5	2.5	63
6	N			N	N			N	N			N	N			N	N	4.5	2.5	80
10	N		30	N	N		30	N	N	10	5	80	N	7	3.5	80	N	4.5	2.5	80
16	N		30	N	N		30	N	N	10	5	100	N	7	3.5	100	N	4.5	2.5	100
25	N	30	7.5	160	N	30	7.5	160	N	10	5	125	N	7	3.5	125	N	4.5	2.5	125
32	N	30	7.5	160	N	30	7.5	160	N	10	5	160	N	7	3.5	160	N	4.5	2.5	160
40	N	30	7.5	160	N	30	7.5	160	N	10	5	160	N	7	3.5	160	N	4.5	2.5	160
PKZ2/ZM-...-8/S(-G)																				
0.6 – 2.4	N			N	N			N	N			N	N			N	N			N
4 – 6	N			N	N			N	N			N	N			N	N	10	5	80
10 – 16	N			N	N			N	N			N	N			N	N	10	5	100
25 – 40	N			N	N			N	N			N	N			N	N	10	5	160

Notes

No upstream protective device required,as it is the auto-protected range (100 kA)

N Not necessary

[1] Fuse (A gG/gL) for increasing the switching capacity of the motor-protective circuit-breakerto 100 kA

Approvals for world markets

Approved rating data[1] UL 508/CSA C 22.2 No. 14	**Maximum motor rating**				Setting ranges		Maximum protective device to UL/CSA			
	Three-phase current				Overload releases	Short-circuit-releases	**Group protection**[1]			
							Up to max. short-circuit rating		Maximum fuse rating	Maximum circuit breaker
	200 V	230 V	460 V	575 V			480 V	600 V		
	HP	HP	HP	HP	A	A	kA	kA	A	A
Motor-protective circuit-breakers PKZ2	"Manual Motor Starter with thermal and magnetic trip"									
PKZ2/ZM-0.6	[2]				0.4 – 0.6	5 – 8	65	42	500	600
PKZ2/ZM-1			½	½	0.6 – 1	8 – 14	65	42	500	600
PKZ2/ZM-1.6			¾	1	1 – 1.6	14 – 22	65	42	500	600
PKZ2/ZM-2.4	½	½	1	1½	1.6 – 2.4	20 – 35	65	42	500	600
PKZ2/ZM-4	1	1	2	3	2.4 – 4	35 – 55	65	42	500	600
PKZ2/ZM-6	1½	1½	3	5	4 – 6	50 – 80	65	42	500	600
PKZ2/ZM-10	2	3	5	7½	6 – 10	80 – 140	65	42	500	600
PKZ2/ZM-16	3	5	10	10	10 – 16	130 – 220	65	42	500	600
PKZ2/ZM-25	7½	7½	20	25	16 – 27	200 – 350	65	42	500	600
PKZ2/ZM-32	10	10	20	30	24 – 32	275 – 425	65	42	500	600
PKZ2/ZM-40	10	15	30	30	32 – 42	350 – 500	65	42	500	600
High-power compact starters PKZ2	"Manual Motor Starter with thermal, magnetic trip and contactor"									
PKZ2/ZM-0.6/S(...)	[2]				0.4 – 0.6	5 – 8	65	42	2000	2000
PKZ2/ZM-1/S(...)			½	½	0.6 – 1	8 – 14	65	42	2000	2000
PKZ2/ZM-1.6/S(...)			¾	1	1 – 1.6	14 – 22	65	42	2000	2000
PKZ2/ZM-2.4/S(...)	½	½	1	1½	1.6 – 2.4	20 – 35	65	42	2000	2000
PKZ2/ZM-4/S(...)	1	1	2	3	2.4 – 4	35 – 55	65	42	2000	2000
PKZ2/ZM-6/S(...)	1½	1½	3	5	4 – 6	50 – 80	65	42	2000	2000
PKZ2/ZM-10/S(...)	2	3	5	7½	6 – 10	80 – 140	65	42	2000	2000
PKZ2/ZM-16/S(...)	3	5	10	10	10 – 16	130 – 220	65	42	2000	2000
PKZ2/ZM-25/S(...)	7½	7½	20	25	16 – 27	200 – 350	65	42	2000	2000
PKZ2/ZM-32/S(...)	10	10	20	30	24 – 32	275 – 425	65	42	2000	2000
PKZ2/ZM-40/S(...)	10	15	30	30	32 – 42	350 – 500	65	42	2000	2000
High-capacity contact modules	"Contact module" in combination with PKZ2/ZM(R)-... motor-protective circuit-breakeror base for separate mounting of EZ-PKZ2									
S-PKZ2(...)	10		15		30	30				
S/HI20-S-PKZ2(...)	10		15		30	30				
S-G-PKZ2(...)	10		15		30	30				
Reversing combination	"Reversing combination" in combination with trip block ZM-...PKZ2 for motor protection									
PKZ2/SW-MV-11(...)	10		15		30	30				
Reversing busbar sys-						42 A 600 V AC				
	A BK50/3-PKZ2 terminal must be ordered separately for UL/CSA use.									

[1] Caution: Changed requirements for group protection

[2] Calculate motor power in this range according to the rated operational current.

Approved rating data[1] UL 508/CSA C 22.2 No. 14	**Maximum motor rating** Three-phase current				Setting ranges	
					Overload releases	Short-circuit-releases
	200 V 208 V HP	230 V 240 V HP	460 V 480 V HP	575 V 600 V HP	A	A
Basic device	"Basic device" In connection with motor protection trip block ZM-...-PKZ2 ZMR -...-PKZ2					
PKZ2	10	15	30	30		
Motor protection trip module with overload relay function	"Motor Protection Trip Module with overload relay function"					
ZMR-0.6-PKZ2	[2]				0.4 – 0.6	5 – 8
ZMR-1-PKZ2			½	½	0.6 – 1	8 – 14
ZMR-1.6-PKZ2			¾	1	1 – 1.6	14 – 22
ZMR-2.4-PKZ2	½	½	1	1½	1.6 – 2.4	20 – 35
ZMR-4-PKZ2	1	1	2	3	2.4 – 4	35 – 55
ZMR-6-PKZ2	1½	1½	3	5	4 – 6	50 – 80
ZMR-10-PKZ2	2	3	5	7½	6 – 10	80 – 140
ZMR-16-PKZ2	3	5	10	10	10 – 16	130 – 220
ZMR-25-PKZ2	7½	7½	20	25	16 – 27	200 – 350
ZMR-32-PKZ2	10	10	20	30	24 – 32	275 – 425
ZMR-40-PKZ2	10	15	30	30	32 – 42	350 – 500
Auxiliary contact ZMB	Pilot Duty		D 300, R 300			
	General Purpose		1.5 A 240 V AC			
			0.6 A 600 V AC			
	Terminal capacity		AWG 18 … 14			
	Torque		1 Nm/9 lb.-in			
Motor protection Trip module						
ZM-1.6-PKZ2	[2]				0.4 – 0.6	5 – 8
ZM-1-PKZ2			½	½	0.6 – 1	8 – 14
ZM-1.6-PKZ2			¾	1	1 – 1.6	14 – 22
ZM-2.4-PKZ2	½	½	1	1½	1.6 – 2.4	20 – 35
ZM-4-PKZ2	1	1	2	3	2.4 – 4	35 – 55
ZM-6-PKZ2	1½	1	3	5	4 – 6	50 – 80
ZM-10-PKZ2	2	3	5	7½	6 – 10	80 – 140
ZM-16-PKZ2	3	5	10	10	10 – 16	130 – 220
ZM-25-PKZ2	7½	7½	20	25	16 – 27	200 – 350
ZM-32-PKZ2	10	10	20	30	24 – 32	275 – 425
ZM-40-PKZ2	10	15	30	30	32 – 42	350 – 500

Notes

Service factor (SF)

Set value I_r on the current scale depending on the load factor

SF = 1.15 → I_r = 1 x $I_{n\ mot}$

SF = 1 → I_r = 0.9 x $I_{n\ mot}$

Terminal capacity

High-capacity compact starters PKZ2/ZM-.../S,

Motor-protective circuit-breakerPKZ2/ZM-...

Cables: Cu 75 °C, min. AWG 14, max. AWG 6

Torque: 1.8 Nm

[1] Devices for world markets IEC q UL/CSA.

[2] Calculate motor power in this range according to the rated operational current.

Stated values to NEC Table 430 – 150.

Approved rating data[1] Ordering data, motor-protective circuit-breaker PKZ2/S-SP "Self-Protected Starter" → Page 7/53		For use with	Pilot Duty	General Use AC	General Use DC
Accessories					
Standard auxiliary contacts	NHI11-PKZ2	PKZ2/ZM..., PKZ2...SP	A 600, R 300	5 A – 600 V 10 A – 300 V	0.5 A – 250 V
	NHI22-PKZ2	PKZ2/ZM..., PKZ2...SP			
	NHI11S-PKZ2	PKZ2/ZM-...			
	NHI22S-PKZ2	PKZ2/ZM-...			
	NHI2-11S-PKZ2	PKZ2/ZM-...			
Trip-indicating auxiliary contacts	AGM2-11-PKZ2	PKZ2/ZM..., PKZ2...SP	A 600, R 300	10 A – 600 V	0.5 A – 250 V[2]
Short-circuit indicators	K-AGM-PKZ2	PKZ2/ZM..., PKZ2...SP			
Shunt release	A-PKZ2-...	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 250 V
	U-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
	U-HI20-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
			B 600, R 300	10 A – 600 V	0.5 A – 250 V
	UVHI-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
			B 600, R 300	10 A – 600 V	0.5 A – 250 V
Auxiliary contacts for contact module	HI11-S-PKZ2	PKZ2/ZM-...	A 600, R 300	10 A – 600 V	0.5 A – 250 V[2]
	HI20-S-PKZ2	PKZ2/ZM-...	A 600	10 A – 600 V	
	HI11-S/EZ-PKZ2	PKZ2/ZM-...	A 600, R 300	5 A – 600 V 10 A – 300 V	0.5 A – 250 V[2]
Remote operator	RE-PKZ2	PKZ2/ZM..., PKZ2...SP	[3]		
	RS-PKZ2	PKZ2/ZM..., PKZ2...SP	D 300 – R 300	1.5 A – 240 V AC 0.6 A – 600 V AC	
Amplifier module for remote drives	ETS4-VS3	PKZ2/ZM..., PKZ2...SP	B 300 – R 300	5 A – 250 V AC	
Clip plates	C-PKZ2	PKZ2/ZM-...			
Door coupling handles	H-PKZ2	PKZ2/ZM..., PKZ2...SP			
	RH-PKZ2	PKZ2/ZM..., PKZ2...SP			
Extension shaft	A-H-PKZ2	PKZ2/ZM..., PKZ2...SP			
Base for separate mounting	EZ-PKZ2	–			
Three-phase commoning links	B3.1/3-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 100 A		
	B3.1/2-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 85 A		
Connecting Terminals for three-phase commoning links	BK50/3-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 100 A Terminal capacity Torque	 AWG 14-0 4.5 Nm	
Padlocking feature	SVB-PKZ2	PKZ2/ZM..., PKZ2...SP			
Mechanical interlock	MV-PKZ2	–			
Coding pins	CS-PKZ2	PKZ2/ZM..., PKZ2...SP			
Busbar adapters	AD-...	PKZ2/ZM..., PKZ2...SP			

Notes

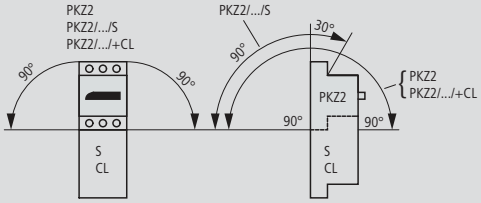
Terminal capacities for all PKZ2 system add-on modules:
- Cables min. AWG 18, max. AWG 14
- Torque 1.0 Nm

[1] Device for world markets IEC = UL/CSA.

[2] >150 V same polarity.

[3] Maximum actuating voltage 120 V 60 Hz or 120 V DC.

Technical data

				PKZ2/ZM-…(8)	PKZ2/ZM-…(8)/SE…	PKZ2/ZM-…(8)/S(+CL)	S(EA)…
General							
Standards				IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14, GL, LR, DNV, PRS, BV, RINA, RS, EZU, MEEI			
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; cyclic to IEC 60068-2-30			
Ambient temperature	Storage		°C	-25…70	-25…70	-25…70	-25…70
	Open		°C	-25…60	-25…60	-25…60	-25…60
	Encapsulated		°C	-25…40	-25…40	-25…40	-25…40
Built-in position							
Direction of incoming supply				Any	Any	Any	Any
Degree of protection				IP00	IP00	IP00	IP00
Mechanical shock resistance							
Half-sinusoidal shock 20 ms to IEC 60068-2-27			g	30	8	8	8
Installation altitude			m	max. 2000	max. 2000	max. 2000	max. 2000
Terminal capacity	Solid or stranded		mm^2	1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)
	Flexible with ferrule		mm^2	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)
	Solid or stranded		AWG	14 - 6	14 - 6	14 - 6	14 - 6
Terminal screw tightening torque	Main conductors		Nm	1.8	1.8	1.8	1.8
	Auxiliary conductors		Nm	1	1	1	1
Main contacts							
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operational voltage		U_e	V AC	690	690	690	690
Rated uninterrupted current = rated operational current		$I_u = I_e$	A	40	40	40	40
Rated frequency			Hz	50 - 60	50 - 60	50 - 60	50 - 60
Heat dissipation (3 pole at operating temperature)			W	14	23	23	9
Lifespan, mechanical[1]		Operations	x 10^6	0.1	5	5	5
Lifespan, electrical	100 % AC-3	Operations	x 10^6	0.05	1	1	1
	AC-4	Operations	x 10^6	–	0.03	0.03	0.03
Maximum operating frequency		Operations/h	Ops/h	60	→ Page 7/72		
Motor switching capacity	AC-3 up to 690 V		A	40	40	40	40
	DC-5 up to 250 V		A	40	40	40	40
DC applications							
Breaking capacity I_{cn}	I_{cn} (250 V DC), L/R = 15 ms		kA	30	30	50	–
	I_{cn} (125 V DC), L/R = 15 ms		kA	50	50	65	–
Switching times in the even of a short-circuit load	Minimum command time		ms	Approx. 2	Approx. 2	Approx. 2	–
	Opening delay		ms	Approx. 0.5	Approx. 0.5	Approx. 0.5	–
	Total opening delay		ms	6	6	4	–

			ZM-…-PKZ2	ZMR-…-PKZ2	ZM-…-8-PKZ2(4)
Trip blocks					
Function			Motor protection	Motor protection	System protection
Temperature compensation	To IEC/EN 60947, VDE 0660	°C	-5…40	-5…40	-5…40
	Operating range	°C	-25…60	-25…60	-25…60
Temperature compensation residual error for T > 40 °C		%/K	≦ 0.25	≦ 0.25	≦ 0.25
Short-circuit release tolerance		%	± 20	± 20	± 20
Setting range of overload releases		x I_u	0.6 - 1	0.6 - 1	0.6 - 1
Short-circuit releases		x I_u	8.5 - 14	8.5 - 14	5 - 8.5

Notes

[1] With dual-frequency coil 50/60 Hz the mechanical lifespan reduces by 30%

					High-capacity contact module S(EA)...
Switching times					
	Closing delay			ms	9 - 30
	Opening delay			ms	4 - 12
Duty factor				% DF	100
Rated making capacity at p.f. = 0.45				A	400
Rated breaking capacity at p.f. = 0.45				A	400
Magnet systems					
AC operation					
	Operating range				
		Pick-up voltage		x U_s	0.85 - 1.1
		Drop-out voltage		x U_s	0.4 - 0.6
	Power consumption				
		AC pick-up rating	Pick-up	VA	190
		AC consumption when closed	Holding	VA	13
DC operation					
	Rated control voltage		U_s	V DC	24
	Operating range				
		Pick-up voltage		x U_s	0.85 - 1.1
	Power consumption				
		DC pick-up rating	Pick-up	W	150
		DC consumption when closed	Holding	W	2.7
	Current consumption				
		Pick-up current (16 - 22 ms)		A	6.3
		Holding current		mA	113
Rated operational current, enclosed/open					
	AC-1	230 V	I_e	A	40
		400 V	I_e	A	40
		440 V	I_e	A	40
		500 V	I_e	A	40
		690 V	I_e	A	40
	AC-3	230 V	I_e	A	40
		400 V	I_e	A	40
		440 V	I_e	A	40
		500 V	I_e	A	40
		690 V	I_e	A	40
	AC-4	230 V	I_e	A	30
		400 V	I_e	A	30
		440 V	I_e	A	30
		500 V	I_e	A	28
		690 V	I_e	A	25
					Current limiters CL-PKZ2
Rated making capacity at p.f. = 0.45				A	400
Rated breaking capacity at p.f. = 0.45				A	400
AC-1 operation	Conventional thermal current		I_{th}	A	40

NHI...PKZ, U-PKZ2

				NHI11(S)-PKZ2	NHI22(S)-PKZ2	NHI2-11S-PKZ2	AGM2-11-PKZ2	HI...-S-PKZ2	HI11-S/EZ-PKZ2	ZMR-...(95 - 96)	ZMR-...(97 - 98)
Auxiliary contacts											
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000	6000	6000	6000	6000	6000	6000
Overvoltage category/degree of pollution				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated operating voltage		U_e	V AC	500	500	500	500	500	500	500	500
Rated operational current											
AC-15	230 - 240 V	I_e	A	6	6	6	5	6	6	1.5	1.5
	400 - 415 V	I_e	A	3	1.5	3	3	1.5	3	0.7	0.5
	440 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5	0.5	0.3
	500 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5	0.5	0.3
Lifespan, mechanical		Operations	x 10^6	0.1	0.1	5	0.01	5	5	0.01	0.01
Lifespan, electrical		Operations	x 10^6	0.05	0.05	1	0.05	1	1	0.05	0.05
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 10 mA)		Fault probability	λ	Control circuit reliability through the entire mechanical lifespan							
Positive opening contacts as specified in EN60947-5-1 Appendix L				–	–	Yes	Yes	–	–	–	–
Short-circuit strength without welding											
Fuseless				240 V: PKZM0-6.3 415 V: PKZM0-4 500 V: PKZM0-1.6						–	–
Fuse			A gG/gL	10	10	10	6	10	10	10	10
Terminal capacity											
Solid or flexible with ferrule			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)							
Solid or stranded			AWG	1 x (22 - 14) 2 x (22 - 14)			22 - 14				
Safe isolation according to EN 61140											
Between auxiliary contacts and main contacts			V AC	690	690	500	–	500	500	–	–

				U-PKZ2...	U-HI20-PKZ2...	UVHI-PKZ2
Undervoltage release						
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3
Terminal capacity						
Solid or flexible conductor with ferrule			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			AWG	22 - 14	22 - 14	22 - 14
Rated operating voltage		U_e	V AC	24 - 600	24 - 600	24 - 600
Rated operating voltage		U_e	V DC	24 - 125	24 - 125	24 - 125
Drop-out voltage			x U_s	0.7 - 0.35	0.7 - 0.35	0.7 - 0.35
Power consumption						
AC voltage						
	AC pick-up rating	Pick-up	VA	5	5	5
	AC consumption when closed	Holding	VA	3	3	3
DC voltage						
	DC pick-up rating	Pick-up	W	3	3	3
	DC consumption when closed	Holding	W	3	3	3
OFF delay			ms	–	–	200
Rated operating current						
AC-15						
	230 V	I_e	A	–	6	6
	400 V	I_e	A	–	3	3
	440 V	I_e	A	–	1.5	1.5

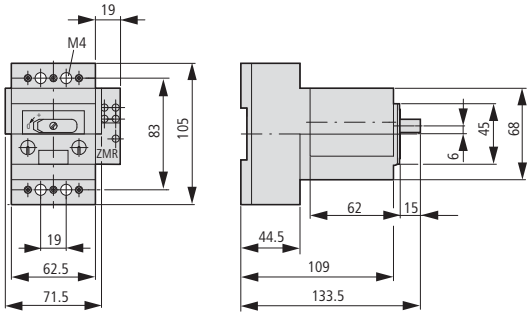
				A-PKZ2…
Shunt release (for power circuit-breakers)				
Rated impulse withstand voltage		U_{imp}	V AC	6000
Overvoltage category/pollution degree				III/3
Terminal capacity				
Solid or flexible conductor with ferrule			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			AWG	22 - 14
Rated operating voltage		U_e	V AC	24 - 600
Rated operating voltage		U_e	V DC	24 - 250
Operating range				
AC voltage			x U_s	0.7 - 1.1
DC voltage			x U_s	0.7 - 1.1
Power consumption				
AC voltage				
	AC pick-up rating	Pick-up	VA	5
	AC consumption when closed	Holding	VA	3
DC voltage				
	DC pick-up rating	Pick-up	W	3
	DC consumption when closed	Holding	W	0.3

				RE-PKZ2	RS-PKZ2
Remote drives					
Rated impulse withstand voltage		U_{imp}	V AC	6000	6000
Overvoltage category/pollution degree				III/3	III/3
Rated operating voltage		U_e	V AC	380 - 440	380 - 440
Rated operating voltage		U_e	V AC/DC	24 - 240	24 - 240
Safe isolation to VDE 0106 Part 101 and Part 101 A1 between the auxiliary contacts and main circuits			V AC	500	500
Required short-time rating (30 ms)			VA/W	700	700
Control transformer short-time rating			VA	1000	1000
Short-circuit voltage			%	4.4	4.4
Closing delay			ms	≦ 30	≦ 30
Opening delay			ms	≦ 30	≦ 30
Reset time to OFF			ms	≦ 30	≦ 30
Maximum operating frequency					
Max. operating frequency			Ops/h	60	60
Operating range					
AC voltage			x U_s	0.85 - 1.1	0.85 - 1.1
DC voltage			x U_s	0.85 - 1	0.85 - 1
Lifespan, electrical		Operations	x 10^6	0.05	0.05
Integrated auxiliary contact (signal manual/automatic 33/34)					
Thermal rated operational current		I_{th}	A	1.5	1.5
Rated operational current					
AC-14	230/240 V	I_e	A	1.5	1.5
	400/415 V	I_e	A	1	1
	440 V	I_e	A	0.5	0.5
Terminal capacity					
Solid or flexible conductor with ferrule			mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			AWG	22 - 14	22 - 14

			BK…-PKZ2, B3.1/…-PKZ2
Supply terminal and three-phase commoning link			
Rated impulse withstand voltage	U_{imp}	V AC	6000
Overvoltage category/pollution degree			III/3
Rated operating voltage	U_e	V AC	690
Rated uninterrupted current	I_u	A	120

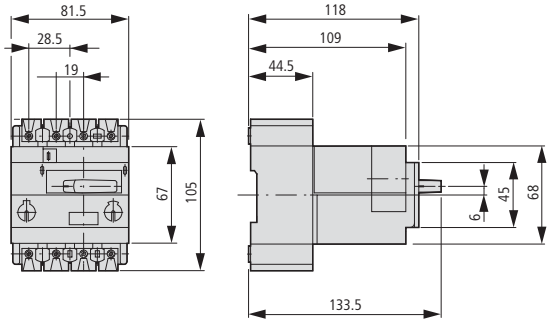
Motor-protective circuit-breakers and trip blocks

PKZ2/ZM… + ZMR-…-PKZ2



Circuit-breakers

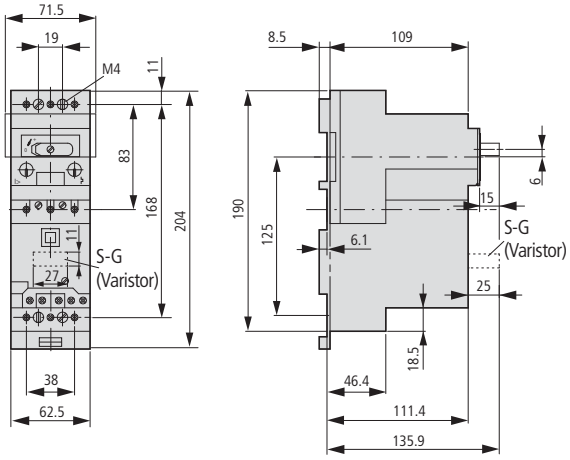
PKZ24



High-capacity compact starters

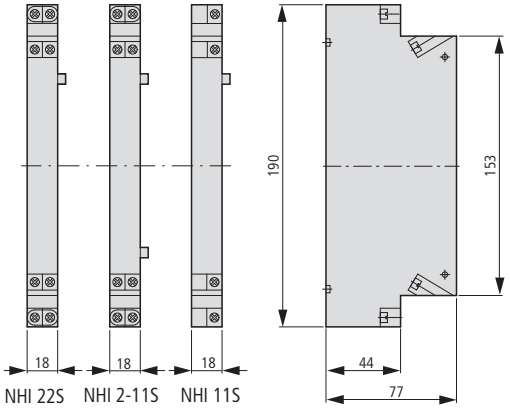
PKZ2/ZM-…/S

PKZ2/ZM-.../SE1A...



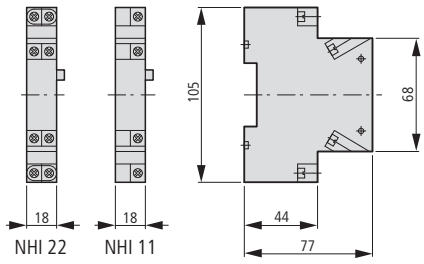
Standard auxiliary contacts for (high-capacity) compact starter

NHI…S-PKZ2



Standard auxiliary contacts

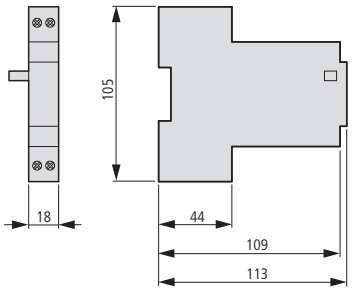
NHI…-PKZ2



Shunt release (for power circuit-breakers)
Undervoltage release

U-PKZ2…

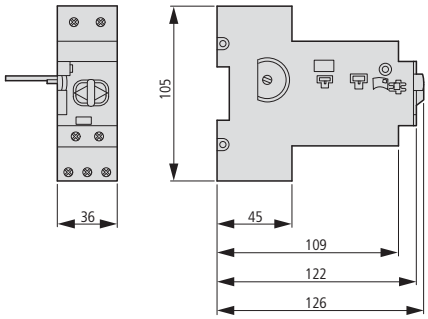
A-PKZ2…



Remote drives

RE-PKZ2…

RS-PKZ2…

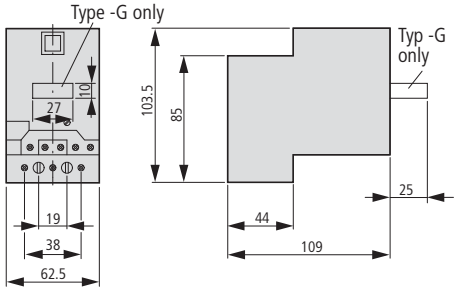


Contact modules
High-capacity contact modules
Current limiters

SE1A/11-PKZ2(...)

S-PKZ2(...)

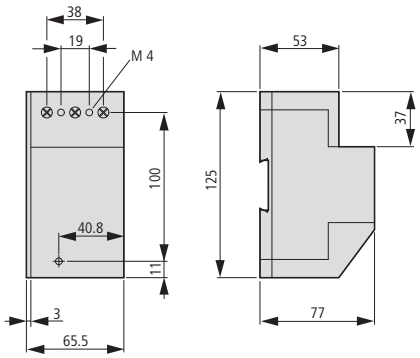
CL-PKZ2



Base for separate mounting
Auxiliary contact for separate mounting

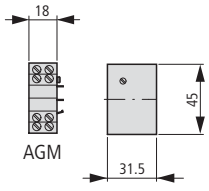
EZ-PKZ2

HI11-S/EZ-PKZ2



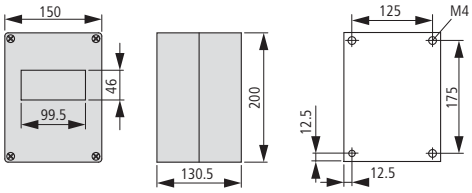
Trip-indicating auxiliary contacts

AGM2-11-PKZ2



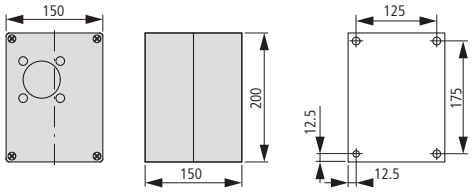
Insulated enclosures for surface mounting

CI19EA-PKZ2

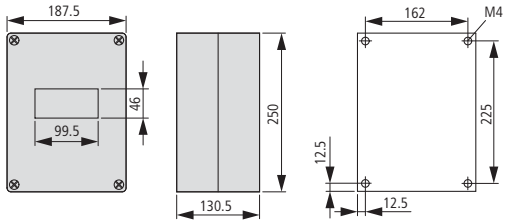


CI19EB-PKZ2
CI19ED-PKZ24

Drilling dimensions

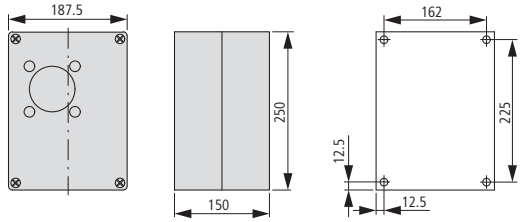


CI23EA-PKZ22



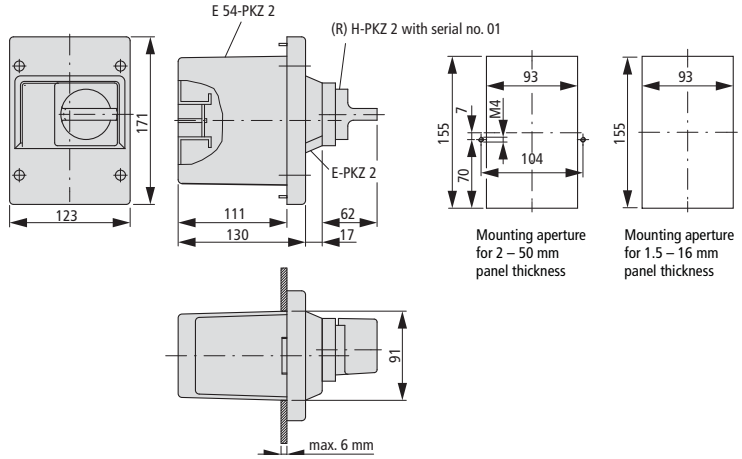
CI23EB-PKZ22

Drilling dimensions



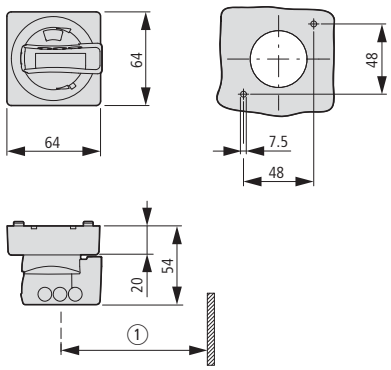
Insulated enclosure for flush mounting

E-PKZ2
E54-PKZ2



Door coupling handles

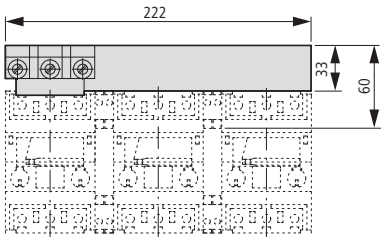
PKZ2-X…



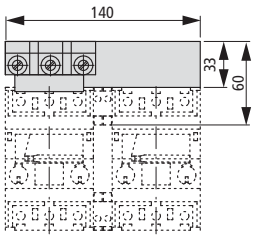
① At least 100 mm from cover hinge

Three-phase commoning links

B3.1/3-PKZ2

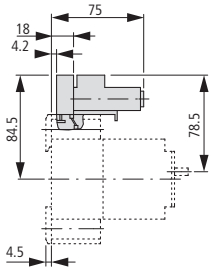


B3.1/2-PKZ2



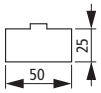
Extension terminal

BK50/3-PKZ2



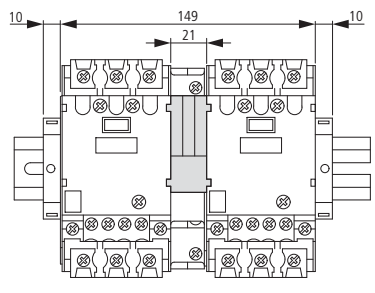
Shroud for unused terminals

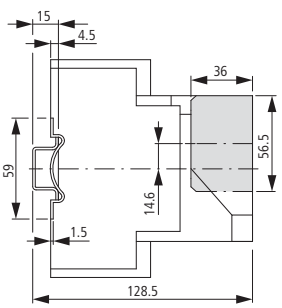
H-B3-PKZ2



Mechanical interlock with (high-capacity) contact module

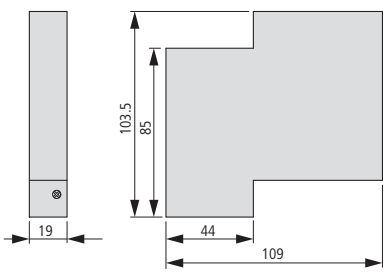
MV-PKZ2





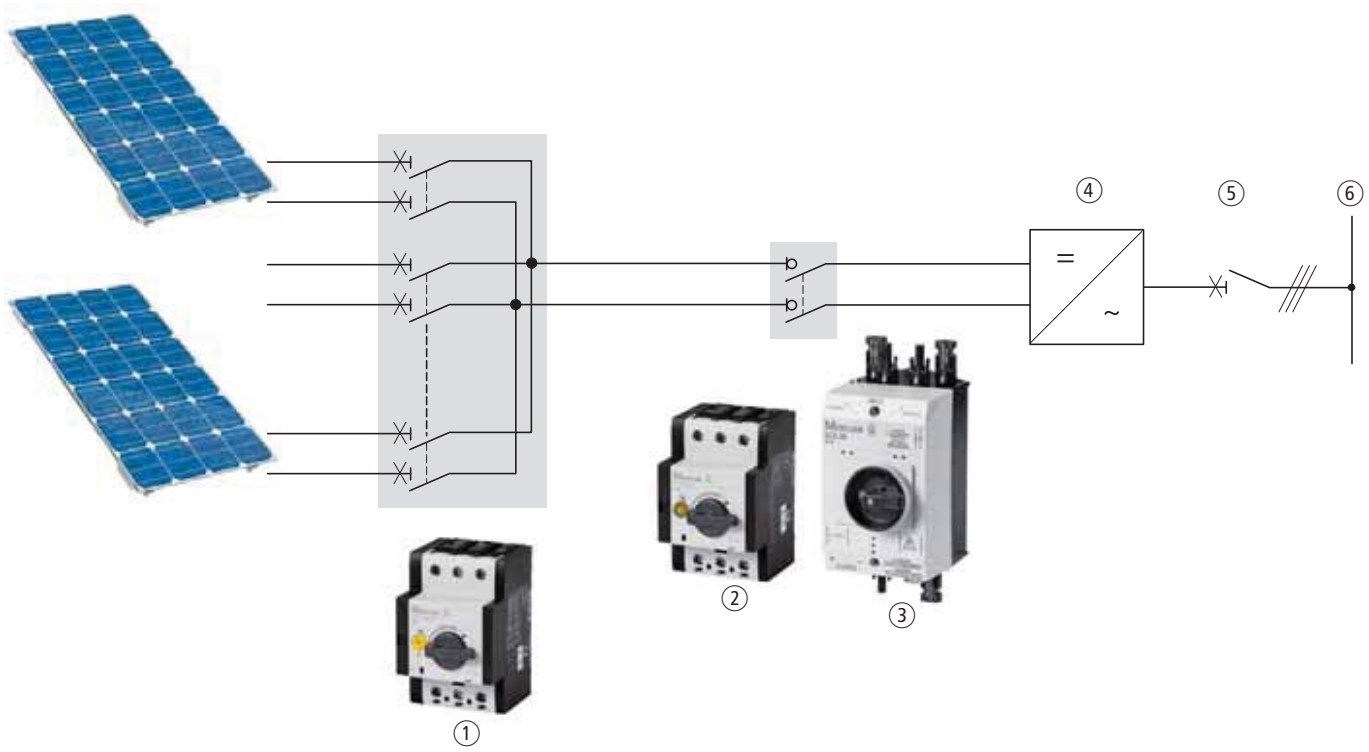
Neutral terminal for (high-capacity) contact module

N-PKZ2



P-SOL, PKZ-SOL, SOL

Description



① DC string circuit-breaker PKZ-SOL
② DC switch-disconnector P-SOL
③ Ready-to-install DC switch-disconnector SOL
④ Inverter module
⑤ AC main switch
⑥ Network

Photovoltaics description

Photovoltaic systems convert sunlight directly into electrical energy using solar cells. Photovoltaics represent a renewable source of energy that can be used on private and public buildings, as well as in large-scale power stations.
These systems can be independent from the power grid or can be connected to it. Photovoltaic systems that are connected to the grid feed the generated power directly into the mains network. This eliminates the need for temporary storage. These systems consist of solar cells, one or more inverters, and a protective device for automatic cutoff in the event of a grid fault. Because of this, photovoltaic systems that are connected to the grid require extremely reliable and safe individual components.

Features

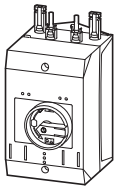
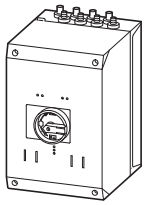
DC string circuit-breakers

- Protect PV modules from fault currents, prevent (in larger systems, for instance) intact modules from feeding power back into a module with a short-circuit.
- Are ready for operation immediately after tripping and after the trip cause has been fixed.
- Open and for installation in customized generator terminal boxes.
- Tripping currents are adjustable within a wide range of limits.
- Optional shunt releases A-PKZ0 and undervoltage releases U-PKZ0 enable remote shutdown, e.g for the fire department. Optional auxiliary contact NHI-E-PKZ0 signals switching state.
- When installed in an enclosure, suitable for voltages of up to 900 VDC.

DC switch-disconnectors

- Required, according to standard VDE 0100-712 (June 2006), between the PV module and inverter.
- Enclosed and open (for installation in enclosure) switch-disconnectors for voltages of up to 1,000 VDC.
- Usable as a separate switching point as required in VDI Guideline VDI 6012, e.g. by de-energizing an inverter in a completely safe manner.
- Two-pole switching, making it suitable for non-earthed systems as well.
- TÜV-certified.
- Open switch-disconnectors P-SOL are designed for installation in customer-specific enclosures or inverters.
- Mounting on 35 mm top-hat rails, their terminals enable a connection to all popular cable types.
- Separate rotary handles and shaft extensions allow for flexible installation.
- An auxiliary switching block can be mounted in order to provide switching state feedback.
- A shunt release or undervoltage release is available for remote tripping.
- Switch-disconnectors SOL with enclosure are ready for installation. Models for 2 and 4 or 4 and 8 strings and for the most popular connector types, such as MC3, MC4, and metric screw connectors, allow for easy integration into various system concepts.
- Enclosure provides degree of protection IP65, making outdoor mounting possible.
- Lockable mechanism provides safety when maintenance is required.
- Pressure-equalizing element prevents the formation of condensed water, preventing failures caused by voltage sparkovers.

Ordering

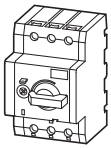
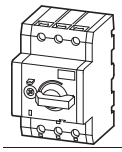
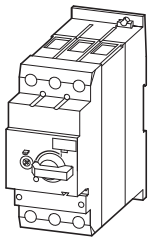
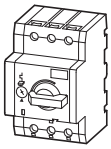
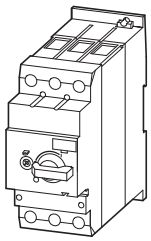
	Inputs Number of strings	Connection type	Outputs Number of strings	Connection type	Max. rated operational current DC-21A I_e A	**Part no.** Article no.	**Price** See price list	Std. pack
DC switch-disconnector, ready-to-install								
Rated operational voltage U_e 1000 V Degree of protection IP65 Protection class 2 2 pole								
	2	MC3	1	MC3	20	**SOL20/2MC3** 120913		1 off
	4	MC3	1	MC3	20	**SOL20/4MC3** 120914		1 off
	2	MC4	1	MC4	20	**SOL20/2MC4** 120915		1 off
	4	MC4	1	MC4	20	**SOL20/4MC4** 120916		1 off
	2	Screw connector M12	1	Screw connector M16	20	**SOL20/2MV** 120919		1 off
	2	MC3	1	MC3	30	**SOL30/2MC3** 120920		1 off
	4	MC3	1	MC3	30	**SOL30/4MC3** 120921		1 off
	2	MC4	1	MC4	30	**SOL30/2MC4** 120922		1 off
	4	MC4	1	MC4	30	**SOL30/4MC4** 120923		1 off
	2	Screw connector M12	1	Screw connector M16	30	**SOL30/2MV** 120926		1 off
	4	MC3	1	Screw connector M20	63	**SOL60/4MC3** 120927		1 off
	8	MC3	1	Screw connector M20	63	**SOL60/8MC3** 120928		1 off
	4	MC4	1	Screw connector M20	63	**SOL60/4MC4** 120929		1 off
	8	MC4	1	Screw connector M20	63	**SOL60/8MC4** 120930		1 off
	4	Screw connector M12	1	Screw connector M20	63	**SOL60/4MV** 120933		1 off

Information relevant for export to North America

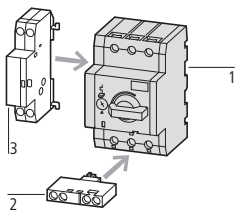
NA Certification Request filed for UL and CSA

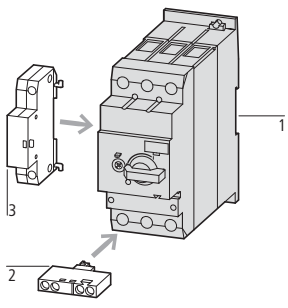
P-SOL, PKZ-SOL

HPL07086EN

	Max. rated operational current DC-21A I_e A	Permissible solar module short-circuit currents I>	**Part no.** Article no.	**Price** See price list	Std. pack
DC switch-disconnector, open					
Rated operating voltage U_e 1000 V Protection class II 2 pole					
	20		**P-SOL20** 120934		1 off
	30		**P-SOL30** 120935		
	63		**P-SOL60** 120936		
DC string circuit-breakers					
Rated operating voltage U_e 900 V Protection class II 2 pole					
	12	5 - 9	**PKZ-SOL12** 120937		1 off
	20	9 - 15	**PKZ-SOL20** 120938		
	30	15 - 22	**PKZ-SOL30** 120939		
	40	22 - 30	**PKZ-SOL40**[1)] 120940		
	50	29 - 38	**PKZ-SOL50**[1)] 120941		
	60	38 - 47	**PKZ-SOL60**[1)] 120942		

Notes [1)] Availability from November 2010





Accessories	**Page**
2 Auxiliary contacts NHI-E	→ 7/10
3 Shunt releases A-PKZ0	→ 7/29
3 Undervoltage releases U-PKZ0	→ 7/29

Information relevant for export to North America

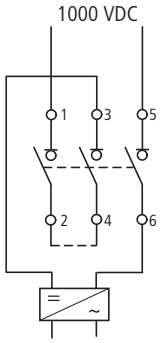
NA Certification Request filed for UL and CSA

Engineering

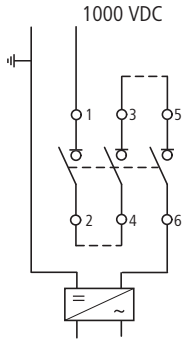
P-SOL and PKZ-SOL wiring

Switch-disconnector P-SOL

Non-earthed grid

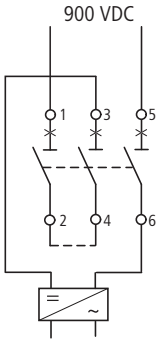


Earthed grid

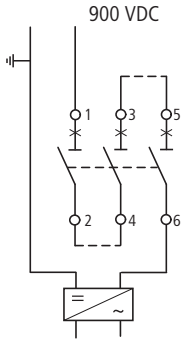


String circuit-breaker PKZ-SOL

Non-earthed grid

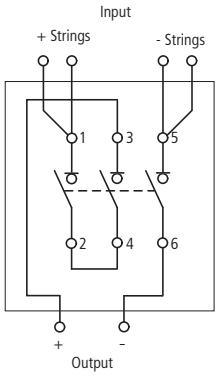


Earthed grid

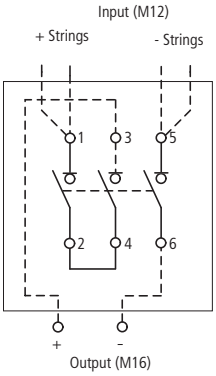


SOL internal circuit

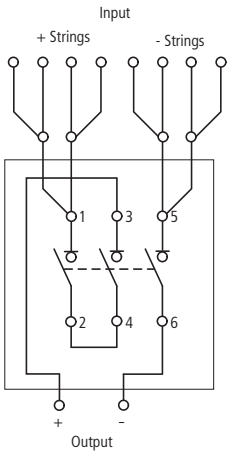
SOL20/2MC3
SOL20/2MC4
SOL30/2MC3
SOL30/2MC4



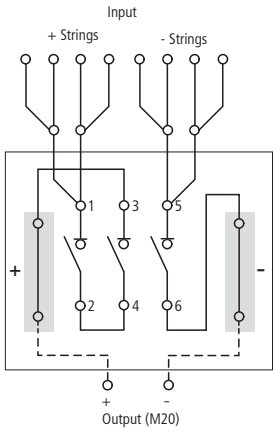
SOL20/2MV
SOL30/2MV



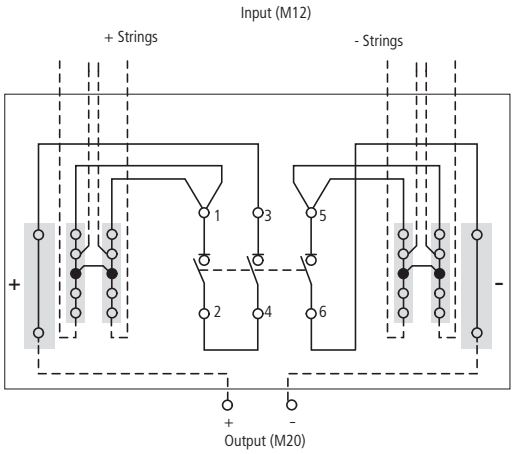
SOL20/4MC3
SOL20/4MC4
SOL30/4MC3
SOL30/4MC4



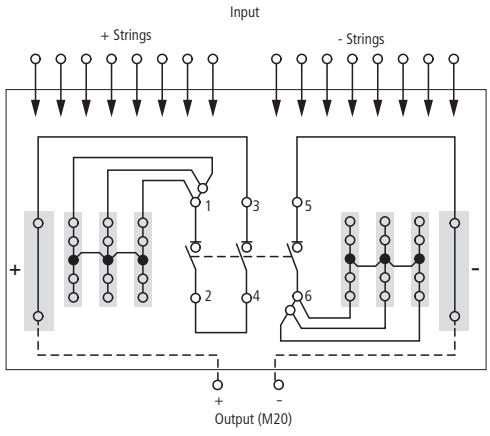
SOL60/4MC3
SOL60/4MC4



SOL60/4MV

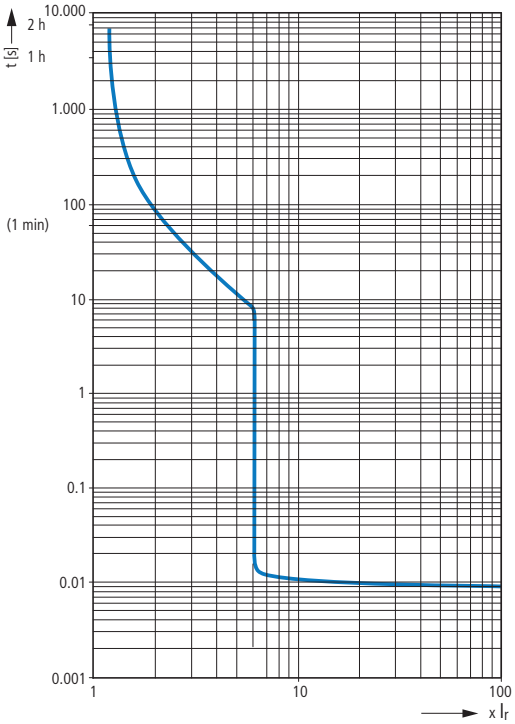


SOL60/8MC3
SOL60/8MC4



Tripping characteristics

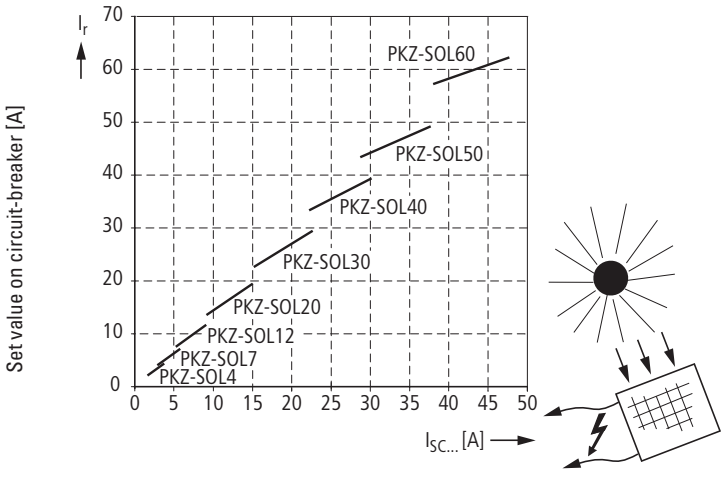
Tripping characteristics
DC string circuit-breaker PKZ-SOL



Characteristic curve set value - short-circuit current

As specified in the IEC 62548-1 draft for the protection of photovoltaic modules, the tripping current of the circuit-breaker must lie between 1.4 and 2 times the value of the photovoltaic module's short-circuit current. Since only the current values of the installed overload release can be plotted on the setting scale for the circuit-breaker[1], the correlation between the protective device's tripping current and the photovoltaic module's short-circuit current must be specified for each point of the scale in a suitable form.

Setting aid for string circuit-breaker PKZ-SOL



Short-circuit current in solar module [A]

[1] Standard IEC/EN 60947-2 (Section 4.7.3) prohibits directly specifying the photovoltaic short-circuit current on the circuit-breaker's setting scale, meaning that only the current set value of the operating current can be plotted there.

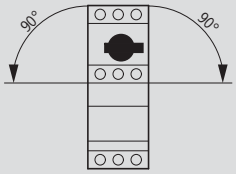
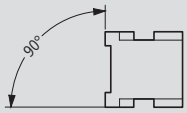
Technical data

			SOL20	SOL30	SOL60
Rated operational current Ie at DC-21A		A	20	30	63
Number of poles			2	2	2
Rated operational voltage U_e		V DC	1000	1000	1000
Isolating characteristics			Yes	Yes	Yes
Standards			IEC/EN 60 947-3 UL 508, TÜV certificate		
Lifespan mechanical	Operations		100,000	100,000	30,000
Lifespan electrical	Operations		100,000	100,000	30,000
Max. operating frequency, mechanical		Ops/h	120	120	120
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30		
Ambient temperature	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			Any	Any	Any
Degree of protection		IP	65	65	65
Dimensions					
Width		mm	100	100	160
Height		mm	215	215	305
Depth		mm	130	130	210
Weight		kg	0.42	0.42	2.2
Lockable in OFF position			Yes	Yes	Yes
Rated short-time withstand current , 1 s to EN 60947-3	I_{cw}	kA	0.24	0.36	0.72
Rated short-circuit making capacity to EN 60947-3	I_{cm}	kA	0.32	0.32	0.6
Internal resistance		mΩ	8	7	4

			P-SOL20	P-SOL30	P-SOL60
Rated operational current at DC-21A	I_e	A	20	30	63
Number of poles			2	2	2
Rated operational voltage	U_e	V DC	1000	1000	1000
Isolating characteristics			Yes	Yes	Yes
Standards			IEC/EN 60 947-3 UL 508, TÜV certificate		
Lifespan mechanical	Operations		100,000	100,000	30,000
Lifespan electrical	Operations		100,000	100,000	30,000
Max. operating frequency, mechanical		Ops/h	120	120	120
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30		
Ambient temperature					
Open	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			Any	Any	Any
Dimensions					
Width		mm	58	58	55
Height		mm	93	93	140
Depth		mm	76	76	160
Mounting					
Top-hat rail			35 mm	35 mm	35 mm
Screw mounting			–	–	2 x M4 x 18 30 x 130
Weight		kg	0.32	0.32	1.25
Terminals					
Flexible with ferrule		mm^2	1 x (1-6)	1 x (1-6)	1 x (1-35)
		mm^2	2 x (1-6)	2 x (1-6)	2 x (1-35)
solid/stranded		AWG	18 - 14	18 - 14	14 - 2
Rated short-time withstand current , 1 s to EN 60947-3	I_{cw}	kA	0.24	0.36	0.72
Rated short-circuit making capacity to EN 60947-3	I_{cm}	kA	0.32	0.32	0.6
Internal resistance		mΩ	6	5	3

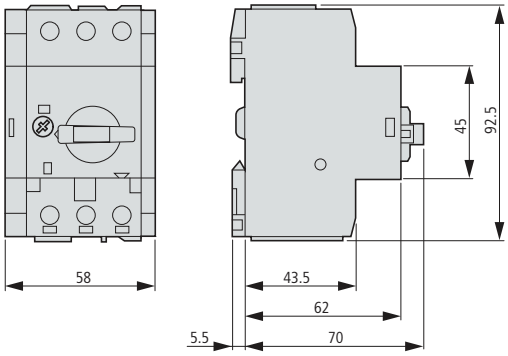
DC string circuit-breakers, open

PKZ-SOL

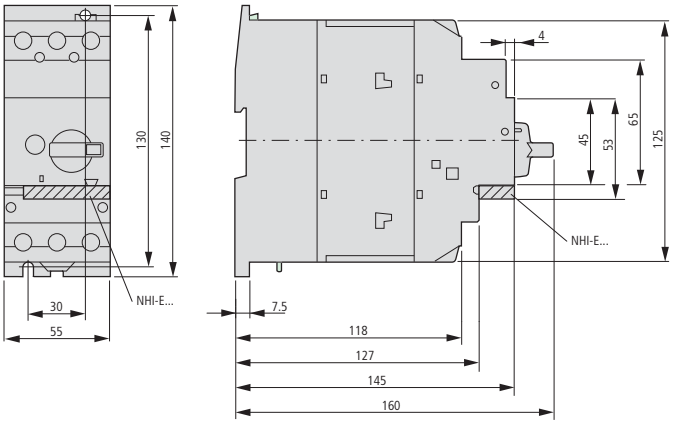
			PKZ-SOL12	PKZ-SOL20	PKZ-SOL30	PKZ-SOL40	PKZ-SOL50	PKZ-SOL60
Rated operational current at DC-21A/750VDC	I_e	A	12	20	30	40	50	63
Number of poles			2	2	2	2	2	2
Rated operational voltage	U_e	V DC	900	900	900	900	900	900
Thermal tripping			1.05 ...1.3 x I_e					
Electromagnetic tripping			6 x I_e					
Standards			IEC/EN 60 947-2 UL 508, TÜV certificate					
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30					
Ambient temperature								
Open	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			 PKZ-SOL12 to PKZ-SOL60			 PKZ-SOL12 to PKZ-SOL30		
Dimensions								
Width		mm	58	58	58	55	55	55
Height		mm	93	93	93	140	140	140
Depth		mm	76	76	76	160	160	160
Mounting								
Top-hat rail			35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Screw mounting			–	–	–	2 x M4 x 18 30 x 130	2 x M4 x 18 30 x 130	2 x M4 x 18 30 x 130
Weight		kg	0.32	0.32	0.32	1.25	1.25	1.25
Terminals								
flexible with ferrule		mm^2	1 x (1-6)	1 x (1-6)	1 x (1-6)	1 x (1-35)	1 x (1-35)	1 x (1-35)
		mm^2	2 x (1-6)	2 x (1-6)	2 x (1-6)	2 x (1-35)	2 x (1-35)	2 x (1-35)
solid/stranded		AWG	18 - 14	18 - 14	18 - 14	14 - 2	14 - 2	14 - 2
Internal resistance		mΩ	31	12	7	–	–	–

Dimensions

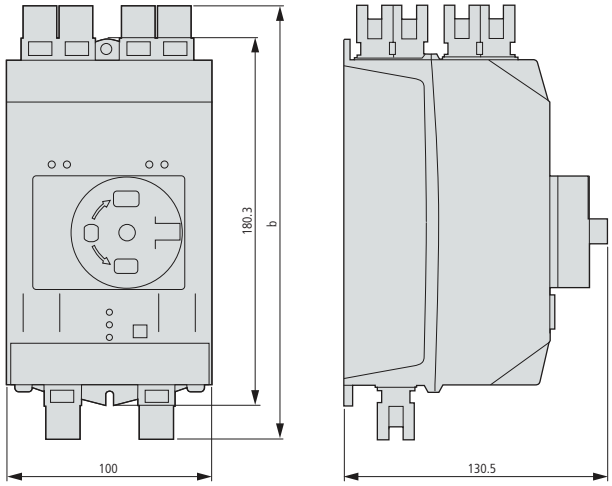
P-SOL20
P-SOL30
PKZ-SOL12
PKZ-SOL20
PKZ-SOL30



P-SOL60
PKZ-SOL40
PKZ-SOL50
PKZ-SOL60

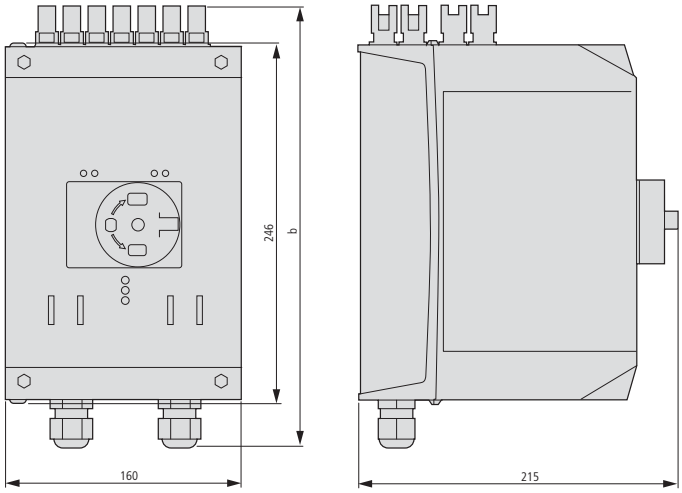


SOL20
SOL30



Connection type	b
	mm
MC3	195
MC4	234
MV	224

SOL60



Connection type	b
	mm
MC3	275
MC4	314
MV	304





Motor-starter combinations

Combining a motor protective circuit breaker or circuit breaker with a contactor results in a motor starter according to coordination type "1" or "2". Both types of coordination safely control short-circuit by switching it off. Coordination type "2" starters offer a high degree of operational continuity: after the cause of the short circuit has been removed, they can be switched back on immediately.

Motor-starter combination - motor starter up to 1400 A
Highest safety through proven combination in coordination type "1" or "2" +++ Approved combinations for export to North America

DOL starter and reversing starter MSC... – motor starter with motor-protective circuit-breaker PKZM0 up to 32A
Mounted starters minimize wiring time +++ Plug & Play with starters on busbar adapters +++ Attractive design for high-quality installations +++ Direct field bus connection through SmartWire-Darwin communication system via plug-in type protective module

DOL starter and reversing starter MSC-DE... – motor starter with electric motor-protective circuit-breaker PKE up to 32A
Increased safety through separate contact systems between switching and safety devices +++ Direct field bus connection through SmartWire-Darwin communication system via plug-in type protective module +++ Direct reading of motor current and state, transfer to subordinate control system through SmartWire-Darwin

Conditions for fulfilling type of coordination
Coordination type: "1": Secure switching off of the entered short-circuit current I_q +++ No danger to personnel or installations in case of short-circuit +++ For further operation without repair and partial renewal, switch does not need to be suitable +++ Damage to the switch or individual components approved

Coordination type: "2": Secure switching off of the entered short-circuit current I_q +++ No danger to personnel or installations in case of short-circuit +++ Switch remains suitable for further operation +++ No damage to switch, except to welds of protective contacts, when these can be easily separated without significant deformation









Ordering

Direct-on-line starters MSC-D

MSC-D complete units	8/02
MSC-US complete units	8/04
MSC-DEA complete units	8/06
Compact starters PKZ2/ZM	8/08
Modules PKZM0/PKZM4 + DILM	8/10
Modules NZMN/NZMH + DILM	8/14
Modules PKM0 + DILM + ZB	8/18
Modules NZMN + DILM + ZB/ZEV	8/18

Ordering

Reversing starter MSC-R

MSC-R complete units	8/20
Modules PKZM0/PKZM4 + DILM	8/22
Modules NZMN/NZMH + DILM	8/24

Ordering

Starter on busbar adapter

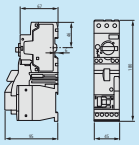
DOL starter complete units MSC-D/BBA	8/26
Reversing starters complete units MSC-R/BBA	8/28

Ordering

Starter for North America

DOL starters, modules PKZ2/S-SP + ZMR/ZM	8/30
Reversing starters, modules PKZ2/S-SP-FVR + ZMR/ZM	8/32
Modules type F starter combinations	8/34
Modules DILEM/DILM + ZE/ZB/Z5/ZW7	8/35
Modules NZMH-…-CNA + DILM + ZB/Z5/ZW7	8/36





System overview, description

Connection system SmartWire	8/37

Ordering

Connection system SmartWire	8/38
Accessories	8/39

Engineering

Connection system SmartWire	8/40

Technical data

Connection system SmartWire	8/41
DOL starters MSC-D, MSC-DE(A)	8/45
Reversing starter MSC-R	8/45

Dimensions

Direct-on-line starter MSC-D

MSC-D complete units	8/45
MSC-D/BBA complete units	8/45
MSC-DE(A) complete units	8/46

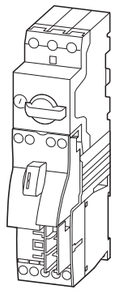
Reversing starter MSC-R

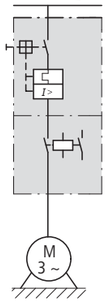
MSC-R complete units	8/46
MSC-R/BBA complete units	8/46
Connection system SmartWire	8/47

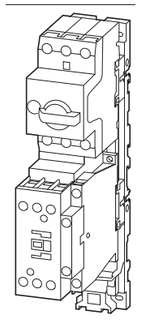


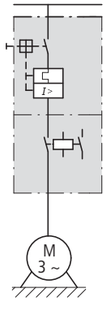
Ordering

Motor data					Setting range		Motor starters actuating voltage 230 V 50 Hz		Motor starters actuating voltage 24 V DC		Std. pack	Motor protective circuit breaker	Contactor	DOL starter wiring set	Notes
Motor rating	Rated operational current	Rated short-circuit current			Overload trip	Short-circuit release	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list				Mechanical connection module and electrical contact module	
AC-3	AC-3	380 - 415 V	380 - 415 V												
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination												
P kW	I_e A	I_q kA	I_q kA		I_r A	I_{rm} A						Type	Type	Type	
Complete units MSC-D															
0.06	0.21	150	50		0.16 - 0.25	3.5	**MSC-D-0.25-M7(230V50HZ)**[1] 281925		**MSC-D-0.25-M7(24VDC)**[1] 283154		1 off	PKZM0-0,25	DILM7-10(...)	PKZM0-XDM12	The DOL starters (complete devices) consist of a motor protective circuit breaker PKZM0 and a contactor DILM. With the adapterless top-hat rail mounting of starters up to 15 A, only the motor-protective circuit-breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element. Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter. From 16 A, the motor protective circuit breaker and contactors are mounted on the top-hat rail adapter plate. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. When using auxiliary contacts DILA-XHIT… (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with NHI-E-...-PKZ0-C standard auxiliary contact with spring-loaded terminal.
0.09	0.31	150	50		0.25 - 0.4	5.6	**MSC-D-0.4-M7(230V50HZ)**[1] 281926		**MSC-D-0.4-M7(24VDC)**[1] 283155		1 off	PKZM0-0,4	DILM7-10(...)	PKZM0-XDM12	
0.12 0.18	0.41 0.6	150	50		0.4 - 0.63	8.82	**MSC-D-0.63-M7(230V50HZ)**[1] 281927		**MSC-D-0.63-M7(24VDC)**[1] 283156		1 off	PKZM0-0,63	DILM7-10(...)	PKZM0-XDM12	
0.25	0.8	150	50		0.63 - 1	14	**MSC-D-1-M7(230V50HZ)**[1] 281929		**MSC-D-1-M7(24VDC)**[1] 283158		1 off	PKZM0-1	DILM7-10(...)	PKZM0-XDM12	
0.37 0.55	1.1 1.5	150	50		1 - 1.6	22.4	**MSC-D-1.6-M7(230V50HZ)**[1] 283140		**MSC-D-1.6-M7(24VDC)**[1] 283159		1 off	PKZM0-1,6	DILM7-10(...)	PKZM0-XDM12	
0.75	1.9	150	50		1.6 - 2.5	35	**MSC-D-2.5-M7(230V50HZ)**[1] 283142		**MSC-D-2.5-M7(24VDC)**[1] 283161		1 off	PKZM0-2,5	DILM7-10(...)	PKZM0-XDM12	
1.1 1.5	2.6 3.6	150	50		2.5 - 4	56	**MSC-D-4-M7(230V50HZ)**[1] 283143		**MSC-D-4-M7(24VDC)**[1] 283162		1 off	PKZM0-4	DILM7-10(...)	PKZM0-XDM12	
2.2	5	150	50		4 - 6.3	88.2	**MSC-D-6.3-M7(230V50HZ)**[1] 283145		**MSC-D-6.3-M7(24VDC)**[1] 283164		1 off	PKZM0-6,3	DILM7-10(...)	PKZM0-XDM12	
3	6.6	150	–		6.3 - 10	140	**MSC-D-10-M7(230V50HZ)** 283146		**MSC-D-10-M7(24VDC)** 283165		1 off	PKZM0-10	DILM7-10(...)	PKZM0-XDM12	
4	8.5	150	–		6.3 - 10	140	**MSC-D-10-M9(230V50HZ)** 283147		**MSC-D-10-M9(24VDC)** 283166		1 off	PKZM0-10	DILM9-10(...)	PKZM0-XDM12	
5.5	11.3	50	–		8 - 12	168	**MSC-D-12-M12(230V50HZ)** 283148		**MSC-D-12-M12(24VDC)** 283167		1 off	PKZM0-12	DILM12-10(...)	PKZM0-XDM12	
7.5	15.2	50	–		10 - 16	224	**MSC-D-16-M15(230V50HZ)** 100414		**MSC-D-16-M15(24VDC)** 100415		1 off	PKZM0-16	DILM15-10(...)	PKZM0-XDM12	
3 4	6.6 8.5	50	50		6.3 - 10	140	**MSC-D-10-M17(230V50HZ)** 101045		**MSC-D-10-M17(24VDC)** 101047		1 off	PKZM0-10	DILM17-10(...)	PKZM0-XDM32	
5.5	11.3	50	50		8 - 12	168	**MSC-D-12-M17(230V50HZ)** 101046		**MSC-D-12-M17(24VDC)** 101048		1 off	PKZM0-12	DILM17-10(...)	PKZM0-XDM32	
7.5	15.2	50	50		10 - 16	224	**MSC-D-16-M17(230V50HZ)**[1] 283150		**MSC-D-16-M17(24VDC)** 283168		1 off	PKZM0-16	DILM17-10(...)	PKZM0-XDM32	
11	21.7	50	50		20 - 25	350	**MSC-D-25-M25(230V50HZ)**[1] 283151		**MSC-D-25-M25(24VDC)** 283169		1 off	PKZM0-25	DILM25-10(...)	PKZM0-XDM32	
15	29.3	50	50		25 - 32	448	**MSC-D-32-M32(230V50HZ)**[1] 283152		**MSC-D-32-M32(24VDC)** 283170		1 off	PKZM0-32	DILM32-10(...)	PKZM0-XDM32	









Further information

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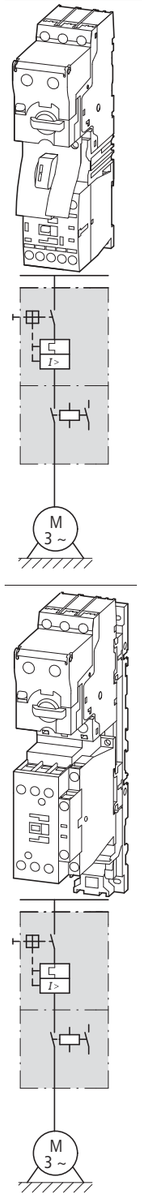
[1] To assemble Type F starters that conform with UL508, incoming terminals BK25/3-PKZ0-E and, if necessary, three-phase terminal blocks B3.../...-PKZ0 can be added to motor starter combinations. Type F starter → Page 8/34

Complete units MSC-US



Motor data			Setting range			Motor starters actuating voltage 230 V 50 Hz		Std. pack	Motor starters actuating voltage 24 V DC		Std. pack	Motor protective circuit breaker	Contactor	DOL starter wiring set	Notes
Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current	Overload trip	Short-circuit release	Type of coordination	Part no. Article no.	Price See price list		Part no. Article no.	Price See price list		Type	Type	Mechanical connection module and electrical contact module	
380 V 400 V 415 V	400 V	380 - 415 V													
P kW	I_e A	I_q kA	I_r A	I_{rm} A											
0.06	0.21	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	The DOL starters (complete devices) consist of a PKE motor protective circuit breaker and a DILM contactor. With the adapterless top-hat rail mounting of starters up to 15 A, only the motor protective circuit breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element. Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter. From 16 A, the motor protective circuit breaker and contactor are mounted on the top-hat rail adapter plate. The connection of the main circuit between PKE and contactor is established with electrical contact modules. When using auxiliary contacts DILA-XHIT… (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminals.
0.09	0.31	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
0.12	0.41	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
0.18	0.6	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
0.25	0.8	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
0.37	1.1	100	0.3 - 1.2	16.8	"1"	**MSC-DE-1.2-M7(230V50HZ)** 121735		1 off	**MSC-DE-1.2-M7(24VDC)** 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
0.55	1.5	100	1 - 4	56	"1"	**MSC-DE-4-M7(230V50HZ)** 121737		1 off	**MSC-DE-4-M7(24VDC)** 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
0.75	1.9	100	1 - 4	56	"1"	**MSC-DE-4-M7(230V50HZ)** 121737		1 off	**MSC-DE-4-M7(24VDC)** 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
1.1	2.6	100	1 - 4	56	"1"	**MSC-DE-4-M7(230V50HZ)** 121737		1 off	**MSC-DE-4-M7(24VDC)** 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
1.5	3.6	100	1 - 4	56	"1"	**MSC-DE-4-M7(230V50HZ)** 121737		1 off	**MSC-DE-4-M7(24VDC)** 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
2.2	5	100	3 - 12	168	"1"	**MSC-DE-12-M7(230V50HZ)** 121739		1 off	**MSC-DE-12-M7(24VDC)** 121740		1 off	PKE12/XTU-12	DILM7-10(...)	PKZM0-XDM12	
3	6.6	100	3 - 12	168	"1"	**MSC-DE-12-M7(230V50HZ)** 121739		1 off	**MSC-DE-12-M7(24VDC)** 121740		1 off	PKE12/XTU-12	DILM7-10(...)	PKZM0-XDM12	
4	8.5	100	3 - 12	168	"1"	**MSC-DE-12-M9(230V50HZ)** 121741		1 off	**MSC-DE-12-M9(24VDC)** 121742		1 off	PKE12/XTU-12	DILM9-10(...)	PKZM0-XDM12	
5.5	11.3	100	3 - 12	168	"1"	**MSC-DE-12-M12(230V50HZ)** 121743		1 off	**MSC-DE-12-M12(24VDC)** 121744		1 off	PKE12/XTU-12	DILM12-10(...)	PKZM0-XDM12	
2.2	5	100	3 - 12	168	"1", "2"	**MSC-DE-12-M17(230V50HZ)** 121745		1 off	**MSC-DE-12-M17(24VDC)** 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
3	6.6	100	3 - 12	168	"1", "2"	**MSC-DE-12-M17(230V50HZ)** 121745		1 off	**MSC-DE-12-M17(24VDC)** 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
4	8.5	100	3 - 12	168	"1", "2"	**MSC-DE-12-M17(230V50HZ)** 121745		1 off	**MSC-DE-12-M17(24VDC)** 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
5.5	11.3	100	3 - 12	168	"1", "2"	**MSC-DE-12-M17(230V50HZ)** 121745		1 off	**MSC-DE-12-M17(24VDC)** 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
7.5	16.7	100	8 - 32	448	"1", "2"	**MSC-DE-32-M17(230V50HZ)** 121747		1 off	**MSC-DE-32-M17(24VDC)** 121748		1 off	PKE32/XTU-32	DILM17-10(...)	PKZM0-XDM32	
11	21.7	100	8 - 32	448	"1", "2"	**MSC-DE-32-M25(230V50HZ)** 121749		1 off	**MSC-DE-32-M25(24VDC)** 121750		1 off	PKE32/XTU-32	DILM25-10(...)	PKZM0-XDM32	
15	29.3	100	8 - 32	448	"1", "2"	**MSC-DE-32-M32(230V50HZ)** 121751		1 off	**MSC-DE-32-M32(24VDC)** 121752		1 off	PKE32/XTU-32	DILM32-10(...)	PKZM0-XDM32	

Further information

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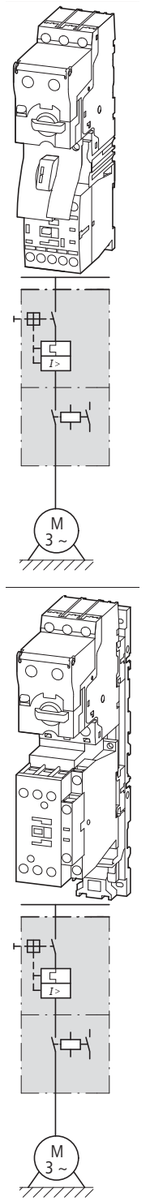
Motor data			Setting range		
Rated operational power	Rated operational current	Rated short-circuit current	Overload trip	Short-circuit release	Type of coordination
AC-3	AC-3				
380 V 400 V 415 V	400 V	380 - 415 V			
P	I_e	I_q	I_r	I_{rm}	
kW	A	kA	A	A	
Complete devices MSD-DEA					
0.06	0.21	100	0.3 - 1.2	16.8	"1"
0.09	0.31	100	0.3 - 1.2	16.8	"1"
0.12	0.41	100	0.3 - 1.2	16.8	"1"
0.18	0.6	100	0.3 - 1.2	16.8	"1"
0.25	0.8	100	0.3 - 1.2	16.8	"1"
0.37	1.1	100	0.3 - 1.2	16.8	"1"
0.55	1.5	100	1 - 4	56	"1"
0.75	1.9	100	1 - 4	56	"1"
1.1	2.6	100	1 - 4	56	"1"
1.5	3.6	100	1 - 4	56	"1"
2.2	5	100	3 - 12	168	"1"
3	6.6	100	3 - 12	168	"1"
4	8.5	100	3 - 12	168	"1"
5.5	11.3	100	3 - 12	168	"1"
2.2	5	100	3 - 12	168	"1", "2"
3	6.6	100	3 - 12	168	"1", "2"
4	8.5	100	3 - 12	168	"1", "2"
5.5	11.3	100	3 - 12	168	"1", "2"
7.5	16.7	100	8 - 32	448	"1", "2"
11	21.7	100	8 - 32	448	"1", "2"
15	29.3	100	8 - 32	448	"1", "2"



Motor starters actuating voltage 24 V DC **Part no.** Article no.	**Price** See price list	Std. pack	Motor protective circuit breaker Type	Contactor Type	DOL starter wiring set Mechanical connection module and electrical contact module Type
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-12-M7(24VDC) 121755		1 off	PKE12/XTUA-12	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-12-M7(24VDC) 121755		1 off	PKE12/XTUA-12	DILM7-10(...)	PKZM0-XDM12
MSC-DEA-12-M9(24VDC) 121756		1 off	PKE12/XTUA-12	DILM9-10(...)	PKZM0-XDM12
MSC-DEA-12-M12(24VDC) 121757		1 off	PKE12/XTUA-12	DILM12-10(...)	PKZM0-XDM12
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32
MSC-DEA-32-M17(24VDC) 121759		1 off	PKE32/XTUA-32	DILM17-10(...)	PKZM0-XDM32
MSC-DEA-32-M25(24VDC) 121760		1 off	PKE32/XTUA-32	DILM25-10(...)	PKZM0-XDM32
MSC-DEA-32-M32(24VDC) 121761		1 off	PKE32/XTUA-32	DILM32-10(...)	PKZM0-XDM32

Notes

The DOL starters (complete devices) consist of a PKE motor protective circuit breaker and a DILM contactor.
With the adapterless top-hat rail mounting of starters up to 15 A, only the motor protective circuit breaker on the top-hat rail requires an adapter.
The contactors are provided with mechanical support via a mechanical connection element.
Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter.
From 16 A, the motor protective circuit breaker and contactor are mounted on the top-hat rail adapter plate.
The connection of the main circuit between PKE and contactor is established with electrical contact modules.
When using auxiliary contacts DILA-XHIT… (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminals.
The DOL starters MSC-DEA... are prepared for communication via SmartWire-Darwin. For this the SWD-PKE communication must be added.

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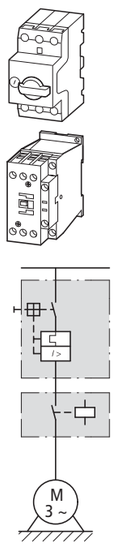
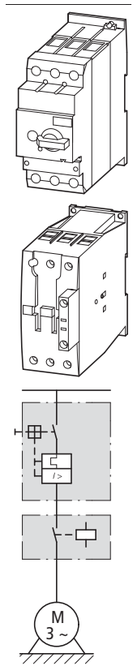
Motor data						Setting range			Part no. / Article no.	Price / See price list	Std. pack	Notes
Rated operational power		Rated operational current		Rated short-circuit current		Overload trip	Short-circuit release	Type of coordination				
AC-3		AC-3										
380 V 400 V 415 V	500 V	400 V	500 V	380 - 415 V	500 V							
P	P	I_e	I_e	I_q	I_q	I_r	I_{rm}					
kW	kW	A	A	kA	kA	A	A					
Compact starter PKZ2												
0.18 0.25	0.25 0.37	0.8	0.6 0.9	100	100	0.6 - 1	8 - 14	"1"	**PKZ2/ZM-1/SE1A/11(230V50HZ,240V60HZ** 063364		1 off	The compact starters consist of a motor protective circuit breaker, which features a plug-in trip block and an attached contact module with matching profile. The devices are prefitted to a clip plate and can be snap fitted as a unit, centrally onto one or two IEC/EN 60715 top-hat rails. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current
0.37 0.55	0.55 0.75	1.1 1.5	1.2 1.5	100	100	1 - 1.6	14 - 22		**PKZ2/ZM-1.6/SE1A/11(230V50HZ,240V60** 063372			
0.75	1.1	1.9	2.1	100	100	1.6 - 2.4	20 - 35		**PKZ2/ZM-2.4/SE1A/11(230V50HZ,240V60** 063382			
1.1 1.5	1.5	2.65 3.6	2.9	100	100	2.4 - 4	35 - 55		**PKZ2/ZM-4/SE1A/11(230V50HZ,240V60HZ** 063392			
2.2	2.2 3	5	4 5.3	100	100	4 - 6	50 - 80		**PKZ2/ZM-6/SE1A/11(230V50HZ,240V60HZ** 063402			
3 4	4 5.5	6.6 8.5	6.8 9	100	7	6 - 10	80 - 140		**PKZ2/ZM-10/SE1A/11(230V50HZ,240V60)** 063412			
5.5 7.5	7.5	11.3 15.2	12.1	100	7	10 - 16	130 - 220		**PKZ2/ZM-16/SE1A/11(230V50HZ,240V60)** 063422			
11	11 15	21.7	17.4 23.4	30	7	16 - 25	200 - 350		**PKZ2/ZM-25/SE1A/11(230V50HZ,240V60)** 063432			
15	18.5	29.3	28.9	30	7	24 - 32	275 - 425		**PKZ2/ZM-32/SE1A/11(230V50HZ,240V60)** 063442			
18.5	22	36	33	30	7	32 - 40	350 - 500		**PKZ2/ZM-40/SE1A/11(230V50HZ,240V60)** 063452			
High-capacity compact starter PKZ2												
0.18 0.25	0.25 0.37	0.8	0.6 0.9	100	100	0.6 - 1	8 - 14	"2"	**PKZ2/ZM-1/S(230V50HZ,240V60HZ)** 063472		1 off	The high-capacity compact starters consist of a motor protective circuit breaker and an attached contact module with matching profile. The devices are prefitted to a clip plate and can be snap fitted as a unit, centrally onto one or two IEC/EN 60715 top-hat rails. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current
0.37 0.55	0.55 0.75	1.1 1.5	1.2 1.5	100	100	1 - 1.6	14 - 22		**PKZ2/ZM-1.6/S(230V50HZ,240V60HZ)** 063482			
0.75	1.1	1.9	2.1	100	100	1.6 - 2.4	20 - 35		**PKZ2/ZM-2.4/S(230V50HZ,240V60HZ)** 063492			
1.1 1.5	1.5	2.6 3.6	2.9	100	100	2.4 - 4	35 - 55		**PKZ2/ZM-4/S(230V50HZ,240V60HZ)** 063502			
2.2	2.2 3	5	4 5.3	100	100	4 - 6	50 - 80		**PKZ2/ZM-6/S(230V50HZ,240V60HZ)** 063512			
3 4	4 5.5	6.6	6.8 9	100	100	6 - 10	80 - 140		**PKZ2/ZM-10/S(230V50HZ,240V60HZ)** 063522			
5.5 7.5	7.5	11.3 15.2	12.1	100	100	10 - 16	130 - 220		**PKZ2/ZM-16/S(230V50HZ,240V60HZ)** 063532			
11	11 15	21.7	17.4 23.4	100	100	16 - 25	200 - 350		**PKZ2/ZM-25/S(230V50HZ,240V60HZ)** 063542			
15	18.5	29.3	28.9	100	100	24 - 32	275 - 425		**PKZ2/ZM-32/S(230V50HZ,240V60HZ)** 063552			
18.5	22	36	33	100	100	32 - 40	350 - 500		**PKZ2/ZM-40/S(230V50HZ,240V60HZ)** 063562			

Motor data				Setting range	
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release
AC-3	AC-3	380 - 415 V	380 - 415 V		
380 V 400 V 415 V	400 V	Type “1” coordination	Type “2” coordination		
P	I_e	I_q	I_q	I_r	I_{rm}
kW	A	kA	kA	A	A
Modules PKZM0 and DILM					
0.06	0.21	150	50	0.16 - 0.25	3.5
0.09	0.31	150	50	0.25 - 0.4	5.6
0.12	0.41	150	50	0.4 - 0.63	8.82
0.18	0.6	150	50	0.4 - 0.63	8.82
0.25	0.8	150	50	0.63 - 1	14
0.37	1.1	150	50	1 - 1.6	22.4
0.55	1.5	150	50	1 - 1.6	22.4
0.75	1.9	150	50	1.6 - 2.5	35
1.1	2.6	150	50	2.5 - 4	56
1.5	3.6	150	50	2.5 - 4	56
2.2	5	150	50	4 - 6.3	88.2
3	6.6	150	50	6.3 - 10	140
4	8.5	150	50	6.3 - 10	140
5.5	11.3	50	50	8 - 12	168
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448



Modules PKZM4 and DILM					
5.5	11.3	50	50	10 - 16	224
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448
18.5	36	50	50	32 - 40	560
22	41	50	50	40 - 50	700
30	55	50	50	50 - 58	812
34	63	50	50	55 - 65	882



Motor protective circuit breaker	Contactor	Contactor	Notes
	Type “1” coordination	Type “2” coordination	
Type	**Type**	**Type**	
PKZM0-0,25	DILM7-...(...)	DILM7-...(...)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
PKZM0-0,4	DILM7-...(...)	DILM7-...(...)	
PKZM0-0,63	DILM7-...(...)	DILM7-...(...)	
PKZM0-0,63	DILM7-...(...)	DILM7-...(...)	
PKZM0-1	DILM7-...(...)	DILM7-...(...)	
PKZM0-1,6	DILM7-...(...)	DILM7-...(...)	
PKZM0-1,6	DILM7-...(...)	DILM7-...(...)	
PKZM0-2,5	DILM7-...(...)	DILM7-...(...)	
PKZM0-4	DILM7-...(...)	DILM7-...(...)	
PKZM0-4	DILM7-...(...)	DILM7-...(...)	
PKZM0-6,3	DILM7-...(...)	DILM7-...(...)	
PKZM0-10	DILM7-...(...)	DILM17-...(...)	
PKZM0-10	DILM9-...(...)	DILM17-...(...)	
PKZM0-12	DILM12-...(...)	DILM17-...(...)	
PKZM0-16	DILM15-...(...)	DILM17-...(...)	
PKZM0-25	DILM25-...(...)	DILM25-...(...)	
PKZM0-32	DILM32-...(...)	DILM32-...(...)	

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PKZM4-16	DILM17-...(...)	DILM17-...(...)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
PKZM4-16	DILM17-...(...)	DILM17-...(...)	
PKZM4-25	DILM25-...(...)	DILM25-...(...)	
PKZM4-32	DILM32-...(...)	DILM32-...(...)	
PKZM4-40	DILM40(...)	DILM40(...)	
PKZM4-50	DILM50(...)	DILM50(...)	
PKZM4-58	DILM65(...)	DILM65(...)	
PKZM4-63	DILM65(...)	DILM65(...)	

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Motor data				**Setting range**		**Motor protective circuit breaker**	**Contactor**	**Contactor**	**Current limiter**	**Notes**
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release		Type “1” coordination	Type “2” coordination		
AC-3	AC-3	500 V	500 V							
500 V	500 V	Type “1” coordination	Type “2” coordination							
						Type	**Type**	**Type**	**Type**	
P	I_e	I_q	I_q	I_r	I_{rm}					
kW	A	kA	kA	A	A					
Modules PKZM0 and DILM										
0.06	0.17	100	50	0.16 - 0.25	3.5	PKZM0-0,25	DILM7-...(...)	DILM7-...(...)	–	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.
0.09	0.25	100	50	0.25 - 0.4	5.6	PKZM0-0,4	DILM7-...(...)	DILM7-...(...)	–	
0.12	0.33	100	50	0.25 - 0.4	5.6	PKZM0-0,4	DILM7-...(...)	DILM7-...(...)	–	
0.18	0.48	100	50	0.4 - 0.63	8.8	PKZM0-0,63	DILM7-...(...)	DILM7-...(...)	–	
0.25	0.7	100	50	0.63 - 1	14	PKZM0-1	DILM7-...(...)	DILM7-...(...)	–	
0.37	0.9	100	50	0.63 - 1	14	PKZM0-1	DILM7-...(...)	DILM7-...(...)	–	
0.55	1.2	100	50	1 - 1.6	22	PKZM0-1,6	DILM7-...(...)	DILM7-...(...)	–	
0.75	1.5	100	50	1 - 1.6	22	PKZM0-1,6	DILM7-...(...)	DILM7-...(...)	–	
1.1	2.1	100	50	1.6 - 2.5	35	PKZM0-2,5	DILM7-...(...)	DILM17-...(...)	–	
1.5	2.9	100	50	2.5 - 4	56	PKZM0-4	DILM7-...(...)	DILM17-...(...)	–	
2.2	4	42	18	4 - 6.3	88	PKZM0-6,3	DILM7-...(...)	DILM17-...(...)	–	
2.2	4	–	50	4 - 6.3	88	PKZM0-6,3	–	DILM17-...(...)	CL-PKZ0	
3	5.3	42	18	4 - 6.3	88	PKZM0-6,3	DILM7-...(...)	DILM17-...(...)	–	
3	5.3	–	50	4 - 6.3	88	PKZM0-6,3	–	DILM17-...(...)	CL-PKZ0	
4	6.8	42	18	6.3 - 10	140	PKZM0-10	DILM9-...(...)	DILM17-...(...)	–	
4	6.8	–	50	6.3 - 10	140	PKZM0-10	–	DILM17-...(...)	CL-PKZ0	
5.5	9	42	18	6.3 - 10	140	PKZM0-10	DILM9-...(...)	DILM17-...(...)	–	
5.5	9	–	50	6.3 - 10	140	PKZM0-10	–	DILM17-...(...)	CL-PKZ0	
6.5	10.6	42	18	8 - 12	168	PKZM0-12	DILM12-...(...)	DILM17-...(...)	–	
6.5	10.6	–	50	8 - 12	168	PKZM0-12	–	DILM17-...(...)	CL-PKZ0	
7.5	12.1	15	18	10 - 16	224	PKZM0-16	DILM17-...(...)	DILM17-...(...)	–	
7.5	12.1	–	50	10 - 16	224	PKZM0-16	–	DILM17-...(...)	CL-PKZ0	
11	17.4	6	–	16 - 20	280	PKZM0-20	DILM25-...(...)	–	–	
11	17.4	15	–	16 - 20	280	PKZM0-20	DILM25-...(...)	–	CL-PKZ0	
15	23.4	6	–	20 - 25	350	PKZM0-25	DILM25-...(...)	–	–	
15	23.4	15	–	20 - 25	350	PKZM0-25	DILM25-...(...)	–	CL-PKZ0	
18.5	28.9	6	–	25 - 32	448	PKZM0-32	DILM32-...(...)	–	–	
18.5	28.9	15	–	25 - 32	448	PKZM0-32	DILM32-...(...)	–	CL-PKZ0	
Modules PKZM4 and DILM										
11	17.4	50	50	16 - 25	350	PKZM4-25	DILM40(...)	DILM40(...)	–	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.
15	23.4	50	50	16 - 25	350	PKZM4-25	DILM40(...)	DILM40(...)	–	
18.5	28.9	50	50	25 - 32	448	PKZM4-32	DILM40(...)	DILM40(...)	–	
22	33	50	50	32 - 40	560	PKZM4-40	DILM40(...)	DILM40(...)	–	
30	44	50	50	40 - 50	700	PKZM4-50	DILM50(...)	DILM50(...)	–	
37	54	50	50	50 - 58	812	PKZM4-58	DILM65(...)	DILM65(...)	–	
45	65	50	50	55 - 65	882	PKZM4-63	DILM65(...)	DILM65(...)	–	



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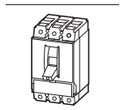
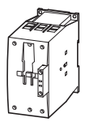
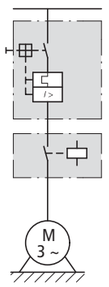
Motor data			**Setting range**		**Circuit-breaker**	**Contactor** Type “1” coordination	**Contactor** Type “2” coordination	**Notes**
Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current	Overload trip	Short-circuit release				
380 V 400 V 415 V	400 V	400/415 V						
P kW	I_e A	I_q kA	I_r A	I_{rm} A	**Type**	**Type**	**Type**	
Modules NZMN and DILM								
18.5	36	50	32 - 40	320 - 560	NZMN1-M40	DILM40(…)	DILM80(…)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
22	41	50	40 - 50	400 - 700	NZMN1-M50	DILM50(…)	DILM80(…)	
30	55	50	50 - 63	504 - 882	NZMN1-M63	DILM65(…)	DILM80(…)	
37	68	50	63 - 80	640 - 1120	NZMN1-M80	DILM80(…)	DILM80(…)	
45	81	50	80 - 100	800 - 1250	NZMN1-M100	DILM95(…)	DILM95(…)	
55	99	50	80 - 100	800 - 1250	NZMN1-M100	DILM115(…)	DILM115(…)	
75	134	50	125 - 160	1280 - 2240	NZMN2-M160	DILM150(…)	DILM150(…)	
90	161	50	160 - 200	1600 - 2500	NZMN2-M200	DILM185A/22(…)	DILM185A/22(…)	
110	196	50	160 - 200	1600 - 2500	NZMN2-M200	DILM225A/22(…)	DILM225A/22(…)	
132	231	50	175 - 350	350 - 4900	NZMN3-ME350	DILM250/22(…)	DILM250/22(…)	
160	279	50	175 - 350	350 - 4900	NZMN3-ME350	DILM300A/22(…)	DILM300A/22(…)	
200	349	50	175 - 350	350 - 4900	NZMN3-ME350	DILM400/22(…)	DILM400/22(…)	
250	437	50	225 - 450	450 - 6300	NZMN3-ME450	DILM500/22(…)	DILM500/22(…)	
315	544	50	275 - 550	550 - 7700	NZMN4-ME550	DILM580/22(…)	–	
400	683	50	438 - 875	875 - 12250	NZMN4-ME875	DILM650/22(…)	–	
450	750	50	438 - 875	875 - 12250	NZMN4-ME875	DILM750/22(…)	–	
500	820	50	438 - 875	875 - 12250	NZMN4-ME875	DILM820/22(…)	–	
560	947	50	700 - 1400	1400 - 19600	NZMN4-ME1400	DILM1000/22(…)	–	
Modules NZMH and DILM								
22	41	100	40 - 50	400 - 700	NZMH2-M50	DILM80(…)	DILM80(…)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
30	55	100	50 - 63	504 - 882	NZMH2-M63	DILM80(…)	DILM80(…)	
37	68	100	63 - 80	640 - 1120	NZMH2-M80	DILM80(…)	DILM80(…)	
45	81	100	80 - 100	800 - 1250	NZMH2-M100	DILM95(…)	DILM95(…)	
55	100	100	100 - 125	1000 - 1750	NZMH2-M125	DILM115(…)	DILM115(…)	
75	134	100	125 - 160	1280 - 2240	NZMH2-M160	DILM150(…)	DILM150(…)	
30	55	100	45 - 90	90 - 1260	NZMH2-ME90	DILM80(…)	DILM80(…)	
37	68	100	45 - 90	90 - 1260	NZMH2-ME90	DILM80(…)	DILM80(…)	
45	81	100	45 - 90	90 - 1260	NZMH2-ME90	DILM95(…)	DILM95(…)	
55	100	100	70 - 140	140 - 1960	NZMH2-ME140	DILM115(…)	DILM115(…)	
75	134	100	70 - 140	140 - 1960	NZMH2-ME140	DILM150(…)	DILM150(…)	
90	161	100	110 - 120	220 - 3080	NZMH2-ME220	DILM185A/22(…)	DILM185A/22(…)	
110	196	100	110 - 120	220 - 3080	NZMH2-ME220	DILM225A/22(…)	DILM225A/22(…)	
132	231	100	175 - 350	350 - 4900	NZMH3-ME350	DILM250/22(…)	DILM250/22(…)	
160	279	100	175 - 350	350 - 4900	NZMH3-ME350	DILM300A/22(…)	DILM300A/22(…)	
200	349	100	175 - 350	350 - 4900	NZMH3-ME350	DILM400/22(…)	DILM400/22(…)	

Motor data				Setting range	
Rated operational power	Rated operational current		Rated short-circuit current	Overload trip	Short-circuit release
AC-3					
500 V 525 V	500 V	525 V	500/525 V		
P	I_e	I_e	I_q	I_r	I_{rm}
kW	A	A	kA	A	A
Modules NZMH and DILM					
11	17.4	17	50	16 - 20	350 - 350
15	23.4	22.5	50	20 - 25	350 - 350
18.5	28.9	28	50	25 - 32	320 - 448
22	33	32	50	32 - 40	320 - 560
30	44	43	50	40 - 50	400 - 700
37	54	54	50	50 - 63	504 - 882
45	65	64	50	63 - 80	640 - 1120
55	79	78	50	63 - 80	640 - 1120
75	107	106	50	100 - 125	1000 - 1750
90	129	127	50	125 - 160	1280 - 2240
30	44	43	50	45 - 90	90 - 1260
37	54	54	50	45 - 90	90 - 1260
45	65	64	50	45 - 90	90 - 1260
55	79	78	50	45 - 90	90 - 1260
75	107	106	50	70 - 140	140 - 1960
90	129	127	50	70 - 140	140 - 1960

Circuit-breaker	Contactor Type “1” coordination	Contactor Type “2” coordination	Notes
Type	Type	Type	
NZMH2-M20	DILM40(…)	DILM80(…)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
NZMH2-M25	DILM40(…)	DILM80(…)	
NZMH2-M32	DILM40(…)	DILM80(…)	
NZMH2-M40	DILM40(…)	DILM80(…)	
NZMH2-M50	DILM80(…)	DILM80(…)	
NZMH2-M63	DILM80(…)	DILM80(…)	
NZMH2-M80	DILM80(…)	DILM80(…)	
NZMH2-M80	DILM80(…)	DILM80(…)	
NZMH2-M125	DILM115(…)	DILM115(…)	
NZMH2-M160	DILM150(…)	DILM150(…)	
NZMH2-ME90	DILM80(…)	DILM80(…)	
NZMH2-ME90	DILM80(…)	DILM80(…)	
NZMH2-ME90	DILM80(…)	DILM80(…)	
NZMH2-ME90	DILM80(…)	DILM80(…)	
NZMH2-ME140	DILM115(…)	DILM115(…)	
NZMH2-ME140	DILM150(…)	DILM150(…)	

PKZM0, DILM, ZB; NZMN1, DILM, ZB, ZEV

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Motor data			Setting range		Basic unit	Contactor	Overload relay	Contactor	Overload relay	Current sensor	Notes
Rated operational power	Rated operational current	Rated short-circuit current	Overload trip	Short-circuit release		Type "1" coordination	Type "1" coordination	Type "2" coordination	Type "2" coordination		
AC-3	AC-3										
380 V 400 V 415 V	400 V	380 - 415 V									
P	I_e	I_q	I_r	I_{rm}	Type	Type	Type	Type	Type	Type	
kW	A	kA	A	A							
Modules PKM0, DILM and ZB with and without automatic reset											
0.06	0.21	100	0.16 - 0.24	3.5	PKM0-0,25	DILM7-...(...)	ZB12-0,24	DILM7-...(...)	ZB12-0,24	–	The motor-starter combinations consist of the motor protective circuit breaker (without overload function), a contactor and overload relay modules. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting and must be reset locally. In the Auto position, the combination automatically switches on again after the bimetallic elements have cooled down.
0.09	0.31	100	0.24 - 0.4	5.6	PKM0-0,4	DILM7-...(...)	ZB12-0,4	DILM7-...(...)	ZB12-0,4	–	
0.12	0.41	100	0.4 - 0.6	8.82	PKM0-0,63	DILM7-...(...)	ZB12-0,6	DILM7-...(...)	ZB12-0,6	–	
0.18	0.6	100	0.4 - 0.6	8.82	PKM0-0,63	DILM7-...(...)	ZB12-0,6	DILM7-...(...)	ZB12-0,6	–	
0.25	0.8	100	0.6 - 1	14	PKM0-1	DILM7-...(...)	ZB12-1	DILM7-...(...)	ZB12-1	–	
0.37	1.1	100	1 - 1.6	22.4	PKM0-1,6	DILM7-...(...)	ZB12-1,6	DILM7-...(...)	ZB12-1,6	–	
0.55	1.5	100	1 - 1.6	22.4	PKM0-1,6	DILM7-...(...)	ZB12-1,6	DILM7-...(...)	ZB12-1,6	–	
0.75	1.9	100	1.6 - 2.4	35	PKM0-2,5	DILM7-...(...)	ZB12-2,4	DILM7-...(...)	ZB12-2,4	–	
1.1	2.6	100	2.4 - 4	56	PKM0-4	DILM7-...(...)	ZB12-4	DILM7-...(...)	ZB12-4	–	
1.5	3.6	100	2.4 - 4	56	PKM0-4	DILM7-...(...)	ZB12-4	DILM7-...(...)	ZB12-4	–	
2.2	5	100	4 - 6	88.2	PKM0-6,3	DILM7-...(...)	ZB12-6	DILM17-...(...)	ZB32-6	–	
3	6.6	100	6 - 10	140	PKM0-10	DILM9-...(...)	ZB12-10	DILM17-...(...)	ZB32-10	–	
4	8.5	100	6 - 10	140	PKM0-10	DILM9-...(...)	ZB12-10	DILM17-...(...)	ZB32-10	–	
5.5	11.3	50	8 - 12	168	PKM0-12	DILM12-...(...)	ZB12-12	–	–	–	
5.5	11.3	50	10 - 16	168	PKM0-12	–	–	DILM17-...(...)	ZB32-16	–	
7.5	15.2	50	10 - 16	224	PKM0-16	DILM17-...(...)	ZB32-16	DILM17-...(...)	ZB32-16	–	
11	21.7	50	16 - 24	350	PKM0-25	DILM25-...(...)	ZB32-24	DILM25-...(...)	ZB32-24	–	
15	29.3	50	20 - 32	448	PKM0-32	DILM32-...(...)	ZB32-32	DILM32-...(...)	ZB32-32	–	
Modules NZMN1, DILM and Z...											
18.5	36	50	24 - 40	320 - 560	NZMN1-S40	DILM40(...)	ZB65-40	–	–	–	The motor-starter combinations consist of the circuit-breaker (without overload function), contactor and overload relay module. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting and must be reset locally. In the Auto position, the combination automatically switches on again after the bimetallic elements have cooled down. Maximum tripping tolerance CLASS10.
18.5	36	50	3 - 65	320 - 560	NZMN1-S40	–	–	DILM40(...)	ZEV	ZEV-XSW-65	
22	41	50	40 - 57	400 - 700	NZMN1-S50	DILM50(...)	ZB65-57	–	–	–	
22	41	50	3 - 65	400 - 700	NZMN1-S50	–	–	DILM50(...)	ZEV	ZEV-XSW-65	
30	55	50	40 - 57	504 - 882	NZMN1-S63	DILM65(...)	ZB65-57	–	–	–	
30	55	50	3 - 65	504 - 882	NZMN1-S63	–	–	DILM65(...)	ZEV	ZEV-XSW-65	
37	68	50	50 - 70	640 - 1120	NZMN1-S80	DILM80(...)	ZB150-70	–	–	–	
37	68	50	10 - 145	640 - 1120	NZMN1-S80	–	–	DILM80(...)	ZEV	ZEV-XSW-145	
45	81	50	70 - 100	800 - 1250	NZMN1-S100	DILM95(...)	ZB150-100	–	–	–	
45	81	50	10 - 145	800 - 1250	NZMN1-S100	–	–	DILM95(...)	ZEV	ZEV-XSW-145	
55	99	50	70 - 100	800 - 1250	NZMN1-S100	DILM115(...)	ZB150-100	–	–	–	
55	99	50	10 - 145	800 - 1250	NZMN1-S100	–	–	DILM115(...)	ZEV	ZEV-XSW-145	

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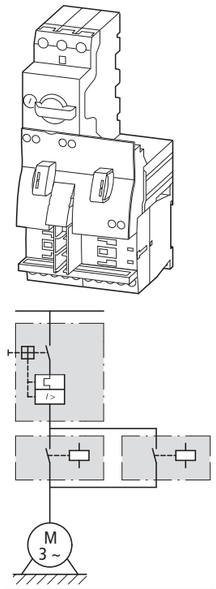
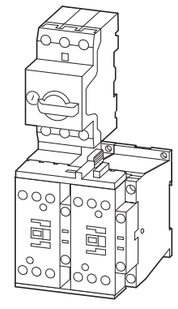
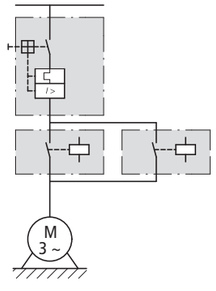
PKZM0, DILM, ZB; NZMN1, DILM, ZB, ZEV

Motor data				Setting range		Motor starters actuating voltage 230 V 50 Hz **Part no.** Article no.	Price See price list	Motor starters actuating voltage 24 V DC **Part no.** Article no.	Price See price list	Std. pack	Motor protective circuit breaker	Contactor	Reversing starter wiring set Mechanical connection module, electrical contact module and reversing connector	Notes
Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current 380 - 415 V	 380 - 415 V	Overload trip	Short-circuit releases									
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination											
P kW	I_e A	I_q kA	I_q kA	I_r A	I_{rm} A						Type	Type	Type	
Complete units MSC-R														
0.06	0.21	150	50	0.16 - 0.25	3.5	**MSC-R-0.25-M7(230V50HZ)** 283171		**MSC-R-0.25-M7(24VDC)** 283190		1 off	PKZM0-0,25	DILM7-01(...)	PKZM0-XRM12	The reversing starters (complete devices) consist of a PKZM0 motor protective circuit breaker and two contactors DILM. With the adapterless top-hat rail mounting of starters up to 12 A, only the motor-protective circuit-breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element. Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter. From 16 A, the motor protective circuit breaker and contactors are mounted on the top-hat rail adapter plate. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Complete units with mechanical interlock, starters up to 12 A also with electrical interlock. When using auxiliary contacts DILA-XHIT… (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminal.
0.09	0.31	150	50	0.25 - 0.4	5.6	**MSC-R-0.4-M7(230V50HZ)** 283172		**MSC-R-0.4-M7(24VDC)** 283191			PKZM0-0,4	DILM7-01(...)	PKZM0-XRM12	
0.12 0.18	0.41 0.6	150	50	0.4 - 0.63	8.82	**MSC-R-0.63-M7(230V50HZ)** 283173		**MSC-R-0.63-M7(24VDC)** 283192			PKZM0-0,63	DILM7-01(...)	PKZM0-XRM12	
0.25	0.8	150	50	0.63 - 1	14	**MSC-R-1-M7(230V50HZ)** 283175		**MSC-R-1-M7(24VDC)** 283194			PKZM0-1	DILM7-01(...)	PKZM0-XRM12	
0.37 0.55	1.1 1.5	150	50	1 - 1.6	22.4	**MSC-R-1.6-M7(230V50HZ)** 283176		**MSC-R-1.6-M7(24VDC)** 283195			PKZM0-1,6	DILM7-01(...)	PKZM0-XRM12	
0.75	1.9	150	50	1.6 - 2.5	35	**MSC-R-2.5-M7(230V50HZ)** 283178		**MSC-R-2.5-M7(24VDC)** 283197			PKZM0-2,5	DILM7-01(...)	PKZM0-XRM12	
1.1 1.5	2.6 3.6	150	50	2.5 - 4	56	**MSC-R-4-M7(230V50HZ)** 283179		**MSC-R-4-M7(24VDC)** 283198			PKZM0-4	DILM7-01(...)	PKZM0-XRM12	
2.2	5	150	50	4 - 6.3	88.2	**MSC-R-6.3-M7(230V50HZ)** 283181		**MSC-R-6.3-M7(24VDC)** 283200			PKZM0-6,3	DILM7-01(...)	PKZM0-XRM12	
3	6.6	150	–	6.3 - 10	140	**MSC-R-10-M7(230V50HZ)** 283182		**MSC-R-10-M7(24VDC)** 283201			PKZM0-10	DILM7-01(...)	PKZM0-XRM12	
4	8.5	150	–	6.3 - 10	140	**MSC-R-10-M9(230V50HZ)** 283183		**MSC-R-10-M9(24VDC)** 283202			PKZM0-10	DILM9-01(...)	PKZM0-XRM12	
5.5	11.3	50	–	8 - 12	168	**MSC-R-12-M12(230V50HZ)** 283184		**MSC-R-12-M12(24VDC)** 283203			PKZM0-12	DILM12-01(...)	PKZM0-XRM12	
3	6.6	50	50	6.3 - 10	140	**MSC-R-10-M17(230V50HZ)** 101049		**MSC-R-10-M17(24VDC)** 101051			PKZM0-10	DILM17-01(...)	PKZM0-XRM32	
4	11.3	50	50	8 - 12	168	**MSC-R-12-M17(230V50HZ)** 101050		**MSC-R-12-M17(24VDC)** 101052			PKZM0-12	DILM17-01(...)	PKZM0-XRM32	
7.5	15.2	50	50	10 - 16	224	**MSC-R-16-M17(230V50HZ)** 283186		**MSC-R-16-M17(24VDC)** 283204			PKZM0-16	DILM17-01(...)	PKZM0-XRM32	
11	21.7	50	50	20 - 25	350	**MSC-R-25-M25(230V50HZ)** 283187		**MSC-R-25-M25(24VDC)** 283205			PKZM0-25	DILM25-01(...)	PKZM0-XRM32	
15	29.3	50	50	25 - 32	448	**MSC-R-32-M32(230V50HZ)** 283188		**MSC-R-32-M32(24VDC)** 283206			PKZM0-32	DILM32-01(...)	PKZM0-XRM32	







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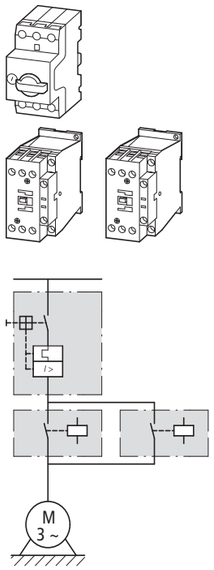
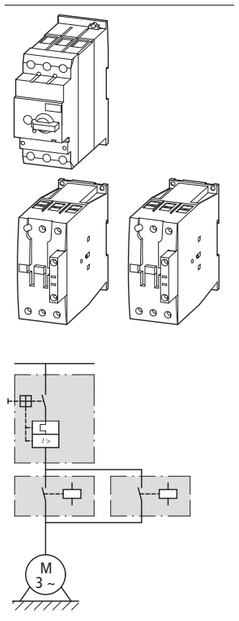
Motor data				Setting range		Motor protective circuit breaker		Contactor		Contactor	Notes
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release			Type “1” coordination		Type “2” coordination	
400 V	AC-3	380 - 415 V	380 - 415 V								
	400 V	Type “1” coordination	Type “2” coordination								
P	I_e	I_q	I_q	I_r	I_{rm}	**Type**		**Type**		**Type**	
kW	A	kA	kA	A	A						
Modules PKZM0 and DILM											
0.06	0.21	150	50	0.16 - 0.25	3.5	PKZM0-0,25	2 x	DILM7-...(...)	2 x	DILM7-...(...)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
0.09	0.31	150	50	0.25 - 0.4	5.6	PKZM0-0,4		DILM7-...(...)		DILM7-...(...)	
0.12	0.41	150	50	0.4 - 0.63	8.82	PKZM0-0,63		DILM7-...(...)		DILM7-...(...)	
0.18	0.6	150	50	0.4 - 0.63	8.82	PKZM0-0,63		DILM7-...(...)		DILM7-...(...)	
0.25	0.8	150	50	0.63 - 1	14	PKZM0-1		DILM7-...(...)		DILM7-...(...)	
0.37	1.1	150	50	1 - 1.6	22.4	PKZM0-1,6		DILM7-...(...)		DILM7-...(...)	
0.55	1.5	150	50	1 - 1.6	22.4	PKZM0-1,6		DILM7-...(...)		DILM7-...(...)	
0.75	1.9	150	50	1.6 - 2.5	35	PKZM0-2,5		DILM7-...(...)		DILM7-...(...)	
1.1	2.6	150	50	2.5 - 4	56	PKZM0-4		DILM7-...(...)		DILM7-...(...)	
1.5	3.6	150	50	2.5 - 4	56	PKZM0-4		DILM7-...(...)		DILM7-...(...)	
2.2	5	150	50	4 - 6.3	88.2	PKZM0-6,3		DILM7-...(...)		DILM7-...(...)	
3	6.6	150	50	6.3 - 10	140	PKZM0-10		DILM9-...(...)		DILM17-...(...)	
4	8.5	150	50	6.3 - 10	140	PKZM0-10		DILM9-...(...)		DILM17-...(...)	
5.5	11.3	50	50	8 - 12	168	PKZM0-12		DILM12-...(...)		DILM17-...(...)	
7.5	15.2	50	50	10 - 16	224	PKZM0-16		DILM17-...(...)		DILM17-...(...)	
11	21.7	50	50	20 - 25	350	PKZM0-25		DILM25-...(...)		DILM25-...(...)	
15	29.3	50	50	25 - 32	448	PKZM0-32		DILM32-...(...)		DILM32-...(...)	



Modules PKZM4 and DILM											
5.5	11.3	50	50	10 - 16	224	PKZM4-16	2 x	DILM17-...(...)	2 x	DILM17-...(...)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.
7.5	15.2	50	50	10 - 16	224	PKZM4-16		DILM17-...(...)		DILM17-...(...)	
11	21.7	50	50	20 - 25	350	PKZM4-25		DILM25-...(...)		DILM25-...(...)	
15	29.3	50	50	25 - 32	448	PKZM4-32		DILM32-...(...)		DILM32-...(...)	
18.5	36	50	50	32 - 40	560	PKZM4-40		DILM40(...)		DILM40(...)	
22	41	50	50	40 - 50	700	PKZM4-50		DILM50(...)		DILM50(...)	
30	55	50	50	50 - 58	812	PKZM4-58		DILM65(...)		DILM65(...)	
34	63	50	50	55 - 65	882	PKZM4-63		DILM65(...)		DILM65(...)	



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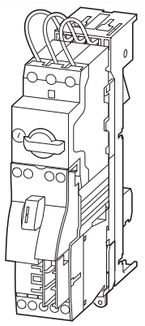
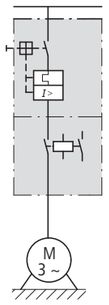
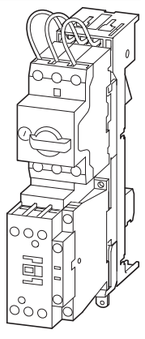
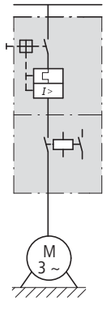
Motor data			**Setting range**		**Circuit-breaker**		**Contactor** Type “1” coordination		**Contactor** Type “2” coordination	**Notes**
Rated operational power	Rated operational current	Rated short-circuit current	Overload trip	Short-circuit release						
AC-3	AC-3									
380 V 400 V 415 V	400 V	400/415 V								
P	I_e	I_q	I_r	I_{rm}	**Type**		**Type**		**Type**	
kW	A	kA	A	A						
Modules NZMN and DILM										
15	29.3	50	25 - 32	320 - 448	NZMN1-M32	2 x	DILM40(…)	2 x	DILM80(…)	The motor starter combinations consist of the motor protective circuit-breaker and a contactor. They comply with IEC/EN 60947-4-1 and VDE 0660 Part 102. I_q = conditional rated current.
18.5	36	50	32 - 40	320 - 560	NZMN1-M40	2 x	DILM40(…)	2 x	DILM80(…)	
22	41	50	40 - 50	400 - 700	NZMN1-M50	2 x	DILM50(…)	2 x	DILM80(…)	
30	55	50	50 - 63	504 - 882	NZMN1-M63	2 x	DILM65(…)	2 x	DILM80(…)	
37	68	50	63 - 80	640 - 1120	NZMN1-M80	2 x	DILM80(…)	2 x	DILM80(…)	
45	81	50	80 - 100	800 - 1250	NZMN1-M100	2 x	DILM95(…)	2 x	DILM95(…)	
55	99	50	80 - 100	800 - 1250	NZMN1-M100	2 x	DILM115(…)	2 x	DILM115(…)	
75	134	50	125 - 160	1280 - 2240	NZMN2-M160	2 x	DILM150(…)	2 x	DILM150(…)	
90	161	50	160 - 200	1600 - 2500	NZMN2-M200	2 x	DILM185A/22(…)	2 x	DILM185A/22(…)	
110	196	50	160 - 200	1600 - 2500	NZMN2-M200	2 x	DILM225A/22(…)	2 x	DILM225A/22(…)	
132	231	50	175 - 350	350 - 4900	NZMN3-ME350	2 x	DILM250/22(…)	2 x	DILM250/22(…)	
160	279	50	175 - 350	350 - 4900	NZMN3-ME350	2 x	DILM300A/22(…)	2 x	DILM300A/22(…)	
200	349	50	175 - 350	350 - 4900	NZMN3-ME350	2 x	DILM400/22(…)	2 x	DILM400/22(…)	
250	437	50	225 - 450	450 - 6300	NZMN3-ME450	2 x	DILM500/22(…)	2 x	DILM500/22(…)	
315	544	50	275 - 550	550 - 7700	NZMN4-ME550	2 x	DILM580/22(…)	2 x	–	
400	683	50	438 - 875	875 - 12250	NZMN4-ME875	2 x	DILM650/22(…)	2 x	–	
450	750	50	438 - 875	875 - 12250	NZMN4-ME875	2 x	DILM750/22(…)	2 x	–	
500	820	50	438 - 875	875 - 12250	NZMN4-ME875	2 x	DILM820/22(…)	2 x	–	
560	947	50	700 - 1400	1400 - 19600	NZMN4-ME1400	2 x	DILM1000/22(…)	2 x	–	
Modules NZMH and DILM										
22	41	100	40 - 50	400 - 700	NZMH2-M50	2 x	DILM80(…)	2 x	DILM80(…)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.
30	55	100	50 - 63	504 - 882	NZMH2-M63	2 x	DILM80(…)	2 x	DILM80(…)	
37	68	100	63 - 80	640 - 1120	NZMH2-M80	2 x	DILM80(…)	2 x	DILM80(…)	
55	81	100	80 - 100	800 - 1250	NZMH2-M100	2 x	DILM95(…)	2 x	DILM95(…)	
55	100	100	100 - 125	1000 - 1750	NZMH2-M125	2 x	DILM115(…)	2 x	DILM115(…)	
75	134	100	125 - 160	1280 - 2240	NZMH2-M160	2 x	DILM150(…)	2 x	DILM150(…)	
30	55	100	45 - 90	90 - 1260	NZMH2-ME90	2 x	DILM80(…)	2 x	DILM80(…)	
37	68	100	45 - 90	90 - 1260	NZMH2-ME90	2 x	DILM80(…)	2 x	DILM80(…)	
45	81	100	45 - 90	90 - 1260	NZMH2-ME90	2 x	DILM95(…)	2 x	DILM95(…)	
55	100	100	70 - 140	140 - 1960	NZMH2-ME140	2 x	DILM115(…)	2 x	DILM115(…)	
75	134	100	70 - 140	140 - 1960	NZMH2-ME140	2 x	DILM150(…)	2 x	DILM150(…)	
90	161	100	110 - 120	220 - 3080	NZMH2-ME220	2 x	DILM185A/22(…)	2 x	DILM185A/22(…)	
110	196	100	110 - 120	220 - 3080	NZMH2-ME220	2 x	DILM225A/22(…)	2 x	DILM225A/22(…)	
132	231	100	175 - 350	350 - 4900	NZMH3-ME350	2 x	DILM250/22(…)	2 x	DILM250/22(…)	
160	279	100	175 - 350	350 - 4900	NZMH3-ME350	2 x	DILM300A/22(…)	2 x	DILM300A/22(…)	
200	349	100	175 - 350	350 - 4900	NZMH3-ME350	2 x	DILM400/22(…)	2 x	DILM400/22(…)	

Motor data					Setting range		Motor starters actuating voltage 230 V 50 Hz **Part no.** Article no.	Price See price list	Std. pack
Motor rating	Rated operational current	Rated short-circuit current			Overload trip	Short-circuit release			
AC-3	AC-3	380 - 415 V	380 - 415 V						
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination						
P kW	I_e A	I_q kA	I_q kA		I_r A	I_{rm} A			
Complete devices PKZ and DIL on BBA									
0.06	0.21	100	50		0.16 - 0.25	3.5	**MSC-D-0.25-M7(230V50HZ)/BBA**[1] 102737		1 off
0.09	0.31	100	50		0.25 - 0.4	5.6	**MSC-D-0.4-M7(230V50HZ)/BBA**[1] 102738		
0.12 0.18	0.41 0.6	100	50		0.4 - 0.63	8.82	**MSC-D-0.63-M7(230V50HZ)/BBA**[1] 102739		
0.25	0.8	100	50		0.63 - 1	14	**MSC-D-1-M7(230V50HZ)/BBA**[1] 102950		
0.37 0.55	1.1 1.5	100	50		1 - 1.6	22.4	**MSC-D-1.6-M7(230V50HZ)/BBA**[1] 102951		
0.75	1.9	100	50		1.6 - 2.5	35	**MSC-D-2.5-M7(230V50HZ)/BBA**[1] 102952		
1.1 1.5	2.6 3.6	100	50		2.5 - 4	56	**MSC-D-4-M7(230V50HZ)/BBA**[1] 102953		
2.2	5	100	50		4 - 6.3	88.2	**MSC-D-6.3-M7(230V50HZ)/BBA**[1] 102954		
3	6.6	100	–		6.3 - 10	140	**MSC-D-10-M7(230V50HZ)/BBA** 102955		
4	8.5	100	–		6.3 - 10	140	**MSC-D-10-M9(230V50HZ)/BBA** 102956		
5.5	11.3	100	–		8 - 12	168	**MSC-D-12-M12(230V50HZ)/BBA** 102957		
7.5	15.2	50	–		10 - 16	224	**MSC-D-16-M15(230V50HZ)/BBA** 102958		
3 4	6.6 8.5	100	50		6.3 - 10	140	**MSC-D-10-M17(230V50HZ)/BBA** 102959		
5.5	11.3	100	50		8 - 12	168	**MSC-D-12-M17(230V50HZ)/BBA** 102960		
7.5	15.2	50	50		10 - 16	224	**MSC-D-16-M17(230V50HZ)/BBA**[1] 102961		
11	21.7	50	50		20 - 25	350	**MSC-D-25-M25(230V50HZ)/BBA**[1] 102962		
15	29.3	50	50		25 - 32	448	**MSC-D-32-M32(230V50HZ)/BBA**[1] 102963		









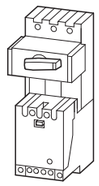
Motor starters actuating voltage 24 V DC **Part no.** Article no.	Price See price list	Std. pack	Motor protective circuit breaker **Type**	Contactor **Type**	DOL starter wiring set Mechanical connection module and electrical contact module **Type**	Busbar adapter **Type**	Notes
MSC-D-0.25-M7(24VDC)/BBA[1] 102964		1 off	PKZM0-0,25	DILM7-10(...)	PKZM0-XDM12	BBA0-25	The DOL starters (complete devices) consist of a motor protective circuit breaker PKZM0 and a contactor DILM. These combinations are mounted on busbars. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminal.
MSC-D-0.4-M7(24VDC)/BBA[1] 102965			PKZM0-0,4	DILM7-10(...)	PKZM0-XDM12		
MSC-D-0.63-M7(24VDC)/BBA[1] 102966			PKZM0-0,63	DILM7-10(...)	PKZM0-XDM12		
MSC-D-1-M7(24VDC)/BBA[1] 102967			PKZM0-1	DILM7-10(...)	PKZM0-XDM12		
MSC-D-1.6-M7(24VDC)/BBA[1] 102968			PKZM0-1,6	DILM7-10(...)	PKZM0-XDM12		
MSC-D-2.5-M7(24VDC)/BBA[1] 102969			PKZM0-2,5	DILM7-10(...)	PKZM0-XDM12		
MSC-D-4-M7(24VDC)/BBA[1] 102970			PKZM0-4	DILM7-10(...)	PKZM0-XDM12		
MSC-D-6.3-M7(24VDC)/BBA 102971			PKZM0-6,3	DILM7-10(...)	PKZM0-XDM12		
MSC-D-10-M7(24VDC)/BBA 102972			PKZM0-10	DILM7-10(...)	PKZM0-XDM12		
MSC-D-10-M9(24VDC)/BBA 102973			PKZM0-10	DILM9-10(...)	PKZM0-XDM12		
MSC-D-12-M12(24VDC)/BBA 102974			PKZM0-12	DILM12-10(...)	PKZM0-XDM12		
MSC-D-16-M15(24VDC)/BBA 102975			PKZM0-16	DILM15-10(...)	PKZM0-XDM12		
MSC-D-10-M17(24VDC)/BBA 102976			PKZM0-10	DILM17-10(...)	PKZM0-XM32DE	BBA0-32	
MSC-D-12-M17(24VDC)/BBA 102977			PKZM0-12	DILM17-10(...)	PKZM0-XM32DE		
MSC-D-16-M17(24VDC)/BBA 102978			PKZM0-16	DILM17-10(...)	PKZM0-XM32DE		
MSC-D-25-M25(24VDC)/BBA 102979			PKZM0-25	DILM25-10(...)	PKZM0-XM32DE		
MSC-D-32-M32(24VDC)/BBA 102980			PKZM0-32	DILM32-10(...)	PKZM0-XM32DE		

Further information **Page**
Technical data PKZM0 → Chapter 7
Accessories PKZ → 7/10
Technical data DILM → Chapter 5
DILM accessories → 5/54

[1] To assemble Type F starters that conform with UL508, incoming terminals BK25/3-PKZ0-E and, if necessary, three-phase terminal blocks B3.../...-PKZ0 can be added to motor starter combinations.
Type F starter → Page 8/34

Motor data				Setting range		Motor starters actuating voltage 230 V 50 Hz	Price See price list	Motor starters actuating voltage 24 V DC	Price See price list	Std. pack	Motor protective circuit breaker		Contactor	Wiring set Reversing starters	Busbar adapter	Notes
Motor rating	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release	Part no. Article no.		Part no. Article no.						Mechanical connection module, electrical contact module and reversing connector		
AC-3	AC-3	380 - 415 V	380 - 415 V													
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination													
P	I_e	I_q	I_q	I_r	I_{rm}						Type		Type	Type	Type	
kW	A	kA	kA	A	A											
Complete devices PKZ and DILM on BBA for reversing starters																
0.06	0.21	100	50	0.16 - 0.25	3.5	**MSC-R-0.25-M7(230V50HZ)/BBA** 102981		**MSC-R-0.25-M7(24VDC)/BBA** 102997		1 off	PKZM0-0,25	2 x	DILM7-01(...)	PKZM0-XRM12	BBA0R-25	The reversing starters (complete devices) consist of a PKZM0 motor protective circuit breaker and two contactors DILM. These combinations are mounted on busbars. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Complete units with mechanical interlock, starters up to 12 A also with electrical interlock.
0.09	0.31	100	50	0.25 - 0.4	5.6	**MSC-R-0.4-M7(230V50HZ)/BBA** 102982		**MSC-R-0.4-M7(24VDC)/BBA** 102998			PKZM0-0,4	2 x	DILM7-01(...)	PKZM0-XRM12		
0.12 0.18	0.41 0.6	100	50	0.4 - 0.63	8.82	**MSC-R-0.63-M7(230V50HZ)/BBA** 102983		**MSC-R-0.63-M7(24VDC)/BBA** 102999			PKZM0-0,63	2 x	DILM7-01(...)	PKZM0-XRM12		
0.25	0.8	100	50	0.63 - 1	14	**MSC-R-1-M7(230V50HZ)/BBA** 102984		**MSC-R-1-M7(24VDC)/BBA** 103000			PKZM0-1	2 x	DILM7-01(...)	PKZM0-XRM12		
0.37 0.55	1.1 1.5	100	50	1 - 1.6	22.4	**MSC-R-1.6-M7(230V50HZ)/BBA** 102985		**MSC-R-1.6-M7(24VDC)/BBA** 103001			PKZM0-1,6	2 x	DILM7-01(...)	PKZM0-XRM12		
0.75	1.9	100	50	1.6 - 2.5	35	**MSC-R-2.5-M7(230V50HZ)/BBA** 102986		**MSC-R-2.5-M7(24VDC)/BBA** 103002			PKZM0-2,5	2 x	DILM7-01(...)	PKZM0-XRM12		
1.1 1.5	2.6 3.6	100	50	2.5 - 4	56	**MSC-R-4-M7(230V50HZ)/BBA** 102987		**MSC-R-4-M7(24VDC)/BBA** 103003			PKZM0-4	2 x	DILM7-01(...)	PKZM0-XRM12		
2.2	5	100	50	4 - 6.3	88.2	**MSC-R-6.3-M7(230V50HZ)/BBA** 102988		**MSC-R-6.3-M7(24VDC)/BBA** 103004			PKZM0-6,3	2 x	DILM7-01(...)	PKZM0-XRM12		
3	6.6	100	–	6.3 - 10	140	**MSC-R-10-M7(230V50HZ)/BBA** 102989		**MSC-R-10-M7(24VDC)/BBA** 103005			PKZM0-10	2 x	DILM7-01(...)	PKZM0-XRM12		
4	8.5	100	–	6.3 - 10	140	**MSC-R-10-M9(230V50HZ)/BBA** 102990		**MSC-R-10-M9(24VDC)/BBA** 103006			PKZM0-10	2 x	DILM9-01(...)	PKZM0-XRM12		
5.5	11.3	100	–	8 - 12	168	**MSC-R-12-M12(230V50HZ)/BBA** 102991		**MSC-R-12-M12(24VDC)/BBA** 103007			PKZM0-12	2 x	DILM12-01(...)	PKZM0-XRM12		
3 4	6.6 8.5	100	50	6.3 - 10	140	**MSC-R-10-M17(230V50HZ)/BBA** 102992		**MSC-R-10-M17(24VDC)/BBA** 103008			PKZM0-10	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL	BBA0R-32	
5.5	11.3	100	50	8 - 12	168	**MSC-R-12-M17(230V50HZ)/BBA** 102993		**MSC-R-12-M17(24VDC)/BBA** 103009			PKZM0-12	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL		
7.5	15.2	50	50	10 - 16	224	**MSC-R-16-M17(230V50HZ)/BBA** 102994		**MSC-R-16-M17(24VDC)/BBA** 103010			PKZM0-16	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL		
11	21.7	50	50	20 - 25	350	**MSC-R-25-M25(230V50HZ)/BBA** 102995		**MSC-R-25-M25(24VDC)/BBA** 103011			PKZM0-25	2 x	DILM25-01(...)	PKZM0-XM32DE+ DILM32-XRL		
15	29.3	50	50	25 - 32	448	**MSC-R-32-M32(230V50HZ)/BBA** 102996		**MSC-R-32-M32(24VDC)/BBA** 103012			PKZM0-32	2 x	DILM32-01(...)	PKZM0-XM32DE+ DILM32-XRL		

Further information **Page**
Technical data PKZM0 → Chapter 7
Accessories PKZ → 7/10
Technical data DILM → Chapter 5
DILM accessories → 5/54



Maximum motor rating				Setting range					Basic unit
Alternating current HP				Overload trip	Short-circuit release	Rated short-circuit breaking capacity			
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V			240 V	480 Y 277 V	600 Y 347 V	Type
HP	HP	HP	HP	I_r A	I_{rm} A	kA	kA	kA	
Modules PKZ2/S-SP and trip blocks ZMR with overload relay function									
1)				0.4 - 0.6	5 - 8	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
		½	½	0.6 - 1	8 - 14	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
		¾	1	1 - 1.6	14 - 22	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
1	1	2	3	2.4 - 4	35 - 55	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
1½	1½	3	5	4 - 6	50 - 80	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
2	3	5	7½	6 - 10	80 - 140	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
3	5	10	10	10 - 16	130 - 220	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
7½	7½	20	25	16 - 27	200 - 350	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
10	10	20	30	24 - 32	275 - 425	100	65	–	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
10	15	30	30	32 - 42	350 - 500	100	65	–	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
Modules PKZ2/S-SP and trip blocks ZM									
1)				0.4 - 0.6	5 - 8	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
		½	½	0.6 - 1	8 - 14	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
		¾	1	1 - 1.6	14 - 22	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
1	1	2	3	2.4 - 4	35 - 55	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
1½	1½	3	5	4 - 6	55 - 80	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
2	3	5	7½	6 - 10	80 - 140	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
3	5	10	10	10 - 16	130 - 220	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
7½	7½	20	25	16 - 27	200 - 350	100	65	42	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
10	10	20	30	24 - 32	275 - 425	100	65	–	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940
10	15	30	30	32 - 42	350 - 500	100	65	–	**PKZ2/S-SP(110V50HZ,120V60HZ)** 050940

Notes 1) Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 … 150

Trip block Type	Price Total of module prices Euro DG	Std. pack	Notes
ZMR-0.6-PKZ2 033943		1 off	For use with networks with grounded star point: Up to 27 A: 600 Y/347 V AC; 480 Y/277 V AC. 27 – 42 A: 480 Y/277 V AC. Service factor (SF): Set value Ir on the current scale, depending on the load factor. SF = 1.15 → I_r = 1 x $I_{n\,mot}$. SF = 1 → I_r = 0.9 x $I_{n\,mot}$. Terminal capacity of high-capacity compact starters PKZ2/ZM…/S. Main terminals. Cables Cu 75 °C, min. AWG 14, max. AWG 6. Torque 1.8 Nm. Control circuit terminals. Cables min. AWG 20, max. AWG 16 (0.5–1 mm²). With insulated/uninsulated blade terminal, nominal size 2.8
ZMR-1-PKZ2 033950		1 off	
ZMR-1.6-PKZ2 033952		1 off	
ZMR-2.4-PKZ2 033955		1 off	
ZMR-4-PKZ2 033957		1 off	
ZMR-6-PKZ2 033966		1 off	
ZMR-10-PKZ2 033967		1 off	
ZMR-16-PKZ2 033968		1 off	
ZMR-25-PKZ2 033969		1 off	
ZMR-32-PKZ2 033973		1 off	
ZMR-40-PKZ2 033975		1 off	
ZM-0.6-PKZ2 024232		1 off	
ZM-1-PKZ2 028979		1 off	
ZM-1.6-PKZ2 031352		1 off	
ZM-2.4-PKZ2 033725		1 off	
ZM-4-PKZ2 036098		1 off	
ZM-6-PKZ2 038471		1 off	
ZM-10-PKZ2 040844		1 off	
ZM-16-PKZ2 043217		1 off	
ZM-25-PKZ2 045590		1 off	
ZM-32-PKZ2 047963		1 off	
ZM-40-PKZ2 050336		1 off	

PKZ2-SP, ZMR, ZM

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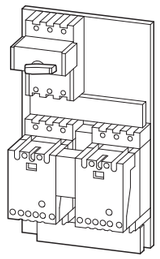
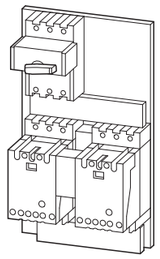
Maximum motor rating				Setting range		Rated short-circuit breaking capacity I_{cn}		
Alternating current HP				Overload trip	Short-circuit release	240 V	480 Y 277 V	600 Y 347 V
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V					
HP	HP	HP	HP	I_r A	I_{rm} A	kA	kA	kA
Modules PKZ2/S-SP and trip blocks ZMR with overload relay function								
								
[1]				0.4 - 0.6	5 - 8	100	65	42
		½	½	0.6 - 1	8 - 14	100	65	42
		¾	1	1 - 1.6	14 - 22	100	65	42
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42
1	1	2	3	2.4 - 4	35 - 55	100	65	42
1½	1½	3	5	4 - 6	50 - 80	100	65	42
2	3	5	7½	6 - 10	80 - 140	100	65	42
3	5	10	10	10 - 16	130 - 220	100	65	42
7½	7½	20	25	16 - 25	200 - 350	100	65	42
10	10	20	–	24 - 32	275 - 425	100	65	–
10	15	30	–	32 - 40	350 - 500	100	65	–
Modules PKZ2/S-SP and trip blocks ZM								
								
[1]				0.4 - 0.6	5 - 8	100	65	42
		½	½	0.6 - 1	8 - 14	100	65	42
		¾	1	1 - 1.6	14 - 22	100	65	42
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42
1	1	2	3	2.4 - 4	35 - 55	100	65	42
1½	1½	3	5	4 - 6	50 - 80	100	65	42
2	3	5	7½	6 - 10	80 - 140	100	65	42
3	5	10	10	10 - 16	130 - 220	100	65	42
7½	7½	20	25	16 - 25	200 - 350	100	65	42
10	10	20	–	24 - 32	275 - 425	100	65	–
10	15	30	–	32 - 40	350 - 500	100	65	–

Notes

[1] Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 … 150

[2] Specify actuating voltage in the range 24 – 600 V 50 or 60 Hz.

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PKZ2-SP, ZMR, ZM

Basic unit	Trip block	Price Total of module prices	Std. pack	Notes
Type[2]	Type	Euro DG		
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-0.6-PKZ2** 033943		1 off	For use with networks with grounded star point: Up to 27 A: 600 Y/347 V AC; 480 Y/277 V AC. 27 – 42 A: 480 Y/277 V AC
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-1-PKZ2** 033950		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-1.6-PKZ2** 033952		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-2.4-PKZ2** 033955		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-4-PKZ2** 033957		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-6-PKZ2** 033966		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-10-PKZ2** 033967		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-16-PKZ2** 033968		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-25-PKZ2** 033969		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-32-PKZ2** 033973		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZMR-40-PKZ2** 033975		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-0.6-PKZ2** 024232		1 off	Service factor (SF): Set value Ir on the current scale, depending on the load factor. SF = 1.15 → I_r = 1 x $I_{n\ mot}$. SF = 1 → I_r = 0.9 x $I_{n\ mot}$. Terminal capacity of high-capacity compact starters PKZ2/ZM…/S. Main terminals: Cables Cu 75 °C, min. AWG 14, max. AWG 6. Torque 1.8 Nm. Control circuit terminals: Cables min. AWG 20, max. AWG 16 (0.5–1 mm²). With insulated/uninsulated blade terminal, nominal size 2.8
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-1-PKZ2** 028979		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-1.6-PKZ2** 031352		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-2.4-PKZ2** 033725		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-4-PKZ2** 036098		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-6-PKZ2** 038471		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-10-PKZ2** 040844		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-16-PKZ2** 043217		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-25-PKZ2** 045590		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-32-PKZ2** 047963		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	**ZM-40-PKZ2** 050336		1 off	

PKZM0, DILM, BK...

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Maximum motor rating Alternating current HP				Setting range		Rated short-circuit breaking capacity I_{cn}			Extension terminal	Motor protective circuit breaker	Contactor
				Overload trip	Short-circuit release	240 V	480 Y 277 V [2]	600 Y 347 V [2]			
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V						Type	Type	Type
HP	HP	HP	HP	I_r A	I_{rm} A	kA	kA	kA			
Modules PKZM0, DIL, BK											
[1]				0.1 - 0.16	2.2	65	65	50	BK25/3-PKZ0	PKZM0-0,16	DILEM…(…)
				0.1 - 0.16	2.2	65	65	50	BK25/3-PKZ0	PKZM0-0,16	DILM7-…(…)
				0.16 - 0.25	3.4	65	65	50	BK25/3-PKZ0	PKZM0-0,25	DILEM…(…)
				0.16 - 0.25	3.4	65	65	50	BK25/3-PKZ0	PKZM0-0,25	DILM7-…(…)
				0.25 - 0.4	5.6	65	65	50	BK25/3-PKZ0	PKZM0-0,4	DILEM…(…)
				0.25 - 0.4	5.6	65	65	50	BK25/3-PKZ0	PKZM0-0,4	DILM7-…(…)
				0.4 - 0.63	8.8	65	65	50	BK25/3-PKZ0	PKZM0-0,63	DILEM…(…)
				0.4 - 0.63	8.8	65	65	50	BK25/3-PKZ0	PKZM0-0,63	DILM7-…(…)
		½	½	0.63 - 1	14	65	65	50	BK25/3-PKZ0	PKZM0-1	DILEM…(…)
		½	½	0.63 - 1	14	65	65	50	BK25/3-PKZ0	PKZM0-1	DILM7-…(…)
		¾	1	1 - 1.6	22	65	65	50	BK25/3-PKZ0	PKZM0-1,6	DILEM…(…)
		¾	1	1 - 1.6	22	65	65	50	BK25/3-PKZ0	PKZM0-1,6	DILM7-…(…)
½	½	1	1½	1.6 - 2.5	35	65	65	50	BK25/3-PKZ0	PKZM0-2,5	DILEM…(…)
½	½	1	1½	1.6 - 2.5	35	65	65	50	BK25/3-PKZ0	PKZM0-2,5	DILM7-…(…)
1	1	2	3	2.5 - 4	56	65	65	50	BK25/3-PKZ0	PKZM0-4	DILEM…(…)
1	1	2	3	2.5 - 4	56	65	65	50	BK25/3-PKZ0	PKZM0-4	DILM7-…(…)
1½	1½	3	5	4 - 6.3	88	65	65	50	BK25/3-PKZ0	PKZM0-6,3	DILEM…(…)
1½	1½	3	5	4 - 6.3	88	65	65	50	BK25/3-PKZ0	PKZM0-6,3	DILM7-…(…)
3	3	7½	10	6.3 - 11	140	65	65	50	BK25/3-PKZ0	PKZM0-10	DILM9-…(…)
3	3	7½	–	9 - 12	168	65	65	50	BK25/3-PKZ0	PKZM0-12	DILM12-…(…)
3	5	10	–	10 - 16	224	50	50	–	BK50/3-PKZ4-E	PKZM0-16	DILM17-…(…)
3	5	10	–	10 - 16	224	18	18	–	BK50/3-PKZ4-E	PKZM0-16	DILM17-…(…)
5	5	10	–	16 - 20	280	18	18	–	BK50/3-PKZ4-E	PKZM0-20	DILM25-…(…)
5	7½	15	–	20 - 25	350	18	18	–	BK50/3-PKZ4-E	PKZM0-25	DILM25-…(…)
7½	10	20	–	25 - 32	448	18	18	–	BK50/3-PKZ4-E	PKZM0-32	DILM32-…(…)
Modules PKZM4, DIL, BK											
3	5	10	15	10 - 16	224	65	65	50	BK50/3-PKZ4-E	PKZM4-16	DILM17-…(…)
5	7½	15	20	16 - 27	350	65	65	50	BK50/3-PKZ4-E	PKZM4-25	DILM25-…(…)
7½	10	25	30	24 - 34	448	65	65	50	BK50/3-PKZ4-E	PKZM4-32	DILM32-…(…)
10	15	30	30	32 - 40	560	65	65	50	BK50/3-PKZ4-E	PKZM4-40	DILM40(…)
10	15	30	–	40 - 52	700	65	65	–	BK50/3-PKZ4-E	PKZM4-50	DILM50(…)
15	15	40	–	50 - 56	812	65	65	–	BK50/3-PKZ4-E	PKZM4-58	DILM65(…)
15	15	40	–	52 - 58	882	65	65	–	BK50/3-PKZ4-E	PKZM4-63	DILM65(…)

Notes

Device for world markets IEC ≙ UL/CSA
Service factor (SF)
Set value I_r on the current scale, depending on the load factor
SF=1.15 -> $I_r = 1 \times I_{n\ mot}$
SF=1.0 -> $I_r = 0.9 \times I_{n\ mot}$
[1] Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 - 150.
[2] Suitable for networks with grounded star-point
Type F starter combinations do not need an upstream protective device.
For use in Canada, the switch must be fitted with an AK-PKZ0.

Rating data for approved types[1]				Max. rated motor current	Contactor	Overload relay	Maximum short-circuit protective device for North America		
Maximum motor rating							Fuse CEC or NEC	Circuit-breaker[2]	
Alternating current HP								Continuous current	Short-circuit release
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V		Type	Type [3]			
HP	HP	HP	HP	A				A	A
Modules DIL, Z									
–	–	½	½	1	DILEM-…(…)	ZE-1.0	3	15	–
–	–	¾	1	1.4	DILEM-…(…)	ZE-1.6	6	15	–
½	½	1	1½	2.3	DILEM-…(…)	ZE-2.4	6	15	–
–	1	2	3	3.9	DILEM-…(…)	ZE-4	15	15	–
1½	1½	3	–	6	DILEM-…(…)	ZE-6	20	15	–
–	2	–	–	6.8	DILEM-…(…)	ZE-9	35	15	–
2	2	5	5	7.8	DILEM-…(…)	ZE-9	35	15	–
2	3	5	5	9.6	DILEM-…(…)	ZE-12	45	–	–
–	–	½	½	1	DILM7…(…)	ZB12-1	3	25	200
–	–	¾	1	1.4	DILM7…(…)	ZB12-1,6	6	25	200
½	½	1	1½	2.3	DILM7…(…)	ZB12-2,4	6	25	200
1	1	2	3	3.9	DILM7…(…)	ZB12-4	15	25	200
1½	½	3	–	6	DILM7…(…)	ZB12-6	20	25	200
–	–	–	7½	9	DILM9…(…)	ZB12-10	25	25	200
–	3	5	7½	9.6	DILM12…(…)	ZE-12	25	25	200
–	–	7½	10	11	DILM12…(…)	ZB12-12	45	25	200
–	5	10	–	15.2	DILM15…(…)	ZB12-16	60	40	320
–	–	½	½	1	DILM17…(…)	ZB32-1	3	25	200
–	–	¾	1	1.4	DILM17…(…)	278447	6	25	200
½	½	1	1½	2.3	DILM17…(…)	ZB32-2,4	6	25	200
1	1	2	3	3.9	DILM17…(…)	ZB32-4	15	25	200
½	1½	3	–	6	DILM17…(…)	ZB32-6	20	25	200
–	3	5	7½	9.6	DILM17…(…)	ZB32-10	25	25	200
–	–	7½	10	11	DILM17…(…)	ZB32-16	40	30	320
–	5	10	–	15.2	DILM17…(…)	ZB32-16	40	30	320
–	7½	15	20	22	DILM25…(…)	ZB32-24	90	100	1200
–	10	20	25	32.2	DILM32…(…)	ZB32-32	125	125	1200
–	3	5	7½	9.6	DILM40(…)	ZB65-10	40	40	380
–	5	10	10	15.2	DILM40(…)	ZB65-16	60	60	760
–	7½	20	25	32.2	DILM40(…)	ZB65-24	90	90	1200
–	10	20	30	34	DILM40(…)	ZB65-40	125	125	1200
–	20	40	50	54	DILM50(…)	ZB65-57	200	150	2000
–	20	50	50	63	DILM65(…)	ZB65-65	200	160	2000
–	25	50	60	68	DILM80(…)	ZB150-70	250	250	2500
–	30	75	100	99	DILM95(…)	ZB150-100	400	400	3200
–	40	100	100	124	DILM115(…)	ZB150-125	500	500	4000
–	60	125	125	156	DILM150(…)	ZB150-150	600	600	4800
50	60	125	150	156	DILM185A/22(…)	Z5-160/FF225A	600 CLASS J	600	7200
60	75	150	200	192	DILM225A/22(…)	Z5-220/FF225A	800 CLASS J	800	16000
75	100	200	250	248	DILM250/22(…)	Z5-250/FF250	700 CLASS J	600	–
100	125	250	300	312	DILM300A/22(…)	ZW7-400	1000	1000	–
125	150	300	400	382	DILM400/22(…)	ZW7-400	1000	1000	–
150	200	400	500	480	DILM500/22(…)	ZW7-540	1000	600	–

Notes
[1] Devices for world markets IEC ≙ UL/CSA
[2] Circuit-breaker -> Chapter 17
[3] The electronic overload relay ZEV can alternatively be used on request.

NZMH...-S...-CNA, DILM..., ZB, Z5, ZW7

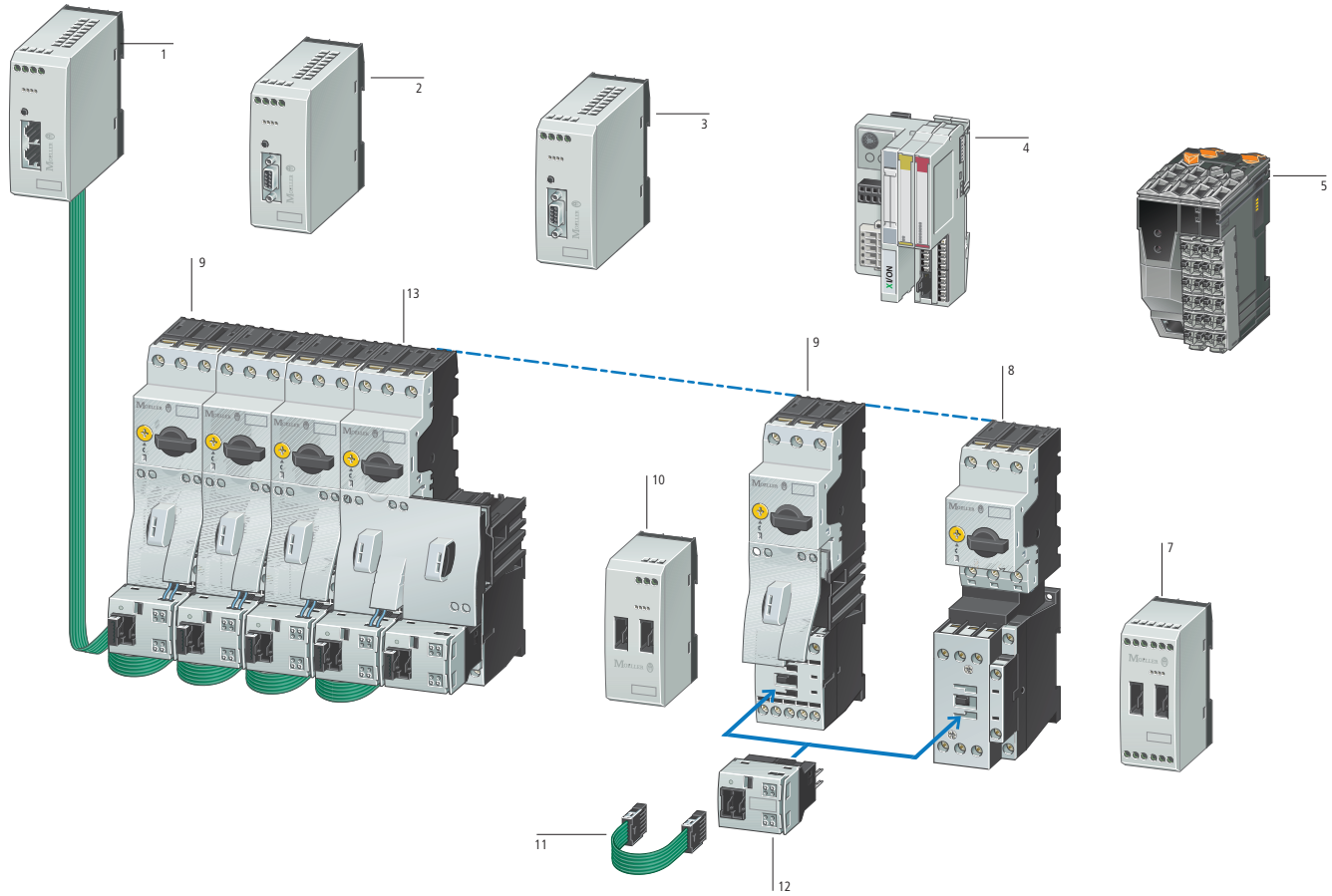
HPL08036EN

Rating data for approved types								Setting range		Circuit-breaker	Contactor	Overload relay	Minimum enclosure volume
Maximum motor rating Alternating current HP				Max. rated motor current	Rated short-circuit breaking capacity			Overload trip	Short-circuit releases				
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V		480 V	600 Y 347 V[1]	600 V			Type	Type	Type	
HP	HP	HP	HP	A	kA	kA	kA	I_r A	I_{rm} A				cm^3
Module NZMH...-S...-CNA, DILM, Z													
–	–	–	½	0.9	100	50	–	0.6 - 1	12.8 - 22.5	NZMH2-S1.6-CNA	DILM17-...(...)	ZB32-1	81.5
–	–	½	¾	1.3	100	50	–	1 - 1.6	12.8 - 22.5	NZMH2-S1.6-CNA	DILM17-...(...)	ZB32-1,6	81.5
–	–	¾	–	1.6	100	50	–	1 - 1.6	19.2 - 33.6	NZMH2-S2.4-CNA	DILM17-...(...)	ZB32-1,6	81.5
–	–	1	1	2.1	100	50	–	1.6 - 2.4	19.2 - 33.6	NZMH2-S2.4-CNA	DILM17-...(...)	ZB32-2,4	81.5
–	½	–	1½	2.4	100	50	–	1.6 - 2.4	32 - 56	NZMH2-S5-CNA	DILM17-...(...)	ZB32-2,4	81.5
¾	¾	2	3	3.9	100	50	–	2.4 - 4	32 - 56	NZMH2-S5-CNA	DILM17-...(...)	ZB32-4	81.5
–	1	–	–	4.2	100	50	–	4 - 6	32 - 56	NZMH2-S5-CNA	DILM17-...(...)	ZB32-6	81.5
1	1½	3	–	6	100	50	–	4 - 6	48 - 84	NZMH2-S8-CNA	DILM17-...(...)	ZB32-6	81.5
1½	2	–	5	6.9	100	50	–	6 - 10	48 - 84	NZMH2-S8-CNA	DILM17-...(...)	ZB32-10	81.5
2	3	5	7½	9.6	100	50	–	6 - 10	80 - 140	NZMH2-S12-CNA	DILM17-...(...)	ZB32-10	81.5
3	5	10	10	15.2	100	50	–	10 - 16	128 - 224	NZMH2-S18-CNA	DILM17-...(...)	ZB32-16	81.5
5	–	–	15	17.5	100	50	–	16 - 24	200 - 350	NZMH2-S26-CNA	DILM17-...(...)	ZB32-24	81.5
–	7½	15	20	22	100	50	–	16 - 24	200 - 350	NZMH2-S26-CNA	DILM25-...(...)	ZB32-24	81.5
7½	–	–	–	25.3	100	50	–	24 - 32	256 - 448	NZMH2-S33-CNA	DILM25-...(...)	ZB32-32	81.5
–	10	20	25	28	100	50	–	24 - 32	256 - 448	NZMH2-S33-CNA	DILM32-...(...)	ZB32-32	81.5
10	–	–	–	32.2	100	50	–	24 - 32	320 - 560	NZMH2-S40-CNA	DILM32-...(...)	ZB32-32	81.5
–	–	25	30	34	100	50	–	32 - 40	320 - 560	NZMH2-S40-CNA	DILM40(...)	ZB65-40	81.5
–	–	30	–	40	100	50	–	32 - 40	400 - 700	NZMH2-S50-CNA	DILM40(...)	ZB65-40	81.5
–	15	–	40	42	100	50	–	40 - 57	400 - 700	NZMH2-S50-CNA	DILM40(...)	ZB65-57	81.5
15	20	40	50	54	100	50	–	40 - 57	504 - 882	NZMH2-S63-CNA	DILM50(...)	ZB65-57	81.5
20	–	50	60	65	100	50	–	57 - 65	640 - 1120	NZMH2-S80-CNA	DILM65(...)	ZB65-65	81.5
–	25	–	–	68	100	50	–	50 - 70	640 - 1120	NZMH2-S80-CNA	DILM80(...)	ZB150-70	163
25	30	60	75	80	100	50	–	70 - 100	800 - 1400	NZMH2-S100-CNA	DILM80(...)	ZB150-100	163
–	40	75	100	104	100	50	–	70 - 100	1000 - 1750	NZMH2-S125-CNA	DILM95(...)	ZB150-100	163
30	–	–	–	92	100	50	–	70 - 100	1000 - 1750	NZMH2-S125-CNA	DILM115(...)	ZB150-100	163
40	–	100	125	125	100	50	–	100 - 125	1280 - 2240	NZMH2-S160-CNA	DILM115(...)	ZB150-125	163
–	50	–	–	130	100	50	–	125 - 150	1280 - 2240	NZMH2-S160-CNA	DILM115(...)	ZB150-150	163
–	–	125	–	156	100	50	–	125 - 150	1600 - 2500	NZMH2-S200-CNA	DILM150(...)	ZB150-150	265
50	60	–	150	154	100	50	–	120 - 160	1600 - 2500	NZMH2-S200-CNA	DILM185/22(...)	Z5-160/FF250	265
60	75	150	200	192	100	50	–	160 - 220	220 - 3080	NZMH2-SE220-CNA	DILM225/22(...)	Z5-220/FF250	265
75	100	200	250	248	100	50	50	160 - 220	350 - 4900	NZMH3-SE350-CNA	DILM250/22(...)	Z5-220/FF250	306
100	–	–	300	289	100	50	50	190 - 290	350 - 4900	NZMH3-SE350-CNA	DILM300/22(...)	ZW7-290	306
–	125	250	–	302	100	50	50	270 - 400	450 - 6300	NZMH3-SE450-CNA	DILM300/22(...)	ZW7-400	306
125	150	300	400	382	100	50	50	270 - 400	450 - 6300	NZMH3-SE450-CNA	DILM400/22(...)	ZW7-400	306

Notes [1] Suitable for networks with grounded star-point

SWIRE-…

Description



1 Gateway easyNET/CANopen
2 Gateway PROFIBUS-DP
3 Gateway MODBUS
4 Coupling unit XI/ON with SmartWire Interface card MicroInnovation AG, www.microinnovation.com
5 Interface module B & R CS1011 for X20 system, www.br-automation.com
6 SmartWire I/O module
7 DOL starter MSC-D up to 32 A
8 DOL starter MSC-D up to 15.5 A
9 SmartWire power module
10 Connection cable
11 SmartWire module for DILM
12 Reversing starter MSC-R up to 12 A

System description

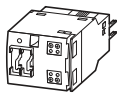
With the SmartWire connection system, switchgear can be connected to a programmable logic controller without the need for complex control wiring. Plug-in SmartWire cards for DILM and a preassembled connection cable replace the control wiring, dramatically reducing wiring complexity and completely eliminating wiring errors. SmartWire also cuts the time needed for installation, commissioning and troubleshooting.
The PLC's inputs and outputs are replaced by the SmartWire module for DILM, and no control wiring terminals are required.
Connection to the various fieldbus systems is through third-party gateways or interface modules.

Features

- Gateway
  - Connects the SmartWire cards with the fieldbus
  - Supports the fieldbus standards PROFIBUS-DP, MODBUS, CANopen and easy-NET
  - Supplies the control voltage for the motor starter or contactor
  - Supplies the supply voltage for the SmartWire connection system
  - Configuration button for automatic addressing of the SmartWire modules for DILM
  - Supports max. 16 SmartWire modules for DILM
- Interface of third-party manufacturers, e.g. for the XI/ON I/O system, X20 system CS1011 interface module
  - Connection to the field buses PROFIBUS-DP, MODBUS, CANopen and DeviceNET
- SmartWire module for DILM
  - Pluggable on contactors
  - Suitable for contactors DILM7 to DILM32 (24 V DC), DILMC7 to DILMC32 (24 V DC), DILMP20 (24 V DC) or motor starter MSC-... (24 V DC)
  - Use the standard switchgear of the xStart range
  - Suitable for DOL and reversing starters
  - The accessories of the contactor series can be used
  - Suitable for contactor combinations with PKZ or with Z relays
  - Integrated switch position monitoring of the contactors
  - Integrated mechanical switch position display
  - Actuation of the contactors
  - Scanning of a potential-free contact, e.g. NHI-E-10-PKZ0
  - Electrical interlocking, e.g. possible with reversing starters
  - LED for status and diagnostic display
  - Connection to gateway or interface from third party devices
- SmartWire I/O module
  - 4 digital inputs for connection of potential-free contacts
  - Power supply for the digital inputs comes from the device
  - 2 relay outputs 250 V AC
- SmartWire power module
  - Supply of the 24 V DC control voltage for actuation of contactors DILM
  - Assembly of Emergency Off groups
  - Increases the control voltage power in the SmartWire line
- Safety engineering
  - Emergency switching off disconnection as per IEC/EN 954-1, Switching Category 3
  - Central switch off of control voltage at the gateway or SmartWire power module
  - Combination with safety-relevant switchgear possible

SWIRE-… HPL08038EN

Ordering

	Description	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Gateway					
PROFIBUS-DP					
	Gateway with integrated supply for the SmartWire module and control voltage for the switchgear. - Connection to PROFIBUS-DP as slave. - Transmission rate: 9.6 Kbits/s to 12 MBit/s. - 9 pole SUB-D socket. - Address range 1…126. - Connection to SmartWire module as master. - Supports 16 SmartWire modules.	**SWIRE-GW-DP** 107027		1 off	–
MODBUS					
	Gateway with integrated supply for the SmartWire module and control voltage for the switchgear. - Connection to MODBUS-RTU as slave. - Transmission rate: 9.6 to 57.6 Kbits/s. - 9 pole SUB-D socket RS232/RS485. - Address range 1…31. - Connection to SmartWire module as master. - Supports 16 SmartWire modules.	**SWIRE-GW-MB** 118562		1 off	–
Modules					
SmartWire module for DILM					
	SmartWire module to assemble on the contactors DILM(C)7…DILM(C)38, DILA…, DILMP20 - One module is necessary per contactor. - Connection to SmartWire gateway as slave. - Max. 16 SmartWire modules per line. - 1 digital input for floating contact. - Signaling contactor switch position.	**SWIRE-DIL** 107028		5 off	• Take account of the max. current consumption of the contactor coils per SmartWire line. • Length of connection cable at the input and the electrical interlock < 2.8 m. • The A2 connection of the contactors must not be linked. • Electrical interlocking only possible via the terminals on the module for DILM. • Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used. • Connection terminals for electrical interlocking are not suitable for safety technology.
SmartWire power module					
	Power module for suppling the control voltage. - Connection on SmartWire gateway as interactive station (no address).	**SWIRE-PF** 107029		1 off	Max. 4 power modules per SmartWire line.
SmartWire I/O module					
	4 digital inputs 2 digital relay outputs	**SWIRE-4DI-2DO-R** 107030		1 off	Max. 4 SmartWire I/O modules per line.

Information relevant for export to North America

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	2252-01
NA Certification	UL Listed, CSA certified

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SWIRE-…

	Description	Part no. Article no.	Price See price list	Std. pack	Notes
Accessory					
SmartWire connection cable[1)]					
Length: 85 mm		**SWIRE-CAB-008** 107032		25 off	Cable lengths: Engineering → A8/40
Length: 110 mm		**SWIRE-CAB-011** 107033			
Length: 150 mm		**SWIRE-CAB-015** 107034		5 off	
Length: 250 mm		**SWIRE-CAB-025** 107035			
Length: 500 mm		**SWIRE-CAB-050** 112027		1 off	
Length: 1000 mm		**SWIRE-CAB-100** 107036			
Length: 2000 mm		**SWIRE-CAB-200** 107037			
Termination connector[1)]					
–	Termination plug for last SmartWire card, 6 pole, no electrical function.	**SWIRE-CAB-000** 107031		25 off	–
Data cable[1)]					
–	6-core, ribbon cable, length: 100 m.	**SWIRE-CAB-100M** 107038		1 off	Preassembly of cable only possible with special tool.
Plug[1)]					
–	6-pin plug for ribbon cable.	**SWIRE-CAB-CON** 107039		50 off	For use with SWIRE-CAB-100M.
NHI-E with cable[1)]					
–	NHI-E-10-PKZ0 with connection cable AWG18 blue, for connection to SmartWire module for DILM.	**NHI-E-10L-PKZ0** 107040		5 off	–
Plug-in reversing bridge[2)]					
–	For assembling reversing starters with tool-less plug connection	**DILM12-XR** 110099		20 off	For use with DILM7…DILM15, without A2 link.

Information relevant for export to North America

1)

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	2252-01
NA Certification	UL Listed, CSA certified

2)

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	012528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

SWIRE-…

Engineering

Cable lengths

For connection between motor starters and contactors DILM, the cable lengths depend on the combination and assembly of the devices.

Applications	PKZ accessories	from	to	Cable length
Contactors DILM	None (45 grid)	DILM7-…15	DILM7-…15	85 mm
		DILM17-…38	DILM17-…38	85 mm
		DILM7-…38	DILM17-…38	110 mm
		DILM17-…38	DILM7-…15	110 mm
	PKZM0 with U-/A…/NHI…/AGM…	DILM7-…15	DILM7-…15	110 mm
		DILM17-…32	DILM17-…32	110 mm
		DILM7-…15	DILM17-…32	110 mm
		DILM17-…32	DILM7-…15	110 mm
Motor starters MSC	None (45 grid)	DILM7-…15	DILM7-…15	85 mm
		DILM17-…32	DILM17-…32	85 mm
		DILM7-…15	DILM17-…32	110 mm
		DILM17-…32	DILM7-…15	110 mm
	PKZM0 with U-/A…/NHI…/AGM…	DILM7-…15	DILM7-…15	110 mm
		DILM17-…32	DILM17-…32	110 mm
		DILM7-…15	DILM17-…32	150 mm
		DILM17-…32	DILM7-…15	150 mm

The cable lengths for connecting SmartWire devices depend on the combination and assembly of the devices.

Applications	Cable length
Connection from power module to SWIRE-DIL with mounting beside PKZ	250 mm
Connection from power module to SWIRE-DIL with mounting beside DILM	150 mm
Connection from gateway to SWIRE-DIL with mounting beside PKZ	250 mm
Connection from coupling unit to SWIRE-DIL with mounting beside DILM	250 mm

Magnet systems

The number of motor starters or contactors DILM that can be connected is dependant on the power consumption of the magnet systems per SmartWire line. To increase the number of SmartWire modules that can be connected, power modules can be used.

24 V DC		DILM7	DILM 9	DILM12	DILM15	DILM17	DILM25	DILM32/38
Pick-up power	W	3	3	4.5	12 at 24 V	12 at 24 V	12 at 24 V	12 at 24 V
Holding power	W	3	3	4.5	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V

SWIRE-…

Technical data

				SWIRE-GW-DP	SWIRE-PF	SWIRE-DIL
General						
Standards						
General				IEC/EN 60947 EN 55011 EN 55022 IEC/EN 61000-4 IEC/EN 60068-2-27		
Profibus-DP				IEC 61158	–	–
Mounting				Top-hat rail IEC/EN 60715 (35mm) or screw fixing with fixing brackets ZB4-101-GF1 (accessories)		on DILM7…DILM38
Dimensions (w x d x h)			mm	35 x 90 x 109	35 x 90 x 74	45 x 44 x 81
Weight			kg	0.15	0.1	0.04
Terminal capacity						
Solid			mm^2	0.34…1.5	0.34…1.5	0.34…1.5
Flexible with ferrule			mm^2	0.34…1.5	0.34…1.5	0.34…1.5
Solid or stranded			AWG	22…16	22…16	22…16
Flat-blade screwdriver			mm	3.5 x 0.8	3.5 x 0.8	3.5 x 0.8
Max. tightening torque			Nm	0.6	0.6	0.5
Ambient climatic conditions						
Ambient temperature	Operation		°C	-25 - +55	-25 - +55	-25 - +60
	Storage		°C	-25 - +70	-25 - +70	-25 - +70
Condensation				Prevent condensation by means of suitable measures		
Relative humidity, non-condensing (IEC/EN 60068-2-30)			%	5 - 95	5 - 95	5 - 95
Air pressure (in operation)			hPa	795 - 1080	795 - 1080	795 - 1080
Ambient mechanical conditions						
Protection type (IEC/EN 60529)				IP20	IP20	IP20
Pollution degree				2	2	2
Mounting position				Vertical	Vertical	As per DILM7 to DILM38
Electromagnetic compatibility (EMC)						
Electrostatic discharge (IEC EN 61000-4-2, Level 3, ESD)						
Air discharge			kV	8	8	8
Contact discharge			kV	–	–	–
Electromagnetic fields (IEC/EN 61000-4-3, RFI)		V/m		10	10	10
Radio interference suppression (EN 55011, EN 55022)				Class A	Class A	Class A
Burst pulses (IEC/EN 61000-4-4, level 3)						
Supply cables			kV	2	2	2
Signal cables			kV	2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, level 2)			kV	0.5 (supply cables, symmetrical)		
Emitted RFI (IEC/EN 61000-4-6)			V	10	10	10
Insulation resistance						
Clearances and creepage distances				EN 50178, EN 60947-1, UL 508, CSA C22.2 No 142		
Insulation resistance				EN 50178, EN 60947-1		
Supply voltage, gateway electronics and SmartWire station electronics $U_{gateway}$						
Rated operational voltage $U_{gateway}$			V DC	24, -15 %, +20 %	–	–
Permissible range				20.4...28.8	20.4...28.8	Supply from gateway or power module
Ripple			%	≦ 5	–	–
Maximum coupling unit power consumption at 24 V DC			mA	500 (typically 100 for gateway + typically 25 per SmartWire module)	–	–
Voltage dips (IEC/EN 61131-2)			ms	10	–	–
Heat dissipation at 24 V DC			W	Normally 6	Normally 1	Normally 0.6
Protection against polarity reversal				Yes		
Short-circuit protection, SmartWire side				Yes	–	–

SWIRE-…

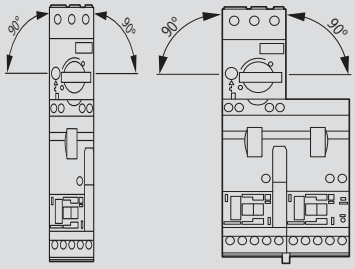
			SWIRE-GW-DP	SWIRE-PF	SWIRE-DIL
General					
Supply voltage U_{AUX} (supply voltage for switching SmartWire elements, e.g. contactor coils)					
Rated operational voltage U_{AUX}		V DC	24, -15 %, +20 % (Derating from > 40 °C)	24, -15 %, +20 % (Derating from > 40 °C)	Supply from gateway or power module
Permissible range		V DC	20.4…28.8, at 45 °C: 21…28.8, at 50 °C: 21.6…28.8, at 55 °C: 22.2…27.6	20.4…28.8, at 45 °C: 21…28.8, at 50 °C: 21.6…28.8, at 55 °C: 22.2…27.6	Supply from gateway or power module
Input current U_{AUX} at 24 V DC		A	Normally 3	Normally 3	–
Ripple		%	≦ 5	≦ 5	–
Voltage dips (IEC/EN 61131-2)		ms	10	10	–
Protection against polarity reversal					
Short-circuit protection, SmartWire side			No, external fuse 3 A or FAZ-Z3	No, external fuse 3 A or FAZ-Z3	–
LED indicators					
Operational			Ready: green	–	Ready: green
Power supply, SmartWire contactors			U_{Aux}: green	U_{Aux}: green	–
PROFIBUS-DP status			PROFIBUS-DP: green	–	–
SmartWire status			SmartWire: green	–	above Ready
Output status			–	–	–
Connection floating contacts					
Number			–	–	1
Rated voltage (internal supply)	U_e	V DC	–	–	17
Input current at "1" signal, typically		mA	–	–	5
Potential isolation			–	–	No
Max. cable length		m	–	–	< 2.8
PROFIBUS-DP					
Terminal type			SUB-D 9-pole, socket	–	–
Station address			1 … 125	–	–
Address setting			DIP switches	–	–
Potential isolation					
From U_{AUX} power supply			Yes		
From $U_{Gateway}$ power supply			Yes		
To SmartWire			Yes		
Function			PROFIBUS-DP slave	–	–
Bus protocol			PROFIBUS-DP	–	–
Bus Terminating Resistors			can be connected via plug	–	–
Baud rate			Automatic, up to 12 Mbits/s	–	–
SmartWire					
Terminal type			Plug, 6-pole	Plug, 6-pole	Plug, 6-pole
Data/power cable			6-core ribbon cable	6-core ribbon cable	6-core ribbon cable
Maximum cable length, SmartWire system		m	Max. 4	Max. 4	Max. 4
Bus termination			No	Plug connectors	Plug connectors
Station address			Automatic assignment	None	1…16
Station			max. 126 PROFIBUS stations	Max. 4 SmartWire cards per line	Max. 16 SmartWire cards per line
Address setting			None	None	automatically via SmartWire
Potential isolation					
From U_{AUX} power supply			No	No	No
From $U_{Gateway}$ power supply			No	No	No
Function			SmartWire master	no SmartWire station	SmartWire slave
Data transfer time, SmartWire system					
Write switch			–	–	Normally 20 ms for all stations
Read status information			–	–	Normally 10 ms per station

SWIRE-…

				SWIRE-4DI-2DO-R	SWIRE-GW-MB
General					
Standards					
General				IEC/EN 60947, EN 55011, EN 55022, IEC/EN 61000-4, IEC/EN 60068-2-27	
Mounting				Tophat rail IEC/EN 60715 (35 mm) or screw fixing with fixing brackets ZB4-101-GF1 (accessories)	
Dimensions (w x d x h)			mm	35 x 90 x 74	35 x 90 x 109
Weight			kg	0.12	0.15
Terminal capacity					
Solid			mm^2	0.5…1.5	0.5…1.5
Flexible with ferrule			mm^2	0.5…1.5	0.5…1.5
Solid or stranded			AWG	22…16	22…16
Flat-blade screwdriver			mm	3.5 x 0.8	3.5 x 0.8
Max. tightening torque			Nm	0.6	0.6
Ambient climatic conditions					
Ambient temperature	Operation		°C	-25 - +55	-25 - +55
	Storage		°C	-25 - +70	-25 - +70
Condensation				Prevent condensation by means of suitable measures	
Relative humidity, non-condensing (IEC/EN 60068-2-30)			%	5 - 95	5 - 95
Air pressure (in operation)			hPa	795 - 1080	795 - 1080
Ambient mechanical conditions					
Protection type (IEC/EN 60529, EN50178, VBG 4)				IP20	IP20
Pollution degree				2	2
Mounting position				Vertical	Vertical
Electromagnetic compatibility (EMC)					
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)					
Air discharge			kV	8	8
Contact discharge			kV	–	–
Electromagnetic fields (IEC/EN 61000-4-3, RFI)		V/m		10	10
Radio interference suppression (EN 55011, EN 55022)				Class A	Class A
Burst pulses (IEC/EN 61000-4-4, level 3)					
Supply cables			kV	2	2
Signal cables			kV	–	2
power pulses (surge) (IEC/EN 61000-4-5, level 2)			kV	0.5 (supply cables, symmetrical)	
Emitted RFI (IEC/EN 61000-4-6)			V	10	10
Insulation resistance					
Clearances and creepage distances				EN 50178, EN 60947-1, UL 508, CSA C22.2 No 142	
Insulation resistance				EN 50178, EN 60947-1	
Supply voltage, gateway electronics and SmartWire station electronics $U_{gateway}$					
Rated operational voltage $U_{gateway}$			V DC	–	24, -15 %, +20 %
Permissible range				Supply from gateway or power module	20.4...28.8
Ripple			%	–	≦ 5
Maximum gateway current consumption at 24 V DC			mA	–	500 (normally 100 coupling unit + normally 25 per SmartWire card)
Voltage dips (IEC/EN 61131-2)			ms	–	10
Heat dissipation at 24 V DC			W	–	Normally 6
Protection against polarity reversal					Yes
Short-circuit protection, SmartWire side				–	Yes
Power supply U_{AUX} (power supply for switching the SmartWire slaves, e.g. contactor coils)					
Rated operational voltage U_{AUX}			V DC	–	24, -15 %, +20 % (Derating from > 40 °C)
Permissible range			V DC	–	20.4…28.8, at 45 °C: 21…28.8, at 50 °C: 21.6…28.8, at 55 °C: 22.2…27.6
Input current U_{AUX} at 24 V DC			A	–	Normally 3
Ripple			%	–	≦ 5
Voltage dips (IEC/EN 61131-2)			ms	–	10
Protection against polarity reversal					Yes
Voltage		U_s	V	–	Yes
Short-circuit protection, SmartWire side				–	No, external 3 A fuse or FAZ-Z3

SWIRE-…

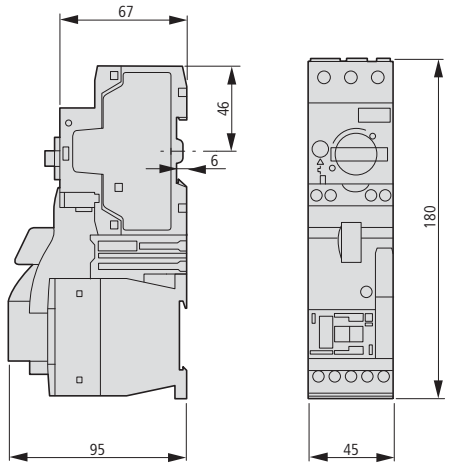
			SWIRE-4DI-2DO-R	SWIRE-GW-MB
LED indicators				
Operational			Ready: green	Ready: green
Power supply, SmartWire contactors			–	U_{Aux}: green
MODBUS status			–	MODBUS: yellow
SmartWire status			–	SmartWire: green
Output status			Q1, Q2: green	–
Connection floating contacts				
Number			4	–
Rated voltage (internal supply)	U_e	V DC	17	–
Input current at "1" signal, typically		mA	5	–
Potential isolation			–	Yes
Max. cable length		m	< 2.8	–
MODBUS				
Terminal type			–	SUB-D, 9 pole, socket RS232/RS485
Station address			–	1 … 31
Address setting			–	DIP switches
Potential isolation				
From U_{AUX} power supply			–	Yes
From $U_{Gateway}$ power supply			–	Yes
To SmartWire			–	Yes
Function			–	MODBUS-RTU Slave
Bus protocol			–	MODBUS-RTU
Bus Terminating Resistors			–	can be connected via plug
Baud rate			–	Adjustable up to 57.6 (9.6/19.2/38.4) kbit/s
SmartWire				
Terminal type			Plug, 6-pole	Plug, 6-pole
Data/power cable			6-core ribbon cable	6-core ribbon cable
Maximum cable length, SmartWire system		m	Max. 4	Max. 4
Bus termination			Plug connectors	No
Station address			1…16	Automatic assignment
Station			Max. 4 SmartWire modules per line.	Max. 16
Address setting			automatically via SmartWire	None
Potential isolation				
From U_{AUX} power supply			No	No
From $U_{Gateway}$ power supply			No	No
Function			SmartWire slave	SmartWire master
Data transfer time, SmartWire system				
Write switch			Normally 20 ms for all stations	–
Read status information			Normally 10 ms per station	–
Relay outputs				
Rated impulse withstand voltage	U_{imp}	V AC	4000	–
Overvoltage category/pollution degree			III/3	
Rated insulation voltage	U_i	V	250	–
Rated operating voltage	U_e	V	250	–
Making capacity		A	30	–
Breaking capacity	380/400 V	A	10	–
Rated operational current				
AC-15, 250 V	I_e	A	3	–
DC-12, 30 V	I_e	A	3	–
Conventional thermal current	I_{th}	A	6	6
Short-circuit rating without welding				
max. fuse		A gG/gL	10	–

General	**Standards**			IEC/EN 60947-4-1, VDE 0660 UL 508 (please enquire) CSA C 22.2 No. 14 (please enquire)
	Mounting position			
Main contacts	**Rated impulse withstand voltage**	U_{imp}	V AC	6000
	Overvoltage category/pollution degree			III/3
	Rated operating voltage	U_e	V	230 - 415
Further technical data	**Motor protective circuit breaker PKZM0, PKE**			→ Chapter 7
	Contactors DILM			→ Chapter 5

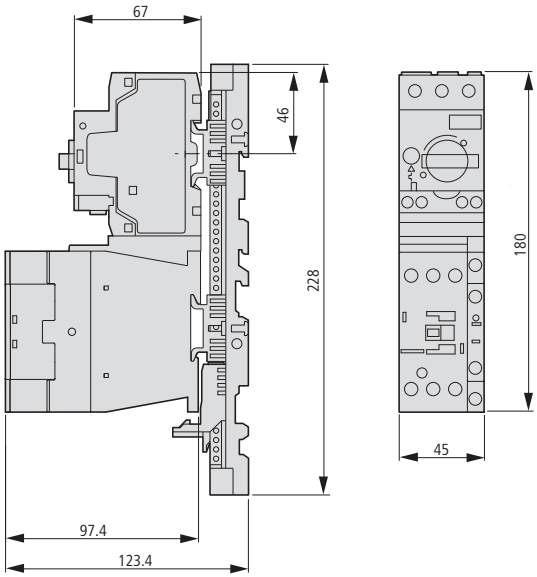
Dimensions

DOL starters

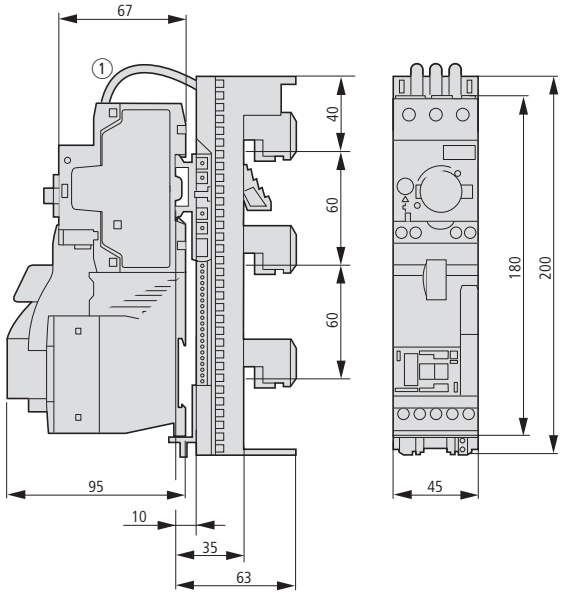
MSC-D-…-M7[…15]…



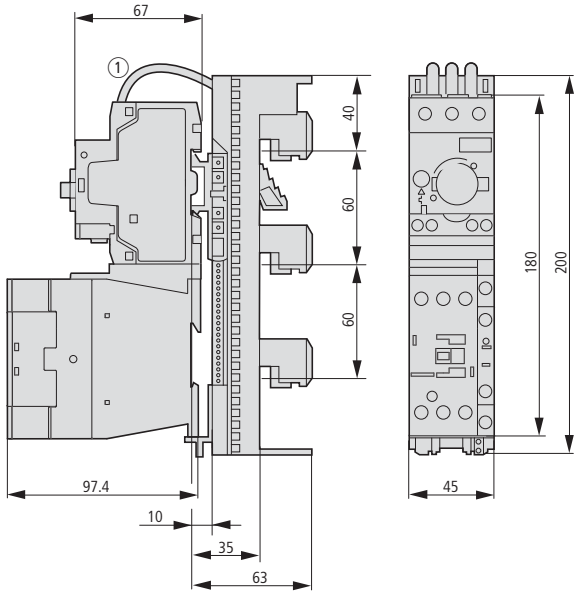
MSC-D-…-M17[…32]…



MSC-D-…-M7[…15]BBA…

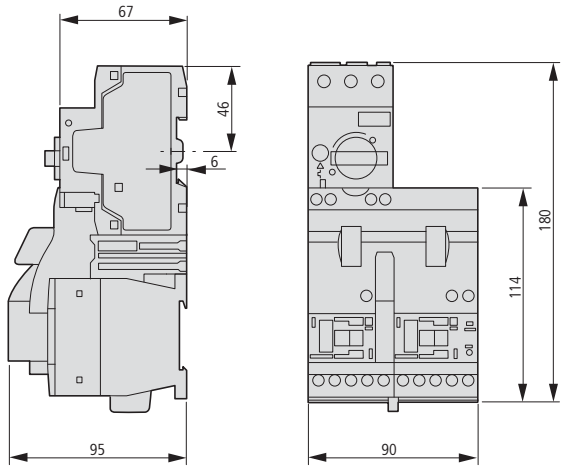


MSC-D-…-M17[…32]BBA…



Reversing starters

MSC-R-...-M7[...12]...



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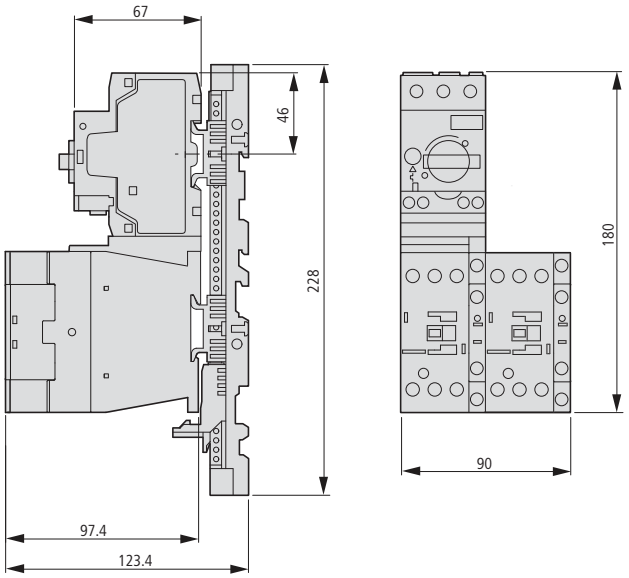

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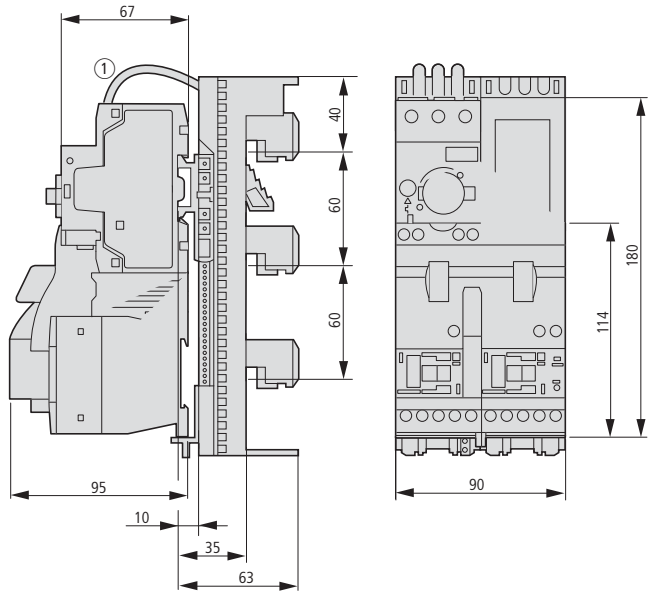

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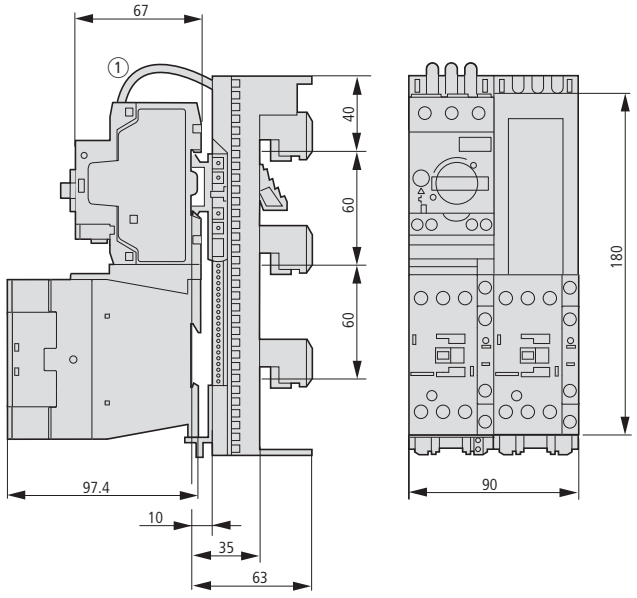
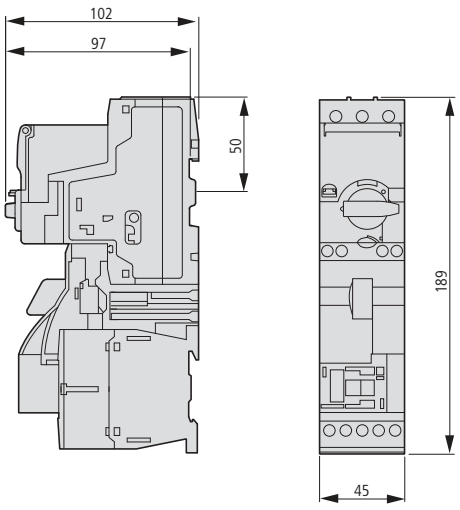
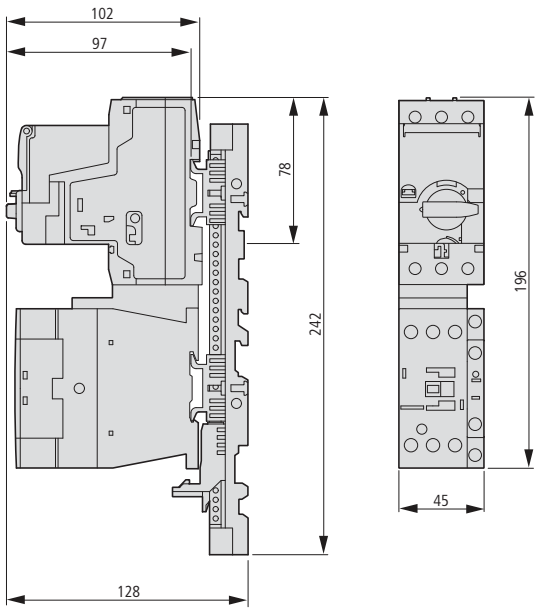


DOL starters

MSC-DE(A)-...-M7[...12]...



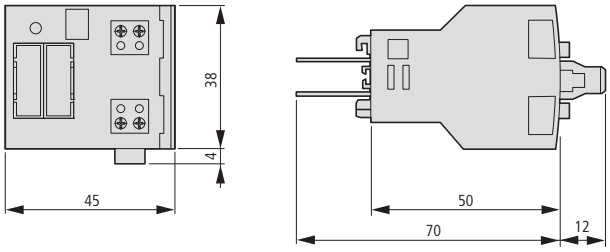
MSC-DE(A)-...-M17[...32]...



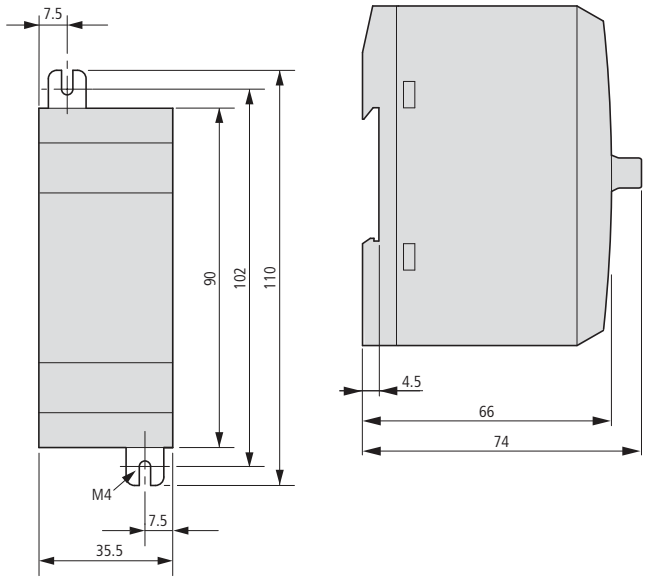
SWIRE-…

Modules

SWIRE-DIL

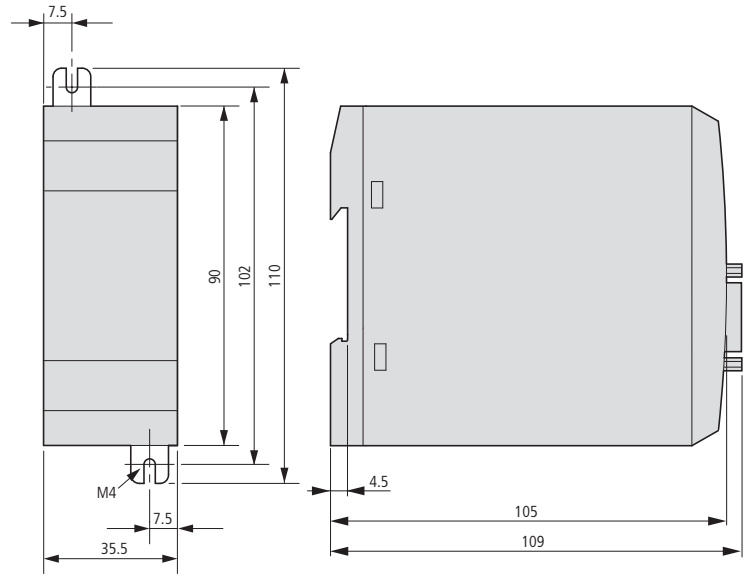


SWIRE-PF , SWIRE-4DI-2DO-R



Gateways

SWIRE-GW-DP..., SWIRE-GW-MB





DS, DM soft starters

Soft starters enable the gentle start of alternating current asynchronous motors through a continuously variable control of the motor supply voltage during the start phase. The resulting torque increase ensures that the motor is adapted to the load characteristics of the machine and is accelerated smoothly.
The soft starter DS7 is available in a communications-capable version for connection to the SmartWire-Darwin communication system.

Two-phase controlled DS6 soft starter with internal bypass
Easy setting through three regulating switches(U-start, t-start, t-stop) +++ special control method (asymmetrical ignition control) +++ Performance range 41 – 200 A, 18.5 – 110 kW (with 400 V) → Page 9/19

Two-phased controlled DS7 soft starter with asymmetrical trigger
Easy setting through three regulating switches(U-start, t-start, t-stop) +++ special control method (asymmetrical ignition control) +++ Optional fan to increase switching rate +++ can be used with numerous contactor options +++ Ramp times and start voltages adjustable by potentiometer +++ Performance range: 3 – 200 A, 1.1 – 110 kW (with 400 V) → Page 9/31

Three-phased controlled DM4 soft starter
Parameterizable and communication-capable +++ Selector switch with 10 standard applications +++ Performance range: 16 – 900 A, 7.5 – to 900 kW (with 400 V) → Page 9/55



Eaton After Sales Service

Testing switching devices in compliance with regulations applicable to this technology
→ Chapter 22



DS, DM soft starters

Technical overview

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DS6, DS7 key to part numbers 9/3

DM4 key to part numbers 9/4

DS6 soft starters

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Dimensions

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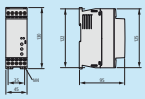
Fuse base, fuses 9/63









DS7 soft starter

System overview

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DM4 soft starters

System overview

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Soft starters with reversing circuit 9/49

Assigned switching and protective elements DM4

Short start-up time 9/50

Long start-up time 9/52

Technical data

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Dimensions

DM4 soft starters 9/62

Fuse bases, fuses 9/63



Technical overview

DS6, DS7, DM4

	DS6-340-…-MX	DS7-34…SX…	DM4-340-…
Power section	Thyristors in two phases	Thyristors in two phases	Thyristors in three phases
Mains supply voltage U_{LN}	230 - 460 V ±15 %	230 - 480 V ±10 %	230 - 460 V ±15 %
Supply voltage	24 V DC	24 V AC/DC, 110/230 V AC	24 V DC, 110 - 230 V AC
Mains frequency	45 - 65 Hz ±0 %	45 - 65 Hz ±0 %	45 - 65 Hz ±0 %
Rated operational current I_e			
Heating load AC 51	–	–	–
Motor load AC 53	41 - 196 A	3 - 200 A	16 - 900 A
Assigned motor rating at 400 V	18.5 - 110 kW	1.1 - 110 kW	7.5 - 500 kW, 11 - 900 kW
Overload cycle	10 starts per h with 3 x I_N for 5 s	10 starts per h with 3 x I_N for 5 s	10 starts per h at 3.5 × I_N for 35 s (up to part no. ... 90K)
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C
Storage temperature	-25 - +55 °C	-25 - +55 °C	-25 - +55 °C
Installation altitude	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)
Protection type	IP20	IP20	IP20
Changeover time for reversing contactors (transition from 100 % FWD to 100 % REV)	–	–	–
Fields of application			
Three-phase resistive and inductive loads	–	–	●
Three-phase motors	●	●	●
Functions			
Fast and silent switching (semiconductor contactor)	–	–	–
Soft start/Soft stop	●	●	●
Reversing function	-	-	–
Suppression of DC components on motors	●	●	●
Potential isolation between power section and control section	●	●	●
Internal bypass	●	●	–
Product standard, determination	IEC/EN 60 947-4-2	IEC/EN 60 947-4-2	IEC/EN 60 947-4-2
Approval, certification	UL, CSA, CCC	UL, CSA, CCC, Gost, Gost-R	UL, cUL

Notes

The value range specifications for the rated operational current and the assigned motor output within each column refer to the entire group, and not to an individual device.
Depending on the specific model, DS7 series soft starters require 24 VDC/VAC or 110/230 VAC as a supply voltage.
An Easy200-POW power supply is sufficient for operation (keep the total load in mind!).

Key to part numbers

DS6 soft starters

DS6-340-22K-MX (example)

DS	6	-	3	4	0	-	22K	-	M	X
DS	6		3	4	0	–	Variable three-digit code	–	M	X

DS = Drives soft starters

Device series

6 = Generation 6

Number of phases

3 = Three-phase connection

Voltage class

4 = 400 V/480 V

Version

0

Motor rating (in kW)

x(x)(x)Ky xx = Decimal specification, whole-number component, y = decimal place

Motor code

M = For three-phase AC motors

Code for additional functions

X = With internal bypass

DS7 soft starters

DS7-340SX081N0-N (example)

DS7	3	4	0	SX	081	N	0	-	N
DS7	3	4	0	SX	Variable three-digit code	N	0	–	N
			2						D
			D						

DS7 = Device series, Generation 7

Number of phases

3 = Three-phase mains supply voltage

Voltage class

4 = 400 V (380 V – -15 % to 480 V + +10 %)

Control voltage supply

0 = 24 V AC/DC

2 = 110/230 V AC

D = 24 V DC SmartWire-Darwin

Device version

SX = Standard soft starters with internal bypass

Rated operational current

Variable magnitude in decimal notation

Radio interference suppression filters

N = No internal radio interference suppression filter

Protection type

0 = IP20

Options

N = No option

D = SmartWire-Darwin

DM4 soft starter

DM4-340-200K (example)

DM	4	-	3	4	0	-	200	K
DM	4		3	4	0		Variable three-digit code	K

DM = drives, motor controllers

Device series

4 = Generation 4

Number of phases

3 = Three-phase connection

Voltage class

4 = 400 V/480 V

Version

0

Motor rating (in kW)

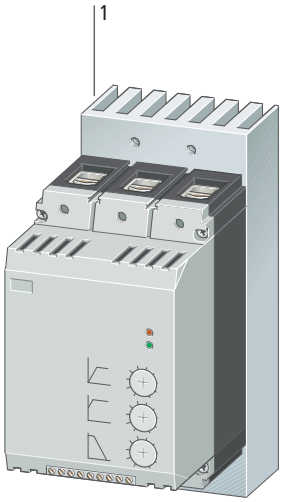
x(x)(x)Ky xx = Decimal specification, whole-number component, y = decimal place

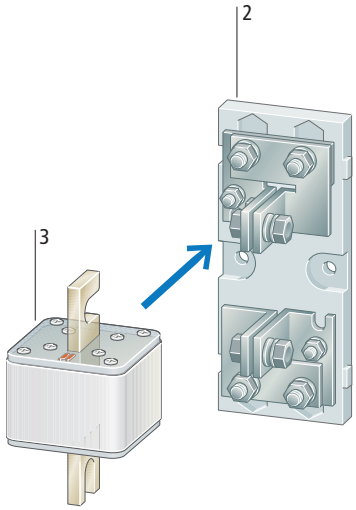
Unit

K = kW



System overview





Basic devices

DS6 soft starters	1
Soft starters for three-phase AC motors	
Assigned motor rating: 18.5 to 110 kW at 400 V	
Rated operating voltage: 230 to 480 V	
Asymmetric trigger control for clearly improved true run behavior (Moeller Patent: PCT/EP00/12938)	
Selection data → Engineering - Assigned switching and protective devices.	
Ordering data → Page 9/7	

Add-on functions

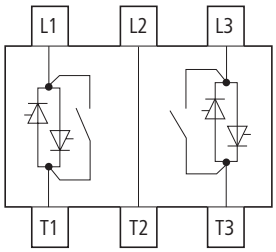
Superfast semiconductor fuses	3
Fuses for protecting the DS7 soft starters from short-circuits or to achieve type “2” coordination for external surface mounting	
Selection data → Engineering - Assigned switching and protective devices.	
Ordering data → Page 9/8	

Fuse bases	2
For external surface mounting of the superfast semiconductor fuse	
Selection data → Engineering - Assigned switching and protective devices.	
Ordering data → Page 9/8	

DS6

Description





Application

The DS6 series soft starters are intended for three-phase motors with normal operating frequency and a rating range of 22 to 110 kW.
A significant reduction of the inrush current for three-phase lamps and heaters (with an ungrounded star point) is achieved by setting a short soft start ramp time (at least 1 s).
The special actuation method (asymmetrical trigger phase control) for the soft start function avoids the DC components that would normally occur in two-phase-controlled soft starters. This suppresses the generation of an elliptical rotating field, which would cause uneven motor starting and increase the motor's acceleration phase. The true run behavior of the DS6 is therefore comparable with that of a three-phase-controlled soft starter.

Features

The soft starter DS6-340-MX is available with a rating of 22 to 110 kW. Starting transients and DC components during startup are effectively suppressed and guarantee even motor starting.
The ramp times and the start voltage are adjustable via potentiometers. The time can be adjusted between 1 and 30 s (start) and between 0 and 30 s (stop); the start voltage (i.e. the starting torque) from 30 to 100 % mains voltage.
The DS6-340-MX models feature built-in bypass contacts that close automatically at TOR (top-of-ramp) and bypass the built-in thyristors. This function provides radio interference level "B" in continuous operation without additional measures.

Typical applications for soft starters

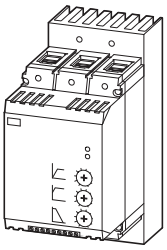
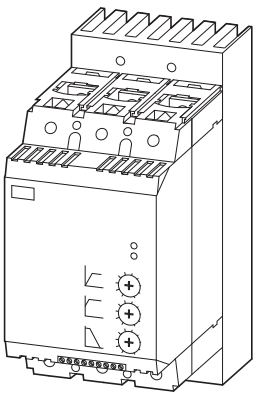
- Pump drives: Soft starting prevents sudden pressure surges. The mechanical load on the whole plant is reduced and its service life increases.
- Fan drives: Soft starting prevents drive belt slippage and premature wear. This reduces operating costs and extends durability.
- Conveyors: The conveyor belt starts up gently instead of with a jerk. The conveyed goods do not fall over, the mechanical stress on the conveyor is reduced and its lifespan increased.

Documentation

Installation instructions
AWA8250-2330

Manual
AWB8250-1346
("Design of soft starters")

Notes:
See also Engineering of DS7 Settings for Potentiometer

	Mains supply voltage (50/60 Hz)	Assigned motor rating		Rated operational current	**Part no.** Article no.	**Price** See price list	Std. pack
		400 V	480 V	(AC-53)			
	U_{LN}	P	P	I_e			
	V AC	kW	HP	A			
DS6 soft starters							
	230…480	22	30	41	**DS6-340-22K-MX** 103086		1 off
		30	40	55	**DS6-340-30K-MX** 103087		
		37	50	68	**DS6-340-37K-MX** 103088		
		45	60	81	**DS6-340-45K-MX** 103089		
		55	75	99	**DS6-340-55K-MX** 103150		
		75	100	134	**DS6-340-75K-MX** 103151		
		90	125	161	**DS6-340-90K-MX** 103152		
		110	150	196	**DS6-340-110K-MX** 103153		

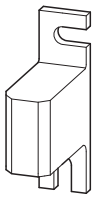
Information relevant for export to North America

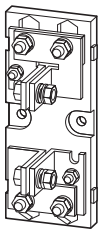
Product Standards	IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05
	CE marking
UL File No.	E251034
UL CCN	NMFT
CSA File No.	012528
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	480 V
Degree of Protection	IP20; UL/CSA Type 1

HPL09008EN

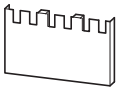
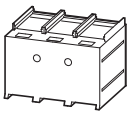
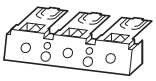
Accessories

Fuse links

	Rated operational current A	Maximum power loss P_v W	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	100	22	80	DS6-340-22K-MX	**20.282.20-100** 106654		6 off	Product Standards UL 248-13 CE marking UL File No. E180276 UL CCN JFHR2 CSA File No. UL report applies to both US and Canada CSA Class No. JFHR8 NA Certification UL Recognized, certified by UL for use in Canada Max. Voltage Rating 660V
	125	24	80	DS6-340-30K-MX	**20.282.20-125** 232087		6 off	
	200	44	80	DS6-340-37K-MX DS6-340-45K-MX DS6-340-55K-MX	**20.610.32-200** 106475		3 off	
	350	61	80	DS6-340-75K-MX	**20.610.32-350** 221161		2 off	
	400	70	80	DS6-340-90K-MX	**20.610.32-400** 106476		3 off	
	500	72	80	DS6-340-110K-MX	**20.610.32-500** 221163		2 off	

	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Fuse bases						
For semiconductor fuses						
	80	20.282.20-… 20.189.20-…	**21.189.01** 232064		5 off	
	80	20.6xx.32-…	**21.313.02** 232076		2 off	

HPL09009EN

	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Terminal cover, knockout, no UL/CSA approval						
For box terminal[1]						
	–	NZM1, PN1, N1 DS6-340-22K…55K-MX	**NZM1-XKSFA** 100780		1 off	UL/CSA certification not required
Cover[2]						
	–	NZM2, PN2, NS2 DS6-340-75K…110K	**NZM2-XKSA** 260038		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
Terminal cover[1]						
	–	NZM2, PN2, N(S)2 DS6-340-75K…110K	**NZM2-XKSFA** 104640		1 off	UL/CSA certification not required
IP2X protection against contact with a finger						
For box terminal[3]						
	–	NZM2, PN2, N(S)2 DS6-340-75K…110K	**NZM2-XIPK** 266773		1 off	UL/CSA certification not required
IP2X protection against contact with a finger						
For cover NZM2-XKSA or NZM2 or NZM2...(C)NA und N(S)2...NA[4]						
	–	NZM2, PN2, N(S)2	**NZM2-XIPA** 266777		1 off	UL/CSA certification not required

Notes

[1] Type contains parts for a terminal located at top or bottom for 3 or 4-pole switches.
Increased protection against direct contact (simplified finger protection).

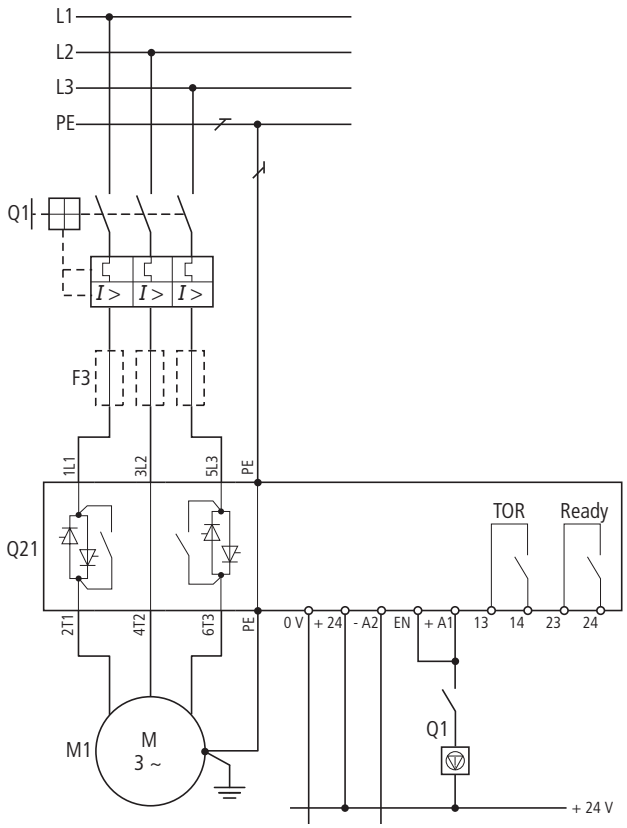
[2] Type contains parts for a terminal located at top or bottom for 3 pole switches.
Protection against direct contact where cable lugs, busbars or tunnel terminals are used.
When using insulated conductor material to protection type IP1X.

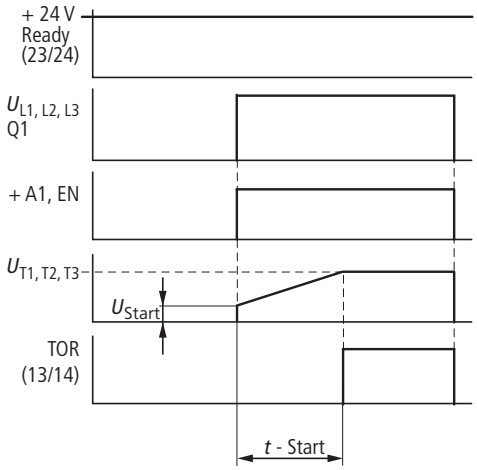
[3] Type contains parts for a terminal located at top or bottom for 3 pole switches.
Increased protection against direct contact to IP2X.
Protection when reaching into the cable connection area with the connection of cables in the box terminal.
With two conductors max cross-section 25 mm^2 or AWG4.
Cannot be combined with NZM-XSTK control circuit terminal.

[4] Type contains parts for a terminal located at top or bottom for 3 or 4-pole switches.
Increased protection against direct contact to IP2X.
When mounting NZM2-..-(C)NA or NZM...-NA the following applies:
With two conductors max cross-section 25 mm^2 or AWG4.

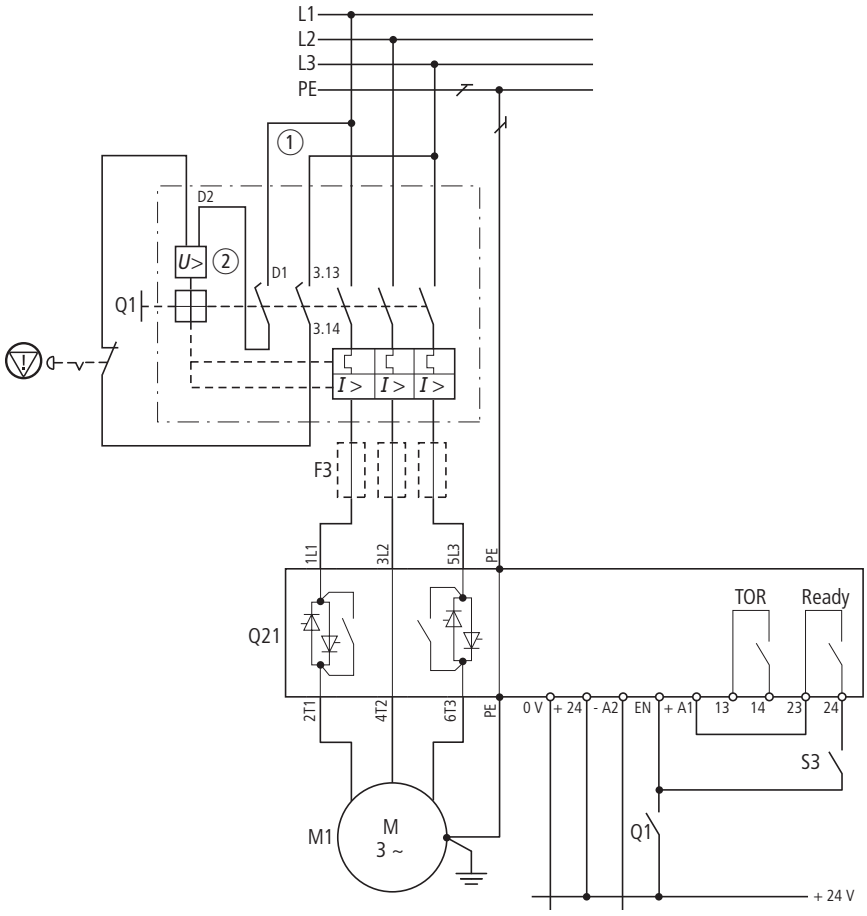
Standard connection

Direct soft start





Soft starters and main switches with EMERGENCY STOP function according to IEC/EN 60204-1 and VDE 0113-1



Q1: NZM1, NZM2

① Control circuit terminal

② Undervoltage releases with early-make auxiliary contacts

3 AC, 230 V	NZM1-XUHIV208-240AC
	NZM2/3-XUHIV208-240AC
3 AC, 400 V	NZM1-XUHIV380-440AC
	NZM2/3-XUHIV380-440AC

= Emergency switching off

Assigned motor rating for		Rated operational current[1]		Part no. Soft starters	Soft starter function			Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination) [5]	
400 V	480 V	Device	Motor		Cable protection[2]	Mains contactor (optional)[3]	Overload relays[4]	Fuses	Fuse holders
P	P	I_e	I_e						
kW	HP	A	A		Type "1" coordination			Number x Part no.	Number x Part no.
Soft starters for three-phase mains connection, low operating frequency, (5 s, 3 x I_e, 10 Starts/h)									
18.5	25	41	36	DS6-340-22K-MX	NZMN1-M40 / PKZM4-40	DILM40	ZB65-40+ZB65-XEZ	2 x 20.282.20-100	3 x 21.189.01
22	30	41	41	DS6-340-22K-MX	NZMN1-M50 / PKZM4-50	DILM50	ZB65-40+ZB65-XEZ	3 x 20.282.20-100	3 x 21.189.01
30	40	55	55	DS6-340-30K-MX	NZMN1-M63 / PKZM4-58	DILM65	ZB65-57+ZB65-XEZ	3 x 20.282.20-125	3 x 21.189.01
37	50	68	68	DS6-340-37K-MX	NZMN1-M80	DILM80	ZB150-100/KK	3 x 20.610.32-200	3 x 21.313.02
45	60	81	81	DS6-340-45K-MX	NZMN1-M100	DILM90	ZB150-100/KK	3 x 20.610.32-200	3 x 21.313.02
55	75	99	99	DS6-340-55K-MX	NZMN1-M100	DILM115	ZB150-125/KK	3 x 20.610.32-200	3 x 21.313.02
75	100	134	134	DS6-340-75K-MX	NZMN2-M160	DILM150	ZB150-150/KK	3 x 20.610.32-350	3 x 21.313.02
90	125	161	160	DS6-340-90K-MX	NZMN2-M200	DILM185	Z5-160/FF250	3 x 20.610.32-400	3 x 21.313.02
110	150	196	196	DS6-340-110K-MX	NZMN2-M200	DILM225	Z5-160/FF250	3 x 20.610.32-500	3 x 21.313.02

Notes

1) Rated operational current based on the load cycle specified here.

2) Used to specify the circuit-breaker required for the specified load cycle. For other switching cycles (operating frequency, overcurrent, overcurrent time, duty factor), this value changes and must be modified accordingly. The same applies to higher motor currents.

3) A mains contactor is not required. Disconnection characteristics in accordance with VDE can only be ensured with the specified circuit-breaker.

4) An external overload relay is required if the main contacts are not to be disconnected in the event of an overload and a controlled soft stop is desired instead.

5) The superfast semiconductor fuses protect the soft starter from short circuits on the motor side. This cannot prevent damage caused by voltage peaks (e.g. caused by a lightning strike).

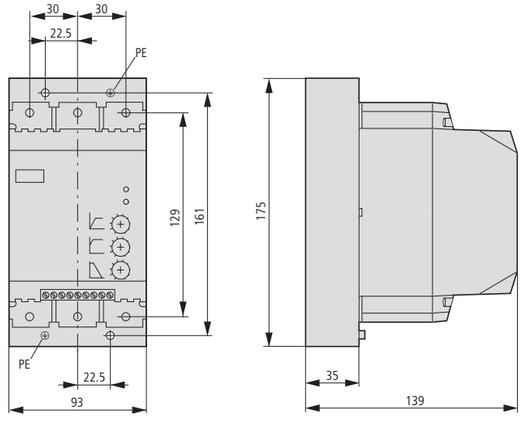


			DS6-340-22K-MX	DS6-340-30K-MX	DS6-340-37K-MX	DS6-340-45K-MX	DS6-340-55K-MX	DS6-340-75K-MX	DS6-340-90K-MX	DS6-340-110K-MX
General										
Standards			IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2
Approvals			–	–	–	–	–	–	–	–
Climatic proofing			Damp heat, constant, according to IEC 60068-2-78, damp heat, cyclic, according to IEC 60068-2-10							
Ambient temperature		°C	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise
Ambient temperature storage		°C	-25 - 55	-25 - 55	-25 - 55	-25 - 55	-25 - 55	-25 - 55	-25 - 55	-25 - 55
Installation altitude		m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m
Mounting position			Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Protection type (power terminals)			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Protection against direct contact			Finger- and back-of-hand proof							
Overvoltage category/pollution degree			II/2	II/2	II/2	II/2	II/2	II/2	II/2	II/2
Mechanical shock resistance			8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms
Vibration resistance to EN 60721-3-2		g	2M2	2M2	2M2	2M2	2M2	2M2	2M2	2M2
Average heat dissipation with nominal load cycle		W	7	10	13	18	25	24	30	42
Dimensions (W x H x D)		mm	93 x 175 x 139	93 x 175 x 139	93 x 175 x 139	93 x 175 x 139	93 x 175 x 139	108 x 215 x 178	108 x 215 x 178	108 x 215 x 178
Radio interference level			A1	A1	A1	A1	A1	A1	A1	A1
Weight		kg	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
Main contacts										
Rated operating voltage	U_e	V AC	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
Mains frequency		Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated operational current										
Motor load (AC-53)	I_e	A	41	55	68	81	99	134	160	196
Assigned motor rating (standard connection)										
230 V	P	kW	11	15	15	22	30	30	45	55
400 V	P	kW	22	30	37	45	55	75	90	110
480 V	P	HP	30	40	50	60	75	100	125	150
Overload cycle to IEC/EN 60947-4-2										
AC-53			41 A: AC-53a: 3 - 5; 75 - 10	55 A: AC-53a: 3 - 5; 75 - 10	68 A: AC-53a: 3 - 5; 75 - 10	81 A: AC-53a: 3 - 5; 75 - 10	99 A: AC-53a: 3 - 5; 75 - 10	135 A: AC-53a: 3 - 5; 75 - 10	160 A: AC-53a: 3 - 5; 75 - 10	200 A: AC-53a: 3 - 5; 75 - 10
Terminal capacity										
Power cables										
Solid		mm²	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)
Flexible with ferrule		mm²	–	–	–	–	–	–	–	–
Stranded		mm²	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)
Solid or stranded		AWG	1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 350 kcmil) 2 x (12 - 00)	1 x (12 - 350 kcmil) 2 x (12 - 00)	1 x (12 - 350 kcmil) 2 x (12 - 00)
Flat conductor										
	min.	mm	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8
	max.	mm	9 x 9 x 0.9	9 x 9 x 0.9	9 x 9 x 0.9	9 x 9 x 0.9	9 x 9 x 0.9	10 x 16 x 0.8	10 x 16 x 0.8	10 x 16 x 0.8
Tightening torque		Nm	–	–	–	–	–	–	–	–
Control cables										
Solid		mm²	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)
Flexible with ferrule		mm²	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)
Stranded		mm²	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)
Solid or stranded		AWG	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)
Flat conductor			–	–	–	–	–	–	–	–
Tightening torque		Nm	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5

			DS6-340-22K-MX	DS6-340-30K-MX	DS6-340-37K-MX	DS6-340-45K-MX	DS6-340-55K-MX	DS6-340-75K-MX	DS6-340-90K-MX	DS6-340-110K-MX
Power section										
Rated impulse withstand voltage 1.2 µs/50 µs (pulse rise time/decay time according to IEC/EN 60947-2 and -3) Applies for control circuit/power section/enclosure	U_{imp}	kV	4	4	4	4	4	4	4	4
Rated insulation voltage	U_i	V AC	500	500	500	500	500	500	500	500
Short-circuit rating										
Type “1” of coordination										
at AC-53a: 3…5 : 75…10			NZMN1-M50/PKZM4-50	NZMN1-M63/PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
Type “2” of coordination (in addition to the fuses for type of coordination “1”)			3 x 20.282.20-100	3 x 20.282.20-125	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-350	3 x 20.610.32-400	3 x 20.610.20-500
Fuse base (number x Part no.)			3 x 21.189.01	3 x 21.189.01	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
Control circuit										
Controller supply voltage										
Voltage		V	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %
Current consumption										
Current consumption at 24 V DC		mA	35	35	35	35	35	35	35	35
Current consumption in operation at 24 V DC		mA	65	65	65	65	65	65	65	65
Current consumption at peak load (close bypass) at 24 V DC			600/50 ms	600/50 ms	600/50 ms	600/50 ms	600/50 ms	600/50 ms	600/50 ms	600/50 ms
Control voltage										
DC operated		V DC	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %
Current consumption at 24 V DC		mA	14	14	14	14	14	14	14	14
Pick-up voltage										
DC operated		V DC	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27
Drop-out voltage										
DC operated		V DC	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
Pick-up time										
DC operated		ms	250	250	250	250	250	250	250	250
Drop-out time										
DC operated		ms	190	190	190	190	190	190	190	190
Relay outputs										
Number (top of ramp)			2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)
Voltage		V AC	250	250	250	250	250	250	250	250
Current		A	3	3	3	3	3	3	3	3
Soft start function										
Ramp times										
Acceleration time		s	1 - 30	1 - 30	1 - 30	1 - 30	1 - 30	1 - 30	1 - 30	1 - 30
Deceleration time		s	0 - 30	0 - 30	0 - 30	0 - 30	0 - 30	0 - 30	0 - 30	0 - 30
Start voltage (= switch-off voltage)		%	30 - 100	30 - 100	30 - 100	30 - 100	30 - 100	30 - 100	30 - 100	30 - 100
Voltage reduction at stop		%	8	8	8	8	8	8	8	8
Torque-free time when changing direction of rotation		ms	–	–	–	–	–	–	–	–

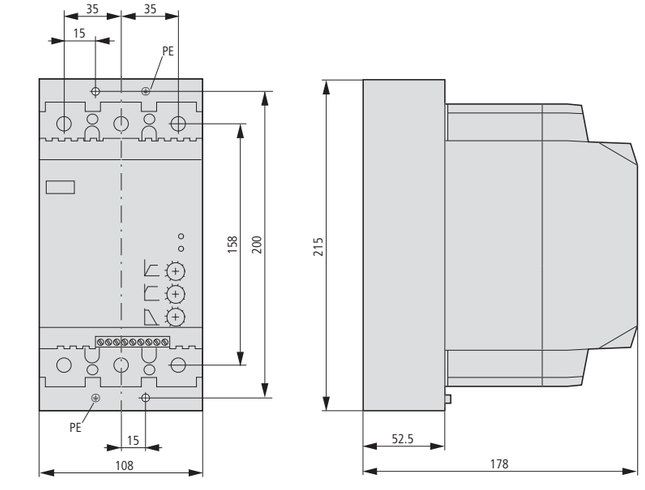
Dimensions

DS6-340-22K-MX
DS6-340-30K-MX
DS6-340-37K-MX
DS6-340-45K-MX
DS6-340-55K-MX



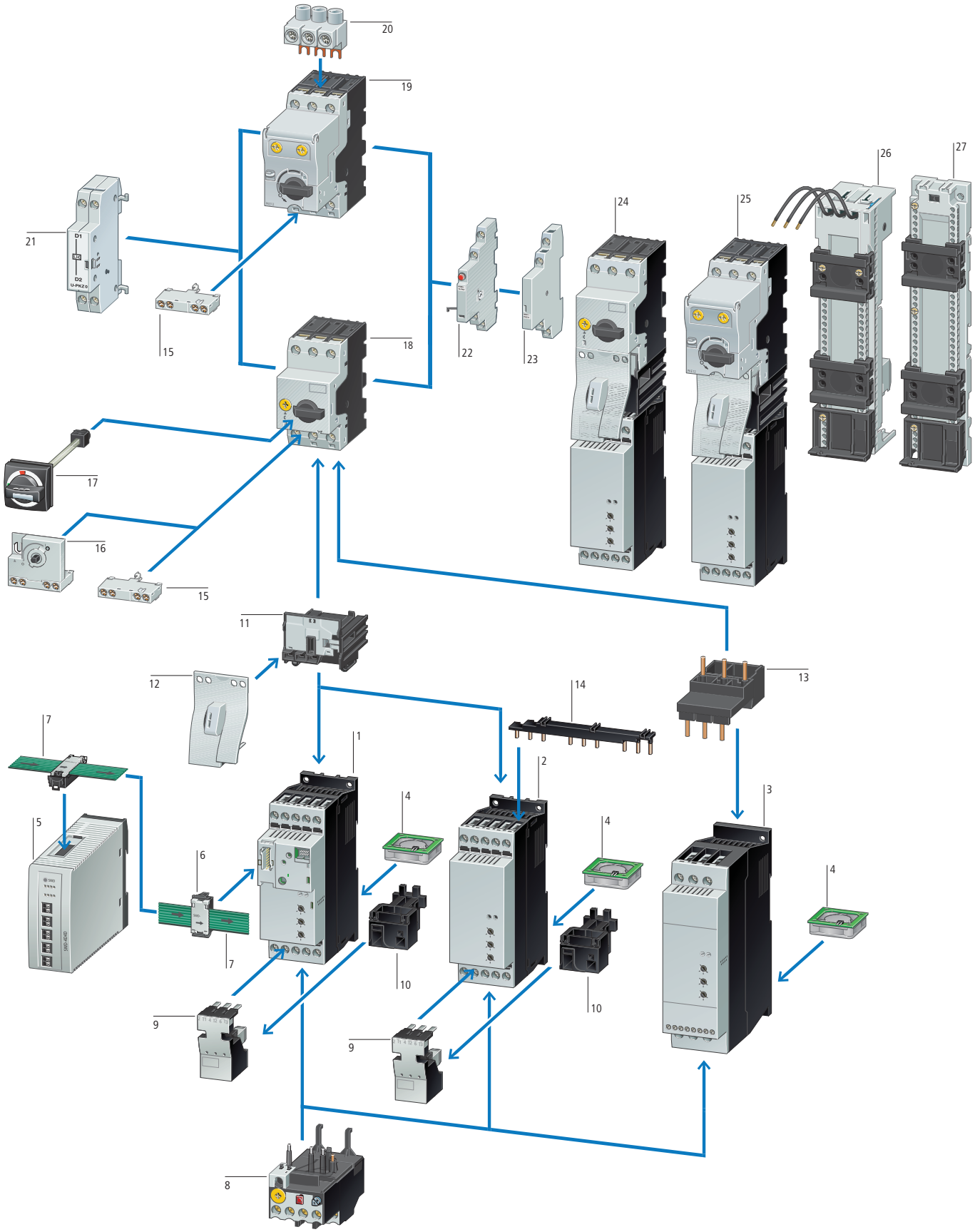
Dimensions

DS6-340-75K-MX
DS6-340-90K-MX
DS6-340-110K-MX



DS7

System overview



DS7

DS7 soft starters with SmartWire-Darwin	1
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DS7 soft starters in frame size 1 for assigned motor current up to 12 A	2
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DS7 soft starters in frame size 2 for assigned motor current up to 32 A	3
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DS7-FAN-32 device fan	4
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SmartWire-Darwin gateway	5
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Motor plug for tool-less plug connection	9
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PKZM0-XDM wiring set for tool-less plug connection	11
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PKZM0-XDM wiring set for tool-less plug connection	12
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PKZM0-XDM wiring set	13
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Three-phase commoning link	14
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Standard auxiliary contact	15
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Early-make auxiliary contacts	16
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PKE motor protective circuit breaker	19
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Standard auxiliary contact	23
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Motor-starter combination with PKZ	24
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Busbar adapter	26
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Top-hat rail adapter	27
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DS7

Description





Application

DS7 soft starter series are two-phase controlled soft starters used to soft start applications with a normal operating frequency and a rating range from 3 to 200 A (1.1 to 110 kW with a 400 V line voltage).
Starting transients and DC components during startup are effectively suppressed and guarantee even motor starting.
The special actuation method (asymmetric trigger control) used for the soft start function prevents DC components (Moeller patent) that would otherwise normally be produced with two-phase controlled soft starters. This eliminates the formation of an elliptical rotary field that would cause the motor to accelerate in a non-uniform manner and lengthen its run-up time unnecessarily, making the smooth-running behavior of a DS7 soft starter comparable to that of a three-phase controlled soft starter.

Features

- The ramp time can be adjusted within a range of 1 to 30 s (for starting) or 0 to 30 s (for stopping) with a potentiometer.
- The start voltage (or start torque) can be adjusted within a range of 30 to 100 percent of the line voltage with a potentiometer.
- Significant reduction in switch-on current, achieved with a short soft start ramp time (min. 1 s) for lamp and heating loads.
- Internal bypass relay in DS7-340 models: switches on automatically after the end of the ramp, bypassing the internal thyristors.
- This makes it possible to comply with radio interference level B without any additional measures.
- The motor's thermal load is smaller than it would be without asymmetric trigger control.
- Designed specifically for long cables.

Functions

Typical applications for DS7 soft starter series are:
- Pump drives: soft starting three-phase motors prevents fluid hammers. The mechanical load on the entire system is decreased, increasing its durability.
- Fan drives: soft starting keeps fan belts from slipping, preventing premature wear. This lowers operating costs and extends the system's lifespan.
- Conveyor belts: conveyor belts start running smoothly, instead of starting with a jolt. This ensures that any goods being conveyed do not topple over. Mechanical damage to the belt itself is avoided, making it more durable.

Documentation

Surface mounting and standard mounting procedures are described in the corresponding installation instructions and in the manual.

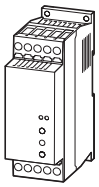
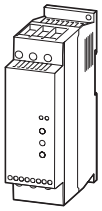
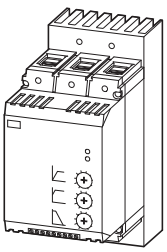
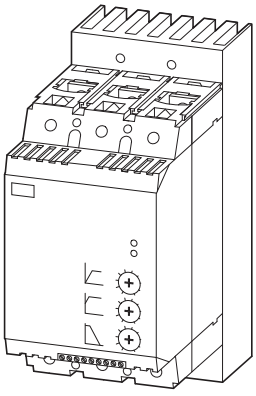
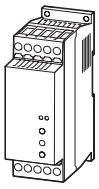
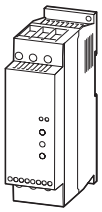
Installation instructions
Instructional leaflet 8250-2541: For devices with frame size 1 (up to 12 A motor rating)
Instructional leaflet 8250-2542: For devices with frame size 2 (up to 32 A motor rating)
Instructional leaflet 8250-2543: For devices with frame sizes 3 and 4 (up to 200 A motor rating)

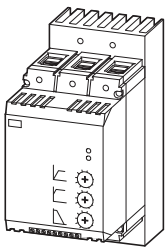
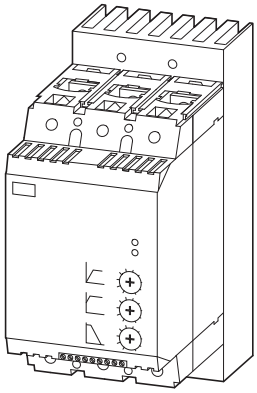
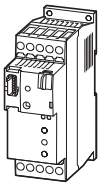
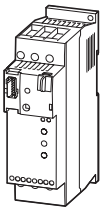
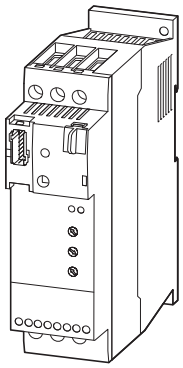
Manual
AWB 8250-1634

You can download the documentation for the DS7 soft starters from the Internet:
www.moeller.net/support

HPL09019EN

Ordering

	Rated operational current	Assigned motor rating at		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Device (AC-53)	400 V	480 V				
	I_e	P	P				
	A	kW	HP				
DS7 soft starters							
Soft starters for three-phase loads, mains supply voltage 230 – 480 V AC (50/60 Hz) Rated control circuit voltage U_c: 24 V AC/DC							
	4	1.5	2	**DS7-340SX004N0-N** 134847		1 off	Product Standards: IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 480 V Degree of Protection: IP20; UL/CSA Part no. 1
	7	3	3	**DS7-340SX007N0-N** 134849			
	9	4	5	**DS7-340SX009N0-N** 134910			
	12	5.5	7.5	**DS7-340SX012N0-N** 134911			
	16	7.5	10	**DS7-340SX016N0-N** 134912			
	24	11	15	**DS7-340SX024N0-N** 134913			
	32	15	20	**DS7-340SX032N0-N** 134914			
	41	22	30	**DS7-340SX041N0-N** 134916			
	55	30	40	**DS7-340SX055N0-N** 134917			
	70	37	50	**DS7-340SX070N0-N** 134918			
	81	45	60	**DS7-340SX081N0-N** 134919			
	100	55	75	**DS7-340SX100N0-N** 134920			
	135	75	100	**DS7-340SX135N0-N** 134921			
	160	90	125	**DS7-340SX160N0-N** 134922			
	200	110	150	**DS7-340SX200N0-N** 134923			
Rated control circuit voltage U_c: 110/230 V AC							
	4	1.5	2	**DS7-342SX004N0-N** 134925		1 off	Product Standards: IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 480 V Degree of Protection: IP20; UL/CSA Part no. 1
	7	3	3	**DS7-342SX007N0-N** 134927			
	9	4	5	**DS7-342SX009N0-N** 134928			
	12	5.5	7.5	**DS7-342SX012N0-N** 134929			
	16	7.5	10	**DS7-342SX016N0-N** 134930			
	24	11	15	**DS7-342SX024N0-N** 134931			
	32	15	20	**DS7-342SX032N0-N** 134932			

	Rated operational current Device (AC-53) I_e A	Assigned motor rating at 400 V P kW	Assigned motor rating at 480 V P HP	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
	41	22	30	**DS7-342SX041N0-N** 134934		1 off	Product Standards: IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 480 V Degree of Protection: IP20; UL/CSA Part no. 1
	55	30	40	**DS7-342SX055N0-N** 134935			
	70	37	50	**DS7-342SX070N0-N** 134936			
	81	45	60	**DS7-342SX081N0-N** 134937			
	100	55	75	**DS7-342SX100N0-N** 134938			
	135	75	100	**DS7-342SX135N0-N** 134939			
	160	90	125	**DS7-342SX160N0-N** 134940			
	200	110	150	**DS7-342SX200N0-N** 134941			
Rated control circuit voltage U_c: 24 VDC, for SmartWire-Darwin							
	4	1.5	2	**DS7-34DSX004N0-D** 134943		1 off	Product Standards: IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 480 V Degree of Protection: IP20; UL/CSA Part no. 1
	7	3	3	**DS7-34DSX007N0-D** 134945			
	9	4	5	**DS7-34DSX009N0-D** 134946			
	12	5.5	7.5	**DS7-34DSX012N0-D** 134947			
	16	7.5	10	**DS7-34DSX016N0-D** 134948			
	24	11	15	**DS7-34DSX024N0-D** 134949			
	32	15	20	**DS7-34DSX032N0-D** 134950			
	41	22	30	**DS7-34DSX041N0-D** 134952			
	55	30	40	**DS7-34DSX055N0-D** 134953			
	70	37	50	**DS7-34DSX070N0-D** 134954			
	81	45	60	**DS7-34DSX081N0-D** 134955			
	100	55	75	**DS7-34DSX100N0-D** 134956			
	135	75	100	**DS7-34DSX135N0-D** 134957			
	160	90	125	**DS7-34DSX160N0-D** 134958			
	200	110	150	**DS7-34DSX200N0-D** 134959			

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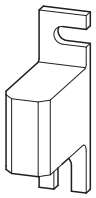
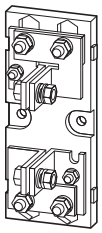
	Rated operational current	Maximum power loss P_v	Frame size/ inside micrometer	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
	A	W	mm					
Accessories								
Superfast semiconductor fuses								
	16	5	10 x 38	DS7-34…SX004N0-…	**50.179.06-16** 232077		10 off	Product Standards: UL 248-13, CE marking; UL File No.: E180276; UL CCN: JFHR2; CSA File No.: UL report applies to both US and Canada; CSA Class No.: JFHR8; NA Certification: UL Recognized, certified by UL for use in Canada; Max. Voltage Rating: 660 V
	25	7	22 x 58	DS7-34…SX007N0-…	**50.140.06-25** 138284		1 off	
	32	9	80	DS7-34…SX009N0-… DS7-34…SX012N0-…	**20.282.20-32** 138285		1 off	
	50	15	22 x 58	DS7-34…SX016N0-…	**50.140.06-50** 232079		10 off	
	63	16	22 x 58	DS7-34…SX024N0-…	**50.140.06-63** 232080		10 off	
	80	18	22 x 58	DS7-34…SX032N0-…	**50.140.06-80** 232081		10 off	
Fuse links								
	100	22	80	DS7-34…SX041N0-…	**20.282.20-100** 106654		6 off	Product Standards: UL 248-13 CE marking; UL File No.: E180276; UL CCN: JFHR2; CSA File No.: UL report applies to both US and Canada; CSA Class No.: JFHR8; NA Certification: UL Recognized, certified by UL for use in Canada; Max. Voltage Rating: 660 V
	125	24	80	DS7-34…SX055N0-…	**20.282.20-125** 232087		6 off	
	200	44	80	DS7-34…SX070N0-… DS7-34…SX081N0-… DS7-34…SX100N0-…	**20.610.32-200** 106475		3 off	
	350	61	80	DS7-34…SX135N0-…	**20.610.32-350** 221161		2 off	
	400	70	80	DS7-34…SX160N0-…	**20.610.32-400** 106476		3 off	
	500	72	80	DS7-34…SX200N0-…	**20.610.32-500** 221163		2 off	
Fuse bases								
	–	–	10 x 38	50.179.06-…	**51.063.04** 232082		12 off	Product Standards: UL 512; CE marking; UL File No.: E186970; UL CCN: IZLT2
	–	–	22 x 58	50.140.06-…	**51.060.04** 232084		6 off	
	–	–	80	20.282.20-… 20.189.20-…	**21.189.01** 232064		5 off	
	–	–	80	20.6xx.32-… 20.6...32-...	**21.313.02** 232076		2 off	

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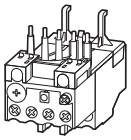
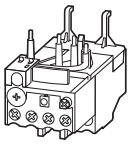
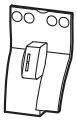
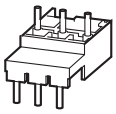
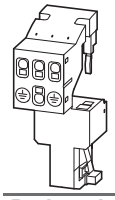
	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Overload relays					
	DS7-34…SX004…	**ZB12-4** 278438		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -
	DS7-34…SX007… DS7-34…SX009…	**ZB12-10** 278440			
	DS7-34…SX012…	**ZB12-12** 278441			
	DS7-34…SX016…	**ZB32-16** 278452		1 off	
	DS7-34…SX024…	**ZB32-24** 278453			
	DS7-34…SX032…	**ZB32-32** 278454			
PKZ-DS7 wiring set					
	DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012…	**PKZM0-XDM12** 283149		1 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
					
Electric contact module					
	DS7-34…SX016… DS7-34…SX024… DS7-34…SX032…	**PKZM0-XM32DE** 239349		5 off	Product Standards: UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 12528 CSA Class No.: 3211-05 NA Certification: UL Listed, CSA certified
Motor feeder plug					
	DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012…	**DILM12-XMCP/T** 121770		1 off	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification: Request filed for UL and CSA
Busbar adapter					
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	**BBA0L-25** 142526		1 off	–
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N... PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	**BBA0L-32** 142527		1 off	
Top-hat rail adapter					
Consists of: 45 mm wide adapter plate					
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	**PKZM0-XC45L** 142529		1 off	
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N... PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	**PKZM0-XC45L/2** 142570		1 off	

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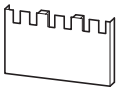
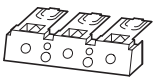
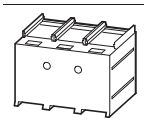
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Three-phase commoning links						
For the DS7's primary side, protected against accidental contact, short-circuit proof, U_e = 690 V, I_u = 35 A, can be lengthened with rotated mounting						
	DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012…	**DILM12-XDSB0/3** 240084		5 off	Suitable for 3 DS7 soft starters Length 135 mm	Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 2411-03 NA Certification: UL Listed, CSA certified
		**DILM12-XDSB0/4** 240085		5 off	Suitable for 4 DS7 soft starters Length 180 mm	
		**DILM12-XDSB0/5** 240086		5 off	Suitable for 5 DS7 soft starters Length 225 mm	
Incoming connection block						
	DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012…	**DILM12-XEK** 240083		5 off		Product Standards: IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No.: E36332 UL CCN: NLRV CSA File No.: 012528 CSA Class No.: 2411-03 NA Certification: UL Listed, CSA certified
Terminal cover						
Knockout, no UL/CSA approval for box terminal						
	DS7-34…SX041… DS7-34…SX055… DS7-34…SX070… DS7-34…SX081… DS7-34…SX100…	**NZM1-XKSFA** 100780		1 off	Type contains parts for a terminal located at top or bottom for 3 pole switches. Increased protection against accidental contact (simplified protection against contact with a finger).	UL/CSA certification not required
Terminal cover						
knockout						
	NZM2, PN2, N(S)2 DS6-340-75K…110K DS7-34…SX135… DS7-34…SX160… DS7-34…SX200…	**NZM2-XKSFA** 104640		1 off	Type contains parts for a terminal located at top or bottom for 3 pole switches. Protection against accidental contact increased to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. With two conductors max cross-section 22 mm² or AWG4. Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
Cover						
	DS7-34…SX135… DS7-34…SX160… DS7-34…SX200…	**NZM2-XKSA** 260038		1 off	Type contains parts for a terminal located at top or bottom for 3 pole switches. Protection against direct contact where cable lugs, busbars or tunnel terminals are used. When using insulated conductor material to protection type IP1X.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information

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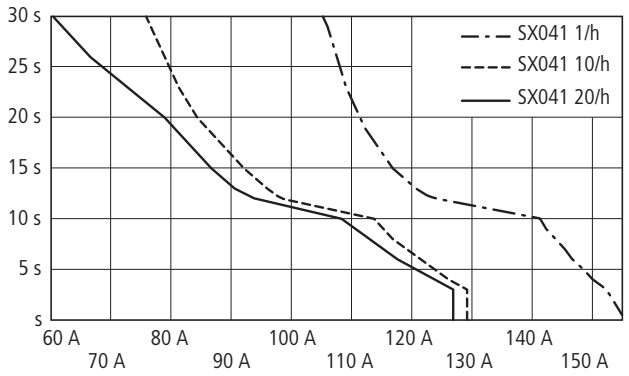
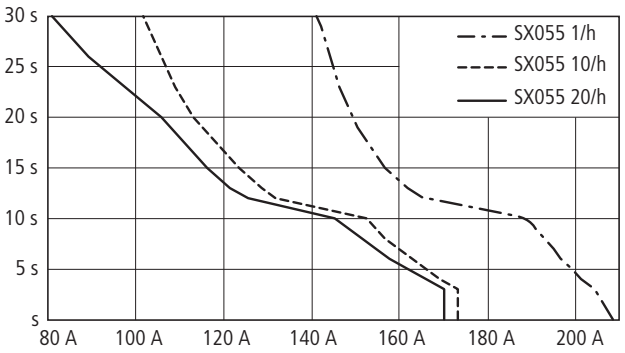
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
IP2X protection against contact with a finger For box terminal						
	DS7-34…SX135… DS7-34…SX160… DS7-34…SX200…	**NZM2-XIPK** 266773		1 off	Type contains parts for a terminal located at top or bottom for 3 pole switches. Increased protection against direct contact to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. With two conductors max cross-section 25 mm² or AWG4. Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
IP2X protection against contact with a finger for NZM2-XKSA cover						
	DS7-34…SX135… DS7-34…SX160… DS7-34…SX200…	**NZM2-XIPA** 266777		1 off		UL/CSA certification not required
Mounting kit When using covers NZM1-XKSFA and NZM2-XKSA						
	DS7-34xSX041N0-x DS7-34xSX055N0-x DS7-34xSX070N0-x DS7-34xSX081N0-x DS7-34xSX100N0-x DS7-34xSX135N0-x DS7-34xSX160N0-x DS7-34xSX200N0-x	**DE6-MNT-NZM** 107323		1 off		
Equipment fan For increasing the load cycle (more starts per hour or longer-lasting starting current)						
	DS7-34…SX004… DS7-34…SX007… DS7-34…SX009… DS7-34…SX012… DS7-34…SX016… DS7-34…SX024… DS7-34…SX032…	**DS7-FAN-032** 135553		1 off		NA Certification: Request filed for UL and CSA

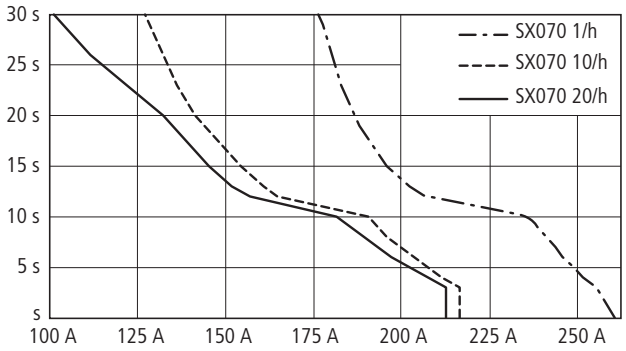
DS7-34...SX041...



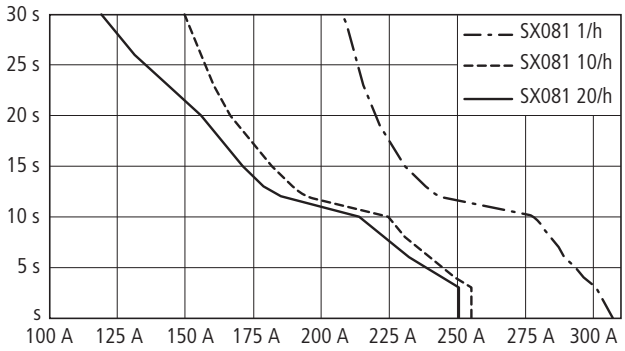
DS7-34...SX055...



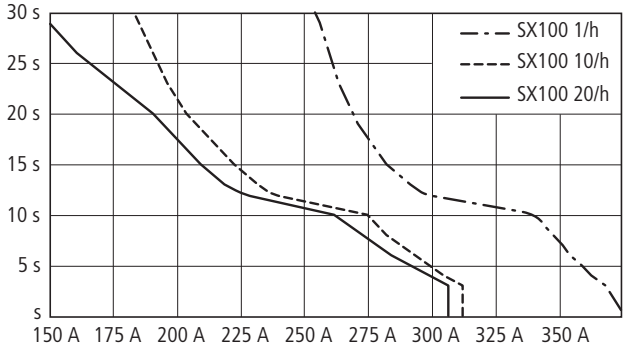
DS7-34...SX070...



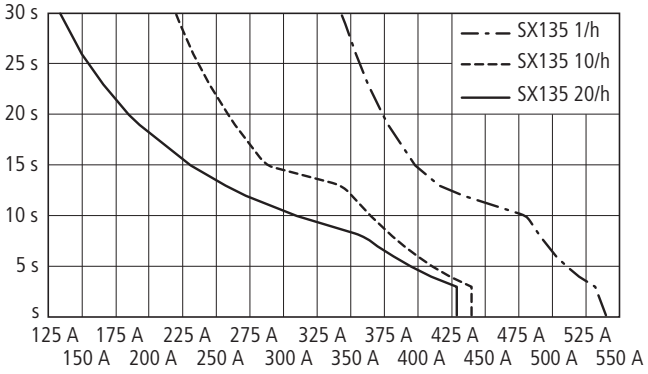
DS7-34...SX081...



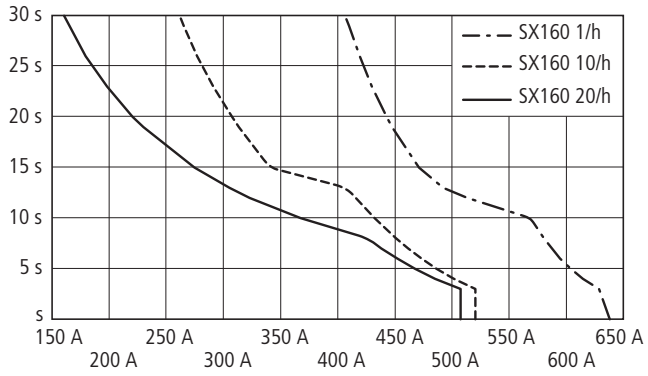
DS7-34...SX100...



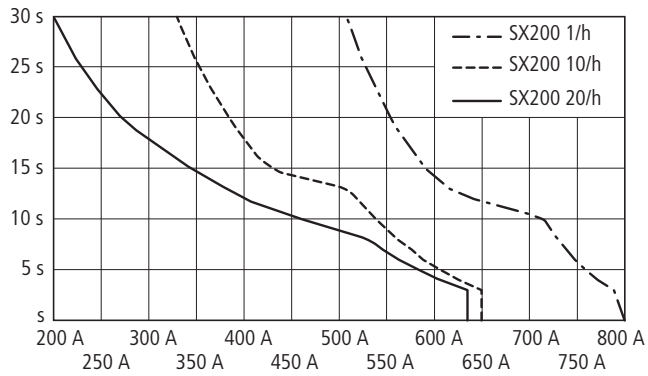
DS7-34...SX135...



DS7-34...SX160...

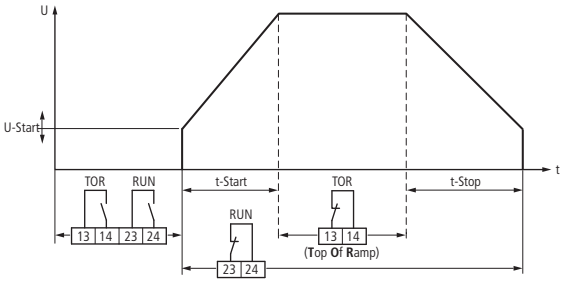


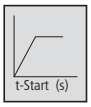
DS7-34...SX200...

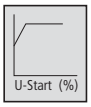


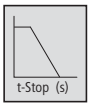
Potentiometer settings

U	I			
		(R)		
(L)		(AC11		
			I_{min}	U_{min}
250 V ~	0.2 A	1 A	10 mA	250 V ~
30 V H	0.7 A	0.5 A	100 mA	5 V H



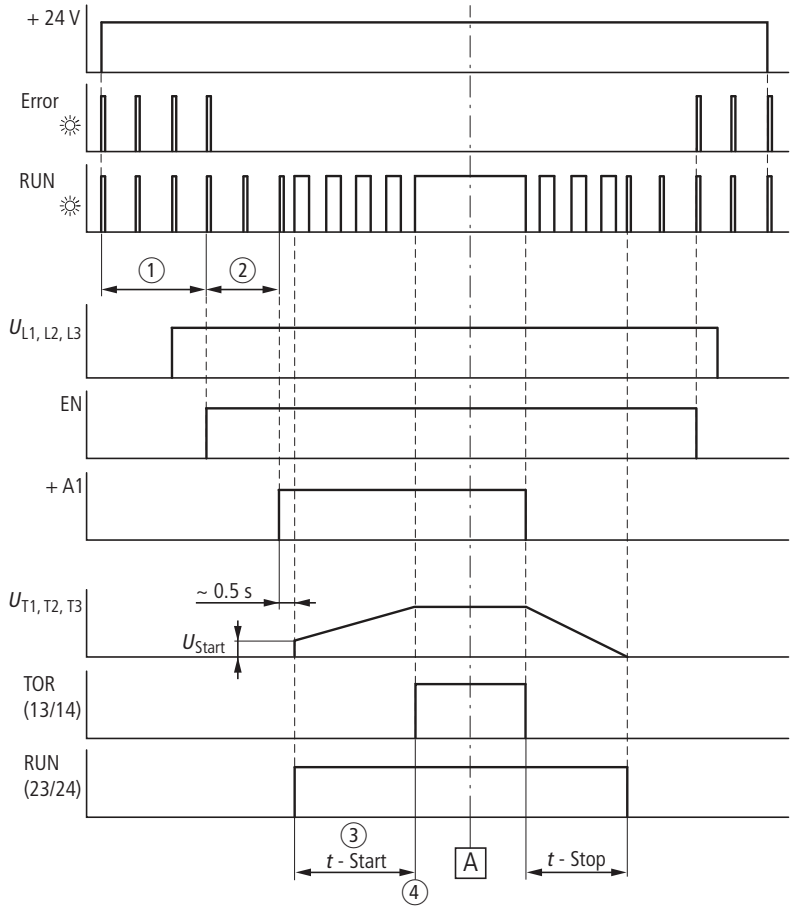




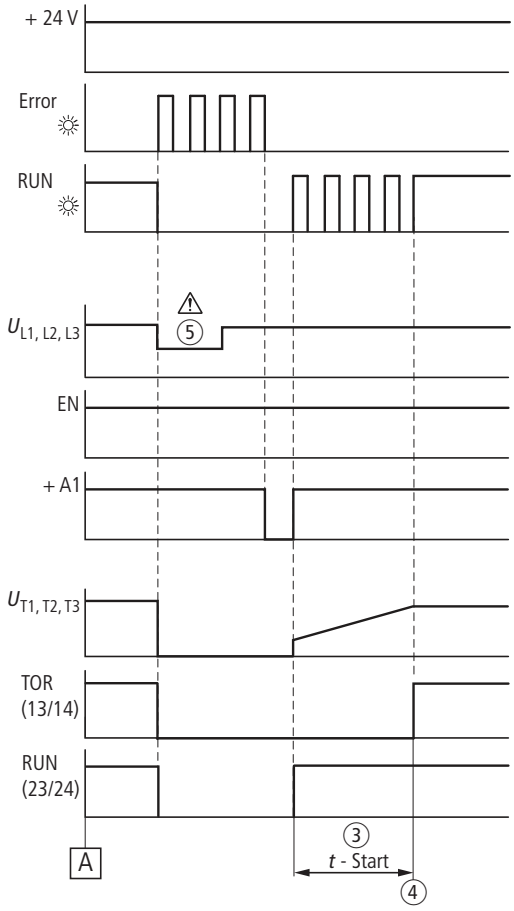


t-Start (s)	U-Start %	t-Stop (s)		
~10	~30	0		J → 0
~25	~30	~30		
~20	~40	0		
~10	~30	~20		
~15	~40	0		
~18	~40	0		J → ∞ → DS7 > P_{Motor}
~15	~50	0		→ DS7 > P_{Motor}
~10	~60	0		
~10	~60	0		→ DS7 > P_{Motor}

Operation



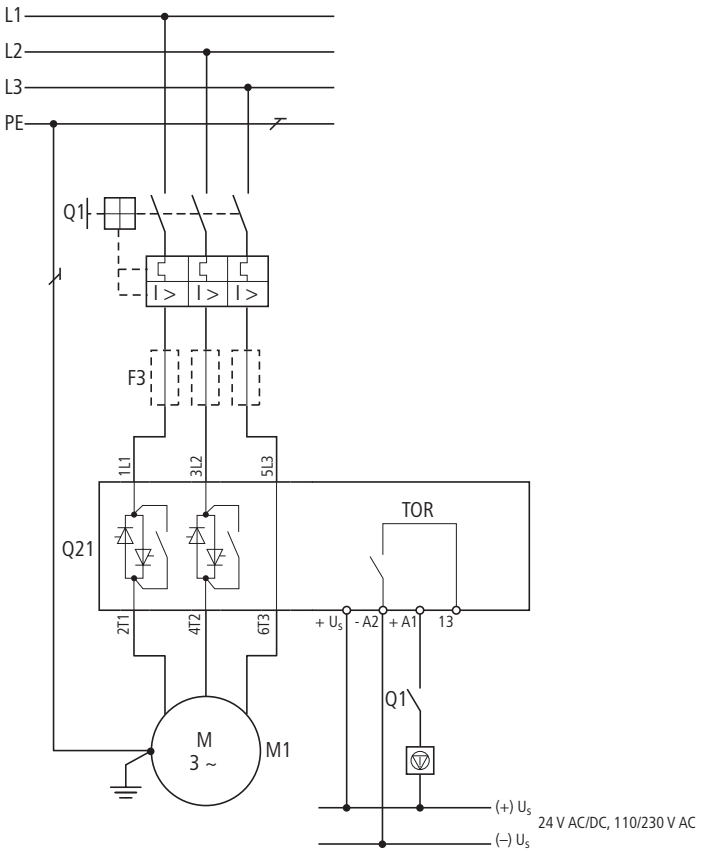
Fault

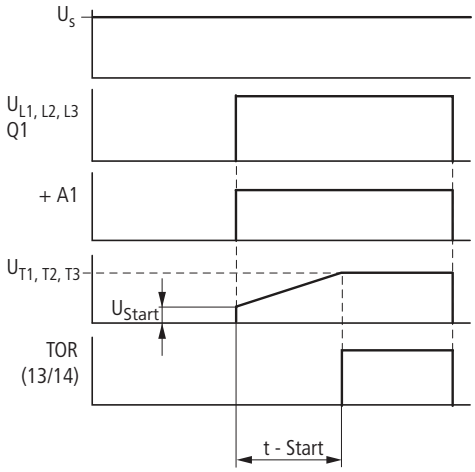


RUN-LED green
Error-LED red

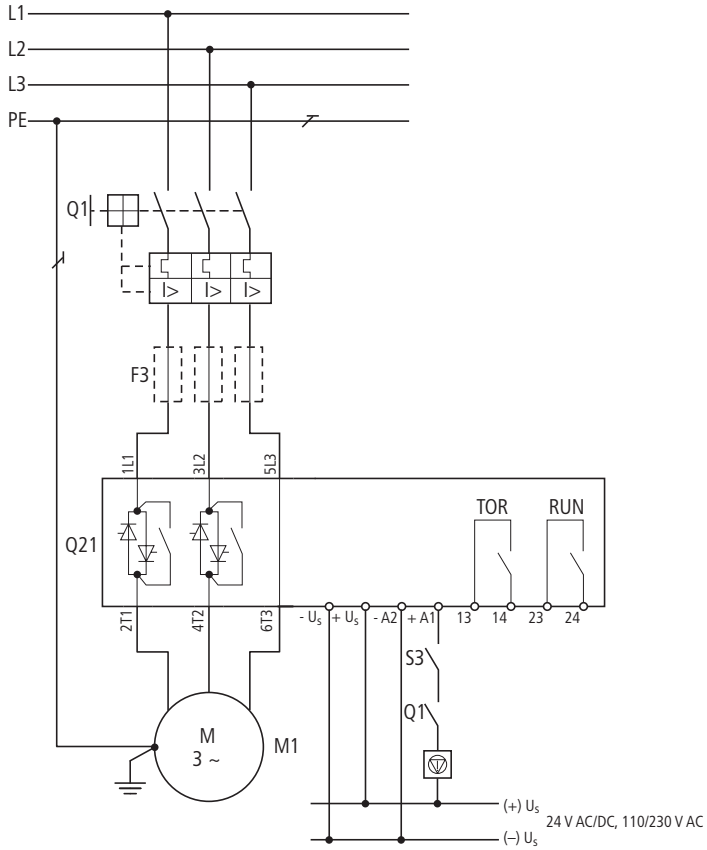
① Initialization
② Ready for operation
③ In ramp
④ Top of ramp reached
⑤ Fault – One phase drops out

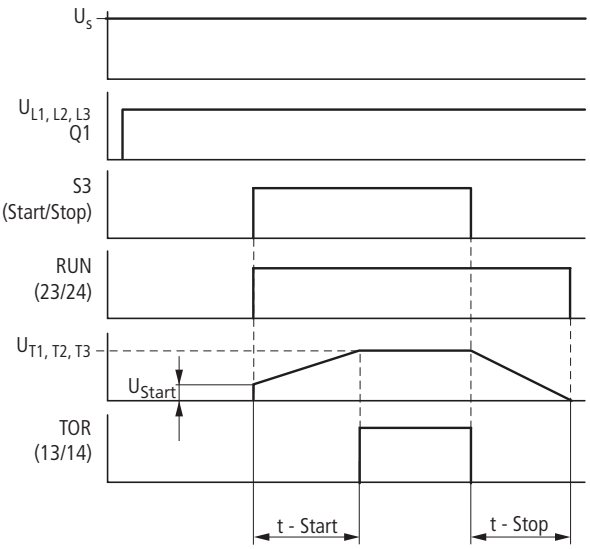
Standard connection
up to 12 A





Standard connection
up to 32 A





Standard connection

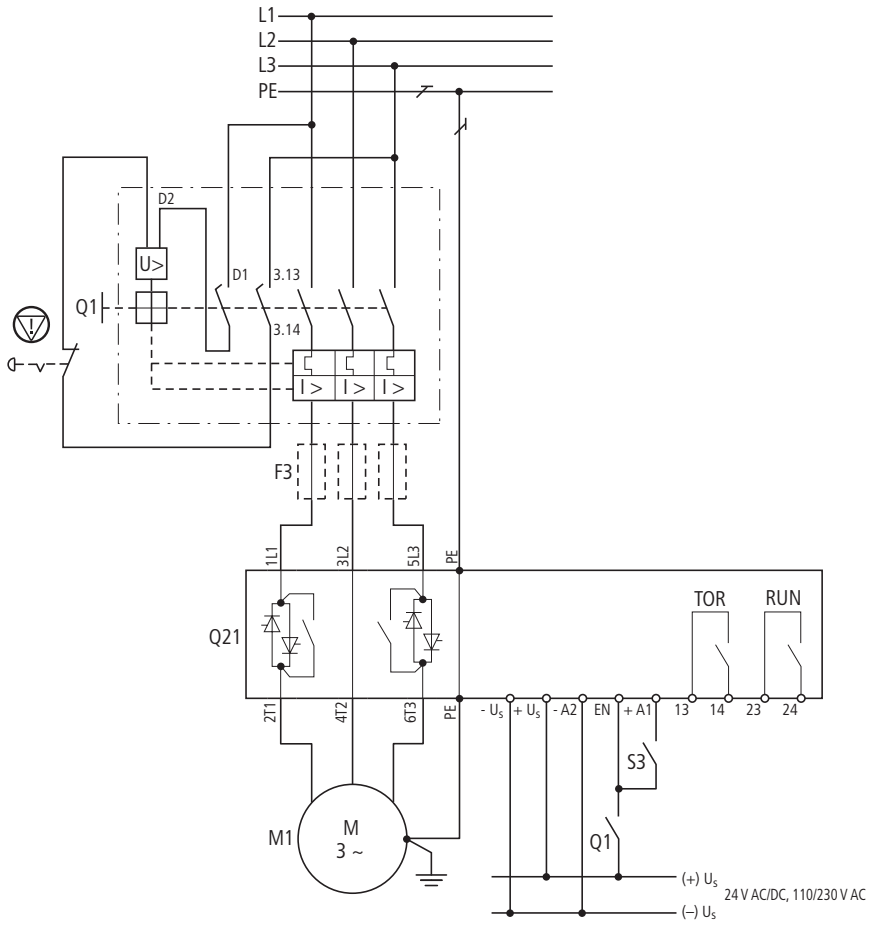
over 32 A

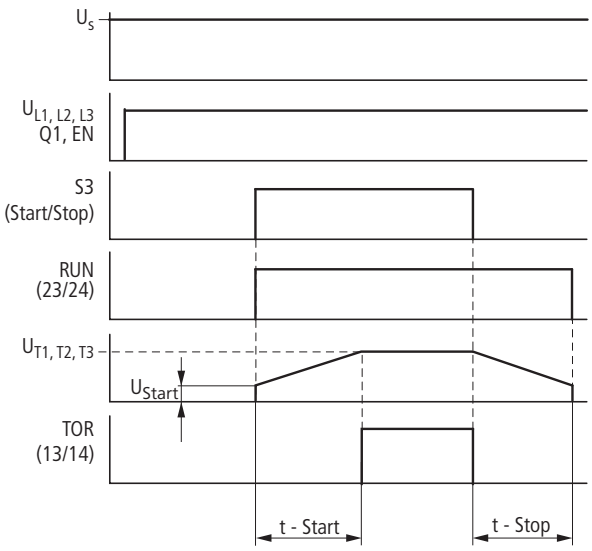
With Emergency switching off function according to IEC/EN 60 204-1 and VDE 0113 Part 1

= Emergency switching off

① Control circuit terminal

② Undervoltage release with early-make auxiliary contact





Assigned Motor rating at		Rated operational current[1]			Part no. Soft starters (device to be selected)	Soft starter function
400 V P kWh	480 V P HP	Motor I_e A	Soft starters I_e A	Cable		Cable protection[2] Type "1" coordination
					Soft starters for three-phase mains connection, low operating frequency (5 s, 3 x I_e, 10 starts/h)	
1.5	2	3.6	4		**DS7-34xSX004N0-x**	PKZM0-4 (+ CL-PKZ0)
3	3	6.6	7		**DS7-34xSX007N0-x**	PKZM0-10 (+ CL-PKZ0)
4	5	8.5	9		**DS7-34xSX009N0-x**	PKZM0-10 (+ CL-PKZ0)
5.5	7.5	11.3	12		**DS7-34xSX012N0-x**	PKZM0-12 (+ CL-PKZ0)
7.5	10	15.2	16		**DS7-34xSX016N0-x**	PKZM0-16 (+ CL-PKZ0)
11	15	21.7	24		**DS7-34xSX024N0-x**	PKZM0-25 (+ CL-PKZ0)
15	20	29.3	32		**DS7-34xSX032N0-x**	PKZM0-32 (+ CL-PKZ0)
22	25	41	41		**DS7-34xSX041N0-x**	NZMN1-M50 / PKZM4-50
30	30	55	55		**DS7-34xSX055N0-x**	NZMN1-M63 / PKZM4-58
37	40	68	70		**DS7-34xSX070N0-x**	NZMN1-M80
45	50	81	81		**DS7-34xSX081N0-x**	NZMN1-M100
55	60	99	100		**DS7-34xSX100N0-x**	NZMN1-M100
75	75	134	135		**DS7-34xSX135N0-x**	NZMN2-M160
90	100	160	160		**DS7-34xSX160N0-x**	NZMN2-M200
110	125	196	200		**DS7-34xSX200N0-x**	NZMN2-M200

Notes

[1] Rated operational current based on the load cycle specified here.

[2] Indicates the circuit-breaker required for the indicated load cycle. At different duty cycles (operating frequency, overcurrent, overcurrent time, duty factor), this value changes and must then be adapted accordingly.

[3] An external overload relay is required if the main contacts are not to be disconnected in the event of an overload and a controlled soft stop is desired instead.

[4] A mains contactor is not required. Disconnection characteristics in accordance with VDE can only be ensured with the specified circuit-breaker.

[5] The superfast semiconductor fuses protect the soft starters from motor-side short-circuits. This can not, however, prevent damage caused by voltage peaks, for example through lightning strike.

Soft starter function with soft stop in case of overload		Mains contactor	Semiconductor protection (optional, fuse required for type 2 coordination in addition to cable protection for type 1 coordination)[5]	
Cable protection[2] Type "1" coordination	Overload relays[3]	optional[4]	Fuses Number x Part no.	Fuse holders Number x Part no.
PKM0-4 (+ CL-PKZ0)	ZB12-4	DILM7	3 × 50.179.06-16	3 x 51.060.04
PKM0-10 (+ CL-PKZ0)	ZB12-10	DILM9	3 × 50.140.06-25	3 x 51.060.04
PKM0-10 (+ CL-PKZ0)	ZB12-10	DILM9	3 × 20.282.20-32	3 x 21.189.01
PKM0-12 (+ CL-PKZ0)	ZB12-12	DILM12	3 × 20.282.20-32	3 x 21.189.01
PZM0-16 (+ CL-PKZ0)	ZB32-16	DILM17	3 × 50.140.06-50	3 x 51.060.04
PZM0-25 (+ CL-PKZ0)	ZB32-24	DILM25	3 × 50.140.06-63	3 x 51.060.04
PZM0-32 (+ CL-PKZ0)	ZB32-32	DILM32	3 × 50.140.06-80	3 x 51.060.04
NZMN1-M50 / PKZM4-50	ZB65-40+ZB65-XEZ	DILM50	3 × 50.140.06-80	3 x 21.189.01
NZMN1-M63 / PKZM4-58	ZB65-57+ZB65-XEZ	DILM65	3 × 20.282.20-125	3 x 21.189.01
NZMN1-M80	ZB150-70/KK	DILM80	3 × 20.610.32-200	3 x 21.313.02
NZMN1-M100	ZB150-100/KK	DILM95	3 × 20.610.32-200	3 x 21.313.02
NZMN1-M100	ZB150-100/KK	DILM115	3 × 20.610.32-200	3 x 21.313.02
NZMN2-M160	ZB150-150/KK	DILM150	3 × 20.610.32-350	3 x 21.313.02
NZMN2-M200	Z5-160/FF250	DILM185	3 × 20.610.32-400	3 x 21.313.02
NZMN2-M200	Z5-220/FF250	DILM225	3 × 20.610.32-500	3 x 21.313.02

				DS7-340SX004	DS7-340SX007	DS7-340SX009	DS7-340SX012
General							
Standards				IEC/EN 60 947-4-2			
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3			
Ambient temperature			°C	0…40, up to 60 °C at 1 % derating per Kelvin temperature rise			
Ambient temperature storage			°C	-25 - +55			
Installation altitude	Higher installation altitude upon request			0…1000 m, above that 1 % derating per 100 m, up to 2000 m			
Mounting position				Vertical			
Protection type				IP20			
Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.				Protection type IP40 can be achieved on all sides with covers from the NZM range.			
Protection against direct contact				Finger- and back-of-hand proof			
Overvoltage category/pollution degree				II/2			
Mechanical shock resistance				8 g/11 ms			
Vibration resistance to EN 60721-3-2				2M2			
Average heat dissipation with nominal load cycle			W	0.2	0.35	0.45	0.6
Dimensions (W x H x D)			mm	45 x 130 x 95			
Radio interference level				B			
Weight			kg	0.35	0.35	0.35	0.35
Main contacts							
Rated operational voltage			V AC	230 - 460			
Mains frequency			Hz	50/60			
Rated operational current	AC-53 (motor loads)	I_e	A	4	7	9	12
Assigned motor rating	230 V	P	kW	0.75	1.5	2.2	3
	400 V	P	kW	1.5	3	4	5.5
	480 V	P	HP	2	3	5	7.5
Overload cycle to EN 60947-4-2							
AC-53a (int. bypass)	For AC-53a:3-5:75-10		A	4	7	9	12
Terminal capacity							
Power cable (box terminal)	Solid		mm²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm²	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Flat conductor		min, mm	–	–	–	–
			max, mm	–	–	–	–
	Tightening torque		Nm	1.2	1.2	1.2	1.2
Control cables	Solid		mm²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm²	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Tightening torque		Nm	1.2	1.2	1.2	1.2
	Screwdriver (flat blade)		mm	0.8 x 5.5; 1 x 6			
Power section							
Rated impulse withstand voltage		U_{imp} 1.2/50 µs	kV	4	4	4	4
Rated insulation voltage		U_i	V	500	500	500	500
Short-circuit rating							
Type "1" coordination	For AC-53a:3-5:75-10			PKZM0-4 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-12 (+ CL-PKZ0)
Type "2" coordination (in addition to fuses for type "1" of coordination)				3 x 50.179.06-16	3 x 50.140.06-25	3 x 20.282.20-32	3 x 20.282.20-32
Fuse holders				3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 51.060.04
Control circuit							
Controller supply voltage	Voltage	U_s	V	24 V AC/DC + 10 % / - 15 %			
	Current consumption at no load 24 V DC		mA	–	–	–	–
	Current consumption in operation at 24 V DC		mA	–	–	–	–
	Current consumption at peak load (close bypass) at 24 V DC		mA/ms	–	–	–	–
Control voltage range	AC operated			24 V AC/DC + 10 % / - 15 %			
	Current consumption at 230 V DC		mA	–	–	–	–
Pick-up voltage	DC operated		V DC	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
	AC operated		V AC	–	–	–	–
Drop-out voltage	DC operated		V DC	0 - +3	0 - +3	0 - +3	0 - +3
	AC operated		V AC	–	–	–	–
Pick-up time	AC operated		ms	–	–	–	–
Drop-out time	AC operated		ms	–	–	–	–
Relay outputs	Number			1 (TOR)			
	Voltage range		V AC	250			
	Current range		A	1 A, AC-1			
Soft start functions							
Ramp times	Acceleration		s	1 - 30			
	Deceleration		s	0 - 30			
Start voltage (= switch-off voltage)				30 % - 100 %			
Voltage reduction at stop				8 %			

DS7-340SX016	DS7-340SX024	DS7-340SX032	DS7-340SX041	DS7-340SX055	DS7-340SX070	DS7-340SX081	DS7-340SX100	DS7-340SX135	DS7-340SX160	DS7-340SX200
IEC/EN 60 947-4-2										
Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3										
0…40, up to 60 °C at 1 % derating per Kelvin temperature rise										
-25 - +55										
0…1000 m, above that 1 % derating per 100 m, up to 2000 m										
Vertical										
IP20										
Protection type IP40 can be achieved on all sides with covers from the NZM range.										
Finger- and back-of-hand proof										
II/2										
8 g/11 ms										
2M2										
0.8	1.1	1.5	7	10	13	18	25	24	30	42
45 x 150 x 118										
B										
0.4	0.4	0.4	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
230 - 460										
50/60										
16	24	32	41	55	70	81	100	135	160	200
4	5.5	7.5	11	15	15	22	30	30	45	55
7.5	11	15	22	30	37	45	55	75	90	110
10	15	20	30	40	50	60	75	100	125	150
16	24	32	41	55	70	81	100	135	160	200
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
1 x (0.75 - 16); 2 x (0.75 - 10)			–	–	–	–	–	–	–	–
1 x 16			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
18 - 6			1 x (12 - 2/0)					1 x (12 - 350 kcmil); 2 x (12 - 00)		
–	–	–	2 x 9 x 0.8					2 x 9 x 0.8		
–	–	–	9 x 9 x 0.8					10 x 16 x 0.8		
3	3	3	–	–	–	–	–	–	–	–
1 x (0.5 - 2.5); 2 x (0.5 - 1.0)										
1 x (0.5 - 1.5); 2 x (0.5 - 0.75)										
1 x (0.5 - 1.5); 2 x (0.5 - 1.0)										
1 x (21 - 14); 2 x (21 - 18)										
1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.6 x 3.5										
4	4	4	4	4	4	4	4	4	4	4
500	500	500	500	500	500	500	500	500	500	500
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50 / PKZM4-50	NZMN1-M63 / PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
3 x 50.140.06-50	3 x 50.140.06-63	3 x 50.140.06-80	3 x 20.282.20-100	3 x 20.282.20-125	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-350	3 x 20.610.32-400	3 x 20.610.32-500
3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
24 V AC/DC + 10 % / - 15 %										
–	–	–	35	35	35	35	35	35	35	35
–	–	–	65	65	65	65	65	65	65	65
–	–	–	600/50	600/50	600/50	600/50	600/50	600/50	600/50	600/50
24 V AC/DC + 10 % / - 15 %										
–	–	–	14	14	14	14	14	14	14	14
+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
–	–	–	–	–	–	–	–	–	–	–
0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3
–	–	–	–	–	–	–	–	–	–	–
–	–	–	250	250	250	250	250	250	250	250
–	–	–	190	190	190	190	190	190	190	190
2 (TOR)										
250										
1 A, AC-1			3 A, AC-1							
1 - 30										
0 - 30										
30 % - 100 %										
8 %										

				DS7-342SX004	DS7-342SX007	DS7-342SX009	DS7-342SX012
General							
Standards				IEC/EN 60 947-4-2			
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3			
Ambient temperature			°C	0…40, up to 60 °C at 1 % derating per Kelvin temperature rise			
Ambient temperature storage			°C	-25 - +55			
Installation altitude	Higher installation altitude upon request			0…1000 m, above that 1 % derating per 100 m, up to 2000 m			
Mounting position				Vertical			
Protection type				IP20			
Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.				Protection type IP40 can be achieved on all sides with covers from the NZM range.			
Protection against direct contact				Finger- and back-of-hand proof			
Overvoltage category/pollution degree				II/2			
Mechanical shock resistance				8 g/11 ms			
Vibration resistance to EN 60721-3-2				2M2			
Average heat dissipation with nominal load cycle			W	0.2	0.35	0.45	0.6
Dimensions (W x H x D)			mm	45 x 130 x 95			
Radio interference level				B			
Weight			kg	0.4	0.4	0.4	0.4
Main contacts							
Rated operational voltage			V AC	230 - 460			
Mains frequency			Hz	50/60			
Rated operational current	AC-53 (motor loads)	I_e	A	4	7	9	12
Assigned motor rating	230 V	P	kW	0.75	1.5	2.2	3
	400 V	P	kW	1.5	3	4	5.5
	480 V	P	HP	2	3	5	7.5
Overload cycle to EN 60947-4-2							
AC-53a (int. bypass)	For AC-53a:3-5:75-10		A	4	7	9	12
Terminal capacity							
Power cable (box terminal)	Solid		mm²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm²	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Flat conductor		min, mm	–	–	–	–
			max, mm	–	–	–	–
	Tightening torque		Nm	1.2	1.2	1.2	1.2
Control cables	Solid		mm²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm²	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Tightening torque		Nm	1.2	1.2	1.2	1.2
	Screwdriver (flat blade)		mm	0.8 x 5.5; 1 x 6			
Power section							
Rated impulse withstand voltage		U_{imp} 1.2/50 µs	kV	4	4	4	4
Rated insulation voltage		U_i	V	500	500	500	500
Short-circuit rating							
Type "1" coordination	For AC-53a:3-5:75-10			PKZM0-4 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-12 (+ CL-PKZ0)
Type "2" coordination (in addition to fuses for type "1" of coordination)				3 x 50.179.06-16	3 x 50.140.06-25	3 x 20.282.20-32	3 x 20.282.20-32
Fuse holders				3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 51.060.04
Control circuit							
Controller supply voltage	Voltage	U_s	V	120 -15 % - 230 +10 %			
	Current consumption at no load 24 V DC		mA	–	–	–	–
	Current consumption in operation at 24 V DC		mA	–	–	–	–
	Current consumption at peak load (close bypass) at 24 V DC		mA/ms	–	–	–	–
Control voltage range	AC operated			120 -15 % - 230 +10 %			
	Current consumption at 230 V DC		mA	–	–	–	–
Pick-up voltage	DC operated		V DC	–	–	–	–
	AC operated		V AC	120 -15 %			
Drop-out voltage	DC operated		V DC	–	–	–	–
	AC operated		V AC	–	–	–	–
Pick-up time	AC operated		ms	–	–	–	–
Drop-out time	AC operated		ms	–	–	–	–
Relay outputs	Number			1 (TOR)			
	Voltage range		V AC	250			
	Current range		A	3 A, AC1			
Soft start functions							
Ramp times	Acceleration		s	1 - 30			
	Deceleration		s	0 - 30			
Start voltage (= switch-off voltage)				30 % - 92 %			
Voltage reduction at stop				8 %			

DS7-342SX016	DS7-342SX024	DS7-342SX032	DS7-342SX041	DS7-342SX055	DS7-342SX070	DS7-342SX081	DS7-342SX100	DS7-342SX135	DS7-342SX160	DS7-342SX200
IEC/EN 60 947-4-2										
Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3										
0…40, up to 60 °C at 1 % derating per Kelvin temperature rise										
-25 - +55 °C										
0…1000 m, above that 1 % derating per 100 m, up to 2000 m										
Vertical										
IP20										
Protection type IP40 can be achieved on all sides with covers from the NZM range.										
Finger- and back-of-hand proof										
II/2										
8 g/11 ms										
2M2										
0.8	1.1	1.5	7	10	13	18	25	24	30	42
45 x 150 x 118										
B										
0.45	0.45	0.45	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
230 - 460										
50/60										
16	24	30	41	55	70	81	100	135	160	200
4	5.5	7.5	11	15	15	22	30	30	45	55
7.5	11	15	22	30	37	45	55	75	90	110
10	15	20	30	40	50	60	75	100	125	150
16	24	30	41	55	70	81	100	135	160	200
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
1 x (0.75 - 16); 2 x (0.75 - 10)			–	–	–	–	–	–	–	–
1 x 16			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
18 - 6			1 x (12 - 2/0)					1 x (12 - 350 kcmil); 2 x (12 - 00)		
–	–	–	2 x 9 x 0.8					2 x 9 x 0.8		
–	–	–	9 x 9 x 0.8					10 x 16 x 0.8		
3	3	3	–	–	–	–	–	–	–	–
1 x (0.5 - 2.5); 2 x (0.5 - 1.0)										
1 x (0.5 - 1.5); 2 x (0.5 - 0.75)										
1 x (0.5 - 1.5); 2 x (0.5 - 1.0)										
1 x (21 - 14); 2 x (21 - 18)										
1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.8 x 5.5; 1 x 6			0.6 x 3.5							
4	4	4	4	4	4	4	4	4	4	4
500	500	500	500	500	500	500	500	500	500	500
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50 / PKZM4-50	NZMN1-M63 / PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
3 x 50.140.06-50	3 x 50.140.06-63	3 x 50.140.06-80	3 x 20.282.20-100	3 x 20.282.20-125	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-350	3 x 20.610.32-400	3 x 20.610.32-500
3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
120 -15 % - 230 +10 %										
–	–	–	35	35	35	35	35	35	35	35
–	–	–	65	65	65	65	65	65	65	65
–	–	–	600/50	600/50	600/50	600/50	600/50	600/50	600/50	600/50
120 -15 % - 230 +10 %										
–	–	–	14	14	14	14	14	14	14	14
–	–	–	–	–	–	–	–	–	–	–
120 -15 %										
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
–	–	–	250	250	250	250	250	250	250	250
–	–	–	190	190	190	190	190	190	190	190
2 (TOR)										
250										
3 A, AC1										
1 - 30										
0 - 30										
30 % - 92 %										
8 %										

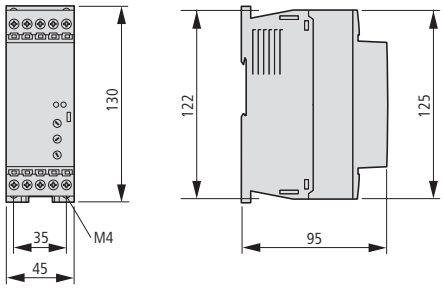
				DS7-34DSX004	DS7-34DSX007	DS7-34DSX009	DS7-34DSX012
General							
Standards				IEC/EN 60 947-4-2			
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3			
Ambient temperature			°C	0…40, up to 60 °C at 1 % derating per Kelvin temperature rise			
Ambient temperature storage			°C	-25 - +55 °C			
Installation altitude	Higher installation altitude upon request			0…1000 m, above that 1 % derating per 100 m, up to 2000 m			
Mounting position				Vertical			
Protection type				IP20			
Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.				Protection type IP40 can be achieved on all sides with covers from the NZM range.			
Protection against direct contact				Finger- and back-of-hand proof			
Overvoltage category/pollution degree				II/2			
Mechanical shock resistance				8 g/11 ms			
Vibration resistance to EN 60721-3-2				2M2			
Average heat dissipation with nominal load cycle			W	0.2	0.35	0.45	0.6
Dimensions (W x H x D)			mm	45 x 135 x 95			
Radio interference level				B			
Weight			kg	0.41	0.41	0.41	0.41
Main contacts							
Rated operational voltage			V AC	230 - 460			
Mains frequency			Hz	50/60			
Rated operational current	AC-53 (motor loads)	I_e	A	4	7	9	12
Assigned motor rating	230 V	P	kW	0.75	1.5	2.2	3
	400 V	P	kW	1.5	3	4	5.5
	480 V	P	HP	2	3	5	7.5
Overload cycle to EN 60947-4-2							
AC-53a (int. bypass)	For AC-53a:3-5:75-10		A	4	7	9	12
Terminal capacity							
Power cable (box terminal)	Solid		mm^2	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm^2	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm^2	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Flat conductor		min, mm	–	–	–	–
			max, mm	–	–	–	–
	Tightening torque		Nm	1.2	1.2	1.2	1.2
Control cables	Solid		mm^2	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
	Flexible with ferrule		mm^2	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
	Stranded		mm^2	–	–	–	–
	Solid or stranded		AWG	18 - 10			
	Tightening torque		Nm	1.2	1.2	1.2	1.2
	Screwdriver (flat blade)		mm	0.8 x 5.5; 1 x 6			
Power section							
Rated impulse withstand voltage		U_{imp} 1.2/50 µs	kV	4	4	4	4
Rated insulation voltage		U_i	V	500	500	500	500
Short-circuit rating							
Type "1" coordination	For AC-53a:3-5:75-10			PKZM0-4 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-10 (+ CL-PKZ0)	PKZM0-12 (+ CL-PKZ0)
Type "2" coordination (in addition to fuses for type "1" coordination)				3 x 50.179.06-16	3 x 50.179.06-25	3 x 20.282.20-32	3 x 20.282.20-32
Fuse holders				3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01
Control circuit							
Controller supply voltage	Voltage	U_s	V	+24 V AC/DC +10 %/-15 %			
	Current consumption at no load 24 V DC		mA	–	–	–	–
	Current consumption in operation at 24 V DC		mA	–	–	–	–
	Current consumption at peak load (close bypass) at 24 V DC		mA/ms	–	–	–	–
Control voltage range	AC operated			24 +10 %/-15 %			
	Current consumption at 230 V DC		mA	-	-	-	-
Pick-up voltage	DC operated		V DC	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
	AC operated		V AC	–	–	–	–
Drop-out voltage	DC operated		V DC	0 - +3	0 - +3	0 - +3	0 - +3
	AC operated		V AC	–	–	–	–
Pick-up time	DC operated		ms	–	–	–	–
Drop-out time	DC operated		ms	–	–	–	–
Relay outputs	Number			1 (TOR)			
	Voltage range		V AC	250			
	Current range		A	3 A, AC1			
Soft start functions							
Ramp times	Acceleration		s	1 - 30			
	Deceleration		s	0 - 30			
Start voltage (= switch-off voltage)				30 % - 92 %			
Voltage reduction at stop				8 %			

DS7-34DSX016	DS7-34DSX024	DS7-34DSX032	DS7-34DSX041	DS7-34DSX055	DS7-34DSX070	DS7-34DSX081	DS7-34DSX100	DS7-34DSX135	DS7-34DSX160	DS7-34DSX200
IEC/EN 60 947-4-2										
Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3										
0…40, up to 60 °C at 1 % derating per Kelvin temperature rise										
-25 - +55 °C										
0…1000 m, above that 1 % derating per 100 m, up to 2000 m										
Vertical										
IP20										
Protection type IP40 can be achieved on all sides with covers from the NZM range.										
Finger- and back-of-hand proof										
II/2										
8 g/11 ms										
2M2										
0.8	1.1	1.5	7	10	13	18	25	24	30	42
45 x 150 x 118										
B										
0.41	0.46	0.46	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
230 - 460										
50/60										
16	24	30	41	55	70	81	100	135	160	200
4	5.5	7.5	11	15	15	22	30	30	45	55
7.5	11	15	22	30	37	45	55	75	90	110
10	15	20	30	40	50	60	75	100	125	150
16	24	30	41	55	70	81	100	135	160	200
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
1 x (0.75 - 16); 2 x (0.75 - 10)			–	–	–	–	–	–	–	–
1 x 16			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)		
18 - 6			1 x (12 - 2/0)					1 x (12 - 350 kcmil); 2 x (12 - 00)		
–	–	–	2 x 9 x 0.8					2 x 9 x 0.8		
–	–	–	9 x 9 x 0.8					10 x 16 x 0.8		
3	3	3	–	–	–	–	–	–	–	–
1 x (0.75 - 4); 2 x (0.75 - 4)			1 x (0.5 - 2.5); 2 x (0.5 - 1.0)					1 x (0.5 - 2.5); 2 x (0.5 - 1.0)		
1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			1 x (0.5 - 1.5); 2 x (0.5 - 0.75)					1 x (0.5 - 1.5); 2 x (0.5 - 0.75)		
–	–	–	1 x (0.5 - 1.5); 2 x (0.5 - 1.0)					1 x (0.5 - 1.5); 2 x (0.5 - 1.0)		
18 - 14			1 x (21 - 14); 2 x (21 - 18)					1 x (21 - 14); 2 x (21 - 18)		
1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.6 x 3.5; 1 x 6			0.6 x 3.5					0.6 x 3.5		
4	4	4	4	4	4	4	4	4	4	4
500	500	500	500	500	500	500	500	500	500	500
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50/ PKZM4-50	NZMN1-M63/ PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
3 x 50.140.06-50	3 x 50.140.06-63	3 x 50.140.06-80	3 x 20.282.20-100	3 x 20.282.20-125	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-200	3 x 20.610.32-350	3 x 20.610.32-400	3 x 20.610.32-500
3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
+24 V AC/DC +10 %/-15 %										
–	–	–	35	35	35	35	35	35	35	35
–	–	–	65	65	65	65	65	65	65	65
–	–	–	600/50	600/50	600/50	600/50	600/50	600/50	600/50	600/50
24 +10 %/-15 %										
-	-	-	14	14	14	14	14	14	14	14
+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
–	–	–	–	–	–	–	–	–	–	–
0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3
–	–	–	–	–	–	–	–	–	–	–
–	–	–	250	250	250	250	250	250	250	250
–	–	–	190	190	190	190	190	190	190	190
2 (TOR, Ready)										
250										
3 A, AC1										
1 - 30										
0 - 30										
30 % - 92 %										
8 %										

Dimensions

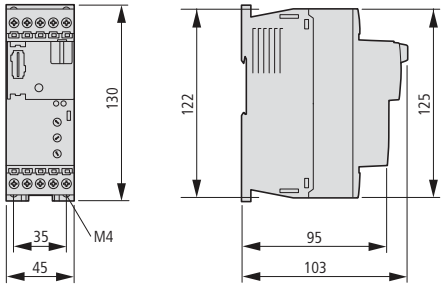
DS7-340SX004N0-N
DS7-340SX007N0-N
DS7-340SX009N0-N
DS7-340SX012N0-N

DS7-342SX004N0-N
DS7-342SX007N0-N
DS7-342SX009N0-N
DS7-342SX012N0-N



DS7-34DSX004N0-D
DS7-34DSX007N0-D

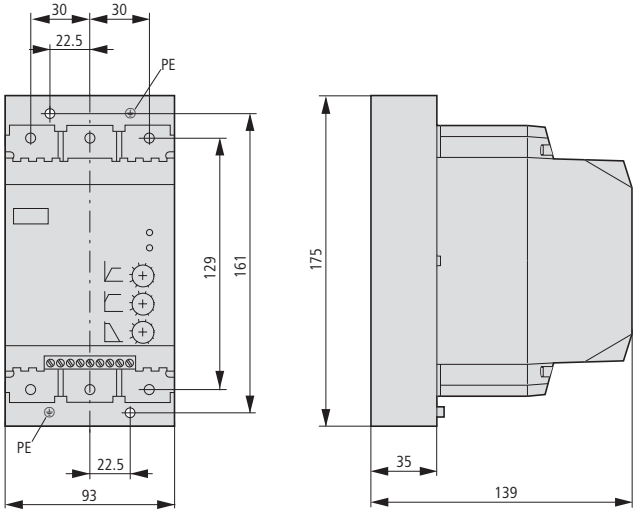
DS7-34DSX009N0-D
DS7-34DSX012N0-D



DS7-340SX041N0-N
DS7-340SX055N0-N
DS7-340SX070N0-N
DS7-340SX081N0-N
DS7-340SX100N0-N

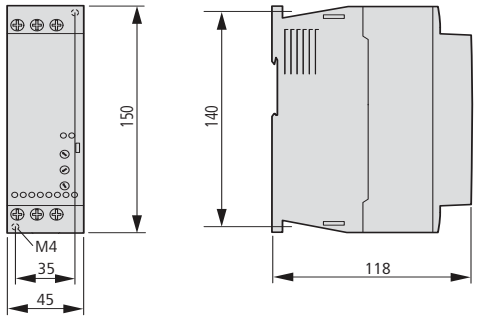
DS7-342SX041N0-N
DS7-342SX055N0-N
DS7-342SX070N0-N
DS7-342SX081N0-N
DS7-342SX100N0-N

DS7-34DSX041N0-D
DS7-34DSX055N0-D
DS7-34DSX070N0-D
DS7-34DSX081N0-D
DS7-34DSX100N0-D

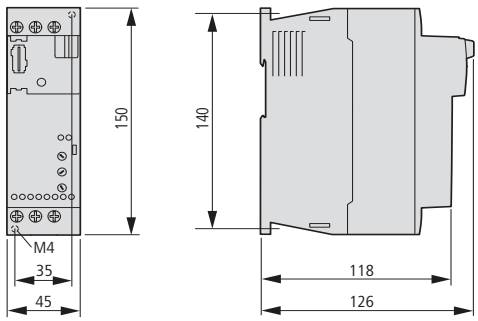


DS7-340SX016N0-N
DS7-340SX024N0-N
DS7-340SX032N0-N

DS7-342SX016N0-N
DS7-342SX024N0-N
DS7-342SX032N0-N



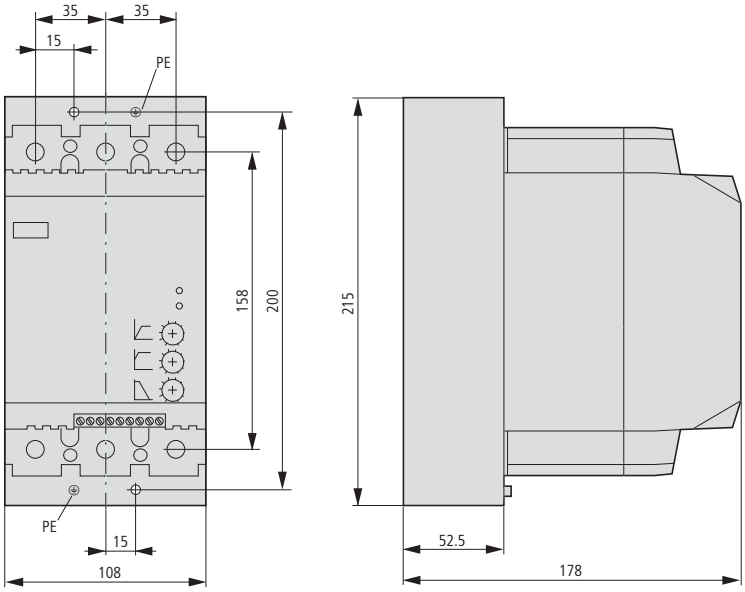
DS7-34DSX016N0-D
DS7-34DSX024N0-D
DS7-34DSX032N0-D



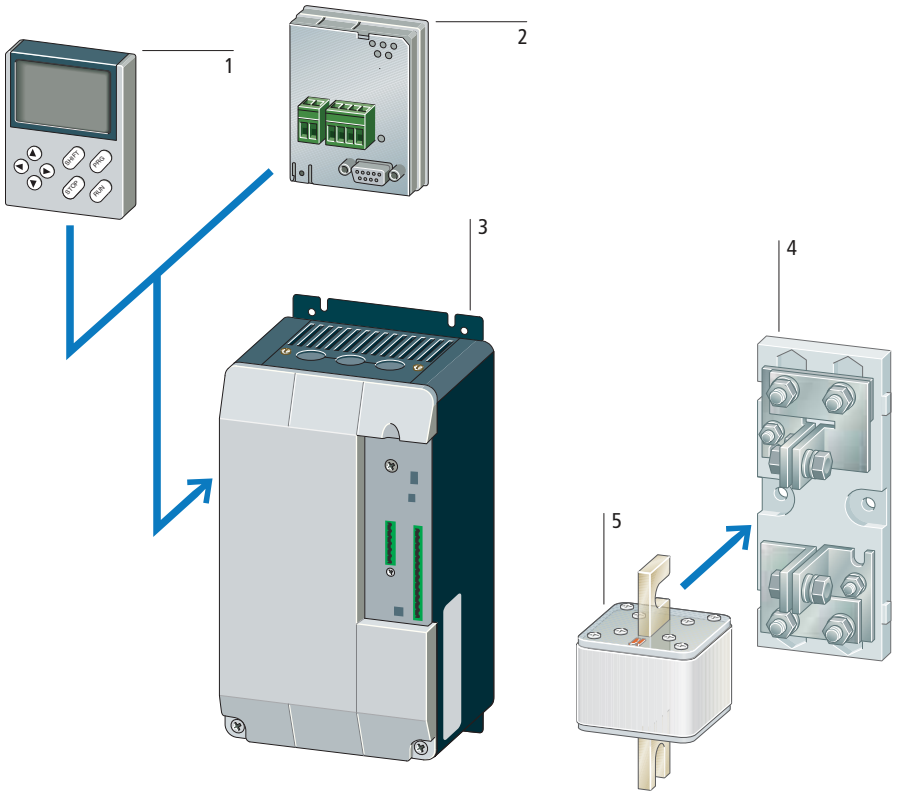
DS7-342SX135N0-N
DS7-342SX160N0-N
DS7-342SX200N0-N

DS7-340SX135N0-N
DS7-340SX160N0-N
DS7-340SX200N0-N

DS7-34DSX135N0-D
DS7-34DSX160N0-D
DS7-34DSX200N0-D



System overview



Basic devices

DM4 soft starter 3

Soft starters for three-phase AC motors

Assigned motor rating:

- From 7.5 to 500 kW for in-line terminal type (before load, standard)
- 11 to 900 kW for Delta terminal type (In-Delta)

Rated operating voltage:
230 to 480 V

10 programmed standard applications allow direct operation; parameter set selection through rotary switch.

Ramp time adjustable from 1 to 255 s

Energy-saving function optimizes efficiency and power factor.

Adjustable current limitation prevents high starting current.

Controller operation for 3-phase resistive and inductive loads from 16 to 900 A (400 V)

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/43

Add-on functions

DE4-KEY-2 keypad 1

Pluggable on DM4 soft starters, with 8 function keys and plain text display;
Language can be selected (German/English)

Ordering data → Page 9/44

Communication modules 2

DE4-COM-2X

RS 485/RS 232 serial interface

DE4-NET-DP2

PROFIBUS DP interface

Ordering data → Page 9/44

Superfast semiconductor fuses 5

Fuses for the protection of semiconductors, optionally for direct installation in DM4 soft starters or for external surface mounting.

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/45

Fuse bases 4

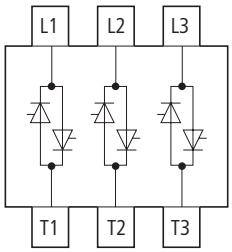
For external surface mounting of the superfast semiconductor fuse.

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/8

Description





Operation as three-phase soft starter

DM4 soft starter series are soft starters for standard three-phase asynchronous motors. They round off Eaton's soft starter range with devices meant for more demanding applications. With a power range (assigned motor rating) starting with 7.5 kW, DM4 soft starters are also suitable for demanding automation tasks.

Their terminal type determines the rating range:

- Inline terminal type (upstream of load = standard):
  7.5 to 500 kW at 400 V.
- Delta terminal type:
  11 to 900 kW at 400 V,
  each phase of the soft starter being connected in series with the individual motor windings
  (6 lines required, motor delta connected only).

Features

- Current limitation
- High overload withstand capability
- Large rating range up to 500 kW (or 900 kW in delta terminal type)
- Predefined parameter sets can be selected for standard applications
- All parameters also individually adjustable
- Keypad with plain text display (optional)
- Programmable relay and analog outputs
- Networkable
- Voltage controller function (generalized phase control) can be implemented for each software changeover.

Typical applications as soft starter

- Pump drives: pressure surges are prevented through soft starting. The mechanical load on the whole plant is reduced and the plant components' service life increases.
- Fan drives and compressors: The soft start prevents belt slippage and premature wear. This in turn lowers the operating costs and increases the durability of the plant.
- Conveyors: Instead of starting with a jolt, the conveyor starts up gently and the transported goods do not fall over. The mechanical stress on the conveyor is reduced and its lifespan increased.
- Circular and ribbon saws: The current limitation at startup prevents current peaks. This results in energy savings and reduced electricity bills.
- Agitators, mixers, mills, crushers: the same advantages described above.

Operation as three-phase controller

The DM4 devices can be changed over with the software to three-phase controller operation. The rating range is 16 to 900 A at 400 V (standard connection only, in-line connection possible). They can be operated in pure controller mode or with a closed-loop control circuit.
The units each have two analog inputs for setpoint/actual values and an additional built-in current feedback loop.
Note: A keypad or the serial interface and PC software are required to configure controller operation.

Typical applications as three-phase controller

- Heater loads: Continuous temperature regulation reduces thermal and mechanical load on heating elements to increase their lifespan.
- Lighting control systems: Gentle switching on of lamps reduce current consumption in cold state. Utilization of the lamps' ideal operating point reduces their current consumption at the same light emission and extends their lifespan. This results in energy savings and reduced electricity bills.
- Ozone generators: Regulation of high-voltage transformers.

Documentation

You can download the documentation for the soft starters from the Internet:
www.moeller.net/support

Installation instructions
AWA8250-1704 (for devices within a rating range from 7.5 to 37 kW)
AWA8250-1751 (for devices within a rating range from 45 to 75 kW)
AWA8250-1752 (for devices within a rating range from 90 to 200 kW)
AWA8250-1783 (for devices within a rating range from 250 to 500 kW)

Manuals
AWB8250-1341
("Hardware and engineering")
AWB8250-1346
("Design of soft starters")

Description





Part no. overview

DE4-KEY-2
Keypad

Application

The DM4 soft starters are factory set for the most common applications.
For various standard applications, parameter sets can be selected via an application selector switch.
There is no longer a need for manual setting for different applications and its associated risk of errors.
The preset application parameter sets can also be selected via an optional keypad with plain text display. With the keypad, all parameters can be viewed, edited and adapted for specific applications. The keypad is also required for reprogramming the soft starter's digital or analog inputs and outputs. Interface modules can be used as an alternative to the keypad.
The soft starters can be interfaced with a PLC via PROFIBUS-DP.
Assigning parameters via the PLC offers the same range of functions as are possible via the keypad.

Documentation

For a detailed description, see the documentation: AWB8240-1344.
The documentation is available on the Internet at:
www.moeller.net/support

Part no. overview

DE4-COM-2X
RS 232C/RS 485 serial interface

Application

The DE4-COM-2X plug-in communication module contains RS 232C and RS 485 serial interfaces for direct connection to a PC (point-to-point connection). It can be used with DM4 soft starters.

Function

The DE4-COM-2X module can be plugged in and removed during operation. It provides direct access to all parameters. The drive can be controlled and monitored from the PC. Status and alarm messages are displayed.

Features

The DE4-COM-2X module receives its power from the basic device or from an external DC supply (+24 V, max. 80 mA) through two plug-in screw terminals.

RS232C interface
- 9-pole SUB-D plug
- Pin 2 (RxD), pin 3 (TxD), pin 5 (GND)
- Point-to-point connection
- Max. cable length: 15 m
- Maximum data transfer rate: 19200 Bit/s

RS485 interface
- 4 pole plug-in screw terminals
- Network topology: in-line
- Max. cable length: 1200 m
- Maximum data transfer rate: 19200 Bit/s

Notes
The PS416-ZBK-210 serial interface cable for connecting the serial interface with a PC must be ordered separately.

Documentation

For a detailed description, see manual AWB823-1279D/GB/F.
This documentation is not supplied with the device. You can download it from our website:
www.moeller.net/support



Part no. overview

DE4-NET-DP2
PROFIBUS DP fieldbus module

Application

The plug-in DE4-NET-DP2 communication module is used for direct connection to the PROFIBUS DP fieldbus (DIN 19245 Part 1 and 3). It can be used with DM4 soft starters.

Function

The DE4-NET-DP2 module can be plugged in and removed during operation. It provides direct access to all parameters. The drive (slave) can be controlled and monitored via the PLC (master). Status and alarm messages are displayed.

Features

The DE4-NET-DP2 module receives its power from the basic device or from an external DC supply (+24 V, max. 60 mA) through two plug-in screw terminals.

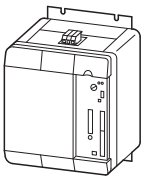
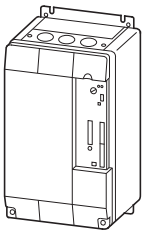
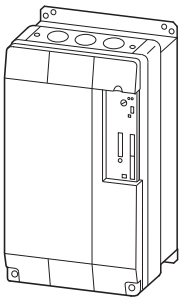
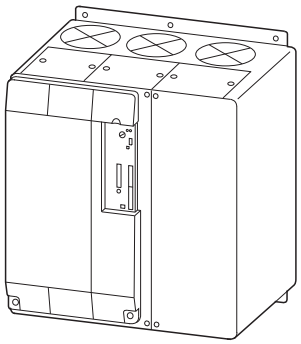
Model:
- 9-pole SUB-D plug
- Network topology: PROFIBUS-DP line
- Max. cable length: 1200 m at 93.7 kBaud, 25 m at 12000 Baud

Documentation

For a detailed description, see the documentation: AWB8240-1398-EN. This documentation is not supplied with the device. You can download it from our website: www.moeller.net/support

HPL09043EN

Ordering

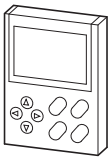
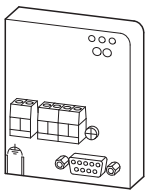
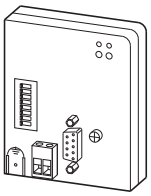
	Mains supply voltage (50/60 Hz) U_{LN} V AC	Rated operational current (AC 53) I_e A	Assigned motor rating 400 V, In-Line terminal type kW	400 V, Delta terminal type kW	**Part no.** Article no.	**Price** See price list	Std. pack
Soft starters up to 37/55 kW at 400 V							
	190-520	16	7	11	**DM4-340-7K5** 207897		1 off
	190-520	23	11	15	**DM4-340-11K** 207898		
	190-520	30	15	22	**DM4-340-15K** 207899		
	190-520	44	22	37	**DM4-340-22K** 207900		
	190-520	59	30	55	**DM4-340-30K** 207901		
	190-520	72	37	55	**DM4-340-37K** 207902		
Soft starters up to 75/132 kW at 400 V							
	190-520	85	45	75	**DM4-340-45K** 207903		1 off
	190-520	105	55	90	**DM4-340-55K** 207904		
	190-520	146	75	132	**DM4-340-75K** 207905		
Soft starters up to 200/315 kW at 400 V							
	190-520	174	90	160	**DM4-340-90K** 207906		1 off
	190-520	202	110	160	**DM4-340-110K** 207907		
	190-520	242	132	200	**DM4-340-132K** 207908		
	190-520	300	160	250	**DM4-340-160K** 207909		
	190-520	370	200	315	**DM4-340-200K** 207910		
Soft starters up to 500/900 kW at 400 V							
	190-520	500	250	400	**DM4-340-250K** 207911		1 off
	190-520	600	315	560	**DM4-340-315K** 207912		
	190-520	750	400	750	**DM4-340-400K** 207913		
	190-520	900	500	900	**DM4-340-500K** 207914		

Notes

Information relevant for export to North America

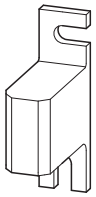
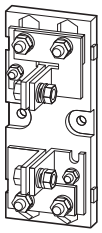
Assigned motor rating data applies for in-line/in-delta terminal type, tripping class 10.

Product Standards	IEC/EN 60947-4-2; UL 508; cUL 508 CE marking
UL File No.	E208760
UL CCN	NMFT
CSA File No.	UL report applies to both US and Canada
CSA Class No.	NMFT7
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	480 V
Degree of Protection	IP20; UL/CSA Type 1

	Description	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Keypad					
	Allows matching of all of the soft starter's parameters for any application and drive control through the keypad. Connection to DM4 soft starters through simple plugging/ pulling, also during operation. With non-volatile memory for parameters; parameter sets can be transferred between soft starters for series applications. Two-line plain text display. Operating status signalling through status symbols.	DM4	**DE4-KEY-2** 211291		1 off
RS 232C/RS 485 serial interface					
Module with RS 232C and RS 485 serial interfaces for direct connection to a PLC or a PC					
	RS 232C: 9-pin SUB-D plug RS 485: plug-in screw terminals PS416-ZBK-210 serial interface cable required	DM4	**DE4-COM-2X** 085028		1 off
–	For connecting the programming PC to the CPU card via the RS232C interface	DE4-COM-2X PS416-CPU-…	**PS416-ZBK-210** 051751		1 off
PROFIBUS DP communication module					
Module for direct connection to the PROFIBUS DP fieldbus					
	All parameters can be addressed and transferred. Connection through 9-pin SUB-D plug	DM4	**DE4-NET-DP2** 230240		1 off

Information relevant for export to North America	UL File No.	E172143
	UL CCN	NMMS
	CSA File No.	UL report applies to both US and Canada
	CSA Class No.	NMMS7
	NA Certification	UL Listed, certified by UL for use in Canada
	Suitable for	Branch circuits
	Degree of Protection	IP20; UL/CSA Type 2

HPL09045EN

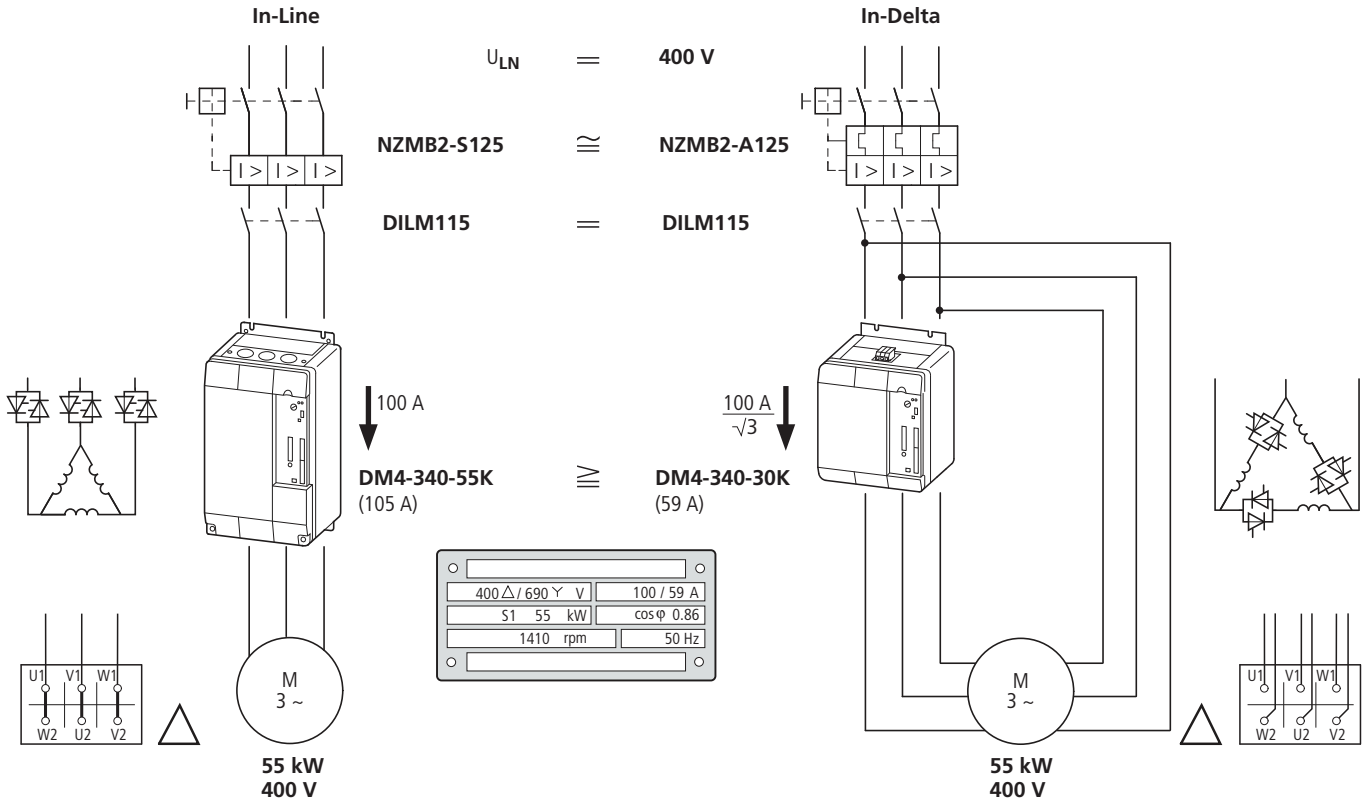
	Rated operational current	Maximum power loss	Frame size/ inside micrometer	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
	A	P_v W	mm					
Superfast semiconductor fuses								
Fuse links								
	40	10	80	DM4-340-7K5	**20.282.20-40** 232085		6 off	–
	80	18	80	DM4-340-11K DM4-340-15K	**20.282.20-80** 232086		6 off	–
	125	24	80	DM4-340-22K DM4-340-30K	**20.282.20-125** 232087		6 off	–
	200	44	80	DM4-340-37K DM4-340-45K	**20.610.32-200** 106475		3 off	–
	350	61	80	DM4-340-55K DM4-340-75K	**20.610.32-350** 221161		2 off	–
	450	70	80	DM4-340-90K DM4-340-110K	**20.610.32-450** 221162		2 off	Mounted internally
	500	72	80	DM4-340-132K DM4-340-160K	**20.610.32-500** 221163		2 off	
	630	80	80	DM4-340-200K	**20.610.32-630** 221164		3 off	
	900	120	80	DM4-340-250K DM4-340-315K	**20.630.32-900** 221165		2 off	
	1250	147	80	DM4-340-400K DM4-340-500K	**20.630.32-1250** 221166		2 off	
Fuse base for semiconductor fuses								
	–	–	80	20.282.20-… 20.189.20-…	**21.189.01** 232064		5 off	–
	–	–	80	20.6xx.32-…	**21.313.02** 232076		2 off	–

Information relevant for export to North America

Product Standards	UL 248-13 CE marking
UL File No.	E180276
UL CCN	JFHR2
CSA File No.	UL report applies to both US and Canada
CSA Class No.	JFHR8
NA Certification	UL Recognized, certified by UL for use in Canada
Max. Voltage Rating	660V

Engineering

In-line/in-delta connection



Soft starters are normally connected directly in series with the motor (so-called "in-line connection"). DM4 series soft starters also allow for operation in a so-called in-delta connection.

Advantages of an in-delta connection in comparison to an in-line connection:

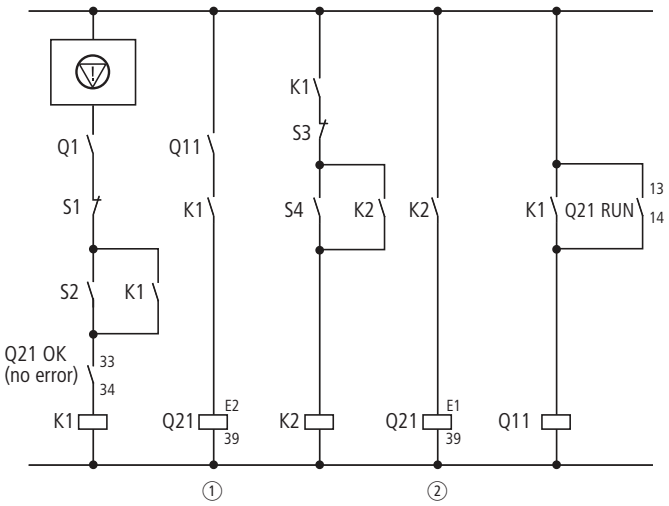
- In-delta connections are more cost-effective, since the soft starter only has to be designed for 58 percent (= 1/√3) of the rated operational current.

Disadvantages of an in-delta connection in comparison to an in-line connection:

- The motor must be connected with six conductors, similar to the star-delta connection.
- The DM4 soft starter's overload protection is active only in one line, so that additional motor protection must be fitted in the parallel phase or in the supply cable.

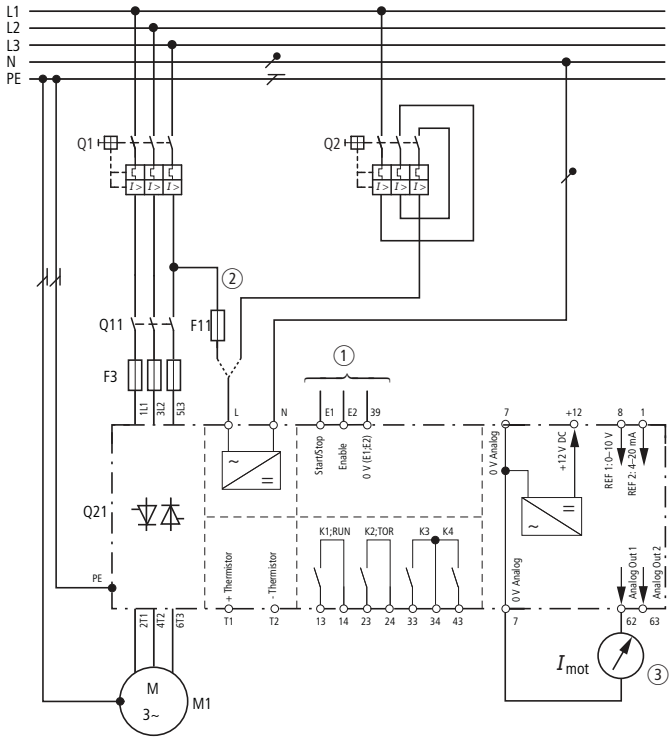
Soft starters with separate mains contactor

Actuation



= Emergency switching off

S1: Off (uncontrolled deceleration)
S2: On
S3: Soft stop (deceleration ramp)
S4: Soft start
① Enable
② Soft start/Soft stop



① See actuation
② Control voltage through Q1 and F11 or through Q2
③ Motor current indication
E1: Start/stop
E2: Enable
T1: + Thermistor
T3: - Thermistor

Connection examples

DM4

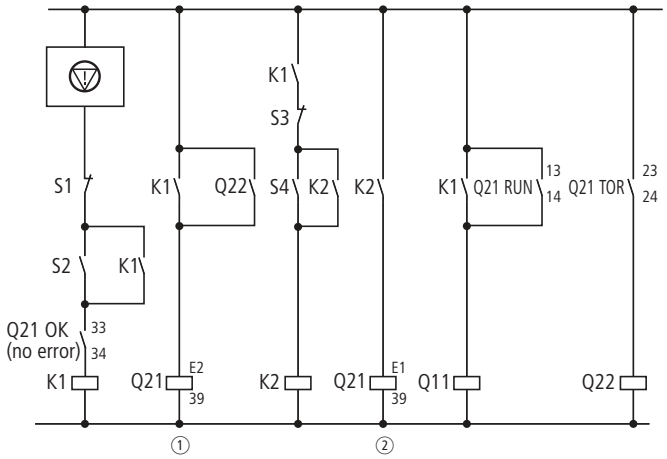
Bypass circuit

After the run-up (full mains voltage reached) the DM4 soft starter actuates the bypass contactor. The motor is then directly connected with the mains.

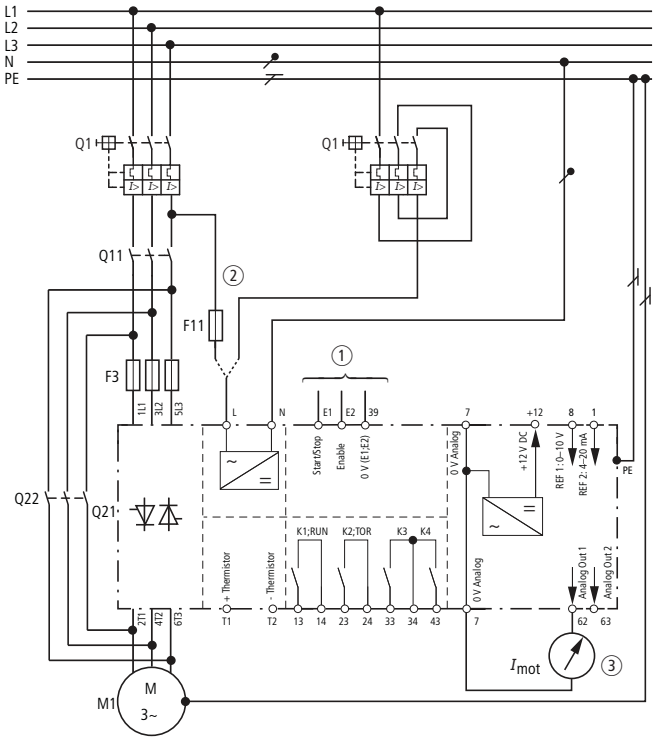
Advantages:

- The soft starter's power loss is reduced to the no-load power loss.
- The limit values of radio interference class "B" are maintained.

Actuation



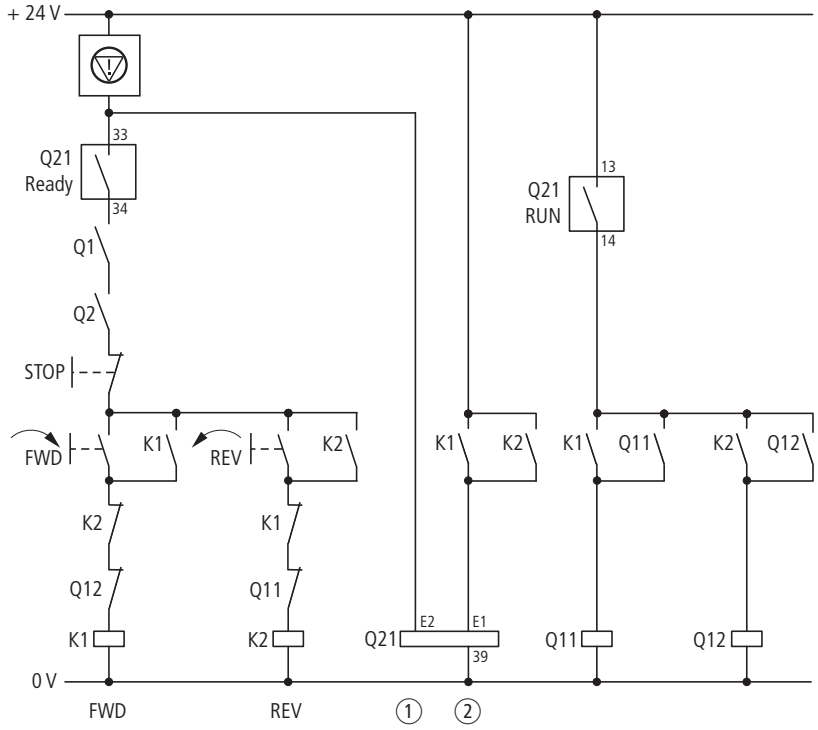
⏚ = Emergency switching off
S1: Off (uncontrolled deceleration)
S2: On
① Enable
② Soft start/Soft stop



① See actuation
② Control voltage through Q1 and F11 or through Q2
③ Motor current indication
E1: Start/stop
E2: Enable
T1: + Thermistor
T2: - Thermistor

Soft starters with reversing circuit

Actuation



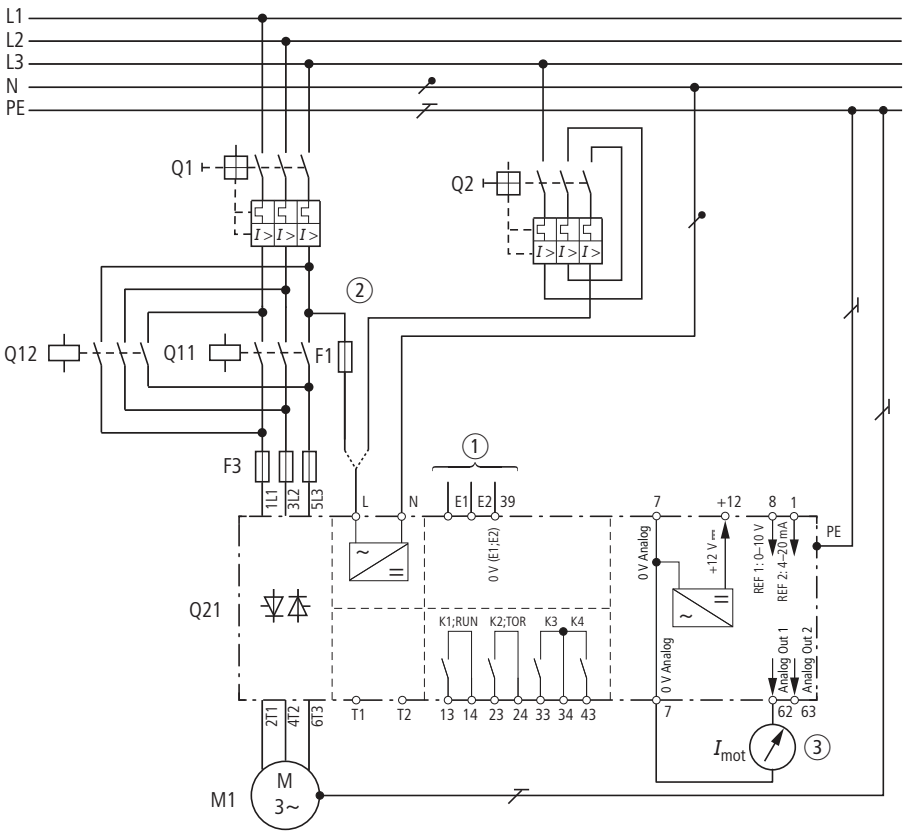
= Emergency switching off

S1: Off (uncontrolled deceleration)

S2: On

1 Enable

2 Soft start/Soft stop



1 See actuation

2 Control voltage through Q1 and F11 or through Q2

3 Motor current indication

E1: Start/stop

E2: Enable

Engineering

Assigned motor rating at		Rated operational current[2]			Part no.[1] Soft starters	Soft starter function			Bypass contactor (optional)[10]	Circuit-breakers Controller supply	Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination)	
						Cable protection[4]	Mains contactor (optional)[4]	Overload relay[5][7]			Fuses	Fuse holders
400 V	480 V	Device	Motor	Cable[3]								
P	P	I_e	I_e	I_e[2]							Number x Part no.	Number x Part no.
kW	HP	A	A	A								
Soft starter for three-phase mains connection, short start-up time, Tripping CLASS 10 (15 s, 3.5 x I_e)												
"In-line" terminal type (upstream of load, standard)												
7.5	10	16	15.2	16	DM4-340-7K5	PKM0-16 (+ CL-PKZ0)	DILM17	ZB32-16 (+ZB32-XEZ)	DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
11	15	22	21.7	23	DM4-340-11K	PKM0-25 (+ CL-PKZ0)	DILM25	ZB32-24 (+ZB32-XEZ)	DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
15	20	30	29.3	30	DM4-340-15K	PKM0-32 (+ CL-PKZ0)	DILM32	ZB32-32 (+ZB32-XEZ)	DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
22	30	44	41	44	DM4-340-22K	PKZM4-50 (+ CL-PKZ0)	DILM50	ZB65-57 (+ZB65-XEZ)	DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
30	40	59	55	59	DM4-340-30K	PKZM4-63 (+ CL-PKZ0)	DILM65	ZB65-65 (+ZB65-XEZ)	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
37	50	72	68	72	DM4-340-37K	NZMN1-S80	DILM80	ZB150-100/KK	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
45	60	85	81	85	DM4-340-45K	NZMN1-S100	DILM95	ZB150-100/KK	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
55	75	105	99	105	DM4-340-55K	NZMN2-S125	DILM115	ZB150-125/KK	DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
75	100	146	134	146	DM4-340-75K	NZMN2-S160	DILM150	ZB150-150/KK	DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
90	125	174	161	174	DM4-340-90K	NZMN2-S200	DILM185	Z5-220/FF6	DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
110	150	202	196	202	DM4-340-110K	NZMN2-ME220	DILM225	Z5-220/FF6	DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
132	200	242	231	242	DM4-340-132K	NZMN3-ME3506)	DILM250	ZW7-290	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
160	250	300	279	300	DM4-340-160K	NZMN3-ME3506)	DILM300	ZW7-400	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
200	300	370	349	370	DM4-340-200K	NZMN3-ME350/...-ME450[6]	DILM400	ZW7-400	DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
250	400	500	437	500	DM4-340-250K	NZMN3-ME450/...-ME550[6]	DILM500	ZW7-540	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
315	500	600	544	600	DM4-340-315K	NZMN3-ME550/...-ME875[6]	DILM580/750[12]	ZW7-630	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
400	600	750	683	750	DM4-340-400K	NZMN3-ME875	DILM750	ZEV (+ZEV-XSW-820)	DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
500	750	900	860	900	DM4-340-500K	NZMN3-ME875/...-ME1400[9]	DILM1000	–	DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
"In-Delta" terminal type (in series with each motor winding)												
11	15	16	21.7	21.7	DM4-340-7K5	PKM0-25 (+ CL-PKZ0)	DILM25	ZB32-16 (+EZ00)	DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
15	20	22	29.3	29.3	DM4-340-11K	PKM0-32 (+ CL-PKZ0)	DILM32	ZB32-24 (+EZ00)	DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
22	25	30	41	41	DM4-340-15K	PKM0-50 (+ CL-PKZ0)	DILM50	ZB32-32 (+EZ1)	DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
30	30	44	55	55	DM4-340-22K	PKM0-58 (+ CL-PKZ0)	DILM65	ZB65-57 (+EZ1)	DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
37	40	44	68	68		NZMN1-S80	DILM80	ZB65-57 (+EZ1)	DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
45	50	59	81	81	DM4-340-30K	NZMN1-S100	DILM95	ZB65-65 (+EZ1)	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
55	60	59	99	99		NZMN1-S100	DILM115	ZB65-65 (+EZ1)	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
75	75	85	134	134	DM4-340-45K	NZMN2-S160	DILM150	ZB150-100/KK	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
90	100	105	161	161	DM4-340-55K	NZMN2-S2006)	DILM185	ZB150-125/KK	DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
110	125	146	196	196	DM4-340-75K	NZMN2-ME2206)	DILM225	ZB150-150/KK	DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
132	200	146	231	231		NZMN3-ME3506)	DILM250	ZB150-150/KK	DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
160	250	174	279	279	DM4-340-90K	NZMN3-ME3506)	DILM300	Z5-220/FF6	DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
200	300	242	349	349	DM4-340-132K	NZMN3-ME3506)	DILM400	ZW7-290	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
250	400	300	437	437	DM4-340-160K	NZMN3-ME4506)	DILM500	ZW7-400	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
315	500	370	544	544	DM4-340-200K	NZMN3-ME5506)	DILM580	ZW7-400	DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
400	600	500	683	683	DM4-340-250K	NZMN4-ME8756)	DILM750	ZW7-540	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
500	750	600	860	860	DM4-340-315K	NZMN4-ME8756)	DILM1000	ZW7-630	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
560		600	960	960		NZMN4-ME14006)	DILM1000	ZW7-630	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
750		750	1280	1280	DM4-340-400K	NZMN4-ME1400(+NZM4-XR...)6)		ZEV (+ZEV-XSW-820)	DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
900		900	1540	1540	DM4-340-500K	IZMB2-U20008)		–	DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02

Notes

1) At a different operating cycle, the r.m.s. current changes so that a higher-rated device may have to be used.
The switching and protective elements are always dimensioned for the following operating cycles (no bypass for any operating cycle):
- Devices DM4-340-7K5 to DM4-340-90K: each 10 switching operations per hour, continuous operation.
- Devices DM4-340-110K and DM4-340-132K: each 10 switching operations per hour with at least 3 minutes no-load pause before each start.
- Devices from DM4-340-160K: each 3 switching operations per hour with at least 8 minutes no-load pause before each start. For all other switching cycles or when a bypass is used, the effective rating changes and a different device is therefore required.
- The rated operational current (device) must be greater than the motor current (in-line operation) indicated on the motor's nameplate or motor current/√3 (delta operation).

2) Rated operational current relative to the specified load cycle.

3) Used to specify the current for which the supply cable must be dimensioned with the given operation and motor current. For higher motor currents and for other operations (operating frequency, overcurrent, overcurrent time, duty factor), the current value changes and must be modified accordingly.

4) In the case of motors with the same rating but with a higher current than the one specified, a switch/contactor with greater specifications must be used if necessary. The motor current is decisive in this case.

5) If the soft starter remains continually live, it can also act as overload relay.
For delta connection, set overload relay to the value motor current/√3.

6) Overload trip block set to $t_r = \infty$

7) In delta connection, the overload relay is connected in series with the motor winding (set to value motor current/√3).

8) To use IZM as "contactor", accessories are required I (see chapter 5). In that case, the recommended circuits may not apply since different contacts may have to be assigned depending on the selected accessories.
If the rated operational current is utilized fully, the switch or contactor with greater specifications must be used.

9) The bypass is dimensioned according to AC-1. If the bypass has to be opened immediately in the event of an emergency stop, it must be dimensioned according to AC-3.

10) In this case, the contactors in the "Mains contactor" column must be used.

Assigned motor rating at		Rated operational current[2]			Part no.[1] Soft starters	Soft starter function			Bypass contactor (optional)[10]	Circuit-breakers Controller supply	Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination)	
											Fuses	Fuse holders
400 V	480 V	Device	Motor	Cable[3]		Cable protection	Mains contactor (optional)[4]	Overload relay[5][7]				
P	P	I_e	I_e	I_e[2]							Number x Part no.	Number x Part no.
kW	HP	A	A	A								
Soft starters for three-phase mains connection, long start-up time												
Tripping class CLASS 10 (15 s, 3.5 x I_e)												
"In-line" terminal type												
(upstream of load, standard)												
7.5	10	22	15.2	21	DM4-340-11K	PKM0-25 (+ CL-PKZ0)	DILM17	ZB32-16 (+ZB32-XEZ)	DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
11	15	30	21.7	31	DM4-340-15K	PKM0-32 (+ CL-PKZ0)	DILM25	ZB32-24 (+ZB32-XEZ)	DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
15	20	44	29.3	41	DM4-340-22K	PKZM4-58 (+ CL-PKZ0)	DILM32	ZB32-32 (+ZB32-XEZ)	DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
22	30	59	41	58	DM4-340-30K	PKZM4-58 (+ CL-PKZ0)	DILM50	ZB65-57 (+ZB65-XEZ)	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
30	40	72	55	78	DM4-340-37K	NZMN1-ME90[6]	DILM65	ZB65-65 (+ZB65-XEZ)	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
37	50	85	68	96	DM4-340-45K	NZMN1-ME90[6]	DILM80	ZEV + ZEV-XSW-145	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
45	60	105	81	114	DM4-340-55K	NZMN1-ME90[6]	DILM95	ZEV + ZEV-XSW-145	DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
55	75	146	99	140	DM4-340-75K	NZMN2-ME140[6]	DILM115	ZEV + ZEV-XSW-145	DILM115	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
75	100	174	134	189	DM4-340-90K	NZMN2-ME140[6]	DILM150	ZEV + ZEV-XSW-145	DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
90	125	202	161	227	DM4-340-110K	NZMN2-ME220[6]	DILM185	ZEV + ZEV-XSW-820	DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
110	150	242	196	276	DM4-340-132K	NZMN2-ME220[6]	DILM225	ZEV + ZEV-XSW-820	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
132	200	300	231	326	DM4-340-160K	NZMN3-ME350[6]	DILM250	ZEV + ZEV-XSW-820	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
160	250	370	279	393	DM4-340-200K	NZMN3-ME350[6]	DILM300	ZEV + ZEV-XSW-820	DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
200	300	500	349	492	DM4-340-250K	NZMN3-ME350[6]	DILM400	ZEV + ZEV-XSW-820	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
250	400	600	437	616	DM4-340-315K	NZMN3-ME450[6]	DILM500	ZEV + ZEV-XSW-820	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
315	500	750	544	767	DM4-340-400K	NZMN3-ME550[6]	DILM580	ZEV + ZEV-XSW-820	DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
400	600	900	683	963	DM4-340-500K	NZMN3-ME875[6]	DILM750	ZEV + ZEV-XSW-820	DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
"In-Delta" terminal type												
(in series with each motor winding)												
11	15	16	21.7	31	DM4-340-7K5	PKM0-32 (+ CL-PKZ0)	DILM25	ZEV + ZEV-XSW-25	DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
15	20	30	29.3	41	DM4-340-15K	PKZM4-58 (+ CL-PKZ0)	DILM32	ZEV + ZEV-XSW-65	DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
22	25	44	41	58	DM4-340-22K	PKZM4-58 (+ CL-PKZ0)	DILM50	ZEV + ZEV-XSW-65	DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
30	30	59	55	78	DM4-340-30K	NZMN1-ME90[6]	DILM65	ZEV + ZEV-XSW-65	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
37	40	59	68	96		NZMN1-ME90[6]	DILM80	ZEV + ZEV-XSW-145	DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
45	50	72	81	114	DM4-340-37K	NZMN1-ME90[6]	DILM95	ZEV + ZEV-XSW-145	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
55	60	85	99	140	DM4-340-45K	NZMN2-ME140[6]	DILM115	ZEV + ZEV-XSW-145	DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
75	75	105	134	189	DM4-340-55K	NZMN2-ME140[6]	DILM150	ZEV + ZEV-XSW-145	DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
90	100	146	161	227	DM4-340-75K	NZMN2-ME220[6]	DILM185	ZEV + ZEV-XSW-820	DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
110	125	174	196	276	DM4-340-90K	NZMN2-ME220[6]	DILM225	ZEV + ZEV-XSW-820	DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
132	200	174	231	326		NZMN3-ME350[6]	DILM250	ZEV + ZEV-XSW-820	DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
160	250	202	279	393	DM4-340-110K	NZMN3-ME350[6]	DILM300	ZEV + ZEV-XSW-820	DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
200	300	300	349	492	DM4-340-160K	NZMN3-ME350[6]	DILM400	ZEV + ZEV-XSW-820	DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
250	400	370	437	616	DM4-340-200K	NZMN3-ME450[6]	DILM500	ZEV + ZEV-XSW-820	DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
315	500	500	544	767	DM4-340-250K	NZMN3-ME550[6]	DILM580	ZEV + ZEV-XSW-820	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
400	600	600	683	963	DM4-340-315K	NZMN3-ME875[6]	DILM750	ZEV + ZEV-XSW-820	DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
500	750	750	860	1213	DM4-340-400K	NZMN3-ME875[6]	DILM1000	ZEV + ZEV-XSW-820	DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
560		900	960	1354	DM4-340-500K	NZMN4-ME1400[6]	DILM1000	ZEV + ZEV-XSW-820	DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02

Notes

1) At a different operating cycle, the r.m.s. current changes so that a higher-rated device may have to be used.
The switching and protective elements are always dimensioned for the following operating cycles (no bypass for any operating cycle):
- Devices DM4-340-7K5 to DM4-340-90K: each 10 switching operations per hour, continuous operation.
- Devices DM4-340-110K and DM4-340-132K: each 10 switching operations per hour with at least 3 minutes no-load pause before each start.
- Devices from DM4-340-160K: each 3 switching operations per hour with at least 8 minutes no-load pause before each start.
For all other switching cycles or when a bypass is used, the effective rating changes and a different device is therefore required.
- The rated operational current (device) must be greater than the motor current (in-line operation) indicated on the motor's nameplate ("in-line" operation) or motor current/√3 (delta operation).

2) Rated operational current relative to the specified load cycle
.

3) Used to specify the current for which the supply cable must be dimensioned with the given operation and motor current. For higher motor currents and for other operations (operating frequency, overcurrent, overcurrent time, duty factor), the current value changes and must be modified accordingly.

4) In the case of motors with the same rating but with a higher current than the one specified, a switch/contactor with greater specifications must be used if necessary. The motor current is decisive in this case.

5) If the soft starter remains continually live, it can also act as overload relay.
For delta connection, set overload relay to the value motor current/√3.

6) Overload trip block set to $t_r = \infty$

7) In delta connection, the overload relay is connected in series with the motor winding (set to value motor current/√3).

8) To use IZM as "contactor", accessories are required I (see chapter 5). In that case, the recommended circuits may not apply since different contacts may have to be assigned depending on the selected accessories.

9) The bypass is dimensioned according to AC-1. If the bypass has to be opened immediately in the event of an emergency stop, it must be dimensioned according to AC-3.

10) In this case, the contactors in the "Mains contactor" column must be used.

			DM4-340-7K5	DM4-340-11K	DM4-340-15K	DM4-340-22K
General						
Standards			IEC/EN 60947-4-2			
Approvals			UL, cUL	UL, cUL	UL, cUL	UL, cUL
Climatic proofing			Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30			
Ambient temperature		°C	0 - +40, to 60 with a reduction of I_e of 2 % per °C			
Ambient temperature storage		°C	-25 - 60	-25 - 60	-25 - 60	-25 - 60
Installation altitude		m	0 - 1000, to 2000 m with a current reduction of 1 % per 100 m			
Mounting position			Vertical	Vertical	Vertical	Vertical
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact			Finger- and back-of-hand proof			
Pollution degree			2	2	2	2
Power loss of rated operational current I_e		W	50	63	91	120
Dimensions (W x H x D)		mm	222 x 290 x 195	222 x 290 x 195	222 x 290 x 195	222 x 290 x 195
Weight		kg	6.7	6.7	6.7	6.7
Main contacts						
Rated operating voltage	U_e	V AC	230 - 460	230 - 460	230 - 460	230 - 460
Rated insulation voltage	U_i	V AC	460	460	460	460
Mains frequency		Hz	50/60	50/60	50/60	50/60
Control section power supply	U_C	V AC	110/230	110/230	110/230	110/230
Rated operational current						
Motor load (AC-53)	I_e	A	16	23	30	44
Assigned motor rating (standard connection)						
230 V	P	kW	4	5.5	7.5	11
400V	P	kW	7.5	11	15	22
480 V	P	HP	10	15	20	30
Phase current						
In-delta terminal type		A	27	39	51	76
Assigned motor rating (in-delta terminal type)						
230 V		kW	7.5	11	15	22
400 V		kW	11	15	22	37
480 V		HP	20	25	30	50
Overload cycle to IEC/EN 60947-4-2						
AC-53a (without bypass)			16 A: AC-53a: 3-35: 99-10	23 A: AC-53a: 3-35: 99-10	30 A: AC-53a: 3-35: 99-10	44 A: AC-53a: 3-35: 99-10
Short-circuit rating						
Type “1” of coordination			PKZM0-16	PKZM0-25	PKZ2/ZM-32	NZM7-63N
Type “2” of coordination additionally			20.282.20-40	20.282.20-80	20.282.20-80	20.282.20-125

DM4-340-30K	DM4-340-37K	DM4-340-45K	DM4-340-55K	DM4-340-75K	DM4-340-90K
IEC/EN 60947-4-2					
UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL
Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30					
0 - +40, to 60 with a reduction of I_e of 2 % per °C					
-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60
0 - 1000, to 2000 m with a current reduction of 1 % per 100 m					
Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
IP20	IP20	IP20	IP20	IP20	IP20
Finger- and back-of-hand proof					
2	2	2	2	2	2
152	190	227	276	380	452
222 x 290 x 195	222 x 290 x 195	222 x 420 x 195	222 x 420 x 195	222 x 420 x 195	520 x 338 x 248
6.7	6.7	15	15	15	15.7
230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
460	460	460	460	460	460
50/60	50/60	50/60	50/60	50/60	50/60
110/230	110/230	110/230	110/230	110/230	110/230
59	72	85	105	146	174
15	18.5	22	30	37	45
30	37	45	55	75	90
40	50	60	75	100	125
102	124	147	181	252	301
30	37	45	55	75	90
55	55	75	90	132	160
75	100	100	150	200	250
59 A: AC-53a: 3-35: 99-10	72 A: AC-53a: 3-35: 99-10	85 A: AC-53a: 3-35: 99-10	105 A: AC-53a: 3-35: 99-10	146 A: AC-53a: 3-35: 99-10	174 A: AC-53a: 3-35: 99-10
NZM7-63N	NZM7-80N	NZM7-100N	NZM7-100N	NZM7-160N	NZM7-200N
20.282.20-125	20.189.20-200	20.189.20-200	20.610.32-350	20.610.32-350	20.610.32-450

			DM4-340-7K5	DM4-340-11K	DM4-340-15K	DM4-340-22K	DM4-340-30K	DM4-340-37K	DM4-340-45K	DM4-340-55K	DM4-340-75K	DM4-340-90K
Terminal capacity												
Power cables												
Connection			–	–	–	–	–	–	M8 bolt for cable lug			
Solid		mm²	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)	1 x (4 - 35) 2 x (4 - 10)	1 x (4 - 35) 2 x (4 - 10)	–	–	–	–
Flexible with ferrule		mm²	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)	1 x (6 - 35) 2 x (6 - 10)	1 x (6 - 35) 2 x (6 - 10)	–	–	–	–
Flexible with cable lug		mm²	–	–	–	–	–	–	35 - 95	35 - 95	35 - 95	35 - 95
Stranded		mm²	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (10 - 50) 2 x 10	1 x (10 - 50) 2 x 10	–	–	–	–
Stranded with cable lug		mm²	–	–	–	–	–	–	50 - 120	50 - 120	50 - 120	50 - 120
Solid or stranded		AWG	12 - 4	12 - 4	12 - 4	12 - 4	10 - 1	10 - 1	1 - 0 250 MCM	1 - 0 250 MCM	1 - 0 250 MCM	1 - 0 250 MCM
Flat conductor	Number of layers x width x thick-ness	mm	–	–	–	–	–	–	6 x 16 x 0.8	6 x 16 x 0.8	6 x 16 x 0.8	2 x (6 x 16 x 0.8)
Busbar	Width	mm	–	–	–	–	–	–	–	–	–	2 x (20 x 6)
Tightening torque		Nm	2	2	2	2	3	3	12	12	12	12
Screwdriver (PZ: Pozidriv)		mm	0.8 x 4	0.8 x 4	0.8 x 4	0.8 x 4	1.2 x 6.5	1.2 x 6.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control cables												
Solid		mm²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Flexible with ferrule		mm²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Stranded		mm²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Solid or stranded		AWG	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12
Tightening torque		Nm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control circuit												
Current consumption												
Digital inputs												
24 V DC		mA	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
230 V AC		mA	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Analog inputs												
0 - 10 V		mA	1	1	1	1	1	1	1	1	1	1
Pick-up voltage												
DC operated		V DC	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
AC operated		V AC	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
Drop-out voltage												
DC operated		V DC	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
AC operated		V AC	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
Programmable relay outputs												
Quantity			4	4	4	4	4	4	4	4	4	4
Max. voltage		V AC	250	250	250	250	250	250	250	250	250	250
Max. current AC-11		A	3	3	3	3	3	3	3	3	3	3
Programmable analog outputs												
Quantity			2	2	2	2	2	2	2	2	2	2
Voltage range		V DC	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
Current carrying capacity		mA	10	10	10	10	10	10	10	10	10	10
Programmable analog inputs												
Ref 1		V DC	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
Ref 2		mA	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20
Soft start function												
Ramp times												
Acceleration time		s	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255
Deceleration time		s	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255
Start voltage		%	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Voltage reduction at stop		%	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100
Kick-start												
Voltage		%	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90
Duration												
50 Hz		ms	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400
60 Hz		ms	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664
Current limitation			(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e

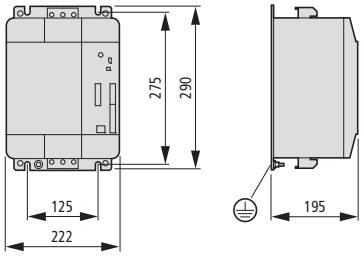
			DM4-340-110K	DM4-340-132K	DM4-340-160K	DM4-340-200K	DM4-340-250K	DM4-340-315K	DM4-340-400K	DM4-340-500K
General										
Standards			IEC/EN 60947-4-2			IEC/EN 60947-4-2				
Approvals			UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL
Climatic proofing			Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30			Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30				
Ambient temperature		°C	0 - +40, to 60 with a reduction of I_e of 2 % per C			0 - +40, to 60 with a reduction of I_e of 2 % per C				
Ambient temperature storage		°C	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60
Installation altitude		m	0 - 1000, to 2000 m with a current consumption of 1% per 100 m			0 - 1000, to 2000 m with a current consumption of 1% per 100 m				
Mounting position			Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Protection type			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Protection against direct contact			Finger- and back-of-hand proof			Finger- and back-of-hand proof				
Pollution degree			2	2	2	2	2	2	2	2
Power loss at rated operational current I_e		W	545	662	795	925	1371	1705	2106	2775
Dimensions (W x H x D)		mm	338 x 520 x 248	338 x 520 x 248	338 x 520 x 248	338 x 520 x 248	640 x 610 x 375	640 x 610 x 375	640 x 610 x 375	640 x 610 x 375
Weight		kg	15.7	22	22	22	56	65	72	72
Main contacts										
Rated operating voltage	U_e	V AC	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
Rated insulation voltage	U_i	V AC	460	460	460	460	460	460	460	460
Mains frequency		Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Control section power supply	U_C	V AC	110/230	110/230	110/230	110/230	110/230	110/230	110/230	110/230
Rated operational current										
Motor load (AC-53)	I_e	A	202	242	300	370	500	600	750	900
Assigned motor rating (standard connection)										
230 V	P	kW	55	75	90	110	132	160	200	250
400V	P	kW	110	132	160	200	250	315	400	500
480 V	P	HP	150	200	250	300	400	500	600	750
Phase current										
In-delta terminal type		A	349	419	519	640	866	1039	1299	1558
Assigned motor rating (in-delta terminal type)										
230 V		kW	110	132	160	200	250	315	400	500
400 V		kW	160	200	250	315	400	560	750	900
480 V		HP	250	350	400	500	600	850	1100	1300
Overload cycle to IEC/EN 60947-4-2										
AC-53a (without bypass)			202 A: AC-53a: 3-35: 60-10	242 A: AC-53a: 3-35: 60-10	300 A: AC-53a: 3-35: 60-3	370 A: AC-53a: 3-35: 60-3	500 A: AC-53a: 3-35: 60-3	600 A: AC-53a: 3-35: 60-3	750 A: AC-53a: 3-35: 60-3	900 A: AC-53a: 3-35: 60-3
Short-circuit rating										
Type “1” of coordination			NZM7-200N	NZM7-250N	NZM10-400N/ZM-400	NZM10-400N/ZM-400	NZM10-630N/ZM-630	NZM10-630N/ZM-630	NZM14-800S	NZM14-1000S
Type “2” of coordination additionally			20.610.32-450	20.610.32-500	20.610.32-500	20.610.32-630	20.610.32-900	20.610.32-900	20.610.32-1250	20.610.32-1250

		DM4-340-110K	DM4-340-132K	DM4-340-160K	DM4-340-200K	DM4-340-250K	DM4-340-315K	DM4-340-400K	DM4-340-500K
Terminal capacity									
Power cables									
Connection		M8 bolt for cable lug			M8 bolt for cable lug	2 x screws M12 for cable lug	2 x screws M12 for cable lug	2 x screws M12 for busbar connection	2 x screws M12 for cable lug
Solid	mm^2	–	–	–	–	–	–	–	–
Flexible with ferrule	mm^2	–	–	–	–	–	–	–	–
Flexible with cable lug	mm^2	2 x (35 - 95)	2 x (35 - 95)	2 x (35 - 95)	2 x (35 - 95)	2 x (50 - 240)	2 x (50 - 240)	–	–
Stranded	mm^2	–	–	–	–	–	–	–	–
Stranded with cable lug	mm^2	2 x (50 - 120)	2 x (50 - 120)	2 x (50 - 120)	2 x (50 - 120)	2 x (70 - 240)	2 x (70 - 240)	–	–
Solid or stranded	AWG	2 x 1/0 2 x 250 MCM	2 x 1/0 2 x 250 MCM	2 x 1/0 2 x 250 MCM	2 x 1/0 2 x 250 MCM	2 x 2/0 2 x 500 MCM	2 x 2/0 2 x 500 MCM	–	–
Flat conductor (number of layers x width x thickness)	mm	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (10 x 21 x 1)	2 x (10 x 21 x 1)	–	–
Busbar (width)	mm	2 x (20 x 6)	2 x (20 x 6)	2 x (20 x 6)	2 x (20 x 6)	21 x 20	21 x 20	45 x 20 60 x 10 80 x 10	45 x 20 60 x 10 80 x 10
Tightening torque	Nm	12	12	12	12	24	24	24	24
Screwdriver (PZ: Pozidriv)	mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control cables									
Solid	mm^2	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Flexible with ferrule	mm^2	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Stranded	mm^2	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Solid or stranded	AWG	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12
Tightening torque	Nm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Screwdriver	mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control circuit									
Current consumption									
Digital inputs									
24 V DC	mA	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
230 V AC	mA	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Analog inputs									
0 - 10 V	mA	1	1	1	1	1	1	1	1
Pick-up voltage									
DC operated	V DC	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
AC operated	V AC	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
Drop-out voltage									
DC operated	V DC	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
AC operated	V AC	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
Programmable relay outputs									
Quantity		4	4	4	4	4	4	4	4
Max. voltage	V AC	250	250	250	250	250	250	250	250
Max. current AC-11	A	3	3	3	3	3	3	3	3
Programmable analog outputs									
Quantity		2	2	2	2	2	2	2	2
Voltage range	V DC	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
Current carrying capacity	mA	10	10	10	10	10	10	10	10
Programmable analog inputs									
Ref 1	V DC	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
Ref 2	mA	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20
Soft start function									
Ramp times									
Acceleration time	s	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255
Deceleration time	s	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255
Start voltage	%	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
Voltage reduction at stop	%	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100
Kick-start									
Voltage	%	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90
Duration									
50 Hz	ms	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400
60 Hz	ms	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664
Current limitation		(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e	(0.5 - 8) x I_e

Dimensions

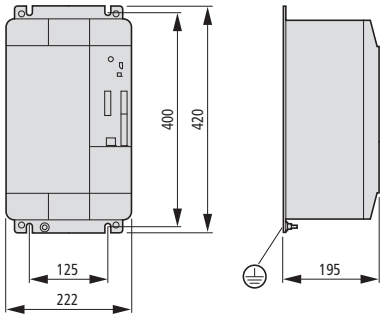
Soft starters

DM4-340-7K5
DM4-340-11K
DM4-340-15K

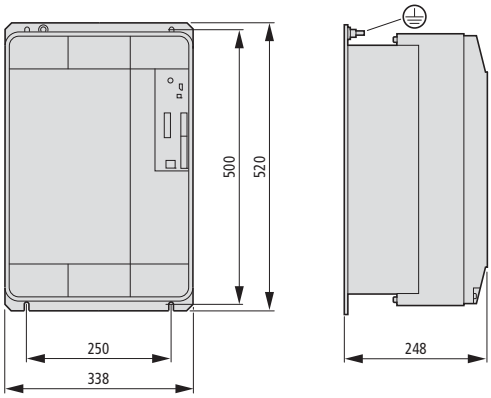


DM4-340-22K
DM4-340-30K
DM4-340-37K

DM4-340-45K
DM4-340-55K
DM4-340-75K



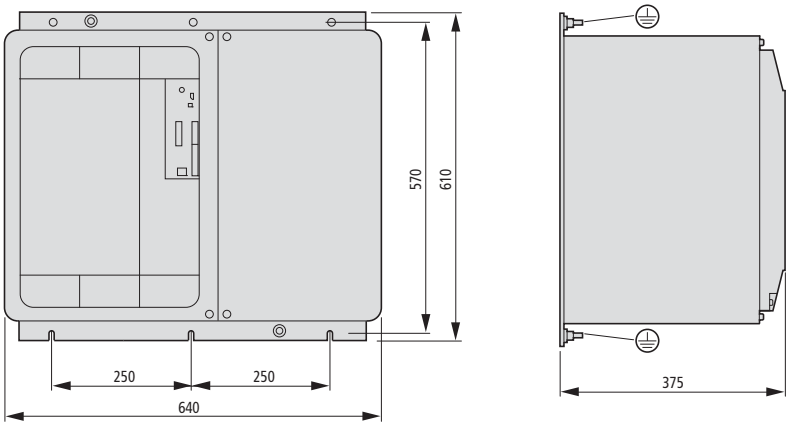
DM4-340-90K
DM4-340-110K
DM4-340-132K



DM4-340-160K
DM4-340-200K

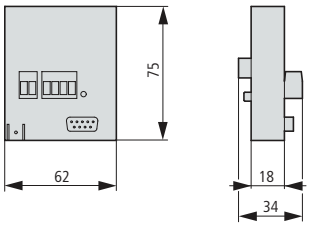
DM4-340-250K
DM4-340-315K

DM4-340-400K
DM4-340-500K



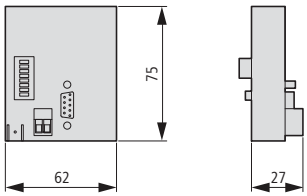
RS 232C/RS 485 serial interface

DE4-COM-2X



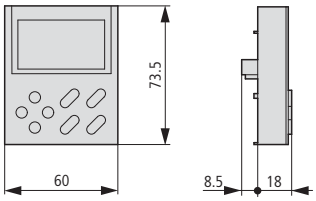
PROFIBUS DP fieldbus connection

DE4-NET-DP2



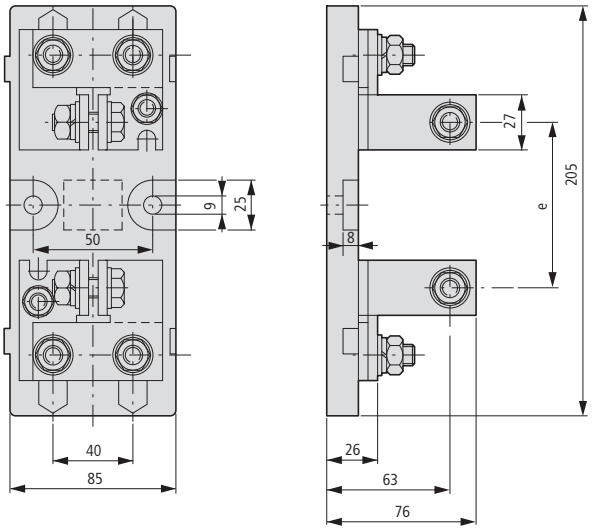
LCD keypad for DM4

DE4-KEY-2

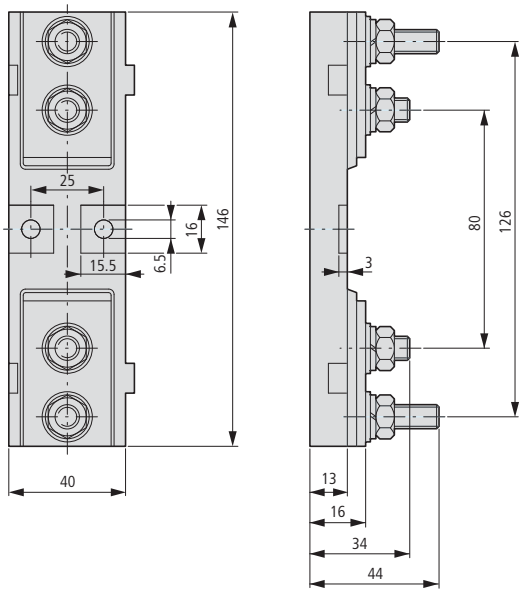


Fuse base

21.313.02

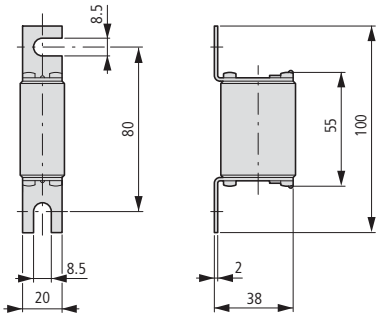


21.189.01

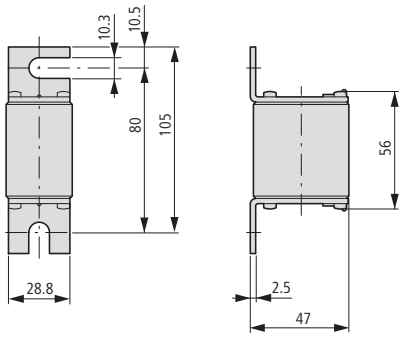


Fuses

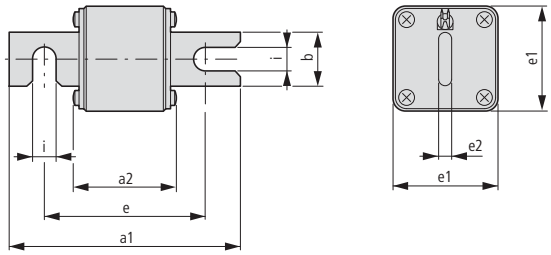
20.282.20-...



20.189.20-...

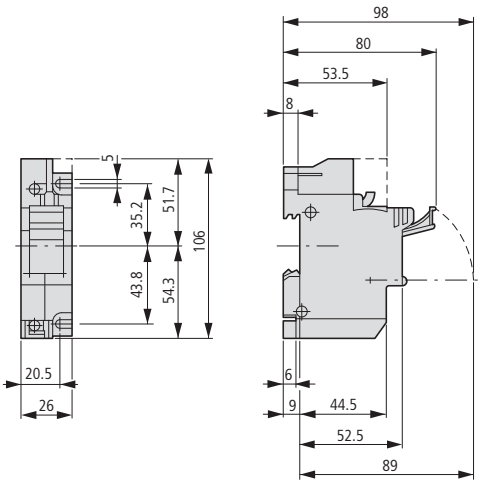


20.6×0.20



Part no.	a1	a2	b	e	e1	e2	l
20.610.32-200	109	47.5	26	76	51	6	11
20.610.32-350	109	47.5	26	76	51	6	11
20.610.32-450	109	47.5	26	76	51	6	11
20.610.32-500	109	47.5	26	76	51	6	11
20.610.32-630	109	47.5	26	76	51	6	11
20.610.32-900	109	49	35	76	73	6	11
20.610.32-1250	109	49	35	76	73	6	11

51.060.04





Frequency inverters M-Max™, H-Max™

Frequency inverters permit the continuously variable speed control of three-phase asynchronous motors, by converting a one- or three-phase alternating current of specific frequency and voltage amplitudes into a three-phase alternating current with variable voltage amplitude.

The M-Max™ and H-Max™ device series find universal application:

Device series M-Max™ is preferred in machinery construction; device series H-Max™ is primarily used in heating, ventilation and air conditioning (HVAC).

Frequency inverters M-Max™

Output voltage with sinusoidal evaluated Pulse-Width Modulation (PWM) for voltage/frequency control (U/f control) and voltage-steered vector control

MMX…-N…: Compact construction type in three sizes, protection type IP20

MMX…-F…: Compact construction type in three sizes, protection type IP20, with internal radio interference suppression filter (EMC)

MMX12…, MMX32…: Nominal current 1.7 – 9.6 A with 230 V single phase mains connection, assigned motor power 0.25 – 2.2 kW (230 V) → Page 10/5

MMX34…: Nominal current 1.3 – 14 A with 400 V three-phase mains connection, assigned motor power 0.37 – 7.5 kW (400 V) → Page 10/7

Frequency inverters H-Max™

Output voltage with sinusoidal evaluated Pulse-Width Modulation (PWM) for voltage / frequency control (U/f control) and sensorless flow vector control

HMX…1-B: Compact construction type in five sizes, protection type IP21, with internal radio interference suppression filter (EMC) and intermediate circuit choke

HMX…2-B: Compact construction type in six sizes, protection type IP54, with internal radio interference suppression filter (EMC) and intermediate circuit choke

HMX32…: Nominal current 3.7 – 310A with 230 V three-phase mains connection , assigned motor power 0.75 – 90 kW (230 V) → Page 10/10

HMX34…: Nominal current 3.4 – 310 A with 400 V three-phase mains connection, assigned motor power 1.1 – 60 kW (400 V) → Page 10/12



Eaton After Sales Service

Extended warranty for authorized commissioning

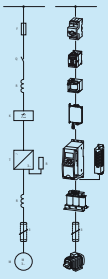
→ Chapter 22

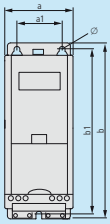












System overview

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Description

Frequency inverter M-Max™ 10/3

Frequency inverters M-Max™ in overview 10/4

Ordering

Frequency inverter M-Max™ 10/5

System overview

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Description

Frequency inverter H-Max™ 10/9

Ordering

Frequency inverter H-Max™ 10/10

Description

Braking resistances 10/13

Interface cards 10/14

Mains chokes, motor chokes 10/16

Ordering

Accessories for M-Max™, H-Max™

Braking resistances 10/17

Interface cards 10/18

Radio interference suppression filters 10/19

Enclosure accessories 10/19

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Engineering

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Components of the Power Drives System (PDS) 10/23

Connecting example for M-Max™ 10/26

Assigned switching and protective elements for M-Max™ 10/28

Assigned switching and protective elements for H-Max™ 10/30

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Braking resistances 10/41

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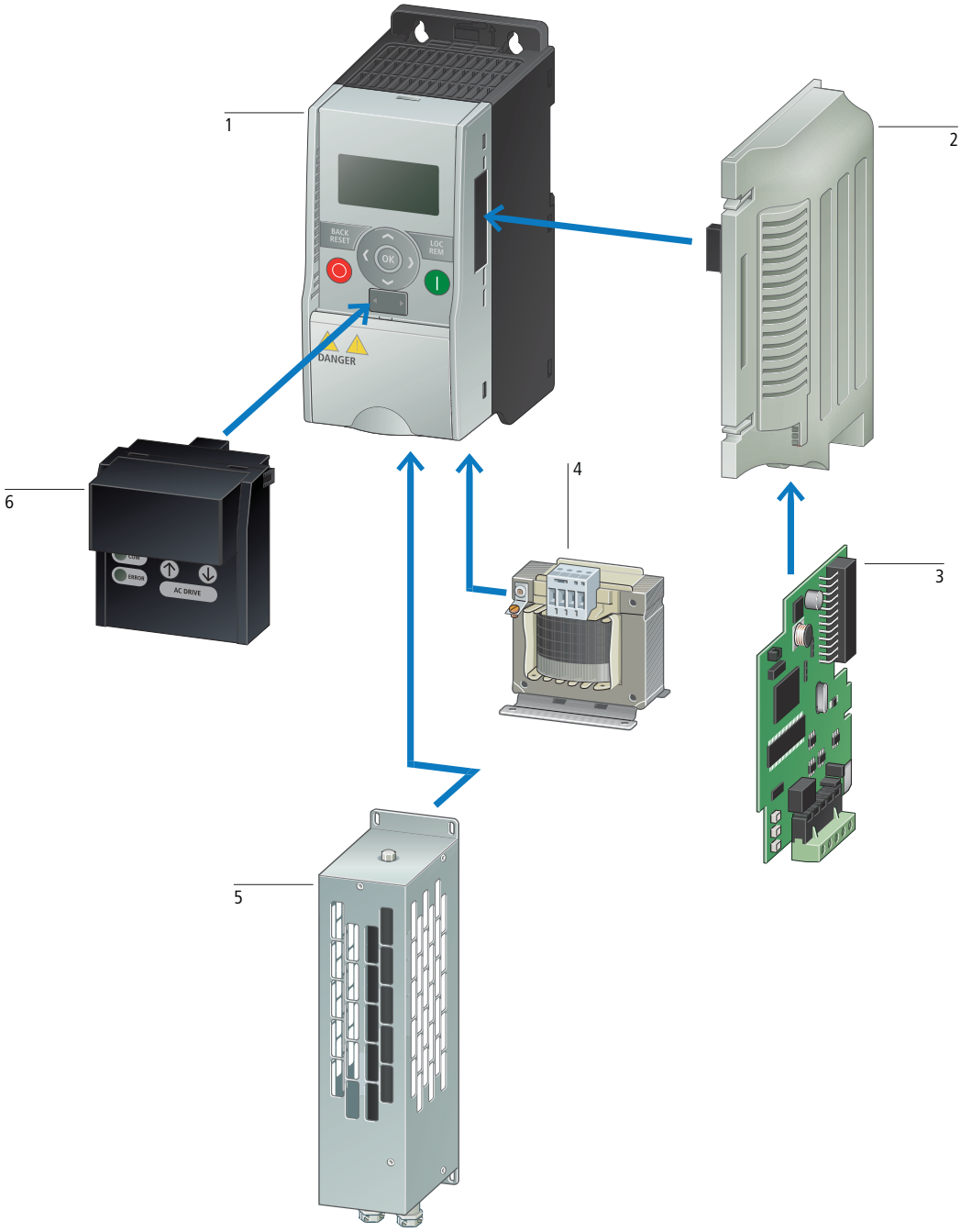
System overview



Basic device

Frequency inverters 1

MMX12…
Mains: single-phase, 230/240 V
Assigned motor rating
from 0.25 up to 2.2 kW (230 V)

→ Page 10/5

MMX32…
Mains: 3-phase, 230/240 V
Assigned motor rating
from 0.25 up to 2.2 kW (230 V)

→ Page 10/6

MMX34…
Mains: 3-phase, 400/480 V
Assigned motor rating
from 0.37 up to 7.5 kW (400 V)

→ Page 10/7

System accessories

Communication module 3

Versions

- CANopen fieldbus connection
- PROFIBUS DP fieldbus connection
- DeviceNet fieldbus connection

→ Page 10/18

PC interface card 6

MMX-COM-PC communication module

→ Page 10/18

Mounting frame 2

For fieldbus connection

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Accessories

Mains chokes 4

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Motor chokes 4

→ Page 10/21

Braking resistor 5

→ Page 10/17

Description



Application

The frequency inverters of the M-Max™ series allow a continuously variable speed control of three-phase asynchronous motors. They are specially suited for applications in which ease of handling and cost-effectiveness have a high priority.
The characteristics-controlled voltage/frequency (U/f) control already allows a wide range of applications even with the default settings: from simple pump and fan drives, standard packaging applications to the operation of multiple motors in horizontal transportation and conveying.
With sensorless vector control, an individual drive can also be used in demanding applications, in which a high torque and concentricity in the lower speed range are vital, such as in the plastics and metal industries, the textile, paper and printing industries or in crane and elevator systems.
Rated operational currents from 1.4 to 21 A allow the operation of standard four-pole asynchronous motors in an assigned rating range of:

- 0.25 to 2.2 kW at 230 V (single-phase mains connection),
- 0.25 to 2.2 kW at 230 V (three-phase mains connection),
- 0.37 to 7.5 kW at 400 V (three-phase mains connection).

Features

- Compact design through state-of-the-art IGBT modules
- Integrated radio interference suppression filter (EMC)
- Keypad with backlit LCD display
- 6 digital inputs (24 V DC) for sink- and source-type control
- 2 relays (1 changeover contact, 1 normally open contact, 230 V)
- 1 transistor output (N/O or N/C, 48 V DC)
- 2 analog inputs (0 to +10 V, 4 to 20 mA), selectable and scaleable
- 1 analog output (0 to +10 V), scaleable
- 1 serial interface (RS485, Modbus RTU)
- Built-in braking transistor with size MMX34…
- Optional fieldbus connection (CANopen, PROFIBUS-DP, DeviceNet)
- User-friendly commissioning through fast configuration and application menu
- Compliance with global standards to CE, UL, c-UL and c-Tick

Functions

A comprehensive range of protection functions allow safe operation and the protection of frequency inverter, motor and application. They offer protection against:

- Overcurrent, ground fault
- Overload (electronic motor protection)
- Overtemperature
- Overvoltage, undervoltage

Further functions are:

- Restart inhibit
- U/f control or sensorless vector control
- Double starting current and 1.5 times overcurrent
- PID controller
- Sequence control
- Braking control (DC braking)
- 8 fixed frequencies
- Electronic motor potentiometer
- Logic function (AND, OR, XOR)
- Upper and lower frequency and current limits
- Frequency hopping (frequency masking)
- DC braking before start and up to motor standstill
- 2 parameter sets

Documentation

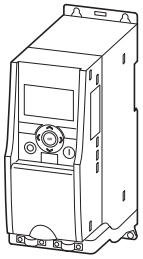
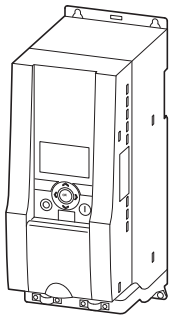
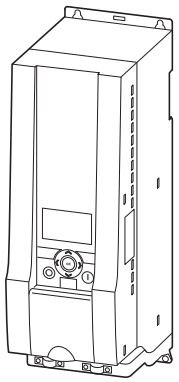
An instructional leaflet and a CD are included with each frequency inverter of the M-Max™ series.
The instructional leaflet is a quick guide with illustrations and notes in 23 languages about the correct handling, mounting and electrical connection of the device. The CD contains the instructional leaflet as well as the Hardware and Engineering manual in several languages.
The current documentation is also available for download from www.moeller.net/support

	MMX12…	MMX32…	MMX34…
Rated operational voltage U_e	230 V	230 V	400 V
System configuration			
1 AC 208 V - 15 % … 240 V + 10 %	●	-	-
3 AC 208 V - 15 % … 240 V + 10 %	-	●	-
3 AC 380 V - 15 % … 480 V + 10 %	-	-	●
Mains frequency	50/60 Hz ±10 %	50/60 Hz ±10 %	50/60 Hz ±10 %
Rated operational current I_e	1.7 - 9.6 A[1)]	1.7 - 11 A[1)]	1.3 - 14 A[1)]
Rated operational current	100 % I_e, continuous current at max. +50 °C	100 % I_e, continuous current at max. +50 °C	100 % I_e, continuous current at max. +50 °C
Starting current	200 % I_e for 2 s every 20 s	200 % I_e for 2 s every 20 s	200 % I_e for 2 s every 20 s
Overload current	150 % I_e for 60 s every 600 s	150 % I_e for 60 s every 600 s	150 % I_e for 60 s every 600 s
Assigned motor rating at rated operational voltage U_{LN}	0.25 - 2.2 kW[1)]	0.25 - 2.2 kW[1)]	0.37 - 7.5 kW[1)]
Operating temperature	-10 - +50 °C	-10 - +50 °C	-10 - +50 °C
Operating mode	U/f control, sensorless vector control	U/f control, sensorless vector control	U/f control, sensorless vector control
Pulse frequency (sinusoidal PWM)	1 - 16 kHz (default settings: 6 kHz)	1 - 16 kHz (default settings: 6 kHz)	1 - 16 kHz (default settings: 6 kHz)
Output voltage	0 - U_{LN} V	0 - U_{LN} V	0 - U_{LN} V
Output frequency	0 - 50 Hz (default settings: 50 Hz)	0 - 50 Hz (default settings: 50 Hz)	0 - 50 Hz (default settings: 50 Hz)
Radio interference suppression filter (EMC)			
Internal	● (for MMX…F…)	● (for MMX…F…)	● (for MMX…F…)
Optional	● (for MMX…N…)	● (for MMX…N…)	● (for MMX…N…)
DC link choke	-	-	-
Protection type			
IP20	●	●	●
IP21/NEMA1	● (optional)	● (optional)	● (optional)
IP54	-	-	-
Keypad	●	●	●
Display	LCD, 7 segment	LCD, 7 segment	LCD, 7 segment
Communication interface			
Internal	RS485, Modbus RTU, system interface	RS485, Modbus RTU, system interface	RS485, Modbus RTU, system interface
Optional	CANopen or PROFIBUS-DP	CANopen or PROFIBUS-DP	CANopen or PROFIBUS-DP
Control signal terminals			
Digital input	6 (max. +30 V DC, R_i > 12 kΩ)	6 (max. +30 V DC, R_i > 12 kΩ)	6 (max. +30 V DC, R_i > 12 kΩ)
Digital output	1 (max. 48 V DC, max. 50 mA)	1 (max. 48 V DC, max. 50 mA)	1 (max. 48 V DC, max. 50 mA)
Analog input	2 (0 - +10 V, 4 - 20 mA)	2 (0 - +10 V, 4 - 20 mA)	2 (0 - +10 V, 4 - 20 mA)
Analog output	1 (0 - +10 V, max. 10 mA)	1 (0 - + 10 V, max. 10 mA)	1 (0 - + 10 V, max. 10 mA)
Relays	2 (1 normally open contact, 1 change-over contact, 250 V, max.°2 A)	2 (1 normally open contact, 1 change-over contact, 250 V, max.°2 A)	2 (1 normally open contact, 1 change-over contact, 250 V, max.°2 A)
PID controller	●	●	●
Internal brake chopper	-	-	● (from 3.3 A rated operational current I_e)
Production quality	RoHS, ISO 9001	RoHS, ISO 9001	RoHS, ISO 9001
Product standard, regulation	IEC61800-3, UL508C	IEC61800-3, UL508C	IEC61800-3, UL508C
Approval, Certification	CE, UL, cUL, c-Tick	CE, UL, cUL, c-Tick	CE, UL, cUL, c-Tick

Notes

[1)] The principle here is that the range is not covered by a single device but by the entire device group.
For specific data of the individual performance values → Ordering

Ordering

	Rated operational current frequency inverter[1]	Assigned motor rating (50/60 Hz)[2]	Rated operational current motor	With internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack	Without internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack
	I_e A	P kW	I_e A						
Rated operational voltage 1 AC 230 V									
	1.7	0.25	1.4	**MMX12AA1D7F0-0** 121363		1 off	**MMX12AA1D7N0-0** 122660		1 off
	2.4	0.37	2	**MMX12AA2D4F0-0** 121364			**MMX12AA2D4N0-0** 122661		
	2.8	0.55	2.7	**MMX12AA2D8F0-0** 121365			**MMX12AA2D8N0-0** 122662		
	3.7	0.75	3.2	**MMX12AA3D7F0-0** 121366			**MMX12AA3D7N0-0** 122663		
	4.8	1.1	4.6	**MMX12AA4D8F0-0** 121367			**MMX12AA4D8N0-0** 122664		
	7	1.5	6.3	**MMX12AA7D0F0-0** 121368			**MMX12AA7D0N0-0** 122665		
	9.6	2.2	8.7	**MMX12AA9D6F0-0** 121369			**MMX12AA9D6N0-0** 122666		

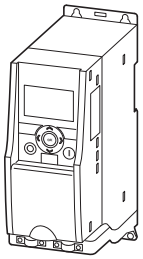
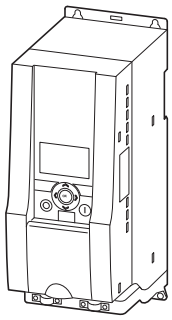
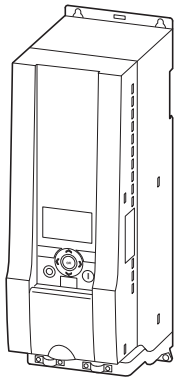
Notes

[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

HPL10006EN

	Rated operational current frequency inverter[1]	Assigned motor rating (50/60 Hz)[2]	Rated operational current motor	With internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack	Without internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack
	I_e A	P kW	I_e A						
Rated operational voltage 3 AC 230 V									
	1.7	0.25	1.4	**MMX32AA1D7F0-0** 121390		1 off	**MMX32AA1D7N0-0** 122667		1 off
	2.4	0.37	2	**MMX32AA2D4F0-0** 121391			**MMX32AA2D4N0-0** 122668		
	2.8	0.55	2.7	**MMX32AA2D8F0-0** 121392			**MMX32AA2D8N0-0** 122669		
	3.7	0.75	3.2	**MMX32AA3D7F0-0** 121393			**MMX32AA3D7N0-0** 122670		
	4.8	1.1	4.6	**MMX32AA4D8F0-0** 121394			**MMX32AA4D8N0-0** 122671		
	7	1.5	6.3	**MMX32AA7D0F0-0** 121395			**MMX32AA7D0N0-0** 122672		
	9.6	2.2	8.7	**MMX32AA011F0-0** 121396			**MMX32AA011N0-0** 122673		

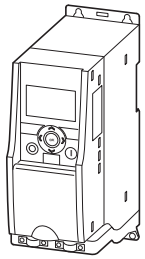
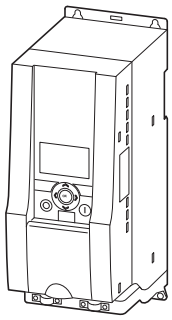
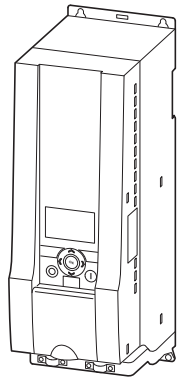
Notes

[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

HPL10007EN

	Rated operational current frequency inverter[1]	Assigned motor rating (50/60 Hz)[2]	Rated operational current motor	With internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack	Without internal radio interference suppression filter **Part no.** Article no.	**Price** See price list	Std. pack
	I_e A	P kW	I_e A						
Rated operational voltage 3 AC 400 V									
	1.3	0.37	1.1	**MMX34AA1D3F0-0** 121397		1 off	**MMX34AA1D3N0-0** 122674		1 off
	1.9	0.55	1.5	**MMX34AA1D9F0-0** 121398			**MMX34AA1D9N0-0** 122675		
	2.4	0.75	1.9	**MMX34AA2D4F0-0** 121399			**MMX34AA2D4N0-0** 122676		
	3.3	1.1	2.6	**MMX34AA3D3F0-0** 121400			**MMX34AA3D3N0-0** 122677		
	4.3	1.5	3.6	**MMX34AA4D3F0-0** 121401			**MMX34AA4D3N0-0** 122678		
	5.6	2.2	5	**MMX34AA5D6F0-0** 121402			**MMX34AA5D6N0-0** 122679		
	7.6	3	6.6	**MMX34AA7D6F0-0** 121403			**MMX34AA7D6N0-0** 122680		
	9	4	8.5	**MMX34AA9D0F0-0** 121404			**MMX34AA9D0N0-0** 122681		
	12	5.5	11.3	**MMX34AA012F0-0** 121405			**MMX34AA012N0-0** 122682		
	14	7.5	15.2	**MMX34AA014F0-0** 122684			**MMX34AA014N0-0** 122683		

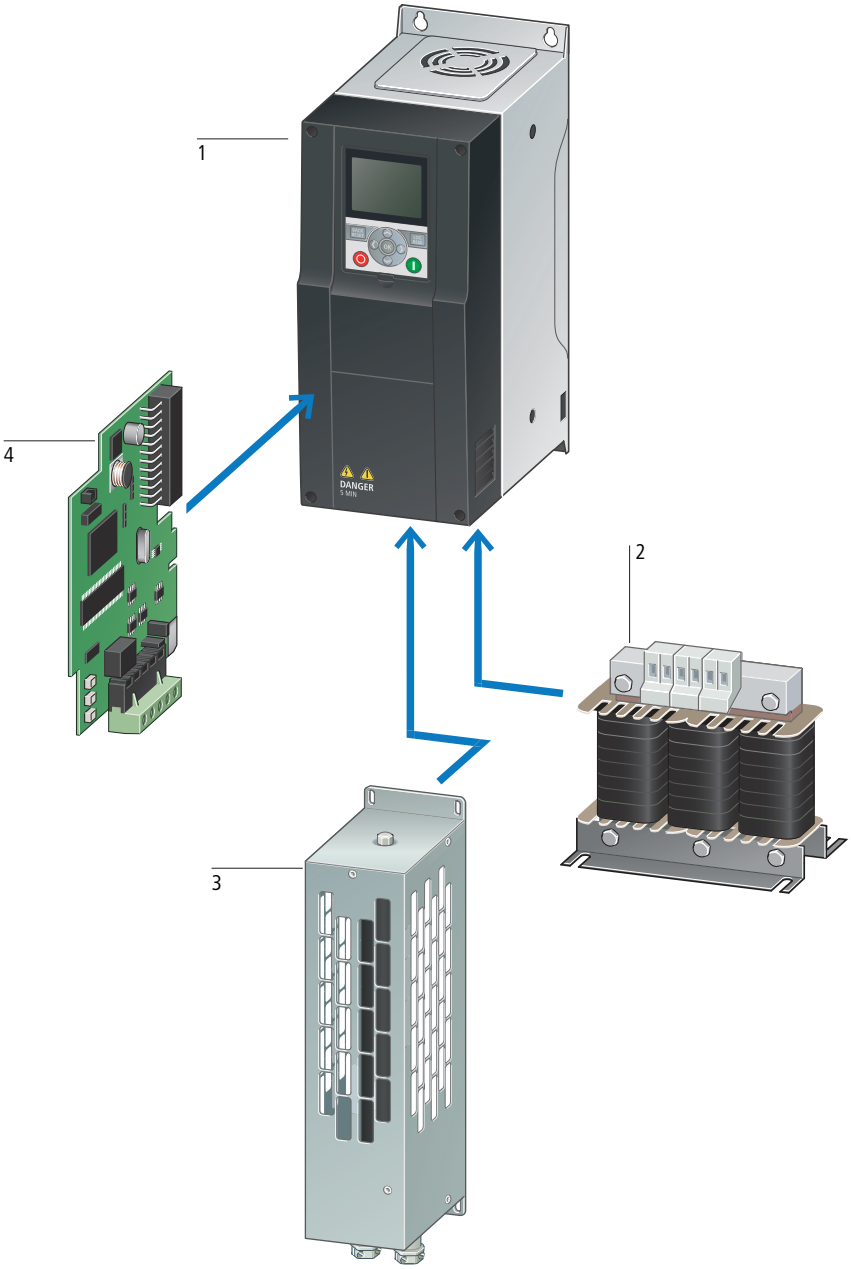
Notes

[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

System overview



Basic device

Frequency inverters 1

HMX32…
Mains: 3-phase, 230/240 V
Assigned motor rating
from 0.75 to 90 kW (230 V)

→ Page 10/10

HMX34…
Mains: 3-phase, 400/480 V
Assigned motor rating
from 1.1 to 160 kW (400 V)

→ Page 10/12

System accessories

Communication module 4

Versions

- CANopen fieldbus connection
- PROFIBUS DP fieldbus connection
- DeviceNet fieldbus connection

→ Page 10/18

Accessories

Motor chokes 2

→ Page 10/21

Braking resistor 3

→ Page 10/17

Description



Application

H-Max™ frequency inverters are specially suitable for continuously variable speed control of three-phase asynchronous motors in heating, ventilation and air conditioning (HVAC) applications. A comprehensive range of control and function modules allow an automatic changeover in applications with severalmotors, cascade and bypass controllers and direct control of non-stabilized motors.
The devices of the H-Max™ series support energy-optimized applications with fluid flow machines (pumps, fans). They allow the PID controllers to maintain a constant conveying pressure in booster stations regardless of throughput. A fire control ensures reliable operation of pumps in sprinkler systems.
The network protocols relevant for HVAC applications – BACNet and Modbus – are included onboard as standard in two versions (RS485, Ethernet).
With this comprehensive range of setting options, ease of handling is important. The frequency inverters are preset for the assigned motor rating and can be taken into operation without any parameterization required. A clear, comprehensive graphic display shows all relevant drive parameters. Two enclosure versions with IP21 and IP54 protection types are available for individual installation.
For the operation of standard three-phase asynchronous motors the devices supply rated operational currents of 3.4 to 310 A for assigned shaft ratings of:

- 0.75 to 90 kW at 230 V (three-phase mains connection),
- 1.1 to 160 kW at 400 V (three-phase mains connection).

Features

- Compact design through state-of-the-art IGBT modules
- Integrated radio interference suppression filter (EMC)
- Integrated DC link choke
- Plug-in keypad with backlit graphic LCD display
- 6 digital inputs (24 V DC) for sink- and source-type control
- 3 relays (2 changeover contacts, 1 N/O, 230 V) on a plug-in card, can be replaced with other relay configurations or additional digital and analog inputs and outputs
- 2 analog inputs (0 to +10 V, 4 to 20 mA), selectable and scaleable
- 1 analog output (0 to +10 V), scaleable
- 1 serial interface (RS485, Modbus RTU)
- Internal braking transistor
- 2 slots for optional fieldbus connection (CANopen, PROFIBUS-DP, DeviceNet, LonWorks)
- User-friendly commissioning through fast configuration and application menu
- Compliance with global standards to CE, UL, c-UL and c-Tick

Functions

A comprehensive range of protection functions allow safe operation and the protection of frequency inverter, motor and application. They offer protection against:

- Overcurrent, ground fault
- Overload (electronic motor protection), underload, dry running
- Overtemperature
- Overvoltage, undervoltage

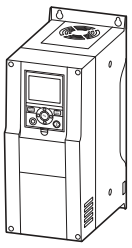
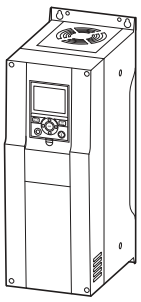
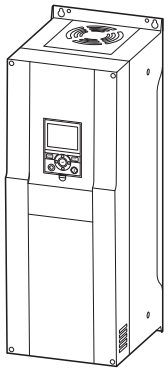
Further functions are:

- Flying restart circuit
- Thermistor protection
- Restart interlock, automatic restart
- Actual/reference value monitoring
- U/f control or sensorless vector control
- Double starting current and 1.1 times overcurrent
- 2 PID controllers
- Sequencing, multi-motor and bypass control, cascading
- Fire control
- Automatic sleep and wake-up function
- Timer function (day/time control)
- Braking control
- DC braking before start and up to motor standstill
- 8 fixed frequencies
- Electronic motor potentiometer
- Logic function (AND, OR, XOR)
- Upper and lower frequency and current limits
- Frequency hopping (frequency masking)
- 2 parameter sets

Documentation

An instructional leaflet and a CD are included with each frequency inverter of the H-Max™ series.
The instructional leaflet is a quick guide with illustrations and notes in 23 languages about the correct handling, mounting and electrical connection of the device. The CD contains the instructional leaflet as well as the Hardware and Engineering manual in several languages.
The current documentation is also available for download from www.moeller.net/support

Ordering

	Rated operational current of frequency inverter[1]	Assigned motor rating (50/60 Hz)[2]	Rated operational current motor	With internal radio interference suppression filter, protection type IP21			With internal radio interference suppression filter, protection type IP54		
				Part no. Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack
	I_e A	P kW	I_e A						
Rated operational voltage 3 AC 230 V									
	3.7	0.55	2.7	**HMX32AG3D721-B** 127151		1 off	**HMX32AG3D722-B** 127170		1 off
	4.8	0.75	3.2	**HMX32AG4D821-B** 127152			**HMX32AG4D822-B** 127171		
	6.6	1.1	4.6	**HMX32AG6D621-B** 127153			**HMX32AG6D622-B** 127172		
	8	1.5	6.3	**HMX32AG8D021-B** 127154			**HMX32AG8D022-B** 127173		
	11	2.2	8.7	**HMX32AG01121-B** 127155			**HMX32AG01122-B** 127174		
	12.5	3	11.5	**HMX32AG01221-B** 127156			**HMX32AG01222-B** 127175		
	18	4	14.8	**HMX32AG01821-B** 127157		1 off	**HMX32AG01822-B** 127176		1 off
	24.2	5.5	19.6	**HMX32AG02421-B** 127158			**HMX32AG02422-B** 127177		
	31	7.5	26.4	**HMX32AG03121-B** 127159			**HMX32AG03122-B** 127178		
	48	11	38	**HMX32AG04821-B** 127160		1 off	**HMX32AG04822-B** 127179		1 off
	62	15	51	**HMX32AG06221-B** 127161			**HMX32AG06222-B** 127180		

Notes

[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	3~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP21; UL/CSA NEMA 1

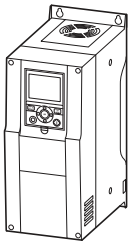
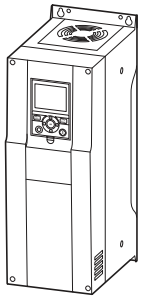
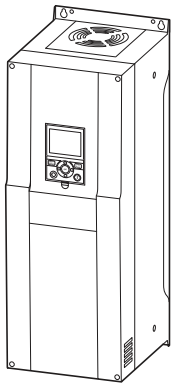
			With internal radio interference suppression filter, protection type IP21			With internal radio interference suppression filter, protection type IP54		
Rated operational current of frequency inverter[1]	Assigned motor rating (50/60 Hz)[2]	Rated operational current motor	**Part no.** Article no.	**Price** See price list	Std. pack	**Part no.** Article no.	**Price** See price list	Std. pack
I_e A	P kW	I_e A						
Rated operational voltage 3 AC 230 V								
77	18.5	63	**HMX32AG07721-B** 127162		1 off	**HMX32AG07722-B** 127181		1 off
88	22	71	**HMX32AG08821-B** 127163			**HMX32AG08822-B** 127182		
106	30	96	**HMX32AG10621-B** 127164			**HMX32AG10622-B** 127183		
143	45	117	**HMX32AG14321-B** 127165			**HMX32AG14322-B** 127184		
170	45	141	**HMX32AG17021-B** 127166			**HMX32AG17022-B** 127185		
208	55	173	**HMX32AG20821-B** 127167			**HMX32AG20822-B** 127186		
261	75	233	**HMX32AG26121-B** 127168			**HMX32AG26122-B** 127187		
310	90	279	**HMX32AG31021-B** 127169			**HMX32AG31022-B** 127188		

Notes

[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	3~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP21; UL/CSA NEMA 1

	Rated operational current of frequency inverter[1] I_e A	Assigned motor rating (50/60 Hz)[2] P kWh	Rated operational current Motor I_e A	With integrated radio interference suppression filter Protection type IP21 **Part no.** Article no.	**Price** See price list	With integrated radio interference suppression filter Protection type IP54 **Part no.** Article no.	**Price** See price list	Std. pack
Rated operational voltage 3 AC 400 V								
	3.4	1.1	2.1	**HMX34AG3D421-B** 126928		**HMX34AG3D422-B** 126958		1 off
	4.8	1.5	3.6	**HMX34AG4D821-B** 126929		**HMX34AG4D822-B** 126959		
	5.6	2.2	5	**HMX34AG5D621-B** 126940		**HMX34AG5D622-B** 126960		
	8	3	6.6	**HMX34AG8D021-B** 126941		**HMX34AG8D022-B** 126961		
	9.6	4	8.5	**HMX34AG9D621-B** 126942		**HMX34AG9D622-B** 126962		
	12	5.5	11.3	**HMX34AG01221-B** 126943		**HMX34AG01222-B** 126963		
	16	7.5	15.2	**HMX34AG01621-B** 126944		**HMX34AG01622-B** 126964		
	23	11	21.7	**HMX34AG02321-B** 126945		**HMX34AG02322-B** 126965		
	31	15	29.3	**HMX34AG03121-B** 126946		**HMX34AG03122-B** 126966		
	38	18.5	36	**HMX34AG03821-B** 126947		**HMX34AG03822-B** 126967		
	46	22	41	**HMX34AG04621-B** 126948		**HMX34AG04622-B** 126968		
	61	30	55	**HMX34AG06121-B** 126949		**HMX34AG06122-B** 126969		
	72	37	68	**HMX34AG07221-B** 126950		**HMX34AG07222-B** 126970		
	87	45	81	**HMX34AG08721-B** 126951		**HMX34AG08722-B** 126971		
	105	55	99	**HMX34AG10521-B** 126952		**HMX34AG10522-B** 126972		
	140	75	134	**HMX34AG14021-B** 126953		**HMX34AG14022-B** 126973		
	170	90	161	**HMX34AG17021-B** 126954		**HMX34AG17022-B** 126974		
	205	110	196	**HMX34AG20521-B** 126955		**HMX34AG20522-B** 126975		
	261	132	231	**HMX34AG26121-B** 126956		**HMX34AG26122-B** 126976		
	310	160	279	**HMX34AG31021-B** 126957		**HMX34AG31022-B** 126977		

Notes

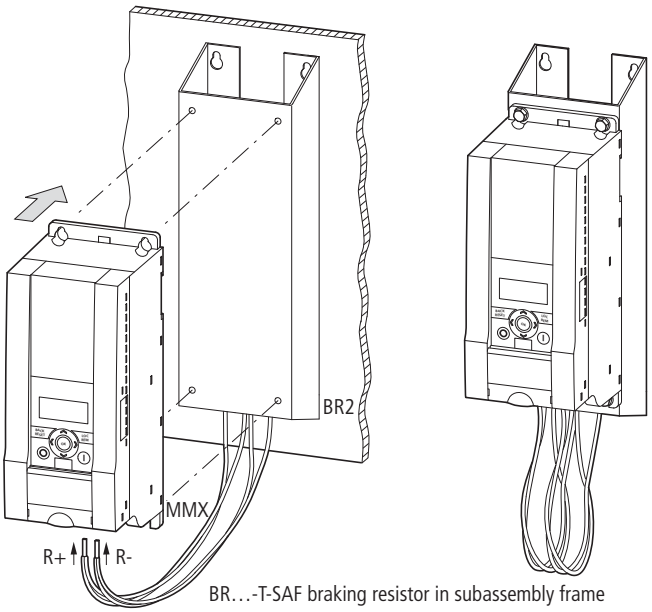
[1] Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C
[2] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America

Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP21; UL/CSA NEMA 1

Description





BR…-T-SAF braking resistor in subassembly frame

Type overview

BR1...-T-PF, BR3...-T-PF

Braking resistors

Application

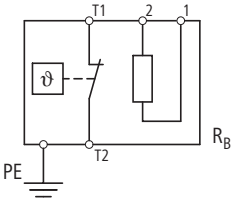
An external braking resistor is required for braking larger moments of inertia or for prolonged regenerative operation. This converts the motor's mechanical braking energy into heat.

Features

These resistors are built into a perforated metal sheet enclosure and equipped with a thermostatic circuit-breaker (230 V, 1 A, AC-1). The enclosures are made of galvanized sheet metal and are open at the bottom. They fulfil protection type IP65 only in their fitted state.
With a combination of several series- and parallel-connected resistors, a higher braking power can be achieved. The braking resistors can be connected directly to the brake choppers of MMX34… frequency inverters.

Function

The frequency inverter's built-in braking transistor automatically switches in the connected braking resistor as soon as the internal DC link voltage exceeds the switching threshold. This prevents excessive voltages on the internal DC link, which would otherwise cause an overvoltage fault message and the frequency inverter's pulse inhibitor to be set. The drive then coasts to a halt uncontrolled.



Documentation

The documentation can also be obtained on the Internet from:
www.moeller.net/support

Type overview

BR2..., BR2...-T-SAF

Braking resistors

Features

BR2… is a short-circuit proof, intrinsically safe braking resistor in an anodized aluminum enclosure with protection type IP65 and without a thermostat.

Note: When used according to UL directives, the rating data for continuous braking and the maximum pulse performance must be reduced by 25%.
Caution: The surface temperature can exceed 100 °C!

- BR2...-T-SAF is a combination of several braking resistors BR2… braking resistors with a thermostat. They are built into a subassembly frame for the M-Max™ frequency inverters.
- BR1...-T-PF is a braking resistor or a combination of several braking resistors with a thermostat. It is installed in an encapsulated enclosure with protection type IP54 and protected against accidental contact.
- BR3...-T-PF is a braking resistor in a steel mesh design with a thermostat. It is installed in an encapsulated enclosure with protection type IP54 and protected against accidental contact.
- ...-T = with a thermostat
- ...-SAF = subassembly frame
- ...-PF = protection frame (protects against accidental contact)

MMX-COM-PC, XMX-NET-DN-A



Type overview

MMX-COM-PC
PC connection for the frequency inverters of M-Max™ series

Application

MMX-COM-PC allows communication and data transfer between a frequency inverter and a PC.
The parameters can also be coplied directly between frequency inverters of the same device series without a PC connection. If a battery (9 V block) is fitted, mains power supply is also not required for this.

Features

The MMX-COM-PC communication module is plugged in at the front of M-Max™ frequency inverters.
The connection cable included as standard (length: 3.2 m) with an isolated interface converter allows connection to a PC with a USB port.
This communication module can help increase data security and cut commissioning and maintenance times:

- Online parameterization and monitoring display (oscilloscope) on a PC; on a connected printer parameter lists and monitor displays can also be printed out
- Upload and download of all parameters
- Parameter backup and comparison
- Parameter copy function (e.g. for series machines or for device replacement)

Documentation

Instructional leaflet AWA8240-2428 (included as standard with each card)
Documentation available for download at www.moeller.net/support

Type overview

XMX-NET-DN-A
DeviceNet fieldbus connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMX-NET-DN-A allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard DeviceNet field bus.
The fieldbus connection is implemented via pluggable 5-pole screw terminals with the XMX-NET-PS-A and a 9-pole SUB-D connector with the XMX-NET-PD-A.

Features

On the H-Max™ frequency inverters, interface card XMX-NET-DN-A is slotted into the housing.
On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.

Technical data:

- Communication protocol: CAN
- Data transfer: ODVA 2.0 compliant
- Transfer rate (adjustable): 125, 250 and 500 Kbit/s
- Maximum cable length, depending on transfer rate: 125 Kbits/s → 500 m, 250 Kbits/s → 250 m, 500 Kbit/s → 100 m
- Network supply: 11 to 25 V DC, 28 mA (typical), peak inrush current 125 mA
- Addressing (adjustable): to 64 (nodes)
- Status indication via LEDs

Documentation

Documentation available for download at www.moeller.net/support

XMX-NET-CO-A, XMX-PD-A, XMX-PS-A



CANopen

Type overview

XMX-NET-CO-A
CANopen connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMX-NET-CO-A allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard CANopen field bus. They are connected to the field bus through 5-pole screw terminals.

Features

On the H-Max™ frequency inverters, the XMX-NET-CO-A interface card is slotted into the housing.
On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.
Technical data:

- Communications protocol: CiA DS-301,
- CiA-DSP-402
- Data transfer: CAN (ISO 11898)
- Transfer rate (adjustable): 10 Kbits/s up to 1 Mbit/s
- Maximum cable length, depending on transfer rate (without amplifier):
- 30 m up to 2.5 km
- Addressing (adjustable): 1 - 127
- Status indication via LEDs

Documentation

Instructional leaflet AWA8240-2426 (included as standard with each card)
Manual AWB8240-1632
Documentation available for download at www.moeller.net/support

PROFI BUS PROCESS FIELD BUS

Type overview

XMX-NET-PD-A, XMX-NET-PS-A
PROFIBUS-DP connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMX-NET-DP-... allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard PROFIBUS-DP field bus.
The XMX-NET-PS-A is connected to the field bus through 5-pole plug-in screw terminals and XMX-NET-PD-A through a 9-pin Sub-D connector.

Features

On the H-Max™ frequency inverters, the XMX-NET-DP-... interface card is slotted into the housing.
On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.
Technical data:

- Communication protocol: Profidrive (PROFIBUS profile for variable-speed drives)
- Data transfer: RS485, half-duplex
- PPO type: 1, 2, 3, 4, 5
- Transfer rate (adjustable): 9.6 Kbits/s up to 12 Mbit/s
- Maximum cable length, depending on transfer rate (without amplifier): 100 m up to 1.2 km
- Addressing (adjustable): 2 - 126
- Status indication via LEDs

Documentation

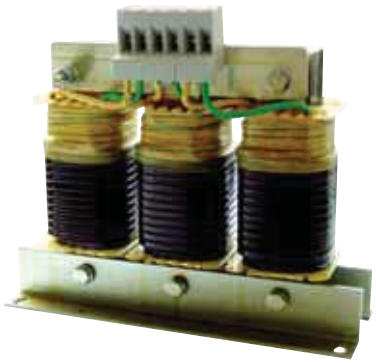
Instructional leaflet AWA8240-2427 (included as standard with each card)
Documentation available for download at www.moeller.net/support

Mains chokes, motor chokes

DEX-LN…, DEX-LM3…







Type overview

DEX-LN1…
Mains chokes, single-phase

DEX-LN3…
Mains chokes, three-phase

Application

Mains chokes (also called mains chokes) are connected in series on the mains side of electronic devices, such as frequency inverters.

Features

The DEX-LN… line reactors are vacuum-impregnated. Their air gaps are therefore bridged with a low-fatigue, metallically and magnetically neutral connection, which reduces noise emission.

Note: Because of the flux distribution caused by their physical design, motor chokes should be installed at a distance of at least 50 mm from metal parts and adjacent subassemblies.

Functions

Mains chokes attenuate any current harmonics and peaks and limit the starting current (internal DC link capacitors). Through the reduction of current harmonics, the r.m.s. value of the absorbed current can be reduced by up to 30 percent. In addition, mains chokes permit a short-circuit voltage to the mains (u_k value) of about four percent, which is often required. Mains chokes also extend the lifespan of components (rectifier diodes, DC link capacitors) in devices with an input-side internal DC link (frequency inverters, USPs).

Documentation

Every line reactor is supplied with an instructional leaflet (AWA 8240-1711). The documentation is also available for download from www.moeller.net/support

Type overview

DEX-LM3…
Motor chokes, three-phase

Application

Motor chokes are connected in series to the output of frequency inverters.

Features

The DEX-LM3… motor chokes are vacuum-impregnated. Their air gaps are therefore bridged with a low-fatigue, metallically and magnetically neutral connection, which reduces noise emission.

Motor chokes have larger dimensions than comparable mains chokes with the same rated operational current.

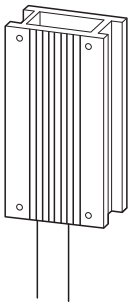
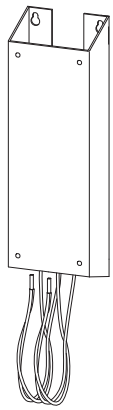
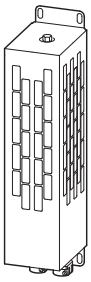
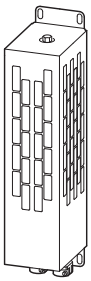
Note: Because of the flux distribution caused by their physical design, motor chokes should be installed at a distance of at least 50 mm from metal parts and adjacent subassemblies.

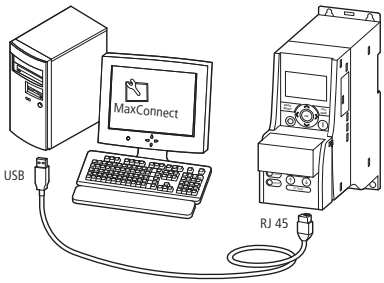
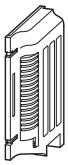
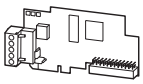
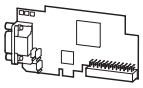
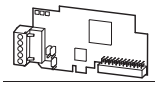
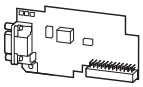
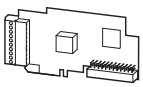
Functions

Motor chokes reduce the edge gradient of the output voltage (du/dt < 500 V/ms) of a frequency inverter. They also reduce the motor's noise emission and heat generation. Through the use of motor chokes the permissible motor cable length can be increased to up to 200 meters. When operating several motors in parallel at the output of a single frequency inverter, the use of motor chokes is recommended, as they attenuate the high capacitive reactive currents.

Documentation

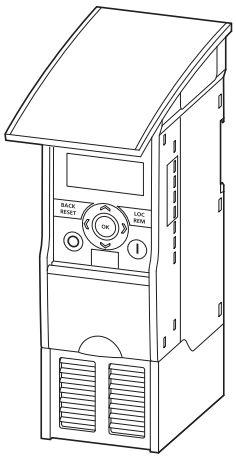
Every motor choke is supplied with an instructional leaflet (AWA 8240-1711). The documentation is also available for download from www.moeller.net/support

	Braking resistance	Continuous braking power	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	R	P_{DB}				
	Ω	W				
Braking resistors						
Protection type IP65						
Short-circuit proof, intrinsically safe braking resistor in anodized aluminum enclosure, with thermostat						
	47	240	MMX34…	**BR2047240** 140434		1 off
	60	200	MMX34…	**BR2060200** 140433		1 off
Short-circuit proof, intrinsically safe braking resistor with thermostat, with mounting frame for base (footprint) mounting						
	36	400	MMX34…	**BR2036400-T-SAF** 140437		1 off
	47	240	MMX34…	**BR2047240-T-SAF** 140436		
	60	200	MMX34…	**BR2060200-T-SAF** 140435		
	65	400	MMX34…	**BR2065400-T-SAF** 140438		
	75	480	MMX34…	**BR2075480-T-SAF** 140439		
Protection type IP54						
	36	2450	MMX34…	**BR30362K4-T-PF** 141325		1 off
	36	2800	MMX34…	**BR30362K8-T-PF** 141326		
	36	3600	MMX34…	**BR30363K6-T-PF** 141327		
Protection type IP54						
	36	500	MMX34…	**BR1036500-T-PF** 141323		1 off
	36	1000	MMX34…	**BR10361K0-T-PF** 141324		
	56	300	MMX34…	**BR1056300-T-PF** 141320		
	56	800	MMX34…	**BR1056800-T-PF** 141321		
	56	1000	MMX34…	**BR10561K0-T-PF** 141322		

			Part no. Article no.	Price See price list	Std. pack	Notes
Interface cards						
For use with MMX…						
PC connection (USB/RJ45) for the frequency inverters of M-Max series • With 3.2 m connection cable and interface converter • Data transfer with PC software and copy function (retentive memory) between MMX... frequency inverters 			**MMX-COM-PC** 121406		1 off	
 Mounting frame for XMX-NET... fieldbus interface cards On M-Max™ frequency inverters			**MMX-NET-XA** 134510		1 off	Mounting frame for side connection to M-Max™ frequency inverters
For use with MMX... und HMX...		Description	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Fieldbus connection						
	CANopen	Connection through plug-in screw terminals The interface card is slotted into the device.	**XMX-NET-CO-A** 134511		1 off	Mounting frame MMX-NET-XA required for M-Max™
	PROFIBUS-DP (Screw terminal)	Connection through plug-in screw terminals The interface card is slotted into the device.	**XMX-NET-PS-A** 136556			
	PROFIBUS-DP (Sub D)	Connection through Sub-D plug The interface card is slotted into the device.	**XMX-NET-PD-A** 136557			
	PROFINET	The interface card is slotted into the device.	**XMX-NET-PN-A** 138237			
	DeviceNet	The interface card is slotted into the device.	**XMX-NET-DN-A** 136558			
	LON	The interface card is slotted into the device.	**XMX-NET-LO-A** 138238			
Plug-in modules						
For use with HMX...						
	Digital I/O card	6 digital input (24 V DC) 6 digital outputs (transistor, 24 - 48 V DC) 24 V supply	**XMX-IO-B1-A** 138239		1 off	–
	Relay/thermistor card	1 relay (changeover contact, N/O/NC, 250 V, 2 A) 1 relay (normally open contact, N/O, 250 V, 2 A) 1 thermistor input	**XMX-IO-B2-A** 138240			–
	Analog I/O card	1 analog input (0 -+ 10 V, 4 - 20 mA) 2 analog outputs (0 -+ 10 V, 4 - 20 mA)	**XMX-IO-B4-A** 138241			–
	Relay card	3 relays (normally open contact, N/O, 250 V, 2 A)	**XMX-IO-B5-A** 138242			–
	PT100 card	3 PT 100 thermistor inputs 24 V supply	**XMX-IO-B8-A** 138243			–
	Digital input/relay card	1 relay (normally open contact, N/O, 250 V, 2 A) 5 digital inputs (42 - 240 V AC)	**XMX-IO-B9-A** 138244			–
	Output card	1 relay (normally open contact, N/O, 250 V, 2 A) 1 digital output (transistor, 24 - 48 V DC) 1 analog output (0 -+ 10 V, 4 - 20 mA)	**XMX-IO-BF-A** 138245			–

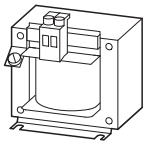
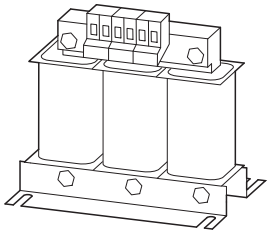
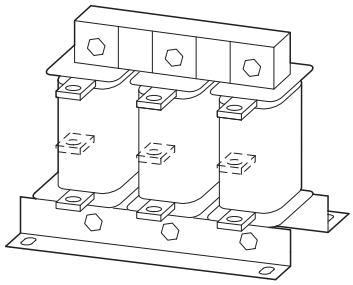
HPL10019EN

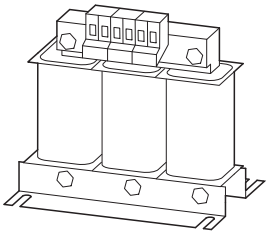
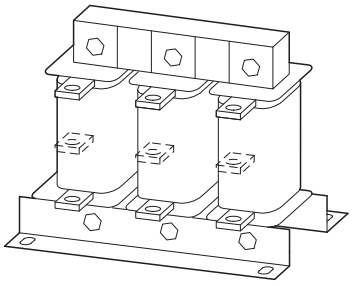
	Input current I_{LN} A	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Radio interference suppression filters, single-phase						
Maximum mains voltage U_{LN}: 240 + 10 % V (50/60 Hz)						
	9	MMX12AA1D7… MMX12AA2D4… MMX12AA2D8… MMX12AA3D7…	**MMX-LZ1-009** 138231		1 off	For mounting next to or underneath the MMX... for size FS1
	15	MMX12AA4D8… MMX12AA7D0…	**MMX-LZ1-015** 138232		1 off	For mounting next to or underneath the MMX... for size FS2
	17	MMX12AA9D6…	**MMX-LZ1-017** 138233		1 off	For mounting next to or underneath the MMX... for size FS3
Radio interference suppression filters, three-phase						
Maximum mains voltage U_{LN}: 480 + 10 % V (50/60 Hz)						
	6	MMX32AA1D7… MMX32AA2D4… MMX32AA2D8… MMX32AA3D7… MMX34AA1D3… MMX34AA1D9… MMX34AA2D4… MMX34AA3D3…	**MMX-LZ3-006** 138234		1 off	For mounting next to or underneath the MMX... for size FS1
	9	MMX32AA4D8… MMX32AA7D0… MMX34AA4D3… MMX34AA5D6…	**MMX-LZ3-009** 138235		1 off	For mounting next to or underneath the MMX... for size FS2
	22	MMX32AA9D6… MMX34AA7D6… MMX34AA9D0… MMX34AA012… MMX34AA014…	**MMX-LZ3-020** 138236		1 off	For mounting next to or underneath the MMX... for size FS3

	For use with		Part no. Article no.	Price See price list	Std. pack
Enclosure accessories					
Increased protection type IP21/NEMA 1, two-part enclosure cover with cable retention clip for EMC-conformant connection					
	For size FS1	MMX12AA1D7… MMX12AA2D4… MMX12AA2D8… MMX32AA1D7… MMX32AA2D4… MMX32AA2D8… MMX34AA1D3… MMX34AA1D9… MMX34AA2D4…	**MMX-IP21-FS1** 121407		1 off
	For size FS2	MMX12AA3D7… MMX12AA4D8… MMX12AA7D0… MMX32AA3D7… MMX32AA4D8… MMX32AA7D0… MMX34AA3D3… MMX34AA4D3… MMX34AA5D6…	**MMX-IP21-FS2** 121408		1 off
	For size FS3	MMX12AA9D6… MMX32AA9D6… MMX34AA7D6… MMX34AA9D0… MMX34AA012… MMX34AA014…	**MMX-IP21-FS3** 121409		1 off

DEX-LN...

HPL10020EN

	Rated operational current I_e A	Inductance L mH	Max. heat dissipation P_v W	**Part no.** Article no.	**Price** See price list	Std. pack
Mains chokes, single-phase						
Max. permissible mains voltage: 260 V +0 % (50/60 Hz)						
	5.8	5.05	9	**DEX-LN1-006** 269490		1 off
	8.6	3.41	11	**DEX-LN1-009** 269495		
	13	2.25	12	**DEX-LN1-013** 269496		
	18	1.63	17	**DEX-LN1-018** 269497		
	24	1.22	20	**DEX-LN1-024** 269498		
Mains chokes, three-phase						
Max. permissible mains voltage: 550 V +0 % (50/60 Hz)						
	3.9	7.51	17	**DEX-LN3-004** 269500		1 off
	6	4.9	19	**DEX-LN3-006** 269501		
	10	2.94	33	**DEX-LN3-010** 269502		
	16	1.84	44	**DEX-LN3-016** 269503		
	25	1.18	57	**DEX-LN3-025** 269504		
	40	0.64	59	**DEX-LN3-040** 269505		
	50	0.37	58	**DEX-LN3-050** 269506		
	60	0.31	60	**DEX-LN3-060** 269507		
	80	0.23	86	**DEX-LN3-080** 269508		
	100	0.18	101	**DEX-LN3-100** 269509		
	120	0.15	100	**DEX-LN3-120** 269510		
	160	0.11	140	**DEX-LN3-160** 269511		
	200	0.09	154	**DEX-LN3-200** 269512		
	250	0.07	155	**DEX-LN3-250** 269513		
	300	0.06	169	**DEX-LN3-300** 269514		

	Rated operational current	Inductance	Max. heat dissipation at 12 kHz	**Part no.** Article no.	**Price** See price list	Std. pack
	I_e	L	P_v			
	A	mH	W			
Motor chokes, three-phase						
Max. permissible mains voltage: 750 V +0 % (50/60 Hz)						
	5	2	24	**DEX-LM3-005** 269538		1 off
	8	4.1	54	**DEX-LM3-008** 269539		
	11	3	71	**DEX-LM3-011** 269541		
	16	1.5	78	**DEX-LM3-016** 269542		
	35	1	116	**DEX-LM3-035** 269543		
	50	0.6	168	**DEX-LM3-050** 269544		
	63	0.5	193	**DEX-LM3-063** 269545		
	80	0.5	206	**DEX-LM3-080** 269546		
	100	0.45	294	**DEX-LM3-100** 269547		
	150	0.35	424	**DEX-LM3-150** 269548		
	180	0.3	498	**DEX-LM3-180** 269549		
	220	0.2	517	**DEX-LM3-220** 269560		
	260	0.15	520	**DEX-LM3-260** 269561		

Series MMX

MMX32AA1D7F0-0 (example)

MMX	3	2	A	A	1D7	F	0	-	0
MMX	1	2	A	A	Variable code	F	0	-	0
	3	4				N			

MMX = Product family M-Max™

Number of phases
1 = Single-phase mains supply
3 = Three-phase mains supply

Voltage class
2 = 200 V (208 V -15 % to 240 V +10 %)
4 = 400 V (380 V -15 % to 480 V +10 %)

Version
A = Software version

Display unit
A = Display unit built-in

Rated operational current (in amperes)
xDy = x,y A (digital; e.g. 1D7 = 1.7 A)
0xy = xy A

Radio interference suppression filters
F = with integrated radio interference suppression filter (C2)
N = without radio interference suppression filter

Protection type
0 = IP20 = NEMA 0

Optional module
0 = no module built in

Series HMX

HMX34AG3D421-B (example)

HMX	3	4	A	G	3D4	2	1	-	B
HMX	3	2	A	G	Variable code	2	1	-	B
		4					2		

HMX = Product family H-Max™

Number of phases
3 = Three-phase mains supply

Voltage class
2 = 200 V (208 V -15 % to 240 V +10 %)
4 = 400 V (380 V -15 % to 480 V +10 %)

Version
A = Software version

Display unit
G = Graphics

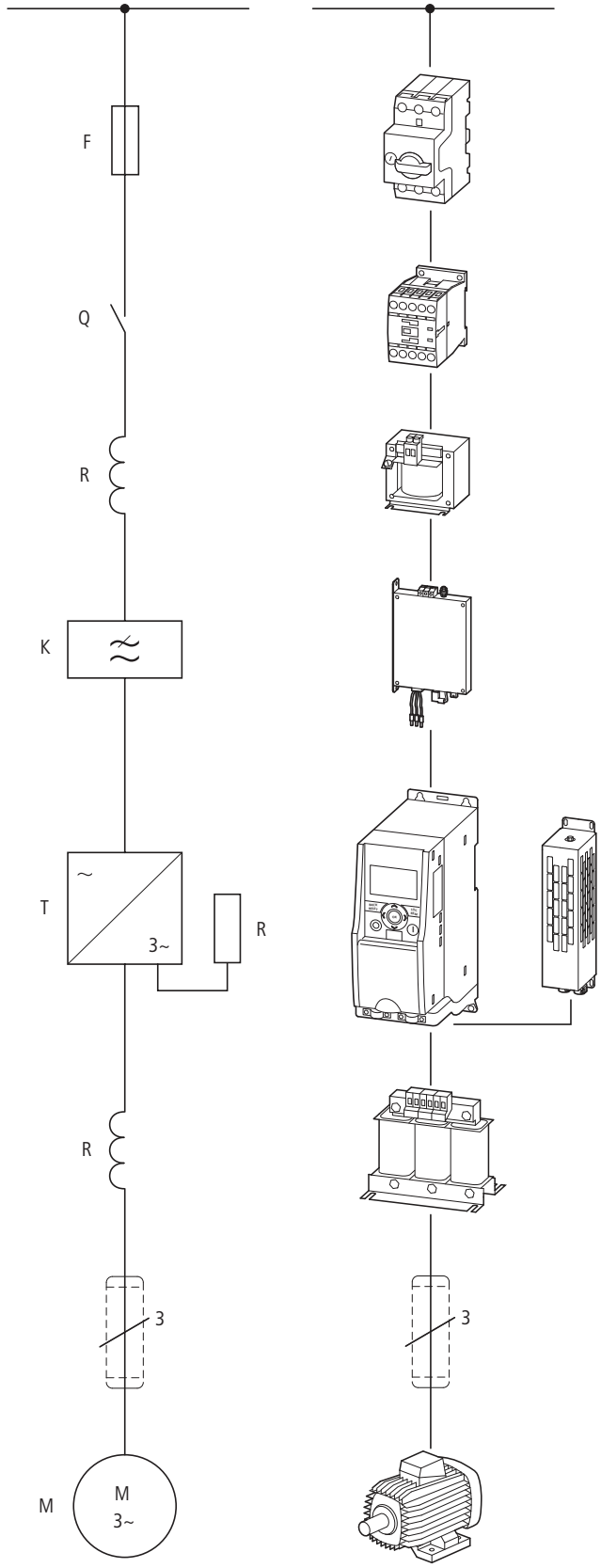
Rated operational current (in amperes)
xDy = x,y A (digital; e.g. 3D4 = 3.4 A)
xyz = xyz A

Radio interference suppression filter (built-in)
2 = C2

Protection type
1 = IP21 = NEMA 1
2 = IP54 = NEMA 2

Brake chopper
B = Built-in brake chopper

Engineering



Item designations
F = fuses and circuit-breakers
Q = controlled switching within energy flow (contactors, circuit-breakers)
R = limitation (reactors, chokes, resistors)
K = radio interference suppression filters
T = frequency inverters
M = motors

Frequency inverters can be connected without limitation to AC supply systems with a grounded star point (TN and TT networks).

Fuses (circuit-breakers) allow the protection of lines and electrical apparatus.
For personnel protection AC/DC-sensitive residual current devices (RCD Type B) are required in addition.

Contactors are used to switch mains voltage on and off.

Mains chokes attenuate any current harmonics and peaks and limit the inrush current (internal DC link capacitors).

Radio interference suppression filters attenuate high-frequency electromagnetic emissions from devices. They ensure that the EMC limit values for conducted interference specified in the applicable product standards are maintained (frequency inverters).

Frequency inverters allow a continuously variable speed control of three-phase motors.
A braking resistor convert the frequency inverter's regenerative braking energy into heat.
The frequency inverter must be equipped with a brake chopper, which connects the braking resistor parallel to the internal DC link.

Motor chokes
- Compensate the capacitive reactive currents,
- Reduce current ripple and the motor's current change noise,
- Attenuate the retroaction on parallel connection of several motors.

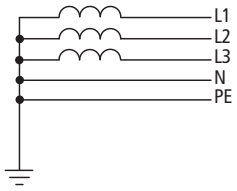
Sine-wave filters
- Smoothen the output voltage sinusoidally,
- Reduce motor noise through du/dt reduction, and thereby increase the motor insulation's lifespan,
- Reduce the leakage currents to allow better motor performance at improved EMC values.

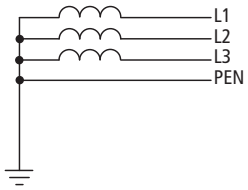
Shielded motor cables attenuate emitted and conducted high-frequency emissions within the limit values specified in the applicable product standard (EMC).

Three-phase asynchronous motor (standard motor)

Electrical mains connection

M-Max™ and H-Max™ frequency inverters can be connected and operated on star-point-grounded AC mains (according to IEC 60364) without limitation.





Connection and operation on asymmetrically grounded networks, such as phase-grounded delta (USA) or non-grounded or high-resistance-grounded (> 30 Ω) IT systems is permitted with limitations. In these networks only frequency inverters without integrated radio interference suppression filters (EMC) must be used. On devices with integrated radio interference suppression filter the filer's ground connection must be disconnected.

The standardized rated operational voltages of the utility companies fulfil the following conditions at the point of transfer to the consumer:

- Maximum deviation from the rated voltage (U_{LN}): ±10 %
- Maximum deviation in the voltage symmetry: ±3 %
- Maximum deviation from the rated frequency: ±4 %

Regarding the lower voltage value (U_{LN} -10 %) of the mains voltage, a further voltage drop of 4 percent in the consumer networks is permissible. The power supply voltage at the consumer must have a value of U_{LN} -14 %.

In ring-operated mesh networks (such as in the EU) the standardized consumer voltages (230/400/690 V) are identical with the utility company's supply voltages. In star networks (for example in North America/USA), the stated consumer voltages take the voltage drop from the utility company's infeed point to the last consumer into account.

Supply voltage U_{LN} of the utility company	Motor voltage according to UL 508 C	Consumer voltage, rated value for the motors
120 V	110 - 120 V	115 V
240 V	220 - 240 V	230 V
480 V	440 - 480 V	460 V
600 V	550 - 600 V	575 V

The wide tolerance band of the frequency inverters of the M-Max™ and H-Max™ series takes all known deviations from the standardized rated operational voltages worldwide into account (IEC 60038):

230 V: 208 V -15 % - 240 V +10 %
400 V: 380 V -15 % - 480 V +10 %
The permissible frequency range is 50 Hz -10 % – 60 Hz +10 %.

Safety and switching

The mains-side components are assigned according to the frequency inverter's input-side rated operational current I_{LN} and utilization category AC-1.

Fuses, circuit-breakers and conductor cross-sections must meet the national and regional requirements and the required approvals at the point of operation.

For fire prevention and the protection of persons and domestic animals from excessive contact voltages residual-current devices (RCD) must be used. In combination with a frequency inverter only AC/DC sensitive RCDs (Type B) must be used.

Identification on the residual-current circuit-breakers

AC/DC sensitive (RCD, type B)



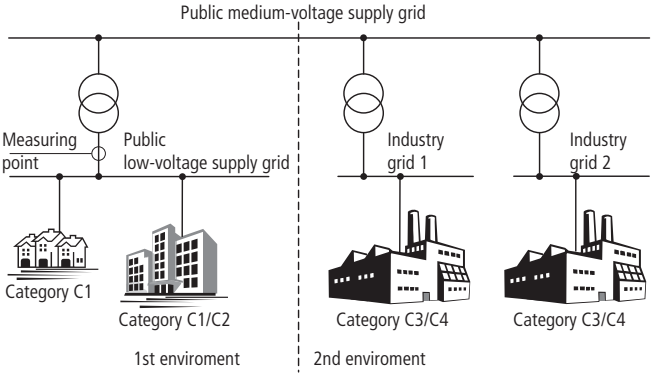
With frequency-controlled power drive systems (PDS), leakage currents to ground occur. The main causes are external capacitances between the phases of the motor cable, the motor cable shielding, Y capacitors in the frequency inverter and radio interference suppression filters and grounding measures at the motor's site of operation. These leakage currents can exceed 3.5 mA and require increased grounding of the PDS according to EN 50178 (ground conductor cross-section ≥ 10 mm²).

EMC measures

Frequency inverters work with fast electronic switches (IGBT) in the inverter. This can cause radio interference in a PDS, which, in turn, can adversely affect nearby electronic equipment. To provide protection from this high-frequency interference, these should be spatially separated and shielded from frequency-controlled PDS.

In Europe, adherence to the EMC Directive is mandatory. The EMC product standard for power drive systems (PDS) is IEC/EN 61800-3. This standard covers the complete drive system, from mains infeed to the motor.

Both versions of the frequency inverters of the M-Max™ and H-Max™ series (with built-in and external radio interference suppression filter) fulfil the requirements of the EMC product standard for residential areas (first environment), and therefore also for the higher limit values in industrial areas (second environment).



Frequency inverters

The frequency inverter is an electronic apparatus for controlling variable-speed drives with three-phase motors. It is intended for installation in a machine or for assembly with other components to a machine or plant. The main components of a modern compact frequency inverter are a power section and a control section. Example: M-Max™ series

The frequency inverter's control section contains a centrally controlling microprocessor, through which all variable values that occur in the frequency inverter are influenced. These values and all control functions are represented as parameters.

The functional control of the frequency inverter and the output values in the power section (such as frequency, voltage and current) can be adjusted through:

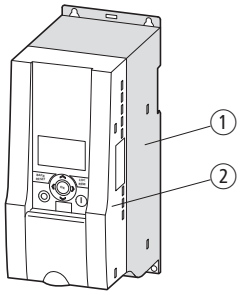
- control terminals (I/O) with analog and digital (binary) inputs,
- a keypad with function keys and display,
- serial interfaces (bus) with RS485 (Modbus RTU) and optional field bus connections (CANopen, PROFIBUS-DP, etc.) and an optional PC connection.

Internal open and closed-loop control circuits monitor all variable values in the frequency inverter and automatically switch the process off if a quantity value reaches a dangerous level.

The power section of a static and compact frequency generally consists of three subgroups:

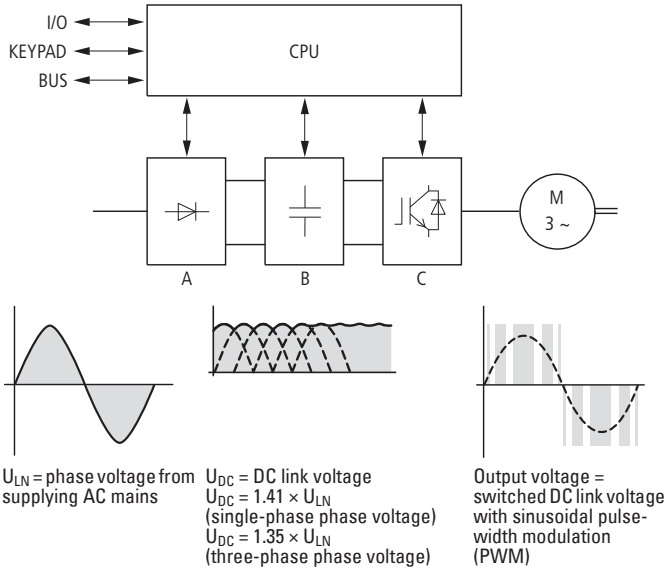
- Rectifier (A),
- Internal DC link (B),
- Inverter module (C).

The devices of the H-Max™ series contain a brake chopper as standard. Depending on their rating, some devices of the M-Max™ series also contain a brake chopper.



① **Power section** with:
A = Rectifier
B = Internal DC link
C = Inverter module

② **Control section** with:
I/O = analog and binary inputs and outputs
KEYPAD = keypad with display
BUS = serial interfaces (RS485, field bus, PC interface)



U_{LN} = phase voltage from supplying AC mains

U_{DC} = DC link voltage
$U_{DC} = 1.41 \times U_{LN}$ (single-phase phase voltage)
$U_{DC} = 1.35 \times U_{LN}$ (three-phase phase voltage)

Output voltage = switched DC link voltage with sinusoidal pulse-width modulation (PWM)

Block diagram with main components of a frequency inverter

Modulation

The IGBTs in the inverter of the M-Max™ and H-Max™ frequency inverters are controlled with sinusoidal pulse-width modulation (PWM). Two control methods are possible:

- Voltage/frequency (U/f) control,
- Sensorless vector control (speed control).

Voltage/frequency control is the best-known and most commonly used method. A simple characteristic curve (linear or square) defines the motor's rotating field frequency and the corresponding three-phase line-to-line voltage of the motor is selected so that the motor is neither over magnetized nor under magnetized.

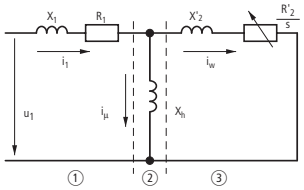
The main fields of application of U/f control are:

- Pump and fan drives,
- Horizontal conveying and transportation systems,
- Drives with several motors (parallel operation of several motors at the output of a frequency inverter).

In **sensorless vector control** the magnetic fields of the stator and rotor windings are aligned so as to oppose each other. With asynchronous motors the magnetic flux in the rotor must be described in an electronic model of the motor. This requires the physical parameters on the motor's rating plate to be entered.
In vector operation the frequency inverter can control only one motor. A parallel operation of several motors is not possible here. The exact calculation of the phase voltages at the frequency inverter's output, however, improves the motor's operational behavior. The motor also heats up less in the lower speed range. The field-oriented vector control results in a significant improvement in the drive dynamics as well as optimizing performance; it also increases the range of possible applications.

The main applications of sensorless vector control are:

- Material processing machines,
- compressors,
- Heavy starting duty (extruders, agitators, mixers),
- Horizontal conveying equipment (cranes, elevators).



① Stator winding
② Air gap
③ Transformed rotor winding

Simplified equivalent circuit diagram with associated current vectors

Explanation:
EMC = electromagnetic compatibility
IGBT = insulated-gate bipolar transistor
PDS = power drive system
RCD = residual-current device

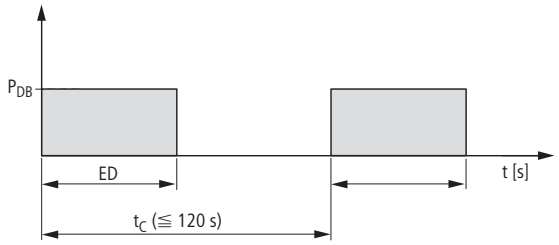
Technical information about the braking resistors:

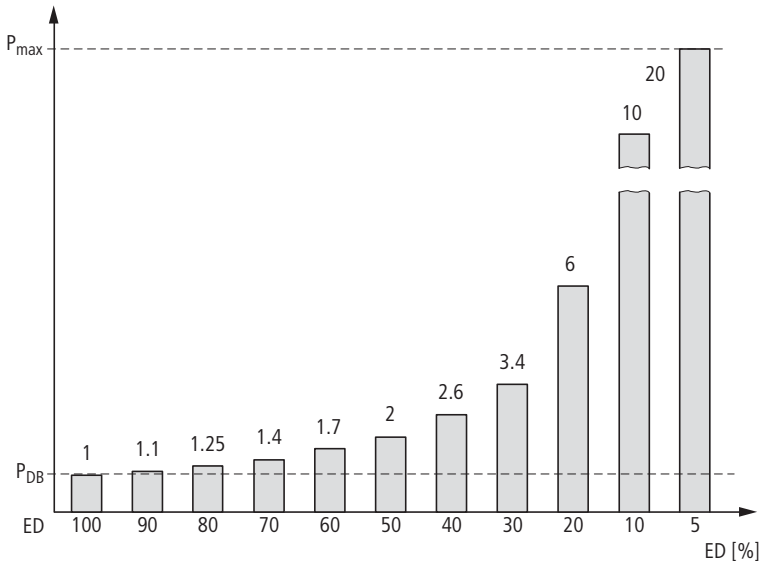
The stated ratings P_{DB} of the braking resistors apply to continuous operation.
In short-time operation these values can be increased through multiplication with the type-specific power factor according to the following formula:

$$P_{max} \leq (P_{DB} \times 100\ \%) \div DF\ [\%]$$

P_{max} = max. pulse rating
P_{DB} = continuous rating at a duty factor of 100 %
DF = duty factor
t_c = cycle time (max. 120 seconds)
The duty factor is given in percent (%) and is calculated with the following formula:

$$DF\ [\%] = (DF \times 100\ \%) \div t_c$$



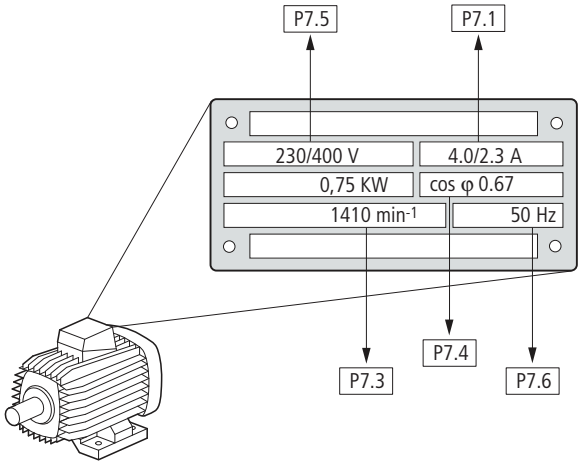


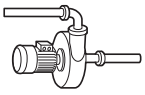
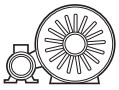
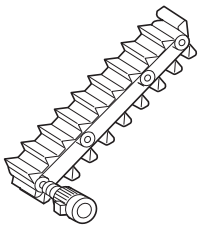
Connecting example for a 0.75 kW motor with the rating plate illustrated here

By default, the M-Max™ frequency inverters are configured so that they can be operated immediately without configuration when connected to the assigned motor rating.

To ensure an optimum operational behavior, the data on the motor's rating label should be entered in the frequency inverter (electrical image).

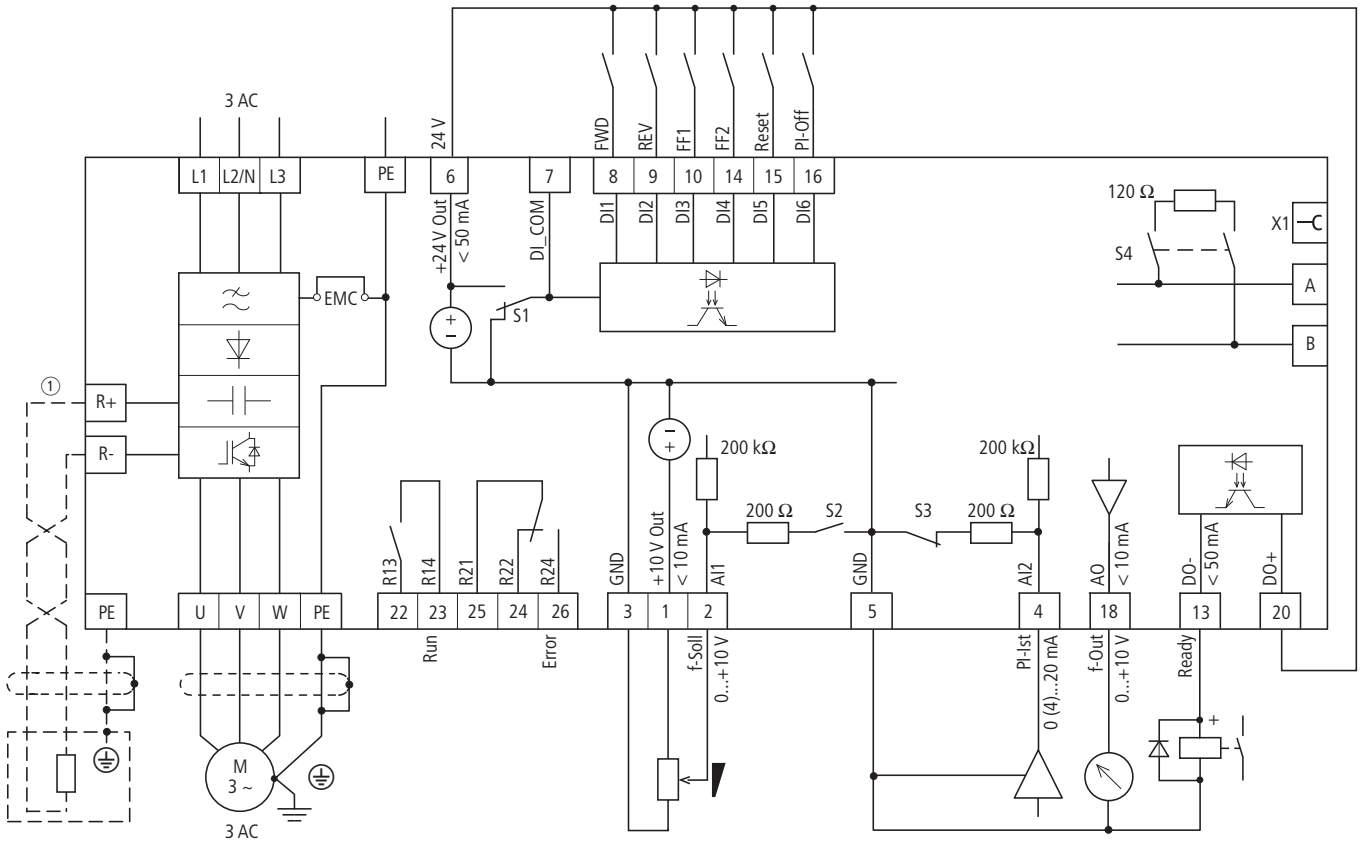
The following example shows the parameters for quick configuration with the selected drive-specific parameters for four standard applications.



Parameters	Basic (Standard drive)	Pump drive	Fan drive	Feed unit (high load)	Designation
P1.1	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	Parameter range
P1.2	0 = Basic	1 = Pump drive	2 = Fan drive	3 = Feed unit (High load)	Application
P 1.3	0 = EU	0 = EU	0 = EU	0 = EU	Default settings country-specific (EU/USA)
P6.1	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	Control level
P6.2	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	Setpoint input (0 - 10 V) terminal 2
P6.3	0.00 Hz	20.00 Hz	20.00 Hz	0.00 Hz	Minimum frequency
P6.4	50.00 Hz	50.00 Hz	50.00 Hz	50.00 Hz	Maximum frequency
P6.5	3.0 s	5.0 s	20.0 s	1.0 s	Acceleration time (acc1)
P6.6	3.0 s	5.0 s	20.0 s	1.0 s	Deceleration time (dec1)
P 6.7	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	Start function
P6.8	0 = Free coasting	1 = Ramp (deceleration)	0 = Free coasting	0 = Free coasting	Stop function
P7.1	I_e	I_e	I_e	I_e	Motor, rated operational current[2)]
P7.3	1440 rpm	1440 rpm	1440 rpm	1440 rpm	Motor, rated speed (rpm)[2)]
P7.4	0.85	0.85	0.85	0.85	Power factor of the motor (cos φ)[2)]
P7.5	230/400 V[1)]	230/400 V[1)]	230/400 V[1)]	230/400 V[1)]	Motor, rated operational voltage
P7.6	50.00 Hz	50.00 Hz	50.00 Hz	50.00 Hz	Motor, rated frequency
P11.7	0 = Deactivated	0 = Deactivated	0 = Deactivated	1 = Enabled	Torque increase
M1.1	0.00 Hz	0.00 Hz	0.00 Hz	0.00 Hz	Output frequency

Notes
[1)] 230 V = MMX12…, MMX32…; 400 V = MMX34…
[2)] Depending on output



Block diagram MMX32 and MMX34
Terminals R+ and R- for external braking resistor (optional), only with MMX34…4D3…, MMX34…5D6…, MMX34…7D6…, MMX34…9D0, MMX34…012… and MMX34…014…

The control signal terminals have the following default assignment

2: AI1: f-Soll = frequency reference value (0 - +10 V)

4: AI2: PI-Ist = PID controller actual value (Process variable, 4 - 20 mA)

8: DI1: FWD = enable forward (clockwise rotating field)

9: DI2: REV = enable reverse (counterclockwise rotating field)

10: DI3: FF1 = Fixed frequency 1

13: DO-: Ready = Ready for operation (transistor output with voltage of terminal 20)

14: DI4: FF2 = Fixed frequency 2

15: DI5: Reset = Error message acknowledge

16: DI6: PI-Off = PID controller disabled

18: AO: f-Out = output frequency to motor (0 – +10 V)

20: DO+: input voltage for transistor output

22/23: R13/R14: RUN = run signal (relay)

24/25/26: R21/R22/R24: Error = error message (relay)

The function of the digital inputs and outputs, and the scaling of the analog inputs and outputs are defined with parameters. These are described in manual AWB8230-1603.

Part no.		Motor		Frequency inverters		Mains supply	Motor connection					
With internal radio interference suppression filter	Without internal radio interference suppression filter	Assigned motor rating (U_{LN}, 50/60 Hz)	Motor current[1]	Rated operational current Frequency inverters	Mains current Without mains choke	Short-circuit and cable protection (fuse)[2]	Short-circuit and cable protection (fuse)	Mains contactor	Mains contactor with parallel connector (main current-paths)[3]	Mains choke	Radio interference suppression filters (only for part nos. MMX…N…)	Motor chokes	Sine-wave filters
		P	I_e	I_e	I_{LN}								
		kW	A	A	A								
MMX12… frequency inverters Single-phase mains connection (1 AC 230 V/240 V)													
MMX12AA1D7F0-0	MMX12AA1D7N0-0	0.25	1.4	1.7	4.2	FAZ-B10/1N	–	DILM7	DILEM+P1DILEM	DEX-LN1-006	MMX-LZ1-009	DEX-LM3-005	SFB400/4
MMX12AA2D4F0-0	MMX12AA2D4N0-0	0.37	2	2.4	5.7	FAZ-B10/1N	–	DILM7	DILEM+P1DILEM	DEX-LN1-006	MMX-LZ1-009	DEX-LM3-005	SFB400/4
MMX12AA2D8F0-0	MMX12AA2D8N0-0	0.55	2.7	2.8	6.6	FAZ-B10/1N	–	DILM7	DILEM+P1DILEM	DEX-LN1-009	MMX-LZ1-009	DEX-LM3-005	SFB400/4
MMX12AA3D7F0-0	MMX12AA3D7N0-0	0.75	3.2	3.7	8.3	FAZ-B10/1N	–	DILM7	DILEM+P1DILEM	DEX-LN1-009	MMX-LZ1-009	DEX-LM3-005	SFB400/4
MMX12AA4D8F0-0	MMX12AA4D8N0-0	1.1	4.6	4.8	11.2	FAZ-B20/1N	–	DILM7	–	DEX-LN1-013	MMX-LZ1-015	DEX-LM3-005	SFB400/10
MMX12AA7D0F0-0	MMX12AA7D0N0-0	1.5	6.3	7	14.1	FAZ-B20/1N	–	DILM7	–	DEX-LN1-018	MMX-LZ1-015	DEX-LM3-008	SFB400/10
MMX12AA9D6F0-0	MMX12AA9D6N0-0	2.2	8.7	9.6	15.8	FAZ-B32/1N	–	DILM7	–	DEX-LN1-018	MMX-LZ1-017	DEX-LM3-011	SFB400/10
MMX32… frequency inverters Three-phase mains connection (3 AC 230 V/240 V)													
MMX32AA1D7F0-0	MMX32AA1D7N0-0	0.25	1.4	1.7	2.7	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX32AA2D4F0-0	MMX32AA2D4N0-0	0.37	2	2.4	3.5	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX32AA2D8F0-0	MMX32AA2D8N0-0	0.55	2.7	2.8	3.8	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX32AA3D7F0-0	MMX32AA3D7N0-0	0.75	3.2	3.7	4.3	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-006	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX32AA4D8F0-0	MMX32AA4D8N0-0	1.1	4.6	4.8	6.8	FAZ-B10/3	PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-005	SFB400/10
MMX32AA7D0F0-0	MMX32AA7D0N0-0	1.5	6.3	7	8.4	FAZ-B10/3	PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-008	SFB400/10
MMX32AA011F0-0	MMX32AA011N0-0	2.2	8.7	11	13.4	FAZ-B20/3	PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-011	SFB400/10
MMX34… frequency inverters Three-phase mains connection (3 AC 400 V/480 V)													
MMX34AA1D3F0-0	MMX34AA1D3N0-0	0.37	1.1	1.3	2.2	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX34AA1D9F0-0	MMX34AA1D9N0-0	0.55	1.5	1.9	2.8	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX34AA2D4F0-0	MMX34AA2D4N0-0	0.75	1.9	2.4	3.2	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX34AA3D3F0-0	MMX34AA3D3N0-0	1.1	2.6	3.3	4	FAZ-B6/3	PKM0-6,3	DILEM	–	DEX-LN3-006	MMX-LZ3-006	DEX-LM3-005	SFB400/4
MMX34AA4D3F0-0	MMX34AA4D3N0-0	1.5	3.6	4.3	5.6	FAZ-B10/3	PKM0-10	DILEM	–	DEX-LN3-006	MMX-LZ3-009	DEX-LM3-005	SFB400/4
MMX34AA5D6F0-0	MMX34AA5D6N0-0	2.2	5	5.6	7.3	FAZ-B10/3	PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-008	SFB400/10
MMX34AA7D6F0-0	MMX34AA7D6N0-0	3	6.6	7.6	9.6	FAZ-B20/3	PKM0-20	DILEM	–	DEX-LN3-010	MMX-LZ3-020	DEX-LM3-008	SFB400/10
MMX34AA9D0F0-0	MMX34AA9D0N0-0	4	8.5	9	11.5	FAZ-B20/3	PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-011	SFB400/10
MMX34AA012F0-0	MMX34AA012N0-0	5.5	11.3	12	14.9	FAZ-B20/3	PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-016	SFB400/16.5
MMX34AA014F0-0	MMX34AA014N0-0	7.5[4]	15.2[4]	14[4]	18.7	FAZ-B25/3	PKM0-25	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-016	SFB400/16.5

Notes

All data apply at an ambient air temperature of up to +50 °C.

1) The rated motor currents apply to normal internally and surface-cooled three-phase motors with 1500 rpm at 50 Hz or 1800 rpm at 60 Hz.
2) If a frequency inverter is operated without mains chokes, current peaks can occur when mains power is applied. This can cause the FAZ-B… to trip prematurely.
Remedy: fit a mains choke upstream or use an FAZ-C...
3) Instead of PKM0, PKZM0 can also be used.
4) Reduced rated operational data: Ambient air temperature up to +40 °C, operating frequency up to 4 kHz, mounting distance at sides (left and right) > 10 mm

cable protection FAZ, PKM, PKZM → chapter 7, 19
DIL mains contactor → chapter 5
Mains chokes DEX-LN… → Page 10/20
Radio interference suppression filters MMX-LZ… → Page 10/19
DEX-LM3-… motor chokes → Page 10/21
Sinusoidal filters SFB400/... please enquire

Engineering

Part no.		Motor		Frequency inverters		Mains supply		Motor connection	
Protection type IP21	Protection type IP54	Assigned motor rating (U_{LN}, 50/60 Hz)	Motor current[1]	Rated operational current Frequency inverters	Mains current (DC link choke)	Short-circuit and line protection (fuse)[2]	Mains contactor	Motor chokes	Sine-wave filters
		P	I_e	I_e	I_{LN}				
		kW	A	A	A				
HMX32… frequency inverters Three-phase mains connection (3 AC 230 V/240 V)									
HMX32AG3D721-B	HMX32AG3D722-B	0.75	3.2	3.7		PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
HMX32AG4D821-B	HMX32AG4D822-B	1.1	4.6	4.8		PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
HMX32AG6D621-B	HMX32AG6D622-B	1.5	6.3	6.6		PKM0-10	DILEM	DEX-LM3-008	SFB400/10
HMX32AG8D021-B	HMX32AG8D022-B	1.5	6.3	8		PKM0-10	DILEM	DEX-LM3-008	SFB400/10
HMX32AG01121-B	HMX32AG01122-B	2.2	8.7	11		PKM0-16	DILM7	DEX-LM3-011	SFB400/16.5
HMX32AG01221-B	HMX32AG01222-B	3	11.5	12.5		PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
HMX32AG01821-B	HMX32AG01822-B	4	14.8	18		PKM0-25	DILM7	DEX-LM3-035	SFB400/32
HMX32AG02421-B	HMX32AG02422-B	5.5	19.6	24.2		PKM0-32	DILM17	DEX-LM3-035	SFB400/32
HMX32AG03121-B	HMX32AG03122-B	7.5	26.4	31		PKM4-40	DILM17	DEX-LM3-035	SFB400/32
HMX32AG04821-B	HMX32AG04822-B	11	38	48		PKM4-50	DILM40	DEX-LM3-050	SFB400/48
HMX32AG06221-B	HMX32AG06222-B	15	51	62		PKM4-63	DILM50	DEX-LM3-063	SFB400/115
HMX32AG07721-B	HMX32AG07722-B	18.5	63	77		NZM...1-A80	DILM65	DEX-LM3-080	SFB400/115
HMX32AG08821-B	HMX32AG08822-B	22	71	88		NZM...1-A100	DILM80	DEX-LM3-100	SFB400/115
HMX32AG10621-B	HMX32AG10622-B	30	96	106		NZM...1-A125	DILM95	DEX-LM3-100[2]	SFB400/115
HMX32AG14321-B	HMX32AG14322-B	37	117	143		NZM...1-A160	DILM150	DEX-LM3-150	SFB400/150
HMX32AG17021-B	HMX32AG17022-B	45	141	170		NZM...2-A200	DILM170	DEX-LM3-180	SFB400/180
HMX32AG20521-B	HMX32AG20522-B	55	173	208		NZM...2-A250	DILM185	DEX-LM3-220	SFB400/250
HMX32AG26121-B	HMX32AG26122-B	75	233	261		NZM...3-AE400	DILM185	DEX-LM3-260	SFB400/440
HMX32AG31021-B	HMX32AG31022-B	90	279	310		NZM...3-AE400	DILM250	Please enquire	SFB400/440
HMX34… frequency inverters Three-phase mains connection (3 AC 400 V/480 V)									
HMX34AG3D421-B	HMX34AG3D422-B	1.1	2.6	3.4		PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
HMX34AG4D821-B	HMX34AG4D822-B	1.5	3.6	4.8		PKM0-6,3	DILEM	DEX-LM3-008	SFB400/10
HMX34AG5D621-B	HMX34AG5D622-B	2.2	5	5.6		PKM0-10	DILEM	DEX-LM3-008	SFB400/10
HMX34AG8D021-B	HMX34AG8D022-B	3	6.6	8		PKM0-10	DILEM	DEX-LM3-011	SFB400/10
HMX34AG9D621-B	HMX34AG9D622-B	4	8.5	9.6		PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
HMX34AG01221-B	HMX34AG01222-B	5.5	11.3	12		PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
HMX34AG01621-B	HMX34AG01622-B	7.5	15.2	16		PKM0-25	DILM7	DEX-LM3-035	SFB400/23.5
HMX34AG02321-B	HMX34AG02322-B	11	21.7	23		PKM0-32	DILM17	DEX-LM3-035	SFB400/32
HMX34AG03121-B	HMX34AG03122-B	15	29.3	31		PKM4-40	DILM17	DEX-LM3-050	SFB400/37
HMX34AG03821-B	HMX34AG03822-B	18.5	36	38		PKM4-50	DILM40	DEX-LM3-050	SFB400/48
HMX34AG04621-B	HMX34AG04622-B	22	41	46		PKM4-63	DILM50	DEX-LM3-063	SFB400/115
HMX34AG06121-B	HMX34AG06122-B	30	55	61		NZM...1-A80	DILM65	DEX-LM3-080	SFB400/115
HMX34AG07221-B	HMX34AG07222-B	37	68	72		NZM...1-A100	DILM80	DEX-LM3-100	SFB400/115
HMX34AG08721-B	HMX34AG08722-B	45	81	87		NZM...1-A125	DILM95	DEX-LM3-100[2]	SFB400/115
HMX34AG10521-B	HMX34AG10522-B	55	99	105		NZM...1-A160	DILM150	DEX-LM3-150	SFB400/150
HMX34AG14021-B	HMX34AG14022-B	75	134	140		NZM...2-A200	DILM170	DEX-LM3-180	SFB400/180
HMX34AG17021-B	HMX34AG17022-B	90	161	170		NZM...2-A250	DILM185	DEX-LM3-220	SFB400/250
HMX34AG20521-B	HMX34AG20522-B	110	196	205		NZM...3-AE400	DILM185	DEX-LM3-260	SFB400/440
HMX34AG26121-B	HMX34AG26122-B	132	231	261		NZM...3-AE400	DILM250	Please enquire	SFB400/440
HMX34AG31021-B	HMX34AG31022-B	160	279	310					

Notes All data apply at an ambient air temperature of up to +40 °C.

1) The rated motor currents apply to normal internally and surface-cooled three-phase motors with 1500 rpm at 50 Hz or 1800 rpm at 60 Hz.
2) At motor currents above 100 A use frame size DEX-LM3-150.

DIL mains contactor → chapter 5
DEX-LM3-… motor chokes → Page 10/21
SFB400/... sine-wave filters please enquire

Technical data

MMX12...

			MMX...1D7...	MMX...2D4...	MMX...2D8...	MMX...3D7...	MMX...4D8...	MMX...7D0...	MMX...9D6...
Power side (primary side)									
Number of phases			1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)
Mains connection voltage	U_{LN}								
IEC (50/60Hz)		V	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
UL/CSA (45 - 66 Hz ±0 %)		V	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %
Rated operational voltage	U_e	V	230	230	230	230	230	230	230
Rated operational current	I_e	A	1.7	2.4	2.8	3.7	4.8	7	9.6
Input current	I_{LN}	A	4.2	5.7	6.6	8.3	11.2	14.1	15.8
Overload current for 60 s every 600 s at 50 °C		A	2.6	3.6	4.2	5.6	7.2	10.4	14.4
Starting current for 2 s every 20 s at 50 °C		A	3.4	4.8	5.6	7.4	9.6	14	19.2
Maximum leakage current to ground (PE) without motor	I_{PE}	mA	15.4	15.4	15.4	11.8	11.8	11.8	24.4
Apparent power at rated operation 230 V		kVA	0.68	0.96	1.12	1.47	1.91	2.79	3.82
Apparent power at rated operation 240 V		kVA	0.71	0.99	1.16	1.54	1.99	2.91	3.99
Assigned motor rating (230 V)	P	kWh	0.25	0.37	0.55	0.75	1.1	1.5	2.2
Assigned motor rating (230 V)	P	HP	1/3[1)]	1/2	1/2	3/4	1.0	2.0	3.0
Braking torque									
Standard			Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N
DC braking			Max. 100 % of rated operational current I_e, adjustable						
Pulse frequency	f_{PWM}	kHz	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
Heat dissipation at rated operational current I_e	P_V	W	17.9	24.6	29.2	40.2	49.6	66.8	78.1
Efficiency	η		0.93	0.93	0.95	0.95	0.95	0.96	0.96
Fan (built into device, temperature-controlled)			•	•	•	•	•	•	•
Frame size			FS1	FS1	FS1	FS2	FS2	FS2	FS3
Weight	m	kg	0.55	0.55	0.55	0.70	0.70	0.70	0.99

Notes

[1)] Not a standardized output

MMX32...

			MMX...1D7...	MMX...2D4...	MMX...2D8...	MMX...3D7...	MMX...4D8...	MMX...7D0...	MMX... 011...
Power side (primary side):									
Number of phases			3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)
Mains connection voltage	U_{LN}	U_{LN}							
IEC (50/60Hz)			208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
UL/CSA (45 - 66 Hz ±0 %)			177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %
Rated operational voltage	U_e	U_e	230	230	230	230	230	230	230
Rated operational current	I_e	I_e	1.7	2.4	2.8	3.7	4.8	7	11
Input current	I_{LN}	I_{LN}	2.7	3.5	3.8	4.3	6.8	8.4	13.4
Overload current for 60 s every 600 s at 50 °C			2.6	3.6	4.2	5.6	7.2	10.4	14.4
Starting current for 2 s every 20 s at 50 °C			3.4	4.8	5.6	7.4	9.6	14	19.2
Maximum leakage current to ground (PE) without motor		I_{PE}	8.6	8.6	8.6	16.1	16.1	16.1	8.6
Apparent power at rated operation 230 V			0.68	0.96	1.12	1.47	1.91	2.79	3.82
Apparent power at rated operation 240 V			0.71	0.99	1.16	1.54	1.99	2.91	3.99
Assigned motor rating (230 V)		P	0.25	0.37	0.55	0.75	1.1	1.5	2.2
Assigned motor rating (230 V)		P	1/3[1)]	1/2	1/2	3/4	1.0	2.0	3.0
Braking torque									
Standard			Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N
DC braking			Max. 100 % of rated operational current I_e, adjustable						
Pulse frequency		f_{PWM}	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
Heat dissipation at rated operational current I_e		P_V	17.4	23.7	28.3	37.9	48.4	63.8	84.0
Efficiency	η	η	0.93	0.94	0.95	0.95	0.96	0.96	0.96
Fan (built into device, temperature-controlled)			•	•	•	•	•	•	•
Frame size			FS1	FS1	FS1	FS2	FS2	FS2	FS3
Weight		m	0.55	0.55	0.55	0.70	0.70	0.70	0.99

Notes

[1)] Guide value, not a standardized output

			MMX...1D3...	MMX...1D9...	MMX...2D4...	MMX...3D3...	MMX...4D3...	MMX...5D6...	MMX...7D6...	MMX...9D0...	MMX...012...	MMX...014...
Power side (primary side):												
Number of phases			3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)
Mains connection voltage	U_{LN}											
IEC (50/60Hz)		V	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %
UL/CSA (45 - 66 Hz ±0 %)		V	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %
Rated operational voltage	U_e	V	400	400	400	400	400	400	400	400	400	400
Rated operational current	I_e	A	1.3	1.9	2.4	3.3	4.3	5.6	7.6	9.0	12.0	21.0
Input current	I_{LN}	A	2.2	2.8	3.2	4.0	5.6	7.3	9.6	11.5	14.9	18.7
Overload current for 60 s every 600 s at 50 °C		A	2.0	2.9	3.6	5.0	6.5	8.4	11.4	13.5	18.0	21.0
Starting current for 2 s every 20 s at 50 °C		A	2.6	3.8	4.8	6.6	8.6	11.2	15.2	18.0	24.0	28.0
Maximum leakage current to ground (PE) without motor	I_{PE}	mA	45.1	45.1	45.1	25.1	25.1	25.1	24.9	24.9	24.9	24.9
Apparent power at rated operation 400 V		kVA	0.9	1.32	1.66	2.29	2.98	3.88	5.27	6.24	8.32	9.70
Apparent power at rated operation 480 V		kVA	1.08	1.56	2.00	2.74	3.57	4.66	6.32	7.48	9.98	11.64
Assigned motor (400 V)	P	kWh	0.37	0.55	0.75	1.10	1.50	2.20	3.00	4.00	5.50	7.50[2]
Assigned motor rating (460 V)	P	HP	1/2	3/4	1	1-1/2	2	3	4[3]	5	7-1/2	10
Braking torque												
Standard			Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N
DC braking			Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable	Max. 100 % of rated operational current I_e, adjustable
Brake chopper with external braking resistor						Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor	Max. 100 % of rated operational current I_e with external braking resistor
Minimum braking resistance	R_B	Ω				55	55	55	35	35	35	35
Closing ripple for braking transistor	U_{DC}	V DC				765	765	765	765	765	765	765
Pulse frequency	f_{PWM}	kHz	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	1 - 4, adjustable
Heat dissipation at rated operational current I_e	P_V	W	21.7	29.7	31.7	51.5	66.4	88.3	116.9	136.2	185.1	223.7
Efficiency	η		0.94	0.95	0.95	0.95	0.96	0.96	0.96	0.97	0.97	0.97
Fan (built into device, temperature-controlled)			•	•	•	•	•	•	•	•	•	•
Frame size			FS1	FS1	FS1	FS2	FS2	FS2	FS3	FS3	FS3	FS3
Weight	m	kg	0.55	0.55	0.55	0.70	0.70	0.70	0.99	0.99	0.99	0.99

Notes

[1] The rated operational data of the MMX34AA014… is limited to 4 kHz at a maximum ambient air temperature of +40 °C.

[2] Assigned motor rating with reduced load torque (about -10 %)

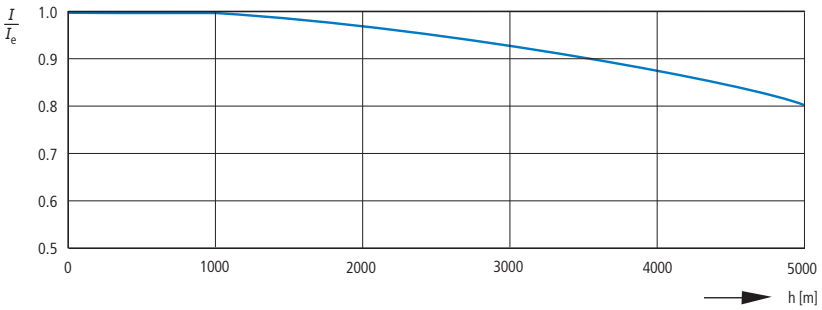
[3] Guide value, not a standardized output

Technical data

			Mains chokes DEX-LN1-…	Mains chokes DEX-LN3-…	DEX-LM3-… motor chokes
General					
Standards			IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA	IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA	IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA
Operating temperature	ϑ	°C	-25 – +40, up to 70 with current reduction (see note)	-25 – +40, up to 70 with current reduction (see note)	-25 – +40, up to 70 with current reduction (see note)
Storage temperature	ϑ	°C	-25 - +85	-25 - +85	-25 - +85
Mechanical shock resistance			11 ms²/15 g, 3 impacts	11 ms²/15 g, 3 impacts	11 ms²/15 g, 3 impacts
Resistance to vibration		g	1 (0 - 150 Hz)	1 (0 - 150 Hz)	1 (0 - 150 Hz)
Vibration			0.35 mm at 10 - 55 Hz	0.35 mm at 10 - 55 Hz	0.35 mm at 10 - 55 Hz
Pollution degree			1 (VDE 0160)	1 (VDE 0160)	1 (VDE 0160)
Installation altitude	H	m	0 – 1000 above seal level, up to 5000 with current reduction (see note)	0 – 1000 above seal level, up to 5000 with current reduction (see note)	0 – 1000 above seal level, up to 5000 with current reduction (see note)
Mounting position			Standing vertically, suspended horizontally	Standing vertically, suspended horizontally	Standing vertically, suspended horizontally
Free surrounding areas			< 50	< 50	< 50
Degree of protection (terminals)			IP20	IP20 to 40 A IP00 from 50 A	IP20 up to 50 A IP00 from 63 A
Rated duty factor		% DF	100	100	100
Overload cycle			1.5 x I_e for 60 s every 600 s	1.5 x I_e for 60 s every 600 s	1.5 x I_e for 60 s every 600 s (< 24 A) 1.2 x I_e for 60 s every 600 s (> 24 A)
Weight	m	kg	0.7 - 2	1.5 - 20.6	1.5 - 45
Electrical data					
Rated operational voltage	U_e	V AC	230/240	400/480	230/400/460/575
Max. supply voltage	U_L	V AC	260 +0 %	550 +0 %	750 +0 %
Operating frequency	*f*	Hz	50/60	50/60	0 - 200
Insulation class			B	B	B (100 A) F (150 A)
Electrical connection					
Terminations			●	● (≦ 40 A)	● (≦ 40 A)
Connection lugs			–	● (≧ 50 A)	● (≧ 63 A)
PE stud			●	●	●

Notes

All rated operational data is based on an ambient air temperature of +40 °C. An ambient air temperature of +50 °C results in a derating of 4 percent.
The derating due to altitude relates to the rated operational current.$_e$



Part no.	Rated operating current	Inductance	Maximum heat dissipation	Cu factor[1]	Voltage drop	Connection Terminal/connection lug		Bore hole	Pick-up
	I_e	L	P_v		u_k				
	A	mH	W		%	mm^2	AWG	mm	Nm
Mains chokes, single-phase, rated operational voltage 1 AC 230 V, 50 Hz									
DEX-LN1-006	5.8	5.05	9	0.09	4	4	20 - 10	–	0.8
DEX-LN1-009	8.6	3.41	11	0.11	4	4	20 - 10	–	0.8
DEX-LN1-013	13	2.25	12	0.18	4	4	20 - 10	–	0.8
DEX-LN1-018	18	1.63	17	0.27	4	4	20 - 10	–	0.8
DEX-LN1-024	24	1.22	20	0.33	4	4	20 - 10	–	0.8
Mains chokes, three-phase, rated operational voltage 3 AC 400 V, 50 Hz									
DEX-LN3-004	3.9	7.51	17	0.25	4	4	20 - 10	–	0.8
DEX-LN3-006	6	4.9	19	0.34	4	4	20 - 10	–	0.8
DEX-LN3-010	10	2.94	33	0.45	4	4	20 - 10	–	0.8
DEX-LN3-016	16	1.84	44	0.53	4	4	20 - 10	–	0.8
DEX-LN3-025	25	1.18	57	0.90	4	4	20 - 10	–	0.8
DEX-LN3-040	40	0.64	59	0.91	2.5	10	20 - 6	–	1.5
DEX-LN3-050	50	0.37	58	1.08	2.5	Cu 15 x 2		7	3
DEX-LN3-060	60	0.31	60	1.51	2.5	Cu 15 x 2		7	3
DEX-LN3-080	80	0.23	86	1.67	2.5	Cu 20 x 3		9	6
DEX-LN3-100	100	0.18	101	1.68	2.5	Cu 20 x 3		9	6
DEX-LN3-120	120	0.15	100	2.26	2.5	Cu 25 x 5		11	10
DEX-LN3-160	160	0.11	140	2.35	2.5	Cu 25 x 5		11	10
DEX-LN3-200	200	0.09	154	3.81	2.5	Cu 25 x 5		11	10
DEX-LN3-250	250	0.07	155	4.26	0	Cu 40 x 5		14	15.5
DEX-LN3-300	300	0.06	169	4.28	2.5	Cu 40 x 5		14	15.5

Part no.	Rated operating current	Inductance	Maximum heat dissipation	Max. heat dissipation (pulse frequency)			Cu factor[1]	Connection Terminal/connection lug		Bore hole	Pick-up
	I_e	L	P_v	P_v (3 kHz)	P_v (5 kHz)	P_v (12 kHz)		mm^2	AWG	mm	Nm
	A	mH	W	W	W	W					
Motor chokes, three-phase, rated operational voltage 3 AC 400 V, max. 200 Hz											
DEX-LM3-005	5	2	24	12	14	24	0.29	4	20 - 10	–	0.8
DEX-LM3-008	8	4.1	54	32	46	54	1.09	4	20 - 10	–	0.8
DEX-LM3-011	11	3	71	45	66	71	1.23	4	20 - 10	–	0.8
DEX-LM3-016	16	1.5	78	50	75	78	0.88	4	20 - 10	–	0.8
DEX-LM3-035	35	1	116	75	114	116	2.30	4	20 - 10	–	0.8
DEX-LM3-050	50	0.6	168	110	157	168	3.60	10	20 - 6	–	1.5
DEX-LM3-063	63	0.5	193	130	190	193	3.01	Cu 15 x 2		7	3
DEX-LM3-080	80	0.5	206	132	206	206	5.88	Cu 20 x 3		9	6
DEX-LM3-100	100	0.45	294	177	279	294	10.10	Cu 20 x 3		9	6
DEX-LM3-150	150	0.35	424	293	418	424	8.22	Cu 25 x 5		11	10
DEX-LM3-180	180	0.3	498	418	439	498	14.75	Cu 25 x 5		11	10
DEX-LM3-220	220	0.2	517	344	512	517	11.37	Cu 40 x 5		14	15.5
DEX-LM3-260	260	0.15	520	358	526	520	11.10	Cu 40 x 5		14	15.5

Notes [1] For material price surcharge → Chapter General information

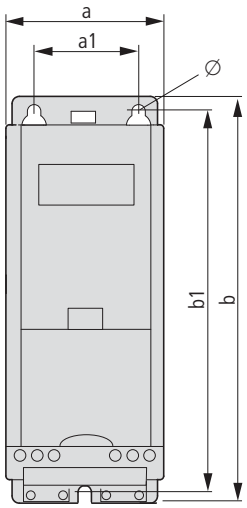
Dimensions

MMX12AA1D7...
MMX12AA2D4...
MMX12AA2D8...
MMX32AA1D7...
MMX32AA2D4...
MMX32AA2D8...
MMX34AA1D3...
MMX34AA1D9...
MMX34AA2D4...

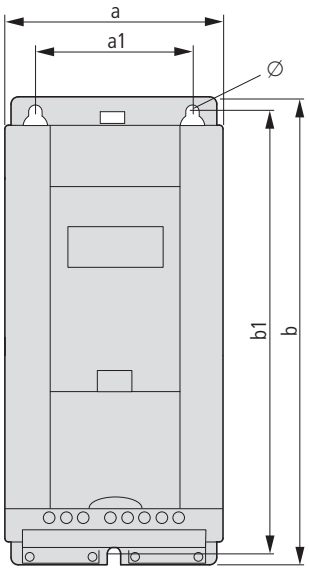
MMX12AA3D7...
MMX12AA4D8...
MMX12AA7D0...
MMX32AA3D7...
MMX32AA4D8...
MMX32AA7D0...
MMX34AA3D3...
MMX34AA4D3...
MMX34AA5D6...

MMX12AA7D0...
MMX32AA011...
MMX34AA7D6...
MMX34AA9D0...
MMX34AA012...
MMX34AA014...

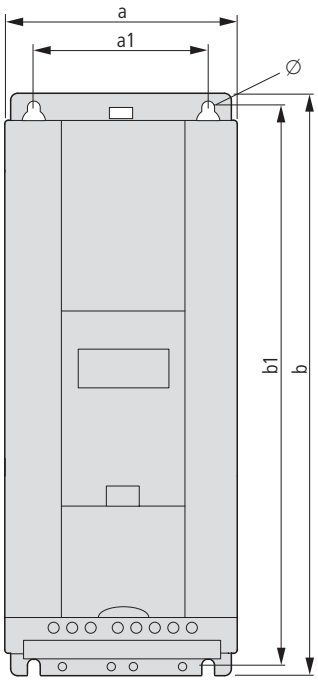
FS1

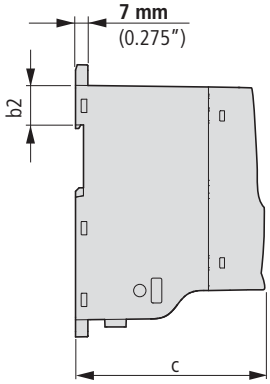


FS2



FS3





1 mm = 0.0394 inches
1 inch (1") = 25.4 mm

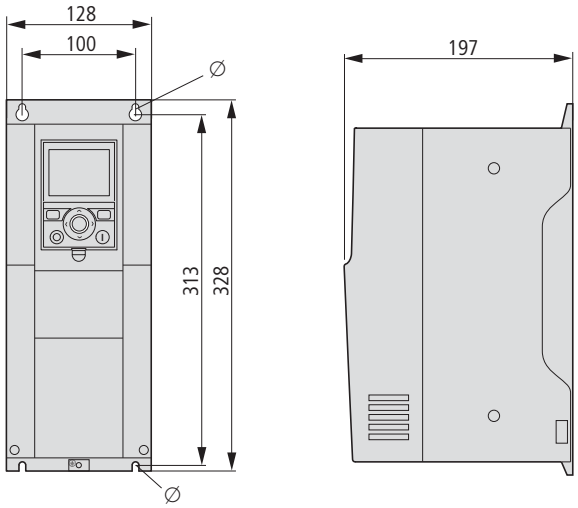
Part no.	a	a1	b	b1	b2	c	∅	Weight	Frame size
	mm	mm	mm	mm	mm	mm	mm	kg	
MMX12AA1D7…	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA2D4…	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA2D8…	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA3D7…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA4D8…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA7D0…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA9D6…	100	75	253	242	34	112	5.5	0.99	FS3
MMX32AA1D7…	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA2D4…	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA2D8…	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA3D7…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA4D8…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA7D0…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA011…	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA1D3…	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA1D9…	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA2D4…	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA3D3…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA4D3…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA5D6…	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA7D6…	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA9D0…	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA012…	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA014…	100	75	253	242	34	112	5.5	0.99	FS3

FS = frame size

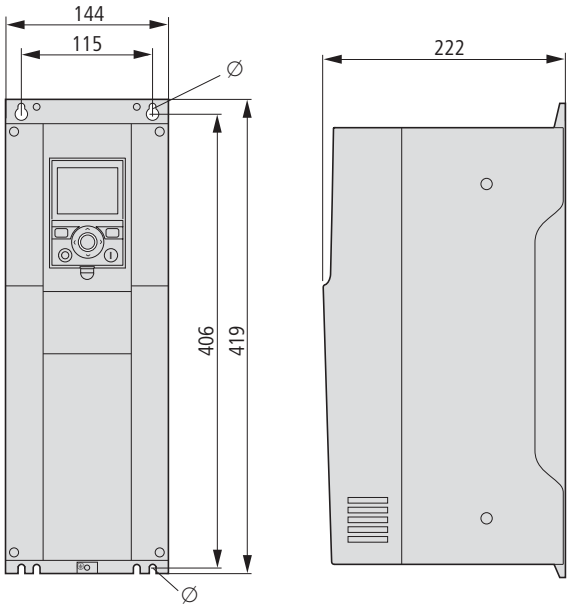
Dimensions

Frequency inverters

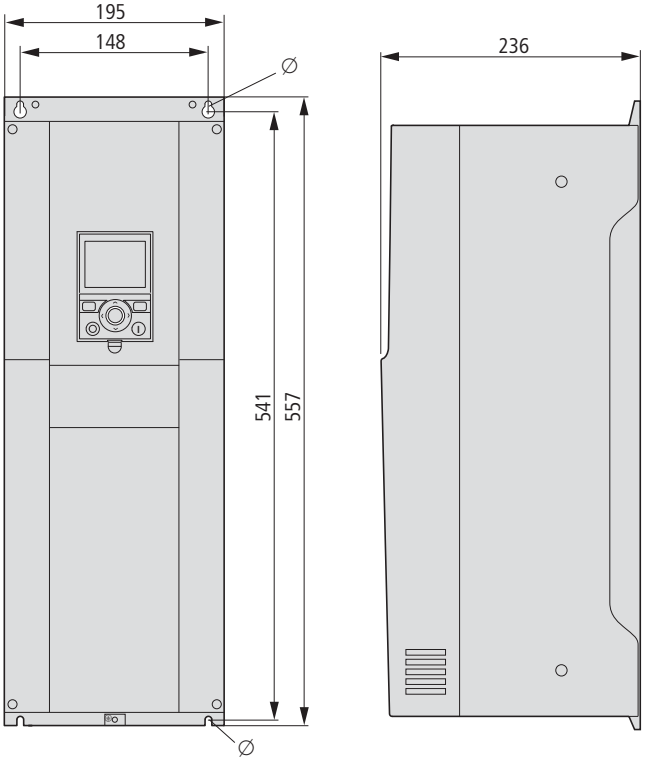
HMX32AG3D721-B	HMX34AG3D421-B
HMX32AG4D821-B	HMX34AG4D821-B
HMX32AG6D621-B	HMX34AG5D621-B
HMX32AG8D021-B	HMX34AG8D021-B
HMX32AG01121-B	HMX34AG9D621-B
HMX32AG01221-B	HMX34AG01221-B
HMX32AG3D722-B	HMX34AG3D422-B
HMX32AG4D822-B	HMX34AG4D822-B
HMX32AG6D622-B	HMX34AG5D622-B
HMX32AG8D022-B	HMX34AG8D022-B
HMX32AG01122-B	HMX34AG9D622-B
HMX32AG01222-B	HMX34AG01222-B



HMX32AG01821-B	HMX34AG01621-B
HMX32AG02421-B	HMX34AG02321-B
HMX32AG03121-B	HMX34AG03121-B
HMX32AG01822-B	HMX34AG01622-B
HMX32AG02422-B	HMX34AG02322-B
HMX32AG03122-B	HMX34AG03122-B



HMX32AG04821-B	HMX34AG03821-B
HMX32AG06221-B	HMX34AG04621-B
HMX32AG04822-B	HMX34AG06121-B
HMX32AG06222-B	HMX34AG03822-B
	HMX34AG04622-B
	HMX34AG06122-B

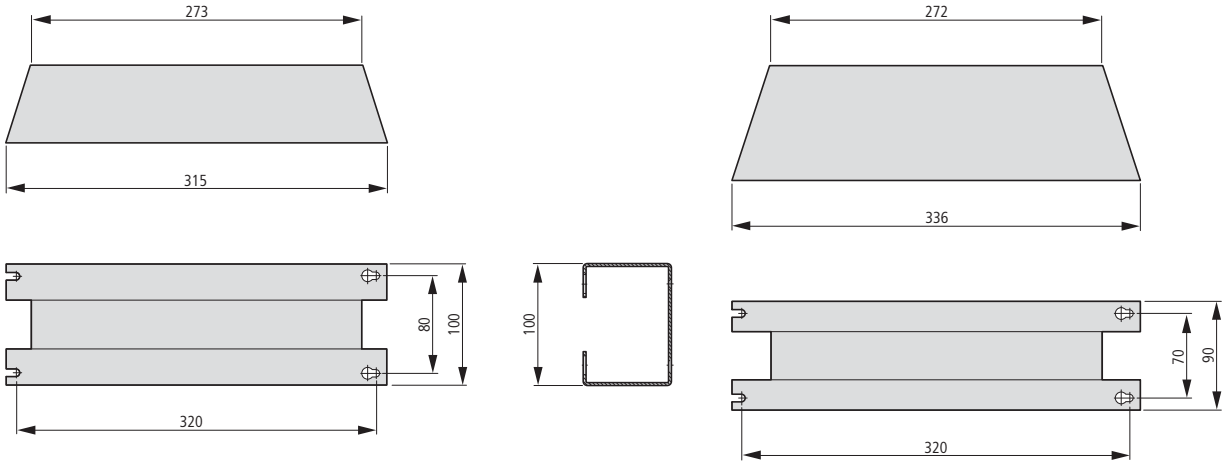


Part no.	a	a1	b	b1	c	Ø	Weight	Frame size
	mm	mm	mm	mm	mm	mm	kg	FS
HMX32AG011…	128	100	328	313	197	7	6	FS4
HMX32AG012…	128	100	328	313	197	7	6	FS4
HMX32AG018…	144	115	419	406	222	7	10	FS5
HMX32AG024…	144	115	419	406	222	7	10	FS5
HMX32AG031…	144	115	419	406	222	7	10	FS5
HMX32AG048…	195	148	557	541	236	9	20	FS6
HMX32AG062…	195	148	557	541	236	9	20	FS6
HMX32AG077…	234		660		266		37.5	FS7
HMX32AG088…	234		660		266		37.5	FS7
HMX32AG106…	234		660		266		37.5	FS7
HMX32AG143…	290		966		350		70	FS8
HMX32AG170…	290		966		350		70	FS8
HMX32AG208…	290		966		350		70	FS8
HMX32AG261…	480		1150		372		108	FS9
HMX32AG310…	480		1150		372		108	FS9
HMX32AG3D7…	128	100	328	313	197	7	6	FS4
HMX32AG4D8…	128	100	328	313	197	7	6	FS4
HMX32AG6D6…	128	100	328	313	197	7	6	FS4
HMX32AG8D0…	128	100	328	313	197	7	6	FS4
HMX34AG012…	128	100	328	313	197	7	6	FS4
HMX34AG016…	144	115	419	406	222	7	10	FS5
HMX34AG023…	144	115	419	406	222	7	10	FS5
HMX34AG031…	144	115	419	406	222	7	10	FS5
HMX34AG038…	195	148	557	541	236	9	20	FS6
HMX34AG046…	195	148	557	541	236	9	20	FS6
HMX34AG061…	195	148	557	541	236	9	20	FS6
HMX34AG077…	234		660		266		37.5	FS7
HMX34AG088…	234		660		266		37.5	FS7
HMX34AG106…	234		660		266		37.5	FS7
HMX34AG140…	290		966		350		70	FS8
HMX34AG170…	290		966		350		70	FS8
HMX34AG205…	290		966		350		70	FS8
HMX34AG261…	480		1150		372		108	FS9
HMX34AG310…	480		1150		372		108	FS9
HMX34AG3D4…	128	100	328	313	197	7	6	FS4
HMX34AG4D8…	128	100	328	313	197	7	6	FS4
HMX34AG5D6…	128	100	328	313	197	7	6	FS4
HMX34AG8D0…	128	100	328	313	197	7	6	FS4
HMX34AG9D6…	128	100	328	313	197	7	6	FS4

FS = frame size

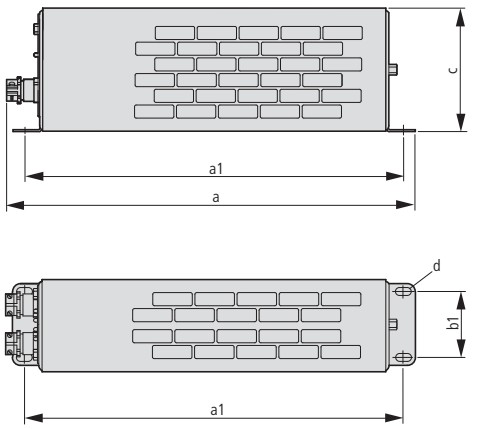
Braking resistors

BR2036400-T-SAF
BR2047240-T-SAF
BR2060200-T-SAF
BR2065400-T-SAF
BR2075480-T-SAF



Braking resistors

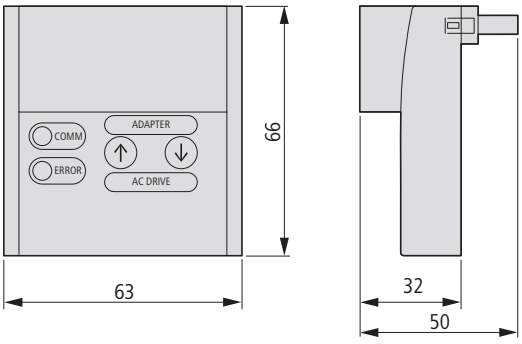
BR10361K0-T-PF
BR10561K0-T-PF
BR1036500-T-PF
BR1056300-T-PF
BR1056800-T-PF
BR30362K4-T-PF
BR30362K8-T-PF
BR30363K6-T-PF



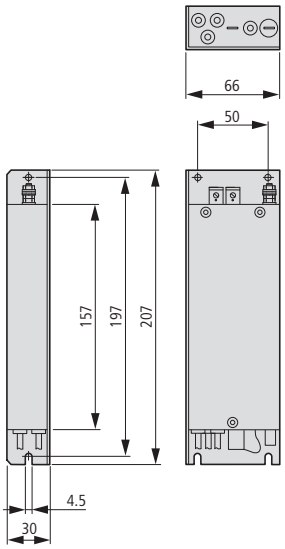
Part no.	a	a1	b	b1	c	d
	mm	mm	mm	mm	mm	mm
BR10361K0-T-PF	445	428	140	120	120	6 x 12
BR10561K0-T-PF	445	428	140	120	120	6 x 12
BR1036500-T-PF	445	428	95	70	95	6 x 12
BR1056300-T-PF	335	328	95	70	95	6 x 12
BR1056800-T-PF	395	378	140	120	120	6 x 12
BR30362K4-T-PF	485	380	326	300	301	9
BR30362K8-T-PF	485	380	326	300	301	9
BR30363K6-T-PF	485	380	326	300	301	9

PC interfacing

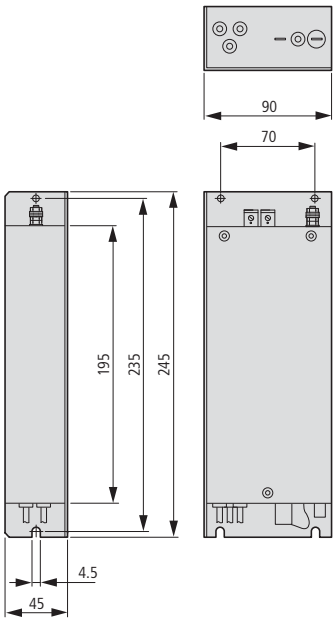
MMX-COM-PC



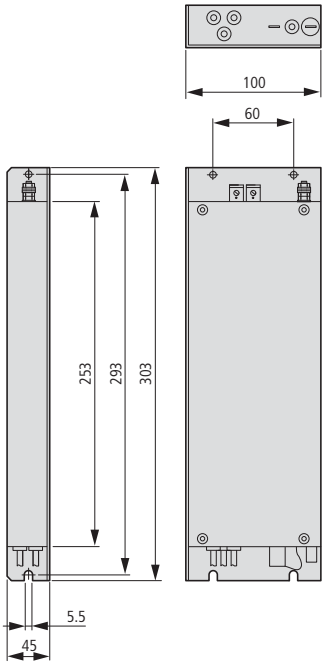
MMX-LZ1-009



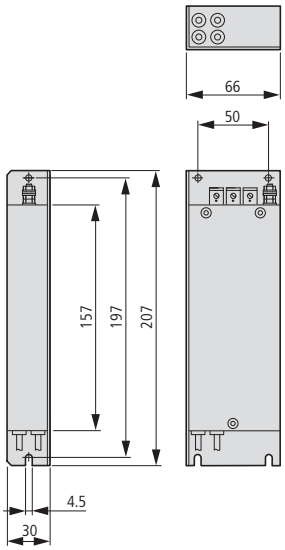
MMX-LZ1-015



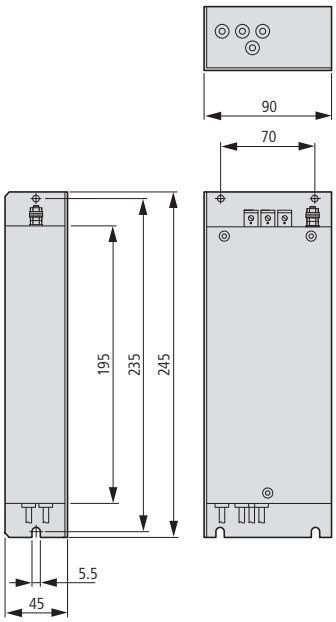
MMX-LZ1-017



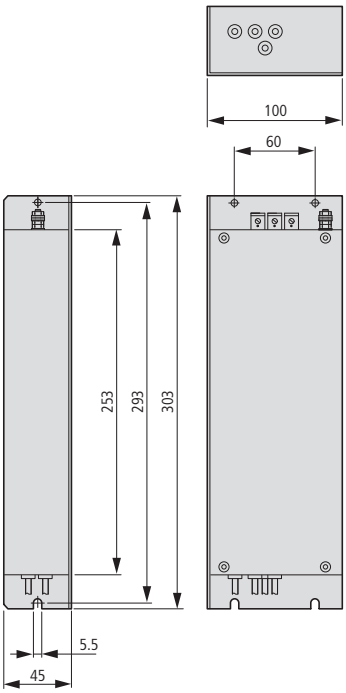
MMX-LZ3-006



MMX-LZ3-009

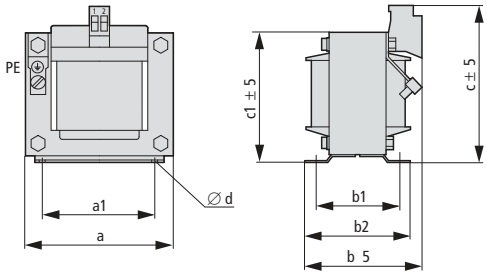


MMX-LZ3-020



Mains chokes

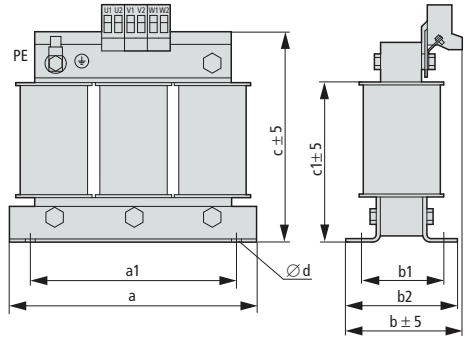
DEX-LN1-...



Part no.	a	a1	b	b1	b2	c	c1	∅d	Weight
	mm	mm	mm	mm	mm	mm	mm	mm	kg
DEX-LN1-006	66	50	71	44	55	80	61	4.5 x 8	0.7
DEX-LN1-009	66	50	71	44	55	80	61	4.5 x 8	0.7
DEX-LN1-013	84	64	67	47	60	90	75	4.8 x 8	1.5
DEX-LN1-018	84	64	90	70	83	90	75	4.8 x 8	1.5
DEX-LN1-024	84	64	67	47	60	90	75	4.8 x 8	2

Mains chokes/motor chokes

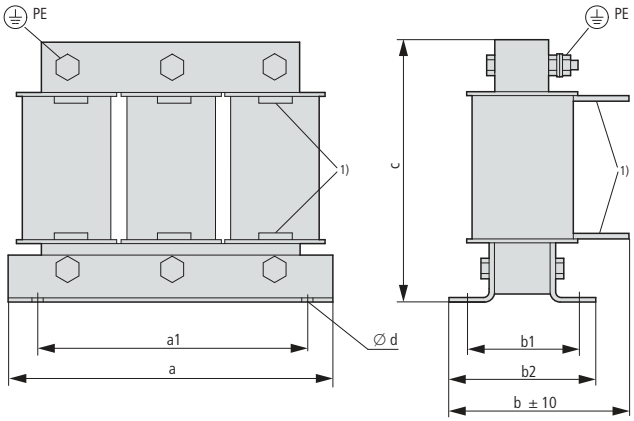
DEX-LN3-..., DEX-LM3-...



Part no.	a	a1	b	b1	b2	c	c1	∅d	Weight
	mm	mm	mm	mm	mm	mm	mm	mm	kg
DEX-LN3-004	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LN3-006	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LN3-010	140	125	61	50	61	138	105	5 x 10	2.2
DEX-LN3-016	140	125	71	50	71	138	105	5 x 10	2.9
DEX-LN3-025	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LN3-040	195	175	104	50	76.5	188	134	8 x 13	4.8
DEX-LM3-005	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LM3-008	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-011	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-016	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-035	220	200	132	75	101.5	195	160	8 x 13	7.3
DEX-LM3-050	270	250	106	75	96	228	198	8 x 13	12.3

Mains chokes/motor chokes

DEX-LN3-..., DEX-LM3-...



Part no.	a	a1	b	b1	b2	c[2]	∅d	Weight
	mm	mm	mm	mm	mm	mm	mm	kg
DEX-LN3-050	195	175	105	75	91.5	132 ±5	8 x 13	5.9
DEX-LN3-060	195	175	105	75	91.5	132 ±5	8 x 13	5.9
DEX-LN3-080	220	200	110	50	81.5	160 ±5	8 x 13	7.3
DEX-LN3-100	220	200	130	75	101.5	160 ±5	8 x 13	10.2
DEX-LN3-120	220	200	130	75	101.5	160 ±5	8 x 13	10.2
DEX-LN3-160	270	250	125	75	96	200 ±5	8 x 13	12.3
DEX-LN3-200	270	250	155	100	120	202 ±5	8 x 13	14.9
DEX-LN3-250	270	250	155	100	125	210 ±5	10 x 18	20.6
DEX-LN3-300	270	250	155	100	125	210 ±5	10 x 18	20.6
DEX-LM3-063	270	250	155	100	120	202 ±10	8 x 13	14.9
DEX-LM3-080	270	250	155	100	125	210 ±10	10 x 18	20.6
DEX-LM3-100	384	350	215	100	130	258 ±30	12 x 20	31
DEX-LM3-150	384	350	260	150	180	258 ±30	12 x 20	45
DEX-LM3-180	384	350	260	150	180	258 ±30	12 x 20	45
DEX-LM3-220	384	350	260	150	180	258 ±30	12 x 20	45
DEX-LM3-260	384	350	260	150	180	258 ±30	12 x 20	45

[1] The position of connection lugs U2-V2-W2 depends on the coil material and can deviate from the position illustrated here.
[2] Tolerance depending on air gap



DILET, ETR Timing Relays, measuring relays and EMR Monitoring relays

The range of electronic time relays comprises three different construction types, adapted for the most widely varying applications. The time relays are mounted on a DIN top-hat rail.

The measurement and monitoring relays monitor fluids, currents, phases, resistances or voltages.

Electronic timing relay DILET
45 mm contactor width +++ Numerous time relay functions +++ Ideal when combined with contactors

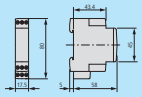
Electronic timing relay ETR2
17.5 mm width (one division unit = 18 mm) +++ With 45 mm cap dimensions, suitable for integration into distribution boards +++ Numerous time relay functions

Electronic timing relay ETR4
Robust industrial construction, 22.5 mm width +++ Numerous time relay functions

EMR Electronic measuring and monitoring relays
Monitors levels of conductive fluids, current, phase sequence and position, insulation resistance, asymmetry, over- and undervoltage +++ All devices in 22.5 mm or 45 mm width +++ Phase monitor at 580 V AC in 45 mm width

Timing relay, measuring relay and monitoring relay





DILET, ETR timing relay

Ordering

DILET timing relays 11/2

ETR4 timing relays 11/4

ETR2 timing relays 11/6

Engineering

DILET, ETR timing relay

Contact sequence diagram 11/8

Load limit curves 11/10

Technical data

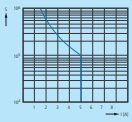
DILET, ETR4 timing relays 11/11

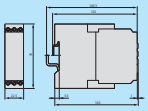
ETR2 timing relays 11/13

Dimensions

DILET, ETR timing relays 11/15







EMR Measuring and monitoring relays

Ordering

EMR measuring and monitoring relays 11/16

Engineering

EMR Measuring and monitoring relays

Load limit curves 11/19

Technical data

EMR Measuring and monitoring relays

EMR4-I... current monitoring relay 11/20

Phase sequence relay EMR5 (300 V) 11/24

Phase imbalance monitor 11/26

Liquid level monitoring relays 11/28

Insulation monitoring relays 11/30

Phase monitoring relays 11/32

Dimensions

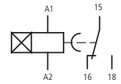
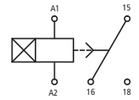
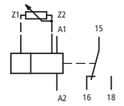
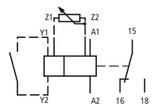
EMR measuring and monitoring relays 11/36

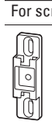


Our product range of measurement and monitoring relays has been partially updated.

Old device	Old article no.	New device	New article no.
EMR4-W500-2-C	221785	EMR5-W500-1-D	134221
EMR4-W500-2-D	221786	EMR5-W500-1-D	134221
EMR4-W580-2-D	221787	EMR5-AWM720-2	134236
EMR4-A400-1	221788	EMR5-A400-1	134222
EMR4-AW300-1-C	290243	EMR5-AW300-1-C	134223
EMR4-AW500-1-D	290244	EMR5-AW500-1-D	134224
EMR4-AWN170-1-E	290245	EMR5-AWN170-1-E	134225
EMR4-AWN280-1-F	290246	EMR5-AWN280-1-F	134226
EMR4-W300-1-C	290182	EMR5-W300-1-C	134227
EMR4-W500-1-D	290183	EMR5-W500-1-D	134221
EMR4-W380-1	290184	EMR5-W380-1	134228
EMR4-W400-1	290185	EMR5-W400-1	134229
EMR4-A300-1-C	290180	EMR5-A300-1-C	134230
EMR4-A500-1-D	290181	EMR5-A400-1	134222

This table provides assistance in replacing EMR4 articles with current EMR5 products.

	Rated operational current AC-11		Conventional thermal current	Time Range	Voltage range	Part no. Article No.	Price See price list	Std. pack	Notes	Information relevant for export to North America
	230 V	400 V	I_{th}							
	I_e	I_e	A							
	A	A								
	A	A								
Timing relays DILET										
On-delayed Timing functions → Page 11/8 Component lifespan → Page 11/10										
	3	3	6	1.5 - 30 s	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**DILET11-30-A** 048878		1 off	Fixed 11, On-delayed 	Product Standards: IEC/EN 61812-1; IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR, NKCR7 CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified Degree of Protection: IEC: IP20, UL/CSA Type: - 
	3	3	6	1.5 - 30 s	400 V AC, 50/60 Hz	**DILET11-30-W** 048904				
	3	3	6	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 3 - 60 s 0.15 - 3 min 0.5 - 10 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h 3 - 60 h	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**DILET11-M-A** 048886				
	3	3	6		400 V AC, 50/60 Hz	**DILET11-M-W** 048891				
Multi-functional with remote potentiometer Timing functions → Page 11/8 Component lifespan → Page 11/10										
	3	3	6	0.05 - 1s 0.15 - 3 s 0.2217925 - 10 s 3 - 60 s 0.15 - 3 min 0.5 - 10 min 3 - 60 min 0.15 - 3 h 0.5 - 10 h 3 - 60 h	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**DILET70-A** 048893		1 off	Adjustable 11, On-delayed 21, Fleeting contact on energization 42, Flashing 81, Pulse generating ON-OFF 	Product Standards: IEC/EN 61812-1; IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking UL File No.: E29184 UL CCN: NKCR, NKCR7 CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified Degree of Protection: IEC: IP20, UL/CSA Type: - 11 ON-DELAYED 21 FLEETING CONTACT ON ENERGIZATION 42 FLASHING 81 PULSE GENERATING CONTACT 
	3	3	6		400 V AC, 50/60 Hz	**DILET70-W** 048899			Adjustable 12, Off-delayed 16, On- and off-delayed 22, Fleeting contact on de-energization 82, Pulse shaping ON-OFF  Cable connection with Y1/Y2, Z1/Z2 Permissible cable length (cable unshielded, with cable cross-section 0.5-1.5 mm²): Two-core cable 250 m Two-core cable in the same cable duct with mains cable, 50/60 Hz 50 m	

	Resistance R kΩ	Rated power P W	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Remote potentiometer, IP66							
	10	≦ 0.5	DILET… ETR4-70	**M22-R10K** 229491		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA Certified Degree of Protection: UL/CSA part no. 3R, 4X, 12, 13
	10	–	DILET… ETR4-70	**M22S-R10K** 232233		1 off	
Screw adapters							
For screw fixing							
	–	–	EWDIL ETS4-VS3 ETR4	**CS-TE** 095853		10 off	UL/CSA certification not required

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		Rated operational current AC-15		Conventional thermal current	Time Range	24 - 240 V AC, 50/60 Hz 24 - 240 V DC		Std. pack	400 V AC, 50/60 Hz		Std. pack
		230 V	400 V			**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	
		I_e A	I_e A	I_{th} A							
Electronic timing relays ETR4, 22.5 mm wide											
	Star-delta switching Timing functions → Page 11/8	3	3	6	3 - 60 s	**ETR4-51-A** 031884		1 off	**ETR4-51-W** 031885		1 off
	On-delayed Timing functions → Page 11/8	3	3	6	0.05 - 1 s 0.15 - 3 s 0.5 - 10 s 1.5 - 30 s 5 - 100 s 15 - 300 s 1.5 - 30 min 15 - 300 min 1.5 - 30 h 5 - 100 h	**ETR4-11-A** 031882			**ETR4-11-W** 031883		
	Multifunctional Timing functions → Page 11/8	3	3	6		**ETR4-69-A** 031891			**ETR4-69-W** 031887		
	Multifunctional with connection for potentiometer, and two changeover contacts that can be converted to two timed contacts or one non-delayed contact and one timed contact. Timing functions → Page 11/8	3	–	6		**ETR4-70-A** 031888					

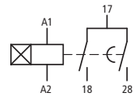
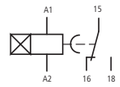
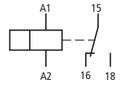
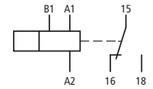
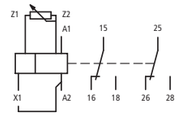
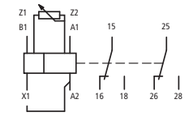
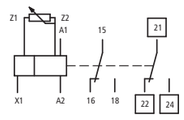
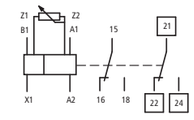
Notes

Information relevant for export to North America

Product Standards	IEC/EN 61812-1; IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

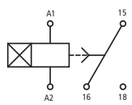
HPL11005EN

Notes

Function	Terminal marking according to EN 50042	Function	Terminal marking according to EN 50042
Fixed 51, Star-delta			
Function	Terminal marking according to EN 50042		
Fixed 11, On-delayed			
Function	Terminal marking according to EN 50042	Function	Terminal marking according to EN 50042
Adjustable 11, On-delayed 21, Fleeting contact on energization 42, Flashing, pulse initiating 81, Pulse generating ON-OFF		Adjustable 12, Off-delayed 16, On- and off-delayed 22, Fleeting contact on de-energization 82, Pulse shaping ON-OFF	
Function	Terminal marking according to EN 50042	Function	Terminal marking according to EN 50042
A2/X1 linked 11, On-delayed 21, Fleeting contact on energization 42, Flashing, pulse initiating 81, Pulse generating ON-OFF		A2/X1 linked 12, Off-delayed 16, On- and off-delayed 22, Fleeting contact on de-energization 82, Pulse shaping ON-OFF	
A2/X1 not linked 11, On-delayed 21, Fleeting contact on energization 42, Flashing, pulse initiating 81, Pulse generating ON-OFF		A2/X1 not linked 12, Off-delayed 16, On- and Off-delayed 22, Fleeting contact on de-energization 82, Pulse shaping ON-OFF	

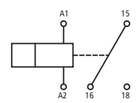
Cable connection with B1, Z1/Z2	
Permissible cable length (cable unshielded, with cable cross-section 0.5--1.5 mm²):	
Two-core cable	250 m
Two-core cable in the same cable duct with mains cable, 50/60 Hz	50 m

ETR4-11



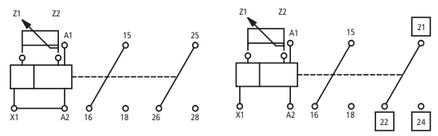
ON-DELAYED

ETR4-69



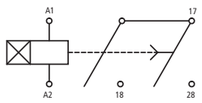
11 ON-DELAYED
21 FLEETING CONTACT ON ENERGIZATION
42 FLASHING
81 PULSE GENERATING CONTACT

ETR4-70

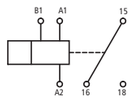


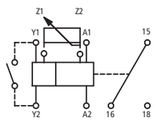
11 ON-DELAYED
21 FLEETING CONTACT ON ENERGIZATION
42 FLASHING
81 PULSE GENERATING CONTACT

ETR4-51

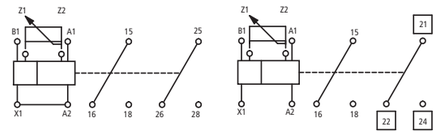


ON-DELAYED



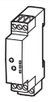
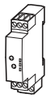
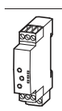


12 OFF-DELAYED
16 ON- and OFF-DELAYED
22 FLEETING CONTACT ON DE-ENERGIZATION
82 PULSE SHAPING CONTACT



12 OFF-DELAYED
16 ON- and OFF-DELAYED
22 FLEETING CONTACT ON DE-ENERGIZATION
82 PULSE SHAPING CONTACT

HPL11006EN

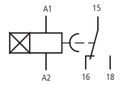
		Rated operation current N/O 230 V I_e A	Rated operation current 230 V (N/C) I_e A	Conventional thermal current I_{th} A	Time Range	Voltage range	**Part no.** Article no.	**Price** See price list	Std. pack
Electronic timing relays ETR2, 17.5 mm wide									
One changeover contact									
	On-delayed Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6	0.05 - 1 s 0.5 - 10 s 5 - 100 s 0.5 - 10 min 5 - 100 min 0.5 - 10 h 5 - 100 h	24 - 240 V AC, 50/60 Hz 24 - 48 V DC	**ETR2-11** 262684		1 off
	Off-delayed Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-12** 262686		
	Fleeting contact on energization Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-21** 262687		
	Flashing, pulse initiating Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-42** 262688		
	Flashing, 2 speeds (ON/OFF times variable) Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-44** 262730		
	Multifunction relay Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-69** 262689		
Two changeover contacts									
	On-delayed Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6	0.05 - 1 s 0.5 - 10 s 5 - 100 s 0.5 - 10 min 5 - 100 min 0.5 - 10 h 5 - 100 h	24 - 240 V AC, 50/60 Hz 24 - 48 V DC	**ETR2-11-D** 119426		1 off
	Off-delayed Timing functions → Page 11/8 Load limit curves → Page 11/10	3	–	6			**ETR2-12-D** 119427		
	Multifunctional Timing functions → Page 11/8 Load limit curves → Page 11/10	3	0.75	6		12 - 240 V AC, 50/60 Hz	**ETR2-69-D** 119428		

HPL11007EN

Information relevant for export to North America

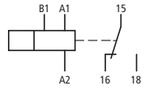
Function
Fixed
11, On-delayed

Terminal marking according to EN 50042



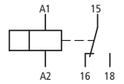
Function
Fixed
12, Off-delayed

Terminal marking according to EN 50042



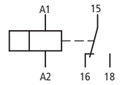
Function
Fixed
21, Fleeting contact on energization

Terminal marking according to EN 50042



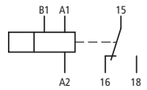
Function
Fixed
42, Flashing, pulse initiating

Terminal marking according to EN 50042



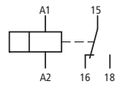
Function
Fixed
44, Flashing, 2 variable times
Can be set to either pulse or pause initiating

Terminal marking according to EN 50042



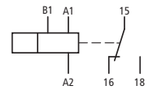
Function
Adjustable
11, On-delayed
21, Fleeting contact on energization
42, Flashing, pulse initiating
43, Flashing, pause initiating

Terminal marking according to EN 50042



Function
Adjustable
12, Off-delayed
22, Fleeting contact on de-energization
82, Pulse shaping

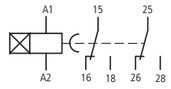
Terminal marking according to EN 50042



Product Standards	IEC/EN 61812-1; IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

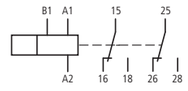
Function
Fixed
11, On-delayed

Terminal marking according to EN 50042



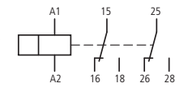
Function
Fixed
12, Off-delayed

Terminal marking according to EN 50042



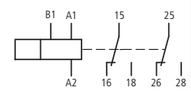
Function
Adjustable
11, On-delayed
21, Fleeting contact on energization
42, Flashing, pulse initiating
43, Flashing, pause initiating

Terminal marking according to EN 50042



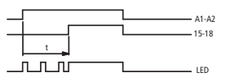
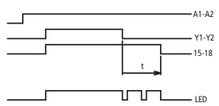
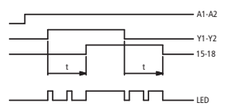
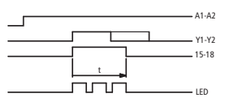
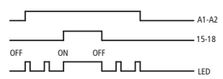
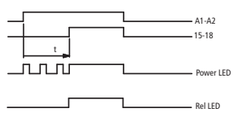
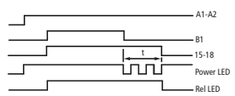
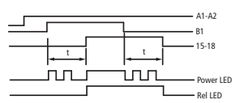
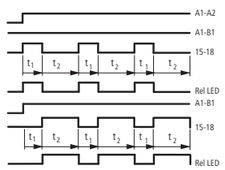
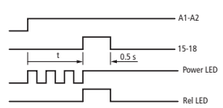
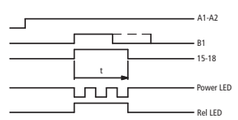
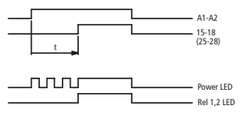
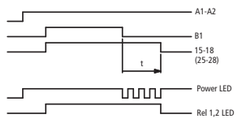
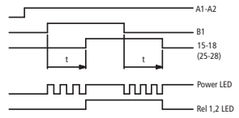
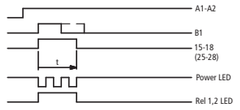
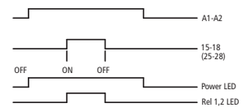
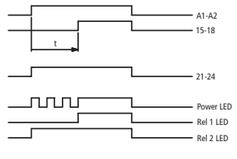
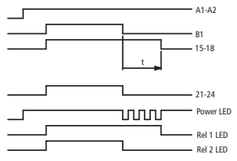
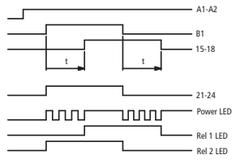
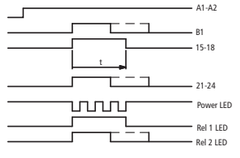
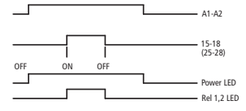
Function
Adjustable
12, Off-delayed
22, Fleeting contact on de-energization
82, Pulse shaping

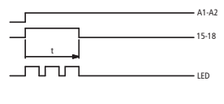
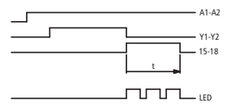
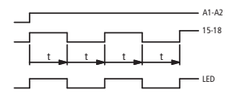
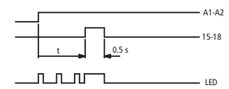
Terminal marking according to EN 50042



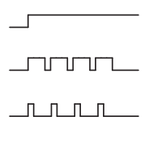
Product Standards	IEC/EN 61812-1; IEC/EN 60947-5-1; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

Engineering

Electronic timing relays	Contact sequence diagram		
DILET	**11** On-delayed	**12** Off-delayed	**16** On- and Off-delayed
			
	82 Pulse shaping	On-Off function	
			
ETR2..., ETR4...	**11** On-delayed	**12** Off-delayed	**16** On- and Off-delayed
			
	44 Flashing, 2 speeds	**81** Pulse generating	**82** Pulse shaping
			
ETR4-70... A2/X1 linked	**11** On-delayed	**12** Off-delayed	**16** On- and Off-delayed
			
	82 Pulse shaping	On-Off function	
			
ETR4-70... A2/X1 not linked	**11** On-delayed	**12** Off-delayed	**16** On- and Off-delayed
			
	82 Pulse shaping	On-Off function	
			

21 Fleeting contact on energization	**22** Fleeting contact on de-energization	**42** Flashing, pulse initiating	**81** Pulse generating
			

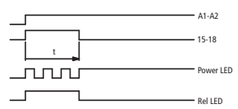
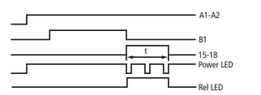
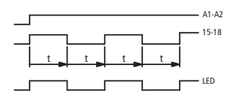
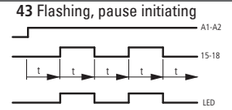
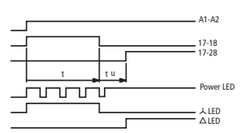
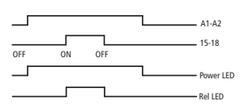
Legend to contact sequence diagrams
LED display

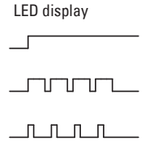


Time not running,
Contact 15 – 18 closed

Time running,
Contact 15 – 18 closed

Time running,
Contact 15 – 18 not closed

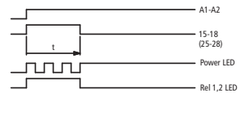
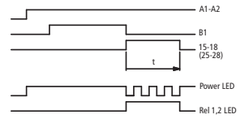
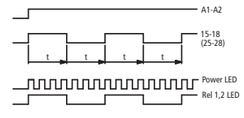
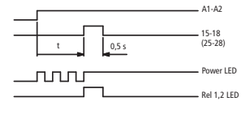
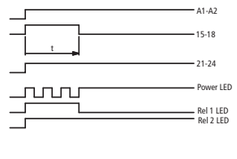
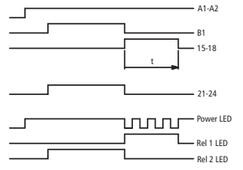
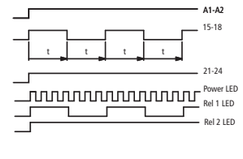
21 Fleeting contact on energization	**22** Fleeting contact on de-energization	**42** Flashing, pulse initiating	**43** Flashing, pause initiating
			
51 Star-delta	On-Off function	Legend to contact sequence diagrams LED display	
			



Time not running,
Contact 15 – 18 closed

Time running,
Contact 15 – 18 closed

Time running,
Contact 15 – 18 not closed

21 Fleeting contact on energization	**22** Fleeting contact on de-energization	**42** Flashing	**81** Pulse generating
			
21 Fleeting contact on energization	**22** Fleeting contact on de-energization	**42** Flashing	**81** Pulse generating
			

Legend to contact sequence diagrams
LED display

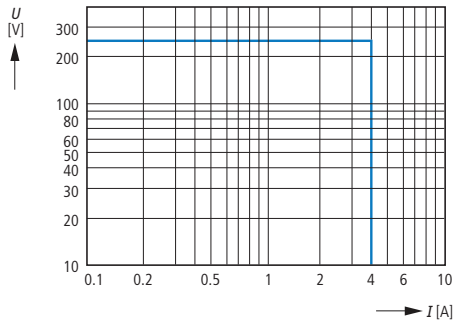
Time not running,
Contact 15 – 18 closed

Time running,
Contact 15 – 18 closed

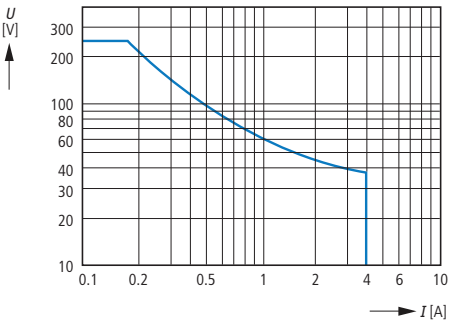
Time running,
Contact 15 – 18 not closed

Load limit curves, ETR2-11/12/21/42/44/69

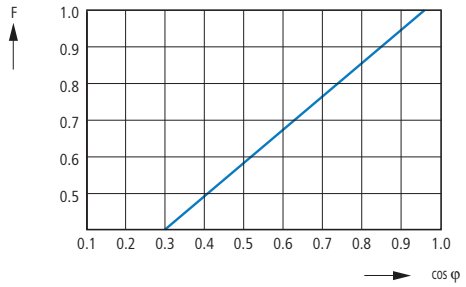
AC load (resistive)



DC load (resistive)

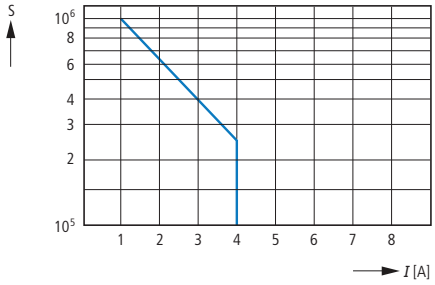


Derating factor with inductive AC load



Derating factor F with inductive load

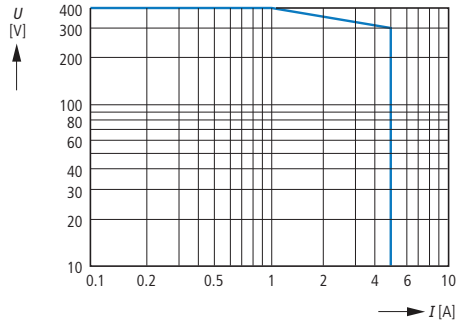
Contact life



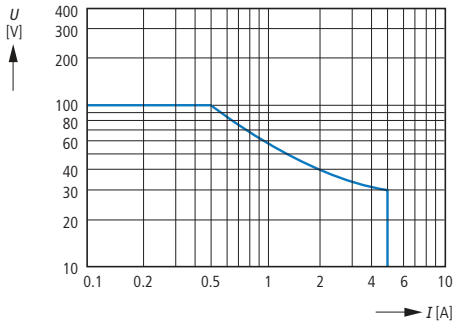
Contact life
Operations S
220 V 50 Hz AC-1
360 operations/h

Load limit curves, ETR2...-D

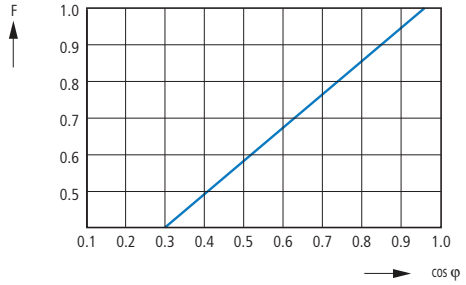
AC load (resistive)



DC load (resistive)

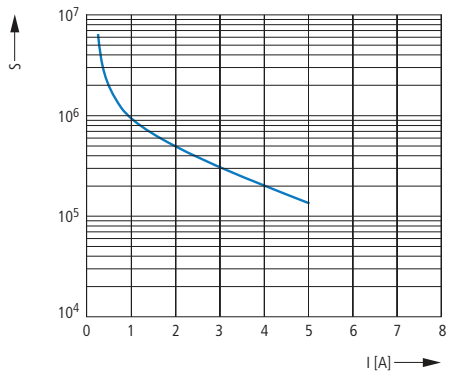


Derating factor with inductive AC load



Derating factor F with inductive load

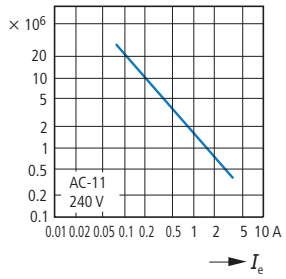
Contact life



Contact life
Operations S
220 V 50 Hz AC-1
360 operations/h

DILET (AC-11)

Component lifespan (operations)
I_e = Rated operational current



			DILET-A	DILET-W	ETR4-A	ETR4-W
General						
Standards			IEC/EN 61812 VDE 0435	IEC/EN 61812 VDE 0435	IEC/EN 61812 VDE 0435	IEC/EN 61812 VDE 0435
Lifespan, mechanical						
AC operated	Switch operations	x 10^6	30	30	30	30
DC operated	Switch operations	x 10^6	30	30	30	30
Climatic proofing			Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Storage		°C			-45 - 60	-45 - 60
Open		°C	-20 - 60	-20 - 60	-25 - 60	-25 - 60
Encapsulated		°C	-20 - 45	-20 - 45	-25 - 45	-25 - 45
Mounting position			Any	Any	Any	Any
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 20 ms						
N/O		g	4	4	4	4
Degree of protection						
Clamps			IP20	IP20	IP20	IP20
Weight		kg	0.09	0.09	0.1	0.1
Terminal capacity						
Solid		mm^2	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)
Flexible with ferrule		mm^2	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)
Solid or stranded		AWG	1 x (18 - 14)	1 x (18 - 14)	1 x (20 - 14)	1 x (20 - 14)
Contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree			III/2	III/2	III/2	III/2
Rated insulation voltage	U_i	V AC	600	600	600	600
Rated operating voltage	U_e	V AC	440	440	440	440
Safe isolation according to EN 61140						
Between coil and auxiliary contacts		V AC	250	250	250	250
Between the auxiliary contacts		V AC	250	250	250	250
Making capacity						
AC-14 p.f. φ = 0.3 440 V		A	48	48	48	48
AC-15 p.f. φ = 0.3 220 V		A	50	50	50	50
DC-11 L/R ≦ 40 ms		x I_e	1.1	1.1	1.1	1.1
Breaking capacity						
AC-14 p.f. φ = 0.3 440 V		A	3	3	3	3
AC-15 p.f. φ = 0.3 220 V		A	3	3	3	3
DC-11 L/R ≦ 40 ms		x I_e	1.1	1.1	1.1	1.1
Rated operation current						
AC-14						
440 V	I_e	A	3	3	3	3
AC-15						
220 V (230 V)	I_e	A	3	3	3	3
DC-11[1]						
L/R max. 15 ms						
24 V	I_e	A	1.5	1.5	1.5	1.5
L/R max. 50 ms		A	1.2	1.2	1.2	1.2
Conventional thermal current	I_{th}	A	6	6	6	6
General use						
AC operated		V	250	250	250	250
AC operated		A	6	6	6	6
Pilot duty						
AC operated			B300	B300	B300	B300
Short-circuit rating without welding[2]						
Max. fuse, N/O (normally open)		A gG/gL	6	6	6	6
Max. fuse, N/C (normally closed)		A gG/gL	6	6	6	6
Max. overcurrent protective device, 220/230 V		Part no.	–	–	FAZ-B4/1-HI	FAZ-B4/1-HI

Notes
[1] Making and breaking conditions to DC13, time constant as stated
[2] When supplied directly from mains or transformer > 1000 VA

			DILET-A	DILET-W	ETR4-A	ETR4-W
Magnet systems						
Rated operating voltage						
AC			24 - 240	400	24 - 240	400
DC			24 - 240	–	24 - 240	–
Rated frequency		Hz	47 - 63	47 - 63	47 - 63	47 - 63
AC operated	Pick-up	x U_c	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1
DC operated	Pick-up	x U_c	0.7 - 1.1	–	0.7 - 1.1	–
Power consumption						
AC pick-up rating		VA	2	0.5	2	0.5
AC holding rating		VA	2	0.5	2	0.5
DC pick-up rating		W	1.8	–	1.8	–
DC holding rating		W	1.8	–	1.8	–
Duty factor		% duty factor	100	100	100	100
Maximum operating frequency		Ops/h	4000	4000	4000	4000
Minimum command time						
AC		ms	50	50	50	50
DC		ms	30	–	30	–
Repetition accuracy (deviation)		%	≦ 0.5	≦ 0.5	≦ 0.5	≦ 0.5
Recovery time (after 100% time delay)		ms	70	70	70	70
Contact changeover time[1)]	t_u	ms	–	–	4	4
Electromagnetic compatibility (EMC)						
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)		kV	–	–	–	–
Air discharge		kV	8	8	8	8
Contact discharge		kV	6	6	6	6
Electromagnetic fields (IEC/EN 61000-4-3, RFI)		V/m	10	10	10	10
Radio interference suppression (EN 55011)			EN 55011 Class A	EN 55011 Class A	EN 55011 Class A	EN 55011 Class A
Burst pulses (IEC/EN 61000-4-4, level 3)			2	2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, level 2)		kV	1	1	1	1
Immunity to line-conducted interference (IEC/EN 61000-4-6)		V	10	10	10	10

Notes [1)] ETR4-51: 50 ms

Technical data

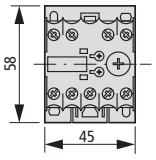
Part no.	ETR2-11(12, 21, 42, 44, 69)	ETR2-69-D	ETR2-11-D/ETR2-12-D
Input circuit - power supply circuit			
Rated control voltage U_S			
A1 - A2	24 - 240 V AC/24 - 48 V DC	12-240 V AC/DC	24 - 240 V AC/24 - 48 V DC
Tolerance of rated control voltage U_S	-15 - +10 %	-15 - +10 %	-15 - +10 %
Rated frequency	DC or 50/60 Hz	DC or 50/60 Hz	DC or 50/60 Hz
Frequency range	DC or 47 - 63 Hz	DC or 47 - 63 Hz	DC or 47 - 63 Hz
Typical current/power consumption			
12 V DC	–	35 mA	–
24 V DC	0.6 W	–	24.1mA
230 V AC	1.3 VA	6.25 mA	31.3 mA
115 V AC	1.3 VA	34.25 mA	20 mA
Mains failure buffering time	min. 30 ms	min. 30 ms	min. 30 ms
Input circuit - control circuit			
Type of actuation	Non-isolated actuation	Non-isolated actuation	Non-isolated actuation
Control input, control function	External time start	External time start	External time start
Parallel connection possible/polarized	Yes/yes	Yes/yes	Yes/yes
Maximum cable length at the control inputs	50 m - 100 pF/m	50 m - 100 pF/m	50 m - 100 pF/m
Minimum control pulse length/duration	30 ms	30 ms	30 ms
Control voltage potential	see Rated control voltage	see Rated control voltage	see Rated control voltage
Power consumption of control input	Max. 4 mA		
12 V DC	–	0.018 mA	–
24 V DC	–	–	0.92 mA
230 V AC	–	0.01 mA	6.43 mA
115 V AC	–	0.01 mA	3.27 mA
Timing circuit			
Time ranges			
7 time ranges 0.05 s - 100 h	0.05 - 1 s, 0.5 - 10 s, 5 - 100 s, 0.5 - 10 min, 5 - 100 min, 0.5 - 10 h, 5 - 100 h	0.05 - 1 s, 0.5 - 10 s, 5 - 100 s, 0.5 - 10 min, 5 - 100 min, 0.5 - 10 h, 5 - 100 h	0.05 - 1 s, 0.5 - 10 s, 5 - 100 s, 0.5 - 10 min, 5 - 100 min, 0.5 - 10 h, 5 - 100 h
Recovery time	< 50 ms	< 50 ms	< 50 ms
Accuracy within the rated control voltage tolerance	Δt < 0.005 %/V	Δt < 0.005 %/V	Δt < 0.005 %/V
Accuracy within temperature range	Δt < 0.06 %/°C	Δt < 0.06 %/°C	Δt < 0.06 %/°C
Operating status indication			
U control voltage/time running: green LED	Continuous light: control voltage present; slow flashing: time running		
Relay status R: yellow LED	Continuous light: output relay 1 picked up	Continuous light: output relay 1 or 2 picked up	Continuous light: output relay 1 or 2 picked up
Output circuits			
Output type			
15 - 16/18	Relay, 1 changeover contact	–	–
15 - 16/18; 25 - 26/28	–	Relay, 2 changeover contacts	Relay, 2 changeover contacts
Contact material	Cadmium-free	Cadmium-free	Cadmium-free
Rated operational voltage Ue	250 V	250 V	250 V
Minimum switching voltage/minimum switching current	12 V/100 mA	12 V/100 mA	12 V/100 mA
Rated operational current (IEC 60947-5-1)			
AC12 (resistive) 230 V	6 A	5 A	5 A
AC15 (inductive) 230 V N/O	3 A	3 A	3 A
AC15 (inductive) 230 V N/C	3 A	0.75 A	0.75 A
DC12 (resistive) 24 V	6 A	5 A	5 A
DC13 (inductive) 24 V N/O	2 A	3 A	3 A
DC13 (inductive) 24 V N/C	2 A	1 A	1 A
Rated operational data AC (UL 508)			
Utilization category (Control Circuit Rating Code)	B300	N/O: B300; N/C: C300	N/O: B300; N/C: C300
Max. rated operational voltage	300 V AC	300 V AC	300 V AC
Max. thermal continuous current	at B300 = 5 A	at B300 = 5 A; at C300 = 2.5 A	at B300 = 5 A; at C300 = 2.5 A
Max. input/output rating (N/O / N/C)	at B300 = 3600/360 VA	at B300 = 3600/360 VA; at C300 = 1800/180 VA	at B300 = 3600/360 VA; at C300 = 1800/180 VA
Mechanical lifespan	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations
Short-circuit rating, max. fuse (IEC/EN 60947-5-1)			
N/C	6 A fast	6 A fast	6 A fast
N/O	10 A fast	10 A fast	10 A fast

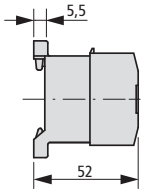
Part no.	ETR2-11(12, 21, 42, 44, 69)	ETR2-69-D	ETR2-11-D/ETR2-12-D
General data			
Duty factor (DF)	100 %	100 %	100 %
Repetition accuracy (constant parameters)	Δt < 0.5 %	Δt < 0.5 %	Δt < 0.5 %
Weight	0.060 kg	0.065 kg	0.065 kg
Enclosure measurements (w x h x d)	17.5 mm x 70 mm x 58 mm (0.69 x 2.76 x 2.28 inches)	17.5 mm x 80 mm x 58 mm (0.69 x 3.15 x 2.28 inches)	17.5 mm x 80 mm x 58 mm (0.69 x 3.15 x 2.28 inches)
Mounting position	Any	Any	Any
Degree of protection of enclosures/terminals	IP50/IP20	IP50/IP20	IP50/IP20
Minimum horizontal/vertical distance to adjacent devices	None/none	None/none	None/none
Mounting	DIN rail (IEC/EN 60715), clip-type toolless	DIN rail (IEC/EN 60715), clip-type toolless	DIN rail (IEC/EN 60715), clip-type toolless
Electrical connection			
Terminal capacity			
Flexible with/without ferrule	2 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG)/ 1 x 0.5 - 2.5 mm² (1 x 20 - 14 AWG)	3 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG)/ 1 x 0.5 - 2.5 mm² (1 x 20 - 14 AWG)	4 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG)/ 1 x 0.5 - 2.5 mm² (1 x 20 - 14 AWG)
Rigid	2 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG) 1 x 0.5 - 4 mm² (1 x 20 - 12 AWG)	2 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG) 1 x 0.5 - 4 mm² (1 x 20 - 12 AWG)	2 x 0.5 - 1.5 mm² (2 x 20 - 16 AWG) 1 x 0.5 - 4 mm² (1 x 20 - 12 AWG)
Stripped length	7 mm (0.28 incheses)	7 mm (0.28 incheses)	7 mm (0.28 incheses)
Tightening torque	0.5 - 0.8 Nm	0.5 - 0.8 Nm	0.5 - 0.8 Nm
Environmental data			
Ambient temperature range, operation/storage	-20 - +60 °C/-40 - +85 °C	-20 - +60 °C/-40 - +85 °C	-20 - +60 °C/-40 - +85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)	6 x 24 h cycle, 55 °C, 95 % RH	6 x 24 h cycle, 55 °C, 95 % RH	6 x 24 h cycle, 55 °C, 95 % RH
Vibration (sinusoidal) (IEC/EN 60068-2-6)	40 m/s², 20 cycles, 10...150...10 Hz	40 m/s², 20 cycles, 10...150...10 Hz	40 m/s², 20 cycles, 10...150...10 Hz
Impact (half-sinusoidal) (IEC/EN 60068-2-27)	100 m/s², 11 ms	100 m/s², 11 ms	100 m/s², 11 ms
Insulation data			
Rated impulse withstand voltage Uimp between all insulated circuits (VDE 0110, IEC/EN 60664-1)	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs
Pollution degree (IEC/EN 60664-1, VDE 0110, UL 508)	3	3	3
Overvoltage category (IEC/EN 60664-1, VDE 0110, UL 508)	III	III	III
Rated insulation voltage Ui			
Input circuit/output circuit	300V	300V	300V
Output circuit 1/output circuit 2	300 V	300 V	300 V
Basic isolation (IEC/EN 61140) input circuit/output circuit	300 V	300 V	300 V
Safe isolation (VDE 0106 Part 101 and Part 101/A1; IEC/EN 61140) input circuit/output circuit	250 V	250 V	250 V
Power-frequency withstand voltage test (test voltage, part test) between all insulated circuits	2.5 kV, 50 Hz, 1s	2.5 kV, 50 Hz, 1s	2.5 kV, 50 Hz, 1s
Directives and standards			
Product standard	IEC 61812-1, EN 61812-1 + A11, DIN VDE 0435 Part 2021	IEC 61812-1, EN 61812-1 + A11, DIN VDE 0435 Part 2021	IEC 61812-1, EN 61812-1 + A11, DIN VDE 0435 Part 2021
Low-Voltage Directive	2006/95/EC	2006/95/EC	2006/95/EC
EMC Directive	2004/108/EC	2004/108/EC	2004/108/EC
RoHS Directive	2002/95/EC	2002/95/EC	2002/95/EC
Electromagnetic compatibility			
Interference immunity	IEC/EN 61000-6-1, IEC/EN 61000-6-2	IEC/EN 61000-6-1, IEC/EN 61000-6-2	IEC/EN 61000-6-1, IEC/EN 61000-6-2
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)
Fast transients (burst) IEC/EN 61000-4-4	Level 3 (2 kV/5 kHz)	Level 3 (2 kV/5 kHz)	Level 3 (2 kV/5 kHz)
High-energy pulses (surge) IEC/EN 61000-4-5	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)
Cable-borne HF IEC/EN 61000-4-6	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)
Emitted interference	IEC/EN 61000-6-3, IEC/EN 61000-6-4	IEC/EN 61000-6-3, IEC/EN 61000-6-4	IEC/EN 61000-6-3, IEC/EN 61000-6-4
Electromagnetic field (resistance to RF interference) IEC/CISPR 22, EN 55022	Class B	Class B	Class B
Cable-borne HF IEC/CISPR 22; EN 55022	Class B	Class B	Class B

Dimensions

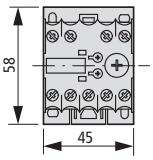
Electronic timing relays

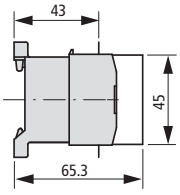
DILET…

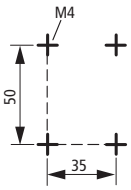




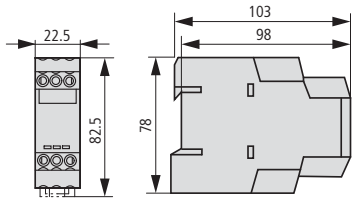
DILET… + HDILE





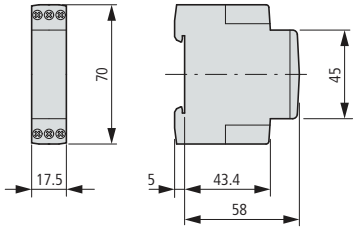


ETR4-…

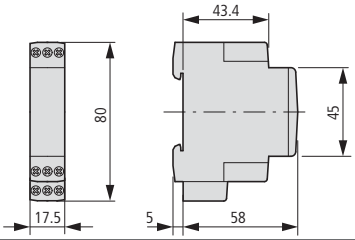


ETR2-…

250 x 006

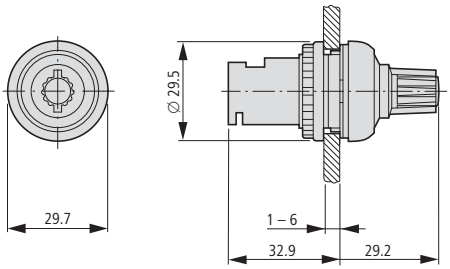


ETR2-…-D



Potentiometers

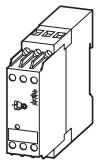
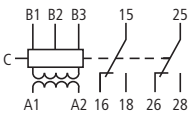
M22-R…K…



Ordering

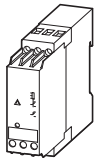
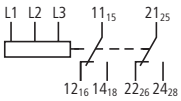
Current monitoring relays EMR4-I..., single-phase

Load limit curves → Page 11/21
Circuit and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net/support

		Current measurement range I~/I= A	Contact sequences	Supply voltage connection	Part no. Article no.	Price See price list	Std. pack
	• Switching hysteresis adjustable from 3 - 30 % • Response delay 0.1 - 30 s • Monitoring of one upper or lower limit • Extension of the measurement range possible with current transformers	3 - 30 mA 10 - 100 mA 0.1 - 1 A		24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**EMR4-I1-1-A** 106942		1 off
		0.3 - 1.5 A 1 - 5 A 3 - 15 A		24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**EMR4-I15-1-A** 106943		1 off
		0.3 - 1.5 A 1 - 5 A 3 - 15 A		220 - 240 V AC, 50/60 Hz	**EMR4-I15-1-B** 106944		1 off

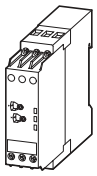
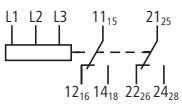
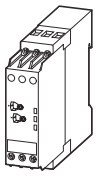
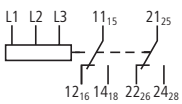
EMR4-F... phase sequence relay

Load limit curves → Page 11/21
Circuit and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net/support

		Monitoring voltage per phase U_N V AC	Contact sequences	Supply voltage connection	Part no. Article no.	Price See price list	Std. pack
	• Monitors three-phase systems for phase sequence and phase failure (< 0.6 x U_e) • Supply voltage connection = monitored voltage	200 - 500 V AC, 50/60 Hz		200 - 500 V AC, 50/60 Hz	**EMR4-F500-2** 221784		1 off

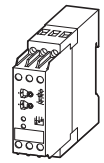
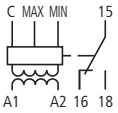
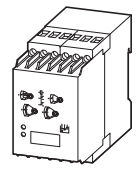
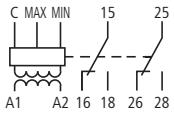
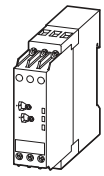
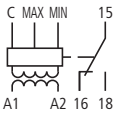
EMR5-A... phase imbalance monitoring relays

Load limit curves → Page 11/21
Circuit and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net/support

		Threshold value	Contact sequences	Supply voltage connection	Part no. Article no.	Price See price list	Std. pack
	Power supply from measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Asymmetry • Imbalance threshold values adjustable 2 - 25 % of mean value of phase voltages • On-delay: None = 0 or adjustable from 0.1 to 30 s	Imbalance = 2 - 25 % of phase voltage mean value		160 - 300 V AC, 50/60 Hz	**EMR5-A300-1-C** 134230		1 off
	Power supply from measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Asymmetry • Imbalance threshold values adjustable • On-delay: None = 0 or adjustable from 0.1 to 30 s	Imbalance = 2 - 25 % of phase voltage mean value		300 - 500 V AC, 50/60 Hz	**EMR5-A400-1** 134222		1 off

Notes **Information relevant for export to North America**

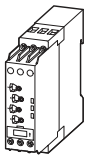
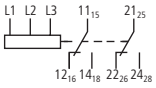
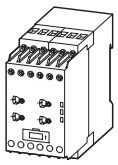
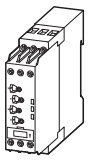
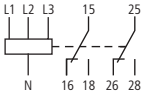
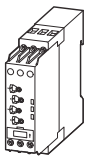
Product Standards	IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

		Response sensitivity	Contact sequences	Supply voltage connection	**Part no.** Article no.	**Price** See price list	Std. pack
Liquid level monitoring relays EMR4-N…							
Load limit curves → Page 11/21 Circuit and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net/support							
	• Fill level monitoring of conductive liquids • Mixture ratio monitoring of conductive liquids • Selectable dry-running or overflow protection	5 kΩ - 100 kΩ		220 - 240 V AC, 50/60 Hz	**EMR4-N100-1-B** 221789		1 off
	• Fill level monitoring of conductive liquids • Mixture ratio monitoring of conductive liquids • Selectable on-delay or off-delay between 0.5 - 10 s	250 Ω - 500 kΩ		24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**EMR4-N500-2-A** 221791		1 off
		250 Ω - 500 kΩ		220 - 240 V AC, 50/60 Hz	**EMR4-N500-2-B** 221790		1 off
Liquid level monitoring relays EMR5N...							
Load limit curves → Page 11/21 Circuit and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net/support							
	• Fill level monitoring of conductive liquids • Conductivity (mixture ratio) monitoring of conductive liquids	5 kΩ - 100 kΩ		220 - 240 V AC, 50/60 Hz	**EMR5-N80-1-B** 134232		1 off

Notes

Information relevant for export to North America

Product Standards	IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

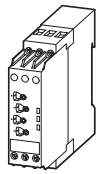
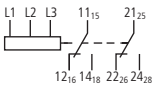
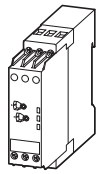
		Monitoring voltage per phase	Threshold value[1]	Contact sequences	Supply voltage connection	Width mm	**Part no.** Article no.	**Price** See price list	Std. pack
Phase monitoring relay EMR5-(A)W...									
Multifunctional Load limit curves → Page 11/21 Connections and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net									
	Power supply from measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Overvoltage • Undervoltage • Asymmetry • Adjustable threshold values for overvoltage/ undervoltage and imbalance • On-/Off-delay: None = 0 or adjustable between 0.1 - 30 s	160 - 300 V AC, 50/60 Hz	U_{max} 220 - 300 V AC U_{min} 160 - 230 V AC		160 - 300 V AC, 50/60 Hz	22.5	**EMR5-AW300-1-C** 134223		1 off
		300 - 500 V AC, 50/60 Hz	U_{max} 420 - 500 V AC U_{min} 300 - 380 V AC		300 - 500 V AC, 50/60 Hz	22.5	**EMR5-AW500-1-D** 134224		
		350 - 580 V AC, 50/60 Hz	U_{max} 480 - 580 V AC U_{min} 350 - 460 V AC		350 - 580 V AC, 50/60 Hz	45	**EMR5-AWM580-2** 134235		
		450 - 720 V AC; 50/60 Hz	U_{max} 600 - 720 V AC U_{min} 450 - 570 V AC		350 - 720 V AC, 50/60 Hz	45	**EMR5-AWM720-2** 134236		
		530 - 820 V AC; 50/60 Hz	U_{max} 690 - 820 V AC U_{min} 530 - 660 V AC		530 - 820 V AC, 50/60 Hz	45	**EMR5-AWM820-2** 134237		1 off
	Power supply from measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Overvoltage • Undervoltage • Asymmetry • Neutral cable break (not EMR5-AWN500-1) • Adjustable threshold values for overvoltage/ undervoltage and imbalance • On-/Off-delay: None = 0 or adjustable between 0.1 - 30 s	90 - 170 V AC, 50/60 Hz	U_{max} 120 - 170 V AC $U_{min.}$ 90 - 130 V AC		90 - 170 V AC, 50/60/ 400 Hz	22.5	**EMR5-AWN170-1-E** 134225		1 off
		180 - 280 V AC, 50/60 Hz	U_{max} 240 - 280 V AC U_{min} 180 - 220 V AC		180 - 280 V AC, 50/60/ 400 Hz	22.5	**EMR5-AWN280-1** 134233		
		180 - 280 V AC, 50/60 Hz	U_{max} 240 - 280 V AC U_{min} 180 - 220 V AC		180 - 280 V AC, 50/60 Hz	22.5	**EMR5-AWN280-1-F** 134226		
		300 - 500 V AC, 50/60 Hz	U_{max} 420 - 500 V AC U_{min} 300 - 380 V AC		300 - 500 V AC, 50/60 Hz	22.5	**EMR5-AWN500-1** 134234		

Notes [1] Imbalance = 2 - 25% of phase voltage mean value

Information relevant for export to North America

Product Standards	IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

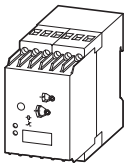
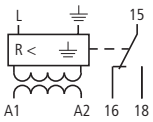
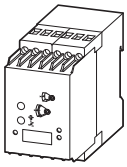
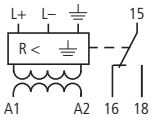
HPL11019EN

		Monitoring voltage per phase	Threshold value[1]	Contact sequences	Supply voltage connection	Width mm	**Part no.** Article no.	**Price** See price list	Std. pack
Phase monitoring relay EMR5-(A)W...									
On- and Off-delayed Load limit curves → Page 11/21 Connections and contact sequence diagrams → Instructional leaflet (AWA) under www.moeller.net									
	Power supply from measuring circuit Three-phase monitoring of phase parameters • Phase sequence • Phase failure • Overvoltage • Undervoltage • Adjustable threshold values for overvoltage/ undervoltage and imbalance • On-/Off-delay: None = 0 or adjustable between 0.1 - 30 s	160 - 300 V AC, 50/60 Hz	U_{max} 220 - 300 V AC U_{min} 160 - 230 V AC		160 - 300 V AC, 50/60 Hz	22.5	**EMR5-W300-1-C** 134227		1 off
		300 - 500 V AC, 50/60 Hz	U_{max} 420 - 500 V AC U_{min} 300 - 380 V AC		300 - 500 V AC, 50/60 Hz	22.5	**EMR5-W500-1-D** 134221		
	Power supply from measuring circuit Three-phase monitoring of phase parameters • Phase sequence • Phase failure • Overvoltage • Undervoltage • Adjustable threshold values for overvoltage/ undervoltage permanently set at ± 10% • On-/Off-delay: None = 0 or adjustable between 0.1 - 30 s	380 V AC, 50/60 Hz	U_{max} 418 V AC U_{min} 342 V AC		380 V, 50/60 Hz	22.5	**EMR5-W380-1** 134228		
		400 V AC, 50/60 Hz	U_{max} 440 V AC U_{min} 360 V AC		400 V, 50/60 Hz	22.5	**EMR5-W400-1** 134229		

Notes [1] Imbalance = 2 - 25% of phase voltage mean value

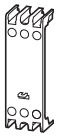
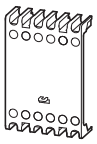
Information relevant for export to North America

Product Standards	IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	UL report valid
CSA Class No.	3211-03
NA Certification	UL Listed, Certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Description	Insulation resistance range Ω	Contact sequences	Supply voltage connection V AC	**Part no.** Article no.	**Price** See price list	Std. pack
Insulation monitoring relays EMR4-R...							
	Monitors the insulation resistance between non-grounded AC supply systems and the protective ground conductor Insulation monitoring in 1- and 3-phase AC voltage networks Test via local test button or remote test operation Status display via LED (according to VDE 0413/Part 2) Tripping function memory	1 - 110 kΩ		24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**EMR4-RAC-1-A** 221793		1 off
	Monitors the insulation resistance in non-grounded DC supply systems Selector switch for open- or closed-circuit principle Test and reset via local test button or remote test operation Status indication via LEDs	10 - 110 kΩ		24 - 240 V AC, 50/60 Hz 24 - 240 V DC	**EMR4-RDC-1-A** 221792		1 off

Information relevant for export to North America

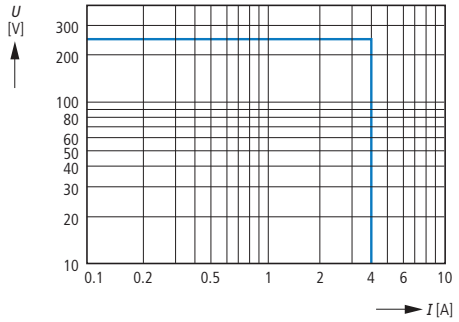
Product Standards	IEC 255-6; UL 508; CSA-22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR, NKCR7
CSA File No.	203843
CSA Class No.	3211-03
NA Certification	UL Listed, CSA Certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Width mm	**Part no.** Article no.	**Price** See price list	Std. pack
Sealable shroud EMR4-PH...				
	22.5	**EMR4-PH22** 221795		1 off
	45	**EMR4-PH45** 221794		1 off

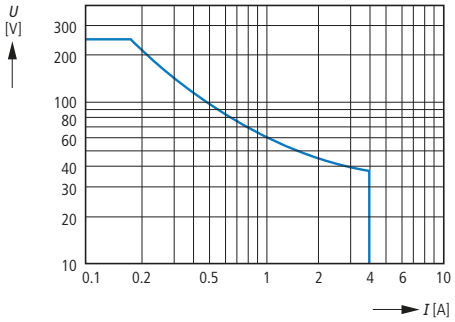
Engineering

Load limit curves, 22.5 mm range

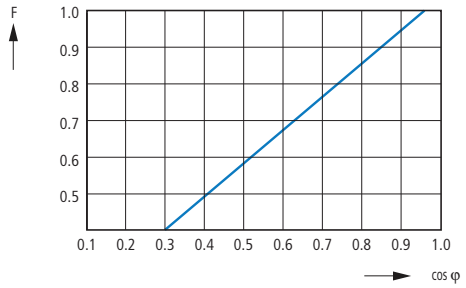
AC load (resistive)



DC load (resistive)

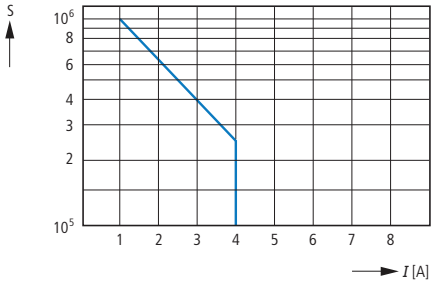


Derating factor with inductive AC load



Derating factor F with inductive load

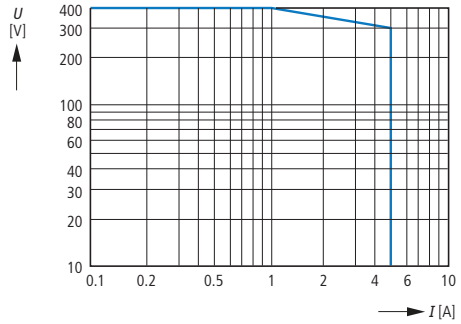
Contact life



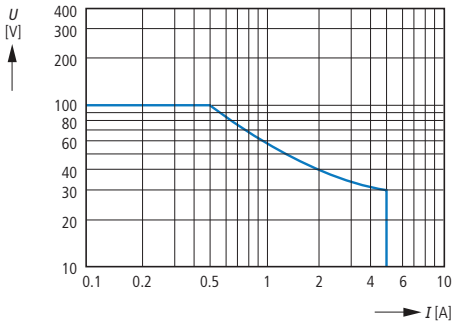
Contact life
Operations S
220 V 50 Hz AC-1
360 operations/h

Load limit curves, 45 mm range

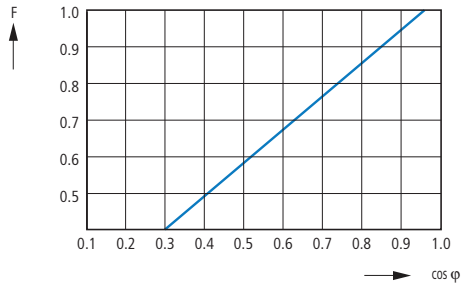
AC load (resistive)



DC load (resistive)

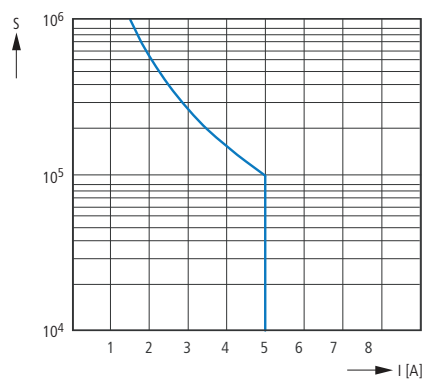


Derating factor with inductive AC load



Derating factor F with inductive load

Contact life



Contact life
Operations S
220 V 50 Hz AC-1
360 operations/h

Technical data

	EMR4-I1-1-A	EMR4-I15-1-A	EMR4-I15-1-B
Input circuit, power supply circuit A1-A2			
Rated control voltage U_S - power consumption:			
A1-A2	24 - 240 V AC/DC	24 - 240 V AC/DC	220 - 240 V AC
Tolerance of rated control voltage U_S	-15 - +10 %	-15 - +10 %	-15 - +10 %
Rated frequency			
AC versions	50/60 Hz	50/60 Hz	50/60 Hz
AC/DC versions	50/60 Hz or DC	50/60 Hz or DC	50/60 Hz or DC
Current/power consumption			
24 V DC	30 mA/0.75 W	30 mA/0.75 W	
115 V AC	24 mA/2.6 VA	24 mA/2.6 VA	
230 V AC	11 mA/2.6 VA	11 mA/2.6 VA	12 mA/2.6 VA
Duty factor (DF)	100 %	100 %	100 %
Mains failure buffering	20 ms	20 ms	20 ms
Transient overvoltage protection	Varistors	Varistors	Varistors
Input circuit measuring circuit B1/B2/B3-C			
Monitoring functions	Overcurrent or undercurrent monitoring can be configured	Overcurrent or undercurrent monitoring can be configured	Overcurrent and undercurrent monitoring
Measurement method	True RMS value measurement, any curve shapes		
Measuring inputs			
Terminal assignment B1 - C	–	–	–
Measurement ranges AC/DC	3 - 30 mA	0.3 - 1.5 A	0.3 - 1.5 A
Input resistance	3.3 Ω	0.05 Ω	0.05 Ω
Pulse overload capacity t < 1 s	500 mA	15 A	15 A
Long-term overload	50 mA	2 A	2 A
Measuring inputs			
Terminal assignment B2 - C	–	–	
Measurement ranges AC/DC	10 - 100 mA	1 - 5 A	1 - 5 A
Input resistance	1 Ω	0.01 Ω	0.01 Ω
Pulse overload capacity t < 1 s	1 A	50 A	50 A
Long-term overload	150 mA	7 A	7 A
Measuring inputs			
Terminal assignment B3 - C	0.1 - 1 A	3 - 15 A	3 - 15 A
Measurement ranges AC/DC	0.1 Ω	0.0025 Ω	0.0025 Ω
Input resistance	10 A	100 A	100 A
Pulse overload capacity t < 1 s	1.5 A	17 A	17 A
Long-term overload	–	–	–
Threshold value(s)	Adjustable within specified measuring range		
Threshold value setting accuracy	0.1	0.1	0.1
Repetition accuracy (constant parameters)	±0.07 % of full-scale value	±0.07 % of full-scale value	±0.07 % of full-scale value
Hysteresis relative to threshold value	3 - 30 % adjustable	3 - 30 % adjustable	3 - 30 % adjustable
Frequency range of measuring signal	DC/15 Hz - 2 kHz	DC/15 Hz - 2 kHz	DC/15 Hz - 2 kHz
Rated frequency range of measuring signal	DC/50 - 60 Hz	DC/50 - 60 Hz	DC/50 - 60 Hz
Maximum response time	AC: 80 ms/DC: 120 ms	AC: 80 ms/DC: 120 ms	AC: 80 ms/DC: 120 ms
Measuring error within control voltage tolerance	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Measuring error within temperature range	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C
Timing circuits			
Release delay T_v	0 or 0.1 - 30 s adjustable	0 or 0.1 - 30 s adjustable	0 or 0.1 - 30 s adjustable
Repetition accuracy (constant parameters)	None	±0.07 % of full-scale value	±0.07 % of full-scale value
Time error within control voltage tolerance	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Timeout error within temperature range	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C
Operating status indication			
Control voltage U/T: green LED	Continuous light: control voltage present; slow flashing: trip delay T_v active		
Measured value I: red LED	Continuous light: overcurrent; slow flashing: undercurrent		
Relay status R: yellow LED	Continuous light: relay picked up, no storage Slow flashing: duty factor long: relay picked up, active storage Slow flashing: duty factor short: relay dropped out, active storage		
Output circuits	11(15) - 12(16)/14(18), 21(25) - 22(26)/24(28) - relays	11(15) - 12(16)/14(18), 21(25) - 22(26)/24(28) - relays	11(15) - 12(16)/14(18), 21(25) - 22(26)/24(28) - relays
Output type	Two changeover contacts	Two changeover contacts	Two changeover contacts
Operating principle	Open-circuit principle: Output relays pick up when actual value exceeds or is below set threshold value.		

	EMR4-I1-1-A	EMR4-I15-1-A	EMR4-I15-1-B
Contact material	AgNi	AgNi	AgNi
Rated operating voltage (VDE 0110, IEC 947-1)	250 V	250 V	250 V
Minimum switching voltage/minimum switching current	24 V/10 mA	24 V/10 mA	24 V/10 mA
Maximum switching voltage/maximum switching current	250 V AC/4 A AC	250 V AC/4 A AC	250 V AC/4 A AC
Rated operational current (IEC 60947-5-1)			
AC12 (resistive) at 230 V	4 A	4 A	4 A
AC15 (inductive) at 230 V	3 A	3 A	3 A
DC12 (resistive) at 24 V	4 A	4 A	4 A
DC13 (inductive) at 24 V	2 A	2 A	2 A
Rating data AC (UL 508)			
Utilization category (Control Circuit Rating Code)	B 300	B 300	B 300
Max. rated operational voltage	300 V AC	300 V AC	300 V AC
Max. thermal uninterrupted current at B 300	5 A	5 A	5 A
Max. input/output rating (N/O / N/C) for B 300	3600/360 VA	3600/360 VA	3600/360 VA
Mechanical lifespan	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations
Short-circuit strength/maximum fuse rating			
Normally closed contact	6 A fast	10 A fast	10 A fast
Normally open contact	6 A fast	10 A fast	10 A fast
General data			
Enclosure measurements (w x h x d)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)
Mounting	DIN rail (EN 50022)	DIN rail (EN 50022)	DIN rail (EN 50022)
Mounting position	Any	Any	Any
Degree of protection of enclosures/terminals	IP50/IP20	IP50/IP20	IP50/IP20
Electrical connection			
Terminal capacities			
Flexible with/without ferrule	2 x 0.75 - 2.5 mm² (2 x 18 - 14 AWG) With measuring currents > 10 A lateral clearance of 10 mm required		
Rigid	2 x 0.5-4 mm² (2 x 20-12 AWG) With measuring currents > 10 A lateral clearance of 10 mm required		
Stripped length	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)
Tightening torque	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm
Environmental data			
Ambient temperature range (operation/storage)	-20 - +60 °C/-40 - +85 °C	-20 - +60 °C/-40 - +85 °C	-20 - +60 °C/-40 - +85 °C
Damp heat (IEC 60068-2-30)	55 °C, 6 cycles	55 °C, 6 cycles	56 °C, 6 cycles
Vibration (sinusoidal) (IEC/EN 60255-21-1)	Class 2	Class 2	Class 2
Impact (IEC/EN 60255-21-2)	Class 2	Class 2	Class 2
Insulation data			
Rated insulation voltage (VDE 0110, IEC 60947-1, IEC/EN 60255-5)			
Power supply/measuring circuit/output	600 V	600 V	600 V
Power supply/output 1/output 2	250 V	250 V	250 V
Rated impulse withstand voltage Uimp (IEC/EN 60947-1, IEC/EN 60255-5)			
Power supply/measuring circuit/output	6 kV 1.2/50 µs	6 kV 1.2/50 µs	6 kV 1.2/50 µs
Power supply/output 1/output 2	4 kV 1.2/50 µs	4 kV 1.2/50 µs	4 kV 1.2/50 µs
Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5)	3	3	3
Overvoltage category (VDE 0110, IEC 664, IEC/EN 60255-5)	III	III	III
Directives and standards			
Product standard	IEC/EN 60255-6	IEC/EN 60255-6	IEC/EN 60255-6
Low-Voltage Directive	2006/95/EC	2006/95/EC	2006/95/EC
EMC Directive	2004/108/EC	2004/108/EC	2004/108/EC
Electromagnetic compatibility			
Noise immunity	IEC/EN 61000-6-2	IEC/EN 61000-6-2	IEC/EN 61000-6-2
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3	Level 3	Level 3
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3	Level 3	Level 3
Fast transients (burst) IEC/EN 61000-4-4	Level 3	Level 3	Level 3
High-energy pulses (surge) IEC/EN 61000-4-9	Level 3	Level 3	Level 3
Cable-borne HF IEC/EN 61000-4-6	Level 3	Level 3	Level 3
Interference emission	IEC/EN 61000-6-3	IEC/EN 61000-6-3	IEC/EN 61000-6-3
Electromagnetic field (immunity to RF interference) IEC/CISPR 22, EN 55022	Class B	Class B	Class B
Cable-borne HF IEC/CISPR 22; EN 55022	Class B	Class B	Class B

	EMR4-F500-2
Input circuit, measuring circuit	
Phase conductor	L1-L2-L3
Rated control voltage U_S	3 x 200 - 500 V AC
Power consumption	Approx. 15 VA
Tolerance of rated control voltage U_S	-15 - +10 %
Rated frequency	50/60 Hz
Duty factor (DF)	100%
Measuring circuit	
Monitoring functions	
Phase failure	Yes
Phase sequence	Yes
Measuring range	3 x 200 - 500 V AC
Threshold value	0.6 x U_N
Frequency of measuring signal	50/60 Hz
Response time	500 ms
Measuring error within rated control voltage tolerance	≤ 0.5 %
Measuring error within temperature range	≤ 0.06 %/°C
Timing circuit	
On-delay T_s	Fixed 500 ms
Operating status indication	
Relay status R: yellow LED	Continuous light: output relay picked up
Output circuits	
Output circuits	11(15) -12(16)/14(18), 21(25) -22(26)/24(28)
Output type	Two changeover contacts
Operating principle	Closed-circuit principle: output relays drop out when value exceeds/below set threshold value
Contact material	AgNi
Rated operating voltage (VDE 0110, IEC 60947-1)	250 V
Maximum switching voltage	250 V AC, 250 V DC
Rated operational current (IEC 60947-5-1)	
AC12 (resistive) at 230 V	4 A
AC15 (inductive) at 230 V	3 A
DC12 (resistive) at 24 V	4 A
DC13 (inductive) at 24 V	2 A
Rating data AC (UL 508)	
Utilization category (Control Circuit Rating Code)	B 300
Max. rated operational voltage	300 V AC
Max. thermal uninterrupted current at B 300	5 A
Max. input/output rating (N/O / N/C) for B 300	3600/360 VA
Mechanical lifespan	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.1 x 10^6 operations
Short-circuit strength/maximum fuse rating	
Normally closed contact	4 A fast
Normally open contact	6 A fast
General data	
Enclosure measurements (w x h x d)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)
Mounting position	Any
Degree of protection of enclosures/terminals	IP50/IP20
Mounting	DIN rail (EN 50022)
Electrical connection	
Terminal capacities	
Flexible with ferrule	2 x 0.75- 2.5 mm² (2 x 18 - 14 AWG)
Flexible without ferrule	2 x 0.75- 2.5 mm² (2 x 18 - 14 AWG)
Rigid	2 x 0.5 - 4 mm² (2 x 20 - 12 AWG)
Stripped length	7 mm (0.28 inches)
Tightening torque	0.6 - 0.8 Nm

	EMR4-F500-2
Environmental data	
Ambient temperature range, operation/storage	-20 - +60 °C / -40 - +85 °C
Climatic testing (IEC 68-2-30)	24 h cycle, 55 °C, 93 % rel., 96 h
Operating safety (IEC 68-2-6)	4 g
Mechanical strength (IEC 68-2-6)	6 g
Insulation data	
Rated voltage between supply, measuring, and output circuits (VDE 0110, IEC 60947-1)	500V
Rated impulse withstand voltage U_{imp} between all insulated circuits (VDE 0110, IEC 664)	2.5 kV, 50 Hz, 1 min.
Test voltage between all insulated circuits (routine test)	4 kV, 50 Hz, 1 min.
Pollution degree (VDE 0110, IEC 664, IEC 255-5)	3
Overvoltage category (VDE 0110, IEC 664, IEC 255-5)	III
Directives and standards	
Product standard	IEC 255-6, EN 60255-6
Low-Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC
Electromagnetic compatibility	
Noise immunity	EN 61000-6-2
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (6 kV/8 kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3 (10 V/m)
Fast transients (burst) IEC/EN 61000-4-4	Level 3 (2 kV/5 kHz)
High-energy pulses (surge) IEC 1000-4-5, EN 61000-4-5	Level 4 (2 kV L-L)
Cable-borne HF IEC 100-4-6, EN 61000-4-6	Level 3 (10 V)
Interference emission	EN 61000-6-4



			EMR5-A300-1-C	EMR5-A400-1
Input circuit, measuring circuit			L1,L2,L3	L1,L2,L3
Rated control voltage, monitored voltage	U_s		3 x 160 - 300 V AC	3 x 300 - 500 V AC
Typical current/power consumption			25 mA/10 VA/230 V AC	25 mA/18 VA/400 V AC
Rated control voltage tolerance	U_s	%	-15 - +10	-15 - +10
Rated frequency		Hz	50/60	50/60
Frequency range		Hz	45 - 65	45 - 65
Measuring circuit				
Monitoring functions				
Phase failure			Yes	Yes
Phase sequence			Yes	Yes
Automatic phase sequence correction			No	No
Asymmetry			Yes	Yes
Overvoltage/undervoltage			No	No
Neutral conductor			No	No
Measuring range				
Overvoltage			No	No
Undervoltage			No	No
Asymmetry			2 - 25 % of phase voltage mean value	
Adjustable threshold values				
Overvoltage			No	No
Undervoltage			No	No
Imbalance (disconnection value)			Adjustable within measuring range	Adjustable within measuring range
Hysteresis relative to threshold value				
Overvoltage/undervoltage			No	No
Asymmetry			Fixed 20 %	Fixed 20 %
Rated frequency of measuring signal		Hz	50/60	50/60
Frequency range of measuring signal		Hz	45 - 65	45 - 65
Maximum monitoring cycle		ms	100	100
Measuring error within rated control voltage tolerance				
Measuring error within temperature range				
Measurement method			True RMS value measurement	True RMS value measurement
Timing circuit				
On-delay	T_s	ms	Fixed 200	Fixed 200
Response delay	T_v	s	On-delayed: none = 0; adjustable 0.1 - 30	On-delayed: none = 0; adjustable 0.1 - 30
Timeout error within rated control voltage tolerance		%	≤ 0.5	≤ 0.5
Timeout error within temperature range		% /°C	≤ 0.06	≤ 0.06
Repetition accuracy (constant parameters)		%	< ±0.2	< ±0.2
Operating status indication				
Relay status R: yellow LED			See instructional leaflet	See instructional leaflet
Output circuits				
Output circuits			15-16/18, 25-26/28	15-16/18, 25-26/28
Output type			2 x 1 relay (changeover contact)	2 x 1 relay (changeover contact)
Operating principle			Closed-circuit principle: output relays drop out when value above/below set threshold value	
Contact material			AgNi alloy, Cd-free	AgNi alloy, Cd-free
Rated operating voltage (VDE 0110, IEC 60947-1)		V	250	250
Minimum switching voltage/minimum switching current		No	24 V/10 mA	24 V/10 mA
Minimum switching duty		V/mA	24/10	24/10
Maximum switching voltage			→ Page 11/21	→ Page 11/21
Rated operational current (IEC 60947-5-1)				
AC12 (resistive) at 230 V		A	4	4
AC15 (inductive) at 230 V		A	3	3
DC12 (resistive) at 24 V		A	4	4
DC13 (inductive) at 24 V		A	2	2
Rating data AC (UL 508)				
Utilization category (Control Circuit Rating Code)			B 300	B 300
Max. rated operational voltage		V AC	300	300
Max. thermal uninterrupted current at B 300		A	5	5
Max. input/output rating (N/O / N/C) for B 300		VA	3600/360	3600/360
Mechanical lifespan		Operations	30 x 10^6	30 x 10^6
Electrical lifespan (AC12, 230 V, 4 A)		Operations	0.1 x 10^6	0.1 x 10^6

			EMR5-A300-1-C	EMR5-A400-1
Short-circuit strength/maximum fuse rating				
Normally closed contact			6 A fast	6 A fast
Normally open contact			10 A fast	10 A fast
General data				
Enclosure measurements (w x h x d)		mm (inch)	22.5 x 78 x 100 (0.89 x 3.07 x 3.94)	22.5 x 78 x 100 (0.89 x 3.07 x 3.94)
Mounting position			Any	
Degree of protection of enclosures/terminals			IP50/IP20	
Mounting			DIN rail (EN 60715), clip-type toolless	
Minimum distance to adjacent devices				
Horizontal (min. 10 mm of continuous voltage)		V	> 220	> 400
Vertical			None	None
Electrical connection				
Terminal capacities				
Flexible with ferrule		mm² (AWG)	2 x 0.75-2.5 (2 x 18 - 14)	2 x 0.75-2.5 (2 x 18 - 14)
Flexible without ferrule		mm² (AWG)	2 x 0.75-2.5 (2 x 18 - 14)	2 x 0.75-2.5 (2 x 18 - 14)
Rigid		mm² (AWG)	2 x 0.5-4 (2 x 20 - 12)	2 x 0.5-4 (2 x 20 - 12)
Stripped length		mm (inch)	7 (0.28)	7 (0.28)
Tightening torque		Nm	0.6 - 0.8	0.6 - 0.8
Environmental data				
Ambient temperature range, operation/storage		°C	-25 - +60/-40 - +85	-25 - +60 /-40 - +85
Damp heat (IEC 60068-2-30)			55 °C, 6 cycles	55 °C, 6 cycles
Climate class			3K3	3K3
Vibration (sinusoidal) (IEC/EN) 60255-21-1)		Class	2	2
Impact (IEC/EN 60255-21-2)		Class	2	2
Insulation data				
Rated voltage between supply, measuring, and output circuits (VDE 0110, IEC 60947-1)				
Rated impulse withstand voltage Uimp between all insulated circuits (VDE 0110,IEC 664)				
Rated insulation voltage Ui				
Input circuit/output circuit		V	600	600
Input circuit 1/output circuit 2		V	300	300
Rated impulse withstand voltage Uimp (VDE 0110, IEC/EN 60664)				
Input circuit			6 kV; 1.2/50 µs	6 kV; 1.2/50 µs
Output circuits			4 kV; 1.2/50 µs	4 kV; 1.2/50 µs
Test voltage between all insulated circuits (routine test)			2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s
Basic insulation, input circuit/output circuit		V	600	600
Safe isolation (VDE 0160 Part 101 and 101/A; IEC/EN 61140) input circuit/output circuit			No	No
Pollution degree (VDE 0110, IEC/EN 60664, UL 508)			3	3
Overvoltage category (VDE 0110, IEC 60664, UL 508)			III	III
Directives/Standards				
Product standard			IEC/EN 60255-6, EN 50178	IEC/EN 60255-6, EN 50178
Low-Voltage Directive			2006/95/EC	2006/95/EC
EMC Directive			2004/108/EC	2004/108/EC
RoHS Directive			2002/95/EC	2002/95/EC
Electromagnetic compatibility				
Noise immunity			EN 61000-6-1, EN 61000-6-2	EN 61000-6-1, EN 61000-6-2
Electrostatic discharge (ESD) IEC/EN 61000-4-2		Level	3 (6 kV/8 kV)	3 (6 kV/8 kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3		Level	3 (10 V/m)	3 (10 V/m)
Fast transients (burst) IEC/EN 61000-4-4		Level	3 (2 kV/2 kHz)	3 (2 kV/2 kHz)
High-energy pulses (surge) IEC 1000-4-5, EN 61000-4-5		Level	4 (2 kV L-L)	4 (2 kV L-L)
Cable-borne HF IEC 100-4-6, EN 61000-4-6		Level	3 (10 V)	3 (10 V)
Resistance to harmonics EN 61000-4-13		Class	3	3
Interference emission			EN 61000-6-3, EN 61000-6-4	EN 61000-6-3, EN 61000-6-4
Electromagnetic field (immunity to RF interference) IEC/CISPR 22, EN 50022		Class	B	B
Cable-borne HF		Class	B	B



	EMR5-N080-1-B	EMR4-N100-1-B	EMR4-N500-2-B	EMR4-N500-2-A
Input circuit				
Rated control voltage U_S - power consumption:				
A1 - A2	220 - 240 V AC approx. 1.5 VA	220 - 240 V AC approx. 4 VA	220 - 240 V AC approx. 3 VA	24 - 240 V AC/DC approx. 2 VA/W
Tolerance of rated control voltage U_S	-15 % - 10 %	-15 % - 10 %	-15 % - +10 %	-15 % - +10 %
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz or DC	50 - 60 Hz or DC
Duty factor (DF)	100 %	100 %	100 %	100 %
Measuring circuit	MAX-MIN-C	MAX-MIN-C	MAX-MIN-C	MAX-MIN-C
Monitoring functions	Level control	Level control	Level control	Level control
Response sensitivity	5 - 100 kΩ, adjustable	5 - 100 kΩ, adjustable	250 Ω - 5 kΩ, adjustable	250 Ω - 5 kΩ, adjustable
Maximum electrode voltage	30 V AC	30 V AC	20 V AC	20 V AC
Maximum electrode current	1 mA	1 mA	8 mA	8 mA
Electrode supply cable				
Cable capacity max.	10 nF	10 nF	200 nF	200 nF
Cable length max.	100 m	100 m	1000 m	1000 m
Response sensitivity			2.5-50 kΩ, adjustable	2.5-50 kΩ, adjustable
Maximum electrode voltage			20 V AC	20 V AC
Maximum electrode current			2 mA	2 mA
Electrode supply cable				
Cable capacity max.			20 nF	20 nF
Cable length max.			100 m	100 m
Response sensitivity			25 - 500 kΩ, adjustable	25 - 500 kΩ, adjustable
Maximum electrode voltage			20 V AC	20 V AC
Maximum electrode current			0.5 mA	0.5 mA
Electrode supply cable				
Cable capacity max.			4 nF	4 nF
Cable length max.			20 m	20 m
Timing circuit				
Release delay	Approx. 250 ms	Approx. 250 ms		
Delay time			0.1 - 10 s, adjustable, on-delay without off-delay	0.1 - 10 s, adjustable, on-delay without off-delay
Operating status indication				
Control voltage	U: green LED	U: green LED	U: green LED	U: green LED
Output relay energized	R MAX/MIN: yellow LED			
Alarm relay AL1	–	R AL1: yellow LED	U: green LED	U: green LED
Alarm relay AL2	–	R AL2: yellow LED	R: yellow LED	R: yellow LED
Output circuits				
Output circuits	11-12/14, 21-22, 31-32	11-12/14, 21-22, 31-32	15-16/18, 25-26/28	15-16/18, 25-26/28
Output type	1 changeover contact, 1 normally closed contact + 1 normally open contact	1 changeover contact, 1 normally closed contact + 1 normally open contact	Two changeover contacts	Two changeover contacts
Operating principle	Live current principle[1)]	Open-[1)] and closed-circuit principle[2)]	Live current principle[1)]	Live current principle[1)]
Contact material	AgCdO	AgCdO	AgCdO	AgCdO
Rated voltage (VDE 0110, IEC 60947-1)	250 V	250 V	400 V	400 V
Maximum switching voltage	250 V	250 V	400 V	400 V
Rated operational current (IEC 60947-5-1)				
AC12 (resistive) 230 V	4 A	4 A	5 A	5 A
AC15 (inductive) 230 V	3 A	3 A	3 A	3 A
DC12 (resistive) 24 V	4 A	4 A	5 A	5 A
DC13 (inductive) 24 V	2 A	2 A	2 A	2 A

Notes

[1)] Output relays pick up when value above/below set threshold value

[2)] Output relays drop out when value above/below set threshold value

	EMR5-N080-1-B	EMR4-N100-1-B	EMR4-N500-2-B	EMR4-N500-2-A
Rated operational data AC (UL 508)				
Utilization category (Control Circuit Rating Code)	B 300	B 300	B 300	B 300
Max. rated operational voltage	300 V AC		300 V AC	300 V AC
Max. thermal uninterrupted current at B 300	5 A	5 A	5A	5A
Max. input/output rating (N/O / N/C) for B 300	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA
Mechanical lifespan	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.3 x 10^6 operations	0.3 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations
Short-circuit rating, max. fuse rating, N/C / N/O contact	10 A fast/10 A fast	10 A fast/10 A fast	4 A fast/6 A fast	4 A fast/6 A fast
General data				
Enclosure measurements (w x h x d)	22.5 x 70 x 100 mm (0.89 x 3.07 x 3.94 in)	22.5 x 70 x 100 mm (0.89 x 3.07 x 3.94 in)	45 x 78 x 100 mm (1.77 x 3.07 x 3.94 in)	45 x 78 x 100 mm (1.77 x 3.07 x 3.94 in)
Mounting position	Any	Any	Any	Any
Degree of protection of enclosures/terminals	IP50/IP20	IP50/IP20	IP50/IP20	IP50/IP20
Ambient temperature range, operation/storage	-20 - +60 °C / -40 - +85 °C	-20 - +60 °C / -40 - +85 °C	-25 - +65°C / -40 - 85°C	-25 - +65°C / -40 - 85°C
Mounting	DIN rail (EN 50022)	DIN rail (EN 50022)	DIN rail (EN 50022)	DIN rail (EN 50022)
Electrical connection				
Terminal capacity	2 x 2.5 mm² (2 x 14 AWG)	2 x 2.5 mm² (2 x 14 AWG)	2 x 2.5 mm² (2 x 14 AWG)	2 x 2.5 mm² (2 x 14 AWG)
Flexible with ferrule				
Directives and standards				
Product standard	IEC 255 - 6, EN 60255-6	IEC 255 - 6, EN 60255-6	IEC 255-6, EN 60255-6	IEC 255-6, EN 60255-6
Low-Voltage Directive	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC
EMC Directive	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC
Electromagnetic compatibility (EMC)	No	No	No	No
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8kV)	Level 3 (6 kV/8kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)
Fast transients (burst) IEC/EN 61000-4-4	Level 3 (2 kV/5 kHz)	Level 3 (2 kV/5 kHz)	Level 3 (2 kV/5 kHz)	Level 3 (2 kV/5 kHz)
High-energy pulses (surge) IEC1000-4-5, EN 61000-4-5	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)
Immunity to line-conducted interference, IEC 1000-4-6, IEC 1000-4-6, EN 61000-4-6	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)
Operating safety (IEC 68-2-6)	4 g	4 g	5 g	5 g
Mechanical strength (IEC 68-2-6)	6 g	6 g	10 g	10 g
Insulation data				
Rated voltage between supply, measuring, and output circuits (VDE 0110, IEC 60947-1)	250 V	250 V	500 V	500 V
Rated impulse withstand voltage between all insulated circuits (VDE 0110, IE C664)	4 kV/1.2 - 50 µs	4 kV / 1.2 - 50 µs	4 kV/1.2 - 50 µs	4 kV/1.2 - 50 µs
Test voltage between all insulated circuits	2.5 kV, 50 Hz, 1 min.	2.5 kV, 50 Hz, 1 min.	2.5 kV, 50 Hz, 1 min.	2.5 kV, 50 Hz, 1 min.
Pollution degree (VDE 0110, IEC 664, IEC 255-5)	3/C	3/C	3/C	3/C
Overvoltage category (VDE 0110, IEC 664, IEC 255-5)	III/C	III/C	III/C	III/C
Climatic testing (IEC 68-2-30)	24 h cycle, 55 °C, 93 % rel., 96 h	24 h cycle, 55 °C, 93 % rel., 96 h	24 h cycle, 55 °C, 93 % rel., 96 h	24 h cycle, 55 °C, 93 % rel., 96 h

	EMR4-RDC-1-A	EMR4-RAC-1-A
Input circuit		
Rated control voltage U_S power consumption:		
A1-B2	24 - 240 V AC/DC - approx. 8 VA / 2 W	24 - 240 V AC/DC - approx. 8 VA / 2 W
Tolerance of rated control voltage U_S	-15 % - +10 %	-15 % - +10 %
Rated frequency		
AC/DC versions	15 - 400 Hz or DC	15 - 400 Hz or DC
AC versions	–	50 - 60 Hz
Duty factor (DF)	100 %	100 %
Measuring circuit L-PE		
Monitoring function, insulation monitoring for isolated AC networks	Isolated DC networks	
Measuring range, threshold value setting range min-max.	10 - 110 kΩ	1 - 11 kΩ , 10 - 110 kΩ
Minimum internal resistance	–	57 kΩ
Minimum internal AC resistance	–	100 kΩ
Internal DC resistance	–	100 kΩ
Test resistance	–	820
Max. voltage at measuring input	300 V DC	415 V AC
Max. DC measuring voltage	24 - 240 V DC	30 V DC
Max. cable length for clear-test button		10 m
Time delay	< 1 s with insulation, < 0.9 x response value	Proportional to insulation resistance and dependent on set threshold value
Operating status indication		
Control voltage	U: green LED	U: green LED
Insulation fault	L+: red LED, L-: red LED	F: red LED
Output circuits		
Output circuits	15-16/18	15-16/18
Output type	One changeover contact	One changeover contact
Operating principle	Open-circuit principle: Output relays pick up when value above/ below set threshold value Closed-circuit principle: output relays drop out when value above/below set threshold value	Open-circuit principle: Output relays pick up when value above/below set threshold value
Contact material	AgCdO	AgCdO
Rated operating voltage (VDE 0110, IEC 664-1, IEC 60947-1)	250 V	250 V
Maximum switching voltage	400 V AC, 300 V DC	400 V AC, 300 V DC
Rated operational current (IEC 60947-5-1, EN 60947-5-1)		
AC12 (resistive) 230 V	5A	5A
AC15 (inductive) 230 V	3A	3A
DC12 (resistive) 24 V	5A	5A
DC13 (inductive) 24 V	2A	2A
Rated operational data AC (UL 508)		
Utilization category (Control Circuit Rating Code)	B300	B300
Max. rated operational voltage	300 V AC	300 V AC
Max. thermal uninterrupted current at B 300	5A	5A
Max. input/output rating (N/O / N/C) for B 300	3600/360 VA	3600/360 VA
Mechanical lifespan	30 x 10^6 operations	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.1 x 10^6 operations	0.1 x 10^6 operations
Short-circuit rating, max. fuse protection, N/C / N/O contact	4 A fast/6 A fast	4 A fast/6 A fast

	EMR4-RDC-1-A	EMR4-RAC-1-A
General data		
Enclosure measurements	45 x 78 x 100 mm (1.77 x 3.07 x 3.94 in)	45 x 78 x 100 mm (1.77 x 3.07 x 3.94 in)
Weight	approx. 0.3 kg (0.66 lb)	approx. 0.3 kg (0.66 lb)
Mounting position	Any	Any
Degree of protection of enclosures/terminals	IP50/IP20	IP50/IP20
Ambient temperature range, operation/storage	-25 - +65 °C / -40 - +85 °C	-25 - +65 °C / -40 - +85 °C
Mounting	DIN rail (EN 50022)	DIN rail (EN 50022)
Electrical connection		
Terminal capacity		
Flexible with ferrule	2 x 2.5 mm² (2 x 14 AWG)	2 x 2.5 mm² (2 x 14 AWG)
Directives and standards		
Product standard	IEC 255-6, EN 60255-6	IEC 255-6, EN 60255-6
Low-Voltage Directive	2006/95/EC	2006/95/EC
EMC Directive	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4	EN 61000-6-2, EN 61000-6-4
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3 (10(3)V/m)	Level 3 (10(3)V/m)
Fast transients (burst) IEC/EN 61000-4-4	Level 3 (2(1) kV/5 kHz)	Level 3 (2(1) kV/5 kHz)
High-energy pulses (surge) IEC 1000-4-5, EN 61000-4-5	Level 3 (2(1) kV L-L)	Level 3 (2(1) kV L-L)
Immunity to line-conducted interference, IEC 1000-4-6, EN 61000-4-6	Level 3 (10(3) V)	Level 3 (10(3) V)
Operating safety (IEC 68-2-6)	5 g	5 g
Mechanical strength (IEC 68-2-6)	10 g	10 g
Climatic testing (IEC 68-2-30)	24 h cycle, 55 °C, 93 % rel., 96 h	24 h cycle, 55 °C, 93 % rel., 96 h
Insulation data		
Rating (HD 625.1 S1, VDE 0110, IEC 664-1, IEC 60255-5)		
Rated voltage between supply, measuring, and output circuits	250 V	250 V
Rated impulse withstand voltage between all insulated circuits	4 kV / 1.2 - 50 µs	4 kV / 1.2 - 50 µs
Test voltage between all insulated circuits	2.5 kV, 50 Hz, 1 min.	2.5 kV, 50 Hz, 1 min.
Pollution degree	3	3
Overvoltage category	III	III



	EMR5-W300-1-C	EMR5-W380-1	EMR5-W400-1	EMR5-W500-1-D	EMR5-AW300-1-C
Input circuit, measuring circuit					
Main pole, neutral conductor	L1,L2,L3	L1,L2,L3	L1,L2,L3	L1,L2,L3	L1, L2, L3
Rated control voltage U_S = monitored voltage	3 x 160 - 300 V AC	3 x 380 V AC	3 x 400 V AC	3 x 300 - 500 V AC	3 x 160 - 300 V AC
Tolerance of rated control voltage U_S	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %
Rated frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Frequency range	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Typical current/power consumption	25 mA/10 VA /at 250 V AC	25 mA/18 VA /at 380 V AC	25 mA/18 VA /at 400 V AC	25 mA/18 VA /at 400 V AC	25 mA/10 VA (230 V AC)
Duty factor (DF)					
Measuring circuit					
Monitoring functions					
Phase failure	Yes	Yes	Yes	Yes	Yes
Phase sequence	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated
Automatic phase sequence correction	No	No	No	No	No
Asymmetry	No	No	No	No	Yes
Overvoltage/undervoltage	Yes	Yes	Yes	Yes	Yes
Neutral conductor/break					No
Neutral conductor	No	No	No	No	
Measuring range					
Overvoltage	3 x 220 - 300 v AC	3 x 418 V AC	3 x 440 V AC	3 x 420 - 500 V AC	3 x 220 - 300 V AC
Undervoltage	3 x 160 - 230 V AC	3 x 342 V AC	3 x 360 V AC	3 x 300 - 380 V AC	3 x 160 - 230 V AC
Asymmetry	No	No	No	No	2 - 25 % of phase voltage mean value
Adjustable threshold values					
Overvoltage	Adjustable within measuring range	Fixed	Fixed	Adjustable within measuring range	Adjustable within measuring range
Undervoltage	Adjustable within measuring range	Fixed	Fixed	Adjustable within measuring range	Adjustable within measuring range
Imbalance (disconnection value)	No	No	No	No	Adjustable within measuring range
Asymmetry					
Hysteresis relative to threshold value					
Overvoltage/undervoltage	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %
Asymmetry	No	No	No	No	Fixed 20 %
Rated frequency of measuring signal	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Frequency range of measuring signal	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Reaction time	No	No	No	No	
Maximum monitoring cycle	100 ms	100 ms	100 ms	100 ms	100 ms
Measuring error within rated control voltage tolerance	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Measuring error within temperature range	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C
Measurement method	True RMS value measurement				
Timing circuit					
On-delay T_s	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms
On-delay T_{s1}					
Response delay T_v	On- or off-delay 0; 0, 1-30 s adjustable	On- or off-delay 0; 0, 1-30 s adjustable	On- or off-delay 0; 0, 1-30 s adjustable	On- or off-delay 0; 0, 1-30 s adjustable	On- or off-delay; none = 0, adjustable 0.1 - 30 s
Timeout error within rated control voltage tolerance	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Timeout error within temperature range	≤ 0.06 % /°C	≤ 0.06 % /°C	≤ 0.06 % /°C	≤ 0.06 % /°C	≤ 0.06 %/°C
Repetition accuracy (constant parameters)	±0.2 %	±0.2 %	±0.2 %	±0.2 %	±0.2 %
Operating status indication					
Relay status R: yellow LED	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet

EMR5-AW500-1-D	EMR5-AWM580-2	EMR5-AWM720-2	EMR5-AWM820-2	EMR5-AWN170-1-E	EMR5-AWN280-1	EMR5-AWN280-1-F	EMR5-AWN500-1
L1, L2, L3	L1, L2, L3	L1, L2, L3	L1, L2, L3	L1, L2, L3, N	L1,L2,L3 N	L1, L2, L3, N	L1,L2,L3
3 x 300 - 500 V AC	3 x 350 - 580 V AC	3 x 450 - 720 V AC	3 x 530 - 820 V AC	3 x 90 - 170 V AC	3 x 180 - 280 V AC	3 x 180 - 280 V AC	3 x 300 - 500 V AC
-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %	-15 - +10 %
50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60/400 Hz	50/60 Hz	50/60/400 Hz
45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 440 Hz	45 - 65 Hz	45 - 440 Hz
25 mA/18 VA (400 V AC)	29 mA/41 VA (480 V AC)	29 mA/52 VA (600 V AC)	29 mA/59 VA (690 V AC)	25 mA / 10 VA (115 V AC)	5 mA/4 VA (230 V AC)	25 mA/18 VA (230 V AC)	5 mA/4 VA (400 V AC)
	100%	100%	100%		100%		100%
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated	Can be deactivated
No	Yes	Yes	Yes	No	Yes	No	Yes
Yes	Yes	Yes	Yes	Yes		Yes	
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	No	Yes	Yes	Yes	No
3 x 420 - 500 V AC	3 x 480 - 580 V AC	3 x 690 - 820 V AC	3 x 690 - 820 V AC	3 x 120 - 170 V AC	3 x 240 - 280 V AC	3 x 240 - 280 V AC	3 x 420 - 500 V AC
3 x 300 - 380 V AC	3 x 450 - 570 V AC	3 x 530 - 660 V AC	3 x 530 - 660 V AC	3 x 90 - 130 V AC	3 x 180 - 220 V AC	3 x 180 - 220 V AC	3 x 300 - 380 V AC
2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value
Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range
Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	
Adjustable within measuring range	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	2 - 25 % of phase voltage mean value	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range
	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range	Adjustable within measuring range
Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %	Fixed 5 %
Fixed 20 %	Fixed 20 %	Fixed 20 %	Fixed 20 %	Fixed 20 %	Fixed 20 %	Fixed 20 %	Fixed 20 %
50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60/400 Hz	50/60 Hz	50/60/400 Hz
45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz	45 - 440 Hz	45 - 65 Hz	45 - 440 Hz
100 ms	100 ms	100 ms	100 ms	100 ms	100 ms	100 ms	100 ms
≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C
True RMS value measurement							
Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms	Fixed 200 ms
	Fixed 250 ms	Fixed 250 ms	Fixed 250 ms		Fixed 250 ms		Fixed 250 ms
On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s	On- or off-delay; none = 0, adjustable 0.1 - 30 s
≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C	≤ 0.06 %/°C
±0.2 %	±0.2 %	±0.2 %	±0.2 %	±0.2 %	±0.2 %	±0.2 %	±0.2 %
See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet	See instructional leaflet

	EMR5-W300-1-C	EMR5-W380-1	EMR5-W400-1	EMR5-W500-1-D	EMR5-AW300-1-C
Output circuits					
Output circuits	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28
Output type	2 x 1 relay (changeover contact)	2 x 1 relay (changeover contact)	2 x 1 relay (changeover contact)	2 x 1 relay (changeover contact)	1 x 2 relays (changeover contact)
Operating principle	Closed-circuit principle: Output relays drop out when value above/below set threshold value				
Contact material	AgNi alloy, Cd-free				
Rated operating voltage (VDE 0110, IEC 60947-1)	250 V	250 V	250 V	250 V	250 V
Minimum switching voltage/minimum switching current	No	No	No	No	
Minimum switching duty	24 V/10 mA	24 V/10 mA	24 V/10 mA	24 V/10 mA	24 V/10 mA
Maximum switching voltage	See TB_EMR_PRO_01	See TB_EMR_PRO_01	See TB_EMR_PRO_01	See TB_EMR_PRO_01	See TB_EMR_PRO_01
Rated operational current (IEC 60947-5-1)					
AC12 (resistive) at 230 V	4 A	4 A	4 A	4 A	4 A
AC15 (inductive) at 230 V	3 A	3 A	3 A	3 A	3 A
DC12 (resistive) at 24 V	4 A	4 A	4 A	4 A	4 A
DC13 (inductive) at 24 V	2 A	2 A	2 A	2 A	2 A
Rated operational data AC (UL 508)					
Utilization category (Control Circuit Rating Code)	B 300	B 300	B 300	B 300	B 300
Max. rated operational voltage	300 V AC	300 V AC	300 V AC	300 V AC	300 V AC
Max. thermal uninterrupted current at B 300	5 A	5 A	5 A	5 A	5 A
Max. input/output rating (N/O / N/C) for B 300	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA
Mechanical lifespan	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations
Electrical lifespan (AC12, 230 V, 4 A)	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations
Short-circuit strength, maximum fuse rating					
Normally closed contact	6 A fast	6 A fast	6 A fast	6 A fast	6 A fast
Normally open contact	10 A fast	10 A fast	10 A fast	10 A fast	10 A fast
Duty factor (DF)	100 %	100 %	100 %	100 %	100 %
General data					
Enclosure measurements (w x h x d)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)
Mounting position	Any	Any	Any	Any	Any
Weight					0.13 kg (0.29 lb)
Degree of protection of enclosures/terminals	IP50/IP20	IP50/IP20	IP50/IP20	IP50/IP20	IP50/IP20
Mounting	DIN rail (IEC/EN 60715), clip-type toolless				
Minimum distance to adjacent devices					
Horizontal (min. 10 mm from continuous voltage)	> 220 V	> 400 V	> 400 V	> 400 V	> 220 V
Vertical	None	None	None	None	None
Electrical connection					
Terminal capacities					
Flexible with ferrule	2 x 0.75-2.5 mm² (2 x 18 - 14 AWG)				
Flexible without ferrule	2 x 0.75-2.5 mm² (2 x 18 - 14 AWG)				
Rigid	2 x 0.5-4 mm² (2 x 20 - 12 AWG)				
Stripped length	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)
Tightening torque	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm
Environmental data					
Ambient temperature range, operation/storage	-25 - +60 °C /-40 - +85 °C				
Damp heat (IEC 60068-2-30)	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles
Climate class	3K3	3K3	3K3	3K3	3K3
Vibration (sinusoidal) (IEC/EN) 60255-21-1)	Class 2	Class 2	Class 2	Class 2	Class 2
Impact (IEC/EN 60255-21-2)	Class 2	Class 2	Class 2	Class 2	Class 2

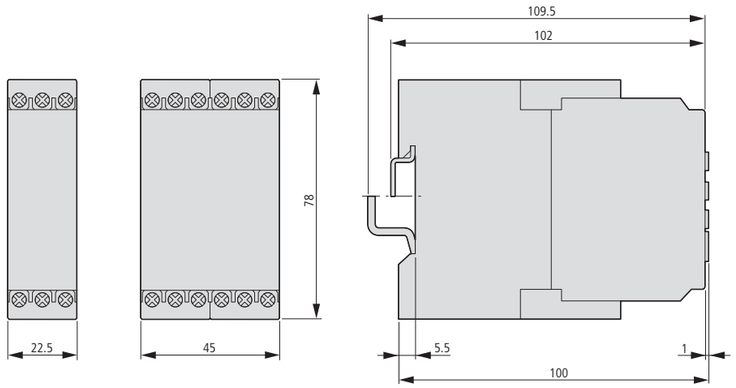
	EMR5-AW500-1-D	EMR5-AWM580-2	EMR5-AWM720-2	EMR5-AWM820-2	EMR5-AWN170-1-E	EMR5-AWN280-1	EMR5-AWN280-1-F	EMR5-AWN500-1
	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28	15-16/18, 25-26/28
	1 x 2 relays (changeover contact)	2 x 1 or 1 x 2 changeover contact, select-able (relay)	2 x 1 or 1 x 2 changeover contact, select-able (relay)	2 x 1 or 1 x 2 changeover contact, select-able (relay)	1 x 2 relays (changeover contact)	2 x 1 or 1 x 2 changeover contact, select-able (relay)	1 x 2 relays (changeover contact)	2 x 1 or 1 x 2 changeover contact, select-able (relay)
	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V
	24 V/10 mA	24 V/10 mA	24 V/10 mA	24 V/10 mA	25 V/10 mA	26 V/10 mA	27 V/10 mA	28 V/10 mA
	See TB_EMR_PRO_01	See TB_EMR_PRO_02	See TB_EMR_PRO_02	See TB_EMR_PRO_02	See TB_EMR_PRO_01	See TB_EMR_PRO_01	See TB_EMR_PRO_01	
	4 A	4 A	4 A	4 A	4 A	4 A	4 A	4 A
	3 A	3 A	3 A	3 A	3 A	3 A	3 A	3 A
	4 A	4 A	4 A	4 A	4 A	4 A	4 A	4 A
	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A
	B 300	B 300	B 300	B 300	B 300	B 300	B 300	B 300
	300 V AC	300 V AC	300 V AC	300 V AC	300 V AC	300 V AC	300 V AC	300 V AC
	5 A	5 A	5 A	5 A	5 A	5 A	5 A	5 A
	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA	3600/360 VA
	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations	30 x 10^6 operations
	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations	31 x 10^6 operations	31 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations	0.1 x 10^6 operations
	6 A fast	10 A fast	10 A fast	10 A fast	6 A fast	6 A fast	6 A fast	6 A fast
	10 A fast	10 A fast	10 A fast	10 A fast	10 A fast	10 A fast	10 A fast	10 A fast
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	45 x 78 x 100 mm (1.78 x 3.07 x 3.94 inches)	45 x 78 x 100 mm (1.78 x 3.07 x 3.94 inches)	45 x 78 x 100 mm (1.78 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)	22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)
	Any	Any	Any	Any	Any	Any	Any	Any
	0.13 kg (0.29 lb)	0.22 kg (0.49 lb)	0.22 kg (0.49 lb)	0.22 kg (0.49 lb)	0.14 kg (0.31 lb)	0.14 kg (0.31 lb)	0.14 kg (0.31 lb)	0.13 kg (0.29 lb)
	IP50/IP20	IP50/IP20	IP50/IP20	IP50/IP20	IP50/IP21	IP50/IP20	IP50/IP20	IP50/IP20
	> 400 V	None	None	None	> 120 V	None	> 240 V	None
	None	None	None	None	None	None	None	None
	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)	7 mm (0.28 inches)
	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm	0.6 - 0.8 Nm
	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles	55 °C, 6 cycles
	3K3	3K3	3K3	3K3	3K3	3K3	3K3	3K3
	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2
	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2

	EMR5-W300-1-C	EMR5-W380-1	EMR5-W400-1	EMR5-W500-1-D	EMR5-AW300-1-C	EMR5-AW500-1-D	EMR5-AWM580-2	EMR5-AWM720-2	EMR5-AWM820-2	EMR5-AWN170-1-E	EMR5-AWN280-1	EMR5-AWN280-1-F	EMR5-AWN500-1
Insulation data													
Rated insulation voltage U_i													
Input circuit/output circuit	600 V	600 V	600 V	600 V	600 V	600 V	1000 V	1000 V	1000 V	600 V	600 V	600 V	600 V
Input circuit 1/output circuit 2	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V
Rated impulse withstand voltage U_{imp} (VDE 0110, IEC/EN 60664)													
Input circuit	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	8 kV; 1.2/50 µs	8 kV; 1.2/50 µs	8 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs	6 kV; 1.2/50 µs
Output circuits	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs	4 kV; 1.2/50 µs
Test voltage between all insulated circuits (routine test)	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s	2.5 kV, 50 Hz, 1 s
Input circuit and insulated output circuits							4 kV, 50 Hz, 1 s	4 kV, 50 Hz, 1 s	4 kV, 50 Hz, 1 s		2.5 kV, 50 Hz, 1 s		2.5 kV, 50 Hz, 1 s
Basic insulation, input circuit/output circuit	600 V	600 V	600 V	600 V	600 V	600 V	1000 V	1000 V	1000 V	600 V	600 V	600 V	600 V
Safe isolation (VDE 0160 Part 101 and 101/A1, IEC/EN 61140) input circuit/output circuit	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No
Pollution degree (VDE 0110, IEC/EN 60664, UL 508)	3	3	3	3	3	3	III	III	III	3	III	3	III
Overvoltage category (VDE 0110, IEC 60664, UL 508)	III	III	III	III	III	III	3	3	3	III	3	III	3
Directives and standards													
Product standard	IEC/EN 60255-6, EN 50178												
Low-Voltage Directive	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC	2006/95/EC
EMC Directive	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC	2004/108/EC
RoHS Directive	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC	2002/95/EC
Electromagnetic compatibility													
Interference immunity	EN 61000-6-1, EN 61000-6-2												
Electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV / 8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)	Level 3 (6 kV/8 kV)
Electromagnetic field (immunity to RF interference) IEC/EN 61000-4-3	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)	Level 3 (10 V/m)
Fast transients (burst) IEC/EN 61000-4-4	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV / 2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)	Level 3 (2 kV/2 kHz)
High-energy pulses (surge) IEC 1000-4-5, EN 61000-4-5	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-N)	Level 4 (2 kV L-N)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-L)	Level 4 (2 kV L-N)	Level 4 (2 kV L-N)	Level 4 (2 kV L-N)	Level 4 (2 kV L-L)
Cable-borne HF IEC 100-4-6, EN 61000-4-6	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)	Level 3 (10 V)
Resistance to harmonics EN 61000-4-13	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3	Class 3
Emitted interference	EN 61000-6-3, EN 61000-6-4												
Electromagnetic field (immunity to RF interference) IEC/CISPR 22, EN 50022	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B
Cable-borne HF	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B

Dimensions

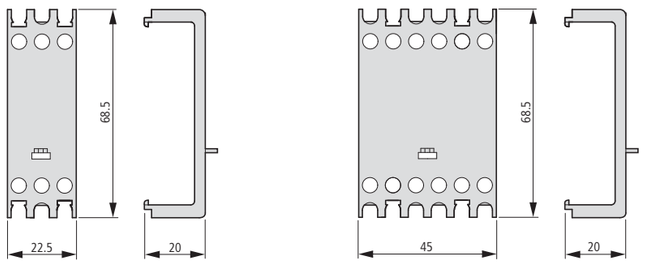
Measuring and monitoring relays

EMR-…



Sealable shrouds

EMR4-PH…





easy control relay
MFD-Titan multi-function display

The control relays easy500/700/800 and the multifunction display MFD Titan offer all the technical possibilities needed to realize applications in industrial and manual applications as well as in machinery or apparatus construction.

easy500
Functions such as multifunction relays, current pulse switches, counters, analog value comparators, week and year time switches +++ Stand-alone device +++ Optimal for smaller applications +++ Connectable to Ethernet

easy700
Complete functional scope of an easy500 +++ Local and remote extension options for flexible applications +++ Connectable to current bus systems or Ethernet

easy800
Complete functional scope of an easy700 +++ Numerous additional functions such as PID controller, arithmetic functions, value scaling, fast counter (5 kHz) +++ To perform comprehensive control tasks +++ Digital and analog expandability +++ Integrated communication through easyNet +++ Connectable to current bus systems or Ethernet

MFD-Titan
Combines control function of an easy800 with convenient visualization +++
Display, control, regulation and communication with one device +++ E/A modules for direct temperature sensing +++ Digital and analog expandability +++ Communication through easyNet possible +++ Connectable to current bus systems or Ethernet










Control relay easy

Technical overview

Control relay, multi-function display 12/3

System overview

Control relays easy500, easy700 12/4

Ordering

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Expansion Devices

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Ethernet gateway 12/8

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System overview

Control relay easy800 12/12

Ordering

Basic devices

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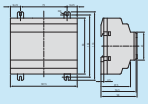

MFD-Titan Multi-function display

System overview

MFD-Titan Multi-function-display 12/20

Ordering

Display/keypad 12/22

Power supply unit/CPU module 12/22

Power supply unit/communication module 12/23

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Control relay, multi-function display

Technical data

Basic devices, Expansion Devices

easy... 12/30

easy...DA... 12/31

easy…AB... 12/32

easy...DC... 12/33

easy…AC... 12/35

Display/operating unit, CPU, communication modules 12/36

Input/output modules 12/39

Basic devices, Expansion Devices

Transistor outputs 12/42

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Dimensions

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Central processing unit, communication module, inputs/outputs modules 12/52

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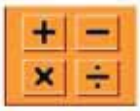
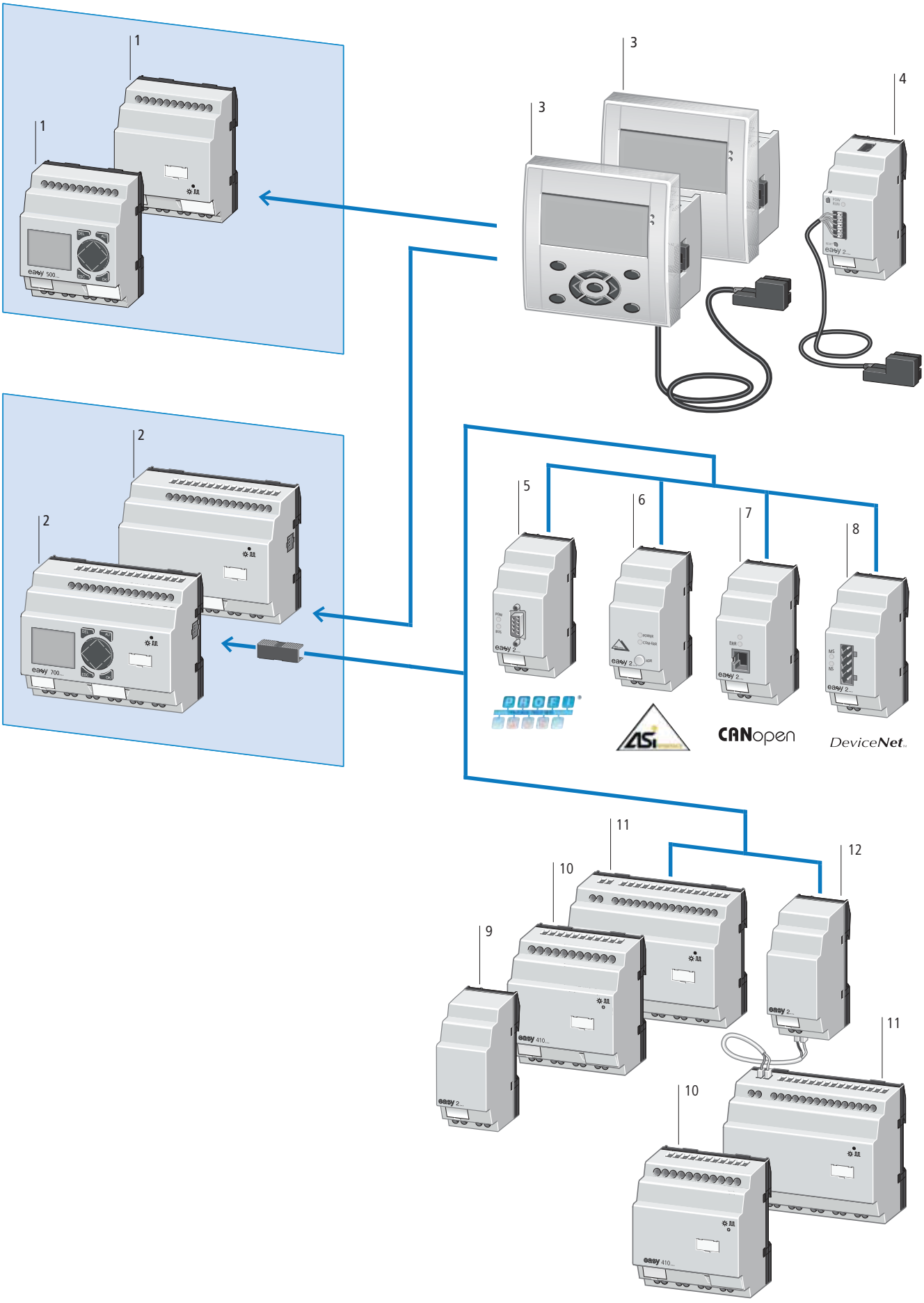
Technical overview

Functions		easy500/700	easy800	MFD-...CP8...
Counter functions 	Counter relay (up, down counting)	16 (0 to 32000)	32 ($\pm 2^{31}$)	32 ($\pm 2^{31}$)
	Frequency counters	2 (max. 1 kHz)	4 (max. 5 kHz)	4 (max. 3 kHz)
	High-Speed counter	2 (max. 1 kHz)	4 (max. 5 kHz)	4 (max. 3 kHz)
	Incremental counters	–	2 (max. 3 kHz)	2 (max. 3 kHz)
	Hour meter	4 (operating hours value is stored super-retentively (e.g also with program change)		
Time functions 	Weekly timer (4 channels per timer, each channel offers one On/Off time)	8	32	32
	Year time switch	8	32	
	Set cycle time	–	1	1
	Timing relay	16 (0.01 s … 99 h 59 min)	32 (0.005 s … 2^{32} min), On-delayed and/or off-delayed (optionally random switching), pulse shaping, flashing	
Program sequencing functions 	Jump	8	32	32
	Conditional jump	–	32	32
	Master reset	3	32	32
Maths functions 	Analog value comparator	16	32	32
	Arithmetic	–	32 (ADD, SUB, MUL, DIV)	32 (ADD, SUB, MUL, DIV)
	PID controller	–	32	32
	PT1 signal smoothing filter	–	32	32
	Value scaling	–	32	32
	Numerical converter	–	32	32
	Pulse output	–	2	–
	Pulse width modulation	–	2	2
	Value limit	–	32	32
Memory functions 	Block comparison	–	32	32
	Block transfer	–	32	32
	Boolean operation	–	32 (AND, OR, NOT)	32 (AND, OR, NOT)
	Comparator	16	32	32
	Data function block	–	32	32
	Data multiplexer	–	32	–
	Shift register	–	32	32
	Table function	–	32	32
Communication functions 	Get value from the NET	–	32	32
	Put value on the NET	–	32	32
	Bit output via NET	–	32	32
	Bit input via NET	–	32	32
	Diagnostic alarm	–	9	9
	Serial protocol	–	32	–
	Synchronize clock via NET	–	1	1
Text functions 	Text display (can be edited via software)	16 × (4 × 12 characters)	32 × (4 × 16 characters)	Yes
	Static text			Yes
	Message text			Yes
	Screen menu			Yes
	Running text			Yes
	Rolling text			Yes
Value entry functions 	Date and time information			Yes
	Year time switch entry			Yes
	Latching pushbutton			Yes
	Button field			Yes
	Timing relay value entry	Yes	Yes	Yes
	Value entry			Yes
	Week clock input			Yes
	Enter counter value/reference value/OT	Yes	Yes	Yes
Value display functions 	Bit display			Yes
	Message bitmap			Yes
	Bargraph			Yes
	Numerical value			Yes
	Timing relay value display			Yes
	Actual values	Yes	Yes	Yes
	Date and time	Yes	Yes	Yes

System overview



Basic devices

easy500 1

Stand-alone

12 V DC = easy...DA...
24 V DC = easy...DC...
24 V AC = easy...AB...
100 - 240 V AC = easy...AC...

8 digital inputs
2 usable as analog inputs
(DA, DC or AB versions)

4 relay outputs (max. 10 A, UL) or
4 transistor outputs

Display and keypad optional

Bolt-on and top-hat rail mounting

Screw terminals

→ Page 12/6

easy700 2

Expandable: Digital inputs/outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet

12 V DC = easy...DA...
24 V DC = easy...DC...
24 V AC = easy...AB...
100 - 240 V AC = easy...AC...

12 digital inputs
4 usable as analog inputs
(DA, DC or AB versions)

6 relay outputs (max. 10 A, UL) or
8 transistor outputs

Display and keypad optional

Bolt-on and top-hat rail mounting

Screw terminals

→ Page 12/7

Remote text display

Consists of:

Display/operating unit MFD-80(-B) 3

Power supply unit/communication module MFD(-AC)-CP4-500 3

Including connection cable
(5 m, can be cut to length) for
easy500/700
24 V DC = MFD-CP4-500
100 - 240 V AC = MFD-AC-CP4-500

Spring-loaded terminals

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Ethernet gateway

EASY209-SE 4

24 V DC

Serial interface easyRelay to Ethernet

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Bus modules

EASY204-DP 5

PROFIBUS-DP slave connection, 24 V DC

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EASY205-ASI 6

AS-Interface connection as slave

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EASY221-CO 7

CANopen connection, 24 V DC

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EASY222-DN 8

DeviceNet connection, 24 V DC

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Output expansion

EASY202-RE 9

2 relay outputs (max. 10 A, UL)

Bolt-on and top-hat rail mounting

Screw terminals

→ Page 12/15

I/O expansions

EASY410... 10

24 V DC

6 digital inputs

4 relay outputs (max. 10 A, UL) or
4 transistor outputs

Bolt-on and top-hat rail mounting

Screw terminals

→ Page 12/15

EASY6... 11

24 V DC

12 digital inputs

6 relay outputs (max. 10 A, UL) or
8 transistor outputs

Bolt-on and top-hat rail mounting

Screw terminals

→ Page 12/15

Coupling module

EASY200-EASY 12

For remote connection of a digital I/O expansion through two-pole connection cable (max. 30 m);
e.g. NYM 3 × 1.5 mm²

Bolt-on and top-hat rail mounting

Screw terminals

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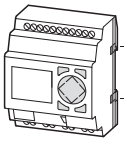
Ordering

	Inputs		Outputs		Other features		Supply voltage	Part no. Article no.	Price See price list	Std. pack
	Digital	Of which can be used as analog	Relays 10 A (UL)	Transistor	Display + keypad	Real-time clock				
easy500										
Stand alone										
	8	2	4	–	√	√	24 V AC	**EASY512-AB-RC** 274101		1 off
	8	2	4	–	–	√	24 V AC	**EASY512-AB-RCX** 274102		
	8	–	4	–	√	–	100 - 240 V AC	**EASY512-AC-R** 274103		
	8	–	4	–	√	√	100 - 240 V AC	**EASY512-AC-RC** 274104		
	8	–	4	–	–	√	100 - 240 V AC	**EASY512-AC-RCX** 274105		
	8	2	4	–	√	√	12 V DC	**EASY512-DA-RC** 274106		
	8	2	4	–	–	√	12 V DC	**EASY512-DA-RCX** 274107		
	8	2	4	–	√	–	24 V DC	**EASY512-DC-R** 274108		
	8	2	4	–	√	√	24 V DC	**EASY512-DC-RC** 274109		
	8	2	4	–	–	√	24 V DC	**EASY512-DC-RCX** 274110		
	8	2	–	4	√	√	24 V DC	**EASY512-DC-TC** 274111		
	8	2	–	4	–	√	24 V DC	**EASY512-DC-TCX** 274112		
	Customized inscription, user program									
	• Customized inscription of easy control relay trough labeling software Labeleditor or • Supply of easy control relay programmed with user program							**EASY-COMBINATION-***1) 257823		1 off

Notes

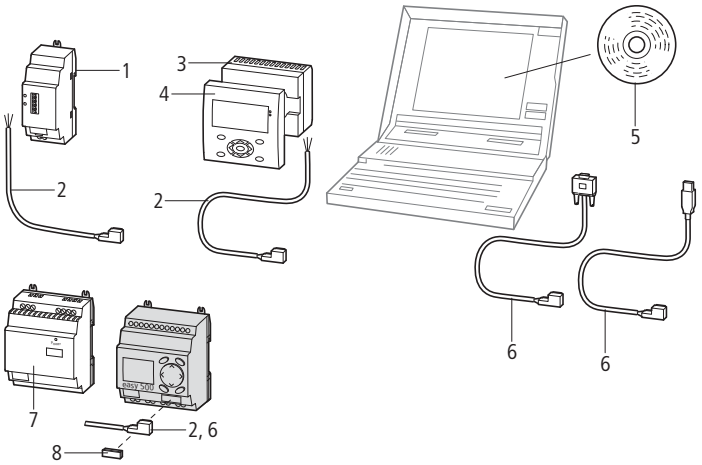
Procedure and ordering example for Labeleditor inscription software
Individually inscribe your device in 4 stages:
– Download the inscription software: www.moeller.net/support, keyword: "Labeleditor"
– Creation of label template (menu-guided in the software)
– Send the label template to the factory by email.
The email address is automatically set for the selected product by the program. When your template is sent, the Labeleditor issues a file name such as "EASY_12345.zip". This file name is part of the article to be ordered (see Ordering examples).
– Send order to the Eaton office or the electrical wholesalers.

Ordering example easy
EASY719-DC-RC with "Company logo":
1 x EASY-COMBINATION-*
1 x EASY719-DC-RC
1 x the file name "EASY_xxxxx.zip" issued by the Labeleditor

Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking
UL File No.	E135462
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-01 + 2258-02
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

[1] UL/CSA certification not required



Accessories

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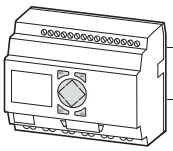
2 Connection cable	→ Page 12/27
3 Power supply unit/communication	→ Page 12/23
4 Display/keypad	→ Page 12/16
5 Programming software	→ Page 12/9
6 PC programming cable	→ Page 12/9
7 Switched-mode power supply unit	→ Page 12/10
8 Memory card	→ Page 12/9

HPL12007EN

	Inputs		Outputs		Other features		Supply voltage	Part no. Article no.	Price See price list	Std. pack
	Digital	Of which can be used as analog	Relays 10 A (UL)	Transistor	Display + keypad	Real-time clock				
easy700										
Expandable: Digital inputs/outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet										
	12	4	6	–	√	√	24 V AC	**EASY719-AB-RC** 274113		1 off
	12	4	6	–	–	√	24 V AC	**EASY719-AB-RCX** 274114		
	12	–	6	–	√	√	100 - 240 V AC	**EASY719-AC-RC** 274115		
	12	–	6	–	–	√	100 - 240 V AC	**EASY719-AC-RCX** 274116		
	12	4	6	–	√	√	12 V DC	**EASY719-DA-RC** 274117		
	12	4	6	–	–	√	12 V DC	**EASY719-DA-RCX** 274118		
	12	4	6	–	√	√	24 V DC	**EASY719-DC-RC** 274119		
	12	4	6	–	–	√	24 V DC	**EASY719-DC-RCX** 274120		
	12	4	–	8	√	√	24 V DC	**EASY721-DC-TC** 274121		
	12	4	–	8	–	√	24 V DC	**EASY721-DC-TCX** 274122		
Customized inscription, user program										
• Customized inscription of easy control relay trough labeling software Labeleditor or • Supply of easy control relay programmed with user program								**EASY-COMBINATION-*[1)]** 257823		1 off

Notes

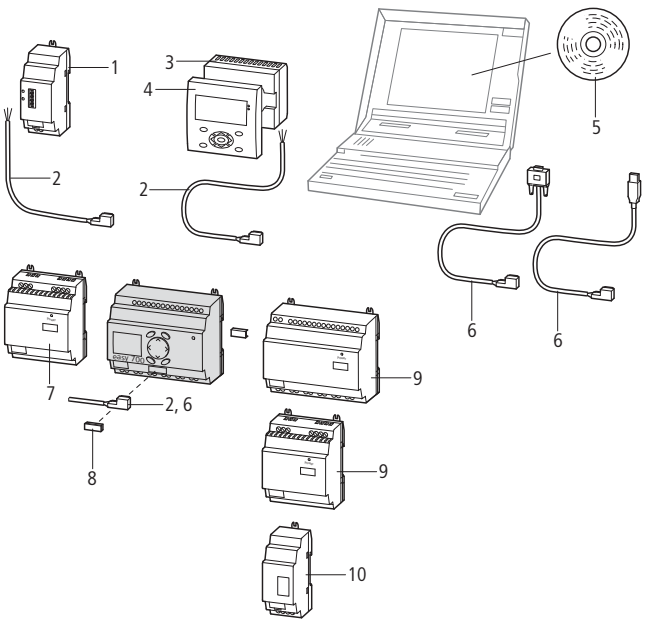
Procedure and ordering example for Labeleditor inscription software
Individually inscribe your device in 4 stages:
– Download the inscription software: www.moeller.net/support, keyword: "Labeleditor"
– Creation of label template (menu-guided in the software)
– Send the label template to the factory by email.
The email address is automatically set for the selected product by the program.
When your template is sent, the Labeleditor issues a file name such as "EASY_12345.zip".
This file name is part of the article to be ordered (see Ordering examples).
– Send order to the Eaton office or the electrical wholesalers.

Ordering example easy
EASY719-DC-RC with "Company logo":
1 x EASY-COMBINATION-*
1 x EASY719-DC-RC
1 x the file name "EASY_xxxxx.zip" issued by the Labeleditor

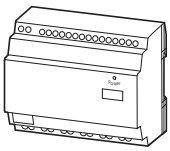
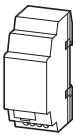
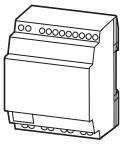
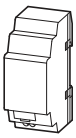
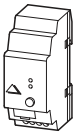
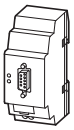
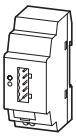
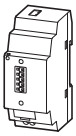
Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking
UL File No.	E135462
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-01 + 2258-02
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

[1)] UL/CSA certification not required



Accessories	Page
1 Ethernet gateway	→ Page 12/16
2 Connection cable	→ Page 12/27
3 Power supply unit/communication module	→ Page 12/23
4 Display/keypad	→ Page 12/16
5 Programming software	→ Page 12/9
6 PC programming cable	→ Page 12/9
7 Switched-mode power supply unit	→ Page 12/10
8 Memory card	→ Page 12/9
9 Inputs/outputs expansion	→ Page 12/15
10 output expansion, bus module, coupling module	→ Page 12/16

	Inputs	Outputs		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Digital	Relay 10 A (UL)	Transistor					
I/O expansions								
Can be used through easyLink								
	12	6	–	100 - 240 V AC	**EASY618-AC-RE** 212314		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	12	–	8	24 V DC	**EASY620-DC-TE** 212313			
	12	6	–	24 V DC	**EASY618-DC-RE** 232112			Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	2	–	24 V DC	**EASY202-RE**[1] 232186			
	6	4	–	24 V DC	**EASY410-DC-RE** 114293			NA Certification: Request filed for UL and CSA Degree of Protection: IEC: IP20, UL/CSA Type: -
	6	–	4	24 V DC	**EASY410-DC-TE** 114294			
Coupling module								
Can be used through easyLink								
	For remote connection of a digital I/O expansion up to 30 m.				**EASY200-EASY** 212315		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Bus modules								
Can be used through easyLink								
	AS-Interface	Slave 4 inputs, 4 outputs, 4 parameter bits Addresses available 0 to 31		–	**EASY205-ASI** 221598		1 off	
	PROFIBUS-DP	Slave Addresses available 1 to 126		24 V DC	**EASY204-DP** 212316			
	CANopen	Addresses available 1 to 127		24 V DC	**EASY221-CO** 233539			
	DeviceNet	Addresses available 0 to 63		24 V DC	**EASY222-DN** 233540			
Ethernet gateway								
	Serial interface easyRelay or MFD-...CP8/CP10... to Ethernet, for connecting to easyOPC server, easySoft, or easyCom			24 V DC	**EASY209-SE** 101520		1 off	

Notes

[1] Not for use in combination with basic unit EASY719-DA-...
Cannot be used on the EASY200-EASY coupling module

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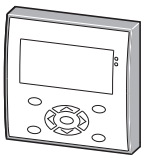
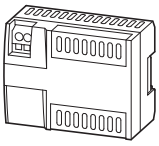
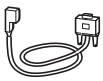
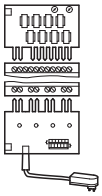
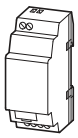
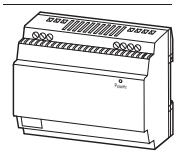
	Supply voltage	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Remote text display						
Display/keypad Monochrome display 132 × 64 pixels with switchable backlight IP65, removable silver front frame						
		With keypad, with Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29	**MFD-80-B** 265251		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, in combination with MFD-XM-80: UL/CSA Type 4X
		With keypad, without Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29	**MFD-80-B-X** 284905			
		Without keypad, with Moeller company logotype	**MFD-80** 265250		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type 4X
		Without keypad, without Moeller company logotype NEMA 4x	**MFD-80-X** 284904			
Power supply unit/communication modules IP20, can be combined with display/operating unit MFD-80... as remote text display						
	24 V DC	With connection cable (5 m, can be cut to length)	**MFD-CP4-500** 274094		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	100 - 240 V AC	With connection cable (5 m, can be cut to length)	**MFD-AC-CP4-500** 286823			
	24 V DC	Without connection cable	**MFD-CP4** 280888			
	100 - 240 V AC	Without connection cable	**MFD-AC-CP4** 286822			
Programming software						
		Menu selection in 13 languages Operating systems: Windows 2000 SP4, Windows XP SP3, Windows Vista (32 Bit), Windows 7 (32 Bit)	**EASY-SOFT-BASIC** 284545		1 off	UL/CSA certification not required
			EASY-SOFT-PRO 266040			
Programming cable						
		SUB-D, 9 pole, serial, 2 m	**EASY-PC-CAB** 202409		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
		USB, 2 m	**EASY-USB-CAB** 107926		1 off	
Connecting cables						
		For connecting the MFD(-AC)-CP4 or EASY209-SE with easy500/easy700, 5 m, can be cut to length	**MFD-CP4-500-CAB5** 280886		1 off	
Memory cards						
		32-kB module	**EASY-M-32K** 270884		1 off	
Manuals						
	Deutsch		**AWB2528-1508D** 278499		1 off	
	English		**AWB2528-1508GB** 278500		1 off	

Input/output simulators

	Supply voltage	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	24 V DC	With plug-in power supply unit 100 - 240 V AC/ 24 V DC	easy500-DC	**EASY412-DC-SIM** 212318		1 off	
	24 V DC	With plug-in power supply unit 120 V AC/24 V DC, plug for North America	easy500-DC	**EASY412-DC-SIM-NA** 222566			
	24 V DC	With plug-in power supply unit 100 - 240 V AC/ 24 V DC	easy700-DC easy800-DC EC4P	**EASY800-DC-SIM** 256278			

Switched-mode power supply units

Primary-switched mode, stabilized

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Rated input voltage: 50/60 Hz: 100 - 240 V Rated output voltage: 24 V/12 V DC Rated output current: 0.35 A/20 mA	**EASY200-POW** 229424		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 1.25 A	**EASY400-POW** 212319		1 off	
		EASY430-POW 110940		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 107.1-01; CE marking UL File No.: E300415 UL CCN: NMTR, NMTR7 CSA File No.: UL report applies to both US and Canada CSA Class No.: 3211-87, 3211-07 NA Certification: UL Listed, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 2.5 A	**EASY500-POW** 110941		1 off	
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 4.2 A	**EASY600-POW** 262399		1 off	

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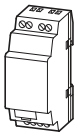
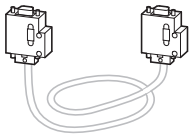
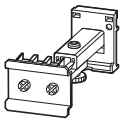
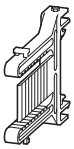
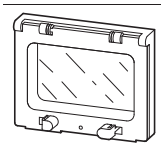
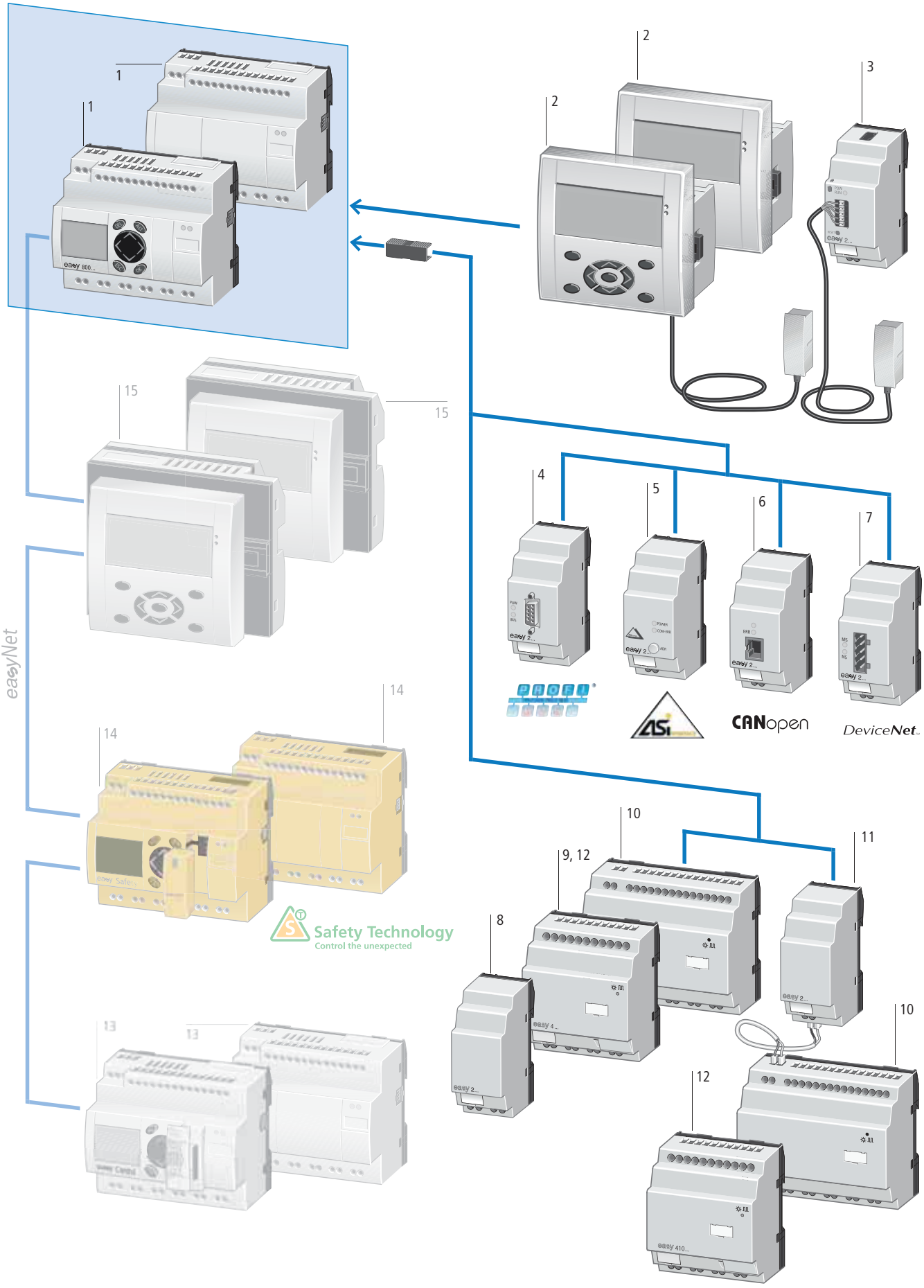
	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Ballast					
To increase the AC input current					
	6 channels, cable length up to 100 m	**EASY256-HCI** 231168		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
PROFIBUS-DP data cable					
	Twisted pair, without plug, 2-core, 2 x 0.64 mm² (only suitable for fixed wiring) 100 m	**ZB4-900-KB1** 206983		100 m	
PROFIBUS-DP bus connector plug					
	Pins, 9 pole Cable entry, angled 90°	**ZB4-209-DS2** 206982		1 off	
	Metallized insulated housing Maximum transfer rate 12 MBit/s Integrated switch (accessible from the outside) for the bus terminating resistors Terminal block for two cable entries, with straight or 90° angled cable entry, as required	**ZB4-209-DS3** 217820		1 off	
Connection plug					
	Bus connector plug between base unit and expansion unit/bus module	**EASY-LINK-DS** 221607		1 off	UL/CSA certification not required
Fixing bracket For screw fixing to mounting plate					
	3 fixing brackets per easy400, 500, 600, 700, 800, EC4P, ES4P 2 fixing brackets per easy200 3 fixing brackets per, MFD...-CP8/CP10…	**ZB4-101-GF1** 061360		9 off	UL/CSA certification not required
Telescopic clip					
	With 35mm top-hat rail to IEC/EN 60715 for adjusting the mounting depth when rear mounting in CI-K… enclosures and cabinets. Stepless adjustment via scale from 75 – 115 mm. Screw and snap fastening	**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Top-hat rail adapter for inspection flap window					
	12 mm x 66 mm x 82 mm Mounting on hinged inspection window, for front fitting of devices. Complete set, consisting of 2 brackets and 4 screws	**SKF-HA** 233782		1 off	UL/CSA certification not required
Inspection window					
	94 mm x 77 mm x 25 mm (4 space units) For use with easy500	**SKF-FF4** 233780		1 off	UL/CSA certification not required
	130 mm x 77 mm x 25 mm (6 space units) For use with EASY700, EASY800, EC4P, ES4P	**SKF-FF6** 233781		1 off	

System overview



Basic device

easy800	1
Expandable: Digital and analog inputs/ outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet	
Bus system easyNet on board	
24 V DC = easy...DC... 100 - 240 V AC = easy...AC...	
12 digital inputs 4 usable as analog inputs (DC versions)	
6 relay outputs (max. 10 A, UL) or 8 transistor outputs	
1 analog output, optional on DC versions	
Display and keypad optional	
Bolt-on and top-hat rail mounting	
Screw terminals	
Technical overview	
→ Page 12/14	

Remote text display

Consists of:	
Display/operating unit MFD-80(-B)	2
Power supply/communication module	2
Including connection cable (5 m, can be cut to length) for easy800 24 V DC = MFD-CP4-800 100 - 240 V AC = MFD-AC-CP4-800	
Spring-loaded terminals	
→Page 12/16	

Ethernet gateway

EASY209-SE	3
24 V DC Serial interface easyRelay to Ethernet	
→ Page 12/16	

Bus modules

EASY204-DP4	4
PROFIBUS DP connection as slave, 24 V DC	
→ Page 12/16	

EASY205-ASI	5
AS-Interface connection as slave	
→ Page 12/16	

EASY221-CO	6
CANopen connection, 24 V DC	
→ Page 12/16	

EASY222-DN	7
DeviceNet connection, 24 V DC	
→ Page 12/16	

Output expansion

EASY202-RE	8
2 relay outputs (max. 10 A, UL)	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

I/O expansions

EASY406-DC-ME	9
24 V DC 1 digital input	
2 analog inputs (2 × 0–10 V, 2 × 0 – 20 mA, or 2 × x Pt100; voltage inputs can be combined in any arrangement Voltage inputs (0 – 10 V) can optionally be used as digital inputs	
2 transistor outputs	
1 analog output (0 - 10 V)	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

EASY411-DC-ME	9
24 V DC	
1 digital input	
6 analog inputs (2 × 0–10 V, 2 × 0–20 mA and 2 × Pt100; voltage inputs (0–10 V) can optionally be used as digital inputs	
2 transistor outputs/ 2 analog outputs (0–10 V)	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

EASY6...	10
24 V DC	
12 digital inputs	
6 relay outputs (max. 10 A, UL) or 8 transistor outputs	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

EASY410...	12
24 V DC	
6 digital inputs	
4 relay outputs (max. 10 A, UL) or 4 transistor outputs	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

Coupling module

EASY200-EASY	11
For remote connection of a digital I/O expansion through two-pole connection cable (max. 30 m); e.g. NYM 3 × 1.5 mm²	
Bolt-on and top-hat rail mounting	
Screw terminals	
→ Page 12/15	

Compact PLC easyControl

EC4P	13
→ Page 14/64	

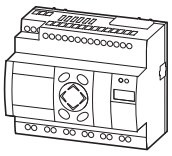
Safety control relays easySafety

ES4P	14
→ Page 13/5	

Multi-function display MFD-Titan	15
→ Page 12/22	

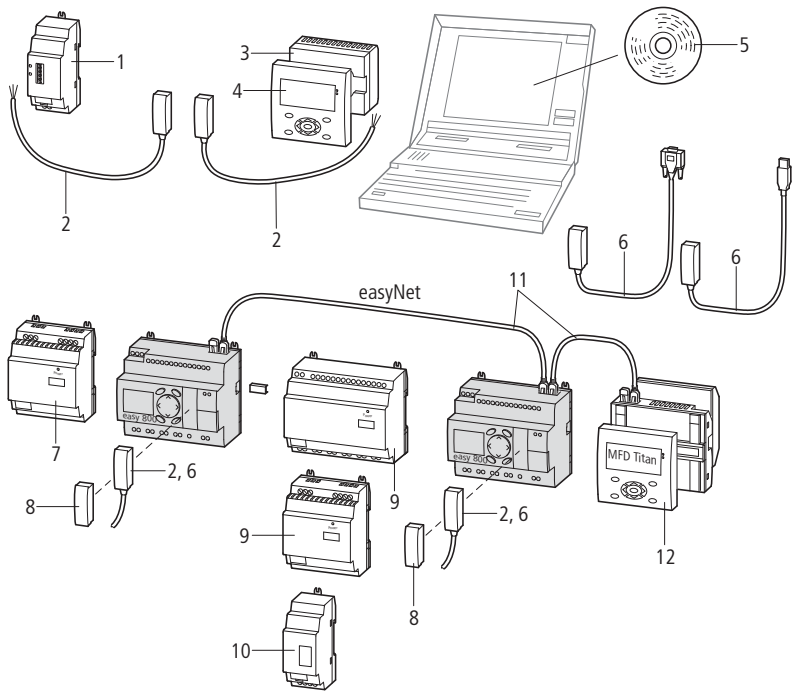


Ordering

Inputs		Outputs			Other features		Supply voltage	Part no. Article no.	Price See price list	Std. pack
Digital	Of which can be used as analog	Relay 10 A (UL)	Transistor	Analog	Display + keypad	Real-time clock				
easy800										
Expandable: Digital and analog inputs/outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet Bus system easyNet on board Individual laser inscription possible with EASY-COMBINATION-* → Page 12/6										
										
easyNet on board										
12	–	6	–	–	√	√	100 - 240 V AC	**EASY819-AC-RC** 256267		1 off
12	–	6	–	–	–	√	100 - 240 V AC	**EASY819-AC-RCX** 256268		
12	4	6	–	–	√	√	24 V DC	**EASY819-DC-RC** 256269		
12	4	6	–	–	–	√	24 V DC	**EASY819-DC-RCX** 256270		
12	4	6	–	1	√	√	24 V DC	**EASY820-DC-RC** 256271		
12	4	6	–	1	–	√	24 V DC	**EASY820-DC-RCX** 256272		
12	4	–	8	–	√	√	24 V DC	**EASY821-DC-TC** 256273		
12	4	–	8	–	–	√	24 V DC	**EASY821-DC-TCX** 256274		
12	4	–	8	1	√	√	24 V DC	**EASY822-DC-TC** 256275		
12	4	–	8	1	–	√	24 V DC	**EASY822-DC-TCX** 256276		

Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking
UL File No.	E135462
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-01 + 2258-02
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -



Accessories	Page
1 Ethernet gateway	→ Page 12/16
2 Connection cable	→ Page 12/27
3 Power supply unit/communication module	→ Page 12/23
4 Display/keypad	→ Page 12/16
5 Programming software	→ Page 12/9
6 PC programming cable	→ Page 12/9
7 Switched-mode power supply unit	→ Page 12/10
8 Memory card	→ Page 12/9
9 Inputs/outputs expansion	→ Page 12/15
10 output expansion units, bus module, coupling module	→ Page 12/16
11 easyNet	→ Page 12/18
12 Multi-function display MFD-Titan	→ Page 12/22

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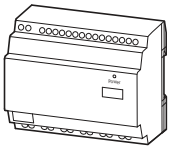
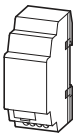
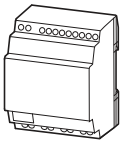
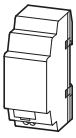
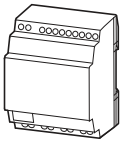
	Inputs	Outputs		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Digital	Relay 10 A (UL)	Transistor					
I/O expansions								
Can be used through easyLink								
	12	6	–	100 - 240 V AC	**EASY618-AC-RE** 212314		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	12	–	8	24 V DC	**EASY620-DC-TE** 212313			
	12	6	–	24 V DC	**EASY618-DC-RE** 232112			Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	2	–	24 V DC	**EASY202-RE**1) 232186			
	6	4	–	24 V DC	**EASY410-DC-RE** 114293			NA Certification: Request filed for UL and CSA Degree of Protection: IEC: IP20, UL/CSA Type: -
	6	–	4	24 V DC	**EASY410-DC-TE** 114294			
Coupling module								
Can be used through easyLink								
	For remote connection of a digital I/O expansion up to 30 m.				**EASY200-EASY** 212315		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CE marking; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987 UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -

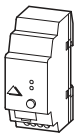
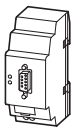
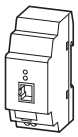
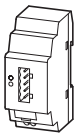
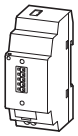
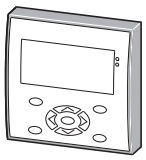
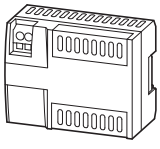
	Inputs		Outputs			Supply voltage	Part no. Article no.	Price See price list	Std. pack
	Digital / analog	Of which usable as digital	Relays 10 A (UL)	Transistor	Analog				
I/O expansions									
Can be used through easyLink									
	1 / 2 2)	2	–	2	1	24 V DC	**EASY406-DC-ME** 114295		1 off
	1 / 6 3)	2	–	2	2	24 V DC	**EASY411-DC-ME** 116567		1 off

Notes

1) Not for use in combination with EASY719-DA-…basic unit
Cannot be used on the EASY200-EASY coupling module
2) 2 × 0 - 10 V, 2 × 0 - 20 mA, 2 × RTD (2/3-wire connection); any combination
Voltage inputs (0–10 V) can optionally be used as digital inputs
3) 2 x 0 - 10 V, 2 x 0 - 20 mA, 2 x Pt100 (2/3 wire connection);
Voltage inputs (0–10 V) can optionally be used as digital inputs

Information relevant for export to North America

NA Certification	Request filed for UL and CSA
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Description		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Bus modules							
Can be used through easyLink							
	AS-Interface	Slave 4 inputs, 4 outputs, 4 parameter bits Addresses available 0 to 31	–	**EASY205-ASI** 221598		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CE marking; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987 UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	PROFIBUS-DP	Slave Addresses available 1 to 126	24 V DC	**EASY204-DP** 212316			
	CANopen	Addresses available 1 to 127	24 V DC	**EASY221-CO** 233539			
	DeviceNet	Addresses available 0 to 63	24 V DC	**EASY222-DN** 233540			
Ethernet gateway							
	Serial interface easyRelay or MFD-...CP8/CP10... to Ethernet, for connecting to easyOPC server, easySoft, or easyCom		24 V DC	**EASY209-SE** 101520		1 off	
Remote text display							
Display/keypad Monochrome display 132 × 64 pixels with switchable backlight IP65, removable silver front frame							
	With keypad, with Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29			**MFD-80-B** 265251		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, in combination with MFD-XM-80: UL/CSA Type 4X
	With keypad, without Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29			**MFD-80-B-X** 284905		1 off	
	Without keypad, with Moeller company logotype			**MFD-80** 265250		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type 4X
	Without keypad, without Moeller company logotype NEMA 4x			**MFD-80-X** 284904		1 off	
Power supply unit/communication modules IP20, can be combined with display/operating unit MFD-80... as remote text display							
	With connection cable (5 m, can be cut to length)		24 V DC	**MFD-CP4-800** 274095		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	With connection cable (5 m, can be cut to length)		100 - 240 V AC	**MFD-AC-CP4-800** 286824			
	Without connection cable		24 V DC	**MFD-CP4** 280888			
	Without connection cable		100 - 240 V AC	**MFD-AC-CP4** 286822			

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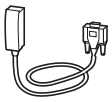
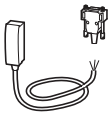
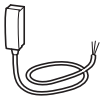
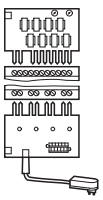
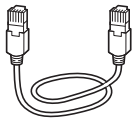
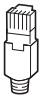
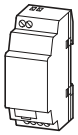
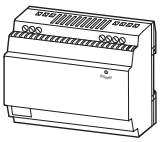
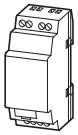
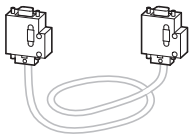
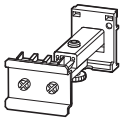
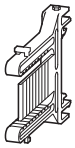
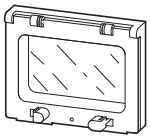
	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Programming software					
	Menu selection in 13 languages Operating systems: Windows 2000 SP4, Windows XP SP3, Windows Vista (32 Bit), Windows 7 (32 Bit)	**EASY-SOFT-PRO** 266040		1 off	UL/CSA certification not required
Programming cable					
	Sub-D, 9 pole, serial, 2 m	**EASY800-PC-CAB** 256277		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified
	USB, 2 m	**EASY800-USB-CAB** 106408		1 off	
Modem cable					
	Configurable modem, printer and programming cable, possible transfer rate 56 kbaud, 9 pole Sub-D plug (plug + socket for assembly by user)	**EASY800-MO-CAB** 286079		1 off	
Connecting cables					
	For connecting MFD(-AC)-CP4 with easy800/MFD-..-CP8/CP10... 5 m, can be cut to length	**MFD-CP4-800-CAB5** 280887		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Memory cards					
	256-kB module	**EASY-M-256K** 256279		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -

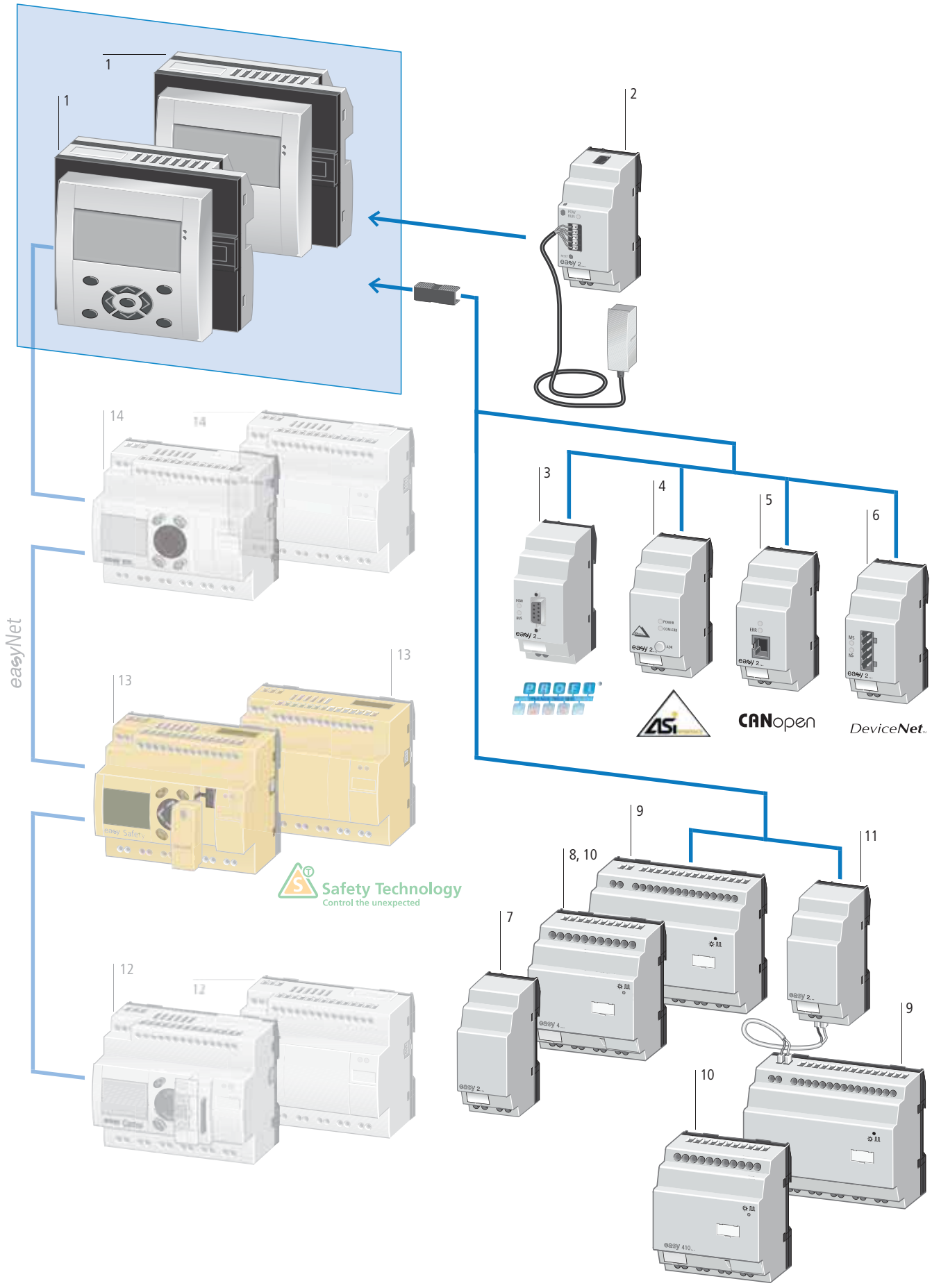
	Supply voltage	Description	For use with	Part no. Article no.	Price See price list	Std. pack
Input/output simulator						
	24 V DC	With plug-in power supply unit 100 - 240 V AC/ 24 V DC	easy700-DC easy800-DC EC4P	**EASY800-DC-SIM** 256278		1 off
Manual						
		User manual, German		**AWB2528-1423D** 261371		1 off
		User manual, English		**AWB2528-1423GB** 262671		1 off

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Network connection cables						
	Length: 0.3 m	easyNet	**EASY-NT-30** 256283		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Length: 0.8 m	easyNet	**EASY-NT-80** 256284			
	Length: 1.5 m	easyNet	**EASY-NT-150** 256285			
Bus termination resistor						
	8 pole, RJ45, 124 Ω Connection to PIN 1 and PIN 2	easyNet	**EASY-NT-R** 256281		2 off	
Data cable						
	4 x 0.14 mm², twisted pair, AWG 26 Length: 100 m	easyNet	**EASY-NT-CAB** 256286		1 off	UL File No.: E135462 UL CCN: NRAQ NA Certification: UL Listed Degree of Protection: IEC: IP 20, UL/CSA Type: -
Bus connector plug						
	8 pole, RJ45	easyNet	**EASY-NT-RJ45** 256280		10 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Crimping tool						
	For RJ45 plug	EASY-NT-CAB EASY-NT-RJ45	**EASY-RJ45-TOOL** 256282		1 off	
Point-to-point connection cable						
	Serial interface for connecting MFD-…-CP8/ CP10... to easy800 or MFD-…-CP8/CP10..., 5 m, can be cut to length		**MFD-800-CAB5** 266041		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Switched-mode power supply units						
Primary-switched mode, stabilized						
	Rated input voltage: 50/60 Hz: 100 - 240 V Rated output voltage: 24 V/12 V DC Rated output current: 0.35 A/20 mA		**EASY200-POW** 229424		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 1.25 A		**EASY400-POW** 212319		1 off	
			EASY430-POW 110940		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 107.1-01; CE marking UL File No.: E300415 UL CCN: NMTR, NMTR7 CSA File No.: UL report applies to both US and Canada CSA Class No.: 3211-87, 3211-07 NA Certification: UL Listed, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 2.5 A		**EASY500-POW** 110941		1 off	
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 4.2 A		**EASY600-POW** 262399		1 off	

HPL12019EN

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Ballast					
To increase the AC input current					
	6 channels, cable length up to 100 m	**EASY256-HCI** 231168		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
PROFIBUS-DP data cable					
	Twisted pair, without plug, 2-core, 2 x 0.64 mm² (only suitable for fixed wiring) 100 m	**ZB4-900-KB1** 206983		100 m	
PROFIBUS-DP bus connector plug					
	Pins, 9 pole Cable entry, angled 90°	**ZB4-209-DS2** 206982		1 off	
	Metallized insulated housing Maximum transfer rate 12 Mbits/s Integrated plug, accessible from outside, for bus terminating resistors Terminal block for two cable entries, with straight or 90° angled cable entry, as required	**ZB4-209-DS3** 217820		1 off	
Connection plug					
	Bus connector plug between base unit and expansion unit/bus module	**EASY-LINK-DS** 221607		1 off	UL/CSA certification not required
Fixing bracket For screw fixing to mounting plate					
	3 fixing brackets per easy400, 500, 600, 700, 800, EC4P, ES4P 2 fixing brackets per easy200 3 fixing brackets per MFD...-CP8/CP10-…	**ZB4-101-GF1** 061360		9 off	UL/CSA certification not required
Telescopic clip					
	With 35 mm top-hat rail to IEC/EN 60715 for mounting depth compensation when rear mounting in CI-K… enclosures and cabinets. Stepless adjustment via scale from 75 – 115 mm. Screw and snap fastening	**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Top-hat rail adapter for inspection flap window					
	12 mm x 66 mm x 82 mm Mounting on hinged inspection window, for front fitting of devices. Complete set, consisting of 2 brackets and 4 screws	**SKF-HA** 233782		1 off	UL/CSA certification not required
Inspection window					
	130 mm x 77 mm x 25 mm (6 space units) For use with EASY700, EASY800, EC4P, ES4P	**SKF-FF6** 233781		1 off	UL/CSA certification not required

System overview



MFD-Titan

The multi-function display MFD-Titan can be used in the following combinations:
Power supply unit/CPU
Power supply unit/CPU + I/O modules
Power supply unit/CPU + display and operating unit
Power supply unit/CPU + display and operating unit + I/O modules
→ Page 12/22

I/O modules 1
24 V DC
100 - 240 V AC
12 digital inputs
4 usable as analog inputs
(DC versions)
4 relay outputs (max. 10 A,UL)
or 4 transistor outputs
1 analog output,
optional on DC versions
Spring-loaded terminals
→ Page 12/24

I/O modules with temperature measuring 1
24 V DC
6 digital inputs
2 of which usable as analog inputs
2 Pt 100 or 2 Ni1000 RTD inputs
4 transistor outputs
1 Analog output, optional
Spring-loaded terminals
→ Page 12/24

Power supply unit/CPU module 1
24 V DC
100 - 240 V AC
Bus system easyNet optionally on-board
→ Page 12/22

Display/keypad 1
24 V DC
Monochrome display
132 × 64 pixels
With or without keypad
Custom laser labeling possible
→ Page 12/16

Ethernet gateway

EASY209-SE 2
24 V DC
Serial interface, PSU/CPU module to Ethernet
→ Page 12/16

Bus modules

EASY204-DP 3
PROFIBUS DP connection as slave, 24 V DC
→ Page 12/16

EASY221-CO 5
CANopen connection, 24 V DC
→ Page 12/16

EASY205-ASI 4
AS-Interface connection as slave
→ Page 12/16

EASY222-DN 6
DeviceNet connection, 24 V DC
→ Page 12/16

Output expansion

EASY202-RE 7
2 relay outputs (max. 10 A, UL)
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 12/15

I/O expansions

EASY406-DC-ME 8
24 V DC
1 digital input
2 analog inputs
(2 × 0–10 V, 2 × 0–20 mA, 2 × RTD);
any combination
Voltage inputs (0–10 V) can optionally be used as digital inputs
2 transistor outputs
1 analog output (0 - 10 V)
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 12/15

EASY411-DC-ME 8
24 V DC
1 digital input
6 analog inputs
(2 x 0 - 10 V, 2 x 0 - 20 mA, 2 x Pt100);
Voltage inputs (0–10 V) can optionally be used as digital inputs
2 transistor outputs/
2 Analog outputs (0 - 10 V)
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 12/15

EASY6... 9
24 V DC
12 digital inputs
6 relay outputs (max. 10 A,UL)
or 8 transistor outputs
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 12/15

EASY410... 10
24 V DC
6 digital inputs
4 relay outputs (max. 10 A,UL)
or 4 transistor outputs
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 12/15

Coupling module

EASY200-EASY 11
For remote connection of a digital I/O expansion through two-pole connection cable (max. 30 m);
e.g. NYM 3 × 1.5 mm²
→ Page 12/15

Compact PLC easyControl

EC4P 12
→ Page 14/64

Safety control relays easySafety

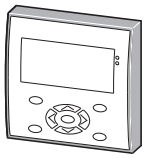
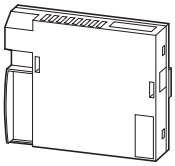
ES4P 13
→ Page 13/5

Control relays easy800

EASY8... 14
→ Page 12/14

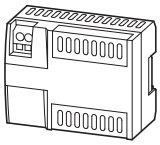


Ordering

	Supply voltage	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Display/keypad						
Monochrome display 132 × 64 pixels with switchable backlight IP65, removable silver front frame						
		With keypad, with Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29	**MFD-80-B** 265251		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, in combination with MFD-XM-80: UL/CSA Type 4X
		With keypad, without Moeller company logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm → 12/29	**MFD-80-B-X** 284905		1 off	
		Without keypad, with Moeller company logotype NEMA 4x	**MFD-80** 265250		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type 4X
		Without keypad, without Moeller company logotype NEMA 4x	**MFD-80-X** 284904		1 off	
Power supply unit/CPU module						
Can be combined with display and control unit MFD-80-.. and I/O module; expandable: Digital and analog inputs/outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet; bus system easyNet optional on-board IP20 Spring-loaded terminals						
	Supply voltage					
	100 - 240 V AC	Program and screen memory, with easyNet	**MFD-AC-CP8-NT** 274092		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	100 - 240 V AC	Program and screen memory, without easyNet	**MFD-AC-CP8-ME** 274091			
	24 V DC	Program and screen memory, without easyNet	**MFD-CP8-ME** 267164			
	24 V DC	Program and screen memory, with easyNet	**MFD-CP8-NT** 265253			
	24 V DC	Dual program and screen memory as MFD-...-CP8..., without easyNet	**MFD-CP10-ME** [1] 133801		1 off	
	24 V DC	Dual program and screen memory as MFD-...-CP8..., with easyNet	**MFD-CP10-NT** [1] 133800		1 off	

[1] **Note** [1] For availability please inquire

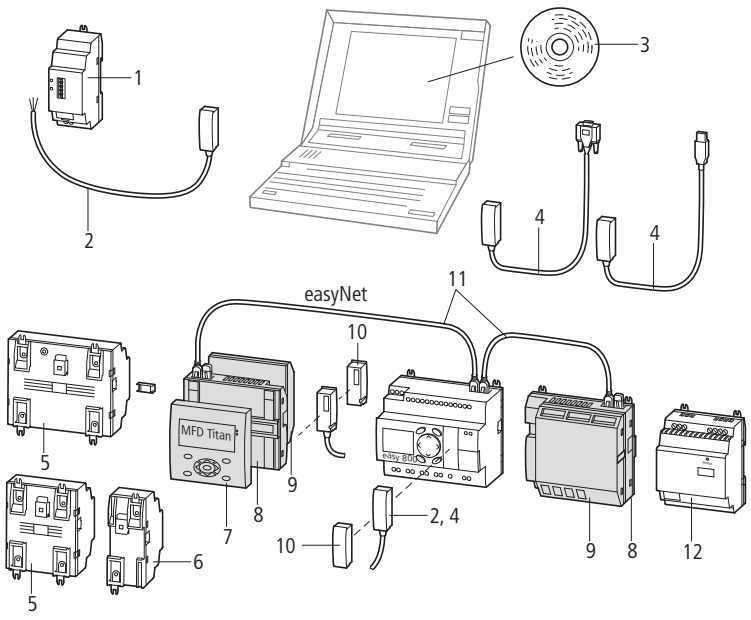
HPL12023EN

	Supply voltage	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Power supply unit/communication modules							
IP20, can be combined with display/operating unit MFD-80... as remote text display							
	24 V DC	With connection cable (5 m, can be cut to length)	easy500 easy700	**MFD-CP4-500** 274094		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	24 V DC	With connection cable (5 m, can be cut to length)	easy800 EC4P ES4P	**MFD-CP4-800** 274095			
	100 - 240 V AC	With connection cable (5 m, can be cut to length)	easy500 easy700	**MFD-AC-CP4-500** 286823			
	100 - 240 V AC	With connection cable (5 m, can be cut to length)	easy800 EC4P ES4P	**MFD-AC-CP4-800** 286824			
	24 V DC	Without connection cable		**MFD-CP4** 280888			
	100 - 240 V AC	Without connection cable		**MFD-AC-CP4** 286822			
Customized inscription, user program							
• Customized inscription of multi-function display with labeling software Labeleditor or • Supply of multi-function display programmed with user program			MFD-80-... MFD-CP8... MFD-CP10...	**MFD-COMBINATION-*** 265260		1 off	UL/CSA certification not required

Notes

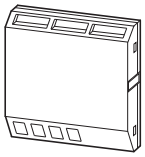
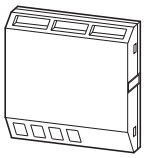
Procedure and ordering example for Labeleditor inscription software
Individually inscribe your device in 4 stages:
– Download the inscription software: www.moeller.net/support, keyword: “Labeleditor”
– Creation of label template (menu-guided in the software)
– Send the label template to the factory by email. The email address is automatically set for the selected product by the program. When your template is sent, the Labeleditor issues a file name such as “EASY_12345.zip”. This file name is part of the article to be ordered (see Ordering examples).
– Send order to the Eaton office or the electrical wholesalers.

Ordering example: MFD-Titan
MFD-80-B multi-function display with “company name”:
1 x MFD-COMBINATION-*
1 x MFD-80-B
1 x the file name “MFD_xxxxx.zip” issued by the Labeleditor



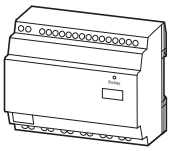
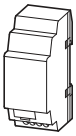
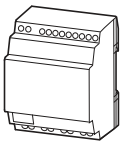
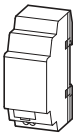
Accessories	Page
1 Ethernet gateway	→ Page 12/16
2 Connection cable	→ Page 12/27
3 Programming software	→ Page 12/9
4 PC programming cable	→ Page 12/9
5 Inputs/outputs expansion	→ Page 12/15
6 output expansion, bus module, coupling module	→ Page 12/16
7 Display/keypad	→ Page 12/16
8 Power supply unit/CPU module	→ Page 12/23
9 I/O module	→ Page 12/17
10 Memory card	→ Page 12/9
11 easyNet	→ Page 12/18
12 Switched-mode power supply unit	→ Page 12/10

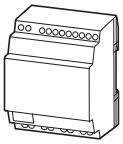
HPL12024EN

Power supply	For use with	Inputs Digital	Ofwhich can be used as analog	Pt100	Outputs Relays 10 A (UL)	Transistor	Analog	Temperature range	**Part no.** Article no.	**Price** See price list	Std. pack
I/O modules											
IP20, spring-loaded terminals 											
24 V DC	MFD-CP8... MFD-CP10...	12	4	–	4	–	–	–	**MFD-R16** 265254		1 off
24 V DC	MFD-CP8... MFD-CP10...	12	4	–	–	4	–	–	**MFD-T16** 265255		1 off
24 V DC	MFD-CP8... MFD-CP10...	12	4	–	4	–	1	–	**MFD-RA17** 265364		1 off
24 V DC	MFD-CP8... MFD-CP10...	12	4	–	–	4	1	–	**MFD-TA17** 265256		1 off
100 - 240 V DC	MFD-AC-CP8...	12	–	–	4	–	–	–	**MFD-AC-R16** 274093		1 off
I/O module with temperature measuring											
IP20, spring-loaded terminals Temperature range configurable 											
24 V DC	MFD-CP8... as of device version 08, MFD-CP10...	6	2	2	–	4	–	-40…+90 °C 0…+250 °C 0…+400 °C	**MFD-TP12-PT-A** 106042		1 off
		6	2	2	–	4	–	-200…+200 °C 0…+850 °C	**MFD-TP12-PT-B** 106043		1 off
		6	2	–	–	4	–	-40…+90 °C 0…+250 °C	**MFD-TP12-NI-A** 106044		1 off
		6	2	2	–	4	1	-40…+90 °C 0…+250 °C 0…+400 °C	**MFD-TAP13-PT-A** 106045		1 off
		6	2	2	–	4	1	-200…+200 °C 0…+850 °C	**MFD-TAP13-PT-B** 106046		1 off
		6	2	–	–	4	1	-40…+90 °C 0…+250 °C	**MFD-TAP13-NI-A** 106047		1 off

Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking
UL File No.	E135462
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-01 + 2258-02
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Inputs	Outputs		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Digital	Relay 10 A (UL)	Transistor					
I/O expansions								
Can be used through easyLink								
	12	6	–	100 - 240 V AC	**EASY618-AC-RE** 212314		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	12	–	8	24 V DC	**EASY620-DC-TE** 212313			
	12	6	–	24 V DC	**EASY618-DC-RE** 232112			Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	2	–	24 V DC	**EASY202-RE**1) 232186			
	6	4	–	24 V DC	**EASY410-DC-RE** 114293			NA Certification: Request filed for UL and CSA Degree of Protection: IEC: IP20, UL/CSA Type: -
	6	–	4	24 V DC	**EASY410-DC-TE** 114294			
Coupling module								
Can be used through easyLink								
		For remote connection of a digital I/O expansion up to 30 m.			**EASY200-EASY** 212315		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -

	Inputs		Outputs			Supply voltage	Part no. Article no.	Price See price list	Std. pack
	Digital / Analog	Of which usable as digital	Relay 10 A (UL)	Transistor	Analog				
I/O expansions									
Can be used through easyLink									
	1 / 2[2]	2	–	2	1	24 V DC	**EASY406-DC-ME** 114295		1 off
	1 / 6[3]	2	–	2	2	24 V DC	**EASY411-DC-ME** 116567		1 off

Notes

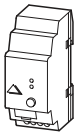
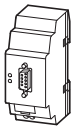
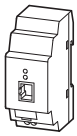
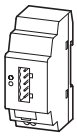
[1] Not for use in combination with basic unit EASY719-DA-... Cannot be used on the EASY200-EASY coupling module

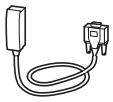
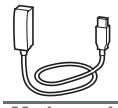
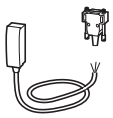
[2] 2 × 0 - 10 V, 2 × 0 - 20 mA, 2 × RTD (2/3-wire connection); any combination
Voltage inputs (0–10 V) can optionally be used as digital inputs

[3] 2 x 0 - 10 V, 2 x 0 - 20 mA, 2 x Pt100 (2/3 wire connection);
Voltage inputs (0 –10 V) can optionally be used as digital inputs

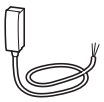
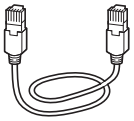
Information relevant for export to North America

NA Certification: Request filed for UL and CSA
Degree of Protection: IEC: IP20, UL/CSA Type: -

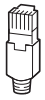
	Description		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Bus modules							
Can be used through easyLink							
	AS-Interface	Slave 4 inputs, 4 outputs, 4 parameter bits Addresses available 0 to 31	–	**EASY205-ASI** 221598		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	PROFIBUS-DP	Slave Addresses available 1 to 126	24 V DC	**EASY204-DP** 212316			
	CANopen	Addresses available 1 to 127	24 V DC	**EASY221-CO** 233539			
	DeviceNet	Addresses available 0 to 63	24 V DC	**EASY222-DN** 233540			
Ethernet gateway							
	Serial interface easyRelay or MFD-...CP8/CP10... to Ethernet, for connection to easyOPC server, easySoft, or easyCom		24 V DC	**EASY209-SE** 101520		1 off	

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Programming software						
	Menu selection in 13 languages Operating systems: Windows 2000 SP4, Windows XP SP3, Windows Vista (32-bit), Windows 7 (32-bit)		**EASY-SOFT-PRO** 266040		1 off	
Programming cable						
	SUB-D, 9 pole, serial, 2 m		**EASY800-PC-CAB** 256277		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified
	USB, 2 m		**EASY800-USB-CAB** 106408		1 off	
Modem cable						
	Configurable modem, printer and programming cable, possible transfer rate 56 kbaud, 9 pole Sub-D plug (plug + socket for self connection)		**EASY800-MO-CAB** 286079		1 off	
Connecting cables						

HPL12027EN

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	For connecting the MFD (-AC)-CP4 or EASY209-SE with easy500/easy700, 5 m, can be cut to length		**MFD-CP4-500-CAB5** 280886		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	For connecting the MFD (-AC)-CP4 or EASY209-SE with easy800/MFD-..-CP8/CP10..., 5 m, can be cut to length		**MFD-CP4-800-CAB5** 280887		1 off	
Memory cards						
	256-kB module	MFD-…-CP8	**EASY-M-256K** 256279		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	512-kB module	MFD-CP10...	**EASY-M-512K**[1] 134969		1 off	
Manuals						
	German	MFD-Titan	**AWB2528-1480D** 267187		1 off	
	English	MFD-Titan	**AWB2528-1480GB** 267188		1 off	
Network connection cables						
	Length: 0.3 m	easyNet	**EASY-NT-30** 256283		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Length: 0.8 m	easyNet	**EASY-NT-80** 256284		1 off	
	Length: 1.5 m	easyNet	**EASY-NT-150** 256285		1 off	
Bus termination resistor						
	8 pole, RJ45, 124 Ω Connection to PIN 1 and PIN 2	easyNet	**EASY-NT-R** 256281		2 off	
Data cable						
	4 x 0.14 mm², twisted pair, AWG 26 Length: 100 m	easyNet	**EASY-NT-CAB** 256286		1 off	UL File No.: E135462 UL CCN: NRAQ NA Certification: UL Listed Degree of Protection: IEC: IP 20, UL/CSA Type: -

Note [1] For availability please inquire

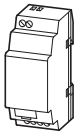
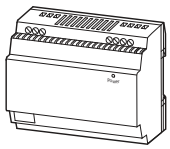
	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Bus connector plug						
	8 pole, RJ45	easyNet	**EASY-NT-RJ45** 256280		10 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Crimping tool						
–	For RJ45 plug	EASY-NT-CAB EASY-NT-RJ45	**EASY-RJ45-TOOL** 256282		1 off	

Point-to-point connection cable

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Serial interface for connecting MFD-…-CP8/CP10... to easy800 or MFD-…-CP8/CP10..., 5 m, can be cut to length	easy800 MFD-…-CP8	**MFD-800-CAB5** 266041		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -

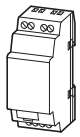
Switched-mode power supply units

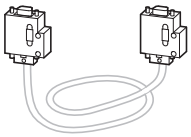
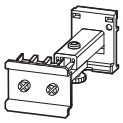
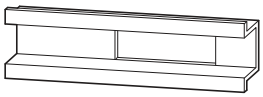
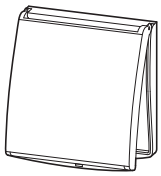
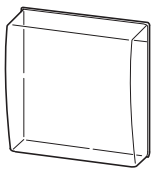
Primary-switched mode, stabilized

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Rated input voltage: 50/60 Hz: 100 - 240 V Rated output voltage: 24 V/12 V DC Rated output current: 0.35 A/20 mA	**EASY200-POW** 229424		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 1.25 A	**EASY400-POW** 212319		1 off	
		EASY430-POW 110940		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 107.1-01; CE marking UL File No.: E300415 UL CCN: NMTR, NMTR7 CSA File No.: UL report applies to both US and Canada CSA Class No.: 3211-87, 3211-07 NA Certification: UL Listed, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 2.5 A	**EASY500-POW** 110941		1 off	
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 4.2 A	**EASY600-POW** 262399		1 off	

Ballast

To increase the AC input current

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	6 channels, cable length up to 100 m	**EASY256-HCI** 231168		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
PROFIBUS-DP data cable						
	Twisted pair, without plug, 2-core, 2 x 0.64 mm² (only suitable for fixed wiring) 100 m		**ZB4-900-KB1** 206983		100 m	
PROFIBUS-DP bus connector plug						
	Pins, 9 pole Cable entry, angled 90°		**ZB4-209-DS2** 206982		1 off	
	Metallised insulated housing Maximum transfer rate 12 MBit/s Integrated switch (accessible from the outside) for the bus terminating resistors Terminal block for two cable entries, with straight or 90° angled cable entry, as required		**ZB4-209-DS3** 217820		1 off	
Connection plug						
	Bus connector plug between base unit and expansion unit/bus module		**EASY-LINK-DS** 221607		1 off	UL/CSA certification not required
Fixing bracket For screw fixing to mounting plate						
	3 fixing brackets per easy400, 500, 600, 700, 800, EC4P, ES4P 2 fixing brackets per easy200 3 fixing brackets per MFD...-CP8/CP10…		**ZB4-101-GF1** 061360		9 off	UL/CSA certification not required
Telescopic clip						
	With 35mm top-hat rail to IEC/EN 60715 for mounting depth compensation when rear mounting in CI-K… enclosures and cabinets. Stepless adjustment via scale from 75 – 115 mm. Screw and snap fastening		**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Mounting rail to IEC/EN 60715 Mounting rail with cutout specifically for MFD...-CP8/CP10… for fixing easy expansion units (2 space units) Length: 142.5 mm						
		easy200	**MFD-TS-144** 274090		1 off	UL/CSA certification not required
Protective cover						
	Transparent Protection against accidental actuation sealable Application without front frames	MFD-80…	**MFD-XS-80** 265259		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified
Protective diaphragm						
	Transparent version for harsh environmental conditions and application in the food industry For increasing the degree of protection to NEMA 4X for MFD-80-B	MFD-80…	**MFD-XM-80** 265258		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type 4X

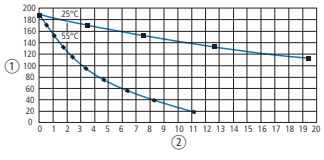
Technical data

			EASY200-EASY EASY202-RE	EASY4…-DC-…E EASY512-…	EASY6... EASY7…	EASY8..-…
General						
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27			
Dimensions (W x H x D)		mm	35.5 x 90 x 58 (2 space units)	71.5 x 90 x 58 (4 space units)	107.5 x 90 x 58 (6 space units)	107.5 x 90 x 72 (6 space units)
Weight		kg	0.07	0.2	0.3	0.3
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories).			
Terminal capacity						
Solid		mm^2	0.2 - 4 (AWG 22 - 12)			
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)			
Flat-blade screwdriver		mm	3.5 x 0.8			
Max. tightening torque		Nm	0.6			
Ambient climatic conditions						
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2			
Condensation			Prevent condensation by means of suitable measures			
LCD display (clearly legible)		°C	0 - 55	0 - 55	0 - 55	0 - 55
Storage		°C	-40 - 70	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080	795 - 1080	795 - 1080
Ambient mechanical conditions						
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20
Vibrations (IEC/EN 60068-2-6)						
	Constant amplitude 0.15 mm	Hz	10 - 57	10 - 57	10 - 57	10 - 57
	Constant acceleration, 2 g	Hz	57 - 150	57 - 150	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1	1	1
Mounting position			Vertical or horizontal			
Electromagnetic compatibility (EMC)						
Overvoltage category/pollution degree			II/2	II/2	II/2	II/2
Electrostatic discharge (ESD), to IEC EN 61000-4-2						
	Air discharge	kV	8	8	8	8
	Contact discharge	kV	6	6	6	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10	10	10	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B			
Burst to IEC/EN 61000-4-4						
	Supply cables	kV	2	2	2	2
	Signal cables	kV	2	2	2	2
Power pulses (surge), to IEC/EN 61000-4-5		kV	2 (supply cables, symmetrical, EASY…AC)			
Power pulses (surge), to IEC/EN 61000-4-5		kV	0.5 (supply cables, symmetrical, EASY…DC)			
Radiated RFI, to IEC/EN 61000-4-6		V	10	10	10	10
Insulation resistance						
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142			
Insulation resistance			EN 50178	EN 50178	EN 50178	EN 50178
Back-up/accuracy of the real-time clock						
Back-up time			–	– [1]	– [1]	[1]
Accuracy of the real-time clock at 55 °C		s/day	–	– Normally ± 5 (± 0.5 h/Year)	– Normally ± 5 (± 0.5 h/Year)	Normally ± 5 (± 0.5 h/Year)
Repetition accuracy of timing relays						
Accuracy of timing relay (of value)		%	–	– ± 1	± 0.02	± 0.02
Resolution	Range "S"	ms	–	– 10	10	5
	Range "M:S"	s	–	– 1	1	1
	Range "H:M"	min	–	– 1		
Retentive memory						
Write cycles of the retentive memory (minimum)			–	– 1000000 (10^6)	1000000 (10^6)	10000000 (10^{10}) (read/write cycles)

Notes

For additional technical data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D

1)



① Back-up time (hours)
② Service life (years)

			EASY512-DA-...	EASY719-DA-...
Power supply				
Rated operational voltage	U_e	V	12 DC (-15/+30%)	12 DC (-15/+30%)
Permissible range		V DC	10.2…15.6	10.2…15.6
Ripple		%	≦ 5	≦ 5
Input current				
At rated voltage		mA	Normally 140	Normally 200
Voltage dips (IEC/EN 61131-2)		ms	10	10
Heat dissipation		W	Normally 2	Normally 3.5
Digital inputs 12 V DC				
Number			8	12
Inputs can be used as analog inputs			2 (I7, I8)	4 (I7, I8, I11, I12)
Status display			LCD display (if provided)	LCD display (if provided)
Potential isolation				
From power supply			No	No
Between digital inputs			No	No
From the outputs			Yes	Yes
Rated operating voltage	U_e	V DC	12	12
On signal "0"	U_e	V DC	4 (I1 - I8)	4 (I1 - I12)
On signal "1"	U_e	V DC	8 (I1 - I8)	8 (I1 - I12)
Input current on signal "1"				
I1 to I6		mA	3.3 (at 12 V DC)	3.3 (at 12 V DC)
I7, I8, I11, I12		mA	1.1 (at 12 V DC)	1.1 (At 12 V DC)
I9 to I10		mA	–	3.3 (at 12 V DC)
Delay time from 0 to 1				
Debounce ON		ms	20	20
Debounce OFF		ms	Normally 0.3 (I1 - I6), 0.35 (I7, I8)	Normally 0.3 (I1 - I6, I9, I10), 0.35 (I7, I8, I11, I12)
Delay time from 1 to 0				
Debounce ON		ms	20	20
Debounce OFF		ms	Normally 0.3 (I1 - I6), 0.15 (I7, I8)	Normally 0.4 (I1 - I6, I9, I10), 0.35 (I7, I8, I11, I12)
Cable length (unshielded)		m	100	100
Frequency counters			2 (I3, I4)	2 (I3, I4)
High-speed counter inputs			2 (I1, I2)	2 (I1, I2)
Maximum counter frequency		kHz	< 1	< 1
Pulse shape			Square	Square
Cable length shielded		m	< 30	< 30
Analog inputs				
Number			2 (I7, I8)	4 (I7, I8, I11, I12)
Potential isolation				
From power supply			No	No
From the digital inputs			No	No
From the outputs			Yes	Yes
Between the inputs			No	No
Input type			DC voltage	DC voltage
Signal range		V DC	0 - 10	0 - 10
Resolution, analog		V	0.01	0.01
Resolution, digital		V	0.01	0.01
Resolution		Bit	10 (value 1 - 1023)	10 (value 0 - 1023)
Input impedance		kΩ	11.2	11.2
Accuracy of actual value				
Two EASY devices		%	± 3	± 3
Within a single device		%	± 2, (I7, I8, I11, I12) ± 0.12 V	± 2, (I7, I8, I11, I12) ± 0.12 V
Conversion time analog/digital		ms	Input delay ON: 20; Input delay OFF: each cycle time	Input delay ON: 20; Input delay OFF: each cycle time
Input current		mA	< 1	< 1
Cable length shielded		m	< 30	< 30

Relay outputs → See technical data, relay outputs

Notes For additional Technical Data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D

			EASY512-AB-...	EASY719-AB-...
Power supply				
Rated operational voltage	U_e	V	24 AC	24 AC
Permissible range		V AC	20.4…26.4	20.4…26.4
Frequency		Hz	50/60 (± 5%)	50/60 (± 5%)
Input current				
At 24 V AC 50/60 Hz		mA	Normally 200	Normally 300
Voltage dips (IEC/EN 61131-2)		ms	20	20
Heat dissipation				
At 24 V AC		VA	Normally 5	Normally 7
Digital inputs 24 V DC				
Number			8	12
Inputs can be used as analog inputs			2 (I7, I8)	4 (I7, I8, I11, I12)
Status display			LCD display (if provided)	LCD display (if provided)
Potential isolation				
From power supply			No	No
Between digital inputs			No	No
From the outputs			Yes	Yes
Rated operational voltage	U_e	V	24 AC	24 AC
Rated voltage L (sinusoidal)				
On signal "0"		V AC	0 - 6	0 - 6
On signal "1"	U_e	V	(I7, I8) > 7 AC, > 9.5 DC (I1 - I6) 14 - 26.4 AC	(I7, I8, I11, I12) > 7 AC, > 9.5 DC (I1 - I6, I9, I10) 14 - 26.4 AC
Rated frequency		Hz	50 - 60	50 - 60
Input current on signal "1"				
I1 to I6		mA	4 (at 24 V AC, 50 Hz)	4 (at 24 V AC, 50 Hz)
I7, I8		mA	2 (at 24 V AC, 50 Hz) 2 (at 24 V DC)	2 (at 24 V AC, 50 Hz) 2 (at 24 V DC)
I9, I10		mA	–	4 (At 24 V AC, 50 Hz)
I11, I12		mA	–	2 (at 24 V AC, 50 Hz) 2 (at 24 V DC)
Delay time (0 - 1/1 - 0) I1 - I12				
Debounce ON, 50/60 Hz		ms	80/66⅔	80/66⅔
Debounce OFF, 50/60 Hz		ms	20/16⅔	20/16⅔
Max. admissible cable length (per input)				
Maximum remote installation distance		m	40	40
I9, I10		m	–	Normally 40
Analog inputs				
Number			2 (I7, I8)	4 (I7, I8, I11, I12)
Potential isolation				
From power supply			No	No
From the digital inputs			No	No
From the outputs			Yes	Yes
Between the inputs			No	No
Input type			DC voltage	DC voltage
Signal range		V DC	0 - 10	0 - 10
Resolution, analog		V	0.01	0.01
Resolution, digital		V	0.01	0.01
Resolution		Bit	10 (value 1 - 1023)	10 (value 0 - 1023)
Input impedance		kΩ	11.2	11.2
Accuracy of actual value				
Two EASY devices		%	± 3	± 3
Within a single device		%	± 2, (I7, I8) ± 0.12 V	± 2, (I7, I8, I11, I12) ± 0.12 V
Conversion time analog/digital		ms	Input delay ON: 20; Input delay OFF: each cycle time	Input delay ON: 20; Input delay OFF: each cycle time
Input current		mA	< 1	< 1
Cable length shielded		m	< 30	< 30
Relay outputs			→ See technical data, relay outputs	

Notes For additional technical data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D

			EASY410-DC-RE EASY410-DC-TE	EASY512-DC-...	EASY6..-DC-.E	EASY7..-DC-...	EASY7..-DC-...	EASY8..-DC-...
Power supply								
Rated operational voltage	U_e	V	24 DC (-15/+20%)					
Permissible range		V DC	20.4…28.8	20.4…28.8	20.4…28.8	20.4…28.8	20.4…28.8	20.4…28.8
Ripple		%	≦ 5	≦ 5	≦ 5	≦ 5	≦ 5	≦ 5
Input current								
At rated voltage		mA	Normally 140	Normally 80	Normally 140	Normally 140	Normally 140	Normally 140
Voltage dips (IEC/EN 61131-2)		ms	10	10	10	10	10	10
Heat dissipation		W	Normally 3.5	Normally 2	Normally 3.4	Normally 3.5	Normally 3.5	Normally 3.4
Digital inputs 24 V DC								
Number			6	8	12	12	12	12
Inputs can be used as analog inputs			-	2 (I7, I8)	–	4 (I7, I8, I11, I12)	4 (I7, I8, I11, I12)	4 (I7, I8, I11, I12)
Status display			LCD display (if provided)					
Potential isolation								
From power supply			No	No	No	No	No	No
Between digital inputs			No	No	No	No	No	No
From the outputs			Yes	Yes	Yes	Yes	Yes	Yes
From PC interface, memory card, easyNet, easyLink			–	–	–	–	–	Yes
Rated operating voltage	U_e	V DC	24	24	24	24	24	24
On signal "0"	U_e	V DC	< 5 (R1 - R6)	< 5 (I1 - I8)	< 5 (I1 - I12, R1 - R12)	< 5 (I1 - I12, R1 - R12)	< 5 (I1 - I12, R1 - R12)	< 5 (I1 - I6, I9, I10) < 8 (I7, I8, I11, I12)
On signal "1"	U_e	V DC	> 15.0 (R1 - R6)	> 15 (I1 - I6), > 8 (I7, I8)	–	> 15.0 (I1 - I6, I9, I10), > 8.0 (I7, I8, I11, I12)	> 15.0 (I1 - I6, I9, I10), > 8.0 (I7, I8, I11, I12)	> 15.0 (I1 - I6, I9, I10), > 8.0 (I7, I8, I11, I12)
Input current on signal "1"								
R1 - R6 (R12)		mA	3.3 (at 24 V DC)	–	3.3 (at 24 V DC)	–	–	–
I1 to I6		mA	–	3.3 (at 24 V DC)	–	3.3 (at 24 V DC)	3.3 (at 24 V DC)	3.3 (at 24 V DC)
I7, I8		mA	–	2.2 (at 24 V DC)	–	2.2 (at 24 V DC)	2.2 (at 24 V DC)	2.2 (at 24 V DC)
I9, I10		mA	–	–	–	3.3 (at 24 V DC)	3.3 (at 24 V DC)	3.3 (at 24 V DC)
I11, I12		mA	–	–	–	2.2 (at 24 V DC)	2.2 (at 24 V DC)	2.2 (at 24 V DC)
Delay time from 0 to 1								
Debounce ON		ms	20	20	20	20	20	20
Debounce OFF		ms	Normally 0.25 (R1 - R6)	Normally 0.25 (I1 - I8)	Normally 0.25 (R1 - R12)	Normally 0.25 (I1 - I12)	Normally 0.25 (I1 - I12)	Normally 0.1 (I1 - I4), normally 0.25 (I5 - I12)
Delay time from 1 to 0								
Debounce ON		ms	20	20	20	20	20	20
Debounce OFF		ms	–	–	–	–	–	Normally 0.1 (I1 - I4), normally 0.4 (I5, I6, I9, I12), normally 0.2 (I7, I8, I11, I12)
Cable length (unshielded)		m	100	100	100	100	100	100
Frequency counters								
Number			–	2 (I3, I4)	–	2 (I3, I4)	2 (I3, I4)	4 (I1, I2, I3, I4)
Counter frequency		kHz	–	< 1	–	< 1	< 1	< 5
Pulse shape			–	Square	–	Square	Square	Square
Incremental counters								
Number			–	–	–	–	–	2 (I1 + I2, I3 + I4)
Counter frequency		kHz	–	≦ 1	–	≦ 1	≦ 1	≦ 3
Pulse shape			–	–	–	–	–	Square
Counter inputs I1 and I2, I3 and I4			–	–	–	–	–	2
Signal offset			–	–	–	–	–	90°
Mark-to-space ratio			–	–	–	–	–	1:1
High-speed counter inputs								
Number			–	2 (I1, I2)	–	2 (I1, I2)	2 (I1, I2)	4 (I1, I2, I3, I4)
Cable length, shielded		m	–	< 20	–	< 20	< 20	< 20
Counter frequency		kHz	–	< 1	–	< 1	< 1	< 5
Pulse shape			–	Square	–	Square	Square	Square
Cable length (unshielded)		m	–	100	100	100	100	100
Relay outputs			→ See technical data, relay outputs					
Transistor outputs			→ See technical data, transistor outputs					
Notes			For additional technical data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D					

		EASY406…-DC-ME	EASY411-DC-ME	EASY512-DC-…	EASY7..-DC-…	EASY8..-DC-…
Analog inputs						
Number		2	6	2 (I7, I8)	4 (I7, I8, I11, I12)	4 (I7, I8, I11, I12)
Potential isolation						
From power supply		No	No	No	No	No
From the digital inputs		No	No	No	No	No
From the outputs		No	No	Yes	Yes	Yes
From PC interface, memory card, easyNet, easyLink		Yes	Yes	No	No	Yes
Input type		DC voltage	DC voltage	DC voltage	DC voltage	DC voltage
Signal range	V DC	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
Resolution, analog	V	–	–	0.01	0.01	0.01
Resolution, digital	V	–	–	0.01	0.01	0.01
Resolution	Bit	10 (value 0 - 1023)				
Input impedance	kΩ	11.2	11.2	11.2	11.2	11.2
Accuracy of actual value						
Two EASY devices	%	± 3	± 3	± 3	± 3	± 3
Within a single device	%	< ± 3 %	< ± 3 %	± 2, (I7, I8, I11, I12) ± 0.12 V	± 2, (I7, I8, I11, I12) ± 0.12 V	± 2, (I7, I8, I11, I12) ± 0.12 V
Conversion time analog/digital	ms	800	800	Input delay ON: 20; input delay OFF: every cycle time		Each CPU cycle
Input current	mA	< 1	< 1	< 1	< 1	< 1
Cable length shielded	m	< 10	< 10	< 30	< 30	< 30
Analog outputs						
Number		1	2	–	–	1
Potential isolation						
From power supply		No	No	No	No	No
From the digital inputs		No	No	No	No	No
From the digital outputs		No	No	No	No	Yes
easyLink		Yes	Yes	No	No	Yes
Output type		DC voltage	DC voltage	–	–	DC voltage
Signal range						
Signal range min. voltage	V	0	0	–	–	0
Signal range max. voltage	V	10	10	–	–	10
Max. output current	A	0.01	0.01	–	–	0.01
Load resistance		1 kΩ	1 kΩ	–	–	1 kΩ
Overload and short-circuit protection		Yes	Yes	–	–	Yes
Resolution, analog	V DC	0.01	0.01	–	–	0.01
Resolution, digital	Bit	10 (value 0 - 1023)	10 (value 0 - 1023)	–	–	10, (value: 0 – 1023)
Recovery time	µs	–	–	–	–	100
Accuracy						
-25 °C - 55 °C	%	2	2	–	–	2
25C	%	1	1	–	–	1
Conversion time analog/digital	ms	200	200	Input delay ON: 20; input delay OFF: every cycle time		Each CPU cycle
Network easyNet						
Stations	Number	–	–	–	–	Max. 8
Data transfer rate/distance		–	–	–	–	1000 Kbit/s, 6 m 500 Kbit/s, 25 m 250 Kbit/s, 60 m 125 Kbit/s, 125 m 50 Kbit/s, 300 m 20 Kbit/s, 700 m 10 Kbit/s, 1000 m
Potential isolation						
Of the 2 additional inputs		–	–	–	–	Yes
Potential isolation		–	–	–	–	Yes
Electrical isolation between inputs and internal power supply		–	–	–	–	Yes
Potential isolation		–	–	–	–	Yes
Bus termination (first and last station)		–	–	–	–	Yes
Terminal type		–	–	–	–	RJ45, 8 pole

Notes For additional technical data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D

			EASY512-AC-R..	EASY618-AC-RE	EASY719-AC-RC.	EASY819-AC-RC.
Power supply						
Rated operational voltage	U_e	V	100/110/115/120/230/240 AC (+10/-15 %)			
Permissible range		V AC	85…264	85…264	85…264	85…264
Frequency		Hz	50/60 (± 5%)	50/60 (± 5%)	50/60 (± 5%)	50/60 (± 5%)
Input current						
At 115/120 V AC 60 Hz		mA	Normally 40	Normally 70	Normally 70	Normally 70
At 230/240 V AC 50 Hz		mA	Normally 20	Normally 35	Normally 35	Normally 35
Voltage dips (IEC/EN 61131-2)		ms	20	20	20	20
Heat dissipation						
At 115/120 V AC		VA	Normally 5	Normally 10	Normally 10	Normally 10
At 115/230 V AC		VA	Normally 5	Normally 10	Normally 10	Normally 10
Digital inputs 115/230 V AC						
Number			8	12	12	12
Status display			LCD display (if provided)			
Potential isolation						
From power supply			No	No	No	No
Between digital inputs			No	No	No	No
From the outputs			Yes	Yes	Yes	Yes
Potential isolation			–	–	–	Yes
Rated voltage L (sinusoidal)						
On signal "0"		V AC	0 - 40	0 - 40	0 - 40	0 - 40
On signal "1"		V AC	79 - 264	79 - 264	79 - 264	79 - 264
Rated frequency		Hz	50 - 60	50 - 60	50 - 60	50 - 60
Input current on signal "1"						
R1 to R12		mA		12 x 0.25 (at 115 V AC, 60 Hz)12 x 0.5 (at 230 V AC, 50 Hz)		
I1 to I6		mA	6 x 0.25 (at 115 V AC, 60 Hz)6 x 0.5 (at 230 V AC, 50 Hz)		6 x 0.25 (at 115 V AC, 60 Hz)6 x 0.5 (at 230 V AC, 50 Hz)	6 x 0.25 (at 115 V AC, 60 Hz)6 x 0.5 (at 230 V AC, 50 Hz)
I7, I8		mA	2 x 4 (at 115 V AC, 60 Hz)2 x 6 (at 230 V AC, 50 Hz)		2 x 4 (at 115 V AC, 60 Hz)2 x 6 (at 230 V AC, 50 Hz)	2 x 4 (at 115 V AC, 60 Hz)2 x 6 (at 230 V AC, 50 Hz)
I9 to I12		mA			4 x 0.25 (at 115 V AC, 60 Hz)4 x 0.5 (at 230 V AC, 50 Hz)	4 x 0.25 (at 115 V AC, 60 Hz)4 x 0.5 (at 230 V AC, 50 Hz)
Delay time						
Delay time (0 - 1/1 - 0) I1 - I6, I9 - I12, R1 - R12						
Debounce ON, 50/60 Hz		ms	80/66⅔	80/66⅔	80/66⅔	80/66⅔
Debounce OFF, 50/60 Hz		ms	20/16⅔	20/16⅔	20/16⅔	20/16⅔
Delay time I7, I8 (1 - 0)						
Debounce ON, 50/60 Hz		ms	160/150	80/66⅔	80/66⅔	120/100
Debounce OFF, 50/60 Hz		ms	100/100	20/16⅔	20/16⅔	40/33⅓
Delay time I7, I8 (0 - 1)						
Debounce ON, 50/60 Hz		ms	80/66⅔	80/66⅔	80/66⅔	80/66⅔
Debounce OFF, 50/60 Hz		ms	20/16⅔	20/16⅔	20/16⅔	20/16⅔
Max. admissible cable length (per input)						
R1 to R12		m	–	Normally 40	–	–
I1 to I6		m	Normally 40	Normally 40	Normally 40	Normally 60
I7, I8		m	Normally 100	Normally 100	Normally 100	Normally 100
I9 to I12		m	–	Normally 40	Normally 40	Normally 60
Relay outputs			→ See technical data, relay outputs			

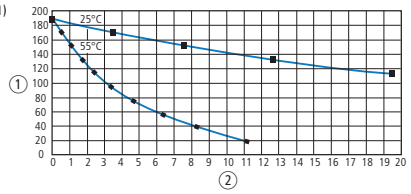
Notes For additional technical data EASY5… and EASY7… → AWB2528-1508D, EASY8… → AWB2528-1423D

			MFD-80..	MFD-CP4...	MFD-AC-CP4.. MFD-AC-CP8..	MFD-CP10.. MFD-CP8..
General						
Standards			EN 61000-6-1/-2/-3/-4, IEC 60068-2-6, IEC 60068-2-27			
Dimensions (W x H x D)		mm	86.5 x 86.5 x 21.5 (with buttons) 86.5 x 86.5 x 20 (without buttons)	75 x 58 x 36.2	107.5 x 90 x 30	107.5 x 90 x 30
Weight		kg	0.13	0.16	0.14	0.14
Mounting			2 x 22.5 mm, display fastened using 2° threaded fixing rings. Wall thickness: without top-hat rail (CPU) 1 – 6 mm with top-hat rail 1 – 4 mm	Plug-fitted to the display fixing shaft	Fitted on the fixing shaft of the display or on top-hat rail according to IEC/EN 60715, 35 mm deep (without display)	Fitted on the fixing shaft of the display or on top-hat rail according to IEC/EN 60715, 35 mm deep (without display)
Terminal capacity						
Solid		mm^2	–	–	0.2/4 (AWG 24 - 12)	0.2/4 (AWG 24 - 12)
Flexible with ferrule		mm^2	–	–	0.2/2.5 (AWG 24 - 12)	0.2/2.5 (AWG 24 - 12)
Flat-blade screwdriver		mm	–	–	3.5 x 0.6	3.5 x 0.6
Max. tightening torque		Nm	–	–	–	–
Ambient climatic conditions						
Operating ambient temperature		°C	-25 - 55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2			
Condensation			Prevent condensation by means of suitable measures			
LCD display (clearly legible)		°C	-5 - 50			
Storage		°C	-40 - 70	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080	795 - 1080	795 - 1080
Ambient mechanical conditions						
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP65	IP20	IP20	IP20
Vibrations (IEC/EN 60068-2-6)						
Constant amplitude 0.15 mm		Hz	10 - 57	10 - 57	10 - 57	10 - 57
Constant acceleration, 2 g		Hz	57 - 150	57 - 150	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1	1	1
Mounting position			Vertical or horizontal			

			MFD-80..	MFD-CP4...	MFD-AC-CP4.. MFD-AC-CP8..	MFD-CP10.. MFD-CP8..
Electromagnetic compatibility (EMC)						
Overvoltage category/ pollution degree			–	–	–	–
Electrostatic discharge (ESD), to IEC EN 61000-4-2						
Air discharge		kV	8	8	8	8
Contact discharge		kV	6	6	6	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10	10	10	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B			
Burst to IEC/EN 61000-4-4						
Supply cables		kV	2	2	2	2
Signal cables		kV	2	2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, Level 2)						
Supply cables, symmetrical			–	0.5	1	0.5
Radiated RFI, to IEC/EN 61000-4-6		V	10	10	10	10
Insulation resistance						
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142			
Insulation resistance			EN 50178			
Back-up/accuracy of the real-time clock						
Back-up time			–	–	1)	1)
Accuracy of the real-time clock at 55 °C		s/day	–	–	Normally ±5 s/day (±0.5 h/Year)	Normally ±5 s/day (±0.5 h/Year)
Repetition accuracy of timing relays						
Accuracy of timing relay (of value)		%	–	–	± 0.02	± 0.02
Resolution						
Range "S"		ms	–	–	5	5
Range "M:S"		s	–	–	1	1
Range "H:M"		min	–	–	1	1
Retentive memory						
Write cycles of the retentive memory (minimum)			–	–	10^{10} (read/write cycles)	10^{10} (read/write cycles)

Notes For additional technical data EASY5... and EASY7... → AWB2528-1508D, EASY8... → AWB2528-1423D

1)



① Backup time (hours)
② Service life (years)

			MFD-CP4..	MFD-CP8.. MFD-CP10..	MFD-AC-CP4.. MFD-AC-CP8..
Power supply					
Rated operational voltage	U_e	V	24 DC (-15/+20 %)	24 DC (-15/+20 %)	100/110/115/120//230/240 AC (+10/-15 %)
Permissible range		V AC			85…264
Permissible range		V DC	20.4…28.8	20.4…28.8	
Ripple		%	≤ 5	≤ 5	–
Frequency		Hz	–	–	50/60 (± 5%)
Input current					
At 115/120 V AC 60 Hz		mA	–	–	Normally 90
At 230/240 V AC 50 Hz		mA	–	–	Normally 60
At 24 V DC		mA	Normally 185	Normally 200	–
Voltage dips (IEC/EN 61131-2)		ms	10	10	10
Heat dissipation					
At 115/120 V AC		VA	–	–	Normally 11
At 230/240 V AC		VA	–	–	Normally 15
At 24 V DC		W	1.5	3.4	–
Point-to-point connection					
Stations			1	–	–
Baud rate					
easy500, easy700		MBit/s	9.6 kBaud	–	–
easy800, MFD, EC4P			19.2 kBaud	–	–
Distance		m	Max. 5	Max. 5	Max. 5
Potential isolation					
From power supply			Yes	–	–
From the connected device			Yes	–	–
Terminal type			Spring-loaded terminals	–	–
Power pulses					
Stations		Number	Max. 1	Max. 8	Max. 8
Data transfer rate/distance			–	1000 Kbit/s, 6 m 500 Kbit/s, 25 m 250 Kbit/s, 40 m 125 Kbit/s, 125 m 50 Kbit/s, 300 m 20 Kbit/s, 700 m 10 Kbit/s, 1000 m	1000 Kbit/s, 6 m 500 Kbit/s, 25 m 250 Kbit/s, 40 m 125 Kbit/s, 125 m 50 Kbit/s, 300 m 20 Kbit/s, 700 m 10 Kbit/s, 1000 m
Potential isolation					
From power supply			–	Yes	Yes
From the inputs			–	–	Yes
From the outputs			–	Yes	Yes
From PC interface, memory card, easyNet, easyLink			–	Yes	Yes
Bus termination (first and last station)			–	Yes	Yes
Terminal type			–	RJ45, 8 pole	RJ45, 8 pole

			MFD-R16 MFD-RA17	MFD-AC-R16	MFD-T16 MFD-TA17	MFD-T.P..
General						
Standards			EN 61000-6-1/-2/-3/-4, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27	EN 61000-6-1/-2/-3/-4, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27	EN 61000-6-1/-2/-3/-4, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27	EN 61000-6-1/-2/-3/-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	89 x 90 x 44	89 x 90 x 44	89 x 90 x 25 (built-in)	89 x 90 x 25 (built-in)
Weight		kg	0.15	0.15	0.14	0.14
Mounting			Fitted into the power supply unit.			
Terminal capacity						
Solid		mm^2	0.2/4 (AWG 24 - 12)	0.2/4 (AWG 24 - 12)	0.2/4 (AWG 24 - 12)	0.2/4 (AWG 24 - 12)
Flexible with ferrule		mm^2	0.2/2.5 (AWG 24 - 12)	0.2/2.5 (AWG 24 - 12)	0.2/2.5 (AWG 24 - 12)	0.2/2.5 (AWG 24 - 12)
Flat-blade screwdriver		mm	3.5 x 0.6	3.5 x 0.6	3.5 x 0.6	3.5 x 0.6
Power supply						
Solid		mm^2	–	–	–	–
Flexible with ferrule		mm^2	–	–	–	–
Flat-blade screwdriver		mm	–	–	–	–
Data cable						
Solid		mm^2	0.08/2.5 (AWG 28 - 12)	0.08/2.5 (AWG 28 - 12)	0.08/2.5 (AWG 28 - 12)	0.08/2.5 (AWG 28 - 12)
Flexible with ferrule		mm^2	0.08/1.5 (AWG 28 - 12)	0.08/1.5 (AWG 28 - 12)	0.08/1.5 (AWG 28 - 12)	0.08/1.5 (AWG 28 - 12)
Ambient climatic conditions						
Operating ambient temperature		°C	-25 - 55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2			
Condensation			Prevent condensation by means of suitable measures			
LCD display (clearly legible)		°C				
Storage		°C	-40 - 70	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080	795 - 1080	795 - 1080
Ambient mechanical conditions						
Pollution degree			2	2	2	2
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20
Vibrations (IEC/EN 60068-2-6)						
Constant amplitude 0.15 mm		Hz	10 - 57	10 - 57	10 - 57	10 - 57
Constant acceleration, 2 g		Hz	57 - 150	57 - 150	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1	1	1
Mounting position			Vertical or horizontal			
Electromagnetic compatibility (EMC)						
Electrostatic discharge (ESD), to IEC EN 61000-4-2						
Air discharge		kV	8	8	8	8
Contact discharge		kV	6	6	6	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10	10	10	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B			
Burst to IEC/EN 61000-4-4						
Supply cables		kV	2	2	2	2
Signal cables		kV	2	2	2	2
Power pulses (surge) (IEC/EN 61000-4-5)		kV	2 (supply cables, symmetrical)	2 (supply cables, symmetrical)	2 (supply cables, symmetrical)	2 (supply cables symmetrical, MFD-AC-CP8..)
Power pulses (surge), to IEC/EN 61000-4-5		kV	0.5 (supply cables, symmetrical)	0.5 (supply cables, symmetrical)	0.5 (supply cables, symmetrical)	0.5 (supply cables, symmetrical, MFD-CP8..)
Radiated RFI, to IEC/EN 61000-4-6		V	10	10	10	10
Insulation resistance						
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142			
Insulation resistance			EN 50178			

			MFD-R16 MFD-RA17	MFD-T16 MFD-TA17	MFD-T...P...	MFD-AC-R16
Digital inputs 24 V DC						
Number			12	12	6	
Inputs can be used as analog inputs			4 (I7, I8, I11, I12)	4 (I7, I8, I11, I12)	2 (I11, I12)	
Potential isolation						
From power supply			No	No	No	
Between digital inputs			No	No	No	
From the outputs			Yes	Yes	Yes	
From PC interface, memory card, easy NET, easyLink			Yes	Yes	Yes	
Rated operating voltage	U_e	V DC	24	24	24	
On signal "0"	U_e	V DC	< 5.0 (I1 - I6, I9 - I10), < 8 (I7, I8, I11, I12)	< 5.0 (I1 - I6, I9 - I10), < 8 (I7, I8, I11, I12)	< 5.0 (I1 - I4), < 8.0 (I11, I12)	
On signal "1"	U_e	V DC	> 15.0 (I1 - I6, I9 - I10), > 8.0 (I7, I8, I11, I12)	> 15.0 (I1 - I6, I9 - I10), > 8.0 (I7, I8, I11, I12)	>15.0 (I1 - I4), > 8.0 (I11, I12)	
Input current on signal "1"						
I1 to I6		mA	3.3 (at 24 V DC)	3.3 (at 24 V DC)	–	
I1 to I4		mA	–	–	3.3 (at 24 V DC)	
I7, I8		mA	2.2 (at 24 V DC)	2.2 (at 24 V DC)	–	
I9, I10		mA	3.3 (at 24 V DC)	3.3 (at 24 V DC)	–	
I11, I12		mA	2.2 (at 24 V DC)	2.2 (at 24 V DC)	2.2 (at 24 V DC)	
Delay time from 0 to 1						
Debounce ON		ms	20	20	20	
Debounce OFF		ms	Normally 0.1 (I1 - I4), normally 0.25 (I5 - I12)			
Delay time from 1 to 0						
Debounce ON		ms	20	20	20	
Debounce OFF		ms	Normally 0.1 (I1 - I4), normally 0.4 (I5, I6, I9, I10), normally 0.2 (I7, I8, I11, I12)	Normally 0.1 (I1 - I4), normally 0.4 (I5, I6, I9, I10), normally 0.2 (I7, I8, I11, I12)	Normally 0.1 (I1 - I4), normally 0.2 (I11, I12)	
Cable length (unshielded)		m	100	100	100	
Frequency counters						
Number			4 (I1, I2, I3, I4)	4 (I1, I2, I3, I4)	4 (I1, I2, I3, I4)	
Counter frequency		kHz	< 3	< 3	< 3	
Pulse shape			Square	Square	Square	
Incremental counters						
Number			2 (I1 + I2, I3 + I4)	2 (I1 + I2, I3 + I4)	2 (I1 + I2, I3 + I4)	
Counter frequency		kHz	≦ 3	≦ 3	≦ 3	
Pulse shape			Square	Square	Square	
Signal offset			90°	90°	90°	
High-speed counter inputs						
Number			4 (I1, I2, I3, I4)	4 (I1, I2, I3, I4)	4 (I1, I2, I3, I4)	
Counter frequency		kHz	< 3	< 3	< 3	
Pulse shape			Square	Square	Square	
Cable length, shielded		m	< 20	< 20	< 20	
Digital inputs 115/230 V AC						
Number						12
Status display						LCD display (if provided)
Potential isolation						
From power supply						No
Between digital inputs						No
From the outputs						Yes
From PC interface, memory card, easyNet, easyLink						Yes
Rated voltage L (sinusoidal)						
On signal "0"		V AC				0 - 40
On signal "1"		V AC				79 - 264
Rated frequency		Hz				50 - 60
Input current on signal "1"						
I1 to I12		mA				12 x 0.2 (at 115 V AC, 60 Hz), 12 x 0.5 (at 230 V AC, 50 Hz)
Delay time						
Delay time (0 - 1/1 - 0) I1 - I12, 50/60 Hz						10/100
Max. admissible cable length (per input)						
I1 to I12		m				Normally 60

		MFD-R... MFD-T...			MFD-RA17 MFD-TA17	MFD-TAP
Analog inputs			**Analog outputs**			
Number		4 (I7, I8, I11, I12) 2 (I11, I12) for MFD-T(A)P	Number		1	1
Potential isolation			Potential isolation			
From power supply		No	From power supply		No	No
From the digital inputs		No	From the digital inputs		No	No
From the outputs		Yes	From the digital outputs		Yes	Yes
From PC interface, memory card, easyNet, easyLink		Yes	From PC interface, memory card, easyNet, easyLink		Yes	Yes
Input type		DC voltage	Output type		DC voltage	DC voltage
Signal range	V DC	0 - 10	Signal range	V DC	0 - 10	0 - 10
Resolution, analog	V	0.01	Max. output current	A	0.01	0.01
Resolution, digital	V	0.01	Load resistance	kΩ	1	1
Resolution	Bit	10 (value 0 - 1023)	Overload and short-circuit protection		Yes	Yes
Input impedance	kΩ	11.2	Resolution, analog	V DC	0.01	0.01
Accuracy of actual value			Resolution, digital	Bit	10 (value 0 - 1023)	12 (value 0 - 4095) at QA01, MD
Two MFD devices	%	± 3	Resolution, digital	V DC	–	0.1, 0.01, 0.001 at MD
Within a single device	%	± 2 %	Recovery time	µs	100	100
Conversion time analog/digital	ms	Each CPU cycle	Accuracy			
Input current	mA	< 1	-25 °C - 55 °C	%	2	2
Cable length shielded	m	< 30	25C	%	1	1
			Conversion time, analog/digital	ms	Each CPU cycle	Each CPU cycle

		MFD-TP, MFD-TAP
Analog input temperature resistance Pt100 or Ni1000 sensors		
Number		2 x Pt 100 or 2 x Ni1000 (according to part no.)
Input type resistance sensor		
Platinum sensor Pt100 according to DIN EN 60751, IEC 751		MFD-TP12-PT...
Nickel sensor Ni1000 according to DIN 43760		MFD-TP12-NI...
Temperature range		
Pt100, range A, selectable	°C, (°F)	-40 - +90, (-40 - 194); 0 - 250, (32 - 482); 0 - 400, (32 - 752)
Ni1000, range A, selectable	°C, (°F)	-40 - +90, (-40 - 194); 0 - 250, (32 - 482)
Pt100, range B	°C, (°F)	-0 - +8500, (32 - 1562); -200 - 200, (-328 - 392)
Potential isolation		
From power supply		No
From the digital inputs		No
From the outputs		Yes
From PC interface, memory card, easyNet, easyLink		Yes
Resolution digital, scaling per sensor		
With operands "IA" and "MD", selectable under scaling	Bit	12 (0 - 4095)
With operand "MD", selectable under scaling	°C, (°F)	1, 0.1, (1), (0.1)
Measurement value resolution analog/digital	Bit	Depending upon the scaling
Measuring current	mA	< 1.6
Damage limit (in the case of a wiring error)		Apply external voltage
Measurement method		Two or three wire per sensor, selectable by connection of sensor
Accuracy (without EMC interference)		
Two MFD devices one above the other	%	Normally 1; maximal 1.6 (Pt), 1.2 (Ni)
Pt100 RTD (offset error, linearity error, repetition accuracy, temperature dependency of the device included)	%	± 0.8 of measurement range
Ni1000 RTD (offset error, linearity error, repetition accuracy, temperature dependency of the device included)	%	± 0,6 of measurement range
Conversion time analog/digital		
Without sampling time setting, selectable per sensor	ms	200
With sampling time (adjustable), selectable per sensor	ms	200 - 65535
Additional measurement aids		
Filtering (software), analog input signal smoothing (Pt1 characteristic), only with set sampling time, selectable for each detector		Yes
Filter for suppression of certain frequencies and their multiples	Hz	50, 60, 250, 500
Diagnostics		
Card diagnostic		Yes
Wire break diagnostic per sensor		Yes
Wire break diagnostic per sensor		Yes
Below lower measurement range		Yes
Upper measuring range limit of sensor exceeded		Yes
Cable length shielded	m	< 10

			EASY4...-DC-ME	EASY512-DC-T..	EASY410-DC-TE EC4E-221-DT...	EASY620-DC-TE	EASY721-DC-T..	EASY8..-DC-T..	MFD-T..
Transistor outputs									
Number			2	4	4	8	8	8	4
Rated operating voltage	U_e	V DC	24	24	24	24	24	24	24
Permissible range	U_e	V DC	20.4 - 28.8	20.4 - 28.8	20.4 - 28.8	20.4 - 28.8	20.4 - 28.8	20.4 - 28.8	20.4 - 28.8
Ripple		%	≦ 5	≦ 5	≦ 5	≦ 5	≦ 5	≦ 5	≦ 5
Supply current									
On signal "0"	Normally/ max.	mA	24V/2A	9/16	9/16	18/32	18/32	18/32	18/32
On signal "1"	Normally/ max.	mA	12/22	12/22	12/22	24/44	24/44	24/44	24 /44
Protection against polarity reversal			Yes (Caution: A short circuit will result if 0 V or GND is applied to the outputs in the event that the supply voltage is connected to the wrong poles.)			Yes (Caution: A short circuit will result if 0 V or GND is applied to the outputs in the event that the supply voltage is connected to the wrong poles.)			
Potential isolation									
Potential isolation from power supply, inputs			No	Yes	Yes	Yes	Yes	Yes	Yes
From PC interface, memory card, easyNet, easyLink			Yes	Yes	Yes	Yes	Yes	Yes	–
From the inputs			–	–	–	–	–	Yes	Yes
Rated operational current on signal "1" DC	I_e	A	1	Max. 0.5	Max. 0.5	Max. 0.5	Max. 0.5	Max. 0.5	Max. 0.5
Lamp load without R_v		W	5	5	5	5	5	3 (Q1 - Q4) 5 (Q5 - Q8)	5 (Q1 - Q4)
Residual current on signal "0" per channel		mA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Max. output voltage									
On "0" at external load < 10 MΩ		V	2.5	2.5	2.5	2.5	2.5	2.5	2.5
On "1" at I_e = 0.5 A		V	$U = U_e$ -1 V	$U = U_e$ -1 V	$U = U_e$ -1 V	$U = U_e$ -1 V	$U = U_e$ -1 V	$U = U_e$ -1 V	$U = U_e$ -1 V
Short-circuit protection			Yes, thermal (analysis via diagnostics input R16)	Yes, thermal (analysis via diagnostics input I16, I15; R15, R16)	Yes, thermal (analysis via diagnostics input R16)	Yes, thermal (analysis via diagnostics input I16, I15; R15, R16)	Yes, thermal (analysis via diagnostics input I16, I15; R15, R16)	Yes, electronic (Q1 – Q4), thermal (Q5 – Q8), (analysis via diagnostics input I16, I15)	Thermal (Q1 – Q4), (analysis via diagnostics input I16)
Short-circuit tripping current for R_a ≦ 10 mΩ		A	$1.4 \leqq I_e \leqq 4$	$0.7 \leqq I_e \leqq 2$ per output	$0.7 \leqq I_e \leqq 2$ per output	$0.7 \leqq I_e \leqq 2$	$0.7 \leqq I_e \leqq 2$ per output	$0.7 \leqq I_e \leqq 2$ per output	$0.7 \leqq I_e \leqq 2$ per output
Total short-circuit current		A	8	8	8	16	16	16	8
Peak short-circuit current		A	16	16	16	32	32	32	16
Thermal cutout			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Max. operating frequency at constant resistive load R_L < 100 kΩ (dependent on program and load)		Ops/h	40000	40000	40000	40000	40000	40000	40000
Parallel connection of outputs									
With resistive load, inductive load with external suppressor circuit, combination within a group			Q1 and Q2	Group 1: Q1 to Q4	Group 1: Q1 to Q4	Group 1: S1 - S4 Group 2: S5 - S8	Group 1: Q1 to Q4 Group 2: Q5 to Q8	Group 1: Q1 to Q4 Group 2: Q5 to Q8	Group 1: Q1 to Q4
Number of outputs	Max.		2	4	4	4	4	4	4
Max. total current		A	2 (Attention! Outputs must be activated simultaneously and for the same duration)			2 (Attention! Outputs must be activated simultaneously and for the same duration)			
Status indication of the outputs			LCD display (if provided)			LCD display (if provided)			
Inductive load to EN 60947-5-1									
Without external suppressor circuit									
$T_{0.95}$ = 1 ms, R = 48 Ω, L = 16 mH									
Utilization factor		g	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Duty factor		% DF	100	100	100	100	100	100	100
Max. operating frequency f = 0.5 Hz (max. ED = 50 %)		Operations	1500	1500	1500	1500	1500	1500	1500
DC-13, $T_{0.95}$ = 72 ms, R = 48 Ω, L = 1.15 H									
Utilization factor		g	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Duty factor		% DF	100	100	100	100	100	100	100
Max. operating frequency f = 0.5 Hz (max. ED = 50 %)		Operations	1500	1500	1500	1500	1500	1500	1500
$T_{0.95}$ = 15 ms, R = 48 Ω, L = 0.24 H									
Utilization factor		g	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Duty factor		% DF	100	100	100	100	100	100	100
Max. operating frequency f = 0.5 Hz (max. ED = 50 %)		Operations	1500	1500	1500	1500	1500	1500	1500
With external suppressor circuit									
Utilization factor		g	1	1	1	1	1	1	1
Duty factor		% DF	100	100	100	100	100	100	100
Max. switching frequency, max. duty factor		Operations	Depending on the suppressor circuit			Depending on the suppressor circuit			

Notes For additional technical data EASY5... and EASY7... → AWB2528-1508D, EASY8... → AWB2528-1423D, MFD-Titan →AWB2528-1480D

				EASY202-RE	EASY410-DC-RE EASY512-..-R.. MFD-R.. MFD-AC-R..	EASY618/719-..-R.. EASY8..-...-R...
Relay outputs						
Number				2	4	6
Outputs in groups of				2	1	1
Parallel switching of outputs to increase performance				Not permissible	Not permissible	Not permissible
Protection of an output relay				Miniature circuit-breaker B16 or fuse 8 A (slow)		
Potential isolation						
From power supply				Yes	Yes	Yes
From the inputs				Yes	Yes	Yes
Electrical isolation in groups				Yes	Yes	Yes
Safe isolation according to EN 50178			V AC	300	300	300
Basic insulation			V AC	600	600	600
Lifespan, mechanical	Operations		x 10^6	10	10	10
Contacts						
Conventional thermal current (10 A UL)			A	8	8	8
Recommended for load: 12 V AC/DC			mA	> 500	> 500	> 500
Short-circuit proof p.f. = 1, characteristic B16 at 600 A			A	16	16	16
Short-circuit proof p.f. = 0.5 - 0.7; characteristic B16 at 900 A			A	16	16	16
Rated impulse withstand voltage U_{imp} contact coil			kV	6	6	6
Rated operating voltage	U_e		V AC	250	250	250
Rated insulation voltage	U_i		V AC	250	250	250
Safe isolation to EN 50178 between coil and contact			V AC	300	300	300
Safe isolation to EN 50178 between two contacts			V AC	300	300	300
Making capacity						
AC-15, 230 V AC, 3 A	Operations			300000	300000	300000
DC-13, 24 V DC, 5 A, 0.1 Hz	Operations			200000	200000	200000
Breaking capacity						
AC--15, 250 V AC, 3 A (600 ops./h)	Operations			300000	300000	300000
DC-13, L/R ≦ 150 ms, 24 V DC, 1 A (500 S/h)	Operations			200000	200000	200000
Filament bulb load						
1000 W at 230/240 V AC	Operations			25000	25000	25000
500 W at 115/120 V AC	Operations			25000	25000	25000
Fluorescent lamp load						
Fluorescent lamp load 10 x 58 W at 230/240 V AC						
With upstream electrical device	Operations			25000	25000	25000
Uncompensated	Operations			25000	25000	25000
Fluorescent lamp load 1 x 58 W at 230/240 V AC, conventionally compensated	Operations			25000	25000	25000
Switching frequency						
Mechanical operations			x 10^6	10	10	10
Switching frequency			Hz	10	10	10
Resistive load/lamp load			Hz	2	2	2
Inductive load			Hz	0.5	0.5	0.5
UL/CSA						
Continuous current at 240 V AC			A	10	10	10
Continuous current at 24 V DC			A	8	8	8
AC						
Control circuit rating codes (utilization category)				B 300 Light Pilot Duty		
Max. rated operational voltage			V AC	300	300	300
Max. thermal continuous current p.f. = 1 at B 300			A	5	5	5
Max. make/break p.f. ≠ capacity 1 at B 300			VA	3600/360	3600/360	3600/360
DC						
Control circuit rating codes (utilization category)				R 300 Light Pilot Duty		
Max. rated operational voltage			V DC	300	300	300
Max. thermal continuous current at R 300			A	1	1	1
Max. make/break capacity at R 300			VA	28/28	28/28	28/28

Notes For additional technical data EASY5... and EASY7... → AWB2528-1508D, EASY8... → AWB2528-1423D, MFD → AWB2528-1480D

			EASY205-ASI EASY204-DP	EASY221-CO EASY222-DN
General				
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 62026	EN 55011, EN 55022, IEC/EN 61000-4, EN 50325
			EN 55011, EN 55022, IEC/EN 61000-4, IEC 61158	EN 55011, EN 55022, IEC/EN 61000-4, IEC 62026
Dimensions (W x H x D)		mm	35.5 x 90 x 58 (2 space units)	35.5 x 90 x 58 (2 space units)
Weight		kg	0.12 0.15	0.15
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories).	
Terminal capacity				
Solid		mm^2	0.2 - 4 (AWG 22 - 12)	0.2 - 4 (AWG 22 - 12)
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)	0.2 - 2.5 (AWG 22 - 12)
Flat-blade screwdriver		mm	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6
Ambient climatic conditions				
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2	
Condensation			Prevent condensation by means of suitable measures	
Storage		°C	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080
Ambient mechanical conditions				
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20
Vibrations (IEC/EN 60068-2-6)				
Constant amplitude 0.15 mm		Hz	10 - 57	10 - 57
Constant acceleration, 2 g		Hz	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1
Mounting position			Vertical or horizontal	Vertical or horizontal
Electromagnetic compatibility (EMC)				
Overvoltage category/pollution degree			II/2	II/2
Electrostatic discharge (ESD), to IEC EN 61000-4-2				
Air discharge		kV	8	8
Contact discharge		kV	6	6
Electromagnetic fields (IEC/EN 61000-4-3, RFI)	V/m		10	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B	
Burst to IEC/EN 61000-4-4				
AS-Interface cables		kV	2	–
Supply cables		kV	–	2
Signal cables		kV	–	2
Power pulses (surge), to IEC/EN 61000-4-5		kV	– 0.5 (supply cables, symmetrical)	0.5 (supply cables, symmetrical)
Radiated RFI, to IEC/EN 61000-4-6		V	10	10
Insulation resistance				
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142	
Insulation resistance			EN 50178	EN 50178

			EASY205-ASI	EASY204-DP	EASY221-CO	EASY222-DN
Power supply						
Rated operational voltage	U_e	V	26.5 - 31.6	24 (-15/+20 %)	24 (-15/+20 %)	24 (-15/+20 %)
Permissible range		V DC		20.4…28.8	20.4…28.8	20.4…28.8
Total power consumption of the AS interface		mA	≦ 30	–	–	–
Ripple		%	–	≦ 5	≦ 5	≦ 5
Max. current consumption (at 24 V DC)		mA	–	Normally 200	Normally 200	Normally 200
Voltage dips (IEC/EN 61131-2)		ms	–	10	10	10
Heat dissipation at 24 V DC		W	–	4.8	4.8	4.8
Protection against polarity reversal						
AS-Interface protection against polarity reversal			Yes	–	–	–
AS-Interface profile			7F (hex)	–	–	–
Slave address			0 - 31			
Addressing unit interface			3.5 mm socket	–	–	–
Power supply			–	Yes	Yes	Yes
LED indicators						
Supply			Power: green	Power LED (POW): green	RUN LED (RUN): green	Module status LED (MS): green
LED display			Com Error: red	LED PROFIBUS-DP (BUS): red	LED ERROR (ERR): red	Network status LED (NS): red/green
I/O addresses						
easy700/easy800 contact and coil ↔ AS-Interface			S1 → input 0 S2 → input 1 S3 → input 2 S4 → input 3 R1 ← outputs 0 R2 ← outputs 1 R3 ← outputs 2 R4 ← outputs 3 R5 ← PARAMETEROUTPUT 0 R6 ← PARAMETEROUTPUT 1 R7 ← PARAMETEROUTPUT 2 R8 ← PARAMETEROUTPUT 3	–	–	–
Network						
Terminal type			–	SUB-D 9 pole, socket	RJ45	5 pole, pluggable screw terminal
Potential isolation			–	Between bus and power supply (simple), between bus and power supply and easy base unit (safe isolation)		
Function			–	PROFIBUS-DP slave	CANopen slave	DeviceNet slave
Interface			–	RS485	CAN	CAN
Bus protocol			AS-Interface	PROFIBUS-DP	CANopen	DeviceNet
Baud rates			–	Automatic search up to 12 MBit/s	Automatic search up to 1 MBit/s	Automatic search up to 500 kBit/s
Bus terminating resistors			–	Can be connected via plug	Separate external bus termination required (120 Ω)	Separate external bus termination required (120 Ω)
Bus addresses			–	1 - 126 can be addressed via easy base unit with display or via EASY-SOFT	1 - 127 can be addressed via easy basic units with display or via easySoft	0 - 63 can be addressed via easy basic units with display or via easySoft
Services						
Cyclical			–	All data R1 - R16, S1 - S8		
Acyclical			–	Read/write, time, day, daylight saving time All parameters of the EASY function relay		

			EASY209-SE	EASY256-HCI
General				
Standards			EN 55011, EN 55022, IEC/EN 61000-4, EN 50178	
Dimensions (W x H x D)		mm	35.5 x 90 x 58 (2 space units)	35.5 x 90 x 58 (2 space units)
Weight		kg	0.15	0.15
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories).	
Channels		Number	–	6
Voltage range for U_e				0 - 264
Current increase 115/230 V AC		mA	–	4/6
Delay time		ms	–	40/37
Cable length		m	–	100
Parallel switching of outputs to increase performance			–	Several possible (Off-delay extended depending on the number of parallel channels)
Type of resistance			–	Capacitive
Terminal capacity				
Solid		mm^2	0.2 - 4 (AWG 22 - 12)	0.2 - 4 (AWG 22 - 12)
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)	0.2 - 2.5 (AWG 22 - 12)
Flat-blade screwdriver		mm	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6
Data cable				
Solid		mm^2	0.25/1.5 (AWG 24/16)	–
Flexible with ferrule		mm^2	0.14/ 1 (AWG 26/17)	–
Ambient climatic conditions				
Operating ambient temperature		°C	-25…55	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures	
Storage		°C	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080
Ambient mechanical conditions				
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20
Vibrations (IEC/EN 60068-2-6)				
Constant amplitude 0.15 mm		Hz	10 - 57	10 - 57
Constant acceleration, 2 g		Hz	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1
Mounting position			Vertical or horizontal	
Electromagnetic compatibility (EMC)				
Overvoltage category/pollution degree			II/2	II/2
Electrostatic discharge (ESD), to IEC EN 61000-4-2				
Air discharge		kV	8	8
Contact discharge		kV	6	6
Electromagnetic fields (IEC/EN 61000-4-3, RFI)	V/m		RS-232 line unshielded: 3, shielded: 10	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B	
Burst to IEC/EN 61000-4-4				
AS-Interface cables		kV	–	–
Supply cables		kV	2	–
Signal cables		kV	–	–
Ethernet interface cable		kV	2	–
COM interface cable		kV	2	–
Power pulses (surge), to IEC/EN 61000-4-5		kV	1 (supply cables, symmetrical)	2 (supply cables, symmetrical, EASY…DC)
Radiated RFI, to IEC/EN 61000-4-6		V	RS-232 line unshielded: 3, shielded: 10	10
Insulation resistance				
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142	
Insulation resistance			EN 50178	EN 50178

			EASY209-SE
Power supply			
Rated operational voltage	U_e	V	24 (-15/+20 %)
Permissible range		V DC	20.4…28.8
Ripple		%	≤ 5
Max. current consumption (at 24 V DC)		mA	Normally 65
Voltage dips (IEC/EN 61131-2)		ms	–
Heat dissipation at 24 V DC		W	1.7
Protection against polarity reversal			
Power supply			Yes
LED indicators			
Supply			Front-LED Power: ON
LED display			Front-LED COM active: flashes
RJ-45 socket, top			No Activity: OFF, Amber: Half Duplex, Green: Full Duplex
RJ-45 socket, bottom			No Link: OFF, Amber: 10 MBit/s, Green: 100 MBit/s
Gateway ready for operation			–
Power supply SmartWire (contactor)			–
Network Status (easyNet/CANopen)			–
Status SmartWire		LED	–
Reset			Front: per pushbuttons > 2s
Strain relief			By cable tie in fastener
Network			
Terminal type			–
Potential isolation			–
Bus protocol			–
Bus terminating resistors			–
Bus addresses			Default settings Ethernet: IP adress 0.0.0.0 SUBNET screen: 255.255.0.0 coupling unit address 0.0.0.0 remote address 0.0.0.0



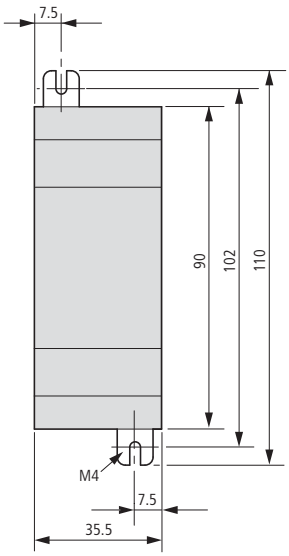
			EASY200-POW	EASY400-POW EASY430-POW	EASY500-POW	EASY600-POW
General						
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27, EN 61000-6-2			
Dimensions (W x H x D)		mm	35.5 x 90 x 58 (2 space units)	71.5 x 90 x 58 (4 space units)	71.5 x 90 x 58 (4 space units)	107.5 x 90 x 58 (6 space units)
Weight		kg	0.1	0.25	0.28	0.3
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories).			
Terminal capacity						
Solid		mm^2	0.2 - 4 (AWG 22 - 12)			
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)			
Flat-blade screwdriver		mm	3.5 x 0.8	3.5 x 0.8	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6	0.6	0.6
Ambient climatic conditions						
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2	-25 - 55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2; -25 - 45 to UL/CSA	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures			
Storage		°C	-40 - 70	-40 - 70	-40 - 70	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080	795 - 1080	795 - 1080
Max. installation altitude above sea level, observe derating at higher altitudes		m	2000	2000	2000	2000
Ambient mechanical conditions						
Pollution degree			2	2	2	2
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20	IP20	IP20
Vibrations (IEC/EN 60068-2-6)						
Constant amplitude 0.15 mm		Hz	10 - 57	10 - 57	10 - 57	10 - 57
Constant acceleration, 2 g		Hz	57 - 150	57 - 150	57 - 150	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18	18	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1	1	1
Mounting position			Vertical or horizontal	Vertical or horizontal	Horizontal, terminals at top	Horizontal, terminals at top
Electromagnetic compatibility (EMC)						
Electrostatic discharge (ESD), to IEC EN 61000-4-2						
Air discharge		kV	8	8	8	8
Contact discharge		kV	6	6	6	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10	10	10	10
Radio interference suppression			EN 55011 Class B; EN 55022 Class B, EN 50081-2 Class B			
Burst pulses (IEC/EN 61000-4-4, level 3)		kV	2	2	2	2
Power pulses (surge) (IEC/EN 61000-4-5)		kV	2 (supply cables, symmetrical)			
Power pulses (surge) (IEC/EN 61000-4-5, Level 2), 24 V		kV	0.5 (output cables, symmetrical)			
Radiated RFI, to IEC/EN 61000-4-6		V	10	10	10	10
Surge voltage (EN 50 178), 24 V		kV	6	6	6	6
Insulation resistance						
Clearance in air and creepage distances			EN 50178			
Insulation resistance			EN 50178			
Protection class U_{out} to U_{in}			Class II to IEC 60536			
Potential isolation primary/secondary			Yes, SELV (VDE 0100 Part 410; IEC 60364-4-41, HD 384.4.41 S2) EN 60950, EN 50178			
Input voltage						
Rated input voltage AC		V	100/120/230/240 (-15/+10 %)			
Protective switches AC			FAZ-C1/1 or FAZ-B6/1			
Rated input voltage DC		V	85 - 264	85 - 264	85 - 264	85 - 264
DC protective switches			FAZ-C2/1-DC	FAZ-C2/1-DC	FAZ-C2/1-DC	FAZ-C2/1-DC
Voltage range		V AC	85 - 264	85 - 264	85 - 264	85 - 264
Frequency range		Hz	47 - 63	47 - 63	47 - 63	47 - 63
Mains failure bridging 115/230 V (IEC/EN 61000-4-11)		ms	> 10/> 20	> 20/> 40	> 20/> 40	> 20/> 40
Fuse 115/230 V		A	1.5 slow	2/1 time delay	2/1 time delay	2/1 time delay



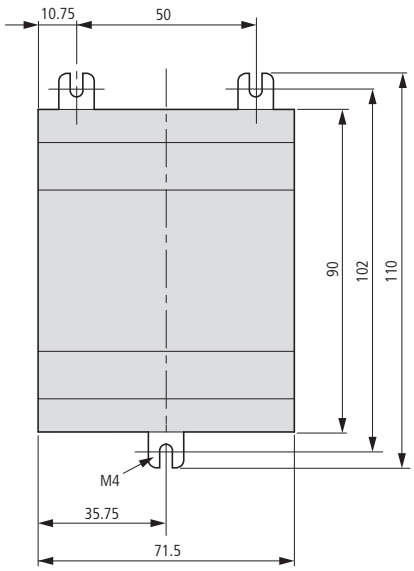
			EASY200-POW	EASY400-POW EASY430-POW	EASY500-POW	EASY600-POW
Rating data						
Efficiency		%	> 80	> 83	> 85	> 85
Power consumption		W	Normally 7	Normally 35	Normally 70	Normally 115
Heat dissipation		W	Normally 1	Normally 5	Normally 10	Normally 18
Input current						
Rated input current value 115/230 V AC		A	Approx. 0.17/0.05	Approx. 0.6/0.3	Approx. 0.8/0.4	Approx. 1/0.5
Inrush current at 230 C 25 V		A	< 5	< 18	< 30	< 30
Output voltage						
12 V DC (reference voltage)						
Rated value		V DC	12	–	–	–
Tolerance		%	± 4	–	–	–
Switching peaks		mV_{SS}	< 7	–	–	–
Effect of input voltage		%	± 1	–	–	–
Effect with 25 – 100 % load change		%	± 1	–	–	–
24 V DC						
Rated value		V DC	24	24	24	24
Tolerance		%	± 3	± 3	± 3	± 3
Switching peaks 115/230		mV_{SS}	< 50/30	< 5	< 5	< 5
Effect of input voltage		%	± 1	± 1	± 1	± 1
Effect with 25 – 100 % load change		%	± 1	± 2	± 2	± 2
Can be connected in parallel to increase power			–	– Yes	Yes	Yes
Output current						
12 V DC (reference voltage)						
Output current		mA	0 - 20	–	–	–
Effectiveness of current limitation		mA	20	–	–	–
Reduction of output voltage after current limitation		V	< 12	–	–	–
Overload proof			Yes, by current limitation permanently short-circuit proof	–	–	–
Proof against sustained short circuit			Yes	–	–	–
24 V DC						
Output current		A	0 - 0.35	0 - 1.25	0 - 2.5	0 - 4.2
Effectiveness of current limitation		A	> 0.4	> 1.5	> 2.8	> 4.8
Reduction of output voltage after current limitation		V	–	< 18	< 18	< 18
Overload proof			Yes, by current limitation			
Proof against sustained short circuit			Yes, hickup-mode	Yes, hickup mode, approx. 2 Hz		
Special load conditions						
Lamp load, cold, 24 V DC		W	2	10	–	–
Base load present		W	1	5	–	–
Behavior in the event of emergency switch off in 24 V circuit, switch off using contactor (contactor load, no damage)		W	6	30	–	–
Indication						
Indication of output voltage (LED, continuous green light = OK)		V DC	24	24	24	24

Dimensions

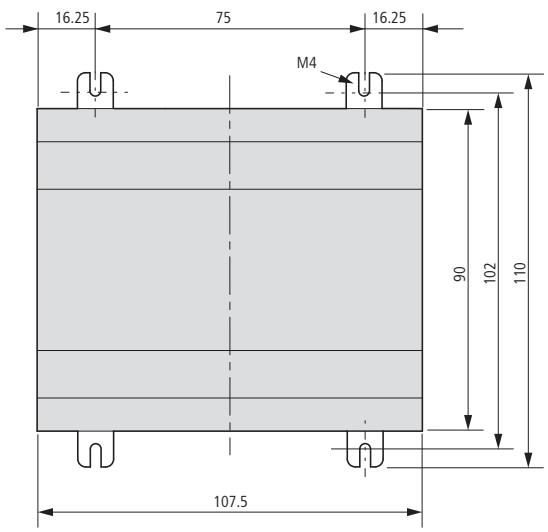
easy200



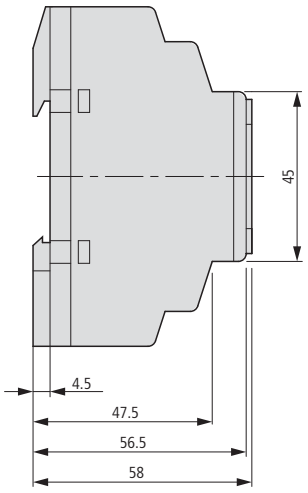
easy400
easy500



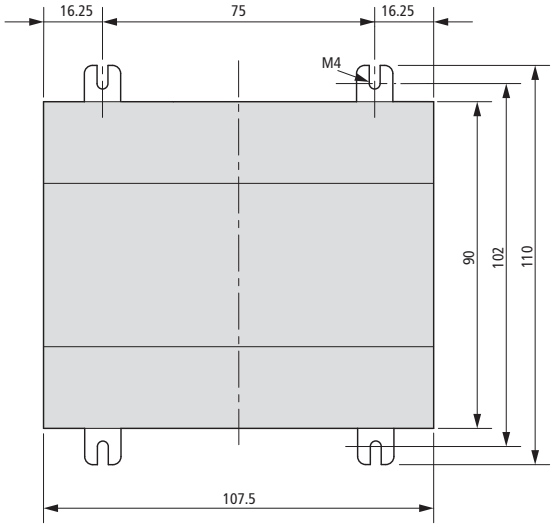
easy600
easy700

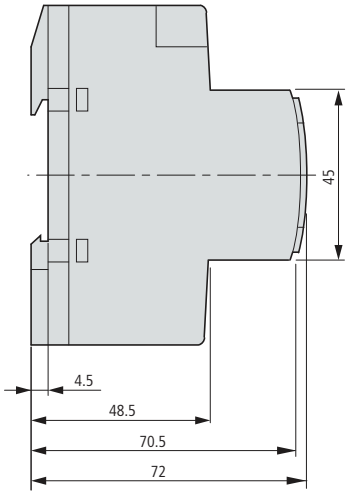


easy200
easy400
easy500
easy600
easy700

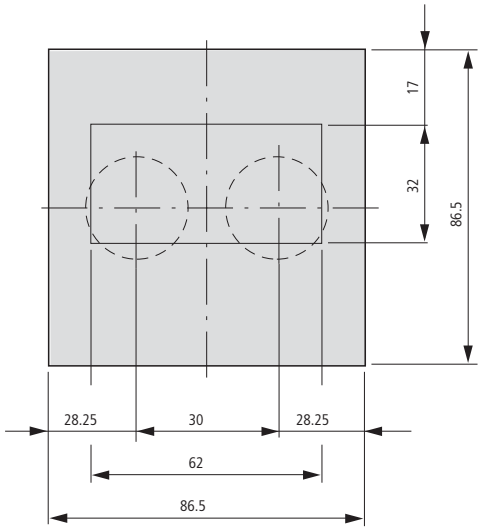


easy800

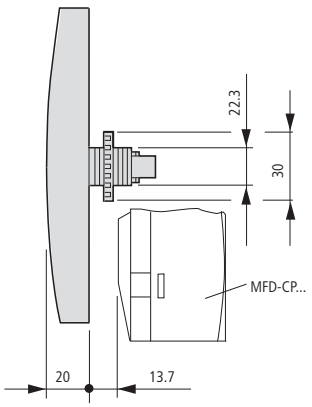




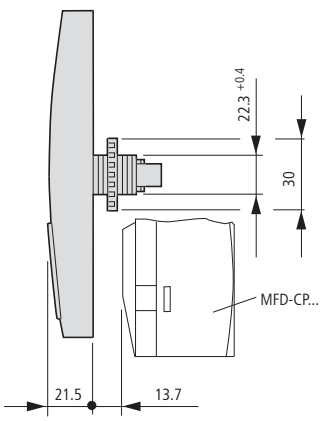
MFD-80...



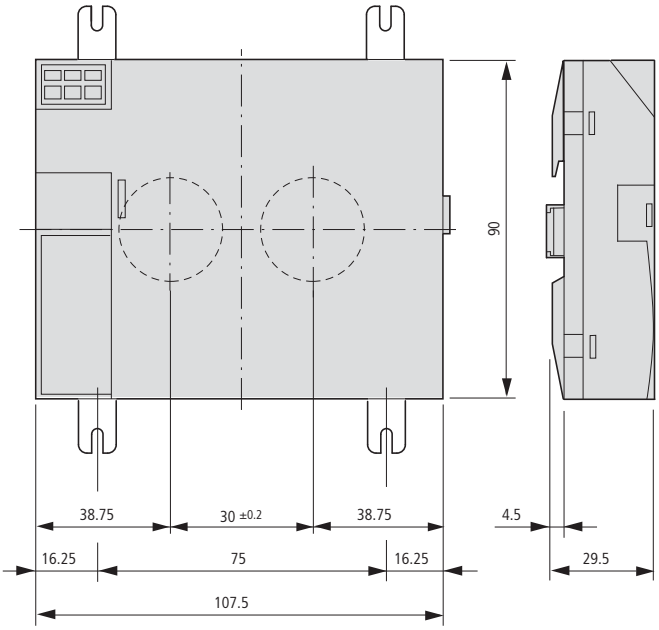
MFD-80



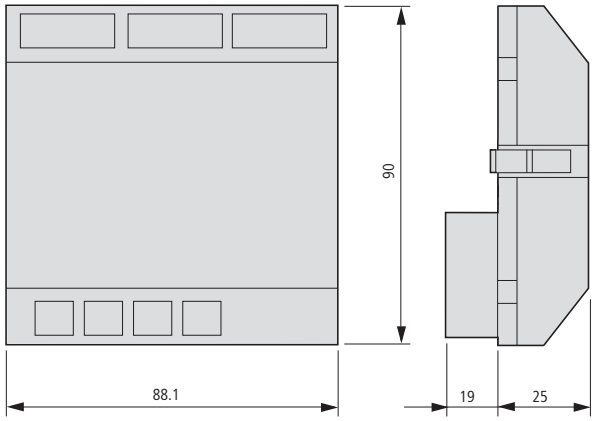
MFD-80-B



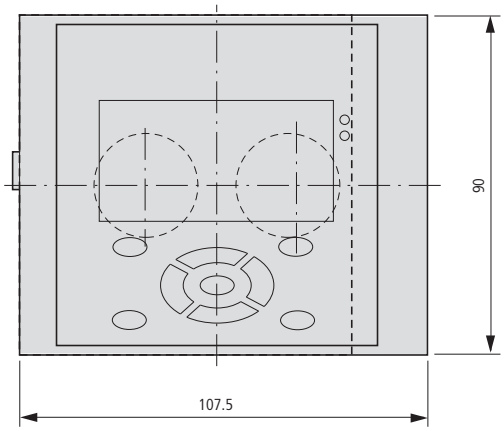
MFD-CP... , MFD-AC-CP...



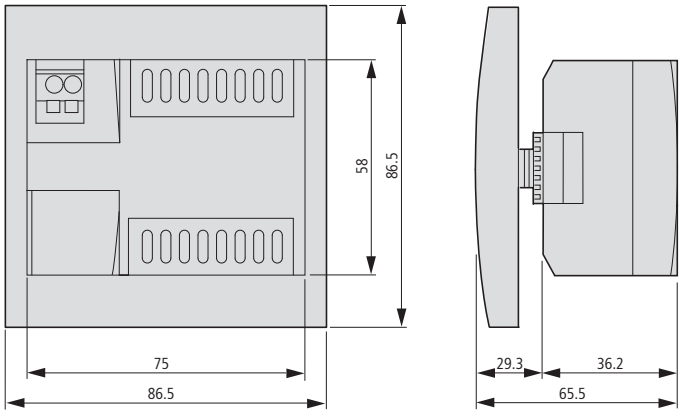
MFD-R... , MFD-T... , MFD-AC-R16

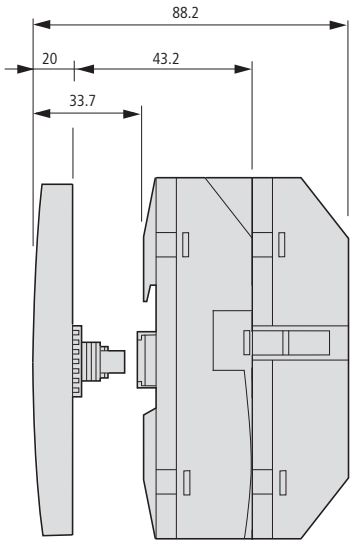


MFD-80... + MFD-CP... + MFD-R.../MFD-T...
MFD-80... + MFD-AC-CP... + MFD-AC-R16



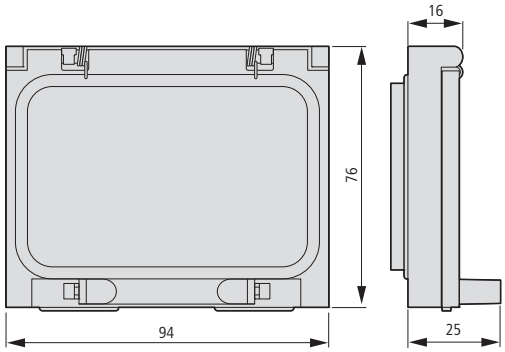
MFD-80... + MFD-CP4



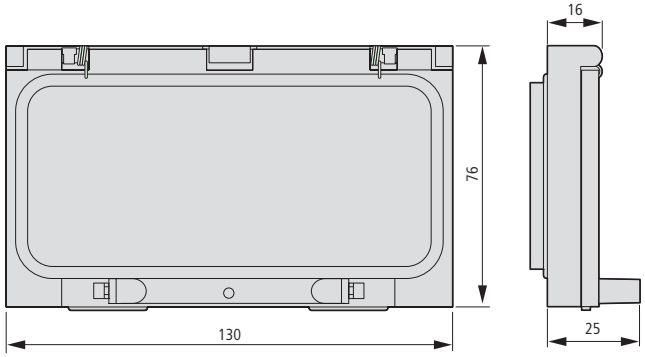


Hinged inspection windows

SKF-FF4

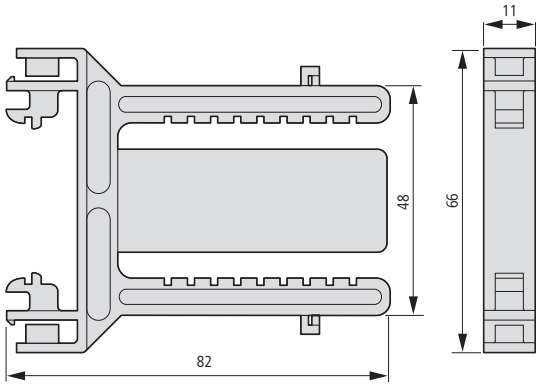


SKF-FF6



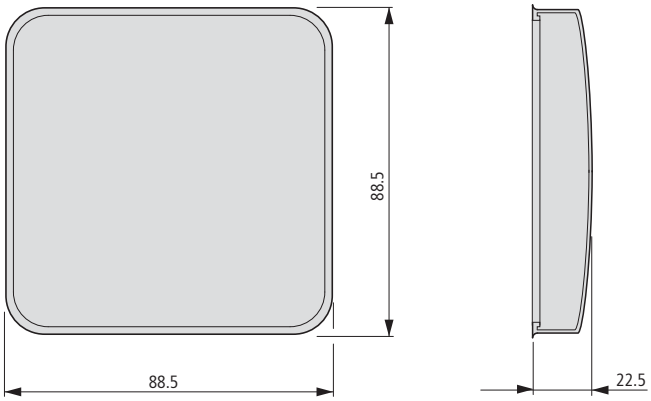
Top-hat rail adapter for hinged inspection window

SKF-HA



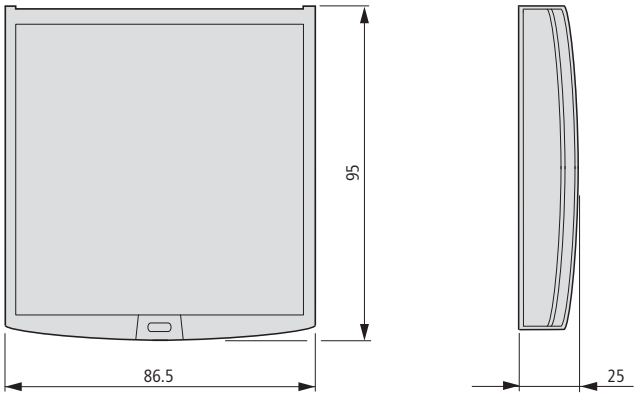
Protective diaphragm

MFD-XM-80



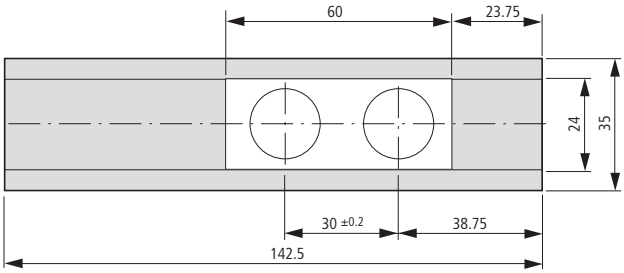
Protective cover

MFD-XS-80



Mounting rail

MFD-TS-144

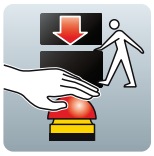
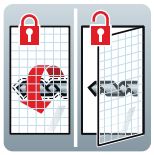
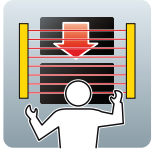
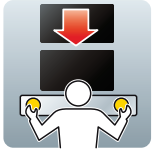
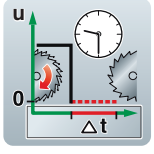


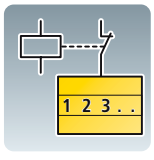


ESR5 safety relay
Control relay suitable for safety applications easySafety

Safety Technology
Control the unexpected

The safety of humans and machinery must be guaranteed throughout the entire life cycle of the machinery or installation. Safety-related components for functional safety, such as position switches, light barriers, two-hand operation, or emergency stop pushbuttons provide personnel protection. Safety-related logic units monitor and evaluate safety-relevant information. Safety relays from the series ESR5 and the safety-related control relay easySafety fulfill the highest requirements of international safety norms.



easySafety control relays – Flexible, safety-related information processing
All-in-One: Safety and control functions combined in one device +++ Simple configuration through prefabricated and tested safety components +++ Direct state display and increased machine availability due to fast error diagnosis through integrated display +++ Multistep password concept prevents unwanted manipulation

ESR5 safety relays – profitable monitoring
The right safety function for each application +++ Fast commissioning and error-free exchange through plug-in screw terminals +++ Multivoltage variants 24 – 230 V AC/DC for universal application

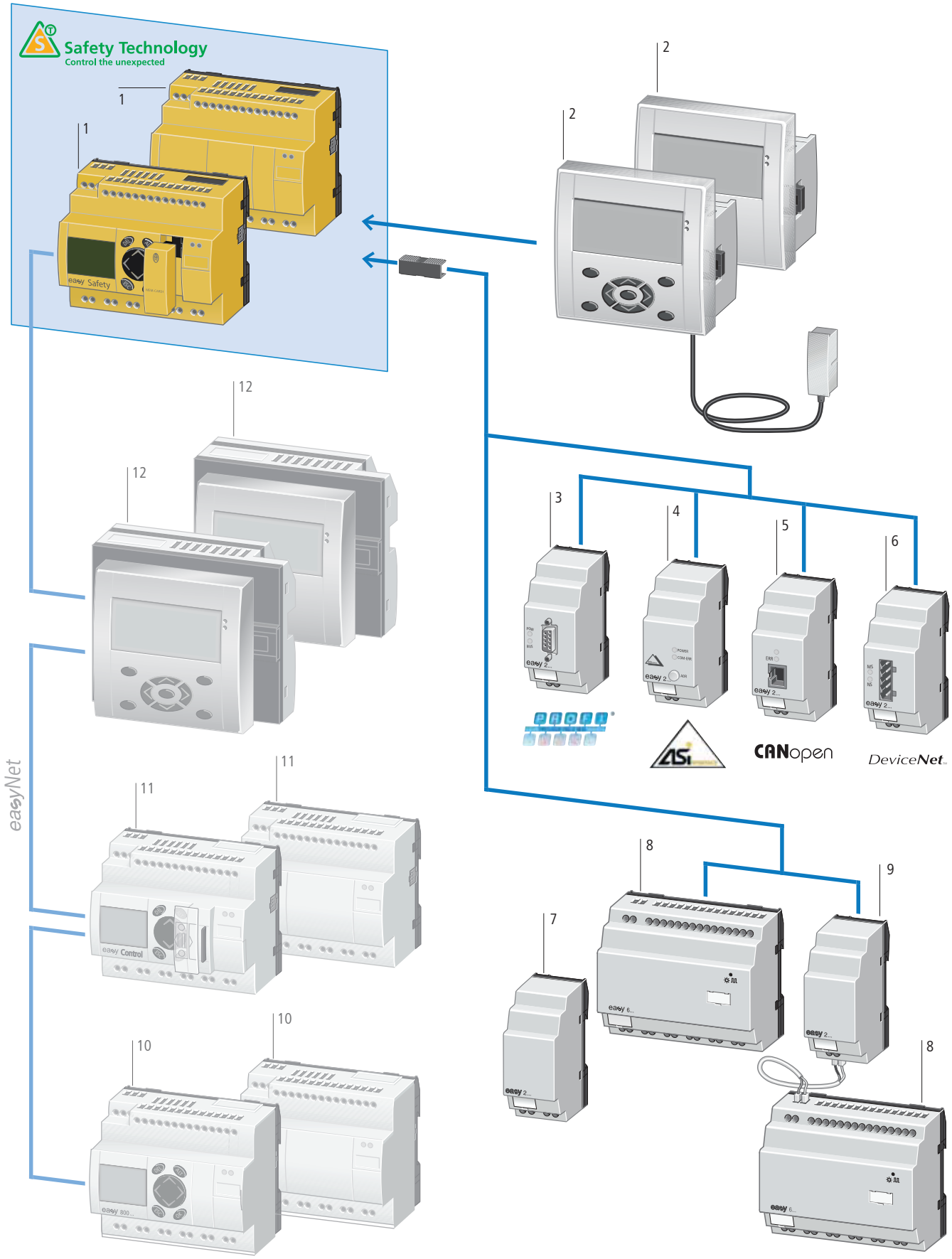
Safety relay, control relay suitable for safety circuits







System overview



Basic device

ES4P… 1

Expandable: standard inputs/outputs and standard bus systems
Bus system easyNet on board
24 V DC
14 safe digital inputs
4 safe relay outputs or
1 safe redundant relay output and 4 safe transistor outputs
Display and keypad optional
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 13/5

Remote text display 2

Consists of:
- display/operating unit MFD-80(-B)
- power supply/communication module

Including connecting cable (can be cut to desired length, 5 m)
24 V DC = MFD-CP4-800
100 - 240 V AC = MFD-AC-CP4-800
Spring-loaded terminals
→ Page 13/7

Bus modules

EASY204-DP 3

PROFIBUS DP slave interface, 24 V DC
→ Page 13/6

EASY205-ASI 4

AS-Interface slave, 24 V DC
→ Page 13/6

EASY221-CO 5

CANopen interface, 24 V DC
→ Page 13/6

EASY222-DN 6

DeviceNet interface, 24 V DC
→ Page 13/6

Output expansion

EASY202-RE 7

2 relay outputs (max. 10 A, UL)
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 13/6

I/O expansions

EASY6... 8

24 V DC
12 digital inputs
6 relay outputs (max. 10 A, UL) or
8 transistor outputs
Bolt-on and top-hat rail mounting
Screw terminals
→ Page 13/6

Coupling module 9

EASY200-EASY
For remote connection of a digital I/O expansion through two-pole connection cable (max. 30 m); e.g. NYM 3 × 1.5 mm²
→ Page 13/6

easy800 10

Expandable: digital and analog inputs/outputs and AS-Interface, CANopen, PROFIBUS-DP, DeviceNet
Bus system easyNet on board
24 V DC = easy...DC...
100 - 240 V AC = easy...AC...
12 digital inputs
4 usable as analog inputs (DC versions)
6 relay outputs (max. 10 A, UL) or
8 transistor outputs
1 analog output, optional in DC models
Display and keypad optional
Bolt-on and top-hat rail mounting
Screw terminals
→Page 12/14

Compact PLC easyControl 11

EC4P
→Page 14/64

MFD-Titan Multi?Function?Display 12

→Page 12/22

Description

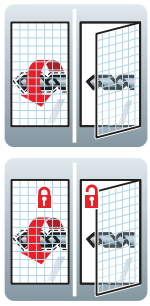


The easySafety control relay for safety-related applications monitors all commonly used safety devices and also takes over the required control tasks for the machine. Packed with a host of conventional safety relays in the form of safety function blocks, easySafety not only features integrated safety functions but also standard functions in a single device – all in one.
In addition to the safety circuit diagram containing the safety configuration, the safety control relay also contains a standard circuit diagram. This circuit diagram can be used for standard tasks, such as the processing of diagnostics signals or general control tasks of a machine.
Thanks to the large number of safety function blocks, this provides the user with a number of application options with only one device. The user can now also respond directly to future and changing application requirements. This saves financial resources and offers future investment security. Last but not least, it reduces the stock-keeping required for special safety relays.
easySafety meets the requirements of category 4 to EN 954-1, PL e to EN ISO 13849-1, SILCL 3 to EN IEC 62061 and SIL 3 to EN IEC 61508. With easySafety, it is therefore possible to implement applications meeting the most stringent safety requirements.

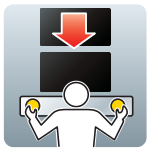
In addition to many standard function blocks from the easy800, easySafety offers the following safety function blocks:



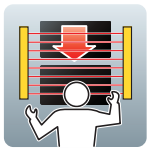
Emergency stop circuits
Allows the safe stopping of a hazardous movement, immediate stop for Stop category 0 and controlled stop for Stop category 1 according to IEC 60204-1; for use in single or dual channel safety monitoring of emergency stop circuits.



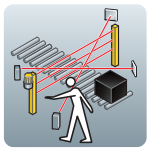
Guard door monitoring with and without interlock/guard locking
Used with moving guards such as doors, barriers or flaps. Positions are reliably detected, monitored and enabled to safety-related requirements – optional interlock device with guard locking when increased personal and process protection are required; this securely keeps the guard closed until machine standstill.



Safe operation with two-hand control
Type III to EN 574. Used for hazardous machine movement such as presses, punching, shearing. It allows the movement of hazardous operation only when both hands of the operator are outside the hazardous area and the two pushbuttons are operated within 0.5 seconds of each other.



Electro-sensitive protective devices (ESPE)
Protection of the hazardous location or area in the vicinity of machines by means of contactless guards such as light grids/light barriers/light curtains.



Optionally with muting function,
which temporarily bypasses the protective function of a safety device, such as a light curtain. Typical applications include feeding materials into a machine without having to interrupt the machine's operation.

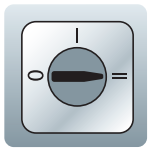


Enabling switch
The manual or foot operated enable switch allows the temporary enabling of a guard, such as a safety door, by continuous actuation. This may be necessary for setting or servicing a machine.

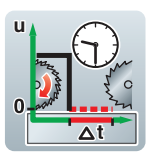




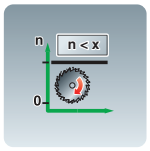
Start device
For the safe starting of an application by means of an external start pushbutton or start condition from the safety circuit diagram.



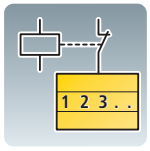
Operating mode selector switches
Used for the safe selection and acceptance of a preselected operating mode on an external control circuit device.



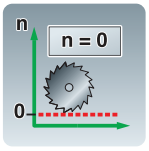
Safety timing relay
Used for changing the switch duration and the on or off switch points of an enable contact in the safety circuit. Safety-related timing relay with on and/or off delayed or single pulse function.



Overspeed monitoring
For the safety-related overspeed monitoring of a motor or a shaft. If the maximum speed is exceeded, the drive is disabled.



Feedback loop monitoring (EDM)
Used for the safety-related monitoring of externally connected actuators, e.g. contactors, relays or valves.



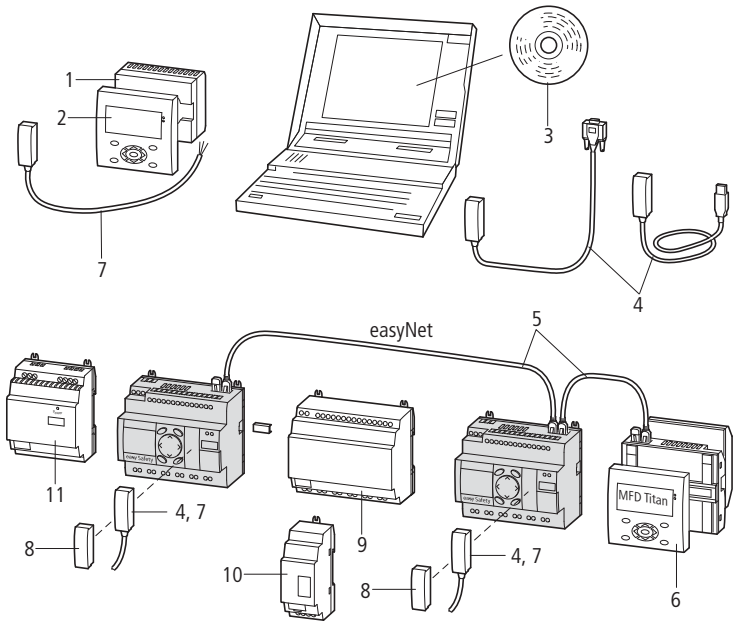
Zero monitoring
Used when the entry or access to the hazardous area is not permitted until the hazardous driving force has come to a standstill.

HPL13005EN

Ordering

Inputs (safety) Digital	Outputs (safety) 6 A relay	Transistor	Test signal	Display + keypad	easyNet/ easyLink	Safety/standard circuit diagram	Part no. Article no.	Price See price list	Std. pack
easySafety									
EN 954-1: 1996, category 4 EN ISO 13849-1: 2006, PL e (Performance Level) IEC 61508: 1998, SIL 3 (Safety integrity Level) IEC 62061: 2005, SILCL 3 (Safety integrity level claim limit) Expandable: standard inputs/outputs and standard bus systems 24 V DC supply voltage									
Safety Technology Control the unexpected									
14	1 (redundant)	4	4	–	✓/✓	✓/✓	**ES4P-221-DMXX1** 111016		1 off
14	1 (redundant)	4	4	✓	✓/✓	✓/✓	**ES4P-221-DMXD1** 111017		1 off
14	4	–	4	–	✓/✓	✓/✓	**ES4P-221-DRXX1** 111018		1 off
14	4	–	4	✓	✓/✓	✓/✓	**ES4P-221-DRXD1** 111019		1 off

Notes



Accessories		Page
1	Power supply unit/communication mod-	→ 13/7
2	Display/keypad	→ 13/7
3	Safety-related programming software	→ 13/8
4	Programming cables, Serial	→ 13/8
	Programming cables, USB	→ 13/8
5	easyNet	→ 13/9
6	MFD silver (Standard)	→ Chapter 12
7	Connection cable	→ 13/8
8	Safety-related memory card	→ 13/8
9	I/O expansion (standard)	→ 13/6
10	Output expansion, bus module, coupling module (standard)	→ 13/6
11	Switched-mode power supply unit	→ 13/9

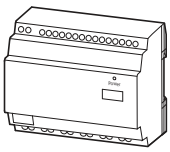
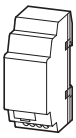
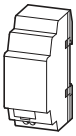
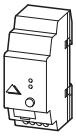
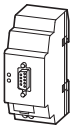
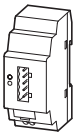
Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA-C22.20.4-04; CSA-22.2 No. 142-MI1987; CE marking
UL File No.	CSA report applies to both US and Canada
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-81; 2252-01
NA Certification	CSA certified, certified by CSA for use in the US
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Part no. Article no.	Price See price list	Std. pack
Individual laser inscription			
• Individual labelling of ES4P control relay for safety-related applications with Labeleditor labelling software	**ES4-COMBINATION-*** 121711		1 off

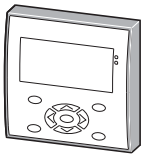
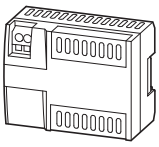
Information relevant for export to North America

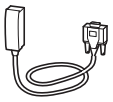
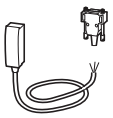
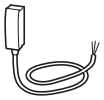
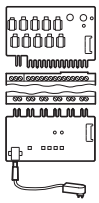
UL/CSA certification not required

	Inputs	Outputs		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Digital	Relay 10 A (UL)	Transis-tor					
I/O expansions								
Can be used through easyLink								
	12	6	–	100 - 240 V AC	**EASY618-AC-RE** 212314		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	12	–	8	24 V DC	**EASY620-DC-TE** 212313			
	12	6	–	24 V DC	**EASY618-DC-RE** 232112			Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	2	–	24 V DC	**EASY202-RE**[1] 232186			
Coupling module								
Can be used through easyLink								
	For remote connection of a digital I/O expansion up to 30 m.				**EASY200-EASY** 212315		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Bus modules								
Can be used through easyLink								
	AS-Interface	Slave 4 inputs, 4 outputs, 4 parameter bits Addresses available 0 to 31		24 V DC	**EASY205-ASI** 221598		1 off	
	PROFIBUS-DP	Slave Addresses available 1 to 126		24 V DC	**EASY204-DP** 212316			
	CANopen	Addresses available 1 to 127		24 V DC	**EASY221-CO** 233539			
	DeviceNet	Addresses available 0 to 63		24 V DC	**EASY222-DN** 233540			

Notes

[1] Not for use in combination with basic devices EASY719-DA-...
Cannot be used on the EASY200-EASY coupling module

	Supply voltage connection	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Remote text display						
Display/keypad monochrome display 132 × 64 pixels with switchable backlight IP65, removable silver front frame						
		With keypad, with Moeller company logotype NEMA 4x in connection with MFD-XM-80 protective membrane → Page 12/29	**MFD-80-B** 265251		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, in combination with MFD-XM-80: UL/CSA part no. 4X
		With keypad, without Moeller company logotype NEMA 4x in connection with MFD-XM-80 protective membrane → Page 12/29	**MFD-80-B-X** 284905			
		Without keypad, with Moeller company logotype NEMA 4x	**MFD-80** 265250		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type 4X
		Without keypad, without Moeller company logotype NEMA 4x	**MFD-80-X** 284904			
Power supply unit/communication modules IP20, can be combined with display/operating unit MFD-80... as remote text display						
	100 - 240 V AC	With connection cable (can be cut to desired length, 5 m)	**MFD-AC-CP4-800** 286824		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	24 V DC	With connection cable (can be cut to desired length, 5 m)	**MFD-CP4-800** 274095			
	24 V DC	Without connection cable	**MFD-CP4** 280888			
	100 - 240 V AC	Without connection cable	**MFD-AC-CP4** 286822			

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Programming software					
	easySoft-Safety (including easySoftPro) → Page 12/17 Menu selection in German, English, French, and Italian Operating systems: Windows 2000 SP4, Windows XP SP1, Windows Vista (32 Bit)	**ESP-SOFT** 111460		1 off	UL/CSA certification not required
Programming cables					
	SUB-D, 9 pole, serial, 2 m	**EASY800-PC-CAB** 256277		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified
	USB, 2 m	**EASY800-USB-CAB** 106408		1 off	
Modem cable					
	Configurable modem, printer and programming cable, possible data transfer rate 56 kBaud, 9 pole SUB-D plug (plug + socket for self connection)	**EASY800-MO-CAB** 286079		1 off	
Connecting cables					
	For the connection of MFD(-AC)-CP4 to easy800/MFD-…-CP8/ES4P 5 m, can be cut to desired length	**MFD-CP4-800-CAB5** 280887		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Memory card					
	256 kB module	**ES4A-MEM-CARD1** 111461		1 off	UL/CSA certification not required
Input/output simulator					
	With plug-in power supply unit 100 - 240 V AC/ 24 V DC	**ES4A-221-DMX-SIM** 116953		1 off	UL/CSA certification not required
Manual					
	German	**AWB2528-1599DE** 121076		1 off	
	English	**AWB2528-1599EN** 121077		1 off	
	French	**AWB2528-1599FR** 121078		1 off	
	Italian	**AWB2528-1599IT** 121079		1 off	

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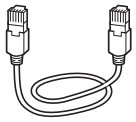
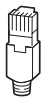
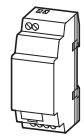
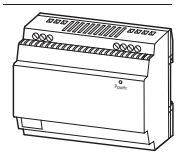
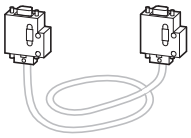
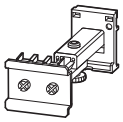
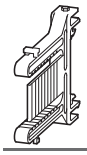
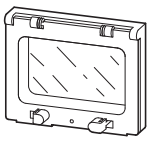
	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Network connection cables						
	Length: 0.3 m	easyNet	**EASY-NT-30** 256283		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Length: 0.8 m	easyNet	**EASY-NT-80** 256284			
	Length: 1.5 m	easyNet	**EASY-NT-150** 256285			
Bus termination resistor						
	8 pole, RJ45, 124 Ω Connection to PIN 1 and PIN 2	easyNet	**EASY-NT-R** 256281		2 off	
Data cable						
	4 x 0.14 mm², twisted pair, AWG 26 Length: 100 m	easyNet	**EASY-NT-CAB** 256286		1 off	UL File No.: E135462 UL CCN: NRAQ NA Certification: UL Listed Degree of Protection: IEC: IP 20, UL/CSA Type: -
Bus connector plug						
	8 pole, RJ45	easyNet	**EASY-NT-RJ45** 256280		10 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Crimping tool						
	For RJ45 plug	EASY-NT-CAB EASY-NT-RJ45	**EASY-RJ45-TOOL** 256282		1 off	

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Switched-mode power supply units					
Primary-switched mode, regulated					
	Rated input voltage: 50/60 Hz: 100 - 240 V Rated output voltage: 24 V/12 V DC Rated output current: 0.35 A/20 mA	**EASY200-POW** 229424		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 1.25 A	**EASY400-POW** 212319			
		EASY430-POW 110940		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 107.1-01; CE marking UL File No.: E300415 UL CCN: NMTR, NMTR7 CSA File No.: UL report applies to both US and Canada CSA Class No.: 3211-87, 3211-07 NA Certification: UL Listed, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 2.5 A	**EASY500-POW** 110941			
	Rated input voltage: 50/60 Hz: 100 - 240 V AC Rated output voltage (residual ripple): 24 V DC (± 3 %) Rated output current: 4.2 A	**EASY600-POW** 262399			

	Supply voltage	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
PROFIBUS-DP data cable						
		Twisted pair, without plug, 2-core, 2 x 0.64 mm² (only suitable for fixed wiring) 100 m	**ZB4-900-KB1** 206983		100 m	
PROFIBUS-DP bus connector plug						
		Pins, 9 pole Cable entry, angled 90°	**ZB4-209-DS2** 206982		1 off	
		Metallised insulated housing Maximum transfer rate 12 MBit/s Integrated switch (accessible from the outside) for the bus terminating resistors Terminal block for two cable entries, with straight or 90° angled cable entry, as required	**ZB4-209-DS3** 217820		1 off	
Connection plug						
		Bus connector plug between base unit and expansion unit/bus module	**EASY-LINK-DS** 221607		1 off	UL/CSA certification not required
Fixing bracket For screw fixing to mounting plate						
		2 fixing brackets per easy200 3 fixing brackets per easy400, 500, 600, 800, ES4P, EC4P, MFD(-AC)-CP8...	**ZB4-101-GF1** 061360		9 off	UL/CSA certification not required
Telescopic clip						
		With 35mm top-hat rail to IEC/EN 60715 for mounting depth compensation when rear mounting in CI-K… enclosures and cabinets. Stepless adjustment via scale from 75 – 115 mm. Screw and snap mounting	**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Top-hat rail adapter for inspection window						
		12 mm x 66 mm x 82 mm Installation on hinged inspection window, for front fitting of devices. Complete set, consisting of 2 brackets and 4 screws	**SKF-HA** 233782		1 off	UL/CSA certification not required
Inspection window						
		130 mm x 77 mm x 25 mm (6 space units) For use with EASY700, EASY800, EC4P, ES4P	**SKF-FF6** 233781		1 off	UL/CSA certification not required

Technical data

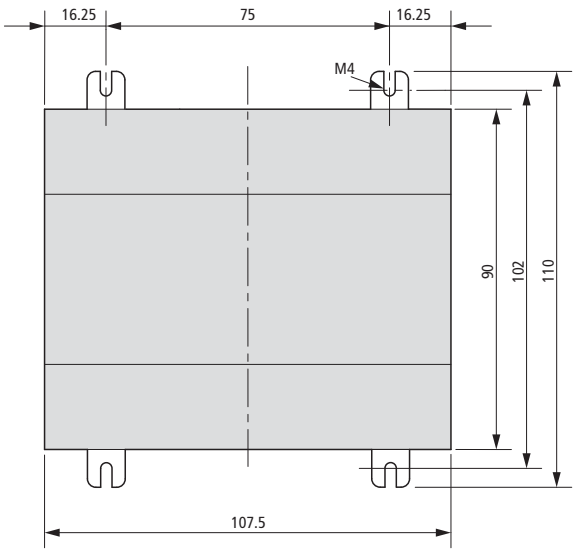
			ES4P…
General			
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27, EN 954-1 : Category 4, EN ISO 13849-1: PL e, EN IEC 62061 : SILCL 3, EN IEC 61508 : SIL 3
Dimensions (W x H x D)		mm	107.5 (6 space units) x 90 x 72
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories)
Times			
Inputs			
Max. duration of external test pulde		ms	1
Semi-conductor output			
Off test pulse		ms	<1
Switch-off delay		ms	<0.15
Terminal capacity			
Solid		mm^2	0.2 - 4 (AWG 22 - 12)
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)
Standard screwdriver		mm	3.5 x 0.8
Max. tightening torque		Nm	0.6
Ambient climatic conditions			
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures
LCD display (clearly legible)		°C	0…55
Storage		°C	-40…70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5…95
Air pressure (in operation)		hPa	795…1080
Ambient mechanical conditions			
Protection type, IEC/EN 60529			IP20
Vibrations (IEC/EN 60068-2-6)			
Constant amplitude 0.15 mm		Hz	10…57
Constant acceleration, 2 g		Hz	57…150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms	Shocks		18
Drop to IEC/EN 60068-2-31	Drop	mm	50
Mounting position			Horizontal/vertical
Electromagnetic compatibility (EMC) according to IEC/EN 61000-6-2			
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)			
Air discharge		kV	8
Contact discharge		kV	6
Radio interference suppression (EN 55011)			EN 55011 Class B, EN 55022 Class B
Power pulses (surge) (IEC/EN 61000-4-5, level 2)		kV	1 (supply cables, symmetrical)
Insulation resistance			
Overvoltage category/pollution degree			III/2
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142, EN 60664-1:2003
Insulation resistance			EN 50178
Back-up/accuracy of the real-time clock			
Accuracy of the real-time clock		s/day	Normally ± 5 (± 0.5 h/year)
Repetition accuracy of timing relays in standard circuit			
Accuracy of timing relay (of value)		%	± 0.02
Resolution			
Range “S”		ms	5
Range “M:S”		s	1
Retentive memory			
Write cycles of the retentive memory (minimum)			10000000000 (10^{10}) (read/write cycles)
Power supply			
Rated operational voltage	U_e	V	24 DC (-15/+20%)
Permissible range		V DC	20.4…28.8
Ripple		%	≦ 5
Interfaces			
easyNet (CAN based)			
Bus termination (first and last station)			Yes
Control operating mode easyNet			
Number of users			Max. 8

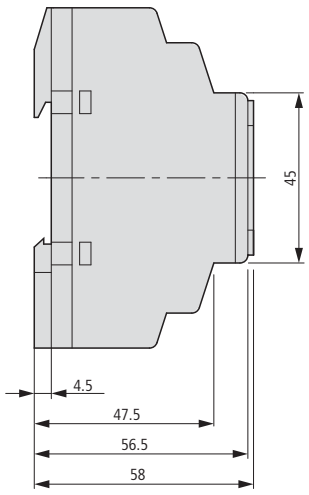
			ES4P…
NET network			
Stations	Number		Max. 8
Data transfer rate/distance			1000 Kbit/s, 6 m 500 Kbit/s, 25 m 250 Kbit/s, 60 m 125 Kbit/s, 125 m 50 Kbit/s, 300 m 20 Kbit/s, 700 m 10 Kbit/s, 1000 m Bus lengths greater than 40 m can only be achieved with enhanced cross-section conductors and terminal adapters.
Potential isolation			
From power supply			Yes
From the inputs			Yes
From the outputs			Yes
From the PC interface, memory card, NET network, EASY-Link			Yes
Bus termination (first and last station)			Yes
Terminal type			RJ45
Digital inputs 24 V DC			
Number			14
Inputs can be used as analog inputs			-
Status display			LCD display (if provided)
Potential isolation			
From power supply			No
Between digital inputs			No
From the outputs			Yes
From PC interface, memory card, easyLink			No
From network easyNet			Yes
Rated operational voltage	U_e	V DC	24
At signal "0"	U_e	V DC	< 5
At signal "1"	U_e	V DC	> 15
Clock outputs			
Number			4
Voltage		V DC	24
Electrical isolation			No
Relay outputs			
Number			4 for ES4P-...-DR.. 1 redundant for ES4P-…-DM…
Outputs in groups of			1
Parallel switching of outputs to increase power			Not permissible
Protection of an output relay			Fuse: 6 A gG, Circuit-breaker with characteristic C: 24 V DC 4 A, Short-circuit current < 250 A
Potential isolation			
From power supply			Yes
From the inputs			Yes
From PC interface, memory card, easyNet, easyLink			Yes
Safe isolation according to EN 50178		V AC	300
Basic insulation		V AC	600
Lifespan, mechanical	Operations	x 10^6	10
Contacts			
Conventional thermal current		A	6
Rated impulse withstand voltage Uimp contact coil		kV	6
Rated operational voltage	U_e	V AC	250
Rated insulation voltage	U_i	V AC	250
Safe isolation to EN 50178 between coil and contact		V AC	300
Making capacity			
AC-15, 230 V AC, 3 A	Operations		80000
DC-13, 24 V DC, 5 A, 0,1 Hz	Operations		40000
Switching frequency			
Mechanical operations		x 10^6	10
Switching frequency		Hz	10
UL/CSA			
UL 508			B300/R300

			ES4P…
Transistor outputs			
Number			4
Rated operational voltage	U_e	V DC	24
Permissible range	U_e	V DC	20.4 - 28.8
Ripple		%	≦ 5
Protection against polarity reversal			Yes (Caution: A short circuit will result if 0 V or GND is applied to the outputs in the event that the supply voltage is connected to the wrong poles.)
Potential isolation			
From power supply			Yes
From the inputs			Yes
From PC interface, memory card, network, easyNet, easyLink			Yes
Rated operational current at signal "1" DC	I_e	A	Max. 0.5
At signal "1" with I_e = 0.5 A		V	$U = U_e$ -1 V
Short-circuit protection			Yes, thermal
Short-circuit tripping current for R_a ≦ 10 mΩ		A	0.7 ≦ I_e ≦ 2 per output
Total short-circuit current		A	8
Peak short-circuit current		A	16
Thermal cutout			Yes
Max. operating frequency at constant resistive load RL < 100 kO (dependant on program and load)		Ops/h	40000
Parallel connection of outputs			No
Status indication of the outputs			LCD display (if provided)
Inductive load			
Without external suppressor circuit			
Duty factor			$T_{0.95} \approx 3 \times T_{0.65} = 3 \times L/R$ $T_{0.95}$ = Time in ms, until 95 % of the steady-state current has been reached
With external suppressor circuit			
Utilization factor		g	1
Duty factor		% DF	100
Max. switching frequency, max. duty factor	Operations		Depending on the suppressor circuit

Safety technical data www.moeller.net/de/products_solutions/solutions/safety/safety_values

ESP4





Description



Functional safety on machines – monitoring with safety relay ESR5
Moeller's new ESR5 safety relays provide optimal safety and an extremely high degree of reliability on plant and machinery. Applications that meet the highest safety requirements in accordance with EN ISO 13849-1 up to PL e, in accordance with IEC 62061 up to SILCL 3 and in accordance with IEC 61508 up to SIL 3 can be realized with the ESR5 series of devices.

Functionality

Safety relays are intended to reliably monitor the signals from safety devices at all times and switch off quickly and reliably in an emergency. Single-channel and dual-channel versions are available for the construction of safety-orientated applications. The internal logic of the safety relay monitors the safety circuits (Emergency Stop, guard door…) and activates the enable paths in fault-free condition. Upon actuation of the safety device or in the event of a fault the enable paths are switched off in compliance with the stop category. Any faults that occur in the control circuit, such as a ground fault, cross connection fault or wire breakage are detected with certainty. Activation of the enable paths is prevented in the event of a fault.

Configuration

Universal use is achieved due to the extensive performance range and voltage range of the ESR5 safety relays. The electronic safety relay consists of the internal logic and two redundant relays with positively driven contacts for the enable and signalling paths. The wiring is effected simply on encoded plug-in terminals. If any servicing is performed, these ensure fault-free replacement of the modules without any additional wiring work.

Approvals

Safety relays ESR5 are approved according to:

- TÜV-Rheinland

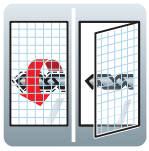
- UL/CUL

Advantages at a glance

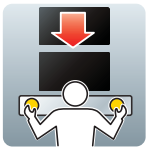
- Use for the highest safety requirements in accordance with EN ISO 13849-1, IEC 62061 and IEC 61508.
- Devices suitable for the world market thanks to certification from UL, CUL and TÜV Rhineland.
- Plug-in screw terminals for fast and fault-free replacement.
- Multi-voltage versions 24 - 230 V AC DC for a flexible range of application.



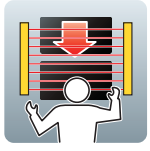
Emergency stop circuits
Allows the safe stopping of a hazardous movement, immediate stop for Stop category 0 and controlled stop Stop category 1 according to IEC 60204-1; for use in single or dual channel safety monitoring of emergency stop circuits.



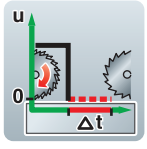
Guard door monitoring
Used with moving guards such as doors, barriers or flaps. Positions are reliably detected, monitored and enabled to safety-related requirements.



Safe operation with two-hand control
Type III to EN 574. Used for hazardous machine movement such as presses, punching, shearing. It allows the movement of dangerous operation only when both hands of the operator are outside the dangerous area and the two pushbuttons are operated within 0.5 seconds of each other.



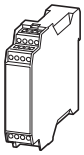
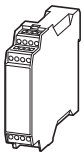
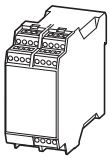
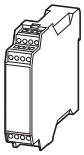
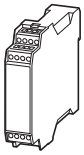
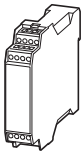
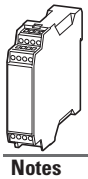
Electro-sensitive protective devices (ESPE)
Protection of the hazardous location or area in the vicinity of machines by means of contactless guards such as light grids/ light barriers/light curtains.



Off-delay circuit
Makes it possible to safely stop a hazardous movement with controlled stopping according to IEC 60204-1 stop category 1.

HPL13015EN

Ordering

	Actuating voltage U_c	Suitable for	Number of enabling paths to IEC/EN 60204 Stop category 0	1	Signal contacts	Part no. Article no.	Price See price list	Std. pack
ESR5 electronic safety relays								
Safety relays for Emergency-Stop and guard door monitoring								
Single-channel 	24 V DC, 24 V AC, 50/60 Hz	Cat. 2 according to EN 954-1 PL d according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508 Cat. 4/PL e possible only with the aid of fault exclusions .	4	–	1	**ESR5-NO-41-24VAC-DC** 118701		1 off
dual channel 		Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508	2	–	1	**ESR5-NO-21-24VAC-DC** 118700		
		Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508	3	–	1	**ESR5-NO-31-24VAC-DC** 118702		
dual-channel 	24 V AC/DC, 230 V AC/DC, 50/60 Hz	Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508	3	–	1	**ESR5-NO-31-24V-230VAC-DC** 118704		1 off
	230 V AC, 50/60 Hz	Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508	3	–	1	**ESR5-NO-31-230VAC** 119380		
Safety relays for emergency stop, guard door and light curtain monitoring								
Off-delayed[1] 	24 V DC	Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508 SIL 3 only for high demand requirements	2	2	0	**ESR5-NV3-30** 118705		
Two-hand relay, suitable for applications to EN 574 Typ III C								
dual channel 	24 V DC, 24 V AC, 50/60 Hz	Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC62061 SIL 3 according to IEC61508	2	–	1	**ESR5-NZ-21-24VAC-DC** 118703		1 off
Contact expansion modules The basic device determines the maximum stop category according to IEC 61508 and IEC 60204								
Off-delayed 	24 V DC, 24 V AC, 50/60 Hz	Cat. 3 according to EN 954-1 PL d according to EN ISO 13849-1 SILCL 2 according to IEC 62061 SIL 2 according to IEC 61508	–	4	2	**ESR5-VE3-42** 118706		
Non-delayed 	24 V DC, 24 V AC, 50/60 Hz	Cat. 4 according to EN 954-1 PL e according to EN ISO 13849-1 SILCL 3 according to IEC 62061 SIL 3 according to IEC 61508	5	–	2	**ESR5-NE-51-24VAC-DC** 118707		1 off

Notes [1] Suitable for safety position switch with guard locking LS-S…MT-ZBZ.

Information relevant for export to North America

Product Standards	IEC/EN see Technical Data; UL 508; CSA-C22.2 No. 14-95; CE marking
UL File No.	E29184
UL CCN	NKCR; NKCR7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-83; 3211-03
NA Certification	UL Listed, certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

Technical data

			ESR5-NO-21…	ESR5-NO-41…	ESR5-NO-31-24VAC-DC	ESR5-NZ-21…	ESR5-NO-31-230VAC	ESR5-NO-31-24V-230VAC-DC	ESR5-NV3…	ESR5-VE3…	ESR5-NE-51…
General											
Standards			EN ISO 13849-1, IEC 62061, IEC 61508, DIN EN 50178, UL/CUL listed			EN ISO 13849-1, IEC 62061, IEC 61508, DIN EN 50178, UL/CUL listed					
Type-dependent standards			–	–	–	EN 574 Part no. IIIC	EN 60204 (if applicable)	EN 60204 (if applicable)	EN 60204 (if applicable)	–	–
Lifespan, mechanical	c (contacts)	× 10^6	10	10	10	10	10	10	10	10	10
Maximum operating frequency											
Max. operating frequency		Ops/h	3600	3600	3600	3600	3600	3600	3600	900	3600
Climatic proofing			Cold according to EN 60068-2-1, dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Cold according to EN 60068-2-1, dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Cold in accordance with: EN 60068-2-1, dry heat in accordance with EN 60068-2-2, humidity storage test in accordance with 60068-2-78	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3	Dry heat according to EN60068-2-2, damp heat according to EN 60068-2-3
Ambient temperature		°C	-20 - 55	-20 - 55	-20 - 55	-20 - 55	-20 - 55	-20 - 55	-20 - 45	-20 - 55	-20 - 55
Ambient temperature storage		°C	-25 - 75	-25 - 75	-25 - 75	-25 - 75	-25 - 75	-25 - 75	-25 - 75	-25 - 75	-25 - 75
Mounting position			Any	Any	Any	Any	Any	Any	Any	Any	Any
Vibration resistance (IEC/EN 60068-2-6)			2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm	2 g, frequency: 10 – 150 Hz, amplitude: 0.15 mm
Shock resistance (IEC 60068-2-27)			-	-	-	-	-	-	-	-	-
Protection type											
Housing			IP20	IP20	IP20	IP20	IP40	IP40	IP20	IP20	IP20
Terminals			IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (IEC 0106 Part 100)			Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof
Weight		kg	0.17	0.22	0.17	0.22	0.3	0.3	0.17	0.17	0.22
Terminal capacity											
Solid or flexible		mm^2	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)	1 x (0.2 - 2.5) 2 x (0.2 - 1)
Flexible with ferrule		mm^2	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)	1 x (0.25 - 2.5) 2 x (0.25 - 1)
Solid or stranded		AWG	24 - 12	24 - 12	24 - 12	24 - 12	24 - 12	24 - 12	24 - 12	24 - 12	24 - 12
Terminal screw											
Pozidriv screwdriver		Size	2	2	2	2	2	2	2	2	2
Flat-blade screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Max. tightening torque		Nm	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Main contacts											
Rated impulse withstand voltage	U_{imp}	V AC	6000	4000	4000	6000	6000	6000	4000	4000	4000
Overvoltage category/pollution degree											
Outside			III/2	III/2	III/2	III/2	III/2	III/2	II/2	III/2	III/2
Inside			-	-	-	-	-	-	-	-	-
Rated insulation voltage	U_i	V AC	250	250	250	250	250	250	250	250	250
Rated operating voltage	U_e	V AC	230	230	230	230	230	230	230	230	230
Rated operation current											
AC-15											
230 V (360 ops./h)	I_e	A	5	4	5	4	4	4	-	5	4
230 V (3600 ops./h)	I_e	A	3	3	3	3	3	3	3	3	3
DC-13											
24 V (360 ops./h)	I_e	A	6	4	6	4	4	4	-	6	4
24 V (3600 ops./h)	I_e	A	3	2.5	3	2.5	2.5	2.5	3	3	2.5
Max. summation current of all poles											
24 V AC/DC devices		A	72	72	72	72	50	50	49	50	50
230 V AC devices		A	-	-	-	-	50	50	-	-	-
Square of the total current (and total current) of all current paths			72 A^2 (6 + 6)	72 A^2 (4.2 + 4.2 + 4.2 + 4.2)	72 A^2 (4.9 + 4.9 + 4.9)	72 A^2 (6 + 6)	50 A^2 (4 + 4 + 4)	50 A^2 (4 + 4 + 4)	50 A^2 (4 + 4 + 4)	49 A^2 (3.5+3.5+3.5+3.5)	50 A^2 (3.7 + 3.7 + 3.7 + 3.7 + 3.7)
Short-circuit protection											
Max. fuse		A gG/gL	10	6	10	6	6	6	10	10	6

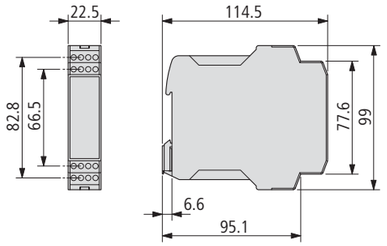
			ESR5-NO-21…	ESR5-NO-41…	ESR5-NO-31-24VAC-DC
Power supply circuit					
Actuating voltage 50/60 Hz		V AC	24	24	24
Actuating voltage	U_s	V DC	24	24	24
Voltage tolerance pick-up voltage		× e	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1
Power consumption					
AC operated 50/60 Hz		VA	-	-	-
AC operated 50/60 Hz		W	3.4	3.4	3.4
DC operated		W	1.6	1.6	1.6
Fuse for control circuit supply					
24 V			Short-circuit proof	Short-circuit proof	Short-circuit proof
115 V/230 V			-	-	-
Control circuit					
Rated output voltage		V DC	24	24	24
Rated operational current		mA	S12, S22: 30, S34: 45	S12: 65, S34: 40	S12, S22: 30, S34: 45
Resistance	R		50	22	50
Short-circuit current		A	2.3	2.3	2.3
Response time		ms	100	65	100
Recovery time		ms	-	-	-
Response time with reset monitoring	t_{A1}	ms	-	-	-
Response time without reset monitoring	tA2	ms	100	65	100
Reset time	t_R/t_{R1}	ms	Single-channel 45; dual-channel 10	45	Single-channel 45; dual-channel 10
Minimum On Duration	t_M	ms	-	-	-
Recovery time	t_W	ms	Approx.1000	Approx.1000	Approx.1000
Synchronous monitoring time	t_S	ms	-	-	-
Electromagnetic compatibility (EMC)					
Emitted interference			EN 61000-6-4	EN 61000-6-4	EN 61000-6-4
Interference immunity			According to EN 61000-6-2, EN 62061	According to EN 61000-6-2	According to EN 61000-6-2, EN 62061
Safety technical data	www.moeller.net/de/products_solutions/safety/safety_values				

ESR5-NZ-21…	ESR5-NO-31-230VAC	ESR5-NO-31-24V-230VAC-DC	ESR5-NV3…	ESR5-VE3…	ESR5-NE-51…
24	230	24 - 230	-	-	24
24	-	230	24	24	24
0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.85 - 1.1	0.8 - 1.1
-	-	-	-	-	-
3	5.8	5.8	-	-	2.2
1.5	2.9	2.9	1.8	2	2.2
Short-circuit proof	-	Short-circuit proof	-	-	-
-	Short-circuit proof	Short-circuit proof	-	-	-
24	24	24	24	24	24
S11, S21: 60, Y2: 45	S10, S12, S22: 35, S34, S35: 45	S10, S12, S22: 35, S34, S35: 45	S12, S22: 3.5, S34, S35: 7	A1, A2: 84, K1/K2: 5	A1, A2: 92
22	11	11	500	-	-
2.3	0.7	0.7	0.1	-	-
50	250	250	150	20	20
-	-	-	-	-	-
-	60	60	150	20	20
50	250	250	150	20	20
20	20	20	20 (non-delayed enable paths); 100 (min. delayed enable paths)	0.3 - 3 s (+ 50 %) adjustable	20
-	-	-	-	-	-
Approx.1000	Approx.1000	Approx.1000	Approx.330	Approx.1000	-
500	-	-	-	-	-
EN 61000-6-4	EN 61000-6-4	EN 61000-6-4	EN 61000-6-4	EN 61000-6-4	EN 61000-6-4
According to EN 61000-6-2	According to EN 61000-6-2	According to EN 61000-6-2	According to EN 61000-6-2, EN 62061	According to EN 61000-6-2	According to EN 61000-6-2

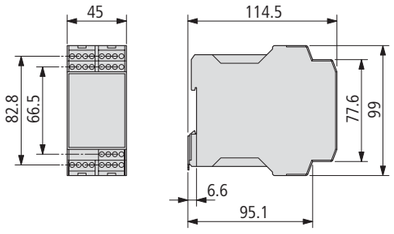
Dimensions

Safety relays, contact expansion modules

ESR5…24VAC-DC



ESR5…230VAC…





Automation solutions

Visualization solutions, modular and compact control systems, remote I/O systems and software: Eaton offer a wide spectrum of automation solutions.

XV - visualisation solutions
Simple operation relieves operators of machinery, installations or in individual applications +++ Simultaneous high performance PLC +++ Resistive touch displays or robust infrared touch displays from 3.5 – 15 inches

XC - modular PLCs
Construction scalable within wide limits +++ Different PLC performance classes, multiple expansion modules +++ Integration into communication concept +++ Data exchange through Ethernet and integrated Web server facilitate innovative solutions

EC4P – Compact control system
Many functions in one device +++ Automation of smaller applications +++ Ethernet variants allow remote programming +++ Numerous local expansion modules, easyNet extensions, CANopen extensions and network modules

XI/ON – Remote I/O system
Control movements, measure temperature or speed, record currents and voltages +++ Ideal for solutions focused on remote signal processing +++ Modular concept and simple handling

Software
All controls programmed with CoDeSys in compliance with IEC 61131-3 +++ Easy and efficient generation of operator guidance with interactive visualization software Galileo +++ Mask generation for HMI-PLC devices (XV100, XV400); also with integrated CoDeSys visualization +++ Convenient, uncomplicated planning and realization of XI/ON stations with the cost-free I/O Assistant +++ Generate SmartWire-DT configurations with cost-free SWD-Assist



System overview

Touch Panel XV 14/2

Description

Touch Panel XV 14/4

Ordering

Touch Panel XV

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- HMI-PLC XV200 14/6
- HMI-PLC MFD4, HMI XVH300 14/7
- HMI-PLC XVS400 14/8
- HMI Mobile Panel XVM400 14/9
- HMI-PLC XV400 14/10

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Engineering

Communication protocols, licensing 14/14

Technical data

Touch Panel XV

- HMI(-PLC) XV100 14/18
- HMI-PLC XV200 14/20
- HMI-PLC MFD4 14/22
- HMI Mobile Panel 14/23
- HMI XVH300 14/24
- HMI-PLC XV400 14/28
- HMI-PLC XVS400 14/32

Dimensions

Touch Panel XV 14/34



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XC100, XC121, XC200 modular PLCs 14/36

Ordering

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Input/output expansion for XC121 14/47

XC200 modular PLCs 14/49

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XI/OC input/output expansion 14/59

Text display for XC100 modular PLC 14/60

XC121 modular PLCs, XIO-EXT expansion 14/60



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Remote I/O XI/ON 14/82

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Remote I/O XI/ON 14/84

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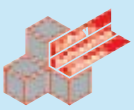
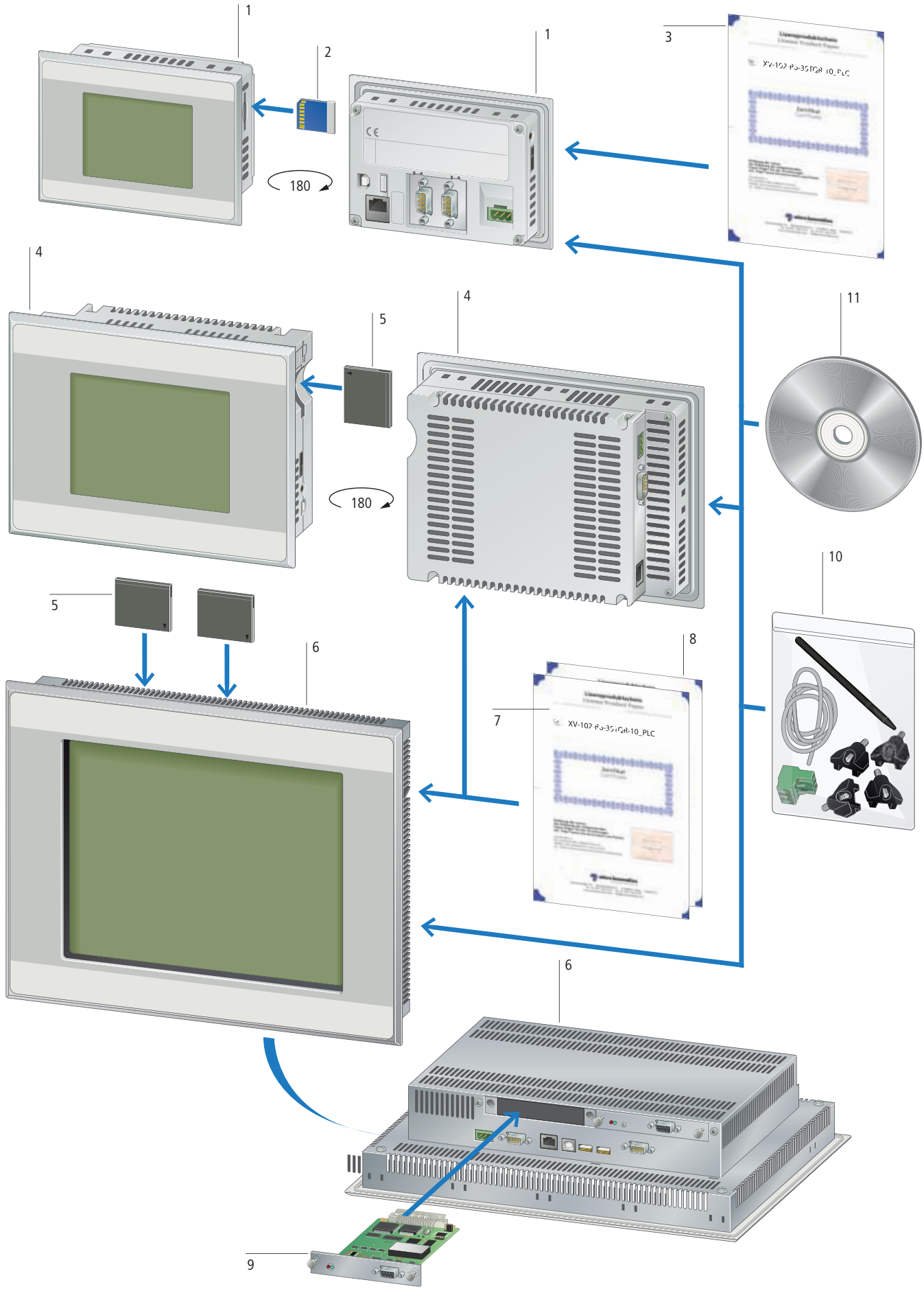




System overview



XV100 HMI/PLC with touch display 1

Compact operator panels with wide range of functions.
Fully-graphical 3.5", 5.7" or 7" wide-screen devices.
TFT display, color or monochrome
Resistive touch
Ethernet interface on board.
In addition CAN, PROFIBUS, RS232 or RS485 possible.

→ Page 14/5

SD memory card 2

Optional memory for project, recipe data, etc.

→ Page 14/12

XV license product certificate 3

Expansion of device functionality through assignment of license points.
Licensing is through the Internet.

→ Page 14/12

XV200 HMI/PLC with touch display 4

Fully graphic 5.7" devices with monochrome or color display (STN).
Resistive touch
Ethernet interface on board.
In addition CAN, PROFIBUS, or RS232 possible.

→ Page 14/6

Compact-Flash memory card 5

Memory for project, recipe data, etc.
With or without pre-installed Win CE operating system.

→ Page 14/12

XV400 HMI/PLC with touch display 6

5.7", 8.4", 10.4", 12.1", 15" devices
TFT color display
Infra-red or Resistive-touch.
Numerous communication possibilities through pluggable communication cards.
Also available in stainless steel design.

→ Page 14/10

XV license product certificate 7

Expansion of device functionality through assignment of license points.
Licensing is through the Internet.

→ Page 14/12

Windows CE licence 8

Win CE license with license label.

→ Page 14/12

Communication card for XV400 9

Depending on device size 1 or 2 cards can be plugged in.

→ Page 14/13

Mounting kit 10

Additional fixing kits for all XV devices.
Fixing kit are generally included as standard.
The illustration shows an XV-100 fixing kit.

→ Page 14/12

Software 11

Visualization software Galileo
Programming software XSOFT-CODESYS, EPAM

→ Page 14/130



Description



HMI with integratable PLC

The modern touch displays XV can optionally be used as fully-featured PLCs. This cost-saving, leading-edge concept offers the perfect solution for every application, whether in the low-cost segment or in the demanding high-end segment, where performance is key. The devices are available in display sizes from 3.5" to 15" and, depending on model with resistive or infrared touch. Alternatively, the panels can also be mounted edgewise.

XV100: Designed for the low-cost segment, these devices excel with a compact design, light-weight plastic housing and a wide range of onboard interfaces. Despite its small size, the XV100 with 3.5" touch display has an exceptional range of performance features, including PLC function.

The touch panels with 5.7" and 7" display feature an additional USB host and an RS232 interface.



XVS400 and XV400: These multipurpose devices with their rugged metal housing are exceptionally flexible and provide comprehensive communication possibilities. The XVS400 features a PROFIBUS-DP master/MPI interface as standard as well as Ethernet, RS232 and onboard USB host. With optional communication modules the XV400 can be easily and quickly expanded and adapted.

The XV400 with stainless steel front is also ideally equipped for special applications:
- IP69K: cleaning using high-pressure and steam jets (5.7")
- Ex zone 1: For use in potentially explosive atmospheres (10.4" and 12.1")

XVM400: The mobile version with its round, ergonomic design is easy to operate with just one hand.



Licencing procedure

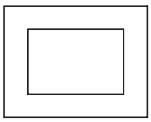
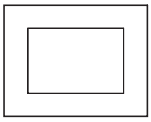
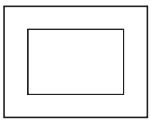
To make sure that you pay for only those functions that you actually need, the devices work with a license point system. Use the points to activate specific functions, such as:
- Runtime for the visualization (GALILEO or EPAM)
- Communication (e.g. Ethernet, CANopen, Siemens MPI)
- Tools (e.g. CE Telediag, S7 PG Router)
- XSOFT-CODESYS-2 runtime for the PLC function

With license product certificates you can buy additional license points. This has the following benefits for you:
- Cost optimization
- Low warehousing costs
- Flexible handling

→ For detailed information about this topic see chapter Licensing

HPL14005EN

Ordering

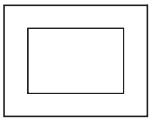
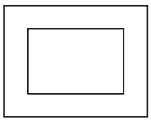
	Display	Front design	Screen diagonal Inches	Resolution Pixels	Communication interface	Part No. Article No.	Price See price list	Std. pack
XV100								
• HMI or HMI PLC with communication through on-board interface. • Communication scope extendable through licensing, → Page 14/12. • Standard front, special front please inquire • Insulating enclosure and front plate • Processor: RISC central processing unit, 32-bit, 400 MHz • OS, program and data memory: 64 MB • 1 slot for 1 SD card • Software (engineering): Visualization = GALILEO or EPAM, PLC = XSOFT-CODESYS-2 (depending on version) • Windows CE Core 5.0 license (incl.)								
– Built-in interfaces: 1 × Ethernet 100/10, 1 × USB device, communications interface – No PLC function possible								
	Resistive touch 3.5'' TFT LCD 32 grey levels	Standard membrane (fully enclosed)	3.5	320 x 240	–	**XV-102-A0-35MQR-10** 141759		1 off
			3.5	320 x 240	PROFIBUS	**XV-102-A2-35MQR-10** 141820		
			3.5	320 x 240	RS232	**XV-102-A3-35MQR-10** 141821		
			3.5	320 x 240	RS485	**XV-102-A4-35MQR-10** 141822		
			3.5	320 x 240	CAN RS232	**XV-102-A5-35MQR-10** 141823		
– Built-in interfaces: 1 × Ethernet 100/10, 1 × USB device, communications interface – Can be expanded with PLC function, → Page 14/14								
	Resistive touch 3.5'' TFT LCD 64 k Colors	Standard membrane (fully enclosed)	3.5	320 x 240	–	**XV-102-B0-35TQR-10** 140007		1 off
			3.5	320 x 240	PROFIBUS	**XV-102-B2-35TQR-10** 140008		
			3.5	320 x 240	RS232	**XV-102-B3-35TQR-10** 140009		
			3.5	320 x 240	RS485	**XV-102-B4-35TQR-10** 140010		
			3.5	320 x 240	CAN RS232	**XV-102-B5-35TQR-10** 140011		
– Including PLC function – Built-in interfaces: 1 × Ethernet 100/10, 1 × USB device, communications interface								
	Resistive touch 3.5'' TFT LCD 32 grey levels	Standard membrane (fully enclosed)	3.5	320 x 240	–	**XV-102-B0-35MQR-10-PLC** 140012		1 off
			3.5	320 x 240	RS232	**XV-102-B3-35MQR-10-PLC** 140013		
			3.5	320 x 240	RS485	**XV-102-B4-35MQR-10-PLC** 140014		
			3.5	320 x 240	CAN RS232	**XV-102-B5-35MQR-10-PLC** 140015		
			3.5	320 x 240	CAN RS485	**XV-102-B6-35MQR-10-PLC** 140016		
			3.5	320 x 240	PROFIBUS RS485	**XV-102-B8-35MQR-10-PLC** 140017		
	Resistive touch 3.5'' TFT LCD 64 k Colors		3.5	320 x 240	–	**XV-102-B0-35TQR-10-PLC** 140018		
			3.5	320 x 240	RS232	**XV-102-B3-35TQR-10-PLC** 140019		
			3.5	320 x 240	RS485	**XV-102-B4-35TQR-10-PLC** 140020		
			3.5	320 x 240	CAN RS232	**XV-102-B5-35TQR-10-PLC** 140021		
			3.5	320 x 240	CAN RS485	**XV-102-B6-35TQR-10-PLC** 140022		
			3.5	320 x 240	PROFIBUS RS485	**XV-102-B8-35TQR-10-PLC** 140023		

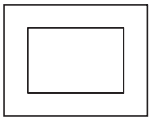
Information relevant for export to North America

Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking
UL File No.	E208621
UL CCN	NWGQ2, NWGQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	-
NA Certification	UL Recognized, certified by UL for use in Canada

Conditions of Acceptability
The investigated Pollution Degree is: 2
The following end-product enclosures are required: Fire. The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks

Degree of Protection
IEC: IP65, UL/CSA Type: -

	Display	Front design	Screen diagonal Inches	Resolution Pixels	Communication interface	**Part No.** Article No.	**Price** See price list	Std. pack
XV100								
– Built-in interfaces: 1 × Ethernet 100/10, 1 × USB device, 1 × USB host, communications interface – Can be expanded with PLC function, → Page 14/14								
	Resistive touch 5.7" TFT LCD 64 k Colors	Standard membrane (fully enclosed)	5.7	640 x 480	RS232	**XV-102-D0-57TVR-10** 142530		1 off
			5.7	640 x 480	CAN RS232 RS485	**XV-102-D6-57TVR-10** 142531		
			5.7	640 x 480	PROFIBUS RS232 RS485	**XV-102-D8-57TVR-10** 142532		
	Resistive touch 7" TFT LCD 64 k Colors		7	800 x 480	RS232	**XV-102-D0-70TWR-10** 142535		
			7	800 x 480	CAN RS232 RS485	**XV-102-D6-70TWR-10** 142536		
			7	800 x 480	PROFIBUS RS232 RS485	**XV-102-D8-70TWR-10** 142537		
– Including PLC function – Built-in interfaces: 1 × Ethernet 100/10, 1 × USB device, 1 × USB host, communications interface								
	Resistive touch 5.7" TFT LCD 64 k Colors	Standard membrane (fully enclosed)	5.7	640 x 480	CAN RS232 RS485	**XV-102-D6-57TVR-10-PLC** 142533		1 off
			5.7	640 x 480	PROFIBUS RS232 RS485	**XV-102-D8-57TVR-10-PLC** 142534		
	Resistive touch 7" TFT LCD 64 k Colors		7	800 x 480	CAN RS232 RS485	**XV-102-D6-70TWR-10-PLC** 142538		
			7	800 x 480	PROFIBUS RS232 RS485	**XV-102-D8-70TWR-10-PLC** 142539		

	Display	Front design	Screen diagonal Inches	Resolution Pixels	Communication interface	**Part No.** Article No.	**Price** See price list	Std. pack
XV200								
• HMI or HMI PLC with communication through on-board interface. • PLC function and communications scope can be upgraded with licenses, → Page 14/12. • Standard front, special front please inquire • Insulating enclosure and front plate • Processor: RISC central processing unit, 32-bit, 200 MHz • OS, program and data memory: 32 MB. • Built-in interfaces: 1 × Ethernet, 1 × USB device, communications interface • 1 slot for 1 Compact Flash™ card. • Software (engineering): visualization = GALILEO or EPAM, PLC = XSOFT-CODESYS-2 • Windows CE license required • Compact Flash™ required → XV accessories • Flush mounting compatible with 5.7" XV-400 devices and older predecessors								
	Resistive touch 5.7" FSTN LCD (monochrome display) 256 grey levels	Standard membrane	5.7	320 x 240	CAN	**XV-230-57CNN-1-10** 139951		1 off
			5.7	320 x 240	PROFIBUS	**XV-230-57MPN-1-10** 139952		
			5.7	320 x 240	RS232	**XV-232-57BAS-1-10** 139950		
	Resistive touch 5.7" CSTN LCD (Color display)		5.7	320 x 240	CAN RS232	**XV-252-57CNN-1-10** 139956		
			5.7	320 x 240	PROFIBUS RS232	**XV-252-57MPN-1-10** 139957		

Information relevant for export to North America	Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking	Conditions of Acceptability	The investigated Pollution Degree is: 2 The following end-product enclosures are required: Fire, Electrical The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks.
	UL File No.	E208621		
	UL CCN	NWGQ2, NWGQ8		
	CSA File No.	UL report applies to both US and Canada		
	CSA Class No.	–		
	NA Certification	UL Recognized, certified by UL for use in Canada	Degree of Protection	IEC: IP65, UL/CSA Type: -

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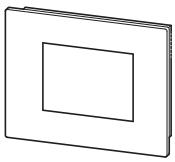
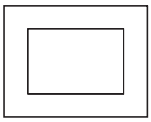
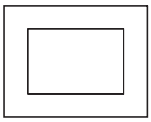
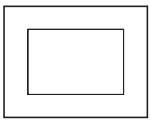
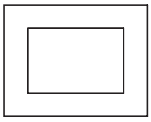
	Display		Screen diagonal Inches	Resolution Pixels	Communication interface	**Part No.** Article No.	**Price** See price list	Std. pack
MFD4								
• Memory card pluggable (optional) → Page 14/41 • Real-time clock • Operating system: Windows CE								
	Resistive touch 5.7" TFT LCD 32 k Colors		5.7	320 x 240	Ethernet CANopen/easyNet RS232	**MFD4-5-XRC-30** 109428		1 off
XVH300								
• HMI (No PLC function possible) with communication through on-board interface. • Communication scope extendable through licensing, → Page 14/12. • Standard front, special front please inquire • Metal enclosure and front plate • Processor: RISC central processing unit, 32-bit, 200 MHz • OS, program and data memory: 64 MB • Display: 5.7" CSTN LCD (Color display), 256 colors • Built-in interfaces: 1 × Ethernet, 1 × USB device, communications interface • 1 slot for 1 Compact Flash™ card • Software (engineering): visualization = GALILEO or EPAM • WinCE license required → XV accessories • Compact Flash™ required → XV accessories								
	Infra-red touch 5.7" CSTN LCD (Color display)	Standard front with standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	–	**XVH-340-57BAS-1-10** 139869		1 off
			5.7	320 x 240	CAN	**XVH-340-57CAN-1-10** 139870		
			5.7	320 x 240	PROFIBUS	**XVH-340-57MPI-1-10** 139871		
			5.7	320 x 240	RS485 (Suconet K) RS232 (Sucom A)	**XVH-342-57SKS-1-10** 139873		
		Satin-finish brushed stainless steel Laminated safety glass, non-reflective	5.7	320 x 240	CAN	**XVH-340-57CAN-1-50**[1)] 139872		
	Resistive touch 5.7" CSTN LCD (Color display)	Standard front with standard membrane (fully laminated)	5.7	320 x 240	–	**XVH-330-57BAS-1-10** 139866		
			5.7	320 x 240	CAN	**XVH-330-57CAN-1-10** 139867		
			5.7	320 x 240	PROFIBUS	**XVH-330-57MPI-1-10** 139868		

Notes

[1)] Approved for IP69K.
Observe installation instructions to IP69K.

Information relevant for export to North America

Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking
UL File No.	E208621
UL CCN	NWGQ2, NWGQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Conditions of Acceptability	The investigated Pollution Degree is: 2 Proper bonding to the end-product main protective earthing termination is: Required The following end-product enclosures are required: Fire, Electrical The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks.
Degree of Protection	IEC: IP65, UL/CSA Type: -

	Display	Front design	Screen diagonal Inches	Resolution Pixels	**Part No.** Article No.	**Price** See price list	Std. pack
XVS400							
• HMI or HMI PLC with communication through on-board interface. • PLC function and communications scope can be upgraded with licenses, → Page 14/12. • Standard front, special front please inquire • Metal enclosure and front plate • Processor: RISC central processing unit, 32-bit, 400 MHz • OS, program and data memory: 64 MB • Software (engineering): visualization = GALILEO or EPAM, PLC = XSOFT-CODESYS-2 • WinCE license required → XV accessories • Compact Flash™ required → XV accessories							
— Display: 5.7" CSTN LCD (color display), 256 colors — 1 slot for Compact Flash™ cards — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × PROFIBUS, 1 × USB host, 1 × USB device							
	Resistive touch 5.7" CSTN LCD (Color display)	Standard membrane (fully laminated)	5.7	320 x 240	**XVS-430-57MPI-1-10** 139967		1 off
	Infra-red touch 5.7" TFT LCD	Standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	**XVS-460-57MPI-1-10** 139970		
— Display: 5.7" or 8.4" TFT LCD (Color display), adjustable: 65536 or 256 colors — 1 slot for Compact Flash™ card — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × PROFIBUS, 1 × USB host, 1 × USB device							
	Infra-red touch 5.7" CSTN LCD (Color display)	Standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	**XVS-440-57MPI-1-10** 139968		1 off
	Resistive touch 5.7" TFT LCD	Standard membrane (fully laminated)	5.7	320 x 240	**XVS-450-57MPI-1-10** 139969		
	Infra-red touch 8.4" TFT LCD	Standard membrane Laminated safety glass, non-reflective	8.4	640 x 480	**XVS-460-84MPI-1-10** 139971		
— Display: 10.4", 12.1" or 15" TFT LCD (Color display), adjustable: 65536 or 256 colors — 2 slots for Compact Flash™ cards — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × PROFIBUS, 2 × USB host, 1 × USB device							
	Infra-red touch 10.4" TFT LCD	Standard membrane Laminated safety glass, non-reflective	10.4	640 x 480	**XVS-440-10MPI-1-10** 139973		1 off
	Resistive touch 10.4" TFT LCD	Standard membrane (fully laminated)	10.4	640 x 480	**XVS-430-10MPI-1-10** 139972		
	Infra-red touch 12.1" TFT LCD	Standard membrane Laminated safety glass, non-reflective	12.1	800 x 600	**XVS-440-12MPI-1-10** 139975		
	Resistive touch 12.1" TFT LCD	Standard membrane (fully laminated)	12.1	800 x 600	**XVS-430-12MPI-1-10** 139974		
	Infra-red touch 15" TFT LCD	Standard membrane Laminated safety glass, non-reflective	15	1024 x 768	**XVS-460-15MPI-1-10** 139976		

Information relevant for export to North America

Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking
UL File No.	E208621
UL CCN	NWGQ2, NWGQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Conditions of Acceptability	The investigated Pollution Degree is: 2 Proper bonding to the end-product main protective earthing termination is: Required The following end-product enclosures are required: Fire, Electrical The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks.
Degree of Protection	IEC: IP65, UL/CSA Type: -

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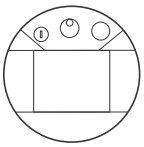
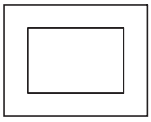
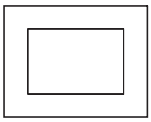
	Display	Operating elements	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
XVM400						
• Mobile HMI (No PLC function possible) with communication through on-board interface. • Communication scope extendable through licensing, → Page 14/12. • Standard front, 31 membrane keys, 4 status LEDs • Insulating enclosure and front plate • Processor: RISC central processing unit, 32-bit, 400 MHz • OS, program and data memory : min 64 MB • Built-in interfaces: 1 × Ethernet, 1 × RS232-C, 1 × USB host • Software (engineering): Visualization = GALILEO (runtime already installed) • Windows CE 5.0 license (incl.)						
	Resistive touch 6.5" TFT LCD 64 k Colors	2 acknowledgement keys (3-stage, 2-circuit) externally wired Emergency switching off button (2-circuit), externally wired	**XVM-430-65TVB-1-11** 139996		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E176666 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP65, UL/CSA Type: -
	Resistive touch 6.5" TFT LCD 64 k Colors	2 acknowledgement keys (3-stage, 2-circuit) externally wired Emergency switching off button (2-circuit), externally wired Key switch (3-position), internally wired Electronic hand wheel, internally wired	**XVM-450-65TVB-1-11** 139998			
	Resistive touch 6.5" TFT LCD 64 k Colors	2 acknowledgement keys (3-stage, 2-circuit) externally wired Key switch (3-position), internally wired Electronic hand wheel, internally wired	**XVM-410-65TVB-1-11** 139997			

	Display	Front design	Screen diagonal Inches	Resolution Pixels	**Part No.** Article No.	**Price** See price list	Std. pack	Notes
XV400								
• HMI or HMI PLC with communication through on-board interface. • PLC function and communications scope can be upgraded with licenses, → Page 14/12. • Standard front, stainless steel front, special fronts please inquire • Metal enclosure and front plate • Processor: RISC central processing unit, 32-bit, 400 MHz • OS, program and data memory: 64 MB • Software (engineering): visualization = GALILEO or EPAM, PLC = XSOFT-CODESYS-2 • WinCE license required → XV accessories • Compact Flash™ required → S XV accessories								
— Display: 5.7" CSTN LCD (color display), 256 colors — 1 slot for Compact Flash™ cards — 1 slot for communication cards — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × CAN, 1 × USB host, 1 × USB device								
	Infra-red touch 5.7" CSTN LCD (Color display)	Standard front with standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	**XV-442-57CQB-1-10** 139892		1 off	–
	Infra-red touch 5.7" CSTN LCD (Color display)	Four-hole front with standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	**XV-442-57CQB-1-20** 139894			1)
	Infra-red touch 5.7" CSTN LCD (Color display)	Satin-finish brushed stainless steel Laminated safety glass, non-reflective	5.7	320 x 240	**XV-442-57CQB-1-50** 139896			1) 2)
	Resistive touch 5.7" CSTN LCD (Color display)	Standard front with standard membrane (fully laminated)	5.7	320 x 240	**XV-432-57CQB-1-10** 139890			–
— Display: 5.7" or 8.4" TFT LCD (Color display), adjustable: 65536 or 256 colors — 1 slot for Compact Flash™ card — 1 slot for communication cards — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × CAN, 1 × USB host, 1 × USB device								
	Infra-red touch 5.7" TFT LCD	Standard front with standard membrane Laminated safety glass, non-reflective	5.7	320 x 240	**XV-460-57TQB-1-10** 139897		1 off	–
	Infra-red touch 5.7" TFT LCD	Satin-finish brushed stainless steel Laminated safety glass, non-reflective	5.7	320 x 240	**XV-460-57TQB-1-50** 139898			2)
	Resistive touch 5.7" TFT LCD	Standard front with standard membrane (fully laminated)	5.7	320 x 240	**XV-450-57TQB-1-10** 139899			–
	Infra-red touch 8.4" TFT LCD	Standard front with standard membrane Laminated safety glass, non-reflective	8.4	640 x 480	**XV-460-84TVB-1-10** 139900			–

Instructions

1) Not for new applications.
2) Approved for II 2G Ex px II IP5x (ATEX 94/9/EC):
Observe installation instructions to IP69K.

Information relevant for export to North America

Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking
UL File No.	E208621
UL CCN	NWGQ2, NWGQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Conditions of Acceptability	The investigated Pollution Degree is: 2 Proper bonding to the end-product main protective earthing termination is: Required The following end-product enclosures are required: Fire, Electrical The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks.
Degree of Protection	IEC: IP65, UL/CSA Type: -

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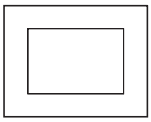
	Display	Front design	Screen diagonal Inches	Resolution Pixels	**Part No.** Article No.	**Price** See price list	Std. pack	Notes
XV400								
— Display: 10.4", 12.1" or 15" TFT LCD (Color display), adjustable: 65536 or 256 colors — 2 slots for Compact Flash™ cards — 2 slots for communication cards — Built-in interfaces: 1 × Ethernet 100/10, 1 × RS232, 1 × CAN, 2 × USB host, 1 × USB device								
	Infra-red touch 10.4" TFT LCD	Standard front with standard membrane Laminated safety glass, non-reflective	10.4	640 x 480	**XV-440-10TVB-1-10** 139904		1 off	–
	Infra-red touch 10.4" TFT LCD	Four-hole front with standard membrane Laminated safety glass, non-reflective	10.4	640 x 480	**XV-440-10TVB-1-20** 139906		1 off	1)
	Infra-red touch 10.4" TFT LCD	Satin-finish brushed stainless steel Laminated safety glass, non-reflective	10.4	640 x 480	**XV-440-10TVB-1-50** 139908		1 off	2)
	Resistive touch 10.4" TFT LCD	Standard front with standard membrane (fully laminated)	10.4	640 x 480	**XV-430-10TVB-1-10** 139902		1 off	–
	Infra-red touch 12.1" TFT LCD	Standard front with standard membrane Laminated safety glass, non-reflective	12.1	800 x 600	**XV-440-12TSB-1-10** 139911		1 off	–
	Infra-red touch 12.1" TFT LCD	Four-hole front with standard membrane Laminated safety glass, non-reflective	12.1	800 x 600	**XV-440-12TSB-1-20** 139913		1 off	1)
	Infra-red touch 12.1" TFT LCD	Satin-finish brushed stainless steel Laminated safety glass, non-reflective	12.1	800 x 600	**XV-440-12TSB-1-50** 139915		1 off	2)
	Resistive touch 12.1" TFT LCD	Standard front with standard membrane (fully laminated)	12.1	800 x 600	**XV-430-12TSB-1-10** 139909		1 off	–
	Infra-red touch 15" TFT LCD	Standard front with standard membrane Laminated safety glass, non-reflective	15	1024 x 768	**XV-460-15TXB-1-10** 139916		1 off	–
	Infra-red touch 15" TFT LCD	Four-hole front with standard membrane Laminated safety glass, non-reflective	15	1024 x 768	**XV-460-15TXB-1-20** 139917		1 off	1)
	Infra-red touch 15" TFT LCD	Satin-finish brushed stainless steel Laminated safety glass, non-reflective	15	1024 x 768	**XV-460-15TXB-1-50** 139918		1 off	–

Instructions

1) Not for new applications.
2) Approved for II 2G Ex px II IP5x (ATEX 94/9/EC):
Zone 1, Category 2G (Only for flush-mounting in a pressurized enclosure! Max. permissible excess pressure: 10 mbar continuous.)
Zone 2, Category 3G (Only for flush-mounting in a pressurized enclosure! Max. permissible excess pressure: 10 mbar continuous.)

Information relevant for export to North America

Product Standards	UL 60950-01; cUL; IEC/EN 61131-2; CE marking
UL File No.	E208621
UL CCN	NWGQ2, NWGQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Conditions of Acceptability	The investigated Pollution Degree is: 2 Proper bonding to the end-product main protective earthing termination is: Required The following end-product enclosures are required: Fire, Electrical The unit must be supplied via a SELV source. The provided Ethernet Connection is only allowed to connect to inhouse networks.
Degree of Protection	IEC: IP65, UL/CSA Type: -

Description	For use with	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
Windows CE licenses					
License for Windows CE 3.0 incl. license label	XV-2… XVH-3… XV-4… XVS-4…	**LIC-OS-CE30** 140405		1 off	UL/CSA certification not required
License for Windows CE 5.0 Core incl. license label		**LIC-OS-CE50-C** 140406			
License for Windows CE 5.0 Professional Plus incl. license label		**LIC-OS-CE50-PP** 140408			
Memory cards					
SD memory card with min. 128 MByte Without operating system	XV-1…	**MEMORY-SD-A1-S** 139807		1 off	UL/CSA certification not required
Compact flash with min. 128 MByte Without operating system	XV-2… XVH-3… XV-4… XVS-4…	**MEMORY-CF-A1-S** 139528			
Compact flash with min. 128 MByte Windows CE 3.0 preinstalled Without Windows license (license required (LIC-OS-CE30))	XV-2… XVH-3… XV-4… XVS-4…	**OS-FLASH-A1-S** 140366			
Compact flash with min. 128 MByte Windows CE 5.0 Core preinstalled Without Windows license (license required (LIC-OS-CE 50-C))		**OS-FLASH-A1-C** 140368			
XV license product certificates					
License product certificate PLC with license label COMPACT	XV-1…-B… XV-1…-D…	**LIC-PLC-MXP-COMPACT** 142581		1 off	UL/CSA certification not required
License product certificate PLC with license label LIGHT	XV-2…-57BAS… XV-2…-57CNN…	**LIC-PLC-MXP-LIGHT** 140388			
License product certificate PLC with license label SMALL	XV-2…-57MPN… XV-4…-57… XV-4…-84… XVS-4…-57… XVS-4…-84…	**LIC-PLC-MXP-SMALL** 140389			
License product certificate PLC with license label MEDIUM	XV-4…-10… XV-4…-12… XV-4…-15… XVS-4…-10… XVS-4…-12… XVS-4…-15…	**LIC-PLC-MXP-MEDIUM** 140390			
License product certificate 40 POINTS	XV-1… XV-2… XVH-3… XV-4… XVS-4… XVM-4...	**LIC-OPT-1ST-LEVEL** 140391			
License product certificate 80 POINTS		**LIC-OPT-2ND-LEVEL** 140392			
License product certificate 160 POINTS		**LIC-OPT-3RD-LEVEL** 140393			
Additional fixing brackets					
4 mounting brackets with grub screw	XVH-3… XV-4… XVS-4…	**ACCESSORIES-HKS-IP65** 139809		1 off	UL/CSA certification not required
100 mounting brackets with grub screw		**ACCESSORIES-HKS-IP65-100** 139810			

HPL14013EN

Description	For use with	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
Standard accessories					
Supplied as standard with devices					
Device accessories as replacement for insulated devices: 8 mounting brackets with grub screw for flush mounting 1 sealing profile for flush mounting device 1 power supply plug 1 touch pen	XV-1… XV-2…	**ACCESSORIES-TP-57-KG-1** 139837		1 off	UL/CSA certification not required
Device accessories as replacement for 5.7" devices with resistive touch and metal front: 4 mounting brackets with grub screw for flush mounting 1 sealing profile for flush mounting device 1 power supply plug 1 touch pen	XVH-330… XV-432-57… XV-450-57… XVS-430-57… XVS-450-57…	**ACCESSORIES-TP-57-RES-1** 139827			
Device accessories as replacement for 5.7" devices with infrared touch and standard front: 4 mounting brackets with grub screw for flush mounting 1 sealing profile for flush mounting device 1 power supply plug	XVH-34… XV-442-57… XV-460-57… XVS-440-57… XVS-460-57…	**ACCESSORIES-TP-57-IR-1**[1)] 139828			
Device accessories as replacement for 5.7" devices with infrared touch and stainless steel front: 8 mounting brackets with grub screw for flush mounting 1 seal for flush mounting device 1 power supply plug	XVH-340-57…-50 XV-442-57…-50 XV-460-57…-50	**ACCESSORIES-TP-57-EST-1** 139830			
Device accessories as replacement for 10.4" and 12.1" devices with resistive touch: 6 mounting brackets with grub screw for flush mounting 1 sealing profile for flush mounting device 1 power supply plug 1 touch pen	XV-430-10… XV-430-12… XVS-430-10… XVS-430-12…	**ACCESSORIES-TP-10/12-RES-1** 139831			UL/CSA certification not required
Device accessories as replacement for 10.4", 12.1" and 15" devices with infrared touch: 8 mounting brackets with grub screw for flush mounting 1 sealing profile for flush mounting device 1 power supply plug	XV-440-10… XV-440-12… XV-440-15… XVS-440-10… XVS-440-12… XVS-460-15… XP-7…-10… XP-7…-12… XP-7…-15…	**ACCESSORIES-TP-15-IR-1** 139843			
Communication cards Protocols for communication cards → Page 14/14					
Multiple protocol card	XV-4…	**COM-MPB1-TP** 139850		1 off	UL/CSA certification refer to main component information
Multiple protocol card MPI		**COM-MPB2-TP** 139847			
PROFIBUS-DP master (12 MBaud)		**COM-DPM-MC2** 139853			
PROFIBUS-DP slave (12 MBaud)		**COM-PDP-TP** 139849			
EIB (3rd release)		**COM-EIB2-TP** 139852			
Accessories for Mobile Panel					
Wall mount with cable holder	XVM-4…	**KETOP-WB095** 139999		1 off	UL/CSA certification not required
Switch box outside control panel IP65		**KETOP-CB211** 140002		1 off	–
Switch box for installation inside control panel		**JB001/ASET** 140003		1 off	–
Connection cable, 5 m		**KETOP-TT050-MV1** 140000		1 off	UL/CSA certification not required
Connection cable, 10 m		**KETOP-TT100-MV1** 140001			
Connection cable, 15 m		**KETOP-TT150-MV1** 140005			
Jumper plug for emergency switching off		**KETOP-BC001** 140004			
Spare keys, 2 off	XVM-410… XVM-450…	**KETOP-EKY001** 140006			

Notes

[1)] XVH-340-57CAN-1-50, XV-442-57CQB-1-50 and XV-460-57TQB-1-50 have a special seal.

Engineering

Protocols for communication cards for panel XV400

For panels XV400, communications protocols are available through optional plug-in communication cards (No license products required):
Excerpt From the most common protocols, which are available for XV400 devices through optional plug-in communication cards:

Protocol	Required communication cards for XV400
EIB (3rd release)	COM-EIB2-TP
Matsushita FP series	COM-MPB1-TP / COM-MPB2-TP
Mitsubishi A series/F series	COM-MPB1-TP / COM-MPB2-TP
Moeller Suconet K	COM-MPB1-TP / COM-MPB2-TP
Omron C, H, or K series	COM-MPB1-TP / COM-MPB2-TP
PROFIBUS-DP master (12 Mbaud)	COM-DPM-MC2
PROFIBUS-DP slave (12 Mbaud)	COM-PDP-TP
Siemens MPI	COM-MPB2-TP
Telemecanique Unitelway new	COM-MPB1-TP / COM-MPB2-TP

To inquire about further protocols, contact your vendor.

Licensing for Panel XV…

The panels XV100, XV200, XVH300, XV400, XVS400 and XVM400 are supplied with license points saved to the device. License points are required to be able to perform certain functions with the device:
- XSOFT-CODESYS-2 runtime for the PLC function (not possible with XV-102-A…,XVH300 and XVM400)
- Runtime for the visualization (GALILEO or EPAM)
- Tools (e. g. CE Telediag, S7 PG Router)
- Communication (e.g. Ethernet, CANopen, Siemens MPI)

Number of license points supplied with standard devices:
- 140 license points: XV100 (without PLC function), XV200, XVH300, XV400, XVS400
- 240 license points: XV100 with PLC function
- 260 licence points: XVM400

If the device does not contain enough license points for the required functions or to add the PLC function to the HMI, you must purchase additional license points. To do this you need one or more license product certificates. The following are available:

- License product certificates for the PLC function: To enable the PLC function (XSOFT-CODESYS-2) special license product certificates are required. These contain a license label for the device type, which must be applied to the device fir legal reasons.
- License product certificates for visualization, communication and tools

Determining required license points

For the visualization and tools and communication features used, add the license points required for each function. Communication connections to several devices with the same protocol must be counted only once. From this total, subtract the points already contained on the devices (e.g. 140 points).
The difference is the number of license points that you must install for communication protocols and tools through license product certificates.

Table: Required license points for runtime and tools

Visualization/Tools	Required on-board interface	Licence points
GALILEO-Runtime	None	100
EPAM runtime	None	100
XSOFT-CODESYS-2 runtime (PLC function)	None	100
XSOFT-CODESYS-2 runtime (PLC function and TargetVisu function)	None	200
CE Telediag	RS232	40
S7 PG Router	Ethernet and PROFIBUS	80
CAN Monitor	CAN	0
Domain Server	Ethernet	80

Table: Required license points for communication through on-board interface

Manufacturer	PLC	Protocol	Required on-board interface	Licence points XSOFT-CODE-SYS-2	Licence points GALILEO	Licence points EPAM
Eaton	XV with PLC function		Local	-	0	0
	XV with PLC function		Ethernet	0	40	0
		CANopen, master	CAN	0	-	-
		CANopen, PDO	CAN	0	40	-
		CANopen, SDO	CAN	0	40	-
		XV200 DP master (1.5 MBaud)	PROFIBUS	40	-	-
		XV100/XVS400 DP master (1.5 Mbaud)	PROFIBUS	0	-	-
		Modbus RTU	RS232	0	40	-
		Modbus TCP	Ethernet	0	80	-
	CoDeSys		Ethernet	0	40	0
A. Bradley	Logix	DF1	RS232	-	120	-
	Logix	Ethernet/IP	Ethernet	-	120	-
	MicroLogix	SLC5/03 MicroLogix DF1	RS232	-	40	-
Beckhoff	TwinCAT	ADS	Ethernet	-	80	-
	BC9000	ADS	Ethernet	-	80	-
HIMA	HIMatrix	Modbus TCP	Ethernet	-	80	-
Mitsubishi	PG-AX/PG-FX		RS232	-	40	-
Eaton	easy500/easy700		RS232	-	40	-
	easy800/MFD-Titan		RS232	-	40	-
	PS4		RS232	-	40	-
	XC100, XC200		CAN	-	40	-
	XC100, XC200		Ethernet	-	40	-
	PS4	Suconet K (to XVH342-57SKS)	Suconet K	-	0	-
Siemens	S7	Industrial Ethernet	Ethernet	-	80	-
	S7	MPI	PROFIBUS	-	40	-
	S7	PROFIBUS-DP (1.5 Mbaud) S7 default profile	PROFIBUS	-	40	-
	S7-200	PPI	PROFIBUS	-	40	-
-	-	XVM400 keypad	Local	-	40	-

- Communication currently not available

To inquire about further protocols, contact your vendor.

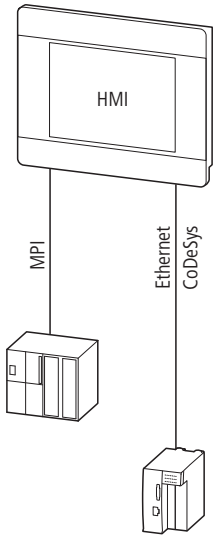
Communication cards for MICRO PANEL XV400

For panels XV400 further communications protocols are available through optional plug-in communication cards (No license products required).
Depending on the required functionality the following license product certificates are available (→ XV accessories):

Licensing examples

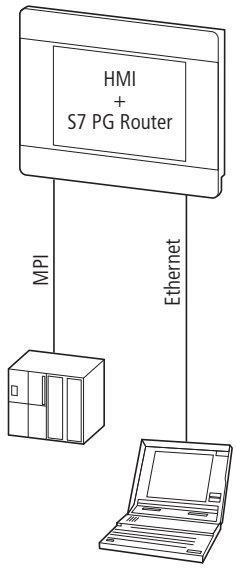
HMI application: XV100, XV200, XVS400		
Visualization, communication		
Visualization (GALILEO)	100	Points
Communication MPI	40	Points
Communication CoDeSys external	40	Points
Total	180	Points
Contained in device on delivery	-140	Points
Additionally required points for communication	40	Points
PLC		
PLC application		No

Required license product certificates:
1 x LIC-OPT-1ST-LEVEL (40 points)



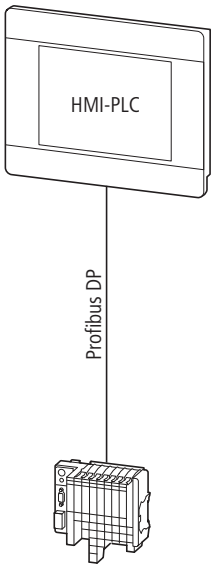
HMI application: XV100, XV200, XVS400, with additional software S7 PG Router		
Visualization, communication		
Visualization (GALILEO)	100	Points
Communication MPI	40	Points
S7 PG Router	80	Points
Total	220	Points
Contained in device on delivery	-140	Points
Additionally required points for communication	80	Points
PLC		
PLC application		No

Required license product certificates:
1 x LIC-OPT-2ND-LEVEL (80 points)



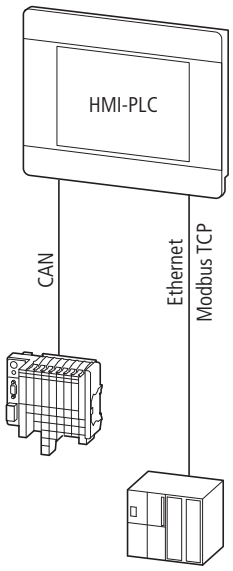
HMI-PLC Application: XV100		
Visualization, communication		
Visualization (GALILEO)	100	Points
Communication HMI-PLC local	0	Points
Communication CANopen or PROFIBUS-DP master (XSOFT-CODESYS-2)	0	Points
Total	100	Points
Contained in device on delivery	-140	Points
Additionally required points for communication	0	Points
PLC		
PLC application	100	Points

Required license product certificates:
1 x LIC-PLC-MXP-COMPACT (100 points)



For device versions XV-102-…-PLC license LIC-PLC-MXP-COMPACT is included with the device as standard (the device therefore has 240 license points).

HMI-PLC Application: XV400 10.4“		
Visualization, communication		
Visualization (GALILEO)	100	Points
Communication HMI-PLC local	0	Points
Communication Modbus TCP client (GALILEO)	80	Points
Communication CANopen (XSOFT-CODESYS-2)	0	Points
Total	180	Points
Contained in device on delivery	-140	Points
Additionally required points for communication	40	Points
PLC		
PLC application	100	Points



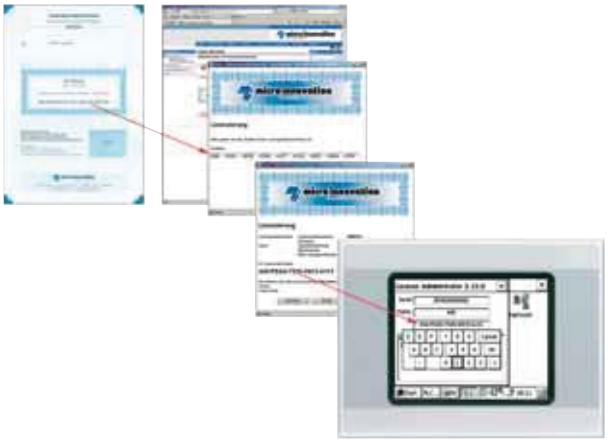
Required license product certificates:
1 x LIC-OPT-1ST-LEVEL (40 points)
1 x LIC-PLC-MXP-MEDIUM (100 points)

For device versions XV-102-…-PLC license LIC-PLC-MXP-COMPACT is included with the device as standard (the device therefore has 240 license points).

Redeeming a license product certificate (XV100, XV200, XV400, XVS400, XVH300)

1 Order the required license product certificate.
2 Keep the following information available:
– Certificate number of license product certificate
– The serial number of your device
– Your e-mail address
3 On the Micro Innovation website (www.microinnovation.com/license), select menu item “Validate License” and click [Start Licensing].
4 In the new window that opens, enter your certificate number. The license product certificate is associated with a specific device through its serial number. The website generates a license code, which is immediately shown on the web page.
5 Enter the license code in your device:
– On the device, select [Start] > [Programs] > [Control Panel].
– Double-click the Licence icon.
– Enter the license code with the License Administrator tool (Change Licence).
6 Restart the device.

After the device has been restarted the new license points are available.



Redeeming a license product certificate for XVM400 devices

Follow the procedure described in document M002379 (Mobile PANEL XVM400), which you can find on the Micro Innovation website under “Downloads”.

	XV-102-A...-35MQR-10					XV-102-B...-35MQR-10-PLC					
Technical data											
Display											
Screen diagonal/type	3.5" TFT LCD (monochrome)					3.5" TFT LCD (monochrome)					
Resolution	QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)					QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)					
Visible screen area	70 mm x 53 mm					70 mm x 53 mm					
Color resolution (grayscale or color)	32 grey levels					32 grey levels					
Contrast ratio	Normally 300:1					Normally 300:1					
Brightness	Normally 250 cd/m²					Normally 250 cd/m²					
Backlight	LED, dimmable via software					LED, dimmable via software					
Lifespan of backlight	Normally 40000 h					Normally 40000 h					
Resistive touch protective screen	Touch sensor (glass with membrane)					Touch sensor (glass with membrane)					
Operation											
Technology	Resistive touch, 4-conductor					Resistive touch, 4-conductor					
System											
Processor	RISC, 32 bit, 400 MHz					RISC, 32 bit, 400 MHz					
Internal memory											
DRAM (OS, program and data memory)	64 MByte					64 MByte					
NAND FLASH (can be used for data backup)	Approx. 128 Byte available					Approx. 128 Byte available					
NVRAM (Retain data)	–					Approx. 32 kByte available					
External memory											
SD Memory Card Slot	SDA Specification 1.00					SDA Specification 1.00					
Real-time clock (battery backup)											
Battery	Zero maintenance					Zero maintenance					
Backup time at zero voltage	Normally 10 years					Normally 10 years					
Operating system	Windows CE					Windows CE					
Engineering											
Visualization software	GALILEO/EPAM					GALILEO/EPAM					
PLC programming software	–					XSOFT-CODESYS-2					
Interfaces, communication											
Ethernet	100Base-TX/10Base-T					100Base-TX/10Base-T					
USB Host	–					–					
USB device	USB 2.0, not isolated					USB 2.0, not isolated					
Part No.	...A0…	...A2…	...A3…	...A4…	...A5…	...B0…	...B3…	...B4…	...B5…	...B6…	...B8…
System Port (RS232)	–	–	●[1]	–	●[1]	–	●[1]	–	●[1]	–	–
CAN	–	–	–	–	●[2]	–	–	–	●[2]	●[2]	–
PROFIBUS	–	●[3]	–	–	–	–	–	–	–	–	●[3]
RS485	–	–	–	●[4]	–	–	–	●[4]	–	●[4]	●[4]
Power supply											
Nominal voltage	24 V DC SELV (safety extra low voltage)					24 V DC SELV (safety extra low voltage)					
Permissible voltage	R.m.s.: 19.2 – 30.0 V DC (rated operating voltage -20 %/+25 %) Absolute with ripple: 18.0 – 31.2 V DC Battery operation: 18.0 – 31.2 V DC (rated operating voltage -25 %/+30 %) 35 V DC for a duration of < 100 ms										
Voltage dips	10 ms from nominal voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)										
Input power	Max. 5 W					Max. 5 W					
Protection against polarity reversal	Yes					Yes					
Fuse	Yes (fuse not accessible)					Yes (fuse not accessible)					
Potential isolation	No					No					
General											
Front design	Standard membrane (fully enclosed)					Standard membrane (fully enclosed)					
Degree of protection											
Front	IP65					IP65					
Rear	IP20					IP20					
Approvals											
Approvals	cUL					cUL					
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, Category 3D					II 3D Ex II T70°C IP5x: Zone 22, Category 3D					
Applied standards and directives											
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-4, EN 61131-2					EN 61000-6-2, EN 61000-6-4, EN 61131-2					
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463					EN 60079-0, EN 61241-1, EN 13463					
Safety	EN 60950/UL 60950					EN 60950/UL 60950					
Product standards	EN 50178, EN 61131-2					EN 50178, EN 61131-2					
Weight	Approx. 0.3 kg					Approx. 0.3 kg					
Environmental Conditions											
Temperature											
Operation	0 – 50°C					0 – 50°C					
Storage/transport	-20 – 60°C					-20 – 60°C					
Relative humidity	10 - 95%, non-condensing					10 - 95%, non-condensing					
Impact resistance	To IEC 68-2-27					To IEC 68-2-27					
Vibration	To IEC 68-2-6					To IEC 68-2-6					

Notes

[1] RS232, not isolated (D-sub 9-pin, UNC)

[2] CAN, not isolated (D-sub 9-pin, UNC)

XV-102B...-35TQR-10					XV-102-B...-35TQR-10-PLC					XV-102-D...-57TVR-10					XV-102-D...70TWR-10...				
3.5" TFT LCD (color)					3.5" TFT LCD (color)					5.7" TFT LCD (color)					7" TFT LCD (color)				
QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)					QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)					VGA (640 × 480 pixels or 480 × 640 pixels in portrait format)					WVGA (800 × 480 pixels or 480 × 800 pixels in portrait format)				
70 mm x 53 mm					70 mm x 53 mm					115 mm x 86 mm					152 mm x 91 mm				
64 k Colors					64 k Colors					64 k Colors					64 k Colors				
Normally 300:1					Normally 300:1					Normally 300:1					Normally 300:1				
Normally 250 cd/m²					Normally 250 cd/m²					Normally 250 cd/m²					Normally 250 cd/m²				
LED, dimmable via software					LED, dimmable via software					LED, dimmable via software					LED, dimmable via software				
Normally 40000 h					Normally 40000 h					Normally 40000 h					Normally 40000 h				
Touch sensor (glass with membrane)					Touch sensor (glass with membrane)					Touch sensor (glass with membrane)					Touch sensor (glass with membrane)				
Resistive touch, 4-conductor					Resistive touch, 4-conductor					Resistive touch, 4-conductor					Resistive touch, 4-conductor				
RISC, 32 bit, 400 MHz					RISC, 32 bit, 400 MHz					RISC, 32 bit, 400 MHz					RISC, 32 bit, 400 MHz				
64 MByte					64 MByte					64 MByte					64 MByte				
Approx. 128 Byte available					Approx. 128 Byte available					Approx. 128 Byte available					Approx. 128 Byte available				
Approx. 32 kByte available					Approx. 32 kByte available					Approx. 32 kByte available					Approx. 32 kByte available				
SDA Specification 1.00					SDA Specification 1.00					SDA Specification 1.00					SDA Specification 1.00				
Zero maintenance					Zero maintenance					Zero maintenance					Zero maintenance				
Normally 10 years					Normally 10 years					Normally 10 years					Normally 10 years				
Windows CE					Windows CE					Windows CE					Windows CE				
GALILEO/EPAM					GALILEO/EPAM					GALILEO/EPAM					GALILEO/EPAM				
XSOFT-CODESYS-2					XSOFT-CODESYS-2					XSOFT-CODESYS-2					XSOFT-CODESYS-2				
100Base-TX/10Base-T					100Base-TX/10Base-T					100Base-TX/10Base-T					100Base-TX/10Base-T				
–					–					USB 2.0 (1.5 - 12 Mbit/s), not isolated									
USB 2.0, not isolated					USB 2.0, not isolated					USB 2.0, not isolated					USB 2.0, not isolated				
...B0…	...B2…	...B3…	...B4…	...B5…	...B0	...B3	...B4	...B5	...B6	...B8	...D0…	...D6…	...D8…	...D6... PLC	...D8... PLC	...D0…	...D6…	...D8…	...D6... PLC	...D8... PLC
–	–	●[1]	–	●[1]	–	●[1]	–	●[1]	–	–	●[1]	●[1]	●[1]	●[1]	●[1]	●[1]	●[1]	●[1]	●[1]	●[1]
–	–	–	–	●[2]	–	–	–	●[2]	●[2]	–	–	●[2]	–	●[2]	–	–	●[2]	–	●[2]	–
–	●[3]	–	–	–	–	–	–	–	–	●[3]	–	–	●[3]	–	●[3]	–	–	●[3]	–	●[3]
–	–	–	●[4]	–	–	–	●[4]	–	●[4]	●[4]	–	●[4]	●[4]	●[4]	●[4]	–	●[4]	●[4]	●[4]	●[4]
24 V DC SELV (safety extra low voltage)					24 V DC SELV (safety extra low voltage)					24 V DC SELV (safety extra low voltage)					24 V DC SELV (safety extra low voltage)				
R.m.s.: 19.2 – 30.0 V DC (rated operating voltage -20 %/+25 %) Absolute with ripple: 18.0 – 31.2 V DC Battery operation: 18.0 – 31.2 V DC (rated operating voltage -25 %/+30 %) 35 V DC for a duration of < 100 ms																			
10 ms from nominal voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)																			
Max. 5 W					Max. 5 W					Max. 10 W					Max. 10 W				
Yes					Yes					Yes					Yes				
Yes (fuse not accessible)																			
No					No					No					No				
Standard membrane (fully enclosed)					Standard membrane (fully enclosed)					Standard membrane (fully enclosed)					Standard membrane (fully enclosed)				
IP65					IP65					IP65					IP65				
IP20					IP20					IP20					IP20				
cUL					cUL					cUL					cUL				
II 3D Ex II T70°C IP5x: Zone 22, Category 3D					II 3D Ex II T70°C IP5x: Zone 22, Category 3D					II 3D Ex II T70°C IP5x: Zone 22, Category 3D					II 3D Ex II T70°C IP5x: Zone 22, Category 3D				
EN 61000-6-2, EN 61000-6-4, EN 61131-2					EN 61000-6-2, EN 61000-6-4, EN 61131-2					EN 61000-6-2, EN 61000-6-4, EN 61131-2					EN 61000-6-2, EN 61000-6-4, EN 61131-2				
EN 60079-0, EN 61241-1, EN 13463					EN 60079-0, EN 61241-1, EN 13463					EN 60079-0, EN 61241-1, EN 13463					EN 60079-0, EN 61241-1, EN 13463				
EN 60950/UL 60950					EN 60950/UL 60950					EN 60950/UL 60950					EN 60950/UL 60950				
EN 50178, EN 61131-2					EN 50178, EN 61131-2					EN 50178, EN 61131-2					EN 50178, EN 61131-2				
Approx. 0.3 kg					Approx. 0.3 kg					Approx. 0.6 kg					Approx. 0.6 kg				
0 – 50°C					0 – 50°C					0 – 50°C					0 – 50°C				
-20 – 60°C					-20 – 60°C					-20 – 60°C					-20 – 60°C				
10 - 95%, non-condensing					10 - 95%, non-condensing					10 - 95%, non-condensing					10 - 95%, non-condensing				
To IEC 68-2-27					To IEC 68-2-27					To IEC 68-2-27					To IEC 68-2-27				
To IEC 68-2-6					To IEC 68-2-6					To IEC 68-2-6					To IEC 68-2-6				

[3] PROFIBUS, not isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)

[4] RS485, not isolated (D-sub 9-pin, UNC)

	XV-230-57CNN-1-10	XV-230-57MPN-1-10	XV-232-57BAS-1-10	XV-252-57CNN-1-10	XV-252-57MPN-1-10
Display					
Screen diagonal/type	5.7" FSTN LCD (monochrome display)			5.7" CSTN LCD (Color display)	
Resolution	QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)				
Visible screen area	115 mm x 86 mm				
Color resolution (grayscale or color)	256 grey levels	256 grey levels	256 grey levels	256 colors	256 colors
Contrast ratio	Normally 10:1	Normally 10:1	Normally 10:1	Normally 35:1	Normally 35:1
Brightness	Normally 150 cd/m²				
Backlight	1 x CCFL, dimmable via software				
Lifespan of backlight	Normally 50000 h				
Resistive touch protective screen	Touch sensor (glass with membrane)				
Operation					
Technology	Resistive touch, 4-conductor				
System					
Processor	RISC, 32-bit, 200 MHz				
Internal memory					
DRAM (OS, program and data memory)	32 MByte	32 MByte	32 MByte	32 MByte	32 MByte
FLASH (can be used for data backup)	Approx. 1.5 MByte available				
NVRAM (Retain data)	Approx. 100 Byte available				
External memory					
CF slot	1 x CompactFlash card type I for operating system, programs and data				
Real-time clock (battery backup)					
Battery	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Backup time at zero voltage	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years
Operating system	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
Engineering					
Visualization software	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM
PLC programming software	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2
Interfaces, communication					
Ethernet	100Base-TX/10Base-T				
System port	–	–	RS232, not isolated (D-sub 9-pin, UNC)		
CAN	CAN, not isolated (D-sub 9-pin, UNC)	–	–	CAN, not isolated (D-sub 9-pin, UNC)	–
PROFIBUS	–	PROFIBUS, not isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)	–	–	PROFIBUS, not isolated, max. 1.5 MBit/s (D-sub 9-pin, UNC)
USB device	USB 1.1, not isolated				
Power supply					
Nominal voltage	24 V DC SELV (safety extra low voltage)				
Permissible voltage	R.m.s.: 19.2 – 30.0 V DC (rated operating voltage -20 %/+25 %) Absolute with ripple: 18.0 – 31.2 V DC Battery operation: 18.0 – 31.2 V DC (rated operating voltage -25 %/+30 %) 35 V DC for a duration of < 100 ms				
Voltage dips	20 ms from nominal voltage (24 V DC), 10 ms from undervoltage (20.4 V DC)				
Input power	Max. 8 W	Max. 8 W	Max. 8 W	Max. 8 W	Max. 8 W
Protection against polarity reversal	Yes	Yes	Yes	Yes	Yes
Fuse	Yes (zero maintenance)	Yes (zero maintenance)	Yes (zero maintenance)	Yes (zero maintenance)	Yes (zero maintenance)
Potential isolation	No	No	No	No	No

	XV-230-57CNN-1-10	XV-230-57MPN-1-10	XV-232-57BAS-1-10	XV-252-57CNN-1-10	XV-252-57MPN-1-10
General					
Front design	Standard membrane	Standard membrane	Standard membrane	Standard membrane	Standard membrane
Degree of protection					
Front	IP65	IP65	IP65	IP65	IP65
Rear	IP20	IP20	IP20	IP20	IP20
Approvals					
Approvals	cUL	cUL	cUL	cUL	cUL
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, Category 3D				
Applied standards and directives					
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2				
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463				
Safety	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950
Product standards	EN 50178, EN 61131-2				
Weight	Approx. 0.7 kg	Approx. 0.7 kg	Approx. 0.7 kg	Approx. 0.7 kg	Approx. 0.7 kg
Environmental Conditions					
Temperature					
Operation	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
Relative humidity	10 - 95%, non-condensing				
Impact resistance	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27
Vibration	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6



	MFD4-5-XRC-30
Display	
Screen diagonal/type	5.7" TFT Color display
Resolution	QVGA (320 x 240 pixels)
Visible screen area	118 mm x 89 mm
Color resolution (grayscale or color)	32 K
Contrast ratio	Normally 350:1
Brightness	Normally 500 cd/m²
Backlight	1 x CCFL, dimmable via software
Lifespan of backlight	Normally 50000 h
Resistive touch protective screen	Touch sensor (glass with membrane)
Operation	
Technology	Resistive touch, 4-conductor
System	
Processor	Risc, 32-bit 130 MHz
Internal memory	
DRAM (OS, program and data memory)	4 MByte
FLASH (can be used for data backup)	512 kByte
NVRAM (Retain data)	32 kByte
External memory	
Slot	1 x MMC for operating system, programs and data
Real-time clock (battery backup)	
Battery	Lithium, 1/2AA(3.6V)
Backup time at zero voltage	Normally 5 years
Operating system	Windows CE
Engineering	
Visualization software	XSOFT-CODESYS-2
PLC programming software	XSOFT-CODESYS-2
Interfaces, communication	
Ethernet	100Base-TX/10Base-T
System port	RS232, not isolated (D-sub 9-pin, UNC)
CAN	CAN, galvanically isolated (D-sub 9-pin, UNC)
PROFIBUS	–
USB device	–
Power supply	
Nominal voltage	24 V DC SELV (safety extra low voltage)
Permissible voltage	20.4 to 28.8 V DC, residual ripple ≤ 5 %
Voltage dips	Duration of dip to IEC/EN 61131-2: 10 ms
Input power	Max. 10 W
Protection against polarity reversal	Yes
Fuse	No
Potential isolation	No
General	
Enclosure	Metal
Front design	Seamless membrane
Degree of protection	
Front	IP65
Rear	IP20
Approvals	
Approvals	LR, GL, DNV,BV, ABS
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T85°C IP5x: Zone 22, Category 3D
Applied standards and directives	
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463
Safety	EN 60950
Product standards	EN 50178, EN 61131-2
Weight	Approx. 1.3 kg
Environmental Conditions	
Temperature	
Operation	0 – 50°C
Storage/transport	- 20 to 70 °C
Relative humidity	10 – 95 %, non-condensing
Impact resistance	15 g/11 ms
Vibration	10 to 57 Hz ± 0.075 mm; 57 to 150 Hz ± 1.0 g

	XVM-430-65TVB-1-11	XVM-450-65TVB-1-11	XVM-410-65TVB-1-11
Display			
Screen diagonal/type	6.5" TFT LCD	6.5" TFT LCD	6.5" TFT LCD
Resolution	VGA (640 x 480 pixel)	VGA (640 x 480 pixel)	VGA (640 x 480 pixel)
Visible screen area	132 mm x 99 mm	132 mm x 99 mm	132 mm x 99 mm
Color resolution (grayscale or color)	64k Colors	64k Colors	64k Colors
Backlight	2 CCFT cold cathode tubes	2 CCFT cold cathode tubes	2 CCFT cold cathode tubes
Lifespan of backlight	Normally 50000 h	Normally 50000 h	Normally 50000 h
Resistive touch protective screen	Touch sensor (glass with membrane)	Touch sensor (glass with membrane)	Touch sensor (glass with membrane)
Operation			
Technology	Resistive touch	Resistive touch	Resistive touch
Keypad	31 membrane keys with tactile feedback, 4 status LEDs	31 membrane keys with tactile feedback, 4 status LEDs	31 membrane keys with tactile feedback, 4 status LEDs
Operating elements	2 acknowledgement keys (3-stage, 2-circuit), externally wired Emergency switching off button (2-circuit), externally wired	2 acknowledgement keys (3-stage, 2-circuit), externally wired Emergency switching off button (2-circuit), externally wired Keyswitch (3-position), internally wired Electronic hand wheel, internally wired	2 acknowledgement keys (3-stage, 2-circuit), externally wired Keyswitch (3-position), internally wired Electronic hand wheel, internally wired
System			
Processor	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz
Internal memory			
DRAM (OS, program and data memory)	Min. 64 MByte	Min. 64 MByte	Min. 64 MByte
FLASH	Min. 64 MByte	Min. 64 MByte	Min. 64 MByte
NVRAM (Retain data)	–	–	–
Operating system	Windows CE	Windows CE	Windows CE
Engineering			
Visualization software	GALILEO	GALILEO	GALILEO
Interfaces, communication			
Ethernet	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T
RS232	RS232-C	RS232-C	RS232-C
USB Host	USB 1.1 (12 Mbit/s)	USB 1.1 (12 Mbit/s)	USB 1.1 (12 Mbit/s)
Power supply			
Nominal voltage	24 V DC	24 V DC	24 V DC
Permissible voltage	R.m.s.: 19.2 – 30.0 V DC	R.m.s.: 19.2 – 30.0 V DC	R.m.s.: 19.2 – 30.0 V DC
Voltage dips	≦ 10 ms	≦ 10 ms	≦ 10 ms
Input power	9.6 W	9.6 W	9.6 W
General			
Front design	Standard membrane Membrane keypad with tactile feedback	Standard membrane Membrane keypad with tactile feedback	Standard membrane Membrane keypad with tactile feedback
Degree of protection			
Front	IP65	IP65	IP65
Rear	IP65	IP65	IP65
Approvals			
Approvals	cUL (UL508)	cUL (UL508)	cUL (UL508)
Applied standards and directives			
Product standards	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2
Weight	Approx. 1.3 kg	Approx. 1.3 kg	Approx. 1.3 kg
Environmental Conditions			
Temperature			
Operation	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 70°C	-20 – 70°C	-20 – 70°C
Relative humidity	5 - 95%, non-condensing	5 - 95%, non-condensing	5 - 95%, non-condensing
Shock (IEC 60068-2-27)	25 g/11ms	25 g/11ms	25 g/11ms
Vibration (IEC 60068-2-6)	10 Hz ≧ f > 57 Hz with 0.15 mm 9 Hz ≧ f > 150 Hz with 2 g	10 Hz ≧ f > 57 Hz with 0.15 mm 9 Hz ≧ f > 150 Hz with 2 g	10 Hz ≧ f > 57 Hz with 0.15 mm 9 Hz ≧ f > 150 Hz with 2 g

	XVH-340-57BAS-1-10	XVH-340-57CAN-1-10	XVH-340-57MPI-1-10
Display			
Screen diagonal/type	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)
Resolution	QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)		
Visible screen area	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm
Color resolution (grayscale or color)	256 colors	256 colors	256 colors
Contrast ratio	Normally 35:1	Normally 35:1	Normally 35:1
Brightness	Normally 150 cd/m²	Normally 150 cd/m²	Normally 150 cd/m²
Backlight	1 x CCFL, dimmable via software		
Lifespan of backlight	Normally 50000 h	Normally 50000 h	Normally 50000 h
Resistive touch protective screen	–	–	–
Infra-red touch protective screen	Laminated safety glass, non-reflective		
Operation			
Technology	Infra-red touch, 47 × 31 logic channels		
System			
Processor	RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz
Internal memory			
DRAM (OS, program and data memory)	64 MByte	64 MByte	64 MByte
FLASH (can be used for data backup)	Approx. 1.5 MByte available	Approx. 1.5 MByte available	Approx. 1.5 MByte available
NVRAM (Retain data)	–	–	–
External memory			
CF slot	1 x CompactFlash card type I/II for operating system, programs and data		
Real-time clock (battery backup)			
Battery	Zero maintenance	Zero maintenance	Zero maintenance
Backup time at zero voltage	Normally 10 years	Normally 10 years	Normally 10 years
Operating system	Windows CE	Windows CE	Windows CE
Engineering			
Visualization software	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM
PLC programming software	–	–	–
Interfaces, communication			
Ethernet	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T
System port	–	–	–
Com Port	–	–	–
CAN	–	CAN, isolated (Sub-D 9-pin plug)	–
PROFIBUS	–	–	PROFIBUS galvanically isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)
USB device	USB 1.1, not isolated		
Power supply			
Nominal voltage	24 V DC SELV (safety extra low voltage)		
Permissible voltage	R.m.s.: 20.4 – 28.8 V DC (rated operating voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms		
Voltage dips	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)		
Input power	Max. 16 W (normally 12 W)	Max. 16 W (normally 12 W)	Max. 16 W (normally 12 W)
Protection against polarity reversal	Yes	Yes	Yes
Fuse	Yes (fuse not accessible)		
Potential isolation	No (0V connection to housing potential)		

XVH-342-57SKS-1-10	XVH-340-57CAN-1-50	XVH-330-57BAS-1-10	XVH-330-57CAN-1-10	XVH-330-57MPI-1-10
5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)
QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)				
115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm
256 colors	256 colors	256 colors	256 colors	256 colors
Normally 35:1	Normally 35:1	Normally 35:1	Normally 35:1	Normally 35:1
Normally 150 cd/m²	Normally 150 cd/m²	Normally 150 cd/m²	Normally 150 cd/m²	Normally 150 cd/m²
1 x CCFL, dimmable via software				
Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h
–	–	Touch sensor (glass with membrane)	Touch sensor (glass with membrane)	Touch sensor (glass with membrane)
Laminated safety glass, non-reflective		–	–	–
Infra-red touch, 47 × 31 logic channels		Resistive touch, 4-conductor	Resistive touch, 4-conductor	Resistive touch, 4-conductor
RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz	RISC, 32-bit, 200 MHz
64 MByte	64 MByte	64 MByte	64 MByte	64 MByte
Approx. 1.5 MByte available	Approx. 1.5 MByte available	Approx. 1.5 MByte available	Approx. 1.5 MByte available	Approx. 1.5 MByte available
–	–	–	–	–
1 x CompactFlash card type I/II for operating system, programs and data				
Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years
Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM
–	–	–	–	–
100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T
RS232 (Sucom A), not isolated (Sub-D 9.pin plug, UNC)	–	–	–	–
RS485 (Suconet K), isolated (Sub-D 9-pin socket, UNC)	–	–	–	–
–	CAN, galvanically isolated (D-sub 9-pin, UNC)	–	CAN, galvanically isolated (D-sub 9-pin, UNC)	–
–	–	–	–	PROFIBUS galvanically isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)
USB 1.1, not isolated				
24 V DC SELV (safety extra low voltage)				
R.m.s.: 20.4 – 28.8 V DC (rated operating voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms				
20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)				
Max. 21 W (normally 17 W)	Max. 16 W (normally 12 W)	Max. 16 W (normally 12 W)	Max. 16 W (normally 12 W)	Max. 16 W (normally 12 W)
Yes	Yes	Yes	Yes	Yes
Yes (fuse not accessible)				
No (0V connection to housing potential)				

	XVH-340-57BAS-1-10	XVH-340-57CAN-1-10	XVH-340-57MPI-1-10
General			
Front design	Standard front with standard membrane	Standard front with standard membrane	Standard front with standard membrane
Degree of protection			
Front	IP65	IP65	IP65
	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)
Rear	IP20	IP20	IP20
Approvals			
Approvals	cUL	cUL	cUL
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D
	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)
Applied standards and directives			
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463
Safety	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950
Product standards	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2
Weight	Approx. 1.7 kg	Approx. 1.7 kg	Approx. 1.7 kg
Environmental Conditions			
Temperature			
Operation	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 60°C	-20 – 60°C	-20 – 60°C
Relative humidity	10 - 95%, non-condensing	10 - 95%, non-condensing	10 - 95%, non-condensing
Impact resistance	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27
Vibration	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6

XVH-342-57SKS-1-10	XVH-340-57CAN-1-50	XVH-330-57BAS-1-10	XVH-330-57CAN-1-10	XVH-330-57MPI-1-10
Standard front with standard membrane	Satin-finish brushed stainless steel	Standard front with standard membrane (fully laminated)	Standard front with standard membrane (fully laminated)	Standard front with standard membrane (fully laminated)
IP65	IP65, IP69K	IP65	IP65	IP65
Additional mounting bracket set required for flush mounting (→ Accessories)	Observe installation instructions to IP69K	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)
IP20	IP20	IP20	IP20	IP20
cUL	cUL	cUL	cUL	cUL
II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D	II 3D Ex II T70°C IP5x: Zone 22, Category 3D
Additional mounting bracket set required for flush mounting (→ Accessories)		Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)	Additional mounting bracket set required for flush mounting (→ Accessories)
EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2
EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463
EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950
EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2
Approx. 1.9 kg	Approx. 2.1 kg	Approx. 1.7 kg	Approx. 1.7 kg	Approx. 1.7 kg
0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
10 - 95%, non-condensing				
To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27
To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6

	XV-442-57CQB-1-10 XV-442-57CQB-1-20	XV-442-57CQB-1-50	XV-432-57CQB-1-10	XV-460-57TQB-1-10	XV-460-57TQB-1-50	XV-450-57TQB-1-10
Display						
Screen diagonal/type	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" CSTN LCD (color)	5.7" TFT LCD (color)	5.7" TFT LCD (color)	5.7" TFT LCD (color)
Resolution	QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)					
Visible screen area	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm
Color resolution (grayscale or color)	256 colors	256 colors	256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors
Contrast ratio	Normally 35:1	Normally 35:1	Normally 35:1	Normally 400:1	Normally 400:1	Normally 400:1
Brightness	Normally 150 cd/m²	Normally 150 cd/m²	Normally 150 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²
Backlight	1 x CCFL, dimmable via software	1 x CCFL, dimmable via software	1 x CCFL, dimmable via software	LED, dimmable via software	LED, dimmable via software	LED, dimmable via software
Lifespan of backlight	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 40000 h	Normally 40000 h	Normally 40000 h
Resistive touch protective screen	–	–	Touch sensor (glass with membrane)	–	–	Touch sensor (glass with membrane)
Infra-red touch protective screen	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting	–	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting	–
Operation						
Technology	Infra-red touch, 47 x 31 logic channels	Infra-red touch, 47 x 31 logic channels	Resistive touch, 4-conductor	Infra-red touch, 47 x 31 logic channels	Infra-red touch, 47 x 31 logic channels	Resistive touch, 4-conductor
System						
Processor	RISC, 32 bit, 400 MHz					
Internal memory						
DRAM (OS, program and data memory)	64 MByte					
FLASH (can be used for data backup)	Approx. 1.5 MByte available					
NVRAM (Retain data)	Approx. 32 kByte available					
External memory						
CF slot	1 × Compact Flash card, type I/II for operating system, programs and data	1 × Compact Flash card, type I/II for operating system, programs and data	1 × Compact Flash card, type I/II for operating system, programs and data	1 × Compact Flash card, type I/II for operating system, programs and data	1 × Compact Flash card, type I/II for operating system, programs and data	1 × Compact Flash card, type I/II for operating system, programs and data
Real-time clock (battery backup)						
Battery	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Backup time at zero voltage	Normally 10 years					
Operating system	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
Engineering						
Visualization software	GALILEO/EPAM					
PLC programming software	XSOFT-CODESYS-2					
Interfaces, communication						
Ethernet	100Base-TX/10Base-T					
System port	RS232, not isolated (D-sub 9-pin, UNC)					
CAN	CAN, galvanically isolated (D-sub 9-pin, UNC)					
PROFIBUS	–	–	–	–	–	–
USB Host	USB 2.0 (1.5/12 MBit/s), not isolated					
USB device	USB 1.1, not isolated					
Slots for communication cards	1	1	1	1	1	1

	XV-460-84TVB-1-10	XV-440-10TVB-1-10 XV-440-10TVB-1-20	XV-440-10TVB-1-50	XV-430-10TVB-1-10	XV-440-12TSB-1-10 XV-440-12TSB-1-20	XV-440-12TSB-1-50	XV-430-12TSB-1-10	XV-460-15TXB-1-10	XV-460-15TXB-1-50
Display									
Screen diagonal/type	8.4" TFT LCD (color)	10.4" TFT LCD (color)	10.4" TFT LCD (color)	10.4" TFT LCD (color)	12.1" TFT LCD (color)	12.1" TFT LCD (color)	12.1" TFT LCD (color)	15" TFT LCD (color)	15" TFT LCD (color)
Resolution	VGA (640 × 480 pixels or 480 × 640 pixels in portrait format)				SVGA (800 × 600 pixels or 600 × 800 pixels in portrait format)	SVGA (800 × 600 pixels or 600 × 800 pixels in portrait format)	SVGA (800 × 600 pixels or 600 × 800 pixels in portrait format)	XGA (1024 x 768 pixel)	XGA (1024 x 768 pixel)
Visible screen area	170 mm x 128 mm	211 mm x 158 mm	211 mm x 158 mm	211 mm x 158 mm	246 mm x 185 mm	246 mm x 185 mm	246 mm x 185 mm	304 mm x 228 mm	304 mm x 228 mm
Color resolution (grayscale or color)	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors
Contrast ratio	Normally 400:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1
Brightness	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 400 cd/m²	Normally 400 cd/m²
Backlight	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	4 x CCFL, dimmable via software	4 x CCFL, dimmable via software
Lifespan of backlight	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h
Resistive touch protective screen	–	–	–	Touch sensor (glass with membrane)	–	–	Touch sensor (glass with membrane)	–	–
Infra-red touch protective screen	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting	–	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting	–	Laminated safety glass, non-reflecting	Laminated safety glass, non-reflecting
Operation									
Technology	Infra-red touch, 63 x 47 logic channel	Infra-red touch, 79 x 59 logic channels	Infra-red touch, 79 x 59 logic channels	Resistive touch, 4-conductor	Infra-red touch, 95 x 71 logic channels	Infra-red touch, 95 x 71 logic channels	Resistive touch, 4-conductor	Infra-red touch, 107 x 83 logic channels	Infra-red touch, 107 x 83 logic channels
System									
Processor	RISC, 32 bit, 400 MHz								
Internal memory									
DRAM (OS, program and data memory)	64 MByte								
FLASH (can be used for data backup)	Approx. 1.5 MByte available								
NVRAM (Retain data)	Approx. 32 kByte available								
External memory									
CF slot	1 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data	2 × Compact Flash card, type I/II for operating system, programs and data
Real-time clock (battery backup)									
Battery	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Backup time at zero voltage	Normally 10 years								
Operating system	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
Engineering									
Visualization software	GALILEO/EPAM								
PLC programming software	XSOFT-CODESYS-2								
Interfaces, communication									
Ethernet	100Base-TX/10Base-T								
System port	RS232, not isolated (D-sub 9-pin, UNC)								
CAN	CAN, galvanically isolated (D-sub 9-pin, UNC)								
PROFIBUS	–	–	–	–	–	–	–	–	–
USB Host	USB 2.0 (1.5/12 MBit/s), not isolated								
USB device	USB 1.1, not isolated								
Slots for communication cards	1	2	2	2	2	2	2	2	2

	XV-442-57CQB-1-10 XV-442-57CQB-1-20	XV-442-57CQB-1-50	XV-432-57CQB-1-10	XV-460-57TQB-1-10	XV-460-57TQB-1-50	XV-450-57TQB-1-10
Power supply						
Nominal voltage	24 V DC SELV (safety extra low voltage)					
Permissible voltage	R.m.s.: 20.4 – 28.8 V DC (rated operating voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms					
Voltage dips	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)					
Input power	Max. 24 W (Normally 13 W)	Max. 24 W (Normally 13 W)	Max. 24 W (Normally 13 W)	Max. 24 W (Normally 13 W)	Max. 24 W (Normally 13 W)	Max. 24 W (Normally 13 W)
Protection against polarity reversal	Yes	Yes	Yes	Yes	Yes	Yes
Fuse	Yes (fuse not accessible)					
Potential isolation	No (0V connection to housing potential)					
General						
Front design	Standard front with standard membrane	Satin-finish brushed stainless steel	Standard front with standard membrane (fully laminated)	Standard front with standard membrane	Satin-finish brushed stainless steel	Standard front with standard membrane (fully laminated)
Degree of protection						
Front	IP65	IP65, IP69K	IP65	IP65	IP65, IP69K	IP65
	Additional mounting bracket set required for flush mounting	Observe installation instructions to IP69K	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting	Observe installation instructions to IP69K	Additional mounting bracket set required for flush mounting
Rear	IP20	IP20	IP20	IP20	IP20	IP20
Approvals						
Approvals	cUL	cUL	cUL	cUL	cUL	cUL
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D
	Additional mounting bracket set required for flush mounting		Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting		Additional mounting bracket set required for flush mounting
Applied standards and directives						
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2					
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463
Safety	EN 60950/UL 60950					
Product standards	EN 50178, EN 61131-2					
Weight	Approx. 1.9 kg	Approx. 2.3 kg	Approx. 1.9 kg	Approx. 1.9 kg	Approx. 2.3 kg	Approx. 1.9 kg
Environmental Conditions						
Temperature						
Operation	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
Relative humidity	10 - 95%, non-condensing					
Impact resistance	To IEC 68-2-27					
Vibration	To IEC 68-2-6					

	XV-460-84TVB-1-10	XV-440-10TVB-1-10 XV-440-10TVB-1-20	XV-440-10TVB-1-50	XV-430-10TVB-1-10	XV-440-12TSB-1-10 XV-440-12TSB-1-20	XV-440-12TSB-1-50	XV-430-12TSB-1-10	XV-460-15TXB-1-10	XV-460-15TXB-1-50
Power supply									
Nominal voltage	24 V DC SELV (safety extra low voltage)								
Permissible voltage	R.m.s.: 20.4 – 28.8 V DC (rated operating voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms								
Voltage dips	20 ms from rated operating voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)	10 ms from nominal voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)							
Input power	Max. 26 W (Normally 15 W)	Max. 32 W (Normally 14 W)	Max. 32 W (Normally 14 W)	Max. 32 W (Normally 14 W)	Max. 32 W (Normally 14 W)	Max. 32 W (Normally 14 W)	Max. 32 W (Normally 14 W)	Max. 44 W (Normally 28 W)	Max. 44 W (Normally 28 W)
Protection against polarity reversal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fuse	Yes (fuse not accessible)								
Potential isolation	No (0V connection to housing potential)								
General									
Front design	Standard front with standard membrane	Standard front with standard membrane	Satin-finish brushed stainless steel	Standard front with standard membrane (fully laminated)	Standard front with standard membrane	Satin-finish brushed stainless steel	Standard front with standard membrane (fully laminated)	Standard front with standard membrane	Satin-finish brushed stainless steel
Degree of protection									
Front	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65
	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting		Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting		Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting
Rear	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Approvals									
Approvals	cUL	cUL	cUL	cUL	cUL	cUL	cUL	cUL	cUL
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 2G Ex px II IP5x: Zone 1, category 2G Zone 2, category 3G Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 2G Ex px II IP5x: Zone 1, category 2G Zone 2, category 3G Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D	II 3D Ex II T70°C IP5x: Zone 22, category 3D
	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting	Zone 1, Category 2G and Zone 2, Category 3G: Only when flush-mounted in a pressurized enclosure! Max. permissible excess pressure: 10 mbar continuous	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting	Zone 1, Category 2G and Zone 2, Category 3G: Only when flush-mounted in a pressurized enclosure! Max. permissible excess pressure: 10 mbar continuous	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting	Additional mounting bracket set required for flush mounting
Applied standards and directives									
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-4, EN 61131-2								
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463, EN 1127-1, EN 60079-2	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463, EN 1127-1, EN 60079-2	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463	EN 60079-0, EN 61241-1, EN 13463
Safety	EN 60950/UL 60950								
Product standards	EN 50178, EN 61131-2								
Weight	Approx. 3.0 kg	Approx. 4.1 kg	Approx. 5.3 kg	Approx. 4.1 kg	Approx. 4.5 kg	Approx. 5.7 kg	Approx. 4.5 kg	Approx. 6.2 kg	Approx. 7.5 kg
Environmental Conditions									
Temperature									
Operation	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
Relative humidity	10 - 95%, non-condensing								
Impact resistance	To IEC 68-2-27								
Vibration	To IEC 68-2-6								

	XVS-440-57MPI-1-10	XVS-430-57MPI-1-10	XVS-460-57MPI-1-10	XVS-450-57MPI-1-10
Display				
Screen diagonal/type	5.7" CSTN LCD (color)		5.7" TFT LCD (color)	
Resolution	QVGA (320 × 240 pixels or 240 × 320 pixels in portrait format)			
Visible screen area	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm	115 mm x 86 mm
Color resolution (grayscale or color)	256 colors	256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors
Contrast ratio	Normally 35:1	Normally 35:1	Normally 400:1	Normally 400:1
Brightness	Normally 150 cd/m²	Normally 150 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²
Backlight	1 x CCFL, dimmable via software	1 x CCFL, dimmable via software	LED, dimmable via software	LED, dimmable via software
Lifespan of backlight	Normally 50000 h	Normally 50000 h	Normally 40000 h	Normally 40000 h
Resistive touch protective screen	–	Touch sensor (glass with membrane)	–	Touch sensor (glass with membrane)
Infra-red touch protective screen	Laminated safety glass, non-reflective	–	Laminated safety glass, non-reflective	–
Operation				
Technology	Infra-red touch, 47 x 31 logic channels	Resistive touch, 4-conductor	Infra-red touch, 47 × 31 logic channels	Resistive touch, 4-conductor
System				
Processor	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz
Internal memory				
DRAM (OS, program and data memory)	64 MByte	64 MByte	64 MByte	64 MByte
FLASH (can be used for data backup)	Approx. 1.5 MByte available			
NVRAM (Retain data)	Approx. 32 kByte available			
External memory				
CF slot	1 x CompactFlash card type I/II for operating system, programs and data			
Real-time clock (battery backup)				
Battery	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Backup time at zero voltage	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years
Operating system	Windows CE	Windows CE	Windows CE	Windows CE
Engineering				
Visualization software	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM
PLC programming software	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2
Interfaces, communication				
Ethernet	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T
System port	RS232, not isolated (D-sub 9-pin, UNC)			
CAN	–	–	–	–
PROFIBUS	PROFIBUS galvanically isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)			
USB Host	USB 2.0 (1.5/12 MBit/s), not isolated			
USB device	USB 1.1, not isolated			
Power supply				
Nominal voltage	24 V DC SELV (safety extra low voltage)			
Permissible voltage	R.m.s.: 20.4 – 28.8 V DC (nominal voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms			
Voltage dips	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)	20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)
Input power	Max. 19 W (Normally 12 W)	Max. 19 W (Normally 12 W)	Max. 19 W (normally 12 W)	Max. 19 W (normally 12 W)
Protection against polarity reversal	Yes	Yes	Yes	Yes
Fuse	Yes (fuse not accessible)			
Potential isolation	No (0V connection to housing potential)			

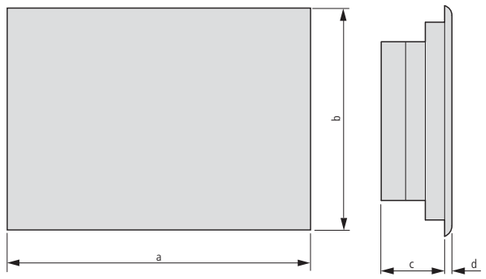
XVS-460-84MPI-1-10	XVS-440-10MPI-1-10	XVS-430-10MPI-1-10	XVS-440-12MPI-1-10	XVS-430-12MPI-1-10	XVS-460-15MPI-1-10
8.4" TFT LCD (color)	10.4" TFT LCD (color)	10.4" TFT LCD (color)	12.1" TFT LCD (color)	12.1" TFT LCD (color)	15" TFT LCD (color)
VGA (640 × 480 pixels or 480 × 640 pixels in portrait format)			SVGA (800 × 600 pixels or 600 × 800 pixels in portrait format)		XGA (1024 x 768 pixel)
170 mm x 128 mm	211 mm x 158 mm	211 mm x 158 mm	246 mm x 185 mm	246 mm x 185 mm	304 mm x 228 mm
Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors	Adjustable: 65536 or 256 colors
Normally 400:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1	Normally 350:1
Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 350 cd/m²	Normally 400 cd/m²
2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	2 x CCFL, dimmable via software	4 x CCFL, dimmable via software
Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h	Normally 50000 h
–	–	Touch sensor (glass with membrane)	–	Touch sensor (glass with membrane)	–
Laminated safety glass, non-reflective	Laminated safety glass, non-reflective	–	Laminated safety glass, non-reflective	–	Laminated safety glass, non-reflective
Infra-red touch, 63 x 47 logic channels	Infra-red touch, 79 x 59 logic channels	Resistive touch, 4-conductor	Infra-red touch, 95 x 71 logic channels	Resistive touch, 4-conductor	Infra-red touch, 107 x 83 logic channels
RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz	RISC, 32 bit, 400 MHz
64 MByte	64 MByte	64 MByte	64 MByte	64 MByte	64 MByte
Approx. 1.5 MByte available					
Approx. 32 kByte available					
1 x CompactFlash card type I/II for operating System, programs and data	2 x CompactFlash card type I/II for operating system, programs and data				
Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance	Zero maintenance
Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years	Normally 10 years
Windows CE	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM	GALILEO/EPAM
XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2	XSOFT-CODESYS-2
100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T	100Base-TX/10Base-T
RS232, not isolated (D-sub 9-pin, UNC)					
–	–	–	–	–	–
PROFIBUS galvanically isolated, max. 1.5 MBit/s (D-sub 9-pin socket, UNC)					
USB 2.0 (1.5/12 MBit/s), not isolated	2 x USB 2.0 (1.5/12 MBit/s), not isolated				
USB 1.1, not isolated					
24 V DC SELV (safety extra low voltage)					
R.m.s.: 20.4 – 28.8 V DC (nominal voltage -15 %/+20 %) Absolute with ripple: 19.2 – 30.0 V DC 35 V DC for a duration < 100 ms					
20 ms from nominal voltage (24 V DC), 2 ms from undervoltage (20.4 V DC)	10 ms from rated operating voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)	10 ms from rated operating voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)	10 ms from rated operating voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)	10 ms from rated operating voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)	10 ms from rated operating voltage (24 V DC), 5 ms from undervoltage (20.4 V DC)
Max. 22 W (normally 15 W)	Max. 24 W (normally 14 W)	Max. 24 W (normally 14 W)	Max. 24 W (normally 14 W)	Max. 24 W (normally 14 W)	Max. 36 W (normally 28 W)
Yes	Yes	Yes	Yes	Yes	Yes
Yes (fuse not accessible)					
No (0 V connection to housing potential)					

	XVS-440-57MPI-1-10	XVS-430-57MPI-1-10	XVS-460-57MPI-1-10	XVS-450-57MPI-1-10
General				
Front design	Standard membrane	Standard membrane (fully laminated)	Standard membrane	Standard membrane (fully laminated)
Degree of protection				
Front	IP65	IP65	IP65	IP65
	Additional mounting bracket set required for flush mounting (→ Page 14/12)			
Rear	IP20	IP20	IP20	IP20
Approvals				
Approvals	cUL	cUL	cUL	cUL
Explosion protection (According to ATEX 94/9/EC)	II 3D Ex II T70°C IP5x: Zone 22, Category 3D			
	Additional mounting bracket set required for flush mounting (→ Page 14/12)			
Applied standards and directives				
EMC (relevant for CE)	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61131-2			
Explosion protection (relevant for CE)	EN 60079-0, EN 61241-1, EN 13463			
Safety	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60951
Product standards	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2
Weight	Approx. 1.8 kg	Approx. 1.8 kg	Approx. 1.8 kg	Approx. 1.8 kg
Environmental Conditions				
Temperature				
Operation	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
Storage/transport	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
Relative humidity	10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing
Impact resistance	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27
Vibration	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6

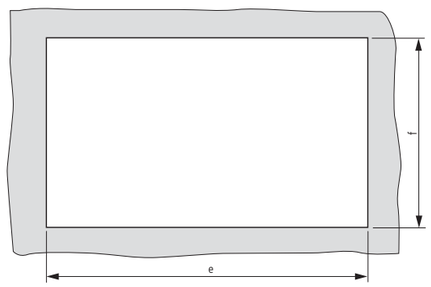
XVS-460-84MPI-1-10	XVS-440-10MPI-1-10	XVS-430-10MPI-1-10	XVS-440-12MPI-1-10	XVS-430-12MPI-1-10	XVS-460-15MPI-1-10
Standard membrane	Standard membrane	Standard membrane (fully laminated)	Standard membrane	Standard membrane (fully laminated)	Standard membrane
IP65	IP65	IP65	IP65	IP65	IP65
Additional mounting bracket set required for flush mounting (→ Page 14/12)					
IP20	IP20	IP20	IP20	IP20	IP20
cUL	cUL	cUL	cUL	cUL	cUL
II 3D Ex II T70°C IP5x: Zone 22, Category 3D					
Additional mounting bracket set required for flush mounting (→ Page 14/12)					
EN 61000-6-2, EN 61000-6-4, EN 61131-2					
EN 60079-0, EN 61241-1, EN 13463					
EN 60950/UL 60952	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950	EN 60950/UL 60950
EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2	EN 50178, EN 61131-2
Approx. 2.6 kg	Approx. 3.7 kg	Approx. 3.7 kg	Approx. 4.1 kg	Approx. 4.1 kg	Approx. 5.8 kg
0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C	0 – 50°C
-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C	-20 – 60°C
10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing	10 – 95%, non-condensing
To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27	To IEC 68-2-27
To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6	To IEC 68-2-6

Dimensions

XV-..., XVH-3..., XVS-4..., MFD4...

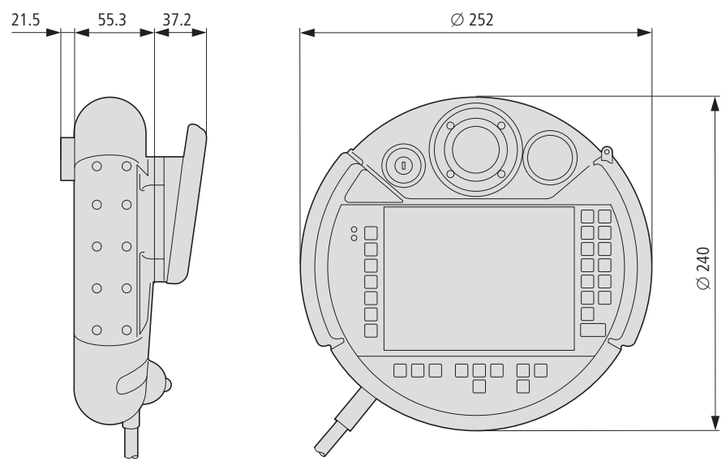


Mounting dimensions

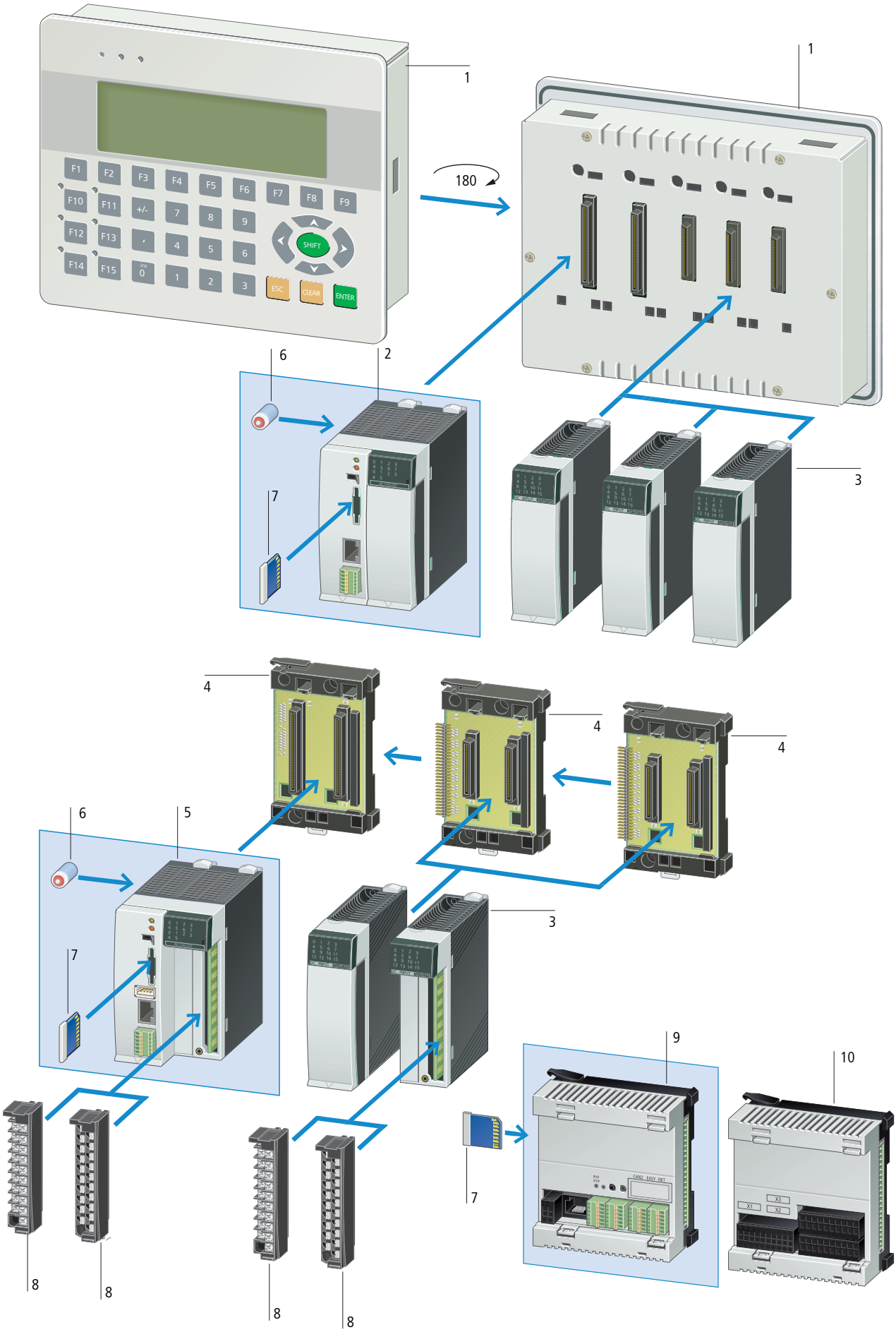


Part No.	a	b	c	d	e	f
XV-102-…-35...	136	100	25	5	123	87
XV-102-…-57...	170	130	34	5	157	117
XV-102-…-70...	210	135	33	5	197	122
XV-2…-57...	212	156	50	5	198	142
MFD4...	212	156	54	5	198	142
XVH-3…-57BAS...	212	156	55	5	198	142
XVH-3…-57CAN...	212	156	55	5	198	142
XVH-3…-57MPI...	212	156	55	5	198	142
XVH-3…-57SKS...	212	156	76	5	198	142
XVS-4…-57...	212	156	55	5	198	142
XVS-4…-84...	275	208	70	5	261	194
XVS-4…-10...	345	260	62	5	329	238
XVS-4…-12...	361	279	62	5	344	262
XVS-4…-15...	427	332	68	5	410	315
XV-4…-57...	212	156	76	5	198	142
XV-4…-84...	275	208	90	5	261	194
XV-4…-10...	345	260	88	5	329	238
XV-4…-12...	361	279	88	5	344	262
XV-4…-15...	427	332	94	5	410	315

XVM-4...



System overview



XV101 text display 1

Always in conjunction with XC100-XV and XI/OC (MMI-PLC)

Displays: 4 lines × 20 characters (or 8 × 40)

LCD display with STN technology

9 (or 15) function keys with insert strips

Numerical key block and arrow keys

Controller status LED

→ Page 14/38

XC100 2

Modular PLC

8 digital inputs

6 digital outputs

4 interrupt inputs

CANopen fieldbus interface

RS232 interface

Locally expandable with XI/OC

Can be combined with XV text displays

→ Page 14/38

XI/OC I/O modules 3

Space-optimized input/ output modules

Local extension on XC100/200

Digital, analog, technology, counter and communica-tion cards

XI/OC modules can be exchanged without the need to undo wiring

→ Page 14/39

Module backplane 4

XI/OC backplane

For connecting the XC100/200 controller and the XI/OC modules with the top-hat rail

→ Page 14/40

XC200 5

Modular PLC with Ethernet interface

8 digital inputs

6 digital outputs

2 counters

2 interrupt inputs

1 incremental input

CANopen fieldbus interface

Web server

RS232 interface

Locally expandable with XI/OC

→ Page 14/38

Battery 6

→ Page 14/41

Memory card (multi-media card) 7

Memory for program, operating system, recipes, and visualization texts

→ Page 14/41

XI/OC terminal block 8

Connection options through spring-loaded or screw terminals

Exchange/remove without disconnecting wiring

→ Page 14/40

XC121 9

Compact PLC

2 CANopen interfaces

RS232 interface

RS232/RS485 interface

MMC Memory card

OPC server

→ Page 14/38

EXT121-1 10

Expansion for compact PLC

10 digital inputs, of which, 6 interrupt inputs

8 digital outputs

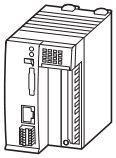
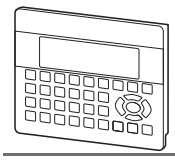
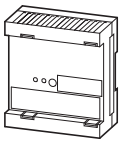
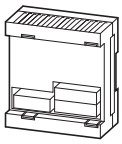
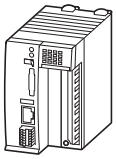
6 analog inputs: 2 Pt100 RTD, 2 x 0-10 V, 2 x 0-20 mA

2 analog outputs 0 - 10 V

→ Page 14/38



Ordering

	Description	Part No. Article No.	Price See price list	Std. pack
XC100				
• 24 V supply • Can be locally expanded with 15 XI/OC is remotely expandable • The following accessories are required: terminals, backplane, battery • Controller with 8 digital inputs (4 interrupt inputs) • 6 digital outputs; RS232 interface for programming and communication • CANopen interface • slot for MMC memory card • optional expansion with text display • RUN/STOP switch and LED indicators.				
	64 kByte user memory	**XC-CPU101-C64K-8DI-6DO** 262152		1 off
	128 kByte user memory	**XC-CPU101-C128K-8DI-6DO** 262146		
	256 kByte user memory	**XC-CPU101-C256K-8DI-6DO** 274399		
	Optical CAN interface: 128 kByte user memory	**XC-CPU101-FC128K-8DI-6DO** 289169		
	Operation with display XV-101-… 64 kByte user memory	**XC-CPU101-C64K-8DI-6DO-XV** 262247		
	Operation with display XV-101-… 128 kByte user memory	**XC-CPU101-C128K-8DI-6DO-XV** 262150		
	Operation with display XV-101-… 256 kByte user memory	**XC-CPU101-C256K-8DI-6DO-XV** 279280		
Text display for XC100				
• Backlit LCD • membrane keypad • 1 slot for XC100 • 3 spare slots for XI/OC modules • numerical keypad • arrow keys • contrast setting adjustable via software				
	Operation with XC-CPU101-….-XV 4 lines x 20 characters, resolution 122 x 32 pixels, 9 function keys	**XV-101-K42** 262403		1 off
	Operation with XC-CPU101-….-XV 8 lines x 40 characters, resolution 240 x 64 pixels, 15 function keys	**XV-101-K84** 262404		1 off
XC121				
• Compact PLC • 24 V supply • 2 CANopen interfaces • RS232 interface for programming and communication • second RS232/RS485 interface • Slot for MMC memory card • Connection through spring-cage terminal blocks • OPC server				
	Can be locally expanded with I/O module XIO-EXT-121-1 256 kByte program memory, 244 kByte data memory	**XC-CPU121-2C256K** 290446		1 off
I/O expansion for XC121				
• Expansion unit with digital and analog inputs/outputs • expandable with XI/OC signal modules (except XIOC-NET-DP-M) • pluggable spring-cage terminals				
	Local I/O expansions for PLC XC121 10 digital inputs 24 V DC, of which 6 interrupt 8 digital inputs/outputs 24 V DC, 0.5 A 2 analog inputs 0 - 10 V 2 analog inputs 0 - 20 mA 2 analog inputs Pt100 RTD 2 analog outputs 0 - 10 V	**XIO-EXT121-1** 290450		1 off
XC200				
• 24 V supply • Can be locally expanded with 15 XI/OC is remotely expandable • The following accessories are required: terminals, backplane, battery • Controller with 8 digital inputs (2 counter, 2 interrupt inputs, 1 incremental input) • 6 digital outputs; Ethernet and RS232 interface for programming and communication • CANopen interface • slot for memory card (MMC) XC-CPU202 (MMC and SD) • USB interface • RUN/STOP switch and LED indicators				
	256 kByte user memory	**XC-CPU201-EC256K-8DI-6DO** 262155		1 off
	2 MByte user memory	**XC-CPU201-EC512K-8DI-6DO** 262157		
	256 kByte user memory Integrated web server	**XC-CPU201-EC256K-8DI-6DO-XV** 262156		
	2 MByte user memory, Integrated web server	**XC-CPU201-EC512K-8DI-6DO-XV** 262158		
	4 Mbyte user memory, integrated Web server	**XC-CPU202-EC4M-8DI-6DO-XV** 134238		

Information relevant for export to North America

Product Standards	IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking	CSA File No.	012528
UL File No.	E135462	CSA Class No.	2252-01
UL CCN	NRAQ	NA Certification	UL Listed, CSA certified
		Degree of Protection	IEC: IP20, UL/CSA Type: -

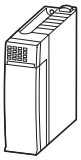
HPL14039EN

Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America

XI/OC

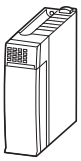
- Compact I/O system for connection to XC100/200 Modular PLCs
- XC100/200 expandable with up to 15 XI/OC modules
- Optionally, screw terminals or spring-loaded terminals for digital/analog modules

Digital modules



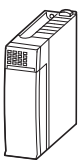
Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
8 inputs, 24 V DC	**XIOC-8DI** 257891		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
16 inputs, 24 V DC	**XIOC-16DI** 257892			
32 inputs, 24 V DC	**XIOC-32DI** 267411			
8 outputs, 24 V DC, 0.3 A	**XIOC-8DO** 257894			
12 relay outputs	**XIOC-12DO-R** 257897			
16 outputs, 24 V DC, 0.3 A	**XIOC-16DO** 257896			
16 outputs, 24 V DC, 0.8 A, short-circuit proof	**XIOC-16DO-S** 257895			
16 terminals, 4 inputs, 12 freely parameterizable as inputs/outputs, 24 V DC Outputs 0.5 A	**XIOC-16DX** 262322			
32 outputs, 24 V DC, 0.2 A	**XIOC-32DO** 267413			

Analog modules

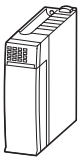
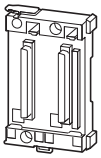
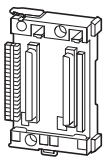
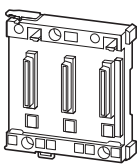
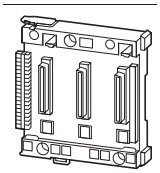


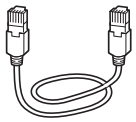
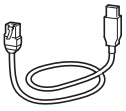
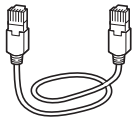
Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
Inputs 8 inputs 4 - 20 mA	**XIOC-8AI-I2** 262549		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Inputs 8 voltage inputs 0 - 10 V	**XIOC-8AI-U1** 257899			
Inputs 8 voltage inputs, ±10 V	**XIOC-8AI-U2** 257900			
Inputs 4 inputs for temperature monitoring, Pt100/1000	**XIOC-4T-Pt** 257901			
Inputs 4 inputs for thermocouples Type K, J, L, B, N, E, R, S, T	**XIOC-4AI-T** 289933			
Outputs 2 outputs, ±10 V	**XIOC-2AO-U2** 257904			
Outputs 2 outputs 0 - 10 V, 2 outputs 4 - 20 mA	**XIOC-2AO-U1-2AO-I2** 257902			
Outputs 4 outputs 0 - 10 V	**XIOC-4AO-U1** 257903			
Combination modules 2 inputs and 1 output 0 - 10 V 1 ms conversion time	**XIOC-2AI-1AO-U1** 262409			
Combination modules 2 inputs and 1 output 0 - 10 V, 0 - 20 mA 1 ms conversion time, individual changeover	**XIOC-2AI-1AO-U1-I1** 281545			
Combination modules 4 inputs und 2 outputs 0 - 10 V 1 ms conversion time	**XIOC-4AI-2AO-U1** 262405			
Combination modules 4 inputs and 2 outputs 0 - 10 V, 0 - 20 mA 1 ms conversion time, individual changeover	**XIOC-4AI-2AO-U1-I1** 281544			

Counter modules



Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
1 input up to 100 kHz, 24 V DC, 5 V DC, 2 digital transistor outputs, opto-isolated, 24 V DC 30 pin connector required for counter module	**XIOC-1CNT-100KHZ** 257906		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
2 inputs up to 100 kHz, (24 V DC or 5 V diff), 4 digital transistor outputs, opto-isolated, 24 V DC 30 pin connector required for counter module	**XIOC-2CNT-100KHZ** 257907			
2 incremental encoders up to 400 kHz, 5 V DC, 2 analog outputs ±10 V	**XIOC-2CNT-2AO-INC** 262417			

	Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
Communication cards					
	PROFIBUS-DP master module	**XIOC-NET-DP-M** 257908		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	PROFIBUS-DP slave module	**XIOC-NET-DP-S** 286419			
	Suconet K master module	**XIOC-NET-SK-M** 289982			
	Serial interfaces RS232C, RS485, RS422 Modes of operation: Transparent mode Modbus master/slave SUCOM-A Suconet-K slave	**XIOC-SER** 267191			
	Serial interfaces RS232C, RS485, RS422 Modes of operation: Transparent mode Modbus master/slave SUCOM-A DNP protocol	**XIOC-TC1** 135265		1 off	NA Certification: Request filed for UL and CSA
Accessories					
Terminals One 18 pole terminal plug is required for each digital and analog module.					
–	18-pin connector with spring-cage terminal for digital or analog I/O.	**XIOC-TERM-18T** 258104		10 off	NA Certification: Request filed for UL and CSA
–	18-pin connector with screw terminals for digital or analog I/O.	**XIOC-TERM-18S** 258102			
–	30 pin connector for counter module, with 4 m cable XIOC-1CNT-100KHZ XIOC-2CNT-100KHZ	**XIOC-TERM30-CNT4** 262248		1 off	
–	40 pin connector for digital module, with 4 m cable XIOC-32DI XIOC-32DO	**XIOC-TERM32** 267414			
Module backplane					
	Basic backplane for mounting XC100/200 on top-hat rail, can be expanded Width: 2 slots for controller	**XIOC-BP-XC** 260792		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Expansion backplane for mounting XI/OC modules on top-hat rail, can be expanded Width: 2 slots for XI/OC modules	**XIOC-BP-2** 260794		1 off	
	Basic backplane for mounting XC100/200 on top-hat rail, can be expanded Width: 3 slots for controller and one XI/OC module	**XIOC-BP-XC1** 260793		1 off	
	Expansion backplane for mounting XI/OC modules on top-hat rail, can be expanded Width: 3 slots for XI/OC modules	**XIOC-BP-3** 260795		1 off	
	Expansion backplane for mounting XI/OC modules on top-hat rail, can be expanded Width: 3 slots for XI/OC modules Note: Module Backplane for expansion with up to 15 modules, must be plugged into the 6th slot	**XIOC-BP-EXT** 274291		1 off	

	Description	Part No. Article No.	Price See price list	Std. pack	Information relevant for export to North America
Accessories					
Memory card For storage of programs, data, recipes for XC100, XC121, XC200, MFD4					
–	512 MByte	**XT-MEM-MM512M** 138257		1 off	NA Certification: Request filed for UL and CSA
–	32 MByte	**XT-MEM-MM32M** 262731		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Battery					
	For backup of real-time clock and retentive data of the MFD4	**XT-CPU-BAT1** 256209		1 off	
Programming cables					
	2 m D-sub 9-pin, serial	**XT-SUB-D/RJ45** 262186		1 off	
	2 m Ethernet cross	**XT-CAT5-X-2** 256487		1 off	
	5 m Ethernet cross	**XT-CAT5-X-5** 256488			
	Programming cable for XC, EC4P, EU5C through USB interface	**EU4A-RJ45-USB-CAB1** 115735			
Connection cables					
	0.3 m Connection cable for XC200 to interface switch	**EASY-NT-30** 256283		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	0.8 m Connection cable for XC200 to interface switch	**EASY-NT-80** 256284			
	1.5 m Connection cable for XC200 to interface switch	**EASY-NT-150** 256285			
CAN cable to ISO 11898 Recommendation: UNITRONIC bus LD, from LAPPKABEL 2 x 2 x 0.22 mm² Characteristic impedance: 100 - 120 Ω Effective capacitance: 800 Hz, max. 60 nF/km					
Empty module					
–	Empty module to cover free XI/OC slots	**XIOC-NOP** 288894		1 off	Product Standards: IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Interface switch					
–	Interface adapter to split the combined RS232/Ethernet interface of the XC200 into RJ45 sockets Connection cable EASY-NT-30/80/150 usable for connection to XC200.	**XT-RJ45-ETH-RS232** 289170		1 off	
Filter					
–	Interference suppression of the external 24 V DC supply of the XC100/200 Max. current consumption: 2.2 A	**XT-FIL-1** 285316		1 off	
–	Power supply interference suppression of I/O modules of XC100/200. Max. current consumption: 12 A	**XT-FIL-2** 118980		1 off	
Insert labels					
–	Insert labels for user inscription For 3 devices: XV-101-K42 For 3 devices: XV-101-K84	**XT-BS1** 265365		1 off	UL/CSA certification not required

Programming software → Page 14/130

Technical data

			XC-CPU101- C64K-8DI-6DO(-XV)	XC-CPU101- C128K-8DI-6DO(-XV)	XC-CPU101-FC128K-8DI-6DO(-XV)	XC-CPU101- C256K-8DI-6DO(-XV)
General						
Standards			IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0 - +55	0 - +55	0 - +55	0 - +55
Storage		°C	-25 to +70	-25 to +70	-25 to +70	-25 to +70
Mounting position			Horizontal	Horizontal	Horizontal	Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	10 - 95	10 - 95	10 - 95	10 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080	795 - 1080	795 - 1080
Vibration resistance			10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g	10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g	10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g	10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g
Mechanical shock resistance			15 g/11 ms	15 g/11 ms	15 g/11 ms	15 g/11 ms
Overvoltage category			II	II	II	II
Pollution degree			2	2	2	2
Degree of Protection			IP20	IP20	IP20	IP20
Rated insulation voltage	U_i	V	500	500	500	500
Emitted interference			EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A
Interference immunity			EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Battery (lifespan)			Normally 5 years	Normally 5 years	Normally 5 years	Normally 5 years
Weight		kg	0.23	0.23	0.23	0.23
Terminals			Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Terminal capacity						
Screw terminals						
Flexible with ferrule		mm^2	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5
Solid		mm^2	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5
Spring-cage terminal						
Flexible		mm^2	0.34 - 1.0	0.34 - 1.0	0.34 - 1.0	0.34 - 1.0
Solid		mm^2	0.14 - 1.0	0.14 - 1.0	0.14 - 1.0	0.14 - 1.0
Electromagnetic compatibility (EMC)			→ Page 14/58			
Power supply						
Mains failure duration		ms	10	10	10	10
Repetition rate		s	1	1	1	1
Input voltage		V DC	24	24	24	24
Permissible range		V DC	20.4…28.8	20.4…28.8	20.4…28.8	20.4…28.8
Input power		W	Max. 26	Max. 26	Max. 26	Max. 26
Ripple		%	≦ 5	≦ 5	≦ 5	≦ 5
Maximum heat dissipation (without local I/O)	P_v	W	6	6	6	6
Overvoltage protection			Yes	Yes	Yes	Yes
Protection against polarity reversal			Yes	Yes	Yes	Yes
Mains filter (external)			Yes	Yes	Yes	Yes
Inrush current		x I_n	Not limited, (limiting only by a supply-side 24 V DC PSU)			
Output voltage for signal modules						
Rated value		V DC	5	5	5	5
Output current		A	3.2	3.2	3.2	3.2
Short-circuit rating			Yes	Yes	Yes	Yes
Isolated from supply voltage			No	No	No	No
CPU						
Microprocessor			Infineon C164	Infineon C164	Infineon C164	Infineon C164
Memory						
Program code/program data		kByte	64/64	128/128	128/128	256/256
Marker/retain data		kByte	4/4	8/8	8/8	8/8
Cycle time for 1 k of instructions (bits, bytes)		ms	< 0.5	< 0.5	< 0.5	< 0.5

			XC-CPU101- C64K-8DI-6DO(-XV)	XC-CPU101- C128K-8DI-6DO(-XV)	XC-CPU101-FC128K-8DI-6DO(-XV)	XC-CPU101- C256K-8DI-6DO(-XV)
Interfaces						
Serial interface (RS232) without handshake lines						
Baud rate		kbit/s	Max. 57.6	Max. 57.6	Max. 57.6	Max. 57.6
Connections			RJ45	RJ45	RJ45	RJ45
Potential isolation			No	No	No	No
CANopen						
Maximum data transfer rate		bit/s	500000	500000	500000	500000
Potential isolation			Yes	Yes	Yes	Yes
Device profile			To DS 301 V4	To DS 301 V4	To DS 301 V4	To DS 301 V4
PDO type			Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.
Connection			Plug-in terminal block	Plug-in terminal block	Optical fiber interface, wavelength 660 mm, plug e.g. HFBR-4516 Agilent Technologies	Plug-in terminal block
Bus terminating resistors			External	External	External	External
Stations		Number	Max. 126	Max. 126	Max. 126	Max. 126
Watchdog			Yes	Yes	Yes	Yes
RTC (real-time clock)			Yes	Yes	Yes	Yes
Power supply of local inputs/outputs (24 V_D/0 V_D)						
Input voltage		V DC	24	24	24	24
Voltage range		V DC	19.2 - 30, observe polarity	19.2 - 30, observe polarity	19.2 - 30, observe polarity	19.2 - 30, observe polarity
Potential isolation						
Between power supply and CPU voltage			Yes	Yes	Yes	Yes
Overvoltage protection			Yes	Yes	Yes	Yes
Protection against polarity reversal			Yes	Yes	Yes	Yes
Digital inputs						
Input current for channel at rated voltage		mA	Normally 3.5	Normally 3.5	Normally 3.5	Normally 3.5
Heat dissipation for channel			Normally 85 m W	Normally 85 m W	Normally 85 m W	Normally 85 m W
Voltage level to IEC/EN 61131-2						
Limit value type 1			Low < 5 V DC, High > 15 V DC	Low < 5 V DC, High > 15 V DC	Low < 5 V DC, High > 15 V DC	Low < 5 V DC, High > 15 V DC
Input delay						
OFF → ON		ms	Normally 0.1	Normally 0.1	Normally 0.1	Normally 0.1
ON → OFF		ms	Normally 0.1	Normally 0.1	Normally 0.1	Normally 0.1
Inputs		Number	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)	8 (of which 4 interrupt inputs)
Channels with the same reference potential		Number	8	8	8	8
Status indication			LED	LED	LED	LED
Digital outputs						
Channels		Number	6	6	6	6
Heat dissipation for channel		W	0.08	0.08	0.08	0.08
Load circuits		A	0.5	0.5	0.5	0.5
Output delay						
OFF → ON			Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
ON → OFF			Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
Channels with the same reference potential		Number	6	6	6	6
Status indication			LED	LED	LED	LED
Switching capacity			IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13	IEC/EN 60947-5-1, utilization category DC-13
Duty factor		% DF	100	100	100	100
Utilization factor		g	1	1	1	1

			XV-101-K42	XV-101-K84
General				
Standards			IEC/EN 60131-2 EN 50178	IEC/EN 60131-2 EN 50178
Ambient temperature				
Operation				
When mounted vertically, up to 45° fitting angle		°C	0…50	0…50
Storage		°C	-20 - 70	-20 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	10 - 95	10 - 95
Protection type				
Front			IP65	IP65
Enclosure			IP20	IP20
Vibration resistance			10 - 57 Hz ± 0.075 mm 57 - 150 Hz ±1 g	10 - 57 Hz ± 0.075 mm 57 - 150 Hz ±1 g
Mechanical shock resistance			15 g/11 ms	15 g/11 ms
Rated impulse withstand voltage	U_{imp}	V	850	850
Overvoltage category			II	II
Pollution degree			2	2
Interference immunity			EN 61000-6-2	EN 61000-6-2
Emitted interference			EN 50081-2, Class A	EN 50081-2, Class A
Weight		kg	Approx. 0.9	Approx. 0.9
Power supply				
Rated voltage	U_e	V DC	24	24
Permissible range		V DC	18…30	18…30
Display				
Backlight			LED	LED
Lifespan of backlight		Operating hours	100000	100000
Character height			5 mm/10 mm	5 mm/10 mm
User-definable characters			256	256
Pushbuttons				
Total number of pushbuttons			29	35
Keypad service life		Operations	> 3000000	> 3000000
Features				
Memory type			SRAM, 32 KB	SRAM, 32 KB
Status indication			LED (RUN, STOP, SF)	LED (RUN, STOP, SF)
Expansions			3 XI/OC signal modules	3 XI/OC signal modules
Real-time clock			Yes	Yes

			XC-CPU121-2C256K
General			
Standards			IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0 - +55
Storage		°C	-25 to +70
Mounting position			Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	10 - 95
Air pressure (in operation)		hPa	795 - 1080
Vibration resistance			Frequency 5 - 9 Hz; 3.5 mm amplitude 9 - 150 Hz; 1.0 g constant acceleration
Mechanical shock resistance			15 g/11 ms
Overvoltage category			II
Pollution degree			2
Degree of protection			IP20
Rated insulation voltage	U_i	V	500
Emitted interference			EN 61000-6-4
Interference immunity			EN 61000-6-2
Backup time			At least 72 hours
Weight		kg	0.15
Electromagnetic compatibility (EMC)			→ Page 14/58
Connections			
Supply voltage			
Connection type			-
Terminal capacity		mm²	0.14 - 1 (AWG28-18)
COM1 interface			
Connection type			RJ45
COM2, CAN1, CAN2 interfaces			
Connection type			Spring-loaded terminal block, 6pole
Terminal capacity		mm²	0.14 - 0.5 (AWG28-20)
Power supply			
Input voltage		V DC	24
Permissible range		V DC	20.4…28.8
Input power		W	Max. 1.44
Input current		mA	60
Ripple		%	≦ 5
Maximum heat dissipation (without local I/O)	P_v	W	6
Overvoltage protection			Yes
Protection against polarity reversal			Yes
Inrush current		x I_n	No limitation (limited only by upstream 24 V DC power supply unit)
Supply failure bridging			
Duration of power failure		ms	10
Repetition rate		s	1
External supply filter			Part No.: XT-FIL-1, → Page 14/41
Memory			
Program code/program data		kByte	256/244
Marker/input/output/retain data		kByte	16/4/4/8
Cycle time for 1 k of instructions (bits, bytes)		ms	< 0.3
Interfaces			
Serial interface (RS232) without handshake lines			
Baud rate		kbit/s	–
Baud rate		kbit/s	Programming (character format: 8 data bits, No parity, 1 stop bit) 19.2, 38.4 (default), 57.6
Connector type			RJ45
Potential isolation			No
In transparent mode			
Baud rate		kbit/s	0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2
Character formats			8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
Number of Send bytes for block			190
Number of Receive bytes for block			190

				XC-CPU121-2C256K
COM2 (RS232/RS485) without handshake lines				
	Baud rate		kbit/s	Transparent mode (setting through function blocks) 0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6
	Character formats			8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1 (setting through function blocks)
	Potential isolation			No
	Bus termination			External, for RS485
CAN1/CAN2 interface				
	Baud rate		kbit/s	10 … 500
	Potential isolation			No
	Stations			126
	Bus termination			Adjustable for each interface (CAN1/CAN2)
	PDO type			Asyn., cyc., acyc.
Power supply of local inputs/outputs (24 V_D/0 V_D)				
Input voltage			V DC	24
Voltage range			V DC	19.2 - 30, observe polarity
Potential isolation				
	Between power supply and CPU voltage			Yes
Overvoltage protection				Yes

			XIO-EXT121-1
General			
Standards			IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0 - +55
Storage		°C	-25 to +70
Mounting position			Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	10 - 95
Air pressure (in operation)		hPa	795 - 1080
Vibration resistance			Frequency 5 - 9 Hz; 3.5 mm amplitude 9 - 150 Hz; 1.0 g constant acceleration
Mechanical shock resistance			15 g/11 ms
Overvoltage category			II
Pollution degree			2
Degree of protection			IP20
Rated insulation voltage	U_i	V	500
Emitted interference			EN 61000-6-4
Interference immunity			EN 61000-6-2
Backup time			At least 72 hours
Weight		kg	0.15
Electromagnetic compatibility (EMC)			→ Page 14/58
Connections			
X1 connector			
Connector type			Spring-loaded terminal block, 20 pole, B2L 3.5 (Weidmüller)
Terminal capacity (solid)		mm²	0.5 - 1
X2/X3 connector			
Connector type			Spring-loaded terminal block, 10 pole, BLZF 3.5/180 or BLI/O 3.5/10F with LEDs (Weidmüller)
Terminal capacity (solid)		mm²	0.5 - 1
Power supply			
Supply failure bridging			
Duration of power failure		ms	10
Repetition rate		s	1
Input voltage		V DC	24
Permissible range		V DC	20.4…28.8
Input power		W	Max. 1.68
Input current		mA	70
Ripple		%	≦ 5
Overvoltage protection			Yes
Protection against polarity reversal			Yes
Inrush current		x I_n	Max. 1 A
Output voltage for signal modules			
Max. field current IL		A	2
Digital inputs			
Number			X2: 9 with plug BLI/O 3.5/10F or 10 with plug BLZF 3.5/180 X3: 8 (can also be used as outputs)
Rated voltage			
Rated voltage	U_e	V DC	24
At state "0"	U_e	V DC	< 5
At state "1"	U_e	V DC	> 15
Rated operational current			
At state "1"	I_e	mA	3.3
Delay time			
X2: DI0…DI3		µs	20
X2: DI4…DI9		µs	250
X2: DX0…DX7		ms	20
Potential isolation			No

			XIO-EXT121-1
Digital outputs			
Number			At X3: 8 (can also be used as inputs)
Rated voltage			
Rated voltage	U_e	V DC	24
Permissible range			20.4 … 28.8 V DC
Ripple		%	≦ 5
Rated operational current			
At state "1"	I_e	A	0.5 at 24 V AC
Utilization factor	%	*g*	1
Maximum duty factor		ms	100 %
Lamp load without R_v		W	5
Potential isolation			No
Residual current at state "0" per channel		mA	< 0.1
Max. output voltage			
At state "0" with external load < 10 MΩ		V	2.5
At state "1" at I_e = 0.5 A		V	$U = U_e$ - 1 V
Short-circuit tripping current			
Short-circuit tripping current for R_a ≦ 10 mΩ		A	0.7 ≦ I_e ≦ 2 for output
Total short-circuit current		A	16
Peak short-circuit current		A	32
Max. operating frequency		Ops/h	40000
Parallel connection capability			Yes
Analog inputs 0…10 V			
Number of channels			2
Primary voltage range		V	0…10
Resolution		bit	10
Conversion time		ms	≦ 5
Overall accuracy			≦ ± 1 % (of full-scale value)
Input resistance		kΩ	200
Analog inputs 0…20 mA			
Number of channels			2
Primary voltage range		mA	0…20
Resolution		bit	10
Conversion time		ms	≦ 5
Overall accuracy			≦ ± 1 % (of full-scale value)
Input resistance		Ω	50
Pt100 RTD			
Number of channels			2
Temperature range		°C	-200…+200
Resistance range		Ω	18.5…175.8
Resolution		bit	10
Overall accuracy			≦ ± 2 %
Analog outputs			
Number of channels			2
Secondary voltage range		V	0…10
Resolution		bit	12
Conversion time		ms	≦ 5
Overall accuracy			≦ ± 1 % (of full-scale value)
External load resistance	R	kΩ	10

				XC-CPU201-EC256K-8DI-6DO(-XV)	XC-CPU201-EC512K-8DI-6DO(-XV)	XC-CPU202-EC4M-8DI-6DO-XV
General						
Standards				IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature			°C	0 - +55	0 - +55	0 - +55
Storage			°C	-25 to +70	-25 to +70	-25 to +70
Mounting position				Horizontal	Horizontal	Horizontal
Relative humidity, non-condensing (IEC/EN 60068-2-30)			%	10 - 95	10 - 95	10 - 95
Air pressure (in operation)			hPa	795 - 1080	795 - 1080	795 - 1080
Vibration resistance				10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g	10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g	10 - 57 Hz ±0.075 mm 57 - 150 Hz ±1.0 g
Mechanical shock resistance				15 g/11 ms	15 g/11 ms	15 g/11 ms
Overvoltage category				II	II	II
Pollution degree				2	2	2
Degree of protection				IP20	IP20	IP20
Rated impulse withstand voltage		U_{imp}	V	850	850	850
Emitted interference				EN 61000-6-4, Class A	EN 61000-6-4, Class A	EN 61000-6-4, Class A
Interference immunity				EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Battery (lifespan)				Normally 5 years	Normally 5 years	Normally 5 years
Weight			kg	0.23	0.23	0.23
Terminals				Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Terminal capacity						
Screw terminals						
	Flexible with ferrule		mm^2	0.5 - 1.5	0.5 - 1.5	0.5 - 1.5
	Solid		mm^2	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5
Spring-cage terminal						
	Flexible		mm^2	0.34 - 1.0	0.34 - 1.0	0.34 - 1.0
	Solid		mm^2	0.14 - 1.0	0.14 - 1.0	0.14 - 1.0
Electromagnetic compatibility (EMC)				→ Page 14/58		
Power supply						
Duration of mains failure			ms	10	10	10
Repetition rate			s	1	1	1
Input voltage			V DC	24	24	24
Permissible range			V DC	20.4…28.8	20.4…28.8	20.4…28.8
Input power			W	Max. 33	Max. 33	Max. 33
Ripple			%	≦ 5	≦ 5	≦ 5
Maximum heat dissipation		P_v	W	6	6	6
Overvoltage protection				Yes	Yes	Yes
Protection against polarity reversal				Yes	Yes	Yes
Line filter				Yes	Yes	Yes
Inrush current			x I_n	Not limited, (limiting only by a supply-side 24 V DC PSU)		
Output voltage for signal modules						
Rated value			V DC	5	5	5
Output current			A	3.2	3.2	3.2
Short-circuit rating				Yes	Yes	Yes
Isolated from supply voltage				No	No	No
CPU						
Microprocessor				NEC VR4181 A MIPS	NEC VR4181 A MIPS	ARM 532 MHz
Memory						
Program code/program data				256 kByte/256 kByte	2 MB/512 kByte	4 MB/512 kByte
Marker/retain data			kByte	16/32	16/32	16/64
Cycle time for 1 k of instructions (bits, bytes)			ms	< 0.15	< 0.15	< 0.025

			XC-CPU201-EC256K-8DI-6DO(-XV)	XC-CPU201-EC512K-8DI-6DO(-XV)	XC-CPU202-EC4M-8DI-6DO-XV
Interfaces					
Ethernet					
Baud rate		MBit/s	10/100 - Autodetect	10/100 - Autodetect	10/100 - Autodetect
Connector type			RJ45	RJ45	RJ45
Potential isolation			No	No	No
Serial interface (RS232) without handshake lines					
Baud rate		kbit/s	Max. 115.2	Max. 115.2	Max. 115.2
Connector type			RJ45	RJ45	RJ45
Potential isolation			No	No	No
USB interface			1.0	1.0	2.0
CANopen					
Maximum data transfer rate		MBit/s	1	1	1
Potential isolation			Yes	Yes	Yes
Device profile			To DS 301 V4	To DS 301 V4	To DS 301 V4
PDO type			Asyn., cyc., acyc.	Asyn., cyc., acyc.	Asyn., cyc., acyc.
Connection			Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Bus terminating resistors			External	External	internal
Stations		Number	Max. 126	Max. 126	Max. 126
Watchdog			Yes	Yes	Yes
RTC (real-time clock)			Yes	Yes	Yes
Power supply of local inputs/outputs (24 V_0/0 V_0)					
Input voltage		V DC	24	24	24
Voltage range		V DC	19.2 - 30, observe polarity	19.2 - 30, observe polarity	19.2 - 30, observe polarity
Potential isolation					
Between power supply and CPU voltage			Yes	Yes	Yes
Between power supply and inputs/outputs			No	No	No
Status indication			LED	LED	LED
Terminals			Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Overvoltage protection			Yes	Yes	Yes
Protection against polarity reversal			Yes	Yes	Yes
Digital inputs					
Input current per channel at rated voltage		mA	Normally 3.5	Normally 3.5	Normally 3.5
Heat dissipation per channel			Normally 85 m W	Normally 85 m W	Normally 85 m W
Voltage level to IEC/EN 61131-2					
Limit value type 1			Low < 5 V DC, High > 15 V DC	Low < 5 V DC, High > 15 V DC	Low < 5 V DC, High > 15 V DC
Input delay					
OFF → ON		ms	Type 0.1	Type 0.1	Type 0.1
ON → OFF		ms	Type 0.1	Type 0.1	Type 0.1
Inputs		Number	8, of which parameterizable:	2 counters, 50 kHz, 2 interrupt inputs, 1 incremental input	
Channels with the same reference potential		Number	8	8	8
Status indication			LED	LED	LED
Digital outputs					
Channels		Number	6	6	6
Heat dissipation per channel		W	0.08	0.08	0.08
Load circuits		A	0.5	0.5	0.5
Output delay					
OFF → ON			Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
ON → OFF			Normally 0.1 ms	Normally 0.1 ms	Normally 0.1 ms
Channels with the same reference potential		Number	6	6	6
Status indication			LED	LED	LED
Switching capacity			IEC/EN 60947-5-1, utilization category DC-13		
Duty factor		% DF	100	100	100
Utilization factor		g	1	1	1

General			
Standards			IEC/EN 61131-2 EN 50178
Ambient temperature		°C	0 - +55
Storage		°C	-25 to +70
Vibration resistance			10 - 57 Hz ± 0.075 mm 57 - 150 Hz ± 1.0 g
Mechanical shock resistance			15 g/11 ms
Impact strength			500 g/50 mm ±25 g
Overvoltage category			II
Pollution degree			2
Protection class			1
Protection type			IP20
Emitted interference			DIN/EN 55011/22, Class A
Electromagnetic compatibility (EMC)			→ Page 14/58
Power supply			
Rated voltage	U_e	V DC	24 (12)
Permissible range			20.4 – 28.8 (11.8 – 14.4)
Ripple		%	≦ 5
Supply failure bridging			
Duration of power failure		ms	10
Repetition rate		s	1

			XIOC-8DI	**XIOC-16DI**	**XIOC-32DI**
Modules					
Input type			DC input	DC input	DC input
Input voltage		V DC	24	24	24
Permissible range		V DC	20.4…28.8	20.4…28.8	20.4…28.8
Input voltage		V AC	–	–	–
Permissible range		V AC			
Input resistance			Normally 3.5 kΩ	Normally 5.9 kΩ	Normally 5.6 kΩ
Input current		mA	Normally 6.9	Normally 4.0	Normally 4.3
Voltage level to IEC 61131-2, limit value type 1					
ON		V	≧ 15 DC	≧ 15 DC	≧ 15 DC
OFF		V	≦ 5 DC	≦ 5 DC	≦ 5 DC
Input delay					
OFF → ON		ms	5 (normally 4)	5 (normally 4)	5 (normally 4)
OFF → ON		ms	5 (normally 4)	5 (normally 4)	5 (normally 4)
Input channels		Number	8	16	32
Channels with the same reference potential		Number	8	16	32
Potential isolation			With optocouplers	With optocouplers	With optocouplers
Indication			LED (green)	LED (green)	16 LEDs (green), switchable: 0 – 15, 16 – 31
Terminals			Plug-in terminal block	Plug-in terminal block	XIOC-TERM32 (connector and cable)
Internal current consumption (5 V DC)		mA	Normally 26	Normally 51	Normally 100
Weight		kg	0.16	0.16	0.16

			XIOC-8DO	XIOC-16DO	XIOC-16DO-S	XIOC-32DO
Modules						
Output type			Transistor (source type)			
Output voltage		V DC	24 (-15…+20 %)	24 (-15…+20 %)	24 (-15…+20 %)	24 (-15…20 %)
Switching current, minimum		mA	1	1	1	1
Leakage current		mA	0.1	0.1	0.1	0.1
Maximum load current						
Per circuit		A	0.3	0.3	0.8	0.2
Per common potential terminal		A	2.4	4	5	3.2
Output delay						
OFF → ON		ms	≦ 0.3	≦ 0.3	≦ 0.3	≦ 0.3
OFF → ON		ms	≦ 1	≦ 1	≦ 1	≦ 1
Output channels		Number	8	16	16	32
Channels with the same reference potential		Number	8	16	16	32
Overvoltage protection			Diode	Diode	Integrated	Diode
Fuse rating		A	4	8	None	8
Potential isolation			With optocouplers			
Indication			LED (green)	LED (green)	LED (green)	16 LEDs (green), switchable: 0 – 15, 16 – 31
Terminals			Plug-in terminal block			XIOC-TERM32 (connector and cable)
Internal current consumption (5 V DC)		mA	Normally 30	Normally 50	Normally 50	Normally 250
External voltage for outputs/module (30 mA for module supply)	U_s	V	24 DC (-15/+20%)	24 DC (-15/+20%)	24 DC (-15/+20%)	24 DC (-15/+20%)
Short-circuit protection			–	–	Yes	–
Weight		kg	0.16	0.16	0.16	0.16

		XIOC-12DO-R
Modules		
Output type		Relays
Output voltage	V DC	24
Output voltage	V AC	100/240
Switching current, minimum	mA	1
Maximum load current		
Per circuit	A	2
Per common potential terminal	A	5
Output delay		
OFF → ON	ms	≦ 10
OFF → ON	ms	≦ 10
Output channels	Number	12
Channels with the same reference potential	Number	12
Overvoltage protection		External
Fuse rating	A	External
Potential isolation		With optocouplers
Indication		LED (green)
Terminals		Plug-in terminal block
Internal current consumption (5 V DC)	mA	Normally 40
External voltage for operating the relay		24 V DC (-15 - +20%, max. 70 mA)
Weight	kg	0.2

		XIOC-16DX
Power supply		
Supply voltage		24 V DC (-15/+20%)
Ripple	%	≦ 5
Overvoltage protection		Yes
Protection against polarity reversal		Yes
Potential isolation		
Between power supply and I/O bus		Yes
Between power supply and I/O		No
Internal current consumption (5 V DC)	mA	Normally 80
Channels	Number	16
Terminals		Plug-in terminal block
Status indication		LED
Inputs		
Input type		DC input
Input voltage	V DC	24 V DC
Inputs	Number	4, 12, configurable
Input current	mA	Normally 4
Voltage level to IEC 61131-2, limit value type 1		
ON	V	≧ 15 DC
OFF	V	≦ 5 DC
Input delay		
OFF → ON	ms	Normally 0.1
OFF → ON	ms	Normally 0.1
Outputs		
Output type		Transistor (source type)
Output voltage	V DC	12/24 (-15…+20 %)
Output current	A	Normally 0.5
Outputs	Number	Max. 12, configurable
Short-circuit tripping current	A	Max. 1.2 over 3 ms for output
Lamp load	W	Max. 3
Drop-out delay (High → Low)	µs	Normally 100
Switching capacity		IEC/EN 60947-5-1, utilization category DC-13
Short-circuit rating		Yes
Parallel connection of outputs		In groups 0 – 3, 4 – 7, 8 – 11; Actuation of the outputs within a group only in the same program cycle
Number of outputs that can be switched in parallel		Max. 3
Total maximum current	A	2 for group
Weight	kg	0.16

			XIOC-8AI-I2	XIOC-8AI-U1	XIOC-8AI-U2	XIOC-4T-Pt
Modules						
Input voltage		V DC	–	0 to 10	-10 to +10	–
Input current		mA	4 - 20	–	–	–
Resolution, digital		bit	12	12	12	15 bit with sign
Conversion time			≦ 5 ms	≦ 5 ms	≦ 5 ms	
Total errors		%	≦ ± 1 (of full-scale value)			–
Input resistance		kΩ	–	100	100	–
Potential isolation						
Circuit within each channel			With optocouplers			
Between the input channels			No	No	No	no
Input channels		Number	8	8	8	4
Terminals			Plug-in terminal block			
External power supply			24 V DC (-15/+20 %), approx. 150 mA			24 V DC (-15/+20 %), 100 mA
External resistance	R	kΩ	–	–	–	max 0.4, 4 channels
Connection type			2-core shielded cable (≦20 m)			Shielded cable
Platinum RTD			–	–	–	Pt100 (IEC 751), Pt1000
Accuracy						
-20 to 40 °C (Pt100)		°C	–	–	–	±0.5
-50 to 400 °C (Pt100)		°C	–	–	–	±3
-50 to 400 °C (Pt1000)		°C	–	–	–	±6
Temperature measuring range			–	–	–	-20 to +40 °C/-50 to +400 °C (uninterrupted current: 2 mA)
Internal current consumption (5 V DC)		mA	Normally 100	Normally 100	Normally 100	Max. 200
Additional function			–	–	–	Linearisation
Fault detection						
-20 to 40 °C			–	–	–	≦ -25 °C or ≧ +45 °C = resistance value 7FFFFhex
-50 to 400 °C			–	–	–	≦ -60 °C or ≧ +410 °C = resistance value 7FFFFhex
Response to cable break or unused inputs			–	–	–	In these cases, the resistance value is 7FFFhex
Weight		kg	0.18	0.18	0.18	0.18

			XIOC-4AI-T
Channels			
Number			4
Temperature measuring range			Type K: -270…1370 Type J: -210…1200 Type B: 100…1800 Type N: -270…1300 Type E: -270…1000 Type R: -50…1760 Type T: -200…400
Voltage measurement			- 50 mV…50 mV -100 mV…100 mV -500 mV…500 mV -1000 mV…1000 mV
cold-junction compensation			Yes, built-in
Interference suppression			50 Hz, 60 Hz
Unit			0.1 °C, 0.1 F
Resolution		bit	16
Total errors		%	±0.5 of measurement range
Conversion time			< 1 s
Temperature coefficient			< 200 ppm/°C of measurement range

			XIOC-2AO-U1-2AO-I2	XIOC-4AO-U1	XIOC-2AO-U2
Modules					
Output voltage		V DC	0 - 10	0 - 10	-10 - 10
Output current		mA	4 - 20	–	–
Resolution		bit	12	12	12
Conversion time			≦ 5 ms	≦ 5 ms	≦ 5 ms
Total errors		%	≦ ± 1 (of full-scale value)		
External load resistance					
Voltage output			≧ 10 kΩ	≧ 10 kΩ	≧ 10 kΩ
Current output		Ω	0 to 500 Ω	–	–
Potential isolation					
Circuit within each channel			With optocouplers		
Between channels			No	No	No
Number of outputs					
Output voltage			2 (channels 0 and 1)	4	2
Output current			2 (channels 2 and 3)	–	–
Terminals			Plug-in terminal block		
Internal current consumption (5 V DC)		mA	Normally 100	Normally 100	Normally 100
External power supply			24 V DC (-15/+20 %), approx. 150 mA		
Connection type			2-core shielded cable (≦ 20 m)		

			XIOC-2AI-1AO-U1	XIOC-2AI-1AO-U1-I1	XIOC-4AI-2AO-U1	XIOC-4AI-2AO-U1-I1
Inputs						
Input voltage		V DC	0 - 10	0 - 10	0 - 10	0 - 10
Input current		mA	–	0 - 20	–	0 - 20
Resolution		bit	14	14	14	14
Conversion time			< 1 ms	< 1 ms	< 1 ms	< 1 ms
Total errors		%	Normally 0.4	Normally 0.4	Normally 0.4	Normally 0.4
Potential isolation						
Circuit within each channel			No	No	No	No
Between the input channels			No	No	No	No
Between input/output channels			No	No	No	No
Channels		Number	2	2	4	4
Input resistance		kΩ	40	40	40	40
Outputs						
Output voltage		V DC	0 - 10	0 - 10	0 - 10	0 - 10
Output current		mA	–	0 - 20	–	0 - 20
Resolution		bit	12	12	12	12
Errors			Normally 0.4 %	Normally 0.4 %	Normally 0.4 %	Normally 0.4 %
Potential isolation						
Circuit within each channel			No	No	No	No
Between the output channels			No	No	No	No
Number of channels			1	1	2	2
External load resistance			≧ 2 kΩ	≧ 2 kΩ	≧ 2 kΩ	≧ 2 kΩ
Short-circuit rating			Yes	Yes	Yes	Yes
Terminal connection						
Terminals			Plug-in terminal block	Plug-in terminal block	Plug-in terminal block	Plug-in terminal block
Internal current consumption (5 V DC)		mA	Normally 200	Normally 200	Normally 200	Normally 200
Weight		kg	0.16	0.16	0.16	0.16

		XIOC-NET-DP-M	XIOC-NET-DP-S	XIOC-NET-SK-M	XIOC-SER	XIOC-TC1
Interfaces						
Interfaces		PROFIBUS-DP, RS485, EN 50170	PROFIBUS-DP, RS485, EN 50170	RS485	RS232(C), RS422, RS485	RS232(C), RS422, RS485
Protocol		PROFIBUS-DP master (class 1)	PROFIBUS-DP slave	Suconet K, K1	Transparent mode, Modbus master/slave, SUCOM-A, Suconet-K slave	Tranparent mode, Modbus Master/Slave, SUCOM-A, DNP3 protocol
Character formats		–	–	–	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
Control and signal cables		–	–	–	RTS, CTS, DTR, DSR, DCD	RTS, CTS, DTR, DSR, DCD
Transfer rate	kbit/s	9.6 to 12000	9.6 to 12000	187.5, 375	0.3 …57.6 187.5, 375 (Suconet)	0.3 …57.6
Potential isolation		Yes	Yes	Yes	Yes (RS485, RS422)	Yes (RS485, RS422)
Number of slaves		124	–	16	–	–
Send/receive data		3500 Byte each	Max. 244 Byte	250 Byte each	250 Byte per slave 120 Byte per slave (Suconet-K slave)	250/500
Bus terminating resistors		Switchable	Switchable	Switchable	Switchable for RS485, RS422	Switchable for RS485, RS422
Connector type		D-sub 9-pin socket	D-sub 9-pin socket	Plug-in terminal block	RS232: D-sub 9-pin RS485, 422: plug-in terminal block	RS232: D-sub 9-pin RS485, 422: plug-in terminal block
Current consumption	mA	< 300	< 300	< 275	< 275	< 275
Weight	kg	Approx. 0.2	Approx. 0.2	Approx. 0.2	Approx. 0.2	Approx. 0.2
Number of modules		XC100: 1 XC200: 3	XC100: 1 XC200: 3	XC100: 2 XC200: 4	XC100: 2 XC200: 4	XC200: 4
Slots		1, 2, 3	1, 2, 3	Any	Any	Any

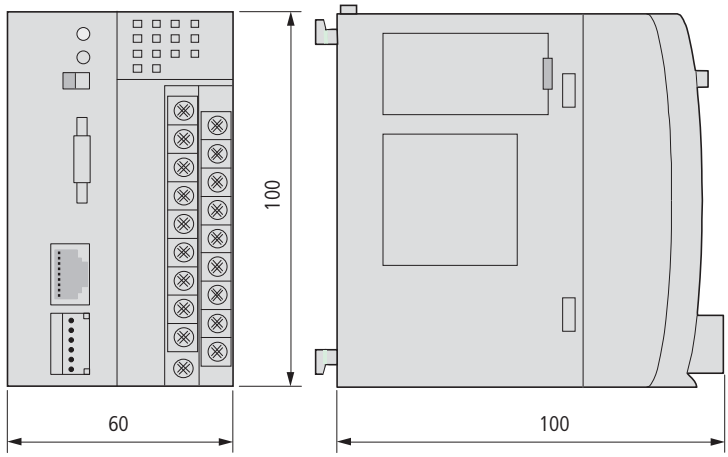
			XIOC-1CNT-100KHZ	XIOC-2CNT-100KHZ	XIOC-2CNT-2AO-INC
Inputs					
Counter limits			0 - 4294967295 (32 bit)	0 - 4294967295 (32 bit)	0 - 4294967295 (32 bit)
Internal current consumption		mA	200	200	450
Frequency		kHz	100 (25 with four times resolution)	100 (25 with four times resolution)	400 (100 with four times resolution)
Number of channels			1	2	2
Input voltage		V DC	12 - 24	12 - 24	–
Voltage for ON		V DC	> 10	> 10	–
Voltage for OFF		VA/W	< 4	< 4	–
Input current		mA	≧ 4	≧ 4	–
Differential input voltage		V DC	± 5	± 5	± 5
Voltage for ON		V DC	2 - 5	2 - 5	0.2 - 5
Voltage for OFF		V DC	-5 - 8	-5 - 8	-5 - -0.2
Differential input current		mA	35	35	5
Minimum pulse width		µs	ON ≧ 4 OFF ≧ 4	ON ≧ 4 OFF ≧ 4	–
Potential isolation			With optocouplers	With optocouplers	–
Connection for external cabling			30-pin plug: XIOC-TERM30-CNT4	30-pin plug: XIOC-TERM30-CNT4	Plug-in terminal block
External cabling			Shielded, twisted pair cable	Shielded, twisted pair cable	Shielded, twisted pair cable
Outputs					
Output type			Transistor (open collector)	Transistor (open collector)	Analog
External power supply			12/24 V DC (30 max.)	12/24 V DC (30 max.)	–
Minimum load current		mA	1	1	–
Maximum load current	I_e	mA	20	20	–
Max. leakage current		mA	0.5	0.5	–
Max. voltage drop at ON		V	1.5	1.5	–
Debounce OFF					
OFF → ON		ms	≦ 1	≦ 1	–
OFF → ON		ms	≦ 1	≦ 1	–
Output channels		Number	2	4	2
Potential isolation			With optocouplers	With optocouplers	–
Output voltage		V DC	–	–	-10 - 10
Resolution		bit	–	–	12
Conversion time			–	–	≦ 1 ms
Total errors		%	–	–	Normally 0.4
Load resistance			–	–	≧ 1 kΩ
Connection for external cabling			30-pin plug: XIOC-TERM30-CNT4	30-pin plug: XIOC-TERM30-CNT4	Plug-in terminal block
External cabling			Shielded, twisted pair cable	Shielded, twisted pair cable	Shielded 2-core cable
Current per channel		mA	–	–	≦ 300
Power supply of encoders			–	–	5 V DC
Current consumption		mA	200	200	Max. 450
Weight		kg	0.16	0.16	0.18

				XT-FIL-1	XT-FIL-2
General					
Standards				IEC/EN 61131-2 EN 50178	IEC/EN 61131-2 EN 50178
Ambient temperature			°C	0 - +55	0 - +55
Storage			°C	-25 - +70	-25 - +70
Mounting position				Vertical or horizontal	Vertical or horizontal
Vibration resistance				10 - 57 Hz ± 0.075 mm 57 - 150 Hz ± 1.0 g	10 - 57 Hz ± 0.075 mm 57 - 150 Hz ± 1.0 g
Mechanical shock resistance				15 g/11 ms	15 g/11 ms
Impact strength				500 g /50 mm ±25 g	500 g/50 mm ±25 g
Overvoltage category				II	II
Pollution degree				2	2
Protection type				IP20	IP20
Rated impulse withstand voltage		U_{imp}	V	850	850
Interference immunity				EN 61000-6-2	EN 61000-6-2
Weight			kg	0.1	0.1
Dimensions (W x H x D)			mm	35 x 90 x 30	35 x 90 x 57
Terminals				Screw terminals	Screw terminals
Terminal capacity					
Screw terminals					
	Flexible with ferrule		mm^2	0.2 - 2.5 (AWG22 - 12)	0.2 - 2.5 (AWG22 - 12)
	Solid		mm^2	0.2 - 2.5 (AWG22 - 12)	0.2 - 2.5 (AWG22 - 12)
Power supply					
Input voltage			V DC	24	24
Permissible range			V DC	20.4…28.8	20.4…28.8
Ripple			%	≦ 5	≦ 5
Mains overvoltage protection				Yes	Yes
Potential isolation					
Between input voltage and PE				Yes	Yes
Between input voltage and output voltage				No	No
Between output voltage and PE				Yes	Yes
Rated value			V DC	24	24
Output current			A	2.2	12

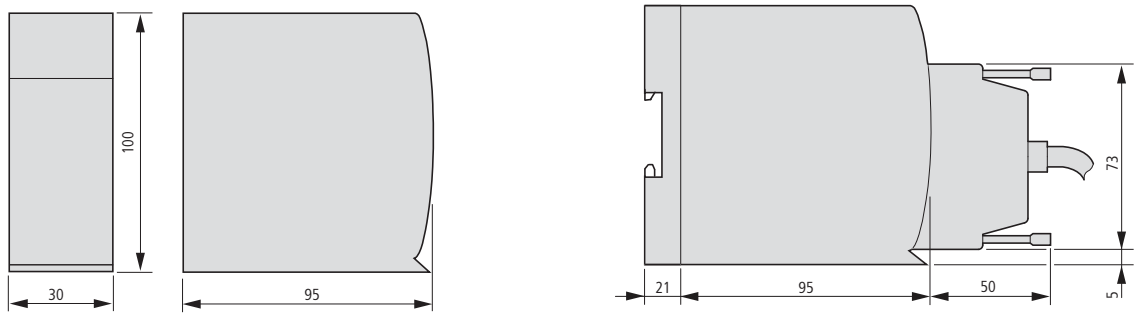
General information on electromagnetic compatibility (EMC) of automation systems				
Emitted interference	EN 55011/22 Class A (VDE 0875, Part 11)			
Interference immunity				
ESD	IEC/EN 61000-4-2	Contact discharge Air discharge		4 kV 8 kV
RFI	IEC/EN 61000-4-3	AM (80 %)	80 - 1000 MHz	10 V/m
Mobile phones/cellphones	IEC/EN 61000-4-3	PM	800 - 960 MHz	10 V/m
Burst	IEC/EN 61000-4-4	Mains/digital I/O (direct) Analog I/O, fieldbus (capacitive coupling)		2 kV 1 kV
Surge	IEC/EN 61000-4-5	Digital I/O, asymmetric, analog I/O, asymmetric, connection to shielding Mains DC, asymmetric Mains DC, symmetric Mains AC, asymmetric Mains AC, symmetric		0.5 kV 1 kV 1 kV 0.5 kV 2 kV 1 kV
Conducted interference, induced by high-frequency fields	IEC/EN 61000-4-6; 2003	AM (80 %)	150 kHz - 80 MHz	3 V

Dimensions

XC-CPU101
XC-CPU201
XC-CPU202

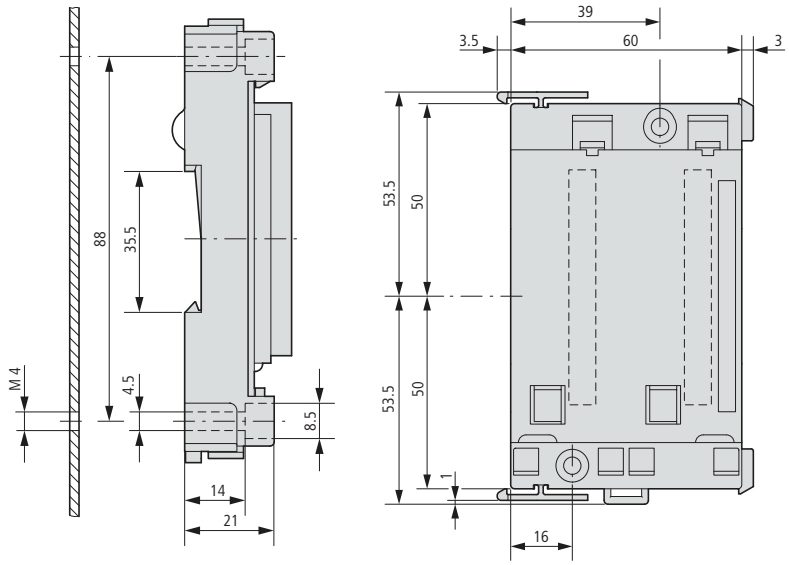


XIOC...

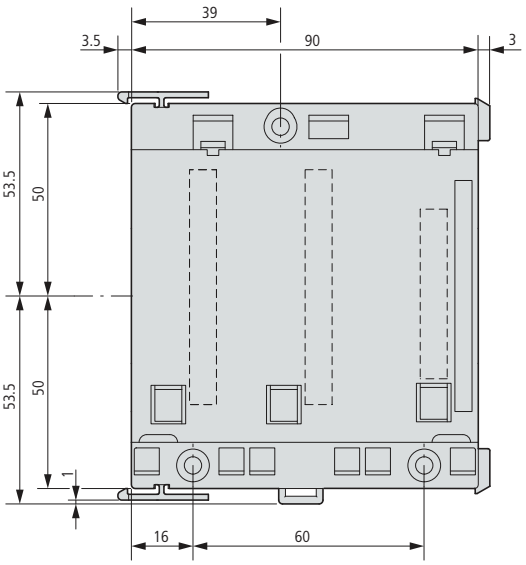


Backplanes

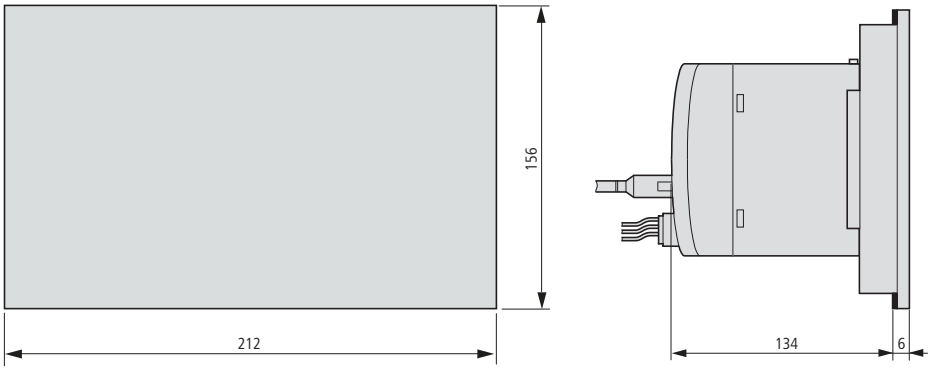
XIOC-BP-2
XIOC-BP-XC



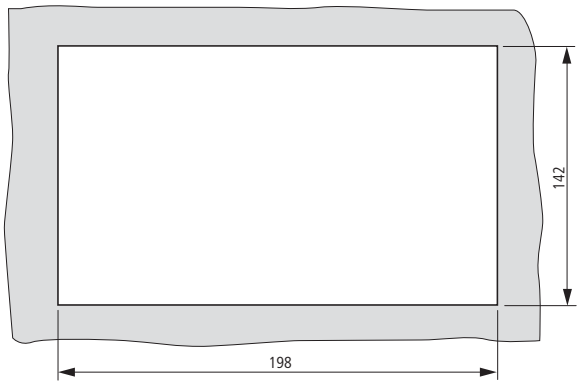
XIOC-BP-3
XIOC-BP-EXT
XIOC-BP-XC1



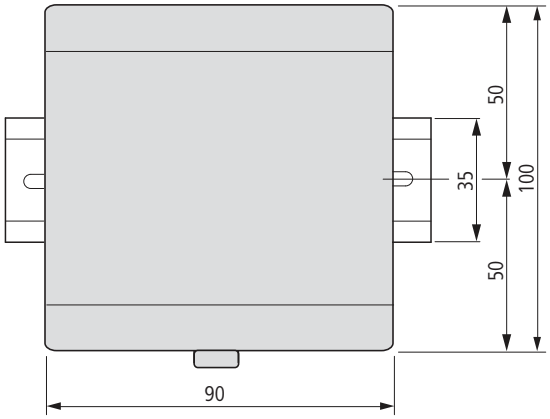
XV-101…

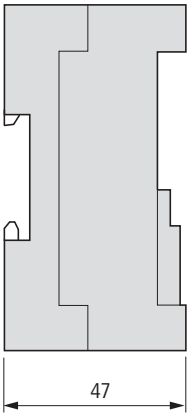


Mounting dimensions

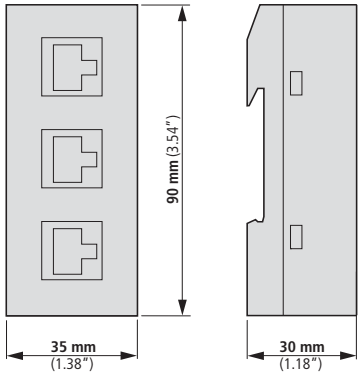


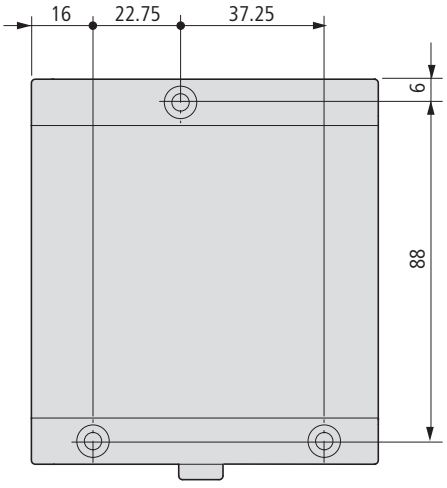
XC-CPU-121...
XIO-EXT121-1

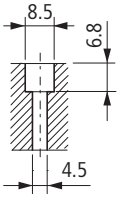




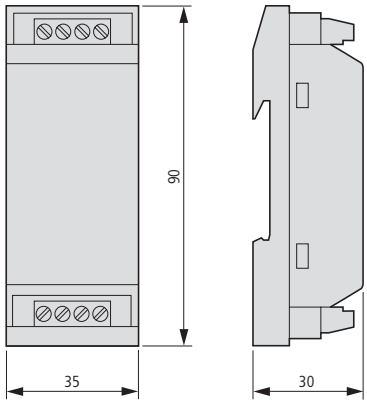
XT-RJ45-ETH-RS232



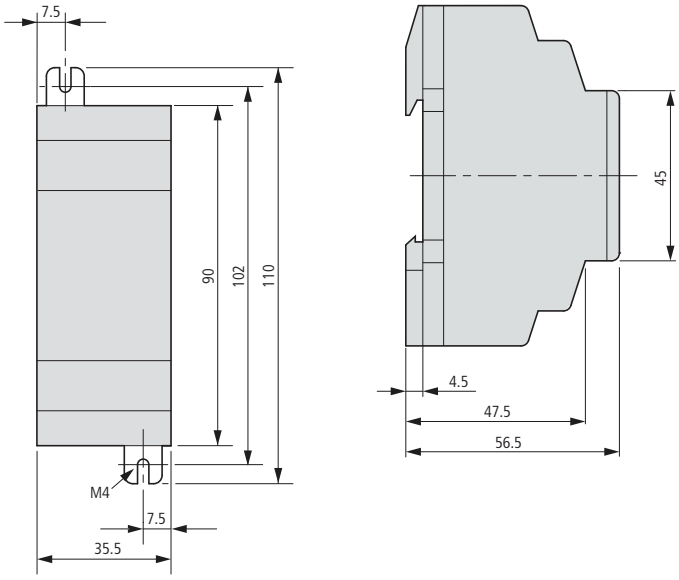




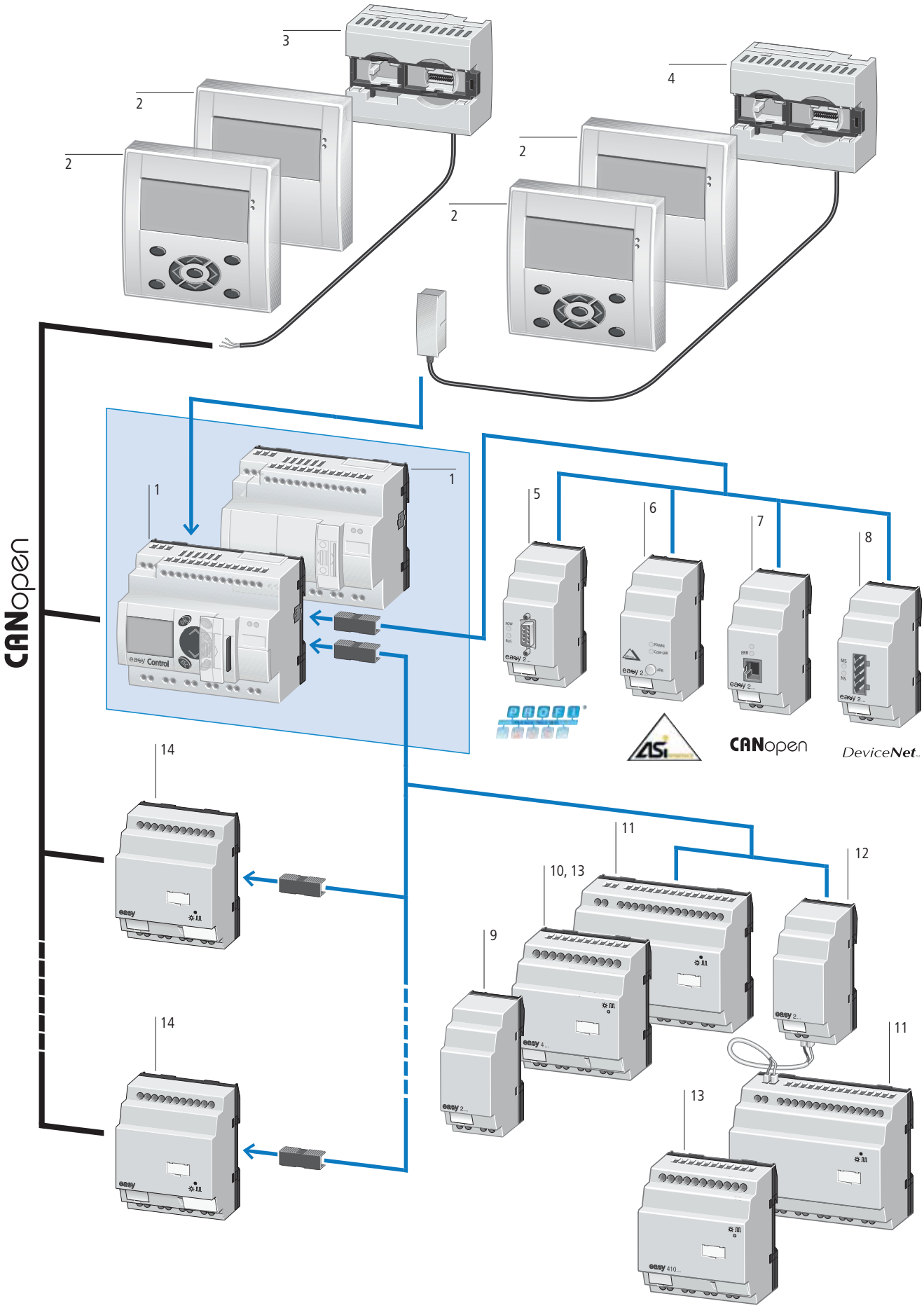
XT-FIL-1



XT-FIL-2



System overview



Basic device

EC4P 1

Expandable: Digital and analog inputs/ outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet; Ethernet optional

Bus system easyNet on board

24 V DC

12 digital inputs
4 of which usable as analog inputs
6 relay outputs (max. 10 A, UL) or
8 transistor outputs
1 analog output optional

Display and keypad optional

Screw and top-hat rail fixing
Screw terminals

→ Page 14/64

Remote text display 2, 3, 4

Consists of:

- Text display MFD-80..(-B) 2
- CANopen interface module MFD-CP4-CO (order connection cable EU4A-RJ45-CAB2 separately) 3
- Power supply unit/communication card, including connection cable (5 m, can be cut to desired length) for EC4P 4

24 V DC = MFD-CP4-800
100 - 240 V AC = MFD-AC-CP4-800
Spring-cage terminals

→ Page 14/66

Bus modules

EASY204-DP 5

PROFIBUS-DP interface, connection as slave
24 V DC

→ Page 14/66

EASY205-ASI 6

AS-Interface connection as slave, 24 V DC

→ Page 14/66

EASY221-CO 7

CANopen interface, 24 V DC

→ Page 14/66

EASY222-DN 8

DeviceNet interface, 24 V DC

→ Page 14/66

Output expansion

EASY202-RE 9

2 relay outputs (max. 10 A, UL)

Screw and top-hat rail fixing
Screw terminals

→ Page 14/65

I/O expansion modules

EASY406-DC-ME 10

24 V DC

1 digital input
2 analog inputs (2 × 0-10 V or
2 × 0-20 mA or 2 × Pt100 RTD;
voltage inputs 0-10 V can optionally be used as digital inputs)
1 analog output (0 - 10 V)
2 transistor outputs

Screw and top-hat rail fixing
Screw terminals

→ Page 14/65

EASY411-DC-ME 10

24 V DC

1 digital input
6 analog inputs (2 × 0-10 V and
2 × 0-20 mA and 2 × Pt100 RTD;
voltage inputs 0-10 V can optionally be used as digital inputs)
2 analog outputs (0 - 10 V)
2 transistor outputs

Screw and top-hat rail fixing
Screw terminals

→ Page 14/65

EASY6... 11

24 V DC

12 digital inputs
6 relay outputs (max. 10 A, UL) or
8 transistor outputs

Screw and top-hat rail fixing
Screw terminals

→ Page 14/65

EASY410... 13

24 V DC

6 digital inputs
4 relay outputs (max. 10 A, UL) or
4 transistor outputs

Screw and top-hat rail fixing
Screw terminals

→ Page 14/65

Coupling module

EASY200-EASY 12

For remote connection of a digital I/O expansion module through two-pole connection cable (max. 30 m);
e.g. NYM 3 × 1.5 mm²

→ Page 14/65

CANopen expansion modules

EC4E-221… 14

24 V DC

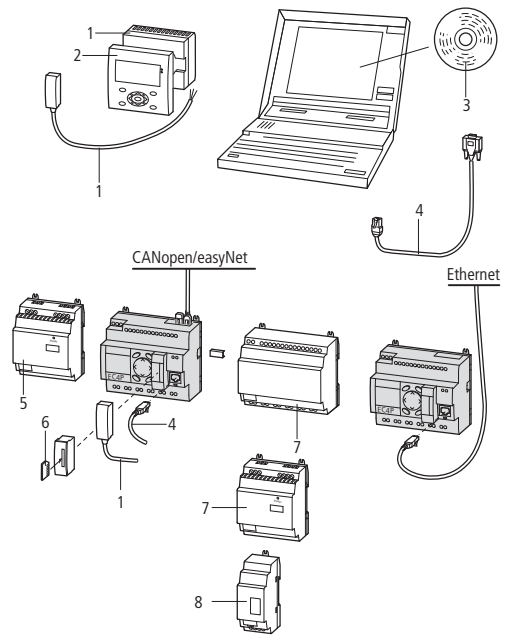
6 digital inputs
4 relay outputs or
4 transistor outputs

→ Page 14/65



Inputs		Outputs			Other features	Supply voltage connection	**Part no.** Article no.	**Price** See price list	Std. pack
Digital	Of which can be used as analog	Relay 10 A (UL)	Transistor	Analog	Display + keypad				
easyControl									
Expandable: Inputs/outputs and bus systems Individual laser inscription possible with EC4-COMBINATION-* → Page 14/69									
easy NET/CANopen on board									
12	4	–	8	–	✓	24 V DC	**EC4P-221-MTXD1** 106391		1 off
12	4	–	8	–	–		**EC4P-221-MTXX1** 106392		
12	4	6	–	–	✓		**EC4P-221-MRXD1** 106393		
12	4	6	–	–	–		**EC4P-221-MRXX1** 106394		
12	4	–	8	1	✓		**EC4P-221-MTAD1** 106395		
12	4	–	8	1	–		**EC4P-221-MTAX1** 106396		
12	4	6	–	1	✓		**EC4P-221-MRAD1** 106397		
12	4	6	–	1	–		**EC4P-221-MRAX1** 106398		
easyNet/CANopen and Ethernet on board									
12	4	–	8	–	✓	24 V DC	**EC4P-222-MTXD1** 106399		1 off
12	4	–	8	–	–		**EC4P-222-MTXX1** 106400		
12	4	6	–	–	✓		**EC4P-222-MRXD1** 106401		
12	4	6	–	–	–		**EC4P-222-MRXX1** 106402		
12	4	–	8	1	✓		**EC4P-222-MTAD1** 106403		
12	4	–	8	1	–		**EC4P-222-MTAX1** 106404		
12	4	6	–	1	✓		**EC4P-222-MRAD1** 106405		
12	4	6	–	1	–		**EC4P-222-MRAX1** 106406		

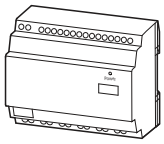
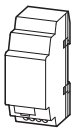
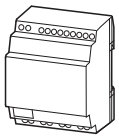
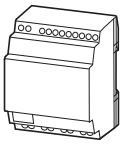
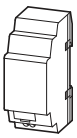
Notes

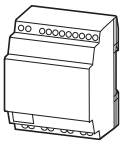


Accessories	**Page**
1 Power supply unit/communication card	→ 14/66
2 Display/keypad	→ 14/66
3 Programming software	→ 14/130
4 PC programming cable	→ 14/67
5 Switched-mode power supply unit	→ 14/131
6 Memory card	→ 14/67
7 Input/output expansion module	→ 14/65
8 Output expansion, bus module, coupling module	→ 14/65

Information relevant for export to North America

Product Standards	IEC: see Technical Data; UL508; CSA-C22.2 No. 0-M; CSA-C22.2 No. 142-M; CE marking
UL File No.	E135462
UL CCN	NRAQ
CSA File No.	012528
CSA Class No.	2252-01
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Inputs	Outputs		Supply voltage	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Digital	Relay 10 A (UL)	Transistor					
I/O expansion modules								
Can be used through easyLink								
	12	6	–	100 - 240 V AC	**EASY618-AC-RE** 212314		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CE marking; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; UL File No.: E135462; UL CCN: NRAQ, NRAQ7; CSA File No.: 012528; CSA Class No.: 2252-01 + 2258-02; NA Certification: UL Listed, CSA certified; Degree of Protection: IEC: IP20, UL/CSA Type: -
	12	–	8	24 V DC	**EASY620-DC-TE** 212313			
	12	6	–	24 V DC	**EASY618-DC-RE** 232112			Product Standards: IEC/EN see Technical Data; UL 508; CE marking; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; UL File No.: E135462; UL CCN: NRAQ, NRAQ7; CSA File No.: 012528; CSA Class No.: 2252-01; NA Certification: UL Listed, CSA certified; Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	2	–	24 V DC	**EASY202-RE**1) 232186			
	6	4	–	24 V DC	**EASY410-DC-RE** 114293			NA Certification: Request filed for UL and CSA; Degree of Protection: IEC: IP20, UL/CSA Type: -
	6	–	4	24 V DC	**EASY410-DC-TE** 114294			
Can be used through CANopen for: XC100/200, EC4P, MFD4, XV								
	6	4	–	24 V DC	**EC4E-221-6D4R1** 114296		1 off	NA Certification: Request filed for UL and CSA; Degree of Protection: IEC: IP20, UL/CSA Type: -
	6	–	4	24 V DC	**EC4E-221-6D4T1** 114297		1 off	
Coupling modules								
Can be used through easyLink								
	For remote connection of a digital I/O expansion up to 30 m.				**EASY200-EASY** 212315		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CE marking; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; UL File No.: E135462; UL CCN: NRAQ, NRAQ7; CSA File No.: 012528; CSA Class No.: 2252-01 + 2258-02; NA Certification: UL Listed, CSA certified; Degree of Protection: IEC: IP20, UL/CSA Type: -

	Inputs		Outputs			Supply voltage	Part no. Article no.	Price See price list	Std. pack
	Digital / Analog	Of which usable as digital	Relay 10 A (UL)	Transistor	Analog				
I/O expansion modules									
Can be used through easyLink									
	1 / 2 2)	2	–	2	1	24 V DC	**EASY406-DC-ME** 114295		1 off
	1 / 6 3)	2	–	2	2	24 V DC	**EASY411-DC-ME** 116567		1 off

Notes

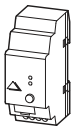
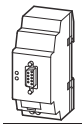
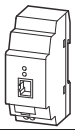
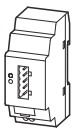
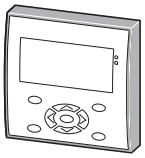
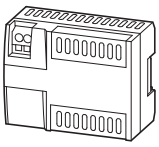
1) Not for use in combination with basic device EASY719-DA-… Cannot be used on coupling module EASY200-EASY coupling module

2) 2 × 0 - 10 V, 2 × 0 - 20 mA, 2 × Pt100 RTD (2/3-conductor connection); any combination
Voltage inputs (0 -10 V) can optionally be used as digital inputs

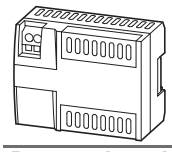
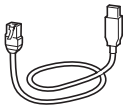
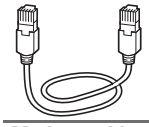
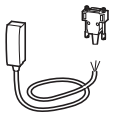
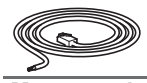
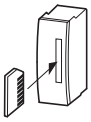
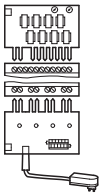
3) 2 x 0 - 10 V, 2 x 0 - 20 mA, 2 x Pt100 RTD(2/3 conductor connection);
Voltage inputs (0 -10 V) can optionally be used as digital inputs

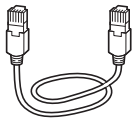
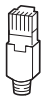
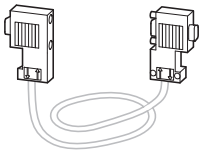
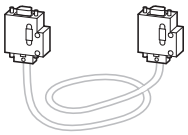
Information relevant for export to North America

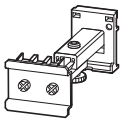
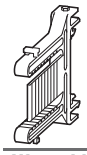
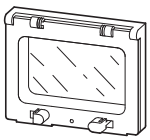
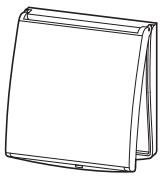
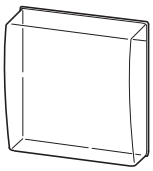
NA Certification	Request filed for UL and CSA
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Description		Supply voltage connection	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Bus modules							
	AS-Interface	Slave 4 inputs, 4 outputs, 4 parameter bits Assignable addresses 0 to 31	24 V DC	**EASY205-ASI** 221598		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ, NRAQ7 CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	PROFIBUS-DP	Slave Assignable addresses 1 to 126	24 V DC	**EASY204-DP** 212316			
	CANopen	Assignable addresses 1 to 127	24 V DC	**EASY221-CO** 233539			
	DeviceNet	Assignable addresses 0 to 63	24 V DC	**EASY222-DN** 233540			
Remote text display							
Display/keypad Monochrome display, 132 × 64 pixels with switchable backlight IP65, removable titanium front frame							
	With keypad and Moeller logotype NEMA 4x in combination with protective membrane MFD-XM-80 → 14/69			**MFD-80-B** 265251		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, in combination with MFD-XM-80: UL/CSA Type: 4X
	With keypad, without Moeller logotype NEMA 4x in combination with protective membrane MFD-XM-80 → 14/69			**MFD-80-B-X** 284905		1 off	
Power supply unit/communication cards IP20, can be combined with display/operating unit MFD-80... as remote text display for easyRelay							
	Without connection cable		24 V DC	**MFD-CP4** 280888		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Without connection cable		100 - 240 V AC	**MFD-AC-CP4** 286822		1 off	

HPL14067EN

	Supply voltage connection	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	
CANopen communication card							
Communication card with CANopen interface For use with display/operating unit MFD-80-B(-X) and connection cable EU4A-RJ45-CAB2 (→ Page 14/67) Automatic baud rate setting up to 1 MBaud; Up to 64 display pages can be saved.							
	24 V DC	–	**MFD-CP4-CO** 115736		1 off	NA Certification	Request filed for UL and CSA
Programming cable							
	–	USB, 2 m	**EASY800-USB-CAB** 106408		1 off		
	–	D-sub 9-pin, serial, 2 m	**EU4A-RJ45-CAB1** 106726		1 off	NA Certification	Request filed for UL and CSA
		For EU5C, XC and EC4P via USB interface	**EU4A-RJ45-USB-CAB1** 115735		1 off		
	–	2 m Ethernet cross	**XT-CAT5-X-2** 256487		1 off		
	–	5 m Ethernet cross	**XT-CAT5-X-5** 256488		1 off		
Modem cable							
	Configurable modem, printer and programming cable, possible transfer rate 56 kBaud, D-sub 9-pin (plug + socket for assembly by user)		**EASY800-MO-CAB** 286079		1 off		
Connecting cables							
	–	For connecting EC4P (RJ45) to MFD-CP4-CO or EC4E (terminal block)	**EU4A-RJ45-CAB2** 115387		1 off	NA Certification	Request filed for UL and CSA
Memory cards							
	–	Adapter with at least 64 MByte memory card	**EU4A-MEM-CARD1** 106409		1 off	NA Certification	Request filed for UL and CSA
Input/output simulator							
	24 V DC	With plug-in power supply unit 100 - 240 V AC/ 24 V DC	**EASY800-DC-SIM** 256278				

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Network connection cables						
	Length: 0.3 m	easyNet	**EASY-NT-30** 256283		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
	Length: 0.8 m	easyNet	**EASY-NT-80** 256284			
	Length: 1.5 m	easyNet	**EASY-NT-150** 256285			
Bus termination resistor						
	8-pin, RJ45, 124 Ω Connection to PIN 1 and PIN 2	easyNet	**EASY-NT-R** 256281		2 off	
Data cable						
	4 x 0.14 mm², twisted pair, AWG 26 Length: 100 m	easyNet	**EASY-NT-CAB** 256286		1 off	UL File No.: E135462 UL CCN: NRAQ NA Certification: UL Listed Degree of Protection: IEC: IP 20, UL/CSA Type: -
Bus connector plug						
	8-pin, RJ45	easyNet	**EASY-NT-RJ45** 256280		10 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Crimping tool						
–	For RJ45 plug	EASY-NT-CAB EASY-NT-RJ45	**EASY-RJ45-TOOL** 256282		1 off	
PROFIBUS-DP data cable						
	Twisted pair, without plug, 2-core, 2 x 0.64 mm² (only suitable for fixed wiring) 100 m		**ZB4-900-KB1** 206983		100 m	
PROFIBUS-DP bus connector plug						
	9-pin male Cable entry, angled 90°		**ZB4-209-DS2** 206982		1 off	
	Metalized insulated housing Maximum transfer rate 12 MBit/s Integrated switch (accessible From the outside) for the bus terminating resistors Terminal block for two cable entries, with straight or 90° angled cable entry, as required		**ZB4-209-DS3** 217820		1 off	
Connection plug						
	Bus connector plug between base unit and expansion unit/bus module		**EASY-LINK-DS** 221607		1 off	UL/CSA certification not required
Fixing bracket For screw fixing to mounting plate						
	3 fixing brackets for easy400, 500, 600, 700, 800, EC4P, ES4P 2 fixing brackets for easy200 3 fixing brackets for MFD-CP8…, MFD-AC-CP8…		**ZB4-101-GF1** 061360		9 off	UL/CSA certification not required

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Telescopic clip						
	For use with 35 mm top-hat rail to IEC/EN 60715 for mounting depth compensation when rear mounting in enclosures CI-K... and panels. Stepless adjustment via scale from 75 – 115 mm. Screw and snap mounting		**M22-TA** 226161		1 off	Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 012528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified
Top-hat rail adapter for hinged inspection window						
	12 mm x 66 mm x 82 mm Installation on hinged inspection window, for front fitting of devices. Complete set, consisting of 2 brackets and 4 screws		**SKF-HA** 233782		1 off	UL/CSA certification not required
Hinged inspection window						
	94 mm x 77 mm x 25 mm (4 space units) For use with easy500		**SKF-FF4** 233780		1 off	UL/CSA certification not required
	130 mm x 77 mm x 25 mm (6 space units) For use with EASY700, EASY800, EC4P, ES4P		**SKF-FF6** 233781			
Protective cover						
	Transparent Protection against accidental actuation Sealable Use without front frame	MFD-80…	**MFD-XS-80** 265259		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified
Protective diaphragm						
	Transparent type for harsh environmental conditions and application in the food industry For increasing the degree of protection to NEMA 4X for MFD-80-B	MFD-80…	**MFD-XM-80** 265258		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP65, UL/CSA Type:°4X

	Supply voltage connection	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Custom labeling, user program							
• Custom labeling of multi-function display with labeling software Labeleditor or • Supply of multi-function display programmed with user program			MFD-80-X MFD-80-B-X	**MFD-COMBINATION-*** 265260		1 off	UL/CSA certification not required
• Custom labeling of easy Control with labeling software Labeleditor or supply of easyControls programmed with user program			EC4P	**EC4-COMBINATION-*[1)]** 107600		1 off	

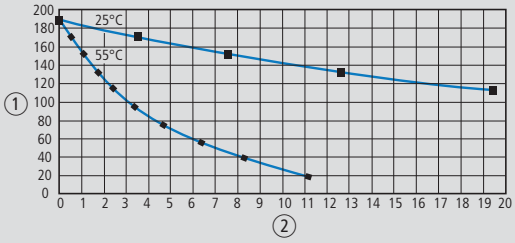
Notes

Example for using the Labeleditor la beling software
Individually label your device in 4 stages:
– Download the labeling software: www.moeller.net/support, keyword: "Labeleditor"
– Create a label template (menu-guided in the software)
– Mail the label template to the factory. The program automatically selects the correct e-mail address for the selected product and assigns a file name, such as "EASY_12345.zip". This file name is part of the article to be ordered (see Ordering examples).
– Send your order to your Eaton sales office or your electrical wholesaler.

Ordering example: MFD-Titan
MFD-80-B multi-function display with "company name":
1 x MFD-COMBINATION-*
1 x MFD-80-B
1 x the file name "MFD_xxxxx.zip" issued by the Labeleditor

Ordering example: EC4P
EC4P-221-MTXD1 with "company name":
1 x EC4-COMBINATION-*
1 x EC4P-221-MTXD1
1 x the file name "EC4P_xxxxx.zip" issued by the Labeleditor

Technical data

			EC4P…
General			
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	107.5 x 90 x 72 without/79 with adapter for memory card
Weight		kg	0.3
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing with 3 fixing brackets ZB4-101-GF1 (accessories)
Terminal capacity			
Solid		mm^2	0.2 - 4 (AWG 22 - 12)
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)
Flat-blade screwdriver		mm	3.5 x 0.8
Max. tightening torque		Nm	0.6
Ambient climatic conditions			
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures
LCD display (clearly legible)		°C	0 - 55
Storage		°C	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95
Air pressure (in operation)		hPa	795 - 1080
Ambient mechanical conditions			
Pollution degree			2
Degree of protection (IEC/EN 60529, EN50178, VBG 4)			IP20
Vibrations (IEC/EN 60068-2-6)			
Constant amplitude 0.15 mm		Hz	10 - 57
Constant acceleration, 2 g		Hz	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18
Drop to (IEC/EN 60068-2-31)	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1
Mounting position			Vertical or horizontal
Electromagnetic compatibility (EMC)			
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)			
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B
Burst pulses (IEC/EN 61000-4-4, Level 3)			
Supply cables		kV	2
Signal cables		kV	2
Surge pulses (IEC/EN 61000-4-5, Level 2)		kV	0.5 (supply cables, symmetrical, EASY…DC)
Line-conducted interference (IEC/EN 61000-4-6)		V	10
Insulation resistance			
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142
Insulation resistance			EN 50178
Real-time clock accuracy/backup time			
Back-up time			 ① Backup time (hours) ② Service life (years)
Accuracy of the real-time clock		s/day	Normally ± 5 (± 0.5 h/year)
Retentive memory			
Write cycles of the retentive memory (minimum)			10000000 (10^{10}) (read/write cycles)

			EC4P-221...	EC4P-222...
Power supply				
Rated operational voltage	U_e	V	24 DC (-15/+20%)	24 DC (-15/+20%)
Permissible range		V DC	20.4 - 28.8	20.4 - 28.8
Ripple		%	≦ 5	≦ 5
Input current				
At rated voltage		mA	Normally 140	Normally 140
At rated operating voltage with load		A	–	–
Voltage dips (IEC/EN 61131-2)		ms	10	10
Heat dissipation		W	Normally 3.4	Normally 3.4
CPU				
Microprocessor			Infineon XC161	Infineon XC161
Memory				
Program code/data		kByte	256/14 segments of 16 KB each	256/14 segments of 16 KB each
Marker/input/output/retain data		kByte	16/4/4/8	16/4/4/8
Cycle time for 1 k of instructions (bits, bytes)		ms	< 0.3	< 0.3
Interfaces				
COM1 (RS232) without control cables				
Data transfer rate for programming		kBit/s	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 (character format: 8 data bits, no parity, 1 stop bit)	
Connections			RJ45 bus	RJ45 bus
Potential isolation			None	None
In the transparent mode				
Baud rate		kBit/s	0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6	0.3, 0.6, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6
Character formats			8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1	8E1, 8O1, 8N1, 8N2, 7E2, 7O2, 7N2, 7E1
Number of transmission bytes in a block			190 Byte	190 Byte
Number of received bytes in a block			190 Byte	190 Byte
Ethernet (for programming)				
Data transfer rate/distance		MBit/s	–	10 MBit/s, 100 m
Connection type			–	RJ45
Potential isolation			–	No
CANopen/easyNet				
Data transfer rate/distance			500 kBit/s, 25 m 250 kBit/s, 60m 125 kBit/s, 125 m 50 kBit/s, 300 m 20 kBit/s, 700 m 10 kBit/s, 1000 m	500 kBit/s, 25 m 250 kBit/s, 60m 125 kBit/s, 125 m 50 kBit/s, 300 m 20 kBit/s, 700 m 10 kBit/s, 1000 m
Potential isolation				
From power supply			Yes	Yes
From the inputs			Yes	Yes
From the outputs			Yes	Yes
Bus termination (first and last station)			EASY-NT-R plug (incl. bus terminating resistor 120 Ω)	
Connections			2 x RJ45, 8-pin	2 x RJ45, 8-pin
Control operating mode easyNet				
Number of users			8	8
CANopen operating mode				
Stations		Number	Max. 126	Max. 126
PDO type			Asynchronous, cyclic, acyclic	
Device profile			To DS 301 V4	To DS 301 V4
Analog outputs				
Number			–	–
Potential isolation				
From power supply			No	No
From the digital inputs			No	No
From the digital outputs			–	–
To network easyNet, easyLink			–	–
Output type			–	–
Signal range		V DC	0 - 10	0 - 10
Conversion time, analog/digital		ms	bit	bit

			EC4P…
Digital inputs 24 V DC			
Number			12
Inputs can be used as analog inputs			4 (I7, I8, I11, I12)
Status indication			LCD display (if fitted)
Potential isolation			
From power supply			No
Between digital inputs			No
From the outputs			Yes
From network easyNet, easyLink			Yes
Rated operating voltage	U_e	V DC	24
At state "0"	U_e	V DC	< 5 (I1 - I6, I9, I10) < 8 (I7, I8, I11, I12)
At state "1"	U_e	V DC	> 15.0 (I1 - I6, I9, I10), > 8.0 (I7, I8, I11, I12)
Input current at state "1"			
I1 to I6		mA	3.3 (at 24 V DC)
I7, I8		mA	2.2 (at 24 V DC)
I9, I10		mA	3.3 (at 24 V DC)
I11, I12		mA	2.2 (at 24 V DC)
Delay time from 0 to 1		ms	Normally 0.02 (I1 - I4), Normally 0.25 (I5 - I12)
Delay time from 1 to 0		ms	Normally 0.02 (I1 - I4), Normally 0.25 (I5 - I12)
Cable length (unshielded)		m	100
Incremental encoder			
Number			1 (I1, I2, I3, I4)
Value range			32 bit
Counter frequency		kHz	≦ 40
Pulse shape			Square
Counter inputs			I1, I2
Reference input			I3
Input for reference switch			I4
Signal offset			90°
Rapid counter inputs			
Number			2 (I1, I2) at 16 bit or 1 (I1) at 32-bit
Value range			16/32-bit
Cable length, shielded		m	< 20
Counter frequency		kHz	< 50
Pulse shape			Square
Analog inputs			
Number			4 (I7, I8, I11, I12)
Potential isolation			
From power supply			No
From the digital inputs			No
From the outputs			Yes
From network easyNet, easyLink			Yes
Input type			DC voltage
Signal range		V DC	0 - 10
Resolution, analog		V	0.01
Resolution, digital		V	0.01
Resolution, digital		bit	10 (value 0 - 1023)
Input impedance		kΩ	11.2
Accuracy of actual value			
Two devices		%	± 3
Within a single device		%	± 2, (I7, I8, I11, I12) ± 0.12 V
Conversion time, analog/digital		ms	each CPU cycle
Input current		mA	< 1
Cable length shielded		m	< 30

			EC4P-…-MT…
Transistor outputs			
Number			8
Rated operating voltage	U_e	V DC	24
Permissible range	U_e	V DC	20.4 - 28.8
Ripple		%	≦ 5
Supply current			
At state "0"	Normally/ max.	mA	18/32
At state "1"	Normally/ max.	mA	24/44
Protection against polarity reversal			Yes (Caution: A short circuit will result if 0 V or GND is applied to the outputs if the supply voltage is connected to the wrong poles.)
Potential isolation			
From power supply			Yes
To PC interface, memory card, network NET, easyLink			Yes
From the inputs			Yes
Rated operational current at state "1" DC	I_e	A	Max. 0.5
Lamp load without R_v		W	5
Residual current at state "0" for channel		mA	< 0.1
Max. output voltage			
At state "0" with external load < 10 MΩ		V	2.5
At state "1" at I_e = 0.5 A		V	$U = U_e$ -1 V
Short-circuit protection			Yes, electronic (Q1 – Q4), thermal (Q5 – Q8), (analysis via diagnostics input I16, I15)
Short-circuit tripping current for R_a ≦ 10 mΩ		A	0.7 ≦ I_e ≦ 2 for output
Total short-circuit current		A	16
Peak short-circuit current		A	32
Thermal cutout			Yes
Max. operating frequency at constant resistive load R_L < 100 kΩ (dependent on program and load)		Ops/h	40000
Parallel connection of outputs			
With resistive load, inductive load with external suppressor circuit, combination within a group			Group 1: Q1 to Q4 Group 2: Q5 to Q8
Number of outputs	max.		4
Max. total current		A	2 (Caution! Outputs must be actuated simultaneously and for the same duration.)
Output status indication			LCD display (if fitted)
Inductive load to EN 60947-5-1			
Without outer suppressor circuit			
$T_{0.95 = 1 ms, R = 48 Ω, L = 16 mH}$			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. operating frequency f = 0.5 Hz (max. DF = 50 %)		Operations	1500
DC-13, $T_{0.95 = 72 ms, R = 48 Ω, L = 1.15 H}$			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. operating frequency f = 0.5 Hz (max. DF = 50 %)		Operations	1500
$T_{0.95 = 15 ms, R = 48 Ω, L = 0.24 H}$			
Utilization factor		g	0.25
Duty factor		% DF	100
Max. operating frequency f = 0.5 Hz (max. DF = 50 %)		Operations	1500
With outer suppressor circuit			
Utilization factor		g	1
Duty factor		% DF	100
Max. operating frequency, max. duty factor		Operations	Depending on the suppressor circuit

				EC4P-...-MR...
Relay outputs				
Number				6
Outputs in groups of				1
Parallel switching of outputs to increase performance				Not permissible
Protection of an output relay				Miniature circuit-breaker B16 or fuse 8 A (slow)
Potential isolation				
From power supply				Yes
From the inputs				Yes
From PC interface, memory card, network NET, easyLink				Yes
Safe isolation			V AC	300
Basic insulation			V AC	600
Lifespan, mechanical		Operations	x 10^6	10
Contacts				
Conventional thermal current (10 A UL)			A	8
Recommended for 12 V AC/DC load			mA	> 500
Short-circuit proof p.f. = 1, characteristic B16 at 600 A			A	16
Short-circuit proof p.f. = 0.5 - 0.7; characteristic B16 at 900 A			A	16
Rated impulse withstand voltage U_{imp} contact coil			kV	6
Rated operating voltage		U_e	V AC	250
Rated insulation voltage		U_i	V AC	250
Safe isolation to EN 50178 between coil and contact			V AC	300
Safe isolation to EN 50178 between two contacts			V AC	300
Making capacity				
AC-15, 230 V AC, 3 A		Operations		300000
DC-13, 24 V DC, 0.1 Hz		Operations		200000
Breaking capacity				
AC-15, 250 V AC, 3 A (600 ops./h)		Operations		300000
DC-13, L/R ≦ 150 ms, 24 V DC, 1 A (500 ops./h)		Operations		200000
Filament bulb load				
1000 W at 230/240 V AC		Operations		25000
500 W at 115/120 V AC		Operations		25000
Fluorescent lamp load				
Fluorescent lamp load 10 x 58 W at 230/240 V AC				
With series-connected electrical device		Operations		25000
Uncompensated		Operations		25000
Fluorescent lamp load 1 x 58 W at 230/240 V AC, conventionally compensated		Operations		25000
Switching frequency				
Mechanical operations			x 10^6	10
Switching frequency			Hz	10
Resistive load/lamp load			Hz	2
Inductive load			Hz	0.5
UL/CSA				
Continuous current at 240 V AC			A	10
Continuous current at 24 V DC			A	8
AC				
Control circuit rating codes (utilization category)				B 300 Light Pilot Duty
Max. rated operational voltage			V AC	300
Max. thermal continuous current p.f. = 1 at B 300			A	5
Max. make/break capacity p.f. ≠ 1 at B 300			VA	3600/360
DC				
Control circuit rating codes (utilization category)				R 300 Light Pilot Duty
Max. rated operational voltage			V DC	300
Max. thermal continuous current p.f. at R 300			A	1
Max. make/break capacity at R 300			VA	28/28

			EC4E-221-…
General			
Standards			EN 55011, EN 55022, IEC/EN 61000-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	71.5 x 90 x 58 (4 space units)
Weight		kg	0.2
Mounting			Top-hat rail IEC/EN 60715, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories).
Terminal capacity			
Solid		mm^2	0.2 - 4 (AWG 22 - 12)
Flexible with ferrule		mm^2	0.2 - 2.5 (AWG 22 - 12)
Flat-blade screwdriver		mm	3.5 x 0.8
Max. tightening torque		Nm	0.6
Ambient climatic conditions			
Operating ambient temperature		°C	-25…55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures
Storage		°C	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95
Air pressure (in operation)		hPa	795 - 1080
Ambient mechanical conditions			
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Vibrations (IEC/EN 60068-2-6)			
Constant amplitude 3.5 mm		Hz	10 - 57
Constant acceleration, 1 g		Hz	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1
Mounted position			Vertical or horizontal
Electromagnetic compatibility (EMC)			
Overvoltage category/pollution degree			II/2
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)			
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B
Burst pulses (IEC/EN 61000-4-4, Level 3)			
Supply cables		kV	2
Signal cables		kV	2
Surge pulses (IEC/EN 61000-4-5, Level 2)		kV	0.5 (supply cables, symmetrical, EASY…DC)
Line-conducted interference (IEC/EN 61000-4-6)		V	10
Insulation resistance			
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142
Insulation resistance			EN 50178

Notes Technical data for the expansion units EASY... → Chapter 12

				EC4E-221-…
Power supply				
Rated operational voltage		U_e	V	24 DC (-15/+20%)
Permissible range				
	Permissible range min.		V DC	20.4
	Permissible range max.		V DC	28.8
Ripple			%	≦ 5
Input current				
	At rated operating voltage without load		mA	Normally 150
	At rated operating voltage with load		A	–
Voltage dips (IEC/EN 61131-2)			ms	10
Heat dissipation			W	Normally 3.5
Interfaces				
CANopen				
	Data transfer rate/distance			500 kBit/s, 25 m 250 kBit/s, 40 m 125 kBit/s, 125 m 50 kBit/s, 300 m 20 kBit/s, 700 m 10 kBit/s, 1000 m
	Potential isolation			No
	Bus termination (first and last station)			Through integrated Dip switch
	Connections			2 x terminals (see terminal capacity)
CANopen operating mode				
	Stations		Number	Max. 62
	PDO type			Asynchronous, cyclic, acyclic
	Device profile			To DS 301 V4
Digital inputs 24 V DC				
Number				6
Potential isolation				
	From power supply			No
	Between digital inputs			No
	From the outputs			Yes
Rated operating voltage		U_e	V DC	24
	At state "0"	U_e	V DC	< 5 (R1 - R6)
	At state "1"	U_e	V DC	> 15 (R1 - R6)
Input current at state "1"				
	R1 - R6 (R12)		mA	3.3 (at 24 V DC)
	R1		mA	–
	R2, R3		mA	–
Delay time from 0 to 1				
	Debounce ON		ms	20
	Debounce OFF		ms	Normally 0.25 (R1 - R12)
Delay time from 1 to 0			ms	20
Cable length (unshielded)			m	100

Notes Technical data for the expansion units EASY... → Chapter 12

				EC4E-221-6D4R1
Relay outputs				
Number				4
Outputs in groups of				1
Parallel switching of outputs to increase performance				Not permissible
Protection of an output relay				Miniature circuit-breakers B16 or fuse 8 A (T)
Potential isolation				
From power supply				Yes
From the inputs				Yes
From PC interface, memory card, network NET, easyLink				Yes
Safe isolation According to EN 50178			V AC	300
Basic insulation			V AC	600
Lifespan, mechanical		Operations	x 10^6	10
Contacts				
Conventional thermal current (10 A UL)			A	8
Recommended for 12 V AC/DC load			mA	> 500
Short-circuit proof p.f. = 1, characteristic B16 at 600 A			A	16
Short-circuit proof p.f. = 0.5 - 0.7; characteristic B16 at 900 A			A	16
Rated impulse withstand voltage U_{imp} contact coil			kV	6
Rated operating voltage		U_e	V AC	250
Rated insulation voltage		U_i	V AC	250
Safe isolation to EN 50178 between coil and contact			V AC	300
Safe isolation to EN 50178 between two contacts			V AC	300
Making capacity				
AC-15, 230 V AC, 3 A		Operations		300000
DC-13, 24 V DC, 0.1 Hz		Operations		200000
Breaking capacity				
AC-15, 250 V AC, 3 A (600 ops./h)		Operations		300000
DC-13, L/R ≦ 150 ms, 24 V DC, 1 A (500 ops./h)		Operations		200000
Filament bulb load				
1000 W at 230/240 V AC		Operations		25000
500 W at 115/120 V AC		Operations		25000
Fluorescent lamp load				
Fluorescent lamp load 10 x 58 W at 230/240 V AC				
	With series-connected electrical device	Operations		25000
	Uncompensated	Operations		25000
Fluorescent lamp load 1 x 58 W at 230/240 V AC, conventionally compensated		Operations		25000
Switching frequency				
Mechanical operations			x 10^6	10
Switching frequency			Hz	10
Resistive load/lamp load			Hz	2
Inductive load			Hz	0.5
UL/CSA				
Continuous current at 240 V AC			A	10
Continuous current at 24 V DC			A	8
AC				
	Control circuit rating codes (utilization category)			B 300 Light Pilot Duty
	Max. rated operational voltage		V AC	300
	Max. thermal continuous current p.f. = 1 at B 300		A	5
	Max. make/break capacity p.f. ≠ 1 at B 300		VA	3600/360
DC				
	Control circuit rating codes (utilization category)			R 300 Light Pilot Duty
	Max. rated operational voltage		V DC	300
	Max. thermal continuous current p.f. at R 300		A	1
	Max. make/break capacity at R 300		VA	28/28

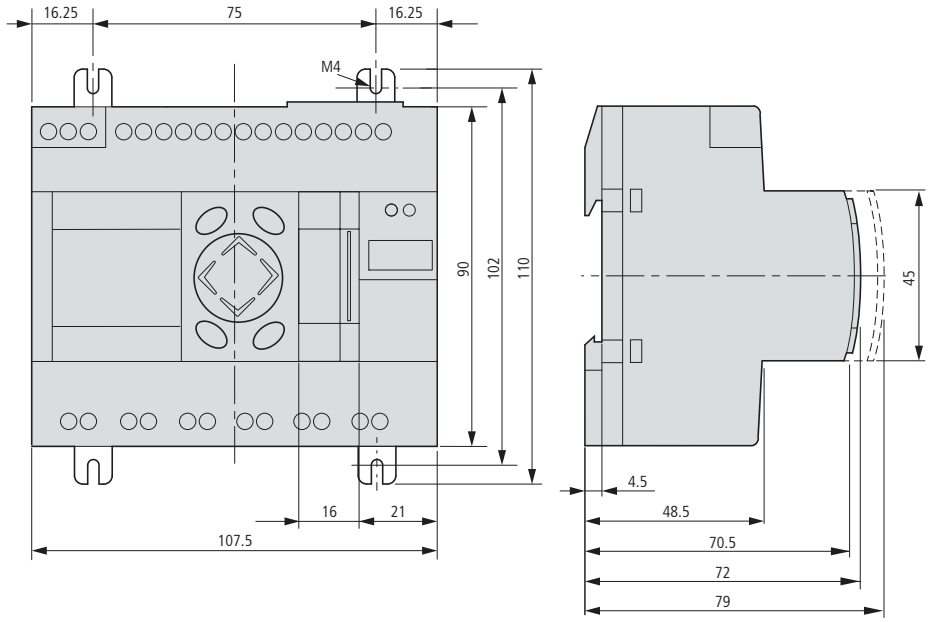
				EC4E-221-6D4T1
Transistor outputs				
Number				4
Rated operating voltage		U_e	V DC	24
Permissible range		U_e	V DC	20.4 - 28.8
Ripple			%	≦ 5
Supply current				
	At state "0"	Normally/ max.	mA	9/16
	At state "1"	Normally/ max.	mA	12/22
Protection against polarity reversal				Yes (Caution: A short circuit will result if 0 V or GND is applied to the outputs if that the supply voltage is connected to the wrong poles.)
Potential isolation				
	From power supply			Yes
	From PC interface, memory card, network NET, easyLink			Yes
Rated operational current at state "1" DC for channel		I_e	A	Max. 0.5
Lamp load without R_v for channel			W	5
Residual current at state "0" for channel			mA	< 0.1
Max. output voltage				
	At state "0" with external load < 10 MΩ		V	2.5
	At state "1" at I_e = 0.5 A		V	$U = U_e$ -1 V
Short-circuit protection				Yes, thermal (analysis via diagnostics input R16)
Short-circuit tripping current for R_a ≦ 10 mΩ			A	$0.7 \leqq I_e \leqq 2$ for output
Total short-circuit current			A	8
Peak short-circuit current			A	16
Thermal cutout				Yes
Max. operating frequency at constant resistive load R_L < 100 kΩ (dependent on program and load)			Ops/h	40000
Parallel connection of outputs				
	With resistive load, inductive load with external suppressor circuit, combination within a group			Group 1: Q1 to Q4
	Number of outputs	Max.		4
	Max. total current		A	2 (Caution! Outputs must be activated simultaneously and for the same duration)



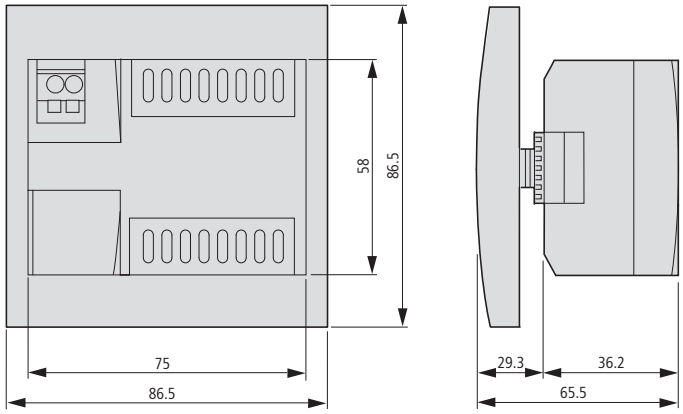
			MFD-CP4-CO
General			
Standards			EN 61000-6-1/-2/-3/-4, IEC 60068-2-6, IEC 60068-2-27
Dimensions (W x H x D)		mm	75 x 58 x 36.2
Weight		kg	0.16
Mounting			Plug-fitted to the display fixing shaft
Terminal capacity			
Power supply			
Solid		mm^2	0.5 - 2.5 (AWG 20 - 14)
Flexible with ferrule		mm^2	0.5 - 1.5 (AWG 20 - 16)
Flat-blade screwdriver		mm	3.5 x 0.6
Data cable			
Solid		mm^2	0.2 - 0.5 (AWG 24 - 20)
Ambient climatic conditions			
Operating ambient temperature		°C	-25 - 55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2
Condensation			Prevent condensation by means of suitable measures
Storage		°C	-40 - 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95
Air pressure (in operation)		hPa	795 - 1080
Ambient mechanical conditions			
Pollution degree			2
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Vibrations (IEC/EN 60068-2-6)			
Constant amplitude 0.15 mm		Hz	10 - 57
Constant acceleration, 2 g		Hz	57 - 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18
Drop to IEC/EN 60068-2-31	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1
Mounted position			Vertical or horizontal
Electromagnetic compatibility (EMC)			
Overvoltage category/pollution degree			–
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)			
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI), to IEC EN 61000-4-2		V/m	10
Radio interference suppression			EN 55011 Class B, EN 55022 Class B
Burst pulses (IEC/EN 61000-4-4, Level 3)			
Supply cables		kV	2
Signal cables		kV	2
Surge pulses (IEC/EN 61000-4-5, Level 2)		kV	0.5
Line-conducted interference (IEC/EN 61000-4-6)		V	10
Insulation resistance			
Clearance in air and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142
Insulation resistance			EN 50178
Power supply			
Rated operational voltage	U_e	V	24 DC (-15/+20 %)
Permissible range		V DC	20.4 - 28.8
Ripple		%	≦ 5
Input current			
At 24 V DC		mA	Normally 185
Voltage dips (IEC/EN 61131-2)		ms	10
Heat dissipation at 24 V DC		W	1.5
Interfaces			
CANopen			
Device profile			To DS301V4
PDO type			Asynchronous (event controlled)
Addresses			1 to 63 can be set through display
Baud rate/length		kBd	10 kByte up to 1 MByte, Automatic detection Manual setting via display possible.
Connections			6 pole spring-cage terminal
Terminal resistor		Ω	External 120

Dimensions

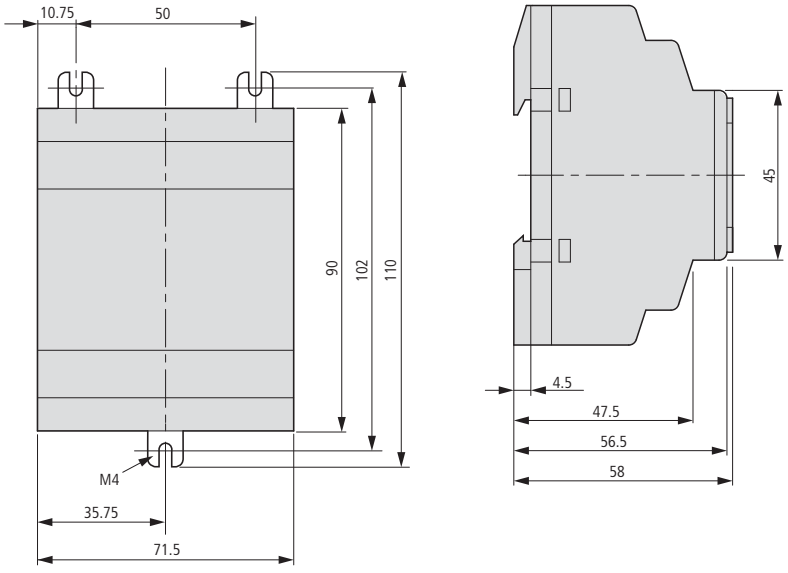
EC4P…



MFD-CP4-CO

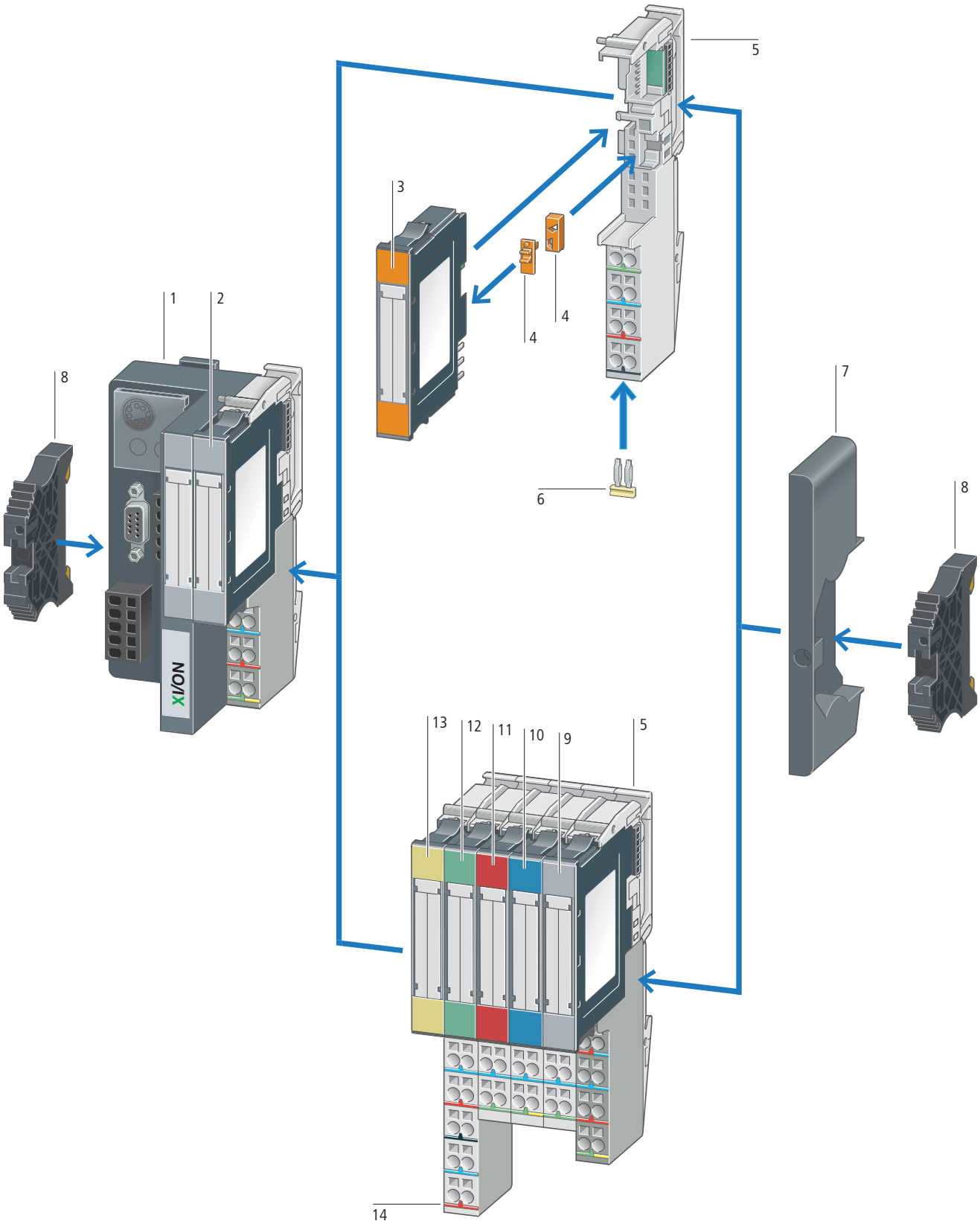


EC4E…



Notes Further dimensions for EASY... and MFD... devices → Chapter 12

System overview



Gateways 1

Gateways XNE:
- XNE-GWBR-PBDP
- XNE-GWBR-CANOPEN
- XNE-GWBR-2ETH-IP

XN gateways:
- XN-GWBR-PBDP
- XN-GWBR-CANOPEN
- XN-GWBR-DNET
- XN-GWBR-MODBUS-TCP
- XN-PLC-CANOPEN
- XN-GW-PBDP-1.5MB
- XN-GW-PBDP-12MB
- XN-GW-CANOPEN
- XN-GW-DNET

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Digital input modules 2

XNE electronics modules:
- XNE-8DI-24VDC-P
- XNE-16DI-24VDC-P

XN electronics modules:
- XN-2DI-24VDC-P
- XN-2DI-24VDC-N
- XN-2DI-120/230VAC
- XN-4DI-24VDC-P
- XN-4DI-24VDC-N
- XN-16DI-24VDC-P
- XN-32DI-24VDC-P

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Relay modules 3

XN electronics modules:
- XN-2DO-R-CO
- XN-2DO-R-NC
- XN-2DO-R-NO

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Basic modules 5

- 3 connection levels
- 4 connection levels
- 6 connection levels

→ Page 14/91

Supply modules 9

XN electronics modules:
- XN-BR-24VDC-D
- XN-PF-24VDC-D
- XN-PF-120/230VAC-D

→ Page 14/90

Analog input modules 10

XNE electronics modules:
- XNE-8AI-U/I-4Pt/Ni

XN electronics modules:
- XN-1AI-I(0/4...20MA)
- XN-2AI-I(0/4...20MA)
- XN-1AI-U(-10/0...+10VDC)
- XN-2AI-U(-10/0...+10VDC)
- XN-2AI-Pt/Ni-2/3
- XN-2AI-THERMO-PI
- XN-4AI-U/I

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Digital output modules 11

XNE electronics modules:
- XNE-8DO-24VDC-0.5A-P
- XNE-16DO-24VDC-0.5A-P

XN electronics modules:
- XN-2DO-24VDC-0.5A-P
- XN-2DO-24VDC-0.5A-N
- XN-2DO-24VDC-2A-P
- XN-2DO-120/230VAC-0.5A
- XN-4DO-24VDC-0.5A-P
- XN-16DO-24VDC-0.5A-P
- XN-32DO-24VDC-0.5A-P

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Analog output modules 12

XNE electronics modules:
- XNE-4AO-U/I

XN electronics modules:
- XN-1AO-I(0/4...20MA)
- XN-2AO-I(0/4...20MA)
- XN-2AO-U(-10/0...+10VDC)

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Technology modules 13

XNE electronics modules:
- XNE-2CNT-2PWM
- XNE-1SWIRE

XN electronics modules:
- XN-1CNT-24VDC
- XN-1RS232
- XN-1RS485/422
- XN-1SSI

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Accessories

End cover	7
End bracket	8
Relay jumpers	6
Marker	14
Coding element	4
Screw terminals	–

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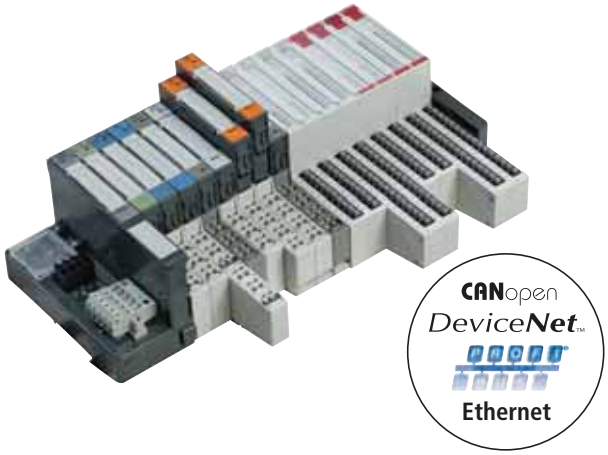
Description





As much as necessary, as little as possible - is the design principle of the modular I/O system XI/ON, which provides a comprehensive range of digital and analog I/Os and technology modules. The gateway products are available for fieldbus systems CANopen, PROFIBUS-DP, DeviceNet and Ethernet.

XI/ON standard gateways and modules

In the standard version, the pluggable I/O modules are wired to base modules.

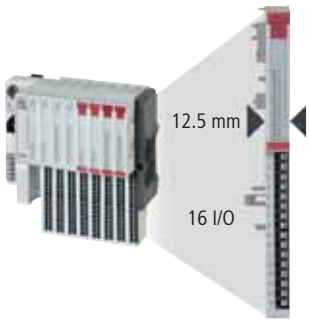
- Bus-independent modules
- Hot-swapping of modules
- Screw or spring-cage terminals
- Mechanical coding of modules prevents incorrect connection
- Serial interface modules allow connection of various peripherals, such as printers, scanners and bar code readers
- Programmable CANopen gateway for decentralizing automation tasks or reducing the burden on higher-level PLCs.



XI/ON ECO gateways and modules

XI/ON ECO adds cost- and space-optimized I/O modules and gateways to the XI/ON I/O system.

- High channel density: up to 16 DI/DO over 12.5 mm
- No base modules required
- Cost saving through electronics with built-in connection level
- Connection through "push-in" spring-cage terminal saves mounting time
- Can be combined with XI/ON standard
- Multi-function modules reduce the number of required slices
- ECO gateways with built-in bus termination resistors/auto-baud function.



Configuration tool I/Oassistant

With the free software I/Oassistant XI/ON stations can be planned simply and conveniently.

- I/Oassistant automatically generates a complete parts list for your order. With the "Check surface mounting" function, you can easily check the configured station design.
- Commissioning the I/O level without connected controller possible; Servicing interface
- EPLAN support
- I/Oassistant can be integrated with XSOFT-CODESYS-2.

CANopen expansion modules

The EC4E modules can be connected to all control systems with CANopen master. The modules can be expanded with a digital or analog easy expansion module.



SWD gateways

Gateways for connecting to field busses PROFIBUS-DP and CANopen and for power supply of the SmartWire-Darwin nodes and switchgear.



SWD I/O modules

SmartWire-Darwin station for the connecting digital I/O.



Configuration tool SWD-Assistant

The software SWD-Assist helps you easily and quickly plan SmartWire-Darwin lines.
Free download at
http://downloadcenter.moeller.net

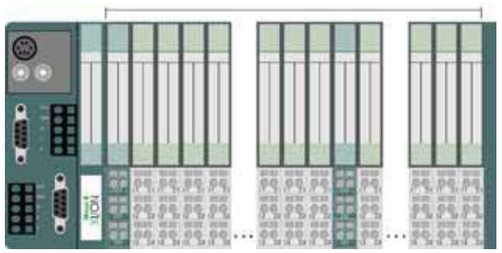


Electronics modules / Basic modules	XN-S3...-SBB	XN-S3...-SBC	XN-S4...-SBBC	XN-S4...-SBBS	XN-S4...-SBCS	XN-S4...-SBBS-CJ	XN-S6...-SBBSBB	XN-S6...-SBCSBC	XN-B3...-SBB	XN-B3...-SBC	XN-B4...-SBBC	XN-B6...-SBBSBB	XN-B6...-SBCSBC	XN-P3...-SBB	XN-P3...-SBB-B	XN-P4...-SBBC	XN-P4...-SBBC-B
Digital input modules																	
XN-2DI-24VDC-P	●		●														
XN-2DI-24VDC-N	●		●														
XN-2DI-120/230VAC	●		●														
XN-4DI-24VDC-P				●			●										
XN-4DI-24VDC-N				●			●										
XN-16DI-24VDC-P									●		●						
XN-32DI-24VDC-P												●					
XNE-8DI-24VDC-P[1]																	
XNE-16DI-24VDC-P[1]																	
Digital output modules																	
XN-2DO-24VDC-0.5A-P		●			●												
XN-2DO-24VDC-0.5A-N		●			●												
XN-2DO-24VDC-2A-P		●			●												
XN-2DO-120/230VAC-0.5A		●			●												
XN-4DO-24VDC-0.5A-P					●			●									
XN-16DO-24VDC-0.5A-P										●							
XN-32DO-24VDC-0.5A-P													●				
XNE-8DO-24VDC-0.5A-P[1]																	
XNE-16DO-24VDC-0.5A-P[1]																	
Relay modules																	
XN-2DO-R-NC				●	●												
XN-2DO-R-NO				●	●												
XN-2DO-R-CO				●													
Analog input modules																	
XN-1AI-I(0/4...20MA)	●			●													
XN-2AI-I(0/4...20MA)	●			●													
XN-1AI-U(-10/0...+10VDC)	●			●													
XN-2AI-U(-10/0...+10VDC)	●			●													
XN-2AI-Pt/Ni-2/3	●			●													
XN-2AI-THERMO-PI						●											
XN-4AI-U/I								●									
XNE-8AI-U/I-4Pt/Ni[1]																	
Analog output modules																	
XN-1AO-I(0/4...20MA)	●																
XN-2AO-I(0/4...20MA)	●																
XN-2AO-U(-10/0...+10VDC)	●																
XNE-4AO-U/I[1]																	
Technology modules																	
XN-1CNT-24VDC				●													
XN-1RS232				●													
XN-1RS485/422				●													
XN-1SSI				●													
XNE-1SWIRE[1]																	
XNE-2CNT-2PWM[1]																	
Supply modules																	
XN-BR-24VDC-D														●[2]	●[3]	●[2]	●[3]
XN-PF-24VDC-D														●		●	
XN-PF-120/230VAC-D														●		●	

Notes

1) No base modules required
2) Base module for gateway supply
3) Base module for bus refreshing within the station

Max. 74 XI/ON modules in slice design



Plan your XI/ON station with the software ""I/Oassistant"" (free download at www.microinnovation.com).
Advantage 1:
Automatically generates a full parts list for your order.
Advantage 2:
Generates an error message as soon as the system limits are exceeded.

Notes:
When extending your system, make sure that you have a sufficient number of bus refresh or power feed modules.

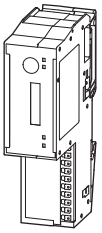
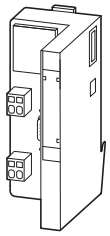
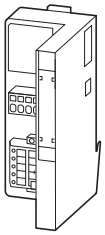
	Max. number/ station	Part no. 140045 XNE-GWBR-PBDP		Part no. 140044 XNE-GWBR-CANOPEN		Part no. 140047 XNE-GWBR-2ETH-IP		Part no. 140154 XN-GWBR-PBDP		Part no. 140055 XN-GWBR-CANOPEN	
		Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules
Modules											
XN-4DI-24VDC-P		136	34	244	61	288	72	288	72	288	72
XN-4DI-24VDC-N		136	34	244	61	288	72	288	72	288	72
XN-16DI-24VDC-P		128	8	128	8	128	8	128	8	128	8
XN-32DI-24VDC-P		256	8	256	8	256	8	256	8	256	8
XNE-8DI-24VDC-P		384	48	512	64	512	64	592	74	512	64
XNE-16DI-24VDC-P		768	48	512	32	512	32	1184	74	512	32
XN-4DO-24VDC-0.5A-P		132	33	244	61	288	72	288	72	288	72
XN-16DO-24VDC-0.5A-P		128	8	128	8	128	8	128	8	128	8
XN-32DO-24VDC-0.5A-P		256	8	256	8	256	8	256	8	256	8
XNE-8DO-24VDC-0.5A-P		384	48	488	61	512	64	592	74	512	64
XNE-16DO-24VDC-0.5A-P		640	40	512	32	512	32	1168	73	512	32
XN-2DO-R-…		70	35	122	61	144	72	144	72	144	72
XN-2AI-I(0/4…20MA)		56	28	100	50	126	63	78	39	144	72
XN-2AI-U(-10/0…+10VDC)		56	28	100	50	126	63	78	39	144	72
XN-2AI-Pt/Ni-2/3		44	22	98	49	126	63	46	23	144	72
XN-2AI-THERMO-PI		44	22	98	49	126	63	58 (76)	29 (38)	144	72
XN-4AI-U/I		64 (132)	16 (33)	108	27	124	31	112	28	144	36
XNE-8AI-U/I-4Pt/Ni		72 (120)	9 (15)	144	18	128	16	88	11	144	18
XN-2AO-I(0/4…20MA)		50	25	70	35	126	63	38	19	144	72
XN-2AO-U(-10/0…+10VDC)		46	23	70	35	126	63	38	19	144	72
XNE-4AO-U/I		64 (76)	16 (19)	108	27	64	16	36	9	144	36
XN-1CNT-24VDC		13	13	27	27	31	31	7	7	72	72
XN-1RS232		7	7	27	27	31	31	22	22	68	68
XN-1RS485/422		16	16	27	27	31	31	22	22	72	72
XN-1SSI		20	20	27	27	31	31	22	22	72	72

Notes

Numeric values in brackets: max. number when diagnostic alarm disabled.
The supply module XN-BR-24VDC-D must be mounted immediately next to the gateway XN-GW-... to provide power for the gateways.

Part no. 140156 XN-GWBR-DNET		Part no. 140162 XN-GWBR-MODBUS-TCP		Part no. 140049 XN-GW-PBDP-1.5MB		Part no. 140048 XN-GW-PBDP-12MB		Part no. 140050 XN-GW-CANOPEN		Part no. 140051 XN-GW-DNET	
Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules
288	72	288	72	288	72	288	72	288	72	288	72
288	72	288	72	288	72	288	72	288	72	288	72
128	8	128	8	128	8	128	8	128	8	128	8
256	8	256	8	256	8	256	8	256	8	256	8
576	72	512	64								
1152	72	512	32								
128	32	288	72	288	72	288	72	288	72	288	72
128	8	128	8	128	8	128	8	128	8	128	8
256	8	256	8	256	8	256	8	256	8	256	8
256	32	512	64								
512	32	512	32								
64	32	144	72	144	72	144	72	144	72	144	72
32	16	144	72	78	39	78	39	144	72	126	63
32	16	144	72	78	39	78	39	144	72	126	63
32	16	144	72	46	23	46	23	142	71	126	63
32	16	144	72	58 (76)	29 (38)	58 (76)	29 (38)	142	71	126	63
64	16	144	36	112	28	112	28	144	36	124	31
128	16	144	18								
32	16	144	72	38	19	38	19	142	71	126	63
32	16	144	72	38	19	38	19	142	71	126	63
64	16	124	31								
16	16	72	72	7	7	7	7	71	71	31	31
8	8	68	68	22	22	22	22	67	67	31	31
8	8	72	72	22	22	22	22	70	70	31	31
8	8	72	72	22	22	22	22	71	71	31	31

Ordering

	Fieldbus connection	Terminal capacity (field bus/supply voltage)	Servicing interface	Transfer rate	Part no. Article no.	Price See price list	Std. pack
Gateway XNE with integrated supply							
	• Supports up to 48 slice-type modules (XN, XNE) • Address setting through DIP switch • Address range: 1 – 125 (dec.)						
	PROFIBUS-DP (DPV0/DPV1 protocol)	Push-in spring-cage terminals	PS/2 socket	9.6 kbit/s to 12 Mbit/s	**XNE-GWBR-PBDP** [1)2)] 140045		1 off
	• Supports up to 62 disc type modules (XN, XNE) • Address set with DIP switch • Address range: 1 – 63 (dec.)						
	CANopen	Push-in spring-cage terminals	PS/2 socket	1000 kbit/s 800 kbit/s 500 kbit/s 250 kbit/s 125 kbit/s 50 kbit/s 20 kbit/s	**XNE-GWBR-CANOPEN** [1)2)] 140044		1 off
	• Supports up to 74 disc type modules (XN, XNE) • 2 x RJ45 socket • Address set with decimal rotary coding switches, BootP, DHCP or I/Oassistant • Address range: 1 – 254 (dec.)						
	Ethernet (Ethernet-IP protocol)	Push-in spring-cage terminals	Mini USB	10/100 MBit/s	**XNE-GWBR-2ETH-IP** [1)3)] 140047		1 off
XN-Gateway with integrated supply							
	• Supports up to 74 disc type modules (XN, XNE) • 1 x D-sub 9-pin socket • Address set with two decimal rotary coding switches • Address range: 1 – 99 (dec.)						
	PROFIBUS-DP (DPV0 protocol)	Screw terminals	PS/2 socket	9.6 kbit/s to 12 Mbit/s	**XN-GWBR-PBDP** [1)4)] 140154		1 off
	• Supports up to 74 disc type modules (XN, XNE) • 1 x open-style connector • Address set with two decimal rotary coding switches • Address range: 1 – 99 (dec.)						
	CANopen	Screw terminals	PS/2 socket	1000 kbit/s 800 kbit/s 500 kbit/s 250 kbit/s 125 kbit/s 50 kbit/s 20 kbit/s 10 kbit/s	**XN-GWBR-CANOPEN** [1)4)] 140155		1 off
	• Supports up to 74 disc type modules (XN, XNE) • 1 x open-style connector • Address set with two decimal rotary coding switches • Address range: 0 – 63 (dec.)						
	DeviceNet	Screw terminals	PS/2 socket	500 kbit/s 250 kbit/s 125 kbit/s	**XN-GWBR-DNET** [1)4)] 140156		1 off

Notes

[1)] Bus refreshing modules is already integrated.

The following are included as standard with all gateways:
2 x end bracket XN-WEW-32/2-SW,
1 x end plate XN-ABPL

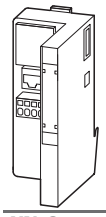
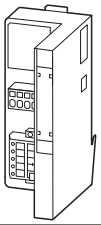
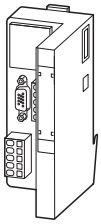
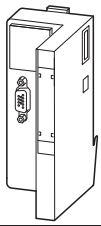
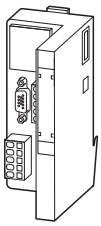
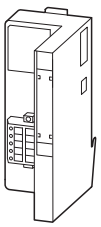
Information relevant for export to North America

[2)] Product Standards: IEC/EN 6113-2; CE marking
NA Certification: Request filed for UL and CSA
Degree of Protection: IEC: IP20, UL/CSA Type: -

[3)] Product Standards: IEC/EN 6113-2; CE marking
NA Certification: Planned for UL and CSA
Degree of Protection: IEC: IP20, UL/CSA Type: -

[4)] Product Standards: UL 508; cUL
IEC/EN 6113-2; CE marking
UL File No.: E205091
UL CCN: NRAQ, NRAQ7
CSA File No.: UL report applies to both US and Canada
CSA Class No.: -
NA Certification: UL Recognized, certified by UL for use in Canada
Degree of Protection: IEC: IP20, UL/CSA Type: -

HPL14089EN

	Fieldbus connection	Terminal capacity (field bus/supply voltage)	Servicing interface	Transfer rate	Part no. Article no.	Price See price list	Std. pack
	• Supports up to 74 disc type modules (XN, XNE) • 1 x RJ45 socket • Address set with decimal rotary coding switches, BootP, DHCP or I/Oassistant • Address range: 1…254 (dec.)						
	Ethernet (Modbus-TCP protocol)	Screw terminals	PS/2 socket	10/100 MBit/s	**XN-GWBR-MODBUS-TCP**[1) 3)] 140162		1 off
XN-Gateway with integrated supply, programmable							
	• Supports up to 74 disc type modules (XN, XNE to limited extent) • 1 x open-style connector • Operating mode and address setting with two hexadecimal rotary coding switches • Address range: 1 – 99 (dec.)						
	CANopen	Screw terminals	PS/2 socket	Adjustable up to 1 Mbit/s	**XN-PLC-CANOPEN**[1) 4)] 140157		1 off
XN gateway without integrated supply							
	• Supports up to 74 disc type modules (XN) • 2 x D-sub 9-pin sockets • Address setting with two hexadecimal rotary coding switches • Address range: 1– 125 (dec.)						
	PROFIBUS-DP (DPV0 protocol)	2 × spring-cage terminal strips for direct wiring	PS/2 socket	9.6 Kbits/s to 1.5 MBit/s	**XN-GW-PBDP-1.5MB**[2) 4)] 140049		1 off
	• Supports up to 74 disc type modules (XN) • 1 x D-sub 9-pin socket • Address setting with two hexadecimal rotary coding switches • Address range: 1– 125 (dec.)						
	PROFIBUS-DP (DPV0 protocol)	–	PS/2 socket	9.6 kbit/s to 12 Mbit/s	**XN-GW-PBDP-12MB**[2) 4)] 140048		1 off
	• Supports up to 74 disc type modules (XN) • 1 x 9 pole SUB-D socket, 1 × D-sub 9-pin • Address setting with two hexadecimal rotary coding switches • Address range: 1– 127 (dec.)						
	CANopen	2 × spring-cage terminals for direct wiring	PS/2 socket	1000 kbit/s 800 kbit/s 500 kbit/s 250 kbit/s 125 kbit/s 50 kbit/s 20 kbit/s 10 kbit/s	**XN-GW-CANOPEN**[2) 4)] 140050		1 off
	• Supports up to 64 disc type modules (XN) • 1 x open-style connector • Address set with two decimal rotary coding switches • Address range: 0…63 (dec)						
	DeviceNet	–	PS/2 socket	500 kbit/s 250 kbit/s 125 kbit/s	**XN-GW-DNET**[2) 4)] 140051		1 off

Notes

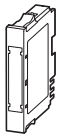
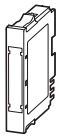
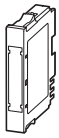
[1)] Bus refreshing modules is already integrated.
[2)] The supply module XN-BR-24VDC-D must be mounted immediately next to the gateway to provide the supply for the gateways.

The following are included as standard with all gateways:
2 x end bracket XN-WEW-32/2-SW,
1 x end plate XN-ABPL

Information relevant for export to North America

[3)] Product Standards: IEC/EN 6113-2; CE marking
Degree of Protection: IEC: IP20, UL/CSA Type: -

[4)] Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking
UL File No.: E205091
UL CCN: NRAQ, NRAQ7
CSA File No.: UL report applies to both US and Canada
CSA Class No.: -
NA Certification: UL Recognized, certified by UL for use in Canada
Degree of Protection: IEC: IP20, UL/CSA Type: -

	Description	For use with	Part no. Article no.	Price See price list	Std. pack
Bus refreshing modules					
Slice modules XN 	Provides system and field power System power supply 24 V DC for generation of power for module bus and gateway (XN-GW-...) Field power supply at a rated voltage of 24 V DC	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC XN-P3T-SBB-B XN-P3S-SBB-B XN-P4T-SBBC-B XN-P4S-SBBC-B	**XN-BR-24VDC-D** 140071		1 off
Power feeding modules					
Slice modules XN 	Field power supply at a rated voltage of 24 V DC	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC	**XN-PF-24VDC-D** 140070		1 off
	Field power supply at a rated voltage of 120/230 V AC nominal voltage	XN-P3T-SBB XN-P3S-SBB XN-P4T-SBBC XN-P4S-SBBC	**XN-PF-120/230VAC-D** 140072		
Digital input modules					
Slice modules XN 	2 digital inputs, 24 V DC Positive switching	XN-S3T-SBB XN-S3S-SBB XN-S4T-SBBC XN-S4S-SBBC	**XN-2DI-24VDC-P** 140056		1 off
	2 digital inputs, 24 V DC Negative switching		**XN-2DI-24VDC-N** 140057		
	2 digital inputs, 120/230 V AC		**XN-2DI-120/230VAC** 140058		
	4 digital inputs, 24 V DC Positive switching	XN-S4T-SBBS XN-S4S-SBBS XN-S6T-SBBSBB XN-S6S-SBBSBB	**XN-4DI-24VDC-P** 140052		
	4 digital inputs, 24 V DC Negative switching		**XN-4DI-24VDC-N** 140059		
Block modules XN 	16 digital inputs, 24 V DC Positive switching	XN-B3T-SBB XN-B3S-SBB XN-B4T-SBBC XN-B4S-SBBC	**XN-16DI-24VDC-P** 140142		
	32 digital inputs, 24 V DC Positive switching	XN-B6T-SBBSBB XN-B6S-SBBSBB	**XN-32DI-24VDC-P** 140147		
Slice modules XNE 	8 digital inputs, 24 V DC Positive switching	–	**XNE-8DI-24VDC-P** 140035		
	16 digital inputs, 24 V DC Positive switching	–	**XNE-16DI-24VDC-P** 140040		

Information relevant for export to North America

Product Standards	UL 508; cUL; IEC/EN 6113-2; CE marking
UL File No.	E205091
UL CCN	NRAQ, NRAQ7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	-
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

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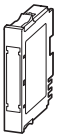
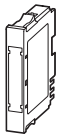
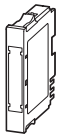
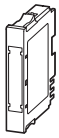
	Description	For use with	Part no. Article no.	Price See price list	Std. pack
Digital output modules					
Slice modules XN 	2 digital outputs, 24 V DC/0.5 A Positive switching	XN-S3T-SBC XN-S3S-SBC XN-S4T-SBCS XN-S4S-SBCS	**XN-2DO-24VDC-0.5A-P** 140053		1 off
	2 digital outputs, 24 V DC/0.5 A Negative switching		**XN-2DO-24VDC-0.5A-N** 140060		
	2 digital outputs, 24 V DC/2 A Positive switching		**XN-2DO-24VDC-2A-P** 140055		
	2 digital outputs, 120/230 V AC/0.5 A		**XN-2DO-120/230VAC-0.5A** 140150		
	4 digital outputs, 24 V DC/0.5 A Positive switching	XN-S4T-SBCS XN-S4S-SBCS XN-S6T-SBCSBC XN-S6S-SBCSBC	**XN-4DO-24VDC-0.5A-P** 140148		
Block modules XN 	16 digital outputs, 24 V DC/0.5 A Positive switching	XN-B3T-SBC XN-B3S-SBC	**XN-16DO-24VDC-0.5A-P** 140141		
	32 digital outputs, 24 V DC/0.5 A Positive switching	XN-B6T-SBCSBC XN-B6S-SBCSBC	**XN-32DO-24VDC-0.5A-P** 140161		
Slice modules XNE 	8 digital outputs, 24 V DC/0.5 A Positive switching	–	**XNE-8DO-24VDC-0.5A-P** 140036		
	16 digital outputs, 24 V DC/0.5 A Positive switching	–	**XNE-16DO-24VDC-0.5A-P** 140039		
Relay modules					
Slice modules XN 	2 changeover contacts, isolated 230 V AC / 30 V DC	XN-S4T-SBBS XN-S4S-SBBS	**XN-2DO-R-CO** 140054		1 off
	2 NC 230 V AC / 30 V DC	XN-S4T-SBBS XN-S4S-SBBS XN-S4T-SBCS XN-S4S-SBCS	**XN-2DO-R-NC** 140061		
	2 N/O 230 V AC / 30 V DC		**XN-2DO-R-NO** 140062		

Information relevant for export to North America

Product Standards	UL 508; cUL; IEC/EN 6113-2; CE marking
UL File No.	E205091
UL CCN	NRAQ, NRAQ7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	-
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Description	For use with	Part no. Article no.	Price See price list	Std. pack
Analog input modules					
Slice modules XN 	1 analog input 0/4 to 20 mA	XN-S3T-SBB XN-S3S-SBB XN-S4T-SBBS XN-S4S-SBBS	**XN-1AI-I(0/4...20MA)**[1] 140063		1 off
	2 analog inputs 0/4 to 20 mA		**XN-2AI-I(0/4...20MA)**[1] 140144		
	1 analog input -10/0 to +10 V DC		**XN-1AI-U(-10/0...+10VDC)**[1] 140064		
	2 analog inputs -10/0 to +10 V DC		**XN-2AI-U(-10/0...+10VDC)**[1] 140145		
	2 analog inputs Reading of standardized signals for temperature measurement Connection of RTDs Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000, and Ni1000TK5000 in 2- or 3-wire circuit		**XN-2AI-Pt/Ni-2/3**[1] 140067		
	2 analog inputs Acquisition of normalized signals for measuring temperatures or voltages up to ± 1 V Connection of thermocouples of types B, E, J, K, N, R, S, T	XN-S4T-SBBS-CJ XN-S4S-SBBS-CJ	**XN-2AI-THERMO-PI**[1] 140068		
	4 analog inputs -10/0 to +10 V DC, 0/4 to 20 mA Selectable for channel	XN-S6T-SBCSBC XN-S6S-SBCSBC	**XN-4AI-U/I**[1] 140158		
Slice modules XNE 	8 analog inputs U/I or 4 analog inputs Pt/Ni -10/0 to +10 V DC, 0/4 to 20 mA Reading of standardized signals for temperature measurement Connection of RTDs Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000, and Ni1000TK5000, Ni1000TK5000 in 2- or 3-wire circuit Selectable for channel	–	**XNE-8AI-U/I-4Pt/Ni** [2] 140037		
Analog output modules					
Slice modules XN 	1 analog output 0/4 to 20 mA	XN-S3T-SBB XN-S3S-SBB	**XN-1AO-I(0/4...20MA)**[3] 140065		1 off
	2 analog outputs 0/4 to 20 mA		**XN-2AO-I(0/4...20MA)**[3] 140146		
	2 analog outputs -10/0 to +10 V DC		**XN-2AO-U(-10/0...+10VDC)**[3] 140066		
Slice modules XNE 	4 analog outputs -10/0 to +10 V DC, 0/4 to 20 mA Selectable for channel	–	**XNE-4AO-U/I** [4] 140034		

Information relevant for export to North America

1)

Product Standards	UL 508; cUL; IEC/EN 6113-2; CE marking
UL File No.	E205091
UL CCN	NRAQ, NRAQ7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	-
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

2)

Product Standards	IEC/EN 6113-2; CE marking
NA Certification	Request filed for UL and CSA
Degree of Protection	IEC: IP20, UL/CSA Type: -

3)

Product Standards	UL 508; cUL; IEC/EN 6113-2; CE marking
UL File No.	E205091
UL CCN	NRAQ, NRAQ7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	-
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20, UL/CSA Type: -

4)

Product Standards	IEC/EN 6113-2; CE marking
NA Certification	Request filed for UL and CSA
Degree of Protection	IEC: IP20, UL/CSA Type: -

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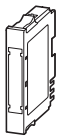
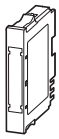
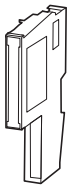
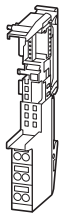
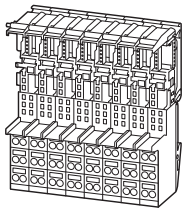
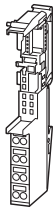
	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	
Counter modules							
Slice modules XN 	1 digital input/24 V DC 1 digital output/24 V DC Counting modes: infinite, once only or periodic count Frequency, rotational speed or period duration count Reading signals from rotary encoders (track A/B)	XN-S4T-SBBS XN-S4S-SBBS	**XN-1CNT-24VDC** 140069		1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Degree of Protection	UL 508; cUL; IEC/EN 6113-2; CE marking E205091 NRAQ, NRAQ7 UL report applies to both US and Canada - UL Recognized, certified by UL for use in Canada IEC: IP20, UL/CSA Type: -
Serial interfaces							
Slice modules XN 	Data transfer rate adjustable up to 115200 bit/s	XN-S4T-SBBS XN-S4S-SBBS	**XN-1RS232** 140151		1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Degree of Protection	UL 508; cUL; IEC/EN 6113-2; CE marking E205091 NRAQ, NRAQ7 UL report applies to both US and Canada - UL Recognized, certified by UL for use in Canada IEC: IP20, UL/CSA Type: -
	Data transfer rate adjustable up to 115200 bit/s		**XN-1RS485/422** 140152				
	Connection of SSI encoders up to 32-bit. Data transfer rate adjustable up to 1 bit/s		**XN-1SSI** 140153				
SmartWire-Darwin Interface							
Slice modules XNE 	Connection of up to 16 motor starters (Eaton) Up to 3 XNE-1SWIRE for XI/ON node	–	**XNE-1SWIRE** 140043		1 off	Product Standards NA Certification Degree of Protection	IEC/EN 6113-2; CE marking Request filed for UL and CSA IEC: IP20, UL/CSA Type: -
Counter/PWM modules							
Slice modules XNE 	2 counter channels and 2 PWM channels Counting modes: infinite, once only or periodic count Frequency, rotational speed or period duration count Reading signals from rotary encoders (track A/B) Output of a defined digital signal Output of a defined number of pulses	–	**XNE-2CNT-2PWM** 140038		1 off	Product Standards NA Certification Degree of Protection	IEC/EN 6113-2; CE marking Planned for UL and CSA IEC: IP20, UL/CSA Type: -

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Basic modules						
Spring-cage terminals • 3 connection levels						
Slice modules 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D)	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	**XN-P3T-SBB** 140074		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E205091 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Base module for bus refresh within the station	XN-BR-24VDC-D	**XN-P3T-SBB-B** 140073			
	–	XN-2DI-... XN-1AI-... XN-2AI-I(0/4...20MA) XN-2AI-U(-10/0...+10VDC) XN-2AI-Pt/Ni-2/3 XN-1AO-I(0/4...20MA) XN-2AO-...	**XN-S3T-SBB** 140077			
	Connection to C rail	XN-2DO-24VDC-... XN-2DO-120/230VAC-0.5A	**XN-S3T-SBC** 140079			
Block modules 	–	XN-16DI-24VDC-P	**XN-B3T-SBB** 140133			
	Connection to C rail	XN-16DO-24VDC-0.5-P	**XN-B3T-SBC** 140134			
• 4 connection levels						
Slice modules 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D) Connection to C rail	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	**XN-P4T-SBBC** 140076		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E205091 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Base module for bus refresh within the station Connection to C rail	XN-BR-24VDC-D	**XN-P4T-SBBC-B** 140075			
	Connection to C rail	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC	**XN-S4T-SBBC** 140078			
	Connection to C rail	XN-2DO-24VDC-... XN-2DO-120/230VAC-0.5A XN-4DO-24VDC-0.5A-P XN-2DO-R-NO XN-2DO-R-NC	**XN-S4T-SBCS** 140080			
	–	XN-4DI-... XN-2DO-R-... XN-1AI-... XN-2AI-I(0/4...20MA) XN-2AI-U(-10/0...+10VDC) XN-2AI-Pt/Ni-2/3 XN-1CNT-24VDC XN-1RS...	**XN-S4T-SBBS** 140081		
	Base module with temperature sensors for cold-junction compensation	XN-2AI-THERMO-PI	**XN-S4T-SBBS-CJ** 140084			

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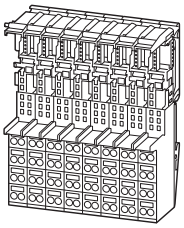
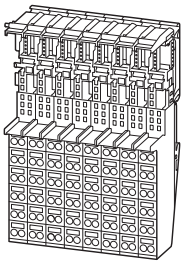
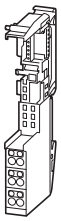
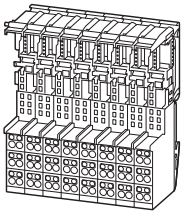
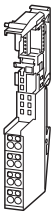
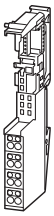
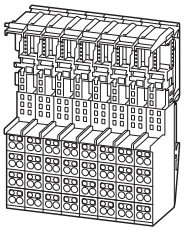
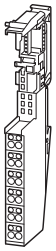
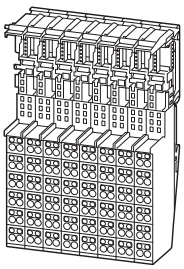
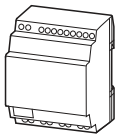
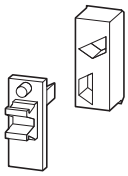
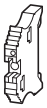
	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
• 4 connection levels						
Block modules 	Connection to C rail	XN-16DI-24VDC-P	**XN-B4T-SBBC** 140135		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E205091 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
• 6 connection levels						
Slice modules 	–	XN-4DI-24VDC-P XN-4DI-24VDC-N	**XN-S6T-SBBSBB** 140082		1 off	
	Connection to C rail	XN-4DO-24VDC-0.5A-P XN-4AI-U/I	**XN-S6T-SBCSBC** 140083			
Block modules 	–	XN-32DI-24VDC-P	**XN-B6T-SBBSBB** 140136			
	Connection to C rail	XN-32DO-24VDC-0.5A-P	**XN-B6T-SBCSBC** 140159			
Screw terminals • 3 connection levels						
Slice modules 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D)	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	**XN-P3S-SBB** 140085		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E205091 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	–	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC XN-1AI-... XN-2AI-I(0/4...20MA) XN-2AI-U(-10/0...+10VDC) XN-2AI-Pt/Ni-2/3 XN-1AO-I(0/4...20MA) XN-2AO-...	**XN-S3S-SBB** 140088			
	Connection to C rail	XN-2DO-24VDC-... XN-2DO-120/230VAC-0.5A	**XN-S3S-SBC** 140090			
Block modules 	–	XN-16DI-24VDC-P	**XN-B3S-SBB** 140137			
	Connection to C rail	XN-16DO-24VDC-0.5A-P	**XN-B3S-SBC** 140138			
• 4 connection levels						
Slice modules 	Base module for field power supply Base module for the gateway supply (with XN-BR-24VDC-D) Connection to C rail	XN-BR-24VDC-D XN-PF-24VDC-D XN-PF-120/230VAC-D	**XN-P4S-SBBC** 140087		1 off	

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Screw terminals • 4 connection levels						
Slice modules 	Base module for bus refresh within the station Connection to C rail	XN-BR-24VDC-D	**XN-P4S-SBBC-B** 140086		1 off	Product Standards: UL 508; cUL; IEC/EN 6113-2; CE marking UL File No.: E205091 UL CCN: NRAQ, NRAQ7 CSA File No.: UL report applies to both US and Canada CSA Class No.: - NA Certification: UL Recognized, certified by UL for use in Canada Degree of Protection: IEC: IP20, UL/CSA Type: -
	Connection to C rail	XN-2DI-24VDC-P XN-2DI-24VDC-N XN-2DI-120/230VAC	**XN-S4S-SBBC** 140089			
	Connection to C rail	XN-2DO-24VDC-... XN-2DO-120/230VAC-0.5A XN-4DO-24VDC-0.5A-P XN-2DO-R-NO XN-2DO-R-NC	**XN-S4S-SBCS** 140091			
	–	XN-4DI-... XN-2DO-R-... XN-1AI-... XN-2AI-I(0/4...20MA) XN-2AI-U(-10/0...+10VDC) XN-2AI-Pt/Ni-2/3 XN-1CNT-24VDC XN-1RS... XN-1SSI	**XN-S4S-SBBS** 140092		
	Base module with temperature sensors for cold-junction compensation	XN-2AI-THERMO-PI	**XN-S4S-SBBS-CJ** 140095			
Block modules 	Connection to C rail	XN-16DI-24VDC-P	**XN-B4S-SBBC** 140139			
• 6 connection levels						
Slice modules 	–	XN-4DI-24VDC-P XN-4DI-24VDC-N	**XN-S6S-SBBSBB** 140093			
	Connection to C rail	XN-4DO-24VDC-0.5A-P XN-4AI-U/I	**XN-S6S-SBCSBC** 140094			
Block modules 	–	XN-32DI-24VDC-P	**XN-B6S-SBBSBB** 140140		1 off	
	Connection to C rail	XN-32DO-24VDC-0.5A-P	**XN-B6S-SBCSBC** 140160			

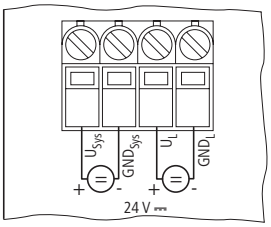
	Inputs			Outputs			Supply voltage connection	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	
	Digital	Analog	Of which usable as digital	Relay 10 A (UL)	Tran-sistor	Analog						
I/O expansion modules												
Can be used through CANopen for: XC100/200, EC4P, MFD4												
	6	–	–	4	–	–	24 V DC	**EC4E-221-6D4R1** 114296		1 off	NA Certification	Requestfiled for UL and CSA
	6	–	–	–	4	–	24 V DC	**EC4E-221-6D4T1** 114297		1 off	Degree of Protection	IEC: IP20, UL/ CSA Type: -
Notes	Technical data for the EASY...expansion units → Chapter 12											
SWD gateways												
Gateway for connecting to the fieldbus and for supplying the SmartWire-Darwin (SWD) slaves and switchgear.												
	Connection to PROFIBUS-DP as slave. Automatic baud rate detection from 9.6 kbit/s to 12 Mbit/s. Address range 1 - 126. D-sub 9-pin socket. Connection of up to 58 SWD slaves.							**EU5C-SWD-DP** 116308		1 off	NA Certification	Requestfiled for UL and CSA
	Connection to CANopen as slave. Automatic baud rate detection from 10 kbit/s to 1 Mbit/s. Address range 1 - 32. D-sub 9-pin plug. Connection of up to 99 SWD slaves.							**EU5C-SWD-CAN** 116307				
SWD I/O modules												
SmartWire-Darwin slaves for the connecting digital I/O.												
	Digital module with 8 digital inputs 24 V DC							**EU5E-SWD-8DX** 116381		1 off	NA Certification	Requestfiled for UL and CSA
	Digital module with 4 digital inputs 24 V DC and 4 transistor outputs 24 V DC/0.5 A							**EU5E-SWD-4D4D** 116382				
	Digital module with 4 digital inputs 24 V DC and 2 relay outputs 250 V AC							**EU5E-SWD-4D2R** 116383				
Coding elements												
	Included as standard with every electronics module. Prevents incorrect connection of the electronics modules.	For use with XN-...DI-24VDC…						**XN-KO/2** 140114		1 off	UL/CSA certification not required	
		XN-2DI-120/230VAC						**XN-KO/5** 140117				
		XN-xDO-24VDC…						**XN-KO/6** 140118				
		XN-2DO-R-NO						**XN-KO/8** 140119				
		XN-2DO-R-NC						**XN-KO/9** 140120				
		XN-2DO-R-CO						**XN-KO/10** 140121				
		XN-1AI-I(0/4…20MA) XN-2AI-I(0/4…20MA)						**XN-KO/11** 140122				
		XN-1AI-U(-10/0...+10VDC) XN-2AI-U(-10/0...+10VDC) XN-2AI-Pt/Ni-2/3 XN-2AI-THERMO-PI XN-4AI-U/I						**XN-KO/12** 140123				
		XN-1AO-I(0/4...20MA) XN-2AO-I(0/4...20MA)						**XN-KO/13** 140124				
		XN-2AO-U(-10/0...+10VDC)						**XN-KO/14** 140125				
		XN-1CNT-24VDC XN-1RS232 XN-1RS485/422 XN-1SSI						**XN-KO/15** 140126				
		XN-BR-24VDC-D XN-PF-24VDC-D						**XN-KO/16** 140127				
		XN-PF-120/230VAC-D						**XN-KO/17** 140128				

	Description	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Relay jumpers						
	1-grid	–	**XN-QV/1** 140097		1 off	UL/CSA certification not required
	2-grid	–	**XN-QV/2** 140098			
	3-grid	–	**XN-QV/3** 140099			
	4-grid	–	**XN-QV/4** 140100			
	5-grid	–	**XN-QV/5** 140101			
	6-grid	–	**XN-QV/6** 140102			
	7-grid	–	**XN-QV/7** 140103			
	8-grid	–	**XN-QV/8** 140104			
End bracket						
	For fixing the XI/ON station on the top-hat rail. 2 end brackets are supplied as standard with the gateways.	–	**XN-WEW-35/2-SW** 140130		1 off	UL/CSA certification not required
End cover						
	For covering an XI/ON station. An end cover is supplied with the gateway as standard	–	**XN-ABPL** 140129		1 off	UL/CSA certification not required
Connection level labels						
	Blue	–	**XN-ANBZ-BL** 140105		1 off	UL/CSA certification not required
	Red	–	**XN-ANBZ-RT** 140106			
	Green	–	**XN-ANBZ-GN** 140107			
	Black	–	**XN-ANBZ-SW** 140108			
	Brown	–	**XN-ANBZ-BR** 140109			
	Red/blue	–	**XN-ANBZ-RT/BL-BED** 140110			
	Yellow/green	–	**XN-ANBZ-GN/GE-BED** 140111			
	White	–	**XN-ANBZ-WS** 140112			
Shield connection for gateway						
–	Shield connection for direct bus connection. Can be used only for XI/ON gateways XN-GW-PBDP-1.5MB and XN-GW-CANOPEN.	–	**SCH-1-WINBLOC** 140236		1 off	UL/CSA certification not required
Servicing cable						
–	Establishes the connection between I/O assistant and the service interface at the gateway.	–	**XN-PS2-CABLE** 140096		1 off	UL/CSA certification not required
Labels						
–	A5 sheet, perforated, 1 x 57 labels	–	**XN-LABEL/SCHEIBE** 140131		1 off	UL/CSA certification not required
–	A5 sheet, perforated, 1 x 6 labels	–	**XN-LABEL/BLOCK** 140132			

Engineering

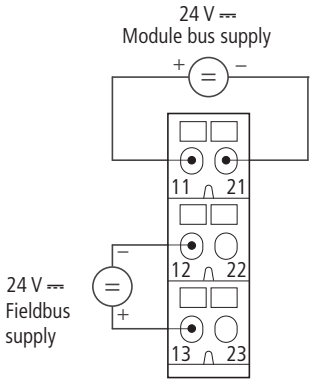
Gateway XN...GWBR...

24 V supply from gateway (U_L) and system bus (U_{sys})

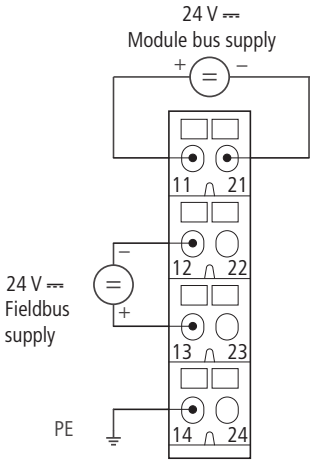


Bus refreshing modules

XN-P3x-SBB with gateway power supply
XN-P3…-SBB-B without gateway power supply

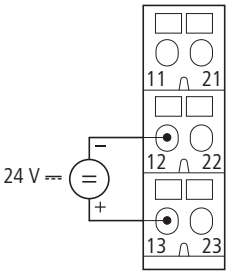


XN-P4…-SBBC with gateway power supply
XN-P4…-SBBC-B without gateway power supply

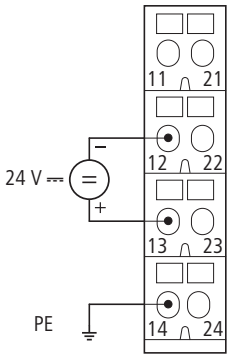


Power feeding modules

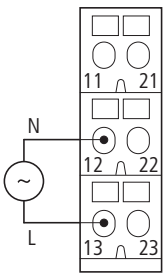
XN-P3…-SBB for XN-PF-24VDC-D



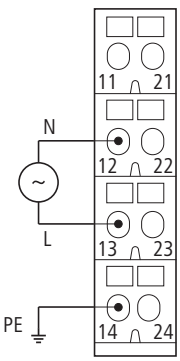
XN-P4…-SBBC for XN-PF-24VDC-D



XN-P3...-SBB for XN-PF-120/230VAC-D

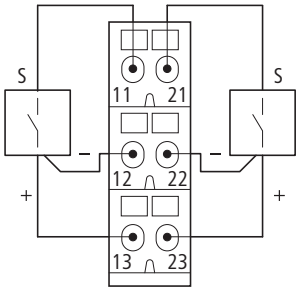


XN-P4...-SBB for XN-PF-120/230VAC-D

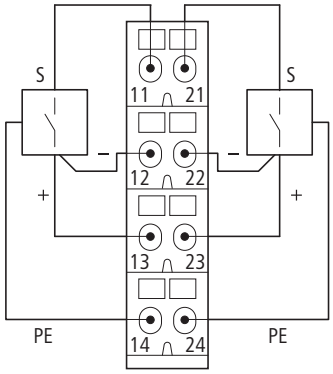


Digital input modules

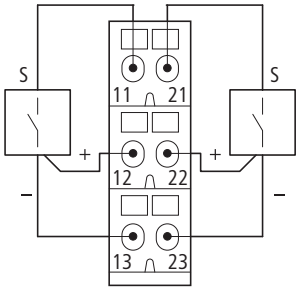
XN-S3...-SBB for XN-2DI-24VDC-P



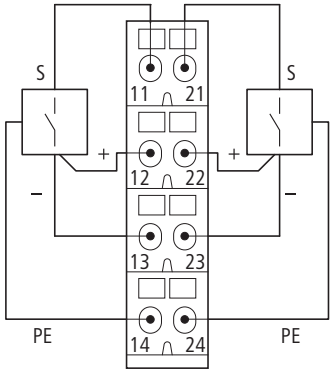
XN-S4...-SBBC for XN-2DI-24VDC-P



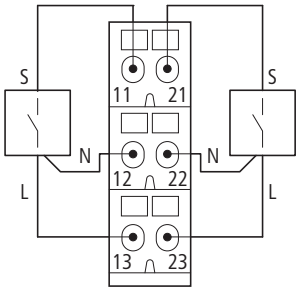
XN-S3...-SBB for XN-2DI-24VDC-N



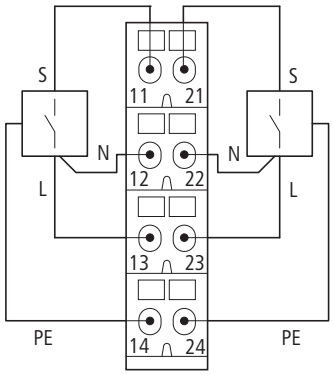
XN-S4...-SBBC for XN-2DI-24VDC-N



XN-S3...-SBB for XN-2DI-120/230VAC

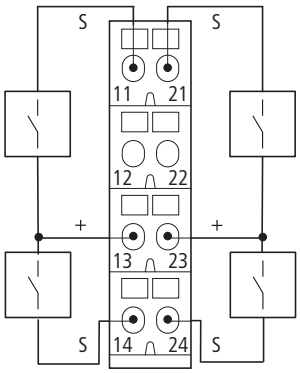


XN-S4...-SBBC for XN-2DI-120/230VAC

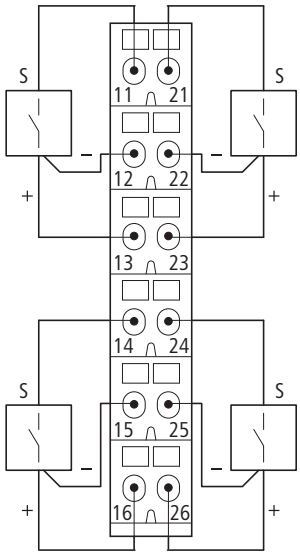


Digital input modules

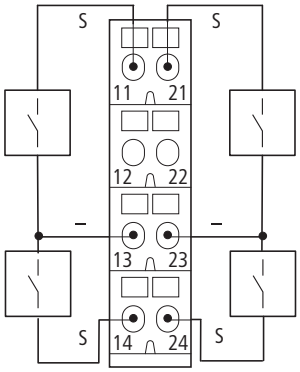
XN-S4...-SBBS for XN-4DI-24VDC-P



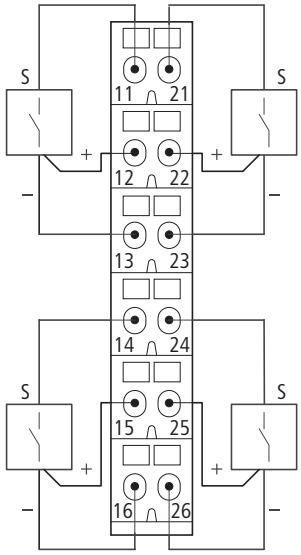
XN-S6...-SBBSBB for XN-4DI-24VDC-P



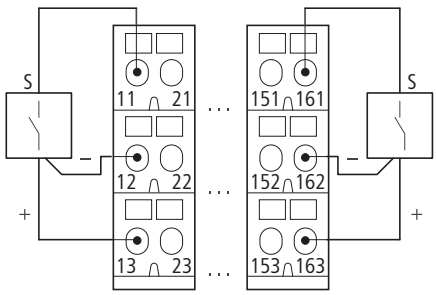
XN-S4...-SBBS for XN-4DI-24VDC-N



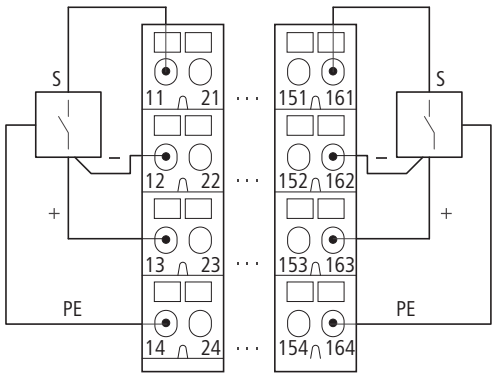
XN-S6...-SBBSBB for XN-4DI-24VDC-N



XN-B3...-SBB for XN-16DI-24VDC-P

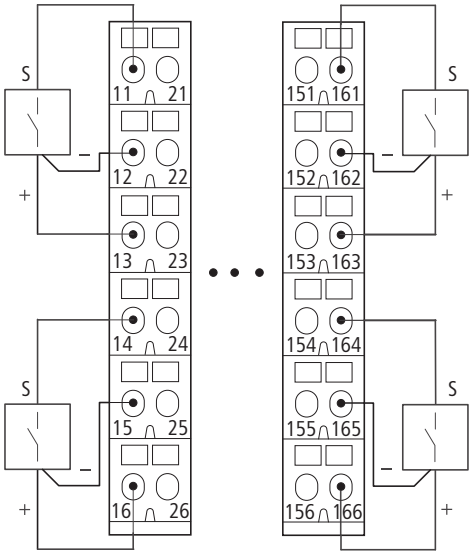


XN-B4...-SBBC for XN-16DI-24VDC-P

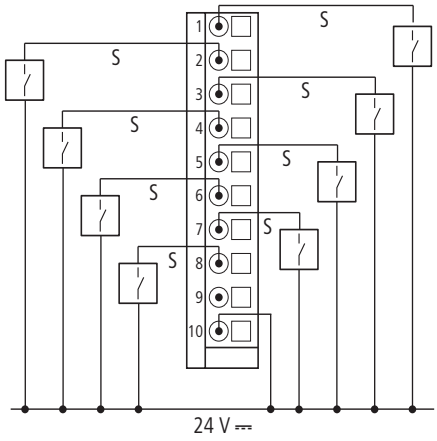


Digital input modules

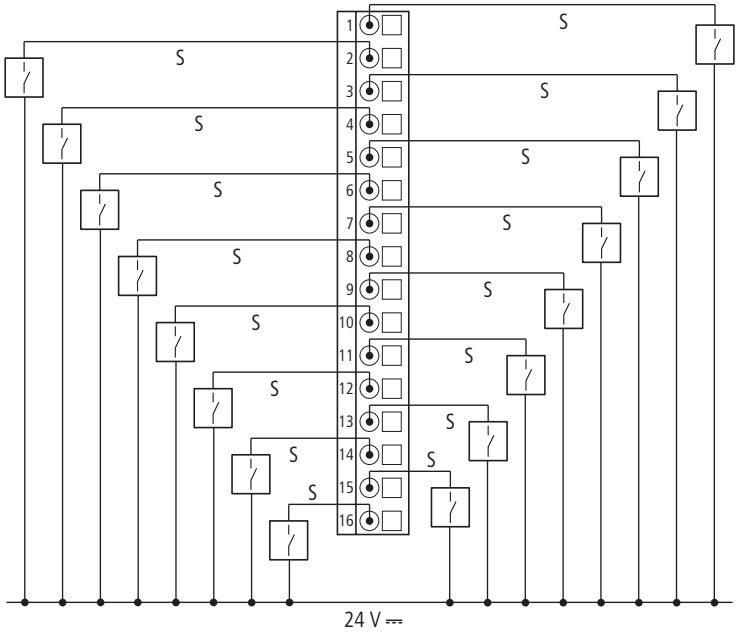
XN-B6...-SBBSBB for XN-32DI-24VDC-P



XNE-8DI-24VDC-P

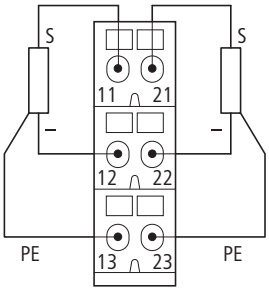


XNE-16DI-24VDC-P

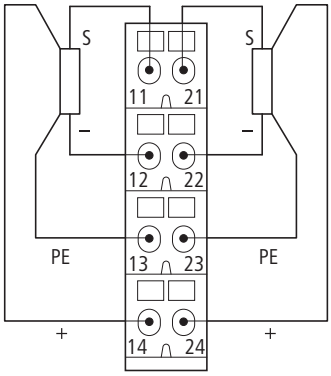


Digital output modules

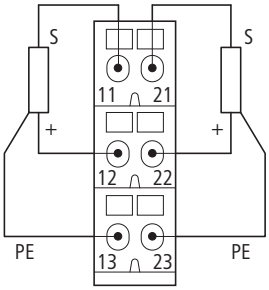
XN-S3…-SBC for
XN-2DO-24VDC-0.5A-P
XN-2DO-24VDC-2A-P



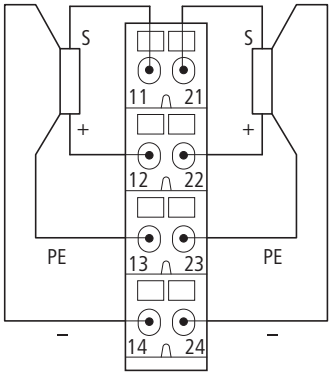
XN-S4…-SBCS for
XN-2DO-24VDC-0.5A-P
XN-2DO-24VDC-2A-P



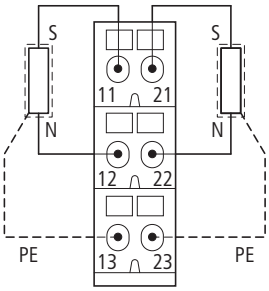
XN-S3…-SBC for XN-2DO-24VDC-0.5A-N



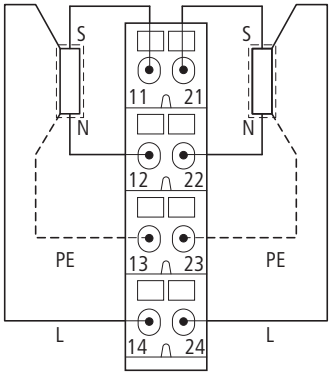
XN-S4…-SBCS for XN-2DO-24VDC-0.5A-N



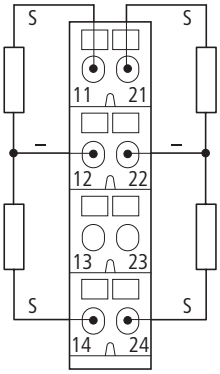
XN-S3…-SBC for XN-2DO-120/230VAC-0.5A



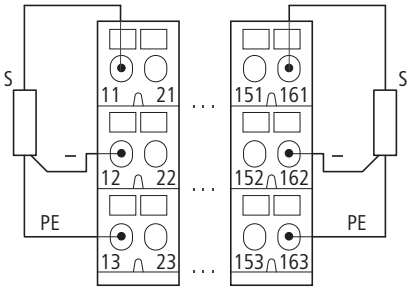
XN-S4…-SBCS for XN-2DO-120/230VAC-0.5A



XN-S4…-SBCS for XN-4DO-24VDC-0.5A-P

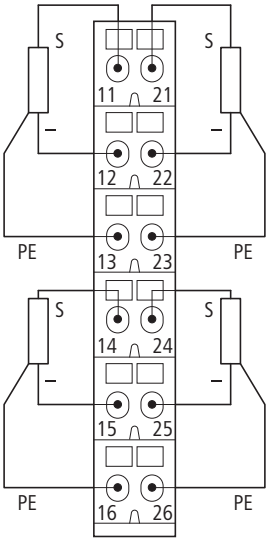


XN-B3…-SBC for XN-16DO-24VDC-0.5A-P

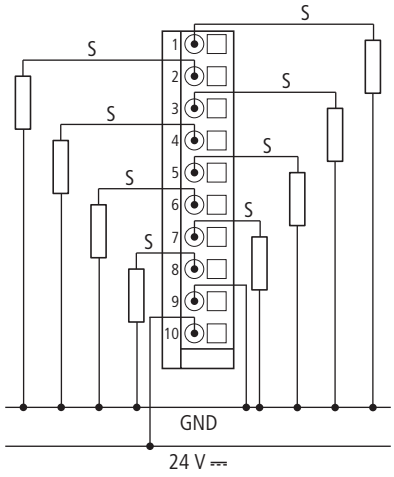


Digital output modules

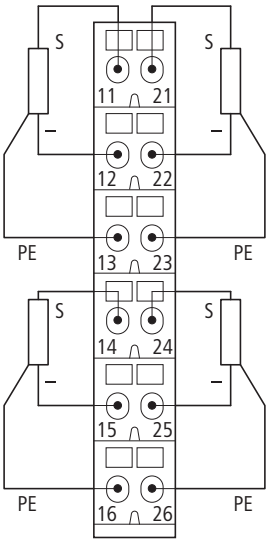
XN-S6…-SBCSBC for XN-4DO-24VDC-0.5A-P



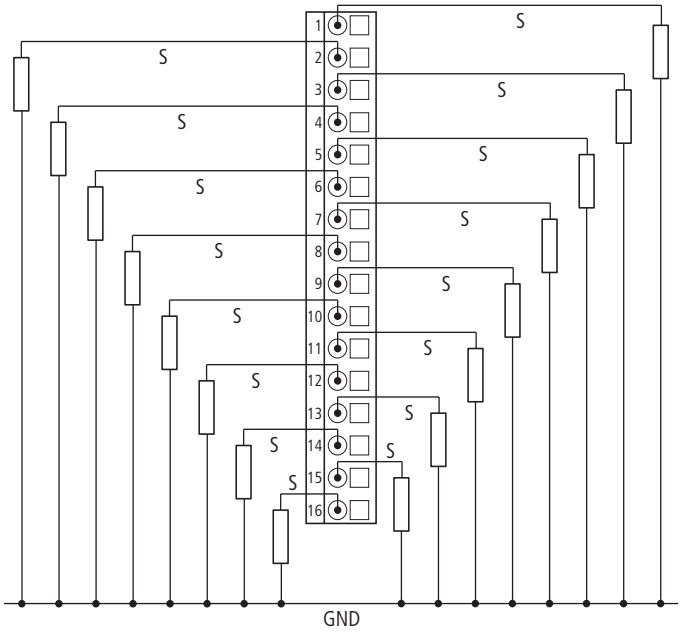
XNE-8DO-24VDC-0.5A-P



XN-B6…-SBCSBC for XN-32DO-24VDC-0.5A-P

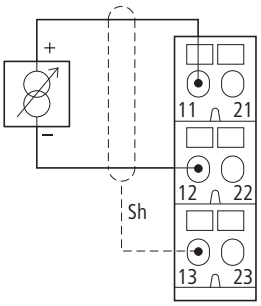


XNE-16DO-24VDC-0.5A-P

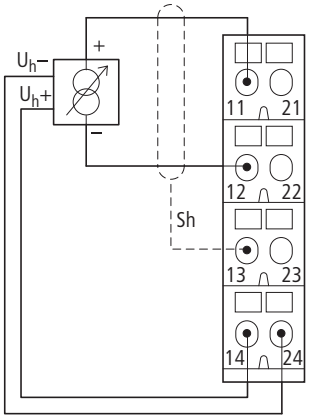


Analog input modules

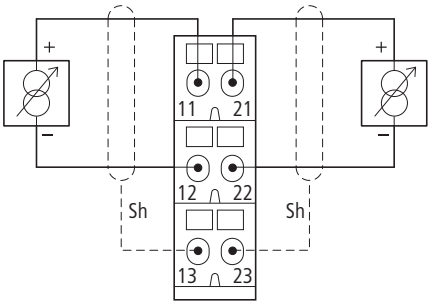
XN-S3…-SBB for XN-1AI-I(0/4...20MA)
XN-S3…-SBB for XN-1AI-U(-10/0...+10VDC)
Analog sensor/transmitter, without transmitter supply



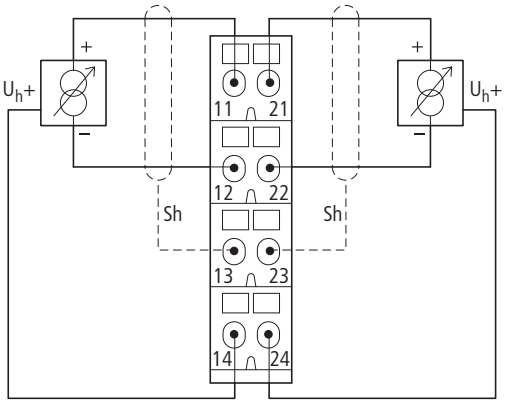
XN-S4…-SBBS for XN-1AI-I(0/4...20MA)
XN-S4…-SBBS for XN-1AI-U(-10/0...+10VDC)
Analog transmitter with non-isolated transmitter supply



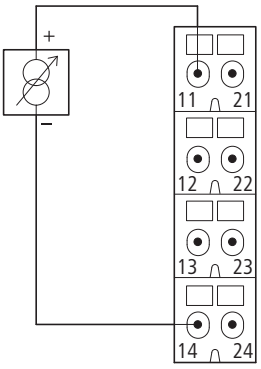
XN-S3…-SBB for XN-2AI-I(0/4...20MA), XN-2AI-U(-10/0...+10VDC)
Analog sensor/transmitter, without transmitter supply



XN-S4…-SBBS for XN-2AI-I(0/4...20MA), XN-2AI-U(-10/0...+10VDC),
Analog transmitter with non-isolated transmitter supply

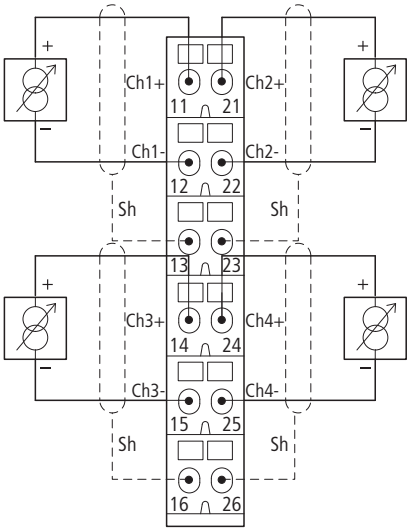


XN-S4...-SBBS for XN-2AI-I(0/4...20MA)
Two-conductor connection without external transmitter supply

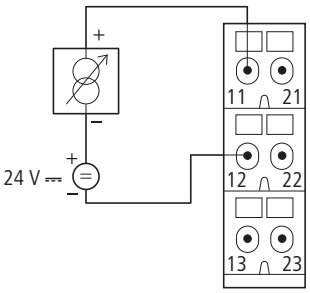


Analog input modules

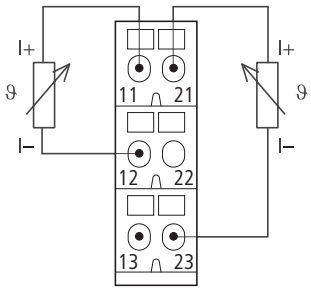
XN-S6…-SBCSBC for XN-4AI-U/I
Analog sensor/transmitter, without transmitter supply



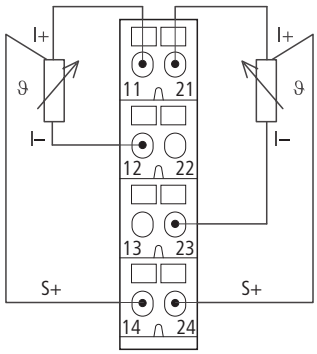
XN-S3...-SSB for XN-AI-U/I
2-conductor connection without external transmitter supply



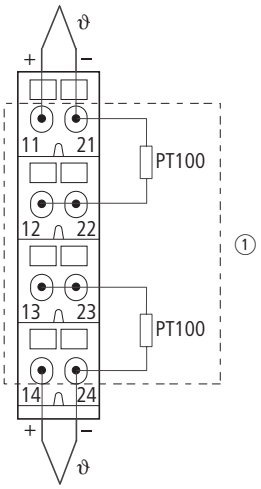
XN-S3…-SBB for XN-2AI-Pt/Ni-2/3
2-conductor connection



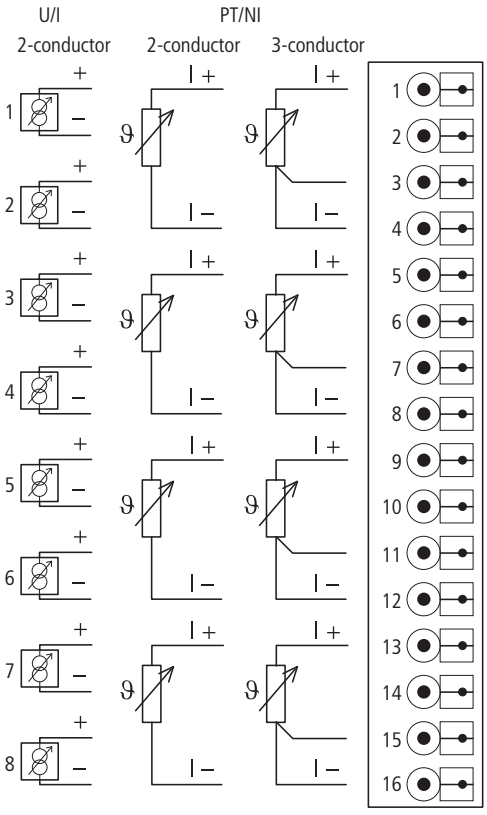
XN-S4…-SBBS for XN-2AI-Pt/Ni-2/3
3-conductor connection



XN-S4…-SBBS-CJ for XN-2AI-THERMO-PI



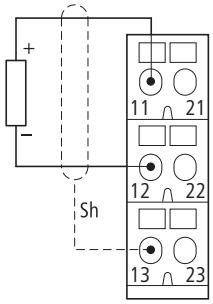
XNE-8AI-U/I-4Pt/Ni



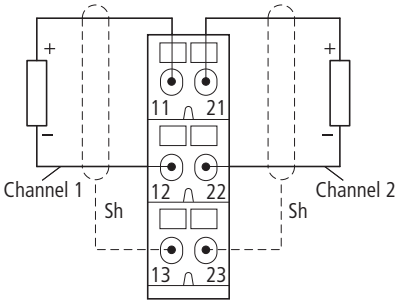
① Cold-junction compensation in base module

Analog output modules

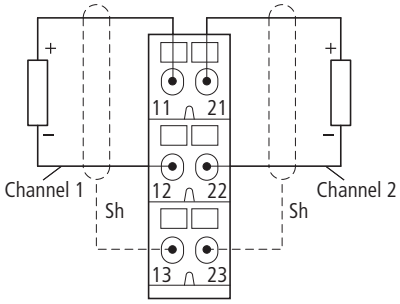
XN-S3...-SSB for XN-1AO-I(0/4...20MA)



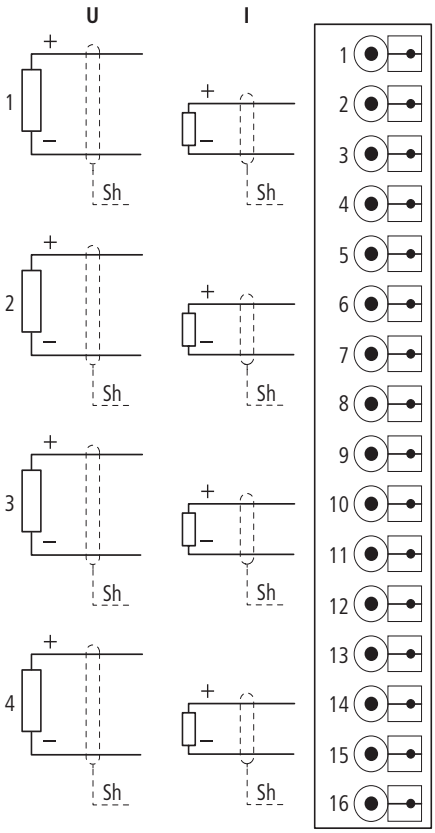
XN-S3...-SBB for XN-2AO-I(0/4...20MA)



XN-S3...-SBB for XN-2AO-U(-10/0...+10VDC)

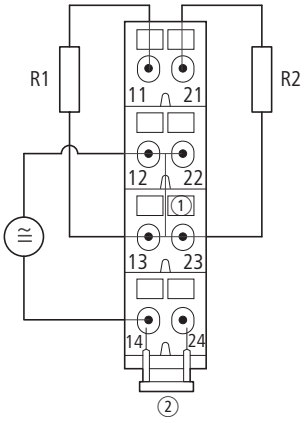


XNE-4AO-U/I

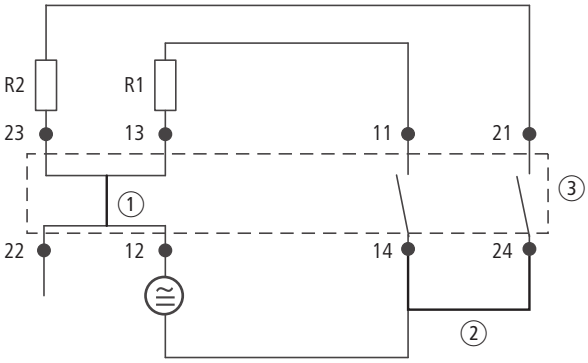


Relay modules

XN-S4x...-SBBS with externally applied supply and common potential link for XN-2DO-R-NC

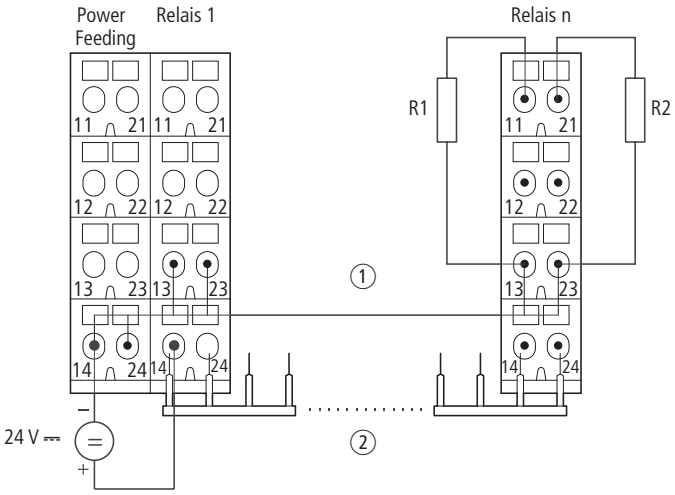


Module circuit XN-S4x...SBBS for XN-2DO-R-NC



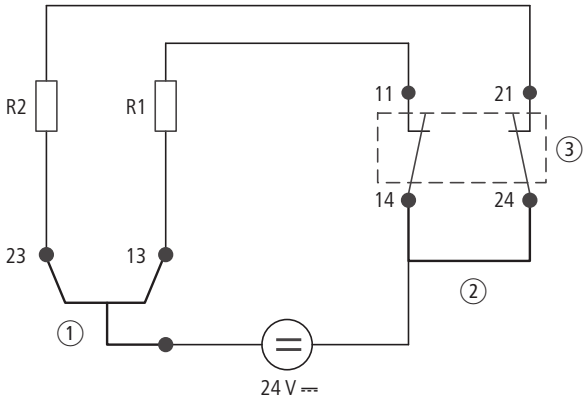
① Linked in the electronics
② Cross-link via QVR in the base module
③ Electronics module

XN-S4x...-SBCS supply via C-rail and common potential link for XN-2DO-R-NC



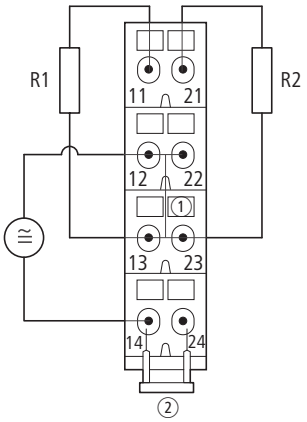
① Supply via C-rail
② Max. 8 relay modules

Module circuit XN-S4x...-SBCS for XN-2DO-R-NC

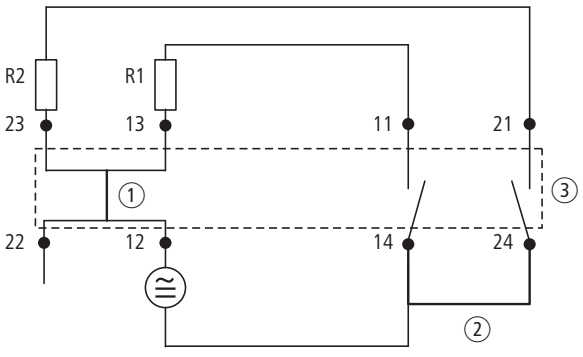


① Linked in the electronics
② Cross-link via QVR in the base module
③ Electronics module

XN-S4x...-SBBS with externally applied supply and common potential link for XN-2DO-R-NO



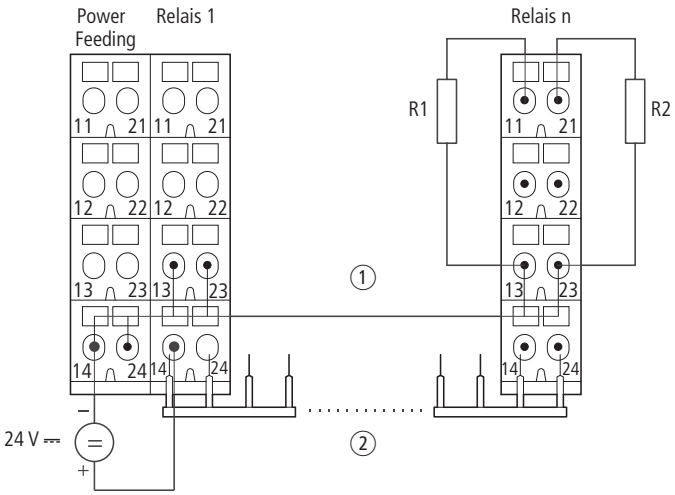
Module circuit XN-S4x...-SBBS for XN-2DO-R-NO



① Linked in the electronics
② Cross-link via QVR in the base module
③ Electronics module

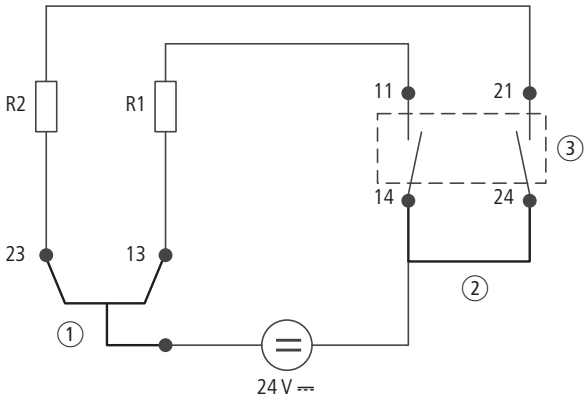
Relay modules

XN-S4x...-SBCS supply via C-rail and common potential link for XN-2DO-R-NO



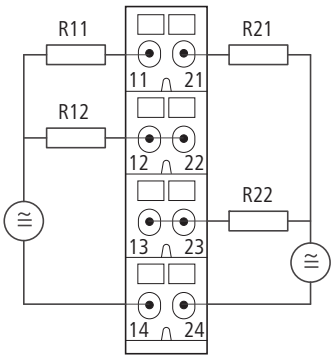
① Supply via C-rail
② Max. 8 relay modules

Module circuit XN-S4x...SBCS for XN-2DO-R-NO

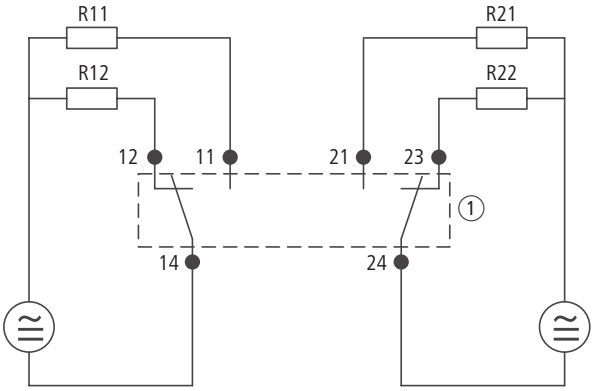


① Top-hat rail
② Cross-link via QVR in the base module
③ Electronics module

XN-S4x...-SBBS for XN-2DO-R-CO



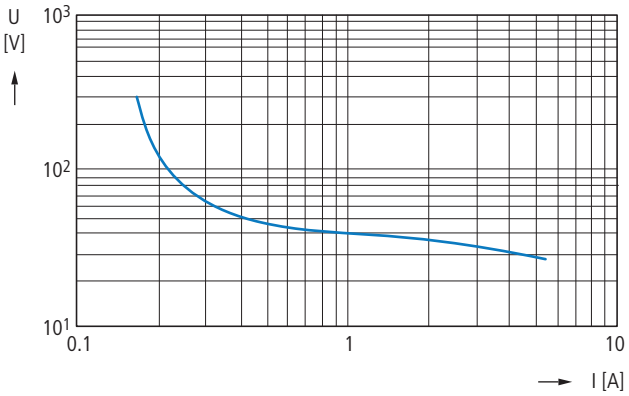
Module circuit XN-S4x...-SBBS for XN-2DO-R-CO



① Electronics module

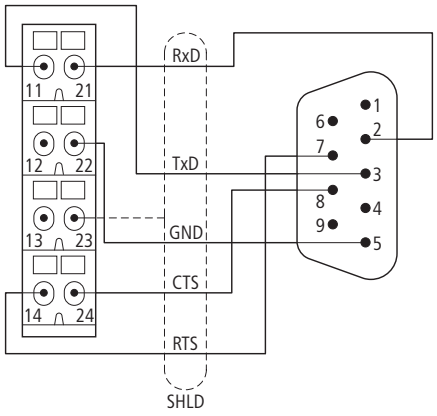
Definition
At 1000 operations, no arc with a duration > 10 ms must occur.

Load limit curve

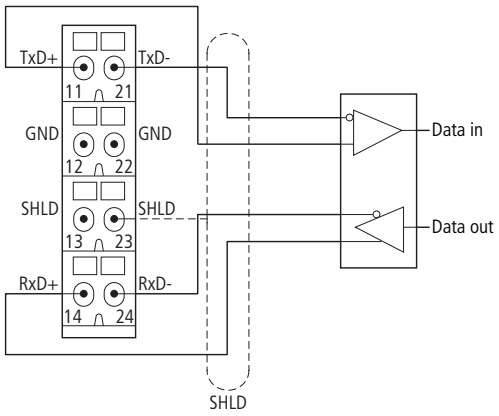


Serial interfaces

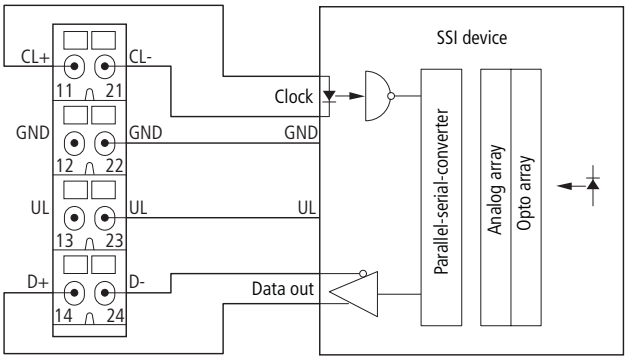
XN-S4x...-SBBS for XN-1RS232 and D-Sub plug



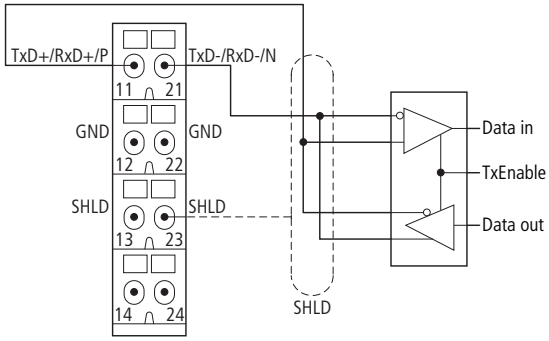
XN-S4x...SBBS for XN-1RS485/422 in RS422 mode



XN-S4x...-SBBS for XN-1SSI on an SSI rotary encoder

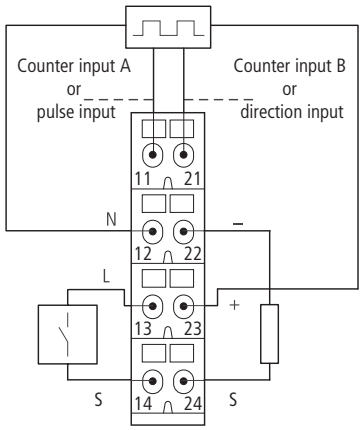


XN-S4...-SBBS for XN-1RS485/422 in RS485 mode

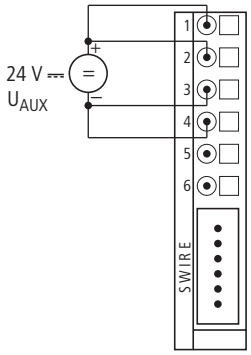


Technology modules / counter

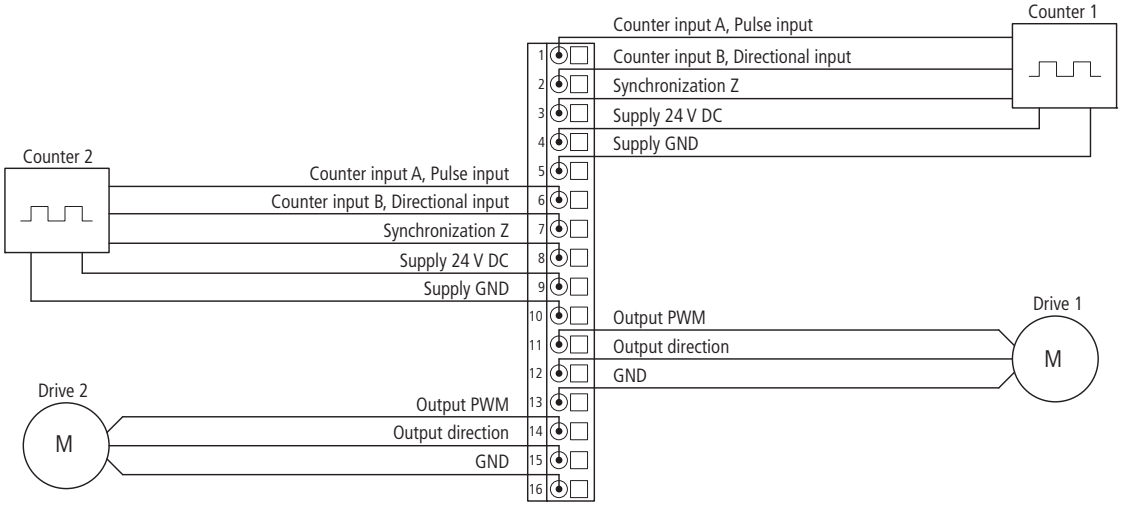
XN-S4...-SBBS for XN-1CNT-24VDC



XNE-1SWIRE



XNE-2CNT-2PWM



Technical data

General		
Standards		EN 61000-6-2, EN 61000-6-4, EN 61131-2
Supported fieldbus systems		PROFIBUS-DP, CANopen, DeviceNet, Ethernet (depending on gateway)
Potential isolation		Yes, through optocoupler
Ambient temperature	°C	0 - 55
Ambient temperature, storage	°C	-25 - +85
Relative humidity	%	5 – 95 (indoor), Level RH-2, non-condensing (for storage at 45°C)
Harmful gases		
SO_2	ppm	10 (rel. humidity < 75%, non-condensing)
H_2S	ppm	1.0 (rel. humidity < 75%, non-condensing)
Vibration resistance, operating conditions		According to IEC 60068-2-6
Mechanical shock resistance		According to IEC 60068-2-27
Repetitive shock resistance		According to IEC 60068-2-29
Drop and free fall		According to IEC 60068-2-31, free fall to IEC 60068-2-32
Protection type		IP20
Electromagnetic compatibility (EMC)		
ESD		EN 61000-4-2
Electromagnetic fields		EN 61000-4-3
Burst		EN 61000-4-4
Surge		EN 61000-4-5
HF, asymmetric		EN 61000-4-6
Radiated interference (RFI)		EN 55016-2-3
Voltage fluctuations		EN 61131-2
Type test		To EN 61131-2
Approvals		CE, cUL (may be in preparation)

		Gateways XN, basic modules	**Gateways XNE, electronics modules XNE**
Terminals			
Dimensional data		To VDE 0611 Part 1/8.92 / IEC/EN 60947-7-1	To VDE 0611 Part 1/8.92 / IEC/EN 60947-7-1
Connection from above		Spring-loaded/screw terminals	Push-in spring-cage terminals
Cable stripped length	mm	8	8
Max. terminal capacity	mm^2	0.5 - 2.5	0.14 - 1.5
Connectable conductors			
"e" solid H07V-U	mm^2	0.5 - 2.5	0.25 - 1.5
"f" flexible H 07V-K	mm^2	0.5 - 1.5	0.25 - 1.5
"f" with ferrule without plastic collar to DIN 46228-1 (ferrules gas-tight)	mm^2	0.5 - 1.5	0.25 - 1.5
"f" with ferrule with plastic collar to DIN 46228-1 (ferrules gas-tight)	mm^2	0.5 - 1.5	0.25 - 0.75
Gage pin IEC/EN 60947-1		A1	A1



			XNE-GWBR-PBDP	XNE-GWBR-CANOPEN	XNE-GWBR-2ETH-IP
Gateways XNE					
Fieldbus			PROFIBUS-DP	CANopen	Ethernet
Protocol			PROFIBUS-DPV0 and PROFIBUS-DPV1	CANopen	EtherNet-IP
Maximum number of stations			48 modules (XN, XNE) of slice design or max. length of station: 1 m	62 modules (XN, XNE) of slice design or max. length of station: 1 m	74 modules (XN, XNE) of slice design or max. length of station: 1 m
System supply	U_{SYS}	V DC	24 V DC/5 V DC	24 V DC/5 V DC	24 V DC/5 V DC
Permissible range, 5 V DC	U_{SYS}	V DC	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3
Permissible range, 24 V DC	U_{SYS}	V DC	18 - 30	18 - 30	18 - 30
Field voltage	U_L	V DC	24	24	24
Permissible range	U_L	V DC	18 - 30	18 - 30	18 - 30
Ripple		%	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)
Servicing interface			PS/2 socket	PS/2 socket	Mini USB
Fieldbus terminals			Push-in spring-cage terminals	Push-in spring-cage terminals	2x RJ45 socket
Transfer rate		kBit/s	9.6 - 12000	20, 50, 125, 250, 500, 800, 1000	10000, 100000
Data transfer rate setting			Automatic	Through DIP switch or automatically	Automatic
Address assignment			Through DIP switch	Through DIP switch	Through DIP switch, BootP, DHCP or PGM
Fieldbus termination			Through DIP switch	Through DIP switch	-
Number of parameter bytes			2	-	-
Number of diagnosis bytes			2	-	-
Address range			1 - 125 decimal	1 - 63 decimal	1 - 254 decimal

			XN-GWBR-PBDP	XN-GWBR-CANOPEN	XN-GWBR-DNET	XN-GWBR-MODBUS-TCP	XN-PLC-CANOPEN
Gateways XN with built-in supply module							
Fieldbus			PROFIBUS-DP	CANopen	DeviceNet	Ethernet	CANopen
Protocol			PROFIBUS-DPV0	CANopen	DeviceNet	Modbus-TCP	CANopen
Maximum number of stations			74 modules (XN, XNE) of slice design or max. length of station: 1 m	74 modules (XN, XNE) of slice design or max. length of station: 1 m	74 modules (XN) of slice design or max. length of station: 1 m	74 modules (XN, XNE) of slice design or max. length of station: 1 m	74 modules (XN, XNE with limitations) of slice design or max. length of station: 1 m
System supply	U_{SYS}	V DC	24 V DC/5 V DC	24 V DC/5 V DC	24 V DC/5 V DC	24 V DC/5 V DC	24 V DC/5 V DC
Permissible range, 5 V DC	U_{SYS}	V DC	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3
Permissible range, 24 V DC	U_{SYS}	V DC	18 - 30	18 - 30	18 - 30	18 - 30	18 - 30
Field voltage	U_L		24	24	24	24	24
Permissible range	U_L	V DC	18 - 30	18 - 30	18 - 30	18 - 30	18 - 30
Ripple		%	< 5 (to EN 61131-2)				
Servicing interface			PS/2 socket	PS/2 socket	PS/2 socket	PS/2 socket	PS/2 socket
Fieldbus terminals			1x D-sub 9-pin socket	Open style connector	Open style connector	RJ45 bus	Open style connector
Transfer rate		kBit/s	9.6 - 12000	10, 20, 50, 125, 250, 500, 800, 1000	125, 250, 500	10000, 100000	10, 20, 50, 125, 250, 500, 800, 1000
Data transfer rate setting				Through DIP switch	Through DIP switch	Automatic	Software
Address assignment			2 decimal rotary coding switches	2 decimal rotary coding switches	2 decimal rotary coding switches	Decimal rotary coding switch, BootP, DHCP or I/Oassistant	Software
Fieldbus termination			External	External	External		External
Number of parameter bytes			5				
Number of diagnosis bytes			3				
Address range			1 - 99 decimal	1 - 99 decimal	1 - 63 decimal	1 - 254 decimal	1 - 127 decimal
Program data		kByte	-	-	-	-	128
Program code		kByte	-	-	-	-	128
Cycle time for 1 k of instructions (bits, bytes)		ms	-	-	-	-	0.5
Real-time clock			-	-	-	-	Yes

			XN-GW-PBDP-1.5MB	XN-GW-PBDP-12MB	XN-GW-CANOPEN	XN-GW-DNET
XN gateways without built-in supply module						
Fieldbus			PROFIBUS-DP	PROFIBUS-DP	CANopen	DeviceNet
Protocol			PROFIBUS-DPV0	PROFIBUS-DPV0	CANopen	DeviceNet
Maximum number of stations			74 modules (XN) of slice design or max. length of station: 1 m	74 modules (XN) of slice design or max. length of station: 1 m	74 modules (XN) of slice design or max. length of station: 1 m	74 modules (XN) of slice design or max. length of station: 1 m
Operating voltage		V DC	5 (from bus refreshing module)	5 (from bus refreshing module)	5 (from bus refreshing module)	5 (from bus refreshing module)
Permissible range		V DC	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3	4.7 - 5.3
Ripple		%	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)
Rated current drawn from module bus	I_{MB}	mA	≦ 430	≦ 430	≦ 350	≦ 250
Servicing interface			PS/2 socket	PS/2 socket	PS/2 socket	PS/2 socket
Fieldbus terminals			2 x D-sub 9-pin sockets; 2 x spring-loaded terminal strips for direct wiring	1x D-sub 9-pin socket	1 x D-sub 9-pin socket; 1 x D-sub 9-pin plug; 2 x spring-loaded terminal strips for direct wiring, 5 -pin	Open style connector
Transfer rate		kBit/s	9.6 - 1500	9.6 - 12000	10, 20, 50, 125, 250, 500, 800, 1000	125, 250, 500
Data transfer rate setting			-	-	Through DIP switch	Through DIP switch
Address assignment			Through two hex rotary coding switches	Through two hex rotary coding switches	Through two hex rotary coding switches	Through two decimal rotary coding switches
Fieldbus termination			Through D-sub plug	Through D-sub plug	Through D-sub plug	Through DIP switch
Number of parameter bytes			5	5	-	-
Number of diagnosis bytes			3	3	-	-
Address range			1 - 125 decimal	1 - 125 decimal	1 - 127 decimal	0 - 63 decimal

			XN-BR-24VDC-D	XN-PF-24VDC-D	XN-PF-120/230VAC-D
Supply modules					
Operating voltage			24 V DC	24 V DC	120/230 V AC
System supply	U_{SYS}	V DC	24	-	-
Permissible range, 24 V DC	U_{SYS}	V DC	18 - 30[1)]	-	-
Permissible range, 5 V DC	U_{MB} (built into system)	V DC	4.7 - 5.3	-	-
Field voltage	U_L		24 V DC	24 V DC	120/230 V AC
Permissible range	U_L		18 - 30 V DC	18 - 30 V DC[2)]	102 - 132 V AC (120 V AC) 195.5 - 253 V AC (230 V AC) [3)]
Rated current drawn from module bus	I_{MB}	mA	-	≦ 28	≦ 25
Insulation test	U_i	V AC	500	500	1500
Ripple		%	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)	< 5 (to EN 61131-2)
Maximum operating current	I_L	A	10	10	10
Maximum system supply current	I_{MB}	A	1.5	-	-
Number of diagnostic bits			4	4	4
Base module without gateway power supply					
Without C connection			XN-P3...-SBB XN-P3...-SBB-B	XN-P3...-SBB	XN-P3...-SBB
With C connection			XN-P4...-SBBC XN-P4...-SBBC-B	XN-P4...-SBBC	XN-P4...-SBBC

Notes

1) Permissible range for system supply:
for U_{SYS} = 24 V DC: 18 to 30 V DC (to EN 61131-2)

2) Permissible range for field voltage U_L: to EN 61131-2 (18 to 30 V DC)

3) Permissible range for rated voltage and field voltage U_L: to EN 61131-2

			XN-2DI-24VDC-P	XN-2DI-24VDC-N	XN-2DI-120/230VAC
Digital input modules					
Channels		Number	2	2	2
Rated voltage at supply terminal	U_L		24 V DC	24 V DC	120/230 V AC
Rated current drawn from supply terminal[1), 2)]	I_L	mA	≦ 20	≦ 20	≦ 20
Rated current drawn from module bus[2)]	I_{MB}	mA	≦ 28	≦ 28	≦ 28
Insulation test	U_i	V AC	500	500	1500
Heat dissipation		W	0.7	0.7	1
Input voltage					
Input voltage, rated value			24 V DC	24 V DC	120/230 V AC
Low level			-30 V - +5 V	30 V - (U_L - 11 V)	0 - 20 V AC
High level			11 - 30 V	0 - 5 V	79 V AC - 265 V AC[3)]
Frequency range		Hz	-	-	48 - 63
Input current					
Low level/active level			0 mA - 1.5 mA	0 mA - 1.7 mA	0 mA - 1 mA
High level/active level			2 mA - 10 mA	1.8 mA - 10 mA	3 mA - 10 mA
Input delay					
$t_{rising\ edge}$		µs	< 200	< 200	< 20000
$t_{falling\ edge}$		µs	< 200	< 200	< 20000
Basic modules					
Without C connection			XN-S3...-SBB 2-conductor proximity switches (Bero®) can be connected, with a permissible quiescent current of up 1.5 mA.	XN-S3...-SBB 2-conductor proximity switches (Bero®) can be connected, with a permissible quiescent current of up 1.5 mA.	XN-S3...-SBB
With C connection			XN-S4...-SBBC	XN-S4...-SBBC	XN-S4...-SBBC

Notes

1) The supply terminal (U_L) provides power for the module electronics and for the sensors at the inputs. The total current required for each module consists of the sum of all partial currents.

2) Part of the XI/ON module's electronics is supplied with module bus voltage (5 V DC), the other part through the supply terminal (U_L).

3) Max. permissible capacity: 141 nF at 79 V AC/50 Hz; 23 nF at 265 V AC/50 Hz

XN-4DI-24VDC-P	XN-4DI-24VDC-N	XN-16DI-24VDC-P	XN-32DI-24VDC-P	XNE-8DI-24VDC-P	XNE-16DI-24VDC-P
4	4	16	32	8	16
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
≦ 40	≦ 40	≦ 40	≦ 30	≦ 1.5	≦ 3
≦ 29	≦ 28	≦ 45	≦ 30	≦ 15	≦ 15
500	500	500	500	500	500
1	1	2.5	4.2	< 1.5	< 2.5
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
-30 V - +5 V	30 V - (U_L - 11 V)	-30 V - +5 V	-30 V - +5 V	-U_L - +5 V	-U_L - +5 V
15 V - 30 V	0 - 5 V	15 V - 30 V	15 V - 30 V	11 V - U_L	11 V -U_L
0 mA - 1.5 mA	0 mA - 1.2 mA	0 mA - 1.5 mA	0 mA - 1.5 mA	-1 mA - 1.5 mA	-1 mA - 1.5 mA
2 mA - 10 mA	1.3 mA - 6 mA	2 mA - 10 mA	2 mA - 10 mA	2 mA - 5 mA	2 mA - 5 mA
< 200	< 200	< 200	< 200	< 100	< 150
< 200	< 200	< 200	< 200	< 200	< 300
XN-S4...-SBBS XN-S6...-SBBSBB	XN-S4...-SBBS XN-S6...-SBBSBB	XN-B3...-SBB	XN-B6...-SBBSBB	Already built in	Already built in
		XN-B4...-SBBC			

			XN-2DO-24VDC-0.5A-P	XN-2DO-24VDC-0.5A-N	XN-2DO-120/230VAC-0.5A
Digital output modules					
Channels		Number	2	2	2
Rated voltage at supply terminal	U_L		24 V DC	24 V DC	120/230 V AC (45 - 65 Hz)
Rated current drawn from supply terminal (for 0 mA load current)[1]	I_L	mA	≦ 20	≦ 20	
Rated current drawn from module bus[2]	I_{MB}	mA	≦ 32	≦ 32	≦ 35
Insulation test	U_i	V AC	500	500	1500
Heat dissipation		W	Normally 1	Normally 1	Normally 1
Output voltage					
High level			> U_L - 1 V DC	< GND_L + 1 V DC	> U_L - 2 V AC, (zero-point switching triac)
Output current		A			
High level (rated)		A	0.5	0.5	0.5[3]
High level (permissible range)		A	< 0.6	< 0.6	0.02 - 0.5
Low level		mA			< 1.5
Back-up fuse					500 mA FF
Surge current	I_S	A			8 (1 period at 60 Hz)
Number of parallel-switchable outputs	max.				
Total module current		A	1	1	1
Delay for signal changeover, resistive load					
From Low to High level		µs	< 100	< 100	< T/2 + 1 ms
From High to Low level		µs	< 100	< 100	< T/2 + 1 ms
Load resistance range			> 48 Ω		At 120 V AC: 240 Ω - 6 kΩ At 230 V AC: 460 Ω - 11.5 kΩ
Utilization factor	%	g	100	100	100 (observe derating)
The following can be connected:			Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads
Resistive load		Ω	> 48	> 48	
Inductive load		H	< 1.2	< 1.2	
Lamp load	R_{LL}	W	< 3	< 12	
Switching frequency					
For resistive load	f	Hz	< 5000 (R_{LO} < 1 kΩ)	< 100 (R_{LO} < 1 kΩ)	
For inductive load		Hz	< 2	< 2	
For lamps		Hz	< 10	< 10	
Number of diagnostic bits			2	2	
Diagnostics			Yes	Yes	No
Outputs to EN 61131-1			Protected	Protected	
Retriggering after elimination of short circuit	I_i		Self-acting	Self-acting	
Basic modules					
With C connection			XN-S3...-SBC XN-S4...-SBCS	XN-S3...-SBC XN-S4...-SBCS	XN-S3...-SBC XN-S4...-SBCS

Notes

1) The supply terminal (U_L) provides power for the module electronics and for the consumers at the outputs. The total current required for each module consists of the sum of all partial currents.

2) Part of the XI/ON module's electronics is supplied with module bus voltage (5 V DC), the other part through the supply terminal (U_L).

3) To increase the maximum output current to up to 1 A, two outputs can be connected in parallel.

XN-2DO-24VDC-2A-P	XN-4DO-24VDC-0.5A-P	XN-16DO-24VDC-0.5A-P	XN-32DO-24VDC-0.5A-P	XNE-8DO-24VDC-0.5A-P	XNE-16DO-24VDC-0.5A-P
2	4	16	32	8	16
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
≦ 50	≦ 25	≦ 30	≦ 50	≦ 3 mA (all outputs OFF)	≦ 3 mA (all outputs OFF)
≦ 33	≦ 30	≦ 120	≦ 30	≦ 15 mA	≦ 25 mA
500	500	500	500	500	500
Normally 1	Normally 1	Normally 4	Normally 5	Normally 1.5	Normally 2.5
> U_L - 1 V DC	> U_L - 1 V DC	> U_L - 1 V DC	> U_L - 1 V DC	> U_L - 1 V DC	> U_L - 1 V DC
2	0.5	0.5	0.5	0.5[3]	0.5[3]
< 2.4	< 0.6	< 0.6	< 1.0	< 1.0	< 1.0
	4		2		
4	2	8	10		
< 100	< 250	< 100	< 300	< 300	< 300
< 100	< 250	< 100	< 300	< 300	< 300
< 12 Ω	> 48 Ω	> 48 Ω	> 48 Ω		
100	100	100	See total module current	100	50%, max. 4 A
Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads
> 12	> 48	> 48	> 48	> 48	> 48
< 1.2	< 1.2	< 1.2	< 1.2	As for DC13 to IEC 60947-5-1	As for DC13 to IEC 60947-5-1
< 6	< 6	< 3	< 6	< 6	< 6
< 5000 (R_{LO} < 1 kΩ)	< 1000 (R_{LO} < 1 kΩ)	< 100 (R_{LO} < 1 kΩ)	< 100(R_{LO} < 1 kΩ)	< 100	< 100
< 2	< 2			As for DC13 to IEC 60947-5-1	As for DC13 to IEC 60947-5-1
< 10	< 10			< 10	< 10
2	1	4	8		
Yes	Yes	Yes	Yes		
Protected	Short-circuit proof	Short-circuit proof	Short-circuit proof	Short-circuit proof	Short-circuit proof
Self-acting	Self-acting	Self-acting	Self-acting	Self-acting	Self-acting
				Already built in	Already built in
XN-S3...-SBC XN-S4...-SBCS	XN-S4...-SBCS XN-S4...-SBCSBC	XN-B3...-SBC	XN-B6...-SBCSBC		

			XN-1AI-I(0/4...20MA)	XN-2AI-I(0/4...20MA)	XN-1AI-U(-10/0...+10VDC)
Analog input modules					
Measured variables			Current	Current	Voltage
Channels		Number	1	2	1
Rated voltage at supply terminal	U_L		24 V DC	24 V DC	24 V DC
Rated current drawn from supply terminal[1), 2)]	I_L	mA	≦ 50	≦ 12	≦ 50
Rated current drawn from module bus[2)]	I_{MB}	mA	≦ 41	≦ 35	≦ 41
Heat dissipation		W	< 1	< 1	< 1
Sensor/transmitter supply			Bridged with U_L and GND_L of incoming unit; not protected	≦ 250 mA; bridged with U_L and GND_L of incoming unit; not protected	Bridged with U_L and GND_L of incoming unit; not protected
Voltage measurement					
Measurement ranges			-	-	-10 - 10 V DC/0 - 10 V DC
Value representation			-	-	Standard, 16 bit/12 bit left-aligned
The following can be connected:			-	-	2-/3-/4-conductor + shield
Maximum input voltage	$U_{max.}$	V DC	-	-	35
Input resistance	R_L	kΩ	-	-	≧ 98.5 kΩ
Limiting frequency	f_G	Hz	-	-	200
Basic error limit at 23 °C		%	-	-	< 0.2
Temperature coefficient			-	-	≦ 300 ppm/°C of full-scale value
Current measurement					
Measurement ranges		mA	0 - 20 mA/4 - 20 mA	0 - 20 mA/4 - 20 mA	-
Value representation			Standard, 16 bit/12 bit left-aligned	Standard, 16 bit/12 bit left-aligned	-
The following can be connected:			2-/3-/4-conductor + shield	2-/3-conductor + shield	-
Maximum input current	$I_{max.}$	mA	50	50	-
Input resistance	R_L	Ω	< 125 Ω	< 125 Ω	-
Limiting frequency	f_G	Hz	200	50	-
Basic error limit at 23 °C		%	< 0.2	< 0.2	-
Temperature coefficient			≦ 300 ppm/°C of full-scale value		-
Temperature measurement					
Connectable sensors			-	-	-
Measurement ranges			-	-	-
Value representation			-	-	-
The following can be connected:			-	-	-
Measuring current	I_{mess}		-	-	-
Destruction limit	$U_{max.}$	V DC	-	-	-
Basic error limit at 23 °C		%	-	-	-
Temperature coefficient			-	-	-
R (resistance measurement)					
Measurement ranges			-	-	-
Value representation			-	-	-
The following can be connected:			-	-	-
Destruction limit	$U_{max.}$	V DC	-	-	-
Limiting frequency	f_G	Hz	-	-	-
Basic error limit at 23 °C		%	-	-	-
Temperature coefficient			-	-	-
Basic modules					
Without C connection			XN-S3...-SBB	XN-S3...-SBB	XN-S3...-SBB
Without C connection, for sensor supply			XN-S4...-SBBS	XN-S4...-SBBS	XN-S4...-SBBS

Notes

1) The supply terminal (U_L) provides power for the module electronics and for the analog transmitters at the inputs. The total current required for each module consists of the sum of all partial currents.

2) Part of the XI/ON module's electronics is supplied with module bus voltage (5 V DC), the other part through the supply terminal (U_L).

XN-2AI-U(-10/0...+10VDC)	XN-4AI-U/I	XN-2AI-THERMO-PI	XN-2AI-Pt/Ni-2/3	XNE-8AI-U/I-4Pt/Ni
Voltage	Voltage, current	Temperature (thermo-couples)	Temperature Pt, Ni resistance R	Voltage, current, temperature Pt, Ni resistance R
2	4	2	2	8 (U/I)/4 (Pt/Ni/R)
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
≦ 12	≦ 20	≦ 30	≦ 30	Normally 35
≦ 35	≦ 50	≦ 45	≦ 45	≦ 30
< 1	< 1	< 1	< 1	< 1.5
≦ 250 mA; bridged with U_L and GND_L of incoming unit; not protected	-	-	-	-
-10 - 10 V DC/0 - 10 V DC	-10 - 10 V DC/0 - 10 V DC	-50 - 50 mV, -100 - 100 mV -500 - 500 mV, -1000 - 1000 mV	-	-10 - 10 VDC/0 - 10 V DC
Standard, 16 bit/12 bit left-aligned	Standard, 16 bit/12 bit left-aligned	Standard, 16 bit/12 bit left-aligned	-	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
2-/3-conductor + shield	2-conductor + shield	2-conductor	-	2-conductor
35	30	10	-	±20
≧ 98.5 kΩ	≧ 98.5 kΩ	-	-	≧ 200 kΩ
50	20	-	-	1.5
< 0.2	< 0.3	< 0.2 (normally)	-	< 0.2
≦ 150 ppm/°C of full-scale value	≦ 300 ppm/°C of full-scale value	≦ 300 ppm/°C of full-scale value	-	≦ 200 ppm/°C of full-scale value
-	0 - 20 mA/4 - 20 mA	-	-	0 - 20 mA/4 - 20 mA
-	Standard, 16 bit/ 12 bit left-aligned	-	-	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
-	2-conductor + shield	-	-	2-conductor
-	50	-	-	40 (Max. input voltage: < 17 V)
-	< 62 Ω	-	-	< 52 Ω
-	20	-	-	1.5
-	< 0.3	-	-	< 0.2
-	≦ 300 ppm/°C of full-scale value	-	-	≦ 200 ppm/°C of full-scale value
-	-	Thermocouple type B, E, J, K, N, R, S, T to IEC 584, Class 1, 2, 3	Pt100 RTD, Pt200, Pt500, Pt100 RTD0 (EN 60751) Ni100, Ni1000 (DIN 43760)	Pt100 RTD, Pt200, Pt500, Pt100 RTD0 (all: EN 60751) Ni100, Ni1000 (DIN 43760), Ni1000TK5000
-	-	Type B: 100 - 1820 °C Type E: -270 - 1000 °C Type J: -210 - 1200 °C Type K: -270 - 1370 °C Type N: -270 - 1300 °C Type R: -50 - 1760 °C Type S: -50 - 1540 °C Type T: -270 - 400 °C	Platinum RTDs: -200 – 850 °C/-200 – 150 °C Nickel RTDs: -60 – 250 °C/-60 – 150 °C	Platinum RTDs: -200 – 850 °C/-200 – 150 °C Nickel RTDs: -60 – 250 °C/-60 – 150 °C
-	-	Standard, 16 bit/12 bit left-aligned		
-	-	2-conductor (cold-junction compensation in base module)	2-conductor/3-conductor	2-conductor/3-conductor
-	-		< 1 mA	< 0.5 mA
-	-		> 30	> 30
-	-	< 0.2 (type T, -200 - 0 °C: 0.6%)	< 0.2	Pt100 RTD, Ni100: 0.35%, Pt200, Pt500, Pt100 RTD0, Ni1000, Ni1000TK5000: 0.2%
-	-	≦ 300 ppm/°C of full-scale value	≦ 300 ppm/°C of full-scale value	≦ 200 ppm/°C of full-scale value
-	-	-	0 - 100 Ω, 0 - 200 Ω, 0 - 400 Ω, 0 - 1000 Ω	0 - 250 Ω, 0 - 400 Ω, 0 - 800 Ω, 0 - 2000 Ω, 0 - 4000 Ω
-	-	-	Standard, 16 bit/12 bit left-aligned	
-	-	-	2-conductor/3-conductor	2-conductor/3-conductor
-	-	-	> 30	> 30
-	-	-		1.5
-	-	-	< 0.2	< 0.2
-	-	-	≦ 300 ppm/°C of full-scale value	≦ 200 ppm/°C of full-scale value
		-		
XN-S3...-SBB	XN-S6...-SBCSBC	-	XN-S3...-SBB	Already built in
XN-S4...-SBBS	-	With integrated cold-junction compensation XN-S4...-SBBS-CJ	XN-S4...-SBBS	-

			XN-1AO-I(0/4...20MA)	XN-2AO-I(0/4...20MA)	XN-2AO-U(-10/0...+10VDC)	XNE-4AO-U/I
Analog output modules						
Measured variables			Current	Current	Voltage	Voltage, current
Channels		Number	1	2	2	4
Rated voltage at supply terminal	U_L		24 V DC	24 V DC	24 V DC	24 V DC
Rated current drawn from supply terminal[1]	I_L	mA	≦ 50	≦ 50	≦ 50	≦ 150
Rated current drawn from module bus[1]	I_{MB}	mA	≦ 39	≦ 40	≦ 43	≦ 40
Heat dissipation		W	Normally 1	Normally 1	Normally 1	< 3
Output value, Voltage						
Output voltage		V DC	-	-	-10 - 10 V DC/ 0 - 10 V DC	-10 - 10 V DC/ 0 - 10 V DC
Value representation			-	-	Standard, 16 bit/12 bit left-aligned	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/ 12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:			-	-	2-conductor + shield	2-conductor
Load resistor			-	-		
Resistive load		Ω	-	-	> 1000	> 1000
Capacitive load		µF	-	-	< 1	< 1
Transfer frequency		Hz	-	-	< 100	< 20
Recovery time			-	-		
Resistive load		ms	-	-	< 0.1	< 1
Inductive load		ms	-	-	< 0.5	< 2
Capacitive load		ms	-	-	< 0.5	< 2
Short-circuit current		mA	-	-	≦ 40	≦ 40
Basic error limit at 23 °C		%	-	-	< 0.2	< 0.2
Temperature coefficient			-	-	≦ 300 ppm/°C of full-scale value	≦ 200 ppm/°C of full-scale value
Output value, current						
Output current		mA	0 - 20 mA/4 - 20 mA	0 - 20 mA/4 - 20 mA	-	0 - 20 mA/4 - 20 mA
Value representation			Standard, 16 bit/12 bit left-aligned	Standard, 16 bit/12 bit left-aligned	-	Standard, 16-bit/12-bit (left-aligned) Extended range, 16-bit/ 12-bit (left-aligned) PA (NE43), 16-bit/12-bit (left-aligned)
The following can be connected:			2-conductor + shield	2-conductor + shield	-	2-conductor
Load resistor						
Resistive load		Ω	< 550	< 450	-	< 450
Inductive load		µH	< 1	< 1	-	< 1
Transfer frequency		Hz	< 200	< 200	-	< 20
Recovery time						
Resistive load		ms	< 0.1	< 2	-	< 1
Inductive load		ms	< 0.5	< 2	-	< 2
Capacitive load		ms	< 0.5	-	-	< 2
Short-circuit current		mA				≦ 40
Basic error limit at 23 °C		%	< 0.2	< 0.2	-	< 0.2
Temperature coefficient			≦ 300 ppm/°C of full-scale value	≦ 300 ppm/°C of full-scale value		≦ 200 ppm/°C of full-scale value
Basic modules						
Without C connection			XN-S3...-SBB	XN-S3...-SBB	XN-S3...-SBB	Already built in

[1] Part of the XI/ON module's electronics is supplied with module bus voltage (5 V DC), the other part through the supply terminal (U_L).

				XN-2DO-R-NC	XN-2DO-R-NO	XN-2DO-R-CO
Relay modules						
Contact type				2 NC	2 N/O	2 change-over contacts
Rated voltage at supply terminal		U_L		24 V DC	24 V DC	24 V DC
Rated current drawn from supply terminal		I_L	mA	≦ 20	≦ 20	≦ 20
Rated current drawn from module bus		I_{MB}	mA	≦ 28	≦ 28	≦ 28
Insulation test		U_i	V AC	1500, 500	1500, 500	1500, 500
Heat dissipation			W	Normally 1	Normally 1	Normally 1
The following can be connected:				Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads	Resistive loads Inductive loads Lamp loads
Nominal load voltage				230 V AC, 30 V DC	230 V AC, 30 V DC	230 V AC, 30 V DC
Output current for channel / 230 V AC						
	Maximum continuous current		A	2	2	2
	Maximum continuous current, resistive load			5 A, load-dependent	5 A, load-dependent	5 A, load-dependent
	Minimum load current		mA	100 mA at 12 V DC	100 mA at 12 V DC	100 mA at 12 V DC
Output current for DC voltage (resistive)				Load limit curve → Page 14/109	Load limit curve → Page 14/109	Load limit curve → Page 14/109
Utilization factor		g	%	100	100	100
Lifespan at 230 V AC						
	At 5 A	Operations	x 10^6	> 0.1	> 0.1	> 0.1
	At 0.5 A	Operations	x 10^6	> 1	> 1	> 1
Basic modules						
	Without C connection			XN-S4...-SBBS	XN-S4...-SBBS	XN-S4...-SBBS
	With C connection			XN-S4...-SBCS	XN-S4...-SBCS	

			XN-1CNT-24VDC	XNE-2CNT-2PWM
Rated voltage at supply terminal	U_L		24 V DC	24 V DC
Rated current drawn from supply terminal	I_L	mA	≦ 50[1)]	≦ 20
Rated current drawn from module bus	I_{MB}	mA	≦ 40	≦ 50
Heat dissipation		W	< 1.3	< 3
Power supply of encoders			Output voltage U_L (-0.8 V) Output current ≦ 0.5 A, short-circuit proof	Output voltage U_L, GND_L Output current 0.5 A, not protectedt
Digital inputs				
Input voltage				
Input voltage, rated value		V DC	24	24
Low level			-30 V DC - 5 V DC	-30 V DC - 5 V DC
High level			11 V DC - 30 V DC	11 V DC - 30 V DC
Input current				
Low level		mA	-8 mA - 1.5 mA	-1 mA - 1.5 mA
High level		mA	2 mA - 10 mA	2 mA - 10 mA
Minimum pulse width		µs	Filter on: > 25 µs (20 kHz) Filter off: < 2.5 µs (200 kHz)	Filter on: > 25 µs (20 kHz) Filter off: < 2.5 µs (200 kHz)
Counter modules				
Channels		Number	1	2
Resolution		bit	32	32
Measurement ranges				
Frequency			0.1 Hz - 200 kHz	0.01 Hz – 200 kHz (scaleable)
Rotational speed			1 rpm- 25000 rpm	Scaleable
Period duration			5 ms - 120 s	5 ms – 120 s (scaleable)
Counter modes				
Signal evaluation A, B			Pulse and direction, rotary encoder: single/double/quadruple	Pulse and direction, rotary encoder: single/double/quadruple
Operating Mode			Endless count, count once, count periodically	Endless count, count once, count periodically
Hysteresis			8 bit	32 bit
Pulse duration			8 bit / max. 0.51 s	32 bit / max. 120 s
Synchronization			Once/periodic	Once/periodic
Counter limits			Upper count limit: 0 - 7FFF FFFF Lower count limit: 8000 0000 - FFFF FFFF	Upper count limit: 0 - 7FFF FFFF Lower count limit: 8000 0000 - FFFF FFFF
Measurement modes				
Signal evaluation A, B			Pulse and direction, single rotary encoder	Pulse and direction, single rotary encoder
Digital outputs				
Output voltage				
Output voltage, nominal value		V DC	24	24
Low level			≦ 3 V DC	≦ 3 V DC
High level			≧ U_L (-1 V)	≧ U_L (-1 V)
Output current				
High level (permissible range)			5 mA - 2 A	5 mA - 0.6 A
High level (nominal)			≦ 0.5 A (55° C)	0.5 A (55° C)
Switching frequency				
For resistive load		Hz	100	20000 / 100
For inductive load		Hz	2	
For lamps		Hz	≦ 10	
Lamp load	R_{LL}	W	≦ 10	
Output delay			100 µs (resistive load)	25 µs (resistive load)
Short-circuit rating			Yes	Yes
PWM module				
Channels		Number	-	2
PWM			-	0.01Hz - 20 kHz
Period duration/duty cycle			-	32-bit at 41.6 ns/bit
Pulse duration			-	32-bit at 41.6 ns/bit
Pause time			-	32-bit at 41.6 ns/bit
Output, number of pulses			-	32-bit Counter
Pulse output modes			-	Once, endless
General data				
Diagnostics			1 bit	4 Byte
Parameters			15 bit	16 Byte
Basic modules				
No C-connection for sensor/transmitter supply			XN-S4...-SBBS	Already built in

Notes

1) The figures for rated operational current from the supply terminal apply for load current = 0 mA.

			XN-1RS232	XN-1RS485/422	XN-1SSI
Interfaces					
Type			RS232	RS485/RS422	SSI
Rated voltage at supply terminal	U_L		24 V DC	24 V DC	24 V DC
Rated current drawn from supply terminal	I_L	mA	0	≦ 25	≦ 25[1]
Rated current drawn from module bus	I_{MB}	mA	≦ 140	≦ 60	≦ 50
Heat dissipation		W	Normally 1	Normally 1	Normally 1
Transfer channels			RxD, TxD, RTS, CTS	RxD, TxD	CL, D
Data buffer					
Receive		Byte	128	128	-
Send		Byte	64	64	-
Connection type					
RS 232			Full-duplex	-	-
RS 485			-	2-wire, half-duplex	-
RS422			-	2-conductor, half-duplex or 4-conductor, full-duplex	4-conductor, full-duplex (clock output/signal input)
Bit transfer rate			Max. 115200 bits/s (parameterizable), Standard: 9600 bits/s, 7 data bits, odd parity and 2 stop bits		Max. 1 MHz (parameterizable), default settings: 500 kBit/s
Insulation test	U_i				
Between interface and module bus/system voltage		V_{eff}	500	500	500
Between interface and field voltage		V_{eff}	500	500	500
Common-mode range		V DC	-7 - 12		
Cable impedance		Ω	-	120	120
Bus termination		Ω	-	120 (external)	internal
Cable length		m	Max. 15	Max. 30	Max. 30
Number of diagnosis bytes			1	1	1
Number of parameter bytes			4	4	4
Basic modules					
No C-connection for sensor/transmitter supply			XN-S4...-SBBS	XN-S4...-SBBS	XN-S4...-SBBS

Notes

[1] The figures for rated operational current From the supply terminal apply when there is no sensor/transmitter current.

			XNE-1SWIRE
Supply			
Rated voltage at supply terminal	U_L		24 V DC
Rated current drawn from supply terminal	I_L	mA	0
Rated current drawn from module bus	I_{MB}	mA	60
Supply voltage connection SWIRE	U_{SW}		24 V DC
Supply current SWIRE (LIN line at full load)		mA	≦ 600
Contactor supply	U_{AUX}		24 V DC
Contactor supply current		A	3
SWIRE connection			
SWIRE lines		Number	1
XNE-1SWIRE modules for XI/ON station		Number	≦ 3
SWIRE nodes for line		Number	≦ 16
Diagnostic bits		Number	4
Data for SWIRE node			max. 4I / 4Ω
Supply of SWIRE nodes (short-circuit proof)			17 V DC
Supply current for all LIN nodes (short-circuit proof)		mA	≦ 500
Insulation			
Potential isolation (module bus ↔ U_{SW}/ U_{AUX} ↔ U_L)	V_{rms}		500
Potential isolation (U_{SW} ↔ U_{AUX})	V_{rms}		None
Climatic requirements			
Ambient temperature		°C	0 - 55
Storage temperature		°C	-25 - 85
Humidity (non-condensing)		%	5 - 95
Protection type			IP20

Dimensions

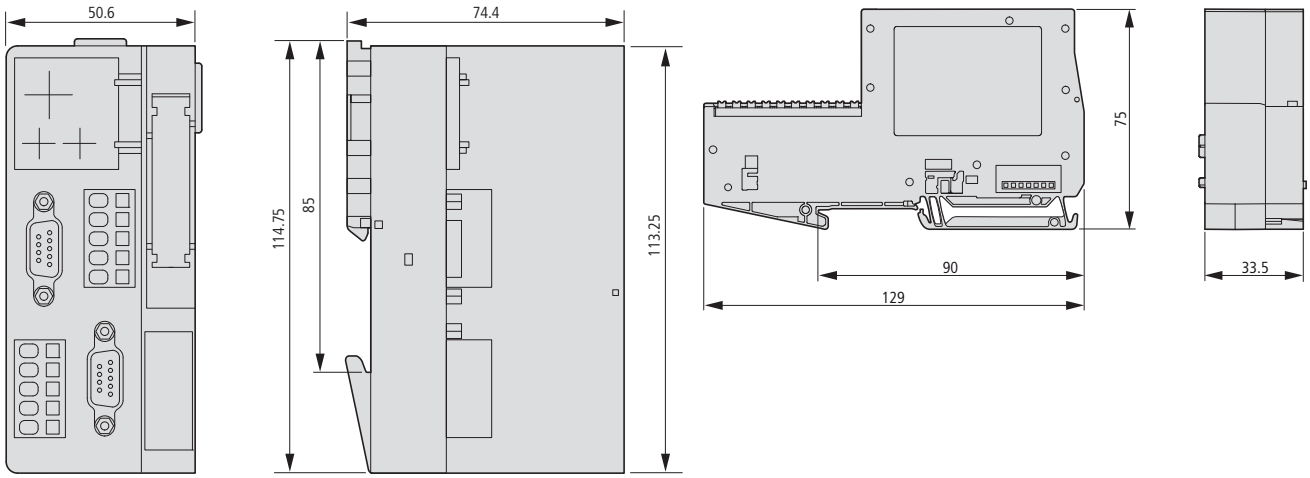
Gateways

Gateways XN

XN-GWBR-PBDP
XN-GWBR-CANOPEN
XN-GWBR-DNET
XN-GWBR-MODBUS-TCP
XN-GW-PDBP-1.5MB
XN-GW-PDBP-12MB
XN-GW-CANOPEN
XN-GW-DNET
XN-PLC-CANOPEN

Gateways XNE

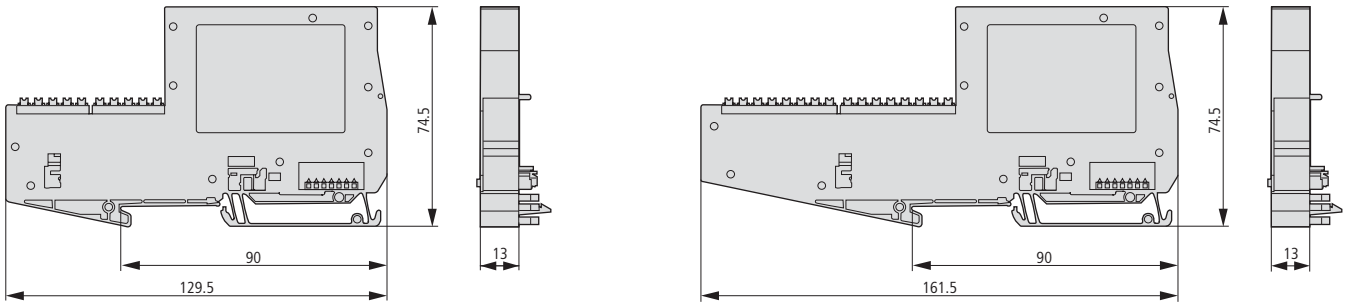
XNE-GWBR-PBDP
XNE-GWBR-CANOPEN
XNE-GWBR-2ETH-IP



Note:
The plugs/connectors used depend on the version.

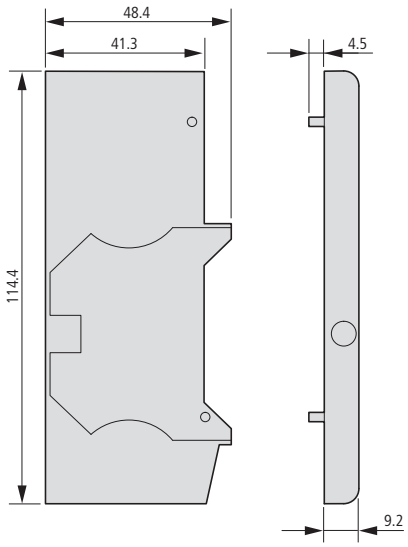
Electronics modules XNE

XNE-8DO-24VDC-0.5A-P
XNE-8DI-24VDC-P
XNE-1SWIRE
XNE-16DI-24VDC-P
XNE-16DO-24VDC-0.5A-P
XNE-8AI-U/I/4Pt/Ni
XNE-4AO-U/I
XNE-2CNT-2PWM



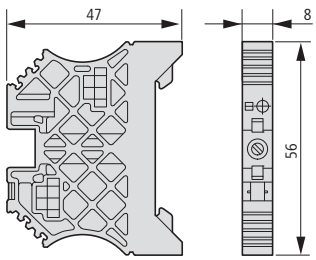
End cover

XN-ABPL



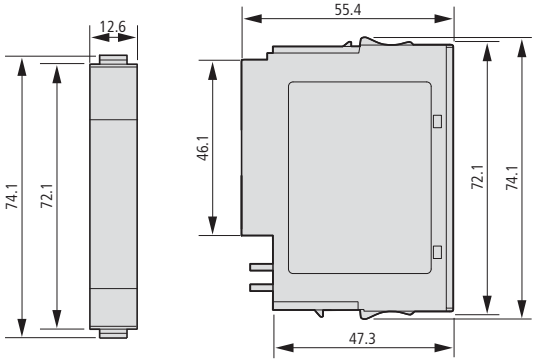
End bracket

XN-WEW-35/2-SW



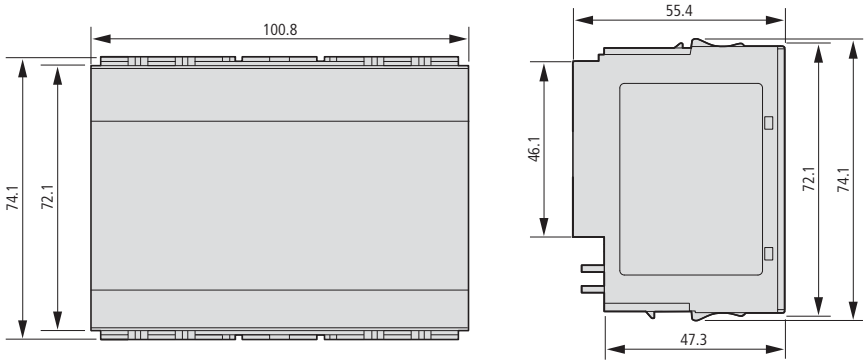
Electronics modules XN in slice design

XN-BR-24VDC-D	XN-2DI-24VDC-P	XN-1AI-I(0/4...20MA)	XN-1CNT-24VDC
XN-PF-24VDC-D	XN-2DI-24VDC-N	XN-2AI-I(0/4...20MA)	XN-1RS232
XN-PF-120/230VAC-D	XN-2DI-120/230VAC	XN-1AI-U(-10/0...+10VDC)	XN-1RS485/422
	XN-4DI-24VDC-P	XN-2AI-U(-10/0...+10VDC)	XN-1SSI
	XN-4DI-24VDC-N	XN-2AI-Pt/Ni-2/3	
	XN-2DO-24VDC-2A-P	XN-2AI-THERMO-PI	
	XN-2DO-24VDC-0.5A-P	XN-4AI-U/I	
	XN-2DO-24VDC-0.5A-N	XN-1AO-I(0/4...20MA)	
	XN-2DO-120/230VAC-0.5A	XN-2AO-I(0/4...20MA)	
	XN-4DO-24VDC-0.5A-P	XN-2AO-U(-10/0...+10VDC)	
	XN-2DO-R-CO		
	XN-2DO-R-NC		
	XN-2DO-R-NO		

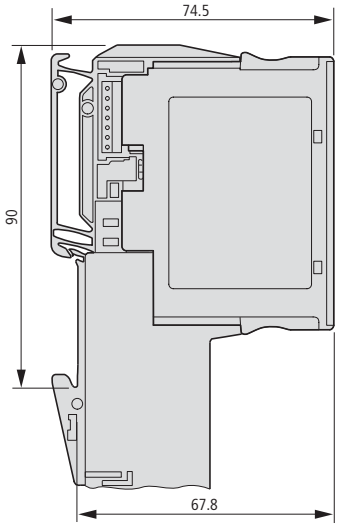


Electronics modules XN in block design

XN-16DI-24VDC-P
XN-32DI-24VDC-P
XN-16DO-24VDC-0.5A-P
XN-32DO-24VDC-0.5A-P

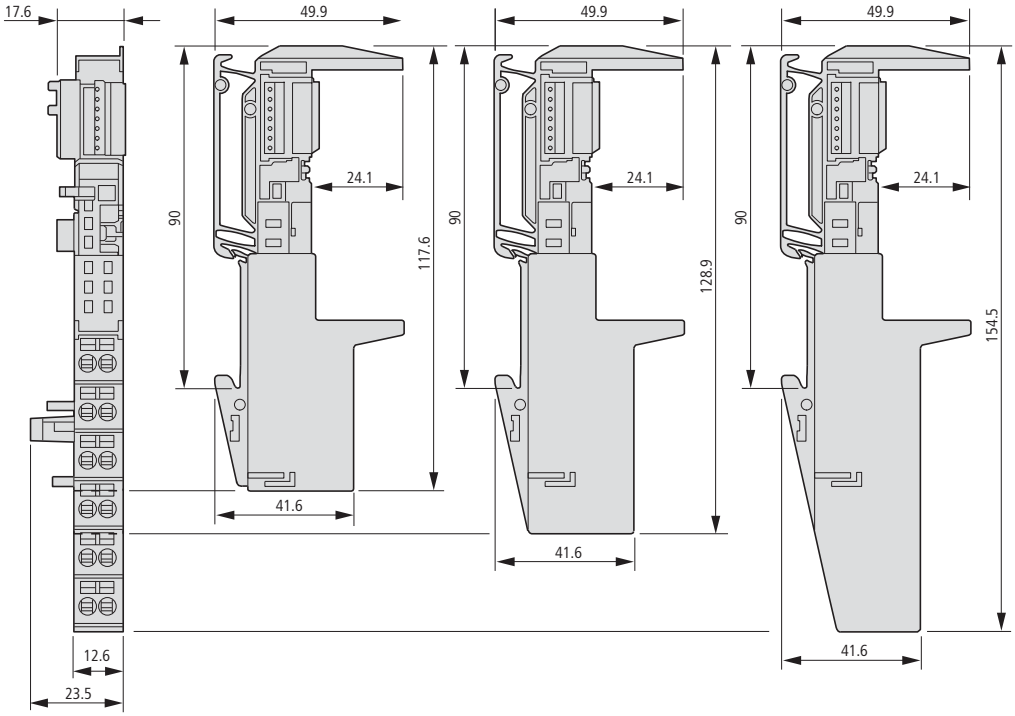


Electronics modules XN completed with base module

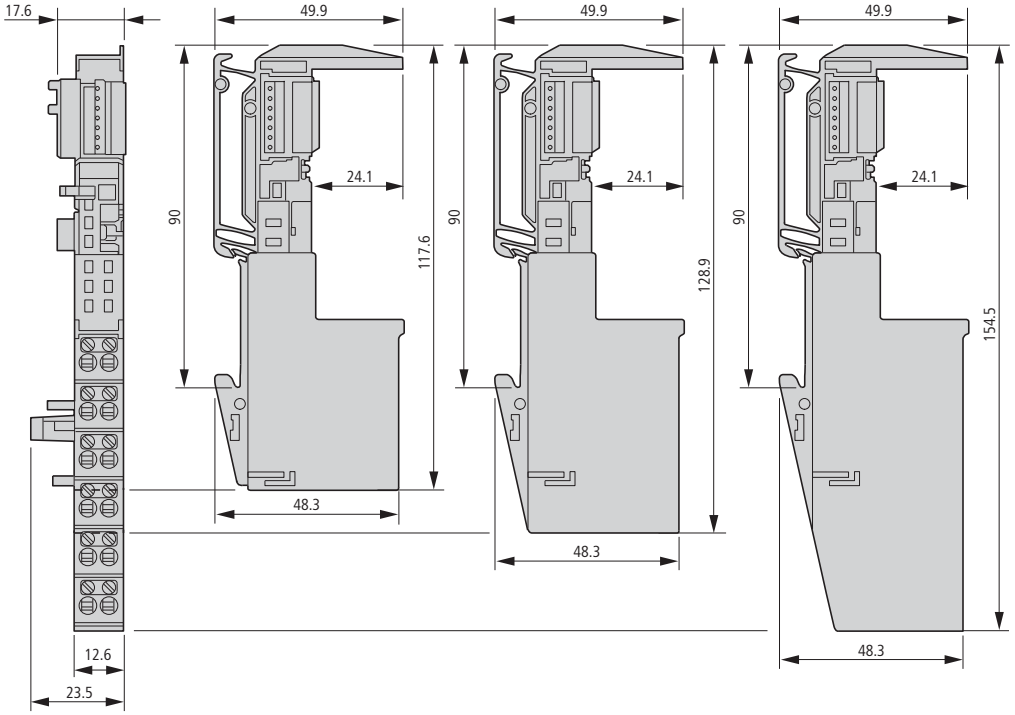


Basic modules in slice design

Spring-cage terminals	3 connection levels	4 connection levels	6 connection levels
	XN-S3T-SBB	XN-S4T-SBBC	XN-S6T-SBBSBB
	XN-S3T-SBC	XN-S4T-SBBS	XN-S6T-SBCSBC
	XN-P3T-SBB	XN-S4T-SBBS-CJ	
	XN-P3T-SBB-B	XN-S4T-SBCS	
		XN-P4T-SBBC	
		XN-P4T-SBBC-B	



Screw terminals	3 connection levels	4 connection levels	6 connection levels
	XN-S3S-SBB	XN-S4S-SBBC	XN-S6S-SBBSBB
	XN-S3S-SBC	XN-S4S-SBBS	XN-S6S-SBCSBC
	XN-P3S-SBB	XN-S4S-SBBS-CJ	
	XN-P3S-SBB-B	XN-S4S-SBCS	
		XN-P4S-SBBC	
		XN-P4S-SBBC-B	



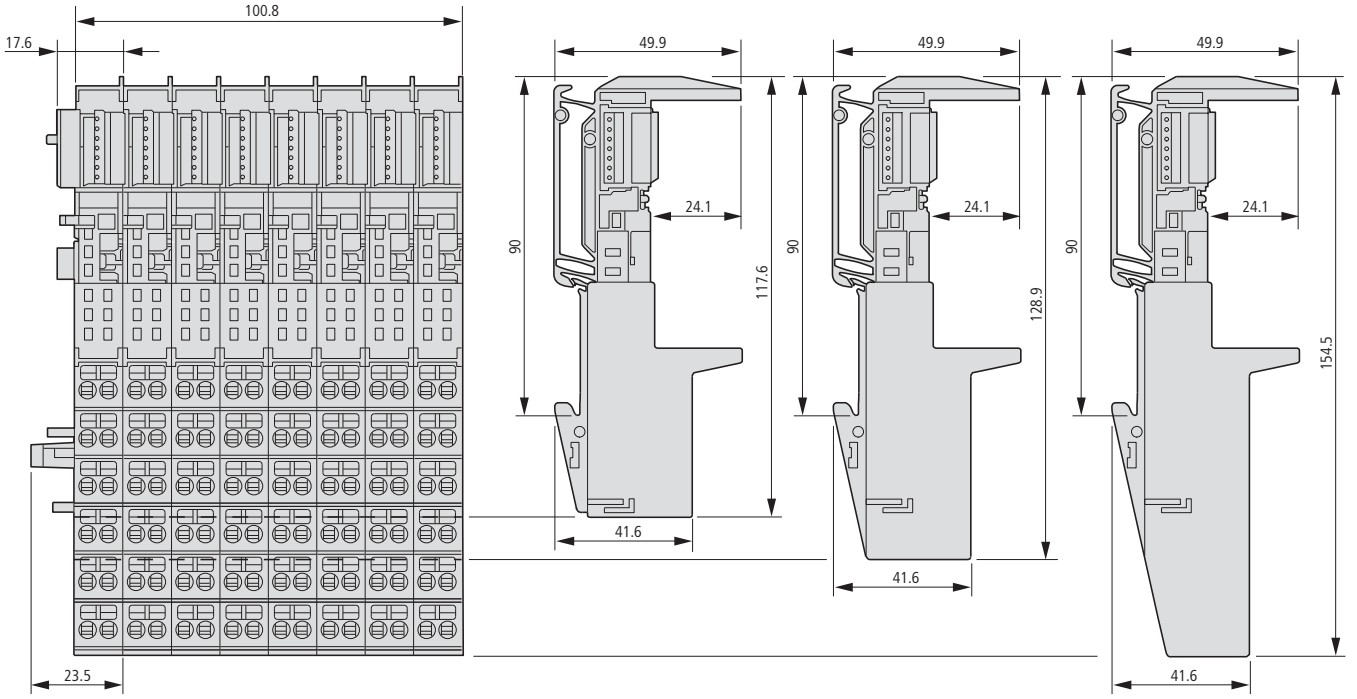
Basic modules in block design

Spring-cage terminals

3 connection levels
XN-B3T-SBB
XN-B3T-SBC

4 connection levels
XN-B4T-SBBC

6 connection levels
XN-B6T-SBBSBB
XN-B6T-SBCSBC

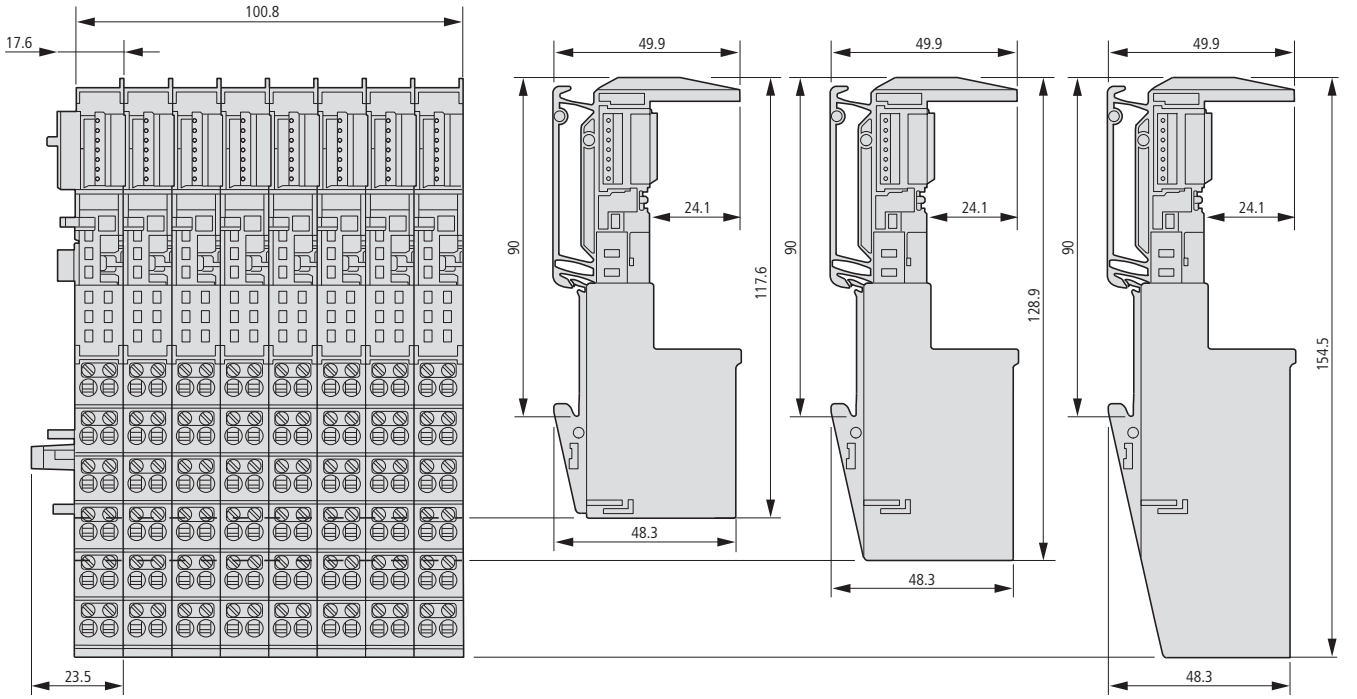


Screw terminals

3 connection levels
XN-B3S-SBB
XN-B3S-SBC

4 connection levels
XN-B4S-SBBC

6 connection levels
XN-B6S-SBBSBB
XN-B6S-SBCSBC



Description



Visualization software Galileo

The powerful, comprehensive engineering platform Galileo is ideal for use in all machine- and process-related applications in plant and machine construction.

- Fast engineering with project simulation on development PC.
- Easy-to-learn, intuitive graphical user interface with project overview window.
- Range of interface styles.
- Object placement with drag & drop WYSIWYG (what you see is what you get).
- Easy object parameterization.
- Object properties table, simple and quick attribute assignment with copy & paste.
- Pointer object.
- Extended password handling with complex password and ageing.
- Comprehensive recipe handling.
- Alarm handling with time stamp, history and diagnostics support with image display.
- Convenient batch definition of texts and graphics for variables.
- Many graphical objects, such as bar graph, scroll bar, graph plotter, line graph, and camera.
- Object parameter list, any number of data objects for template.
- Dynamic measurement unit selection (e.g. °C <-> °F, inches <-> mm).
- Many specific objects and functions.
- Direct printing at panel (reports, forms).
- Brilliant image reproduction with up to 65536 colors.
- Import of 15 different graphic formats.
- Easy import of PLC variables.
- Online language selection.
- Unicode support (including Asian character sets).
- Text import/export in XML format, e.g. Excel.
- Full functionality always available; no performance grading.
- Dynamic objects.

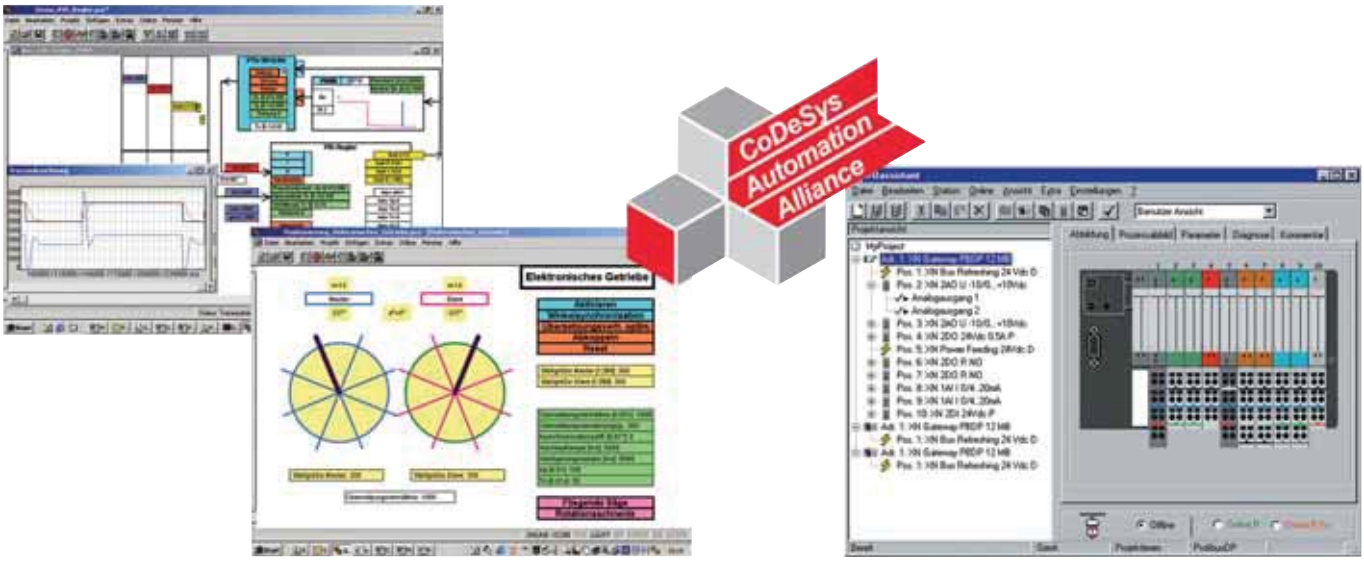
Useful add-on tools

S7 PG router: Programming S7 PLCs connected to the panel through the Ethernet interface.
CE Telediag: Convenient remote maintenance through a modem connection with dial assistant and device call-back.
CAN monitor: Observing and tracing CAN messages with relative time stamp for COB-ID and data directly on the panel.

EPAM: visualization tool for Microsoft Office

Designed as an open visualization tool for OEM machine vendors, EPAM can be expanded with custom funtions programmed in Visual Basic at any time.

- The visualization is configured in Microsoft Excel.
- Every visualization created with EPAM is web-capable, allowing remote plant operation from any standard PC without having to install additional Software.



PLC programming with XSOFT-CODESYS-2

The CoDeSys-based software XSOFT-CODESYS-2 offers matured technical features and easy operation. CoDeSys is one of the most powerful IEC 61131-3 PLC programming tools. All five programming languages of the standard are supported.

- SMS/e-mail library for alarm message notifications.
- UDP/TCP library for powerful Ethernet communication with PC-based applications.
- FTP server/client.

Web visualization (XV100, XVS400 and XV400 only):
Optionally XSOFT-CODESYS-2 can generate an XML description from the visualization information, which is saved to the PLC together with a Java applet and can be displayed in a web browser through TCP/IP to make the visualization data available online on a wide range of platforms.

Target visualization (XV100, XVS400 and XV400 only):
The programming system can convert visualization information into IEC 61131-3 code and translate it for the respective target system with the code generator.

Closed-loop control toolbox:
The closed-loop control toolbox contains about 120 function blocks. The standard function blocks provide leverage of the implemented closed-loop control know-how. Being combinable and cascadable, the function blocks allow the creation of special application solutions.

Motion control toolbox:
The motion control toolbox contains about 40 function blocks that can be individually incorporated and optimally adapted to the automation task.

I/O configuration tool I/Oassistant for XI/ON

The free software I/Oassistant is a universal tool that provides interactive support in planning and implementing your XI/ON system. Just select the gateways, electronics, base modules and accessories, and the program configures your stations either online or offline. Once designed, the system can go into operation. Integrated in XSOFT-CODESYS-2, the I/Oassistant engineering tool for XI/ON is also available within the PLC programming software. Without having to quit XSOFT-CODESYS-2, you have access to the full functionality of I/Oassistant to interactively plan and implement your remote XI/ON station.

- I/Oassistant automatically generates a full parts list for your order.
- With the [Check station design] function, you can easily check the configured station design.
- Commissioning the I/O level without connected controller possible; servicing interface
- EPLAN support.

Planning and ordering help (SWD?Assist)

Planning a SmartWire-Darwin line is quick and easy with the SWD-Assist software. Generate applications easily and quickly with the system SmartWire-Darwin.

- Built-in function for generating ordering lists.
- Built-in validity check.

Free download from
http://downloadcenter.moeller.net

HPL14130EN

Ordering

	Description	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Visualization software					
GALILEO	Microsoft Windows™-based, intelligent and interactive visualization tool. For creating projects to operate and visualize machines, plants and buildings. Comprehensive help and documentation.	**SW-GALILEO** 140379		1 off	UL/CSA certification not required
GALILEO OPEN	For continuous, unrestricted operation of the GALILEO runtime systems on a standard PC. The runtime system software is part of the development software GALILEO.	**LIC-GALILEO-OPEN-PC** 140385			
EPAM	Open visualization system Easy Page Machine (EPAM) An add-in for Microsoft Excel.	**SW-EPAM** 140380			
PLC programming software					
Programming to IEC 61131-1 with IL, ST, LAD, FBD, AS, CFC Supports XV, XC, XN, EC4P Bus configuration CAN, PROFIBUS-DP, XI/ON. Menu selection in 5 languages Operating systems: Win NT 4.0 SP6, Win 2000 SP3, Win XP SP2, Windows Vista OPC configurator Comprehensive help and documentation.					
XSOFT-CODESYS-2	Single-user license	**SW-XSOFT-CODESYS-2-S**[1)] 142582		1 off	UL/CSA certification not required
XSOFT-CODESYS-2	Multi-user license	**SW-XSOFT-CODESYS-2-M**[2)] 142583		1 off	
Add-on software					
S7-PG router	For programming S7 PLCs through the panel's Ethernet interface. Suitable for XV100, XV200, and XVS400 devices with on-board PROFIBUS and Ethernet Interface. 80 license points required on the device → Page 14/14. Including software with documentation and license product certificate with 80 points for licensing one device.	**SW-S7-PG-ROUTER** 140381		1 off	UL/CSA certification not required
CE Telediag	For remote maintenance through a modem connection with dial assistant and device call-back. Suitable for XV100, XV200, XVS400, XV400 and XVH300 devices on-board RS232 interface 40 license points required on the device → Page 14/14. Including software with documentation and license product certificate with 40 points for licensing one device.	**SW-CE-TELEDIAG** 140383			
CAN monitor	For observing and tracing CAN messages with relative time stamp, COB-ID and data. Error frames are not detected. Suitable for XV100, XV200, XV400 and XVH300 devices with on-board CAN interface. No licence points required. Includes software with documentation.	**SW-CAN-MONITOR** 140382			
Domain server	Connection of a Micro Panel with GALILEO project to the central user management of a Windows 2003 Server domain.	**SW-DOMAIN-SERVER** 140384			

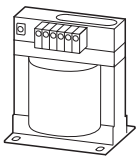
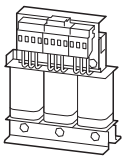
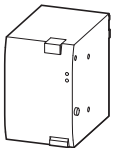
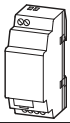
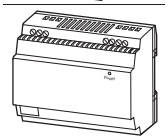
Notes

[1)] Replaces ECP-Soft

[2)] Replaces MXPRO

HPL14131EN

Ordering

	Rated input voltage 50/60 Hz V AC	Rated output voltage (residual ripple) V DC	Input voltage range V	Rated output current A	**Part no.** Article no.	**Price** See price list	Std. pack
Power supply units GW4, GD4							
Unregulated, smoothed							
Single-phase 	230	24 (± 5 %)	–	3	**GW4-030-BA3** 200016		1 off
	230	24 (± 5 %)	–	5	**GW4-050-BA3** 200017		
	230	24 (± 5 %)	–	8	**GW4-080-BA3** 200018		
	230	24 (± 5 %)	–	10	**GW4-100-BA3** 200019		
Three-phase 	400 (± 5 %)	24 (± 3 %)	–	5	**GD4-050-BD3** 200007		
	400 (± 5 %)	24 (± 3 %)	–	10	**GD4-100-BD3** 200009		
	400 (± 5 %)	24 (± 3 %)	–	15	**GD4-150-BD3** 200011		
	400 (± 5 %)	24 (± 3 %)	–	20	**GD4-200-BD3** 200012		
	400 (± 5 %)	24 (± 3 %)	–	30	**GD4-300-BD3** 200014		
Switched-mode power supply units SN3							
Primary switched-mode power supply unit, power reserve of up to 50 %, Up to 5 devices can be connected in parallel increase power and for redundancy							
	110 - 240 AC	24 V DC (fixed) (20 MHz normally < 50 mV_{ss})	85 - 264 AC 100 - 350 DC[1)]	5	**SN3-050-BU8** 100640		1 off
	110 - 120 AC 220 - 240 AC	24 V DC (fixed) (20 MHz normally < 50 mV_{ss})	85 - 132 AC 184 - 264 AC 220 - 350 DC[1)]	10	**SN3-100-BV8** 100641		
	110 - 120 AC 220 - 240 AC	24 V DC (fixed) (20 MHz normally < 50 mV_{ss})	85 - 132 AC 184 - 264 AC 220 - 350 DC[1)]	20	**SN3-200-BV8** 100642		
	110 - 240 AC/DC	22 - 28 V DC (adjustable) (20 MHz normally < 50 mV_{ss})	85 - 264 AC 100 - 350 DC[1)]	5	**SN3-050-EU8** 100643		
	110 - 240 AC/DC	22 - 28 V DC (adjustable) (20 MHz normally < 50 mV_{ss})	85 - 264 AC 100 - 350 DC[1)]	10	**SN3-100-EU8** 100644		
	110 - 240 AC/DC	22 - 28 V DC (adjustable) (20 MHz normally < 50 mV_{ss})	85 - 264 AC 100 - 350 DC[1)]	20	**SN3-200-EU8** 100645		
Switched-mode power supply units easyPOW							
Primary-switched mode, regulated							
	100 - 240	24/12	–	0.35 0.02	**EASY200-POW** 229424		1 off
	100 - 240	24 (± 3%)	–	1.25	**EASY400-POW** 212319		
	100 - 240	24 (± 3%)	–	1.25	**EASY430-POW** 110940		
	100 - 240	24 (± 3%)	–	2.5	**EASY500-POW** 110941		
	100 - 240	24 (± 3%)	–	4.2	**EASY600-POW** 262399		
Signal module for power supply units SN3-...-EU8							
	LED display: Input OK LED display: Output OK LED display: Remote off Relay output 1 changeover: Input OK Relay output 1 changeover: Output OK Remote On/Off function for external switching	For use with SN3-50-EU8 SN3-100-EU8 SN3-200-EU8			**SN3-000-MMEU8** 100646		1 off

Notes

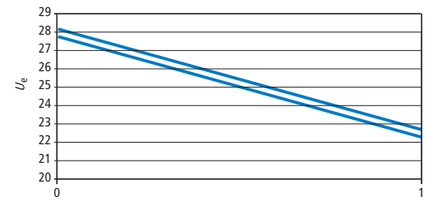
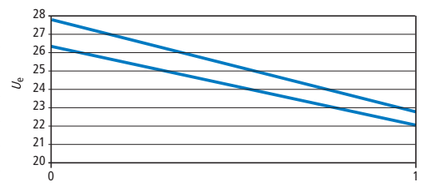
[1)] At U ≧ 264 V DC, use suitable external fuse in addition

[2)] For UL/CSA information, technical data and dimensions see Chapter 12.

			Power supply units GD4				
			GD4-050-BD3	GD4-100-BD3	GD4-150-BD3	GD4-200-BD3	GD4-300-BD3
General							
Protection class			1				
Potential isolation			Yes, VDE 0551, IEC/EN 60742, SELV				
Mains frequency							
Rated value		Hz	50/60				
Range		Hz	50…60				
Electromagnetic compatibility (EMC)							
Emitted interference			Class B (EN 55011, 22)				
ESD			6 kV contact (Level 3), 8 kV air (Level 3), IEC/EN 61000-4-2				
RFI			10 V/m, modulated, IEC/EN 61000 4-2				
Burst			2 kV (Level 3) IEC/EN 61000-4-4				
Surge			2 kV (Inst. Class 3), IEC/EN 61000-4-5				
Impulse voltage			4.9 kV, IEC EN 60947				
Environmental data							
Ambient temperature		°C	-25 - 55				
Ambient temperature, storage		°C	-25 - 85				
Pollution degree			2, EN 50178				
Vibration			0.075 mm (10 - 57 Hz), 10 cycles, IEC 60068-2-6				
Shock resistance, shock duration 11 ms		g	15, IEC 60068-2-27 (3 shocks)				
Installation altitude		m	Max. 2000 m a.m.s.l., observe derating above this[1)]				
Protection type			IP20				
Fixing			Screw-on				
Mounted position			Any				
Input voltage							
Rated value		V AC	400	400	400	400	400
Range		V AC	Taps ± 5% 380, 400, 420				
Rated input current for phase		A	0.24	0.46	0.65	0.9	1.8
No-load losses		W	5	14.2	13.9	25.5	38.2
Short-circuit losses		W	19.6	28.6	44.2	59	55.5
Output voltage							
Rated value		V DC	24	24	24	24	24
Tolerance							
Tolerance			See current/voltage characteristic				
			–	–	–	–	–
Ripple		%	≦ 3	≦ 3	≦ 3	≦ 3	≦ 3
Output current (rated value)		A	5	10	15	20	30
Output current range at 55 °C		A	0 - 5	0 - 10	0 - 15	0 - 20	0 - 30
Terminal capacity							
Solid		mm²	0.5 - 4	0.5 - 4	0.5 - 4	0.5 - 4	0.5 - 4
Flexible with ferrule		mm²	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5
Connections			Screw terminals	Screw terminals	Screw terminals	Screw terminals	Screw terminals
Dimensions							
Width		mm	125	155	155	190	190
Height		mm	73	82	97	105	115
Depth		mm	140	170	170	225	240
Weight		kg	2.4	4.4	5.8	7.6	11.2
Protection							
Input voltage	u_1	V	3 x 400	3 x 400	3 x 400	3 x 400	3 x 400
Input current	I_1	A	0.24	0.46	0.65	0.9	1.8
Circuit-breaker							
PKZ			PKZM0-0,25	PKZM0-0,63	PKZM0-1	PKZM0-1	PKZM0-2,5
Current setting		A	0.24	0.46	0.65	0.9	1.8
Miniature circuit-breaker (MCB)							
FAZ			FAZ-S1/1	FAZ-S1/1	FAZ-S1/1	FAZ-S1/1	FAZ-S2/1
Short-circuit protection only			●	●	–	–	–

Notes

[1)] Derating
From +44 to +55 °C: linear derating
from 100 % to 93 %

Power supply units GW4				Notes
GW4-030-BA3	GW4-050-BA3	GW4-080-BA3	GW4-100-BA3	
				Current-voltage characteristic
1				At 230 V or 3 x 400 V AC (primary side) and a load current of I = 0 A up to the rated operational current 1x Iq
Yes, VDE 0551, IEC/EN 60742, SELV				
				GD4... with transformer
50/60				
Class B (EN 55011, 22)				
6 kV contact (Level 3), 8 kV air (Level 3), IEC/EN 61000-4-2				
10 V/m, modulated, IEC/EN 61000 4-2				
2 kV (Level 3) IEC/EN 61000-4-4				
2 kV (Inst. Class 3), IEC/EN 61000-4-5				
4.9 kV, IEC EN 60947				
				GW4... with transformer
-25 - 55				
-25 - 85				
2, EN 50178				
0.075 mm (10 - 57 Hz), 10 cycles, IEC 60068-2-6				
15, IEC 60068-2-27 (3 shocks)				
Max. 2000 m a.m.s.l., observe derating above this[1)]				
IP20				
Screw-on				
Any				
230	230	230	230	
230	230	230	230	
0.45	0.8	1.2	1.4	
7.6	9	12.8	10.2	
15.5	29.7	32.7	35	
24	24	24	24	
See current/voltage characteristic				
–	–	–	–	
≦ 5	≦ 5	≦ 5	≦ 5	
3	5	8	10	
0 - 3	0 - 5	0 - 8	0 - 10	
0.5 - 4	0.5 - 4	0.5 - 4	0.5 - 4	
0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	
Screw terminals	Screw terminals	Screw terminals	Screw terminals	
85	85	106	121	
90	98	100	105	
122	135	151	169	
2	2.5	3.65	4.45	
230	230	230	230	
0.45	0.8	1.2	1.4	
PKZM0-0,63	PKZM0-1	PKZM0-1,6	PKZM0-1,6	
0.45	0.8	1.2	1.4	
FAZ-S1/1	FAZ-S1/1	FAZ-S2/1	FAZ-S2/1	
●	–	–	–	

		SN3-050-BU8	SN3-100-BV8	SN3-200-BV8	SN3-050-EU8	SN3-100-EU8	SN3-200-EU8
General							
Standards		EN 61204, 73/23/EWG, 89/336/EWG, EN 50178, EN 60950, UL 60950, UL 508, SELV (EN 60950)					
Protection type							
Enclosure		IP20	IP20	IP20	IP20	IP20	IP20
Terminals		IP20	IP20	IP20	IP20	IP20	IP20
Protection class		According to EN 61140, Class 1					
Mounting		DIN rail (IEC/EN 60715), snap fixing					
Mounted position		Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Heat dissipation	W	Normally ≦ 15	Normally ≦ 29	Normally ≦ 58	Normally ≦ 15	Normally ≦ 29	Normally ≦ 58
Efficiency	%	≧ 88	≧ 88	≧ 88	≧ 88	≧ 88	≧ 88
Dimensions							
Width	mm	57	90	200	57	90	200
Height	mm	130	130	130	130	130	130
Depth	mm	130	130	130	130	130	130
Weight	kg	0.96	1.07	2.83	0.96	1.07	2.83
Minimum distance to adjacent devices	mm	Horizontal 10, vertical 80					
Terminal capacity							
		Only operate plug-in terminals off load.					
Input circuit							
Flexible with ferrule	mm^2	0.2…2.5 (22…14 AWG)		2.5 … 10 (14 … 8 AWG)	0.2…2.5 (22…14 AWG)		2.5 … 10 (14 … 8 AWG)
Flexible without ferrule	mm^2	0.2…2.5 (22…14 AWG)		0.5 … 10 (20 … 8 AWG)	0.2…2.5 (22…14 AWG)		0.5 … 10 (20 … 8 AWG)
Solid	mm^2	0.2…2.5 (22…14 AWG)		0.5 … 16 (22 … 6 AWG)	0.2…2.5 (22…14 AWG)		0.5 … 16 (22 … 6 AWG)
Output circuit							
Flexible with ferrule	mm^2	0.12…2.5 (26…14 AWG)		2.5 … 10 (14 … 8 AWG)	0.12…2.5 (26…14 AWG)		2.5 … 10 (14 … 8 AWG)
Flexible without ferrule	mm^2	0.12…2.5 (26…14 AWG)		0.5 … 10 (20 … 8 AWG)	0.12…2.5 (26…14 AWG)		0.5 … 10 (20 … 8 AWG)
Solid	mm^2	0.12…2.5 (26…14 AWG)		0.5 … 16 (22 … 6 AWG)	0.12…2.5 (26…14 AWG)		0.5 … 16 (22 … 6 AWG)
Environmental data							
Ambient temperature, operation	°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Ambient temperature, full load	°C	0 - +60 (without derating)					
Ambient temperature, storage	°C	-40 - +85	-40 - +85	-40 - +85	-40 - +85	-40 - +85	-40 - +85
Climatic proofing		According to IEC 60068-2-3, 93% at +40 °C, non-condensing					
Pollution degree		According to EN 50178; 2					
Climate class (IEC)		According to EN 60721; 3K3					
Vibration resistance (IEC/EN 60068-2-6)		1…57 Hz, amplitude ±0.075 mm; 57…100 Hz, 5 g					
Shock resistance (IEC 60068-2-27)		30 g all directions					
Insulation voltage							
Inputs/outputs		3 kV AC (type test), 1.2 kV AC (routine test)					
Input		1.5 kV AC (type test), 1.2 kV AC (routine test)					
Output		350 V AC (routine test)					
Electromagnetic compatibility (EMC)							
Interference immunity		EN 61000-6-2					
ESD		According to EN 61000-4-2, Level 4-8 kV/15 kV					
RFI		According to EN 61000-4-3, Level 3-10 V/m					
Burst		According to EN 61000-4-4, Level 4-4 kV					
Surge		According to EN 61000-4-5, Level 4-2 kV symmetrical, level 3-3 kV asymmetrical					
Conducted HF		According to EN 61000-4-6, Level 3-10 V					
Emitted interference		EN 61000-6-3					
Electromagnetic fields		According to EN 55022, Class B					
Conducted HF		According to EN 55022, Class B					

		SN3-050-BU8	SN3-100-BV8	SN3-200-BV8	SN3-050-EU8	SN3-100-EU8	SN3-200-EU8
Input circuit							
Rated input voltage	V	110 …240 AC	–	–	110 …240 AC	110 …240 AC	110 …240 AC
Switch position 110	V	–	110 … 120 AC	110 … 120 AC	–	–	–
Switch position 230	V	–	220 … 240 AC	220 … 240 AC	–	–	–
Primary voltage range	V	85 … 264 AC	–	–	85 …264 AC	85 …264 AC	85 …264 AC
Input voltage range[1)]	V	100 … 350 DC	–	–	100 … 350 DC	100 … 350 DC	100 … 350 DC
Switch position 110 V AC	V	–	85 … 132 AC	85 … 132 AC	–	–	–
Switch position 230 V AC	V	–	184 … 264 AC	184 … 264 AC	–	–	–
Switch position 230 V DC	V	–	220 … 350 DC	220 … 350 DC	–	–	–
Mains frequency							
Rated value	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Range	Hz	47…63	47…63	47…63	47…63	47…63	47…63
Current consumption							
At 110 … 240 V AC	A	Approx. 2.2 …1.2	–	–	Approx. 2.2 …1.2	Approx. 3.5 …1.6	Approx. 5.5 …2.5
At switch position 110 V AC	A	–	Approx. 4.2…4.0	Approx. 9.0…8.0	–	–	–
At switch position 230 V AC	A	–	Approx. 2.4…2.2	Approx. 4.4…4.0	–	–	–
Input power	W	Normally 135	Normally 269	Normally 538	Normally 135	Normally 269	Normally 538
Inrush current limiter/i^2t (cold start)		≦ 23 A / ca. 0.9 A^2s	≦ 40 A / ca. 1.8 A^2s	≦ 70 A / ca. 8 A^2s	≦ 23 A / ca. 0.9 A^2s	≦ 33 A / ca. 0.2 A^2s	≦ 40 A / ca. 1.9 A^2s
Mains failure bridging duration	ms	Normally ≧ 100	Normally ≧ 50	Normally ≧ 50	Normally ≧ 100	Normally ≧ 40	Normally ≧ 40
Start-up after mains voltage applied	ms	Normally ≧ 100	Normally ≧ 10	Normally ≧ 20	Normally ≧ 100	Normally ≧ 5	Normally ≧ 370
Transient overvoltage protection		Varistors	Varistors	Varistors	Varistors	Varistors	Varistors
Internal input fuse (device protection, not accessible)		4 AT	6.3 AT	12 AF	4 AT	6.3 AT	12 AF
Leakage current to PE	mA	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA	< 3.5 mA
Output circuit							
L+, L+, L-, L-		Proof against short-circuit, no-load and overload					
Rated output voltage	V	24 DC	24 DC	24 DC	24 DC	24 DC	24 DC
Tolerance		-1…+5 %	-1…+5 %	-1…+5 %	-1…+5 %	-1…+5 %	-1…+5 %
Output voltage setting range		Fixed 24 V DC			22…28 V DC; default setting 24 V ±0.5%		
Rated output power	W	120	240	480	120	240	480
Rated output current T_u ≦ 60 °C	A	5	10	20	5	10	20
Peak output current (power reserves) Tu ≦ 40 °C	A	Normally ≦ 7.25	Normally ≦ 12.25	Normally ≦ 22.5	Normally ≦ 7.25	Normally ≦ 12.25	Normally ≦ 22.5
Derating 60 °C ≦ T_u ≦ 70 °C		2.5 % for Kelvin temperature increase					
Control deviation at							
Load change 10…90 %, static	Normally	±0.1 %	±0.1 %	±0.1 %	±0.05 %	±0.05 %	±0.05 %
Load change 10…90 %, dynamic	Normally	±3 %	±3 %	±3 %	±3 %	±3 %	±3 %
Controller acting time	ms	Normally 1	Normally 1	Normally 1	Normally 1	Normally 1	Normally 1
Input voltage deviation ±10 %		Normally ±0.05 %	Normally ±0.05 %	Normally ±0.05 %	Normally ±0.05 %	Normally ±0.05 %	Normally ±0.05 %
Rise time 10…90 %	ms	Normally ≦ 30	Normally ≦ 5	Normally ≦ 15	Normally ≦ 30	Normally ≦ 4	Normally ≦ 12
Residual ripple and switching peaks		20 MHz normally < 50 mV_{ss}					
Parallel connection capability		Yes, up to 5 devices for redundancy and for power increase, non symetrical current					
Series connection capability		Yes, for voltage increase (max. 2 off)					
Resistance to reverse feed		Yes, limited to Approx. 35 V AC					
Power factor correction (PFC)		No			Yes		
Status indication		OUTPUT OK: LED green					
Overload characteristics		Thermal protection			Thermal protection		
Response to short-circuit		Continuously with current limitation					
Current limitation at short-circuit	A	Approx. 11	Approx. 19	Approx. 25	Approx. 11	Approx. 19	Approx. 25
Short-circuit protection		Proof against sustained short circuit					
Overload protection		Thermal protection					
Capacitive load starting		Not restricted					

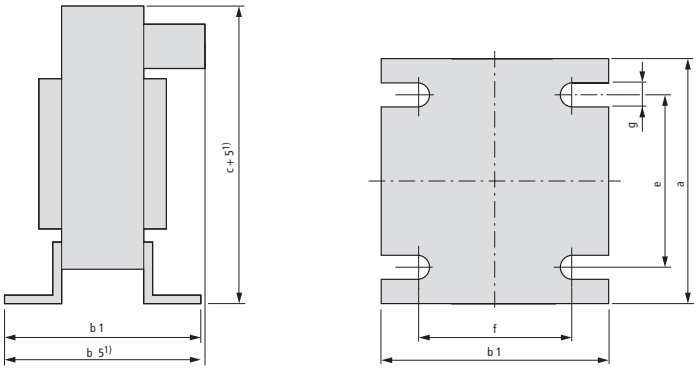
Notes [1)] At ≧ 264 V DC, use suitable external fuse in addition

			SN3-000-MMEU8
General			
Standards			IEC 61204 73/23/EEC 89/336/EEC EN 50178, EN 60950, UL 60950, UL 508
Duty factor		%	100
Dimensions (W x H x D)		mm	56.25 × 54 × 24 (in fitted state)
Weight		kg	0.065
Terminal capacity			
Flexible with ferrule		mm^2	0.2…2.5 (22…14 AWG)
Flexible without ferrule		mm^2	0.2…2.5 (22…14 AWG)
Solid		mm^2	0.2…4 (22…14 AWG)
Protection type			
Enclosure			IP20
Terminals			IP20
Protection class			2
Mounting			Snap-fitted to power supply unit
Fixing			Snap-fitting, tool-less
Vibration resistance (IEC/EN 60068-2-6)			1…57 Hz, amplitude ±0.075 mm, 57…100 Hz, 5 g
Shock resistance (IEC 60068-2-27)			5 g all directions
Environmental data			
Ambient temperature			
Operation		°C	-25… +70
Storage		°C	-40 - +85
Climatic proofing			93% at +40°C According to IEC 60068-2-3, non-condensing
Climate class (IEC)			3K3 According to EN 60721
Insulation voltage			
Rated insulation voltage	U_i	V AC	250 According to IEC 60974-1, EN 50178, VDE 0160
Power supply/measuring circuit/relay outputs			Safe isolation According to EN 50178, EN 60950
Rated impulse withstand voltage between all insulated circuits	U_{imp}	kV	4 According to IEC 664, VDE 0110
Test voltage between all circuits		kV	2.5 AC (routine test)
Overvoltage category/pollution degree			According to EN 60950, Class 2
Input circuit			
Rated input voltage		V	110…240 AC / 100…350 DC (supplied From the input circuit of the power supply)
Primary voltage range		V	70…264 AC
Primary voltage range		V	80 … 350 DC
Input power		VA	2.5
Input power		W	1.5
REMOTE-OFF input			
			Floating
Switching off			R ≦ 1 kΩ
Switching on			R ≧ 10 kΩ
Input current		mA	Normally 1 (200 mA for 200 µs)
Cable length		m	25
Measuring circuits			
INPUT			
Monitoring function			Undervoltage monitoring
Threshold values			85 V AC / 90 V DC
Accuracy/tolerance		%	-5 % for AC and DC
Hysteresis relative to the threshold value			Normally -8 % for AC and -30 % for DC
Measuring cycle, max.		ms	Normally ≦ 50
OUTPUT			
Monitoring function			Undervoltage monitoring
Threshold values			20 V DC
Accuracy/tolerance		%	±1
Hysteresis relative to the threshold value		%	Normally 5
Measuring cycle, max.		ms	Normally ≦ 10

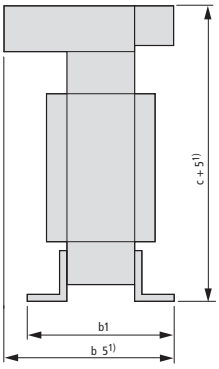
				SN3-000-MMEU8
Output circuit				
				11-12/14, 21-22/24
Contacts			Number	2 x 1 relay (changeover contact)
Operating principle				Quiescent current principle
Contact material				AgNi
Rated voltage			V	250 According to VDE 0110, IEC 60947-1
Minimum switching voltage			V	24
Maximum switching voltage			V	250
Minimum switching voltage			mA	10
Maximum switching current			A	1
Rated operational current				
AC-12 (resistive) 230 V				1 A
AC-15 (inductive) 230 V				1 A
DC-12 (resistive) 24 V				1 A
DC-13 (inductive) 24 V				1 A
Durability				
Mechanical				30 x 10^6 operations
Electrical				0.1 x 10^6 operations
Short-circuit rating				
NC contacts	A		gL	2
N/O contacts	A		gL	2
Operating state display				
Input OK				LED lit green when relay “Input OK” picked up
Output OK				LED lit green when relay “Output OK” picked up
Remote OFF				LED lit green when relay “Remote OFF” input R ≦ 1kΩ
Notes				Data at T_u = 25 °C, U_{IN} = 230 V AC and nominal values, when no others are given

Dimensions

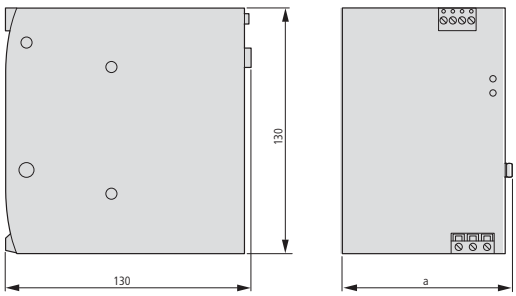
GW4-...



GD4-...



SN3-050
SN3-100
SN3-200



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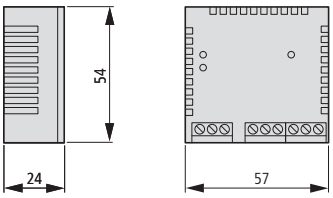




Control transformers STN..., DTZ
Multi-winding transformer UTI
Multipurpose power supply units AING

All transformers are constructed and tested according to IEC/EN 61558 guidelines. Depending on version, they can therefore be used in compliance with the safety norm IEC/EN 60204.

Single-phase STN control transformers
Complete safety for electrical controls → Page 15/4

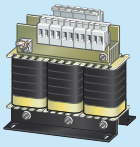
Single/three-phase control, isolating, and STI, STZ, DTZ safety transformers
With increased insulation for the production of low voltages → Page 15/6

Single-phase UTI multi-winding transformers
Control, isolation and safety transformers according to IEC/EN 61558-2-2 +++ simple engineering as they are adapted to various worldwide control voltages → Page 15/9

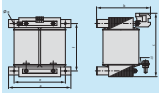
Multipurpose power supply units AING
Safety transformers to IEC/EN 61558-2-6 +++ All voltages from one device +++ allow simple engineering and low wiring costs → Page 15/9

Control transformers, multi-winding transformers, universal power supply units









System overview

Transformers, universal power supply units 15/2

Ordering

Single-phase control transformers with STN standard voltages 15/4

Single-phase STN control transformers 15/5

Single-phase control, isolating and STI safety transformers 15/6

Single-phase control, isolating and STZ safety transformers 15/7

Three-phase control, isolating, and DTZ safety transformers 15/8

Single-phase UTI multi-winding transformers 15/9

Multipurpose power supply units AING 15/9

IP23 enclosures 15/10

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Engineering

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Single-phase control, isolating, and STI, STZ safety transformers 15/16

Three-phase control, isolating, and DTZ safety transformers 15/17

Multipurpose power supply units AING 15/18

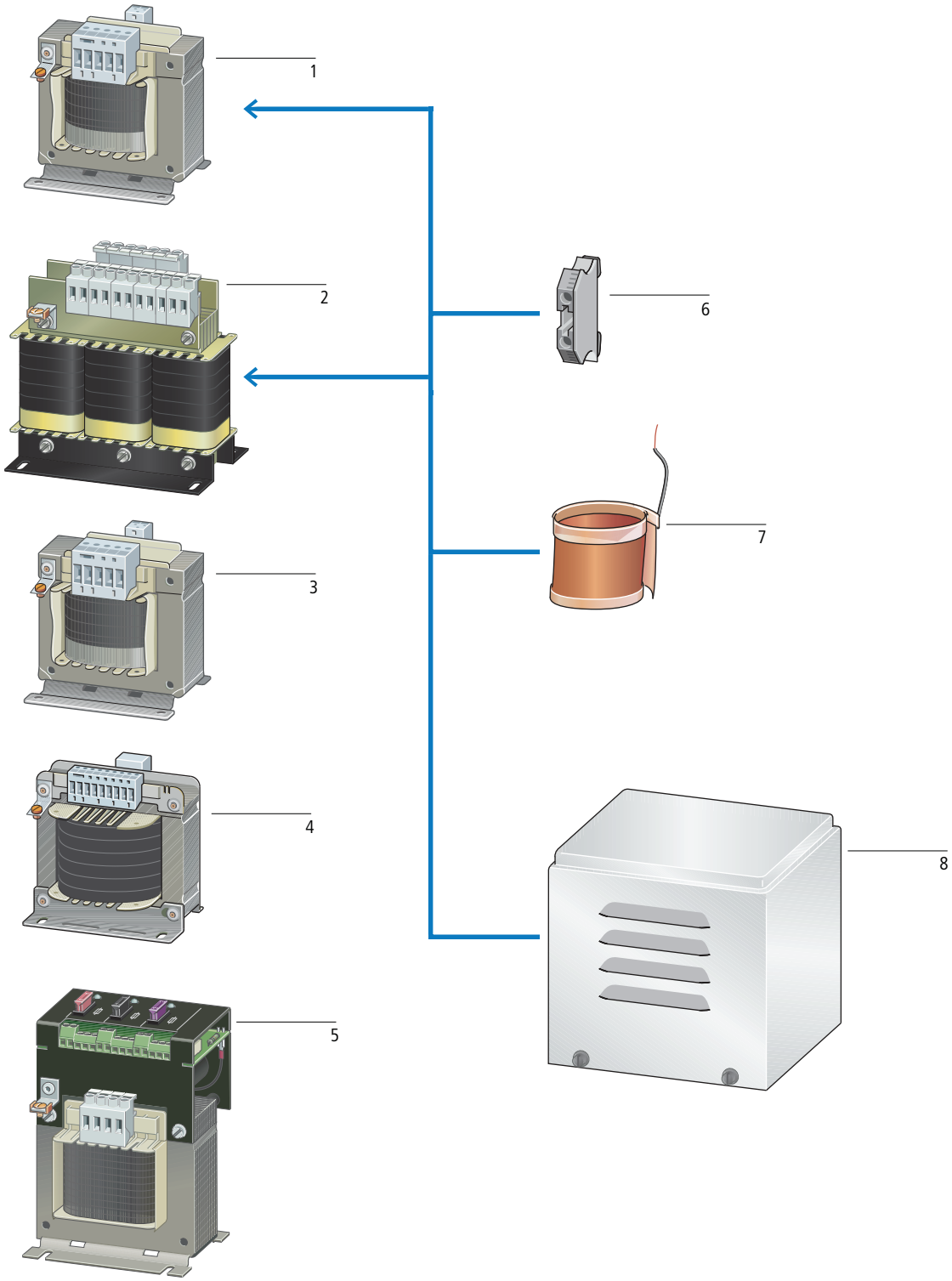
Single-phase UTI multi-winding transformers 15/18

IP23 enclosures for transformers 15/19

Further transformers can be obtained from:

Trafomodern Transformatoren Ges.m.b.H.
Industriestraße II/11
A-7053 Hornstein
E-Mail: info@trafomodern.com
Internet: www.trafomodern.com

System overview



Standard transformers

Single-phase control transformers STZ safety transformers STZ isolating transformers STZ 1

Primary tapping ± 5 %

Built and tested to IEC/EN 61558-2-2/2-4/2-6, VDE 0570-2-2/2-4/2-6, UL 506, CSA 22.2 No. 66

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Three-phase control transformers DTZ safety transformers DTZ isolating transformers DTZ 2

Primary tapping ± 5 %

Built and tested to IEC/EN 61558-2-2/2-4/2-6, VDE 0570-2-2/2-4/2-6, UL 506, CSA 22.2 No. 66

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Single-phase control transformers STI safety transformers STI isolating transformers STI 3

Primary tapping ± 5 %

Built and tested to IEC/EN 61558-2-2/2-4/2-6, VDE 0570-2-2/2-4/2-6, UL 506, CSA 22.2 No. 66

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Single-phase control transformers STN 3

Primary tapping ± 5 %

Built and tested to IEC/EN 61558-2-2, VDE 0570-2-2 UL 506, CSA 22.2 No. 66

→ Page 15/4

Single-phase multi-winding transformers UTI 4

Primary tapping 208 to 600 V

Built and tested to IEC/EN 61558-2-2/2-4/2-6, VDE 0570-2-2/2-4/2-6, UL 506, CSA 22.2 No. 66

→ Page 15/9

Universal power supply unit AING 5

Primary tapping ± 5 %

Safety transformer to IEC/EN 61558-2-2/2-6, VDE 0570-2-2/2-6,

For every output voltage
- a fuse
- an LED
- a changeover contact

→ Page 15/9

Transformer features

Additional tappings 6

Primary, secondary

→ Page 15/11

Shielding winding 7

→ Page 15/10

Sheet-steel enclosure, degree of protection IP23 8

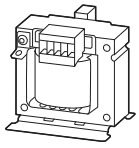
Enclosure for enhanced degree of protection

Selection of features
→ Ordering details of the respective transformer

→ Page 15/10



Ordering

Rated output kVA	Short-time rating kVA	Preferred voltage 400/230 V **Part no.** Article no.	**Price** See price list	Preferred voltage 400/24 V **Part no.** Article no.	**Price** See price list	Preferred voltage 230/24 V **Part no.** Article no.	**Price** See price list	Std. pack
Single-phase control transformers with standard voltages IEC/EN 61558-2-2 VDE 0570 Part 2-2 Rated input voltage 230 ± 5 % V , 400 ± 5 % V Rated output voltage 24 V , 230 V 								
0.06	0.095	**STN0.06(400/230)** 204936		**STN0.06(400/24)** 204937		**STN0.06(230/24)** 204935		1 off
0.1	0.16	**STN0.1(400/230)** 204942		**STN0.1(400/24)** 204943		**STN0.1(230/24)** 204941		
0.16	0.32	**STN0.16(400/230)** 204948		**STN0.16(400/24)** 204949		**STN0.16(230/24)** 204947		
0.2	0.38	**STN0.2(400/230)** 204977		**STN0.2(400/24)** 204978		**STN0.2(230/24)** 204976		
0.25	0.44	**STN0.25(400/230)** 204980		**STN0.25(400/24)** 221509		**STN0.25(230/24)** 221508		
0.315	0.6	**STN0.315(400/230)** 204982		**STN0.315(400/24)** 221511		**STN0.315(230/24)** 221510		
0.4	0.62	**STN0.4(400/230)** 204984		**STN0.4(400/24)** 221514		**STN0.4(230/24)** 221513		
0.5	0.88	**STN0.5(400/230)** 204986		**STN0.5(400/24)** 221516		**STN0.5(230/24)** 221515		
0.63	1.51	**STN0.63(400/230)** 204988		**STN0.63(400/24)** 221518		**STN0.63(230/24)** 221517		
0.8	2.25	**STN0.8(400/230)** 204990		**STN0.8(400/24)** 221520		**STN0.8(230/24)** 221519		
1	3.28	**STN1.0(400/230)** 204992		**STN1.0(400/24)** 221522		**STN1.0(230/24)** 221521		
1.3	4.8	**STN1.3(400/230)** 221523						
1.6	3.98	**STN1.6(400/230)** 221524						
2	5.75	**STN2.0(400/230)** 221525						
2.5	7.24	**STN2.5(400/230)** 221526						
3	8.36	**STN3.0(400/230)** 221527						
4	12.2	**STN4.0(400/230)** 221528						

Notes

Information relevant for export to North America

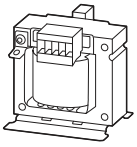
Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

Rated output kVA	Short-time rating kVA	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Single-phase control transformers					
IEC/EN 61558-2-2 VDE 0570 Part 2-2 Rated input voltage 100 – 690 ± 5 % V Rated output voltage 12 – 250 V					
0.06	0.095	**STN0.06(*/*)** 204938		1 off	**Ordering example** When ordering, the part number must include the following details: **STN0, 1(*/*)** First asterisk ≙ rated input voltage Second asterisk ≙ rated output voltage • Desired part no. STN0, 1 • Desired rated input voltage 200 V • Desired rated output voltage 18.5 V The correct part no. is **STN0. 1(200/18.5)** Transformer-protective circuit-breakers PKZMO-…-T → Page 7/6
0.1	0.16	**STN0.1(*/*)** 204939			
0.16	0.32	**STN0.16(*/*)** 204944			
0.2	0.38	**STN0.2(*/*)** 204950			
0.25	0.44	**STN0.25(*/*)** 204979			
0.315	0.6	**STN0.315(*/*)** 204981			
0.4	0.62	**STN0.4(*/*)** 204983			
0.5	0.88	**STN0.5(*/*)** 204985			
0.63	1.51	**STN0.63(*/*)** 204987			
0.8	2.25	**STN0.8(*/*)** 204989			
1	3.28	**STN1.0(*/*)** 204991			
1.3	4.8	**STN1.3(*/*)** 204993			
1.6	3.98	**STN1.6(*/*)** 204994			
2	5.75	**STN2.0(*/*)** 204995			
2.5	7.24	**STN2.5(*/*)** 204996			
3	8.36	**STN3.0(*/*)** 204997			
4	12.2	**STN4.0(*/*)** 204998			

Notes

Information relevant for export to North America

Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

Rated output kVA	Short-time rating kVA	**Standard voltage 400/230 V** **Part no.** Article no.	**Standard voltage 400/24 V** **Part no.** Article no.	**Standard voltage 230/230 V** **Part no.** Article no.	**Standard voltage 230/24 V** **Part no.** Article no.	**Price** See price list	Std. pack
Single-phase control, isolating and safety transformers with standard voltages IEC/EN 61558-2-2/2-4/2-6 VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers) Rated input voltage 230 ± 5 % V, 400 ± 5 % V Rated output voltage 24 , 230 V 							
0.06	0.13	**STI0.06(400/230)** 029975	**STI0.06(400/24)** 029971	**STI0.06(230/230)** 029968	**STI0.06(230/24)** 029977		1 off
0.1	0.24	**STI0.1(400/230)** 046630	**STI0.1(400/24)** 046631	**STI0.1(230/230)** 029976	**STI0.1(230/24)** 046629		
0.16	0.36	**STI0.16(400/230)** 046633	**STI0.16(400/24)** 046634	**STI0.16(230/230)** 035247	**STI0.16(230/24)** 046632		
0.2	0.44	**STI0.2(400/230)** 046636	**STI0.2(400/24)** 046637	**STI0.2(230/230)** 035248	**STI0.2(230/24)** 046635		
0.25	0.6	**STI0.25(400/230)** 046638	**STI0.25(400/24)** 035249	**STI0.25(230/230)** 036400	**STI0.25(230/24)** 035262		
0.315	0.75	**STI0.315(400/230)** 046639	**STI0.315(400/24)** 035250	**STI0.315(230/230)** 040641	**STI0.315(230/24)** 036392		
0.4	1.1	**STI0.4(400/230)** 046640	**STI0.4(400/24)** 035251	**STI0.4(230/230)** 040642	**STI0.4(230/24)** 036393		
0.5	1.6	**STI0.5(400/230)** 046641	**STI0.5(400/24)** 035252	**STI0.5(230/230)** 040643	**STI0.5(230/24)** 036394		
0.63	1.7	**STI0.63(400/230)** 046883	**STI0.63(400/24)** 035253	**STI0.63(230/230)** 040644	**STI0.63(230/24)** 036395		
0.8	2	**STI0.8(400/230)** 046889	**STI0.8(400/24)** 035254	**STI0.8(230/230)** 026641	**STI0.8(230/24)** 036396		
1	2.8	**STI1.0(400/230)** 046895	**STI1.0(400/24)** 035255	**STI1.0(230/230)** 026642	**STI1.0(230/24)** 036397		
1.3	3.7	**STI1.3(400/230)** 046918		**STI1.3(230/230)** 035256			
1.6	5.5	**STI1.6(400/230)** 046952		**STI1.6(230/230)** 035257			
2	7	**STI2.0(400/230)** 035258		**STI2.0(230/230)** 036398			
2.5	9	**STI2.5(400/230)** 035259		**STI2.5(230/230)** 036399			
3	11.5	**STI3.0(400/230)** 035260					
4	15	**STI4.0(400/230)** 035261					

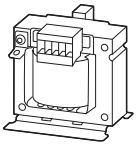
Notes

Information relevant for export to North America

Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

Single-phase control, isolating and safety transformers

IEC/EN 61558-2-2/2-4/2-6
VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)
Rated input voltage 50 – 950 ± 5 % V
Rated output voltage 12 – 1000 V



Rated output kVA	Short-time rating kVA	Part no. Article no.	Price See price list	Std. pack		Notes
0.06	0.13	**STZ0.06(*/*)** 914761		1 off		• Transformers with rated output voltages ≦ 50 V can be used as safety transformers to IEC/EN 61558.
0.1	0.24	**STZ0.1(*/*)** 914762				**Ordering example**
0.16	0.36	**STZ0.16(*/*)** 914763				When ordering, the part number must include the following details:
0.2	0.44	**STZ0.2(*/*)** 914764				**STZ0.06(*/*)**
0.25	0.6	**STZ0.25(*/*)** 914765				First asterisk ≙ rated input voltage
0.315	0.75	**STZ0.315(*/*)** 914766				Second asterisk ≙ rated output voltage
0.4	1.1	**STZ0.4(*/*)** 914767				• Desired part no. STZ0.06
0.5	1.6	**STZ0.5(*/*)** 914768				• Desired rated input voltage 230 V
0.63	1.7	**STZ0.63(*/*)** 914769				• Desired rated output voltage 12 V
0.8	2	**STZ0.8(*/*)** 914770				The correct type reference is
1	2.8	**STZ1.0(*/*)** 914771				**STZ0.06(230/12)**
1.3	3.7	**STZ1.3(*/*)** 914772				**Caution!**
1.6	5.5	**STZ1.6(*/*)** 914773				Standard voltages 400/230 V, 400/24 V,230/230 V, 230/24 V are only supplied as STI → Page 15/6 if other suffixes, e.g. shield winding, are not ordered.
2	7	**STZ2.0(*/*)** 914774				
2.5	9	**STZ2.5(*/*)** 914775				Accessories → Page 15/10
3	11.5	**STZ3.0(*/*)** 914776				
4	15	**STZ4.0(*/*)** 914777				
5.3	13	**STZ5.3(*/*)** 201060				
8.3	21	**STZ8.3(*/*)** 201062				
13.3	34	**STZ13.3(*/*)** 201064				

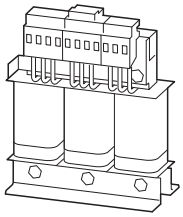
Notes

Information relevant for export to North America

Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

Three-phase control, isolating and safety transformers

IEC/EN 61558-2-2/2-4/2-6
VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)
Rated input voltage 50 – 950 ± 5 % V
Rated output voltage 18.5 – 1000 V

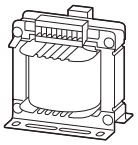


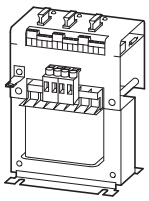
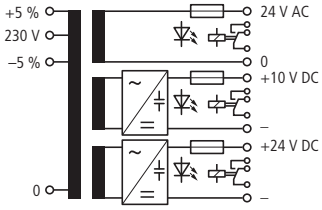
Rated output kVA	Short-time rating kVA	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
0.1	0.2	**DTZ0.1(*/*)*** 914799		1 off	• Transformers with rated output voltages ≦ 50 V can be used as safety transformers in accordance with IEC/EN 61558.
0.16	0.32	**DTZ0.16(*/*)*** 914800			**Ordering example** When ordering, the part number must include the following details: **DTZ0.1(*/*)*** First asterisk ≙ rated input voltage Second asterisk ≙ rated output voltage Third asterisk ≙ configuration • Desired part no. DTZ0.1 • Desired rated input voltage 200 V • Desired rated output voltage 18.5 V • Desired configuration Dy(n)5 The correct type reference is **DTZ0.1(200/18.5)DY(N)5)**
0.25	0.5	**DTZ0.25(*/*)*** 914801			
0.4	0.8	**DTZ0.4(*/*)*** 914802			
0.5	1	**DTZ0.5(*/*)*** 914803			
0.63	1.38	**DTZ0.63(*/*)*** 914804			
1	2.2	**DTZ1.0(*/*)*** 914805			
1.6	3.5	**DTZ1.6(*/*)*** 914806			Accessories → Page 15/10
2	4.4	**DTZ2.0(*/*)*** 914807			
2.5	5.5	**DTZ2.5(*/*)*** 914808			
4	6.2	**DTZ4.0(*/*)*** 914809			
6.3	15.7	**DTZ6.3(*/*)*** 914810			
8	20	**DTZ8.0(*/*)*** 914811			
10	25	**DTZ10(*/*)*** 914812			
12.5	31	**DTZ12.5(*/*)*** 914813			
16	40	**DTZ16(*/*)*** 914814			
20	50	**DTZ20(*/*)*** 914815			
25	62	**DTZ25(*/*)*** 914816		1 off	

Notes

Information relevant for export to North America

Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

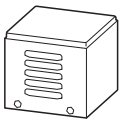
Rated output kVA	Rated input voltage V	Rated output voltage V	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Single-phase multi-winding transformers						
(Universal) control, isolating and safety transformers to VDE 0550, IEC/EN 61558-2-2/2-4/2-6 VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)						
 0.1	208 230	2 x 115	**UTI0.1-115** 206923		1 off	Transformer-protective circuit-breakers PKZM0-...-T → Page 7/6
0.2	380 400		**UTI0.2-115** 206924			
0.315	415 440 460		**UTI0.315-115** 206925			
0.5	480 500		**UTI0.5-115** 206926			
0.63	525 550		**UTI0.63-115** 206927			
0.8	575 600		**UTI0.8-115** 206928			
1			**UTI1.0-115** 206929			

Rated output kVA	Max. output current A	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Multipurpose power supply units AING					
Safety transformer to IEC/EN 61558-2-2/2-6 VDE 0570 Part 2-2/2-6 For every output voltage a fuse, an LED and a changeover contact for monitoring and annunciation. Non-standard voltages please enquire Rated input voltage 230 ± 5 % V Rated output voltage 24 AC, 10 DC, 24 DC V					
 0.1	4.2 1 3	**AING4** 269516		1 off	• Circuit diagram:  Signal contacts Switching voltage max. 250 V AC/110 V DC max. 1 A Switching duty 62 VA/30 W LED indicators • Output voltage present: LED = green • Fuse fault/missing: LED = red Size/type FK2 fuses are used.
0.192	8 1 3	**AING8** 269517			

Notes

Information relevant for export to North America

Product Standards	UL 506; UL5085-1; UL 5085-2; CSA-C22.2 No. 66; CSA-C22.2 No. 66.1-06; CSA-C22.2 No. 66.2-06; IEC/EN 61558-2-2; CE marking
UL File No.	E167225
UL CCN	XPTQ2, XPTQ8
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Recognized, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

	For use with	Part no. suffix Article no. for ordering only with basic unit	Price See price list	Std. pack	Notes	Information relevant for export to North America
IP23 enclosures						
	STZ0.06 … STZ0.16	**+IP23/01** 200618		1 off	Enclosure can be used with primary or secondary voltages >110 V. For lower voltages, please enquire.	
	STZ0.2 … STZ0.5	**+IP23/02** 200623				
	STZ0.63 … STZ1.3	**+IP23/03** 200624				
	STZ1.6 … STZ2.0	**+IP23/04** 226100				
	STZ5.3 … STZ8.3	**+IP23/05** 200648				
	STZ13.3	**+IP23/06** 200649				
	STZ2.5 … STZ4.0 DTZ1.0 … DTZ2.0	**+IP23/32A** 200763			Enclosure can be used with primary or secondary voltages from 42 V to max. 1000 V incl. taps.	
	DTZ0.1 … DTZ0.16	**+IP23/30** 200706				
	DTZ0.25 … DTZ0.63	**+IP23/31** 200753				
	DTZ2.5 … DTZ6.3	**+IP23/33** 200754				
	DTZ8.0 … DTZ25	**+IP23/34** 200755				
Shielding winding						
	STZ0.06 … STZ1.6	**+W1.8** 082270		1 off	Shielding winding means additional shielding between the primary and secondary winding.	UL/CSA approval not required
	STZ2.0 … STZ13.3	**+W4.0** 082271				
	DTZ0.1… DTZ6.3	**+W6.0** 082274				
	DTZ8.0 … DTZ20	**+W20.0** 082275				

Primary current I_N A	For use with	Type Article no. when ordered separately	Price See price list	Type suffix Article no. for ordering only with basic unit	Price See price list	Std. pack	Notes
Inrush current limiters							
For single-phase transformers							
1	STI STZ	**EEB1** 226102		**+EEB1** 226101		1 off	Primary current: from the transformer rating plate or by calculation Single-phase: $I_N = S_N / (U_{Nprim} \times \eta)$ Three-phase: $I_N = S_N / (\sqrt{3}\ U_{Nprim} \times \eta)$ S_N = rated transformer output U_{Nprim} = Transformer´s primary rated voltage η = efficiency (from the technical data table)
2		**EEB2** 226104		**+EEB2** 226103			
3		**EEB3** 226106		**+EEB3** 226105			

Current range A	For use with			**Part no. suffix** Article no. for ordering only with basic unit	**Price** See price list	Std. pack	**Notes**
Additional tappings							
For deviations in the rated input or output voltage of more than ± 10 %: • Ask about size of the transformer. • Also state distribution of rating in addition to the tapping.							
< 16	STZ	Primary side	Single-phase transformers	**+ZA16P(*)** 931897		1 off	**Selection of the correct tap.** Ordering example for single-phase transformers: • Selected transformer STZ0.25(400/24) • Required voltage of additional tapping 22 V • The current for selection of the tapping is calculated as follows: I = S/U I = current S = apparent power U = voltage of the tapping I = 250/22 = 11.4 A → +ZA16 For the secondary tapping, the correct suffix is: **+ZA16S(22)** A primary side additional tapping is determined in the same manner.
< 16	STZ	Second-ary	Single-phase transformers	**+ZA16S(*)** 931895			
< 16	DTZ	Primary side	Three-phase transformers	**+DZA16P(*)** 930200			**Selection of the correct tap.** Ordering example for three-phase transformers: • Selected transformer DTZ0.25(400/24) • Required voltage of additional tapping 22 V • The current for selection of the tapping is calculated as follows: I = S/(√3 x U) I = current S = apparent power U = voltage of the tapping I = 250/(√3 x 22) = 6.6 A → +DZA16 For the secondary tapping, the correct suffix is: **+DZA16S(22)** A primary side additional tapping is determined in the same manner.
< 16	DTZ	Second-ary	Three-phase transformers	**+DZA16S(*)** 200406			
Additional windings							
For primary extra winding please enquire A maximum of 5 additional windings can be ordered for the primary and/or secondary side.							
< 16	STZ	Second-ary	Single-phase transformers	**+ZW16S(*V*VA)** 279276		1 off	**Ordering example for single-phase transformers:** Transformer STZ...(400 V/200 V) with 1000 VA and a secondary additional winding for 100 V and 200 VA, resulting in the required rating of 1200 VA. The correct part no. is: **STZ1.3(400/200)** For pricing of the additional winding, the current is calculated as follows.: I = S/U I = current S = apparent power of the additional winding U = voltage of the additional winding I = 200/100 = 2 A → +ZW16 For the secondary additional winding, the correct suffix is: **+ZW16S(100V200VA)**

Notes

Information relevant for export to North America

UL/CSA approval not required

Engineering

Size selection for control transformers

Determination of the continuous rating
The control transformer must be rated in size so that the voltage drop remains within the permissible tolerance range even under unfavorable conditions. The determination of the transformer rating is performed by the addition of all the sealing powers of all loads which are to be connected simultaneously as well as addition of the inrush power of the largest load, and multiplying the result by a factor of 0.8.

If the ratings of the loads are very similar, the sum of all inrush powers of the simultaneously connected loads is added to the sum of all the sealing powers and the result is multiplied by a factor of 0.8.

Determination of the short-time rating
If the primary requirement is to switch large contactors, it is recommended that the control transformer is selected on the basis of the short-time rating. In most cases, this will mean that the transformer rating is reduced. It is important to ensure that the sealing power does not exceed the continuous rating.

Protection of control transformers

Operational conditions
The protective device shown in the table below must be connected upstream of the primary. The overload release of the circuit-breaker must be set to the stated current. The current to be set must also be stated on the rating plate of the transformer. If a short-circuit release is present it must be set to the maximum value.
The setting values of the circuit-breaker apply up to 1.06 times the rated voltage. For a higher mains voltage the +5 % terminal is to be used. In the case of transformers > 2.0 kVA (DT...> 4.0 kVA) the circuit-breaker may trip under certain mains supply conditions (I_k > 6 kA) and with unfavorable starting torque. In such cases we recommend the use of an inrush current limiter.
The inrush current limiter can be ordered as an accessory. Ordering details → Accessories

Setting range of the motor-protective circuit-breaker as a function of the STI, STZ and DTZ transformer rated power (VA)

Part no.	Primary voltage													
	200 V		230 V		400 V		415 V		440 V		500 V		690 V	
	Protective device	Setting A	Protective device	Setting A	Protective device	Setting A	Protective device	Setting A	Protective device	Setting A	Protective device	Setting A	Protective device	Setting A
ST…0.06	-		PKZM0-0.4	0.3	PKZM0-0.25	0.2	PKZM0-0.25	0.2	PKZM0-0.25	0.2	PKZM0-0.16	0.2	PKZM0-0.16	0.1
ST…0.1	-		PKZM0-0.63	0.5	PKZM0-0.4	0.3	PKZM0-0.4	0.3	PKZM0-0.4	0.3	PKZM0-0.25	0.2	PKZM0-0.25	0.2
ST…0.16	-		PKZM0-1	0.8	PKZM0-0.63	0.5	PKZM0-0.63	0.5	PKZM0-0.63	0.4	PKZM0-0.4	0.4	PKZM0-0.4	0.3
ST…0.2	-		PKZM0-1.6	1.0	PKZM0-0.63	0.6	PKZM0-0.63	0.6	PKZM0-0.63	0.5	PKZM0-0.63	0.5	PKZM0-0.4	0.3
ST…0.25	-		PKZM0-1.6	1.3	PKZM0-1	0.7	PKZM0-1	0.7	PKZM0-1	0.7	PKZM0-0.63	0.6	PKZM0-0.63	0.4
ST…0.315	-		PKZM0-1.6	1.5	PKZM0-1	0.9	PKZM0-1	0.9	PKZM0-1	0.8	PKZM0-1	0.7	PKZM0-0.63	0.5
ST…0.4	-		PKZM0-2.5	2.0	PKZM0-1.6	1.1	PKZM0-1.6	1.1	PKZM0-1.6	1.0	PKZM0-1	0.9	PKZM0-1	0.7
ST…0.5	-		PKZM0-2.5	2.4	PKZM0-1.6	1.4	PKZM0-1.6	1.3	PKZM0-1.6	1.2	PKZM0-1.6	1.1	PKZM0-1	0.8
ST…0.63	-		PKZM0-4	3.0	PKZM0-2.5	1.7	PKZM0-2.5	1.7	PKZM0-1.6	1.6	PKZM0-1.6	1.4	PKZM0-1.6	1.0
ST…0.8	-		PKZM0-4	3.8	PKZM0-2.5	2.2	PKZM0-2.5	2.1	PKZM0-2.5	2.0	PKZM0-2.5	1.7	PKZM0-1.6	1.3
ST…1.0	-		PKZM0-6.3	4.7	PKZM0-4	2.7	PKZM0-4	2.6	PKZM0-4	2.5	PKZM0-2.5	2.2	PKZM0-1.6	1.6
ST…1.3	-		PKZM0-10	6.3	PKZM0-4	3.5	PKZM0-4	3.4	PKZM0-4	3.2	PKZM0-4	2.8	PKZM0-2.5	2.0
ST…1.6	-		PKZM0-10	7.4	PKZM0-6.3	4.2	PKZM0-6.3	4.1	PKZM0-4	4.0	PKZM0-4	3.4	PKZM0-2.5	2.5
ST…2.0	-		PKZM0-16	10.0	PKZM0-6.3	5.3	PKZM0-6.3	5.1	PKZM0-6.3	4.8	PKZM0-6.3	4.2	PKZM0-4	3.1
ST…2.5	-		PKZ2/ZM-16	11.5	PKZ2/ZM-10	6.6	PKZ2/ZM-10	6.4	PKZ2/ZM-10	6.0	PKZ2/ZM-6	5.3	PKZ2/ZM-4	4.0
ST…3.0	-		PKZ2/ZM-25	16.0	PKZ2/ZM-16	10.0	PKZ2/ZM-16	10.0	PKZ2/ZM-10	7.1	PKZ2/ZM-10	6.2	PKZ2/ZM-6	4.5
ST…4.0	-		PKZ2/ZM-25	18.1	PKZ2/ZM-16	10.4	PKZ2/ZM-16	10.0	PKZ2/ZM-10	10.0	PKZ2/ZM-10	8.3	PKZ2/ZM-6	6.0
DT…0.1	PKZM0-0.4	0.4	PKZM0-0.4	0.3	PKZM0-0.25	0.2	PKZM0-0.25	0.2	PKZM0-0.25	0.2	PKZM0-0.16	0.1	PKZM0-0.16	0.1
DT…0.16	PKZM0-0.63	0.5	PKZM0-0.63	0.5	PKZM0-0.4	0.3	PKZM0-0.4	0.3	PKZM0-0.4	0.3	PKZM0-0.25	0.2	PKZM0-0.25	0.2
DT…0.25	PKZM0-1	0.8	PKZM0-1	0.7	PKZM0-0.63	0.4	PKZM0-0.63	0.4	PKZM0-0.4	0.4	PKZM0-0.4	0.3	PKZM0-0.4	0.3
DT…0.4	PKZM0-1.6	1.3	PKZM0-1.6	1.1	PKZM0-1	0.7	PKZM0-1	0.6	PKZM0-0.63	0.6	PKZM0-0.63	0.5	PKZM0-0.63	0.4
DT…0.5	PKZM0-2.5	1.6	PKZM0-1.6	1.4	PKZM0-1	0.8	PKZM0-1	0.8	PKZM0-1	0.7	PKZM0-1	0.6	PKZM0-0.63	0.5
DT…0.63	PKZM0-2.5	2.0	PKZM0-2.5	1.8	PKZM0-1.6	1.0	PKZM0-1.6	1.0	PKZM0-1	0.9	PKZM0-1	0.8	PKZM0-0.63	0.6
DT…1.0	PKZM0-4	3.1	PKZM0-4	2.7	PKZM0-2.5	1.6	PKZM0-1.6	1.5	PKZM0-1.6	1.4	PKZM0-1.6	1.3	PKZM0-1	0.9
DT…1.6	PKZM0-6.3	5.0	PKZM0-6.3	4.3	PKZM0-4	2.5	PKZM0-2.5	2.4	PKZM0-2.5	2.3	PKZM0-2.5	2.0	PKZM0-1.6	1.4
DT…2.0	PKZM0-6.3	6.2	PKZM0-6.3	5.4	PKZM0-4	3.1	PKZM0-4	3.0	PKZM0-4	2.8	PKZM0-2.5	2.5	PKZM0-2.5	1.8
DT…2.5	PKZM0-10	7.6	PKZM0-10	6.7	PKZM0-4	3.8	PKZM0-4	3.7	PKZM0-4	3.5	PKZM0-4	3.1	PKZM0-2.5	2.2
DT…4.0	PKZM0-16	12.0	PKZM0-16	10.4	PKZM0-6.3	6.0	PKZM0-6.3	5.8	PKZM0-6.3	5.5	PKZM0-6.3	4.8	PKZM0-4	3.5
DT…6.3	PKZ2/ZM-25	18.9	PKZ2/ZM-25	16.4	PKZ2/ZM-10	9.5	PKZ2/ZM-10	9.1	PKZ2/ZM-10	8.6	PKZ2/ZM-10	7.6	PKZM0-6.3	5.5

For all other transformers use transformer-protective circuit-breakers PKZM0-...-T. → Page 7/6

Technical data

		Control transformers			Multi-winding transformers	Universal power supply units
		STI, STZ	**DTZ**	**STN**	**UTI**	**AING**
General						
Standards						
Built and tested to		IEC/EN 61558-2-2/ 2-4/2-6 VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)	IEC/EN 61558-2-2/ 2-4/2-6 VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)	IEC/EN 61558-2-2 VDE 0570 Part 2-2	(Universal) control, isolating and safety transformers to VDE 0550, IEC/EN 61558-2-2/ 2-4/2-6 VDE 0570 Part 2-2, Part 2-6 (safety transformers), Part 2-4 (isolating transformers)	Safety transformer to IEC/EN 61558-2-2/ 2-6 VDE 0570 Part 2-2/ 2-6
Suitable for use to		IEC/EN 60204-1, ÖVE-EN 13 VDE 0113, VDE 0100 Part 410	IEC/EN 60204-1, ÖVE-EN 13 VDE 0113, VDE 0100 Part 410	IEC/EN 60204-1, ÖVE-EN 13 VDE 0113, VDE 0100 Part 410	IEC/EN 60204-1, ÖVE-EN 13 VDE 0113, VDE 0100 Part 410	IEC/EN 60204-1 VDE 0113
Ambient temperature	°C	-25 - +40	-25 - +40	-25 - +40	-25 - +40	-25 - +40
Characteristics						
Terminals		● (< 115 A)	● (< 115 A)	● (< 115 A)	●	●
Connection lugs		● (> 115 A)	● (> 115 A)	● (> 115 A)	–	–
Insulation class		B	B	B	B	B
Rated frequency	Hz	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60
Primary tapping		± 5 %	± 5 %	± 5 %	± 20 %	± 5 %
Degree of protection		IP00	IP00	IP00	IP00	IP20
Separate windings		●	●	●	●	●
Completely vacuum-impregnated		●	●	●	●	●
Reinforced insulation		●	●	–	●	●
Rated duty factor	% DF	100	100	100	100	100

STI, STZ, DTZ, UTI

	Total weight kg	No-load losses W	Short-circuit losses W	Short-circuit voltage %	Efficiency
Single-phase control, isolating, and safety transformers[1)]					
ST…0.06	1.5	6	5	7.8	0.85
ST…0.1	2	7	8	6.9	0.87
ST…0.16	2.3	9	12	6.6	0.88
ST…0.2	3	11	17	6.6	0.88
ST…0.25	3.8	13	14	5.1	0.9
ST…0.315	4.3	10	18	5.5	0.92
ST…0.4	5.2	17	18	4.4	0.92
ST…0.5	6.8	15	24	3.9	0.93
ST…0.63	7.7	15	27	4.1	0.94
ST…0.8	9.6	17	25	3.2	0.95
ST…1.0	13.4	27	29	2.9	0.95
ST…1.3	14.9	32	35	3	0.95
ST…1.6	17.4	21	37	2.4	0.96
ST…2.0	21.5	27	33	2	0.97
ST…2.5	21.5	39	43	2.4	0.97
ST…3.0	26	30	55	2.1	0.97
ST…4.0	35	38	88	2.2	0.97
STZ5.3	40	40	165	4	0.96
STZ8.3	55	65	200	4	0.97
STZ13.3	80	95	265	3.5	0.97
Single-phase control transformers[1)]					
STN0.06	1	7	10	11	0.79
STN0.1	1.5	7	15	10	0.84
STN0.16	2.4	11	16	6.7	0.87
STN0.2	2.8	9	19	6.8	0.88
STN0.25	2.9	9	21	6.3	0.9
STN0.315	3.5	11	21	5.3	0.91
STN0.4	4.2	12	27	5.3	0.92
STN0.5	5.1	15	27	4.1	0.93
STN0.63	7.1	21	32	3.8	0.93
STN0.8	9.8	24	24	2.5	0.94
STN1.0	12.4	33	26	2.2	0.94
STN1.3	14.1	46	33	2.1	0.94
STN1.6	14.3	43	44	2.5	0.95
STN2.0	19.9	56	42	2	0.95
STN2.5	20	21	145	2.4	0.95
STN3.0	23	32	94	2.4	0.96
STN4.0	27	28	143	2.4	0.96

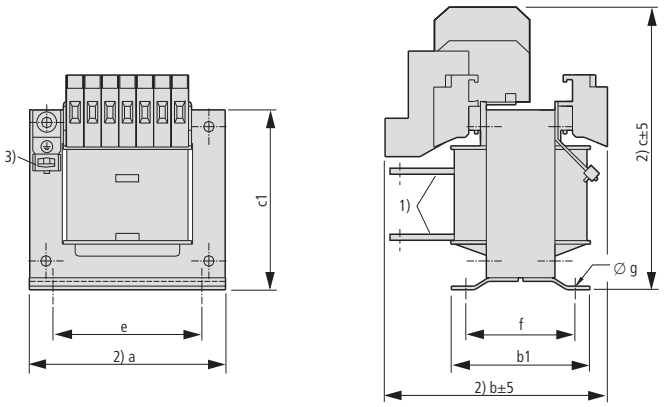
	Total weight kg	No-load losses W	Short-circuit losses W	Short-circuit voltage %	Efficiency
Three-phase control, isolating, and safety transformers[1)]					
DTZ0.1	1.9	5	28	15	0.75
DTZ0.16	2.5	8	20	9.5	0.85
DTZ0.25	3.6	11	25	8.5	0.88
DTZ0.4	5.1	15	40	8	0.88
DTZ0.5	6.1	20	35	6	0.9
DTZ0.63	8.9	25	50	5.5	0.9
DTZ1.0	12.9	35	50	4	0.92
DTZ1.6	18.5	55	60	3	0.93
DTZ2.0	22.4	60	75	3.5	0.94
DTZ2.5	29.3	80	85	2.5	0.94
DTZ4.0	39.6	60	100	2	0.96
DTZ6.3	50.2	66	170	2	0.96
DTZ8.0	55	60	250	4	0.96
DTZ10	70	80	280	3.5	0.97
DTZ12.5	80	95	300	4	0.97
DTZ16	95	100	420	4.5	0.97
DTZ20	125	140	400	3.5	0.98
DTZ25	160	180	350	3	0.98
Single-phase multi-winding transformers					
UTI0.1	2	8	11	7.5	0.84
UTI0.2	3	10	19	6.5	0.87
UTI0.315	4.3	15	23	5	0.89
UTI0.5	6.8	26	23	3.5	0.92
UTI0.63	7.7	25	32	3.8	0.92
UTI0.8	9.6	33	29	2.8	0.93
UTI1.0	13.4	46	30	2.1	0.93

[1)] All no-load loss, short-circuit loss, short-circuit voltage and efficiency values apply at a temperature of 20 °C.

Dimensions

Single-phase control transformers

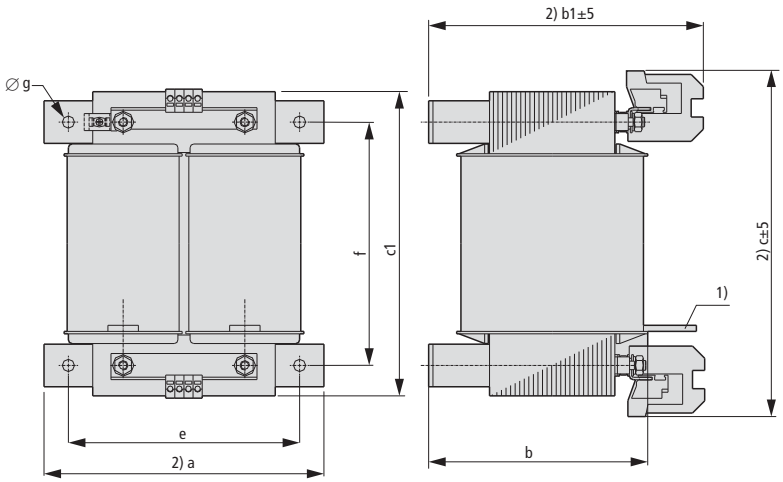
STN0.06...2.0



① Connection lugs
② Maximum space requirement
③ With STN0,06-0.2 ground connection at bottom

		12 V		24 V		42 V		110 V		230 V						
Part no.	a	b	c	b	c	b	c	b	c	b	c	e	f	∅g	b1	c1
STN0.06	66	79	78	79	78	79	78	79	78	79	78	50	56	4.8x8	67	60
STN0.1	85	75	91	75	91	75	91	75	91	75	91	64	47	4.8x8	60	76
STN0.16	85	97	91	97	91	97	91	97	91	97	91	64	70	4.8x8	83	76
STN0.2	106	83	112	83	112	83	112	83	112	83	112	80	61	5.8x9	80	97
STN0.25	106	103	121	83	112	83	112	83	112	83	112	80	61	5.8x9	80	97
STN0.315	106	111	121	91	112	91	112	91	112	91	112	80	70	5.8x9	89	97
STN0.4	121	108	133	88	124	88	124	88	124	88	124	90	68	5.8x12	86	106
STN0.5	121	120	133	120	133	100	124	100	124	100	124	90	80	5.8x12	98	106
STN0.63	151	121	157	121	157	107	145	107	145	107	145	122	82	7x15	104	132
STN0.8	151	124	196	138	157	124	145	124	145	124	145	122	99	7x15	121	132
STN1.0	151	150	196	164	157	164	157	150	145	150	145	122	125	7x15	147	132
STN1.3	175	138	213	148	169	148	169	138	157	138	157	135	110	7x15	135	152
STN1.6	175	183	170	138	216	148	169	138	157	138	157	135	110	7x15	135	152
STN2.0	175	213	170	168	216	178	169	168	157	168	157	135	141	7x15	165	152

STN2.5...4.0

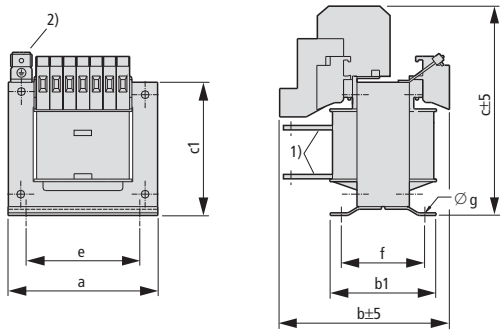


① Connection lugs
② Maximum space requirement

							b1	c	b1	c	b1	c	b1	c	b1	c
Part no.	a	b	c1	e	f	∅g	12 V	12 V	24V	24V	42 V	42 V	110 V	110 V	230 V	230 V
STN2.5	230	130	250	190	200	11	185	260	185	250	205	255	160	275	145	255
STN3.0	230	155	250	190	200	11	210	260	230	250	230	255	185	275	170	255
STN4.0	230	170	250	190	200	11	225	260	245	250	245	255	200	275	185	255

Single-phase control, isolating, and safety transformers

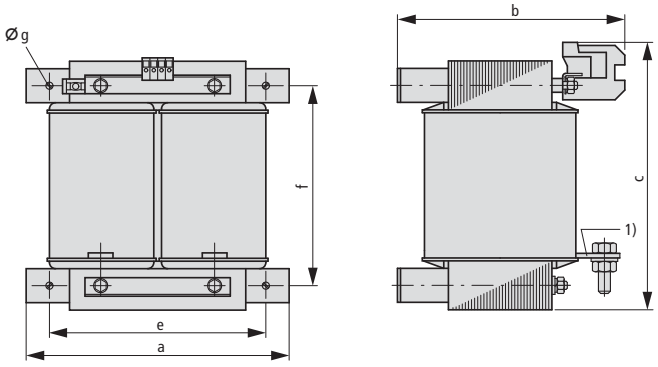
ST...0.06...2.5



① Connection lugs
② With STI/STZ0.06 … 0.16 ground connection at bottom

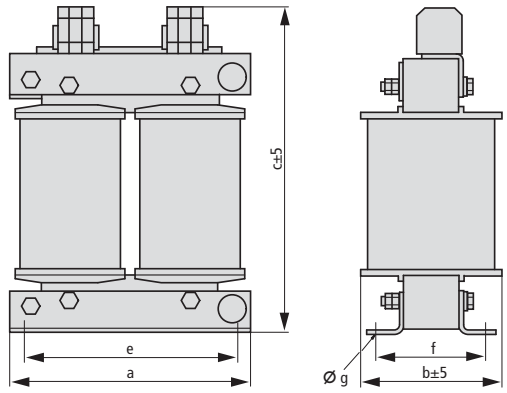
		12 V		24 V		42 V		110 V		230 V						
Part no.	a	b	c	b	c	b	c	b	c	b	c	b1	c1	e	f	Ø g
ST…0.06	85	75	91	75	91	75	91	75	91	75	91	60	76	64	47	4.8x8
ST…0.1	85	89	91	89	91	89	91	89	91	89	91	74	76	64	61	4.8x8
ST…0.16	85	97	91	97	91	97	91	97	91	97	91	83	76	64	70	4.8x8
ST…0.2	106	83	112	83	112	83	112	83	112	83	112	80	97	80	61	5.8x9
ST…0.25	106	111	124	91	112	91	112	91	112	91	112	89	97	80	70	5.8x9
ST…0.315	121	-	-	88	119	88	119	88	119	88	119	86	106	90	68	5.8x12
ST…0.4	121	-	-	100	119	100	119	100	119	100	119	98	106	90	80	5.8x12
ST…0.5	121	-	-	140	131	120	119	120	119	120	119	118	106	90	100	5.8x12
ST…0.63	151	-	-	121	157	107	145	107	145	107	145	104	132	122	82	7x15
ST…0.8	151	-	-	138	157	124	145	124	145	124	145	121	132	122	99	7x15
ST…1.0	151	-	-	164	157	164	157	150	145	150	145	147	132	122	125	7x15
ST…1.3	175	-	-	148	169	148	169	138	157	138	157	135	152	135	110	7x15
ST…1.6	195	-	-	142	240	149	186	142	174	142	174	140	166	150	110	10x18
ST…2.0	195	-	-	154	240	161	186	154	174	154	174	152	166	150	122	10x18
ST…2.5	195	-	-	154	240	154	240	161	186	154	174	152	166	150	122	10x18

ST...3.0...4.0



		12 V		24 V		42 V		110 V		230 V				
Part no.	a	b	c	b	c	b	c	b	c	b	c	e	f	Ø g
ST…3.0	230	-	-	210	250	230	255	185	275	170	255	190	200	11
ST…4.0	230	-	-	235	250	255	255	210	275	200	255	190	200	11

STZ5.3...13.3

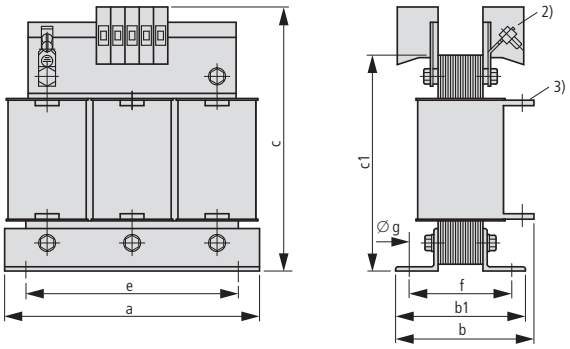


		12 V		24 V		42 V		110 V		230 V				
Part no.	a	b	c	b	c	b	c	b	c	b	c	e	f	Øg
STZ5.3	260	200	*)	200	*)	200	*)	214	374	214	360	230	126	10x18
STZ8.3	260	-	-	230	*)	230	*)	244	374	244	374	230	156	10x18
STZ13.3	320	-	-	240	*)	240	*)	270	440	270	440	270	172	13x20

*) The higher rated voltage is valid

Three-phase control, isolating, and safety transformers

DTZ0.1...25



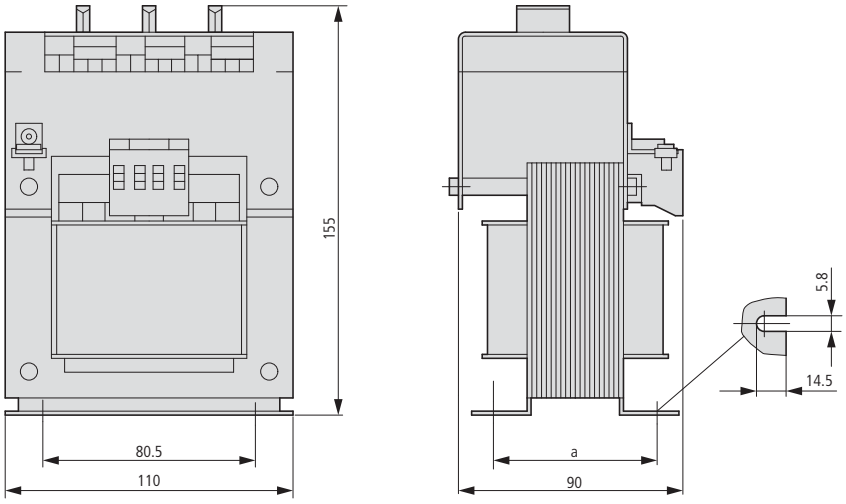
① The higher rated operating voltage applies
② Terminals ≦ 25 A
③ Connection lugs > 63 A

		18.5 V		24 V		42 V		110 V		230-690 V						
Part no.	a	b	c	b	c	b	c	b	c	b	c	e	f	Øg	b1	c1
DTZ0.1	125	65	134	65	134	65	134	65	134	65	134	100	45	8 x 5	61	102
DTZ0.16	125	75	134	75	134	75	134	75	134	75	134	100	55	8 x 5	71	102
DTZ0.25	155	77	154	77	154	77	154	77	154	77	154	130	57	8 x 12	77	128
DTZ0.4	155	92	154	92	154	92	154	92	154	92	154	130	72	8 x 12	92	128
DTZ0.5	190	82	180	112	191	82	180	82	180	82	180	170	58	8 x 12	82	155
DTZ0.63	190	102	180	132	191	102	180	102	180	102	180	170	78	8 x 12	102	155
DTZ1.0	210	137	210	137	210	137	210	117	199	117	199	175	97	8 x 12	117	174
DTZ1.6	230	144	234	114	269	144	234	114	223	114	223	176	95	7 x 13	114	198
DTZ2.0	240	117	279	117	279	117	279	141	244	117	233	185	95	10 x 18	117	208
DTZ2.5	265	132	299	132	299	132	299	152	264	132	253	200	102	10 x 18	132	228
DTZ4.0	300	166	317	166	333	147	333	157	296	157	296	224	119	10 x 18	147	260
DTZ6.3	300	193	285	210	285	193	333	173	333	173	296	224	145	10 x 18	173	260
DTZ8.0	390	200	1)	200	1)	200	1)	184	374	184	374	350	126	10 x 18	152	310
DTZ10.0	390	-	-	216	1)	216	1)	199	374	199	374	350	141	10 x 18	167	310
DTZ12.5	390	-	-	231	1)	231	1)	214	374	214	374	350	156	10 x 18	182	310
DTZ16	450	-	-	221	1)	221	1)	204	434	204	434	400	142	13 x 20	172	360
DTZ20	450	-	-	251	1)	251	1)	234	1)	234	434	400	172	13 x 20	202	360
DTZ25	450	-	-	281	1)	281	1)	264	1)	264	434	400	202	13 x 20	232	360

UTI, AING

Universal power supply units

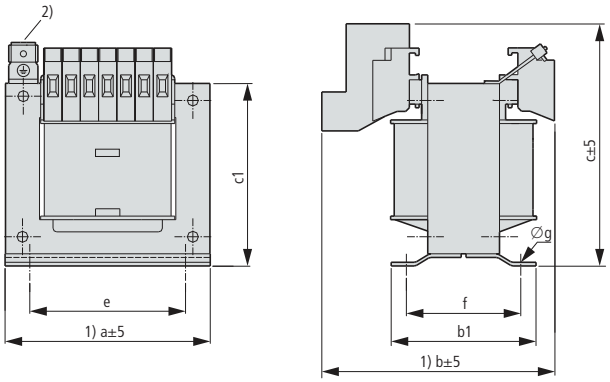
AING4, AING8



Part no.	a
AING4	62
AING8	70

Single-phase multi-winding transformers

UTI...



		U_s = 115 V						
Part no.	a	b	c	e	f	∅g	b1	c1
UTI0.1…	85	89	93	64	61	4.8x8	74	76
UTI0.2…	106	82	112	80	61	5.8x9	80	97
UTI0.315…	121	88	124	90	68	5.8x12	86	106
UTI0.5…	121	120	124	90	100	5.8x12	118	106
UTI0.63…	151	107	150	122	82	7x15	104	132
UTI0.8…	151	124	150	122	99	7x15	121	132
UTI1.0…	151	150	150	122	125	7x15	147	132

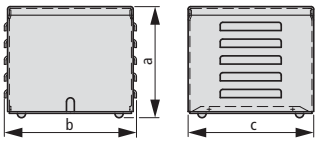
U_s … Secondary voltage

[1] Maximum space requirement

[2] With type UTI0,1… ground connection at bottom

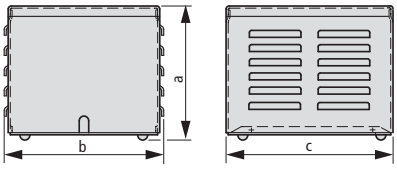
IP23 enclosures

+IP23/01, +IP23/02

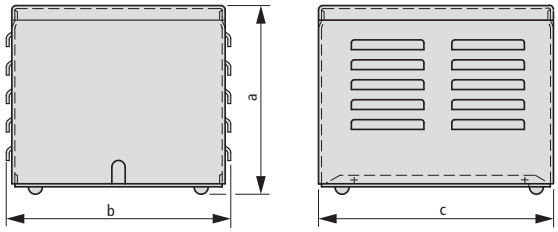


Part no.	a	b	c
+IP23/01	122	118	145
+IP23/02	160	192	184
+IP23/03	203	192	184
+IP23/04	203	231	254
+IP23/30	160	192	184
+IP23/31	203	231	254
+IP23/32A	315	263	360

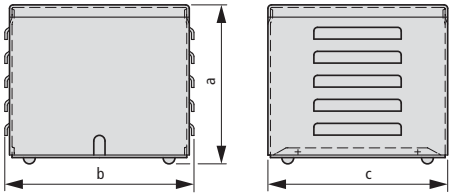
+IP23/03



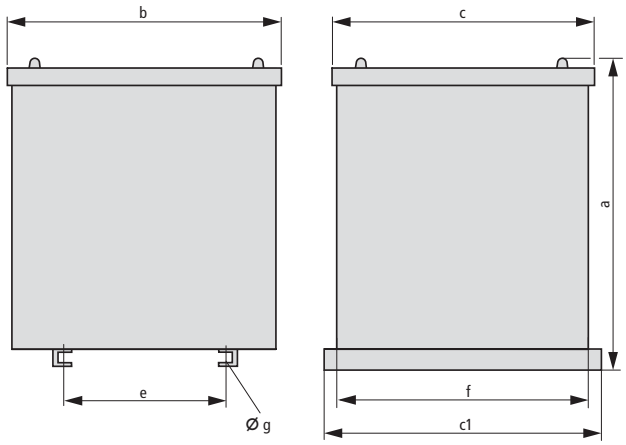
+IP23/04, +IP23/31, +IP 23/32A



+IP23/30



+IP23/05, +IP23/06, +IP 23/33, +IP23/34



Part no.	a	b	c	c1	e	f	∅g
+IP23/05	570	390	390	430	230	390	10
+IP23/06	690	500	480	540	270	500	13
+IP23/33	520	410	340	360	212	330	10
+IP23/34	620	560	440	460	350	430	12



SASY busbars system
Accessories for control panel building

The innovative accessory for control panel construction is optimally matched to the Eaton control and distribution systems. Whether cable management systems, connection and interconnection technology or locking systems, Eaton accessories help you to realize your applications easily and without wasting time.

SASY busbar system
Interval between busbar centers of 60 or 185 mm conforms to market requirements +++ Devices and adapter mount directly to rail without bore holes +++ System covering for optimal protection against accidental contact +++ For application worldwide +++ Type-tested in Eaton control panel systems

D fuse switch-disconnector with flashing function - D02-LTS/63/3-R
Blink function signals tripped fuse link+++ Snap-action drive switches the load all-pole and hand-autonomous+++ Available with/without integrated auxiliary contact → Page 16/21

LV h.b.c. fuse switch-disconnectors - GST
Construction sizes 000, 00, 1, 2, 3 to 630 A +++ Easy, fast mounting to 60 mm systems +++ Comprehensive device accessories and fuse inserts LV h.b.c. → Page 16/16

K connecting terminals
For cross sections from 16 to 4 x 185 mm² +++ Accepts round and ribbon cables +++ Conductor mounts easily from front → Page 16/67

F3A flanges, ZSD-2K, DH-COMF comfort hinged handle
Insulating material or steel plate +++ Metric cable entry knockouts or cable grommets +++ Version with sponge rubber for direct cable inlet +++ Simple handling +++ Halogen-free +++ Hinge comfort grip for control panels +++ Fold instead of swing +++ Ergonomically formed grip from cast zinc +++ For all market-typical profile semi-cylinders → Pages 16/62, 16/81

Cable grommets and cable glands
For cable external diameters from 1 to 68 mm +++ Simple handling, high protection type +++ PG or metric → Page 16/62

Accessories for control panel building
Optimally matched to busbar systems SASY, Chapter 16 +++ CI insulation material housing, Chapter 20 +++ Steel plate wall housing CS, Chapter 21 +++ Installation distributor IVS, Chapter 22 +++ Add-on board XVTL, Chapter 22 +++ Universal application in other control panels

Prefabricated energy and control distribution
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SASY busbars system, accessories for control panel building











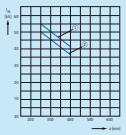

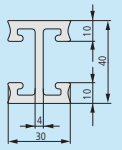

SASY busbar system

System overview

60 mm system 16/2

Ordering

System for flat busbars 16/4
System for profile busbars 16/6
System covers 16/7
Terminals and connectors 16/9
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Busbar adapters for MSC motor starters 8/26
Busbar fuse material 16/16

System overview

Compact system 16/22

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System overview

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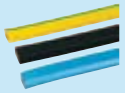
Busbar adapters for PKZ and PKE 7/40
Busbar adapters for MSC motor starters 8/45
Busbar fuse material 16/58
KSX system 16/61











Accessories for control panel building

Ordering

Cable management system 16/62
Cable inlet flanges 16/62
Cable glands 16/62
Ventilation cable glands 16/63
Pressure equalization plug 16/64
Cable grommets 16/64
Stepped cable grommets 16/64
Pressure compensating grommet 16/64
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Engineering

Conductor supports for insulated copper strip 16/84

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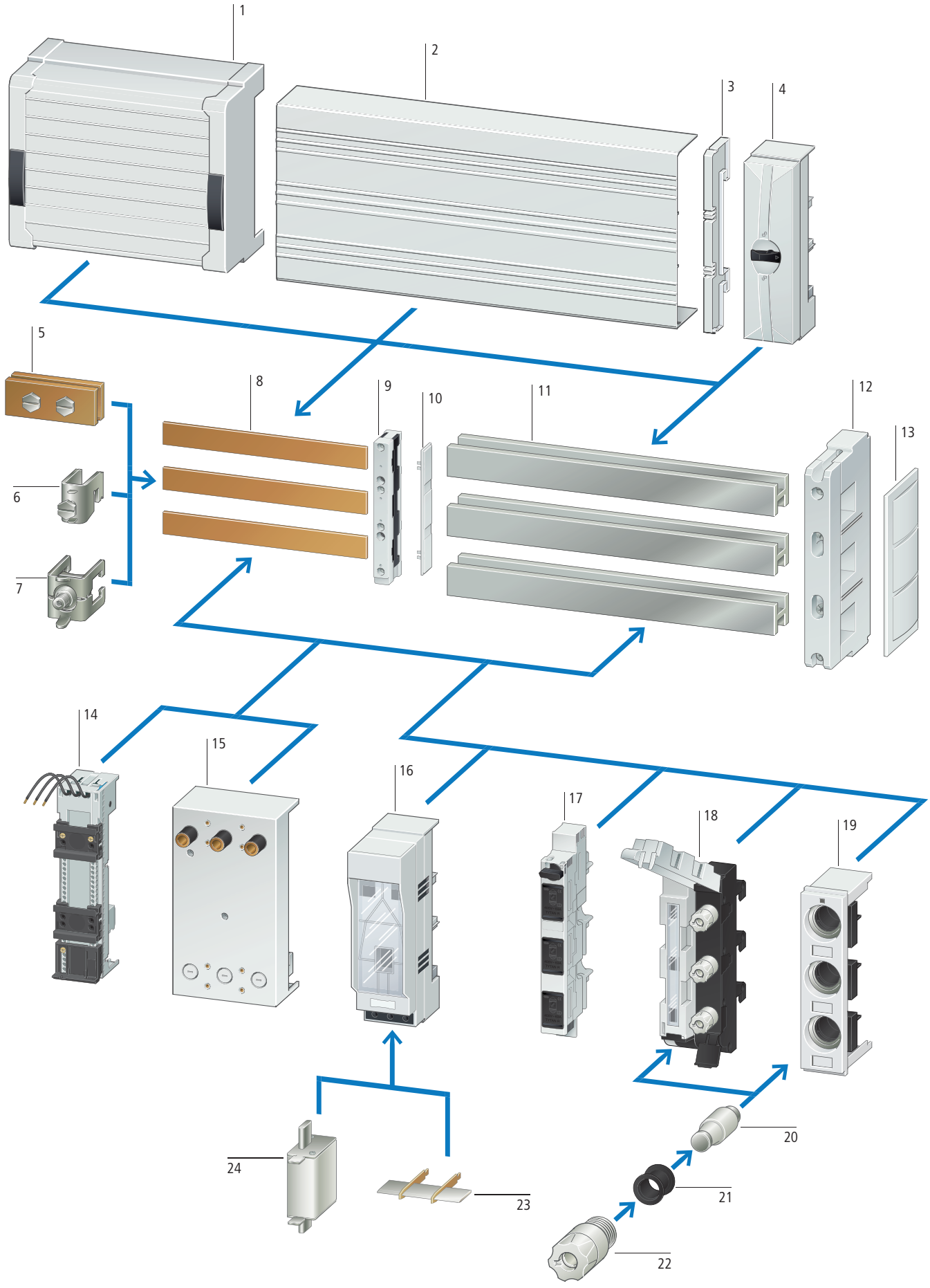
System overview



System covers 1
Partitioning of busbars or terminals for increased personal safety.
Different versions, for individual customization or ready to install in defined dimensions.
For 3- and 4 pole systems.
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Cover for empty sections, modular 2
Spare section cover can be cut to length.
Clipped on simply and quickly to the support provided.
For 3- and 4 pole systems
→ Page 16/7

Cover for empty sections support 3
Simple push-fit, for all copper busbars.
For 3- and 4 pole systems
→ Page 16/7

Terminal plates 4
Terminal modules protected against direct contact, lockable.
For commonly available connection cables and busbars.
For 3- and 4 pole systems
→ Page 16/7

Busbar end-to-end connectors 5
For interconnecting busbar systems.
For flat and profiled busbars.
→ Page 16/13

Universal conductor terminals 6
With integrated retaining spring.
Captive fixing screw.
Suitable for all copper, flat and profiled busbars.
→ Page 16/12

Expansion terminals 7
For fitting to busbars without drilling
Cables can be inserted from the top simply and quickly.
→ Page 16/10

Profiled busbars 11
Cross-sections 500, 720 and 1140 mm².
Tin-plated surface for low contact resistance
Tin-plated copper busbars cut time needed to prepare contact points.
→ Page 16/11

Double T profile busbar supports 9
Cross-sections 500 mm² (1250 A) and 720 mm² (1600 A)
Very high short-circuit rating for greater system safety.
Fewer supports required.
Spacing between busbar centers 60 mm.
→ Page 16/6

Terminal shroud 10
For covering the copper busbar ends for increased contact protection.
→ Page 16/6

Flat busbars 8
12 x 5 up to 30 x 10 mm, Cu.
→ Page 16/24

Busbar supports 12
For all commonly available flat busbars.
Can be fitted to all busbar sizes using concertina system.
For 3- and 4 pole systems
Versions for IEC and UL/CSA.
Spacing between busbar centers 60 mm.
→ Page 16/4

Terminal shroud 13
For covering the ends of flat copper busbars
→ Page 16/4

Busbar adapters for PKZ and PKE 14
Mounting rails and connection cables prepared for motor starter combinations with PKZ, PKE or DILM.
With combi-base suitable for 5 and 10 mm thick flat and profiled busbars.
Versions with connection cables for spring-loaded terminals or without electrical contact.
→ Page 7/22
Two-row double adapter for specific applications, e.g. with fuses.
→ Page 16/21
Complete devices prefitted and wired for DOL starters.
→ Page 8/26
Complete devices prefitted and wired for reversing starters.
→ Page 8/28

Busbar adapters for NZM 15
Innovative terminal design for rear connetion.
For all commonly available flat busbars and for double T profile.
For 3- and 4 pole systems.
Conductors completely embedded for maximum safety.
Easy mounting and terminal connection
→ Page 16/14

LV h.b.c. fuse switch-disconnectors 16
Switching devices NH000, NH00, NH1, NH2 and NH3 up to 630 A.
→ Page 16/16

D fuse switch-disconnectors without flashing function 17
Switch-disconnectors for D02 screw fuses.
Clear contact position indication.
Screw caps available as accessories.
→ Page 16/21

D fuse switch-disconnectors with flashing function 17
Flashing function indicates blown fuse link.
Switches the load on all poles and without touching by hand.
With fuse plug, therefore no new screw caps required.
Low heat dissipation.
With contact position indicator.
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D busbar mounting fuse devices 19
D02, DII and DIII with front and bottom plate supplied.
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Fuse links 20
D01, D02, DII, DIII and C10.
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Fuse adapters 21
D01, D02 cartridge ring adaptes, DII and DIII gage rings.
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Screw caps 22
D01, D02, DII and DIII.
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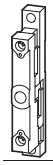
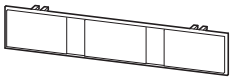
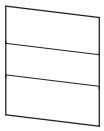
Disconnecting blades 23
Can be used instead of LV h.b.c. fuse links.
Full contact blades.

LV h.b.c. fuse links 24
Compact construction size up to 100 A; NH00 fuses can also used in NH000 devices.
Fuse links NH00, NH1, NH2 and NH3 up to 630 A.
High breaking capacity 120 kA.
→ Page 19/53

Ordering

		Poles	Rated operational current I_e A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar supports							
• Thermoplast, silicone-free, chlorine-free • Halogen-free • Self-extinguishing to UL 94 • RAL 7035 • Creepage resistance CTI 200 • Temperature-resistant up to 120 °C							
IEC busbar supports							
	Can be fitted to all busbar sizes using concertina system. With internal screw holes.	3	630	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10	**BBS-3/FL**[1) 2)] 107066		10 off
		4	630		**BBS-4/FL** 138381		10 off
UL busbar supports							
	Can be fitted to all busbar sizes using concertina system. With internal screw holes.	3	630	12 x 5/10 20 x 5/10 30 x 5/10	**BBS-3/FL-NA**[1) 2)3)] 107067		10 off
PE/N busbar supports							
	Can be fitted to all busbar sizes using concertina system. Can be mounted individually.	2	630	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10	**BBS-2/FL** 107069		10 off
		1	630		**BBS-1/FL** 107161		10 off
Terminal shroud							
	For covering busbars.	–	–	BBS-3/FL BBS-3/FL-NA	**ES-BBS-3/FL**[1) 2)3)] 107068		10 off
UL bottom plate							
• Silicone-free, chlorine-free • Temperature-resistant up to 110 °C • Self-extinguishing to UL 94							
	For use when air gap between busbars and mounting plate is not sufficient. 1100 mm long.	–	–	BBS-3/FL BBS-3/FL-NA	**BBC-BT-NA**[1) 2)] 107172		2 off

Notes

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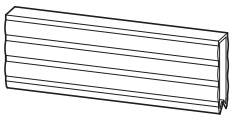
[2)] Current load → Page 16/39

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Specially designed for NA	No Yes[3)]
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

Busbar shrouds

- Silicone-free, chlorine-free
- Temperature-resistant up to 110 °C
- Self-extinguishing to UL 94



	Poles	Rated operational current I_e A	For use with	Part no. Article no.	Price See price list	Std. pack
1000 mm long.	–	–	12 x 5 15 x 5 20 x 5 25 x 5 30 x 5	**BBC-FL5** 107173		10 off
	–	–	12 x 10 15 x 10 20 x 10 25 x 10 30 x 10	**BBC-FL10** 107174		10 off

Flat busbars



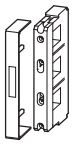
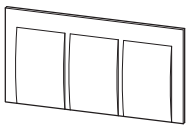
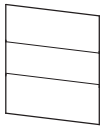
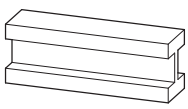
Rated operational current I_e A	Copper bars mm	Length mm	Copper factor[1]	Material	Part no. Article no.	Price See price list	Std. pack
160	12 x 5	1500		Copper, tinned	**CU12X5** 034121		10 off
160	12 x 5	2250		Copper, tinned	**CU12X5-2250** 005093		10 off
250	20 x 5	1500		Copper, tinned	**CU20X5** 044092		10 off
250	20 x 5	2250		Copper, tinned	**CU20X5-2250** 007466		10 off
460	20 x 10	1500		Copper, tinned	**CU20X10** 041719		5 off
460	20 x 10	2250		Copper, tinned	**CU20X10-2250** 009839		5 off
630	30 x 10	1500		Copper, blank	**CU30X10** 051211		1 off

Notes

[1] Calculation of material surcharge → Chapter 23

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Specially designed for NA	✓
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

		Poles	Rated operational current I_e A	For use with	Copper factor	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar supports								
Double T profile busbar supports • Thermoplast, silicone-free, chlorine-free • Halogen-free • Self-extinguishing to UL 94 • RAL 7035 • Creepage resistance CTI 200 • Temperature-resistant up to 120 °C								
	For use as outer or center support. With internal screw holes.	3	1600	Double T profile		**BBS-3/PR**[1) 4)] 107162		3 off
	Suitable for assembly of PE or N bar. With internal screw holes.	1	1600	Double T profile		**BBS-1/PR**[3)] 107165		10 off
Terminal shroud								
	For shrouding busbar systems.	–	–	BBS-3/PR		**ES-BBS-3/PR**[4)] 107164		4 off
UL bottom plate								
• Silicone-free, chlorine-free • Temperature-resistant up to 110 °C • Self-extinguishing to UL 94								
	For use when air gap between busbars and mounting plate is not sufficient. 1100 mm long.	–	–	BBS-3/PR		**BBC-BT-NA**[4)] 107172		2 off
Busbar shrouds								
• Silicone-free, chlorine-free • Temperature-resistant up to 110°C • Self-extinguishing to UL 94								
	1000 mm long.	–	–	Double T profile		**BBC-CU-BAR/PR**[4)] 107175		5 off
Profiled busbars								
E-CU double T profile busbar								
	Tinned, cross-section 500 mm², 2400 mm long.	–	1250	For supports BBS-3/PR, BBS-1/PR, BBS-3/FL-185		**CU-BAR-500/T**[2) 4)] 107166		32 off
	Tinned, cross-section 720 mm², 2400 mm long.	–	1600	For supports BBS-3/PR, BBS-1/PR, BBS-3/FL-185		**CU-BAR-720/T**[2) 4)] 107167		32 off

Notes

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Calculation of material surcharge → Chapter 23

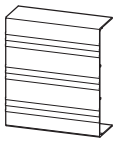
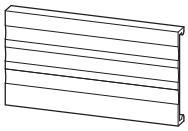
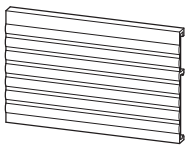
Information relevant for export to North America

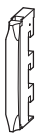
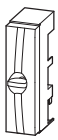
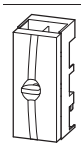
[3)]

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

[4)]

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Specially designed for NA	Yes
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

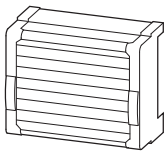
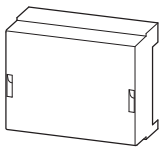
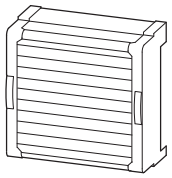
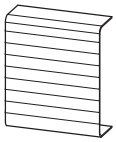
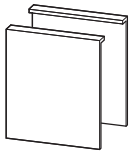
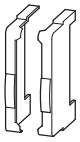
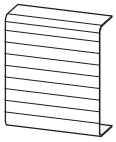
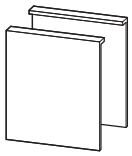
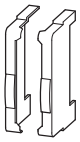
		Description	**Part no.** Article no.	**Price** See price list	Std. pack
Spare covers					
Cover for empty sections, modular					
	To cover the 60 mm system from the front Can only be used with BBC-MRCOV1.	1100 mm long.	**BBC-RCOV1** 107178		2 off
Empty sections cover support					
	Suitable for all busbar thicknesses. Can only be used with BBC-RCOV1.	–	**BBC-MRCOV1** 107179		10 off
Empty sections cover for front panel cutouts					
	Cover module for cutouts	54 mm wide. 194 mm high.	**AM-195/54** 107963		15 off
Separation profiles double T					
	For 3 pole systems with BBS-3/PR	48 mm high. 2400 mm long. Fixing on (profile) busbar support.	**BBC-CS48/PR** 107176		1 off
		76 mm high. 2400 mm long. Fixing on (profile) busbar support.	**BBC-CS76/PR** 107177		1 off

		Width	Poles	Rated operating current	Terminal capacity ○ Round conductor, solid ⊛ Round conductor, flexible, with correctly crimped ferrule ○ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded ▤ Copper strip ■ Copper bar	For use with	Cu factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
		mm		I_e A	mm					
Terminal plates • Silicone-free, chlorine-free • Temperature-resistant up to 120°C • Self-extinguishing to UL 94 • Creepage resistance CTI 200										
	Spring-type terminal design.	20	3	80	1.5 - 16 mm² AWG 16 - AWG 6. ⊛ ○	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10 Double T profile		**BBA-TP3/16** 107205		1 off
	The terminal can be removed for the connection of uncut conductors. Terminal area W x H 10 x 15 mm . Loop-through is possible.	54		300	6 - 50 mm² AWG 10 - AWG 2/0. ⊛ ○ ▤ 6 x 9 x 0.8			**BBA-TP3/50** 107183		1 off
	The terminal can be removed for the connection of uncut conductors. Terminal area W x H 15 x 15 mm. Loop-through is possible.	81		440	35 - 120 mm² AWG 2 - MCM 250. ⊛ ○ ▤ 10 x 16 x 0.8			**BBA-TP3/120** 107184		1 off

Notes [1] Calculation of material surcharge → Chapter 23

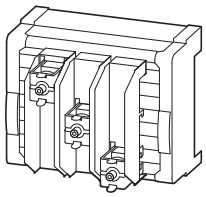
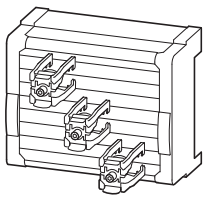
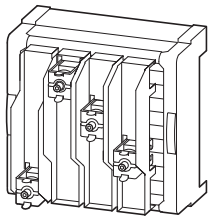
Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

		Description	**Part no.** Article no.	**Price** See price list	Std. pack
System cover, complete					
	For 3 pole systems	228 mm long.	**BBC-CS1** 107209		1 off
		270 mm long.	**BBC-CS3** 138377		1 off
	For 4 pole systems	228 mm long.	**BBC-CS4** 138387		1 off
System cover, modular					
• Silicone-free, chlorine-free • Temperature-resistant up to 120 °C • Self-extinguishing to UL 94					
	For 3 pole systems	Cover for empty sections, front. 1100 mm long.	**BBC-CS2-F** 107180		1 off
		Cover for empty sections, top/bottom 1100 mm long.	**BBC-CS2-T/B** 107181		2 off
		Support for cover for empty sections. Each set contains one left and one right support bracket.	**BBC-MCS2** 107182		1 off
	For 4 pole systems	Cover for empty sections, front. 1100 mm long.	**BBC-CS4-F** 138384		1 off
		Cover for empty sections, top/bottom 1100 mm long.	**BBC-CS4-T/B** 138383		2 off
		Support for cover for empty sections. Each set contains one left and one right support bracket.	**BBC-MCS4** 138382		1 off

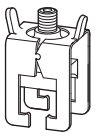
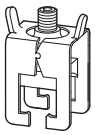
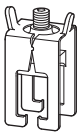
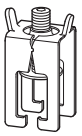
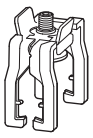
Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W × H	Width	Poles	Rated operating current	Terminal capacity Round conductor, solid Round conductor, flexible, with correctly crimped ferrule Round conductor, stranded Sectoral conductor, solid Sectoral conductor,, stranded Copper strip Copper bar	For use with	Cu factor	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm		I_e A	mm					
Connection kit										
• Silicone-free, chlorine-free • Temperature-resistant up to 120°C • Self-extinguishing to UL 94 • Creepage resistance CTI 200										
Pole spacing adjustable. Fixing direct over busbar terminal. Includes shroud with adjustable width. Loop-through is possible.										
	–	180 - 240	3	560	120 - 300 mm² MCM 300 - MCM 600. ○ ○ ▽	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile		**BBA-TP3/300**[1] 107185		1 off
	32 x 25	180 - 240		800	Up to 10 x 32 x 1 30 x 25			**BBA-TP3/ CU-BAND**[1] 107186		1 off
Adapted to Eaton NZM4. Fixing direct over busbar terminal. Loop-through is possible.										
	5 x 28	228	3	1600	Up to (2 x) 10 x 50 x 1 Up to (2 x) 50 x 10	30 x 10 Double T profile		**CU-BAND** **BBA-TP3/1000**[2][4] 107207		1 off
Pole spacing adjustable. Fixing direct over busbar terminal. Includes shroud with adjustable width. Loop-through is possible.										
	–	180 - 228	4	560	120 - 300 mm² MCM 300 - MCM 600. ○ ○ ▽	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile		**BBA-TP4/300**[3] 138385		1 off
	32 x 25	180 - 228		800	Up to 10 x 32 x 1 30 x 25			**BBA-TP4/ Copper strip**[3] 138386		1 off

Notes

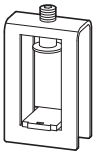
[1] Each set contains 3 pole pieces.
[2] Equipment supplied: 1 x BBC-CS1, 3 x AKS1000.
[3] Each set contains 3 pole pieces.
[4] Calculation of material surcharge → Chapter 23

	Terminal area W × H	Width	Rated operating current	Terminal capacity Round conductor, solid Round conductor, flexible, with correctly crimped ferrule Round conductor, stranded Sectoral conductor, solid Sectoral conductor,, stranded Copper strip Copper bar	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm					
Expansion terminals									
Connects onto busbars without drilling									
	Contacting of cable with busbar via cable bedding.	–	38	480	35 - 150 mm² AWG2/0 - MCM 300. Directly clamped 	12 x 5/10 20 x 5/10		**AKS150** 138374		6 off
		–	38	500	95 - 185 mm² AWG3/0 - MCM 350. Directly clamped 	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile		**AKS185** 107195		6 off
		–	41	600	150 - 300 mm² MCM300 - MCM 600. Directly clamped 			**AKS300** 107196		3 off
	Contacting of cable with busbar via contact block.	32 x 25	41	800	 3 x 20 x 1 up to 2 x (10 x 32 x1) 32 x 25			**AKS-CU-BAND** 107197		3 off
		55 x 28	72	1600	Up to (2 x) 10 x 50 x 1 Up to (2 x) 50 x 10			**AKS1000** 107208		1 off
		68 x 28	122	1600	Up to (2 x) 60 x 10	30 x 10 Double T profile Triple T profile		**AKS1200** 138375		3 off
		105 x 28	122	1600	Up to (2 x) 100 x 10			**AKS2000** 138376		3 off

Notes [1] Calculation of material surcharge → Chapter 23

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

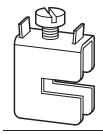
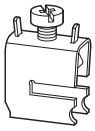
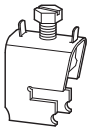
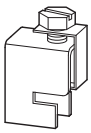
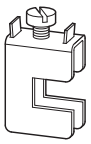
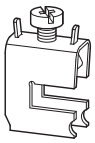
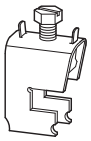
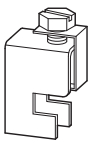
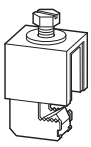
	Terminal area W × H	Width	Rated operating current	Terminal capacity Round conductor, solid Round conductor, flexible, with correctly crimped ferrule Round conductor, stranded Sectoral conductor, solid Sectoral conductor,, stranded Copper strip Copper bar	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm					
Profile terminals									
Connects onto busbars without drilling									
 When connecting laminated busbars in parallel, fit a spacer.	–	82	1600	750 mm², terminal area 51 x 5 - 28	Double T profile		**AKP750** 138364		3 off
	–	72	1600	800 mm², terminal area 41 x 20 - 42			**AKP800** 107198		3 off
	–	94	1600	900 mm², terminal area 64 x 5 - 28			**AKP900** 138365		3 off
	–	94	1600	1000 mm², terminal area 51 x 20 - 42			**AKP1000** 107199		3 off
	–	94	2000	1200 mm², terminal area 64 x 20-42			**AKP1200** 138366		3 off
	–	112	2500	1600 mm², terminal area 81 x 20 - 42			**AKP1600** 138367		3 off
	–	132	3000	2000 mm², terminal area 101 x 20 - 42			**AKP2000** 138368		3 off
	–	132	3200	3600 mm², terminal area 101 x 23 - 45			**AKP3600** 138369		3 off

Notes

[1] Calculation of material surcharge → Chapter 23

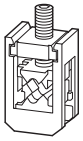
Information relevant for export to North America

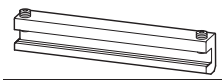
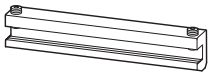
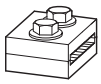
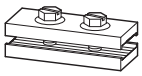
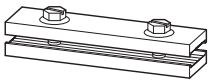
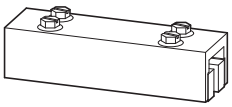
Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W × H	Width	Rated operating current	Terminal capacity ○ Round conductor, solid ⊜ Round conductor, flexible, with correctly crimped ferrule ⊙ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded ▤ Copper strip ■ Copper bar	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm				
Universal conductor Connection terminals								
With integrated retaining spring, open clamping area and captive terminal screw.								
	7.5 x 7.5	11.5	180	1.5 - 16 mm² AWG 14 - AWG 6. ⊜ Directly clamped ○ ⊙ ▤ 8 x 6 x 0.5	All 5 mm thick flat busbars	**AKU16/5** 107187		100 off
	10.5 x 11	15.5	270	4 - 35 mm² AWG 10 - AWG 2. ⊜ Directly clamped ○ ⊙ ▤ 3 x 9 x 0.8 or 6 x 9 x 0.8		**AKU35/5** 107188		50 off
	14 x 14	20.5	400	16 - 70 mm² AWG 4 - AWG 2/0. ⊜ Directly clamped ⊙ ▤ 2 x (3 x 9 x 0.8) or 6 x 9 x 0.8		**AKU70/5** 107189		25 off
	17 x 1	23.5	440	16 - 120 mm² AWG 4 - MCM 250. ⊜ Directly clamped ⊙ ▤ 4 x 16 x 0.8 or 6 x 16 x 0.8 or 10 x 16 x 0.8		**AKU120/5** 107190		25 off
	7.5 x 7.5	11.5	180	1.5 - 16 mm² AWG 14 - AWG 6. ⊜ Directly clamped ○ ⊙ ▤ 8 x 6 x 0.5	All 10 mm thick flat busbars	**AKU16/10** 107191		100 off
	10.5 x 11	15.5	270	4 - 35 mm² AWG 10 - AWG 2. ⊜ Directly clamped ○ ⊙ ▤ 3 x 9 x 0.8 or 6 x 9 x 0.8		**AKU35/10** 107192		50 off
	14 x 14	20.5	400	16 - 70 mm² AWG 4 - AWG 2/0. ⊜ Directly clamped ⊙ ▤ 2 x (3 x 9 x 0.8) or 6 x 9 x 0.8		**AKU70/10** 107193		25 off
	17 x 15	23.5	440	16 - 120 mm² AWG 4 - MCM 250. ⊜ Directly clamped ⊙ ▤ 4 x 16 x 0.8 or 6 x 16 x 0.8 or 10 x 16 x 0.8		**AKU120/10** 107194		25 off
	M8 x 8 bolts	30	490	Cable lugs M8	All 10 mm thick flat busbars Double T profile	**AKU-M8/10** 138362		20 off
	M10 x 10 bolts	38	630	Cable lugs M10		**AKU-M10/10** 138361		6 off

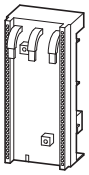
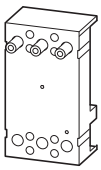
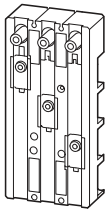
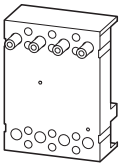
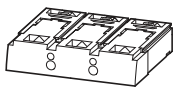
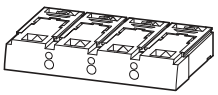
Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W × H	Width	Rated operating current	Terminal capacity ○ Round conductor, solid ⦾ Round conductor, flexible, with correctly crimped ferrule ⦾ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded Copper strip Copper bar	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm				
Plate terminals								
	–	50	630	–	All 10 mm thick flat busbars	**PK900** 138378		3 off
Connection terminals								
	Contacting of cable with busbar via cable bedding.	48	630	95 - 300 mm²	30 x 10 Double T profile Triple T profile	**AK300** 138363		3 off

		Width	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
		mm					
Busbar end-to-end connectors							
For hole-less connection of identical busbars.							
For the same flat copper bars Rated operating current 630 A							
	System spacing 100 - 110 mm. Max. permissible busbar offset 1 mm.	38	12 x 5/10 15 x 5/10 20 x 5/10		**BBT-CU12-20X5/10-38** 138379		12 off
		150			**BBT-CU12-20X5/10-150** 107200		3 off
	System spacing 50 - 60 mm. Max. permissible busbar offset 5 mm.	40			**BBT-CU20-30X5/10-40** 138380		6 off
		95			**BBT-CU20-30X5/10-95** 107201		3 off
	System spacing 100 - 110 mm. Max. permissible busbar offset 5 mm.	150			**BBT-CU20-30X5/10-150** 107202		3 off
For differing and same double T profile busbars. Rated operating current 1600 A							
	System spacing 9 - 20 mm. Max. permissible busbar offset 2 mm.	50	Double T profile		**BBT-CU-BAR500/720-50** 107203		6 off
	System spacing 100 - 110 mm. Max. permissible busbar offset 5 mm.	150			**BBT-CU-BAR500/720-150** 107204		3 off

Notes [1] Calculation of material surcharge → Chapter 23

	Number of poles	Rated operational current I_e A	Adapter width mm	For use with	Copper factor[9]	**Part no.** Article no.	**Price** See price list	Std. pack	
Component adapters for circuit-breakers and switch-disconnectors									
For installation on flat copper busbars 12 – 30 x 5 – 10, double T and triple T profile Rated operating voltage U_e: 690 V • Temperature-resistant up to 120 °C • Self-extinguishing to UL 94 • Creepage resistance CTI 200									
	3 pole	160	90	NZM1, PN1, N(S)1		**NZM1-XAD160**[7] 104554		1 off	1)
		250	106	NZM2, PN2, N(S)2		**NZM2-XAD250**[7] 104555		1 off	2)
		630	140	NZM3, PN3, N3		**NZM3-XAD630** 107206		1 off	3)
	4 pole	250	140	NZM2, PN2, N(S)2 NZM2(-4), PN2(-4), N(S)2(-4)		**NZM2-4-XAD250** 138388		1 off	5)
		630	185	NZM3, PN3, N(S)3 NZM3(-4), PN3(-4), N3(-4)		**NZM3-4-XAD630** 138389		1 off	4)
Connection blocks for component adapters									
For NZM2, NZM3 circuit-breakers									
	3 pole	250		NZM2, PN2, N(S)2		**NZM2-XKR4**[8] 281666		1 off	6)
	3 pole	630		NZM3, PN3, N(S)3		**NZM3-XKR13**[8] 281668		1 off	
	4 pole	250		NZM2-4, PN2-4, N(S)2-4		**NZM2-4-XKR4** 118907		1 off	
	4 pole	630		NZM3-4, PN3-4, N(S)3-4		**NZM3-4-XKR13** 119020		1 off	

Notes

1) For switches with standard box terminal connection.
Connection to the system at top using supplied connection cable.
In conjunction with IP2X protection against contact with a finger
Enhanced contact protection on the switch output end possible.
Latch fitting to busbar using combination fixing base
Combination fixing base for adjustment to 5 and 10 mm rail thickness, terminal capacity 6 x 9 x 0.8.
Rated short-circuit switching capacity 35 kA at 480 V.
Busbar must be de-energized for mounting.

2) Connection to the system from above or below through rear connection (+)NZM2-XKR4…
Mounted with clamp and screw fixing.
Rated short-circuit switching capacity 65 kA at 480 V, 50 kA at 600 V.
Busbar must be de-energized for mounting.

3) Connection to the system from above or below through rear connection (+)NZM3-XKR13…
Mounted with claw-type terminal.
Rated short-circuit switching capacity 65 kA at 480 V, 50 kA at 600 V.
Busbar must be de-energized for mounting. Reduction of rated operating current → Page 16/41

4) Connection to the system from above or below through rear connection (+)NZM3-4-XKR13…
Mounted with clamp and screw fixing.

5) Connection to the system from above or below through rear connection (+)NZM2-4-XKR4…
Mounted with clamp and screw fixing.

6) Part no. and part no. suffix include parts for one switch side at top or bottom (with NZM...-4-... top only).
Required for component adapters NZM2-XAD and NZM3-XAD
O = for fitting at the top
U = for fitting at the bottom

Information relevant for export to North America

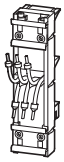
7)

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

8)

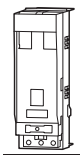
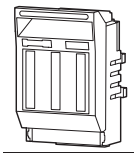
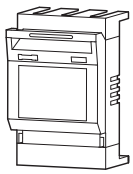
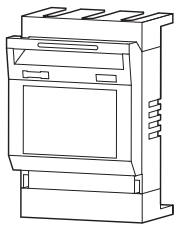
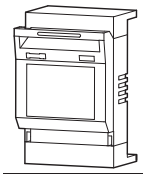
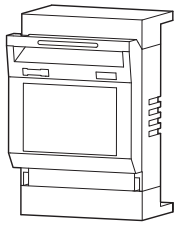
Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Refer to main component information

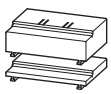
9) Calculation of material surcharge → Chapter 23

	Rated operational voltage U_e V AC	Conductor cross-section	Adapter width mm	For use with	Support rail Number	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar adapters for PKZ and PKE								
Complete range → Chapter 7 For surface mounting to flat copper busbars with 60 mm between busbar centers, suitable for 5 mm and 10 mm busbar thickness and also double T profile. Mounted by latching onto de-energized busbar.								
Connecting cables								
–	–	–	–	BBA…	–	**BBA-XLT-6-130** 116902		30 off
–	–	–	–	BBA…	–	**BBA-XLT-16-142** 116903		30 off
Double adapters Rated operational current 35 A								
	690	AWG 10 (6 mm²)	45	12x5/10 15x5/10 20x5/10 25x5/10 30x5/10	2	**Z-SS-60-ADD/6-45** 288790		1 off
	690	AWG 10 (6 mm²)	54	12x5/10 15x5/10 20x5/10 25x5/10 30x5/10	2	**Z-SS-60-ADD/6-54** 288791		1 off
	690	AWG 10 (6 mm²)	72	12x5/10 15x5/10 20x5/10 25x5/10 30x5/10	2	**Z-SS-60-ADD/6-72** 288792		1 off
	690	AWG 10 (6 mm²)	81	12x5/10 15x5/10 20x5/10 25x5/10 30x5/10	2	**Z-SS-60-ADD/6-81** 288793		1 off

Information relevant for export to North America

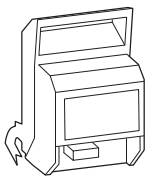
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	On request
UL CCN	On request
CSA File No.	On request
CSA Class No.	On request
NA Certification	UL Recognized, CSA certified

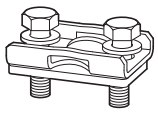
	Connection	Spacing between busbar centers	Rated operational current	Max. fuse link			For use with	**Part no.** Article no.	**Price** See price list	Std. pack
			I_e	500 V	690 V	Size				
		mm	A	A	A					
LV h.b.c. fuse switch-disconnectors										
• Includes handguard top and bottom (except GST-160-40-60-AOU) • Mounting without holes • For surface mounting on busbars 3 pole										
	Box terminal 1.5 - 50 mm² Bottom	60	100	100	–	NH000	20 x 5/10 30 x 5/10 Double T profile	**LTS-100/C00/3-R** 284690		1 off
	Box terminal 1.5 - 70 mm² Top or bottom	40 50 60	160	160	100	NH00	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	**GST00-160-40-60-AOU**[1] 224550		1 off
	Screw M10 Top	60	250	250	200	NH1	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	**GST1-AO** 107250		1 off
		60	400	400	315	NH2		**GST2-AO** 107252		1 off
		60	630	630	500	NH3		**GST3-AO** 107254		1 off
	Screw M10 Bottom	60	250	250	200	NH1	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	**GST1-AU** 107251		1 off
		60	400	400	315	NH2		**GST2-AU** 107253		1 off
		60	630	630	500	NH3		**GST3-AU** 107255		1 off

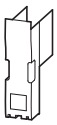
	Size	Rated operating voltage U_e V	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Handguard for switch-disconnectors							
Provides additional protection for operator during actuation of fuse switch-disconnector							
	00	–	GST00-160-…	**BS-SET-GST00** 107955		1 off	One set contains handguard top and bottom.

Notes

[1] Without handguard.
Order optional handguard BS-SET-GST00 → Page 16/16
LV h.b.c. fuse links → Page 19/53

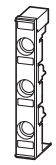
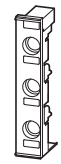
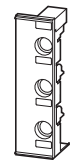
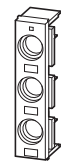
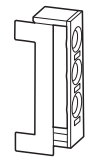
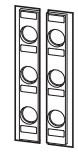
	Size	Rated operating voltage U_e V	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Cover with fuse monitoring for fuse switch-disconnectors							
• Operation indicator 1 green LED • Fuse failure indication 3 red LEDs (F1, F2, F3) • Fault indication through relay contacts (floating) • Not for 1-phase application.							
	00	400 - 690	GST00...-A...	**GST00-DSI** 107956		1 off	–
	1	400 - 690	GST1-A...	**GST1-DSI** 107957		1 off	–
	2	400 - 690	GST2-A...	**GST2-DSI** 107958		1 off	–
	3	400 - 690	GST3-A...	**GST3-DSI** 107959		1 off	–

	Terminal range	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Sets of prism terminals						
	1 x (70 - 150) mm² Cu/Al	GSU1, GST…1	**PSK1** 038734		1 off	One set contains 3 prism terminals.
	1 x (120 - 240) mm² Cu/Al	GSU2, GST…2	**PSK2** 043480			
	1 x (120 - 300) mm² Cu/Al	GSU3, GST…3	**PSK3** 048226			
Sets of double prism terminals						
	2 x (70 - 95) mm² Cu/Al	GSU1, GST…1	**PSK12** 041107		1 off	One set contains 3 double prism terminals
	2 x (120 - 150) mm² Cu/Al	GSU2, GST…2	**PSK22** 045853			
	2 x (120-240) mm² Cu/Al	GSU3, GST…3	**PSK32** 050599			
Box terminals						
	25 - 150 mm² Copper strip 6 x 16 x 0.8 mm	GST…1	**SK1-GS** 107960		3 off	3 required for each GST....
	25 - 240 mm² Copper strip 10 x 16 x 0.8 mm	GST…2	**SK2-GS** 107961			
	25 - 300 mm² Copper strip 11 x 21 x 1 mm	GST…3	**SK3-GS** 107962			

	Rated operational current	Max. fuse link		Size	For use with	Connection	**Part no.** Article no.	**Price** See price list	Std. pack
	I_e	400 V	690 V						
	A	A	A						
LV h.b.c. fuse switches									
• With terminal compartment cover • Mounting without holes with spike type terminal Components supplied • NH-SLS-00/160-60(-SI): with box terminals Busbar mounting • NH-SLS-00/160-60(-SI) 60 mm spacing between busbar centers									
Without fuse monitoring									
	160	160	160	00	12 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10 Double-T-profiles	Top or bottom	**NH-SLS-00/160-60**[1] 106211		1 off
With fuse monitoring									
	160	160	–	00	12 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10 Double-T-profiles	Top or bottom	**NH-SLS-00/160-60-SI**[1] 106216		1 off
Terminal shroud/size adapter for GST…									
For NH-SLS-00/160-60 Size 00									
							**Z-NH-SLS-KA** 106223		2 off

Notes

[2] LV h.b.c. fuse links → Page 19/53

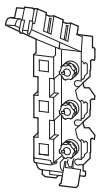
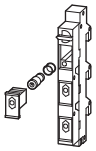
		Rated operational current I_e A	Rated operating voltage U_e V AC	Size	Mounting width mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
D busbar mounting fuse devices									
Basic units									
• Includes contact protection shroud with front and bottom plate and designation label • Supplied empty without screw cap									
	Cartridge ring adapter	63	400	E18, D 02	27	12 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	**D02-SO/63/3-R-27**[1] 114315		10 off
	Cartridge ring adapter			E18, D 02	36		**Z-D02/R/3-36**[1] 100663		60 off
	Cartridge ring adapter			E18, D 02	54		**Z-D02/R/3-54**[1] 100664		40 off
	Gage ring	25	500	E 27, D II	45		**DII-SO/25/3-R**[2] 107965		10 off
	Gage screw	25	500	E 27, D II	45		**DII-SO/25/3-R-PS**[2] 110394		10 off
	Gage ring	63	690	E 33, D III	54		**DIII-SO/63/3-R**[3] 107966		10 off
	Gage screw	63	690	E 33, D III	54		**DIII-SO/63/3-R-PS**[3] 110395		10 off
Side cover Can be fitted on right or left Can be fitted to D…-SO/…/3-R(-PS)									
	–	–	–	–	–	DII-SO/…/3-R(-PS)	**SBS-RS60** 060541		10 off
Kit for fitting over busbar supports Can be fitted to D02-SO/63/3-R-27									
	–	–	–	–	36	D02-SO/63/3-R-27	**Z-D02-S-AB-SET** 100662		10 off

Notes

[1] A complete and functional fuse element consists of the basic unit
- Fuse link → Page 19/47
- Fuse adapter → Page 19/47
- Screw cap → Page 19/47

[2] A complete and functional fuse element consists of the basic unit
- Fuse link → Page 19/43
- Fuse adapter → Page 19/44
- Screw cap → Page 19/44

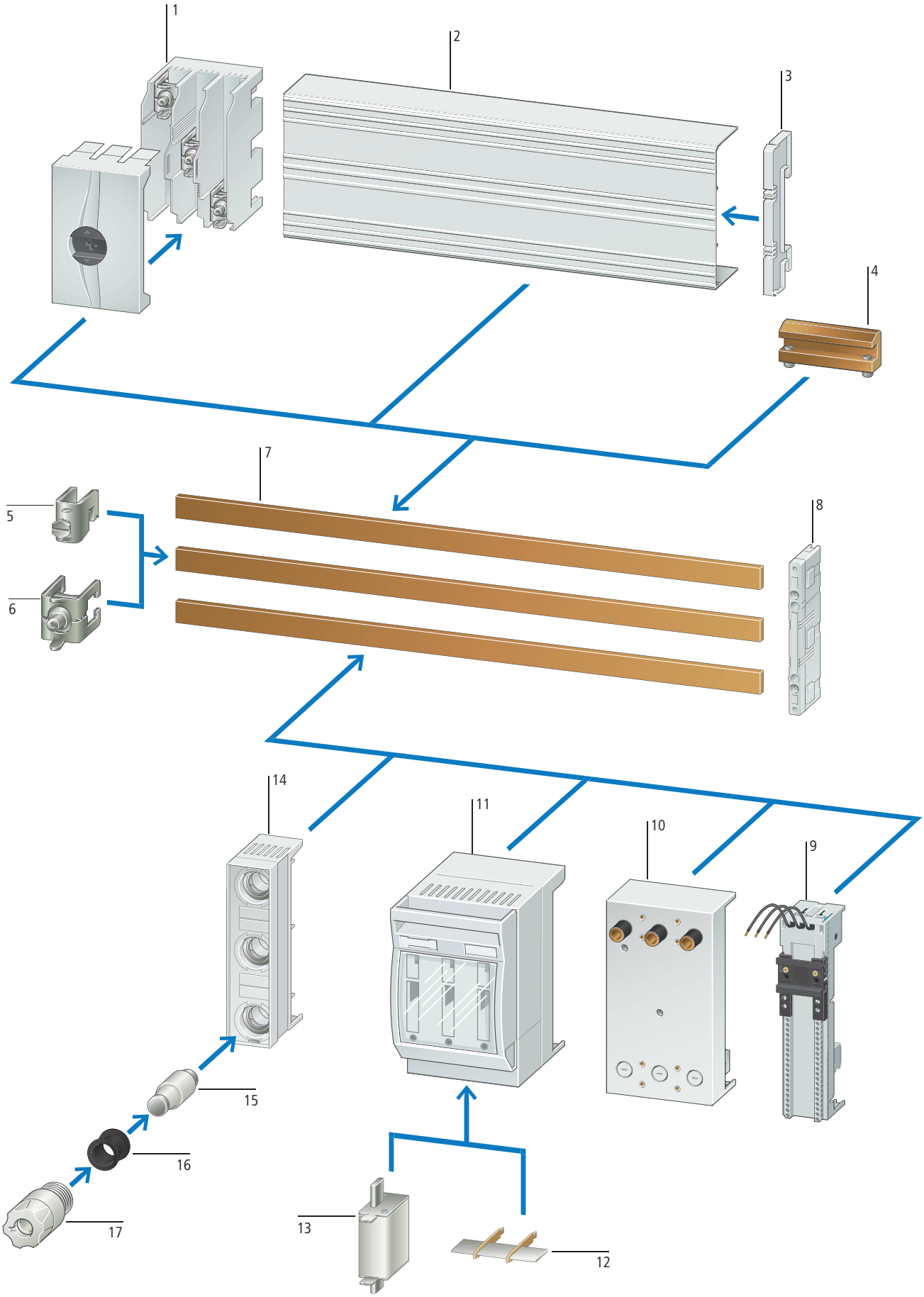
[3] A complete and functional fuse element consists of the basic unit
- Fuse link → Page 19/43
- Fuse adapter → Page 19/44
- Screw cap → Page 19/44

		Rated operational current I_e A	Rated operational voltage U_e V AC	Size	Mounting width mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
D fuse switch-disconnectors without flashing function									
• 3 pole • Including contact protective shroud with front and bottom plate • Delivered empty and without screw cap									
	Gage ring	63	400	E18, D 02	36	20 x 5/10 30 x 5/10 Double T profile	**D02-S/63/3-RS**[1] 284649		1 off
D fuse switch-disconnectors with flashing function									
• The flashing function indicates a blown fuse link • Supplied empty, without cartridge ring adapters and fuse links • Retaining springs for D01 fuse links or 10x38 cylindrical fuse links supplied • Contact position indicator • Fuse plug without screw cap • Switches the load on all poles and without touching by hand • D02-LTS/63/3-R-HK with integrated auxiliary contact • Sealable and lockable									
	–	32	400	C10x38	27	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	**D02-LTS/63/3-R** 114316		3 off
	–	63	400	E18, D02	27		**D02-LTS/63/3-R-HK** 114318		3 off

Notes

[1] A complete and functional fuse element consists of the basic unit
- Fuse link → Page 19/47
- Fuse adapter → Page 19/47
- Screw cap → Page 19/47

System overview



Terminal plates 1
Simple connection by contacting the conductor.
Full contact protection.
→ Page 16/25

Cover for empty sections, modular 2
Spare section cover can be cut to length.
Clipped on simply and quickly to the support provided.
Compact height.
For 3 pole systems.
→ Page 16/24

Empty sections cover support 3
Simple push-fit, for busbars 12 x 5/10.
For 3 pole systems.
→ Page 16/24

Busbar end-to-end connectors 4
For interconnecting busbar systems.
For flat busbars.
→ Page 16/26

Universal conductor Connection terminals 5
With integrated retaining spring.
Captive fixing screw.
Suitable for all copper, flat and profiled busbars.
→ Page 16/26

Expansion terminals 6
For fitting to busbars without drilling
Cables can be inserted from the top simply and quickly.
→ Page 16/25

Flat busbars 7
12 x 5 and 12 x 10 mm, Cu.
→ Page 16/24

Busbar supports 8
Suitable for use with flat busbars 12 x 5/10.
Compact height.
For 3 pole systems.
Spacing between busbar centers 60 mm.
→ Page 16/24

Busbar adapters for PKZ and PKE 9
Mounting rails and connection cables prepared for motor starter combinations with PKZ, PKE or DILM.
Compact height.
→ Page 7/23

Busbar adapters for NZM 10
Safe termination.
For 3 pole systems
Conductors completely embedded for maximum safety.
Easy mounting and terminal connection
→ Page 16/27

LV h.b.c. fuse switch-disconnectors 11
Switching device NH000 up to 100 A.
Simple changing of termination direction bottom/top.
Compact height.
→ Page 16/27

Disconnecting blades 12
Can be used instead of LV h.b.c. fuse links.
Full contact blades.

LV h.b.c. fuse links 13
Compact construction size up to 100 A, NH00 fuses can also be used in NH000 devices.
→ Page 19/53

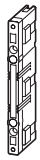
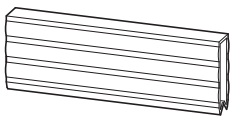
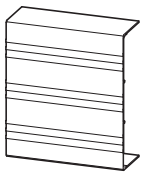
D busbar mounting fuse devices 14
D02, compact height.
Box terminal for connecting cables up to 25 mm^2.
Integrated protection against direct contact
→ Page 16/20

Fuse links 15
D.02
→ Page 19/47

Gage pieces 16
Gage rings D02.
→ Page 19/47

Screw cap 17
D.02
→ Page 19/47

Ordering

		Poles	Rated operational current I_e A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar supports							
Compact busbar support							
	With removable contact element for adapting to the busbar size. With screw holes on inside and integrated end cover.	3	360	12 x 5/10	**BBS-3/FL-C**[1] 138370		10 off
Busbar shrouds							
• Silicone-free, chlorine-free • Temperature-resistant up to 110 °C • Self-extinguishing to UL 94							
	1000 mm long.	–	–	12 x 5 15 x 5 20 x 5 25 x 5 30 x 5	**BBC-FL5** 107173		10 off
	1000 mm long.	–	–	12 x 10 15 x 10 20 x 10 25 x 10 30 x 10	**BBC-FL10** 107174		10 off
System covers							
Cover for empty sections, modular For covering the Compact System from the front. Can only be used with BBC-MRCOV3-C.							
	1100 mm long.	–	–		**BBC-RCOV3-C** 138371		2 off
Empty sections cover support Suitable for 5 and 10 mm busbar thickness. Can only be used with BBBC-RCOV3-C.							
	–	–	–	12 x 5/10	**BBC-MRCOV3-C** 138372		10 off

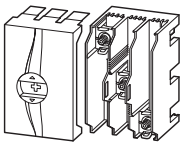
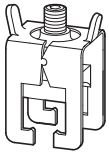
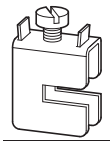
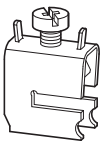
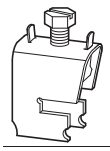
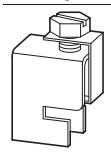
	Rated operational current I_e A	Copper bars mm	Length mm	Copper factor[2]	Material	**Part no.** Article no.	**Price** See price list	Std. pack
Flat busbars								
	160	12 x 5	1500		Copper, tinned	**CU12X5** 034121		10 off
	160	12 x 5	2250		Copper, tinned	**CU12X5-2250** 005093		10 off

Notes

[1] Short-circuit strength → Page 16/40
[2] Calculation of material surcharge → Chapter 23

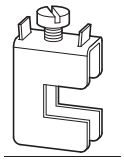
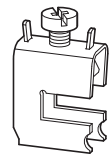
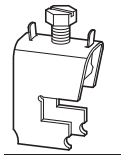
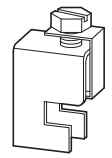
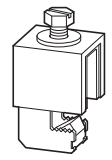
Information relevant for export to North America

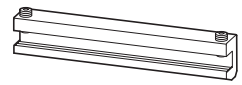
Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W x H	Width	Poles	Rated operating current	Terminal capacity ○ **Round conductor, solid** ⊛ Round conductor, flexible, with correctly crimped ferrule ○ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded ▤ Copper strip ■ **Copper bar**	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm		I_e A	mm				
Terminal plates									
The terminal can be removed for the connection of uncut conductors. Contacting of cable with busbar via cable bedding.									
	–	90	3	480	35 - 150 mm² AWG 2 - MCM 300. ⊛ ○ ▤ 10 x 20 x 1	12 x 5/10 15 x 5/10 20 x 5/10	**BBA-TP3/100-C** 138373		1 off
Expansion terminals									
Contacting of cable with busbar via cable bedding.									
	–	38	–	480	35 - 150 mm² AWG2/0 - MCM 300. ⊛ Directly clamped ○ ▽	12 x 5/10 20 x 5/10	**AKS150** 138374		6 off
Universal conductor Connection terminals									
	7.5 x 7.5	11.5	–	180	1.5 - 16 mm² AWG 14 - AWG 6. ⊛ Directly clamped ○ ○ ▤ 8 x 6 x 0.5	All 5 mm thick flat busbars	**AKU16/5** 107187		100 off
	10.5 x 11	15.5	–	270	4 - 35 mm² AWG 10 - AWG 2. ⊛ Directly clamped ○ ○ ▤ 3 x 9 x 0.8 or 6 x 9 x 0.8		**AKU35/5** 107188		50 off
	14 x 14	20.5	–	400	16 - 70 mm² AWG 4 - AWG 2/0. ⊛ Directly clamped ○ ▤ 2 x (3 x 9 x 0.8) or 6 x 9 x 0.8		**AKU70/5** 107189		25 off
	17 x 15	23.5	–	440	16 - 120 mm² AWG 4 - MCM 250. ⊛ Directly clamped ○ ▤ 4 x 16 x 0.8 or 6 x 16 x 0.8 or 10 x 16 x 0.8		**AKU120/5** 107190		25 off

Information relevant for export to North America

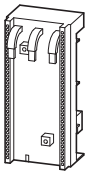
Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

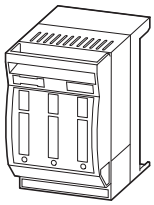
	Terminal area W x H	Width	Poles	Rated operational current	Terminal capacity ○ Round conductor, solid ⊛ Round conductor, flexible, with correctly crimped ferrule ⊙ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded ▤ Copper strip ■ Copper bar	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm		I_e A	mm				
Universal conductor connection terminals									
	7.5 x 7.5	11.5	–	180	1.5 - 16 mm² AWG 14 - AWG 6. ⊛ Directly clamped ○ ⊙ ▤ 8 x 6 x 0.5	All 10 mm thick flat busbars	**AKU16/10** 107191		100 off
	10.5 x 11	15.5	–	270	4 - 35 mm² AWG 10 - AWG 2. ⊛ Directly clamped ○ ⊙ ▤ 3 x 9 x 0.8 or 6 x 9 x 0.8		**AKU35/10** 107192		50 off
	14 x 14	20.5	–	400	16 - 70 mm² AWG 4 - AWG 2/0. ⊛ Directly clamped ⊙ ▤ 2 x (3 x 9 x 0.8) or 6 x 9 x 0.8		**AKU70/10** 107193		25 off
	17 x 15	23.5	–	440	16 - 120 mm² AWG 4 - MCM 250. ⊛ Directly clamped ⊙ ▤ 4 x 16 x 0.8 or 6 x 16 x 0.8 or 10 x 16 x 0.8		**AKU120/10** 107194		25 off
	M8 x 8 bolts	30	–	490	Cable lugs M8	All 10 mm thick flat busbars Double T profile	**AKU-M8/10** 138362		20 off
	M10 x 10 bolts	38	–	630	Cable lugs M10		**AKU-M10/10** 138361		6 off

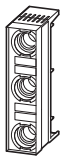
		Width	Rated operating current	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
		mm	I_e A				
End-to-end busbar econnectors							
For hole-less connection of identical busbars.							
	For the same flat copper bars. System spacing 100 - 110 mm. Max. permissible busbar offset 1 mm.	38	630	12 x 5/10 15 x 5/10 20 x 5/10	**BBT-CU12-20X5/10-38** 138379		12 off
		150			**BBT-CU12-20X5/10-150** 107200		3 off

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Poles	Rated operational current I_e A	Adapter width mm	For use with	Copper factor[2]	Part no. Article no.	Price See price list	Std. pack
Component adapters for circuit-breakers and switch-disconnectors								
For surface mounting on flat copper busbars 12 – 30 x 5 – 10, double T and triple T profile Rated operating voltage U_e: 690 V • Temperature-resistant up to 120 °C • Self-extinguishing to UL 94 • Creepage resistance CTI 200								
	3 pole	160	90	NZM1, PN1, N(S)1	0.23	**NZM1-XAD160**[1][2] 104554		1 off

	Poles	Spacing between busbar centers mm	Rated operational current I_e A	Max. fuse link 500 V A	Max. fuse link 690 V A	Size	For use with	Part no. Article no.	Price See price list	Std. pack
LV h.b.c. fuse switch-disconnectors										
 For surface mounting on busbars	3 pole	60	100	100	100	NH00(0) (max. 21 mm width)	–	**FCFSDNH000BBC60-3**[4] 139533		1 off

	Rated operational current I_e A	Rated operational voltage U_e V AC	Size	Width mm	For use with	Part no. Article no.	Price See price list	Std. pack
D busbar mounting fuse devices								
Basic units								
 Latch mechanism for push-fitting on busbar. Gage ring	63	400	E18 D02	36	12 x 5/10	**FCFBD02BBC60-3-36**[3] 139532		6 off

Notes

[1] For switches with standard box terminal connection.
Connection to the system at top using supplied connection cable.
In conjunction with IP2X protection against contact with a finger
Enhanced contact protection on the switch output end possible.
Latch fitting to busbar using combination fixing base
Combination fixing base for adjustment to 5 and 10 mm rail thickness, terminal capacity 6 x 9 x 0.8.
Rated short-circuit switching capacity 35 kA at 480 V.
Busbar must be de-energized for mounting.

[2] Calculation of material surcharge → hapter 23

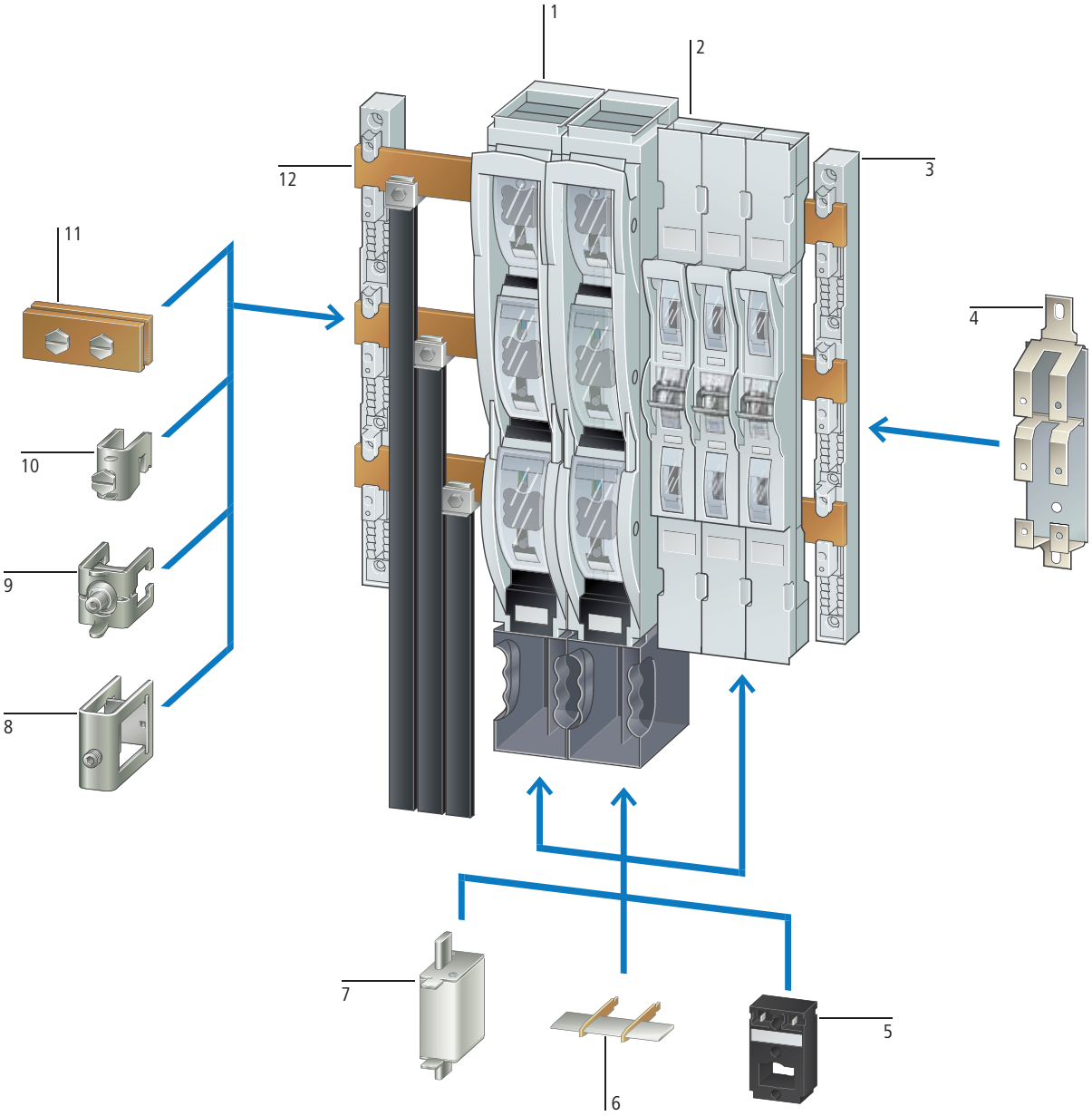
[3] A complete and functional fuse element consists of the basic unit
- Fuse link → Page 19/47
- Fuse adapter → Page 19/47
- Screw cap → Page 19/47

[4] LV h.b.c. fuse links → Page 19/53

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

System overview



LV h.b.c. fuse switches 250 up to 630 A 1

Spacing between busbar centers 185 mm.

Prepared for current transformer.

Top or bottom outgoer possible.

With/without electronic fuse monitoring.

→ Page 16/32

LV h.b.c. fuse switches 160 A 2

Spacing between busbar centers 100 mm.

Adaptable for 185 mm system.

With/without electronic fuse monitoring.

Top or bottom outgoer possible.

→ Page 16/32

Busbar supports 3

Spacing between busbar centers 185 mm.

Hole-less mounting of 30, 40, 50, to 120 x 10 mm flat busbars, double T and triple T profiled busbars.

→ Page 16/31

Adapters 4

Adapts NH00 fuse combination units to the 185 mm system.

Single or double adapters.

Prepared for current transformer.

→ Page 16/33

Current transformer 5

Can be retrofitted at any time with all fuse combination units.

No additional space required, simply swing in.

→ Page 16/33

Disconnecting blades 6

Can be used instead of LV h.b.c. fuse links.

Full contact blades.

LV h.b.c. fuse links 7

High breaking capacity 120 kA.

Fuse links NH00, NH1, NH2 and NH3 up to 630 A.

→ Page 19/53

Profile terminals 8

Safe connection of flat copper busbars or multi-layer copper strip to profiled busbars.

8 different construction sizes from 750 to 3600 mm² terminal area.

→ Page 16/35

Expansion terminals 9

For fitting to busbars without drilling.

Cables can be inserted from the top simply and quickly.

→ Page 16/34

Universal conductor terminals 10

With integrated retaining spring.

Captive fixing screw.

Suitable for all copper, flat and profiled busbars.

→ Page 16/36

End-to-end busbar connectors 11

For interconnecting busbar systems.

For flat and profiled busbars.

→ Page 16/37

Flat busbars, profiled busbars 12

Profiled busbars with cross-sections 500, 720 and 1140 mm², and flat copper busbars up to 30 x 10 mm.

Tin-plated copper busbars cut time needed to prepare contact points.

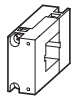
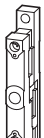
Flat busbars

→ Page 16/24

Profiled busbars

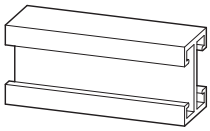
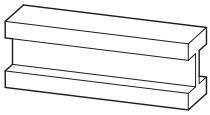
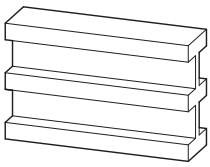
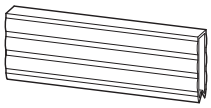
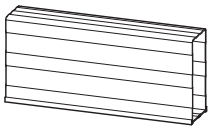
→ Page 16/31

Ordering

		Poles	Rated operational current I_e A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar supports							
Double T/Triple T profile busbar supports • Thermoplast, silicone-free, chlorine-free • Halogen-free • Self-extinguishing to UL 94 • RAL 7035 • Creepage resistance CTI 200 • Temperature-resistant up to 120 °C							
	Can be fitted with NH-SLS… Hole-less mounting of busbars.	3	2500	30 x 10 40 x 10 50 x 10 60 x 10 80 x 10 100 x 10 120 x 10 Double T profile Triple T profile	**BBS-3/FL-185** 107210		1 off
Double T profile busbar supports • Thermoplast, silicone-free, chlorine-free • Halogen-free • Self-extinguishing to UL 94 • RAL 7035 • Creepage resistance CTI 200 • Temperature-resistant up to 120 °C							
	Suitable for surface mounting of PE or N bar. With internal screw holes.	1	1600	Double T profile	**BBS-1/PR** 107165		10 off
PE/N busbar supports • Thermoplast, silicone-free, chlorine-free • Halogen-free • Self-extinguishing to UL 94 • RAL 7035 • Creepage resistance CTI 200 • Temperature-resistant up to 120 °C							
	Can be fitted to all busbar sizes using concertina system. Can be mounted individually.	2	630	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10	**BBS-2/FL** 107069		10 off
	Can be fitted to all busbar sizes using concertina system. Can be mounted individually.	1	630	12 x 5/10 15 x 5/10 20 x 5/10 25 x 5/10 30 x 5/10	**BBS-1/FL** 107161		10 off

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

		Poles	Rated operational current I_e A	For use with	Cu factor	**Part no.** Article no.	**Price** See price list	Std. pack
Profiled busbars								
E-CU double T profile busbar								
	Tinned, cross-section 500 mm², 2400 mm long.	–	1250	For supports BBS-3/PR, BBS-1/PR, BBS-3/FL-185		**CU-BAR-500/T**[1] 107166		32 off
	Tinned, cross-section 720 mm², 2400 mm long.	–	1600	For supports BBS-3/PR, BBS-1/PR, BBS-3/FL-185		**CU-BAR-720/T**[1] 107167		32 off
E-CU triple T profiled busbars								
	Tinned, cross-section 1140 mm², 2400 mm long.	–	2500	For supports BBS-3/FL-185, KSX-3….		**CU-BAR-1140/T** 107168		10 off
Busbar shrouds								
• Silicone-free, chlorine-free • Temperature-resistant up to 110 °C • Self-extinguishing to UL 94								
	1000 mm long.	–	–	12 x 10 15 x 10 20 x 10 25 x 10 30 x 10		**BBC-FL10** 107174		10 off
	1000 mm long.	–	–	For double T profile		**BBC-CU-BAR/PR** 107175		5 off

Notes

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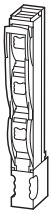
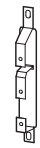
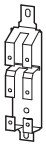
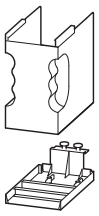
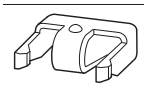
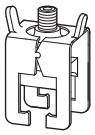
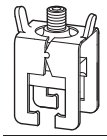
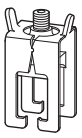
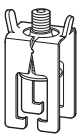
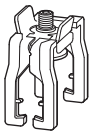
Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Rated operational current	Max. fuse link		Size	For use with	Connection	**Part no.** Article no.	**Price** See price list	Std. pack
	I_e	400 V	690 V						
	A	A	A						
LV h.b.c. fuse switches									
• With terminal compartment cover • Mounting without holes with spike type terminal Equipment supplied • NH-SLS-00/160(-SI): with claw-type and box terminals • NH-SLS sizes 1, 2, 3: without claw-type and box terminals Busbar mounting • For size 00: • NH-SLS-00/160-60(-SI) 100 mm spacing between busbar centers, hole-less or screw fixing • Sizes 1, 2, 3: 185 mm space between busbar centers, hole-less or screw fixing									
Without fuse monitoring									
	160	160	160	00	30 x 10 40 x 10 50 x 10 60 x 10 80 x 10 100 x 10 120 x 10 Double T profile Triple T profile	Top or bottom	**NH-SLS-00/160** 106210		1 off
	250	250	250	1			**NH-SLS-1/250** 106212		
	400	400	400	2			**NH-SLS-2/400** 106213		
	630	630	630	3			**NH-SLS-3/630** 106214		
With fuse monitoring									
	160	160	160	00	30 x 10 40 x 10 50 x 10 60 x 10 80 x 10 100 x 10 120 x 10 Double T profile Triple T profile	Top or bottom	**NH-SLS-00/160-SI** 106215		1 off
	250	250	250	1			**NH-SLS-1/250-SI** 106217		
	400	400	400	2			**NH-SLS-2/400-SI** 106218		
	630	630	630	3			**NH-SLS-3/630-SI** 106219		

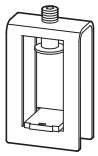
		For use with/ transformer ratio K_N A	**Part no.** Article no.	**Price** See price list	Std. pack
Adapters					
	Single adapter 100/185	30 x 10 40 x 10 50 x 10 60 x 10 80 x 10 100 x 10 120 x 10 Double T profile Triple T profile	**Z-NH-SLS-00-SAD** 106220		1 off
	Single adapter 100/185 for mounting without holes		**Z-NH-SLS-00-SAD-KR** 106222		1 off
	Double adapter 100/185		**Z-NH-SLS-00-SADD** 106221		1 off
Terminal shroud/size adapter for NH-SLS					
	Size 00	for NH-SLS-00/160	**Z-NH-SLS-KA** 106223		2 off
Claw-type terminals					
	For connection at bottom	NH-SLS, size 1, 2, 3	**Z-NH-SLS-KRU** 106224		3 off
	For connection at top	NH-SLS, size 1, 2, 3	**Z-NH-SLS-KRO** 106225		3 off
V-terminals					
Up to 240 mm² for stranded sectoral conductor, up to 300 mm² for solid sectoral conductor					
	For size 1, 2	NH-SLS, size 1, 2	**Z-NH-SLS-1+2-VAK** 106226		3 off
	For size 3	NH-SLS, size 3	**Z-NH-SLS--3VAK** 106227		3 off
Terminal expansion for 2 cable lugs					
	For size 1, 2	–	**Z-NH-SLS-1+2-AE** 106239		1 off
	For size 3		**Z-NH-SLS--3AE** 106240		
Device support with DIN rail for terminals etc.					
	Cover	–	**Z-NH-SLS-1+2+3-GTAB** 106231		1 off
	Lower section		**Z-NH-SLS-1+2+3-GT** 106230		
Current transformer					
	NH-SLS-00 • Fit to Z-NH-SLS-00-SAD… with fixing clip Z-NH-SLS-00BC. NH-SLS size 1, 2, 3 • Swing into the standard rail, no additional space requirement. • Mounting of claw-type terminals still possible • Fix current transformer cables with fixing clips Z-NH-SLS--1+2+3-BC.	150/5	**Z-WAS-150/5A-1** 106232		3 off
		200/5	**Z-WAS-200/5A-1** 106233		
		250/5	**Z-WAS-250/5A-1** 106234		
		300/5	**Z-WAS-300/5A-1** 106235		
		400/5	**Z-WAS-400/5A-1** 106236		
		500/5	**Z-WAS-500/5A-1** 106237		
		600/5	**Z-WAS-600/5A-1** 106238		
Fixing clip					
	For fixing current transformer to adapter in 185 mm busbar system (size 00)	–	**Z-NH-SLS-00-BC** 106229		3 off
	For fixing (current transformer) cables to rear of the LV h.b.c. rails of sizes 1, 2, 3		**Z-NH-SLS-1+2+3-BC** 106228		100 off

		Terminal area W × H	Width	Rated operating current	Terminal capacity Round conductor, solid Round conductor, flexible, with correctly crimped ferrule Round conductor, stranded Sectoral conductor, solid Sectoral conductor,, stranded Copper strip Copper bar	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
		mm	mm	I_e A	mm					
Expansion terminals										
For fitting to busbars without drilling										
	Contacting of cable with busbar via cable bedding.	–	38	480	35 - 150 mm² AWG2/0 - MCM 300. Directly clamped Round conductor, solid Sectoral conductor, solid	12 x 5/10 20 x 5/10	0.00	**AKS150** 138374		6 off
		–	38	500	95 - 185 mm² AWG3/0 - MCM 350. Directly clamped Round conductor, solid Sectoral conductor, solid	20 x 5/10 25 x 5/10 30 x 5/10 Double T profile	0.00	**AKS185** 107195		6 off
		–	41	600	150 - 300 mm² MCM300 - MCM 600. Directly clamped Round conductor, solid Sectoral conductor, solid		0.00	**AKS300** 107196		3 off
	Contacting of cable with busbar via contact block.	32 x 25	41	800	Copper strip 3 x 20 x 1 to 2 x (10 x 32 x1) Copper bar 32 x 25		0.00	**AKS-CU-BAND** 107197		3 off
		55 x 28	72	1600	Up to Copper strip (2 x) 10 x 50 x 1 Up to Copper bar (2 x) 50 x 10		0.20	**AKS1000** 107208		1 off
		68 x 28	122	1600	Up to Copper bar (2 x) 60 x 10	30 x 10 Double T profile Triple T profile	0.00	**AKS1200** 138375		3 off
		105 x 28	122	1600	Up to Copper bar (2 x) 100 x 10		0.00	**AKS2000** 138376		3 off

Notes [1] Calculation of material surcharge → Chapter 23

Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

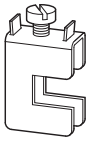
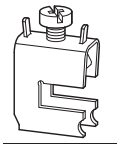
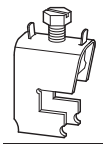
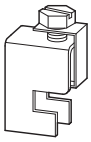
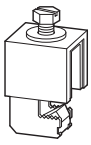
	Terminal area W × H	Width	Rated operating current	Terminal capacity Round conductor, solid Round conductor, flexible, with correctly crimped ferrule Round conductor, stranded Sectoral conductor, solid Sectoral conductor,, stranded Copper strip Copper bar	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm					
Profile terminals									
For fitting to busbars without drilling									
 When connecting laminated busbars in parallel, fit a spacer.	–	82	1600	750 mm², terminal area 51 x 5 - 28	Double T profile		**AKP750** 138364		3 off
	–	72	1600	800 mm², terminal area 41 x 20 - 42			**AKP800** 107198		3 off
	–	94	1600	900 mm², terminal area 64 x 5 - 28			**AKP900** 138365		3 off
	–	94	1600	1000 mm², terminal area 51 x 20 - 42			**AKP1000** 107199		3 off
	–	94	2000	1200 mm², terminal area 64 x 20-42			**AKP1200** 138366		3 off
	–	112	2500	1600 mm², terminal area 81 x 20 - 42			**AKP1600** 138367		3 off
	–	132	3000	2000 mm², terminal area 101 x 20 - 42			**AKP2000** 138368		3 off
	–	132	3200	3600 mm², terminal area 101 x 23 - 45			**AKP3600** 138369		3 off

Notes

[1] Calculation of material surcharge → Chapter 23

Information relevant for export to North America

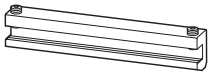
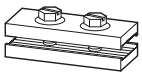
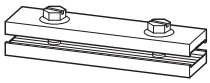
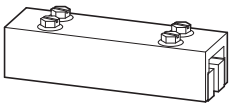
Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W × H	Width	Rated operating current	Terminal capacity ○ Round conductor, solid ⊜ Round conductor, flexible, with correctly crimped ferrule ⊙ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded ▤ Copper strip ■ Copper bar	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm				
Universal conductor connection terminals								
With integrated retaining spring, open clamping area and captive terminal screw.								
	7.5 x 7.5	11.5	180	1.5 - 16 mm² AWG 14 - AWG 6. ⊜ Directly clamped ○ ⊙ ▤ 8 x 6 x 0.5	All 10 mm thick flat busbars	**AKU16/10** 107191		100 off
	10.5 x 11	15.5	270	4 - 35 mm² AWG 10 - AWG 2. ⊜ Directly clamped ○ ⊙ ▤ 3 x 9 x 0.8 or 6 x 9 x 0.8		**AKU35/10** 107192		50 off
	14 x 14	20.5	400	16 - 70 mm² AWG 4 - AWG 2/0. ⊜ Directly clamped ⊙ ▤ 2 x (3 x 9 x 0.8) or 6 x 9 x 0.8		**AKU70/10** 107193		25 off
	17 x 15	23.5	440	16 - 120 mm² AWG 4 - MCM 250. ⊜ Directly clamped ⊙ ▤ 4 x 16 x 0.8 or 6 x 16 x 0.8 or 10 x 16 x 0.8		**AKU120/10** 107194		25 off
	M8 x 8 bolts	30	490	Cable lugs M8	All 10 mm thick flat busbars Double T profile	**AKU-M8/10** 138362		20 off
	M10 x 10 bolts	38	630	Cable lugs M10		**AKU-M10/10** 138361		6 off

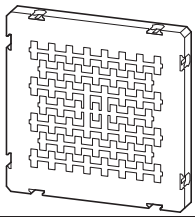
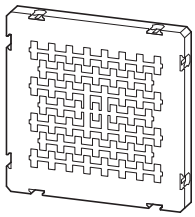
Information relevant for export to North America

Product Standards	UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking
UL File No.	E307559
UL CCN	NMTR2, NMTR8
CSA File No.	236217
CSA Class No.	3211-37
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Refer to approbation report
Suitable for	Feeder circuits
Max. Voltage Rating	600 V AC

	Terminal area W × H	Width	Rated operating current	Terminal capacity ○ Round conductor, solid ⦾ Round conductor, flexible, with correctly crimped ferrule ⦾ Round conductor, stranded ▽ Sectoral conductor, solid ▽ Sectoral conductor,, stranded Copper strip Copper bar	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	I_e A	mm				
Plate terminals								
	–	50	630	–	All 10 mm thick flat busbars	**PK900** 138378		3 off

		Width	For use with	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
		mm					
End-to-end busbar onnectors							
For hole-less connection of identical busbars.							
For the same flat copper bars. Rated operating current 630 A							
	System spacing 100 - 110 mm. Max. permissible busbar offset 1 mm.	150	12 x 5/10 15 x 5/10 20 x 5/10		**BBT-CU12-20X5/10-150** 107200		3 off
	System spacing 50 - 60 mm. Max. permissible busbar offset 5 mm.	95			**BBT-CU20-30X5/10-95** 107201		3 off
	System spacing 100 - 110 mm. Max. permissible busbar offset 5 mm.	150			**BBT-CU20-30X5/10-150** 107202		3 off
For differing and same double T profile busbars. Rated operating current 1600 A							
	System spacing 9 - 20 mm. Max. permissible busbar offset 2 mm.	50	Double T profile		**BBT-CU-BAR500/720-50** 107203		6 off
	System spacing 100 - 110 mm. Max. permissible busbar offset 5 mm.	150			**BBT-CU-BAR500/720-150** 107204		3 off

Notes [1] Calculation of material surcharge → Chapter 23

		Poles	Rated operational current I_e A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar supports							
KSX busbar support, end universal							
	For use in type-tested power distribution systems xEnergy and distribution panels XVTL. Impulse withstand current 110 kA Includes fixing bracket, fixing screws and supports for covers.	3/4	3200	30 x 10 Double T profile Triple T profile	**KSX-34P-EXT** 138268		2 off
KSX busbar support, center support							
	For use in type-tested power distribution systems xEnergy and distribution panels XVTL. Includes fixing material.	3/4	2000	30 x 10 Double T profile Triple T profile	**KSX-34P-MID** 138269		1 off
		3	3200	Triple T profile	**KSX-3P-MID** 138360		1 off

Engineering

Electrical load

BBS-3/FL..., BBS-3/BR

UL 508A

For untested busbar supports UL 508A stipulates a current-carrying capacity of 1000 A/inch² (1.55 A/mm²) unless tests were carried out.
This value can be higher if the product or application was tested accordingly.
Eaton has carried out extensive tests in this area in order to provide the user with maximum benefits when using the 60 mm system.

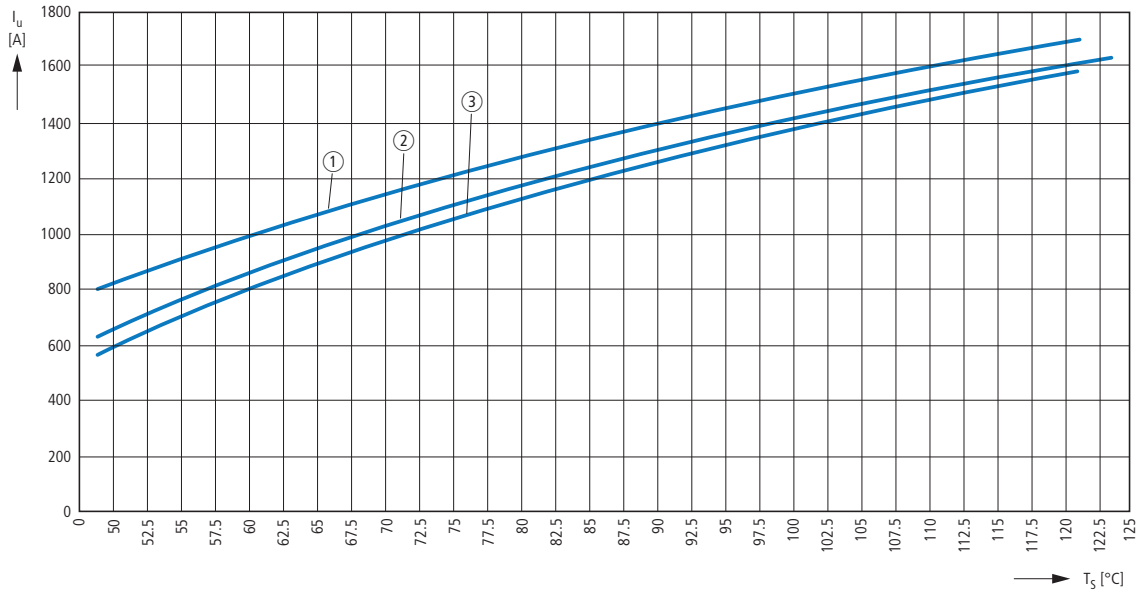
The 60 mm system can be used with higher rated operational currents than permitted by the default value. For example, a busbar support with the dimensions 30 x 10 can be loaded with 630 A instead of 465 A.

DIN EN 13601

The current carrying capacity values that exceed DIN 43671 specifications have been determined under normal operating conditions.
The temperature of the busbars is normally favorably influenced by the fitting of busbar supports and the air circulation within the system.
A correction factor k2 according to DIN 43671 can be determined, depending on the respective ambient air temperature. The correction factor must be taken into account when conditions change or when the load is continuous.

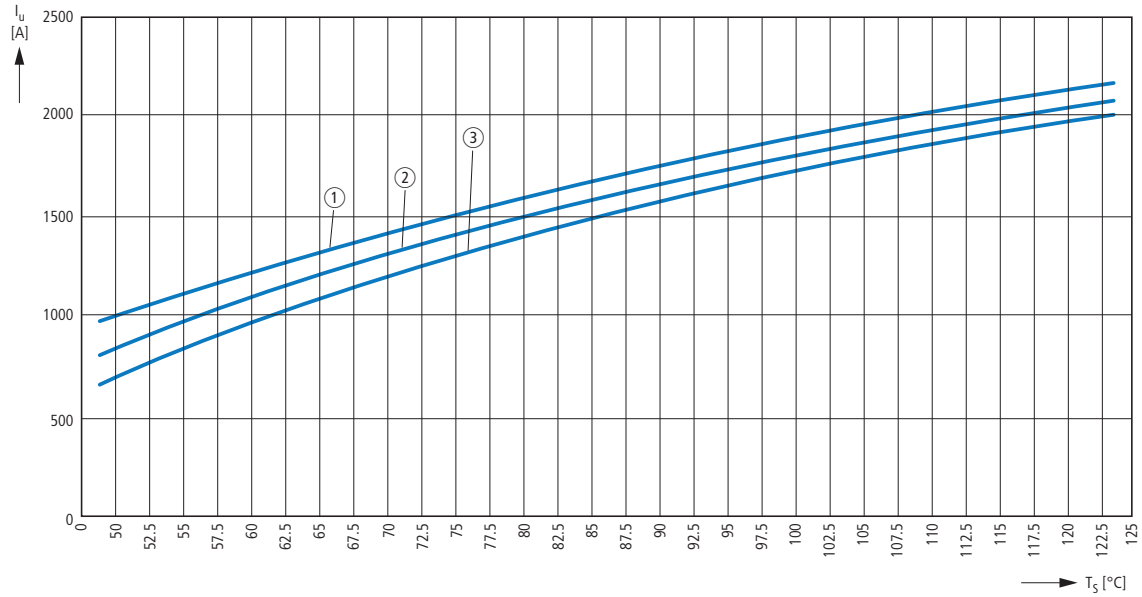
Otherwise, a higher load is possible if the components have a suitable temperature resistance.
A 30 x 10 tinned busbar can be loaded to 630 A. At a load of 800 A, for example, a correction factor k2 of 1.3 is required. The graph shows that with this factor, and at an air temperature of 35°C, the busbars temperature rises to 85°C.

CU-BAR-500/T



Ambient temperature:
① 30 °C
② 35 °C
③ 40 °C
I_U = rated uninterrupted current
T_S = busbar temperature

CU-BAR-720/T



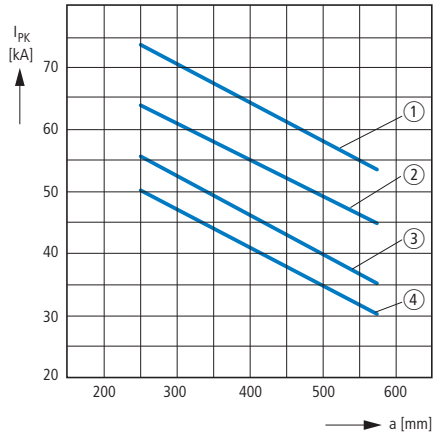
Ambient temperature:
① 30 °C
② 35 °C
③ 40 °C
I_U = rated uninterrupted current
T_S = busbar temperature

Characteristic curves of busbar supports

BBS

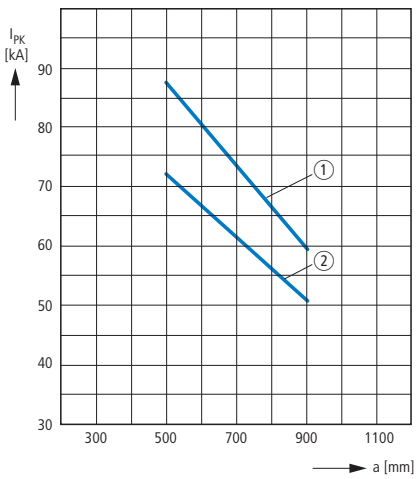
Short-circuit rating to IEC/EN 60439-1

BBS-3/FL



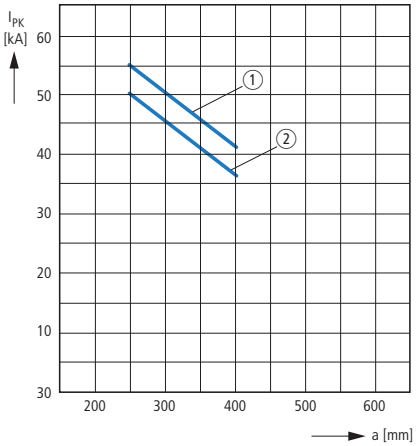
① 30 x 10 mm
② 30 x 5 mm
③ 12 x 10 mm
20 x 10 mm
④ 12 x 5 mm
20 x 5 mm
I_{pk} = Rated peak withstand current
a = Busbar support spacing

BBS-3/PR



① 720 mm²
② 500 mm²
I_{pk} = Rated peak withstand current
a = Busbar support spacing

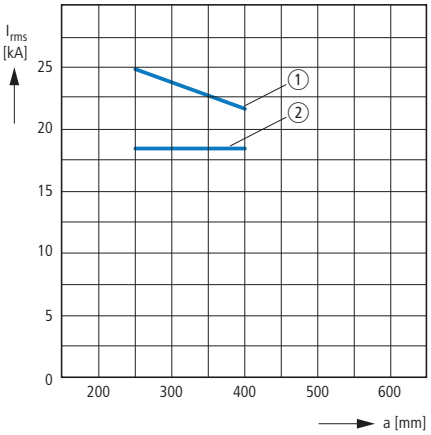
BBS-3/FL-C



① 12 x 10 mm
② 12 x 5 mm
I_{pk} = Rated peak withstand current
a = Busbar support spacing

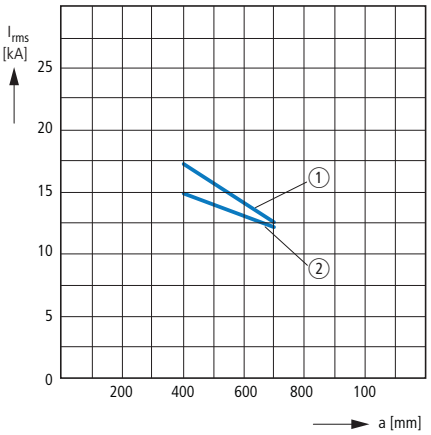
Short-circuit strength to UL 845

BBS-3/FL-NA



① 30 x 5 mm
30 x 10 mm
② 12 x 5 mm
20 x 5 mm
12 x 10 mm
20 x 10 mm
I_{rms} = surge current (RMS)
a = Busbar support spacing

BBS-3/PR



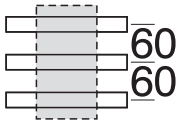
① 500 mm²
② 720 mm²
I_{rms} = surge current (RMS)
a = Busbar support spacing

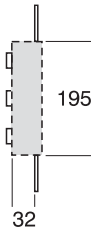
Reduction of rated operating current

Device part no.	Release type	Reduction of the rated operational current (derating) under particular ambient conditions (according to IEC 947) Derating coefficient						
		20 °C	30 °C	40 °C	50 °C	60 °C	65 °C	70 °C
Device adapter for circuit-breakers and switch-disconnectors (reference temperature 40 °C)								
NZM…3-630…+NZM3-XAD630	with XAD…	1	0.96	0.92	0.88	0.84	0.82	0.8

Notes To determine the maximum permissible current load at different ambient temperatures, refer to the derating coefficients shown in the table.
Example: An NZM…3-…630… with a component adapter is to be used at an ambient temperature of 50 °C.
What is the highest permissible rated operating current Ie?
At 50 °C the derating coefficient is 0.88, which means that Ie = 630 A x 0.88 = 554.40 A.
The NZM…3-…630… can therefore be used at an ambient temperature of 50 °C with a maximum Ie = 554.40 A.

Possible combinations without bending the flat busbars





	Device	GST00-160-40-60-AOU	LTS-100/C00/3-R	D02-S/63/3-RS	D02-LTS/63/3-R(-HK)	D02-SO/63/3-R-27 Z-D02/R/3-…	DII-SO/25/3-R…	DIII-SO/63/3-R(-PS)
	Accessories	BS-SET-GST00	-	-	-	-	SBS-RS60	SBS-RS60
CU	12 x 5/10	-	-	-	x	x	x	x
	20 x 5/10	x	x	x	x	x	x	x
	25 x 5/10	x	-	-	x	x	x	x
	30 x 5/10	x	x	x	x	x	x	x
	Double T	x	x	x	x	x	x	x
	Width mm	106	63	36	27	27 36 - 54	45	54

Technical data

			BBS-3/FL(-NA)	BBS-4/FL	BBS-3/PR	BBS-3/FL-C	BBS-3/FL-185
General							
Standards			Type-tested to VDE 0660 Part 500, IEC/EN 60439-1				
Mounting position			Vertical, horizontal				
Material							
Material			Thermoplast, silicone-free, chlorine-free				
Halogen-free			Yes	Yes	Yes	Yes	Yes
Flammability characteristics			Self-extinguishing to UL 94				
Color			RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035
Creepage resistance			CTI 200	CTI 200	CTI 200	CTI 200	CTI 200
Temperature resistance		°C	120	120	120	120	120
Contacts							
Rated insulation voltage	U_i	V	3000	3000	3000	3000	3000
Rated operating voltage	U_e	V	690	690	690	690	690
Rated frequency	f	Hz	50/60	50/60	50/60	50/60	50/60
Spacing between busbar centers		mm	60	60	60	60	185
Rated uninterrupted current			With temperature deviations, DIN 43671 stipulates that a correction factor k2 must be taken into account.				
with 12 × 5 mm busbar	I_u	A	218	218	–	200	–
with 15 × 5 mm busbar	I_u	A	273	273	–	–	–
with 20 × 5 mm busbar	I_u	A	349	349	–	–	–
with 25 × 5 mm busbar	I_u	A	436	436	–	–	–
with 30 × 5 mm basbar	I_u	A	491	491	–	–	–
with 12 × 10 mm busbar	I_u	A	392	392	–	360	–
with 20 × 10 mm busbar	I_u	A	567	567	–	–	–
with 30 × 10 mm basbar	I_u	A	687	687	–	–	630
with 500 mm²	I_u	A	–	–	1003	–	950
with 720 mm²	I_u	A	–	–	1281	–	1200
Ambient temperature		°C	35	35	35	35	35
Busbar temperature		°C	70	70	70	70	70
Rated peak withstand current							
with 12 × 5 mm busbar	I_{pk}	kA	50	50	–	50	–
with 20 × 5 mm busbar	I_{pk}	kA	50	50	–	–	–
with 25 × 5 mm busbar	I_{pk}	kA	50	50	–	–	–
with 30 × 5 mm basbar	I_{pk}	kA	64	64	–	–	–
with 12 × 10 mm busbar	I_{pk}	A	56	56	–	55	–
with 20 × 10 mm busbar	I_{pk}	kA	56	56	–	–	–
with 30 × 10 mm basbar	I_{pk}	kA	73	73	–	–	100
with 500 mm²	I_{pk}	kA	–	–	72	–	100
with 720 mm²	I_{pk}	kA	–	–	87	–	100
Short-circuit duration	t	ms	20	20	20	20	20
Distance between busbar supports	a	mm	250	250	500	250	400
For other intervals between busbar supports			See Short-circuit rating characterstics, → Page 16/40				–

			CU...	CU-BAR-500-T CU-BAR-720-T	CU-BAR-1140/T
General					
Standards			EN 13061, UL 508	EN 13061, UL 508	EN 13061, UL 508
Contacts					
Rated uninterrupted current			With temperature deviations, DIN 43671 stipulates that a correction factor k2 must be taken into account.		
T_u = 35 °C and T_s = 65 °C					
with 12 × 5 mm busbar	I_u	A	200	–	–
with 20 × 5 mm busbar	I_u	A	320	–	–
with 30 × 5 mm basbar	I_u	A	450	–	–
with 12 × 10 mm busbar	I_u	A	360	–	–
with 20 × 10 mm busbar	I_u	A	520	–	–
with 30 × 10 mm basbar	I_u	A	630	–	–
with 500 mm²	I_u	A	–	950	–
with 720 mm²	I_u	A	–	1200	–
1140 mm²	I_u	A	–	–	2500

				LTS-100/C00/3-R	GST…00-160-40-60-AOU	GST1-AO(AU)	GST2-AO(AU)	GST3-AO(AU)
General								
Standards				IEC/EN 60947-3				
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical to IEC 60068-2-30				
Ambient temperature			°C	-25 - +55	-25 - +55	-25 - +55	-25 - +55	-25 - +55
Installation altitude			m	Max. 2000	Max. 2000	Max. 2000	Max. 2000	Max. 2000
Distance between busbar centers			m	60	60	60	60	60
Mounting position				Vertical or horizontal				
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3
Touch protection at the front								
Operational status				IP20	IP20	IP20	IP20	IP20
Front cover open				IP10	IP10	IP10	IP10	IP10
Direction of incoming supply				Any				
Lifespan, mechanical	Operations			1700	1700	1700	1700	1700
Weight			kg	0.57	0.93	4.4	5.3	6.6
Contacts								
Rated operational current								
	500 V AC/220 V DC	I_e	A	100	160	250	400	630
	690 V AC / 440 V DC	I_e	A	–	100	200	315	500
Rated frequency			Hz	40 - 60	40 - 60	40 - 60	40 - 60	40 - 60
Rated conditional short-circuit current								
	AC	I_q	kA_{rms}	50	50	50	50	50
	DC	I_q	kA_{rms}	25	25	25	25	25
Utilization category AC-22B								
Rated making capacity								
	500 V AC		A	300	480	750	1200	1890
	690 V AC		A	–	300	600	945	1500
Rated breaking capacity								
	500 V AC		A	300	480	750	1200	1890
	690 V AC		A	–	300	600	945	1500
Utilization category DC-21B								
Rated making capacity								
	220 V DC/440 V DC		A	400	150	300	475	750
Rated breaking capacity								
	220 V DC/440 V DC		A	400	150	300	475	750
Lifespan, electrical	Operations			300	300	200	200	200
Heat dissipation at I_{th}, without fuse link								
	500 V AC		W	11.5	6.9	12.9	27	52
	690 V AC		W	–	2.7	8.3	16.7	32.8
	220 V DC		W	7.7	4.6	8.6	18	34.7
	440 V DC		W	–	1.8	5.5	11.2	21.8
Rated insulation voltage		U_i	V	500	750	750	750	750
Max. fuse link								
Construction size				NH000	NH00	NH1	NH2	NH3
Max. rated operational current, gL/gG			A	100	160	250	400	630
Max. permissible heat dissipation fuse link		P_v	W	7.5	12	23	34	48
Terminal capacities								
Box terminal								
Stranded			mm^2	1.5 - 50	1.5 - 70	–	–	–
Copper strip	Number of segments x width x thickness		mm	6 x 9 x 0.8	6 x 9 x 0.8	–	–	–
Flange connection								
Bolt diameter		d	mm	–	–	M10	M10	M10
Cable lug			mm^2	–	–	1 x 25 - 100	1 x 25 - 100	1 x 25 - 100
Flat rail		max.	mm	–	–	30 x 10	30 x 10	30 x 10
Box terminal								
Stranded copper			mm^2	–	–	25 - 150	25 - 240	25 - 300
Copper strip	Number of segments x width x thickness		mm	–	–	6 x 16 x 0.8	10 x 16 x 0.8	11 x 21 x 1
Cable clamp								
Stranded aluminium/copper			mm^2	–	–	70 - 150	120 - 240	120 - 300
Double cable clamp								
Stranded aluminium/copper			mm^2	–	–	2 x (70 - 95)	2 x (120 - 150)	2 x (120 - 240)

NH-SLS-...

					NH-SLS-00/ 160-60	NH-SLS-00/160	NH-SLS-1/250	NH-SLS-2/400	NH-SLS-3/630
General									
Standards					IEC/EN 60947-3				
Climatic proofing					Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30				
Ambient temperature				°C	-5 - +40	-5 - +40	-5 - +40	-5 - +40	-5 - +40
Installation altitude				m	Max. 2000	Max. 2000	Max. 2000	Max. 2000	Max. 2000
Distance between busbar centers				mm	60	100	185	185	185
Number of poles/phases				n	3	3	3	3	3
Mounting position					Vertical, horizontal				
Overvoltage category/pollution degree					III/3	III/3	III/3	III/3	III/3
Contact protection shroud at the front	Operational status				IP30	IP30	IP30	IP30	IP30
	Front cover open				IP10	IP10	IP10	IP10	IP10
Direction of incoming supply					Any				
Lifespan, mechanical		Operations			1400	1400	1400	800	800
Weight				kg	1.46	1.37	5.2	6.3	7.0
Contacts									
Rated frequency			f	Hz	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60
Rated insulation voltage			U_i	V	1000	1000	1000	1000	1000
Rated operating mode					Continuous operation; with continuous operation of several adjaced devices the rated diversity factor to VDE 0660 part 500 / EN 60439-1, table 1 must be observed.				
Rated impulse withstand voltage			U_{imp}	kV	8	8	12	12	12
Rated conditional short-circuit current AC			I_q	kA_{rms}	50	50	100	100	100
Utilization category AC-23B									
Rated operational voltage AC			U_e	V AC	500/400	500/400	500	500	500
Rated operational current			I_e	A	125/160	125/160	250	400	630
Utilization category AC-22B									
Rated operational voltage AC			U_e	V AC	690	690	690	690	690
Rated operational current			I_e	A	160	160	250	400	630
Utilization category AC-21B									
Rated operational voltage AC			U_e	V AC	690	690	690	690	690
Rated operational current			I_e	A	160	160	250	400	630
Heat dissipation at I_{th} AC, without fuse link				W	20	20	30	67	116
Lifespan, electrical		Operations			200	200	200	200	200
Max. fuse link									
Construction size				NH	00	00	1	2	3
Max. rated operational current gL/gG				A	160	160	250	400	630
Max. permissible heat dissipation without fuse link			P_v	W	12	12	23	34	48
Mechanical data									
Mounting on busbars									
Adapter for busbars					–	Z-…SAD Z-…SADD	–	–	–
Combination base for busbars					Directly on 12 - 30 x 5/10 Double T profile Triple T profile	–	–	–	–
Screw connection for busbars					–	M8 … x 5/10 mm	M12… x 10 mm	M12 … x 10 mm	M12 … x 10 mm
Terminal capacities									
Flange connection	Bolt diameter		d	mm	M8	M8	M10	M10	M12
	Cable lug			mm^2	1 x 70	1 x 70	1 x 120	1 x 240	2 x 185
	Flat rail		max.	mm	20 x 8	20 x 10	30 x 10	30 x 10	30 x 10
Box terminal	Stranded			mm^2	1.5 - 70	1.5 - 70	–	–	–
	Flexible with ferrule[1)]			mm^2	1.5 - 70	1.5 - 70	–	–	–
Copper strip	Number of segments x width x thickness				6 x 9 x 0.8	6 x 9 x 0.8	–	–	–
V-terminals	Stranded			mm^2		–	50 - 185	50 - 185	120 - 300
	Sectoral conductor, stranded			mm^2	–	–	70 - 240	70 - 240	120 - 240
	Sectoral conductor, solid			mm^2	–		95 - 300	95 - 300	150 - 300
Terminal expansion	Cable lugs			n	–	–	max.2	max.2	max.2

Notes The clearance to grounded parts must be at least 50/100 mm at the top and 25/50 mm on the sides with construction sizes 00/1-3.
Technical data for fuse monitoring → Page 16/45

[1)] Ferrule with maximum cross-section with a correctly crimped ferrule.

				NH-SLS-…-SI
General				
Standards				IEC/EN 60255, VDE 0435 part 303
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature			°C	-5 - +40
Installation altitude			m	Max. 2000
Contacts				
Rated operating voltage		U_e	V	3 x 400 AC
Voltage range			V AC	0.8 … 1.1 x U_e
Rated frequency		*f*	Hz	50 - 60
Intrinsic consumption per phase (conductor)			VA	2 (L2/L3)
Rated insulation voltage		U_i	V	400
Overvoltage category				III
Rated operating mode				Continuous operation
Rated impulse withstand voltage		U_{imp}	kV	4
Relay contacts				
Standards				EN 60947-5-1
Rated voltage		U_e	V AC	250
Conventional thermal current		I_{th}	A	4
Utilization category AC-15				
Rated operating voltage		U_e	V AC	230
Rated operational current	AC-15 at 230 V	I_e	A	1
Lifespan, electrical		Operations		1.5 x 10^5
Lifespan, mechanical		Operations		> 10^8
Max. admissible back-up fuse			A gL	4
Terminal capacities				
Box terminal	Solid		mm^2	2 x 2.5
	Flexible		mm^2	2 x 1.5
Response/reset time			ms	< 500

				GST…-DSI
Electrical data				
Standards				IEC/EN 60255, VDE 0435 part 303
Rated operating voltage		U_e	V AC	3 x 400 - 690
Voltage range			V AC	0.9 … 1.1 x U_e
Rated frequency		*f*	Hz	50 - 60
Energy consumption		P	VA	1.5 (L2/L3)
Rated insulation voltage		U_i	V	690
Overvoltage category				III
Rated impulse withstand voltage		U_{imp}	kV	6
Rated voltage		U_e	V AC	250
Rated operational current		I_e	A	8 A DC
Inrush current			A	≦ 15
Minimum switching load				5 V AC/DC, 300 mW, 5mA
Max. switching power	AC 1		VA	2000
	250 V AC 15		VA	400
	250 V AC 3		W	300
Lifespan, electrical		Operations		80 x 10^3 (AC 1)
Max. admissible back-up fuse				4 A gL/gG / PLSM-B4…-HS
Mechanical data				
Terminals				Lift terminals
Terminal cross-section, flexible			mm^2	0.25 - 1.5
Tightening torque of terminal screws			Nm	0.5 - 0.6
Lifespan, mechanical		Operations	x 10^6	> 10
Response/reset time			ms	< 500
Degree of protection				IP20
Temperature range			°C	-10 … +55
Pollution degree				3
Terminal capacity			mm^2	0.25 - 1.5

			D02-SO/63/3-R-27 Z-D02/R/3…	DII-SO/25/3-R(-PS)	DIII-SO/63/3-R(-PS)
General					
Standards			Design according to IEC/EN 60269-1, VDE 0636 Part 301		
Climatic proofing			Damp heat, constant, to IEC 60068-2-78, Damp heat, cyclical to IEC 60068-2-30		
Ambient temperature		°C	-25 - +55	-25 - +55 35 normal temperature, at 55 with reduced operating current	
Mounting position			Vertical or horizontal		
Electrical data					
Poles			3	3	3
Rated operating voltage	U_e	V AC	400	500	690
	U_e	V DC	–	–	–
Conditional rated short-circuit current tested with fuse links	I_q	kA	50	50	50
Rated frequency	f	Hz	40-60	40-60	40-60
Rated operational current	I_e	A	63	25	63
Conventional thermal current with fuse links	I_{th}	A	63	25	63
Rated operating mode			Continuous operation		
Overvoltage category			IV	III	III
Utilization category			–	–	–
Rated impulse withstand voltage	U_{imp}	kV	6	4	4
Current heat dissipation per contact at I_e		W	0.5	0.4	3.34
Heat dissipation					
Heat dissipation per contact with fuse link at I_e		W	1.5	1.2	10
Max. permissible heat dissipation of fuse links		W	5.5	4	7
Operating category			–	–	–
Mechanical data					
Standard front dimension		mm	194	194	194
Enclosure width		mm	201	200	200
Built-in width		mm	27	45	54
Weight		g	150	140	150
Electric thread			E18	E27	E33
Mounting			–	–	–
Degree of protection Integrated			IP20	IP20	IP20
Terminals			Lift terminals	Lift terminals	Lift terminals
Terminal capacity					
Solid		mm^2	1.5 - 35	1.5 - 25	1.5 - 25
Pollution degree			3	3	3
Creepage resistance			–	–	–

				D02-S/63/3-RS	D02-LTS/63/3-R(-HK)
General					
Standards				Design according to IEC/EN 60947-3	
Climatic proofing				Damp heat, constant, to IEC 60068-2-78, Damp heat, cyclical to IEC 60068-2-30	
Ambient temperature			°C	-25 - +55	-25 - +55
Mounting position				Vertical or horizontal	
Electrical data					
Poles				3	3
Rated operating voltage		U_e	V AC	400	400
		U_e	V DC	–	–
Rated short-circuit current, tested with fuse links		I_q	kA	50	63
Rated frequency		f	Hz	40-60	40-60
Rated operational current		I_e	A	63	63
Conventional thermal current with fuse links		I_{th}	A	63	63
Rated operating mode				Continuous operation	
Rated short-circuit switching capacity		I_{cn}	kA	–	50
Overvoltage category				III	IV
Utilization category				AC 23 B	AC 22 B
Rated impulse withstand voltage		U_{imp}	kV	8	6
Current heat dissipation per contact at I_e			W	2	1.5
Heat dissipation					
Heat dissipation per contact with fuse link at I_e			W	7.5	7
Max. permissible heat dissipation of fuse links			W	5.5	5.5
Auxiliary contacts					
Changeover contacts			Number	–	5A/250 V AC
Back-up fuse			A gL	–	2 A gL PLSM-B4/…-HS/CLS6-B4/…-HS
Connection				–	Blade terminal sleeve 2.8 x 0.5 mm
Mechanical data					
Standard front dimension			mm	194	194
Enclosure width			mm	212	226
Built-in width			mm	36	27
Weight			g	260	340
Electric thread				E18	–
Mounting				Busbar with 60 mm clearance	
Degree of protection	Integrated			IP30	IP20/IP40
Terminals				Lift terminals	Lift terminals
Terminal capacity					
Solid			mm^2	1.5 - 25	1.5 - 35
Pollution degree				3	3
Creepage resistance				–	–

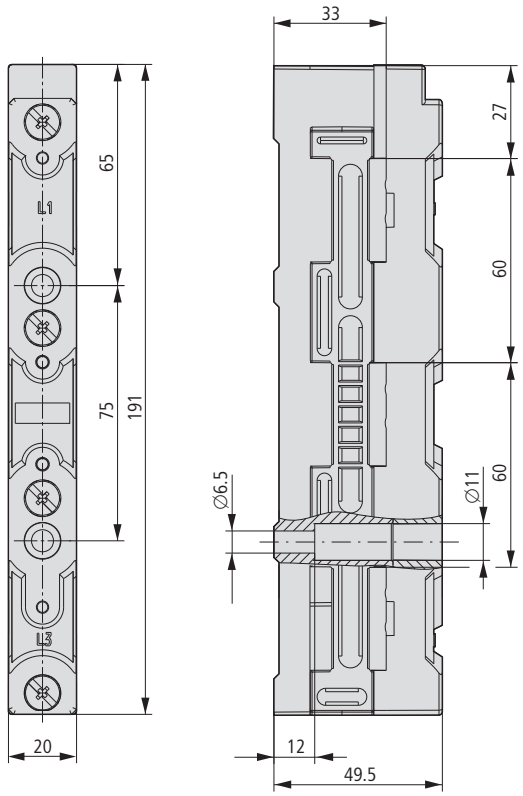
						FCFSDNH000BBC60-3
General						
Standards						IEC/EN 60947-3
Climatic proofing						Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature					°C	
Installation altitude					m	Max. 2000
Mounting position						Vertical or horizontal
Overvoltage category/pollution degree						III/3
Contact protection shroud at the front	Operational status					IP20
	Front cover open					IP10
Direction of incoming supply						any
Lifespan, mechanical		Operations				1700
Weight					kg	0.93
Contacts						
Rated operational current		690 V AC / 440 V DC	I_e	A		100
Rated frequency			f	Hz		40 - 60
Rated conditional short-circuit current		690 V AC	I_q	kA_{rms}		50
		440 V DC	I_q	kA_{rms}		25
Utilization category AC-22B	Rated making capacity			A		100
	Rated breaking capacity			A		100
Utilization category DC-21B	Rated making capacity			A		80
	Rated breaking capacity			A		80
Lifespan, electrical		Operations				300
Heat dissipation at I_{th}, without fuse link		690 V AC	W	W		2.7
		440 V DC		W		1.8
Rated insulation voltage			U_{imp}	V		750
Max. fuse link						
Construction size	Number of segments x width x thickness					NH00(0) (max. 21 mm width)
Max. rated operational current gL/gG				A		100
Max. permissible heat dissipation of fuse link			P_v	W		9
Terminal capacity						
Box terminal	Flexible			mm^2		2.5 - 50
	Flexible with ferrule			mm^2		1.5 - 50 (ferrule with maximum cross-section may not be possible)
	Solid			mm^2		1.5 - 10
	Stranded			mm^2		16 - 50
Copper strip	Number of segments x width x thickness			mm		6 x 9 x 0.8; 9 x 9 x 0.8

					FCFBD02BBC60-3-36
General					
Standards					Type according to IEC/EN 60269-1, VDE 0636 Part 301
Climatic proofing					Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature				°C	-25 - +55
Mounting position					Vertical or horizontal
Contacts					
Poles					3
Rated operational voltage			U_e	V AC	400 V AC
Rated short-circuit current, tested with fuse links			I_q	kA_{rms}	50
Rated frequency			f	Hz	40 - 60
Rated operational current			I_e	A	63
Conventional thermal current with fuse links			I_{th}	A	63
Rated operating mode					Uninterrupted operation
Overvoltage category					IV
Rated impulse withstand voltage			U_{imp}	kV	6
Current heat dissipation per contact at I_e				W	0.5
Heat dissipation per contact with fuse link at I_e				W	1.5
Max. permissible heat dissipation of fuse links			P_v	W	5.5
Mechanical data					
Enclosure width				mm	160
Built-in width				mm	36
Weight			g	g	130
Electric thread					E18
Degree of protection	Integrated				IP20
Terminals					Lift terminals
Terminal capacity	Solid			mm^2	1.5 - 25
Pollution degree					3

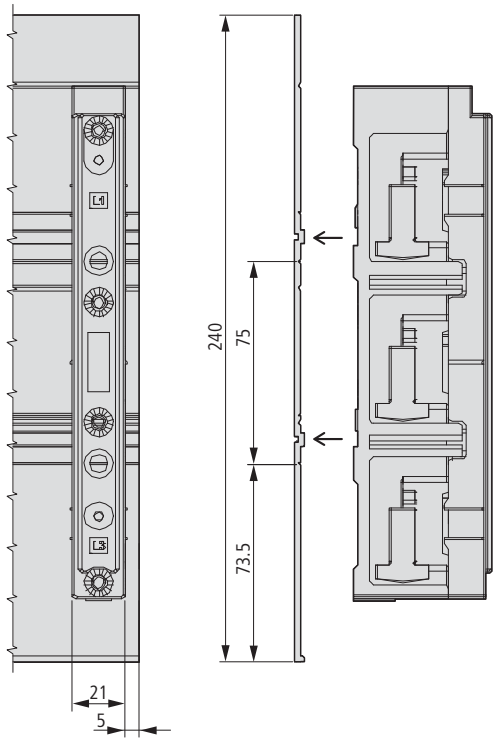
Dimensions

Busbar supports

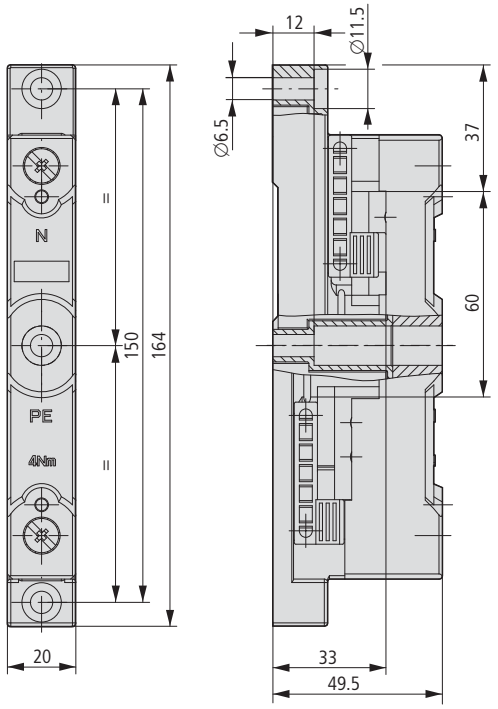
BBS-3/FL



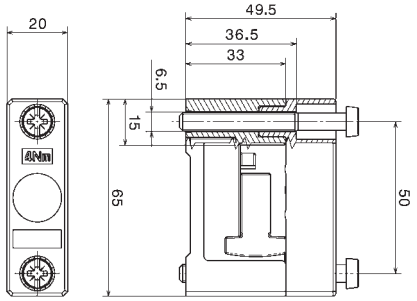
BBS-3/FL-NA



BBS-2/FL



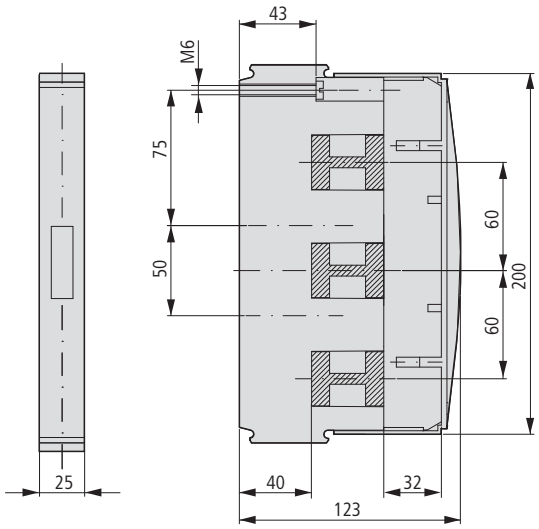
BBS-1/FL



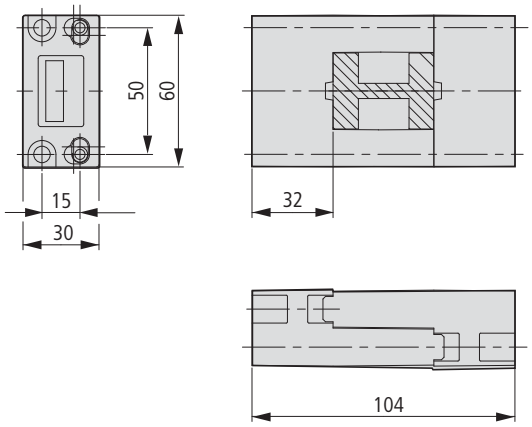
BBS, ES-BBS, BBC

Busbar supports

BBS-3/PR

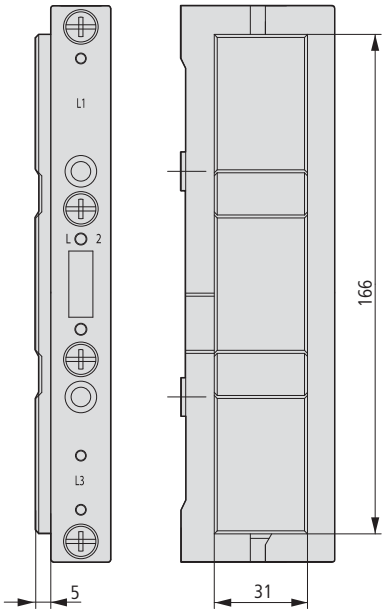


BBS-1/PR

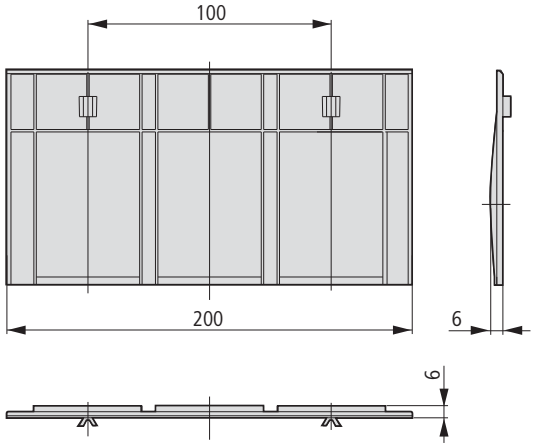


Terminal shroud

ES-BBS-3/FL

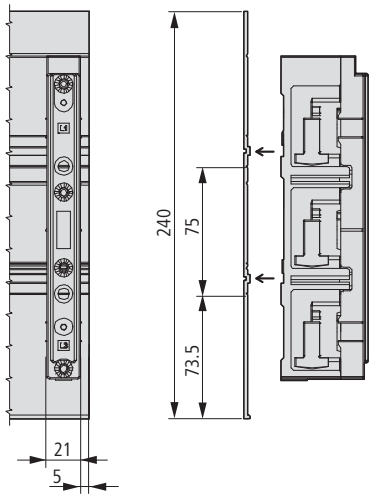


ES-BBS-3/PR



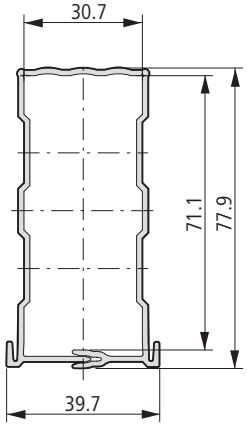
UL bottom plate

BBC-BT-NA



Busbar shroud

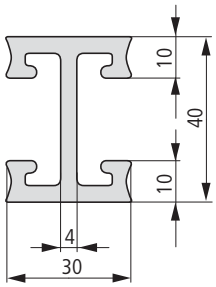
BBC-CU-BAR/PR



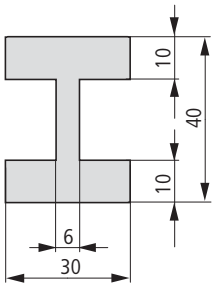
CU-BAR, AM, BBC-CS

Profiled busbars

CU-BAR-500/T

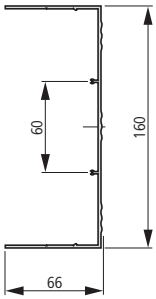


CU-BAR-720/T

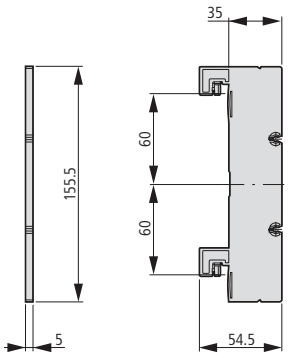


Spare covers

BBC-RCOV1

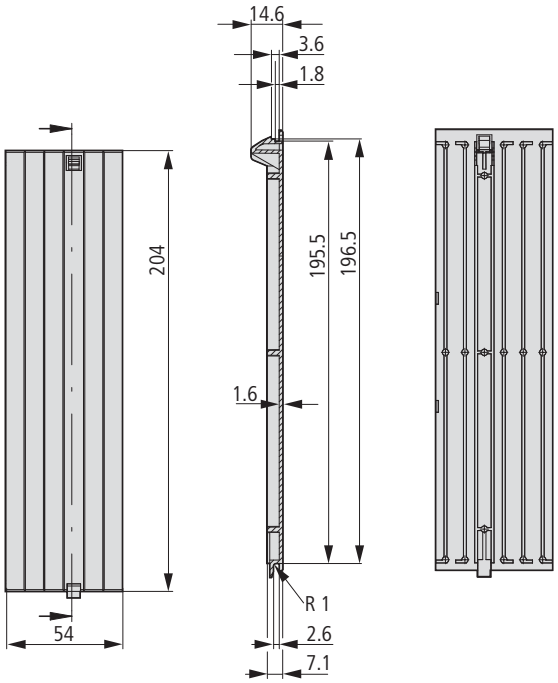


BBC-MRCOV1



Spare covers

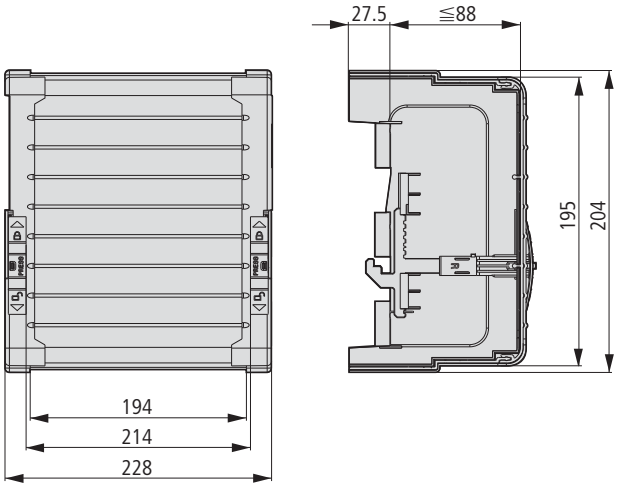
AM-195/54



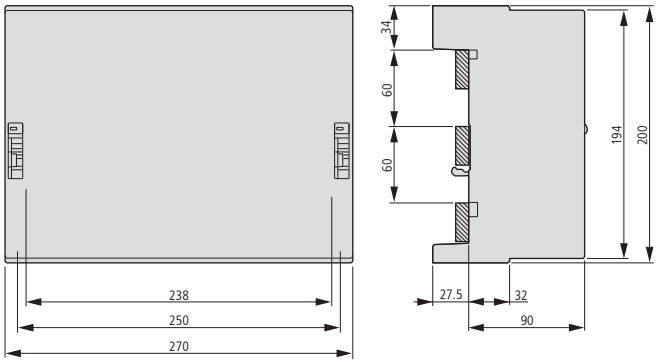
System covers

BBC-CS1

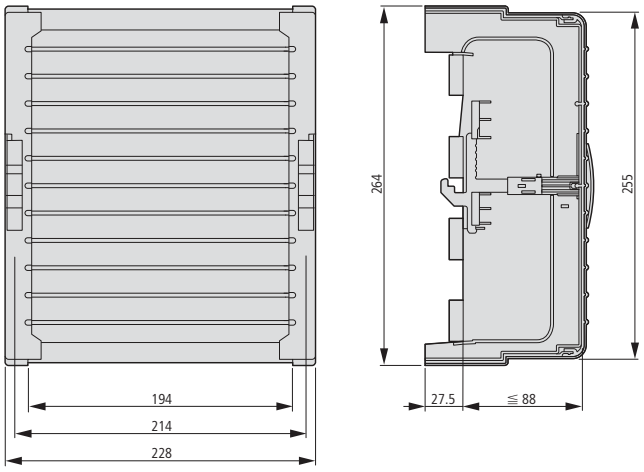
BBC-CS2-...



BBC-CS3



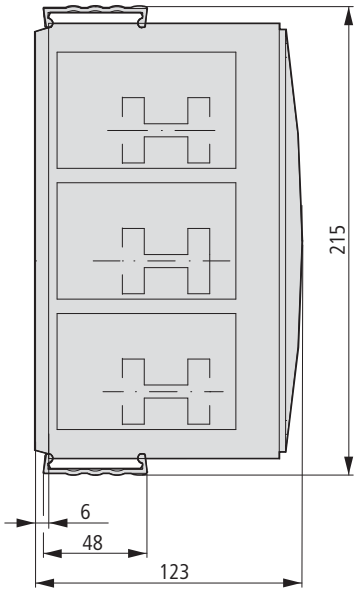
BBC-CS4



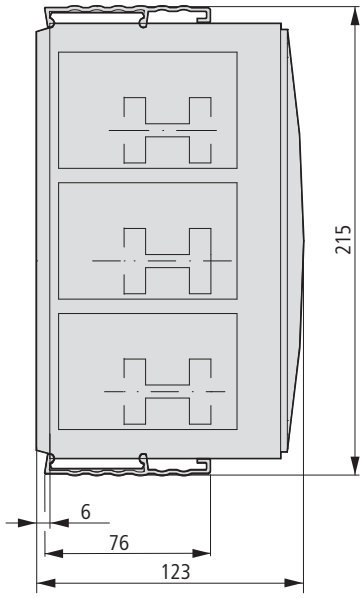
BBC-CS, BBA-TP

System covers

BBC-CS48/PR

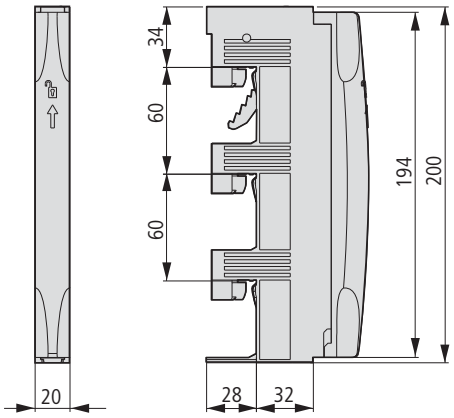


BBC-CS76/PR

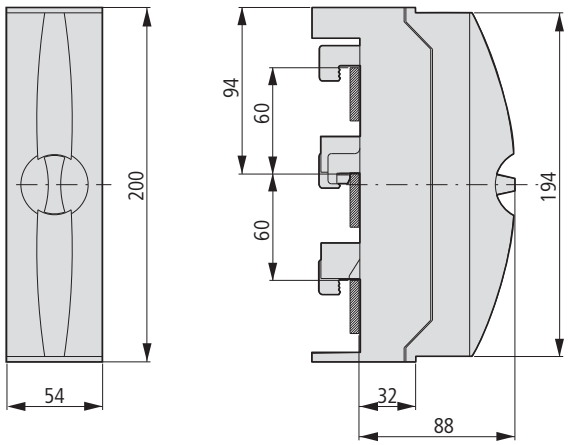


Terminal plates

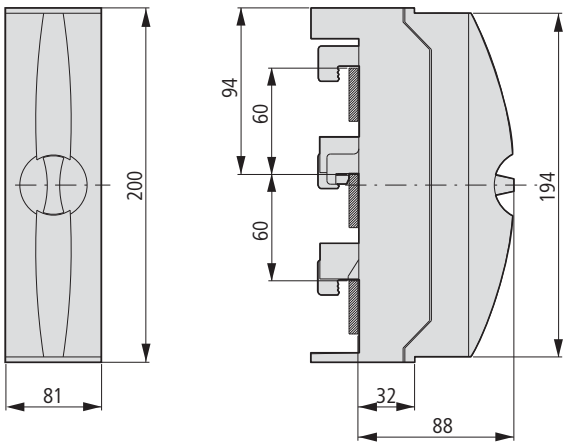
BBA-TP3/16



BBA-TP3/50



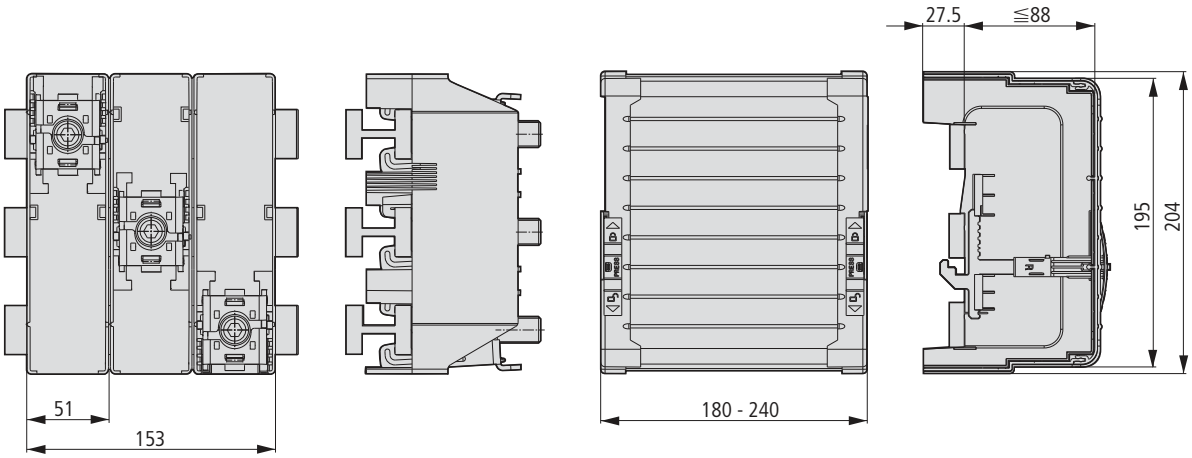
BBA-TP3/120



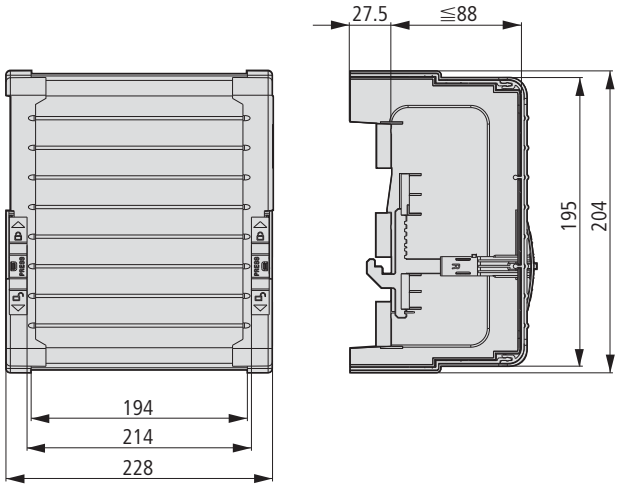
Terminal kits

BBA-TP3/300

BBA-TP3/CU-BAND

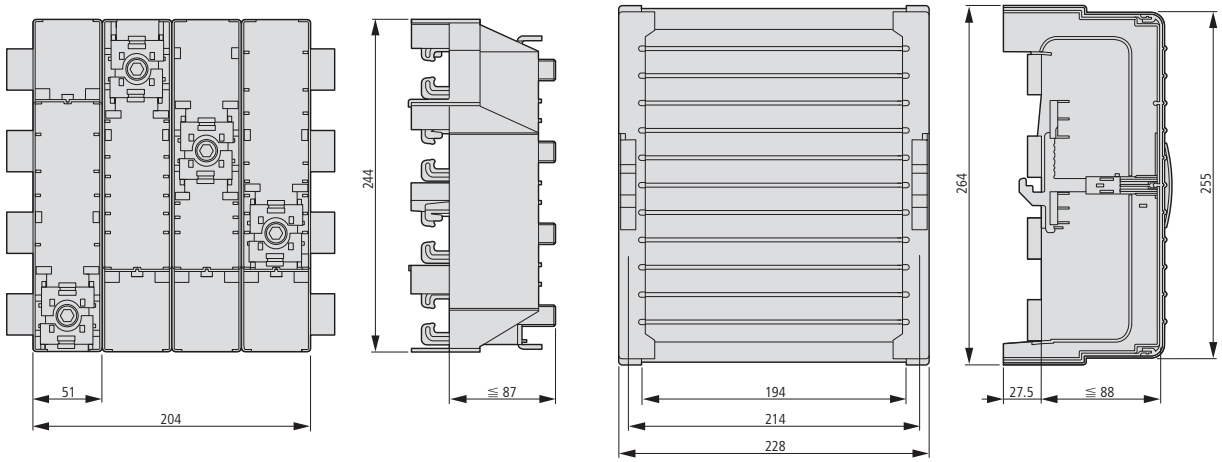


CU-BAND BBA-TP3/1000



BBA-TP4/300

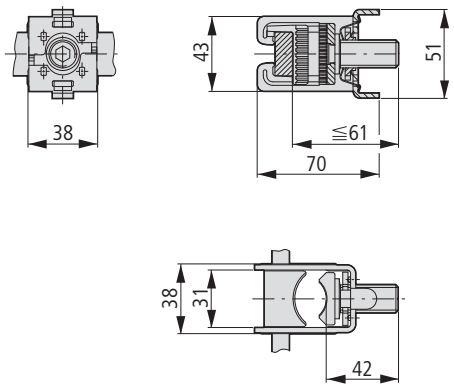
BBA-TP4/CU-BAND



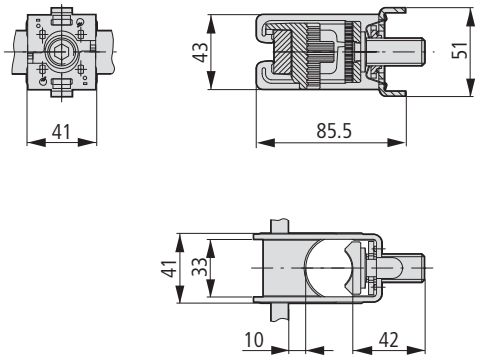
AKS, AKP

Expansion terminals

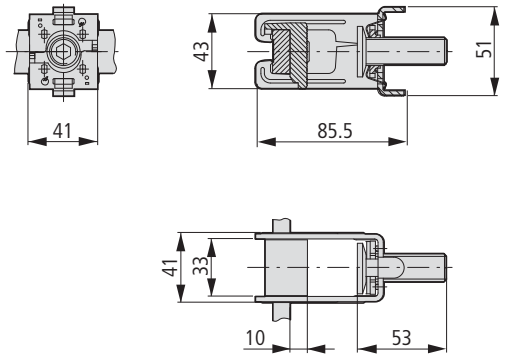
AKS185



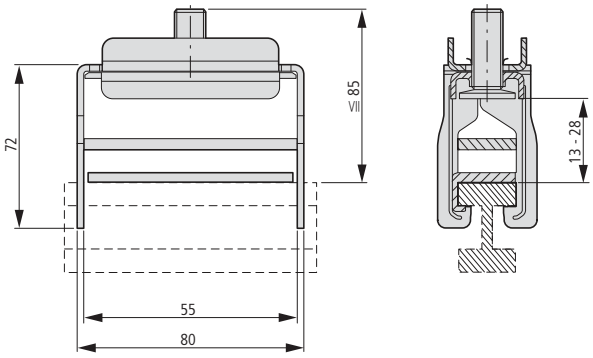
AKS300



AKS CU-BAND

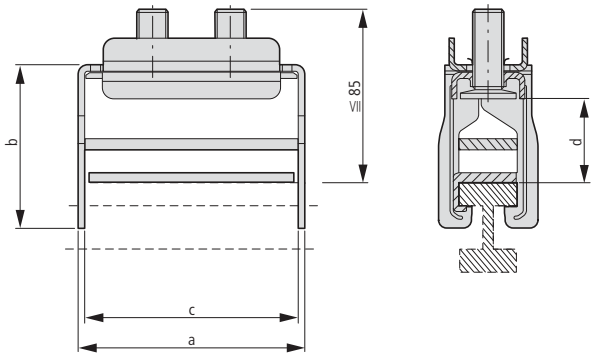


AKS1000



AKS1200

AKS2000

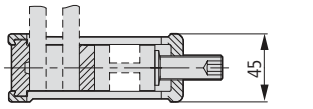


Part no.	a	b	c	d
AKS1200	85	80	68	13-38
AKS2000	122	80	105	13-38

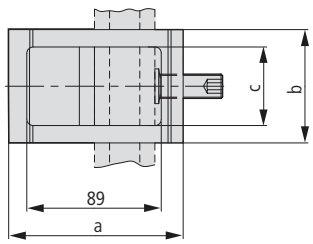
Profile terminals

AKP800

AKP1000



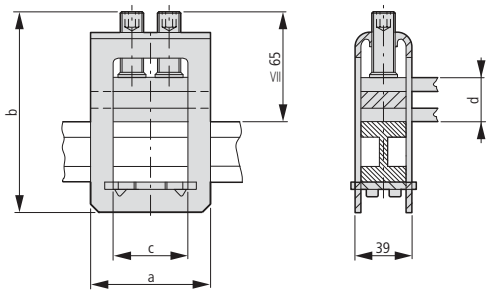
Part no.	a	b	c
AKP800	118	72	41
AKP1000	103	94	64



AKP, AKU

Profile terminals

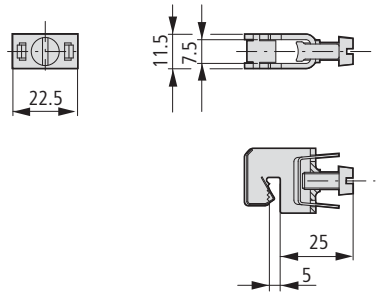
AKP750
AKP900
AKP1200
AKP1600
AKP2000
AKP3600



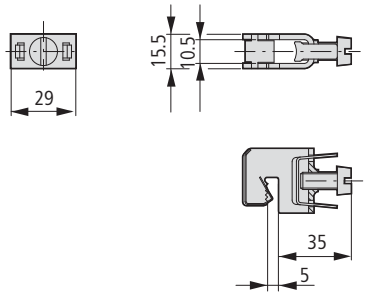
Part no.	a	b	c	d
AKP750	82	103	51	5-28
AKP900	94	103	64	5-28
AKP1200	94	118	64	20-42
AKP1600	112	118	81	20-42
AKP2000	132	118	101	20-42
AKP3600	132	154	101	23-45

Universal conductor connection terminals

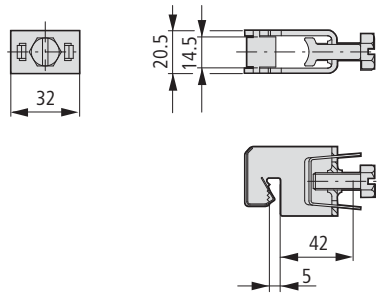
AKU16/5



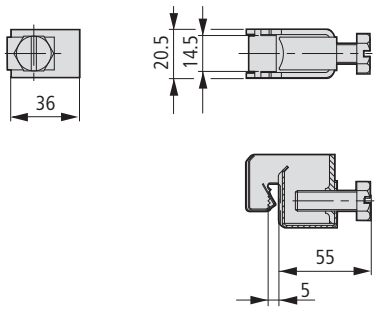
AKU35/5



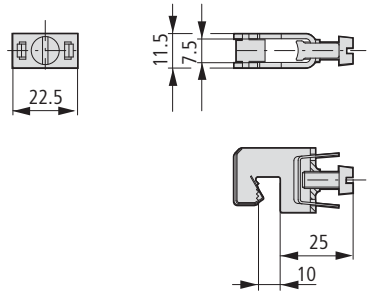
AKU70/5



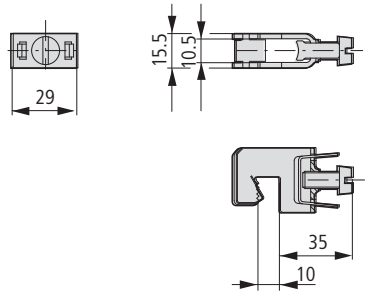
AKU120/5



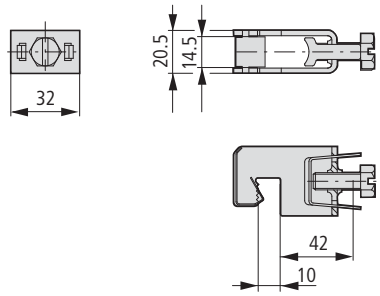
AKU16/10



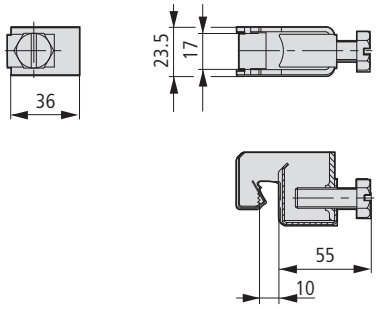
AKU35/10



AKU70/10



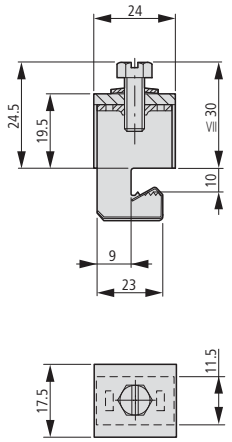
AKU120/10



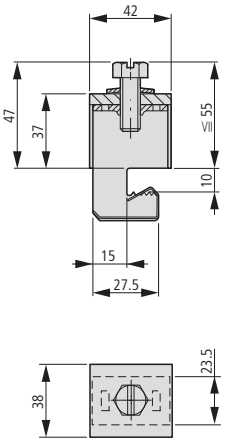
BBT-CU

Universal conductor connection terminals

AKUM8/10

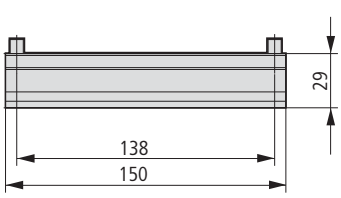


AKUM10/10

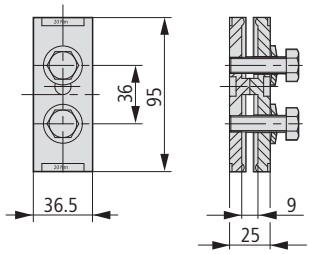


End-to-end busbar connectors

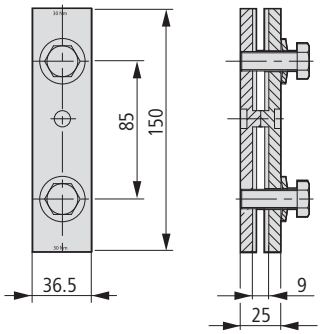
BBT-CU12-20X5/10-150



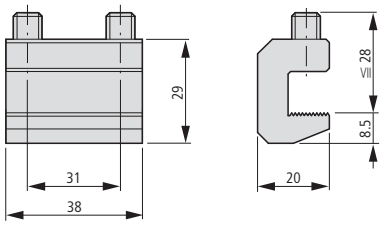
BBT-CU20-30X5/10-95



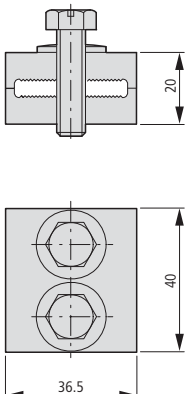
BBT-CU20-30X5/10-150



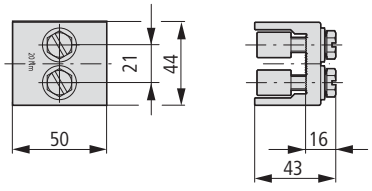
BBT-CU12-20X5/10-38



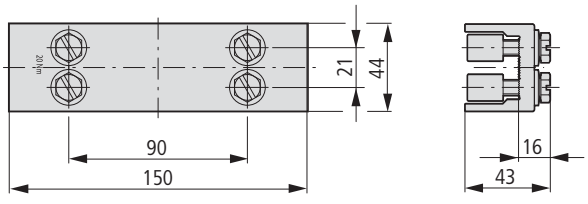
BBT-CU20-30X5/10-40



BBT-CU-BAR500/720-50



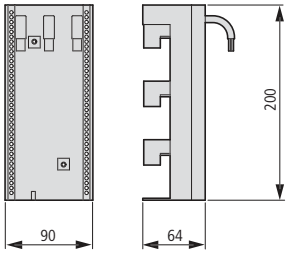
BBT-CU-BAR500/720-150



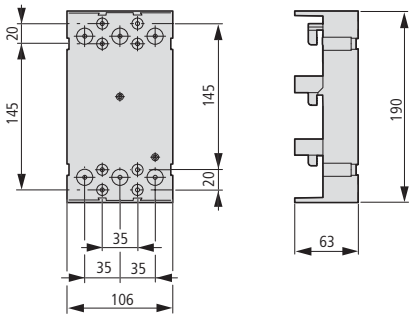
NZM...-XAD...

Component adapters for circuit-breakers and switch-disconnectors

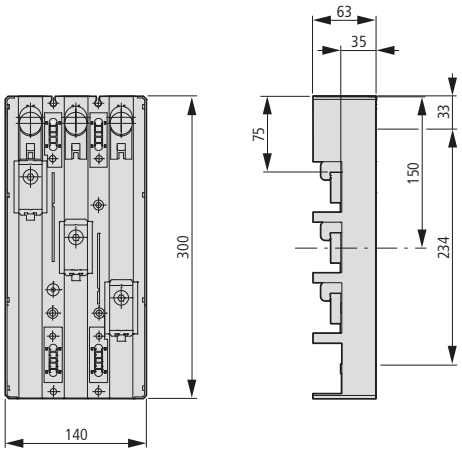
NZM1-XAD160



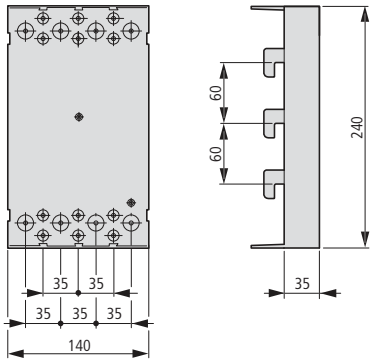
NZM2-XAD250



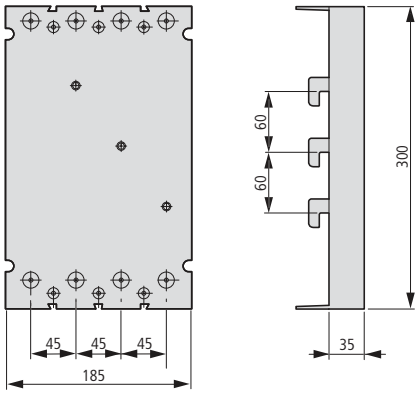
NZM3-XAD630



NZM2-4-XAD250

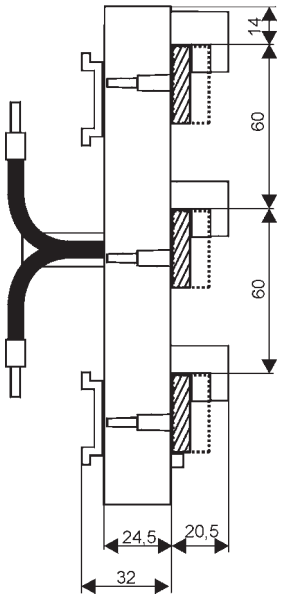


NZM3-4-XAD630



Double adapters

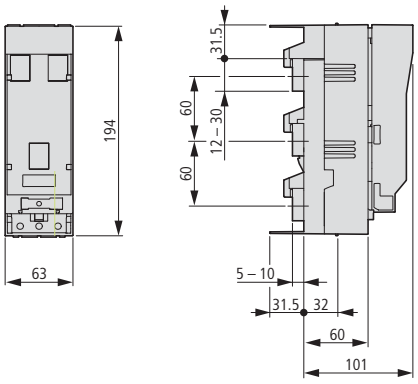
Z-SS-60-ADD/6...



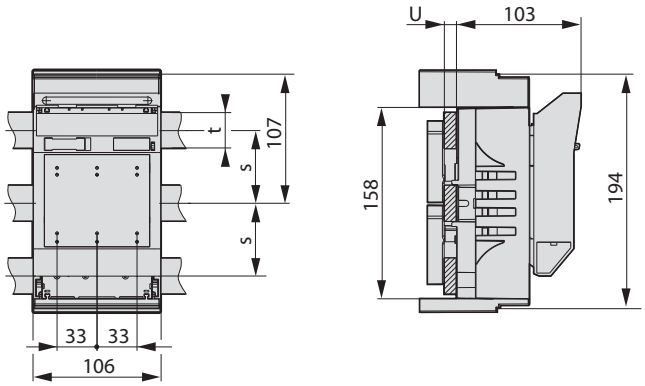
LTS, GST

LV h.b.c. fuse switch-disconnectors

LTS-100/C00/3-R

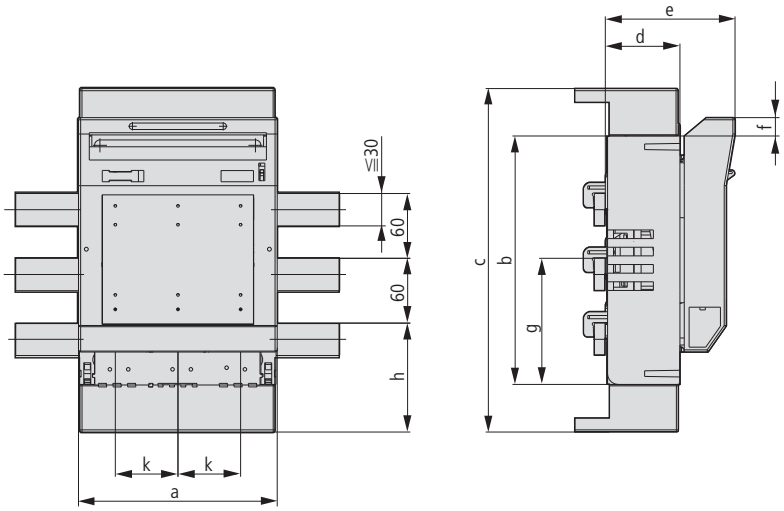


GST00-160-40-60-AOU



Part no.	s	t	u
GST0-160-40-60-AOU	40	12	5-10
	50	20	5-15
	60	20-30	5-10

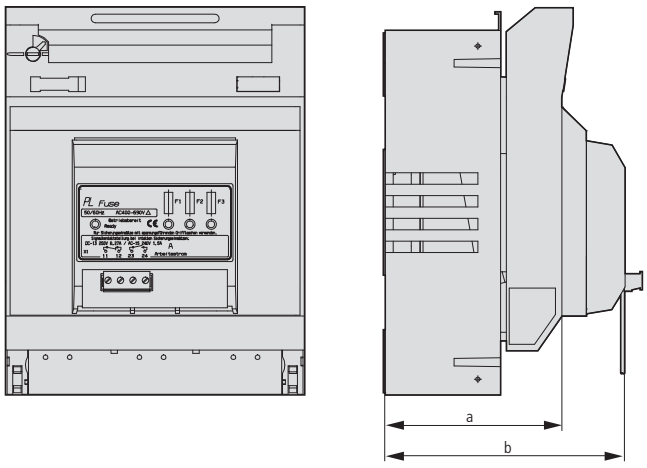
GST1-A...
GST2-A...
GST3-A...



Part no.	a	b	c	d	e	f	g	h	k
GST1-A...	184	230	322	70	121	16.5	115	104	58
GST2-A...	210	256	408	83	135	16.5	128	145	66
GST3-A...	254	270	434	98	149	9	135	156	82

Cover with fuse monitoring for fuse switch-disconnectors

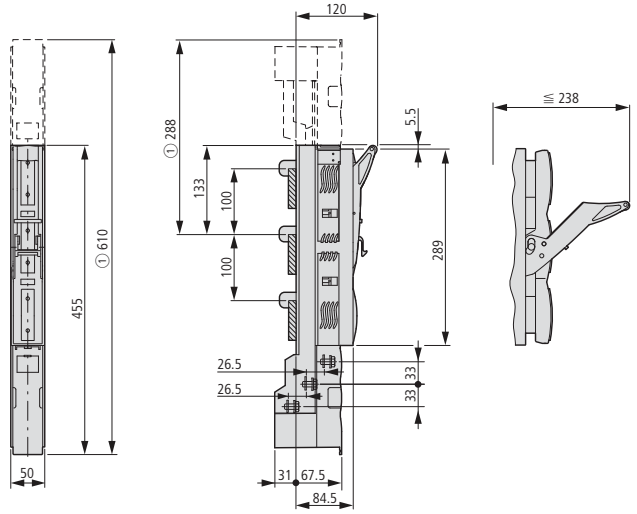
GST...-DSI



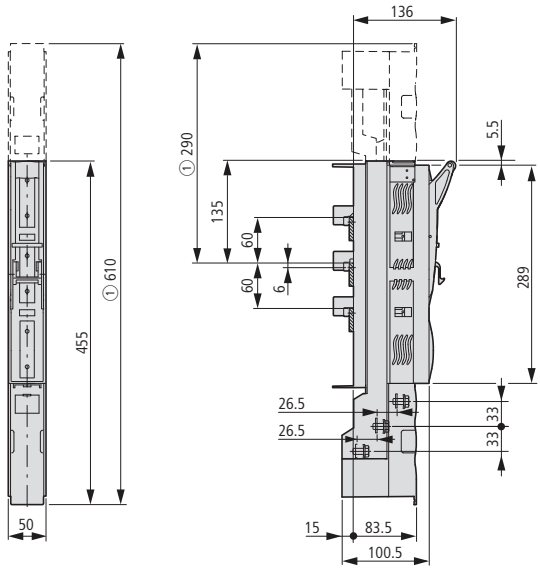
Part no.	Size	a	b
GST00...	NH00	90	123
GST1...	NH1	120	151
GST2...	NH2	135	166
GST3...	NH3	145	176

LV h.b.c. fuse switches

NH-SLS-00/160
NH-SLS-00/160-SI

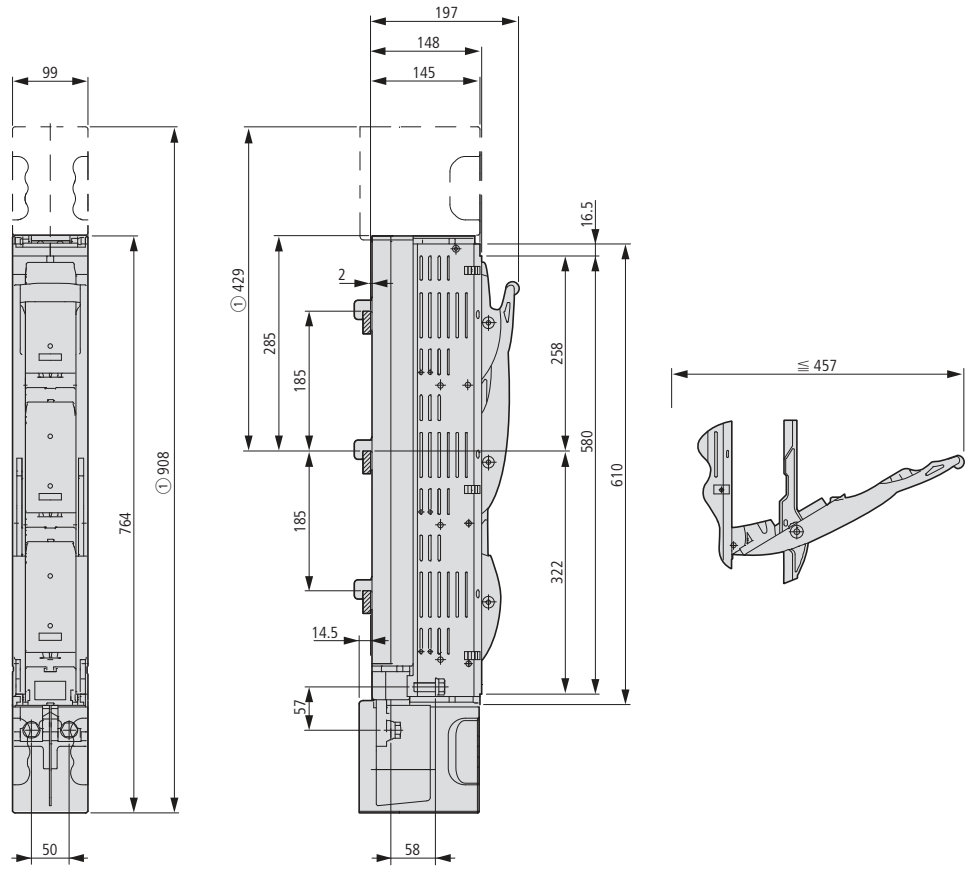


NH-SLS-00/160-60
NH-SLS-00/160-60-SI



NH-SLS-1/250
NH-SLS-1/250-SI
NH-SLS-2/400
NH-SLS-2/400-SI
NH-SLS-3/630
NH-SLS-3/630-SI

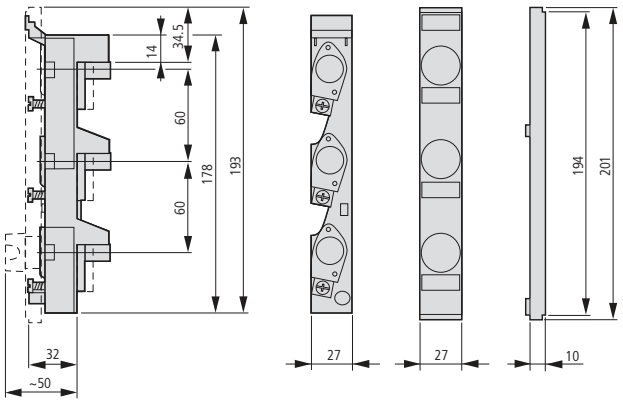
① NH-SLS-...-SI
(with fuse monitoring)



D02, DII, DIII

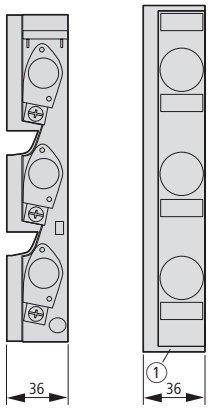
D busbar mounting fuse devices

D02-SO/63/3-R-27

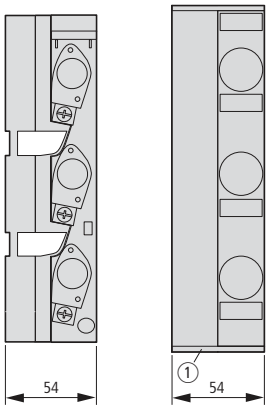


① Front plate support

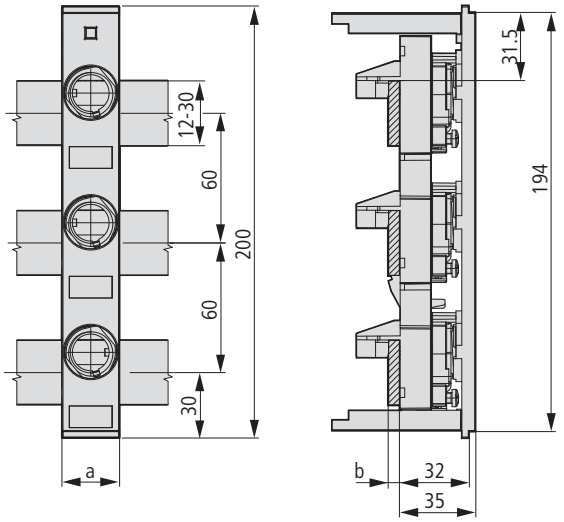
Z-D02/R/3-36



Z-D02/R/3-54

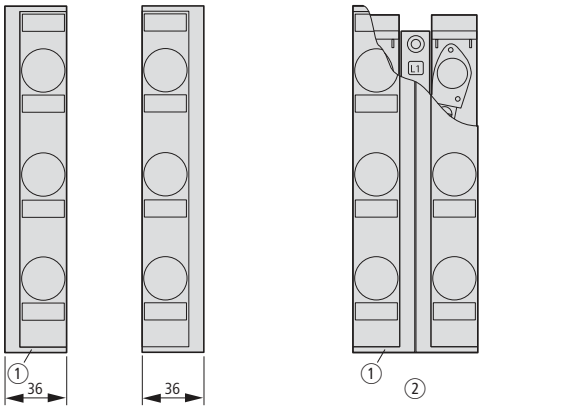


DII-SO/25/3-R(-PS)
DIII-SO/63/3-R(-PS)



Part no.	a	b
DII-SO/25/3-R(-PS)	45	5-10
DIII-SO/63/3-R(-PS)	54	5-10

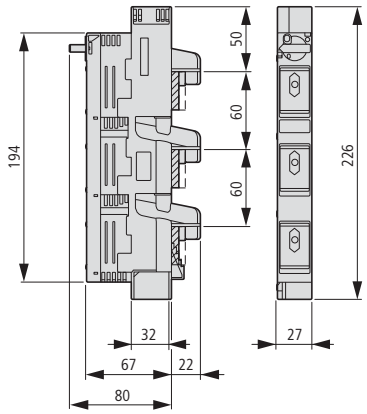
Z-D02-S-AB-SET



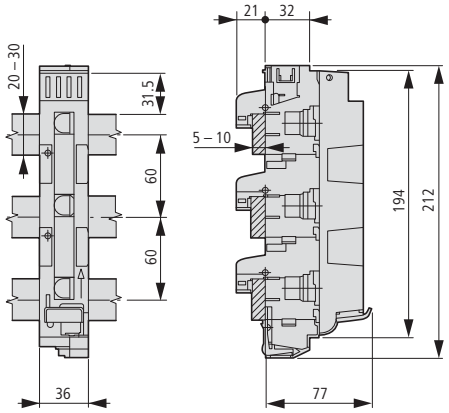
① Front plate support
② Covered busbar support

D fuse switch-disconnector

D02-LTS/63/3-R(-HK)

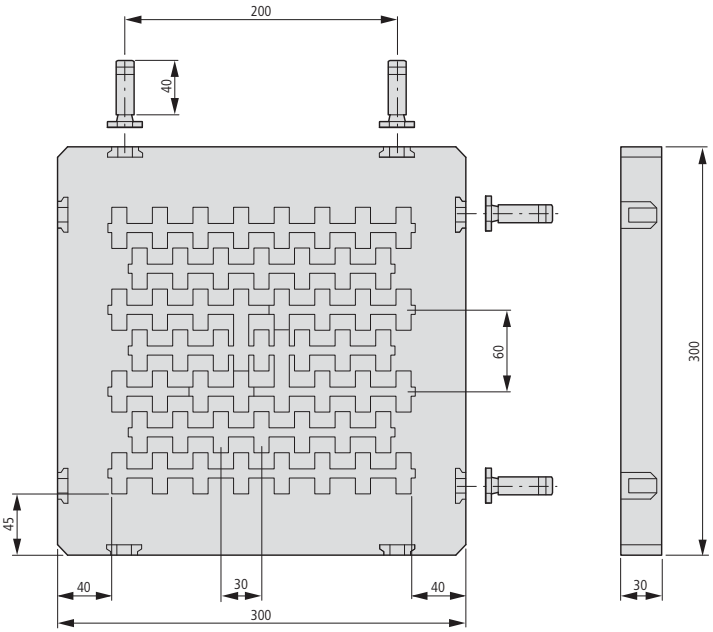


D02-S/63/3-RS

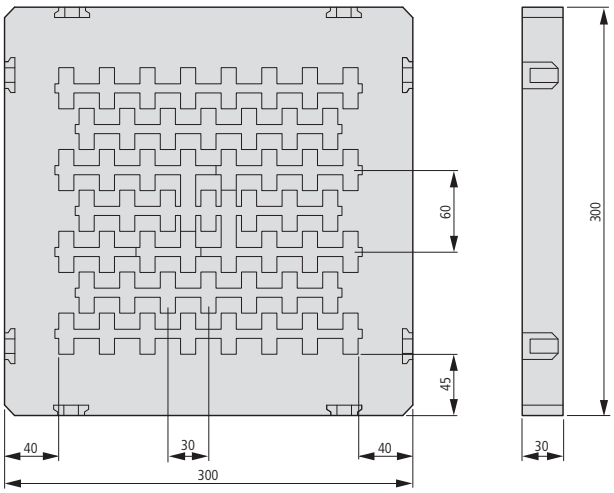


Busbar supports

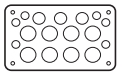
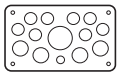
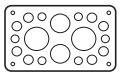
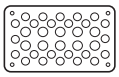
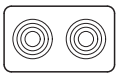
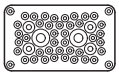
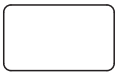
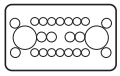
KSX-34P-EXT

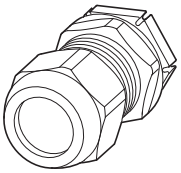


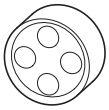
KSX-34P-MID



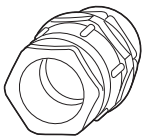
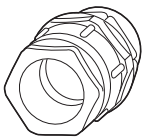
Ordering

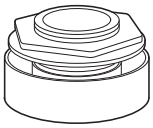
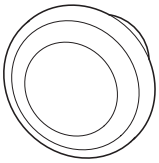
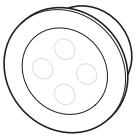
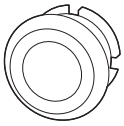
	Material	Features	Cable entry	Part no. Article no.	Price See price list	Std. pack
Flanges						
• With captive, sponge-rubber gasket • RAL 7035						
	Insulating material	Blank plate	-	**F3A-0** 074182		10 off
	Insulating material	With metric cable entry knockouts	6 x M25/16 8 x M32/20, 4 x M16	**F3A-4** 081301		10 off
	Insulating material	With metric cable entry knockouts	2 x M20 8 x M25/16 4 x M32/20 1 x M50/32	**F3A-8** 091468		10 off
	Insulating material	With metric cable entry knockouts	12 x M20, 2 x M16 2 x M40/25 2 x M50/32	**F3A-12** 076555		10 off
	Insulating material	With metric cable entry knockouts	24 x M16 13 x M20	**F3A-34** 078928		10 off
	Insulating material	With cable grommets	2 cables up to 70 mm ∅	**F3A-KTD** 083674		5 off
	Insulating material	Sponge-rubber flange	40 cables, 10 – 13 mm ∅ 4 cables, 17 - 21 mm ∅ 2 cables, 27 - 30 mm ∅	**F3A-D** 010145		10 off
	Sheet steel	Blank plate 2 mm, powder-spray painted RAL 7035	-	**F3A-XP** 113426		1 off
	Insulating material	Diaphragm flange for push-fitting cables, base RAL 9016, white For cutouts 195 x 64 mm	14 x 11 mm ∅ 8 x 15 mm ∅ 2 x 28 mm ∅	**ZSD-2K/FLA** 272166		1 off

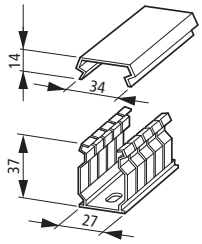
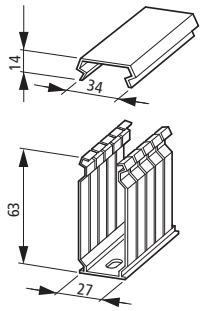
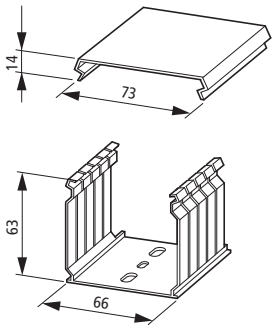
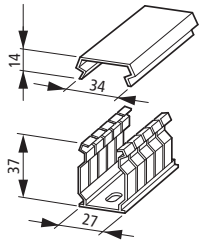
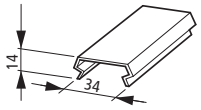
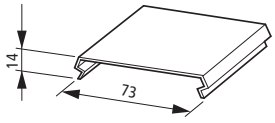
	Cable entry	Drilling dimensions mm	External diameter of cable mm	For use with NYM/NYY cables, 4-core mm²	Part no. Article no.	Price See price list	Std. pack
Metric cable glands to EN 50262							
• With lock nut and built-in strain relief • IP68 up to 5 bar, polyamide, halogen-free • Flammability classification V2 according to UL94 • Color RAL 7035							
Cable screw gland							
	M12	12.5	3 - 7	H03VV-F3 x 0.75 mm², NYM 1 x 2.5 mm²	**V-M12** 215078		20 off
	M16	16.5	4.5 - 10	H05VV-F3 x 1.5 mm², NYM 1 x 16/3 x 1.5 mm²	**V-M16** 215077		20 off
	M20	20.5	6 - 13	H05VV-F4 x 2.5/3 x 4 mm², NYM 5 x 1.5/5 x 2.5 mm²	**V-M20** 206910		20 off
	M25	25.5	9 - 17	H05VV-F5 x 2.5/5 x 4 mm², NYM 5 x 2.5/5 x 6 mm²	**V-M25** 206911		20 off
	M32	32.5	13 - 21	NYM 5 x 10 mm²	**V-M32** 206912		10 off
	M40	40.5	16 - 28	NYM 5 x 16 mm²	**V-M40** 209668		10 off
	M50	50.5	21 - 35	NYM 4 x 35/5 x 25 mm²	**V-M50** 206913		5 off
	M63	63.5	34 - 48	NYM 4 x 35 mm²	**V-M63** 214835		3 off

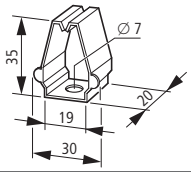
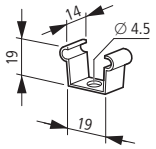
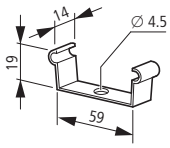
	Cable entry	External diameter of cable mm	For use with NYM/NYY cables, 4-core mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Multiple gaskets for cable glands V-M... , metric						
	M25	4 x 5 - 6	H03VV-F2 x 0.75/3 x 0.75 mm²	**MFD25** 215451		50 off
	M32	4 x 3.5 - 7	H03VV-F4 x 0.75 mm²	**MFD32** 215452		25 off
Stoppers for unused openings in multiple gaskets MFD...						
	M25	6	–	**MFV25-6** 215453		50 off
	M32	7	–	**MFV32-7** 215454		50 off

	Part no. Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
PG cable glands • Conduit union and lock nut with grouding screw • Suitable for standard commercial conduit • Suitable for all enclosures CI…-NA → Page 20/9				
½ "	**STB1/2ZOLL** 045878		1 off	Product Standards: UL 467; UL 514B; CSA-C22.2 No. 18 UL File No.: E23018, E3060 UL CCN: DWTT, KDER CSA File No.: LR 2884 CSA Class No.: 4412-03, 4414-04 NA Certification: UL Listed, CSA certified Conditions of Acceptability: Only used in combination with CI-…-NA enclosures Specially designed for NA: Yes Suitable for: Conduit, Tubing, and Cable Fittings, Grounding and Bonding Equipment Degree of Protection: Refer to main component information See also: Refer to basic component information
¾ "	**STB3/4ZOLL** 060116			
1 "	**STB1ZOLL** 052997			
1 ¼ "	**STB1-1/4ZOLL** 043505			
1 ½ "	**STB1-1/2ZOLL** 041132			
2 "	**STB2ZOLL** 002203			

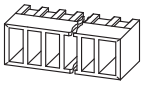
	Cable entry	Drilling dimensions mm	External diameter of cable mm	For use with NYM/NYY cables, 4-core mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Ventilation cable glands • Color RAL 7035							
Ventilation cable gland IP69							
	M20	20.5	6 - 13	H05VV-F 4 x 2.5/3 x 4 mm², NYM 5 x 1.5/5 x 2.5 mm2	**V-M20-VENT** 120814		1 off
Ventilation cable glands IP56 • Permeable to air, impermeable to dust • For the prevention of condensation For use in the enclosure bottom or sides, polyamide, halogen-free							
	M20	20.5	–	–	**STB-M20F** 224557		20 off
	M25	25.5	–	–	**STB-M25F** 224558		20 off

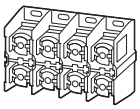
	Cable entry	Drilling dimensions mm	External diameter of cable mm	For use with NYM/NYY cables, 4-core mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Pressure compensating plug							
Pressure compensating plug, IP66, metric Color RAL 7035							
	M40 x 1.5	–	–	–	**DAV-M40** 107225		2 off
Pressure compensating plug, IP66, PG Color RAL 7032							
	PG29	–	–	–	**DA412** 079219		2 off
Cable grommets, metric							
• IP66, with integrated push-through diaphragm • PE and thermoplastic elastomer, halogen-free • Color RAL 7035							
	M16	16.5	1 - 9	H03VV-F3 x 0.75 mm², NYM 1 x 16/3 x 1.5 mm²	**KT-M16** 216983		100 off
	M20	20.5	1 - 13	H03VV-F3 x 0.75 mm², NYM 5 x 1.5/5 x 2.5 mm²	**KT-M20** 207602		100 off
	M25	25.5	1 - 18	H03VV-F3 x 0.75 mm², NYM 4 x 10 mm²	**KT-M25** 207603		100 off
	M32	32.5	1 - 25	H03VV-F3 x 0.75 mm², NYM 4 x 16/5 x 10 mm²	**KT-M32** 207604		100 off
PG cable grommets							
• For wall thickness 2 - 8 mm • Soft PVC, cadmium- and lead-free • Color similar to RAL 7035							
	PG13.5	21.5	7 - 16	1.5 - 4	**KT13.5** 019658		100 off
	PG16	23.5	7 - 17	1.5 - 10	**KT16** 022031		100 off
	PG21	29.5	12.5 - 20	1.5 - 16	**KT21** 026777		100 off
	PG29	38	12.5 - 31	1.5 - 35	**KT29** 029150		50 off
	PG36	48	18 - 40	10 - 70	**KT36** 033896		20 off
	PG42	55	18 - 47	10 - 95	**KT42** 038642		10 off
Stepped cable grommets							
• For wall thickness 2 - 3 mm, • PVC • Color RAL 7035							
	–	58	14 - 54	–	**KT3** 031523		2 off
	–	75	14 - 68	–	**KT4** 036269		3 off
Pressure compensating grommets							
• Ventilation grommet with filter disc • Fitting below or on side of enclosure • PE and PVC • Color RAL 7035 • Metric and P6							
	M25	25.5	–	–	**KT-M25F** 224556		100 off
	PG16	23.5	–	–	**KT16F** 024404		100 off

	Length	Capacity: max. no. of cables (approx.)	Type and cross-section		**Part no.** Article no.	**Price** See price list	Std. pack
			H 0… V-K	H 0… V-K			
	mm		mm²	AWG			
Cable ducts							
For screw-fitting							
	1500	60 40 25 15	0.75 1.5 2.5 4	- 16 14 12	**KL25/35** 012531		60 off
	1500	100 70 45 30 25	0.75 1.5 2.5 4 6	- 16 14 12 10	**KL25/60** 017277		40 off
	1500	260 180 120 80 65	0.75 1.5 2.5 4 6	- 16 14 12 10	**KL60/60** 029142		20 off
Self-adhesive Max. ambient temperature +55 °C							
	650	60 40 25 15	0.75 1.5 2.5 4	- 16 14 12	**KL25/35K** 014904		50 off
Cable duct cover Supplied as spares							
	1500	–	–	–	**KD25** 019649		200 off
	1500	–	–	–	**KD60** 024395		100 off

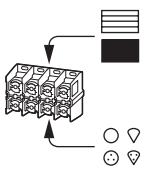
	Length	Capacity: max. no. of cables (approx.)	Type and cross-section		Part no. Article no.	Price See price list	Std. pack
			H 0… V-K	H 0… V-K			
	mm		mm²	AWG			
Cable support brackets for cable ducts							
• Can be used in cable ducts KL25/35 (K) • Screw-fitting							
	–	15	4	–	**KH25/35** 078974		20 off
Clamping brackets for cable ducts							
KL25/...: fixing interval: ≦ 500 mm							
	–	–	–	–	**KK25** 081347		100 off
K60/60: fixing interval: ≦ 300 mm							
	–	–	–	–	**KK60** 083720		100 off

	Features	Length	Width	Bundle area	Tensile strength	Part no. Article no.	Price See price list	Std. pack
		mm	mm	mm	N			
ITB Industrial cable binders								
• For bundling and fastening cables, cable looms, hoses, pipes etc. • Continuous ribbing up to tip • Temperature-resistant from -40 to +85 °C • Material PO 6.6, color natural, flame resistant to UL 94 V2 • Resistant to oils, petrol/gasoline, salt water, solvent, mold								
	1000 off	98	2.5	21	8	**ITB1** 083550		1 off
	1000 off	140	3.6	35	13	**ITB2** 085923		1 off
	With 4.8 mm fixing eyelet 100 off	205	4.2	60	220	**ITB3** 088296		1 off

	For use with	Part no. Article no.	Price See price list	Std. pack
Conductor supports for copper strip, insulated				
Section strip				
	Latch fastener	**BZ248** 076516		10 off
Latch fastener for section strip				
	3 x 9 x 0.8 + BZ248 6 x 9 x 0.8 + BZ248	**BZ249** 078889		10 off
	4 x 16 x 0.8 + BZ248 6 x 16 x 0.8 + BZ248 10 x 16 x 0.8 + BZ248	**BZ251** 081262		10 off
	11 x 21 x 1 + BZ248	**BZ252** 083635		10 off

	Rated operational current I_e A	Poles	Terminal capacities[1] Cu ⊙▽○▽ Al ▽ Al ○▽		Terminal capacities[1] Copper strip mm	Copper bar mm	**Part no.** Article no.	**Price** See price list	Std. pack
Terminals 160 - 1000 A									
Includes labels for terminal marking U, V, W - X, Y, Z - L 1, L 2, L3 - T 1, T 2, T 3 - PE, N, PEN, ⏚ U_i = 1000 V AC Assignment of rated current → Terminal capacities to IEC/EN 60439, VDE 0660 Part 500 or EN 50021 Outer terminal for round or sectoral conductor, other side for copper strip. Conversion kits for converting flat strip terminal to cable terminal → Page 16/69, terminal shroud → Page 16/69									
	160	1	1 x 16 - 95	1 x 35 - 70	3 x 9 x 0.8 - 6 x 9 x 0.8	18 x 4	**K95/1N** 010773		1 off
		3					**K95/3** 025017		
		4					**K95/4** 027390		
		5					**K95/5** 029763		
		1			–	–	**K95/1N/BR** 012336		
	250	1	1 x 35 - 150 2 x 16 - 70	1 x 50 - 120 2 x 35 - 50	1 x 4 x 16 x 0.8 - 2 x 6 x 16 x 0.8	18 x 4	**K150/1** 089085		1 off
		3					**K150/3** 032136		
		4					**K150/4** 034509		
		5					**K150/5** 036882		
		1			–	–	**K150/1/BR** 014709		
	400	1	1 x 50 - 240 2 x 25 - 120	1 x 95 - 185 2 x 50 - 95	6 x 16 x 0.8 - 10 x 16 x 0.8	25 x 15	**K240/1** 091458		1 off
		3					**K240/3** 039255		
		4					**K240/4** 041628		
		5					**K240/5** 044001		
		1			–	–	**K240/1/BR** 017082		
	630	1	1 x 150 - 300 2 x 50 - 240	1 x 150 - 240 2 x 95 - 185	10 x 16 x 0.8 - 11 x 21 x 1	40 x 15	**K2X240/1** 093831		1 off
		3					**K2X240/3** 046374		
		4					**K2X240/4** 048747		
		5					**K2X240/5** 051120		
		1			–	18 x 4	**K2X240/1/BR** 019455		

Notes

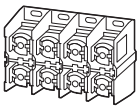


[1] ▬ Copper strip
■ Copper bar
○ Round conductor, solid
⊙ Round conductor, stranded
▽ Sectoral conductor, solid
▽ Sectoral conductor, stranded

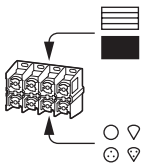
Part nos. K95/1N/BR, K150/1/BR, K240/1/BR and K2X240/1/BR
= suitable for connection of round and sectoral conductors at both sides

Terminals 160 - 1000 A

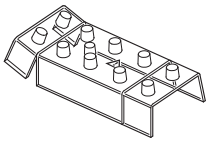
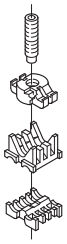
Includes labels for terminal marking U, V, W - X, Y, Z - L 1, L 2, L3 - T 1, T 2, T 3 - PE, N, PEN, ⏚
U_i = 1000 V AC
Assignment of rated current → Terminal capacities to IEC/EN 60439,
VDE 0660 Part 500 or EN 50021
Outer terminal for round or sectoral conductor, other side for copper strip.
Conversion kits for converting flat strip terminal to cable terminal → Page 16/69, terminal shroud → Page 16/69

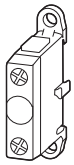
	Rated operational current I_e A	Poles	Terminal capacities[1] Cu ⊙▽○▽ Al ▽ Al ○▽		Terminal capacities[1] ▤ Copper strip mm	■ Copper bar mm	**Part no.** Article no.	**Price** See price list	Std. pack
	800	1	2 x 120 - 240 3 x 50 - 185	2 x 150 - 185 3 x 95 - 150	2 x (11 x 21 x 1)	50 x 20	**K3X185/1** 062985		1 off
		3					**K3X185/3** 065358		
		4					**K3X185/4** 067731		
		5					**K3X185/5** 070104		
	1000	1	2 x 150 - 300 3 x 50 - 240	2 x 150 - 240 3 x 150 - 185	2 x 150 - 240 3 x 150 - 185	60 x 15	**K3X240/1** 060612		1 off
		3					**K3X240/3** 058239		
		4					**K3X240/4** 055866		
		5					**K3X240/5** 053493		
		1	2 x 150 - 300 4 x 50 - 185	2 x 240 4 x 120 - 150	2 x 240 4 x 120 - 150		**K4X185/1** 079596		
		3					**K4X185/3** 077223		
		4					**K4X185/4** 074850		
		5					**K4X185/5** 072477		

Notes

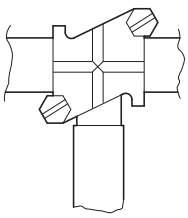


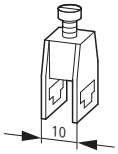
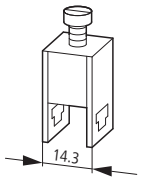
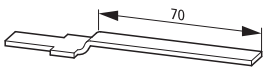
[1] ▤ Copper strip
■ Copper bar
○ Round conductor, solid
⊙ Round conductor, stranded
▽ Sectoral conductor, solid
▽ Sectoral conductor, stranded

	For use with	Rated uninterrupted current I_u A	**Part no.** Article no.	**Price** See price list	Std. pack
Terminal shrouds, 5 pole					
Including warning label To DIN (lightning symbol) Break off end sections for 3- and 4 pole terminal shrouds					
	K95/3, K95/4, K95/5	–	**H-K95/5** 036888		4 off
	K150/3, K150/4, K150/5	–	**H-K150/5** 039261		1 off
	K240/3, K240/4, K240/5	–	**H-K240/5** 041634		
	K2X240/3, K2X240/4, K2X240/5	–	**H-K2X240/5** 044007		
	K3X185/3, K3X185/4, K3X185/5	–	**H-K3X185/5** 048753		
	K3X240/3, K3X240/4, K3X240/5	–	**H-K3X240/5** 046380		
	K4X185/3, K4X185/4, K4X185/5	–	**H-K4X185/5** 051126		
Conversion kits for terminals 160 – 1000 A					
For one conductor To convert from flat strip terminal to cable terminal					
	K95/…	160	**D-K95** 020277		1 off
	K150/…	250	**D-K150** 022650		
	K240/…	400	**D-K240** 025023		
	K2X240/…	630	**D-K2X240** 027396		
	K3X185/…	800	**D-K3X185** 032142		
	K3X240/…	1000	**D-K3X240** 029769		
	K4X185/…	1000	**D-K4X185** 034515		
For one control circuit cable M4 screw with pressure plate Terminal capacity 0.5 - 2.5 mm²					
	K95/... + K150/...	–	**HK-K95-K150** 001916		1 off
	K240/…	–	**HK-K240** 098585		
	K2X240/…	–	**HK-K2X240** 010785		
	K3X185/…	–	**HK-K3X185** 015531		
	K3X240/…	–	**HK-K3X240** 013158		
	K3X240/... + K4X185/...	–	**HK-K3X240-K4X185** 001917		

	Circuit	Rated uninterrupted current I_u A	Terminal capacities[1] Terminal capacities for round conductors mm²	Terminal capacities for flat conductors mm	**Part no.** Article no.	**Price** See price list	Std. pack
Insulated individual terminals 32 - 100 A							
• With adhesive labels • Can be screwed onto mounting plates and stacking mandrels of enclosures CI and CI-K • For snap-fitting to mounting rails to IEC/EN 60715 • Terminal capacities to IEC/EN 60947-1, VDE 0609 Part 1 • Rated insulation voltage U_i = 1000 V AC							
With two connections							
		32	○ 1.5 - 10 ⊜ 1.5 - 6	–	**K10/1** 093827		10 off
		63	○ 4 - 16 ⊙ 16 - 25 ⊜ 6 - 16	–	**K25/1** 096200		10 off
		100	○ 10 - 16 ⊙ 16 - 50 ⊜ 10 - 35	▤ 3 x 9 x 0.8	**K50/1** 098573		10 off

Notes [1] ⊙ Solid
⊙ Stranded
⊜ Flexible with ferrule
▤ Copper strip

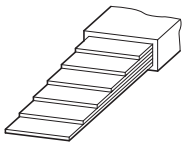
	For use with busbars mm	Terminal capacities for flat conductors mm	Rated operational current, flat conductor I_e A	Terminal capacities, round conductors Type: ○ solid ⊜ flexible with ferrule mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Ultra-flat busbar terminals 100 - 800 A							
	Cu 12 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8	100 160 200 250	○ 1.5 - 10 ⊜ 1.5 - 6	**K12X5/25** 002324		10 off
	Cu 20 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8	100 160 200 250	○ 1.5 - 10 ⊜ 1.5 - 6	**K20X5/25** 002327		10 off
	Cu 20 x 5 Cu 20 x 10	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8	100 160 200 250 400	○ 1.5 - 10 ⊜ 1.5 - 6	**K20X10/35** 002325		10 off
	Cu 20 x 5 Cu 20 x 10	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8	100 160 200 250 400	○ 1.5 - 10 ⊜ 1.5 - 6	**K20X15/40** 002285		10 off
	Cu 20 x 10 Cu 20 x 15	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	100 160 200 250 400 630	○ 1.5 - 10 ⊜ 1.5 - 6			
	Cu 20 x 15	11 x 21 x 1 2 x (11 x 21 x 1)	630 800	○ 1.5 - 10 ⊜ 1.5 - 6	**K20X15/50** 002326		5 off

	For use with busbars	Terminal capacities for flat conductors	Terminal capacities, round conductors Type: ○ solid ⊙ stranded ⊛ flexible with ferrule	**Part no.** Article no.	**Price** See price list	Std. pack
	mm	mm	mm^2			
Terminal expansions for ultra-flat busbar terminals						
Expansion terminals for tongue						
	Cu 10 x 3	–	○ ⊙ 1.5 - 16 ⊛ 0.75 - 16	**AK16** 079336		50 off
	Cu 10 x 3	–	○ 6 - 16 ⊙ 6 - 25 ⊛ 4 - 25	**AK35** 079614		50 off
Tongue for expansion terminal AK… in conjunction with busbar terminals K...						
	–	–	–	**L-KL-R** 079269		50 off

Copper strip

Copper strip insulated

- Laminated E-Cu conductor, tin-plated
- Rated operating voltage 690 V AC
- UL approved up to 600 V AC
- Dielectric strength 20 kV/mm
- Insulating material heat resistant up to +105 °C
- Self-extinguishing to UL 94 V 0
- 2000 mm long, black (BK), blue (BU) and green/yellow (GNYE).



Rated operational current[1] I_e A	Dimensions (number of layers × width × layer thickness) mm	Cross-section[2] mm²	Cu factor[3]	Color	**Part no.** Article no.	**Price** See price list	Std. pack
100	3 x 9 x 0.8	21.6	0.41	Black	**CU-BAND3X9X0.8-BK** 081167		20 off
100	3 x 9 x 0.8	21.6	0.41	Yellow/green	**CU-BAND3X9X0.8-GNYE** 081006		20 off
100	3 x 9 x 0.8	21.6	0.41	Blue	**CU-BAND3X9X0.8-BU** 080960		20 off
160	6 x 9 x 0.8	43.2	0.83	Black	**CU-BAND6X9X0.8-BK** 081414		10 off
160	6 x 9 x 0.8	43.2	0.83	Yellow/green	**CU-BAND6X9X0.8-GNYE** 081367		10 off
160	6 x 9 x 0.8	43.2	0.83	Blue	**CU-BAND6X9X0.8-BU** 081344		10 off
200	9 x 9 x 0.8	64.8	1.24	Black	**CU-BAND9X9X0.8-BK** 081515		10 off
200	9 x 9 x 0.8	64.8	1.24	Yellow/green	**CU-BAND9X9X0.8-GNYE** 081485		10 off
200	9 x 9 x 0.8	64.8	1.24	Blue	**CU-BAND9X9X0.8-BU** 081436		10 off
250	6 x 16 x 0.8	74.4	1.43	Black	**CU-BAND6X16X0.8-BK** 081310		10 off
250	6 x 16 x 0.8	74.4	1.43	Yellow/green	**CU-BAND6X16X0.8-GNYE** 081275		10 off
250	6 x 16 x 0.8	74.4	1.43	Blue	**CU-BAND6X16X0.8-BU** 081222		10 off
400	5 x 24 x 1	120	2.14	Black	**CU-BAND5X24X1-BK** 119032		5 off
400	10 x 16 x 0.8	124	2.38	Black	**CU-BAND10X16X0,8-BK** 080739		5 off
400	10 x 16 x 0.8	124	2.38	Yellow/green	**CU-BAND10X16X0,8-GNYE** 080698		5 off
400	10 x 16 x 0.8	124	2.38	Blue	**CU-BAND10X16X0,8-BU** 079736		5 off
630	5 x 32 x 1	160	2.85	Black	**CU-BAND5X32X1-BK** 119035		5 off
630	8 x 24 x 1	192	3.42	Black	**CU-BAND8X24X1-BK** 119033		5 off
630	10 x 24 x 1	240	4.28	Black	**CU-BAND10X24X1-BK** 119034		5 off
630	11 x 21 x 1	231	4.44	Black	**CU-BAND11X21X1-BK** 080923		5 off
630	11 x 21 x 1	231	4.44	Yellow/green	**CU-BAND11X21X1-GNYE** 080836		5 off
630	11 x 21 x 1	231	4.44	Blue	**CU-BAND11X21X1-BU** 080769		5 off
800	10 x 32 x 1	320	5.70	Black	**CU-BAND10X32X1-BK** 119036		3 off
1000	10 x 40 x 1	400	7.12	Black	**CU-BAND10X40X1-BK** 119037		3 off
1250	10 x 50 x 1	500	8.90	Black	**CU-BAND10X50X1-BK** 119038		2 off
1600	10 x 80 x 1	800	14.25	Black	**CU-BAND10X80X1-BK** 119039		1 off

Notes

[1] Rated operational current: conforms to VDE 0281
[2] Observe component wiring instructions (e.g. min. terminal capacities in mm²)
[3] Calculation of material surcharge → Page 23/3

Information relevant for export to North America

Product Standards	UL 758; EN 60439-1, -3; CE marking
UL File No.	E248096
UL CCN	AVLV2
CSA File No.	UL report applies to both US and Canada
CSA Class No.	–
NA Certification	UL Listed, certified by UL for use in Canada
Conditions of Acceptability	max. 105 °C
Suitable for	Appliance Wiring Material - Component
Max. Voltage Rating	600 V AC, 750 V DC

Flat copper bars



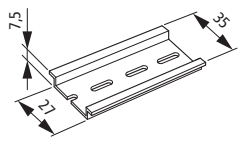
	Rated operational current I_e A	Dimensions mm	Part no. Article no.	Price See price list	Std. pack
Tinned	160	12 x 5 x supplied in lengths of 1500	**CU12X5** 034121		10 off
Tinned	160	12x 5 x supplied in lengths of 2250	**CU12X5-2250** 005093		10 off
Tinned	240	12 x 10 x supplied in lengths of 1500	**CU12X10** 215269		5 off
Tinned	310	15 x 5 x supplied in lengths of 1500	**CU15X5** 215270		10 off
Tinned	360	15 x 10 x supplied in lengths of 1500	**CU15X10** 215271		5 off
Tinned	250	20 x 5 x supplied in lengths of 1500	**CU20X5** 044092		10 off
Tinned	250	20 x 5 x supplied in lengths of 2250	**CU20X5-2250** 007466		10 off
Tinned	250	20 x 5 x supplied in lengths of 2500	**CU20X5-2500** 032703		1 off
Tinned	400	12 x 10 x supplied in lengths of 1500	**CU20X10** 041719		5 off
Tinned	400	20 x 10 x supplied in lengths of 2250	**CU20X10-2250** 009839		5 off
Untreated	630	30 x 10 x supplied in lengths of 1500	**CU30X10** 051211		1 off
Untreated	850	40 x 10 x supplied in lengths of 1500	**CU40X10** 063076		3 off

Flat copper busbars, predrilled

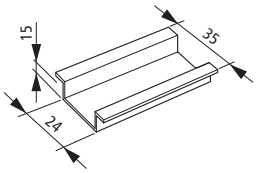


	Rated operational current I_e A	Thread	Dimensions mm	Part no. Article no.	Price See price list	Std. pack
218	M6	15 x 5 x supplied in lengths of 1000	**BPZ-BB/T-15/5/1000** 289861		4 off
274	M6	20 x 5 x supplied in lengths of 1000	**BPZ-BB/T-20/5/1000** 289862		4 off
400	M6	32 x 5 x supplied in lengths of 1000	**BPZ-BB/T-32/5/1000** 289863		1 off
218	M6	15 x 5 x supplied in lengths of 2000	**BPZ-BB/T-15/5/2000** 289864		1 off
274	M6	20 x 5 x supplied in lengths of 2000	**BPZ-BB/T-20/5/2000** 289865		1 off
427	M8	20 x 10 x supplied in lengths of 1000	**BPZ-BB/T-20/10/1000** 289866		1 off
573	M8	30 x 10 x supplied in lengths of 1000	**BPZ-BB/T-30/10/1000** 289867		1 off

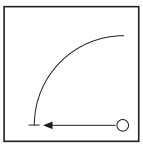
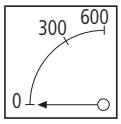
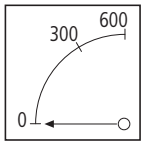
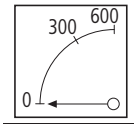
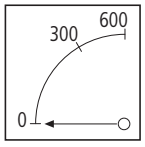
DIN-rails

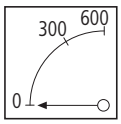


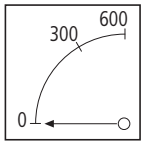
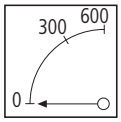
	Part no. Article no.	Price See price list	Std. pack
To IEC/EN 60715 35 x 7.5 mm Short-circuit rating as PE conductor corresponds to 16 mm² copper conductor to IEC/EN 60439-1 Supplied in lengths of 2 m	**TS35X7.5** 053030		20 off

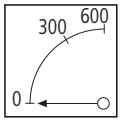
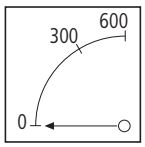


	Part no. Article no.	Price See price list	Std. pack
To IEC/EN 60715 35 x 15 mm Short-circuit rating as PE conductor corresponds to 50 mm² copper conductor to IEC/EN 60439-1 Supplied in lengths of 2 m	**TS35X15** 050657		10 off

	Measuring range A	Measuring range V	**Part no.** Article no.	**Price** See price list	Std. pack
Power factor (p. f.) meters					
• Rated operational voltage 3 × 400 V AC • Current through transformer secondary winding 5 A/VA • Scale division 0.5 capacitive - 1 - 0.5 inductive					
	0 - 10/20	–	**LWQ96** 086856		1 off
Voltmeters, class 1.5					
• To DIN 43780 and VDE 410 • Enclosure to DIN 43700 • Narrow version to DIN 43718 • Quadrant scale DIN 43802 (dual scale) • Terminals protected against accidental contact • Vertical operating position • Snap fitting for EQ72 and EQ96 • Class 1.5 • Direct connection					
Unshielded					
EQ45 • 45 x 45 mm	–	0 - 250	**EQ45C-250V** 057968		1 off
	–	0 - 500	**EQ45C-500V** 060341		1 off
EQ72 • 72 x 72 mm	–	0 - 250	**EQ72-250V** 033051		1 off
	–	0 - 500	**EQ72-500V** 033052		
	–	0 - 600	**EQ72-600V** 033053		
	–	0 - 800	**EQ72-800V** 033054		
EQ96 • 96 x 96 mm	–	0 - 250	**EQ96-250V** 033047		1 off
	–	0 - 500	**EQ96-500V** 033048		
	–	0 - 600	**EQ96-600V** 033049		
	–	0 - 800	**EQ96-800V** 033050		
Shielded 4 mT					
EQ72 • 72 x 72 mm	–	0 - 250	**EQ72S-250V** 038581		1 off
	–	0 - 500	**EQ72S-500V** 045700		4 off
	–	0 - 600	**EQ72S-600V** 052819		1 off
EQ96 • 96 x 96 mm	–	0 - 250	**EQ96S-250V** 071803		1 off
	–	0 - 500	**EQ96S-500V** 078922		4 off
	–	0 - 600	**EQ96S-600V** 086041		1 off
	–	0 - 800	**EQ96S-800V** 088414		1 off

	Measuring range A	Part no. Article no.	Price See price list	Std. pack
Ammeters, class 1.5				
• To DIN 43780 and VDE 410 • Enclosure to DIN 43700 • Narrow version to DIN 43718 • Quadrant scale DIN 43802 (dual scale) • Terminals protected against accidental contact • Vertical operating position • Snap fitting for EQ72 and EQ96 • Class 1.5 • For 5 A transformer connection • Power consumption 0.7 VA				
Unshielded				
EQ45 • 45 x 45 mm 	0 - 50	**EQ45C-50/5** 043730		1 off
	0 - 100	**EQ45C-100/5** 046103		
	0 - 200	**EQ45C-200/5** 048476		
	0 - 250	**EQ45C-250/5** 050849		
	0 - 400	**EQ45C-400/5** 053222		
	0 - 600	**EQ45C-600/5** 055595		
EQ48 • 48 x 48 mm 	0 - 10	**EQ48-10-5** 033006		
	0 - 50	**EQ48-50-5** 033007		
	0 - 150	**EQ48-150-5** 033008		
	0 - 200	**EQ48-200-5** 033009		
	0 - 250	**EQ48-250-5** 033010		
	0 - 400	**EQ48-400-5** 033011		
	0 - 600	**EQ48-600-5** 033012		
EQ72 • 72 x 72 mm 	0 - 50	**EQ72-50-5** 032989		1 off
	0 - 100	**EQ72-100-5** 032990		
	0 - 200	**EQ72-200-5** 032991		
	0 - 250	**EQ72-250-5** 032992		
	0 - 400	**EQ72-400-5** 032993		
	0 - 600	**EQ72-600-5** 032994		
	0 - 800	**EQ72-800-5** 032995		
	0 - 1000	**EQ72-1000-5** 032996		
	0 - 1250	**EQ72-1250-5** 032997		
	0 - 1600	**EQ72-1600-5** 032998		
	0 - 2000	**EQ72-2000-5** 032999		
	0 - 2500	**EQ72-2500-5** 033000		
	0 - 3000	**EQ72-3000-5** 033001		
	0 - 3200	**EQ72-3200-5** 033002		
	0 - 4000	**EQ72-4000-5** 033003		
	0 - 5000	**EQ72-5000-5** 033004		
	0 - 6300	**EQ72-6300-5** 209675		

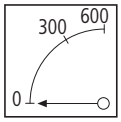
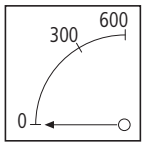
	Measuring range A	**Part no.** Article no.	**Price** See price list	Std. pack
EQ96 • 96 x 96 mm 	0 - 50	**EQ96-50-5** 032972		1 off
	0 - 100	**EQ96-100-5** 032973		
	0 - 200	**EQ96-200-5** 032974		
	0 - 250	**EQ96-250-5** 032975		
	0 - 400	**EQ96-400-5** 032976		
	0 - 600	**EQ96-600-5** 032977		
	0 - 800	**EQ96-800-5** 032978		
	0 - 1000	**EQ96-1000-5** 032979		
	0 - 1250	**EQ96-1250-5** 032980		
	0 - 1600	**EQ96-1600-5** 032981		
	0 - 2000	**EQ96-2000-5** 032982		
	0 - 2500	**EQ96-2500-5** 032983		
	0 - 3000	**EQ96-3000-5** 032984		
	0 - 3200	**EQ96-3200-5** 032985		
	0 - 4000	**EQ96-4000-5** 032986		
	0 - 5000	**EQ96-5000-5** 032987		
	0 - 6300	**EQ96-6300-5** 209676		
Shielded 4 mT				
EQ48 • 48 x 48 mm 	0 - 10	**EQ48S-10/5** 076469		1 off
	0 - 50	**EQ48S-50/5** 076489		
	0 - 100	**EQ48S-100/5** 076490		
	0 - 200	**EQ48S-200/5** 076491		
	0 - 250	**EQ48S-250/5** 076492		
	0 - 400	**EQ48S-400/5** 076532		
	0 - 600	**EQ48S-600/5** 076583		
EQ72 • 72 x 72 mm 	0 - 10	**EQ72S-10** 024343		1 off
	0 - 15	**EQ72S-15** 029089		
	0 - 25	**EQ72S-25** 033835		
	0 - 40	**EQ72S-40** 040954		
	0 - 60	**EQ72S-60** 048073		
	0 - 50	**EQ72S-50/5** 033567		
	0 - 100	**EQ72S-100/5** 026716		
	0 - 200	**EQ72S-200/5** 031462		
	0 - 250	**EQ72S-250/5** 036208		
	0 - 400	**EQ72S-400/5** 043327		
	0 - 600	**EQ72S-600/5** 050446		

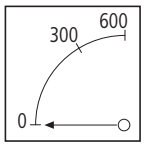
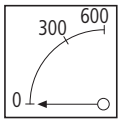
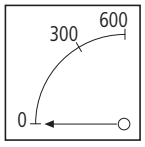
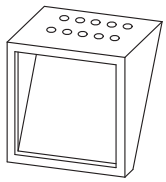
	Measuring range A	Part no. Article no.	Price See price list	Std. pack
EQ72 • 72 x 72 mm 	0 - 800	**EQ72S-800/5** 074118		1 off
	0 - 1000	**EQ72S-1000/5** 074119		1 off
	0 - 1250	**EQ72S-1250/5** 074301		1 off
	0 - 1600	**EQ72S-1600/5** 074302		1 off
	0 - 2000	**EQ72S-2000/5** 074303		1 off
	0 - 2500	**EQ72S-2500/5** 074304		1 off
	0 - 3200	**EQ72S-3200/5** 074405		1 off
	0 - 4000	**EQ72S-4000/5** 074562		1 off
	0 - 5000	**EQ72S-5000/5** 074563		1 off
	0 - 6300	**EQ72S-6300/5** 209671		1 off
EQ96 • 96 x 96 mm 	0 - 10	**EQ96S-10** 057565		1 off
	0 - 15	**EQ96S-15** 062311		1 off
	0 - 25	**EQ96S-25** 067057		1 off
	0 - 40	**EQ96S-40** 074176		1 off
	0 - 50	**EQ96S-50/5** 038984		1 off
	0 - 60	**EQ96S-60** 081295		1 off
	0 - 100	**EQ96S-100/5** 059938		1 off
	0 - 200	**EQ96S-200/5** 064684		1 off
	0 - 250	**EQ96S-250/5** 069430		1 off
	0 - 400	**EQ96S-400/5** 076549		6 off
	0 - 600	**EQ96S-600/5** 083668		1 off
	0 - 800	**EQ96S-800/5** 067460		1 off
	0 - 1000	**EQ96S-1000/5** 069833		1 off
	0 - 1250	**EQ96S-1250/5** 072206		1 off
	0 - 1600	**EQ96S-1600/5** 074579		1 off
	0 - 2000	**EQ96S-2000/5** 076952		1 off
	0 - 2500	**EQ96S-2500/5** 079325		1 off
	0 - 3000	**EQ96S-3000/5** 081698		1 off
	0 - 3200	**EQ96S-3200/5** 098920		1 off
	0 - 4000	**EQ96S-4000/5** 084071		1 off
	0 - 5000	**EQ96S-5000/5** 076621		1 off
	0 - 6300	**EQ96S-6300/5** 209672		1 off

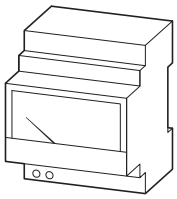
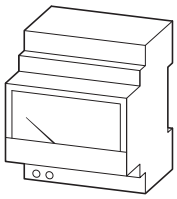
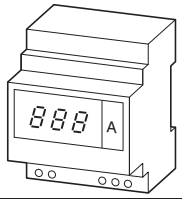
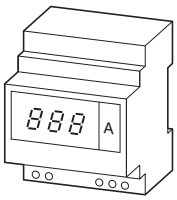
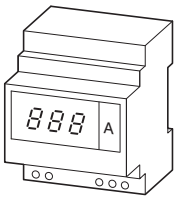
Maximum demand (bimetal) ammeters for C.T. connection, class 3

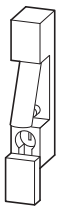
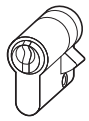
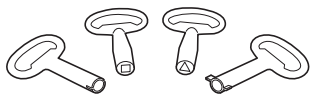
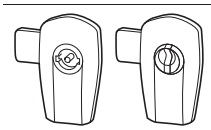
- With maximum-demand indicator
- With instantaneous value indication (moving-iron measuring element)
- Class 3
- Moving-iron ammeter accuracy class 1.5
- Overload 1.2 times
- Power consumption 4.8 VA
- Time setting of bimetal: 8 min

Unshielded

	Measuring range A	Part no. Article no.	Price See price list	Std. pack
BIEQ72 • 72 x 72 mm 	0 - 50	**BIEQ72-50-5** 033030		1 off
	0 - 100	**BIEQ72-100-5** 033031		
	0 - 200	**BIEQ72-200-5** 033032		
	0 - 250	**BIEQ72-250-5** 033033		
	0 - 400	**BIEQ72-400-5** 033034		
	0 - 600	**BIEQ72-600-5** 033035		
	0 - 800	**BIEQ72-800-5** 033036		
	0 - 1000	**BIEQ72-1000-5** 033037		
	0 - 1250	**BIEQ72-1250-5** 033038		
	0 - 1600	**BIEQ72-1600-5** 033039		
	0 - 2000	**BIEQ72-2000-5** 033040		
	0 - 2500	**BIEQ72-2500-5** 033041		
	0 - 3000	**BIEQ72-3000-5** 033042		
	0 - 3200	**BIEQ72-3200-5** 033043		
	0 - 4000	**BIEQ72-4000-5** 033044		
	0 - 5000	**BIEQ72-5000-5** 033045		
	0 - 6300	**BIEQ72-6300-5** 209677		
BIEQ96 • 96 x 96 mm 	0 - 50	**BIEQ96-50-5** 033013		1 off
	0 - 100	**BIEQ96-100-5** 033014		
	0 - 200	**BIEQ96-200-5** 033015		
	0 - 250	**BIEQ96-250-5** 033016		
	0 - 400	**BIEQ96-400-5** 033017		
	0 - 600	**BIEQ96-600-5** 033018		
	0 - 800	**BIEQ96-800-5** 033019		
	0 - 1000	**BIEQ96-1000-5** 033020		
	0 - 1250	**BIEQ96-1250-5** 033021		
	0 - 1600	**BIEQ96-1600-5** 033022		
	0 - 2000	**BIEQ96-2000-5** 033023		
	0 - 2500	**BIEQ96-2500-5** 033024		
	0 - 3000	**BIEQ96-3000-5** 033025		
	0 - 3200	**BIEQ96-3200-5** 033026		

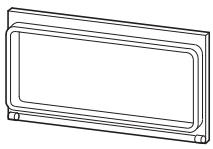
	For use with	Measuring range A	Part no. Article no.	Price See price list	Std. pack
BIEQ96 • 96 x 96 mm 		0 - 4000	**BIEQ96-4000-5** 033027		1 off
		0 - 5000	**BIEQ96-5000-5** 033028		
		0 - 6300	**BIEQ96-6300-5** 209678		
Shielded 4 mT					
BIEQ72 • 72 x 72 mm 		0 - 800	**BIEQ72S-800/5** 074565		1 off
		0 - 1000	**BIEQ72S-1000/5** 074566		
		0 - 1250	**BIEQ72S-1250/5** 074567		
		0 - 1600	**BIEQ72S-1600/5** 074568		
		0 - 2000	**BIEQ72S-2000/5** 074569		
		0 - 2500	**BIEQ72S-2500/5** 074988		
		0 - 3200	**BIEQ72S-3200/5** 076098		
		0 - 4000	**BIEQ72S-4000/5** 076195		
		0 - 5000	**BIEQ72S-5000/5** 076261		
		0 - 6300	**BIEQ72S-6300/5** 209673		
BIEQ96 • 96 x 96 mm 		0 - 100	**BIEQ96S-100/5** 098308		1 off
		0 - 200	**BIEQ96S-200/5** 010508		
		0 - 250	**BIEQ96S-250/5** 012881		
		0 - 400	**BIEQ96S-400/5** 015254		
		0 - 600	**BIEQ96S-600/5** 017627		
		0 - 800	**BIEQ96S-800/5** 020000		
		0 - 1000	**BIEQ96S-1000/5** 022373		
		0 - 1250	**BIEQ96S-1250/5** 024746		
		0 - 1600	**BIEQ96S-1600/5** 027119		
		0 - 2000	**BIEQ96S-2000/5** 029492		
		0 - 2500	**BIEQ96S-2500/5** 031865		
		0 - 3000	**BIEQ96S-3000/5** 034238		
		0 - 3200	**BIEQ96S-3200/5** 098921		
		0 - 4000	**BIEQ96S-4000/5** 036611		
		0 - 5000	**BIEQ96S-5000/5** 076692		
		0 - 6300	**BIEQ96S-6300/5** 209674		
Retaining frames					
• For measuring instruments EQ • For door mounted devices • Color RAL 7035 	EQ72 (72 x 72 mm)		**BT434** 088379		10 off
	EQ96 (96 x 96 mm)		**BT435** 090752		10 off

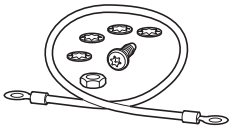
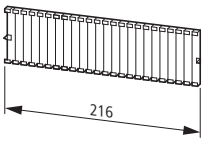
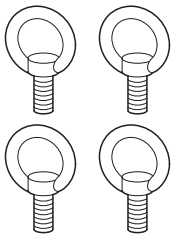
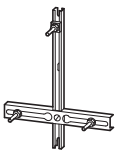
	Features	Measuring range A	Measuring range V	**Part no.** Article no.	**Price** See price list	Std. pack
Meters for DIN-rail, analog						
• For measuring single-phase AC voltages and currents • Moving-iron measuring element						
Voltmeters						
	–	–	0 - 250	**Z-MG/VA-250** 248223		1 off
	–	–	0 - 500	**Z-MG/VA-500** 248224		1 off
Ammeters						
	–	0 - 10	–	**Z-MG/AA-10** 248228		1 off
	–	0 - 40	–	**Z-MG/AA-40** 248229		1 off
Meters for DIN-rail, digital						
• For measuring single-phase AC voltages and currents • Digital display, green LEDs • LED overload indication						
Voltmeters						
	–	–	0 - 600	**Z-MG/VD-600** 248222		1 off
Ammeters						
	–	0 - 20	–	**Z-MG/AD-20** 248225		1 off
	12 adjustable transformer ratios	0 - 999 A, x/5A	–	**Z-MG/AD-999** 248226		1 off
Voltmeters and ammeter						
	–	0 - 8 kA, x/5 A	0 - 600	**Z-MG/VD+AD** 263140		1 off
	With 2 programmable switch contacts	0 - 8 kA, x/5 A	0 - 600	**Z-MG/VD+AD+S** 263141		1 off

	Description	For lock mechanism	Features	Part no. Article no.	Price See price list	Std. pack
Closing and locking systems						
Comfort hinged handle						
• Lever made from high-grade, impact-resistant pressure-cast zinc • Ergonomically designed lever • For XVTL, Profi Plus floor standing distribution boards • Color black, powder-spray painted						
	–	Europrofile single cylinder lock	With pushbutton	**DH-COMF** 133107		1 off
Comfort rotary handle						
• Rotary handle for taking europrofile cylinders • With integrated “locked” indication • As retrofitting or complete kit • Handle made from high-grade, impact-resistant pressure-cast zinc • Suitable for all universal locks LC-... • For standardized door cutouts 22.5 × 20.4 mm • Color dusty grey RAL 7037, powder-coated • Order lock cylinders separately						
	Complete kit	Europrofile single cylinder lock	–	**PHZ-A-COMP** 133105		1 off
	Retrofitting kit	Europrofile single cylinder lock	–	**PHZ-A-ADD-ON** 133106		1 off
Cylinder locks for comfort handles						
• For comfort rotary and hinged handles • Lock cylinder designed to DIN 18252 and DIN EN 1303 • Cylinder locks 10/30 with nickel silver pin tumblers • Lock bit with eight adjustment positions, five pin pairs • Keyed alike or individually keyed mechanism • One key included per cylinder						
	Keyed alike	–	–	**PHZ-E10/30-GS** 138574		1 off
	Individually keyed mechanism	–	–	**PHZ-E10/30-VS** 138575		1 off
Spare keys for cylinder locks						
• For cylinder locks PHZ-E…-GS						
	Keyed alike	Europrofile single cylinder lock	–	**KEY-E10/30-GS** 138576		4 off
Key for lock mechanisms						
	–	–	3 mm double ward key	**NWS-SL/DLB/3** 255317		1 off
	–	–	5 mm double ward key	**NWS-SL/DLB/5** 255318		1 off
Universal locks						
• Escutcheon made from high-grade, impact-resistant pressure-cast zinc • Metal lock mechanisms and bolts • Color dusty grey RAL 7037, powder-coated • For indoor and outdoor use • Metal lock nut, notched • Compatible with standard bolts • For standardized door cutouts 22.5 × 20.4 mm						
	–	–	3 mm double ward key	**LC-DBIT3-CS** 133102		1 off
	–	–	5 mm double ward key	**LC-DBIT5-CS** 133103		
	Keyed alike	–	Cylinder lock with two keys	**LC-ZSBIT-CS** 133104		

	Features	Part no. Article no.	Price See price list	Std. pack
Circuit diagram pockets, insulating material				
• Made of plastic with self-adhesive back • RAL 7035 light grey				
	DIN A4 landscape	**SPT4** 002275		10 off
	DIN A5 landscape	**SPT5** 002276		10 off
	DIN A6 landscape	**SPT6** 002277		10 off
Circuit diagram pocket, metal				
• For fitting to door porfile with M5 bolts				
	DIN A6 landscape	**XVTL-SPT6** 115247		1 off

	Description	Part no. Article no.	Price See price list	Std. pack
Control panel illumination				
Control panel lights				
	–	**XVTL-SRL/S** 116892		1 off
	With switches, socket and magnetic holder	**NWS-SRL/S/ST/MG** 255355		1 off
Door contact switches				
	–	**NWS-TKT** 255420		1 off
	Mounted on retaining bracket	**NWS-TKT/M** 285046		

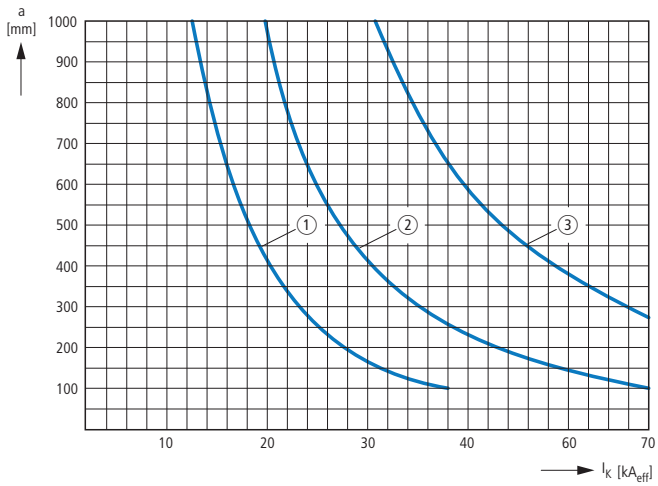
	For use with	Part no. Article no.	Price See price list	Std. pack
Hinged flaps				
• For positioning on cover, change as required • Degree of protection IP55 • Opening angle up to 180° • Hinge on one side cannot be changed • Transparent				
	145 x 80 mm	**K-A** 043372		1 off
	185 x 90 mm	**KG-A** 055244		1 off

	Features	Description	**Part no.** Article no.	**Price** See price list	Std. pack
Door grouding set					
• Cross-section 6 mm² • Includes installation accessories					
	–	–	**BFZ-DES** 101665		1 off
Touch-up paint					
• Brush bottle • For repairing paint damage					
	RAL 7035	–	**BPZ-CPS-7035** 286771		1 off
	RAL 9010	–	**PAINT-RAL9010** 288947		
	RAL 9016	–	**PAINT-RAL9016** 288948		
Spray	RAL 7035	–	**BPZ-SPRAY-7035** 116678		
Blanking strips					
For blanking off unused slots					
	For 12 space units	–	**VST12** 002322		10 off
Eye bolts					
One set consists of 4 lifting eyelets					
	–	M10	**XAT** 283855		1 off
Meter rail					
	To DIN 43853, Including 3 fixing screws with nuts to DIN 46300. For fixing on mounting plates, tamper seal, → Page 20/22 → Page 20/28	–	**ZK1** 001892		5 off

Engineering

Conductor supports for insulated copper strip, with section strip and latch fastener

BZ249, BZ251, BZ252



① BZ249
② BZ251
③ BZ252
I_K = short-circuit current
a = busbar support spacing

Technical data

	KT-M…	V-M…	MFD…	MFV…	KT-M25F	STB-M…F
Material	Polyethylene and thermoplastic elastomer	Polyamide, halogen-free	Thermoplastic elastomer	Polyamide	PVC and polyethylene	Glass-fiber reinforced polyamide with flame retardant, self-extinguishing
Color	Gray, RAL 7035	Gray, RAL 7035	Black, similar to RAL 9005	Red	Grey, RAL 7032 + white	Gray, RAL 7035
Degree of protection	Up to IP66	IP68 up to 5 bar (30 min)	IP66	–	Up to IP50	IP56, mounting only on enclosure underside
Chemical resistance	Resistant to: alcohol, animal and plant fats, weak alkalis, light acids, water	Resistant to: acetone, petrol, paraffin, diesel oil, greases, oils, paint solvents	–	–	Resistant to: diluted non-oxidizing acids, alkalis and salt, alcohol, aromatic and halogenated hydrocarbons, surfactants.	Resistant to: acetone, petrol/gasoline, paraffin, diesel oil, greases, oils, paint solvents
Danger of stress fracture	Relatively high	Low	–	–	Relatively high	Low
Temperature resistance	-40 °C - 80 °C, up to about 100 °C for short periods	-20 °C - 100 °C, up to about 120 °C for short periods	-25 °C - 100 °C, up to about 120 °C for short periods	-25 °C - 80 °C, up to about 120 °C for short periods	0 °C - 60 °C, up to about 80 °C for short periods	-40 °C - 100 °C, up to about 150 °C for short periods
Flame resistance	–	Glow wire test 750 °C according to EN 60695-2-11	–	–	–	Glow wire test 750 °C according to EN 60695-2-11
Flammability to UL94	–	V2	–	–	–	–

Analog devices			Z-MG/VA-250	Z-MG/VA-500	Z-MG/AA-10	Z-MG/AA-40
Electrical						
Rated voltage	U_n	V AC	250	500	–	–
Rated current	I_n	A	–	–	10	40
Input signal			Symmetrical, sinusoidal, harmonic factor 1.11			
Rated frequency		Hz	50	50	50	50
Operating frequency		Hz	45 - 65	45 - 65	45 - 65	45 - 65
Measuring accuracy class			1.5	1.5	1.5	1.5
Measuring range			0 - U_n	0 - U_n	0 - I_n	0 - I_n
Intrinsic consumption		VA	< 3	< 3	< 1.1	< 1.1
Measuring range overshoot						
Continuous			1.2 x U_n	1.2 x U_n	1.2 x I_n	1.2 x I_n
Momentary			2 x U_n/5 s	2 x U_n/5 s	10 x I_n/5 s	10 x I_n/5 s
Rated insulation voltage		kV	0.6	0.6	0.6	0.6
Test voltage 50 Hz/1 min.		kV	2	2	2	2
Mechanical						
Standard front dimension		mm	45	45	45	45
Size of device base		mm	89	89	89	89
Built-in width		mm	70	70	70	70
Weight		kg	0.13	0.13	0.13	0.13
Mounting			Quick attachment for top-hat rail IEC/EN 60715			
Degree of protection when fitted			IP50	IP50	IP50	IP50
Terminals top and bottom			Lift terminals	Lift terminals	Lift terminals	Lift terminals
Terminal capacity		mm^2	4	4	4	8
Tightening torque of terminal screws		Nm	1	1	1	1.8
Admissible relative humidity		%	65	65	65	65
Temperature range		°C	-25 - +50	-25 - +50	-25 - +50	-25 - +50
Flammability classification according to UL94			V1	V1	V1	V1

Z-MG

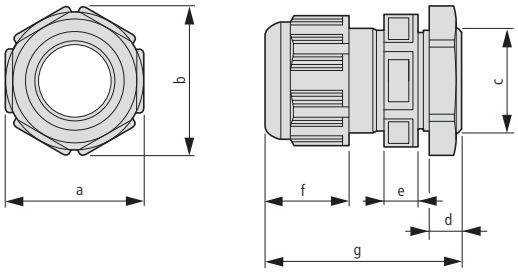
Digital devices				Z-MG/VD-600	Z-MG/AD-20	Z-MG/AD-999	Z-MG/VD+AD	Z-MG/VD+AD+S
Electrical								
Rated voltage		U_n	V AC	600	–	–	500	500
Rated current		I_n	A	–	20	5	5	5
Auxilliary voltage				230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Intrinsic consumption, auxiliary voltage input			VA	< 4.5	< 4.5	< 4.5	≤ 2.5	≤ 2.5
Input signal				Symmetrical, sinusoidal, harmonic factor 1.11				
Rated frequency			Hz	50	50	50	50	50
Operating frequency			Hz	45 - 65	45 - 65	45 - 65	47 - 63	47 - 63
Measuring accuracy				± 1 % + 1 digit	± 1 % + 1 digit	± 1 % + 1 digit	± 1 % + 1 digit	± 1 % + 1 digit
Resolution				1 digit	1 digit	1 digit	1 V/0.01 - 10 A	1 V/0.01 - 10 A
Number of measurements per second				3	3	3	0.67	0.67
Measuring range				0 - U_n	0 - I_n	0 - I_n	0 - 500 V/01 - 6 A	0 - 500 V/01 - 6 A
Intrinsic consumption								
Voltage input			VA	–	–	–	≤ 0.1	≤ 0.1
Current input			VA	–	< 1.1	< 1.1	≤ 0.6	≤ 0.6
Input impedance				> 1 MΩ	–	–	–	–
Measuring range overshoot								
Continuous				1.1 x U_n	2 x I_n	2 x I_n	1.2 x U_n/1.2 x I_n	1.2 x U_n/1.2 x I_n
Momentary				–	2.5 x I_n/5 s	10 x I_n/5 s	2 x I_n/5 s	2 x I_n/5 s
Insulation voltage			kV	0.66	0.66	0.66	0.66	0.66
Test voltage 50 Hz/1 min.			kV	2	2	2	3	3
Alarm contacts				–	–	–	–	2, programmable
Type				–	–	–	–	Min. and/or max.
Setpoint				–	–	–	–	0 - 120 %
Hysteresis				–	–	–	–	0 - setpoint value
Delay				–	–	–	–	0 - 60 s (1 s steps)
Relay position				–	–	–	–	Active/passive
Contact rating				–	–	–	–	5 A/250 V AC
Mechanical								
Standard front dimension			mm	45	45	45	45	45
Size of device base			mm	89.5	89.5	89.5	89.5	89.5
Built-in width			mm	71.2	71.2	71.2	71.2	71.2
Maximum display				999	999	999	999	999
Digit height			mm	14	14	14	14	14
Weight			kg	0.3	0.3	0.3	0.25	0.27
Mounting				Quick attachment for top-hat rail IEC/EN 60715				
Degree of protection when fitted				IP50	IP50	IP50	IP50	IP50
Terminals top and bottom				Lift terminals	Lift terminals	Lift terminals	Lift terminals	Lift terminals
Terminal capacity			mm^2	4	4	4	4	4
Tightening torque of terminal screws			Nm	0.6	0.6	0.6	0.6	0.6
Admissible relative humidity			%	95	95	95	20 - 80	20 - 80
Temperature range			°C	-10 - +55	-10 - +55	-10 - +55	-5 - +55	-5 - +55
Flammability classification according to UL94				V1	V1	V1	V1	V1

	Z-MG/VD+AD Z-MG/VD+AD+S												
Measuring range, resolution													
Range	–	–	–	–	–	–	–	–	5 A	–	–	–	–
Indication	–	–	–	–	–	–	–	–	5.00	–	–	–	–
Resolution	10 mA												
Range	10 A	–	15 A	–	20 A	25 A	30 A	40 A	50 A	60 A	70 A	75 A	80 A
Indication	10.0	–	15.0	–	20.0	25.0	30.0	40.0	50.0	60.0	70.0	75.0	80.0
Resolution	100 mA												
Range	100 A	120 A	150 A	160 A	200 A	250 A	300 A	400 A	500 A	600 A	700 A	750 A	800 A
Indication	100	120	150	160	200	250	300	400	500	600	700	750	800
Resolution	1 A												
Range	1 kA	1.2 kA	1.5 kA	1.6 kA	2 kA	2.5 kA	3 kA	4 kA	5 kA	6 kA	7 kA	7.5 kA	8 kA
Indication	1.00	1.20	1.50	1.60	2.00	2.50	3.00	4.00	5.00	6.00	7.00	7.50	8.00
Resolution	10 A												

Dimensions

Cable glands, metric

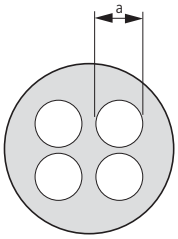
V-M…



Part no.	a	b	c	d	e	f	g
V-M12	16	18	M12x1.5	9	5.3	14	29 … 34
V-M16	20	22	M16x1.5	9	5.5	16.5	31 … 37
V-M20	24	27	M20x1.5	10	6.1	20	36 … 45
V-M25	29	32	M25x1.5	10	8.1	20	38 … 47
V-M32	36	40	M32x1.5	12	10.1	20	42 … 51
V-M40	46	51	M40x1.5	12	11.1	29	52 … 65
V-M50	55	61	M50x1.5	14	12.1	33	59 … 72
V-M63	68	75	M63x1.5	15	12.1	36.5	64 … 78

Multiple gaskets

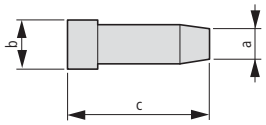
MFD…



Part no.	a
MFD25	5.0 - 6.0
MFD32	3.5 - 7.0

Sealing plugs

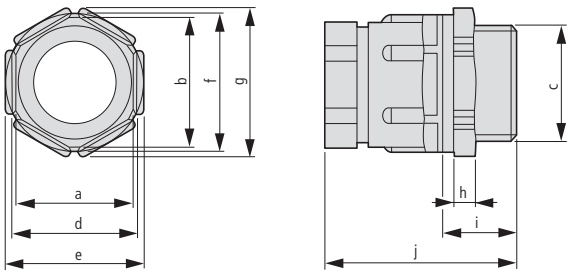
MFV…



Part no.	a	b	c
MFV25-6	5.5	6	20
MFV32-7	7	8	20

Cable screw glands

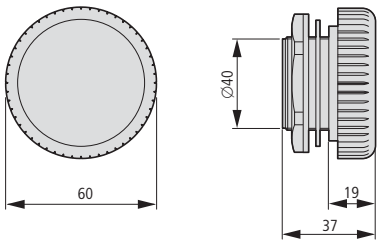
STB-M…F



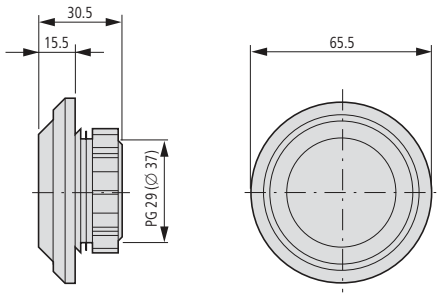
Part no.	c	h	l	j	g	f	b	a	d	e
STB-M20F	20	5	15	40	29	27	23	21	24	27
STB-M25F	25	6	15	45	35.5	35.5	33.4	30	33	32

Pressure compensating plugs

DAV-M40

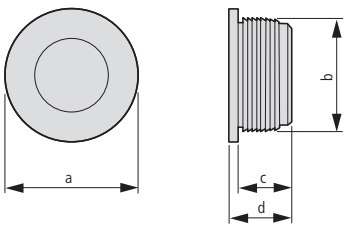


DA412



Diaphragm grommets, metric

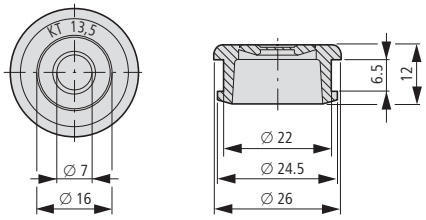
KT-M…



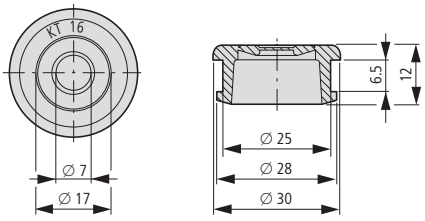
Part no.	a	b	c	d
KT-M16	21.2	16	9.5	11
KT-M20	25.2	20	9.5	11
KT-M25	30.2	25	9.5	11
KT-M32	37.2	32	9.5	11

PG cable grommets

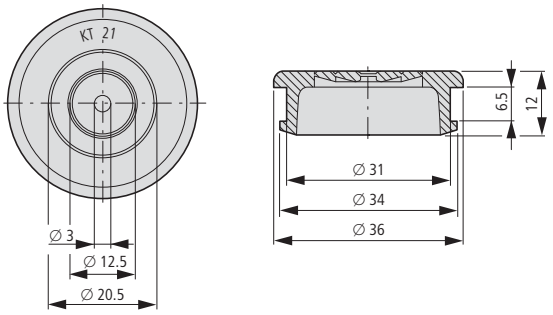
KT13.5



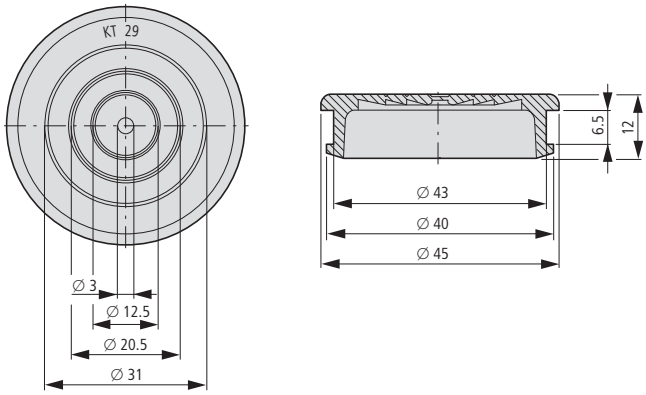
KT16



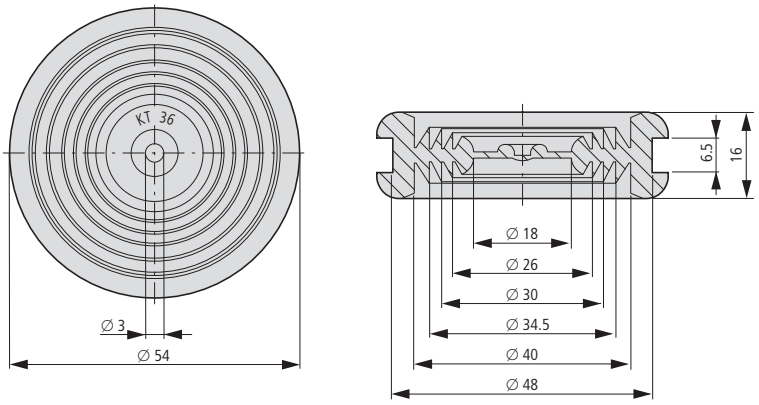
KT21



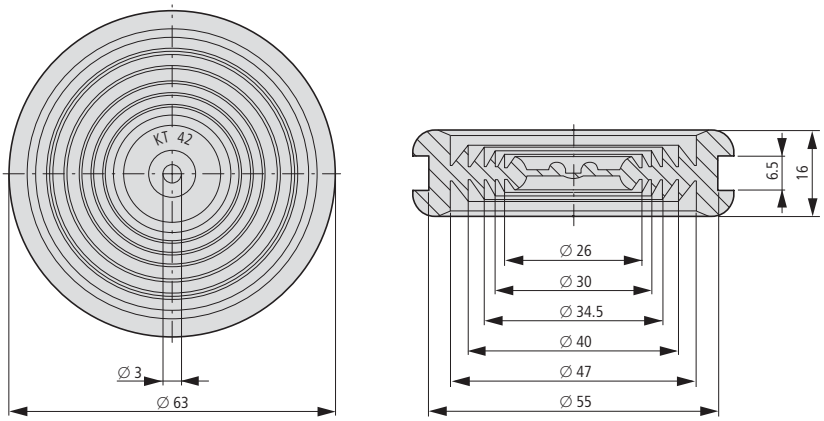
KT29



KT36

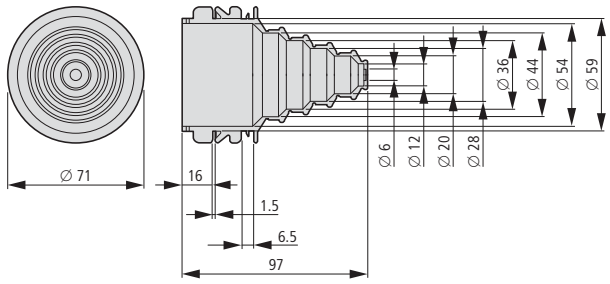


KT42

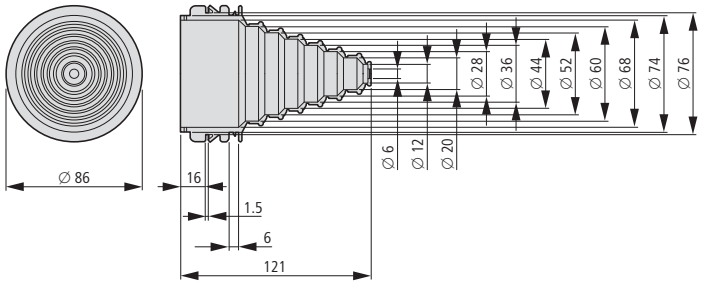


Stepped cable grommets

KT3

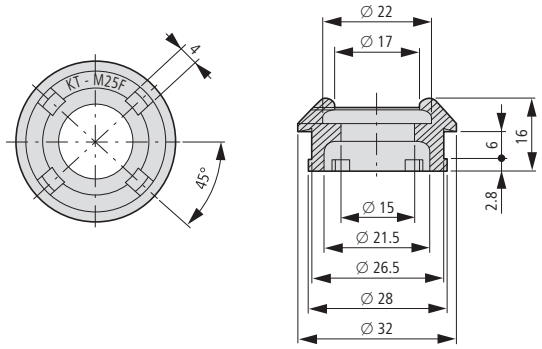


KT4

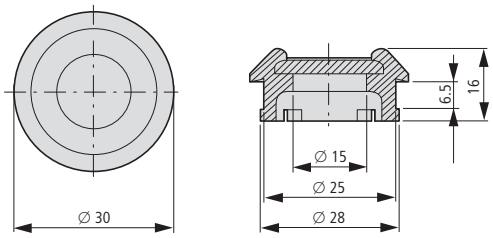


Pressure compensating grommets

KT-M25F

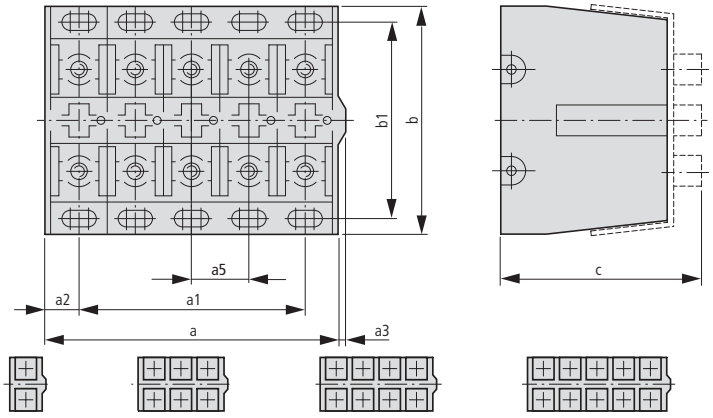


KT16F



Terminals 160 - 1000 A

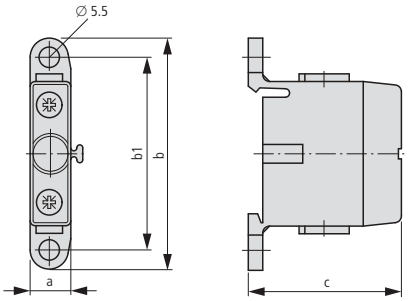
K...



Part no.	a	a1	a2	a3	b	b1	c	a5	l
K95/1	37	-	18.5	3	115	100	88	-	13
K95/3	99	75	12					31	
K95/4	130	100	15						
K95/5	161	125	18						
K150/1	37	-	18.5				105	-	13
K150/3	99	75	12					31	
K150/4	130	100	15						
K150/5	161	125	18						
K240/1	52	-	26				120	-	12
K240/3	144	100	22					46	
K240/4	190	150	20						
K240/5	236	175	30.5						
K2X240/1	68	-	34	4	140	125	127	-	15
K2X240/3	192	125	33.5					62	
K2X240/4	254	200	27						
K2X240/5	316	250	33						
K3X185/1	78	-	39				166	-	15
K3X185/3	222	150	36					72	
K3X185/4	294	225	34.5						
K3X185/5	366	300	33						
K3X240/1	88	-	44	4	165	150	196	-	20
K3X240/3	252	175	39					82	
K3X240/4	334	250	42						
K3X240/5	416	325	45.5						
K4X185/1	88	-	44					-	20
K4X185/3	252	175	39					82	
K4X185/4	334	250	42						
K4X185/5	416	325	45.5						

Insulated individual terminals 32 - 100 A

K…/1

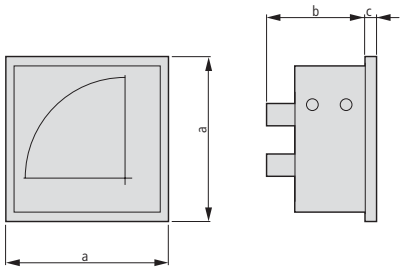


Part no.	a	b	b1	c
K10/1	11	60	50	30
K25/1	14	60	50	33
K50/1	18	60	50	36

Ammeters, voltmeters

EQ

BIEQ

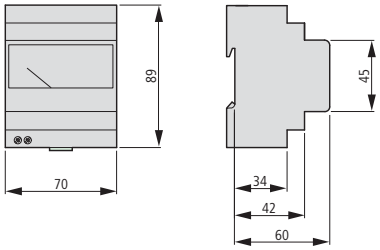


		a	b	c
EQ	45	45	47	5
EQ	48 DIN	48	53	5
EQ, BIEQ	72	72	64	5
EQ, BIEQ	96	96	64	5

Meters for DIN rails, analog

Z-MG/VA...

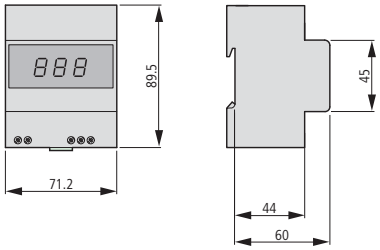
Z-MG/AA...



Meters for DIN rails, digital

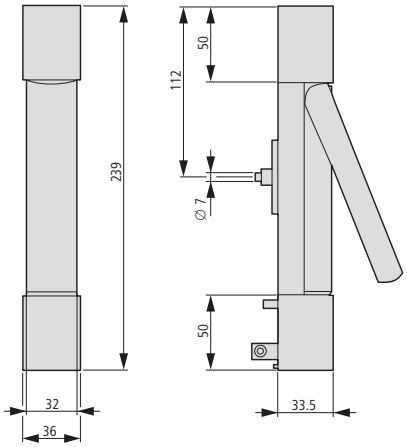
Z-MG/VD...

Z-MG/AD...

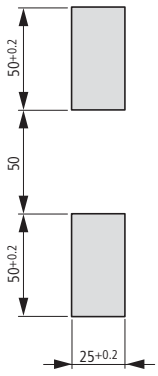


Comfort hinged handle

DH-COMF

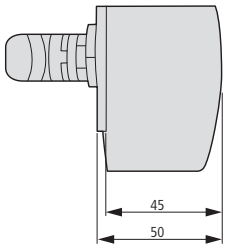


Mounting hole

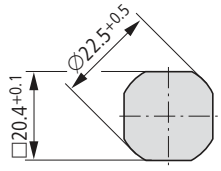


Comfort rotary handles

PHZ-A-...



Mounting hole





Compact circuit-breaker NZM up to 1600 A
Compact switch-disconnectors N, PN up to 1600 A

Safe energy control, switching and control in industrial settings, buildings and machinery construction: innovative protection concept coupled with diagnostic and communication functions make it possible.

The NZM circuit-breaker assortment offers an interface for the SmartWire-Darwin communication system. → Page 17/140

Model series NZM1 – NZM4
Only four compact switches cover all applications +++ 3- and 4-pole +++ Flexible mounting through modular functions groups +++ Complete nominal current up to 50 °C ambient temperature +++ Suitable for use worldwide → Page 17/4

Door coupling rotary handles
Very wide range of variants for each application +++ All applications have identical drilling template +++ Automatic centering +++ Shaft support for years of operational safety +++ Sidewall installation for space-saving main switch installation → Page 17/118

Standard auxiliary contacts, trip-indicator auxiliary contacts from the Eaton command device program.
Favorably priced identical parts from the Titan program reduce variety of types and stockkeeping +++ Installation from front to same position +++ Easy clip-in reduces assembling costs → Page 17/106

Remote operators
Unified functions concept for all variants +++ Small closing delays from 60 – 100 ms +++ Can be locked and sealed to provide safety → Page 17/134

Diagnostics software NZM-XPC-SOFT
Diagnostics in fault scenario +++ Error-free commissioning +++ Load analysis in operation → Page 17/138



Eaton After Sales Service
Testing switching devices in compliance with regulations applicable to this technology → S22/2

Compact circuit-breakers and switch-disconnectors up to 1600 A







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Technical overview

Circuit-breakers, switch-disconnectors 3/4 pole 17/6

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Circuit-breakers, magnetic short-circuit releases, 3 pole 17/18

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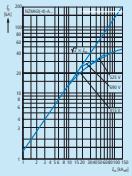

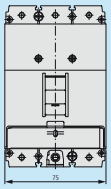

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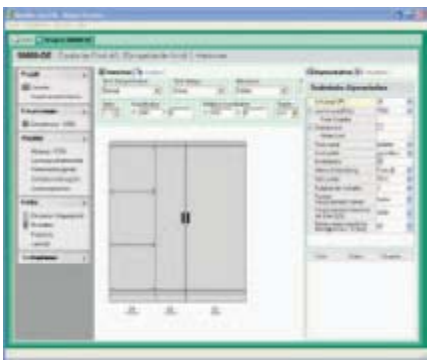
Measuring and communication module 17/233

SmartWire-DT communication module 17/233



xEnergy is a freely combinable range of system products for energy distribution systems – specially designed for infrastructures in buildings and industrial applications up to 4000 A. The Moeller xEnergy system – consisting of switching and protective devices, the mounting system, the switchboard, as well as the planning and calculation tool – is optimally tailored for safe and reliable energy distribution.

The optimum mechanical adaption of the switchboard components to the Moeller switchgear keeps mounting times short and ensures a high level of flexibility. Type-testing of the complete switchgear–mounting system–switchboard assemblies to IEC EN 60 439 ensures a high level of safety.



Moeller Configurator

Moeller Configurator

The software tool offers you the support you need for configuring the required xEnergy switchgear assembly simply and quickly. You can thus create your quotations and generate the exact parts list at the click of a mouse.



xEnergy Product features

- Enclosures for combination- and separate mounting
- Protection type IP 31 or 55
- Main busbars up to 4000 A
- 2 main busbar systems can be integrated in each section
- Clear separation into functional areas to Form 1 up to Form 4b for increased personal and system protection
- Widths 425, 600, 800, 1000 und 1200 mm
- Height 2000 mm
- Color RAL 7035 (others possible)
- Mains system types TN-C, TN-C-S, TN-S, TT, IT
- Type-tested switchgear assembly (TSK) according to IEC/EN 60439-1
- Optimized for 3 and 4 pole switchgear from Moeller



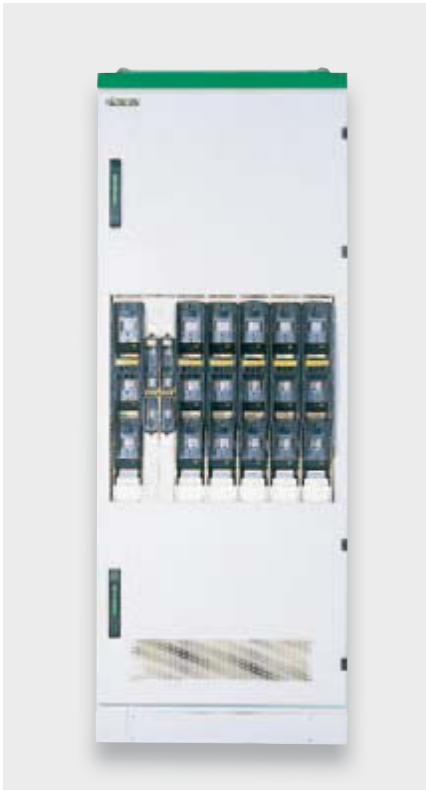


IZM and NZM circuit-breakers for xEnergy XPower sections

- Clear and symmetrical design reduces the number of busbar connections and saves mounting time
- Simple installation with cable terminal system for drill-free connection in section width

NZM and PKZ circuit-breakers for xEnergy XFixed sections

- High packing density with up to 38 modules in one section thus optimum component utilization
- Flexible module mounting to Form 4 with individual swing front panels
- Simple module mounting to Form 2 on one mounting level
- Flexible combination of functional areas and busbars to IEC/EN 60439 and national installation practices



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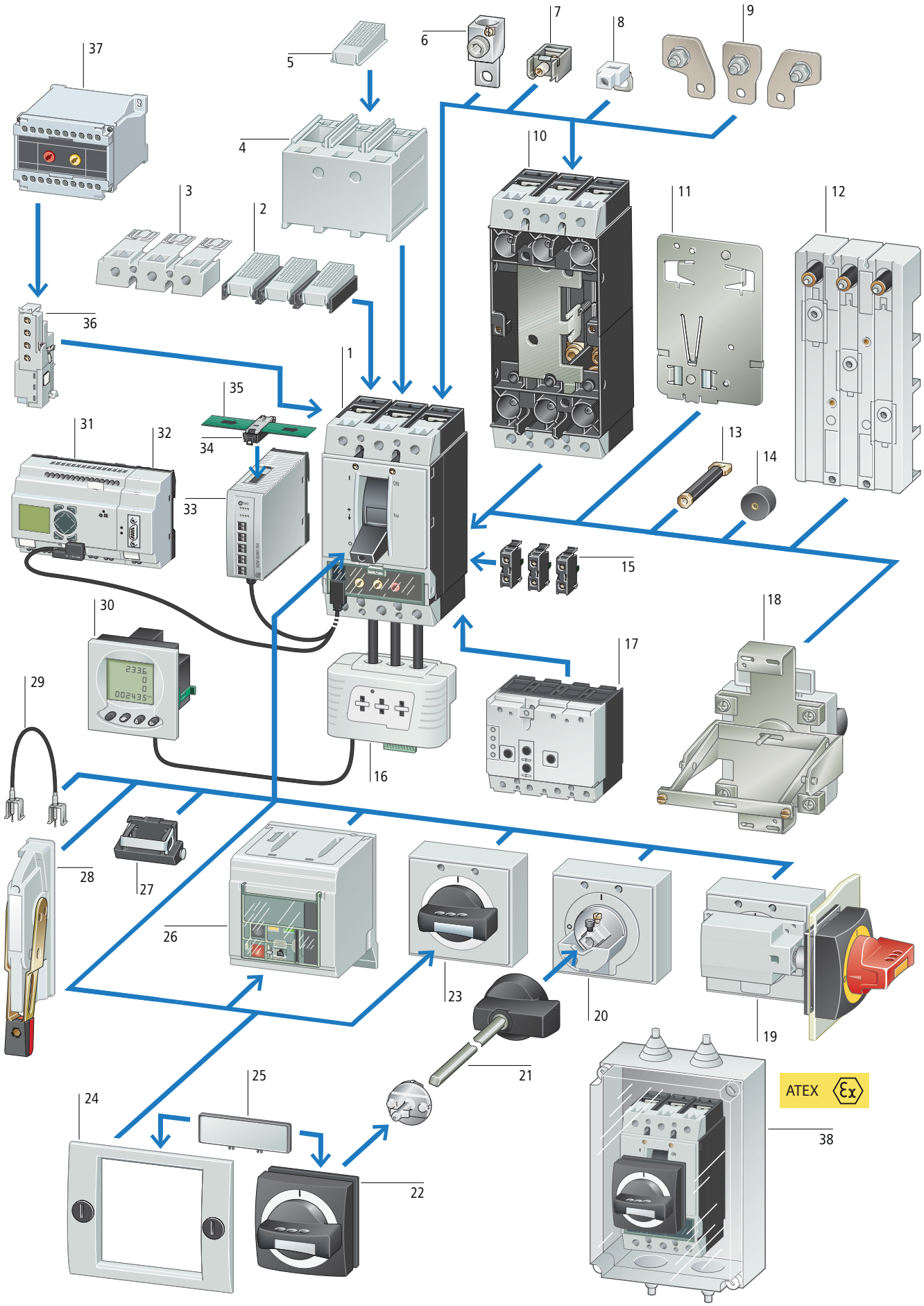
NZM

System overview



NZM

Basic devices

Circuit-breakers 1
Rated uninterrupted current up to 1600 A
Switching capacity 25, 36, 50, 150 kA at 415 V
Adjustable releases for overload and short-circuit
Adjustable time selectivity
Protection of systems, cables, motors, generators
3 and 4 pole; IEC/EN 60947
→ Page 17/8

Switch-disconnectors 1
Rated uninterrupted current up to 1600 A
Can be tripped remotely with undervoltage or shunt release
3 and 4 pole; IEC/EN 60947
→ Page 17/42

Circuit-breakers for North America 1
Rated uninterrupted current up to 1200 A
Switching capacity 25, 35, 100 kA at 480 V
Adjustable release for overload and short-circuit
Adjustable time selectivity
Protection of systems, cables, motors, generators
3 and 4 pole, UL 489/CSA 22.2 no. 5.1, IEC/EN 60947
→ Page 17/54

Molded case switches for North America 1
Rated uninterrupted current up to 1200 A
Can be tripped remotely with undervoltage or shunt release
3 pole, UL489/CSA 22.2 no. 5.1
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- With door interlock

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IP2X protection against contact with finger 5
For covers
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Circuit-breakers

With main switch characteristics to IEC/EN 60204 and Isolator characteristics to IEC/EN 60947, VDE 0660





Rated uninterrupted current I_u = Rated current I_n	**Thermomagnetic releases**								
	System and cable protection					**Motor protection**			
Adjustable overload releases I_r	I_u	I_u	I_o	I_r	I_i	I_u	I_u	I_r	I_i
Adjustable short-circuit releases I_i	A	A	A	A	A	A	A	A	A
Delayed short-circuit releases I_{sd}									
Ambient temperature at 100% I_u min./max. -25/+50 °C	20	20		0.8 – 1 × I_n	350		20	0.8 – 1 × I_n	350
	25	25					25		
	32	32					32		10 – 14 × I_n
	40	40			8 – 10 × I_n	40	40		8 – 14 × I_n
	50	50			6 – 10 × I_n	50	50		
	63	63				63	63		
	80	80				80	80		
	100	100				**100**	100		NZM1: 8 – 12.5 × I_n NZM2: 8 – 14 × I_n
	125	125					125		8 – 14 × I_n
	160	160			NZM1:8 × I_n 6 – 10 × I_n		160		
		200					**200**		
		250							
			320						
			400						
			500						

Basic switching capacity		**NZMB1-A...**		**NZMB2-A...**						**NZMB1-M...**		**NZMB2-M...**			
400/415 V	kA/p.f	25	0.25	25	0.25					25	0.25	25	0.25		
440 V	kA/p.f	25	0.25	25	0.25					25	0.25	25	0.25		
Comfort switching capacity		**NZMC1-A...**		**NZMC2-A...**		**NZMC3-A...**									
400/415 V	kA/p.f	36	0.25	36	0.25	36	0.25								
440 V	kA/p.f	30	0.25	30	0.25	30	0.25								
525 V	kA/p.f	12	0.5	12	0.5	12	0.5								
690 V	kA/p.f	8	0.5	8	0.5	8	0.5								
Normal switching capacity		**NZMN1-A...**		**NZMN2-A...**		**NZMN3-A...**				**NZMN1-M...**		**NZMN2-M...**			
400/415 V	kA/p.f	50	0.25	50	0.25	50	0.25			50	0.25	50	0.25		
440 V	kA/p.f	35	0.25	35	0.25	35	0.25			35	0.25	35	0.25		
525 V	kA/p.f	20	0.30	25	0.25	25	0.25			20	0.30	25	0.25		
690 V	kA/p.f	10	0.50	20	0.30	20	0.30			10	0.50	20	0.30		
High switching capacity		**NZMH1-A-...**		**NZMH2-A-...**		**NZMH3-A-...**						**NZMH2-M...**			
400/415 V	kA/p.f	100	0.20	150	0.20	150	0.20					150	0.20		
440 V	kA/p.f	35	0.25	130	0.20	130	0.20					130	0.20		
525 V	kA/p.f	20	0.30	50	0.25	65	0.20					50	0.25		
690 V	kA/p.f	10	0.50	20	0.30	35	0.25					20	0.30		

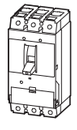
Notes **The stated switching capacity values are rated ultimate short-circuit breaking capacities (I_{cu})**

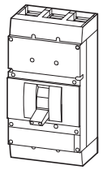
Switch-disconnectors

With main switch characteristics to IEC/EN 60204 and VDE 0113
Isolating characteristics to IEC/EN 60947, VDE 0660
without overload and short-circuit release

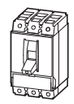


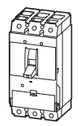


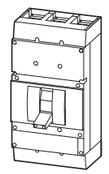




Rated uninterrupted current I_u = Rated current I_n		63 – **160**		160 – **250**		400 – **630**		630 – **1600**
Type N can be triggered with U/A shunt release		**PN1-...**	**N1-...**	**PN2-...**	**N2-...**	**PN3-...**	**N3-...**	**N4-...**
Rated short-circuit making capacity I_{cm}	kA	2.8	2.8	5.5	5.5	25	25	53
Rated short-time withstand current I_{cw} (1s-current$_{rms}$)	kA	2	2	3.5	3.5	12	12	25







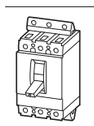
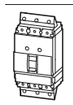
	Electronic releases														
	Systems, cable, selectivity and generator protection										**Motor protection**				
	I_u	I_u	I_u	I_r	I_{sd}	I_i	I_u	I_r	I_i						
	A	A	A	A	A	A	A	A	A						
	100	250		0.5 – 1 × I_n	2 – 10 × I_r	2 – 12 × I_n	90	0.5 – 1 × I_n	2 – 14 × I_r						
	160	400					140								
	250	**630**	630				220								
			800				350								
			1000				450								
			1250		2 – 6 × I_r	2 – 8 × I_r	550								
			1600				875								
							1400								

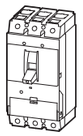
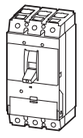
NZMN2-...E...		**NZMN3-...E...**		**NZMN4-...E...**						**NZMN2-ME...**		**NZMN3-ME...**		**NZMN4-ME...**	
50	0.25	50	0.25	50	0.25					50	0.25	50	0.25	50	0.25
35	0.25	35	0.25	35	0.25					35	0.25	35	0.25	35	0.25
25	0.25	25	0.25	25	0.25					25	0.25	25	0.25	25	0.25
20	0.30	20	0.30	20	0.30					20	0.30	20	0.30	20	0.30
NZMH2-...E...		**NZMH3-...E...**		**NZMH4-...E...**						**NZMH2-ME...**		**NZMH3-ME...**		**NZMH4-ME...**	
150	0.20	150	0.20	85[1)]	0.20					150	0.20	150	0.20	85[1)]	0.20
130	0.20	130	0.20	85	0.20					130	0.20	130	0.20	85	0.20
50	0.25	65	0.20	65	0.20					50	0.25	65	0.20	65	0.20
20	0.30	35	0.30	50	0.25					20	0.30	35	0.30	50	0.25

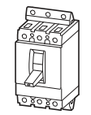
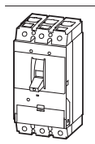
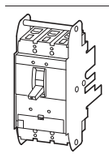
A selection of approved circuit-breakers and switch-disconnectors for world-wide use → Page 17/54

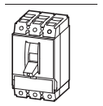
[1)] For higher switching capacity please inquire

Ordering

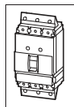
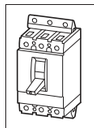
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range		**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in units** **Part no.** Article no. Order base separately	**Price** See price list	Std. pack	**Notes**
			Overload releases	Short-circuit releases Non-delayed										**B = box terminals** **S = screw terminals** For further terminal types see accessories
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x ...										
System and cable protection														
Basic switching capacity														
	**25**	20	15-20	350 A fixed	Screw terminals as accessories			**NZMB1-A20** 280987		B		**NZMB1-A20-SVE** 112733		1 off	IEC/EN 60947-2
		25	20-25	350 A fixed				**NZMB1-A25** 280988		B		**NZMB1-A25-SVE** 112734		
		32	25-32	350 A fixed				**NZMB1-A32** 280989		B		**NZMB1-A32-SVE** 112735		
		40	32-40	8-10				**NZMB1-A40** 259075		B		**NZMB1-A40-SVE** 112703		
		50	40-50	6-10				**NZMB1-A50** 259076		B		**NZMB1-A50-SVE** 112704		
		63	50-63	6-10				**NZMB1-A63** 259077		B		**NZMB1-A63-SVE** 112705		
		80	63-80	6-10				**NZMB1-A80** 259078		B		**NZMB1-A80-SVE** 112706		
		100	80-100	6-10				**NZMB1-A100** 259079		B		**NZMB1-A100-SVE** 112707		
		125	100-125	6-10				**NZMB1-A125** 259080		B		**NZMB1-A125-SVE** 112708		
		160	125-160	1280 A fixed				**NZMB1-A160** 281230		B		–		
		160	125-160	6-10	**NZMB2-A160** 259088		S	**NZMB2-A160-BT** 110215		B		**NZMB2-A160-SVE** 113193		
		200	160-200	6-10	**NZMB2-A200** 259089		S	**NZMB2-A200-BT** 110216		B		**NZMB2-A200-SVE** 113194		
		250	200-250	6-10	**NZMB2-A250** 259090		S	**NZMB2-A250-BT** 110217		B		**NZMB2-A250-SVE** 113195		
		300	240-300	6-10	**NZMB2-A300** 107518		S	**NZMB2-A300-BT** 110214		B		–		
Comfort switching capacity														
	**36**	20	15-20	350 A fixed	Screw terminals as accessories			**NZMC1-A20** 283293		B		**NZMC1-A20-SVE** 112753		1 off	IEC/EN 60947-2
		25	20-25	350 A fixed				**NZMC1-A25** 283294		B		**NZMC1-A25-SVE** 112754		
		32	25-32	350 A fixed				**NZMC1-A32** 283295		B		**NZMC1-A32-SVE** 112755		
		40	32-40	8-10				**NZMC1-A40** 271392		B		**NZMC1-A40-SVE** 112737		
		50	40-50	6-10				**NZMC1-A50** 271393		B		**NZMC1-A50-SVE** 112738		
		63	50-63	6-10				**NZMC1-A63** 271394		B		**NZMC1-A63-SVE** 112739		
		80	63-80	6-10				**NZMC1-A80** 271395		B		**NZMC1-A80-SVE** 112740		
		100	80-100	6-10				**NZMC1-A100** 271396		B		**NZMC1-A100-SVE** 112741		
		125	100-125	6-10				**NZMC1-A125** 271397		B		**NZMC1-A125-SVE** 112742		
		160	125-160	1280 A fixed				**NZMC1-A160** 283296		B		–		

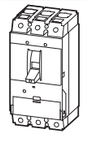
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range		**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in units** **Part no.** Article no. Order base separately	**Price** See price list	Std. pack	**Notes**
			Overload releases	Short-circuit releases										
				Non-delayed										
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …										
System and cable protection														**B = box terminals** **S = screw terminals** For further terminal types see accessories
Comfort switching capacity														
	**36**	160	125-160	6-10	**NZMC2-A160** 271421		S	**NZMC2-A160-BT** 110219		B	**NZMC2-A160-SVE** 113220		1 off	IEC/EN 60947-2
		200	160-200	6-10	**NZMC2-A200** 271422		S	**NZMC2-A200-BT** 110280		B	**NZMC2-A200-SVE** 113221			
		250	200-250	6-10	**NZMC2-A250** 271423		S	**NZMC2-A250-BT** 110281		B	**NZMC2-A250-SVE** 113222			
		300	240-300	6-10	**NZMC2-A300** 107519		S	**NZMC2-A300-BT** 110218		B	–			
		320	250-320	6-10	**NZMC3-A320** 109665		S	**NZMC3-A320-BT** 110299		B	**NZMC3-A320-AVE** 113509			
		400	320-400	6-10	**NZMC3-A400** 109666		S	**NZMC3-A400-BT** 110300		B	**NZMC3-A400-AVE** 113510			
		500	400-500	6-10	**NZMC3-A500** 109667		S	**NZMC3-A500-BT** 110301		B	**NZMC3-A500-AVE** 113511			
Normal switching capacity														
	**50**	20	15-20	350 A fixed	Screw terminals as accessories			**NZMN1-A20** 281231		B	**NZMN1-A20-SVE** 112776		1 off	IEC/EN 60947-2
		25	20-25	350 A fixed				**NZMN1-A25** 281232		B	**NZMN1-A25-SVE** 112777			
		32	25-32	350 A fixed				**NZMN1-A32** 281233		B	**NZMN1-A32-SVE** 112778			
		40	32-40	8-10				**NZMN1-A40** 259081		B	**NZMN1-A40-SVE** 112757			
		50	40-50	6-10				**NZMN1-A50** 259082		B	**NZMN1-A50-SVE** 112758			
		63	50-63	6-10				**NZMN1-A63** 259083		B	**NZMN1-A63-SVE** 112759			
		80	63-80	6-10				**NZMN1-A80** 259084		B	**NZMN1-A80-SVE** 112760			
		100	80-100	6-10				**NZMN1-A100** 259085		B	**NZMN1-A100-SVE** 112761			
		125	100-125	6-10				**NZMN1-A125** 259086		B	**NZMN1-A125-SVE** 112762			
		160	125-160	1280 A fixed				**NZMN1-A160** 281234		B	–			
		160	125-160	6-10	**NZMN2-A160** 259092		S	**NZMN2-A160-BT** 110283		B	**NZMN2-A160-SVE** 113244			IEC/EN 60947-2
		200	160-200	6-10	**NZMN2-A200** 259093		S	**NZMN2-A200-BT** 110284		B	**NZMN2-A200-SVE** 113245			
		250	200-250	6-10	**NZMN2-A250** 259094		S	**NZMN2-A250-BT** 110285		B	**NZMN2-A250-SVE** 113246			
		300	240-300	6-10	**NZMN2-A300** 107580		S	**NZMN2-A300-BT** 110282		B	–			
		320	250-320	6-10	**NZMN3-A320** 109669		S	**NZMN3-A320-BT** 110302		B	**NZMN3-A320-AVE** 110858			
		400	320-400	6-10	**NZMN3-A400** 109670		S	**NZMN3-A400-BT** 110303		B	**NZMN3-A400-AVE** 110859			
		500	400-500	6-10	**NZMN3-A500** 109671		S	**NZMN3-A500-BT** 110304		B	**NZMN3-A500-AVE** 110860			

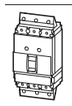
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range		**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in units**			Std. pack	**Notes**
			Overload releases	Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no. Order base separately	**Price** See price list			
				Non-delayed										
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x ...										
														
System and cable protection														**B = box terminals** **S = screw terminals** For further terminal types see accessories
High switching capacity														
	**100**	20	15-20	350 A fixed	Screw terminals as accessories		**NZMH1-A20** 284376		B		**NZMH1-A20-SVE** 112795		1 off	IEC/EN 60947-2
		25	20-25	350 A fixed			**NZMH1-A25** 284377		B		**NZMH1-A25-SVE** 112796			
		32	25-32	350 A fixed			**NZMH1-A32** 284378		B		**NZMH1-A32-SVE** 112797			
		40	32-40	8-10			**NZMH1-A40** 284379		B		**NZMH1-A40-SVE** 112798			
		50	40-50	6-10			**NZMH1-A50** 284410		B		**NZMH1-A50-SVE** 112799			
		63	50-63	6-10			**NZMH1-A63** 284411		B		**NZMH1-A63-SVE** 112800			
		80	63-80	6-10			**NZMH1-A80** 284412		B		**NZMH1-A80-SVE** 112801			
		100	80-100	6-10			**NZMH1-A100** 284413		B		**NZMH1-A100-SVE** 112802			
		125	100-125	6-10			**NZMH1-A125** 284414		B		**NZMH1-A125-SVE** 112803			
		160	125-160	1280 A fixed			**NZMH1-A160** 284415		B		–			
	150	20	15-20	350 A fixed	**NZMH2-A20** 281281		**NZMH2-A20-BT** 110296		B		**NZMH2-A20-SVE** 113351		1 off	
		25	20-25	6-10	**NZMH2-A25** 281282		**NZMH2-A25-BT** 110297		B		**NZMH2-A25-SVE** 113352			
		32	25-32	350 A fixed	**NZMH2-A32** 281283		**NZMH2-A32-BT** 110298		B		**NZMH2-A32-SVE** 113353			
		40	32-40	8-10	**NZMH2-A40** 259095		**NZMH2-A40-BT** 110287		B		**NZMH2-A40-SVE** 113328			
		50	40-50	6-10	**NZMH2-A50** 259096		**NZMH2-A50-BT** 110288		B		**NZMH2-A50-SVE** 113329			
		63	50-63	6-10	**NZMH2-A63** 259097		**NZMH2-A63-BT** 110289		B		**NZMH2-A63-SVE** 113330			
		80	63-80	6-10	**NZMH2-A80** 259098		**NZMH2-A80-BT** 110290		B		**NZMH2-A80-SVE** 113331			
		100	80-100	6-10	**NZMH2-A100** 259099		**NZMH2-A100-BT** 110291		B		**NZMH2-A100-SVE** 113332			
		125	100-125	6-10	**NZMH2-A125** 259100		**NZMH2-A125-BT** 110292		B		**NZMH2-A125-SVE** 113333			
		160	125-160	6-10	**NZMH2-A160** 259101		**NZMH2-A160-BT** 110293		B		**NZMH2-A160-SVE** 113334			
		200	160-200	6-10	**NZMH2-A200** 259102		**NZMH2-A200-BT** 110294		B		**NZMH2-A200-SVE** 113335			
		250	200-250	6-10	**NZMH2-A250** 259103		**NZMH2-A250-BT** 110295		B		**NZMH2-A250-SVE** 113336			
		300	240-300	6-10	**NZMH2-A300** 107581		**NZMH2-A300-BT** 110286		B		–			
		320	250-320	6-10	**NZMH3-A320** 109673		**NZMH3-A320-BT** 110305		B		**NZMH3-A320-AVE** 110861			
		400	320-400	6-10	**NZMH3-A400** 109674		**NZMH3-A400-BT** 110306		B		**NZMH3-A400-AVE** 110862			
		500	400-500	6-10	**NZMH3-A500** 109675		**NZMH3-A500-BT** 110307		B		**NZMH3-A500-AVE** 110863			

	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range: Overload releases	Setting range: Short-circuit releases Non-delayed	Rated operational power AC-3 50/60 Hz	Rated operational current	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in units** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
					400 V	400 V							Order base separately			
	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...	P	I_e										
	kA	A	A		kW	A										
Motor protection																**B = box terminals** **S = screw terminals**
• NZM...1-M...: with phase failure sensitivity • Tripping class 10 A																For further terminal types see accessories
Basic switching capacity																
	**25**	40	32-40	8-14	18.5	36	Screw terminals as accessories			**NZMB1-M40** 265710		B	**NZMB1-M40-SVE** 112709		1 off	IEC/EN 60947-4-1, IEC/EN 60947-2
		50	40-50	8-14	22	41				**NZMB1-M50** 265711		B	**NZMB1-M50-SVE** 112720			The circuit-breakers fulfill all requirements for utilization category AC-3.
		63	50-63	8-14	30	55				**NZMB1-M63** 265712		B	**NZMB1-M63-SVE** 112721			
		80	63-80	8-14	37	68				**NZMB1-M80** 265713		B	**NZMB1-M80-SVE** 112722			
		100	80-100	8-12.5	45	81				**NZMB1-M100** 265714		B	**NZMB1-M100-SVE** 112723			
		125	100-125	8-14	45	99	**NZMB2-M125** 265715		S	Terminals as accessory			**NZMB2-M125-SVE** 113196			
		160	125-160	8-14	75	134	**NZMB2-M160** 265716		S				**NZMB2-M160-SVE** 113197			
		200	160-200	8-14	110	196	**NZMB2-M200** 265717		S				**NZMB2-M200-SVE** 113198			
Comfort switching capacity																
	**36**	40	32-40	8-14	18.5	36	Screw terminals as accessories			**NZMC1-M40** 271398		B	**NZMC1-M40-SVE** 112743		1 off	
		50	40-50	8-14	22	41				**NZMC1-M50** 271399		B	**NZMC1-M50-SVE** 112744			
		63	50-63	8-14	30	55				**NZMC1-M63** 271400		B	**NZMC1-M63-SVE** 112745			
		80	63-80	8-14	37	68				**NZMC1-M80** 271401		B	**NZMC1-M80-SVE** 112746			
		100	80-100	8-12.5	45	81				**NZMC1-M100** 271402		B	**NZMC1-M100-SVE** 112747			
		125	100-125	8-14	45	99	**NZMC2-M125** 271424		S	Terminals as accessory			**NZMC2-M125-SVE** 113223			
		160	125-160	8-14	75	134	**NZMC2-M160** 271425		S				**NZMC2-M160-SVE** 113224			
		200	160-200	8-14	110	196	**NZMC2-M200** 271426		S				**NZMC2-M200-SVE** 113225			
Normal switching capacity																
	**50**	40	32-40	8-14	18.5	36	Screw terminals as accessories			**NZMN1-M40** 265718		B	**NZMN1-M40-SVE** 112763		1 off	
		50	40-50	8-14	22	41				**NZMN1-M50** 265719		B	**NZMN1-M50-SVE** 112764			
		63	50-63	8-14	30	55				**NZMN1-M63** 265720		B	**NZMN1-M63-SVE** 112765			
		80	63-80	8-14	37	68				**NZMN1-M80** 265721		B	**NZMN1-M80-SVE** 112766			
		100	80-100	8-12.5	45	81				**NZMN1-M100** 265722		B	**NZMN1-M100-SVE** 112767			
		125	100-125	8-14	45	99	**NZMN2-M125** 265723		S	Terminals as accessory			**NZMN2-M125-SVE** 113250			
		160	125-160	8-14	75	134	**NZMN2-M160** 265724		S				**NZMN2-M160-SVE** 113251			
		200	160-200	8-14	110	196	**NZMN2-M200** 265725		S				**NZMN2-M200-SVE** 113252			

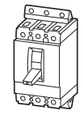
Tripping class	**Tripping time T_p with load on all poles of 7.2 times set current value.**
10 A	2 s < T_p ≦ 10 s
10	4 s < T_p ≦ 10 s
20	6 s < T_p ≦ 20 s
30	9 s < T_p ≦ 30 s

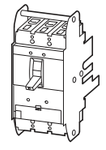
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range		Rated operational power AC-3 50/60 Hz	Rated operational current	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in units** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
			Overload releases	Short-circuit releases Non-delayed	400 V	400 V							Order base separately			
	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...	P	I_e										
	kA	A	A		kW	A										
																B = box terminals **S = screw terminals** For further terminal types see accessories
Motor protection																
• NZM...1-M...: with phase failure sensitivity • Tripping class 10 A																
High switching capacity																
	**100**	40	32-40	8-14	18.5	36	Screw terminals as accessories			**NZMH1-M40** 115450		B	 **NZMH1-M40-SVE** 115790		1 off	IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breakers fulfill all requirements for utilization category AC-3.
		50	40-50	8-14	22	41				**NZMH1-M50** 115451		B	**NZMH1-M50-SVE** 115791			
		63	50-63	8-14	30	55				**NZMH1-M63** 115452		B	**NZMH1-M63-SVE** 115792			
		80	63-80	8-14	37	68				**NZMH1-M80** 115453		B	**NZMH1-M80-SVE** 115793			
		100	80-100	8-12.5	45	81				**NZMH1-M100** 115454		B	**NZMH1-M100-SVE** 115794			
	**150**	20	16-20	350 A fixed	7.5	16	**NZMH2-M20** 281299		S	Terminals as accessory			 **NZMH2-M20-SVE** 113354			**Tripping class** / **Tripping time T_p with load on all poles of 7.2 times set current value.** 10 A: $2 s < T_p \leqq 10 s$ 10: $4 s < T_p \leqq 10 s$ 20: $6 s < T_p \leqq 20 s$ 30: $9 s < T_p \leqq 30 s$
		25	20-25	350 A fixed	11	21.7	**NZMH2-M25** 281300		S				**NZMH2-M25-SVE** 113355			
		32	25-32	10-14	15	29.3	**NZMH2-M32** 281301		S				**NZMH2-M32-SVE** 113356			
		40	32-40	8-14	18.5	36	**NZMH2-M40** 281302		S				**NZMH2-M40-SVE** 113357			
		50	40-50	8-14	22	41	**NZMH2-M50** 281303		S				**NZMH2-M50-SVE** 113358			
		63	50-63	8-14	30	55	**NZMH2-M63** 281304		S				**NZMH2-M63-SVE** 113359			
		80	63-80	8-14	37	68	**NZMH2-M80** 281305		S				**NZMH2-M80-SVE** 113360			
		100	80-100	8-14	45	81	**NZMH2-M100** 281306		S				**NZMH2-M100-SVE** 113361			
		125	100-125	8-14	45	99	**NZMH2-M125** 281307		S				**NZMH2-M125-SVE** 113362			
		160	125-160	8-14	75	134	**NZMH2-M160** 281308		S				**NZMH2-M160-SVE** 113363			
		200	160-200	8-14	110	196	**NZMH2-M200** 281309		S				**NZMH2-M200-SVE** 113364			

Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range	Rated operational power AC-3 50/60 Hz	Rated operational current AC-3 50/60 Hz	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Plug-in/withdrawable units** **Part no.** Article no.	**Price** See price list		Std. pack	**Notes**
		Short-circuit releases	400 V	400 V								
I_{cu}	$I_n = I_u$	Non-delayed	P	I_e								
kA	A	$I_i = I_n$ x ...	kW	A				Order base separately				
		$I>$										
Short-circuit protection												**B = box terminals** **S = screw terminals** For further terminal types see accessories
Motor protection in conjunction with overload relay • With short-circuit releases • Without overload releases I_r												
Basic switching capacity												
	**25**	40	8-14	18.5	max. 36	Screw terminals as accessories		**NZMB1-S40-SVE** 112724			1 off	IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breakers fulfill all requirements for utilization category AC-3.
		50	8-14	22	max. 41			**NZMB1-S50-SVE** 112725				
		63	8-14	30	max. 55			**NZMB1-S63-SVE** 112726				
		80	8-14	37	max. 68			**NZMB1-S80-SVE** 112727				
		100	8-12.5	45	max. 99			**NZMB1-S100-SVE** 112728				
		125	8-14	45	max. 99	**NZMB2-S125** 265736	S	**NZMB2-S125-SVE** 113199				
		160	8-14	75	max. 134	**NZMB2-S160** 265737	S	**NZMB2-S160-SVE** 113200				
		200	8-12.5	110	max. 196	**NZMB2-S200** 265738	S	**NZMB2-S200-SVE** 113201				
Comfort switching capacity												
	**36**	40	8-14	18.5	max. 36	Screw terminals as accessories		**NZMC1-S40-SVE** 112748			1 off	
		50	8-14	22	max. 41			**NZMC1-S50-SVE** 112749				
		63	8-14	30	max. 55			**NZMC1-S63-SVE** 112750				
		80	8-14	37	max. 68			**NZMC1-S80-SVE** 112751				
		100	8-12.5	45	max. 99			**NZMC1-S100-SVE** 112752				
		125	8-14	45	max. 99	**NZMC2-S125** 271427	S	**NZMC2-S125-SVE** 113226				
		160	8-14	75	max. 134	**NZMC2-S160** 271428	S	**NZMC2-S160-SVE** 113227				
		200	8-12.5	110	max. 196	**NZMC2-S200** 271429	S	**NZMC2-S200-SVE** 113228				
		250	8-14	132	max. 231	**NZMC3-S250** 109676	S	**NZMC3-S250-AVE** 113512				
		320	8-14	160	max. 279	**NZMC3-S320** 109677	S	**NZMC3-S320-AVE** 113513				
		400	6-10	200	max. 349	**NZMC3-S400** 109678	S	**NZMC3-S400-AVE** 113514				
		500	6-10	250	max. 437	**NZMC3-S500** 109679	S	**NZMC3-S500-AVE** 113515				
Normal switching capacity												
	**50**	40	8-14	18.5	max. 36	Screw terminals as accessories		**NZMN1-S40-SVE** 112768			1 off	
		50	8-14	22	max. 41			**NZMN1-S50-SVE** 112769				
		63	8-14	30	max. 55			**NZMN1-S63-SVE** 112770				
		80	8-14	37	max. 68			**NZMN1-S80-SVE** 112771				
		100	8-12.5	45	max. 99			**NZMN1-S100-SVE** 112772				

	Terminals as accessory			
NZMB1-S40 265726		B		
NZMB1-S50 265727		B		
NZMB1-S63 265728		B		
NZMB1-S80 265729		B		
NZMB1-S100 265730		B		
NZMC1-S40 271403		B		
NZMC1-S50 271404		B		
NZMC1-S63 271405		B		
NZMC1-S80 271406		B		
NZMC1-S100 271407		B		
NZMN1-S40 265731		B		
NZMN1-S50 265732		B		
NZMN1-S63 265733		B		
NZMN1-S80 265734		B		
NZMN1-S100 265735		B		





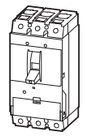
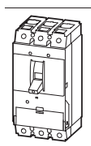


Tripping class	**Tripping time T_p with load on all poles of 7.2 times set current value.**
10 A	2 s < T_p ≦ 10 s
10	4 s < T_p ≦ 10 s
20	6 s < T_p ≦ 20 s
30	9 s < T_p ≦ 30 s

Selection of circuit-breakers without overload release when combining for instance with ZEV electronic motor-protective relays:

The tripping response of the motor-protective relay is matched by setting the tripping class to match the starting behavior of the motor to be protected.

	I_n in A	**Maximum permissible tripping class**
NZM...1-S...	40	30
	50	30
	63	30
	80	20
	100	15
NZM...2-S...	40	30
	50	30
	63	30
	80	30
	100	30
	125	30
	160	20
	200	10
NZM...3-S...	250	30
	320	30
	400	30
	500	20

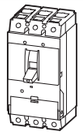
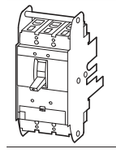
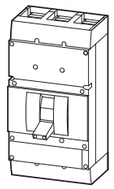
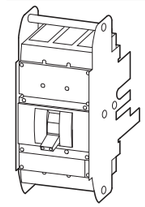
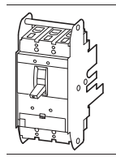
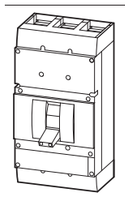
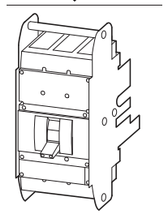
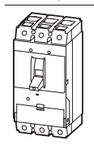
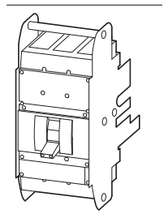
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range	Rated operational power AC-3 50/60 Hz	Rated operational current AC-3 50/60 Hz	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Plug-in/withdrawable units** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
			Short-circuit releases	400 V	400 V							
	I_{cu}	$I_n = I_u$	Non-delayed	P	I_e				Order base separately			
	kA	A	$I_i = I_n$ x …	kW	A							
			$I>$									
Short-circuit protection												**B = box terminals** **S = screw terminals** For further terminal types see accessories
Motor protection in conjunction with overload relay • With short-circuit release • Without overload release I_r												
Normal switching capacity												
	**50**	125	8-14	45	max. 99	**NZMN2-S125** 265739		S	Terminals as accessory		1 off	IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breakers fulfill all requirements for utilization category AC-3.
		160	8-14	75	max. 134	**NZMN2-S160** 265740		S				
		200	8-12.5	110	max. 196	**NZMN2-S200** 265741		S				
		250	8-14	132	max. 231	**NZMN3-S250** 109680		S				
		320	8-14	160	max. 279	**NZMN3-S320** 109681		S				
		400	6-10	200	max. 349	**NZMN3-S400** 109682		S				
		500	6-10	250	max. 437	**NZMN3-S500** 109683		S				
High switching capacity												
	**100**	40	8-14	18.5	max. 36	Screw terminals as accessories			**NZMH1-S40** 284436		B	**NZMH1-S40-SVE** 112805
		50	8-14	22	max. 41				**NZMH1-S50** 284437		B	**NZMH1-S50-SVE** 112806
		63	8-14	30	max. 55				**NZMH1-S63** 284438		B	**NZMH1-S63-SVE** 112807
		80	8-14	37	max. 68				**NZMH1-S80** 284439		B	**NZMH1-S80-SVE** 112808
		100	8-12.5	45	max. 99				**NZMH1-S100** 284440		B	**NZMH1-S100-SVE** 112809
	**150**	40	8-14	18.5	max. 36	**NZMH2-S40** 265742		S	Terminals as accessory			**NZMH2-S40-SVE** 113340
		50	8-14	22	max. 41	**NZMH2-S50** 265743		S				**NZMH2-S50-SVE** 113341
		63	8-14	30	max. 55	**NZMH2-S63** 265744		S				**NZMH2-S63-SVE** 113342
		80	8-14	37	max. 68	**NZMH2-S80** 265745		S				**NZMH2-S80-SVE** 113343
		100	8-14	45	max. 99	**NZMH2-S100** 265746		S				**NZMH2-S100-SVE** 113344
		125	8-14	45	max. 99	**NZMH2-S125** 265747		S				**NZMH2-S125-SVE** 113345
		160	8-14	75	max. 134	**NZMH2-S160** 265748		S				**NZMH2-S160-SVE** 113346
		200	8-12.5	110	max. 196	**NZMH2-S200** 265749		S				**NZMH2-S200-SVE** 113347
		250	8-14	132	max. 231	**NZMH3-S250** 109684		S				**NZMH3-S250-AVE** 113566
		320	8-14	160	max. 279	**NZMH3-S320** 109685		S				**NZMH3-S320-AVE** 113567
		400	6-10	200	max. 349	**NZMH3-S400** 109686		S				**NZMH3-S400-AVE** 113568
		500	6-10	250	max. 437	**NZMH3-S500** 109687		S				**NZMH3-S500-AVE** 113569

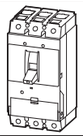
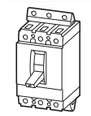
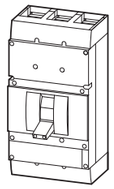
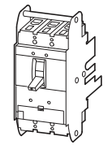
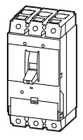
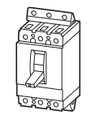
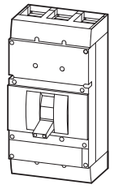
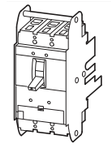
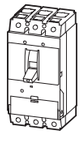
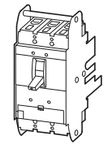
Tripping class	Tripping time T_p with load on all poles of 7.2 times set current value.
10 A	2 s < T_p ≦ 10 s
10	4 s < T_p ≦ 10 s
20	6 s < T_p ≦ 20 s
30	9 s < T_p ≦ 30 s

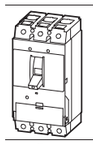
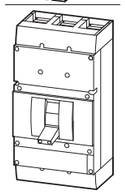
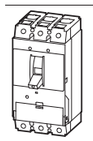
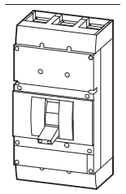
Selection of circuit-breakers without overload release when combining for instance with ZEV electronic motor-protective relays:

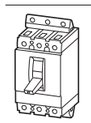
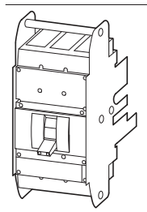
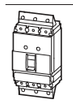
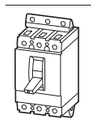
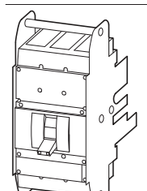
The tripping response of the motor-protective relay is matched by setting the tripping class to match the starting behavior of the motor to be protected.

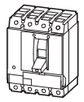
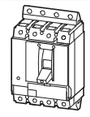
	I_n in A	Maximum permissible tripping class
NZM...1-S...	40	30
	50	30
	63	30
	80	20
	100	15
NZM...2-S...	40	30
	50	30
	63	30
	80	30
	100	30
	125	30
	160	20
	200	10
NZM...3-S...	250	30
	320	30
	400	30
	500	20

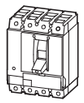
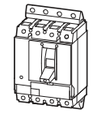
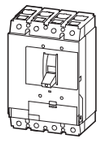
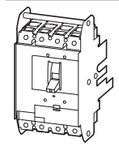
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range		**Fixed mounting** with screw terminals			**Withdrawable units**				
			Overload releases	Short-circuit releases Non-delayed	**Part no.** Article no.	**Price** See price list		**Part no.** Article no. Order base separately	**Price** See price list		Std. pack	**Notes**
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …								
System and cable protection												**B = box terminals** **S = screw terminals** For further terminal types see accessories
Normal switching capacity												
	**50**	630	315-630	2-8	**NZMN3-AE630** 259115		S	**NZMN3-AE630-BT** 111656		B 	**NZMN3-AE630-AVE** 110842			1 off	IEC/EN 60947-2 R.m.s. value measurement and "thermal memory"
	**50**	630	315-630	2-12	**NZMN4-AE630** 265758		S	Terminals as accessory			Withdrawable units as accessories				
		800	400-800	2-12	**NZMN4-AE800** 265759		S								
		1000	500-1000	2-12	**NZMN4-AE1000** 265760		S								
		1250	630-1250	2-12	**NZMN4-AE1250** 265761		S								
		1600	800-1600	2-12	**NZMN4-AE1600** 265762		S								
High switching capacity												
	150	630	315-630	2-8	**NZMH3-AE630** 259118		S	Terminals as accessory			**NZMH3-AE630-AVE** 110851			1 off	
	**85**	630	315-630	2-12	**NZMH4-AE630** 265763		S				Withdrawable units as accessories				
		800	400-800	2-12	**NZMH4-AE800** 265764		S								
		1000	500-1000	2-12	**NZMH4-AE1000** 265765		S								
		1250	630-1250	2-12	**NZMH4-AE1250** 265766		S								
		1600	800-1600	2-12	**NZMH4-AE1600** 265767		S								
Earth fault protection												
	**50**	250	125-250	2-11	**NZMN3-AE250-T** 110888		S	Terminals as accessory			**NZMN3-AE250-T-AVE** 113527			1 off	
		400	200-400	2-11	**NZMN3-AE400-T** 110889		S				**NZMN3-AE400-T-AVE** 113528				
		630	315-630	2-8	**NZMN3-AE630-T** 110890		S				**NZMN3-AE630-T-AVE** 113093				
	150	250	125-250	2-11	**NZMH3-AE250-T** 110894		S				**NZMH3-AE250-T-AVE** 113570				
		400	200-400	2-11	**NZMH3-AE400-T** 110895		S				**NZMH3-AE400-T-AVE** 113571				
		630	315-630	2-8	**NZMH3-AE630-T** 110896		S				**NZMH3-AE630-T-AVE** 113572				

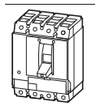
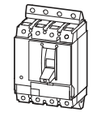
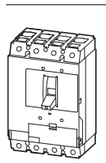
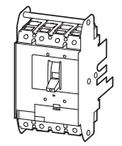
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range			**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in/withdrawable units**				
			Overload releases	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no. Order base separately	**Price** See price list		Std. pack	**Notes**
				Non-delayed	Delayed										
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	$I_{sd} = I_r$ x …										
Systems protection, cable protection, selectivity, generator protection															**B = box terminals** **S = screw terminals** For further terminal types see accessories
Normal switching capacity															
	**50**	100	50-100	1200 A fixed	2-10	**NZMN2-VE100** 259122		Terminals as accessory			**NZMN2-VE100-SVE** 113247			1 off	IEC/EN 60947-2 R.m.s. value measurement and "thermal memory" Adjustable delay setting t_r • 2 – 20 s at 6 x I_r and infinite (without overload release) Adjustable delay t_{sd} • Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable
		160	80-160	1920 A fixed	2-10	**NZMN2-VE160** 259123					**NZMN2-VE160-SVE** 113248				
		250	125-250	3000 A fixed	2-10	**NZMN2-VE250** 259124					**NZMN2-VE250-SVE** 113249				
		250	125-250	2-11	2-10	**NZMN3-VE250** 259131					**NZMN3-VE250-AVE** 110843				
		400	200-400	2-11	2-10	**NZMN3-VE400** 259132		**NZMN3-VE400-BT** 111659	**1,467.37** 43	B	**NZMN3-VE400-AVE** 110844				
		630	315-630	2-8	1.5-7	**NZMN3-VE630** 259133		**NZMN3-VE630-BT** 111730	**1,914.22** 43	B	**NZMN3-VE630-AVE** 110845				
		630	315-630	2-12	1.5-7	**NZMN4-VE630** 265768		Terminals as accessory			Withdrawable units as accessories				
		800	400-800	2-12	2-10	**NZMN4-VE800** 265769									
		1000	500-1000	2-12	2-10	**NZMN4-VE1000** 265770									
		1250	630-1250	2-12	2-10	**NZMN4-VE1250** 265771									
		1600	800-1600	2-12	2-10	**NZMN4-VE1600** 265772									
High switching capacity															
	**150**	100	50-100	1200 A fixed	2-10	**NZMH2-VE100** 259125		Terminals as accessory			**NZMH2-VE100-SVE** 113337			1 off	
		160	80-160	1920 A fixed	2-10	**NZMH2-VE160** 259126					**NZMH2-VE160-SVE** 113338				
		250	125-250	3000 A fixed	2-10	**NZMH2-VE250** 259127					**NZMH2-VE250-SVE** 113339				
		250	125-250	2-11	2-10	**NZMH3-VE250** 259134					**NZMH3-VE250-AVE** 110852				
		400	200-400	2-11	2-10	**NZMH3-VE400** 259135		**NZMH3-VE400-BT** 111731	**1,668.52** 43	B	**NZMH3-VE400-AVE** 110853				
		630	315-630	2-8	1.5-7	**NZMH3-VE630** 259136		**NZMH3-VE630-BT** 111732	**2,079.92** 43	B	**NZMH3-VE630-AVE** 110854				
	**85**	630	315-630	2-12	1.5-7	**NZMH4-VE630** 265773		Terminals as accessory			Withdrawable units as accessories				
		800	400-800	2-12	2-10	**NZMH4-VE800** 265774									
		1000	500-1000	2-12	2-10	**NZMH4-VE1000** 265775									
		1250	630-1250	2-12	2-10	**NZMH4-VE1250** 265776									
		1600	800-1600	2-12	2-10	**NZMH4-VE1600** 265777									
Earth fault protection															
	**50**	250	125-250	2-11	2-10	**NZMN3-VE250-T** 110891		Terminals as accessory			**NZMN3-VE250-T-AVE** 113529			1 off	
		400	200-400	2-11	2-10	**NZMN3-VE400-T** 110892					**NZMN3-VE400-T-AVE** 113530				
		630	315-630	2-8	1.5-7	**NZMN3-VE630-T** 110893					**NZMN3-VE630-T-AVE** 113531				
	150	250	125-250	2-11	2-10	**NZMH3-VE250-T** 110897					**NZMH3-VE250-T-AVE** 113573				
		400	200-400	2-11	2-10	**NZMH3-VE400-T** 110898					**NZMH3-VE400-T-AVE** 113574				
		630	315-630	2-8	1.5-7	**NZMH3-VE630-T** 110899					**NZMH3-VE630-T-AVE** 113575				

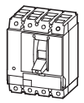
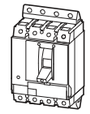
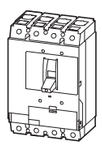
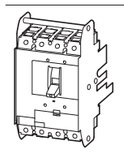
		Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range: Overload releases	Setting range: Short-circuit releases	Rated operational power AC-3 50/60 Hz		Rated operational current AC-3 50/60 Hz		**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list	
					Non-delayed	400 V	690 V	400 V	690 V			
		I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x …	P	P	I_e	I_e			
		kA	A	A		kW	kW	A	A			
Motor protection												
With phase-failure sensitivity												
Normal switching capacity												
	**50**		90	45-90	2-14	45	75	81	78	**NZMN2-ME90** 265778		S
			140	70-140	2-14	75	132	134	134	**NZMN2-ME140** 265779		S
			220	110-220	2-14	110	200	196	202	**NZMN2-ME220** 265780		S
			220	110-220	2-14	110	200	196	202	**NZMN3-ME220** 265781		S
			350	175-350	2-14	200	315	349	316	**NZMN3-ME350** 265782		S
			450	225-450	2-12	250	450	437	446	**NZMN3-ME450** 284468		S
			550	275-550	2-14	315	560	544	550	**NZMN4-ME550** 265783		S
			875	438-875	2-14	500	600	820	588	**NZMN4-ME875** 265784		S
			1400	700-1400	2-14	630	600	1066	588	**NZMN4-ME1400** 265785		S
High switching capacity												
	**150**		90	45-90	2-14	45	45	81	78	**NZMH2-ME90** 265786		S
			140	70-140	2-14	75	132	134	134	**NZMH2-ME140** 265787		S
			220	110-220	2-14	110	200	196	202	**NZMH2-ME220** 265788		S
			220	110-220	2-14	110	200	196	202	**NZMH3-ME220** 265789		S
			350	175-350	2-14	200	315	349	316	**NZMH3-ME350** 265790		S
			450	225-450	2-12	250	450	437	446	**NZMH3-ME450** 284469		S
	**85**		550	275-550	2-14	315	560	544	550	**NZMH4-ME550** 265791		S
			875	438-875	2-14	500	600	820	588	**NZMH4-ME875** 265792		S
			1400	700-1400	2-14	630	600	1066	588	**NZMH4-ME1400** 265793		S

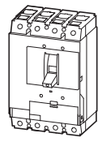
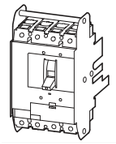
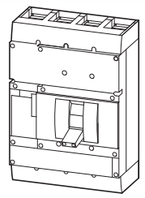
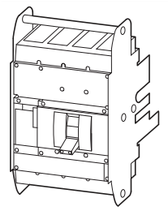
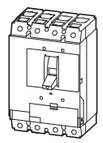
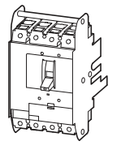
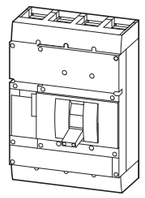
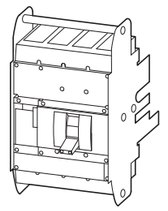
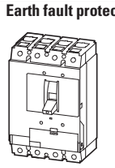
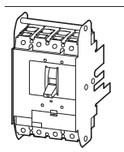
	Plug-in units **Part no.** Article no. Order base separately	**Price** See price list	Std. pack	**Notes**
				B = box terminals **S = screw terminals** For further terminal types see accessories
	**NZMN2-ME90-SVE** 113256		1 off	IEC/EN 60947-4-1, IEC/EN 60947-2 The circuit-breakers fulfill all requirements for utilization category AC-3. R.m.s. value measurement and “thermal memory” Adjustable delay setting t_r • 2 – 20 s at 6 x I_r, and infinite (without overload release)
	NZMN2-ME140-SVE 113257			
	NZMN2-ME220-SVE 113258			
	**NZMN3-ME220-AVE** 110846			
	NZMN3-ME350-AVE 110847			
	NZMN3-ME450-AVE 110848			
	Withdrawable units as accessories			
	**NZMH2-ME90-SVE** 113348		1 off	
	NZMH2-ME140-SVE 113349			
	NZMH2-ME220-SVE 113350			
	**NZMH3-ME220-AVE** 110855			
	NZMH3-ME350-AVE 110856			
	NZMH3-ME450-AVE 110857			
	Withdrawable units as accessories			

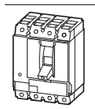
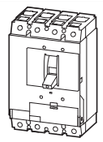
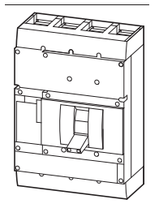
Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range			**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in units**		Std. pack	**Notes**
			Overload releases		Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list		
	Phase conductors	Neutral conductor		Phase conductors	Non-delayed						Order base separately			
I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …									
kA	A	%	A	A										**B = box terminals** **S = screw terminals** For further terminal types see accessories
System and cable protection														
Basic switching capacity														
	**25**	20	100	15-20	15…20	350 A fixed	Screw terminals as accessories		**NZMB1-4-A20** 281237	B	–	–	1 off	IEC/EN 60947-2 Set value for neutral conductor is same as set value I_r for main pole.
		25	100	20-25	20…25	350 A fixed			**NZMB1-4-A25** 281239	B		–		
		32	100	25-32	25…32	350 A fixed			**NZMB1-4-A32** 281241	B		–		
		40	100	32-40	32…40	8-10			**NZMB1-4-A40** 265799	B		–		
		50	100	40-50	40…50	6-10			**NZMB1-4-A50** 265801	B		–		
		63	100	50-63	50…63	6-10			**NZMB1-4-A63** 265803	B		–		
		80	100	63-80	63…80	6-10			**NZMB1-4-A80** 265805	B		–		
		100	100	80-100	80…100	6-10			**NZMB1-4-A100** 265807	B		–		
		125	100	100-125	100…125	6-10			**NZMB1-4-A125** 265809	B		–		
		160	100	125-160	125…160	1280 A fixed			**NZMB1-4-A160** 281243	B		–		
		160	100	125-160	125…160	6-10	**NZMB2-4-A160** 265849	S	Terminals as accessory			**NZMB2-4-A160-SVE** 113209		
		160	60	125-160	80…100	6-10	**NZMB2-4-A160/100** 265850	S				**NZMB2-4-A160/100-SVE** 113210		
		200	100	160-200	160…200	6-10	**NZMB2-4-A200** 265852	S				**NZMB2-4-A200-SVE** 113212		
		200	60	160-200	100…125	6-10	**NZMB2-4-A200/125** 265853	S				**NZMB2-4-A200/125-SVE** 113213		
		250	100	200-250	200…250	6-10	**NZMB2-4-A250** 265855	S				**NZMB2-4-A250-SVE** 113215		
		250	60	200-250	125…160	6-10	**NZMB2-4-A250/160** 265856	S				**NZMB2-4-A250/160-SVE** 113216		
		300	100	240-300	240…300	6-10	**NZMB2-4-A300** 107582	S				–		
		300	60	240-300	160…200	6-10	**NZMB2-4-A300/200** 107583	S				–		
Comfort switching capacity														
	**36**	20	100	15-20	15…20	350 A fixed	Screw terminals as accessories		**NZMC1-4-A20** 283300	B	–	–	1 off	
		25	100	20-25	20…25	350 A fixed			**NZMC1-4-A25** 283302	B		–		
		32	100	25-32	25…32	350 A fixed			**NZMC1-4-A32** 283304	B		–		
		40	100	32-40	32…40	8-10			**NZMC1-4-A40** 271408	B		–		
		50	100	40-50	40…50	6-10			**NZMC1-4-A50** 271410	B		–		
		63	100	50-63	50…63	6-10			**NZMC1-4-A63** 271412	B		–		
		80	100	63-80	63…80	6-10			**NZMC1-4-A80** 271414	B		–		
		100	100	80-100	80…100	6-10			**NZMC1-4-A100** 271416	B		–		
		125	100	100-125	100…125	6-10			**NZMC1-4-A125** 271418	B		–		
		160	100	125-160	125…160	1280 A fixed			**NZMC1-4-A160** 283306	B		–		

		Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range			**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in units**				
					Overload releases		Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	
			Phase conductors	Neutral conductor		Phase conductors	Non-delayed										
		I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …						Order base separately				
		kA	A	%	A	A											
System and cable protection																**B = box terminals** **S = screw terminals** For further terminal types see accessories	
Comfort switching capacity																	
	**36**	125	100	100-125	100…125	6-10	**NZMC2-4-A125** 271430		S	Terminals as accessory			**NZMC2-4-A125-SVE** 113231		1 off	IEC/EN 60947-2 Set value for neutral conductor is same as set value I_r for main pole.	
		160	100	125-160	125…160	6-10	**NZMC2-4-A160** 271432		S				**NZMC2-4-A160-SVE** 113233				
		160	60	125-160	80…100	6-10	**NZMC2-4-A160/100** 271433		S				**NZMC2-4-A160/100-SVE** 113234				
		200	100	160-200	160…200	6-10	**NZMC2-4-A200** 271435		S				**NZMC2-4-A200-SVE** 113236				
		200	60	160-200	100…125	6-10	**NZMC2-4-A200/125** 271436		S				**NZMC2-4-A200/125-SVE** 113237				
		250	100	200-250	200…250	6-10	**NZMC2-4-A250** 271438		S				**NZMC2-4-A250-SVE** 113239				
		250	60	200-250	125…160	6-10	**NZMC2-4-A250/160** 271439		S				**NZMC2-4-A250/160-SVE** 113240				
		300	100	240-300	240…300	6-10	**NZMC2-4-A300** 107584		S				–				
		300	60	240-300	160…200	6-10	**NZMC2-4-A300/200** 107585		S				–				
		320	100	250-320	250…320	6-10	**NZMC3-4-A320** 109688		S				**NZMC3-4-A320-AVE** 113516				
		320	60	250-320	160…200	6-10	**NZMC3-4-A320/200** 109689		S				**NZMC3-4-A320/200-AVE** 113517				
		400	100	320-400	320…400	6-10	**NZMC3-4-A400** 109690		S				**NZMC3-4-A400-AVE** 113518				
		400	60	320-400	200…250	6-10	**NZMC3-4-A400/250** 109691		S				**NZMC3-4-A400/250-AVE** 113519				
		500	100	400-500	400…500	6-10	**NZMC3-4-A500** 109692		S				**NZMC3-4-A500-AVE** 113520				
		500	60	400-500	250…320	6-10	**NZMC3-4-A500/320** 109693		S				**NZMC3-4-A500/320-AVE** 113521				
Normal switching capacity																	
	**50**	20	100	15-20	15…20	350 A fixed	Screw terminals as accessories						–		1 off		
		25	100	20-25	20…25	350 A fixed											
		32	100	25-32	25…32	350 A fixed											
		40	100	32-40	32…40	8-10											
		50	100	40-50	40…50	6-10											
		63	100	50-63	50…63	6-10											
		80	100	63-80	63…80	6-10											
		100	100	80-100	80…100	6-10											
		125	100	100-125	100…125	6-10											
		160	100	125-160	125…160	1280 A fixed											

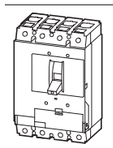
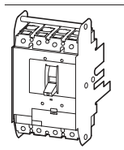
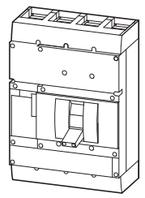
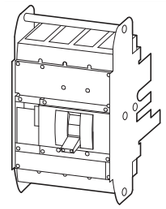
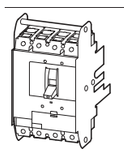
	Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range			**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in units**				
				Overload releases		Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	
		Phase conductors	Neutral conductor		Phase conductors	Non-delayed						Order base separately				
	I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …										
	kA	A	%	A	A											
System and cable protection															**B = box terminals** **S = screw terminals** For further terminal types see accessories	
Normal switching capacity																
	**50**	160	100	125-160	125…160	6-10	**NZMN2-4-A160** 265860		Terminals as accessory			**NZMN2-4-A160-SVE** 113266		1 off	IEC/EN 60947-2 Set value for neutral conductor is same as set value I_r for main pole.	S
		160	60	125-160	80…100	6-10	**NZMN2-4-A160/100** 265861					**NZMN2-4-A160/100-SVE** 113267				S
		200	100	160-200	160…200	6-10	**NZMN2-4-A200** 265863					**NZMN2-4-A200-SVE** 113269				S
		200	60	160-200	100…125	6-10	**NZMN2-4-A200/125** 265864					**NZMN2-4-A200/125-SVE** 113270				S
		250	100	200-250	200…250	6-10	**NZMN2-4-A250** 265866					**NZMN2-4-A250-SVE** 113272				S
		250	60	200-250	125…160	6-10	**NZMN2-4-A250/160** 265867					**NZMN2-4-A250/160-SVE** 113273				S
		300	100	240-300	240…300	6-10	**NZMN2-4-A300** 107586					–				S
		300	60	240-300	160…200	6-10	**NZMN2-4-A300/200** 107587					–				S
		320	100	250-320	250…320	6-10	**NZMN3-4-A320** 109694					**NZMN3-4-A320-AVE** 113532				S
		320	60	250-320	160…200	6-10	**NZMN3-4-A320/200** 109695					**NZMN3-4-A320/200-AVE** 113533				S
		400	100	320-400	320…400	6-10	**NZMN3-4-A400** 109696					**NZMN3-4-A400-AVE** 113534				S
		400	60	320-400	200…250	6-10	**NZMN3-4-A400/250** 109697					**NZMN3-4-A400/250-AVE** 113535				S
		500	100	400-500	400…500	6-10	**NZMN3-4-A500** 109698					**NZMN3-4-A500-AVE** 113536				S
		500	60	400-500	250…320	6-10	**NZMN3-4-A500/320** 109699					**NZMN3-4-A500/320-AVE** 113537				S
High switching capacity																
	**100**	20	100	15-20	15…20	350 A fixed	Screw terminals as accessories		**NZMH1-4-A20** 284416		B –	–		1 off		
		25	100	20-25	20…25	350 A fixed			**NZMH1-4-A25** 284418		B	–				
		32	100	25-32	25…32	350 A fixed			**NZMH1-4-A32** 284420		B	–				
		40	100	32-40	32…40	8-10			**NZMH1-4-A40** 284422		B	–				
		50	100	40-50	40…50	6-10			**NZMH1-4-A50** 284424		B	–				
		63	100	50-63	50…63	6-10			**NZMH1-4-A63** 284426		B	–				
		80	100	63-80	63…80	6-10			**NZMH1-4-A80** 284428		B	–				
		100	100	80-100	80…100	6-10			**NZMH1-4-A100** 284430		B	–				
		125	100	100-125	100…125	6-10			**NZMH1-4-A125** 284432		B	–				
		160	100	125-160	125…160	1280 A fixed			**NZMH1-4-A160** 284434		B	–				

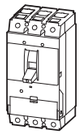
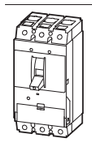
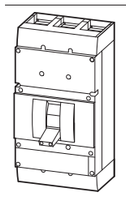
		Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range			**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Plug-in units**				
					Overload releases		Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	
			Phase conductors	Neutral conductor		Phase conductors	Non-delayed										
		I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …						Order base separately				
		kA	A	%	A	A											
System and cable protection																**B = box terminals** **S = screw terminals** For further terminal types see accessories	
High switching capacity																	
	**150**	20	100	15-20	15…20	350 A fixed	**NZMH2-4-A20** 281287		S	Terminals as accessory			**NZMH2-4-A20-SVE** 113396		1 off	IEC/EN 60947-2 Set value for neutral conductor is same as set value I_r for main pole.	
		25	100	20-25	20…25	350 A fixed	**NZMH2-4-A25** 281289		S				**NZMH2-4-A25-SVE** 113398				
		32	100	25-32	25…32	350 A fixed	**NZMH2-4-A32** 281291		S				**NZMH2-4-A32-SVE** 113400				
		40	100	32-40	32…40	6-10	**NZMH2-4-A40** 265823		S				**NZMH2-4-A40-SVE** 113367				
		50	100	40-50	40…50	6-10	**NZMH2-4-A50** 265825		S				**NZMH2-4-A50-SVE** 113369				
		63	100	50-63	50…63	6-10	**NZMH2-4-A63** 265827		S				**NZMH2-4-A63-SVE** 113371				
		80	100	63-80	63…80	6-10	**NZMH2-4-A80** 265829		S				**NZMH2-4-A80-SVE** 113373				
		100	100	80-100	80…100	6-10	**NZMH2-4-A100** 265831		S				**NZMH2-4-A100-SVE** 113375				
		125	100	100-125	100…125	6-10	**NZMH2-4-A125** 265833		S				**NZMH2-4-A125-SVE** 113377				
		160	100	125-160	125…160	6-10	**NZMH2-4-A160** 265871		S				**NZMH2-4-A160-SVE** 113379				
		160	60	125-160	80…100	6-10	**NZMH2-4-A160/100** 265872		S				**NZMH2-4-A160/100-SVE** 113380				
		200	100	160-200	160…200	6-10	**NZMH2-4-A200** 265874		S				**NZMH2-4-A200-SVE** 113382				
		200	60	160-200	100…125		**NZMH2-4-A200/125** 265875		S				**NZMH2-4-A200/125-SVE** 113383				
		250	100	200-250	200…250	6-10	**NZMH2-4-A250** 265877		S				**NZMH2-4-A250-SVE** 113385				
		250	60	200-250	125…160	6-10	**NZMH2-4-A250/160** 265878		S				**NZMH2-4-A250/160-SVE** 113386				
		300	100	240-300	240…300	6-10	**NZMH2-4-A300** 107588		S				–				
		300	60	240-300	160…200	6-10	**NZMH2-4-A300/200** 107589		S				–				
	**150**	320	100	250-320	250…320	6-10	**NZMH3-4-A320** 109700		S				**NZMH3-4-A320-AVE** 113578		1 off		
		320	60	250-320	160…200	6-10	**NZMH3-4-A320/200** 109701		S				**NZMH3-4-A320/200-AVE** 113579				
		400	100	320-400	320…400	6-10	**NZMH3-4-A400** 109702		S				**NZMH3-4-A400-AVE** 113580				
		400	60	320-400	200…250	6-10	**NZMH3-4-A400/250** 109703		S				**NZMH3-4-A400/250-AVE** 113581				
		500	100	400-500	400…500	6-10	**NZMH3-4-A500** 109704		S				**NZMH3-4-A500-AVE** 113582				
		500	60	400-500	250…320	6-10	**NZMH3-4-A500/320** 109705		S				**NZMH3-4-A500/320-AVE** 113583				

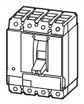
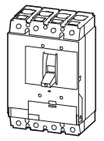
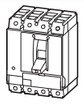
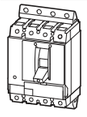
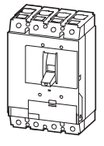
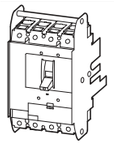
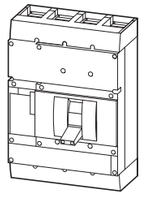
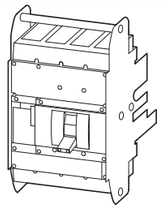
Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range				**Fixed mounting** with screw terminals		**Fixed mounting** with box terminals			**Withdrawable units**				
	Phase conductors	Neutral conductor	Overload releases		Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list		Std. pack	**Notes**
I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …						Order base separately				
kA	A	%	A	A												
																B = box terminals S = screw terminals
System and cable protection																
Normal switching capacity																
	**50**	630	100	315-630	315…630	2-8	–	**NZMN3-4-AE630** 265894		S		**NZMN3-4-AE630-BT** 111658		B		**NZMN3-4-AE630-AVE** 110875			1 off	For further terminal types see accessories IEC/EN 60947-2 R.m.s. value measurement and "thermal memory" Set value for neutral conductor is same as set value I_r for main pole.
		630	60	315-630	200…400	2-8	–	**NZMN3-4-AE630/400** 265895		S		Terminals as accessory				**NZMN3-4-AE630/400-AVE** 113544				
		800	100	400-800	400…800	2-12	–	**NZMN4-4-AE800** 265909		S						Withdrawable units as accessories				
		800	60	400-800	250…500	2-12	–	**NZMN4-4-AE800/500** 265910		S										
		1000	100	500-1000	500…1000	2-12	–	**NZMN4-4-AE1000** 265912		S										
		1000	60	500-1000	315…630	2-12	–	**NZMN4-4-AE1000/630** 265913		S										
		1250	100	630-1250	630…1250	2-12	–	**NZMN4-4-AE1250** 265915		S										
		1250	60	630-1250	400…800	2-12	–	**NZMN4-4-AE1250/800** 265916		S										
		1600	100	800-1600	800…1600	2-12	–	**NZMN4-4-AE1600** 265918		S										
		1600	60	800-1600	500…1000	2-12	–	**NZMN4-4-AE1600/1000** 265919		S										
High switching capacity																
	**150**	630	100	315-630	315…630	2-8	–	**NZMH3-4-AE630** 265900		S						**NZMH3-4-AE630-AVE** 110879			1 off	
	150	630	60	315-630	200…400	2-8	–	**NZMH3-4-AE630/400** 265901		S						**NZMH3-4-AE630/400-AVE** 113590				
	**85**	800	100	400-800	400…800	2-12	–	**NZMH4-4-AE800** 265921		S						Withdrawable units as accessories				
		800	60	400-800	250…500	2-12	–	**NZMH4-4-AE800/500** 265922		S										
		1000	100	500-1000	500…1000	2-12	–	**NZMH4-4-AE1000** 265924		S										
		1000	60	500-1000	315…630	2-12	–	**NZMH4-4-AE1000/630** 265925		S										
		1250	100	630-1250	630…1250	2-12	–	**NZMH4-4-AE1250** 265927		S										
		1250	60	630-1250	400…800	2-12	–	**NZMH4-4-AE1250/800** 265928		S										
		1600	100	800-1600	800…1600	2-12	–	**NZMH4-4-AE1600** 265930		S										
		1600	60	800-1600	500…1000	2-12	–	**NZMH4-4-AE1600/1000** 265931		S										
Earth fault protection																
	**50**	400	100	200-400	200…400	2-11	–	**NZMN3-4-AE400-T** 110902		S		Terminals as accessory				**NZMN3-4-AE400-T-AVE** 113538			1 off	
		400	60	200-400	125…250	2-11	–	**NZMN3-4-AE400/250-T** 110903		S						**NZMN3-4-AE400/250-T-AVE** 113539				
		630	100	315-630	315…630	2-8	–	**NZMN3-4-AE630-T** 110904		S						**NZMN3-4-AE630-T-AVE** 113540				
		630	60	315-630	200…400	2-8	–	**NZMN3-4-AE630/400-T** 110905		S						**NZMN3-4-AE630/400-T-AVE** 113541				
	150	400	100	200-400	200…400	2-11	–	**NZMH3-4-AE400-T** 110906		S						**NZMH3-4-AE400-T-AVE** 113584				
		400	60	200-400	125…250	2-11	–	**NZMH3-4-AE400/250-T** 110907		S						**NZMH3-4-AE400/250-T-AVE** 113585				
		630	100	315-630	315…630	2-8	–	**NZMH3-4-AE630-T** 110908		S						**NZMH3-4-AE630-T-AVE** 113586				
		630	60	315-630	200…400	2-8	–	**NZMH3-4-AE630/400-T** 110909		S						**NZMH3-4-AE630/400-T-AVE** 113587				

Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current: Phase conductors	Rated current = Rated uninterrupted current: Neutral conductor	Setting range: Overload releases: Phase conductor	Setting range: Short-circuit releases: Non-delayed	Setting range: Short-circuit releases: Delayed	**Fixed mounting** with screw terminals: **Part no.** Article no.	**Price** See price list	**Plug-in/withdrawable units**: **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …			Order base separately			
kA	A	%	A	A							
											**B = box terminals** **S = screw terminals** For further terminal types see accessories
Systems protection, cable protection, selectivity, generator protection											
Normal switching capacity											
	**50**	100	100	50-100	50…100	1200 A fixed	2-10	**NZMN2-4-VE100** 265933		**NZMN2-4-VE100-SVE** 113275	1 off	S
		160	100	80-160	80…160	1920 A fixed	2-10	**NZMN2-4-VE160** 265935		**NZMN2-4-VE160-SVE** 113277		S
		160	60	80-160	50…100	1920 A fixed	2-10	**NZMN2-4-VE160/100** 265936		**NZMN2-4-VE160/100-SVE** 113278		S
		250	100	125-250	125…250	3000 A fixed	2-10	**NZMN2-4-VE250** 265938		**NZMN2-4-VE250-SVE** 113280		S
		250	60	125-250	80…160	3000 A fixed	2-10	**NZMN2-4-VE250/160** 265939		**NZMN2-4-VE250/160-SVE** 113281		S
		400	100	200-400	200…400	2-11	2-10	**NZMN3-4-VE400** 265957		**NZMN3-4-VE400-AVE** 110876		S
		400	60	200-400	125…250	2-11	2-10	**NZMN3-4-VE400/250** 265958		**NZMN3-4-VE400/250-AVE** 113546		S
		630	100	315-630	315…630	2-8	1.5-7	**NZMN3-4-VE630** 265960		**NZMN3-4-VE630-AVE** 110877		S
		630	60	315-630	200…400	2-8	1.5-7	**NZMN3-4-VE630/400** 265961		**NZMN3-4-VE630/400-AVE** 113548		S
		800	100	400-800	400…800	2-12	2-10	**NZMN4-4-VE800** 265975		Withdrawable units as accessories		S
		800	60	400-800	250…500	2-12	2-10	**NZMN4-4-VE800/500** 265976				S
		1000	100	500-1000	500…1000	2-12	2-10	**NZMN4-4-VE1000** 265978				S
		1000	60	500-1000	315…630	2-12	2-10	**NZMN4-4-VE1000/630** 265979				S
		1250	100	630-1250	630…1250	2-12	2-10	**NZMN4-4-VE1250** 265981				S
		1250	60	630-1250	400…800	2-12	2-10	**NZMN4-4-VE1250/800** 265982				S
		1600	100	800-1600	800…1600	2-12	2-10	**NZMN4-4-VE1600** 265984				S
		1600	60	800-1600	500…1000	2-12	2-10	**NZMN4-4-VE1600/1000** 265985				S
Terminals as accessory												

- IEC/EN 60947-2
- Set value for neutral conductor is same as set value I_r for main pole.
- R.m.s. value measurement and "thermal memory"
- Adjustable delay setting t_r
  - 2 – 20 s at 6 x I_r and infinite (without overload release)
  - NZM...3-4-VE400(630): 2 – 14 s at 6 x I_r and infinite (without overload release)
- Adjustable delay t_{sd}
  - Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms
- i^2t constant function
  - NZM2 fixed OFF
  - NZM3, NZM4 switchable

		Switching capacity 400/415 V 50/60 Hz	Rated current = Rated uninterrupted current		Setting range Overload releases		Short-circuit releases		**Fixed mounting** with screw terminals			**Plug-in/withdrawable units**			Std. pack	**Notes**
			Phase conductors	Neutral conductor		Phase conductor	Non-delayed	Delayed	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list			
		I_{cu}	$I_n = I_u$	I_r x % of phase conductor	I_r	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …				Order base separately				
		kA	A	%	A	A										
																B = box terminals **S = screw terminals** For further terminal types see accessories
Systems protection, cable protection, selectivity, generator protection																
High switching capacity																
	**150**	100	100	50-100	50…100	1200 A fixed	2-10		**NZMH2-4-VE100** 265941		S				1 off	IEC/EN 60947-2 Set value for neutral conductor is same as set value I_r for main pole. R.m.s. value measurement and "thermal memory" Adjustable delay setting t_r • 2 – 20 s at 6 x I_r and infinite (without overload release) – NZM...3-4-VE400(630): 2 – 14 s at 6 x I_r and infinite (without overload release) Adjustable delay t_{sd} • Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable
		160	100	80-160	80…160	1920 A fixed	2-10		**NZMH2-4-VE160** 265943		S	**NZMH2-4-VE160-SVE** 113390				
		160	60	80-160	50…100	1920 A fixed	2-10		**NZMH2-4-VE160/100** 265944		S	**NZMH2-4-VE160/100-SVE** 113391				
		250	100	125-250	125…250	3000 A fixed	2-10		**NZMH2-4-VE250** 265946		S	**NZMH2-4-VE250-SVE** 113393				
		250	60	125-250	80…160	3000 A fixed	2-10		**NZMH2-4-VE250/160** 265947		S	**NZMH2-4-VE250/160-SVE** 113394				
		400	100	200-400	200…400	2-11	2-10		**NZMH3-4-VE400** 265963		S	 **NZMH3-4-VE400-AVE** 110880				
		400	60	200-400	125…250	2-11	2-10		**NZMH3-4-VE400/250** 265964		S	**NZMH3-4-VE400/250-AVE** 113592				
		630	100	315-630	315…630	2-8	1.5-7		**NZMH3-4-VE630** 265966		S	**NZMH3-4-VE630-AVE** 110881				
		630	60	315-630	200…400	2-8	1.5-7		**NZMH3-4-VE630/400** 265967		S	**NZMH3-4-VE630/400-AVE** 113594				
	**85**	800	100	400-800	400…800	2-12	2-10		**NZMH4-4-VE800** 265987		S	 Withdrawable units as accessories			1 off	
		800	60	400-800	250…500	2-12	2-10		**NZMH4-4-VE800/500** 265988		S					
		1000	100	500-1000	500…1000	2-12	2-10		**NZMH4-4-VE1000** 265990		S					
		1000	60	500-1000	315…630	2-12	2-10		**NZMH4-4-VE1000/630** 265991		S					
		1250	100	630-1250	630…1250	2-12	2-10		**NZMH4-4-VE1250** 265993		S					
		1250	60	630-1250	400…800	2-12	2-10		**NZMH4-4-VE1250/800** 265994		S					
		1600	100	800-1600	800…1600	2-12	2-10		**NZMH4-4-VE1600** 265996		S					
		1600	60	800-1600	500…1000	2-12	2-10		**NZMH4-4-VE1600/1000** 265997		S					
Earth fault protection																
	50	400	100	200-400	200…400	2-11	2-10		–			 **NZMN3-4-VE400-T-AVE** 119902			1 off	
		630	100	315-630	315…630	2-8	1.5-7		–			**NZMN3-4-VE630-T-AVE** 119903				
	150	400	100	200-400	200…400	2-11	2-10		–			**NZMH3-4-VE400-T-AVE** 119900				
		630	100	315-630	315…630	2-8	1.5-7		–			**NZMH3-4-VE630-T-AVE** 119901				

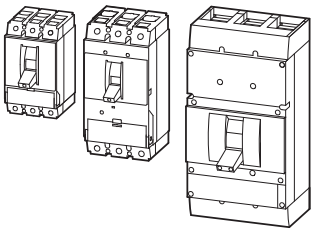
	Rated current = Rated uninterrupted current $I_n = I_u$ A	Short-circuit protection, max. fuse gL-characteristic A gL	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in/withdrawable units** **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Switch-disconnectors												**B = box terminals** **S = screw terminals** For further terminal types see accessories
2 switch positions I, 0												
	63	125	Screw terminals as accessories			**PN1-63** 259140		B	–		1 off	IEC/EN 60947-3 Main switch characteristics including positive operation to IEC/EN 60204, VDE 0113 Isolating characteristics to IEC/EN 60947-3, VDE 0660 Contact protection to VDE 0160 part 100
	100	125				**PN1-100** 259141		B	–			
	125	125				**PN1-125** 259142		B	–			
	160	160				**PN1-160** 281235		B	–			
	160	250	**PN2-160** 266005		S	**PN2-160-BT** 110308		B	–			
	200	250	**PN2-200** 266006		S	**PN2-200-BT** 110309		B	–			
	250	250	**PN2-250** 266007		S	**PN2-250-BT** 110310		B	–			
	400	630	**PN3-400** 266017		S	**PN3-400-BT** 110314		B	–			
	630	630	**PN3-630** 266018		S	**PN3-630-BT** 110315		B	–			
3 switch positions I, +, 0 Can be remotely operated with shunt release XU/XA, remote operator XR, Can be equipped with trip-indicating auxiliary contact M22-K..												
	63	125	Screw terminals as accessories			**N1-63** 259143		B	**N1-63-SVE** 113729		1 off	
	100	125				**N1-100** 259144		B	**N1-100-SVE** 113730			
	125	125				**N1-125** 259145		B	**N1-125-SVE** 113731			
	160	160				**N1-160** 281236		B	–			
	160	250	**N2-160** 266008		S	**N2-160-BT** 110311		B	**N2-160-SVE** 113733			
	200	250	**N2-200** 266009		S	**N2-200-BT** 110312		B	**N2-200-SVE** 113734			
	250	250	**N2-250** 266010		S	**N2-250-BT** 110313		B	**N2-250-SVE** 113735			
	400	630	**N3-400** 266019		S	**N3-400-BT** 110316		B	**N3-400-AVE** 110768			
	630	630	**N3-630** 266020		S	**N3-630-BT** 110317		B	**N3-630-AVE** 110769			
	800	1600	**N4-800** 266025		S	Terminals as accessory			Withdrawable units as accessories			
	1000	1600	**N4-1000** 266026		S							
	1250	1600	**N4-1250** 266027		S							
	1600	1600	**N4-1600** 266028		S							

	Rated current = Rated uninterrupted current $I_n = I_u$ A	Short-circuit protection, max. fuse gL-characteristic A gL	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		**Fixed mounting** with box terminals **Part no.** Article no.	**Price** See price list		**Plug-in units** **Part no.** Article no. Order base separately	**Price** See price list		Std. pack	**Notes**
Switch-disconnectors													**B = box terminals** **S = screw terminals** For further terminal types see accessories
2 switch positions I, 0													
	63	125	Screw terminals as accessories			**PN1-4-63** 265999		B	–			1 off	IEC/EN 60947-3 Main switch characteristics including positive operation to IEC/EN 60204, VDE 0113 Isolating characteristics to IEC/EN 60947-3, VDE 0660 Contact protection to VDE 0160 part 100
	100	125				**PN1-4-100** 266000		B					
	125	125				**PN1-4-125** 266001		B					
	160	160				**PN1-4-160** 281253		B					
	160	250	**PN2-4-160** 266011		S	**PN2-4-160-BT** 118880		B	–				
	200	250	**PN2-4-200** 266012		S	**PN2-4-200-BT** 118881		B					
	250	250	**PN2-4-250** 266013		S	**PN2-4-250-BT** 118882		B					
	400	630	**PN3-4-400** 266021		S	**PN3-4-400-BT** 111653		B	–				
	630	630	**PN3-4-630** 266022		S	**PN3-4-630-BT** 111654		B					
3 switch positions I, +, 0 Can be remotely operated with shunt release XU/XA, remote operator XR, Can be equipped with trip-indicating auxiliary contact M22-K..													
	63	125	Screw terminals as accessories			**N1-4-63** 266002		B	–			1 off	
	100	125				**N1-4-100** 266003		B					
	125	125				**N1-4-125** 266004		B					
	160	160				**N1-4-160** 281254		B					
	160	250	**N2-4-160** 266014		S	**N2-4-160-BT** 118883		B			**N2-4-160-SVE** 113736		
	200	250	**N2-4-200** 266015		S	**N2-4-200-BT** 118884		B			**N2-4-200-SVE** 113737		
	250	250	**N2-4-250** 266016		S	**N2-4-250-BT** 118885		B			**N2-4-250-SVE** 113738		
	400	630	**N3-4-400** 266023		S	**N3-4-400-BT** 111651		B			**N3-4-400-AVE** 110872		
	630	630	**N3-4-630** 266024		S	**N3-4-630-BT** 111652		B			**N3-4-630-AVE** 110873		
	800	1600	**N4-4-800** 266029		S	Terminals as accessory					Withdrawable units as accessories		
	1000	1600	**N4-4-1000** 266030		S								
	1250	1600	**N4-4-1250** 266031		S								
	1600	1600	**N4-4-1600** 266032		S								

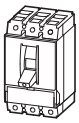
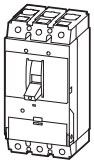
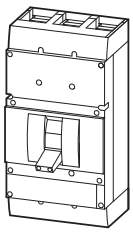
With main switch characteristics to IEC/EN 60204 and isolating characteristics to IEC/EN 60947, VDE 660

Circuit-breakers for 1000 V AC, 3 pole

Switch-disconnectors for 1000 V DC, 2 pole
Without overload and short-circuit release

			System and cable protection			**Selectivity protection**		**Motor protection**				
Switching capacity												
1000 V	kA/p.f.	I_{cu}	10/0.5	15/0.5	20/0.3	10/0.5	20/0.3	15/0.5	20/0.3			
		I_{cs}	3/0.5	10/0.5	15/0.3	3/0.5	15/0.3	10/0.5	15/0.3			
Rated uninterrupted current I_u = Rated current I_n			I_u	I_u	I_u	I_u	I_u	I_u	I_u	I_u	I_u	I_u
Ambient air temperature at 100% I_u min./max. –25/+50 °C N... S1-DC max. +70 °C			A	A	A	A	A	A	A	A	A	A
			NZMH2-A...-S1	NZMH3-AE...-S1	NZMH4-AE...-S1	NZMH2-VE...-S1	NZMH4-VE...-S1	NZMH3-ME...-S1	NZMH4-ME...-S1	N2-...-S1-DC	N3-...-S1-DC	N4-...-S1-DC
			20	250	630	100	630	220	550	160	320	800
			25	400	800	160	800	350	875	**200**	400	1000
			32	**630**	1000	**250**	1000	**450**	**1400**		**500**	1250
			40		1250		1250					**1400**
			50		**1600**		**1600**					
			63									
			80									
			100									
			125									
			160									
			200									
			250									
			300									
Rated short-time withstand current I_{cw} (0.1s current$_{rms}$)		kA								3	6	25

HPL17047EN

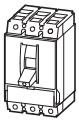
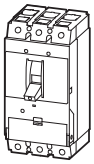
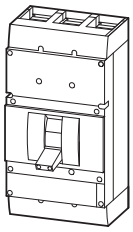
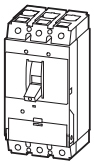
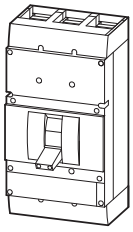
	Switching capacity 1000 V 50/60 Hz	Rated current = Rated uninterrupted current	**Setting range** Overload releases	Short-circuit releases		**Fixed mounting** **Part no.** Article no.	**Price** See price list		Std. pack
				Non-delayed	Delayed				
	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	$I_{sd} = I_r$ x …				
				I>	I>				
System and cable protection									
Thermomagnetic releases									
	**10**	20	15-20	350 A fixed	–	**NZMH2-A20-S1** 290355		S	1 off
		25	20-25	350 A fixed	–	**NZMH2-A25-S1** 290356		S	
		32	25-32	350 A fixed	–	**NZMH2-A32-S1** 290357		S	
		40	32-40	8-10	–	**NZMH2-A40-S1** 290358		S	
		50	40-50	6-10	–	**NZMH2-A50-S1** 290359		S	
		63	50-63	6-10	–	**NZMH2-A63-S1** 290360		S	
		80	63-80	6-10	–	**NZMH2-A80-S1** 290361		S	
		100	80-100	6-10	–	**NZMH2-A100-S1** 290362		S	
		125	100-125	6-10	–	**NZMH2-A125-S1** 290363		S	
		160	125-160	6-10	–	**NZMH2-A160-S1** 290364		S	
		200	160-200	6-10	–	**NZMH2-A200-S1** 290365		S	
		250	200-250	6-10	–	**NZMH2-A250-S1** 290366		S	
		300	240-300	6-10	–	**NZMH2-A300-S1** 107577		S	
Electronic releases R.m.s. value measurement and “thermal memory”									
	**15**	250	125-250	2-11	–	**NZMH3-AE250-S1** 119361		S	1 off
		400	200-400	2-11	–	**NZMH3-AE400-S1** 119362		S	
		630	315-630	2-8	–	**NZMH3-AE630-S1** 119363		S	
	**20**	630	315-630	2-12	–	**NZMH4-AE630-S1** 290370		S	
		800	400-800	2-12	–	**NZMH4-AE800-S1** 290371		S	
		1000	500-1000	2-12	–	**NZMH4-AE1000-S1** 290372		S	
		1250	630-1250	2-12	–	**NZMH4-AE1250-S1** 290373		S	
		1600	800-1600	2-12	–	**NZMH4-AE1600-S1** 290374		S	

Notes

B = box terminals
S = screw terminals

IEC/EN 60947-2

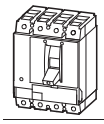
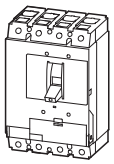
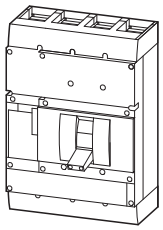
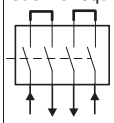
Terminal type:
NZM2: Cover NZM2-XKSA required
NZM3: Cover NZM3-XKSA required
NZM4: Isolated bar connection (screw terminal NZM4-XKS)

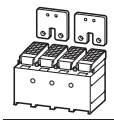
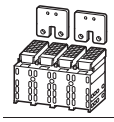
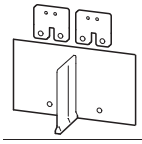
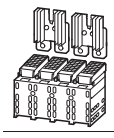
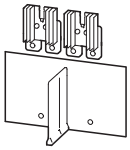
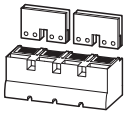
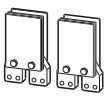
	Switching capacity 1000 V 50/60 Hz	Rated current = Rated uninterrupted current	Setting range Overload releases	Short-circuit releases		Fixed mounting Part no. Article no.	Price See price list		Std. pack
				Non-delayed	Delayed				
	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …				
	kA	A	A						
Systems protection, cable protection, selectivity, generator protection									
IEC/EN 60947-2 R.m.s. value measurement and “thermal memory” Adjustable delay setting t_r • 2 – 20 s at 6 x I_r and infinite (without overload release) Adjustable delay t_{sd} • Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable									
	**10**	100	50-100	1200 A fixed	2-10	**NZMH2-VE100-S1** 100777		S	1 off
		160	80-160	1920 A fixed	2-10	**NZMH2-VE160-S1** 100778		S	
		250	125-250	3000 A fixed	2-10	**NZMH2-VE250-S1** 100779		S	
		400	200-400	2-11	2-10	**NZMH3-VE400-S1** 119367		S	
		630	315-630	2-8	1.5-7	**NZMH3-VE630-S1** 119368		S	
	**20**	630	315-630	2-12	2-10	**NZMH4-VE630-S1** 290375		S	
		800	400-800	2-12	2-10	**NZMH4-VE800-S1** 290376		S	
		1000	500-1000	2-12	2-10	**NZMH4-VE1000-S1** 290377		S	
		1250	630-1250	2-12	2-10	**NZMH4-VE1250-S1** 290378		S	
		1600	800-1600	2-12	2-10	**NZMH4-VE1600-S1** 290379		S	
Motor protection									
IEC/EN 60947-4-1, IEC/EN 60947-2 Phase-failure sensitivity R.m.s. value measurement and “thermal memory” Adjustable delay setting t_r • 2 – 20 s at 6 x I_r and infinite (without overload release)									
	**15**	220	110-220	2-14	–	**NZMH3-ME220-S1** 119364		S	1 off
		350	175-350	2-14	–	**NZMH3-ME350-S1** 119365		S	
		450	225-450	2-12	–	**NZMH3-ME450-S1** 119366		S	
	**20**	550	275-550	2-14	–	**NZMH4-ME550-S1** 290383		S	
		875	438-875	2-14	–	**NZMH4-ME875-S1** 290384		S	
		1400	700-1400	2-14	–	**NZMH4-ME1400-S1** 290385		S	

Notes

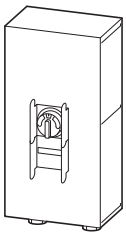
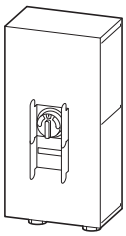
B = box terminals
S = screw terminals

Terminal type:
NZM2: Cover NZM2-XKSA required
NZM3: Cover NZM3-XKSA required
NZM4: Isolated bus connection (screw terminal NZM4-XKS)

	Rated current = Rated uninterrupted current $I_n = I_u$ A	Short-circuit protection, max. fuse gR-characteristic A gR	**Fixed mounting** **Part no.** Article no.	**Price** See price list	Std. pack		**Notes**
Switch-disconnectors for 1000 V DC							**B = box terminals S = screw terminals**
	160	200	**N2-4-160-S1-DC** 127732		1 off	S	IEC/EN 60947-3
	200	200	**N2-4-200-S1-DC** 127733			S	Main switch characteristics including positive operation to IEC/EN 60204, VDE 0113. Isolating characteristics to IEC/EN 60947, VDE 0660. Protection against electric shock to VDE 0160 part 100. Switch-disconnectors N can, in addition, be combined with shunt releases NZM...-XU, NZM...-XA and auxiliary contacts as well as with remote operator NZM...-XR...
	320	500	**N3-4-320-S1-DC** 127734			S	
	400	500	**N3-4-400-S1-DC** 142267			S	
	500	500	**N3-4-500-S1-DC** 142268			S	Connection types: For 2 pole switching, series connection of two poles each is required. See jumper kits under accessories
	800	1600	**N4-4-800-S1-DC** 119890			S	
	1000	1600	**N4-4-1000-S1-DC** 119891			S	
	1250	1600	**N4-4-1250-S1-DC** 119886			S	
	1400	1400	**N4-4-1400-S1-DC** 119887			S	Terminals as accessory Switch can not be combined with plug-in/withdrawable units and/or connection on rear.

		Rated operational current I_n A	For use with	Number of poles	Degree of protection	**Part no.** Article no.	**Price** See price list	Std. pack
Jumper kits								
Model contains parts for upper switch side for 4 pole switches N...-S1-DC that are used as 2 pole switches for DC. The jumpers each connect two current paths in series. Incomer and outgoer at bottom or top, freely selectable. ≥ 1250 A: For 65 °C ambient air temperature connection at bottom through module plates NZM4-4-XKM2S-1600.								
	Jumper kit with cover	200 at 65 °C 160 at 70 °C	N2-4-…S1-DC	4 pole/ 2 pole	IP2X	**NZM2-4-XKV2P** 131730		1 off
	Terminal jumpers with cover	400 at 70 °C	N3-320(400)-S1-DC	4 pole/ 2 pole	IP2X	**NZM3-4-XKV2P** 131731		
	Jumper kit with insulating plates	500 at 50 °C 400 at 70 °C	N3-400(500)-S1-DC	4 pole/ 2 pole	IP00	**NZM3-4-XKVI2P** 142269		
	Jumper kit with cover and heat sink	400 at 70 °C 500 at 55 °C 500 at 40 °C	N3-400(500)-S1-DC	4 pole/ 2 pole	IP1X IP2X	**NZM3-4-XKV2P-K** 142271		
	Jumper kit with insulating plates and heat sinks	500 at 65 °C	N3-500-S1-DC	4 pole/ 2 pole	IP00	**NZM3-4-XKVI2P-K** 142270		
	Jumper kit with cover	1400 at 40 °C 1250 at 65 °C	N4-4-…S1-DC	4 pole/ 2 pole	IP2X	**NZM4-4-XKV2P** 119888		
	Jumper kit with heat sink	1400 at 65 °C	N4-4-1400-S1-DC	4 pole/ 2 pole	IP00	**NZM4-4-XKV2P-1400** 119905		

PN...ATEX

	Number of conductors	Rated current = Rated uninterrupted current $I_n = I_u$ A	Short-circuit protection, max. fuse gL-characteristic A gL	Fixed mounting Part no. Article no.	Price See price list	Std. pack
Switch-disconnectors for ATEX type						
2 switch positions I, 0						
	3 pole	125	125	**PN1-125/HIV/DA-SVD-SW/ATEX22** 119386		1 off
		160	160	**PN1-160/HIV/DA-SVD-SW/ATEX22** 119387		
		200	250	**PN2-200/HIV/DA-SVD-SW/ATEX22** 119388		
		240	250	**PN2-250/HIV/DA-SVD-SW/ATEX22** 119389		
		400	630	**PN3-400/HIV/DA-SVD-SW/ATEX22** 119410		
		630	630	**PN3-630/HIV/DA-SVD-SW/ATEX22** 119411		
	6 pole	160	160	**2PN1-160/HIV/DA-SVD-SW/ATEX22** 119418		
	6 pole	250	250	**2PN2-250/HIV/DA-SVD-SW/ATEX22** 119419		
ATEX switches for EMC type						
	3 pole	125	125	**PN1-125/HIV/DA-SVD-SW/EMV/ATEX22** 119412		
		160	160	**PN1-160/HIV/DA-SVD-SW/EMV/ATEX22** 119413		
		200	250	**PN2-200/HIV/DA-SVD-SW/EMV/ATEX22** 119414		
		240	250	**PN2-250/HIV/DA-SVD-SW/EMV/ATEX22** 119415		
		400	630	**PN3-400/HIV/DA-SVD-SW/EMV/ATEX22** 119416		
		630	630	**PN3-630/HIV/DA-SVD-SW/EMV/ATEX22** 119417		

Notes

Main switch characteristics including positive operation to IEC/EN 60204, VDE 0113.
Isolating characteristics to IEC/EN 60947-3, VDE 0660.
Protection against electric shock to VDE 0160 part 100.

ATEX = Atmosphères explosibles = explosive atmospheres
Eaton supplies switch-disconnectors PN1, PN2 and PN3 for a current range of up to 630 A as complete device according to ATEX Directive 94/9 EG (binding as of 06/2003).
The switches are approved for device group II, the application “everything, except for mining” and for category 3 (normal safety).
Switch-disconnectors in surface mounting enclosure with ATEX approval are used in potentially explosive dust-laden areas, such as mills, metal grinding works, wood processing operations, cement works, the aluminum industry, the foodstuffs industry, grain storage and processing plants, agriculture, and in the pharmaceuticals industry.

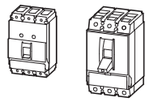
ATEX switches for EMC are suitable for use with screened cables.
For important general flush mounting and application notes, see the included installation instructions AWA1230-2480, which you can also download from our homepage www.moeller.net.

Circuit-breakers

UL/CSA approved to UL 489, CSA-C22.2 No. 5-09 as well as IEC/EN 60947

With main switch characteristics to IEC/EN 60204 and isolating characteristics to IEC/EN 60947, VDE 0660

Rated uninterrupted current I_u = Rated current I_n
Adjustable overload releases I_r
Adjustable short-circuit releases I_i
Delayed short-circuit releases I_{sd}

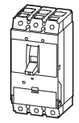
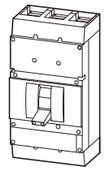


Thermomagnetic releases
Overload release

Fixed			Adjustable				None	
I_u			I_u		I_r		I_u	
A			A		A		A	
NZM1		NZM2	NZM1	NZM2			NZM1	NZM2
15-**125**		15-**250**	20-**125**	20-**250**	0.8-1 x I_n		1.2-**100**	1.6-**250**

Basic switching capacity[1]			**NZMB1-...-NA**		**NZMB2-...-NA**					
NEMA Test Procedure	240 V 60 Hz	sym. rms kA	35		35					
SCCR	480 V 60 Hz	sym. rms kA	25[2]		25					
	600 V 60 Hz	sym. rms kA	–		18[4]					
IEC/EN 60947	400/415 V	kA/p.f.	25	0.25	25	0.25				
	440 V	kA/p.f.	25	0.25	25	0.25				
Normal switching capacity[1]			**NZMN1-...-NA**		**NZMN2-...-NA**					
NEMA Test Procedure	240 V 60 Hz	sym. rms kA	85		85					
SCCR	480 V 60 Hz	sym. rms kA	35[2]		35					
	600 V 60 Hz	sym. rms kA	–		25[4]					
IEC/EN 60947	400/415 V	kA/p.f.	50	0.25	50	0.25				
	440 V	kA/p.f.	35	0.25	35	0.25				
	525 V	kA/p.f.	20	0.30	25	0.25				
	690 V	kA/p.f.	10	0.50	20	0.30				
High switching capacity[1]					**NZMH2-...-NA**					
NEMA Test Procedure	240 V 60 Hz	sym. rms kA			150					
SCCR	480 V 60 Hz	sym. rms kA			100					
	600 V 60 Hz	sym. rms kA			65[3][4]					
IEC/EN 60947	400/415 V	kA/p.f.			150	0.20				
	440 V	kA/p.f.			130	0.20				
	525 V	kA/p.f.			50	0.25				
	690 V	kA/p.f.			20	0.30				

Notes
[1] Switches correspond with both UL/CSA and IEC regulations
IEC switching performance values shown on type label. → Technical data
[2] For NZM...1-...-NA 480Y/277V
[3] For NZMH2 > 125 A: 50 kA
[4] For NZM...2: 600Y/347 V

Electronic releases
Overload release

Fixed	Adjustable		None	Fixed	Adjustable		None	Fixed	Adjustable		**Short-circuit releases**		
											System protection		Motor protection
I_u	I_u	I_r	I_u	I_u	I_u	I_r	I_u	I_u	I_u	I_r	I_{sd}	I_i	I_i
A	A	A	A	A	A	A	A	A	A	A	A	A	A
150-**250**	100-**250**	0.5 - 1 x I_n	90-**220**	250-**600**	250-**600**	0.5 - 1 x I_n	220-**450**	600-**1200**	800-**1200**	0.5 - 1 x I_n	2-10 x I_r	2-12 x I_n	2-14 x I_n

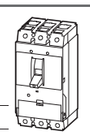
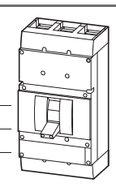
NZMN2-...E...-NA				**NZMN3-...E...-NA**				**NZMN4-...E...-NA**					
85				85				85					
35				42				42					
25[4]				35				35					
50	0.25			50	0.25			50	0.25				
35	0.25			35	0.25			35	0.25				
25	0.25			25	0.25			25	0.25				
20	0.30			20	0.30			20	0.30				
NZMH2-...E...-NA				**NZMH3-...E...-NA**				**NZMH4-...E...-NA**					
150				150				125					
100				100				85					
50[4]				50				50					
150	0.20			150	0.20			85	0.20				
130	0.20			130	0.20			85	0.20				
50	0.25			65	0.25			65	0.25				
20	0.30			35	0.25			50	0.25				

The approved switches are suitable for world-wide use. The UL and CSA certificates can be found at www.ul.com and www.csa.com
UL certificates: File No.:E 31593 (NZM1-4), E 148671 (N(S)1-4)
CSA certificates: File No.165628 (NZM1-4)

Molded case switch
UL/CSA approved to UL 489, CSA 22.2 No. 5-09 as well as IEC/EN 60947-2 Annex L

With main switch characteristics to IEC/EN 60204, VDE 0113
Isolating characteristics to IEC/EN 60947
Without overcurrent protection
With short-circuit release
Rated uninterrupted current I_u = I_n



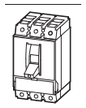
63	160	400	800
100	200	**600**	1000
125	**250**		**1200**

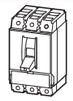
	Switching capacity		**NS1-...-NA**	**NS2-...-NA**	**NS3-...-NA**	**NS4-...-NA**
	according to UL 489, CSA 22.2	240 V	85	150	150	85
	SCCR	480 V	35[1]	100	100	65
		600 V	–	50[4]	50	42
	IEC/EN 60947	400/415 V	50	150	150	70
		440 V	35	130	130	65
		525 V	20	50	65	40
		690	10	20	35	35

Notes
[1] For NS1-...-NA: 480Y/277V
[4] For NZM...2: 600Y/347 V

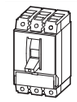
Switching capacity				Rated current = Rated uninterrupted current	Setting range		**Fixed mounting**		
SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases	**Part no.** Article no.	**Price** See price list	
					Fixed	Non-delayed			
I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...			
kA	kA	kA	kA	A	A				
System and cable protection									
Fixed overload releases I_r									
Basic switching capacity									
	**25**	–	–	–	20	20	350 A fixed	Screw terminals as accessories	–
			–	–	25	25	350 A fixed		–
			–	–	30	30	350 A fixed		–
			–	–	35	35	Approx. 8-10		–
			–	–	40	40	Approx. 8-10		–
			–	–	45	45	Approx. 6-10		–
			–	–	50	50	Approx. 6-10		–
			–	–	60	60	Approx. 6-10		–
			–	–	70	70	Approx. 6-10		–
			–	–	80	80	Approx. 6-10		–
			–	–	90	90	Approx. 6-10		–
			–	–	100	100	Approx. 6-10		–
			–	–	110	110	Approx. 6-10		–
			–	–	125	125	Approx. 6-10		–
	**25**	**25**	18	–	15	15	350 A fixed	**NZMB2-AF15-NA** 269142	S
				–	20	20	350 A fixed	**NZMB2-AF20-NA** 269143	S
				–	25	25	350 A fixed	**NZMB2-AF25-NA** 269144	S
				–	30	30	350 A fixed	**NZMB2-AF30-NA** 269145	S
				–	35	35	Approx. 8-10	**NZMB2-AF35-NA** 269146	S
				–	40	40	Approx. 8-10	**NZMB2-AF40-NA** 269147	S
				–	45	45	Approx. 6-10	**NZMB2-AF45-NA** 269148	S
				–	50	50	Approx. 6-10	**NZMB2-AF50-NA** 269149	S
				–	60	60	Approx. 6-10	**NZMB2-AF60-NA** 269160	S
				–	70	70	Approx. 6-10	**NZMB2-AF70-NA** 269161	S
				–	80	80	Approx. 6-10	**NZMB2-AF80-NA** 269162	S
				–	90	90	Approx. 6-10	**NZMB2-AF90-NA** 269163	S
				–	100	100	Approx. 6-10	**NZMB2-AF100-NA** 269164	S
				–	110	110	Approx. 6-10	**NZMB2-AF110-NA** 269165	S
				–	125	125	Approx. 6-10	**NZMB2-AF125-NA** 269166	S
				–	150	150	Approx. 6-10	**NZMB2-AF150-NA** 269167	S

Fixed mounting with box terminals						
Part no. Article no.	**Price** See price list		Std. pack	**Information relevant for export to North America**		**Notes**
				B = box terminals **S = screw terminals**		
NZMB1-AF20-NA 281554		B	1 off	Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
NZMB1-AF25-NA 281555		B		UL File No.	E31593	
NZMB1-AF30-NA 281556		B		UL CCN	DIVQ	
NZMB1-AF35-NA 272204		B		CSA File No.	022086	
NZMB1-AF40-NA 272205		B		CSA Class No.	1432-01	
NZMB1-AF45-NA 272206		B		NA Certification	UL Listed, CSA certified	
NZMB1-AF50-NA 272207		B		Specially designed for NA	Yes	
NZMB1-AF60-NA 272208		B		Suitable for	Feeder circuits, branch circuits	
NZMB1-AF70-NA 272209		B		Current Limiting CB	Yes	
NZMB1-AF80-NA 272250		B		Max. Voltage Rating	480Y/277 V	
NZMB1-AF90-NA 272251		B		Degree of Protection	IEC: IP20; UL/CSA Type: -	
NZMB1-AF100-NA 272252		B				
NZMB1-AF110-NA 281557		B				
NZMB1-AF125-NA 281558		B				
NZMB2-AF15-BT-NA 107611		B	1 off	Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking	
NZMB2-AF20-BT-NA 107612		B		UL File No.	E31593	
NZMB2-AF25-BT-NA 107613		B		UL CCN	DIVQ	
NZMB2-AF30-BT-NA 107614		B		CSA File No.	022086	
NZMB2-AF35-BT-NA 107615		B		CSA Class No.	1432-01	
NZMB2-AF40-BT-NA 107616		B		NA Certification	UL Listed, CSA certified	
NZMB2-AF45-BT-NA 107617		B		Specially designed for NA	Yes	
NZMB2-AF50-BT-NA 107618		B		Suitable for	Feeder circuits, branch circuits	
NZMB2-AF60-BT-NA 107619		B		Current Limiting CB	Yes	
NZMB2-AF70-BT-NA 107620		B		Max. Voltage Rating	600Y/347 V, 480 V	
NZMB2-AF80-BT-NA 107621		B		Degree of Protection	IEC: IP20; UL/CSA Type: -	
NZMB2-AF90-BT-NA 107622		B				
NZMB2-AF100-BT-NA 107623		B				
NZMB2-AF110-BT-NA 107624		B				
NZMB2-AF125-BT-NA 107625		B				
NZMB2-AF150-BT-NA 107626		B				

	Switching capacity				Rated current = Rated uninterrupted current	Setting range		**Fixed mounting**			**Fixed mounting** with box terminals					
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
						Fixed	Non-delayed								
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...								
	kA	kA	kA	kA	A	A									
System and cable protection														**B = box terminals S = screw terminals**	
Fixed overload releases I_r															
Basic switching capacity															
	**25**	**25**	18	–	175	175	Approx. 6-10	**NZMB2-AF175-NA** 269168		S	**NZMB2-AF175-BT-NA** 107627		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
				–	200	200	Approx. 6-10	**NZMB2-AF200-NA** 269169		S	**NZMB2-AF200-BT-NA** 107628		B			
				–	225	225	Approx. 6-10	**NZMB2-AF225-NA** 271089		S	**NZMB2-AF225-BT-NA** 107629		B			
				–	250	250	Approx. 6-10	**NZMB2-AF250-NA** 271100		S	**NZMB2-AF250-BT-NA** 107630		B			
Normal switching capacity															
	**35**	–	–	–	20	20	350 A fixed	Screw terminals as accessories			**NZMN1-AF20-NA** 281565		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 480Y/277 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
			–	–	25	25	350 A fixed				**NZMN1-AF25-NA** 281566		B			
			–	–	30	30	350 A fixed				**NZMN1-AF30-NA** 281567		B			
			–	–	35	35	Approx. 8-10				**NZMN1-AF35-NA** 274220		B			
			–	–	40	40	Approx. 8-10				**NZMN1-AF40-NA** 274223		B			
			–	–	45	45	Approx. 6-10				**NZMN1-AF45-NA** 274230		B			
			–	–	50	50	Approx. 6-10				**NZMN1-AF50-NA** 274231		B			
			–	–	60	60	Approx. 6-10				**NZMN1-AF60-NA** 274232		B			
			–	–	70	70	Approx. 6-10				**NZMN1-AF70-NA** 274233		B			
			–	–	80	80	Approx. 6-10				**NZMN1-AF80-NA** 274234		B			
			–	–	90	90	Approx. 6-10				**NZMN1-AF90-NA** 274235		B			
			–	–	100	100	Approx. 6-10				**NZMN1-AF100-NA** 274236		B			
			–	–	110	110	Approx. 6-10				**NZMN1-AF110-NA** 281568		B			
			–	–	125	125	Approx. 6-10				**NZMN1-AF125-NA** 281569		B			
	**35**	**35**	25	–	15	15	350 A fixed	**NZMN2-AF15-NA** 269170		S	**NZMN2-AF15-BT-NA** 107631		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
				–	20	20	350 A fixed	**NZMN2-AF20-NA** 269171		S	**NZMN2-AF20-BT-NA** 107632		B			
				–	25	25	350 A fixed	**NZMN2-AF25-NA** 269172		S	**NZMN2-AF25-BT-NA** 107633		B			
				–	30	30	350 A fixed	**NZMN2-AF30-NA** 269173		S	**NZMN2-AF30-BT-NA** 107634		B			
				–	35	35	Approx. 8-10	**NZMN2-AF35-NA** 269174		S	**NZMN2-AF35-BT-NA** 107635		B			
				–	40	40	Approx. 8-10	**NZMN2-AF40-NA** 269175		S	**NZMN2-AF40-BT-NA** 107636		B			
				–	45	45	Approx. 6-10	**NZMN2-AF45-NA** 269176		S	**NZMN2-AF45-BT-NA** 107637		B			
				–	50	50	Approx. 6-10	**NZMN2-AF50-NA** 269177		S	**NZMN2-AF50-BT-NA** 107638		B			
				–	60	60	Approx. 6-10	**NZMN2-AF60-NA** 269178		S	**NZMN2-AF60-BT-NA** 107639		B			
				–	70	70	Approx. 6-10	**NZMN2-AF70-NA** 269179		S	**NZMN2-AF70-BT-NA** 107640		B			

Switching capacity				Rated current = Rated uninterrupted current	Setting range		Fixed mounting		Fixed mounting with box terminals					
SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases	**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
					Fixed	Non-delayed							
I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...							
kA	kA	kA	kA	A	A								
												B = box terminals S = screw terminals	
System and cable protection													
Fixed overload releases I_r													
Normal switching capacity													
	**35**	**35**	25	–	80	80	Approx. 6-10	**NZMN2-AF80-NA** 269180			**NZMN2-AF80-BT-NA** 107641	B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
				–	90	90	Approx. 6-10	**NZMN2-AF90-NA** 269181			**NZMN2-AF90-BT-NA** 107642	B			
				–	100	100	Approx. 6-10	**NZMN2-AF100-NA** 269182			**NZMN2-AF100-BT-NA** 107643	B			
				–	110	110	Approx. 6-10	**NZMN2-AF110-NA** 269183			**NZMN2-AF110-BT-NA** 107644	B			
				–	125	125	Approx. 6-10	**NZMN2-AF125-NA** 269184			**NZMN2-AF125-BT-NA** 107645	B			
				–	150	150	Approx. 6-10	**NZMN2-AF150-NA** 269185			**NZMN2-AF150-BT-NA** 107646	B			
				–	175	175	Approx. 6-10	**NZMN2-AF175-NA** 269186			**NZMN2-AF175-BT-NA** 107647	B			
				–	200	200	Approx. 6-10	**NZMN2-AF200-NA** 269187			**NZMN2-AF200-BT-NA** 107648	B			
				–	225	225	Approx. 6-10	**NZMN2-AF225-NA** 271101			**NZMN2-AF225-BT-NA** 107649	B			
				–	250	250	Approx. 6-10	**NZMN2-AF250-NA** 271102			**NZMN2-AF250-BT-NA** 107650	B			
High switching capacity															
	**150**	**150**	65	–	15	15	350 A fixed	**NZMH2-AF15-NA** 269188			**NZMH2-AF15-BT-NA** 107809	B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
					20	20	350 A fixed	**NZMH2-AF20-NA** 269189			**NZMH2-AF20-BT-NA** 107810	B			
					25	25	350 A fixed	**NZMH2-AF25-NA** 269190			**NZMH2-AF25-BT-NA** 107811	B			
					30	30	350 A fixed	**NZMH2-AF30-NA** 269191			**NZMH2-AF30-BT-NA** 107812	B			
					35	35	Approx. 8-10	**NZMH2-AF35-NA** 269192			**NZMH2-AF35-BT-NA** 107813	B			
					40	40	Approx. 8-10	**NZMH2-AF40-NA** 269193			**NZMH2-AF40-BT-NA** 107814	B			
					45	45	Approx. 6-10	**NZMH2-AF45-NA** 269194			**NZMH2-AF45-BT-NA** 107815	B			
					50	50	Approx. 6-10	**NZMH2-AF50-NA** 269195			**NZMH2-AF50-BT-NA** 107816	B			
					60	60	Approx. 6-10	**NZMH2-AF60-NA** 269196			**NZMH2-AF60-BT-NA** 107817	B			
					70	70	Approx. 6-10	**NZMH2-AF70-NA** 269197			**NZMH2-AF70-BT-NA** 107818	B			
					80	80	Approx. 6-10	**NZMH2-AF80-NA** 269198			**NZMH2-AF80-BT-NA** 107819	B			
					90	90	Approx. 6-10	**NZMH2-AF90-NA** 269199			**NZMH2-AF90-BT-NA** 107820	B			
					100	100	Approx. 6-10	**NZMH2-AF100-NA** 269200			**NZMH2-AF100-BT-NA** 107821	B			
					110	110	Approx. 6-10	**NZMH2-AF110-NA** 269201			**NZMH2-AF110-BT-NA** 107822	B			
					125	125	Approx. 6-10	**NZMH2-AF125-NA** 269202			**NZMH2-AF125-BT-NA** 107823	B			
	100	**100**	50	–	150	150	Approx. 6-10	**NZMH2-AF150-NA** 269203			**NZMH2-AF150-BT-NA** 107824	B			
					175	175	Approx. 6-10	**NZMH2-AF175-NA** 269204			**NZMH2-AF175-BT-NA** 107825	B			
					200	200	Approx. 6-10	**NZMH2-AF200-NA** 269205			**NZMH2-AF200-BT-NA** 107826	B			
					225	225	Approx. 6-10	**NZMH2-AF225-NA** 271103			**NZMH2-AF225-BT-NA** 107827	B			
					250	250	Approx. 6-10	**NZMH2-AF250-NA** 271104			**NZMH2-AF250-BT-NA** 107828	B			

Switching capacity				Rated current = Rated uninterrupted current	Setting range		**Fixed mounting**			**Fixed mounting** with box terminals					
SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases Non-delayed	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
I_{cu} kA	I_{cu} kA	I_{cu} kA	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x ...							**B = box terminals S = screw terminals**	
System and cable protection														
Adjustable overload release I_r														
Basic switching capacity														
25	–	–	–	20	15-20	350 A fixed	Screw terminals as accessories			**NZMB1-A20-NA** 281559		B	1 off	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
		–	–	25	20-25	350 A fixed				**NZMB1-A25-NA** 281560		B		
		–	–	32	25-32	350 A fixed				**NZMB1-A32-NA** 281561		B		
		–	–	40	32-40	8-10				**NZMB1-A40-NA** 272253		B		
		–	–	50	40-50	6-10				**NZMB1-A50-NA** 272254		B		
		–	–	63	50-63	6-10				**NZMB1-A63-NA** 272255		B		
		–	–	80	63-80	6-10				**NZMB1-A80-NA** 272256		B		
		–	–	100	80-100	6-10				**NZMB1-A100-NA** 272258		B		
		–	–	125	100-125	6-10				**NZMB1-A125-NA** 281562		B		
25	**25**	18	–	20	15-20	350 A fixed	**NZMB2-A20-NA** 269206		S	**NZMB2-A20-BT-NA** 107773		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA Certified Specially designed for NA: Yes Suitable for: Feeder circuits, Branch Circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -
			–	25	20-25	350 A fixed	**NZMB2-A25-NA** 269207		S	**NZMB2-A25-BT-NA** 107774		B		
			–	32	25-32	350 A fixed	**NZMB2-A32-NA** 269208		S	**NZMB2-A32-BT-NA** 107775		B		
			–	40	32-40	8-10	**NZMB2-A40-NA** 269209		S	**NZMB2-A40-BT-NA** 107776		B		
			–	50	40-50	6-10	**NZMB2-A50-NA** 269210		S	**NZMB2-A50-BT-NA** 107777		B		
			–	63	50-63	6-10	**NZMB2-A63-NA** 269211		S	**NZMB2-A63-BT-NA** 107778		B		
			–	80	63-80	6-10	**NZMB2-A80-NA** 269212		S	**NZMB2-A80-BT-NA** 107779		B		
			–	100	80-100	6-10	**NZMB2-A100-NA** 269213		S	**NZMB2-A100-BT-NA** 107780		B		
			–	125	100-125	6-10	**NZMB2-A125-NA** 269214		S	**NZMB2-A125-BT-NA** 107781		B		
			–	160	125-160	6-10	**NZMB2-A160-NA** 269215		S	**NZMB2-A160-BT-NA** 107782		B		
			–	200	160-200	6-10	**NZMB2-A200-NA** 269216		S	**NZMB2-A200-BT-NA** 107783		B		
			–	250	200-250	6-10	**NZMB2-A250-NA** 271105		S	**NZMB2-A250-BT-NA** 107784		B		
Normal switching capacity														
35	–	–	–	20	15-20	350 A fixed	Screw terminals as accessories			**NZMN1-A20-NA** 281570		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA Certified Specially designed for NA: Yes Suitable for: Feeder circuits, Branch Circuits Current Limiting CB: Yes Max. Voltage Rating: 480Y/277 V Degree of Protection: IEC: IP20; UL/CSA Type: -
		–	–	25	20-25	350 A fixed				**NZMN1-A25-NA** 281571		B		
		–	–	32	25-32	350 A fixed				**NZMN1-A32-NA** 281572		B		
		–	–	40	32-40	8-10				**NZMN1-A40-NA** 274237		B		
		–	–	50	40-50	6-10				**NZMN1-A50-NA** 274239		B		
		–	–	63	50-63	6-10				**NZMN1-A63-NA** 274240		B		

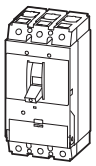
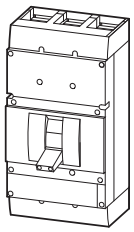
	Switching capacity				Rated current = Rated uninterrupted current	Setting range		**Fixed mounting**			**Fixed mounting** with box terminals				
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases Non-delayed	**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
	I_{cu} kA	I_{cu} kA	I_{cu} kA	I_{cu} kA	$I_n = I_u$ A	I_r A	$I_i = I_n$ x ...							**B = box terminals S = screw terminals**	
System and cable protection															
Adjustable overload release I_r															
Normal switching capacity															
	**35**	–	–	–	80	63-80	6-10	Screw terminals as accessories			**NZMN1-A80-NA** 274241		B	1 off	Product Standards UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking Max. Voltage Rating 480Y/277 V Other Standards as NZMN2... below.	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
			–	–	100	80-100	6-10				**NZMN1-A100-NA** 274242		B			
			–	–	125	100-125	6-10				**NZMN1-A125-NA** 281573		B			
	**35**	**35**	25	–	20	15-20	350 A fixed	**NZMN2-A20-NA** 269217		S	**NZMN2-A20-BT-NA** 107785		B		Product Standards UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No. E31593 UL CCN DIVQ CSA File No. 022086 CSA Class No. 1432-01 NA Certification UL Listed, CSA Certified Specially designed for NA Yes Suitable for Feeder circuits, Branch Circuits Current Limiting CB Yes Max. Voltage Rating 600Y/347 V, 480 V Degree of Protection IEC: IP20; UL/CSA Type: -	
				–	25	20-25	350 A fixed	**NZMN2-A25-NA** 269218		S	**NZMN2-A25-BT-NA** 107786		B			
				–	32	25-32	350 A fixed	**NZMN2-A32-NA** 269219		S	**NZMN2-A32-BT-NA** 107787		B			
				–	40	32-40	8-10	**NZMN2-A40-NA** 269220		S	**NZMN2-A40-BT-NA** 107788		B			
				–	50	40-50	6-10	**NZMN2-A50-NA** 269221		S	**NZMN2-A50-BT-NA** 107789		B			
				–	63	50-63	6-10	**NZMN2-A63-NA** 269222		S	**NZMN2-A63-BT-NA** 107790		B			
				–	80	63-80	6-10	**NZMN2-A80-NA** 269223		S	**NZMN2-A80-BT-NA** 107791		B			
				–	100	80-100	6-10	**NZMN2-A100-NA** 269224		S	**NZMN2-A100-BT-NA** 107792		B			
				–	125	100-125	6-10	**NZMN2-A125-NA** 269225		S	**NZMN2-A125-BT-NA** 107793		B			
				–	160	125-160	6-10	**NZMN2-A160-NA** 269226		S	**NZMN2-A160-BT-NA** 107794		B			
				–	200	160-200	6-10	**NZMN2-A200-NA** 269227		S	**NZMN2-A200-BT-NA** 107795		B			
				–	250	200-250	6-10	**NZMN2-A250-NA** 271106		S	**NZMN2-A250-BT-NA** 107796		B			
High switching capacity																
	**150**	**150**	65	–	20	15-20	350 A fixed	**NZMH2-A20-NA** 269228		S	**NZMH2-A20-BT-NA** 107797		B			
					25	20-25	350 A fixed	**NZMH2-A25-NA** 269229		S	**NZMH2-A25-BT-NA** 107798		B			
					32	25-32	350 A fixed	**NZMH2-A32-NA** 269230		S	**NZMH2-A32-BT-NA** 107799		B			
					40	32-40	8-10	**NZMH2-A40-NA** 269231		S	**NZMH2-A40-BT-NA** 107800		B			
					50	40-50	6-10	**NZMH2-A50-NA** 269232		S	**NZMH2-A50-BT-NA** 107801		B			
					63	50-63	6-10	**NZMH2-A63-NA** 269233		S	**NZMH2-A63-BT-NA** 107802		B			
					80	63-80	6-10	**NZMH2-A80-NA** 269234		S	**NZMH2-A80-BT-NA** 107803		B			
					100	80-100	6-10	**NZMH2-A100-NA** 269235		S	**NZMH2-A100-BT-NA** 107804		B			
					125	100-125	6-10	**NZMH2-A125-NA** 269236		S	**NZMH2-A125-BT-NA** 107805		B			
	100	**100**	50	–	160	125-160	6-10	**NZMH2-A160-NA** 269237		S	**NZMH2-A160-BT-NA** 107806		B			
					200	160-200	6-10	**NZMH2-A200-NA** 269238		S	**NZMH2-A200-BT-NA** 107807		B			
					250	200-250	6-10	**NZMH2-A250-NA** 271107		S	**NZMH2-A250-BT-NA** 107808		B			

	Switching capacity				Rated current = Rated uninterrupted current	Setting range			Fixed mounting			
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases Non-delayed		**Part no.** Article no.	**Price** See price list		Std. pack
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...					
	kA	kA	kA	kA	A	A						

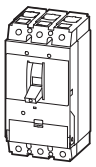
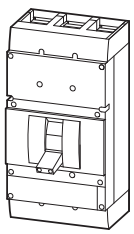
System and cable protection

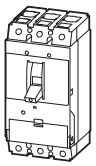
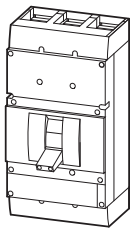
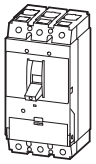
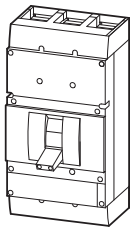
Fixed overload release I_r
R.m.s. value measurement and "thermal memory"

Normal switching capacity

	**42**	**42**	35	35	250	250	2-11	1)	**NZMN3-AEF250-NA** 269275		S	1 off
					300	300	2-11		**NZMN3-AEF300-NA** 269276		S	
					350	350	2-11		**NZMN3-AEF350-NA** 269277		S	
					400	400	2-11		**NZMN3-AEF400-NA** 269278		S	
					450	450	2-8		**NZMN3-AEF450-NA** 269279		S	
					500	500	2-8		**NZMN3-AEF500-NA** 269280		S	
					550	550	2-8		**NZMN3-AEF550-NA** 269281		S	
					600	600	2-8		**NZMN3-AEF600-NA** 269282		S	
	**42**	**42**	35	35	600	600	2-12	2)	**NZMN4-AEF600-NA** 271108		S	
					700	700	2-12		**NZMN4-AEF700-NA** 271109		S	
					800	800	2-12		**NZMN4-AEF800-NA** 271110		S	
					900	900	2-12		**NZMN4-AEF900-NA** 271111		S	
					1000	1000	2-12		**NZMN4-AEF1000-NA** 271112		S	
					1200	1200	2-12		**NZMN4-AEF1200-NA** 271113		S	

High switching capacity

	**100**	**100**	50	50	250	250	2-11	1)	**NZMH3-AEF250-NA** 269283		S	1 off
					300	300	2-11		**NZMH3-AEF300-NA** 269284		S	
					350	350	2-11		**NZMH3-AEF350-NA** 269285		S	
					400	400	2-11		**NZMH3-AEF400-NA** 269286		S	
					450	450	2-8		**NZMH3-AEF450-NA** 269287		S	
					500	500	2-8		**NZMH3-AEF500-NA** 269288		S	
					550	550	2-8		**NZMH3-AEF550-NA** 269289		S	
					600	600	2-8		**NZMH3-AEF600-NA** 269290		S	
	**85**	**85**	50	50	600	600	2-12	2)	**NZMH4-AEF600-NA** 271114		S	
					700	700	2-12		**NZMH4-AEF700-NA** 271115		S	
					800	800	2-12		**NZMH4-AEF800-NA** 271116		S	
					900	900	2-12		**NZMH4-AEF900-NA** 271117		S	
					1000	1000	2-12		**NZMH4-AEF1000-NA** 271118		S	
					1200	1200	2-12		**NZMH4-AEF1200-NA** 271119		S	

	Switching capacity				Rated current = Rated uninterrupted current	Setting range			Fixed mounting			
	SCCR 480Y/277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases Non-delayed		**Part no.** Article no.	**Price** See price list		Std. pack
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x ...					
	kA	kA	kA	kA	A	A						
												
System and cable protection												
Adjustable overload release I_r R.m.s. value measurement and "thermal memory"												
Normal switching capacity												
	**42**	**42**	35	35	250	125-250	2-11	1)	**NZMN3-AE250-NA** 269299		S	1 off
					400	200-400	2-11		**NZMN3-AE400-NA** 269300		S	
					600	300-600	2-8		**NZMN3-AE600-NA** 269301		S	
	**42**	**42**	35	35	800	400-800	2-12	2)	**NZMN4-AE800-NA** 271120		S	
					1000	500-1000	2-12		**NZMN4-AE1000-NA** 271121		S	
					1200	600-1200	2-12		**NZMN4-AE1200-NA** 271122		S	
High switching capacity												
	**100**	**100**	50	50	250	125-250	2-11	1)	**NZMH3-AE250-NA** 269302		S	1 off
					400	200-400	2-11		**NZMH3-AE400-NA** 269303		S	
					600	300-600	2-8		**NZMH3-AE600-NA** 269304		S	
	**85**	**85**	50	50	800	400-800	2-12	2)	**NZMH4-AE800-NA** 271123		S	
					1000	500-1000	2-12		**NZMH4-AE1000-NA** 271124		S	
					1200	600-1200	2-12		**NZMH4-AE1200-NA** 271125		S	

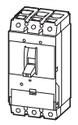
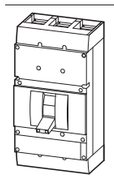
Notes

Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.

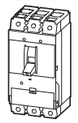
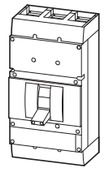
B = box terminals
S = screw terminals

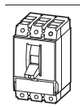
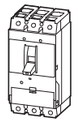
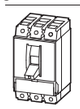
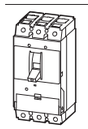
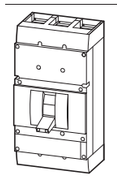
Information relevant for export to North America

Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.	E31593
UL CCN	DIVQ
CSA File No.	022086
CSA Class No.	1432-01
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Feeder circuits, branch circuits
Current Limiting CB	1)Yes 2)No
Max. Voltage Rating	600 V
Degree of Protection	IEC: IP20; UL/CSA Type: -

	Switching capacity				Rated current = Rated uninterrupted current	Setting range			Fixed mounting **Part no.** Article no.	**Price** See price list	
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases				
						Fixed	Non-delayed	Delayed			
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …			
	kA	kA	kA	kA	A	A					
Systems protection, cable protection, selectivity, generator protection											
Fixed overload release I_r R.m.s. value measurement and "thermal memory"											
Normal switching capacity											
	**35**	**35**	25	–	150	150	1800 A fixed	2-10	**NZMN2-VEF150-NA** 271126		S
				–	175	175	2100 A fixed	2-10	**NZMN2-VEF175-NA** 271127		S
				–	200	200	2400 A fixed	2-10	**NZMN2-VEF200-NA** 271128		S
				–	225	225	2700 A fixed	2-10	**NZMN2-VEF225-NA** 271129		S
				–	250	250	3000 A fixed	2-10	**NZMN2-VEF250-NA** 271130		S
	**42**	**42**	35	35	250	250	2-11	2-10	**NZMN3-VEF250-NA** 269308		S
					300	300	2-11	2-10	**NZMN3-VEF300-NA** 269309		S
					350	350	2-11	2-10	**NZMN3-VEF350-NA** 269310		S
					400	400	2-11	2-10	**NZMN3-VEF400-NA** 269311		S
					450	450	2-8	1.5-7	**NZMN3-VEF450-NA** 269312		S
					500	500	2-8	1.5-7	**NZMN3-VEF500-NA** 269313		S
					550	550	2-8	1.5-7	**NZMN3-VEF550-NA** 269314		S
					600	600	2-8	1.5-7	**NZMN3-VEF600-NA** 269315		S
	**42**	**42**	35	35	600	600	2-12	2-10	**NZMN4-VEF600-NA** 271136		S
					700	700	2-12	2-10	**NZMN4-VEF700-NA** 271137		S
					800	800	2-12	2-10	**NZMN4-VEF800-NA** 271138		S
					900	900	2-12	2-10	**NZMN4-VEF900-NA** 271139		S
					1000	1000	2-12	2-10	**NZMN4-VEF1000-NA** 271140		S
					1200	1200	2-12	2-10	**NZMN4-VEF1200-NA** 271141		S

Fixed mounting with box terminals **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
NZMN2-VEF150-BT-NA 107593		B	1 off	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
NZMN2-VEF175-BT-NA 107594		B		
NZMN2-VEF200-BT-NA 107595		B		Adjustable delay setting t_r • 2 – 20 s at 6 x I_r
NZMN2-VEF225-BT-NA 107596		B		Adjustable delay t_{sd} • Steps 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms
NZMN2-VEF250-BT-NA 107597		B		i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable (ex-works OFF)
Terminals as accessory			1 off Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
Terminals as accessory			1 off	

	Switching capacity				Rated current = Rated uninterrupted current	Setting range			**Fixed mounting**			**Fixed mounting** with box terminals					
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases		**Part no.** Article no.	**Price** See price list		**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
						Fixed	Non-delayed	Delayed								
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …								
	kA	kA	kA	kA	A	A										
							I>	I>								
Systems protection, cable protection, selectivity, generator protection																
Fixed overload release I_r R.m.s. value measurement and "thermal memory"																
High switching capacity																
	**100**	**100**	50	–	150	150	1800 A fixed	2-10	**NZMH2-VEF150-NA** 271131		S	**NZMH2-VEF150-BT-NA** 107598		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	IEC switching performance values shown on type label. Adjustable delay setting t_r • 2 – 20 s at 6 x I_r Adjustable delay t_{sd} • Steps 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable (ex-works OFF)
				–	175	175	2100 A fixed	2-10	**NZMH2-VEF175-NA** 271132		S	**NZMH2-VEF175-BT-NA** 107599		B			
				–	200	200	2400 A fixed	2-10	**NZMH2-VEF200-NA** 271133		S	**NZMH2-VEF200-BT-NA** 107840		B			
				–	225	225	2700 A fixed	2-10	**NZMH2-VEF225-NA** 271134		S	**NZMH2-VEF225-BT-NA** 107841		B			
				–	250	250	3000 A fixed	2-10	**NZMH2-VEF250-NA** 271135		S	**NZMH2-VEF250-BT-NA** 107842		B			
	**100**	**100**	50	50	250	250	2-11	2-10	**NZMH3-VEF250-NA** 269316		S	Terminals as accessory			1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 600 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
					300	300	2-11	2-10	**NZMH3-VEF300-NA** 269317		S						
					350	350	2-11	2-10	**NZMH3-VEF350-NA** 269318		S						
					400	400	2-11	2-10	**NZMH3-VEF400-NA** 269319		S						
					450	450	2-8	1.5-7	**NZMH3-VEF450-NA** 269320		S						
					500	500	2-8	1.5-7	**NZMH3-VEF500-NA** 269321		S						
					550	550	2-8	1.5-7	**NZMH3-VEF550-NA** 269322		S						
					600	600	2-8	1.5-7	**NZMH3-VEF600-NA** 269323		S						
	**85**	**85**	50	50	600	600	2-12	2-10	**NZMH4-VEF600-NA** 271142		S	Terminals as accessory					
					700	700	2-12	2-10	**NZMH4-VEF700-NA** 271143		S						
					800	800	2-12	2-10	**NZMH4-VEF800-NA** 271144		S						
					900	900	2-12	2-10	**NZMH4-VEF900-NA** 271145		S						
					1000	1000	2-12	2-10	**NZMH4-VEF1000-NA** 271146		S						
					1200	1200	2-12	2-10	**NZMH4-VEF1200-NA** 271147		S						

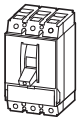
	Switching capacity				Rated current = Rated uninterrupted current	Setting range			**Fixed mounting**				**Fixed mounting** with box terminals					
	SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Short-circuit releases		**Part no.** Article no.		**Price** See price list		**Part no.** Article no.		**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
							Non-delayed	Delayed										
	I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …										
	kA	kA	kA	kA	A	A												
							I>	I>										
Systems protection, cable protection, selectivity, generator protection																		
Adjustable overload release I_r R.m.s. value measurement and “thermal memory”																		
Normal switching capacity																		
	**35**	**35**	25	–	100	50-100	1200 A fixed	2-10	**NZMN2-VE100-NA** 271148			S	**NZMN2-VE100-BT-NA** 107843		B	1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Specially designed for NA Suitable for Current Limiting CB Max. Voltage Rating Degree of Protection	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking E31593 DIVQ 022086 1432-01 UL Listed, CSA certified Yes Feeder circuits, branch circuits Yes 600Y/347 V, 480 V IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label. Adjustable delay setting t_r • 2 – 20 s at 6 x I_r Adjustable delay t_{sd} • Steps: 0, 20, 60, 100, 200, 300, 500, 750, 1000 ms i^2t constant function • NZM2 fixed OFF • NZM3, NZM4 switchable (ex-works OFF)
					160	80-160	1920 A fixed	2-10	**NZMN2-VE160-NA** 271149			S	**NZMN2-VE160-BT-NA** 107844		B			
					250	125-250	3000 A fixed	2-10	**NZMN2-VE250-NA** 271150			S	**NZMN2-VE250-BT-NA** 107845		B			
	**42**	**42**	35	35	250	125-250	2-11	2-10	**NZMN3-VE250-NA** 269332			S	Terminals as accessory				Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Specially designed for NA Suitable for Current Limiting CB Max. Voltage Rating Degree of Protection	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking E31593 DIVQ 022086 1432-01 UL Listed, CSA certified Yes Feeder circuits, branch circuits Yes 600 V IEC: IP20; UL/CSA Type: -	
					400	200-400	2-11	2-10	**NZMN3-VE400-NA** 269333			S						
					600	300-600	2-8	1.5-7	**NZMN3-VE600-NA** 269334			S						
	42	**42**	35	35	800	400-800	2-12	2-10	**NZMN4-VE800-NA** 271154			S						
					1000	500-1000	2-12	2-10	**NZMN4-VE1000-NA** 271155			S						
					1200	630-1200	2-12	2-10	**NZMN4-VE1200-NA** 271156			S						
High switching capacity																		
	**100**	**100**	50	–	100	50-100	1200 A fixed	2-10	**NZMH2-VE100-NA** 271151			S	**NZMH2-VE100-BT-NA** 107846		B	1 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Specially designed for NA Suitable for Current Limiting CB Max. Voltage Rating Degree of Protection	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking E31593 DIVQ 022086 1432-01 UL Listed, CSA certified Yes Feeder circuits, branch circuits Yes 600Y/347 V, 480 V IEC: IP20; UL/CSA Type: -	
					160	80-160	1920 A fixed	2-10	**NZMH2-VE160-NA** 271152			S	**NZMH2-VE160-BT-NA** 107847		B			
					250	125-250	3000 A fixed	2-10	**NZMH2-VE250-NA** 271153			S	**NZMH2-VE250-BT-NA** 107848		B			
	**100**	**100**	50	50	250	125-250	2-11	2-10	**NZMH3-VE250-NA** 269335			S	Terminals as accessory				Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Specially designed for NA Suitable for Current Limiting CB Max. Voltage Rating Degree of Protection	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking E31593 DIVQ 022086 1432-01 UL Listed, CSA certified Yes Feeder circuits, branch circuits Yes 600 V IEC: IP20; UL/CSA Type: -	
					400	200-400	2-11	2-10	**NZMH3-VE400-NA** 269336			S						
					600	300-600	2-8	1.5-7	**NZMH3-VE600-NA** 269337			S						
	**85**	**85**	50	50	800	400-800	2-12	2-10	**NZMH4-VE800-NA** 271157			S						
					1000	500-1000	2-12	2-10	**NZMH4-VE1000-NA** 271158			S						
					1200	630-1200	2-12	2-10	**NZMH4-VE1200-NA** 271159			S						

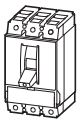
Rated current = Rated uninterrupted current $I_n = I_u$ A	Setting range Short-circuit releases Non-delayed $I_i = I_n$ x ... $I>$	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list	
Short-circuit protection				
Motor protection in conjunction with contactor and overload relay • With short-circuit release • Without overload release I_r				
Basic switching capacity				
 1.2	7-12	Screw terminals as accessories		
2	6-11			
3	6-11			
5	6-11			
8	6-11			
12	7-12			
18	7-12			
26	8-13			
33	8-14			
40	8-14			
50	8-14			
63	8-14			
80	8-14			
100	8-13			
 1.6	8-14	**NZMB2-S1.6-CNA** 269472		S
2.4	8-14	**NZMB2-S2.4-CNA** 269473		S
5	6-11	**NZMB2-S5-CNA** 103034		S
8	6-11	**NZMB2-S8-CNA** 103035		S
12	7-12	**NZMB2-S12-CNA** 103036		S
18	7-12	**NZMB2-S18-CNA** 103037		S
26	8-13	**NZMB2-S26-CNA** 103038		S
33	8-14	**NZMB2-S33-CNA** 103039		S
40	8-14	**NZMB2-S40-CNA** 269243		S
50	8-14	**NZMB2-S50-CNA** 269244		S
63	8-14	**NZMB2-S63-CNA** 269245		S
80	8-14	**NZMB2-S80-CNA** 269246		S
100	8-14	**NZMB2-S100-CNA** 269247		S
125	8-14	**NZMB2-S125-CNA** 269248		S
160	8-14	**NZMB2-S160-CNA** 269249		S
200	8-13	**NZMB2-S200-CNA** 269250		S
250	8-10	**NZMB2-S250-CNA** 102478		S

Fixed mounting with box terminals **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
				B = box terminals **S = screw terminals** For further terminal types see accessories
NZMB1-S1.2-CNA 102906		B	1 off Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DKPU2 CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Recognized, CSA certified Conditions of Acceptability: Only used in motor circuits in conjunction with suitable contactor and overload relay. SCCR value applies for complete combination starter only, consisting of instantaneous trip circuit breaker, contactor and overload relay. Specially designed for NA: Yes Suitable for: Branch circuits, feeder circuits Max. Voltage Rating: 480Y/277 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
NZMB1-S2-CNA 102907		B		
NZMB1-S3-CNA 102908		B		
NZMB1-S5-CNA 102909		B		
NZMB1-S8-CNA 103020		B		
NZMB1-S12-CNA 103021		B		
NZMB1-S18-CNA 103022		B		
NZMB1-S26-CNA 103023		B		
NZMB1-S33-CNA 103024		B		
NZMB1-S40-CNA 281263		B		
NZMB1-S50-CNA 281264		B		
NZMB1-S63-CNA 281265		B		
NZMB1-S80-CNA 281266		B		
NZMB1-S100-CNA 281267		B		
NZMB2-S1.6-BT-CNA 107651		B	1 off Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DKPU2 CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Recognized, CSA certified Conditions of Acceptability: Only used in motor circuits in conjunction with suitable contactor and overload relay. SCCR value applies for complete combination starter only, consisting of instantaneous trip circuit breaker, contactor and overload relay. Specially designed for NA: Yes Suitable for: Branch circuits, feeder circuits Max. Voltage Rating: 600Y/347 V, 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	
NZMB2-S2.4-BT-CNA 107652		B		
NZMB2-S5-BT-CNA 107653		B		
NZMB2-S8-BT-CNA 107654		B		
NZMB2-S12-BT-CNA 107655		B		
NZMB2-S18-BT-CNA 107656		B		
NZMB2-S26-BT-CNA 107657		B		
NZMB2-S33-BT-CNA 107658		B		
NZMB2-S40-BT-CNA 107659		B		
NZMB2-S50-BT-CNA 107660		B		
NZMB2-S63-BT-CNA 107661		B		
NZMB2-S80-BT-CNA 107662		B		
NZMB2-S100-BT-CNA 107663		B		
NZMB2-S125-BT-CNA 107664		B		
NZMB2-S160-BT-CNA 107665		B		
NZMB2-S200-BT-CNA 107666		B		
NZMB2-S250-BT-CNA 107667		B		

Circuit-breakers UL/CSA, IEC magnetic short-circuit releases, 3 pole

NZM...-S...CNA

	Rated current = Rated uninterrupted current	Setting range		**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list		Std. pack
		Short-circuit releases					
	$I_n = I_u$	Non-delayed					
	A	$I_i = I_n$ x ...					
		$I>$					
Short-circuit protection							
Motor protection in conjunction with contactor and overload relay • With short-circuit release • Without overload release I_r							
Normal switching capacity							
	1.2	7-12	[1]	**NZMN1-S1.2-CNA** 103025		B	1 off
	2	6-11		**NZMN1-S2-CNA** 103026		B	
	3	6-11		**NZMN1-S3-CNA** 103027		B	
	5	6-11		**NZMN1-S5-CNA** 103028		B	
	8	6-11		**NZMN1-S8-CNA** 103029		B	
	12	7-12		**NZMN1-S12-CNA** 103030		B	
	18	7-12		**NZMN1-S18-CNA** 103031		B	
	26	8-13		**NZMN1-S26-CNA** 103032		B	
	33	8-14		**NZMN1-S33-CNA** 103033		B	
	40	8-14		**NZMN1-S40-CNA** 281276		B	
	50	8-14		**NZMN1-S50-CNA** 281277		B	
	63	8-14		**NZMN1-S63-CNA** 281278		B	
	80	8-14		**NZMN1-S80-CNA** 281279		B	
	100	8-13		**NZMN1-S100-CNA** 281280		B	
	1.6	8-14	[2]	**NZMN2-S1.6-CNA** 269478		S	
	2.4	8-14		**NZMN2-S2.4-CNA** 269479		S	
	5	6-11		**NZMN2-S5-CNA** 103040		S	
	8	6-11		**NZMN2-S8-CNA** 103041		S	
	12	7-12		**NZMN2-S12-CNA** 103042		S	
	18	7-12		**NZMN2-S18-CNA** 103043		S	
	26	8-13		**NZMN2-S26-CNA** 103044		S	
	33	8-14		**NZMN2-S33-CNA** 103045		S	
	40	8-14		**NZMN2-S40-CNA** 269255		S	
	50	8-14		**NZMN2-S50-CNA** 269256		S	
	63	8-14		**NZMN2-S63-CNA** 269257		S	
	80	8-14		**NZMN2-S80-CNA** 269258		S	
	100	8-14		**NZMN2-S100-CNA** 269259		S	
	125	8-14		**NZMN2-S125-CNA** 269260		S	
	160	8-14		**NZMN2-S160-CNA** 269261		S	
	200	8-13		**NZMN2-S200-CNA** 269262		S	
	250	8-10		**NZMN2-S250-CNA** 102479		S	

	Rated current = Rated uninterrupted current	Setting range		Fixed mounting with screw terminals Part no. Article no.	Price See price list		Std. pack
		Short-circuit releases					
	$I_n = I_u$	Non-delayed					
	A	$I_i = I_n$ x ...					
		$I>$					
Short-circuit protection							
Motor protection in conjunction with contactor and overload relay • With short-circuit release • Without overload release I_r							
High switching capacity							
	1.6	8-14	[2]	**NZMH2-S1.6-CNA** 269482		S	1 off
	2.4	8-14		**NZMH2-S2.4-CNA** 269483		S	
	5	6-11		**NZMH2-S5-CNA** 103046		S	
	8	6-11		**NZMH2-S8-CNA** 103047		S	
	12	7-12		**NZMH2-S12-CNA** 103048		S	
	18	5-9		**NZMH2-S18-CNA** 103049		S	
	26	8-13		**NZMH2-S26-CNA** 103050		S	
	33	8-14		**NZMH2-S33-CNA** 103051		S	
	40	8-14		**NZMH2-S40-CNA** 269267		S	
	50	8-14		**NZMH2-S50-CNA** 269268		S	
	63	8-14		**NZMH2-S63-CNA** 269269		S	
	80	8-14		**NZMH2-S80-CNA** 269270		S	
	100	8-14		**NZMH2-S100-CNA** 269271		S	
	125	8-14		**NZMH2-S125-CNA** 269272		S	
	160	8-14		**NZMH2-S160-CNA** 269273		S	
	200	8-13		**NZMH2-S200-CNA** 269274		S	
	250	8-10		**NZMH2-S250-CNA** 102490		S	

Notes

B = box terminals
S = screw terminals

For further terminal types see accessories

Switches correspond with both UL/CSA and IEC regulations.
IEC switching performance values shown on type label.

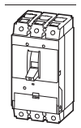
Information relevant for export to North America

Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.	E31593
UL CCN	DKPU2
CSA File No.	022086
CSA Class No.	1432-01
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Only used in motor circuits in conjunction with suitable contactor and overload relay. SCCR value applies for complete combination starter only, consisting of instantaneous trip circuit breaker, contactor and overload relay.
Specially designed for NA	Yes
Suitable for	Branch circuits, feeder circuits
Max. Voltage Rating	[1] 480Y/277 V [2] 600Y/347 V, 480 V
Degree of Protection	IEC: IP20; UL/CSA Type: -

Switching capacity SCCR 480Y/277 V 60 Hz I_{cu} kA	Switching capacity SCCR 480 V 60 Hz I_{cu} kA	Rated current = Rated uninterrupted current $I_n = I_u$ A	Setting range Overload releases I_r A	Setting range Short-circuit releasess Non-delayed $I_i = I_n \times \ldots$	Motor power 460 V 480 V HP	**Fixed mounting with screw terminals** **Part no.** Article no.	**Price** See Price list	Std. pack	**Information relevant for export to North America**	**Notes**
Motor protection										**B = box terminals** **S = screw terminals** For further terminal types see accessories
100% rated Adjustable overload releases For use in motor circuits with contactor. Additional motor protective characteristics (calibration) to UL508, CSA-C22.2 No. 14-05.										
Normal switching capacity										
 35	35	90	45-90	2-14	60	**NZMN2-ME90-NA** 118964		S	1 off	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label. Adjustable delay setting t_r • 2 – 20 s at 6 x I_r
		140	70-140	2-14	100	**NZMN2-ME140-NA** 118965		S		
		200	100-200	2-14	150	**NZMN2-ME200-NA** 118966		S		
High switching capacity										
 100	100	90	45-90	2-14	60	**NZMH2-ME90-NA** 118967		S	1 off	
		140	70-140	2-14	100	**NZMH2-ME140-NA** 118968		S		
		200	100-200	2-14	150	**NZMH2-ME200-NA** 118969		S		

Switching capacity SCCR 480Y/277 V 60 Hz I_{cu} kA	Switching capacity SCCR 480 V 60 Hz I_{cu} kA	Rated current = Rated uninterrupted current $I_n = I_u$ A	Setting range Overload releases I_r A	Setting range Short-circuit releasess Non-delayed $I_i = I_n \times \ldots$	Motor power 460 V 480 V HP	**Fixed mounting with box terminals** **Part no.** Article no.	**Price** See Price list	Std. pack	**Information relevant for export to North America**	**Notes**
Motor protection										**B = box terminals** **S = screw terminals** For further terminal types see accessories
100% rated Adjustable overload releases For use in motor circuits with contactor. Additional motor protective characteristics (calibration) to UL508, CSA-C22.2 No. 14-05.										
Normal switching capacity										
35	35	90	45-90	2-14	60	**NZMN2-ME90-BT-NA** 142421		S	1 off	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label. Adjustable delay setting t_r • 2 – 20 s at 6 x I_r
		140	70-140	2-14	100	**NZMN2-ME140-BT-NA** 142422		S		
		200	100-200	2-14	150	**NZMN2-ME200-BT-NA** 142423		S		
High switching capacity										
100	100	90	45-90	2-14	60	**NZMH2-ME90-BT-NA** 142424		S	1 off	
		140	70-140	2-14	100	**NZMH2-ME140-BT-NA** 142425		S		
		200	100-200	2-14	150	**NZMH2-ME200-BT-NA** 142426		S		

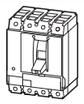
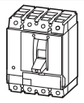
Rated current = Rated uninterrupted current $I_n = I_u$ A	Setting range Short-circuit releases Non-delayed $I_i = I_n \times \ldots$	**Fixed mounting with screw terminals** **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
Short-circuit protection Motor protection in conjunction with contactor and overload relay • With short-circuit release • Without overload release I_r						**B = box terminals** **S = screw terminals** For further terminal types see accessories
Normal switching capacity						
 90	2-14	**NZMN2-SE90-CNA** 271160		S	1 off Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DKPU2 CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Recognized, CSA certified Conditions of Acceptability: Only used in motor circuits in conjunction with suitable contactor and overload relay. SCCR value applies for complete combination starter only, consisting of instantaneous trip circuit breaker, contactor and overload relay. Specially designed for NA: Yes Suitable for: Branch circuits, feeder circuits Max. Voltage Rating: 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
140	2-14	**NZMN2-SE140-CNA** 271161		S		
220	2-14	**NZMN2-SE220-CNA** 271162		S		

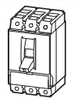
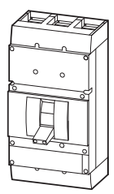
Rated current = Rated uninterrupted current $I_n = I_u$ A	Setting range Short-circuit releases Non-delayed $I_i = I_n \times \ldots$	**Fixed mounting with screw terminals** **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
Short-circuit protection Motor protection in conjunction with contactor and overload relay • With short-circuit release • Without overload release I_r						**B = box terminals** **S = screw terminals** For further terminal types see accessories
Normal switching capacity						
 220	2-14	**NZMN3-SE220-CNA** 269341		S	1 off Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DKPU2 CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Recognized, CSA certified Conditions of Acceptability: Only used in motor circuits in conjunction with suitable contactor and overload relay. SCCR value applies for complete combination starter only, consisting of instantaneous trip circuit breaker, contactor and overload relay. Specially designed for NA: Yes Suitable for: Branch circuits, feeder circuits Max. Voltage Rating: 600 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
350	2-14	**NZMN3-SE350-CNA** 269342		S		
450	2-12	**NZMN3-SE450-CNA** 284465		S		

Switching capacity				Rated current = Rated uninterrupted current	Setting range		
SCCR 480Y/ 277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/ 347 V 60 Hz	SCCR 600 V 60 Hz		Overload releases	Neutral conductor	Short-circuit releases
						I_r x % of phase conductor	Non-delayed
I_{cu}	I_{cu}	I_{cu}	I_{cu}	$I_n = I_u$	I_r		$I_i = I_n$ x ...
kA	kA	kA	kA	A	A	%	

Fixed mounting
with box terminals

Part no. Article no.	**Price** See price list		Std. pack	**Information relevant for export to North America**	**Notes**
					B = box terminals **S = screw terminals** For further terminal types see accessories
System and cable protection					
Fixed overload releases I_r					
Basic switching capacity					
NZMB2-4-AF125-BT-NA 113011		B	1 off	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: – CSA Class No.: – NA Certification: UL Listed Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 480 V Degree of Protection: IEC: IP20; UL/CSA Type: -	Switches correspond with both UL/CSA and IEC regulations. IEC switching performance values shown on type label.
NZMB2-4-AF150-BT-NA 113012		B			
NZMB2-4-AF175-BT-NA 113013		B			
NZMB2-4-AF200-BT-NA 113014		B			
NZMB2-4-AF225-BT-NA 113015		B			
NZMB2-4-AF250-BT-NA 113016		B			
Normal switching capacity					
NZMN2-4-AF125-BT-NA 113005		B	1 off		
NZMN2-4-AF150-BT-NA 113006		B			
NZMN2-4-AF175-BT-NA 113007		B			
NZMN2-4-AF200-BT-NA 113008		B			
NZMN2-4-AF225-BT-NA 113009		B			
NZMN2-4-AF250-BT-NA 113010		B			
High switching capacity					
NZMH2-4-AF125-BT-NA 113017		B	1 off		
NZMH2-4-AF150-BT-NA 113018		B			
NZMH2-4-AF175-BT-NA 113019		B			
NZMH2-4-AF200-BT-NA 113020		B			
NZMH2-4-AF225-BT-NA 113021		B			
NZMH2-4-AF250-BT-NA 113022		B			

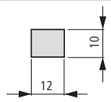
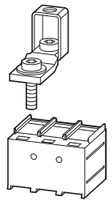
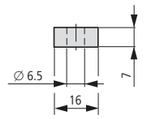
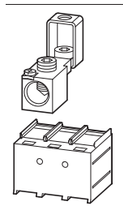
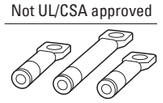
Basic switching capacity							
	**25**	**25**	–	–	125	125	100	Approx. 6 - 10
			–	–	150	150	100	Approx. 6 - 10
			–	–	175	175	100	Approx. 6 - 10
			–	–	200	200	100	Approx. 6 - 10
			–	–	225	225	100	Approx. 6 - 10
			–	–	250	250	100	Approx. 6 - 10
Normal switching capacity							
	**35**	**35**	–	–	125	125	100	Approx. 6 - 10
			–	–	150	150	100	Approx. 6 - 10
			–	–	175	175	100	Approx. 6 - 10
			–	–	200	200	100	Approx. 6 - 10
			–	–	225	225	100	Approx. 6 - 10
			–	–	250	250	100	Approx. 6 - 10
High switching capacity							
	**150**	**150**	–	–	125	125	100	Approx. 6 - 10
	100	**100**	–	–	150	150	100	Approx. 6 - 10
			–	–	175	175	100	Approx. 6 - 10
			–	–	200	200	100	Approx. 6 - 10
			–	–	225	225	100	Approx. 6 - 10
			–	–	250	250	100	Approx. 6 - 10

		Rated current = Rated uninterrupted current	Switching capacity SCCR 480Y/277 V 60 Hz	SCCR 480 V 60 Hz	SCCR 600Y/347 V 60 Hz	SCCR 600 V 60 Hz	Response value of short-circuit releases	**Fixed mounting** with screw terminals **Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	**Notes**
		$I_n = I_u$	I_{cu}	I_{cu}	I_{cu}	I_{cu}	I_i					
		A	kA	kA	kA	kA	A					
Molded case switches for North America												**B = box terminals** **S = screw terminals** For further terminal types see accessories
With permanently set short-circuit release (self-protection)												
3 switch positions I, +, 0 Can be remotely operated with shunt release XU/XA, remote operator XR, Can be equipped with trip-indicating auxiliary contact M22-K..												
		63	**35**	–	–	–	1250	Screw terminals as accessories		B	1 off	IEC/EN 60947-2: circuit-breaker without overcurrent protection (CBI-X) with main switch characteristics and isolating characteristics to IEC/EN 60204
		100			–	–	1250			B		
		125			–	–	1250			B		
		160	**100**	**100**	50	–	2500	**NS2-160-NA** 102684		B	1 off	
		200					2500	**NS2-200-NA** 102685		B		
		250					2500	**NS2-250-NA** 102686		B		
		400	**100**	**100**	50	50	6600	**NS3-400-NA** 102687				
		600					6600	**NS3-600-NA** 102688				
		800	**65**	**65**	42	42	25000	**NS4-800-NA** 102689				
		1000					25000	**NS4-1000-NA** 102690				
		1200					25000	**NS4-1200-NA** 102691				
								Terminals as accessory			1 off	

Information relevant for export to North America	
Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.	E148671
UL CCN	WJAZ
CSA File No.	022086
CSA Class No.	4652-06
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Feeder circuits, branch circuits
Max. Voltage Rating	480Y/277 V
Degree of Protection	IEC: IP20; UL/CSA Type: -

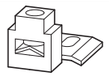
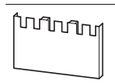
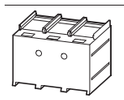
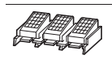
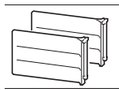
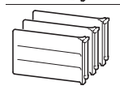
Information relevant for export to North America	
Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.	E148671
UL CCN	WJAZ
CSA File No.	022086
CSA Class No.	4652-06
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Feeder circuits, branch circuits
Max. Voltage Rating	600Y/347 V
Degree of Protection	IEC: IP20; UL/CSA Type: -

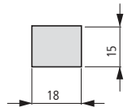
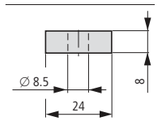
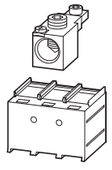
Information relevant for export to North America	
Product Standards	UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking
UL File No.	E148671
UL CCN	WJAZ
CSA File No.	022086
CSA Class No.	4652-06
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Feeder circuits, branch circuits
Max. Voltage Rating	600 V
Degree of Protection	IEC: IP20; UL/CSA Type: -

	Max. cable connection area	Number of poles	For use with	Terminal capacity Cable Cable lugs	Terminal capacity Terminal capacity	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness	Terminal capacity Copper bar width x thickness	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
					mm²		mm	mm					
Box terminal													
Standard equipment													
		3 pole	NZM1, PN1, N(S)1	Copper cable	1 x 10 - 70 2 x 6 - 25 1)	1 x 12 - 2/0	≧ 2 x 9 x 0.8	–	**NZM1-XKC** 260015		1 set	Standard connection with all NZM1, PN1 and N(S)1 switches. Conversion kit for circuit-breaker with screw terminal. Contains parts for a 3 or 4 pole switch side. Fitted within the switch housing. Use ferrules with flexible and highly flexible conductors. Max. cross section shown can only be connected when flexible and without ferrules.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		4 pole	NZM1-4, PN1-4, N1-4						**NZM1-4-XKC** 267075		1 set		–
Screw terminals													
		3 pole	NZM1, PN1, N(S)1	Copper cable lugs Aluminium cable lugs	1 x 10 - 70 2 x 6 - 25 1 x 10 - 35 2 x 10 - 35 1)	1 x 12 - 2/0	–	≧ 12 x 5	**NZM1-XKS** 260019		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Flush mounting outside the switch housing. Cover NZM1(-4)-XKSA must be fitted (included as standard).	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		4 pole	NZM1-4, PN1-4, N1-4						**NZM1-4-XKS** 266725		1 set		–
Tunnel terminal													
		3 pole	NZM1, PN1, N(S)1	Copper cable ⊙ ▽ Aluminium cable ⊙ ▽	1 x 16 - 95 1)	1 x 6 - 3/0 -	–	–	**NZM1-XKA** 266730		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. With control circuit terminal for 1 x 0.75 - 2.5 mm² (18 - 14 AWG) or 2 x 0.75 - 1.5 mm² (18 - 14 AWG) copper conductor. Flush mounting outside the switch housing. Use ferrules with flexible and highly flexible conductors. Max. cross section shown can only be connected when flexible and without ferrules. Cover NZM1(-4)-XKSA must be fitted (included as standard).	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		4 pole	NZM1-4, PN1-4, N1-4						**NZM1-4-XKA** 266731		1 set		–
Rear terminal bolts													
Not UL/CSA approved													
	–	3 pole	NZM1, PN1, N1	Copper cable lugs Aluminium cable lugs	1 x 10-70 2 x 6-25 1 x 10-35 2 x 10-35 1)	–	–	min. 12 x 5 max. 16 x 5	**NZM1-XKR** 266734		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches.	–
	–	4 pole	NZM1-4, PN1-4, N1-4						**NZM1-4-XKR** 266737		1 set		–

Notes

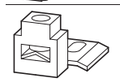
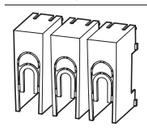
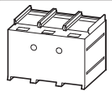
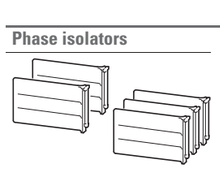
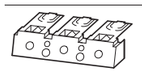
1) Up to 95 mm² can be connected depending on make of cable.

	Max. cable connection area	Number of poles	For use with	Connection	Terminal capacity[1] mm²	AWG/kcmil	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes	Information relevant for export to North America
Control cable terminals											
	–	3 and 4 pole	NZM1(-4), PN1(-4), N(S)1(-4)	Screw terminals	1 x 0.75-2.5 2 x 0.75-1.5	1 x 18-14 2 x 18-16	**NZM1-XSTS** 260150		1 set	Contains for two terminal locations located at top or bottom for 3 or 4 pole circuit-breakers. Included as standard with tunnel terminal. Degree of protection IP1X Height or thickness of connections: 2 mm	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
	–	3 and 4 pole	NZM1(-4), PN1(-4), N(S)1(-4)	Box terminal	1 x 0.75-2.5 2 x 0.75-1.5	1 x 18-14 2 x 18-16	**NZM-XSTK** 266739		1 set	Contains for two terminal locations located at top or bottom for 3 or 4 pole circuit-breakers. cannot be combined with NZM1(-4)-XIPK IP2X protection against contact with a finger. Degree of protection IP1X Height or thickness of connections: 2 mm	
Terminal covers knockout											
Not UL/CSA approved For box terminal											
	–	3 pole	NZM1, PN1, N1	–	–	–	**NZM1-XKSFA** 100780		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection (simplified finger protection). Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
	–	4 pole	NZM1-4, PN1-4, N1-4	–	–	–	**NZM1-4-XKSFA** 100781		1 off		–
Cover											
	–	3 pole	NZM1, PN1, N(S)1	–	–	–	**NZM1-XKSA** 260021		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Contact protection against direct contact where cable lugs, bars or tunnel terminals are used. Contained in the set with tunnel terminals and screw terminals. When using insulated conductor material to degree of protection IP1X.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
	–	4 pole	NZM1-4, PN1-4, N1-4	–	–	–	**NZM1-4-XKSA** 266741		1 off		–
IP2X protection against contact with finger											
For box terminal											
	–	3 pole	NZM1, PN1, N1	–	–	–	**NZM1-XIPK** 266744		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. Cannot be combined with NZM-XSTK control circuit terminal.	–
	–	4 pole	NZM1-4, PN1-4, N1-4	–	–	–	**NZM1-4-XIPK** 266745		1 set		–
For covers NZM1(-4)-XKSA or NZM1…(C)NA, N(S)1…NA											
	–	3 pole	NZM1, PN1, NS1	–	–	–	**NZM1-XIPA** 266748		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection to IP2X.	UL/CSA certification not required
	–	4 pole	NZM1-4, PN1-4, N1-4	–	–	–	**NZM1-4-XIPA** 266749		1 set		–
Phase isolators											
	–	3 pole	NZM1, PN1, N(S)1	–	–	–	**NZM1-XKP** 119862		1 set	Contains parts, including insulating plate for mounting plate, for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Insulation protection up to a rated operating voltage U_e of 415 V AC when minimum distances are not maintained. Can not be combined with connection on rear NZM1(-4)-XKR.	UL/CSA certification not required
	–	4 pole	NZM1-4, PN1-4, N1-4	–	–	–	**NZM1-4-XKP** 119863		1 set		–

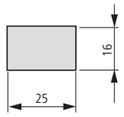
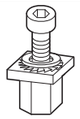
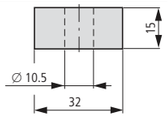
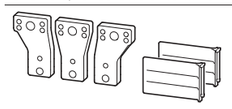
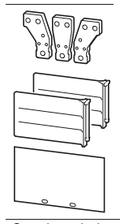
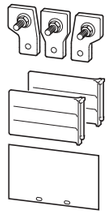
	Max. cable connection area	Number of poles	For use with	Terminal capacity Cable Cable lugs	Terminal capacity[1)] mm²	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness mm	Copper bar width x thickness mm
Box terminal								
		3 pole	NZM2, PN2, N(S)2 ≤ 160 A	Copper cable	1 x 10-185 2 x 4-70	1 x 12 - 350	≧ 2 x 9 x 0.8	–
			NZM2, PN2, N(S)2 > 160 A					
		4 pole	NZM2-4, PN2-4, N2-4 ≤ 160 A					
			NZM2-4, PN2-4, N2-4 > 160 A					
Screw terminals								
Standard equipment								
		3 pole	NZM2, PN2, N(S)2	Copper cable lugs Aluminium cable lugs	1 x 10 - 185 2 x 4 - 70 1 x 10 - 50 2 x 10 - 50	1 x 12 - 350	≧ 2 x 16 x 0.8	≧ 16 x 5
		4 pole	NZM2-4, PN2-4, N2-4					
Tunnel terminal								
		3 pole	NZM2, PN2, N(S)2	Copper cable Aluminium cable	1 x 16 - 185 1 x 16 - 185 Up to 240 mm² can be connected depending on the cable manufacturer.	1 x 6 - 350	–	–
		4 pole	NZM2-4, PN2-4, N2-4					
Rear terminal bolts								
Not UL/CSA approved When using cable lugs without NZM3(-4)-XKSA cover, they must be insulated.								
	–	3 pole	NZM2, PN2, N2	Copper cable lugs Aluminium cable lugs	1 x 10 - 185 2 x 4 - 70 1 x 10 - 50 2 x 10 - 50	–	≧ 2 x 16 x 0.8 ≦ 6 x 24 x 0.5	≧ 16 x 5 ≦ 20 x 5
		4 pole	NZM2-4, PN2-4, N2-4					

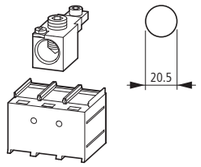
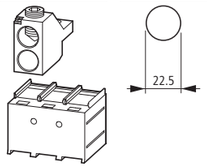
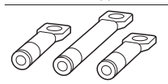
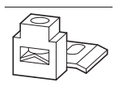
Notes [1)] Up to 240 mm² can be connected depending on the cable manufacturer.

Part no. suffix Article no. for ordering with basic device	**Price** See price list	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
+NZM2-160-XKCO 262218		**NZM2-160-XKC** 262240		1 set	Part no. suffix and part no.contain parts for a circuit-breaker side at top or bottom for 3 or 4 pole switches. Conversion kit for circuit-breaker with screw terminal. Fitted within the switch housing. O = for fitting at the top U = for fitting at the bottom U_e ≧ 525 V AC: Use NZM2(-4)-XKSA cover. Use ferrules with flexible and highly flexible conductors. Max. cross section shown can only be connected when flexible and without ferrules.	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 022086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
+NZM2-160-XKCU 262223		–		1 set		
+NZM2-250-XKCO 262242		**NZM2-250-XKC** 262244		1 set		
+NZM2-250-XKCU 262243		–		1 set		
+NZM2-4-160-XKCO 266751		**NZM2-4-160-XKC** 266755		1 set		–
+NZM2-4-160-XKCU 266753		–		1 set		
+NZM2-4-250-XKCO 266752		**NZM2-4-250-XKC** 266756		1 set		
+NZM2-4-250-XKCU 266754		–		1 set		
–		**NZM2-XKS** 260030		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Standard connection with all NZM2, PN2 and N2 circuit-breakers. Conversion kit for circuit-breaker with box terminal. Use special cable lugs narrow version, → 17/88 Fitted within the switch housing. If a bar is used, insulation (400 mm) e.g sleeving and a NZM2(-4)-XKSA cover are required. U_e ≧ 525 V AC: With all other connection materials, e.g. cables and strips, use cover NZM2(-4)-XKSA.	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 022086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
–		**NZM2-4-XKS** 266750		1 set		–
–		**NZM2-XKA** 271457		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. With control circuit terminal for 1 x 0.75 - 2.5 mm² (18 - 14 AWG) or 2 x 0.75 - 1.5 mm² (18 - 16 AWG) copper conductor. Flush mounting outside the switch housing. Use ferrules with flexible and highly flexible conductors. Max. cross section shown can only be connected when flexible and without ferrules. Cover NZM2(-4)-XKSA must be fitted (included as standard).	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 022086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
–		**NZM2-4-XKA** 271458		1 set		–
+NZM2-XKRO 266763		**NZM2-XKR** 266765		1 set	Part no. suffix and part no.contain parts for a circuit-breaker side at top or bottom for 3 or 4 pole switches. O = for fitting at the top U = for fitting at the bottom	–
+NZM2-XKRU 266764		–		1 set		
+NZM2-4-XKRO 266766		**NZM2-4-XKR** 266768		1 set		
+NZM2-4-XKRU 266767		–		1 set		

	Number of poles	For use with	Terminal capacity Connection	Terminal capacity[1] mm²	AWG/kcmil	**Part no. suffix** Article no. for ordering with basic device	**Price** See price list
Control cable terminals							
	3 and 4 pole	NZM2(-4), PN2(-4), N(S)2(-4)	Screw terminals	1 x 0.75 - 2.5 2 x 0.75 - 1.5	1 x 18 - 14 2 x 18 - 16	–	
	3 and 4 pole	NZM2(-4), PN2(-4), N(S)2(-4)	Box terminal			–	
Cable lug cover							
	3 pole	NZM2, PN2, NS2	Copper cable lugs Aluminium cable lugs	1 x 10-185 2 x 4-70 1 x 10-50 2 x 10-50	–	–	
	4 pole	NZM2-4, PN2-4, N2-4			–	–	
Cover							
	3 pole	NZM2, PN2, NS2	–	–	–	–	
	4 pole	NZM2-4, PN2-4, N2-4	–	–	–	–	
Phase isolators							
	3 pole	NZM2, PN2, N(S)2	–	–	–	–	
	4 pole	NZM2-4, PN2-4, N2-4	–	–	–	–	
Terminal covers, knockout							
	3 pole	NZM2, PN2, N(S)2	–	–	–	**+NZM2-XKSFA0** 108269	
			–	–	–	**+NZM2-XKSFAU** 108270	
	4 pole	NZM2-4, PN2-4, N2-4	–	–	–	**+NZM2-4-XKSFA0** 108271	
			–	–	–	**+NZM2-4-XKSFAU** 108272	
IP2X protection against contact with finger							
For box terminal							
	3 pole	NZM2, PN2, N(S)2	–	–	–	–	
	4 pole	NZM2-4, PN2-4, N2-4	–	–	–	–	
For covers NZM2(-4)-XKSA or NZM2(-4) or NZM2…(C)NA and N(S)2…NA							
	3 pole	NZM2, PN2, N(S)2	–	–	–	–	
	4 pole	NZM2-4, PN2-4, N2-4	–	–	–	–	
Copper cable lug							
Not UL/CSA approved When using cable lugs without NZM3(-4)-XKSA cover, they must be insulated.							
	3 and 4 pole	NZM2(-4), PN2(-4), N2(-4)	–	150 mm²	–	–	
			–	120 mm²	–	–	
			–	95 mm²	–	–	
			–	185 mm²	–	–	

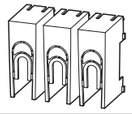
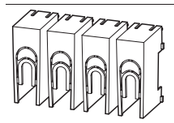
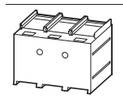
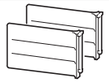
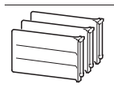
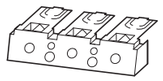
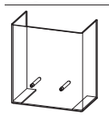
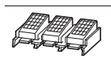
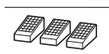
Part no. Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
NZM2-XSTS 260156		1 set	Contains parts for two terminal locations located at top or bottom for 3 or 4 pole switches. Included as standard with tunnel terminal. Degree of protection IP1X NZM-XSTK cannot be combined with NZM1(-4)-XIPK IP2X protection against contact with a finger. Height or thickness of connections: 2 mm	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E140305 UL CCN DIHS CSA File No. 022086 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
NZM-XSTK 266739		1 set		
NZM2-XKSAE 119868		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Contact protection where cable lugs are used on screw terminals. When using insulated conductor material, degree of protection IP2X	UL/CSA certification not required
NZM2-4-XKSAE 119870		1 set		–
NZM2-XKSA 260038		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Contact protection where cable lugs, bars or tunnel terminals are used. When using insulated conductor material, degree of protection IP1X	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 22086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
NZM2-4-XKSA 266770		1 off		–
NZM2-XKP 119864		1 set	Contains parts, including insulating plate for mounting plate, for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Can not be combined with connection on rear NZM2(-4)-XKR. Insulation protection up to a rated operating voltage U_e of 415 V AC when minimum distances are not maintained.	UL/CSA certification not required
NZM2-4-XKP 119865		1 set		–
NZM2-XKSFA 104640		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection (simplified finger protection). O = for fitting at the top U = for fitting at the bottom	UL/CSA certification not required
		1 off		
NZM2-4-XKSFA 104641				
NZM2-XIPK 266773		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection to IP2X. Protection on grasping terminal chamber when connecting cables in box terminals. With two conductors maximum cross-section 25 mm² or AWG4. Can not be combined with control cable terminal NZM-XSTK.	UL/CSA certification not required
NZM2-4-XIPK 266774		1 set		–
NZM2-XIPA 266777		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection to IP2X. When fitting to NZM2-..-(C)NA or NZM...-NA: With 2 conductors maximum cross-section 25 mm² or AWG4.	UL/CSA certification not required
NZM2-4-XIPA 266778		1 set		–
KS150-NZM7 059777		3 off	Contains a cable lug for 3 or 4 pole switch. Special cable lug, narrow style	–
KS120-NZM7 059776				
KS95-NZM7 059775				
NZM2-XKS185 260032				

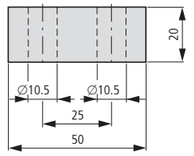
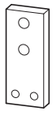
	Max. cable connection area	Number of poles	For use with	Rated current[1] I_n A	Terminal capacity Cable Cable lugs	Terminal capacities[1] mm²	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness mm	Copper bar width x thickness mm	**Part no. suffix** Article no. for ordering with basic device	**Price** See price list	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**	
Box terminal																	
		3 pole	NZM3(-4), PN3(-4), N(S)3(-4)	max. 500 400 UL/ CSA	Copper cable Copper cable	1 x 35 - 240 2 x 16 - 120	1 x 2 - 350	min. 6 x 16 x 0.8 max. 10 x 24 x 1.0 or max. 11 x 21 x 1	–	**+NZM3-XKCO** 262246		**NZM3-XKC** 260042		1 set	Part no. suffix and part no.contain parts for a circuit-breaker side at top or bottom for 3 or 4 pole switches. Conversion kit for circuit-breaker with screw terminal. Fitted within the switch housing. O = for fitting at the top U = for fitting at the bottom U_e ≧ 525 V AC: Use NZM3(-4)-XKSA cover. Use ferrules with flexible and highly flexible conductors. Observe limited cable cross-section through sleeve.	Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
										+NZM3-XKCU 262245		–				UL File No.	E31593
																UL CCN	DIHS
																CSA File No.	022086
																CSA Class No.	1437-01
																NA Certification	UL Listed, CSA certified
				630	Copper cable	1 x 35 - 240 2 x 16 - 120	1 x 2 - 350	10 x 24 x 1.0 + 5 x 24 x 1.0 or (2 x) 8 x 24 x 1.0								Suitable for	Refer to main component information
		4 pole								**+NZM3-4-XKCO** 266781		**NZM3-4-XKC** 266783		1 set		–	
										+NZM3-4-XKCU 266782		–					
Screw connection, standard																	
		3 pole	NZM3, PN3, N(S)3	630	Copper cable lugs	1 x 16 - 300 2 x 16 - 240	1 x 4 - 350 2 x 350	10 x 32 x 1.0 + 5 x 32 x 1.0	30 x 10 + 30 x 5	–	–	**NZM3-XKS** 260039		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Standard connection with all NZM3, PN3 and N3 circuit-breakers. Conversion kit for circuit-breaker with box terminal. Use special cable lugs narrow version, → 17/88 Fitted within the switch housing. If a bar is used, insulation (400 mm) heat-shrink tubing and a cover NZM3(-4)-XKSA are required. U_e ≧ 525 V AC: For all other connection types use cover NZM3(-4)-XKSA.	Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
																UL File No.	E31593
																UL CCN	DIHS
																CSA File No.	022086
																CSA Class No.	1437-01
																NA Certification	UL Listed, CSA certified
				Max. 400	Aluminium cable lugs	1 x 10 - 120 2 x 10 - 120	1 x 4 - 350 2 x 350									Suitable for	Refer to main component information
		4 pole	NZM3-4, PN3-4, N(S)3-4							–	–	**NZM3-4-XKS** 266780		1 set		–	
Connection width extension																	
One hole, for screws or terminals																	
		3 pole	NZM3, PN3, N(S)3	630	Copper cable lugs Aluminium cable lugs	2 x 300	2 x 500	(2 x) 10 x 50 x 1.0	(2 x) 10 x 50	–	–	**NZM3-XKV70** 100514		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Central drilling for e.g. up to 2 cable lugs per phase. For fitting to switches with screw terminal. Phase isolator and insulation plate are included as standard. Distance between pole centres with NZM3(-4)-XKV70: 70 mm Hole for control wire exists. Connection terminals NZM3(-4)-XK300 and NZM3(-4)-XK22X21 can be installed.	Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
																UL File No.	E140305
																UL CCN	DIHS
																CSA File No.	022086
																CSA Class No.	1432-01
																NA Certification	UL Listed, CSA certified
		4 pole	NZM3-4, PN3-4, N3-4							–	–	**NZM3-4-XKV70** 100515		1 set		–	
Two holes, for screws or terminals																	
	–	3 pole	NZM3, PN3, N(S)3	630	Copper cable lugs	NZM3-XKV70-2: 4 x 35 - 185 NZM3-XKV70-2 + NZM4-XKA: 4 x 50 - 240	NZM3-XKV70-2: 2 x 350 NZM3-XKV70-2 + NZM4-XKA: 4 x 500	NZM3-XKV70-2 + NZM4-XKB: ≧ 6 x 16 - 0.8 ≦ (2 x) 10 x 32 x 1	(2 x) 10 x 50	–	–	**NZM3-XKV70-2** 119860		1 set	Contains parts for a terminal located at top or bottom for 3 pole circuit-breakers. Double hole fitting for up to four 185 mm² cable lugs, 50 mm bbar or large flat cable terminal NZM4-XKB or large tunnel terminal NZM4-XKA For fitting to switches with screw terminal. Phase isolator, insulation plate and 2 control circuit terminals supplied.	Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
																NA Certification	Request filed for UL and CSA
																Suitable for	Refer to main component information
		4 pole	NZM3-4, PN3-4, N3-4							–	–	**NZM3-4-XKV70-2** 132673					
One threaded stud																	
	–	3 pole	NZM3, PN3, N(S)3	630	Copper cable lugs	2 x 95-300	2 x 500	(2x) 10 x 32 x 1.0	(2 x) 10 x 40	–	–	**NZM3-XKV70KB** 112884		1 set	Contains parts for a terminal located at top or bottom for 3 pole circuit-breakers. Threaded stud for cable lugs up to 2 × 300 mm² For fitting to switches with screw terminal. Phase isolator, insulation plate and 2 control circuit terminals supplied.	–	

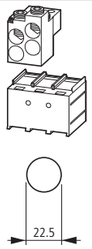
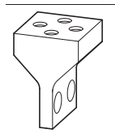
	Max. cable connection area	Number of poles	For use with	Rated current[1] I_n A	Terminal capacity Cable Cable lugs	Terminal capacities[1] mm²	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness mm	Copper bar width x thickness mm	**Part no. suffix** Article no. for ordering with basic device	**Price** See price list	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Terminals for connection width extension																
		3 pole	NZM3, PN3, N(S)3	Max. 500	Copper cable	1 x 120 - 300	–	–	–	–		**NZM3-XK300** 100782		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Only in combination with connection width extension NZM3(-4)-XKV70. Use ferrules with flexible and highly flexible conductors. With control cable terminal for 1 × 0.75 – 2.5 mm² or 2 × 0.75 – 1.5 mm² copper conductor as standard.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		4 pole	NZM3-4, PN3-4, N3-4							–		**NZM3-4-XK300** 100783		1 set		–
Not UL/CSA approved																
		3 pole	NZM3, PN3, N(S)3	630	–	–	–	(2 ×) 11 x 21 x 1.0	–	–		**NZM3-XK22X21** 100784		1 set		–
		4 pole	NZM3-4, PN3-4, N3-4							–		**NZM3-4-XK22X21** 100785		1 set		
Tunnel terminal																
		3 pole	NZM3, PN3, N(S)3	Max. 350	Copper cable ⊙ ▽ Aluminium cable ⊙ ▽	1 x 16 - 185	1 x 6 - 350	–	–	–		**NZM3-XKA1**[2] 271459		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. With control cable terminal for 1 × 0.75 – 2.5 mm² (18 – 14 AWG) or 2 × 0.75 – 1.5 mm² (18 – 16 AWG) copper cable as standard. Fitting outside switch housing. Use ferrules with flexible and highly flexible conductors. Max. cross section shown can only be connected when flexible and without ferrules. Cover NZM3(-4)-XKSA must be fitted (included as standard).	–
		4 pole	NZM3-4, PN3-4, N3-4							–		**NZM3-4-XKA1**[2] 271460		1 set		
		3 pole	NZM3, PN3, N(S)3	Max. 630	Copper cable ⊙ ▽ Aluminium cable ⊙ ▽	1 x 50-240 2 x 50-240	1 x 0-500 2 x 0-500	–	–	–		**NZM3-XKA2** 271461		1 set		Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		4 pole	NZM3-4, PN3-4, N3-4							–		**NZM3-4-XKA2** 271462		1 set		–
Rear terminal bolts																
Not UL/CSA approved																
		3 pole	NZM3, PN3, N3	Max. 630 Max. 500	Copper cable lugs Aluminium cable lugs	1 x 16-240 2 x 16-240 1 x 10-120 2 x 10-120	–	min. 6 x 16 x 0.8 max. 10 x 32 x 1.0	min. 20 x 5 max. 30 – 10	**+NZM3-XKRO** 266790		**NZM3-XKR** 266792		1 set	Part no. suffix and part no.contain parts for a circuit-breaker side at top or bottom for 3 or 4 pole switches. O = for fitting at the top U = for fitting at the bottom	–
										+NZM3-XKRU 266791		–		1 set		
		4 pole	NZM3-4, PN3-4, N3-4							**+NZM3-4-XKRO** 266793		**NZM3-4-XKR** 266795		1 set		
										+NZM3-4-XKRU 266794		–		1 set		
Control cable terminals																
		3 and 4 pole	NZM3, PN3, N(S)3	–	Screw terminals	1 x 0.75-2.5 2 x 0.75-1.5	1 x 18-14 2 x 18-16	–	–	–	–	**NZM3/4-XSTS** 266797		1 set	Contains for two terminal locations located at top or bottom for 3 or 4 pole circuit-breakers. Included as standard with tunnel terminal. Degree of protection IP1X Height or thickness of connections: 2 mm	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
		3 and 4 pole	NZM3-4, PN3, N(S)3-4	–	Box terminal	1 x 0.75-2.5 2 x 0.75-1.5	1 x 18-14 2 x 18-16	–	–	–	–	**NZM-XSTK** 266739		1 set	Contains for two terminal locations located at top or bottom for 3 or 4 pole circuit-breakers. Included as standard with tunnel terminal. Degree of protection IP1X NZM-XSTK cannot be combined with NZM1(-4)-XIPK IP2X protection against contact with a finger. Height or thickness of connections: 2 mm	

Notes

[1] The rated operational current values have been determined according to IEC/EN 60947 (switchgear standard). They generally relate to the max. defined cross-sections and are intended as a general guide.
The engineering standards which apply in each case must be observed.

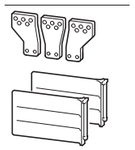
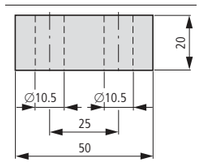
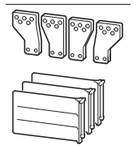
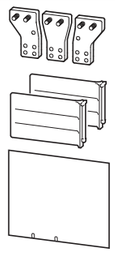
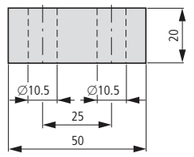
	Max. cable connection area	Number of poles	For use with	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Cable lug cover								
	–	–	3 pole	NZM3, PN3, N(S)3	**NZM3-XKSAE** 119869		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Contact protection where cable lugs are used on screw terminals· When using insulated conductor material, degree of protection IP2X.	UL/CSA certification not required
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XKSAE** 119871		1 set		–
Cover									
	–	–	3 pole	NZM3, PN3, N(S)3	**NZM3-XKSA** 260045		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Insulation/protection against direct contact where cable lugs, bars or tunnel terminals are used. Included in set with tunnel terminals. When using insulated conductor material to degree of protection IP1X.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XKSA** 266801		1 off		–
Phase isolators									
	–	–	3 pole	NZM3, PN3, N(S)3	**NZM3-XKP** 100512		1 set	Contains parts, including insulating plate for mounting plate, for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Included with the connection width extension. Cannot be combined with the NZM3(-4)-XKA tunnel terminal, NZM3(-4)-XKR connection on rear. Insulation protection where cable lugs, bars, or flat conductor are used.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XKP** 100513		1 set		
Terminal covers, knockout									
	–	–	3 pole	NZM3, PN3, N(S)3	**NZM3-XKSFA** 104642		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection (simplified finger protection).	UL/CSA certification not required
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XKSFA** 104643		1 off		–
Large cover for connection width extension									
	–	–	3 pole	NZM3, PN3, N3 + NZM3-XKV70(-2)	**NZM3-XKSAV** 119858		1 off	Contains parts for a terminal located at top or bottom for 3 pole circuit-breakers. Insulation protection/protection against direct contact for connection of cable lugs or bars to connection width extension. Can also be used fir connection width extension NZM3-XKV70 with terminals NZM3-XK300, NZM3-XK22x21 or NZM4-XKA. When using insulated conductor material, degree of protection IP2X.	–
			4 pole	NZM3-4, PN3-4, N3-4 + NZM3-4-XKV70	**NZM3-4-XKSAV** 132675		1 off		
IP2X protection against contact with finger									
For box terminal									
	–	–	3 pole	NZM3, PN3, N3	**NZM3-XIPK** 266804		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Enhanced contact protection to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. with 2 conductors max. cross section 70 mm². Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XIPK** 266805		1 set		–
For covers NZM3(-4)-XKSA or NZM3...(C)NA and N(S)3…NA									
	–	–	3 pole	NZM3, PN3, N(S)3	**NZM3-XIPA** 266808		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Enhanced contact protection to IP2X. When fitting to NZM3...-(C)NA or N3...-NA: with 2 conductors max. cross section 70 mm².	UL/CSA certification not required
	–	–	4 pole	NZM3-4, PN3-4, N3-4	**NZM3-4-XIPA** 266809		1 set		–
Copper cable lug									
Not UL/CSA approved When using cable lugs **without** NZM3(-4)-XKSA cover, they must be insulated.									
	185 mm²	–	3 and 4 pole	NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XKS185** 260040		3 off	The part no. contains a cable lug for 3 or 4 pole switch. Special cable lug, narrow style	–
	240 mm²	–			**NZM3-XKS240** 260041		3 off		–

		Space requirement	Rated current[1)]	Number of poles	For use with	Terminal capacity			Terminal capacity		**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
						Cable Cable lugs	Terminal capacity	AWG/kcmil	Copper strip No. of discs × width × disc thickness	Copper bar width x thickness					
			I_n A				mm²		mm	mm					
Screw terminals															
Threaded stud standard equipment	2-hole		Max. 1600	3 and 4 pole	NZM4(-4) N4(-4) N(S)4	Copper cable lugs	1 x 120-185 4 x 50-185	1 x 250-350 4 x 0-350	(2 x) 10 x 50 x 1.0	(2 x) 50 x 10	–			Double hole fitting with M10 threaded stud at 25 mm spacing. Use special cable lug narrow version.	–
Screws				3 pole	NZM4, N(S)4						**NZM4-XKS** 127736		1 set	Double hole fitting with M10 screw at 25 mm spacing. Use special cable lug narrow version.	UL/CSA certification not required
				4 pole	NZM4-4, N4-4						**NZM4-4-XKS** 127737		1 set		–
Module plate															
	1-hole	–	Max. 1250	3 pole	NZM4, N(S)4	Copper cable lugs	1 x 120-300 2 x 95-300	1 x 250-600 2 x 000-600	(2 x) 10 x 40 x 1.0 (2 x) 10 x 50 x 1.0	(2 x) 40 x 10 (2 x) 50 x 10	**NZM4-XKM1** 266814		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. For M10 screws. Can be enlarged for M12 screws. Use special cable lug narrow version. Can be fitted to circuit-breaker with screw terminal. Insulation using cover NZM4(-4)-XKSA or phase divider NZM4(-4)-XKP necessary.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
				4 pole	NZM4-4, N4-4						**NZM4-4-XKM1** 266815		1 set		–
	2-hole	–	Max. 1400	3 pole	NZM4, N(S)4		2 x 95-185 4 x 35-185	2 x 000-350 4 x 2-350	(2 x) 10 x 50 x 1.0	(2 x) 50 x 10	**NZM4-XKM2** 266820		1 set		Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
				4 pole	NZM4-4, N4-4						**NZM4-4-XKM2** 266821		1 set		–
	2-hole	–	Max. 1250	3 pole	NZM4, N(S)4	Copper cable lugs	2 x 95-300	2 x 000-600	(2 x) 10 x 40 x 1.0 (2 x) 10 x 50 x 1.0	(2 x) 40 x 10 (2 x) 50 x 10	**NZM4-XKM2S-1250** 284471		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole circuit-breakers. Insulation using cover NZM4(-4)-XKSA or phase divider NZM4(-4)-XKP necessary.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
				4 pole	NZM4-4, N4-4						**NZM4-4-XKM2S-1250** 284472		1 set		–
		–	Max. 1600	3 pole	NZM4, N(S)4						**NZM4-XKM2S-1600** 284473		1 set		Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E31593 UL CCN: DIHS CSA File No.: 22086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Refer to main component information
				4 pole	NZM4-4, N4-4						**NZM4-4-XKM2S-1600** 284474		1 set		–

	Rated current [1] I_n A	Number of poles	For use with	Terminal capacity Cable Cable lugs	Terminal capacity mm²	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness mm	Copper bar width x thickness mm	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes	Information relevant for export to North America
Flat cable terminal													
	Max. 1100	3 pole	NZM4, N(S)4	–	–	–	min. 6 x 16 x 0.8 max. (2 x) 10 x 32 x 1.0	–	**NZM4-XKB** 266829		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Conversion kit for circuit-breaker with screw terminal. Insulation using cover NZM4(-4)-XKSA or phase divider NZM4(-4)-XKP necessary. When the circuit-breaker is installed on a conductive mounting plate, cover NZM4(-4)-XKSA must be used With control circuit terminal for 1 x 0.75-2.5 mm² or 2x 0.75-1.5 mm² copper conductors as standard.	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking NA Certification Request filed for UL and CSA
		4 pole	NZM4-4, N4-4	–	–	–	min. 6 x 16 x 0.8 max. (2 x) 10 x 32 x 1.0	–	**NZM4-4-XKB** 266831		1 set		–
Tunnel terminal													
	Max. 1400	3 pole	NZM4, N(S)4	Copper cable Aluminium cable	1 x 50-240 4 x 50-240	1 x 0-500 4 x 0-500	–	–	**NZM4-XKA** 266836		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. With control circuit terminal for 1 x 0.75-2.5 mm² (18-14 AWG) or 2 x 0.75-1.5 mm² (18-16 AWG) copper cable as standard. Can be fitted to circuit-breaker with screw terminal. Use ferrules with flexible and highly flexible conductors. Cover NZM4(-4)-XKSA must be fitted (included as standard).	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 22086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
		4 pole	NZM4-4, N4-4				–	–	**NZM4-4-XKA** 266837		1 set		–
Rear terminal bolts													
Not UL/CSA approved													
	Max. 1250	3 pole	NZM4, N4	Copper cable lugs Aluminium cable lugs	1 x 120-185 2 x 95-185 4 x 35-185 1 x 185 2 x 70-185 4 x 50-185	–	(2 x) 10 x 50 x 1.0	(2 x) 50 x 10	**NZM4-XKR** 266842		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Can also be retrofitted: Module plate NZM4...-XKM... or connection width extension NZM4-...-XKV...	–
		4 pole	NZM4(-4), N4(-4)						**NZM4-4-XKR** 266843		1 set		–

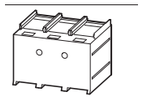
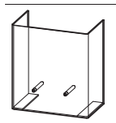
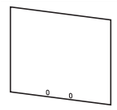
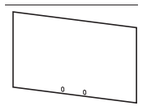
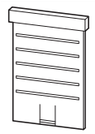
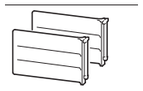
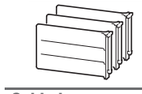
Notes

[1] The rated operational current values have been determined according to IEC/EN 60947 (switchgear standard). They generally relate to the max. defined cross-sections and are intended as a general guide.
The engineering standards which apply in each case must be observed.

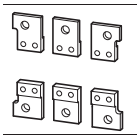
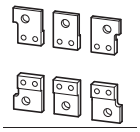
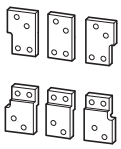
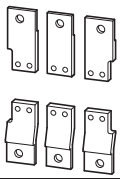
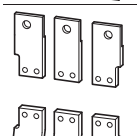
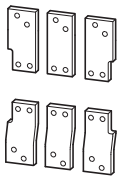
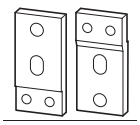
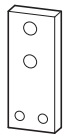
	Space requirement	Rated current[1] I_n A	Number of poles	For use with	Terminal capacity Cable Cable lugs	Terminal capacity mm²	AWG/kcmil	Terminal capacity Copper strip No. of discs × width × disc thickness mm	Copper bar width x thickness mm	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Connection width extension														
		Max. 1600	3 pole	NZM4, N(S)4	Copper cable lugs	4 x 300 6 x 95-240	4 x 600 6 x 000-500	max. (2 x) 10 x 80 x 1.0	max. (2 x) 80 x 10	**NZM4-XKV95** 281591 **NZM4-XKV110** 281593		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Five-hole fitting, for example, for up to nine cable lugs per phase. Can be fitted to circuit-breaker with screw terminal. Phase isolator supplied. Distance between pole centres with NZM4(-4)-XKV95: 95 mm Installation conditions for current transformer up to 130 mm width with 80 mm bar width. Distance between pole centers with NZM4-XKV110: 107.5 mm Installation conditions for current transformer up to 135 mm width with 80 mm bar width. Distance between pole centers with NZM4-4-XKV120: 122 mm Installation conditions for current transformer up to 164 mm width with 80 mm bar width. 4 mm holes predrilled for control cable terminal. NZM4-XKV95 contains hole for large cover NZM4-XKSAV.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E31593 DIHS 022086 1432-01 UL Listed, CSA certified Refer to main component information
		Max. 1600	4 pole	NZM4-4, N4-4						**NZM4-4-XKV95** 281592 **NZM4-4-XKV120** 281594		1 set		Product Standards: – –: –
With two threaded studs														
		1600	3 pole	NZM4, N(S)4	Copper cable lugs	4 x 95-300	4 x 500	(2x) 10 x 80 x 1.0	(2 x) 10 x 80	**NZM4-XKV95-2KB** 119861		1 set	Contains parts for a terminal located at top or bottom for 3 pole circuit-breakers. Threaded stud for cable lugs up to 4 × 300 mm² Can be fitted to circuit-breaker with screw terminal. Phase isolator, insulation plate and 2 control circuit terminals supplied.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E31593 DIHS 022086 1432-01 UL Listed, CSA certified Refer to main component information

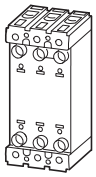
Notes

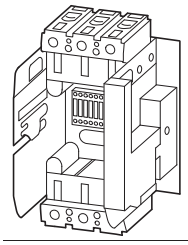
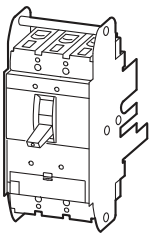
[1] The rated operational current values have been determined according to IEC/EN 60947 (switchgear standard). They generally relate to the max. defined cross-sections and are intended as a general guide.
The engineering standards which apply in each case must be observed.

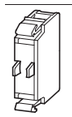
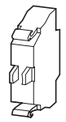
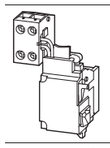
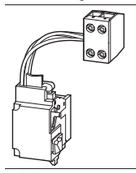
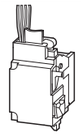
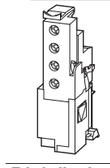
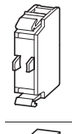
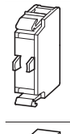
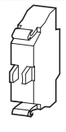
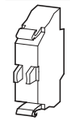
	Number of poles	For use with	Terminal capacity Connection	Terminal capacity mm²	AWG/kcmil
Control cable terminals					
	3 and 4 pole	NZM3(-4), PN3, N(S)3(-4)	Screw terminals	1 x 0.75-2.5 2 x 0.75-1.5	1 x 18-14 2 x 18-16
Cover					
	3 pole	NZM4, N(S)4			
	4 pole	NZM4-4, N4-4			
Cover size					
For connection width extension					
	3 pole	NZM4, N(S)4 + NZM4-XKV95(KB)			
Insulation plate					
	3 pole	NZM4, N(S)4 + NZM4-XKV…			
	4 pole	NZM4(-4), N(S)4(-4) + NZM4-4-XKV…			
Terminal covers, knockout					
	3 pole	NZM4, N(S)4			
	4 pole	NZM4-4, N4-4			
Phase isolators					
	3 pole	NZM4 N(S)4			
	4 pole	NZM4-4, N4-4			
Cable lug					
Not UL/CSA approved When using cable lugs without NZM3(-4)-XKSA cover, they must be insulated.					
	3 and 4 pole	NZM4(-4), N(S)4(-4)		185 mm² 240 mm²	

Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes	Information relevant for export to North America	
NZM3/4-XSTS 266797		1 off	Contains parts for two terminal locations located at top or bottom for 3 or 4 pole circuit-breakers. Included as standard with tunnel terminal. Degree of protection IP1X Height or thickness of the control circuit terminals: NZM-XSTS = 2 mm	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E140305 DIHS 022086 1437-01 UL Listed, CSA certified Refer to main component information
NZM4-XKSA 266846		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Contact protection where cable lugs, bars, flat cable terminals or tunnel terminals are used. Included in set with tunnel terminals. When using insulated conductor material, degree of protection IP1X.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E31593 DIHS 022086 1432-01 UL Listed, CSA certified Refer to main component information
NZM4-4-XKSA 266847		1 off			
NZM4-XKSAV 119876		1 off	Contains parts for a terminal located at top or bottom for 3 pole circuit-breakers. Insulation protection/protection against direct contact for connection of cable lugs or bars to connection width extension. When using insulated conductor material, degree of protection IP2X.	UL/CSA certification not required	
NZM4-XISP 119866		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Insulation protection when minimum distance from mounting plate not observed. Included with the connection width extension.	Product Standards NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking Request filed for UL and CSA Refer to main component information
NZM4-4-XISP 119867		1 off			
NZM4-XKSFA 292193		1 off	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Increased contact protection with connection of insulated bars or flat band.	UL/CSA certification not required	
NZM4-4-XKSFA 292194		1 off			
NZM4-XKP 281595		1 set	Contains parts for a terminal located at top or bottom for 3 or 4 pole switches. Included with the connection width extension. Cannot be combined with tunnel terminal NZM4(-4)-XKA or rear connection NZM4-XKR. Insulation protection where cable lugs, bars, module plates or tunnel terminals are used.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E31593 DIHS 022086 1432-01 UL Listed, CSA certified Refer to main component information
NZM4-4-XKP 281596		1 set			
NZM3-XKS185 260040		3 off	The part no. contains a cable lug for 3 or 4 pole switch. Special cable lug, narrow style		
NZM3-XKS240 260041					

	Rated current I_n A	For use with		**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Adapter set N(ZM)4/N(ZM)12							
Not UL/CSA approved							
	Max. 1000	N4	3 pole	**N4-XAS12-1000** 285609		1 set	Conversion kit from N(ZM)12 to N(ZM)4. With the terminal lugs of the replacement kit all three-pole NZM12 and N12 can be adapted to the connection dimensions of the NZM4 or N4 supplied from model year 1983. 4 pole basic devices, withdrawable units and basic devices with remote operator can not be replaced.
	Max. 1250	N4	3 pole	**N4-XAS12-1250** 285610		1 set	Contents of replacement kits N(ZM)4-XAS12…: 3 connection extensions on outlet side 3 connection extensions on trip block side 2 mounting brackets 4 fixing screws 4 phase isolators 6 fixing screws, nuts and washers Paper drilling template in the instructional leaflet (AWA) The replacement kits have the same dimensions as models N(ZM)12…, which correspond to production status 02/97 to the present.
	Max. 1600	N4	3 pole	**N4-XAS12-1600** 285611		1 set	
	Max. 1000	NZM4	3 pole	**NZM4-XAS12-1000** 285612		1 set	Special feature: Prior to 02/97 the N(ZM)12-800 was supplied with 10 mm instead of 8 mm terminal lugs. With these models the customer must determine the device's year of manufacture by measuring the thickness of the terminal lug and order replacement kit N(ZM)4-XAS12-1250. Example: N(ZM)12-800…(1000) > N(ZM)4-XAS12-1000 N(ZM)12-800 before 02/97 > N(ZM)4-XAS12-1250 N(ZM)12-1250 > N(ZM)4-XAS12-1250 N(ZM)12-1600 > N(ZM)4-XAS12-1600 Addition for devices constructed prior to 1983! Here the replacement kit for switch-disconnectors can be used in full. For circuit-breakers with "long" ZM design, the adapter fit only at the top! At the bottom the devices are about 65 mm longer and the lower connection is about 26 mm deeper. Consequently the bottom adapters are too short and the heights do not correspond.
	Max. 1250	NZM4	3 pole	**NZM4-XAS12-1250** 285613		1 set	
	Max. 1600	NZM4	3 pole	**NZM4-XAS12-1600** 285614		1 set	
	Max. 1250	NZM4, N4	3 pole	**NZM4-XAS14-1250** 283291		1 set	Conversion kit for NZM14 to NZM4. Same connections as NZM14. Contains for both sides of switch. 3 connection extensions on outlet side 3 connection extensions on trip block side. 1 long shroud for the outlet side Paper drilling template in the instructional leaflet (AWA) Cannot be combined with the module plate (NZM4-XKM...), flat cable terminal (NZM4-XKB), connection width extension (NZM4-XKV...), tunnel terminal (NZM4-XKA), connection on rear (NZM4-XKR) and withdrawable unit (NZM4-XAV...).
	1600	NZM4, N4	3 pole	**NZM4-XAS14-1600** 283292		1 set	

		For use with	Number of poles	**Part no.** Article no.	**Price** See Price List		Std. pack	**Notes**
Plug-in units								**B = box terminals** **S = screw terminals**
For circuit-breakers NZM and switch-disconnectors N Not UL/CSA approved Not for U_e > 690 V								For further terminal types see accessories
Plug-in socket								
	Completion through switches with plug-in insert NZM...-SVE...	NZM1 N1	3 pole	**NZM1-XSVS** 109777		B	1 off	$I_{nmax.}$ at: 20°C: 125 A (NZM1) 70°C: 100 A (NZM1) Mounting position: vertical, 90° right, 90° left Order control circuit plug unit separately!
		NZM2 N2	3 pole	**NZM2-XSVS** 266699		S	1 off	$I_{nmax.}$ at: 20°C: 250 A 40°C: 230 A (NZM…2-…) 250 A (NZM…2-E…) Mounting position: vertical, 90° right, 90° left Order control circuit plug unit separately!
		NZM2-4 N2-4	4 pole	**NZM2-4-XSVS** 266700		S	1 off	
Control circuit plug unit								
	–	NZM1, N1 NZM2(-4) N2(-4)	For auxiliary contact, shunt/over-voltage release	**NZM2-XSVHI** 266705		–	1 off	10 terminals
	–	NZM2(-4) N2(-4)	For remote operator	**NZM2-XSVR** 266706		–	1 off	

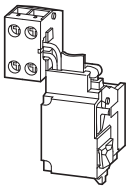
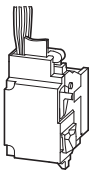
	For use with	Number of poles	**Part no. suffix** Article no. for order with basic device	**Price** See Price List	Std. pack	**Part no.** Article no. for separate order	**Price** See Price List		Std. pack	**Notes**
Withdrawable unit										
For circuit-breakers NZM and switch-disconnectors N Not UL/CSA approved Not for U_e > 690 V										
Socket base For switches with withdrawable carrier. Also for reserved compartments.										
	NZM3 N3	3 pole	–			**NZM3-XAVS** 266711		S	1 off	$I_{nmax.}$ at: 20 °C: 605 A (NZM3), 1600 A (NZM4) 40 °C: 550 A (NZM3), 1500 A (NZM4) Mounting position: NZM3: vertical, 90° left NZM4: vertical 3 positions: Connected, test, disconnected Position indication is mechanical with pointers. Additional electrical indication with auxiliary contacts possible. One N/O or NC contact M22-(C)K01 or M22-(C)K10 each per position. Alternatively also double contacts M22-CK... Complete with control circuit plug unit. All auxiliary contact (HIA, HIN, HIV) and shunt release connections to the control circuit plug unit are already present. Maximum configuration: 3 contacts HIN, 2 contacts HIA, 2 contacts HIV Cannot be combined with adapter set NZM4/NZM14 (NZM4-XSAS14-…) or N(ZM)4/N(ZM)12.
	NZM3-4 N3-4	4 pole	–			**NZM3-4-XAVS** 266712		S	1 off	
	NZM4 N4	3 pole	–			**NZM4-XAVS** 266713		S	1 off	
	NZM4-4 N4-4	4 pole	–			**NZM4-4-XAVS** 266714		S	1 off	
Withdrawable carrier Suitable for socket base Only in combination with switch										
	NZM4 N4	3 pole	**+NZM4-XAVE** 266717		1 off	–		–		
	NZM4-4 N4-4	4 pole	**+NZM4-4-XAVE** 266718		1 off	–		–		

	For use with	Contact configuration: ⊖ = safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact	NC = normally closed contact	Contact sequences	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Notes**
Auxiliary contacts												
Standard auxiliary contacts (HIN)[1)] Switches with the main contacts. Used for indicating and interlocking tasks.												
	Single contact	NZM1(-4), 2(-4), 3(-4), 4(-4) PN1(-4), 2(-4), 3(-4) N(S)1(-4), 2(-4), 3(-4), 4(-4)	1 N/O			**M22-K10** 216376		20 off	**M22-CK10** 216384		20 off	The following applies for the std. pack: M22-(C)K… : Std. pack = 20 off	The following can be clipped into the switch: • NZM1: one standard auxiliary contact • NZM2: up to two standard auxiliary contacts M22-(C)K... • NZM3: up to three standard auxiliary contacts M22-(C)K... • NZM4: up to three standard auxiliary contacts M22-(C)K... Any combinations of the auxiliary contact types are possible. Marking on switch: HIN On combination with remote operator NZM-XR... the right mounting location of standard auxiliary contact HIN can be fitted only with individual contacts.
			1 NC ⊖			**M22-K01** 216378			**M22-CK01** 216385			
	Double contact	NZM1(-4), 2(-4), 3(-4), 4(-4) PN1(-4), 2(-4), 3(-4) N(S)1(-4), 2(-4), 3(-4), 4(-4)	1 N/O	1 NC ⊖					**M22-CK11** 107940			
				2 NC ⊖					**M22-CK02** 107899			
			2 N/O						**M22-CK20** 107898			
Early-make auxiliary contact[2)] For interlocking and load shedding circuits, as well as for early make of the undervoltage release in main switch/emergency switching off applications												
	With clamp terminal on left switch side.	NZM1(-4) PN1(-4) N(S)1(-4)	2 N/O	–		**NZM1-XHIV** 259426		1 off				Not in conjunction with undervoltage release NZM…-XU… or shunt release NZM…-XA… Early make with switch on and switch off (manual actuation): approx. 20 ms
	With clamp terminal on right switch side.		2 N/O	–		**NZM1-XHIVR** 292195						
	With 3 m connection cable instead of screw connection.		2 N/O	–		**NZM1-XHIVL** 259432						
	–	NZM2(-4), 3(-4) PN2(-4), 3(-4) N(S)2(-4), 3(-4)	2 N/O	–		**NZM2/3-XHIV** 259430						Not in conjunction with undervoltage release NZM…-XU…, shunt release NZM…-XA… or remote operator NZM…-XR… Early make (manual operation): approx. 20...90 ms
		NZM4(-4) N(S)4(-4)	2 N/O	–		**NZM4-XHIV** 266172						
Trip indicating auxiliary contact (HIA), (HIAFI)[1)] General trip indication "+", when tripped by shunt release, overload release, short-circuit release or earth-fault release due to fault current.												
	Single contact	NZM1(-4), 2(-4), 3(-4), 4(-4) PN1(-4), 2(-4), 3(-4) N(S)1(-4), 2(-4), 3(-4), 4(-4)	1 N/O			**M22-K10** 216376		20 off		**M22-CK10** 216384	20 off	The following applies for the std. pack: M22-(C)K… : Std. pack = 20 off	The following can be clipped into the switch: • NZM1 - one trip-indicating auxiliary switch • NZM2 - one trip-indicating auxiliary switch M22-(C)K… • NZM3 - one trip-indicating auxiliary switch M22-(C)K… • NZM4 - up to two trip-indicating auxiliary switches M22-(C)K…. Any combinations of the auxiliary contact types are possible. Not in combination with switch-disconnector PN… Marking on switch: HIA Labeling in residual-current block: HIAFI. If the trip-indicating auxiliary contacts are used in the residual-current block, the NC contacts operates as N/O contacts and the N/O contact operates as an NC contact.
			1 NC ⊖			**M22-K01** 216378		20 off		**M22-CK01** 216385	20 off		
	Double contact	NZM1(-4), 2(-4), 3(-4), 4(-4) PN1(-4), 2(-4), 3(-4) N(S)1(-4), 2(-4), 3(-4), 4(-4)	1 N/O	1 NC ⊖						**M22-CK11** 107940	20 off		
				2 NC ⊖						**M22-CK02** 107899	20 off		
			2 N/O							**M22-CK20** 107898	20 off		

Information relevant for export to North America

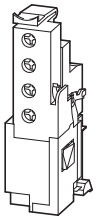
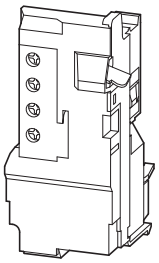
[1)] Product Standards: IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.: E29184
UL CCN: NKCR
CSA File No.: 012528
CSA Class No.: 3211-03
NA Certification: UL Listed, CSA certified
Degree of Protection: UL/CSA Part no.:

[2)] Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.: E140305
UL CCN: DIHS
CSA File No.: 022086
CSA Class No.: 1437-01
NA Certification: UL Listed, CSA certified

		For use with	Rated control voltage U_s V	**Part no.** Article no. for separate order	**Price** See price list	Std. pack	**Notes**
Undervoltage releases							
Without auxiliary contacts							
Non-delayed disconnection of circuit-breaker NZM or switch-disconnector N when control voltage drops below 35 – 70% U_S. For use with emergency switching off devices in conjunction with emergency switching off button.							
	With clamp terminal on left switch side.	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XU24AC** 259434		1 off	When the undervoltage release is de-energized, accidental contact with the main contacts of the switch during attempts to switch on is reliably prevented. Undervoltage releases cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA...
			48 V 50/60 Hz	**NZM1-XU48AC** 259436			
			60 V 50/60 Hz	**NZM1-XU60AC** 259438			
			110 V-130 V 50/60 Hz	**NZM1-XU110-130AC** 259440			
			208 V-240 V 50/60 Hz	**NZM1-XU208-240AC** 259442			
			380 V-440 V 50/60 Hz	**NZM1-XU380-440AC** 259444			
			480 V-525 V 50/60 Hz	**NZM1-XU480-525AC** 259446			
			600 V 50/60 Hz	**NZM1-XU600AC** 259448			
			12 V DC	**NZM1-XU12DC** 259450			
			24 V DC	**NZM1-XU24DC** 259452			
			110 V-130 V DC	**NZM1-XU110-130DC** 259458			
			220 V-250 V DC	**NZM1-XU220-250DC** 259460			
	With 3 m connection cable instead of screw terminal.	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUL24AC** 259462		1 off	
			110 V-130 V 50/60 Hz	**NZM1-XUL110-130AC** 259468			
			208 V-240 V 50/60 Hz	**NZM1-XUL208-240AC** 259471			
			380 V-440 V 50/60 Hz	**NZM1-XUL380-440AC** 259473			
			480 V-525 V 50/60 Hz	**NZM1-XUL480-525AC** 259475			
			600 V 50/60 Hz	**NZM1-XUL600AC** 259477			
			12 V DC	**NZM1-XUL12DC** 259479			
			24 V DC	**NZM1-XUL24DC** 259481			
			110 V-130 V DC	**NZM1-XUL110-130DC** 259487			
			220 V-250 V DC	**NZM1-XUL220-250DC** 259489			

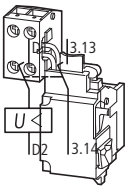
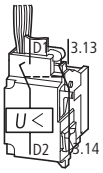
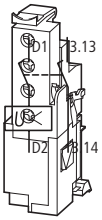
Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	Rated control voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Undervoltage releases						
Without auxiliary contacts Non-delayed disconnection of circuit-breaker NZM or switch-disconnector N when control voltage drops below 35 – 70% U_S. For use with emergency switching off devices in conjunction with emergency switching off button						
	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	24 V 50/60 Hz	**NZM2/3-XU24AC** 259491		1 off	When the undervoltage release is de-energized, accidental contact with the main switches of the switch during attempts to switch on is reliably prevented. Undervoltage release cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or undervoltage release NZM...-XA...
		48 V 50/60 Hz	**NZM2/3-XU48AC** 259493			
		60 V 50/60 Hz	**NZM2/3-XU60AC** 259495			
		110 V-130 V 50/60 Hz	**NZM2/3-XU110-130AC** 259497			
		208 V-240 V 50/60 Hz	**NZM2/3-XU208-240AC** 259499			
		380 V-440 V 50/60 Hz	**NZM2/3-XU380-440AC** 259501			
		480 V-525 V 50/60 Hz	**NZM2/3-XU480-525AC** 259503			
		600 V 50/60 Hz	**NZM2/3-XU600AC** 259505			
		12 V DC	**NZM2/3-XU12DC** 259507			
		24 V DC	**NZM2/3-XU24DC** 259509			
		110 V-130 V DC	**NZM2/3-XU110-130DC** 259515			
		220 V-250 V DC	**NZM2/3-XU220-250DC** 259517			
	NZM4(-4), N(S)4(-4)	24 V 50/60 Hz	**NZM4-XU24AC** 266189		1 off	
		48 V 50/60 Hz	**NZM4-XU48AC** 266190			
		60 V 50/60 Hz	**NZM4-XU60AC** 266191			
		110 V-130 V 50/60 Hz	**NZM4-XU110-130AC** 266192			
		208 V-240 V 50/60 Hz	**NZM4-XU208-240AC** 266193			
		380 V-440 V 50/60 Hz	**NZM4-XU380-440AC** 266194			
		480 V-525 V 50/60 Hz	**NZM4-XU480-525AC** 266195			
		600 V 50/60 Hz	**NZM4-XU600AC** 266196			
		12 V DC	**NZM4-XU12DC** 266203			
		24 V DC	**NZM4-XU24DC** 266204			
		110 V-130 V DC	**NZM4-XU110-130DC** 266207			
		220 V-250 V DC	**NZM4-XU220-250DC** 266208			

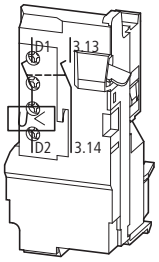
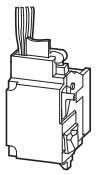
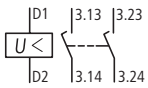
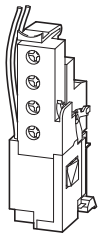
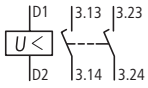
Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	Rated control voltage U_s V	**Part no.** Article no. for separate order	**Price** See price list	Std. pack	**Notes**
Undervoltage releases						
With two early-make auxiliary contacts For interlocking and load-shedding circuits, as well as for early-make of the undervoltage release in main-switch applications. For use with emergency switching off devices in conjunction with emergency switching off button.						
	With clamp terminal on left switch side.	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUHIV24AC** 259531		1 off	When the undervoltage release is de-energized, accidental contact with the main contacts of the switch during attempts to switch on is reliably prevented. Early-make of auxiliary contacts on switching on and off (manual operation): approx. 20 ms Undervoltage releases cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA... .
			48 V 50/60 Hz	**NZM1-XUHIV48AC** 259533			
			60 V 50/60 Hz	**NZM1-XUHIV60AC** 259535			
			110 V-130 V 50/60 Hz	**NZM1-XUHIV110-130AC** 259537			
			208 V-240 V 50/60 Hz	**NZM1-XUHIV208-240AC** 259539			
			380 V-440 V 50/60 Hz	**NZM1-XUHIV380-440AC** 259541			
			480 V-525 V 50/60 Hz	**NZM1-XUHIV480-525AC** 259543			
			12 V DC	**NZM1-XUHIV12DC** 259545			
			24 V DC	**NZM1-XUHIV24DC** 259547			
			110 V-130 V DC	**NZM1-XUHIV110-130DC** 259553			
			220 V-250 V DC	**NZM1-XUHIV220-250DC** 259555			
	With 3 m connection cable instead of screw connection.	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUHIVL24AC** 259557		1 off	
			110 V-130 V 50/60 Hz	**NZM1-XUHIVL110-130AC** 259563			
			208 V-240 V 50/60 Hz	**NZM1-XUHIVL208-240AC** 259565			
			380 V-440 V 50/60 Hz	**NZM1-XUHIVL380-440AC** 259567			
			480 V-525 V 50/60 Hz	**NZM1-XUHIVL480-525AC** 259569			
			12 V DC	**NZM1-XUHIVL12DC** 259571			
			24 V DC	**NZM1-XUHIVL24DC** 259573			
			110 V-130 V DC	**NZM1-XUHIVL110-130DC** 259579			
			220 V-250 V DC	**NZM1-XUHIVL220-250DC** 259581			
		NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	24 V 50/60 Hz	**NZM2/3-XUHIV24AC** 259583		1 off	When the undervoltage release is de-energized, accidental contact with the main contacts of the switch during attempts to switch on is reliably prevented. Early-make of auxiliary contacts on switching on and off (manual operation): approx. 20 ms Cannot be used in conjunction with remote operator NZM...-XR.... Undervoltage releases cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA....
			48 V 50/60 Hz	**NZM2/3-XUHIV48AC** 259585			
			60 V 50/60 Hz	**NZM2/3-XUHIV60AC** 259587			
			110 V-130 V 50/60 Hz	**NZM2/3-XUHIV110-130AC** 259589			
			208 V-240 V 50/60 Hz	**NZM2/3-XUHIV208-240AC** 259591			
			380 V-440 V 50/60 Hz	**NZM2/3-XUHIV380-440AC** 259594			
			480 V-525 V 50/60 Hz	**NZM2/3-XUHIV480-525AC** 259598			
			12 V DC	**NZM2/3-XUHIV12DC** 259600			
			24 V DC	**NZM2/3-XUHIV24DC** 259602			
			110 V-130 V DC	**NZM2/3-XUHIV110-130DC** 259608			
			220 V-250 V DC	**NZM2/3-XUHIV220-250DC** 259610			

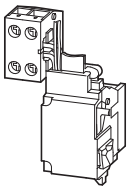
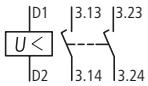
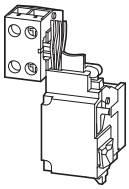
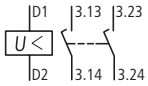
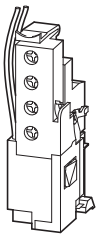
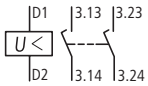
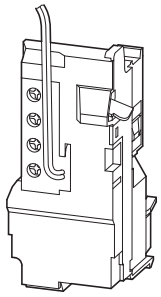
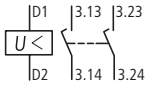
Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	Rated operating voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Undervoltage releases						
With two early-make auxiliary contacts						
For interlocking and load-shedding circuits, as well as for early-make of the undervoltage release in main-switch applications. For use with emergency switching off devices in conjunction with emergency switching off button.						
	NZM4(-4), N(S)4(-4)	24 V 50/60 Hz	**NZM4-XUHIV24AC** 266217		1 off	When the undervoltage release is de-energized, accidental contact with the main contacts of the switch during attempts to switch on is reliably prevented. Early make of auxiliary contacts on switching on (manual operation): approx. 90 ms Cannot be used in conjunction with remote operator NZM...-XR.... Undervoltage release cannot be installed together with early-make auxiliary contact NZM…-XHIV… or shunt release NZM…-XA…
		48 V 50/60 Hz	**NZM4-XUHIV48AC** 266218			
		60 V 50/60 Hz	**NZM4-XUHIV60AC** 266219			
		110 V-130 V 50/60 Hz	**NZM4-XUHIV110-130AC** 266220			
		208 V-240 V 50/60 Hz	**NZM4-XUHIV208-240AC** 266221			
		380 V-440 V 50/60 Hz	**NZM4-XUHIV380-440AC** 266222			
		480 V-525 V 50/60 Hz	**NZM4-XUHIV480-525AC** 266223			
		12 V DC	**NZM4-XUHIV12DC** 266231			
		24 V DC	**NZM4-XUHIV24DC** 266232			
		110 V-130 V DC	**NZM4-XUHIV110-130DC** 266235			
		220 V-250 V DC	**NZM4-XUHIV220-250DC** 266236			
With 2 separate early-make auxiliary contacts						
With 3 m connection cable instead of screw terminal.						
 	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUHIV20L24AC** 259612		1 off	When the undervoltage release is de-energized, accidental contact with the main switches of the switch during attempts to switch on is safely prevented. Early make of auxiliary contacts on switching on and off (manual operation): approx. 20 ms Cannot be used in conjunction with remote operator NZM...-XR.... Undervoltage release cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA...
		110 V-130 V 50/60 Hz	**NZM1-XUHIV20L110-130AC** 259620			
		208 V-240 V 50/60 Hz	**NZM1-XUHIV20L208-240AC** 259622			
		380 V-440 V 50/60 Hz	**NZM1-XUHIV20L380-440AC** 259624			
		24 V DC	**NZM1-XUHIV20L24DC** 259630			
Contacts 3.23 and 3.24 with separate 3 m connection cables.						
 	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	24 V 50/60 Hz	**NZM2/3-XUHIV2024AC** 259640		1 off	
		110 V-130 V 50/60 Hz	**NZM2/3-XUHIV20110-130AC** 259648			
		208 V-240 V 50/60 Hz	**NZM2/3-XUHIV20208-240AC** 259651			
		380 V-440 V 50/60 Hz	**NZM2/3-XUHIV20380-440AC** 259653			
		24 V DC	**NZM2/3-XUHIV2024DC** 259659			

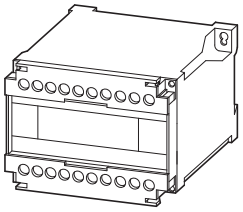
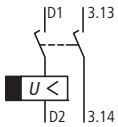
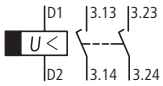
Information relevant for export to North America

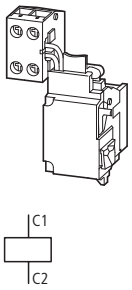
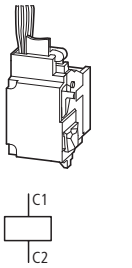
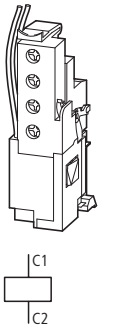
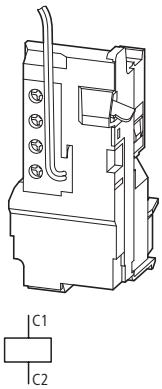
Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	Rated control voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Undervoltage releases						
With 2 separate early-make auxiliary contacts For use with emergency switching off devices in conjunction with emergency switching off button.						
Coil connections wired to clamp terminals, auxiliary contact connections with 3 m loose connection cables.						
 	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUHIV20KL24AC** 284388		1 off	When the undervoltage release is de-energized, accidental contact with the main contacts of the switch during attempts to switch on is reliably prevented.
		110 V-130 V 50/60 Hz	**NZM1-XUHIV20KL110-130AC** 284389			
		208 V-240 V 50/60 Hz	**NZM1-XUHIV20KL208-240AC** 284400			
		24 V DC	**NZM1-XUHIV20KL24DC** 284387			
Coil connections with 3 m loose connection cables, auxiliary contact connections wired to clamp terminals.						Early make of auxiliary contacts on switching on and off (manual operation): approx. 20 ms
 	NZM1(-4), N(S)1(-4)	24 V 50/60 Hz	**NZM1-XUHIV20LK24AC** 284402		1 off	
		110 V-130 V 50/60 Hz	**NZM1-XUHIV20LK110-130AC** 284403			Cannot be used in conjunction with remote operator NZM...-XR....
		208 V-240 V 50/60 Hz	**NZM1-XUHIV20LK208-240AC** 284404			
		24 V DC	**NZM1-XUHIV20LK24DC** 284401			
 	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	24 V 50/60 Hz	**NZM2/3-XUHIV20LK24AC** 285291		1 off	Undervoltage release cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA...
		110 V-130 V 50/60 Hz	**NZM2/3-XUHIV20LK110-130AC** 284407			
		208 V-240 V 50/60 Hz	**NZM2/3-XUHIV20LK208-240AC** 284408			
		24 V DC	**NZM2/3-XUHIV20LK24DC** 284405			
Contacts 3.23 and 3.24 with separate 3 m connection cables.						
 	NZM4(-4), N(S)4(-4)	24 V 50/60 Hz	**NZM4-XUHIV2024AC** 266244		1 off	
		110 V-130 V 50/60 Hz	**NZM4-XUHIV20110-130AC** 266247			
		208 V-240 V 50/60 Hz	**NZM4-XUHIV20208-240AC** 266248			
		380 V-440 V 50/60 Hz	**NZM4-XUHIV20380-440AC** 266249			
		24 V DC	**NZM4-XUHIV2024DC** 266258			

Information relevant for export to North America

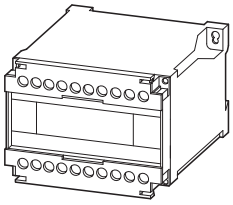
Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

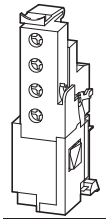
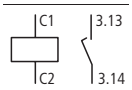
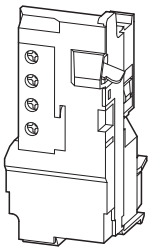
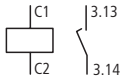
	For use with	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes
Undervoltage releases, off-delayed					
Combination of separate delay unit and special releases. For use with emergency switching off devices in conjunction with emergency switching off button. Not UL/CSA approved					
Delay unit					
Voltage dips of less than 0.06 – 16 s do not cause disconnection of the NZM circuit-breaker or N switch-disconnector.					
	NZM1(-4), 2(-4), 3(-4), 4(-4) N(S)1(-4), 2(-4), 3(-4), 4(-4) 50/60 Hz 220 V-240 V 380 V-440 V 480 V-550 V DC/AC 24 V	**UVU-NZM** 260154		1 off	Delay time can be set from 70 ms – 4 s. With additional external capacitor: • 30,000 µF ≧ 35 V up to 8 s • 90,000 µF ≧ 35 V up to 16 s A special release is required. Cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA... . Delay unit for separate installation (mounting: top-hat rail or screws). For other operating voltages use a control transformer.
Special trip block					
For combination with separate delay unit					
Without auxiliary contacts					
NZM1 with 3 m loose connection cables instead of screw terminal, NZM2, 3, and 4 with screw terminals					
	NZM1(-4) N(S)1(-4)	**NZM1-XUVL** 271607		1 off	Delay unit UVU-NZM is additionally required. Cannot be installed simultaneously with separate early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA....
	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	**NZM2/3-XUV** 259527			
	NZM4(-4) N(S)4(-4)	**NZM4-XUV** 266588			
With two early-make auxiliary contacts					
	NZM1(-4) N(S)1(-4)	**NZM1-XUVHIVL** 271608		1 off	Cannot be used in conjunction with remote operator NZM...-XR.... Delay unit UVU-NZM is additionally required. Cannot be installed simultaneously with separate early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XA.... NZM1, 2, 3: Early make of auxiliary contacts on switching on and off (manual operation): approx. 20 ms. NZM4: Early make of auxiliary contacts on switching on (manual operation): approx. 90 ms.
	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	**NZM2/3-XUVHIV** 259684			
	NZM4(-4) N(S)4(-4)	**NZM4-XUVHIV** 266596			
With two independently operating early-make auxiliary contacts					
NZM1 with 3 m separate connection cables instead of screw terminal, NZM2, 3, 4 with screw terminal, contact 3.23 and 3.24 with 3 m separate connection cables.					
	NZM1(-4) N(S)1(-4)	**NZM1-XUVHIV20L** 271609		1 off	
	NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	**NZM2/3-XUVHIV20** 259688			
	NZM4(-4) N(S)4(-4)	**NZM4-XUVHIV20** 266604			

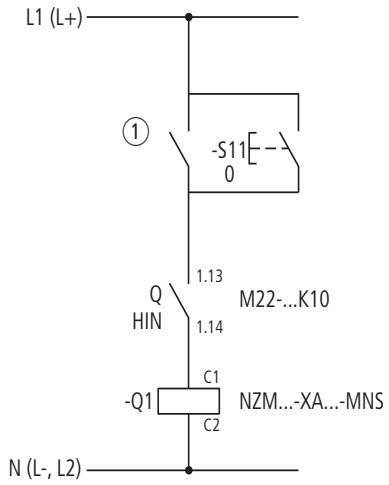
	For use with	Rated cntrol voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Shunt releases						
Without auxiliary contacts						
Switches are tripped by a voltage pulse or by the application of uninterrupted voltage.						
	With clamp terminal on left switch side.	NZM1(-4), N(S)1(-4)	12 V AC/DC	**NZM1-XA12AC/DC** 259706		1 off	When the shunt release is live, contact with the switch's main contacts on switching on is reliably prevented. Undervoltage releases cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or shunt release NZM...-XU... .
			24 V AC/DC	**NZM1-XA24AC/DC** 259708		
			48 V AC/DC	**NZM1-XA48AC/DC** 259720		
			60 V AC/DC	**NZM1-XA60AC/DC** 259722		
			110 V-130 V AC/DC	**NZM1-XA110-130AC/DC** 259724		
			208 V-250 V AC/DC	**NZM1-XA208-250AC/DC** 259726		
			380 V-440 V AC/DC	**NZM1-XA380-440AC/DC** 259728		
	With 3 m connection cable instead of screw terminal.	NZM1(-4), N(S)1(-4)	12 V AC/DC	**NZM1-XAL12AC/DC** 259734		1 off	
			24 V AC/DC	**NZM1-XAL24AC/DC** 259736		
			110 V-130 V AC/DC	**NZM1-XAL110-130AC/DC** 259742		
			208 V-250 V AC/DC	**NZM1-XAL208-250AC/DC** 259744		
			380 V-440 V AC/DC	**NZM1-XAL380-440AC/DC** 259746		
		NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	12 V AC/DC	**NZM2/3-XA12AC/DC** 259752		1 off	
			24 V AC/DC	**NZM2/3-XA24AC/DC** 259754		
			48 V AC/DC	**NZM2/3-XA48AC/DC** 259756		
			60 V AC/DC	**NZM2/3-XA60AC/DC** 259758		
			110 V-130 V AC/DC	**NZM2/3-XA110-130AC/DC** 259760		
			208 V-250 V AC/DC	**NZM2/3-XA208-250AC/DC** 259763		
			380 V-440 V AC/DC	**NZM2/3-XA380-440AC/DC** 259766		
		NZM4(-4), N(S)4(-4)	12 V AC/DC	**NZM4-XA12AC/DC** 266446		1 off	
			24 V AC/DC	**NZM4-XA24AC/DC** 266447		
			48 V AC/DC	**NZM4-XA48AC/DC** 266448		
			60 V AC/DC	**NZM4-XA60AC/DC** 266449		
			110 V-130 V AC/DC	**NZM4-XA110-130AC/DC** 266450		
			208 V-250 V AC/DC	**NZM4-XA208-250AC/DC** 266451		
			380 V-440 V AC/DC	**NZM4-XA380-440AC/DC** 266452		

Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	With screw terminal **Part no.** Article no. With screw terminal	**Price** See price list	Std. pack	**Notes**
Shunt releases					
Capacitor unit 230 V 50/60 Hz in conjunction with shunt release NZM...-XA208-250 AC/DC Enclosure: degree of protection IP20 Not UL/CSA approved					Enables the reliable use of circuit-breakers as mesh network circuit-breakers in the range from 0 – 110 % U_n with constant switch-off time of 40 ms. If the mains voltage is absent, the installed capacitor supplies power for actuating the shunt release for at least 12 hours. The capacitor unit is arranged independently of the circuit-breaker. Connect NZM-XCM to the power feed side. Note on engineering: Connect a standard auxiliary contact (HIN) as N/O in series with the coil of the shunt release! Standard auxiliary contact not included as standard.
	NZM1(-4), N(S)1(-4) NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM-XCM** 229413		1 off	

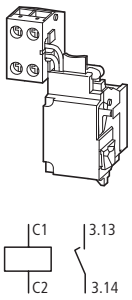
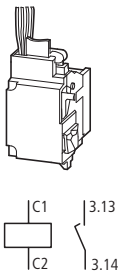
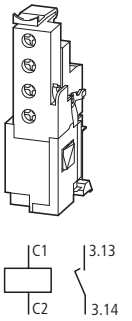
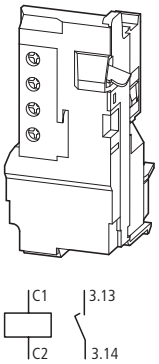
			Part no. Article no. With screw terminal	**Price** See price list	Std. pack	**Notes**
Shunt releases						
For mesh network circuit-breakers For intermittent operation Maximum On-time = 1 s Operating range 10-110 % U_s Not UL/CSA approved						Rated control voltage 230 V AC For use with NZM3(-4), N3(-4) and NZM4(-4), N4(-4) Cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or undervoltage release NZM...-XU... . Intermittent operation guaranteed by series connection of a make contact M22-(C)K10. The maximum duty factor of the shunt releases for mesh network circuit-breakers is 1 s.
		Without auxiliary contacts	**NZM3-XA-230AC-MNS** 274097		1 off	
		With early-make auxiliary contact	**NZM3-XAHIV-230AC-MNS** 274141		1 off	
		Without auxiliary contacts	**NZM4-XA-230AC-MNS** 274138			
		With early-make auxiliary contact	**NZM4-XAHIV-230AC-MNS** 274143		1 off	



①	Reverse power relay contact from mesh network relay
-S11	Remote off
q	Standard auxiliary contacts
-Q1	Shunt releases

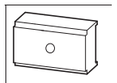
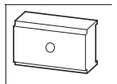
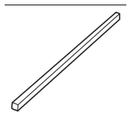
NZM...-XAHIV:
Cannot be used in conjunction with remote operator NZM...-XR....

NZM3: Early make of auxiliary contact on switching on and off (manual operation): approx. 20 ms.
NZM4: Early make of auxiliary contact on switching on (manual operation): approx. 90 ms.

	For use with	Rated control voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Shunt releases						
With early-make auxiliary contact						
Not in combination with remote operator.						
	With clamp terminal on left switch side.	NZM1(-4), N(S)1(-4)	12 V AC/DC	**NZM1-XAHIV12AC/DC** 259772		1 off	When the shunt release is live, contact with the switch's main contacts on switching on is reliably prevented. Early make of auxiliary contact on switching on and off (manual operation): approx. 20 ms. Undervoltage release cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or undervoltage release NZM...-XU...
			24 V AC/DC	**NZM1-XAHIV24AC/DC** 259774			
			48 V AC/DC	**NZM1-XAHIV48AC/DC** 259776			
			60 V AC/DC	**NZM1-XAHIV60AC/DC** 259778			
			110 V-130 V AC/DC	**NZM1-XAHIV110-130AC/DC** 259780			
			208 V-250 V AC/DC	**NZM1-XAHIV208-250AC/DC** 259782			
			380 V-440 V AC/DC	**NZM1-XAHIV380-440AC/DC** 259784			
	With 3 m connection cable instead of screw connection .	NZM1(-4), N(S)1(-4)	12 V AC/DC	**NZM1-XAHIVL12AC/DC** 259790		1 off	
			24 V AC/DC	**NZM1-XAHIVL24AC/DC** 259792			
			110 V-130 V AC/DC	**NZM1-XAHIVL110-130AC/DC** 259798			
			208 V-250 V AC/DC	**NZM1-XAHIVL208-250AC/DC** 259800			
			380 V-440 V AC/DC	**NZM1-XAHIVL380-440AC/DC** 259802			
		NZM2(-4), N(S)2(-4) NZM3(-4), N(S)3(-4)	12 V AC/DC	**NZM2/3-XAHIV12AC/DC** 259808		1 off	
			24 V AC/DC	**NZM2/3-XAHIV24AC/DC** 259810			
			48 V AC/DC	**NZM2/3-XAHIV48AC/DC** 259812			
			60 V AC/DC	**NZM2/3-XAHIV60AC/DC** 259814			
			110 V-130 V AC/DC	**NZM2/3-XAHIV110-130AC/DC** 259816			
			208 V-250 V AC/DC	**NZM2/3-XAHIV208-250AC/DC** 259818			
			380 V-440 V AC/DC	**NZM2/3-XAHIV380-440AC/DC** 259820			
		NZM4(-4), N(S)4(-4)	12 V AC/DC	**NZM4-XAHIV12AC/DC** 266470		1 off	When the shunt release is live, contact with the switch's main contacts on switching on is reliably prevented. Early make of auxiliary contact on switching on (manual operation): approx. 90 ms. Cannot be used in conjunction with remote operator NZM...-XR.... Undervoltage release cannot be installed simultaneously with early-make auxiliary contact NZM...-XHIV... or undervoltage release NZM...-XU...
			24 V AC/DC	**NZM4-XAHIV24AC/DC** 266471			
			48 V AC/DC	**NZM4-XAHIV48AC/DC** 266472			
			60 V AC/DC	**NZM4-XAHIV60AC/DC** 266473			
			110 V-130 V AC/DC	**NZM4-XAHIV110-130AC/DC** 266474			
			208 V-250 V AC/DC	**NZM4-XAHIV208-250AC/DC** 266475			
			380 V-440 V AC/DC	**NZM4-XAHIV380-440AC/DC** 266476			

Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

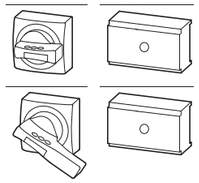
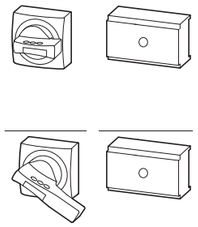
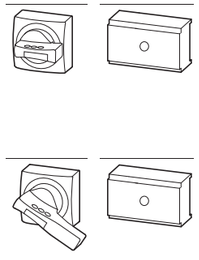
Product view		For use with	Standard **Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	For maximum shaft length 60 mm **Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	Extremely narrow fittings **Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Door coupling rotary handles															
Complete including rotary drive and coupling parts An additional extension shaft is necessary with the NZM...-XT(V)D(V)(R)(-60) part numbers. Degree of protection IP66/UL/CSA type 4X, 12															
Standard, black/grey															
		Lockable in 0 position on handle with up to 3 padlocks. With door interlock.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XTVD** 260166		1 off	**NZM1-XTVD-60** 271504		1 off	Door interlock • Can **not** be defeated in the locked OFF and ON positions • Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position. • Door can be opened in OFF NZM…-XTVD(V)-60 • For maximum shaft length 60 mm • Without shaft support • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	**NZM1-XTVD-0** 279392		1 off	Door interlock • Can **not** be defeated in the locked OFF and ON positions • Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position. • Door can be opened in OFF NZM…-XTVD(V)-0 • For extremely narrow fittings • With special short extension shaft • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E140305 UL CCN DIHS CSA File No. 022086 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified Degree of Protection IEC: IP66, UL/CSA Type 4X, 12
			NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XTVD** 260168			**NZM2-XTVD-60** 271505				**NZM2-XTVD-0** 279393				
			NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XTVD** 260170			**NZM3-XTVD-60** 271506				**NZM3-XTVD-0** 279394				
			NZM4(-4), N(S)4(-4)	**NZM4-XTVD** 266614			**NZM4-XTVD-60** 271507				**NZM4-XTVD-0** 279395				
		Lockable on handle and switch with up to 3 padlocks. Can be locked in 0 position, with adequate modification also in I position. With door interlock. Lockable on switch in 0 position.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XTVDV** 260172			**NZM1-XTVDV-60** 271508				**NZM1-XTVDV-0** 279396				
			NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XTVDV** 260174			**NZM2-XTVDV-60** 271509				**NZM2-XTVDV-0** 279397				
			NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XTVDV** 260176			**NZM3-XTVDV-60** 271510				**NZM3-XTVDV-0** 279398				
			NZM4(-4), N(S)4(-4)	**NZM4-XTVDV** 266616			**NZM4-XTVDV-60** 271511				**NZM4-XTVDV-0** 279399				
Red-yellow for emergency switching off															
		Lockable on handle and switch with up to 3 padlocks. Lockable in 0 position on handle. With door interlock. Lockable on switch in 0 position.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XTVDVR** 260178		1 off	**NZM1-XTVDVR-60** 271512		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position. • Door can be opened in OFF NZM…-XTVDVR-60 • For maximum shaft length 60 mm • Without shaft support • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	**NZM1-XTVDVR-0** 279400		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position. • Door can be opened in OFF NZM…-XTVDVR-0 • For extremely narrow fittings • With special short extension shaft • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	
			NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XTVDVR** 260180			**NZM2-XTVDVR-60** 271513				**NZM2-XTVDVR-0** 279401				
			NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XTVDVR** 260182			**NZM3-XTVDVR-60** 271514				**NZM3-XTVDVR-0** 279402				
			NZM4(-4), N(S)4(-4)	**NZM4-XTVDVR** 266618			**NZM4-XTVDVR-60** 271515				**NZM4-XTVDVR-0** 279403				
Extension shaft															
	–	400 mm max. mounting depth	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV4** 261232		1 off	–			–	–			–	UL/CSA certification not required
			NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV4** 261234			–				–				
		600 mm max. mounting depth	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV6** 260191			–				–				
			NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV6** 260193			–				–				

Notes Circuit-breaker can also be installed in a horizontal position 90° left/right, with the handle still in the same position.

Door coupling rotary handles for North America

NZM1, NZM2, NZM3, NZM4

HPL17120EN

Product view	For use with	Standard **Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Door coupling rotary handles Complete including rotary drive and coupling parts Extension shaft additionally required. Degree of protection IP66/UL/CSA type 4X, 12 Difference to normal IEC handles: Door opening only possible with active rotation beyond the 0 position.					
Standard, black/grey					
 Lockable in 0 position on handle. With door interlock.	NZM1, N1	**NZM1-XTVD-NA** 271445		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on.
	NZM2, N2	**NZM2-XTVD-NA** 271446			
	NZM3, N3	**NZM3-XTVD-NA** 271447			
	NM4, N4	**NZM4-XTVD-NA** 271448			
 Lockable on handle and switch with up to 3 padlocks. Lockable in 0 position on handle. With door interlock. Lockable on switch in 0 position.	NZM1, N(S)1	**NZM1-XTVDV-NA** 100683		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening possible with active rotation beyond the 0 position. Can be defeated from the outside using a screwdriver. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on.
	NZM2, N(S)2	**NZM2-XTVDV-NA** 100684			
	NZM3, N(S)3	**NZM3-XTVDV-NA** 100685			
	NZM4, N(S)4	**NZM4-XTVDV-NA** 100686			
Red-yellow for emergency switching off					
 Lockable on handle and switch with up to 3 padlocks. Lockable in 0 position on handle. With door interlock. Lockable on switch in 0 position.	NZM1, N(S)1	**NZM1-XTVDVR-NA** 271449		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on.
	NZM2, N(S)2	**NZM2-XTVDVR-NA** 271450			
	NZM3, N(S)3	**NZM3-XTVDVR-NA** 271451			
	NZM4, N(S)4	**NZM4-XTVDVR-NA** 271452			
Extension shaft					
	400 mm max. mounting depth NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV4** 261232		1 off	Length 290 mm, can be cut to required length.
	NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV4** 261234			
	600 mm max. mounting depth NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV6** 260191			Length 425 mm, can be cut to required length.
	NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV6** 260193			

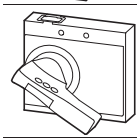
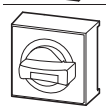
Notes Circuit-breaker can also be installed in a lying position 90° left/right, with the handle still in the same position.

Door coupling rotary handles for North America

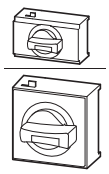
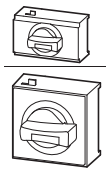
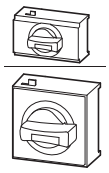
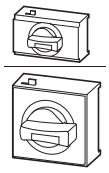
NZM1, NZM2, NZM3, NZM4

HPL17121EN

For maximum shaft length 60 mm **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	Extremely narrow fittings **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
–			–	–			–	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E140305 UL CCN DIHS CSA File No. 022086 CSA Class No.1437-01 NA Certification UL Listed, CSA certified Degree of Protection IEC: IP66, UL/CSA Type 4X, 12
–				–				
–				–				
–				–				
NZM1-XTVDV-60-NA 100667		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening possible with active rotation beyond the 0 position. Can be defeated from the outside using a screwdriver. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on. NZM…-XTVDV-60-NA • For a maximum shaft length of 60 mm • Without shaft support • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	**NZM1-XTVDV-0-NA** 100675		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening possible with active rotation beyond the 0 position. Can be defeated from the outside using a screwdriver. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on. NZM…-XTVDV-0-NA • For extremely narrow fittings • With special short extension shaft • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	
NZM2-XTVDV-60-NA 100668				**NZM2-XTVDV-0-NA** 100676				
NZM3-XTVDV-60-NA 100669				**NZM3-XTVDV-0-NA** 100677				
NZM4-XTVDV-60-NA 100670				**NZM4-XTVDV-0-NA** 100678				
NZM1-XTVDVR-60-NA 100671		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on. NZM…-XTVDVR-60-NA • For a maximum shaft length of 60 mm • Without shaft support • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	**NZM1-XTVDVR-0-NA** 100679		1 off	Door interlock • Can **not** be defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • Cannot be combined with mechanical interlock • External warning plate/designation label can be clipped on. NZM…-XTVDVR-0-NA • For extremely narrow fittings • With special short extension shaft • Cannot be combined with additional handle NZM...-XDZ • External warning plate/designation label can be clipped on.	
NZM2-XTVDVR-60-NA 100672				**NZM2-XTVDVR-0-NA** 100680				
NZM3-XTVDVR-60-NA 100673				**NZM3-XTVDVR-0-NA** 100681				
NZM4-XTVDVR-60-NA 100674				**NZM4-XTVDVR-0-NA** 100682				
–			–	–			–	UL/CSA certification not required
–				–				
–				–				
–				–				

		For use with	**Part no.** Article no. for separate order	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Rotary handle on circuit-breaker							
Complete with rotary drive							
Standard, black/grey							
   	Lockable in 0 position on switch with up to 3 padlocks.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDV** 260125		1 off	NZM1, 2, 3: Can also be combined with insulating surround. MODAN handle position detection by wire release can be retrofitted.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDV** 260127				
		NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XDV** 260129				
		NZM4(-4), N(S)4(-4)	**NZM4-XDV** 266608				
 	Lockable in 0 position on handle with up to 3 padlocks.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDVG** 285247		1 off	Can also be combined with insulating surround.	
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDVG** 285248				
Red-yellow for emergency switching off							
   	Lockable in 0 position on switch with up to 3 padlocks.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDVR** 260135		1 off	NZM1, 2, 3: Can also be combined with insulating surround. MODAN handle position detection by wire release can be retrofitted.	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDVR** 260137				
		NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XDVR** 260140				
		NZM4(-4), N(S)4(-4)	**NZM4-XDVR** 266610				
 	Lockable in 0 position on handle with up to 3 padlocks.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDVGR** 285249		1 off	Can also be combined with insulating surround.	
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDVGR** 285280				

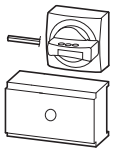
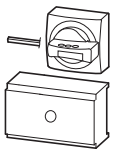
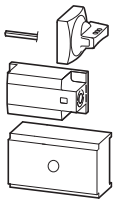
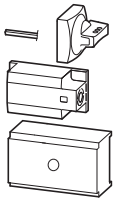
Notes Circuit-breaker can also be installed in a lying position 90° left/right, with the handle still in the same position.

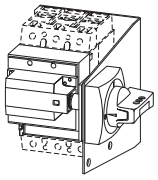
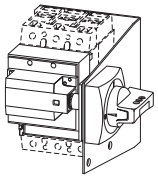
		For use with	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes	Information relevant for export to North America
Rotary handles on switch with door interlock							
Complete with rotary drive and insulating surround							
Standard, black/grey							
	Lockable in 0 position on handle with up to 3 padlocks, can also be modified for the I position. Also available with door interlock e.g. for MCC service distribution.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDTV** 260131		1 off	Door interlock • In the ON position, can be defeated from the outside using a 1 mm pin • Can **not** be defeated in the locked OFF and ON positions • Door can be opened in OFF • Can only be switched ON when the door is closed	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDTV** 260133				
Red-yellow for emergency switching off							
	Lockable in 0 position on handle with up to 3 padlocks. Also available with door interlock e.g. for MCC service distribution.	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XDTVR** 260142		1 off		
		NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XDTVR** 260144				
Rotary handles on switch with door interlock for UL/CSA approved NA switches							
Difference to normal IEC handles: Door opening only possible with active rotation beyond the 0 position.							
Complete with rotary drive and insulating surround							
Standard, black/grey							
	Lockable in 0 position on handle with up to 3 padlocks, can also be modified for the I position. Also available with door interlock e.g. for MCC service distribution.	NZM1, N(S)1	**NZM1-XDTV-NA** 271453		1 off	Door interlock • In the ON position, can be defeated from the outside using a 1 mm pin • Can **not** be defeated in the locked OFF and ON positions • Door opening only possible with active rotation beyond the 0 position. • Can only be switched ON when the door is closed • Cannot be combined with mechanical interlock	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified
		NZM2, N(S)2	**NZM2-XDTV-NA** 271454				
Red-yellow for emergency switching off							
	Lockable in 0 position on handle with up to 3 padlocks. Also available with door interlock e.g. for MCC service distribution.	NZM1, N(S)1	**NZM1-XDTVR-NA** 271455		1 off		
		NZM2, N(S)2	**NZM2-XDTVR-NA** 271456				

Notes Circuit-breaker can also be installed in a lying position 90° left/right, with the handle still in the same position.

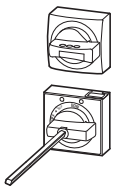
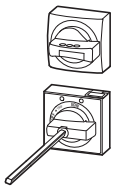
Main switch assembly kit

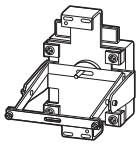
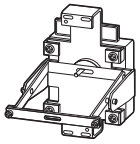
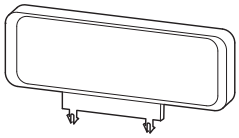
NZM...-XHB..., NZM...-XS...

	Model	For use with	Part no. Article no. for separate order	Price See price list	Std. pack	Information relevant for export to North America
Main switch assembly kit						
Equipment supplied: • Door coupling rotary handle • Extension shaft NZM...-XV4 • External warning plate/designation label in German/English • Black and yellow flash For enhanced protection against direct contact on the incomer side, IP2X protection against contact with a finger can be ordered → Page 17/84 Other external warning plates/designation labels can be clipped on. Degree of protection IP66/UL/CSA type 4X, 12						
With black door coupling rotary handle						
 Lockable in 0 position on handle with up to 3 padlocks, can also be modified for the I position. With door interlock.	–	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XHB** 266626		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
	–	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHB** 266627			
	–	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHB** 266628			
	–	NZM4(-4) N(S)4(-4)	**NZM4-XHB** 271779			
With red door coupling rotary handle for use of switch as emergency switching off device to IEC/EN 60204-1						
 Lockable in 0 position on handle with up to 3 padlocks. Lockable door as additional feature, locking facility on circuit-breaker in 0 position.	–	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XHBR** 266632			
	–	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHBR** 266633			
	–	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHBR** 266634			
	–	NZM4(-4) N(S)4(-4)	**NZM4-XHBR** 271842			
For side wall installation Actuation of the switch on the control panel side wall Switch mounting on mounting plate						
Standard, black/grey						
 Lockable in 0 position on handle with up to 3 padlocks, with adequate modification also in I position.	For operation on the left	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XS-L** 266641		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XS-L** 266642			
		NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XS-L** 266643			
		NZM4(-4) N(S)4(-4)	**NZM4-XS-L** 289806			
	For operation on the right	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XS-R** 266644			
		NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XS-R** 266645			
		NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XS-R** 266646			
		NZM4(-4) N(S)4(-4)	**NZM4-XS-R** 289807			
Red-yellow for emergency switching off						
 Lockable in 0 position on handle with up to 3 padlocks.	For operation on the left	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSR-L** 266653		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSR-L** 266654			
		NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XSR-L** 266655			
		NZM4(-4) N(S)4(-4)	**NZM4-XSR-L** 289808			
	For operation on the right	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSR-R** 266656			
		NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSR-R** 266657			
		NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XSR-R** 266658			
		NZM4(-4) N(S)4(-4)	**NZM4-XSR-R** 289809			

		Model	For use with	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Information relevant for export to North America**
Main switch assembly kit for side wall installation with mounting bracket.							
For direct mounting of circuit-breaker and handle in the side wall of the control cabinet Equipment supplied: • Door coupling rotary handle • Mounting bracket • Special short extension shaft • External warning plate/designation label in German/English • Black and yellow flash For enhanced protection against direct contact on the incomer side, IP2X protection against contact with a finger can be ordered → Page 17/84 Other external warning plates/designation labels can be clipped on. Degree of protection IP66/UL/CSA type 4X, 12							
Standard, black/grey							
	Lockable in 0 position, with adequate modification also in I position. Minimum clearance between control panel side walls and circuit-breaker is defined by mounting bracket. Extension cannot be used.	For operation on the left	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSM-L** 266663		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		For operation on the left	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSM-L** 266664			
		For operation on the right	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSM-R** 266665			
		For operation on the right	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSM-R** 266666			
Red-yellow for emergency switching off							
	Lockable in 0 position on handle. Minimum clearance between control panel side walls and circuit-breaker is defined by mounting bracket. Extension cannot be used.	For operation on the left	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSRM-L** 266671		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		For operation on the left	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSRM-L** 266672			
		For operation on the right	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XSRM-R** 266673			
		For operation on the right	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XSRM-R** 266674			
Additional plate							
For fitting to the mounting bracket when using neutral conductor or PE conductor terminals K25, K50, K95 or K150.							
	–	–	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), N(S)2(-4)	**NZM1/2-XZB** 266676		1 off	UL/CSA certification not required

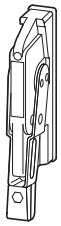
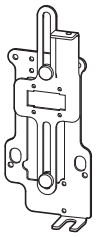
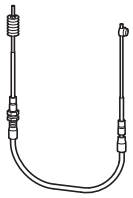
Notes Additional terminal arrangement for side wall operator with mounting bracket.
→ Engineering, Page 17/153

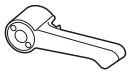
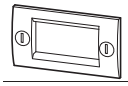
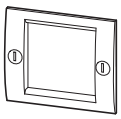
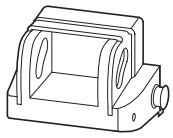
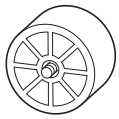
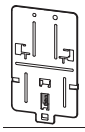
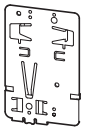
	Model	For use with	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Information relevant for export to North America**
Main switch assembly kit with additional rotary handle						
Main switch assembly kit with additional rotary handle for switching with opened control panel door Equipment supplied: • Door coupling rotary handle • Additional rotary handle on switch with "Deliberate Action" operation • Extension shaft NZM…-XV6 for mounting depth 600 mm, NZM1/2-XV4 with NZM1 for mounting depth 400 mm • External warning plate/designation label in German/English • Black and yellow flash For enhanced protection against direct contact on the incomer side, IP2X protection against contact with a finger can be ordered → Page 17/84 Other external warning plates/designation labels can be clipped on. Degree of protection IP66/UL/CSA type 4X, 12						
With black door coupling rotary handle						
	Lockable in 0 position on handle with up to 3 padlocks, can also be modified for the I position. Lockable door as additional feature, locking facility on circuit-breaker in 0 position.	IEC	NZM1(-4) PN1(-4), N1(-4)	**NZM1-XHB-DA** 125956		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		UL/CSA	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XHB-DA-NA** 125958			
		IEC	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHB-DA** 116895			
		UL/CSA	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHB-DA-NA** 116897			
		IEC	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHB-DA** 118988			
		UL/CSA	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHB-DA-NA** 119000			
		IEC	NZM4(-4) PN4(-4), N(S)4(-4)	**NZM4-XHB-DA** 119002			
		UL/CSA	NZM4(-4) PN4(-4), N(S)4(-4)	**NZM4-XHB-DA-NA** 119004			
With red door coupling rotary handle For use of switch as emergency switching off device							
	Lockable in 0 position on handle with up to 3 padlocks. With door interlock and lockable on switch in 0 position.	IEC	NZM1(-4) PN1(-4), N1(-4)	**NZM1-XHB-DAR** 125957		1 off	Product Standards: UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No.: E140305 UL CCN: DIHS CSA File No.: 022086 CSA Class No.: 1437-01 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP66, UL/CSA Type 4X, 12
		UL/CSA	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XHB-DAR-NA** 125959			
		IEC	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHB-DAR** 116896			
		UL/CSA	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XHB-DAR-NA** 116898			
		IEC	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHB-DAR** 118989			
		UL/CSA	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XHB-DAR-NA** 119001			
		IEC	NZM4(-4) PN4(-4), N(S)4(-4)	**NZM4-XHB-DAR** 119003			
		UL/CSA	NZM4(-4) PN4(-4), N(S)4(-4)	**NZM4-XHB-DAR-NA** 119005			

		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Rear-mounted drives						
For direct rear connection of the switch to the side of the control panel or control panel door. Switch actuation on rear through side wall or control panel door. For switch with toggle lever. For enhanced protection against direct contact on the incomer side, IP2X protection against contact with a finger can be ordered → Page 17/84 Degree of protection IP66, UL/CSA type 4X, 12						
Standard, black/grey						
	Lockable in 0 position on handle with up to 3 padlocks.	NZM1, N1, NS1, PN1	**NZM1-XRAV** 107245		1 off	External warning plate can be clipped on
		NZM2, N2, NS2, PN2	**NZM2-XRAV** 107247			
Red-yellow for emergency switching off						
	Lockable in 0 position on handle with up to 3 padlocks.	NZM1, N1, NS1, PN1	**NZM1-XRAVR** 107249		1 off	
		NZM2, N2, NS2, PN2	**NZM2-XRAVR** 107261			
External warning plate/designation label						
						
"Main switch – open in 0 position"	German/English	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4) NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**ZFS61/62-NZM7** 272525		10 off	A bilingual external warning plate/ designation label in German/English is already included in the main switch assembly kit.
	German		**ZFS61-NZM7** 051089			
	English		**ZFS62-NZM7** 065957			
	French		**ZFS63-NZM7** 065958			
	Chinese/English		**ZFS82-NZM** 104910		1 off	External warning plates are available in the following languages: 64 Bulgarian, 65 Danish, 66 Finnish, 67 Dutch, 68 Italian, 69 Greek, 70 Norwegian, 71 Polish, 72 Portuguese, 73 Romanian, 74 Russian, 75 Swedish, 76 Serbo-Croatian, 77 Spanish, 78 Czech, 79 Turkish, 80 Hungarian, 81 Afrikaans, 82 Chinese/English, 83 Chinese. To obtain the order number, insert the language code number into the part number required. **Ordering example** External warning plate in Finnish: ZFS**66**-NZM7
	Chinese		**ZFS83-NZM** 105945			
	Further languages		**ZFS*-NZM7** 999978			
Symbol	Circuit-breaker symbol		**ZFS-LS-NZM** 104829			
	Switch-disconnector symbol		**ZFS-LTS-NZM** 104828			
	Disconnector symbol		**ZFS-TS-NZM** 115365			
Blank	Blank (for engraving or printing)		**ZFS60-NZM7** 065896		10 off	
Lightning symbol						
Including terminal marking for main switch						
Small		NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**BPF-NZM7** 217294		10 off	Included as standard in main switch assembly kit Marking of the input side of the switch is possible
Large		NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**BPF-NZM10** 231363			

Information relevant for export to North America

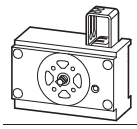
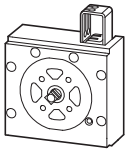
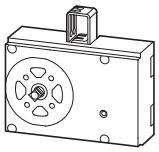
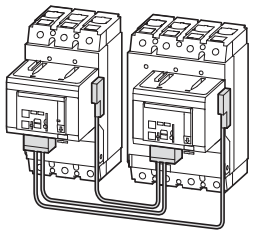
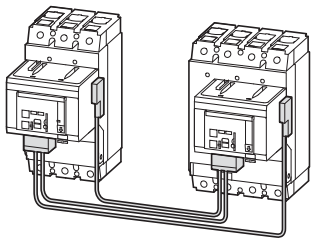
Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP66, UL/CSA Type 4X, 12

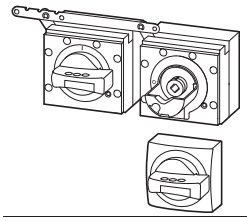
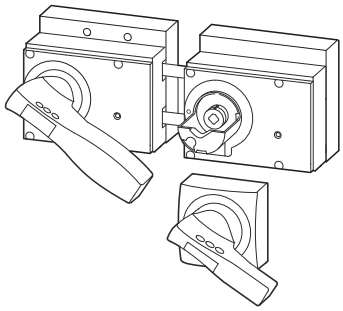
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Side-mounted handle						
For mounting outside the control panel door. Actuation of a switch with toggle lever using a Bowden cable and mechanical components mounted on the front of the switch. For switch with toggle lever. **Caution! Intended exclusively for use outside the scope of validity of the IEC/EN 60947 area**.						
Handle, metal, black/red						
 Degree of protection UL/CSA Type 12	NZM2…-NA, NS2…-NA NZM3…-NA, NS3…-NA	**NZM-XSHGVR12-NA** 107269		1 off	Lockable in 0-position on handle with up to 3 padlocks, for 1 door of an American style control panel (door plus wide bar beside the door). For each handle 1 additional mechanical unit and 1 Bowden cable is required.	Product Standards UL489; CSA-C22.2 No. 5-09 UL File No. E140305 UL CCN DIHS CSA File No. 236770 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified Degree of Protection IEC: IP66, UL/CSA Type 12
Degree of protection UL/CSA Type 4X		**NZM-XSHGVR4X-NA** 107268				Product Standards UL489; CSA-C22.2 No. 5-09 UL File No. E140305 UL CCN DIHS CSA File No. 236770 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified Degree of Protection IEC: IP66, UL/CSA Type 4X
Mechanical unit						
	NZM2…-NA, NS2…-NA	**NZM2-XSHM-NA** 107266		1 off	For mounting on the front of a switch with toggle lever, including fixing sundries.	UL/CSA certification not required
	NZM3…-NA, NS3…-NA	**NZM3-XSHM-NA** 107267				
Bowden cables						
 Nominal length 36" = 91.4 cm	NZM2…-NA, NS2…-NA NZM3…-NA, NS3…-NA	**NZM-XSHBZ36-NA** 107263		1 off	–	Product Standards UL489; CSA-C22.2 No. 5-09 UL File No. E140305 UL CCN DIHS CSA File No. 236770 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified
Nominal length 48" = 121.9 cm		**NZM-XSHBZ48-NA** 107264				
Nominal length 60" = 152.4 cm		**NZM-XSHBZ60-NA** 107265				Product Standards UL489; CSA-C22.2 No. 5-09 UL File No. E140306 UL CCN DIHS CSA File No. 236771 CSA Class No. 1437-02 NA Certification UL Listed, CSA certified

	For use with	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes
Additional handle					
Enables switching when control panel door is open					
	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XDZ** 266621		1 off	Push-fits on to the extension shaft. 100 mm free extension shaft required. Cannot be combined with door coupling rotary handles NZM...-XT...-60 or NZM...-XT...0.
	NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XDZ** 266622			
Insulating surround					
For toggle levers, rotary handles with rotary drive and remote operators Degree of protection IP40					
	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XBR** 260195		1 off	For rectangular cut-out on doors and enclosures with material thicknesses of 1.5 – 5 mm. External warning plate/designation label can be clipped on. NZM4-XBR can not be combined with rotary handle with rotary mechanism.
	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XBR** 260197			
	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XBR** 284645			
	NZM4(-4) N(S)4(-4)	**NZM4-XBR** 284646			
Toggle lever locking device					
Lockable in Off position with up to three padlocks (hasp thickness 4 – 8 mm)					
	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XKAV** 260199		1 off	Cannot be combined with insulating surround.
	NZM2(-4), PN2(-4), N(S)2(-4) NZM3(-4), PN3(-4), N(S)3(-4)	**NZM2/3-XKAV** 260201			
Spacers					
Enables fast and attractively priced offsetting of varying construction sizes with/without rotary handle or remote operator to the same front depth					
	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XAB** 260203		1 set	Grid depth 17.5 mm, M4 thread One set contains 4 spacers Maximum component fitting: NZM1: 4 off per fixing screw, NZM2: 2 off per fixing screw, 2 (NZM1) or 4 (NZM2) fixing screws contained per switch
	NZM3(-4) PN3(-4), N(S)3(-4) NZM4(-4) N(S)4(-4)	**NZM3-XAB** 260211			Grid depth 17.5 mm, M5 thread One set contains 4 spacers NZM3, NZM4: 1 off per fixing screw 4 fixing screws per switch included
Clips					
Allows switches to be clipped onto DIN rails					
	NZM1(-4) PN1(-4) N(S)1(-4)	**NZM1-XC35** 260213		1 off	For 35 mm top-hat rails
	NZM2(-4) PN2(-4) N(S)2(-4)	**NZM2-XC75** 260215			For 75 mm top-hat rails Not in combination with remote operator.

Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

	For use with	Part no. Article no. for separate order	Price See price list	Std. pack	Notes	Information relevant for export to North America
Mechanical interlock for (door coupling) rotary handles						
	NZM1(-4) PN1(-4), N(S)1(-4)	**NZM1-XMV** 281581		1 off	Allows interlocking of 2, 3 or 4 switches, including different construction sized switches, with Bowden cables. For every switch an interlocking module NZM…-XMV and a rotary handle on switch NZM…-XDV or a door coupling rotary handle NZM…-XTVD and Bowden cables are required. Possible combinations and interlock variants, → Engineering Cannot be combined with UL/CSA door coupling rotary handles NZM…-XTV…-NA, paralleling mechanisms, side wall operators, remote operators or insulating surrounds. Selection and combinations of required Bowden cables → Engineering	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E140305 UL CCN DIHS CSA File No. 022086 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified
	NZM2(-4) PN2(-4), N(S)2(-4)	**NZM2-XMV** 281582				
	NZM3(-4) PN3(-4), N(S)3(-4)	**NZM3-XMV** 281583				
	NZM4(-4) N(S)4(-4)	**NZM4-XMV** 281584				
Bowden cables						
For mechanical interlock for (door coupling) rotary handles						
 Length: 225 mm	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4) NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM-XBZ225** 281585		1 off	Selection and combinations of Bowden cables → Engineering	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E140305 UL CCN DIHS CSA File No. 022086 CSA Class No. 1437-01 NA Certification UL Listed, CSA certified
Length: 600 mm		**NZM-XBZ600** 281586				
Length: 1000 mm		**NZM-XBZ1000** 281587				
Mechanical interlock for remote operator						
For 2 switches of the same or different construction size with opposed operation. Adjacent mounting.						
	NZM2(-4), N(S)2(-4) +NZM2(-4), N(S)2(-4)	**NZM2-XMVR** 104543		1 off	Contains parts for both switch sides. Extension shaft additionally required. Maximum switch spacing → Engineering Can not be combined with rotary handles, door coupling rotary handles, early-make auxiliary contacts, and direct-switching remote operator NZM2-XRD.	–
	NZM2(-4), N(S)2(-4) +NZM3(-4), N(S)3(-4)	**NZM2/3-XMVR** 104544				
	NZM3(-4), N(S)3(-4) +NZM3(-4), N(S)3(-4)	**NZM3-XMVR** 104545				
	NZM3(-4), N(S)3(-4) +NZM4(-4), N(S)4(-4)	**NZM3/4-XMVR** 104546				
	NZM4(-4), N(S)4(-4) +NZM4(-4), N(S)4(-4)	**NZM4-XMVR** 104547				
For 2 switches of the same or different construction size with opposed operation. Extra long Bowden cable for mounting one above the other or in adjacent enclosures.						
	NZM2(-4), N(S)2(-4) +NZM2(-4), N(S)2(-4)	**NZM2-XMVRL** 104548		1 off	Contains parts for both switch sides. Extension shaft additionally required. Maximum switch spacing → Engineering Can not be combined with rotary handles, door coupling rotary handles, early-make auxiliary contacts, and direct-switching remote operator NZM2-XRD.	–
	NZM2(-4), N(S)2(-4) +NZM3(-4), N(S)3(-4)	**NZM2/3-XMVRL** 104549				
	NZM3(-4), N(S)3(-4) +NZM3(-4), N(S)3(-4)	**NZM3-XMVRL** 104550				
	NZM3(-4), N(S)3(-4) +NZM4(-4), N(S)4(-4)	**NZM3/4-XMVRL** 104551				
	NZM4(-4), N(S)4(-4) +NZM4(-4), N(S)4(-4)	**NZM4-XMVRL** 104552				

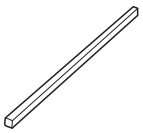
	For use with	Part no. Article no. for separate order	Price See price list	Std. pack	Notes	Information relevant for export to North America
Paralleling mechanism Simultaneous actuation of 2 PN switch-disconnectors of the same type mounted side-by-side. Not UL/CSA approved						
	PN1(-4) + PN1(-4)	**PN1-XPA** 283471		1 off	**PN1, PN2** • 1 × rotary handle on switch (-XD) supplied. • 1 × door coupling rotary handle (-XTVD) supplied.	–
	PN2(-4) + PN2(-4)	**PN2-XPA** 283472				
	PN3(-4) + PN3(-4)	**PN3-XPA** 283473			**PN3** • 1 × rotary handle on switch (not lockable) supplied. • 1 × door coupling rotary handle (not lockable) supplied. • Not suitable for use as a main switch.	

Notes

Extension shaft (-XV4(6)) additionally required for the door coupling rotary handle.
Cannot be combined with mechanical interlock, insulating surrounds, side wall operators or remote operators.

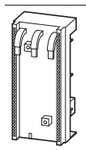
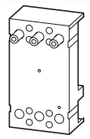
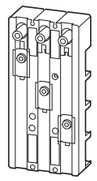
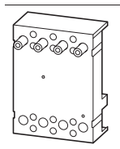
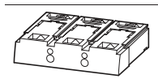
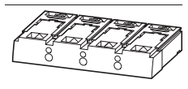
For use as emergency switching off device
For this the door coupling rotary handle requires an exchange thumb-grip in red/yellow according to the following order number:
- for PN1 and PN2: NZM2-XDGVR → 100747
- for PN3: NZM4-XDGVR → 100774

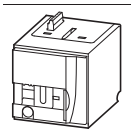
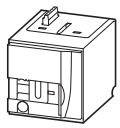
Note: The locking function of these handles must not be used.

		For use with	Part no. Article no. for separate order	Price See price list	Std. pack	Notes	Information relevant for export to North America
Extension shaft							
	400 mm max. built-in depth	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV4** 261232		1 off	Length 290 mm, can be cut to required length.	UL/CSA certification not required
		NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV4** 261234				
	600 mm max. built-in depth	NZM1(-4), PN1(-4), N(S)1(-4) NZM2(-4), PN2(-4), N(S)2(-4)	**NZM1/2-XV6** 260191			Length 425 mm, can be cut to required length.	
		NZM3(-4), PN3(-4), N(S)3(-4) NZM4(-4), N(S)4(-4)	**NZM3/4-XV6** 260193				

Notes

Circuit-breaker can also be installed in a lying position 90° left/right, with the handle still in the same position.

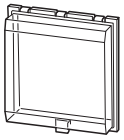
	Number of poles	Rated operational current I_e A	Adapter width mm	For use with	**Part no. suffix** Article no. for ordering with basic device	**Price** See price list	**Part no.** Article no. for separate order	**Price** See price list	Std. pack	**Notes**	**Information relevant for export to North America**
Component adapters for circuit-breakers and switch-disconnectors											
For mounting on flat copper bars 12–30x5–10 mm, double T and triple T profile Rated operating voltage U_e: 690 V • Temperature resistant to 120 °C • Self-extinguishing to UL 94 • Track resistance CTI 200											
	3 pole	160	90	NZM1, PN1, N(S)1	–		**NZM1-XAD160** 104554		1 off	For switch and standard connection with box terminal. Connection to the system at top using supplied connection cable. In conjunction with IP2X protection against contact with a finger. Enhanced contact protection on the switch secondary side. Clips onto busbar with combination foot. Combination foot for adjustment to 5 and 10 mm rail thickness , terminal capacity 6 x 9 x 0.8. Rated short-circuit switching capacity 35 kA at 480 V. Mounted by latching onto de-energized busbar.	Product Standards: UL508A; CSA-C22.2 No. 14; IEC 60439-1; CE marking UL File No.: E300273 UL CCN: NMTR, NMTR7 CSA File No.: 236217 CSA Class No.: 3211-37 NA Certification: UL Listed, CSA certified Conditions of Acceptability: Refer to approbation report Suitable for: Feeder circuits Max. Voltage Rating: 600 V AC Degree of Protection: Feeder circuits
		250	106	NZM2, PN2, N(S)2	–		**NZM2-XAD250** 104555			Connection to the system possible at top or bottom via connection on rear (+)NZM2-XKR4… Mounting using clamp and screw fixing. Rated short-circuit switching capacity 65 kA at 480 V, 50 kA at 600 V. Mounted by latching onto de-energized busbar.	
		630	140	NZM3, PN3, N(S)3	–		**NZM3-XAD630** 107206			Connection to the system possible at top or bottom via connection on rear (+)NZM3-XKR13… For mounting use claw terminal. Rated short-circuit switching capacity 65 kA at 480 V, 50 kA at 600 V. Mounted by latching onto de-energized busbar.	
	4 pole	250	140	NZM2-4, PN2-4, N2-4	–		**NZM2-4-XAD250** 138388			Connection to the system possible at top via connection on rear with (+)NZM2-4-XKR4… Mounting using clamp and screw fixing.	
		630	185	NZM3-4, PN3-4, N3-4	–		**NZM3-4-XAD630** 138389			Connection to the system possible at top via connection on rear with (+)NZM3-4-XKR13… Mounting using clamp and screw fixing.	
Connection block for component adapters											
For NZM2, NZM3 circuit-breakers											
	3 pole	Above	250	–	NZM2, PN2, N(S)2	**+NZM2-XKR4O** 281664			1 off	Part no. and part no. suffix include parts for one switch side at top or bottom (for NZM3 top only). Required with component adapter and switch with connection on rear.	Product Standards: UL 489; CSA-C22.2 No. 5-09; IEC 60947-2; CE marking UL File No.: E31593 UL CCN: DIVQ CSA File No.: 022086 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Feeder circuits, branch circuits Current Limiting CB: Yes Max. Voltage Rating: 480Y/277 V Degree of Protection: IEC: IP20; UL/CSA Type: -
		Below		–	NZM2, PN2, N(S)2	**+NZM2-XKR4U** 281665					
		Above	630	–	NZM3, PN3, N(S)3	**+NZM3-XKR13O** 281667					
		Below		–	NZM3-4, PN3-4, N(S)3-4	**+NZM3-XKR13U** 115796					
	4 pole	Above	250	–	NZM2-4, PN2-4, N(S)2-4	**+NZM2-4-XKR4O** 118905					
		Below		–	NZM3, PN3, N(S)3	**+NZM2-4-XKR4U** 118906					
		Above	630	–	NZM3-4, PN3-4, N(S)3-4	**+NZM3-4-XKR13O** 118908					
		Below		–	NZM2-4, PN2-4, N(S)2-4	**+NZM3-4-XKR13U** 118909					

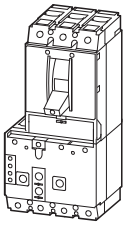
	For use with	Rated control voltage U_s V	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	**Notes**
Remote operators						
For remote switching of circuit-breakers and switch-disconnectors. ON and OFF switching and resetting by means of two-wire or three-wire control. Local switching by hand possible. Lockable in the 0 position of the remote operator with up to 3 padlocks (hasp thickness: 4 – 8 mm)						
Closing delay 110 – 170 ms, opening delay 110 – 170 ms						
	NZM2(-4) N(S)2(-4)	110-130 V 50/60 Hz	**NZM2-XRD110-130AC** 115390		1 off	Sliding switch for "Auto" or "Manual" Max. number auxiliary contacts: - Standard auxiliary contacts: 2 - Trip-indicating auxiliary contact: 1 Cannot be combined with switch-disconnector PN... Cannot be combined with mechanical interlock [1] Not UL/CSA approved
		208-240 V 50/60 Hz	**NZM2-XRD208-240AC** 115391			
		380-440 V 50/60 Hz[1]	**NZM2-XRD380-440AC** 115392			
		24-30 V DC	**NZM2-XRD24-30DC** 115393			
		110-130 V DC	**NZM2-XRD110-130DC** 115394			
		220-250 V DC	**NZM2-XRD220-250DC** 115395			
Closing delay 60 – 100 ms, opening delay 300 – 3000 ms Can be synchronized						
	NZM2(-4) N(S)2(-4)	110-130 V 50/60 Hz	**NZM2-XR110-130AC** 259830		1 off	Cannot be combined with switch-disconnector PN... Dual auxiliary switch M 22-CK11 (20/02) can not be combined with remote operator NZM3-XR...
		208-240 V 50/60 Hz	**NZM2-XR208-240AC** 259832			
		380-440 V 50/60 Hz	**NZM2-XR380-440AC** 259834			
		24-30 V DC	**NZM2-XR24-30DC** 259836			
		48-60 V DC	**NZM2-XR48-60DC** 259838			
		110-130 V DC	**NZM2-XR110-130DC** 259840			
		220-250 V DC	**NZM2-XR220-250DC** 259842			
	NZM3(-4) N(S)3(-4)	110-130 V 50/60 Hz	**NZM3-XR110-130AC** 259848			
		208-240 V 50/60 Hz	**NZM3-XR208-240AC** 259850			
		380-440 V 50/60 Hz	**NZM3-XR380-440AC** 259852			
		24-30 V DC	**NZM3-XR24-30DC** 259854			
		48-60 V DC	**NZM3-XR48-60DC** 259856			
		110-130 V DC	**NZM3-XR110-130DC** 259858			
		220-250 V DC	**NZM3-XR220-250DC** 259860			
	NZM4(-4) N(S)4(-4)	110-130 V 50/60 Hz	**NZM4-XR110-130AC** 266684			
		208-240 V 50/60 Hz	**NZM4-XR208-240AC** 266685			
		380-440 V 50/60 Hz	**NZM4-XR380-440AC** 266686			
		24-30 V DC	**NZM4-XR24-30DC** 266691			
		48-60 V DC	**NZM4-XR48-60DC** 266692			
		110-130 V DC	**NZM4-XR110-130DC** 266693			
		220-250 V DC	**NZM4-XR220-250DC** 266694			

Notes
Two- and three-wire control, circuit diagram → Engineering, Page 17/153

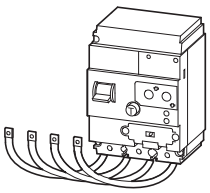
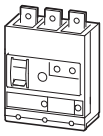
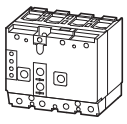
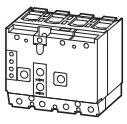
Information relevant for export to North America

Product Standards	UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking
UL File No.	E140305
UL CCN	DIHS
CSA File No.	022086
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified

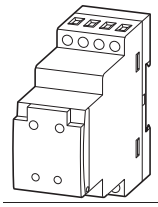
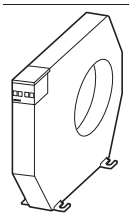
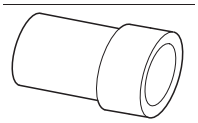
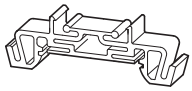
	For use with	Part no. Article no. when ordered separately	Price See price list	Std. pack	Notes
Cover for 4th pole					
Additional shroud for mounting the NZM2-XR... and NZM3-XR... on a 4 pole switch	NZM2-4 N2-4	**NZM2-XAVPR** 266677		1 off	–
	NZM3-4 N3-4	**NZM3-XAVPR** 266678		1 off	
Sealing device for "Auto" position					
Manual operation possible only after removing seal	NZM2(-4) N(S)2(-4)	**NZM2-XRDPL** 137305		1 off	Suitable for remote operator NZM2-XRD
Protective cover for door cutout					
	NZM2-XR NZM3-XR NZM4-XR	**RTR-NZM10** 034825		1 off	Electrical remote switching and manual tripping (push to trip) are still possible.

	Number of poles	Rated current = Rated uninterrupted current	Setting range		High switching capacity 150 kA; 415 V 50/60 Hz Part no. Article no.	Price See price list		Std. pack
			Overload releases	Short-circuit releases				
		I_u	I_r	I_i	**B = box terminals S = screw terminals**			
		A	A	A				
Circuit-breakers with earth-fault release, 3 pole For apparatus with power electronics, such as power inverters and frequency inverters								
AC/DC sensitive according to core-balance principle in range of 0 – 100 kHz residual-current frequency. Not UL/CSA approved. Suitable for use in three-phase systems. Rated operating voltage: 400 V (50/60 Hz) Rated fault current $I_{\Delta n}$ = 0.03 A Internal power supply U_e = 50 - 400 V Turnkey combination of current-limiting circuit-breaker and residual-current device. Adjusting buttons can be sealed.								
	3 pole	125	100-125	750…1250	**NZMH2-A125-FIA30** 129710		S	1 off
		160	125-160	960…1600	**NZMH2-A160-FIA30** 112627		S	
		200	160-200	1200…2000	**NZMH2-A200-FIA30** 112628		S	
		250	200-250	1500…2500	**NZMH2-A250-FIA30** 112629		S	
		125	100-125	750…1250	**NZMH2-A125-FIA30-BT** 129711		B	
		160	125-160	960…1600	**NZMH2-A160-FIA30-BT** 116304		B	
		200	160-200	1200…2000	**NZMH2-A200-FIA30-BT** 116305		B	
		250	200-250	1500…2500	**NZMH2-A250-FIA30-BT** 116306		B	

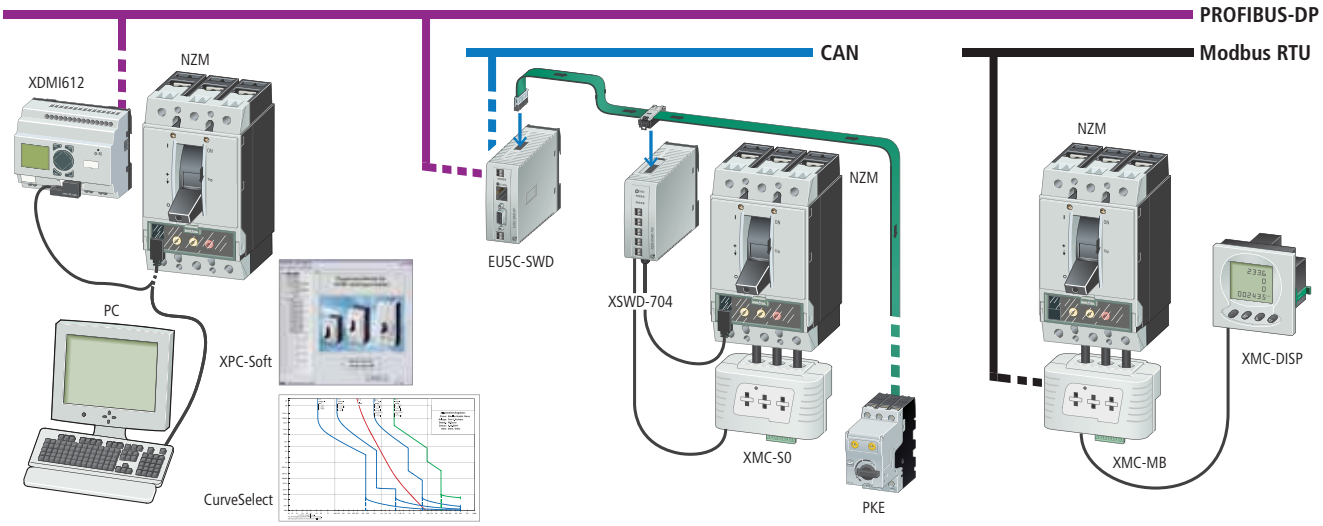
Notes Notes about terminals → Page 17/86

	For use with	Number of conductors	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Earth-fault release						
To IEC/EN 60947-2 Not UL/CSA approved Suitable for use in three- and single-phase systems						
Pulse-current sensitive according to core-balance principle For 3 and 4 pole NZM1(-4) circuit-breakers and N1(-4) switch-disconnectors, dependant on mains power U_e = 200 … 415 V 50/60 Hz						
Mounting on right side up to I_n = 160 A at I_{Cu} = 50 kA						
 Rated fault current $I_{\Delta n}$ = 0.03 A	NZM1 N(S)1	3 pole	**NZM1-XFI30R** 104603		1 off	At $I_{\triangle n}$ = 0.03 A: delay time t_v always fixed at 10 ms. Alarm indication > 30 % $I_{\triangle n}$ by yellow LED. Trip indication by up to 2 auxiliary contacts (HIAFI) can be retrofitted: N/O = M22-K01, NC = M22-K10 are reset with the reset toggle lever. If the trip-indicating auxiliary contact in the fault current block is used, the NC contacts operates as a N/O contact and the NC contact operates as N/O contacts. Double contact not permissible. Not in combination with insulated enclosure or main switch assembly kit for side wall installation with mounting bracket. NZM1-XFI...R can not be used in combination with lower cover NZM1-XKSA. NZM1-XFI…U not in combination with shunt or undervoltage release, early-make auxiliary contacts. Rated ultimate short-circuit breaking capacity is determined by the fitted NZM1 or NS1, or, Iif a switch-disconnector N1 is used, by the fitted back-up fuse → Technical data. Adjusting buttons can be sealed.
	NZM1-4 N1-4	4 pole	**NZM1-4-XFI30R** 104606			
Rated fault current $I_{\Delta n}$ = 0.3 A	NZM1 N(S)1	3 pole	**NZM1-XFI300R** 104604			
	NZM1-4 N1-4	4 pole	**NZM1-4-XFI300R** 104607			
Rated fault current $I_{\Delta n}$ = 0.03-0.1-0.3-0.5-1-3 A Delay time t_v = 10-60-150-300-450 ms	NZM1 N(S)1	3 pole	**NZM1-XFIR** 104605			
	NZM1-4 N1-4	4 pole	**NZM1-4-XFIR** 104608			
Mounting below up to 100 A						
 Rated fault current $I_{\Delta n}$ = 0.03 A	NZM1 N(S)1	3 pole	**NZM1-XFI30U** 104609		1 off	
	NZM1-4 N1-4	4 pole	**NZM1-4-XFI30U** 104612			
Rated fault current $I_{\Delta n}$ = 0.3 A	NZM1 N(S)1	3 pole	**NZM1-XFI300U** 104610			
	NZM1-4 N1-4	4 pole	**NZM1-4-XFI300U** 104613			
Rated fault current $I_{\Delta n}$ = 0.03-0.1-0.3-0.5-1-3 A Delay time t_v = 10-60-150-300-450 ms	NZM1 N(S)1	3 pole	**NZM1-XFIU** 104611			
	NZM1-4 N1-4	4 pole	**NZM1-4-XFIU** 104614			
Mounting below up to 250 A						
Pulse-current sensitive according to core-balance principle For 4 pole circuit-breaker NZM2-4 and switch-disconnector N2-4 independent of mains voltage U_e = 280 … 690 V 50/60 Hz						
 Rated fault current $I_{\Delta n}$ = 0.03 A	NZM2-4 N2-4	4 pole	**+NZM2-4-XFI30** 292343		1 off	Auxiliary contacts (1 N/O, 1 NC built-in) are reset with the reset button. Not in combination with plug-in units, insulated enclosure or main switch assembly kit for side wall installation with mounting bracket. Rated ultimate short-circuit breaking capacity is determined by fitted NZM2 and, when using a switch-disconnector N2, by the back-up fuse used → Technical data. Adjusting buttons can be sealed.
Rated fault current $I_{\Delta n}$ 0.1-0.3-1-3 A Delay time t_v = 60-150-300-450 ms	NZM2-4 N2-4	4 pole	**+NZM2-4-XFI** 292344		1 off	
Core-balance principle with AC/DC current sensitivity (in range 0 … 100 kHz) For 4 pole circuit-breaker NZM2-4 and switch-disconnector N2-4 Internal voltage supply U_e = 50 … 400 V						
 Rated fault current $I_{\Delta n}$ = 0.03 A	NZM2-4 N2-4	4 pole	**+NZM2-4-XFIA30** 292345		1 off	Observe response threshold dependence on frequency! See "Frequency response" characteristic curve. Adjusting buttons can be sealed.
Rated fault current $I_{\Delta n}$ 0.3- 0.5-1 A Delay time t_v = 60-150-300-450 ms	NZM2-4 N2-4	4 pole	**+NZM2-4-XFIA** 292346		1 off	

	For use with	Part no. suffix Article no. for ordering with basic device	Price See price list	Std. pack	Notes
Earth-fault release, 3 pole, 4 pole					
Not dependent on mains and control voltages I_g = 0.35-0.4-0.5-0.6-0.7-0.8-0.9-1.0 x I_n t_g = 0-20-60-100-200-300-500-750-1000 ms Not UL/CSA approved	NZM4 NS4	**+NZM4-XT** 266721		1 off	Only suitable for use in conjunction with circuit-breakers with electronic releases. Not in combination with motor-protective circuit-breakers NZM…-ME… Indication of the earth-fault in optional DMI communication module.
	NZM4-4	**+NZM4-4-XT** 266722		1 off	

	Description	Rated current Energy I_n A	Rated current Motor I_n A	Part no. Article no.	Price See price list	Std. pack	Notes
Residual-current relays							
Pulsed current sensitive Rated control voltage: U_s = 230 V AC (50/60 Hz) Integrated auxiliary contact (1 C/O) Ring-type transformer must also be ordered. Not UL/CSA approved							
	Rated fault current $I_{\triangle N}$ = 0.03 A	–	–	**PFR-003** 285555		1 off	–
	Rated fault current $I_{\triangle N}$ = 0.3 A	–	–	**PFR-03** 285556			–
	Rated fault current $I_{\triangle N}$ = 0.03-5 A Adjustable fault current and delay time Fault current early warning by flashing, red LED	–	–	**PFR-5** 285557			Adjustable fault current: 0.03, 0.1, 0.3, 0.5, 1, 3, 5 A Adjustable delay time: 0.02, 0.1, 0.3, 0.5, 1, 3, 5 A
–	–	–	–	**PFR-5-110AC** 116963			–
Ring-type transformer							
Rated operating voltage: 690 V (50/60 Hz) Not UL/CSA approved							
	Internal diameter: 20 mm	50	50	**PFR-W-20** 285558		1 off	Includes fixing clip for DIN rail mounting
	Internal diameter: 30 mm	150	100	**PFR-W-30** 285559			
	Internal diameter: 35 mm	150	100	**PFR-W-35** 285600			Includes screw fixing Alternative: fixing clip for DIN mounting rail **Note on engineering:** The current transformer diameter must be selected 1.5 times larger than the envelope diameter of the passed through conductor.
	Internal diameter: 70 mm	400	200	**PFR-W-70** 285601			
	Internal diameter: 105 mm	600	250	**PFR-W-105** 285602			
	Internal diameter: 140 mm	1200	630	**PFR-W-140** 285603			
	Internal diameter: 210 mm	1800	800	**PFR-W-210** 285604			
Magnetic shielding							
Not UL/CSA approved							
	PFR-W-35	–	–	**PFR-WMA-35** 286001		1 off	Required for load circuits with high inrush currents > 4 × I_n, e.g. motors and capacitors.
	PFR-W-70	–	–	**PFR-WMA-70** 286002			
	PFR-W-105	–	–	**PFR-WMA-105** 286003			
	PFR-W-140	–	–	**PFR-WMA-140** 286004			
	PFR-W-210	–	–	**PFR-WMA-210** 286005			
Mounting clip							
	For the DIN rail mounting current transformers PFR-W-35 and larger	–	–	**PFR-WC** 286006		1 off	1 set = 2 off

Description



Overview

For the compact circuit-breakers NZM Eaton supplies the following energy measurement and communication components:

- NZM-XPC-Soft: Diagnostics software
- CurveSelect: Software for viewing characteristic curves
- NZM-XMC-S0: Energy measuring module
- NZM-XMC-MB: Measuring and communication module
- NZM-XSWD-704: Communication interface for SmartWire-Darwin with S0 input for energy data
- NZM-XDMI612: Data management interface with field bus connection for PROFIBUS-DP and bus diagnostics software

XPC-Soft

Circuit-breakers NZM with electronic trip block provide all required diagnostics data directly to the USB or COM interface of a connected PC through a built-in interface.
On overload or short-circuit, the NZM instantly switches off the system and, if a PC is connected, documents the events complete with date and time.
With the software XPC-Soft, users can view the history and analyze possible causes. The software can also output power consumption trend graphs as MS Excel table.

CurveSelect

The free characteristic curve program Moeller CurveSelect allows a settings-specific representation of the tripping characteristics of several protective devices with the same time and current scales.
This clearly simplifies an assessment of the interaction of Eaton's circuit-breakers NZM and IZM, motor-protective circuit-breakers PKZ, overload relays ZB, miniature circuit-breakers, and LV h.b.c. fuses.
Available for free download from www.moeller.net:
Products & Solutions > Power Distribution > Switching and Protecting Power > CurveSelect: Characteristics program for short-circuit- and overload protection.

Measuring and communication module

For measuring and optimizing energy consumption, Eaton provides module NZM-XMC. This compact device with built-in current converter determines the power and energy values per phase from the measured voltage and current. The module can operate the circuit-breaker through a remote operator. The data is made available on the MODBUS RTU.
With the XMC applications up to 500 A can be operated; the readings have a high accuracy of 0.5 %. Cables, strip or bar can be used. The conductors pass through a tunnel in the device and do not have to be severed. An optional external door display provides real-time local indication of the measured values.

Communication interface for SmartWire-Darwin

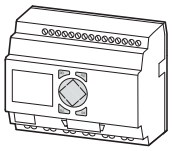
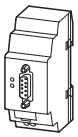
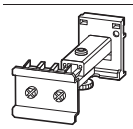
For remote diagnostics of the circuit-breaker, communication module NZM-XSWD-704 is used. With this module, the switch settings, trip causes, and actual currents can be transmitted to a field bus through SmartWire-Darwin. The circuit-breaker can therefore also be operated through SmartWire-Darwin, like the electronic motor protection PKE and the typical devices such as RMQ and DIL.
As a special feature, the XSWD features a built-in power meter, which can be supplied from an external energy measurement module XMC-S0. This provides everything that is necessary for optimizing energy usage.
With the data from the XSWD-704 all relevant information about energy supply or the respective outgoer on the desired field bus are available. This allows visualization and logging of the machines or system components.
For visualization, the free software BreakerVisu can, for example, be used, available for download from www.moeller.net:
www.moeller.net, Products & Solutions > Power Distribution > Switching and Protecting Power Distribution > Moeller BreakerVisu: Visualization for circuit-breakers

Data Management with PROFIBUS-DP interface

An alternative to the XSWD-704 is provided by data management interface NZM-XDMI612 with a field bus connection for PROFIBUS-DP.

The advantages of this solution are:

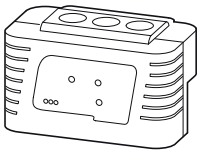
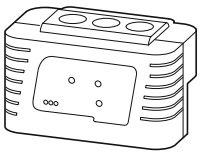
- For motor starter applications a ZMR function is available that does not trip the circuit-breaker in the event of an overload but that deactivates the contactor through the DMI.
- The built-in display provides a local indication of all parameters of the circuit-breaker.
- The DMI can change the circuit-breakers' tripping parameters. (remote parameterization)
- The DMI's six inputs and six outputs can be used for remote control and for any user functions.
- Through the outputs a "Tripped" signal can be issued locally.
- A central diagnosis across the entire bus to the FDT standard can be implemented through the DMI with the DPV1 module. For this purpose, software NZM-XPC-DTM and, in some cases, FDT-FAVIGATOR are required.

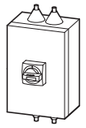
	Description	Part no. Article no.	Price See price list	Std. pack	Notes
Diagnostics and configuration software for NZM and DMI (local)					
	PC software for direct connection to all new NZM circuit-breakers with electronic releases (IEC and UL/CSA devices) or for direct connection to the DMI module, including the required connection cable to NZM. • Protection parameter: online display and curve display, export option to curve characteristics program "Moeller CurveSelect". • Warning and release messages: reading of diagnostic memory also in voltage-free state. • Load currents: display and trend indication. • Recording and export options to Excel for load currents and diagnostic messages. • Configuration of the DMI: motor starter, remote operator, assignment of the DMI inputs and outputs and displays.	**NZM-XPC-KIT** 265631		1 off	Only for use in combination with circuit-breakers with **electronic** releases. Download the manual AWB1230-1459 and demo-software at www.moeller.net. Order connecting cable to DMI separately: EASY-USB-CAB.
Connecting cable PC (USB) to DMI					
	• For transmission of DMI configuration between PC with XPC-Soft and DMI • For upgrading DMI firmware	**EASY-USB-CAB** 107926		1 off	Can also be used for programming easy small controllers.
Data management interface (DMI module)					
	• Access to diagnostics and operational data. • Recording current values, motor starter function, and setting parameters. • Control of the circuit-breakers with electronic trip block. • Comprehensive remote diagnostic options and remote operation via fieldbus in combination with a field Bus connection.	**NZM-XDMI612** 260217		1 off	Includes connection cable NZM-XDMI-CAB between NZM and DMI (length: 2 m). Only for use in combination with circuit-breakers with **electronic** releases.
Fieldbus interface for DMI					
	Connection to the DMI module • Transfer of phase currents, parameter data, status data and diagnostics data. • Transfer of circuit-breaker position (wiring of auxiliary contacts to DMI inputs). • Actuation of the DMI motor starter functions and the NZM remote operator. • Detection of digital inputs and actuation via field Bus. • PROFIBUS-DPV1-Slave fieldbus interface. Can be operated with class 1 and class 2 masters. Addresses available: 1 to 126.	**NZM-XDMI-DPV1** 270333		1 off	Connected to the DMI module and has the same contour appearance.
Switched-mode power supply unit For DMI module					
	• Rated input voltage: 50/60 HZ: 115/230 V AC • Rated output voltage (residual ripple): 24 V DC (± 3 %) • Rated output current: 1.25 A	**EASY400-POW** 212319		1 off	–
Telescopic adapter For DMI module For equalization of the mounting depth when rear mounted in CI-K... enclosures and cabinets.					
	With 35 mm top-hat rail IEC/EN 60715, adjustable from 75 – 115 mm. Screw and snap fitting.	**M22-TA** 226161		1 off	–

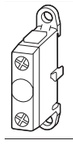
Information relevant for export to North America

Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

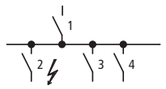
	Description	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
FDT frame software for operating field devices					
	PC software for integration of software modules (DTM's) according to the FDT standard V1.2 (e.g. NZM-XPC-DTM). • Operation of a temporary or stationary service station for engineering, remote diagnostics, remote operation and remote parameter definition of networked switchgear and field devices. • Engineering of the network topology of networked field devices. • Overview representation of the topology with online status information. • Access to the device-specific DTM's for configuration, operation, parameterization and diagnostics of the devices. • Storage of all engineering information in a central database. Download and upload from/to the devices.	**FDT-NAVIGATOR** 281623		1 off	The connection of the field devices can be implemented via the PROFIBUS DPV1 master or via gateways (e.g.: USB/PROFIBUS, Ethernet/ PROFIBUS). Communication interfacing for the PC and a communication DTM (driver) is necessary for this purpose.
DTM software module to FTD standard					
	PC software module (Device Type Manager) to FDT/DTM standard V1.2 for integration in the FDT navigator or other FDT-capable framework software packages (primary control system, PLC engineering systems). • Remote diagnostics, remote monitoring, remote parameter definition and remote operation of the new NZM2,3,4 circuit-breakers with electronic trip release via PROFIBUS-DPV1. • Indication of the circuit-breaker state (on/off/tripped), the phase currents, parameter data, status data and diagnostics data. • Definition of the trip parameters. • Display and setting the DMI motor starter functions and assignment of the DMI inputs and outputs. • Control of the motor starter functions.	**NZM-XPC-DTM** 281624		1 off	For connection of the circuit-breaker to the PROFIBUS-DP fieldbus, the accessory device NZM-XDMI612 and the fieldbus interface NZM-XDMI-DPV1 are required.
NZM interface module to SmartWire-Darwin					
	The module implements the data connection between the NZM2/3/4 with electronic release and SmartWire-Darwin. The following data is transmitted: • Digital status data (ON/OFF/Tripped) • Load warnings • Reason for last trip • The actual currents • Switch model • The current settings of the rotary coding switches The switch can also be operated with a remote operator. • Two digital inputs for the switch status • Two transistor outputs for remote switching • Retentive memory for energy data (kWh) Energy data is transmitted through digital input (S_0) from an external energy measuring module NZN...-XMC-SO.	**NZM-XSWD-704** 135530		1 off	A connection cable to the circuit-breaker and auxiliary contacts NZM is included as standard.

	Number of conductors	Description	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Energy measuring module							
For measuring the electrical active energy. The module has three built-in current transformers and three voltage taps, which are contacted with self-tapping screws that penetrate the cable insulation. Power supply 24 VDC The module supplies S0 pulses, which can be counted with an external device. One pulse output for active energy. The pulse rate is fixed.							
	3 pole	–	NZM 2 ≦ 300 A	**NZM2-XMC-S0** 129839		1 off	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or output side.
		–	NZM 3 ≦ 500 A	**NZM3-XMC-S0** 129960		1 off	
	4 pole	–	NZM 2 ≦ 300 A	**NZM2-4-XMC-S0** 129963		1 off	
		–	NZM 3 ≦ 500 A	**NZM3-4-XMC-S0** 129964		1 off	
Measuring and communication module							
For measuring current, voltage, power and energy. The module has three built-in current transformers and three voltage taps, which are contacted with self-tapping screws that penetrate the cable insulation. Power supply 24 VDC Two S0 pulse outputs MODBUS interface (slave) The total energy consumption value is permanently stored in the module. Display device NZM-XMC-DISP can be connected for local indication of the readings. Can be extended with up to two add-on cards +NZM-XMC.							
	3 pole	–	NZM 2 ≦ 300 A	**NZM2-XMC-MB** 129961		1 off	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or output side.
		–	NZM 3 ≦ 500 A	**NZM3-XMC-MB** 129962		1 off	
	4 pole	–	NZM 2 ≦ 300 A	**NZM2-4-XMC-MB** 129965		1 off	
		–	NZM 3 ≦ 500 A	**NZM3-4-XMC-MB** 129966		1 off	
Digital display device							
For door-mounting (connection to local display) For all measurement and communication modules with MODBUS interface Per-phase indication of current, voltage, power and energy values Includes fixed display configurations							
	3/4 pole	Front cutout 96 × 96 knockout	NZM...XMC-MB	**NZM-XMC-DISP** 129967		1 off	–
Power supply							
Power supply 230 V AC							
	3/4 pole	Can be plugged onto basic device	NZM...XMC-MB	**NZM-XMC-AC** 129968		1 off	–
Add-on cards for NZM-XMC modules							
Every measurement and communication module can be equipped with up to two expansion cards.							
		MODBUS interface	–	**+NZM-XMC-MB** 135524		1 off	Order add-on cards together with basic device. The cards are then supplied readily fitted in the basic device.
		Analog output for 4–20 mA pointer-type instruments	–	**+NZM-XMC-1AO** 135525		1 off	
		2 relay outputs (changeover contact)	–	**+NZM-XMC-2DO-R** 135526		1 off	
		4 relay outputs (changeover contact)	–	**+NZM-XMC-4DO-R** 135527		1 off	
		4 digital inputs and 4 digital outputs	–	**+NZM-XMC-4DI-4DO** 135528		1 off	

	Degree of protection	Max. rated uninterrupted current I_u A	For use with	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack	Basic enclosure	Terminals for 3-pole switches fitted by user: for fourth and fifth conductor (N and PE), on 4 pole switches: for fifth conductor (PE)	**Notes**
Insulated enclosures									
With door coupling rotary handle Complete includes all necessary functional parts Not UL/CSA approved									
Standard, black/grey									
 Lockable in 0 position on handle with up to 3 padlocks. Additionally with cover interlock.	IP65	≦ 63 A	PN1, N(S)1	**NZM1-XCIK5-TVD** 271521		1 off	CI-K5-160-M	K10/1, K25/1	Enclosures for separate mounting with top and bottom cable entry, suitable for installation of circuit-breakers and switch-disconnectors. Include fixing straps for wall mounting. Short-circuit resistance at 415 V 50/60 Hz up to 10 kA. Cannot be used in combination with remote operator NZM...-XR..., plug-in unit NZM...-XSV or withdrawable unit NZM...-XAV. Order insulated additional terminal for 4th or 5th pole separately. Enclosure CI-K5 with hard metric knock-outs Enclosure CI23 with flanges CI43, CI45 and CI48 feature gland plates. **Only for switches with box terminals for direct connection of cables.**
	IP65	≦ 63 A	NZM1, PN1, N(S)1	**NZM1-XCI23-TVD** 271522		1 off	CI23-150	K10/1, K25/1	
	IP64	≦ 125 A	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XCI43-TVD** 271523		1 off	CI43-150	K10/1, K25/1, K50/1, K95/1N/BR	
	IP64	≦ 160 A	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XCI43/2-TVD** 104645		1 off	CI43-200	K10/1, K25/1, K50/1, K95/1N/BR	
	IP64	≦ 200 A	NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XCI43-TVD** 271524		1 off	CI43-200	K10/1, K25/1, K50/1, K95/1N/BR, K150/1/BR, K240/1/BR	
	IP64	≦ 250 A	NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XCI45-TVD** 280418		1 off	CI45-200	K10/1, K25/1, K50/1, K95/1N/BR, K150/1/BR, K240/1/BR	
	IP64	≦ 400 A	NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XCI48-TVD** 271525		1 off	CI48-250	K95/1N/BR, K150/1/BR, K240/1/BR, K2X240/1/BR	
Red-yellow for emergency switching off									
 Lockable on handle and switch with up to 3 padlocks. Lockable in 0 position on handle. Additionally with cover interlock and locking facility on circuit-breaker in 0 position.	IP65	≦ 63 A	PN1, N(S)1	**NZM1-XCIK5-TVDVR** 271526		1 off	CI-K5-160-M	K10/1, K25/1	
	IP65	≦ 63 A	NZM1, PN1, N(S)1	**NZM1-XCI23-TVDVR** 271527		1 off	CI23-150	K10/1, K25/1	
	IP64	≦ 125 A	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XCI43-TVDVR** 271528		1 off	CI43-150	K10/1, K25/1, K50/1, K95/1N/BR	
	IP64	≦ 160 A	NZM1(-4), PN1(-4), N(S)1(-4)	**NZM1-XCI43/2-TVDVR** 104646		1 off	CI43-200	K10/1, K25/1, K50/1, K95/1N/BR	
	IP64	≦ 200 A	NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XCI43-TVDVR** 271529		1 off	CI43-200	K10/1, K25/1, K50/1, K95/1N/BR, K150/1/BR, K240/1/BR	
	IP64	≦ 250 A	NZM2(-4), PN2(-4), N(S)2(-4)	**NZM2-XCI45-TVDVR** 279356		1 off	CI45-200	K10/1, K25/1, K50/1, K95/1N/BR, K150/1/BR, K240/1/BR	
	IP64	≦ 400 A	NZM3(-4), PN3(-4), N(S)3(-4)	**NZM3-XCI48-TVDVR** 271530		1 off	CI48-250	K95/1N/BR, K150/1/BR, K240/1/BR, K2X240/1/BR	

	Rated uninterrupted current I_u A	Terminal capacity mm²	**Part no.** Article no. when ordered separately	**Price** See price list	Std. pack
Insulated additional terminals					
For passing through the neutral and protective conductor 1 pole					
	32	Flexible, 1 × (1.5 – 6)	**K10/1** 093827		10 off
	63	Flexible, 1 × (6 – 16), stranded, 1 × (16 – 25)	**K25/1** 096200		10 off
	100	Flexible, 1 × (10 – 35), stranded, 1 × (16 – 50)	**K50/1** 098573		10 off
	160	Stranded, 1 × (16 – 95)	**K95/1N/BR** 012336		1 off
	250	Stranded, 1 × (35 – 150), 2 x (16 – 70)	**K150/1/BR** 014709		1 off
	400	Stranded, 1 × (50 – 240), 2 × (25 – 120)	**K240/1/BR** 017082		1 off
	630	Stranded, 1 × (240 – 300), 2 × (50 – 240)	**K2X240/1/BR** 019455		1 off

Engineering



Incoming circuit-breaker

Outgoing circuit-breaker

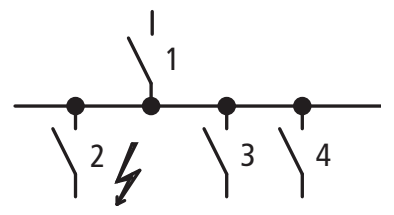
Selectivity 415 V AC

between circuit-breakers enables separate shut-down of faulty system sections.
Selectivity (discrimination) exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, **only** outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 continue to operate.

			Incoming circuit-breaker (S1)																	
			NZM...1-A...							**NZM...2-A...**										
	I_{cu} [kA]		25(36)(50)(100)							25(36)(50)(150)										
	I_n [A]		20-40	50	63	80	100	125	160	20-40	50	63	80	100	125	160	200	250	300
Outgoing circuit-breaker (S2)	I_n [A]	$I_{cu(415V)}$ [kA]	Selectivity threshold I_s [kA] for selectivity between S2 and S1, overload and short-circuit release set to max. value																	
FAZ–B(C)	0.5	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2	15	2	T	T	T	T	T	T	3	T	T	T	T	T	T	T	T	T	T
	3	15	1.2	2	3	3	10	T	T	1.5	1.5	3	5	T	T	T	T	T	T	T
	4	15	1.2	2	3	3	8	T	T	1.2	1.5	3	4	T	T	T	T	T	T	T
	6	15	1.2	2	2.5	3	5	10	10	1.2	1.5	2.5	3	T	T	T	T	T	T	T
	10	15	1.2	1.5	2	2	4	10	10	1	1.5	2.5	3	10	10	10	10	10	10	10
	13	15	1	1.5	2	2	4	10	10	1	1.2	2	3	10	10	10	10	10	10	10
	16	15	1	1.2	1.5	2	3	8	8	1	1.2	1.5	2.5	10	10	10	10	10	10	10
	20	15	0.8	1.2	1.5	1.5	3	8	8	1	1.2	1.5	2.5	10	10	10	10	10	10	10
	25	15	0.7	1.2	1.5	1.5	3	7	7	0.8	1	1.5	2	10	10	10	10	10	10	10
	32	15	–	1.2	1	1.5	2	6	6	–	1	1.5	2	8	8	8	8	10	10	10
	40	15	–	–	1	1.5	2	5	5	–	–	1.2	1.5	7	7	7	7	10	10	10
	50	15	–	–	–	1.2	1.5	4	4	–	–	–	1.5	6	6	6	6	10	10	10
	63	15	–	–	–	–	1.5	3	3	–	–	–	–	6	6	6	6	10	10	10
PKZM0-...	0.16	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.25	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.4	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.63	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2.5	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	4	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	6.3	100	4	5	5	T	T	T	T	2	3	4	5	T	T	T	T	T	T	T
	10	100	3	4	5	6	25	T	T	1.5	2.5	4	4	T	T	T	T	T	T	T
	12	50	3	4	5	6	25	T	T	1.5	2.5	4	4	T	T	T	T	T	T	T
	16	50	1.5	1.5	2	3	5	7	T	1	1.6	2	2.5	T	T	T	T	T	T	T
	20	50	0.8	1.5	1.5	2	3	5	T	0.8	1.2	1.5	2	T	T	T	T	T	T	T
	25	50	–	1	1.5	1.5	2.5	4	T	–	1	1.5	2	10	T	T	T	T	T	T
	32	50	–	–	1	1	2	3.5	T	–	–	1	1.5	8	40	T	T	T	T	T
PKZ2/ZM-...	0.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.0	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2.4	100	1.2	2	2.5	10	T	T	T	1.2	2	2.5	10	T	T	T	T	T	T	T
	4	100	1	1.5	2	2.5	2.5	4	10	1	1.5	2	2.5	2.5	10	10	10	T	T	T
	6	100	0.6	0.8	1	1.2	2	3	8	0.6	0.8	1	1.2	2	8	8	8	10	10	T
	10	100	0.5	0.7	0.8	1	1.2	2	4	0.5	0.7	0.8	1	1.2	4	4	4	5	5	T
	16	100	0.5	0.6	0.7	0.8	1.2	1.5	3	0.5	0.6	0.7	0.8	1.2	3	3	3	4	4	T
	25	30	–	0.6	0.7	0.7	1.2	1.5	2	–	0.6	0.7	0.7	1.2	2	2	2	3	3	T
	32	30	–	–	0.6	0.7	1.2	1.5	2	–	–	0.6	0.7	1.2	2	2	2	3	3	T
	40	30	–	–	0.6	0.7	1	1.5	2	–	–	0.6	0.7	1	2	2	2	2	2	T
PKZM4	16	100	0.5	0.8	0.8	0.8	2	5	5	0.5	0.8	0.8	0.8	2	5	5	5	5	5	T
	25	100	–	0.7	0.8	0.8	1.5	5	5	–	0.7	0.8	0.8	1.5	5	5	5	5	5	T
	32	50	–	–	0.8	0.8	1.5	4	4	–	–	0.8	0.8	1.5	4	4	4	4	4	T
	40	50	–	–	–	0.8	1.5	3	3	–	–	–	0.8	1.5	3	3	3	3	3	T
	50	50	–	–	–	–	1	2.5	2.5	–	–	–	–	1	2.5	2.5	2.5	2.5	2.5	T
	58	50	–	–	–	–	–	2.5	2.5	–	–	–	–	–	2.5	2.5	2.5	2.5	2.5	T
	63	50	–	–	–	–	–	2	2	–	–	–	–	–	2	2	2	2	2	T

Notes T: total selectivity

			Incoming circuit-breaker (S1)																	
			NZM...2-VE...			**NZM...3-A...**				**NZM...3-AE...**			**NZM…3-VE…**			**NZM...4-AE...**					**NZM…4-VE…**				
	I_{cu} [kA]		50(150)			36(50)(150)				50(150)			50(150)			50(85)					50(85)				
	I_n [A]		100	160	250	250	320	400	500	250	400	630	250	400	630	630	800	1000	1250	1600	630	800	1000	1250	1600
Outgoing circuit-breaker (S2)	I_n [A]	$I_{cu(415V)}$ [kA]	Selectivity threshold I_s [kA] for selectivity between S2 and S1, overload and short-circuit release set to max. value																						
FAZ–B(C)	0.5	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	3	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	4	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	6	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	15	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	13	15	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	16	15	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	20	15	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	15	10	10	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	15	8	8	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	15	7	7	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	15	6	6	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	15	6	6	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
PKZM0-...	0.16	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.25	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.4	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	0.63	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2.5	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	4	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	6.3	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	12	50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	16	50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	20	50	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	50	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	50	8	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
PKZ2/ZM-...	0.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.0	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1.6	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	2.4	100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	4	100	10	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	6	100	8	8	T	10	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	10	100	4	4	5	5	6	9	T	5	13	T	5	13	T	T	T	T	T	T	T	T	T	T	T
	16	100	3	3	4	4	4	5	30	4	7	T	4	7	T	T	T	T	T	T	T	T	T	T	T
	25	30	2	2	3	3	3	4	10	3	5	20	3	5	20	T	T	T	T	T	T	T	T	T	T
	32	30	2	2	3	3	3	4	8	3	3.5	15	3	3.5	15	T	T	T	T	T	T	T	T	T	T
	40	30	2	2	2.5	2	3	4	8	2.5	3.5	15	2.5	3.5	15	T	T	T	T	T	T	T	T	T	T
PKZM4	16	100	5	5	6	5	10	13	30	6	16	45	6	16	45	45	T	T	T	T	45	T	T	T	T
	25	100	5	5	3.3	5	6	10	15	3.3	10	25	3.3	10	25	25	42	T	T	T	25	42	T	T	T
	32	50	4	4	3	4	5	7	12	3	8	18	3	8	18	18	30	45	T	T	18	30	45	T	T
	40	50	3	3	3	3	5	7	12	3	8	18	3	8	18	18	30	45	T	T	18	30	45	T	T
	50	50	2.5	2.5	3	2.5	5	7	10	3	8	18	3	8	18	18	30	45	T	T	18	30	45	T	T
	58	50	2.5	2.5	2.5	2.5	4	6	10	2.5	6.5	15	2.5	6.5	15	15	25	40	T	T	15	25	40	T	T
	63	50	2	2	2.5	2	4	6	10	2.5	6.5	15	2.5	6.5	15	15	25	40	T	T	15	25	40	T	T



Incoming circuit-breaker

Outgoing circuit-breaker

Selectivity 415 V AC

between circuit-breakers enables separate shut-down of faulty system sections.
Selectivity (discrimination) exists between incoming breaker 1 and outgoing breaker 2 if, **only** outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 continue to be operational.

Incoming circuit-breaker (S1)

Prospective short-circuit current (kA). Set the overload and short-circuit release of the incoming circuit-breaker to the max. value.

Outgoing circuit-breaker (S2)	I_n [A]	$I_{cu(415V)}$ [kA]	NZM...1-A...							NZM...2-A...									
		I_{cu}[kA]	25(36)(50)(100)							25(36)(50)(150)									
		I_n[A]	20-40	50	63	80	100	125	160	20-40	50	63	80	100	125	160	200	250	300
NZM...1-A...	20-40	25-100	–	–	0.5	0.7	0.8	1.5	1.5	–	–	0.6	0.8	1.5	1.5	1.5	2	3	3
	50	25-100	–	–	–	0.6	0.8	1.5	1.5	–	–	–	0.8	1.5	1.5	1.5	2	3	3
	63	25-100	–	–	–	–	0.8	1.5	1.5	–	–	–	–	1.5	1.5	1.5	2	3	3
	80	25-100	–	–	–	–	–	1.5	1.5	–	–	–	–	–	1.5	1.5	2	3	3
	100	25-100	–	–	–	–	–	–	1.5	–	–	–	–	–	–	1.5	2	3	3
	125	25-100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	3	3
	160	25-100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	3	3
NZM...2-A...	20-40	25-150	–	–	0.5	0.6	0.8	1	1	–	–	0.5	0.6	0.8	1	1.2	1.6	2	2
	50	25-150	–	–	–	0.6	0.8	1	1	–	–	–	0.6	0.8	1	1.2	1.6	2	2
	63	25-150	–	–	–	–	0.8	1	1	–	–	–	–	0.8	1	1.2	1.6	2	2
	80	25-150	–	–	–	–	–	1	1	–	–	–	–	–	1	1.2	1.6	2	2
	100	25-150	–	–	–	–	–	–	1	–	–	–	–	–	–	1.2	1.6	2	2
	125	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.6	2	2
	160	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2
	200	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	250	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	300	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...1-M...	40	25-150	–	–	–	–	0.8	1	1	–	–	–	–	0.8	1	1.2	1.6	2	2
	50	25-150	–	–	–	–	–	–	1	–	–	–	–	–	–	1.2	1.6	2	2
	63	25-150	–	–	–	–	–	–	1	–	–	–	–	–	–	1.2	1.6	2	2
	80	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.6	2	2
	100	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2
NZM...2-M...	20-12	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	160	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	25-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...2-VE...	100	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	1.2	1.6	2	2
	160	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	250	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...2-ME...	90	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	1.2	1.6	2	2
	140	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	220	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...3-AE...	250	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	320	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	400	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	500	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	630	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM…3-VE…	250	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	400	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	630	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...3-ME...	220	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	350	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	450	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...4-AE...	630	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	800	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1000	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1250	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1600	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM…4-VE…	630	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	800	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1000	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1250	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1600	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...4-ME...	550	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	875	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1400	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Incoming circuit-breaker (S1)

Prospective short-circuit current (kA). Set the overload and short-circuit release of the incoming circuit-breaker to the max. value.

Outgoing circuit-breaker (S2)	I_n [A]	$I_{cu(415V)}$ [kA]	NZM...2-VE...			NZM...3-A...				NZM...3-AE...			NZM…3-VE…			NZM...4-AE...					NZM…4-VE…				
		I_{cu}[kA]	50(150)			36(50)(150)				50(150)			50(150)			50(85)					50(85)				
		I_n[A]	100	160	250	250	320	400	500	250	400	630	250	400	630	630	800	1000	1250	1600	630	800	1000	1250	1600
NZM...1-A...	20-40	25-100	2	5	7.5	3	4	6	7	7.5	20	20	12.5	25	25	T	T	T	T	T	T	T	T	T	T
	50	25-100	2	5	7.5	3	4	6	7	7.5	20	20	12.5	25	25	T	T	T	T	T	T	T	T	T	T
	63	25-100	2	5	6	3	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	80	25-100	–	5	6	3	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	100	25-100	–	5	6	3	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	125	25-100	–	5	6	3	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	160	25-100	–	5	6	3	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
NZM...2-A...	20-40	25-150	1	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	50	25-150	1	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	63	25-150	1	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	80	25-150	–	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	100	25-150	–	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	125	25-150	–	–	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	160	25-150	–	–	4	2.5	4	5	6	5	10	10	10	15	15	T	T	T	T	T	T	T	T	T	T
	200	25-150	–	–	–	–	–	5	6	–	10	10	–	15	15	T	T	T	T	T	T	T	T	T	T
	250	25-150	–	–	–	–	–	5	6	–	10	10	–	15	15	T	T	T	T	T	T	T	T	T	T
	300	25-150				–	–	5	6		10	10	–	15	15	T	T	T	T	T	T	T	T	T	T
NZM...1-M...	40	25-150	1	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	50	25-150	–	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	63	25-150	–	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	80	25-150	–	2	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
	100	25-150	–	–	4	2.5	4	6	7	6	15	15	11	20	20	T	T	T	T	T	T	T	T	T	T
NZM...2-M...	20-12	25-150	–	–	2	2.5	4	6	7	6	7	10	7	10	12	T	T	T	T	T	T	T	T	T	T
	160	25-150	–	–	–	2.5	4	6	7	6	7	10	7	10	12	T	T	T	T	T	T	T	T	T	T
	200	25-150	–	–	–	–	–	6	7	–	7	10	–	10	12	T	T	T	T	T	T	T	T	T	T
NZM...2-VE...	100	50-150	–	1.2	2	2.5	4	6	7	6	7	10	7	8	11	T	T	T	T	T	T	T	T	T	T
	160	50-150	–	–	2	2.5	4	6	7	6	7	10	7	8	11	T	T	T	T	T	T	T	T	T	T
	250	50-150	–	–	–	–	–	6	7	–	7	10	–	8	11	T	T	T	T	T	T	T	T	T	T
NZM...2-ME...	90	50-150	–	–	2	2.5	4	6	7	6	7	10	5	10	12	T	T	T	T	T	T	T	T	T	T
	140	50-150	–	–	–	2.5	4	6	7	6	7	10	5	10	12	T	T	T	T	T	T	T	T	T	T
	220	50-150	–	–	–	–	–	6	7	–	7	10	5	10	12	T	T	T	T	T	T	T	T	T	T
NZM...3-AE...	250	50-150	–	–	–	–	–	–	–	–	5	7.5	–	10	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	320	50-150				–	–	–	–		5	7.5	–	10	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	400	50-150	–	–	–	–	–	–	–	–	–	7.5	–	–	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	500	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	T/80	T/80	T/80	T/80	–	T/80	T/80	T/80	T/80
	630	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	T/80	T/80	T/80	T/80	–	T/80	T/80	T/80	T/80
NZM…3-VE…	250	50-150	–	–	–	–	–	–	–	–	3.5	4	–	10	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	400	50-150	–	–	–	–	–	–	–	–	–	4	–	–	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	630	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	T/80	T/80	T/80	T/80	–	T/80	T/80	T/80	T/80
NZM...3-ME...	220	50-150	–	–	–	–	–	–	–	–	3.5	4	–	10	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	350	50-150	–	–	–	–	–	–	–	–	–	4	–	–	12	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80	T/80
	450	50-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	T/80	T/80	T/80	T/80	–	T/80	T/80	T/80	T/80
NZM...4-AE...	630	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10	15	20	20	–	10	15	20	20
	800	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	–	–	–	20	20
	1000	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	–	–	–	20	20
	1250	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	–	–	–	–	20
	1600	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM…4-VE…	630	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10	15	20	20	–	10	15	20	20
	800	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	–	–	–	20	20
	1000	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	–	–	–	20	20
	1250	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	–	–	–	–	20
	1600	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NZM...4-ME...	550	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	20	–	–	–	20	20
	875	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20	–	–	–	–	20
	1400	50-85	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Notes T: total selectivity

Protection of PVC insulated cables against thermal overload due to short-circuits

According to VDE 0100 Part 430 Wiring Regulations, cables and conductors must be protected from overload and short-circuits. In circuit-breakers NZM, overload protection is implemented through the adjustable, current-dependently delayed overload release.

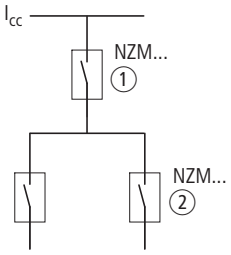
Short-circuit protection is provided by adjustable instantaneous releases, which open the main contacts in less than 25 ms. The short-circuit total opening time restricts the temperature rise of the cable to a minimum.

The tables indicate the minimum conductor cross-section reliably protected by circuit-breakers during a short-circuit.
(Operating voltage U_N = 415 V)

	Minimum protected cross-section mm² copper
NZM...1(-4)-...20	6
NZM...1(-4)-...25 – 160	10
NZM...2(-4)-...20 – 300	10
NZM...3(-4)-...250 – 630	16
NZM...4(-4)-...630 – 1600	95

Backup protection

between incoming circuit-breaker NZM(N)(H) and outgoing circuit-breaker NZMB(N)(H)



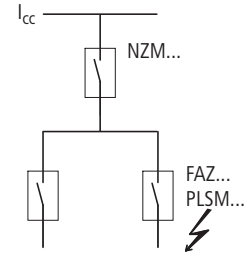
		Incoming circuit-breaker ①										
		NZM1				NZM2				NZM3		
	I_n	Up to 160 A				Up to 250 A				Up to 500 A	Up to 630 A	
	I_{cu}(415 V)	25 kA	36 kA	50 kA	100 kA	25 kA	36 kA	50 kA	150 kA	36 kA	50 kA	150 kA
Outgoing circuit-breaker ②												
I_{cu}(415 V)	I_n											
NZMB1 25 kA	Up to 160 A	25	36	50	100	25	36	50	100	36	50	100
NZMC1 36 kA	Up to 160 A	–	36	50	100	–	36	50	100	36	50	100
NZMN1 50 kA	Up to 160 A	–	–	50	100	–	–	50	100	–	50	100
NZMH1 100 kA	Up to 160 A	–	–	–	100	–	–	–	100	–	–	100
NZMB2 25 kA	Up to 300 A	25	36	50	100	25	36	50	150	36	50	150
NZMC2 36 kA	Up to 300 A	–	36	50	100	–	36	50	150	36	50	150
NZMN2 50 kA	Up to 300 A	–	–	50	100	–	–	50	150	–	50	150
NZMH2 150 kA	Up to 300 A	–	–	–	–	–	–	–	150	–	–	150
NZMC3 36 kA	Up to 500 A	–	–	–	–	–	–	–	–	–	50	150
NZMN3 50 kA	Up to 630 A	–	–	–	–	–	–	–	–	–	50	150
NZMH3 150 kA	Up to 630 A	–	–	–	–	–	–	–	–	–	–	150

Where the prospective fault current at the mounting location of circuit-breakers is very high current-limiting circuit-breakers NZMN(H) are normally used. A cost-effective alternative if the fault level is too high for circuit-breakers NZMB(C)(N) is to fit a current-limiting circuit-breaker NZMN(H) upstream of an arrangement of standard circuit-breakers NZMB(C)(N).

The table shows which current-limiting circuit-breakers NZMN(H) provide reliable protection at network locations with high short-circuit ratings in combination with NZMB(C)(N).

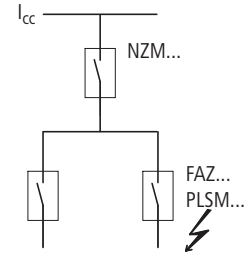
The selectivity limit is determined by the response current of the non-delayed short-circuit release in the upstream incoming circuit-breaker. In many applications this is sufficient.

between incoming circuit-breaker NZM...1-A... and outgoing circuit-breaker FAZ-B(C)/PLSM-B(C)...



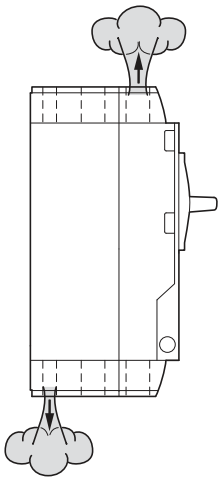
Outgoing circuit-breaker	Incoming circuit-breaker	
	NZMB1-A...	NZMC(N)(H)1-A...
FAZ-B(C)...		
0.5 – 16	25 kA	30 kA
20 – 40	20 kA	20 kA
50, 63	15 kA	15 kA
PLSM-B(C)...(/...)		
0.5 – 16	25 kA	30 kA
20 – 40	20 kA	20 kA
50, 63	15 kA	15 kA

between incoming circuit-breaker NZM...2-A... and outgoing circuit-breaker FAZ-B(C)/PLSM-B(C)...



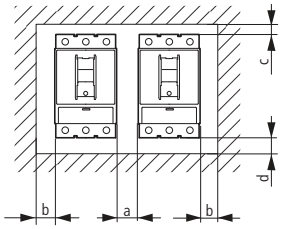
Outgoing circuit-breaker	Incoming circuit-breaker	
	NZMB2-A...	NZMN(H)2-A...
FAZ-B(C)...		
0.5 – 10	25 kA	50 kA
13 – 32	25 kA	30 kA
40 – 63	20 kA	20 kA
PLSM-B(C)...(/...)		
0.5 – 10	25 kA	50 kA
13 – 32	25 kA	30 kA
40 – 63	20 kA	20 kA

Direction of blow-out



	Top, front	Bottom, rear
NZM1	X	–
NZMB(C)2-A... 250	X	–
(P)N2(-4)-...	X	–
NZMN(H)2...	X	X
NZM...2-4..	X	X
NZM3	X	X
NZM4	X	–

Minimum clearances



between two adjacently mounted switches
Minimum clearance a in mm

	NZM1	NZM2	NZM3	NZM4
NZM1	0	5	5	15
NZM2	5	5	5	15
NZM3	5	5	5	15
NZM4	15	15	15	15

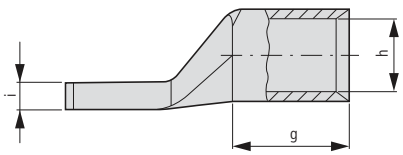
between switches and other parts
Minimum clearances in mm

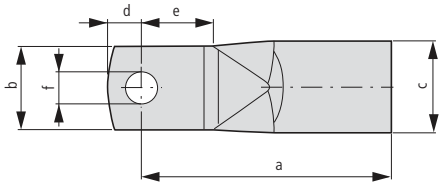
	b		c			d	
	≦ 690 V	1000 V	≦ 440 V	≦ 690 V	1000 V	≦ 690 V	1000 V
NZM1	0	–	30	60	–	0	–
NZM2[1)]	5	5	20[1)]	35[1)]	35	35	35
NZM3	5	5	30	60	60	60	60
NZM4	15	15	50	100[2)]	200	0	0

[1)] NZMB(C)2 – A … ≦ 440 V: C= 20 mm, d = 0 mm
≦ 690 V: C= 60 mm, d = 0 mm

[2)] At 690 V IT network: 200 mm

Tube cable lugs, dimensions





For pressing the cable lugs a press tool K22, HK60/22 or EK22 from Klauke with the following press inserts is required:
R22/95 for 95 mm²
R22/120 for 120 mm²
R22/150 for 150 mm²
R22/185 for 185 mm²
R22/240 for 240 mm²

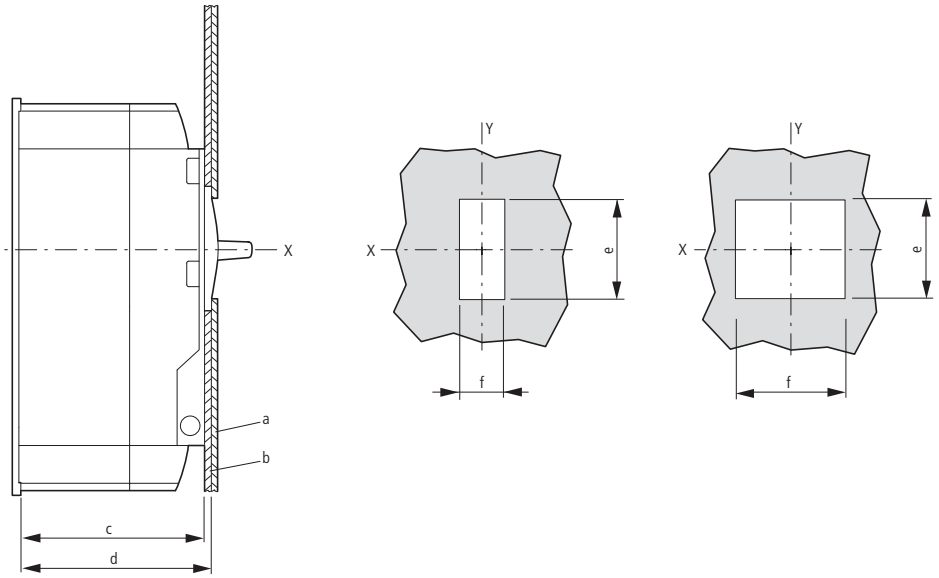
Cable lug	For use with	Nominal cross section	Terminal bolt	Dimensions in mm								
		mm²	∅	a	b	c	d	e	f	g	h	i
KS95-NZM7	NZM2	95	M8	53_{+2}	$23_{\pm0.5}$	$18_{\pm0.2}$	$10_{\pm1}$	19	8.5	25	13.5	4.4
KS120-NZM7	NZM2	120	M8	56_{+2}	$23_{\pm0.5}$	$19.5_{\pm0.2}$	$10_{\pm1}$	19	8.5	26	15	4.4
KS150-NZM7	NZM2	150	M8	61_{+2}	$23_{\pm0.5}$	$21_{\pm0.2}$	$10_{\pm1}$	19	8.5	30	16.5	4.4
NZM2-XKS185	NZM2	185	M8	$65_{\pm1.5}$	$22_{\pm1}$	$24_{\pm0.3}$	$9^{+1}_{-0.5}$	$19^{+2,5}_{-0.5}$	$8.5^{+0,05}_{-0.1}$	$30_{\pm2}$	$19_{\pm0.4}$	7
NZM3-XKS185	NZM3, NZM4	185	M10	65	24.5	24	11.5	18	10.5	30	19	$7.0_{\pm0.8}$
NZM3-XKS240	NZM3, NZM4	240	M10	72	31	26	11.5	19	10.5	35	21	$5.0_{\pm0.8}$

Engineering

Front cut-outs

Cut-out **a**
Rocker lever

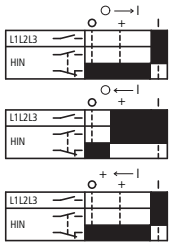
Cut-out **b**
Rotary handle, remote operator



	Distance from mounting plate and door cut-out		Cut-out **a**		Cut-out **b**	
	c	d	e	f	e	f
	mm	mm	mm	mm	mm	mm
NZM1	68	73	40	23	46	91
NZM2	103	108	79	36	96	101
NZM3	120.5	125.5	79	36	96	136
NZM4	138	146	101	105	118	204

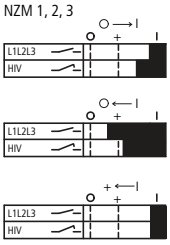
Contact sequence of the auxiliary contacts

Standard auxiliary contacts (HIN)

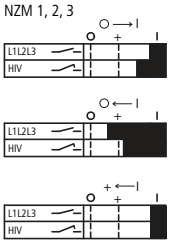


Early-make auxiliary contact (HIV)

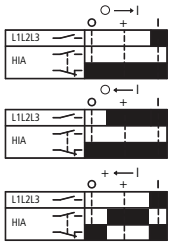
NZM 1, 2, 3



NZM 1, 2, 3



Trip-indicating auxiliary contacts (HIA)



0 → I Switch-on

0 ← I Switch-off

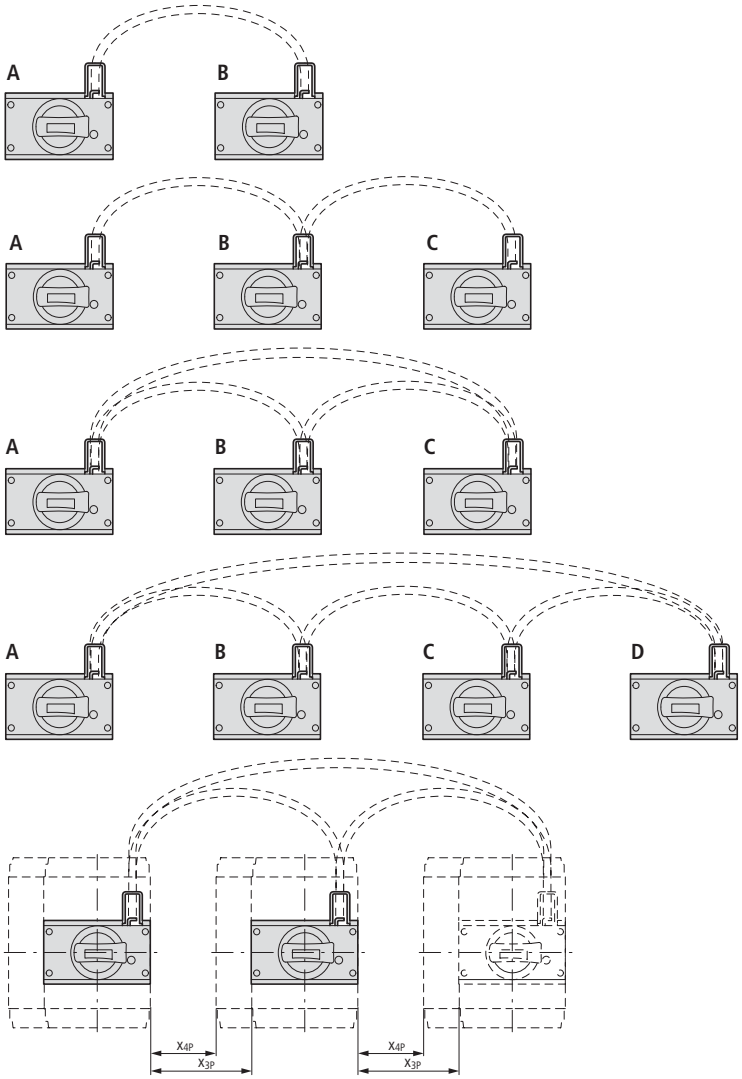
+← I Trip

■ Contact closed

□ Contact opened

Notes If early-make contacts are required in combination with shunt or undervoltage releases, please select the combination type in section "Releases"

Interlock variations and combination possibilities



A	B
OFF	OFF
ON/TRIP	~~ON~~
~~ON~~	ON/TRIP

A	B	C
OFF	OFF	OFF
~~ON~~	ON/TRIP	~~ON~~
ON/TRIP	~~ON~~	ON/TRIP

A	B	C
OFF	OFF	OFF
ON/TRIP	~~ON~~	~~ON~~
~~ON~~	ON/TRIP	~~ON~~
~~ON~~	~~ON~~	ON/TRIP

A	B	C	D
OFF	OFF	OFF	OFF
ON/TRIP	~~ON~~	ON/TRIP	~~ON~~
~~ON~~	ON/TRIP	~~ON~~	ON/TRIP

X_{3p} = switch spacing, 3 pole
X_{4p} = switch spacing, 4 pole

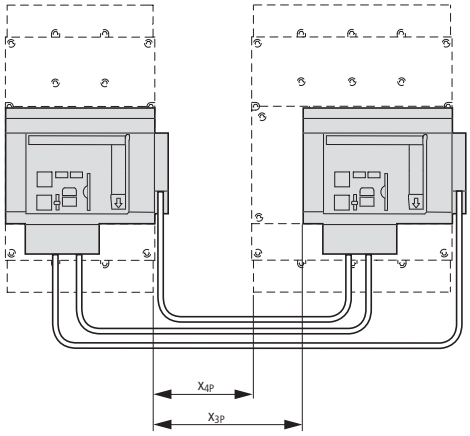
NZM-						Right switch			
Max. switch spacing		NZM1		NZM2		NZM3		NZM4	
		X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}
Left switch		mm	mm	mm	mm	mm	mm	mm	mm
NZM1	3/4 pole	135	105	120	85	135	90	125	80
NZM2	3/4 pole	135	105	120	85	135	90	125	80
NZM3	3/4 pole	90	75	75	35	85	40	80	45
NZM4	3/4 pole	50	35	40	15	25	–	15	–

NZM-XBZ600						Right switch			
Max. switch spacing		NZM1		NZM2		NZM3		NZM4	
		X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}
Left switch		mm	mm	mm	mm	mm	mm	mm	mm
NZM1	3/4 pole	510	480	495	460	510	465	475	405
NZM2	3/4 pole	510	480	495	460	510	465	475	405
NZM3	3/4 pole	460	430	450	410	460	415	460	390
NZM4	3/4 pole	400	370	380	340	400	375	390	320

NZM-XBZ1000						Right switch			
Max. switch spacing		NZM1		NZM2		NZM3		NZM4	
		X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}	X_{3P}	X_{4P}
Left switch		mm	mm	mm	mm	mm	mm	mm	mm
NZM1	3/4 pole	910	880	895	860	910	865	865	795
NZM2	3/4 pole	910	880	895	860	910	865	865	795
NZM3	3/4 pole	820	790	850	810	860	815	860	790
NZM4	3/4 pole	750	720	730	700	800	775	790	720

Mechanical interlock for remote operator, residual-current relay

NZM...-XMVR(L)



X_{3p} = max. switch spacing 3 pole
X_{4p} = max. switch spacing 4 pole

Mechanical interlock XMVR

NZM...-XMVR (mounted side-by-side)

Max. switch spacing Right switch

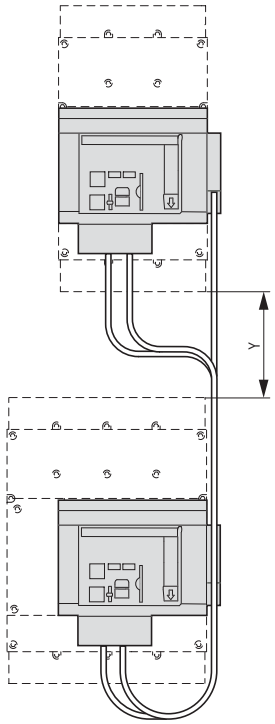
		NZM2		NZM3		NZM4	
		X_{3p}	X_{4p}	X_{3p}	X_{4p}	X_{3p}	X_{4p}
Left switch		mm	mm	mm	mm	mm	mm
NZM2	3/4 pole	130	95	95	50	–	–
NZM3	3/4 pole	–	–	135	90	155	85
NZM4	3/4 pole	–	–	–	–	120	50

Mechanical interlock XMVRL

NZM...-XMVRL (mounted side-by-side, in adjacent enclosures)

Max. switch spacing Right switch

		NZM2		NZM3		NZM4	
		X_{3p}	X_{4p}	X_{3p}	X_{4p}	X_{3p}	X_{4p}
Left switch		mm	mm	mm	mm	mm	mm
NZM2	3/4 pole	350	315	420	385	–	–
NZM3	3/4 pole	–	–	400	365	460	390
NZM4	3/4 pole	–	–	–	–	420	350



Mechanical interlock XMVRL

NZM…-XMVRL (mounted one above the other)

Max. switch spacing Switch at top

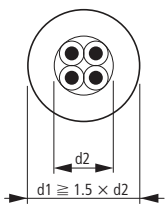
		NZM2	NZM3	NZM4
		3/4 pole	3/4 pole	3/4 pole
		Y	Y	Y
Switch at bottom		mm	mm	mm
NZM2	3/4 pole	220	225	–
NZM3	3/4 pole	–	220	230
NZM4	3/4 pole	–	–	230

Y = max. switch spacing

Residual-current relay PFR

Ring-type transformer PFR-W...

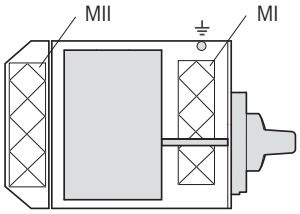
Maximum rated operational current [A]		Diameter	
Power distribution	Motor/capacitor	Transformer part no. PFR-W-… d1	Maximum conductor circumference (mm) d2
50	50	20	13
150	100	30	20
150	100	35	23
400	200	70	47
600	250	105	70
1200	630	140	93
1800	800	210	140



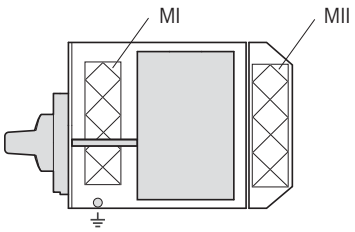
Additional terminal arrangement for side wall operator with mounting bracket.
NZM1-XS(R)M-..., NZM2-XS(R)M-...
Additional terminals K25, K50, K95, K150
Actuation:

3 pole

For operation on the right

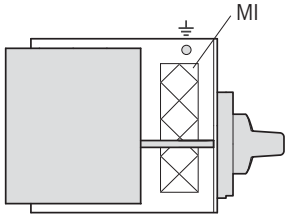


For operation on the left

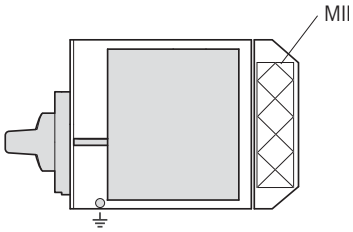


4 pole

For operation on the right



For operation on the left

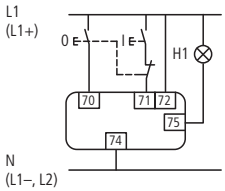


Mounting areas		MI				MII	
Variation options		V1	V2	V3	V4	V1	V2
Maximum number of additional terminals	K25	2 x	–	–	–	–	–
	K50	–	2 x	–	–	–	–
	K95	–	–	1 x	–	1 x	–
	K150	–	–	–	1 x	–	1 x

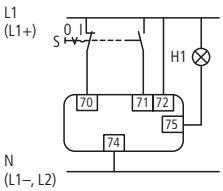
Example: In mounting area MI, variation option 1 allows the K25 additional terminal to be mounted twice.

2/3-wire control remote operator

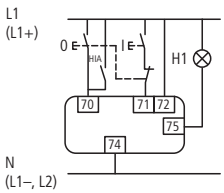
Three-wire control



Two-wire control



Three-wire control with automatic reset to the 0 position after the switch has tripped



Please note for engineering:

Terminal 70/71:

NZM-XR: Contact loading according to technical data

NZM2-XRD: Full current flows though the contact during make and break!

RMQ series contact elements can be used for the remote operators.NZM2(3.4)-XR(D)...

Terminal 75:

NZM-XR: Operational readiness signal when cover closed and not locked.

NZM2-XRD: Operational readiness signal when sliding switch set to Auto.

Sliding switch with three positions: Manual/Auto/Locked for reliable differentiation of operating positions.

AC-15: 400 V; 2 A

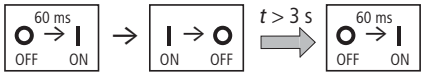
DC-13: 220 V; 0.2 A

Switching cycle:

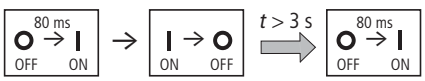
NZM2-XRD



NZM2-XR

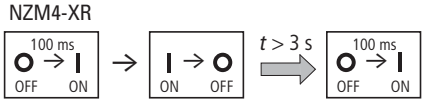


NZM3-XR



The time interval between OFF and ON is 3 seconds.
ON commands received during the time interval are ignored within the first 3 seconds after switch off.

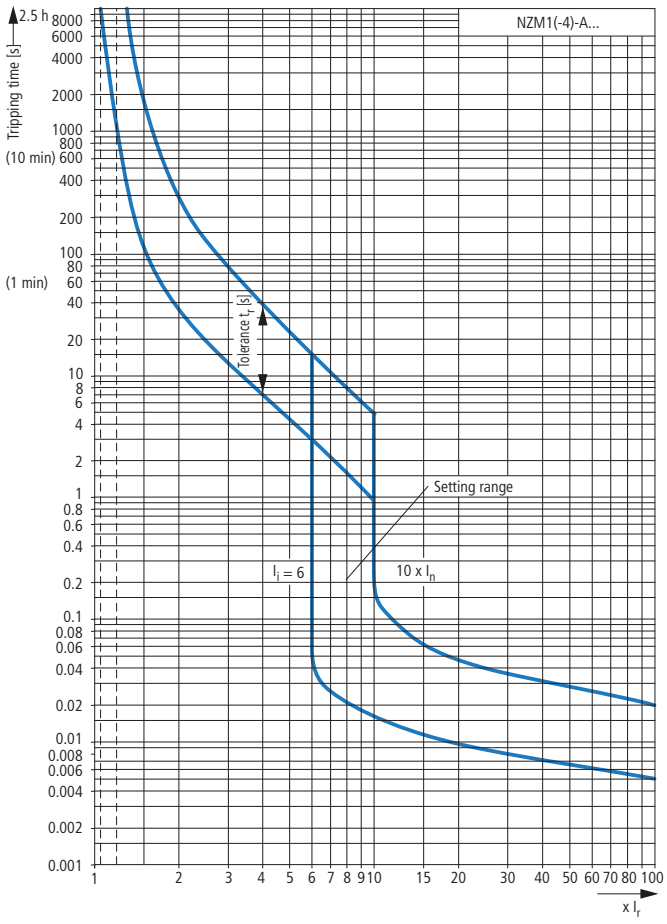
NZM4-XR



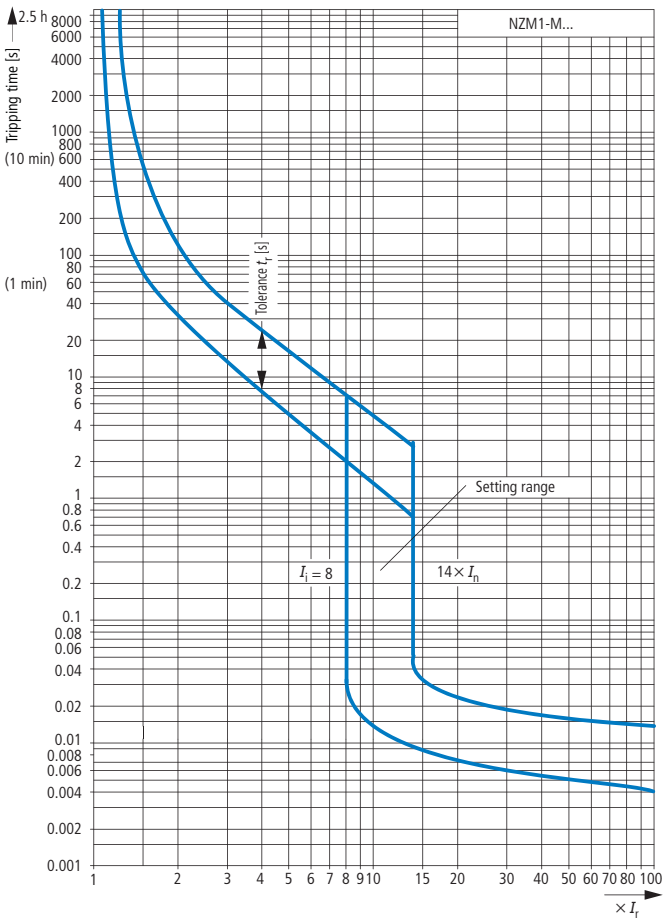
Construction size 1, 2: tripping characteristics

NZM1, NZM2

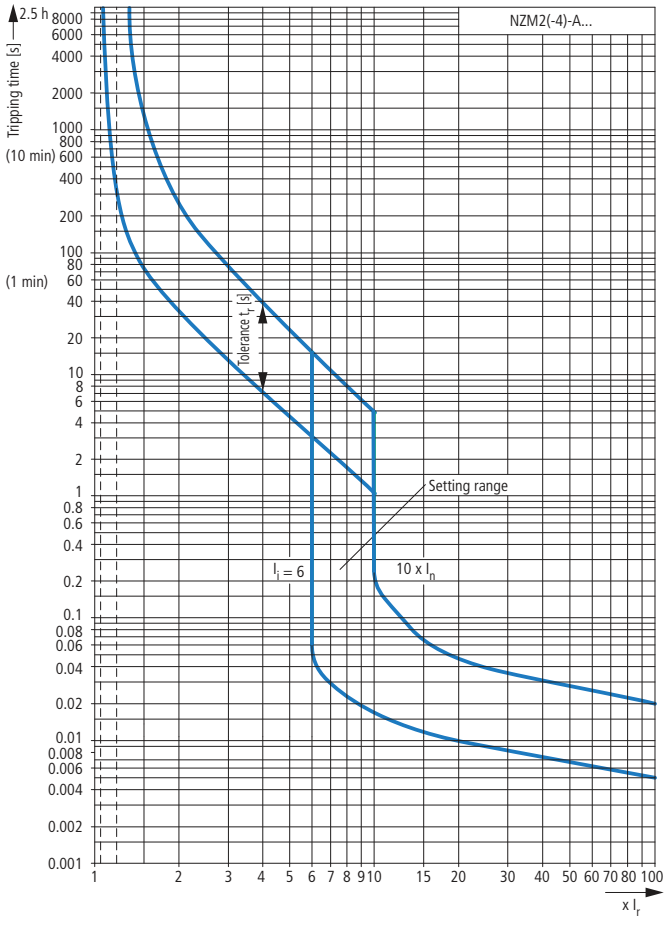
System and line protection with NZM1



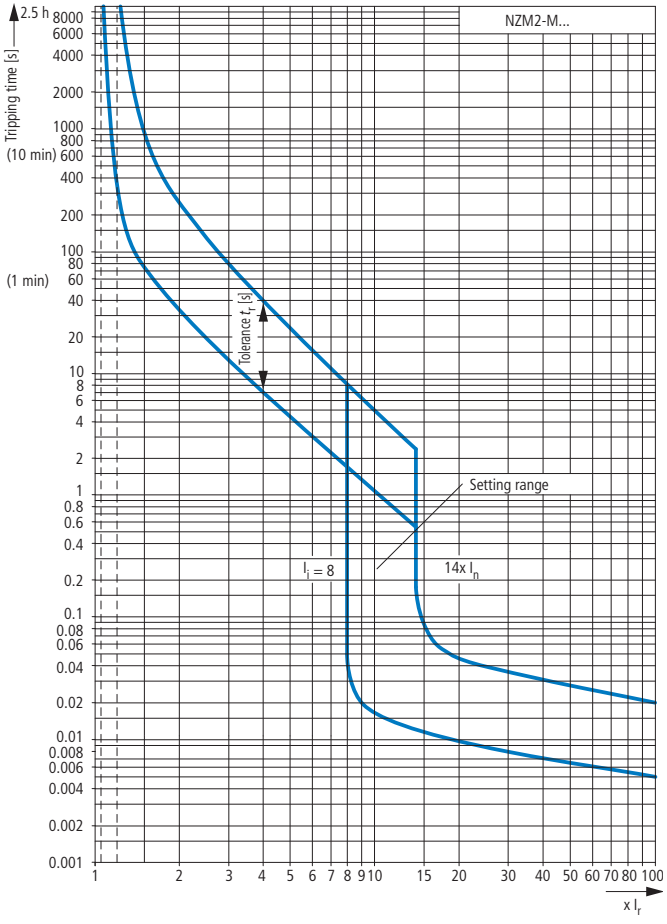
Motor protection with NZM1



System and line protection with NZM2

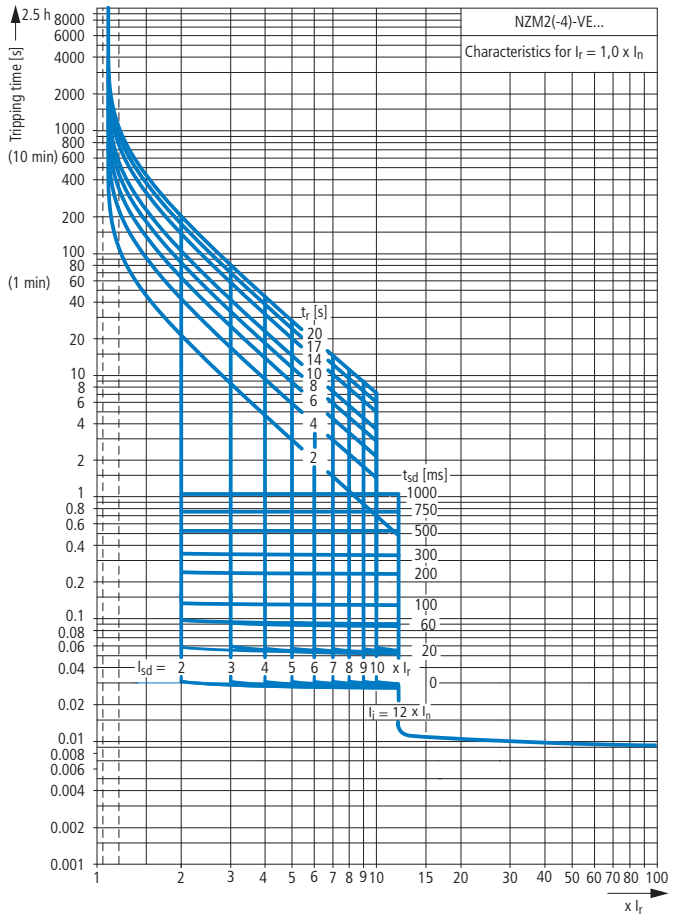


Motor protection with NZM2

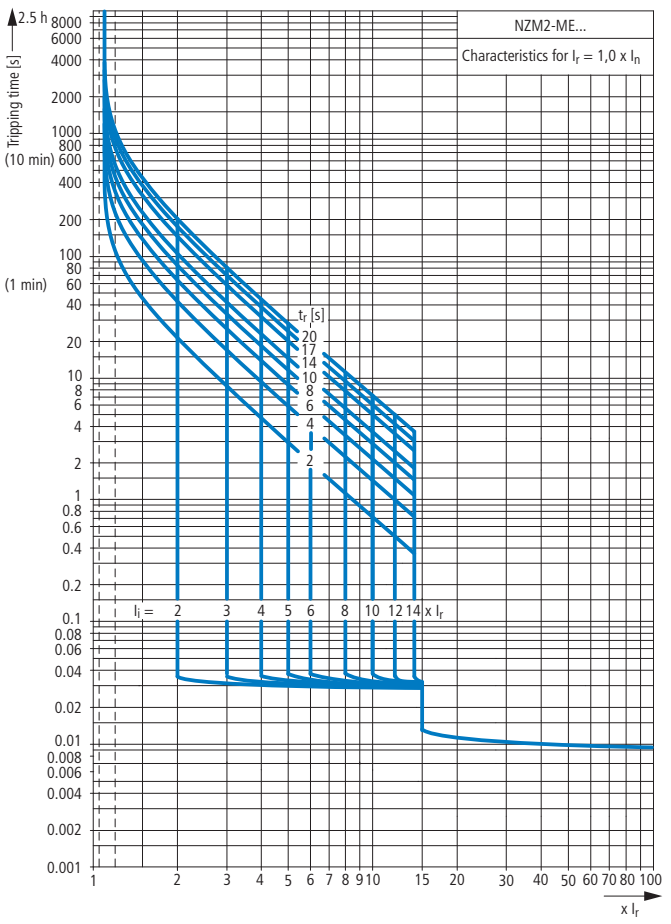


Notes With the free CurveSelect software you can quickly and easily create detailed representations of individual settings:
www.moeller.net, Products & Solutions > Power Distribution > Switching and Protecting Power Distribution > CurveSelect: Characteristics program

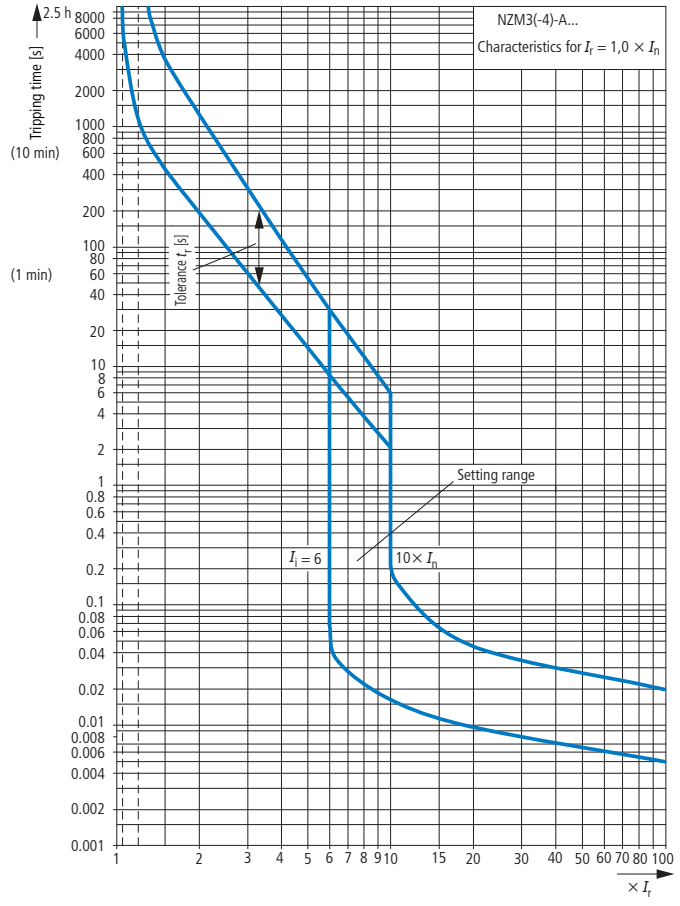
Systems, cable, selectivity and generator protection with NZM2

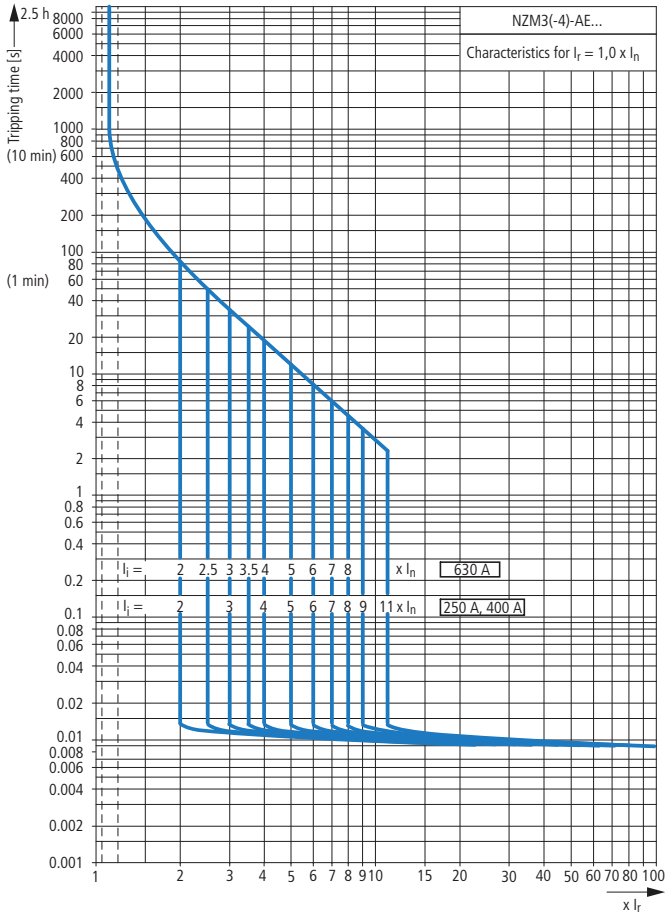


Motor protection with NZM2



System and line protection with NZM3





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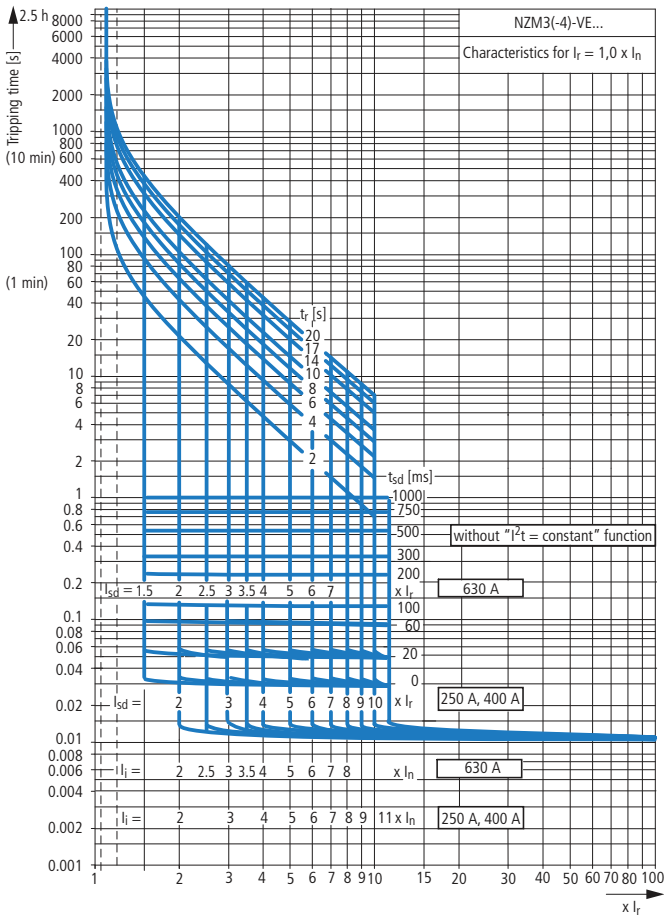
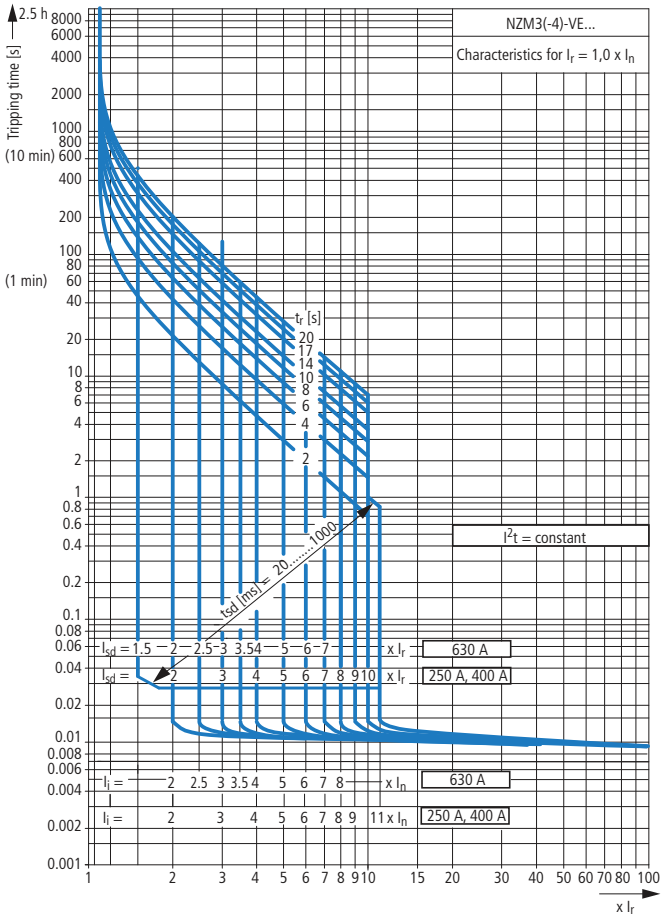
Construction size 3, 4: tripping characteristics

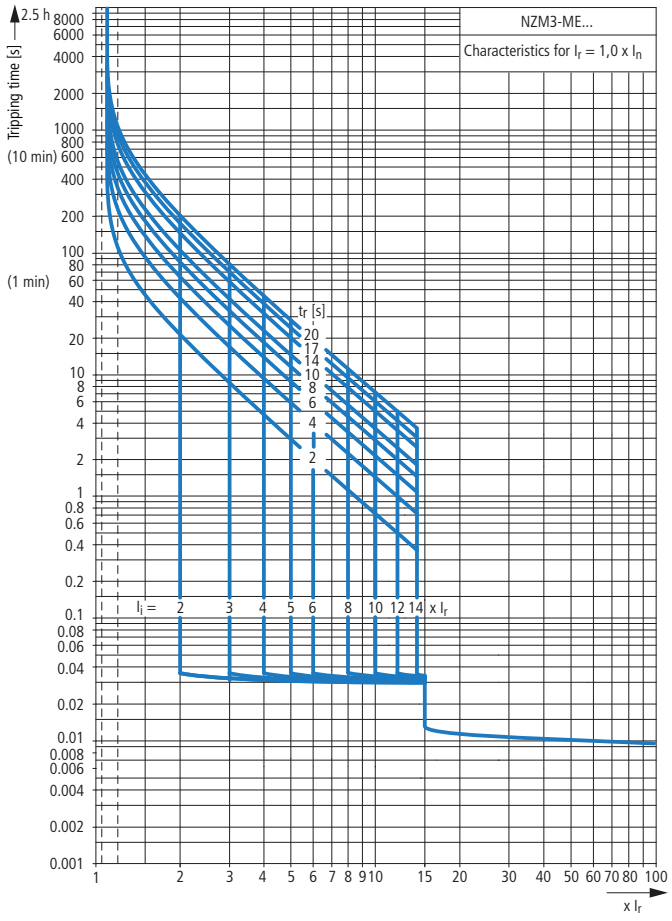
NZM3, NZM4

Systems, cable, selectivity and generator protection with NZM3





Motor protection with NZM3



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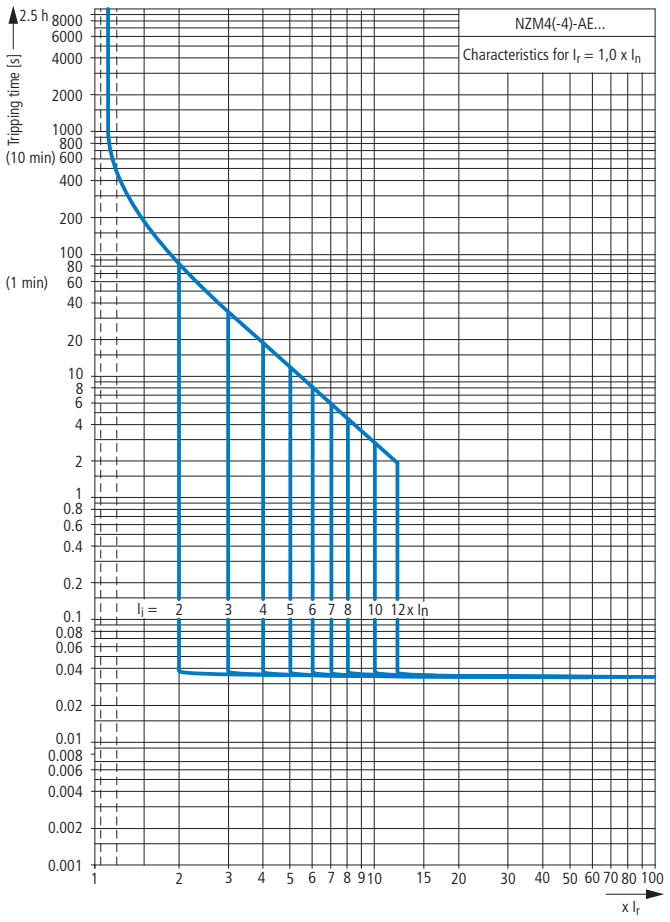
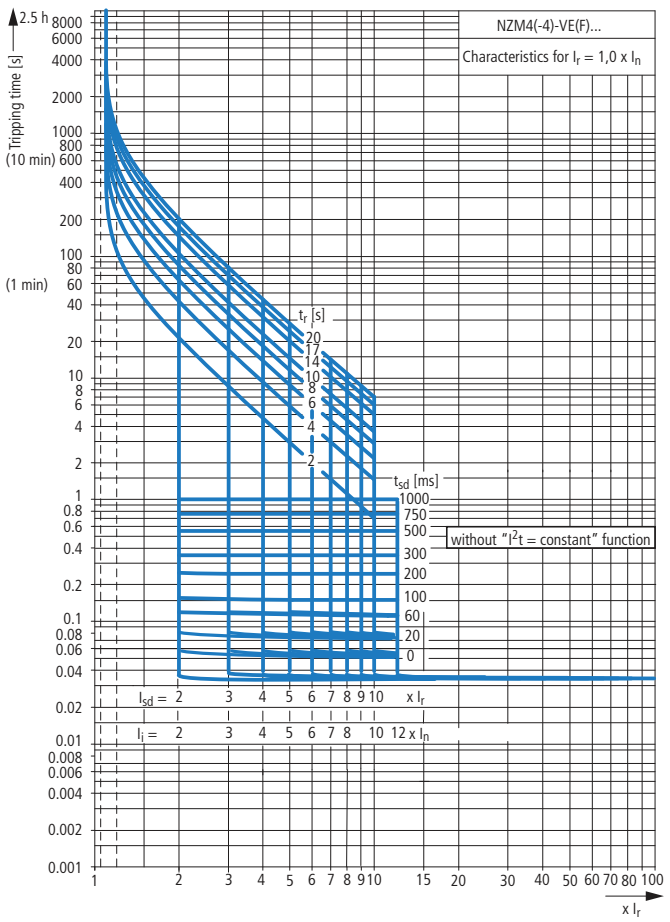
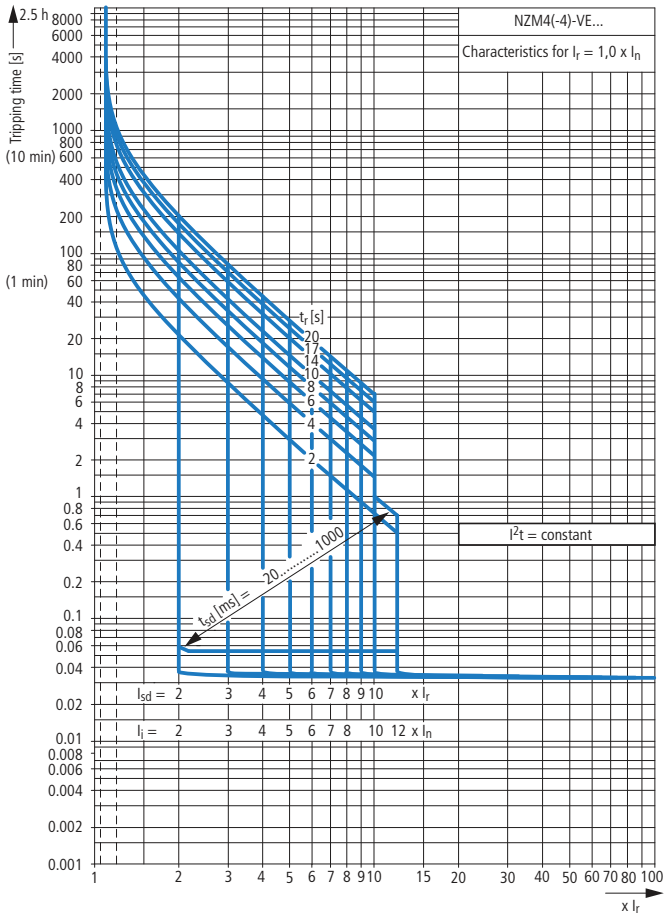
System and line protection with NZM4



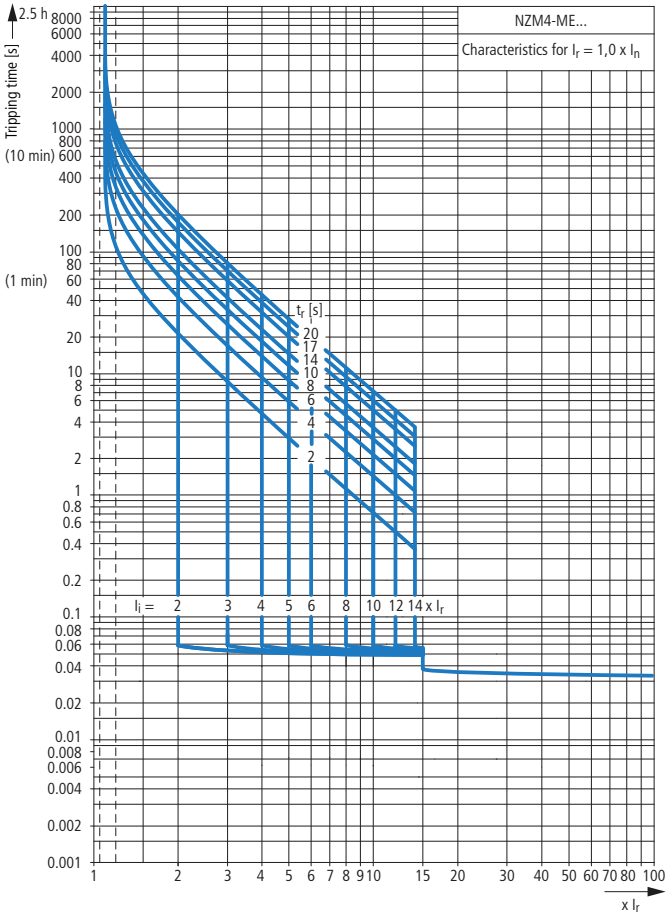
Systems, cable, selectivity and generator protection with NZM4



Systems, cable, selectivity and generator protection with NZM4



Motor protection with NZM4



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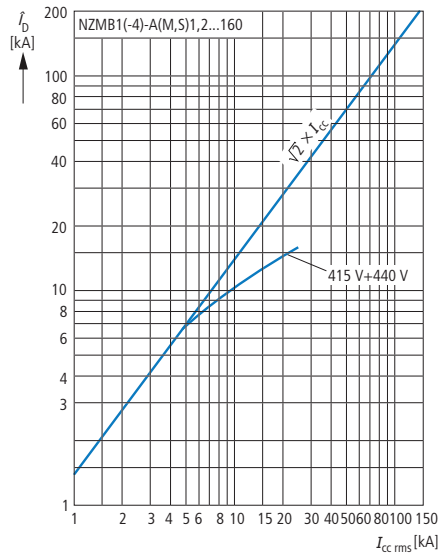
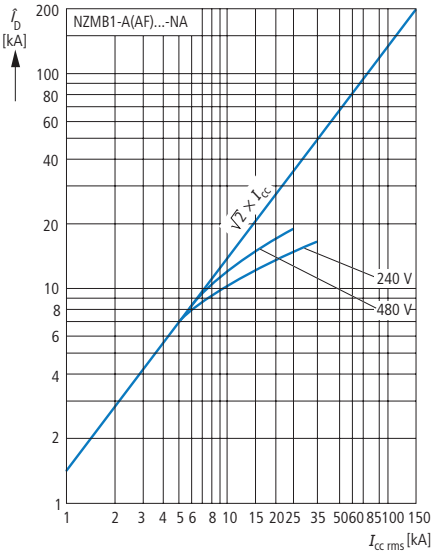
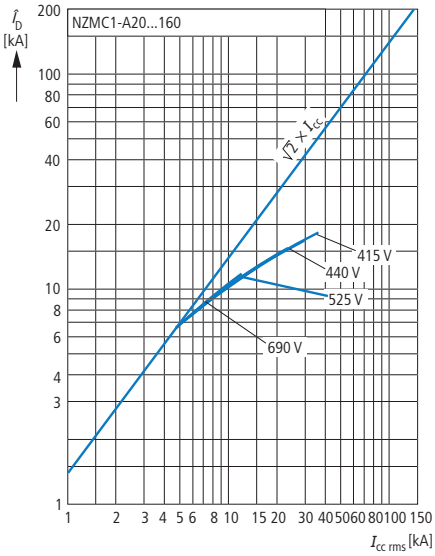
Construction size 1: let-through characteristsics

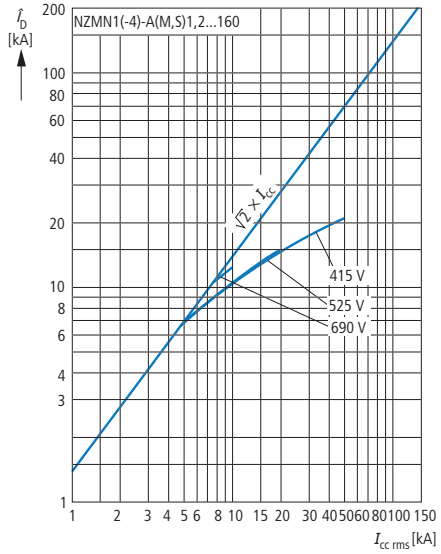
NZM1

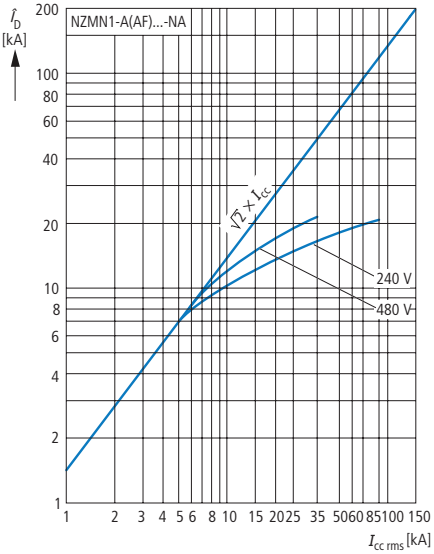
Let-through current I_D

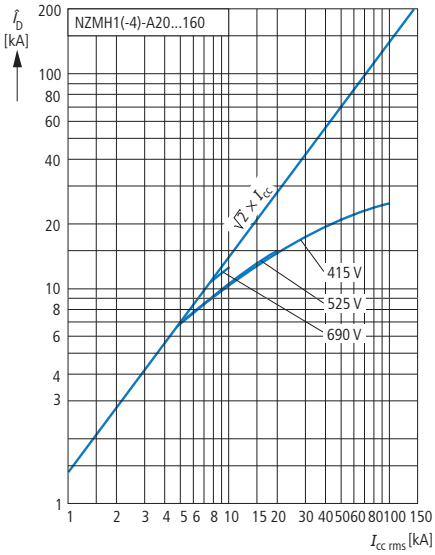




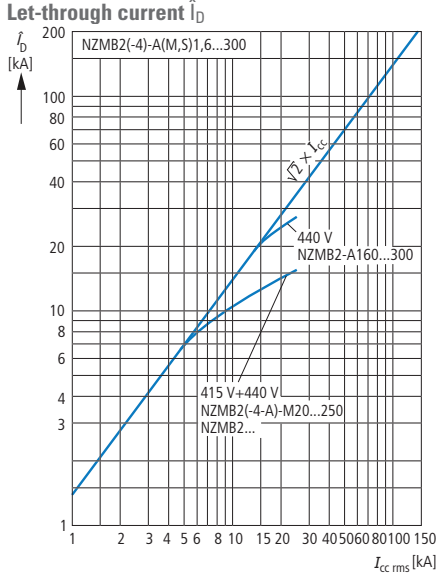


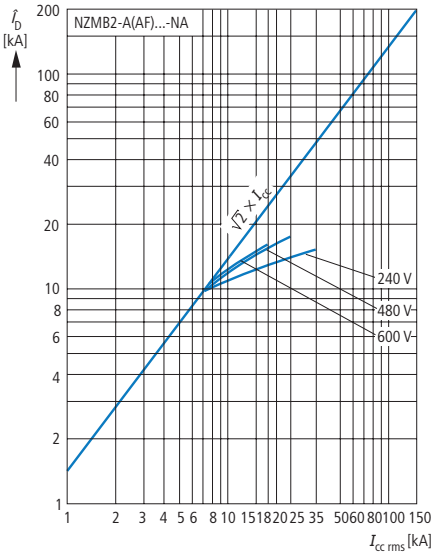


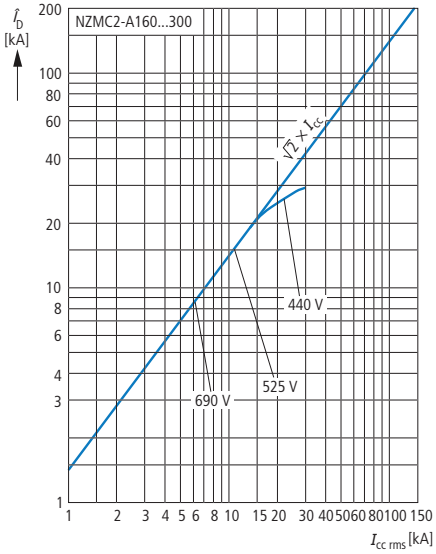


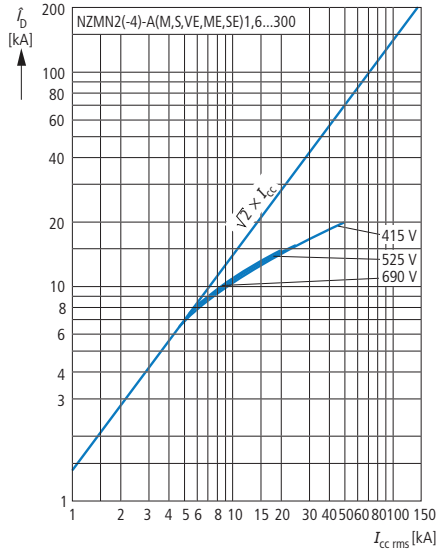


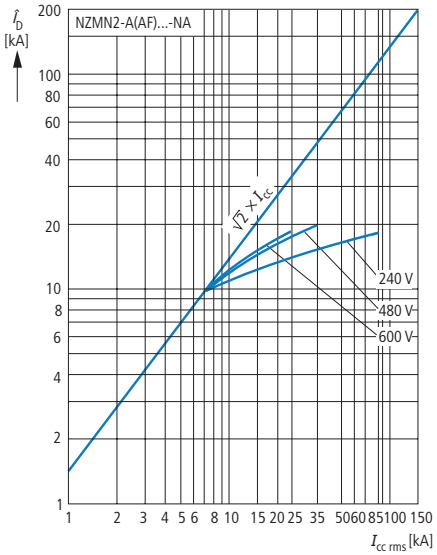
Let-through current $\hat{i}_D$

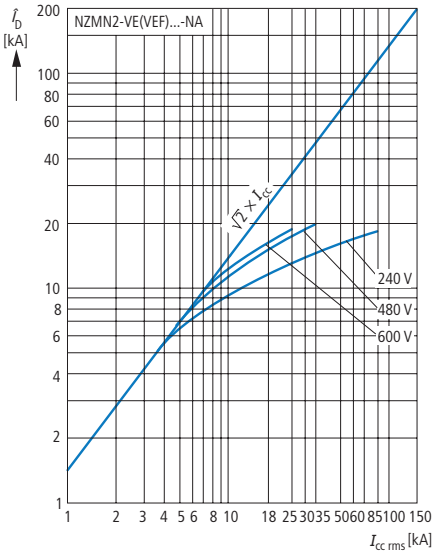


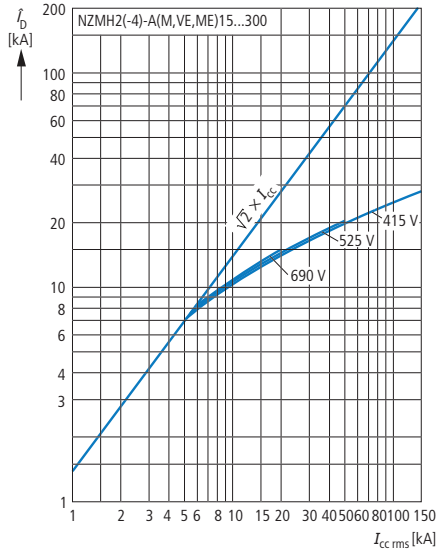


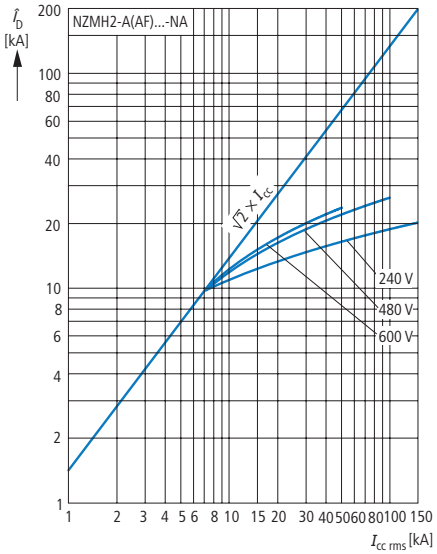


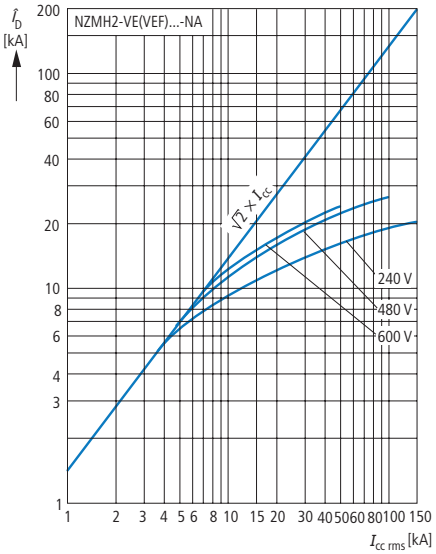








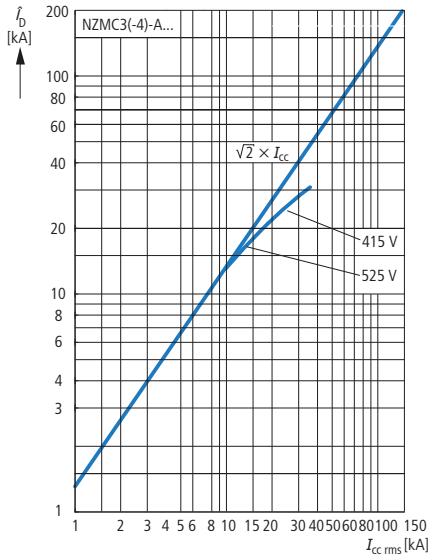


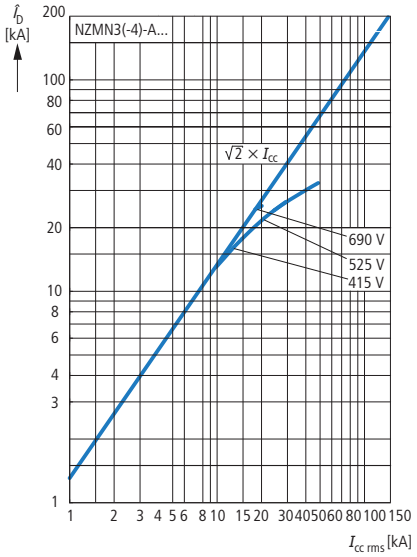


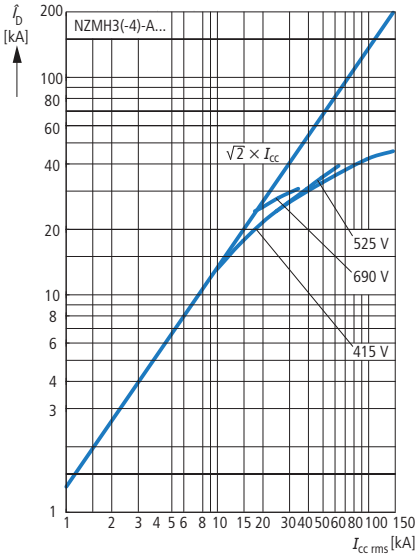
Construction size 3: let-through characteristics

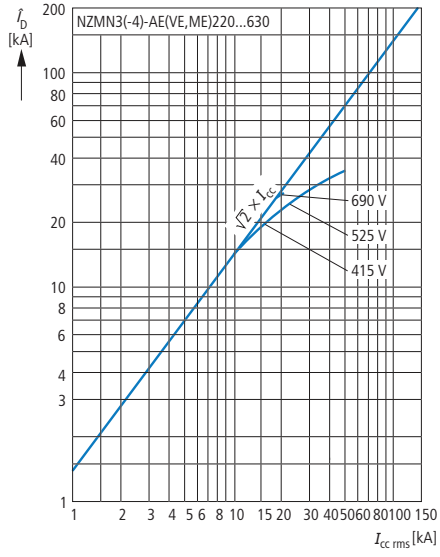
NZM3

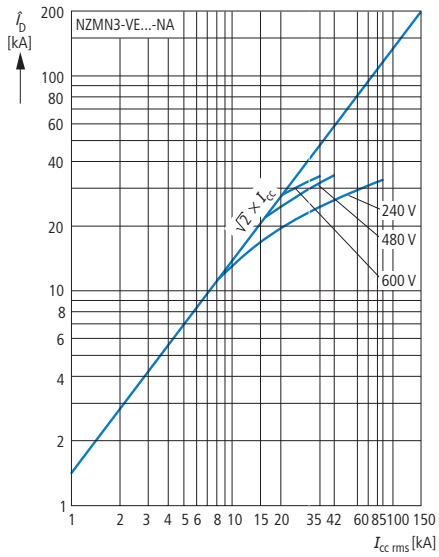
Let-through current $\hat{i}_D$

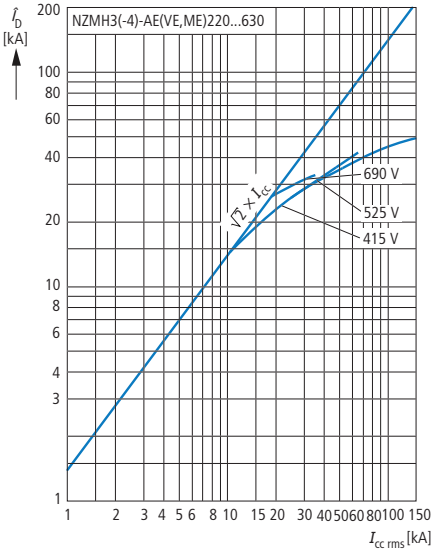


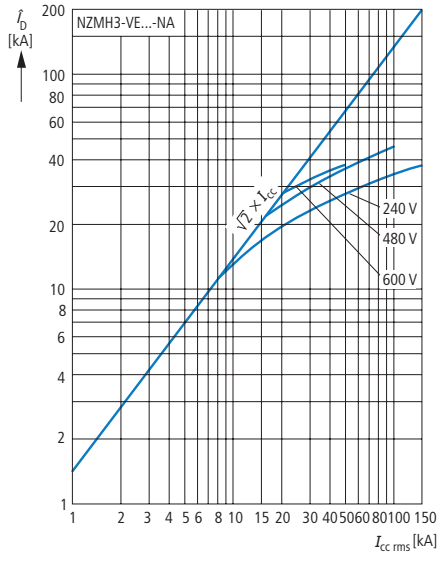




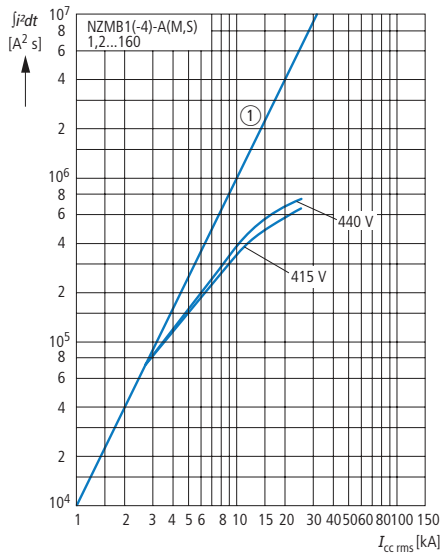


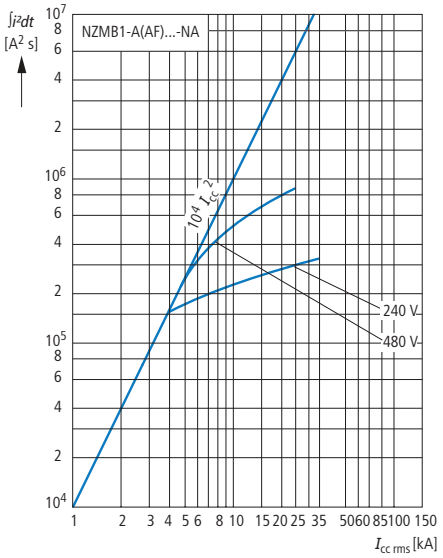


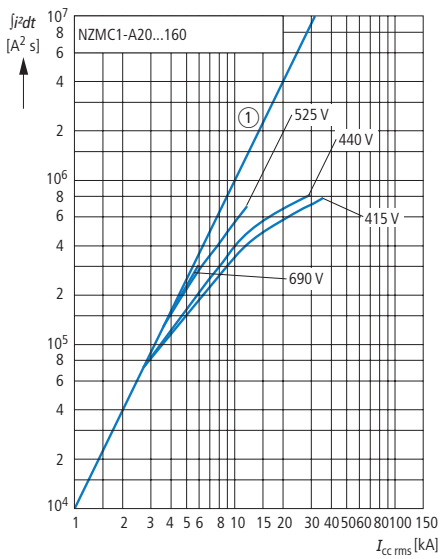


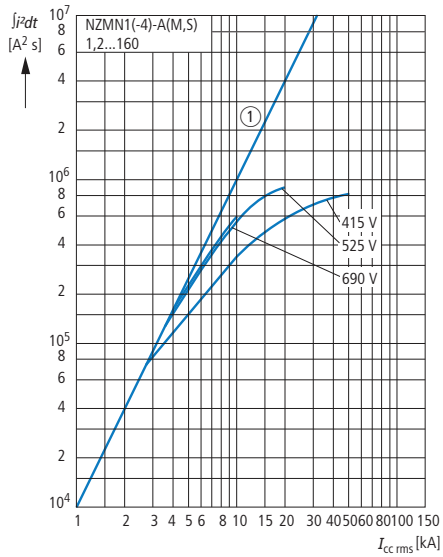


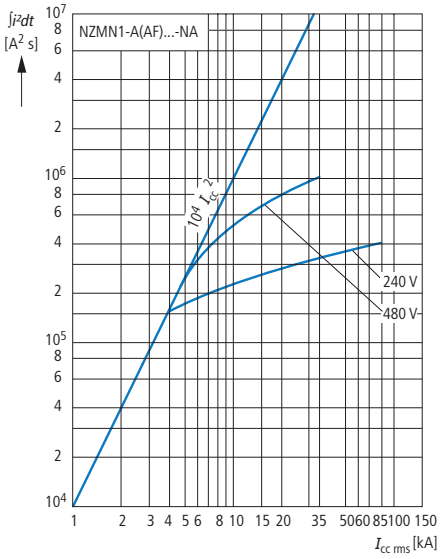
Let-through energy I^2t

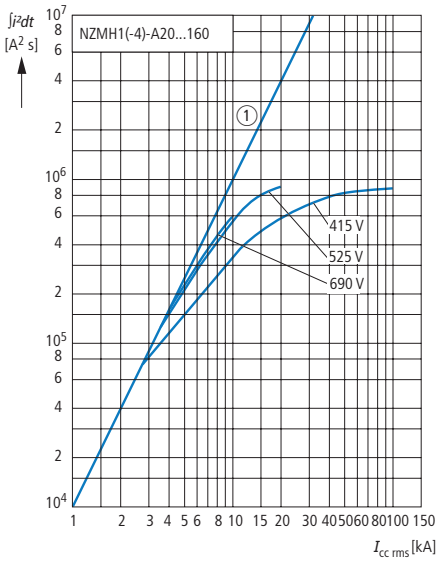












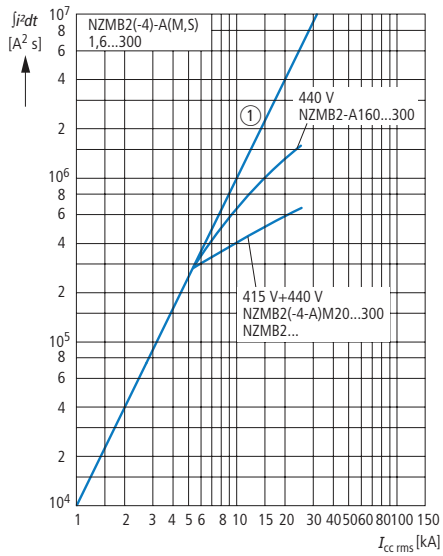
① 1 half-cycle

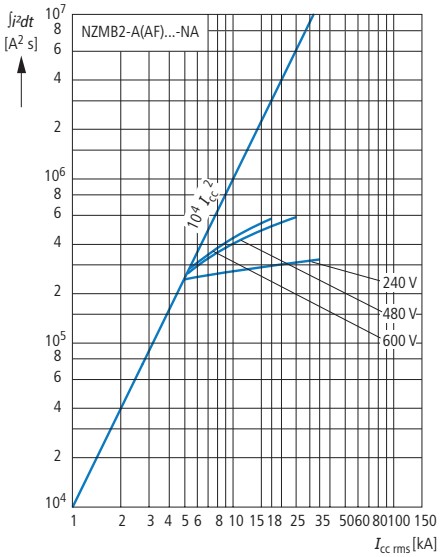
① 1 half-cycle

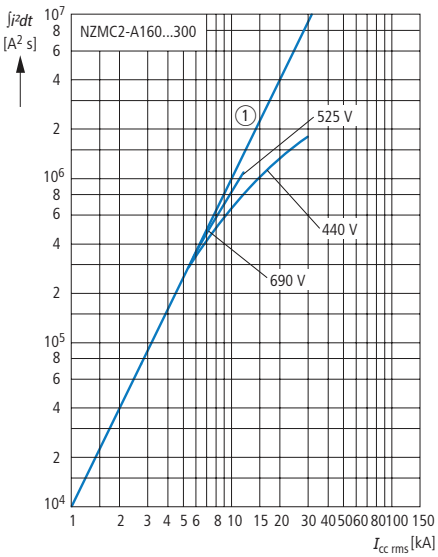
Construction size 2: let-through characteristics

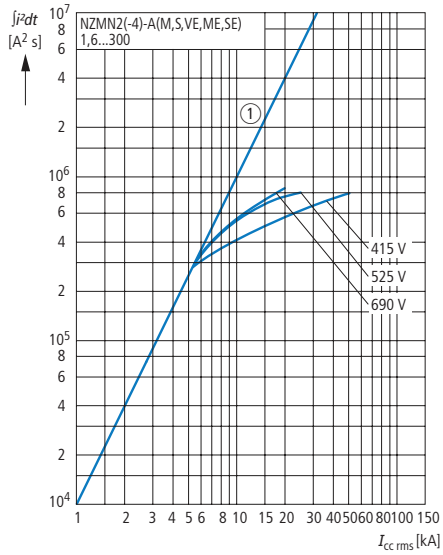
NZM2

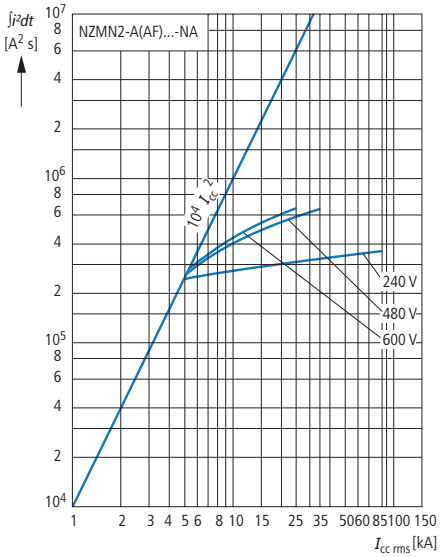
Let-through energy I^2t

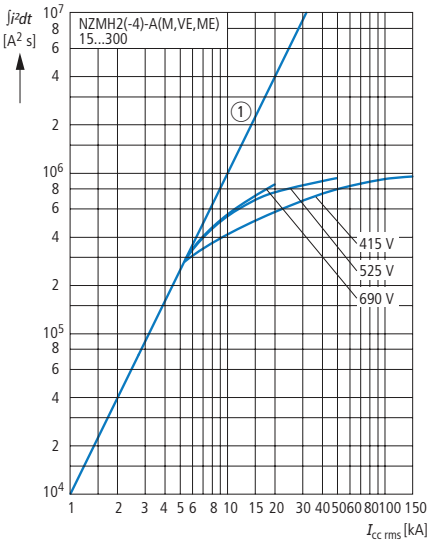


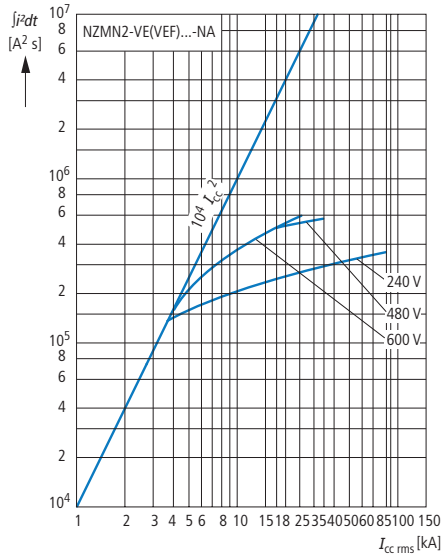


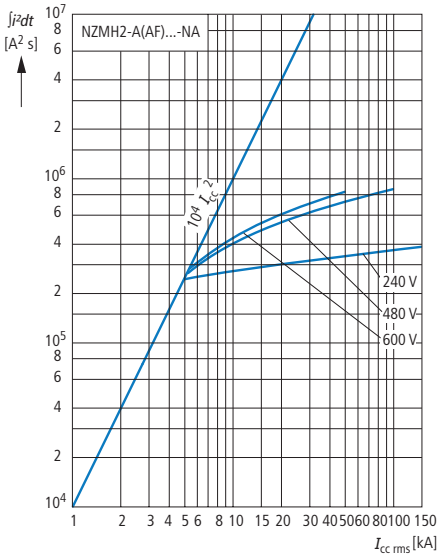


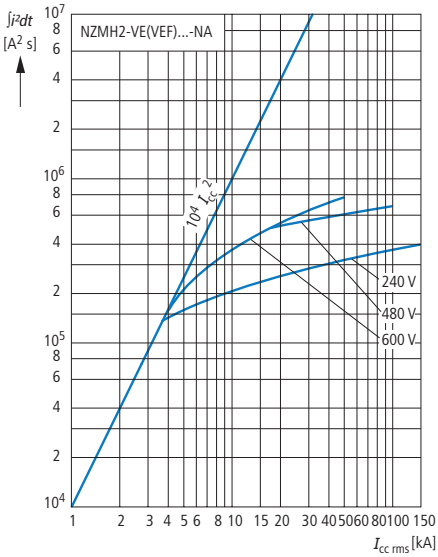








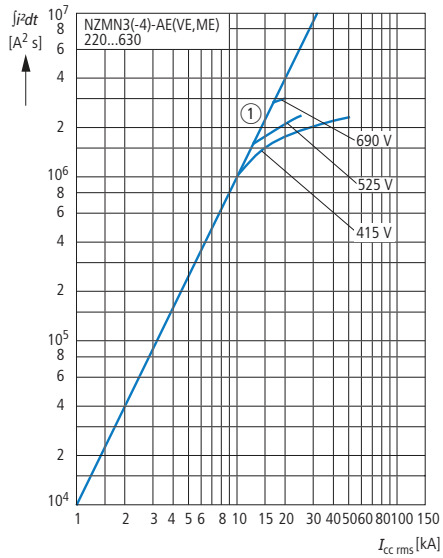


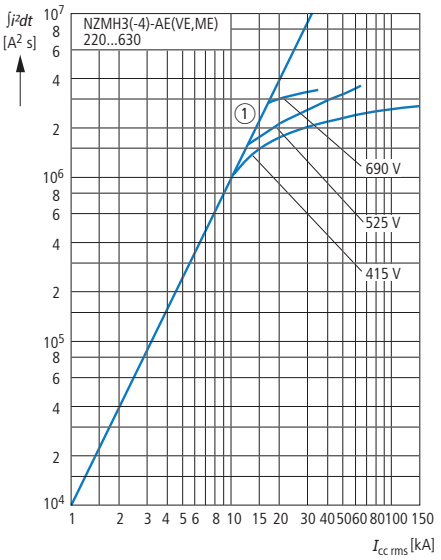


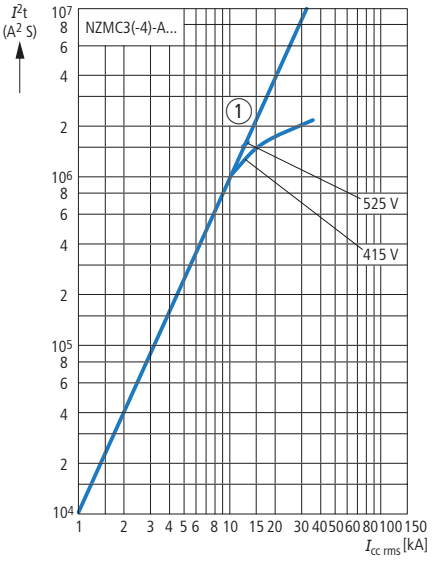
① 1 half-cycle

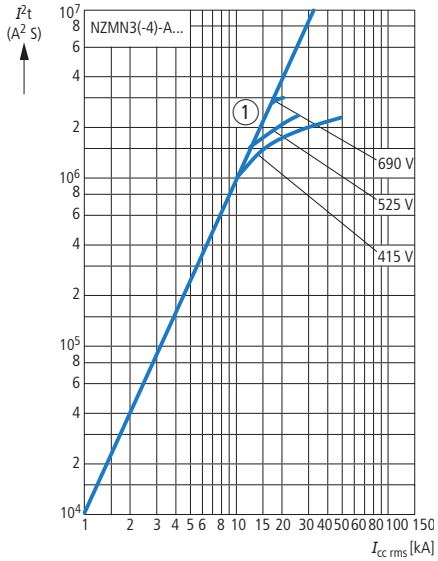
① 1 half-cycle

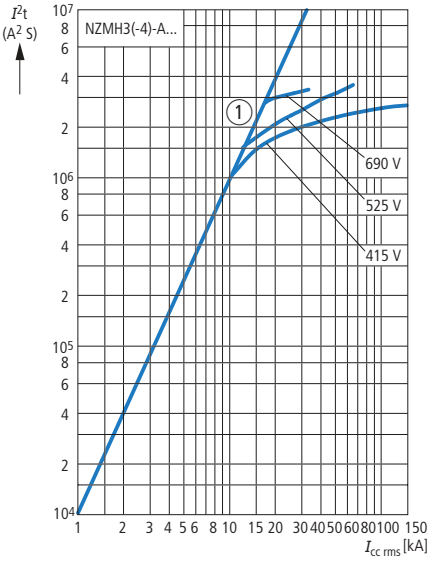
Let-through energy I^2t

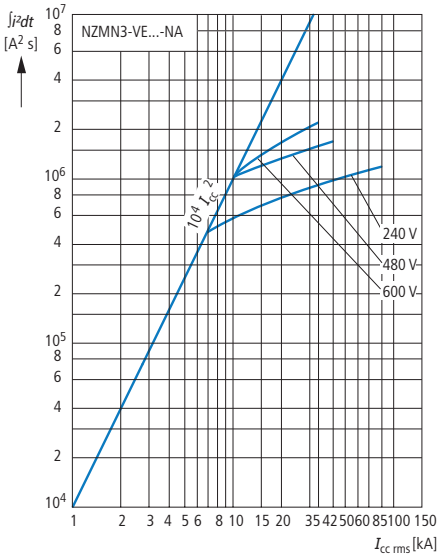


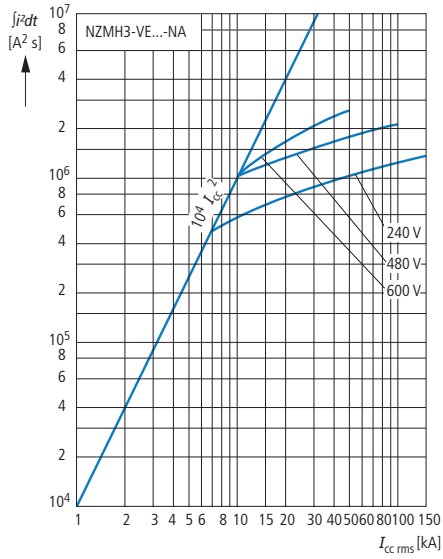










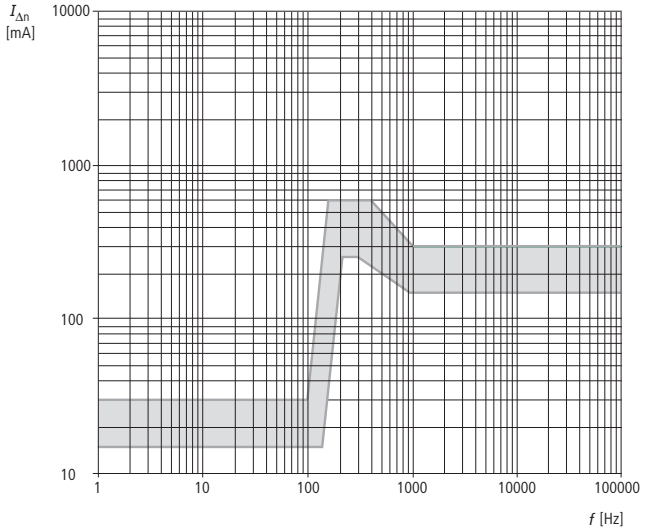


① 1 half-cycle

Frequency response

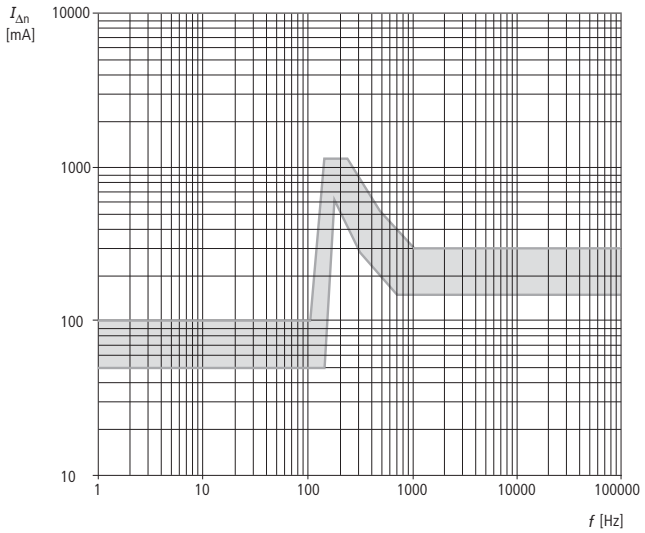
+NZM2-4-XFIA30

30 mA



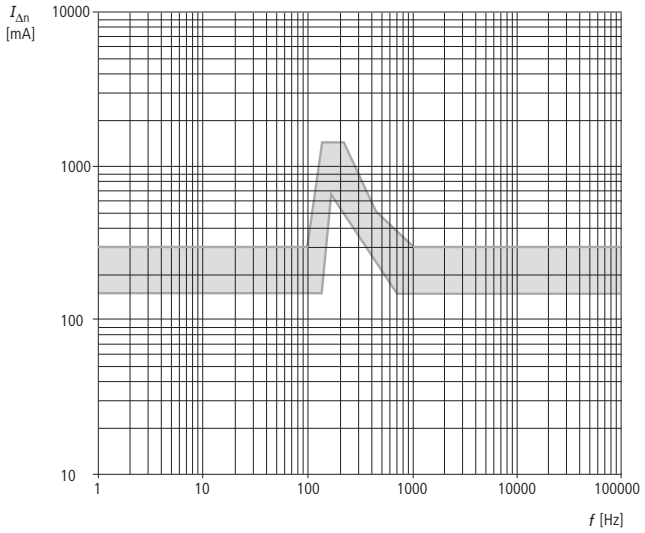
+NZM2-4-XFIA

100 mA

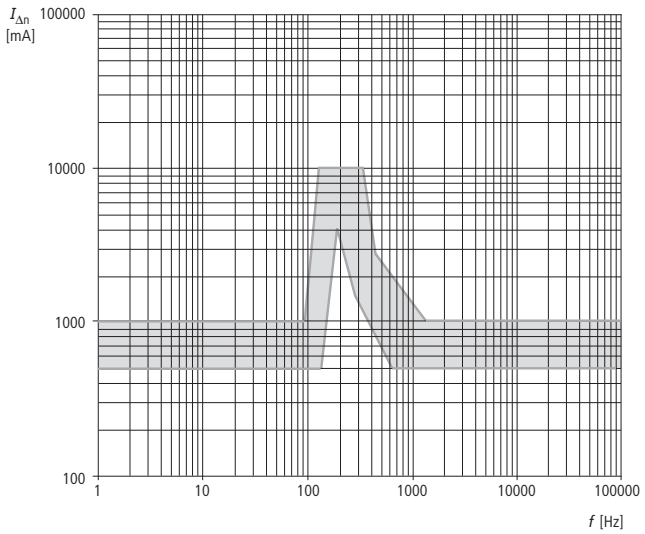


+NZM2-4-XFIA

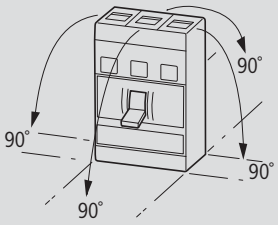
300 mA



1000 mA



Technical data

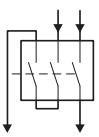
General			
Standards			IEC/EN 60947 and VDE 0660
Contact protection			Finger and back-of-hand proof to DIN EN 50274/VDE 0660 Part 514
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature			
Storage		°C	-25…+70
Operation		°C	-25…+70
Mechanical shock resistance (IEC/EN 60068-2-27)		g	20 (half-sinusoidal shock 20 ms)
Safe isolation according to EN 61140			
Between auxiliary contacts and main contacts		V AC	500
Between the auxiliary contacts		V AC	300
Built-in position			Vertical and 90° in all directions  With residual-current release XFI: - NZM1, N1, NZM2, N2: vertical and 90° in all directions With plug-in adapter elements - NZM1, N1, NZM2, N2: vertical, 90° right/left With withdrawable unit: - NZM3, N3: vertical, 90° left - NZM4, N4: vertical With remote operator: - NZM2, N(S)2, NZM3, N(S)3, NZM4, N(S)4: vertical and 90° in all directions
Direction of incoming supply			Any
Degree of protection			
Device			In the area of the HMI devices: IP20 (basic degree of protection)
Enclosure			With insulating surround: IP40 With door coupling rotary handle: IP66
Terminal type			Tunnel terminal: IP10 Phase isolator and cable terminal: IP00

			Rated uninterrupted current									
			max. 160 A			**max. 300 A**			**max. 630 A**		**max. 1600 A**	
			NZMB1	**NZMC1**	**NZMN1** **NZMH1**	**NZMB2**	**NZMC2**	**NZMN2** **NZMH2**	**NZMC3**	**NZMN3** **NZMH3**	**NZMN4**	**NZMH4**
Circuit-breaker												
Rated impulse withstand voltage U_{imp}												
Main contacts		V	6000	6000	6000	8000	8000	8000	8000	8000	8000	8000
Auxiliary contacts		V	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Rated operating voltage	U_e	V AC	440	690	690	440	690	690	690	690	690	690
		V DC[1]	–	–	500	–	–	750	750	–	–	–
Overvoltage category/degree of pollution			III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V	690	690	690	690	690	1000	1000	1000	1000	1000
For use in IT electrical power networks		V	440	690	690	440	690	690	690	690	525	690[2]

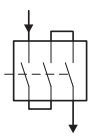
Notes

[1] Details apply for 3 pole system protection circuit-breaker with thermomagnetic release NZMN(H)1(2)(3)-A... up to 500 A.
For rated operating voltage switching on 3 contacts the following applies:
DC correction factor for instantaneous release
response value NZM1: 1.25, NZM2: 1.35, NZM3: 1.45
Setting for I_i at DC = setting I_i AC/correction factor DC

Switching of one pole via two series contacts



Switching of one pole via three series contacts



[2] > 800 A = 525

NZM...1, NZM...2, NZM...3, NZM...4

NZM...1, NZM...2, NZM...3, NZM...4

					Max. rated uninterrupted current 160 A				Max. rated uninterrupted current 300 A				Max. rated uninterrupted current 630 A			Max. rated uninterrupted current 1600 A	
					NZMB1	NZMC1	NZMN1	NZMH1	NZMB2	NZMC2	NZMN2	NZMH2	NZMC3	NZMN3	NZMH3	NZMN4	NZMH4
Switching capacity																	
Rated short-circuit making capacity																	
	240 V		I_{cm}	kA	63	121	187	220	63	121	187	330	121	187	330	105	275
	400/415 V		I_{cm}	kA	53	76	105	220	53	76	105	330	76	105	330	105	187
	440 V		I_{cm}	kA	53	63	74	74	53	63	74	286	63	74	286	74	187
	525 V		I_{cm}	kA	–	24	40	40	–	24	53	105	24	53	143	53	143
	690 V		I_{cm}	kA	–	14	17	17	–	9	40	40	14	40	74	40	105
Rated short-circuit breaking capacity I_{cn}																	
I_{cu} according to IEC/EN 60947 Operating sequence O-t-CO	240 V 50/60 Hz		I_{cu}	kA	30	55	85	100	30	55	85	150	55	85	150	50	125
	400/415 V 50/60 Hz		I_{cu}	kA	**25**	**36**	**50**	**100**	**25**	**36**	**50**	**150**	**36**	**50**	**150**	**50**	**85**
	440 V 50/60 Hz		I_{cu}	kA	25	30	35	70	25	30	35	130	30	35	130	35	85[7]
	525 V 50/60 Hz		I_{cu}	kA	–	12	20	20	–	12	25	50	12	25	65	25	65
	690 V 50/60 Hz		I_{cu}	kA	–	8	10	10	–	8	20	20	8	20	35	20	50
	500 V DC[3]		I_{cu}	kA	–	–	15	30	–	–	30	60	–	30	70	–	–
	750 V DC[3]		I_{cu}	kA	–	–	–	–	–	–	30	60	–	30	70	–	–
I_{cs} according to IEC/EN 60947 Operating sequence O-t-CO-t-CO	240 V 50/60 Hz		I_{cs}	kA	30	55	85	100	30	55	85	150	55	85	150	37	63
	400/415 V 50/60 Hz		I_{cs}	kA	**25**	**36**	**50**	**50**	**25**	**36**	**50**	**150**	**36**	**50**	**150**	**37**	**43**
	440 V 50/60 Hz		I_{cs}	kA	18.5	22.5	35	35	18.5	22.5	35	130	22.5	35	130	26	43
	525 V 50/60 Hz		I_{cs}	kA	–	6	10	10	–	6	25	37.5	9	13	33	19	49
	690 V 50/60 Hz		I_{cs}	kA	–	4	7.5	7.5	–	4	5	5	4	5	9	15	37
Maximum LV h.b.c. fuse[6]				A gG/gL	NZM.1-…20…100: 200 NZM.1-…125, 160: 315				355	355	355	355	NZMC3...500: 630	NZMH3-...250, 400: 400 NZMH3...500: 630 NZMH3...630: 630	NZMH3-...250, 400: 400 NZMH3...500: 630 NZMH3...630: 630	NZMN4-…630…1250: 2 x 630 NZMN4-…1600: 2 x 800	
Rated short-time withstand current																	
t = 0.3 s			I_{cw}	kA	–	–	–	–	–	–	1.9	1.9	3.3	3.3	3.3	19.2	19.2
t = 1 s			I_{cw}	kA	–	–	–	–	–	–	1.9	1.9	3.3	3.3	3.3	19.2	19.2
Utilization category according to IEC/EN 60947-2					A	A	A	A	A	A	A	A	A	A	A	B	B
Rated making and breaking capacity																	
Rated operational current	AC-1	**400/415 V 50/60 Hz**	I_e	A	**160**	**160**	**160**	**160**	**300**	**300**	**300**	**300**	**500**	**630**	**630**	**1600**	**1600**
		690 V 50/60 Hz	I_e	A	160	160	160	160	250	250	250	250	500	630	630	1600	1600
	AC-3	**400/415 V 50/60 Hz**	I_e	A	**160**	**160**	**160**	**160**	**300**	**300**	**300**	**300**	**450**	**450**	**450**	**1600[2]**	**1600[2]**
		690 V 50/60 Hz	I_e	A	160	160	160	160	250	250	250	250	450	450	450	1600[2]	1600[2]
	DC-1[3]	500 V DC	I_e	A	–	–	125	125	–	–	250	250	–	500	500	–	–
		750 V DC	I_e	A	–	–	–	–	–	–	250	250	–	500	500	–	–
	DC-3[3]	500 V DC	I_e	A	–	–	125	125	–	–	250	250	–	500	500	–	–
		750 V DC	I_e	A	–	–	–	–	–	–	250	250	–	500	500	–	–
Lifespan, mechanical of which max. 50 % trip by shunt/undervoltage release			Operations		20000	20000	20000	20000	20000	20000	20000	20000	15000	15000	15000	10000	10000
Lifespan, electrical																	
	AC-1	**400/415 V 50/60 Hz**	Operations		**7500**	**7500**	**10000**	**10000**	**7500**	**7500**	**10000**	**10000**	**5000**	**5000**	**5000**	**3000**	**3000**
		690 V 50/60 Hz	Operations		–	5000	7500	7500	–	7500	7500	7500	3000	3000	3000	2000	2000
	AC-3	**400/415 V 50/60 Hz**	Operations		–	–	**7500**	**7500**	–	–	**6500**	**6500**	**2000**	**2000**	**2000**	**2000**	**2000**
		690 V 50/60 Hz	Operations		–	–	5000	5000	–	5000	5000	5000	2000	2000	2000	1000	1000
	DC-1[3]	500 V DC	Operations		–	–	10000	10000	–	–	7500	7500	–	5000	5000	–	–
		750 V DC	Operations		–	–	–	–	–	–	7500	7500	–	5000	5000	–	–
	DC-3[3]	500 V DC	Operations		–	–	5000	5000	–	–	3000	3000	–	2000	2000	–	–
		750 V DC	Operations		–	–	–	–	–	–	3000	3000	–	2000	2000	–	–
Max. operating frequency				Ops/h	120	120	120	120	120	120	120	120	60	60	60	60	60
Heat dissipation per pole at I_u[5]				W	16.7	16.7	16.7	16.7	19	19	19	19	31	31	31	97	97
Total opening delay on short-circuit				ms	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 25 ≤ 415 V; < 35 > 415 V	< 25 ≤ 415 V; < 35 > 415 V
Technical data that diverge from products for the IEC market Switching capacity of NA switch (UL489, CSA 22.2 No. 5-09) Short-circuit current rating (SCCR)																	
	240 V 60 Hz			kA	35	–	85	–	35	–	85	150	–	85	150	85	125
	480 V 60 Hz			kA	25[1]	–	35[1]	–	25	–	35	100	–	42	100	42	85
	600 V 60 Hz			kA	–	–	–	–	18[4]	–	25[4]	50[4]	–	35	50	35	50

Notes

[1] Switching capacity of NA switches with NZM…1-…(C)NA: 480 Y/277 V
[2] For rated operational current AC-3 with NZM4: 400 V: max. 650 kW; 690 V: max. 600 kW
[3] DC data apply only for NZM...A... with thermomagnetic release
[4] For switching capacity NZM2...NA: 600 V/347 V
[5] For thermal losses per pole the specification refers to the maximum rated operational current of the construction size
[6] Maximum back-up fuse, if the expected short-circuit currents at the installation location exceed the switching capacity of the circuit-breaker
[7] For higher switching capacity please inquire

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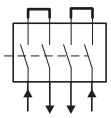
Circuit-breakers for 1000 V AC			**NZMH2...S1 max. 300 A**	**NZMH3...S1 max. 630 A**	**NZMH4...S1 max. 1600 A**
Rated operating voltage	U_e	V AC	1000	1000	1000
Rated uninterrupted current	I_u	A	300/50 °C	630/50 °C	1600/50 °C
Rated operational current					
AC-1			300	630	1600
Rated short-circuit making capacity					
1000 V 50/60 Hz	I_{cm}	kA	17	17	40
Rated short-circuit breaking capacity I_{cn}					
I_{cu} according to IEC/EN 60947 Operating sequence O-t-CO	I_{cu}	kA	10	15	20
I_{cs} according to IEC/EN 60947 Operating sequence O-t-CO-t-CO	I_{cs}	kA	3	10	15
Utility category			A	A	A/B
Maximum operating frequency		Ops/h	120	60	60
Durability					
Mechanical (of which max. 50 % trip by shunt/ undervoltage release)		Operations	20000	15000	10000
Electrical, AC-1 1000 V		Operations	3000	1000	500
Rated insulation voltage	U_i	V AC	1000	1000	1000
For use in IT electrical power networks			–	–	–

Switch-disconnectors for 1000 V DC			**N2-4...S1-DC max. 200 A**	**N3-4...S1-DC max. 500 A**	**N4-4...S1-DC max. 1400 A**
Rated operating voltage	U_e	V DC	1000	1000	1000
Rated uninterrupted current with terminal jumpers	I_u	A	200/65 °C	500/65 °C	1400/65 °C
Rated operational current	I_e		200 (DC 22-B)	500 (DC 22-B)	1400 (DC 21-B)
Rated short-time withstand current t =0.1 s	I_{cw}	kA	3	6	25
Rated conditional short-circuit current	I_q	kA	15	15	–
With back-up fuse		A_gR	200	500	–
Maximum operating frequency		Ops/h	120	60	60
Durability					
Mechanical (of which max. 50 % trip by shunt/ undervoltage release)		Operations	20000	15000	10000
Electrical, 1000 V DC		Operations	2500 (DC 22-B)	1000 (DC 22-B)	500 (DC 21-B)
Rated insulation voltage	U_i	V DC	1250	1250	1250
For use in IT electrical power networks		V DC	1000	1000	1000

Notes

NZM...S1 and N...S1-DC can not be combined with withdrawable units and/or connection on rear.
Can not be combined with early-make auxiliary contacts NZM-...XHIV or box terminal NZM2-4-XKC at U_i > 1000 V DC.

Terminal type N...S1-DC:
for 2 pole switches series connection of two poles each is required. See jumper kit NZM...-4-XKV2P



				PN1/N1 max. 160 A	PN2/N2 max. 250 A	PN3/N3 max. 630 A	N4 max. 1600 A
Switch-disconnectors							
Rated impulse withstand voltage U_{imp}							
Main contacts			V	6000	8000	8000	8000
Auxiliary contacts			V	6000	6000	6000	6000
Rated operating voltage AC (40-60 Hz)		U_e	V AC	690	690	690	690
Max. rated uninterrupted current							
IEC/EN 60947-3		I_u	A	160	250	630	1600
Overvoltage category/degree of pollution				III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V AC	690	690	1000	1000
For use in IT electrical power networks			V	690	690	690	525
Switching capacity							
Rated short-circuit making capacity		I_{cm}	kA	2.8	5.5	25	53
Rated short-time withstand current							
t = 0.3 s		I_{cw}	kA	2	3.5[1]	12	25
t = 1 s		I_{cw}	kA	2	3.5[1]	12	25
Rated conditional short-circuit current Iq							
With back-up fuse			A gG/gL	PN1(N1)-63…125: 125 PN1(N1)-160: 160	PN2(N2)-160…250: 250	PN3(N3)-400…630: 630	N4-630…1600: 2 x 800
400/415 V			kA	100	100	100	100
690 V			kA	80	80	80	80
With downstream fuse			A gG/gL	PN1(N1)-63…125: 125 PN1(N1)-160: 160	PN2(N2)-160…250: 250	PN3(N3)-400…630: 630	N4-630…1600: 2 x 800
400/415 V			kA	100	100	100	100
690 V			kA	10	80	80	80
Rated making and breaking capacity							
Rated operational current AC-22/23A							
	415 V	I_e	A	160	250	630	1600
	690 V	I_e	A	160	250	630	1600
Lifespan, mechanical		Operations		20000	20000	15000	10000
Maximum operating frequency			Ops/h	120	120	60	60
Lifespan, electrical according to IEC/EN 60947-4-1 Annex B							
AC-1							
	400/415 V	Operations		10000	10000[4]	5000	3000
	690 V	Operations		7500	7500[4]	3000	2000
AC-3							
	400/415 V	Operations		7500	7500[5]	3000	2000
	690 V	Operations		5000	5000[3][5]	2000	1000
Heat dissipation per pole at I_u[2]			W	12.7	16	40	97

Notes

[1] The rated short-time withstand current for PN2/N2 in conjunction with residual-current release NZM2-4-XFI... I_{cw} = 1.5 kA

[2] For thermal losses per pole the specification refers to the maximum rated operational current of the construction size.

[3] For the electrical life at AC-3 for PN2/N2 the following applies: 690 V: max. 160 kW

[4] For 4 pole switch-disconnectors the following applies: 400/415 V 7500 switching operations; 690 V 5000 switching operations

[5] For 4 pole switch-disconnectors the following applies: 400/415 V 6000 switching operations; 690 V 4000 switching operations



						NS1-...-NA max. 125A	NS2-...-NA max. 250A	NS3-...-NA max. 600A	NS4-...-NA max. 1200A
Molded Case Switch									
Rated peak withstand current			U_{imp}						
Main contacts					V	6000	8000	8000	8000
Auxiliary contacts					V	6000	6000	6000	6000
Rated operating voltage			U_e		VAC	690	690	690	690
Max. rated uninterrupted current									
IEC/EN 60947-2 Annex L			I_n		A	125	250	600	1200
UL489/CSA 22.2 No. 5.1			I_n		A	125	250	600	1200
Overvoltage category/pollution degree						III/3	III/3	III/3	III/3
Rated insulation voltage			U_{imp}		V	690	1000	1000	1000
Switching capacity according to UL 489, CSA 22.2 No. 5.1									
		240 V 60 Hz			KA	85	150	150	85
		480 V 60 Hz			KA	35	100	100	65
		600 V 60 Hz			KA	–	50	50	42
Switching capacity divergent from products for North America.									
Rated short-circuit making capacity		240 V 50/60 Hz	I_{cm}		KA	187	330	330	187
		400/415 V 50/60 Hz	I_{cm}		KA	105	330	330	154
		440 V 50/60 Hz	I_{cm}		KA	74	286	286	143
		525 V 50/60 Hz	I_{cm}		KA	53	105	143	84
		690 V 50/60 Hz	I_{cm}		KA	17	53	74	74
Rated short-circuit breaking capacity $I_{cc} = I_{cu}$ To IEC/EN 60947-2 Annex L	I_{cu} to IEC/EN 60947 test cycle O-t-CO	240 V 50/60 Hz	I_{cu}		KA	85	150	150	85
		400/415 V 50/60 Hz	I_{cu}		KA	50	150	150	70
		440 V 50/60 Hz	I_{cu}		KA	35	130	130	65
		525 V 50/60 Hz	I_{cu}		KA	20	50	85	40
		690 V 50/60 Hz	I_{cu}		KA	10	20	35	35
	I_{cs} according to IEC/EN 60947 test cycle O-t-CO-t-CO	240 V 50/60 Hz	I_{cs}		KA	85	150	150	43
		400/415 V 50/60 Hz	I_{cs}		KA	50	150	150	35
		440 V 50/60 Hz	I_{cs}		KA	35	130	130	33
		525 V 50/60 Hz	I_{cs}		KA	10	37.5	33	20
		690 V 50/60 Hz	I_{cs}		KA	7.5	5	9	18
Lifespan, mechanical (of which max. 50 % trip by shunt/undervoltage release)			Operations			20000	20000	15000	10000
Maximum operating frequency			ops./h			120	120	60	60
Lifespan, electrical	AC-1	400/415 V 50/60 Hz	Operations			10000	10000	5000	3000
		690 V 50/60 Hz	Operations			7500	7500	3000	2000
	AC-3	400/415 V 50/60 Hz	Operations			7500	6500	2000	2000
		690V 50/60 Hz	Operations			5000	5000	2000	1000
Heat dissipation per pole at I_u [1]			W			8.7	19	40	97
Total downtime on short-circuit			ms			< 10	< 10	< 10	< 25 ≦ 415 V < 35 > 415 V

Notes [1] Figures apply to the maximum rated operational current of the construction size

Circuit-breaker		Volts AC	Threshold current			Intermediate current			High interrupting capacity		
Part no.	Cont. amps	60Hz		Maximum			Maximum			Maximum	
			rms sym	Peak	I^2dt	rms sym	Peak	I^2dt	rms sym	Peak	I^2dt
	(A)	(V)	(kA)	(kA)	(kA^2s)	(kA)	(kA)	(kA^2s)	(kA)	(kA)	(kA^2s)
NZM B1	125 A	240	8.125	7.4	0.18	22	13.53	0.33	35	16.78	0.35
A.../AF...NA		480	8.125	9.22	0.38	18	15.16	0.67	25	26.55	0.78
NZM N1-	125 A	240	8.125	7.4	0.18	50	18.53	0.38	85	19.16	0.36
A.../AF...NA		480	8.125	9.22	0.38	22	18.55	0.97	35	20.58	1.02
NZMB2-	250 A	240	16.25	13.00	0.4	22	14.5	0.6	35	15.5	0.4
A.../AF...NA		480	15	14	0.6	22	13.5	0.45	25	16.5	0.6
		600	10	12	0.5	14	14.5	0.75	18	15.5	0.75
NZMN2-	250 A	240	16.25	13	0.4	50	17	0.45	85	19.5	0.45
A.../AF...NA		480	16.25	13.5	0.6	22	14.5	0.6	35	20	0.65
		600	15	14.5	0.7	22	16.5	0.8	25	17	0.75
NZMN2-	250 A	240	16.25	12	0.45	50	18	0.4	85	19.5	0.4
VE(F)-NA		480	16.25	14.5	0.5	22	18	0.65	35	20	0.6
		600	15	14.5	0.6	22	17	0.75	25	18	0.65
NZMH2-	125 A	240	8.125	9	0.3	100	19	0.35	200	21.5	0.35
A.../AF...NA		480	8.125	9	0.35	55	23	0.7	150	29	0.85
		600	8.125	10	0.4	42	22.5	0.7	55	26	0.8
NZMH2-	250 A	240	16.25	13	0.4	100	20.5	0.4	150	20	0.4
A... /AF...NA		480	16.25	13.5	0.5	65	24	0.9	100	27	0.8
		600	16.25	13	0.6	30	20	0.7	50	25	0.9
NZMH2-	250 A	240	16.25	11.5	0.4	100	18.5	0.3	150	21	0.4
VE.../VEF...NA		480	16.25	14.5	0.5	65	24	0.6	100	27	0.7
		600	16.25	14.5	0.5	30	20	0.6	50	25	0.8
NZMN3-	250 A	39	24.5	1	-	-	-	85	33.5	1.1	240
VE...NA		25	27	1.8	-	-	-	42	35	1.8	480
		20	25	1.8	-	-	-	35	34	2.6	600
NZMH3-	600 A	240	39	45	4.5	100	35	2	150	40	2.5
VE...NA		480	39	35	2.5	65	39	3	100	47	3
		600	30	31	2.4	42	37	3	50	42	2.8

Part no.	Weight kg
Circuit-breakers	
NZM...1-...	1.046
NZM...1-4-...	1.325
NZM...2-...	2.345
NZM...2-4-...	3.5
NZM...3-...	6.34
NZM...3-4-...	8.4
NZM...4-...	21
NZM...4-4-...	27
Plug-in adapter elements	
+NZM2-XSV	4.7
+NZM2-4-XSV	5.9
Withdrawable units	
+NZM3-XAV	21
+NZM3-4-XAV	27
+NZM4-XAV	52
+NZM4-4-XAV	65

Part no.	Weight kg
Switch-disconnectors	
PN1-..., N1-...	0.926
PN1-4-..., N1-4-...	1.325
PN2-..., N2-...	2.15
PN2-4-..., N2-4-...	2.65
PN3-..., N3-...	5.7
PN3-4-..., N3-4...	7.1
N4-...	17
N4-4-...	22



Temperature dependency, derating

NZM...A(F), NZM...M(S)

Device part no.	Release type	Response time of the overload release at temperatures deviating from the reference temperatures Temperature compensation coefficient 20 °C	30 °C	40 °C	50 °C	60 °C	65 °C	70 °C
Thermomagnetic release (TM)								
System protection		System protection (reference temperature 40 °C)						
NZM…1(-4)-A(F)15…80(-NA)	TM	1.14	1.07	1	0.93	0.86	0.83	0.79
NZM…1(-4)-A(F)90…125(-NA)	TM	1.14	1.07	1	0.93	0.86	0.83	0.79
NZM…1(-4)-A160	TM	1.08	1.04	1	0.96	0.92	0.90	0.88
NZM…1-A20…125-SVE	TM with SVE	1.14	1.07	1	0.93	0.86	0.83	0.79
NZM…2(-4)-A(F)15…200(-NA)	TM	1.04	1.02	1	0.98	0.96	0.95	0.94
NZM…2(-4)-A(F)250(-NA)	TM	1.04	1.02	1	0.98	0.96	0.95	0.94
NZM…2(-4)-A20…200-SVE	TM with SVE	1.04	1.02	1	0.98	0.96	0.95	0.94
NZM…2(-4)-A250-SVE	TM with SVE	1.04	1.02	1	0.98	0.96	0.95	0.94
NZM…3(-4)A-250…500	TM	1.12	1.06	1	0.94	0.88	0.85	0.82
NZM…3(-4)A-250…500	TM with XAV	1.06	1	0.94	0.88	0.82	0.79	0.76
Short-circuit/motor protection		Motor protection (reference temperature 20 °C)						
NZM…1-M(S)40…80(-CNA)	TM	1	0.98	0.95	0.93	0.90	0.89	0.88
NZM…1-M(S)100(-CNA)	TM	1	0.98	0.95	0.93	0.90	0.89	0.88
NZM…1-M(S)40…100-SVE	TM with SVE	1	0.98	0.95	0.93	0.90	0.89	0.88
NZM…2-M(S)20…200(-CNA)	TM	1	0.98	0.96	0.94	0.92	0.91	0.90
NZM…2-M(S)20…200-SVE	TM with SVE	1	0.98	0.96	0.94	0.92	0.91	0.90
NZM…3-S250…500	TM with/without XAV	1	1	1	1	1	1	1

Notes

If temperatures deviate from the reference temperature, a slight change of the overload protection properties occurs. To determine the response time from the tripping characteristics, the temperature compensation coefficients listed in the table must be considered.
Example:
An NZM1-A100 is calibrated for a reference temperature of 40 °C.
What happens when it is operated at an ambient temperature of 60 °C ?
At 60 °C, the temperature compensation coefficient of 0.86 results in a reduced operating current of I_r = 100 A x 0.86 = 86 A. In other words at an ambient temperature of 60 °C the NZM1-A100 trips as if it were set to 86 A.

Device part no.	Release type	Reduction of the rated operational current (derating) under particular ambient conditions (according to IEC 947) Derating coefficient 20 °C	30 °C	40 °C	50 °C	60 °C	65 °C	70 °C
Thermomagnetic release (TM)								
System protection		System protection (reference temperature 40 °C)						
NZM…1(-4)-A(F)15…80(-NA)	TM	1	1	1	1	1	1	1
NZM…1(-4)-A(F)90…125(-NA)	TM	1	1	1	1	0.86	0.83	0.8
NZM…1(-4)-A160	TM	1	1	1	0.95	0.9	0.85	0.8
NZM…1-A20…100-SVE	TM with SVE	1	1	1	1	1	1	1
NZM…1-A125-SVE	TM with SVE	1	0.92	0.87	0.81	–	–	–
NZM…2(-4)-A(F)15…200(-NA)	TM	1	1	1	1	1	1	1
NZM…2(-4)-A(F)250(-NA)	TM	1	1	1	1	0.9	0.85	0.8
NZM…2(-4)-A20…200-SVE	TM with SVE	1	1	1	1	1	1	1
NZM…2(-4)-A250-SVE	TM with SVE	1	0.97	0.92	0.87	0.81	–	–
NZM…3(-4)A-250…500	TM	1	1	1	0.94	0.88	0.85	0.82
NZM…3(-4)A-250…500	TM with XAV	1	1	0.94	0.88	0.82	0.79	0.76
Short-circuit/motor protection		Motor protection (reference temperature 20 °C)						
NZM…1-M(S)40…80(-CNA)	TM	1	1	1	1	1	1	1
NZM…1-M(S)100(-CNA)	TM	1	1	1	1	0.86	0.83	0.8
NZM…1-M(S)40…100-SVE	TM with SVE	1	0.92	0.87	0.81	–	–	–
NZM…2-M(S)20…200(-CNA)	TM	1	1	1	1	1	1	1
NZM…2-M(S)20…200-SVE	TM with SVE	1	1	1	1	1	1	1
NZM…3-S250…500		1	1	1	0.94	0.88	0.85	0.82
NZM…3-S250…500	TM with XAV	1	1	1	0.94	0.88	0.85	0.82
NZM…3-S250…400	TM	1	1	1	1	1	1	1
NZM…3-S250…400	TM with XAV	1	1	1	1	1	0.97	0.94

Notes

In determining the maximum permissible current loads at different ambient temperatures, the derating coefficients listed in the table must be considered.
Example:
An NZM2-A250 should be operated at an ambient air temperature of 65 °C.
How high is the permissible rated operational current I_e?
At 65 °C the derating coefficient is 0.85, i.e. I_e = 250 A × 0.85 = 212.5 A.
At an ambient temperature of 65 °C the NZM2-A250 can therefore be operated at up to I_e = 212.5 A.

Device part no.	Release type	Reduction of the rated operational current (derating) under particular ambient conditions (according to IEC 947) Derating coefficient 20 °C	30 °C	40 °C	50 °C	60 °C	65 °C	70 °C
Electronic release (E)								
System protection								
NZM...3(-4)-AE(F)250...500(-NA)	E	1	1	1	1	1	1	1
NZM...3(-4)-AE(F)550...630(-NA)	E	1	1	1	1	0.9	0.85	0.8
NZM...3(-4)-AE250...400 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...3(-4)-AE630 + XAV	E with XAV	0.96	0.92	0.87	0.83	0.78	0.75	0.73
NZM...4(-4)-AE(F)600...1250(-NA)	E	1	1	1	1	1	1	1
NZM...4(-4)-AE1600	E	1	1	1	1	0.87	0.85	0.82
NZM...4(-4)-AE630...1250 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...4(-4)-AE1600 + XAV	E with XAV	1	0.98	0.93	0.89	0.85	0.83	0.8
Selectivity and generator protection								
NZM...2(-4)-VE(F)100...175(-NA) (-S1)	E	1	1	1	1	1	1	1
NZM...2(-4)-VE(F)200...250(-NA) (-S1)	E	1	1	1	1	0.9	0.85	0.8
NZM...2(-4)-VE100...160 + XSV	E with XSV	1	1	1	1	1	1	1
NZM...2(-4)-VE250 + XSV	E with XSV	1	1	1	0.94	0.88	0.84	0.81
NZM...3(-4)-VE(F)250...500(-NA)	E	1	1	1	1	1	1	1
NZM...3(-4)-VE(F)550...630(-NA)	E	1	1	1	1	0.9	0.85	0.8
NZM...3(-4)-VE250...400 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...3(-4)-VE630 + XAV	E with XAV	0.96	0.92	0.87	0.83	0.78	0.75	0.73
NZM...4(-4)-VE(F)600...1250(-NA) (-S1)	E	1	1	1	1	1	1	1
NZM...4(-4)-VE1600 (-S1)	E	1	1	1	1	0.87	0.85	0.82
NZM...4(-4)-VE630...1250 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...4(-4)-VE1600 + XAV	E with XAV	1	0.98	0.93	0.89	0.85	0.83	0.8
Motor protection								
NZM...2-ME(SE)90...140(-CNA)	E	1	1	1	1	1	1	1
NZM...2-ME(SE)220(-CNA)	E	1	1	1	1	0.9	0.85	0.8
NZM...2-ME90...140 + XSV	E with XSV	1	1	1	1	1	1	1
NZM...2-ME220 + XSV	E with XSV	1	1	1	0.94	0.88	0.84	0.81
NZM...3-ME(SE)220...350(-CNA) (-S1)	E	1	1	1	1	1	1	1
NZM...3-ME(SE)450(-CNA) (-S1)	E	1	1	1	1	1	1	1
NZM...3-ME220...350 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...3-ME450 + XAV	E with XAV	0.96	0.92	0.87	0.83	0.78	0.75	0.73
NZM...4-ME550...875 (-S1)	E	1	1	1	1	1	1	1
NZM...4-ME1400 (-S1)	E	1	1	1	1	1	1	1
NZM...4-ME550...875 + XAV	E with XAV	1	1	1	1	1	1	1
NZM...4-ME1400 + XAV	E with XAV	1	0.98	0.93	0.89	0.85	0.83	0.8
Switch-disconnectors/Molded Case Switch								
N1(-4) -63, PN1(-4)-63, NS1-63-NA		1	1	1	1	1	1	1
N1(-4) -100...125, PN1(-4)-100...125, NS1-100...125-NA		1	1	1	1	0.86	0.83	0.8
N1(-4) -160, PN1(-4)-160		1	1	1	0.95	0.9	0.85	0.8
N2(-4) -160...200, PN2(-4)-160...200, NS2-160...200-NA		1	1	1	1	1	1	1
N2(-4) -250, PN2(-4)-200, NS2-250-NA		1	1	1	1	0.9	0.85	0.8
N2(-4) -160...200 + XSV		1	1	1	1	1	1	1
N2(-4) -250, NS2-250-NA		1	0.97	0.92	0.87	0.81	-	-
N3(-4)-400, PN3(-4)-400, NS3-400-NA		1	1	1	1	1	1	1
N3(-4)-630, PN3(-4)-630, NS3-600-NA		1	1	1	0.94	0.89	0.86	0.84
N3(-4)-400 + XAV		1	1	1	1	1	1	1
N3(-4)-630 + XAV		0.96	0.92	0.87	0.83	0.78	0.75	0.73
N4(-4)-630...1250, NS4-800...1200-NA		1	1	1	1	1	1	1
N4(-4)-1600		1	1	1	1	0.87	0.85	0.82
N4(-4)-630...1250 + XAV		1	1	1	1	1	1	1
N4(-4)-1600 + XAV		1	0.98	0.93	0.89	0.85	0.83	0.8
Multi-function component adapters								
NZM...3-630...+NZM3-XAD630	with XAD	1	0.96	0.92	0.88	0.84	0.82	0.8

Notes

In determining the maximum permissible current loads at different ambient temperatures, the derating coefficients listed in the table must be considered.
Example:
An NZM2-A250 should be operated at an ambient air temperature of 65 °C.
How high is the permissible rated operational current I_e?
At 65 °C the derating coefficient is 0.85, this means I_e = 250 A x 0.85 = 212.5 A.
The NZM2-A250 may be operated at an ambient temperature of 65 °C with a maximum I_e = 212.5 A.

NZM up to 500 A with thermomagnetic release (3 and 4 pole)

	Fixed mounted											
	NZM1-								NS1-		N1-, PN1-	
	A...(-NA)		M...		AF...-NA		S...-CNA		...-NA			
I_n [A]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]
1.2	–	–	–	–	–	–	1.8	413000	–	–	–	–
1.6	–	–	–	–	–	–	–	–	–	–	–	–
2	–	–	–	–	–	–	0.8	66000	–	–	–	–
2.4	–	–	–	–	–	–	–	–	–	–	–	–
3	–	–	–	–	–	–	1.8	66000	–	–	–	–
5	–	–	–	–	–	–	0.7	9180	–	–	–	–
8	–	–	–	–	–	–	1.8	9180	–	–	–	–
12	–	–	–	–	–	–	0.7	1670	–	–	–	–
15	–	–	–	–	5.5	8180	–	–	–	–	–	–
18	–	–	–	–	–	–	1.6	1670	–	–	–	–
20	9.8	8180	–	–	9.8	8180	–	–	–	–	–	–
25	8.8	4680	–	–	8.8	4680	–	–	–	–	–	–
26	–	–	–	–	–	–	2.0	1050	–	–	–	–
30	–	–	–	–	8.2	3030	–	–	–	–	–	–
32	9.3	3030	–	–	–	–	–	–	–	–	–	–
33	–	–	–	–	–	–	3.4	1050	–	–	–	–
35	–	–	–	–	8.2	2220	–	–	–	–	–	–
40	10.7	2220	13.5	2810	10.7	2220	2.7	562	–	–	–	–
45	–	–	–	–	10.7	1760	–	–	–	–	–	–
50	13.2	1760	14.1	1880	13.2	1760	4.2	562	–	–	–	–
60	–	–	–	–	12.9	1190	–	–	–	–	–	–
63	14.2	1190	14.9	1250	–	–	6.7	562	6.7	562	6	380
70	–	–	–	–	12.5	850	–	–	–	–	–	–
80	16.3	850	20.8	1085	16.3	850	10.8	562	–	–	–	–
90	–	–	–	–	17.7	730	–	–	–	–	–	–
100	21.9	730	23.9	795	21.9	730	16.9	562	16.9	562	11.4	380
110	–	–	–	–	20.7	570	–	–	–	–	–	–
125	26.7	570	–	–	26.7	570	–	–	26.3	562	17.8	380
150	–	–	–	–	–	–	–	–	–	–	–	–
160	36.1	470	–	–	–	–	–	–	–	–	29.2	380
175	–	–	–	–	–	–	–	–	–	–	–	–
200	–	–	–	–	–	–	–	–	–	–	–	–
225	–	–	–	–	–	–	–	–	–	–	–	–
250	–	–	–	–	–	–	–	–	–	–	–	–
300	–	–	–	–	–	–	–	–	–	–	–	–
400												
500												

NZM2/3/4 with electronic release

	Fixed mounted	
	NZM2-...	
I_n [A]	P [W]	B [µohms]
200	–	–
250	52	275

	NZM3-...	
I_n [A]	P [W]	B [µohms]
450	–	–
630	119	100

	NZM4-...	
I_n [A]	P [W]	B [µohms]
1250	–	–
1400	–	–
1600	284	37

N2/3/4, PN2/3

Fixed mounted			
N2-..., PN2-...		N2-4-...-S1-DC (N+L1+L2+L3)	
P [W]	B [µohms]	P [W]	B [µohms]
–	–	44	275
48	256	–	–

N3-..., PN3-...		N3-4-...-S1-DC (N+L1+L2+L3)	
P [W]	B [µohms]	P [W]	B [µohms]
–	–	122	150
107	90	–	–

N4-...		N4-4-...-S1-DC (N+L1+L2+L3)	
P [W]	B [µohms]	P [W]	B [µohms]
–	–	231	37
–	–	290	37
284	37	–	–

Additional plug-in units

	NZM1-...	
I_n [A]	P [W]	B [µohms]
125	14	300

	NZM2-...	
I_n [A]	P [W]	B [µohms]
250	19	100

Additional withdrawable units

	NZM3-...	
I_n [A]	P [W]	B [µohms]
630	83	70

	NZM4-...	
I_n [A]	P [W]	B [µohms]
1600	77	10

	Fixed mounted															
	NZM2-								NS2-		N2-, PN2-		NZM3-	
	A...(-NA)		M...		AF...-NA		S...-CNA		...-NA				A.../S...	
I_n [A]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]	P [W]	B [µohms]
1.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1.6	–	–	–	–	–	–	5.8	750000	–	–	–	–	–	–
2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2.4	–	–	–	–	–	–	7.8	450000	–	–	–	–	–	–
3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5	–	–	–	–	–	–	0.3	4600	–	–	–	–	–	–
8	–	–	–	–	–	–	0.9	4600	–	–	–	–	–	–
12	–	–	–	–	–	–	0.5	1200	–	–	–	–	–	–
15	–	–	–	–	2.9	4250	–	–	–	–	–	–	–	–
18	–	–	–	–	–	–	1.2	1200	–	–	–	–	–	–
20	5.1	4250	5.1	4250	5.1	4250	–	–	–	–	–	–	–	–
25	8	4250	8	4250	5.9	3140	–	–	–	–	–	–	–	–
26	–	–	–	–	–	–	1.6	780	–	–	–	–	–	–
30	–	–	–	–	8.5	3140	–	–	–	–	–	–	–	–
32	9.6	3140	9.6	3140	–	–	–	–	–	–	–	–	–	–
33	–	–	–	–	–	–	2.5	780	–	–	–	–	–	–
35	–	–	–	–	10.3	2800	–	–	–	–	–	–	–	–
40	13.4	2800	13.4	2800	13.4	2800	1.5	317	–	–	–	–	–	–
45	–	–	–	–	13.8	2270	–	–	–	–	–	–	–	–
50	17	2270	17	2270	17	2270	2.4	317	–	–	–	–	–	–
60	–	–	–	–	18.4	1700	–	–	–	–	–	–	–	–
63	20.2	1700	20.2	1700	–	–	3.8	317	–	–	–	–	–	–
70	–	–	–	–	15.7	1070	–	–	–	–	–	–	–	–
80	20.5	1070	20.5	1070	20.5	1070	6.1	317	–	–	–	–	–	–
90	–	–	–	–	20.8	855	–	–	–	–	–	–	–	–
100	25.7	855	25.7	855	25.7	855	9.5	317	–	–	–	–	–	–
110	–	–	–	–	21.4	589	–	–	–	–	–	–	–	–
125	27.6	589	27.6	589	27.6	589	14.9	317	–	–	–	–	–	–
150	–	–	–	–	33.6	500	–	–	–	–	–	–	–	–
160	38.4	500	38.4	500	–	–	24.3	317	24.3	317	19.7	256		
175	–	–	–	–	36.8	400	–	–	–	–	–	–		
200	48	400	48	400	48	400	38	317	38	317	30.7	256		
225	–	–	–	–	47.1	310	–	–	–	–	–	–		
250	58.1	310	–	–	58.1	310	59.4	317	59.4	317	48	256	68	364
300	83.7	310	–	–	83.7	310	85.6	317	–	–	–	–	79	256
400													72	151
500													93	124

Notes:
The values stated in the table apply for 3 and 4 pole fixed mounted devices with an equal load distribution.
On 4 pole devices the current in the neutral conductor is equal to zero.
The total resistive load is the measured value for a 3 pole or a 4 pole switch (independent of I_n and the type of release).

The total resistive load for a switch or withdrawable plug results from:
the resistive value for fixed mounting + resistive value
for plug-in or withdrawable.
The heat dissipation can be calculated with the
formula: $P = 3 \times R \times I^2$

Terminal capacities

NZM…, PN…, NS…, N…

					NZM1, PN1, N1, NS1 160 A	I_n[1] A	NZM2, PN2, N2, NS2 300 A	I_n[1] A	NZM3, PN3, N3, NS3 630 A	I_n[1] A
Terminal capacities										
Standard equipment					Box terminal	–	Screw terminal	–	Screw terminal	–
Accessories					Screw terminals Tunnel terminals Rear terminal bolts		Box terminal Tunnel terminals Rear terminal bolts		Box terminal Tunnel terminals Rear terminal bolts	
Copper conductors and cables										
Box terminal	Solid			mm²	1 x (10 – 16) 2 x (6 – 16)	160	1 x (10 – 16) 2 x (4 – 16)	300	2 x 16	500
	Stranded			mm²	1 x (25 – 70)[3] 2 x (6 – 25)		1 x (25 – 185) 2 x (25 – 70)		1 x (35 – 240) 2 x (25 – 120)	
Tunnel terminal	Solid Stranded			mm²	1 x 16	160	1 x 16	300	–	–
		1-hole		mm²	1 x (25 – 95)		1 x (25 – 185)		1 x (25 – 185)	350
		Double-hole		mm²	–	–	–	–	1 x (50 – 240) 2 x (50 – 240)	630 2 x 185
		4-hole		mm²	–	–	–	–	–	–
Screw terminals and connection on rear										
Directly on switch	Solid			mm²	1 x (10 – 16) 2 x (6 – 16)	160	1 x (10 – 16) 2 x (4 – 16)	300	1 x 16 2 x 16	630 2 x 185
	Stranded			mm²	1 x (25 – 70)[3] 2 x 25		1 x (25 – 185) 2 x (25 – 70)		1 x (25 – 240) 2 x (25 – 240)	
Module plate	1-hole	min.		mm²	–	–	–	–	–	–
		max.		mm²	–	–	–	–	–	–
Module plate	2-hole	min.		mm²	–	–	–	–	–	–
		max.		mm²	–	–	–	–	–	–
Connection width extension				mm²					2 x 300	630 2 x 185
Aluminium conductors and cables										
Tunnel terminal	Solid Stranded			mm²	1 x 16	160	1 x 16	250	1 x 16	350
		1-hole		mm²	1 x (25 – 95)		1 x (25 – 185)		1 x (25 – 185)[2]	
		Double-hole		mm²	–	–	–	–	1 x (50 – 240) 2 x (50 – 240)	630
		4-hole		mm²	–	–	–	–	–	–
Screw terminals and connection on rear										
Directly on switch	Solid			mm²	1 x (10 – 16) 2 x (10 – 16)	160	1 x (10 – 16) 2 x (10 – 16)	250	1 x 16 2 x (10 – 16)	400
	Stranded			mm²	1 x (25 – 35) 2 x (25 – 35)		1 x (25 – 50) 2 x (25 – 50)		1 x (25 – 120) 2 x (25 – 120)	
Module plate	1-hole	min.		mm²	–	–	–	–	–	–
	1-hole	max.		mm²	–	–	–	–	–	–
Module plate	2-hole			mm²	–	–	–	–	–	–
Connection width extension				mm²						
Copper strip (number of segments x width x segment thickness)										
Box terminal		min.		mm	2 x 9 x 0.8	160	2 x 9 x 0.8	300	6 x 16 x 0.8	630
		max.		mm	9 x 9 x 0.8		10 x 16 x 0.8 (2 x) 8 x15.5 x 0.8		10 x 24 x 1.0 + 5 x 24 x 1.0 (2 x) 8 x 24 x 1.0	
Single flat cable terminal		min.		mm	–	–	–	–	–	–
		max.		mm	–	–	–	–	–	–
Module plate	1-hole			mm	–	–	–	–	–	–
Screw terminals and connection on rear										
Copper strip, perforated		min.		mm	–	–	2 x 16 x 0.8	300	6 x 16 x 0.8	630
Copper strip, perforated		max.		mm	–	–	10 x 24 x 0.8		10 x 32 x 1.0 + 5 x 32 x 1.0	
Connection width extension				mm²	–	–	–	–	(2 x) 10 x 50 x 1.0	
Copper bar (width x thickness)										
Screw terminals and connection on rear										
Screw terminals					M6	–	M8	–	M10	–
Directly on switch		min.		mm	12 x 5	160	16 x 5	300	20 x 5	630
		max.		mm	16 x 5		24 x 8		30 x 10 +30 x 5	
Module plate	1-hole	min.		mm	–	–	–	–	–	–
		max.		mm	–	–	–	–	–	–
Module plate	2-hole			mm	–	–	–	–	–	–
Connection width extension		min.		mm	–	–	–	–	–	630
		max.		mm	–	–	–	–	2 x (10 x 50)	10 x 40

Notes

[1] The rated currents I_n have been determined according to IEC/EN 60947 (switchgear standard) and generally relate to the max. defined cross-sections. They are given for general reference here. The engineering standards which apply in each case must be observed.

[2] To 240 mm² can be connected depending on the make of cable.

[3] To 95 mm² can be connected depending on the make of cable.

Terminal capacities

NS…, NZM…-NA

					NZM4, N4, NS4 1600 A	I_n[1] A		NZM…1…NA, NS1…NA	NZM…2…NA, NS2…NA	NZM…3…NA, NS3…NA	NZM…4…NA, NS4…NA
Terminal capacities											
Standard equipment					Screw terminal	–	–	Box terminal	Screw terminal	Screw terminal	Screw terminal
Accessories					Tunnel terminals Rear terminal bolts Strip terminal		–	Screw terminals Tunnel terminals Rear terminal bolts	Box terminal Tunnel terminals Rear terminal bolts	Box terminal Tunnel terminals Rear terminal bolts	Tunnel terminals Rear terminal bolts Strip terminal
Copper conductors and cables											
Box terminal	Solid			mm²	–	–	AWG	1 x (12 – 6)	1 x (12 – 6)	–	–
	Stranded			mm²	–	–	AWG/kcmil	1 x (4 – 2/0)	1 x (4 – 350)	1 x (2 – 500)	–
Tunnel terminal	Solid Stranded			mm²	–	–	AWG	1 x 6	1 x 6	1 x 6	–
		1-hole		mm²	–	–	AWG/kcmil	1 x (4 – 3/0)	1 x (4 – 350)	1 x (4 – 350)	–
		Double-hole		mm²	–	–	AWG/kcmil	–	–	1 x (0 – 500) 2 x (0 – 500)	–
		4-hole		mm²	4 x (50 – 240)	1400	AWG/kcmil	–	–	–	4 x (0 – 500)
Screw terminals and connection on rear											
Directly on switch	Solid			mm²	–	–	AWG	1 x (12 – 6) 2 x (9 – 6)	1 x (12 – 6)	–	–
	Stranded			mm²	1 x (120 – 185) 4 x (50 – 185)	1250	AWG/kcmil	1 x (4 – 2/0)	1 x (4 – 3/0)	1 x (4 – 350) 2 x 350	1 x (250 – 350) 4 x (0 – 350)
Module plate	1-hole	min.		mm²	1 x (120 – 300)	1000	kcmil	–	–	–	1 x (250 – 600)
		max.		mm²	2 x (95 – 300)		AWG/kcmil	–	–	–	2 x (3/0 – 600)
Module plate	2-hole	min.		mm²	2 x (95 – 185)	1400	AWG/kcmil	–	–	–	2 x (3/0 – 350)
		max.		mm²	4 x (35 – 185)		AWG/kcmil	–	–	–	4 x (2 – 350)
Connection width extension				mm²	4 x 300 6 x (95 – 240)	1600 4 x 240	AWG/kcmil			2 x 500	4 x 600 6 x (3/0 – 500)
Aluminium conductors and cables											
Tunnel terminal	Solid Stranded			mm²	–	–	AWG	–	–	–	–
		1-hole		mm²	–	–	AWG/kcmil	–	–	–	–
		Double-hole		mm²	–	–	AWG/kcmil	–	–	–	–
		4-hole		mm²	4 x (50 – 240)	1400	AWG/kcmil	–	–	–	–
Screw terminals and connection on rear											
Directly on switch	Solid			mm²	–	–	AWG	–	–	–	–
	Stranded			mm²	–	–	AWG/kcmil	–	–	–	–
Module plate	1-hole	min.		mm²	1 x (185 – 240)	Please inquire	kcmil	–	–	–	–
	1-hole	max.		mm²	2 x (70 – 185)	Please inquire	AWG/kcmil	–	–	–	–
Module plate	2-hole			mm²	4 x 50	–	AWG	–	–	–	–
Connection width extension				mm²	2 x 240 6 x (70 – 240)	Please inquire	AWG/kcmil				–
Copper strip (number of segments x width x segment thickness)											
Box terminal		min.		mm	–	–	mm	2 x 9 x 0.8	2 x 9 x 0.8	6 x 16 x 0.8	–
		max.		mm	–	–	mm	9 x 9 x 0.8	10 x 16 x 0.8	10 x 24 x 1.0 + 5 x 24 x 1.0 (2 x) 8 x 24 x 1.0	–
Single flat cable terminal		min.		mm	6 x 16 x 0.8	1100	mm	–	–	–	6 x 16 x 0.8
		max.		mm	(2 x) 10 x 32 x 1.0		mm	–	–	–	(2 x) 10 x 32 x 1.0
Module plate	1-hole			mm	(2 x) 10 x 50 x 1.0	1250 (2 x) 10 x 40 x 1.0	mm	–	–	–	(2 x) 10 x 50 x 1.0
Screw terminals and connection on rear											
Copper strip, perforated		min.		mm	(2 x) 10 x 50 x 1.0	1600	mm	–	2 x 16 x 0.8	6 x 16 x 0.8	(2 x) 10 x 50 x 1.0
Copper strip, perforated		max.		mm	(2 x) 10 x 50 x 1.0		mm	–	10 x 16 x 0.8	10 x 32 x 1.0 + 5 x 32 x 1.0	(2 x) 10 x 50 x 1.0
Connection width extension				mm²	(2 x) 10 x 80 x 1.0	1600 2 x (10 x 50 x 1.0)	mm	–	–	(2 x) 10 x 50 x 1.0	(2 x) 10 x 80 x 1.0
Copper bar (width x thickness)											
Screw terminals and connection on rear											
Screw terminals					M10	–	–	M6	M8	M10	M10
Directly on switch		min.		mm	25 x 5	1600	mm	12 x 5	16 x 5	20 x 5	25 x 5
		max.		mm	2 x (50 x 10) 2 x (80x 10)		mm	16 x 5	20 x 5	30 x 10 +30 x 5	2 x (50 x 10)
Module plate	1-hole	min.		mm	25 x 5	1250 2 x (40 x 10)	mm	–	–	–	25 x 5
		max.		mm	2 x (50 x 10)		mm	–	–	–	2 x (50 x 10)
Module plate	2-hole			mm	2 x (50 x 10)	1600	mm	–	–	–	2 x (50 x 10)
Connection width extension		min.		mm	60 x 10	1600 2 x (50 x 10)	mm	–	–	–	60 x 10
		max.		mm	2 x (80 x 10)		mm	–	–	2 x (10 x 50)	2 x (80 x 10)

Temperature dependency

N...S1-DC

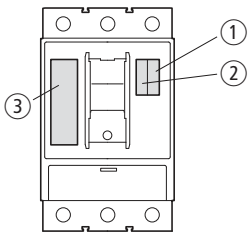
Basic devices	Jumper kits	Reduction of the rated operational current (derating) under particular ambient conditions									
		Contact protection	Mounting position	Temperature compensation coefficient							
				20 °C	30 °C	40 °C	50 °C	55 °C	60 °C	65 °C	70 °C
Switch-disconnectors											
N2-4-160-S1-DC	+NZM2-4-XKV2P	IP2X	v	1	1	1	1	1	1	1	1
			h	1	1	1	1	1	1	1	1
N2-4-200-S1-DC	+NZM2-4-XKV2P	IP2X	v	1	1	1	1	1	1	1	0.95
			h	1	1	1	1	1	1	0.95	0.92
N3-4-320(400)-S1-DC	+NZM3-4-XKV2P	IP2X	v	1	1	1	1	1	1	1	1
			h	1	1	1	1	1	1	1	1
	+NZM3-4-XKVI2P	IP00	v	1	1	1	1	1	1	1	1
			h	1	1	1	1	1	1	1	1
N3-4-500-S1-DC	+NZM3-4-XKVI2P-K	IP00	v	1	1	1	1	1	1	1	0.97
			h	1	1	1	1	1	1	0.97	0.95
	+NZM3-4-XKVI2P	IP00	v	1	1	1	1	0.97	0.95	0.92	0.89
			h	1	1	1	0.97	0.95	0.92	0.89	0.87
	+NZM3-4-XKV2P-K	IP1X	v	1	1	1	1	1	0.98	0.95	0.92
			h	1	1	1	1	0.97	0.94	0.91	0.89
	+NZM3-4-XKV2P-K	IP2X	v	1	1	1	0.95	0.92	0.89	0.86	0.83
			h	1	1	0.98	0.93	0.9	0.87	0.84	0.81
N4-4-800(1000)-S1-DC	+NZM4-4-XKV2P	IP2X	v	1	1	1	1	1	1	1	1
			h	1	1	1	1	1	1	1	1
N4-4-1250-S1-DC	+NZM4-4-XKV2P	IP2X	v	1	1	1	1	1	1	1	0.97
			h	1	1	1	1	1	1	0.97	0.95
N4-4-1400-S1-DC	+NZM4-4-XKV2P	IP2X	v	1	1		0.94	0.92	0.9	–	–
			h	1	1	0.97	0.91	–	–	–	–
	+NZM3-4-XKV2P-1400	IP00	v	1	1	1	1	1[1)]	1[1)]	1[1)]	0.97
			h	1	1	1	1	1[1)]	1[1)]	1[1)]	0.97

Notes

Mounting position:
v = vertical, h = horizontal
Incomer and outgoer at bottom or top, freely selectable.
[1)] Incomer at from bottom only.

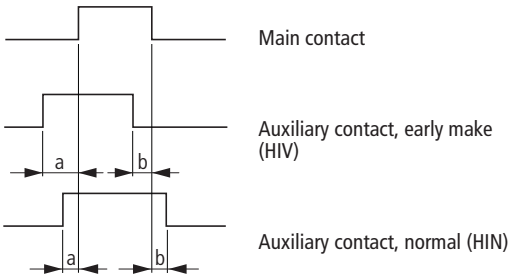
		At AC = 50/60 Hz		**M22-K...**	**M22-CK...**	**XHIV**
Auxiliary contacts						
Rated operating voltage						
AC voltage		U_e	V AC	500	230	500
DC voltage		U_e	V DC	220	220	220
Conventional thermal current		$I_{th} = I_e$	A	4	4	4
Rated operational current						
AC-15	115 V	I_e	A	4	4	4
	230 V	I_e	A	4	4	4
	400 V	I_e	A	2	–	2
	500 V	I_e	A	1	–	1
DC-13	24 V	I_e	A	3	3	3
	42 V	I_e	A	1.7	1	1.5
	60 V	I_e	A	1.2	0.8	0.8
	110 V	I_e	A	0.8	0.5	0.5
	220 V	I_e	A	0.3	0.2	0.2
Short-circuit protection						
Max. fuse			A gG/gL	10	10	10
Max. miniature circuit-breaker			A	PKZM0-10/FAZ-B6	FAZ-B6/B1	FAZ-B6
Early make times compared to main contacts on make and break (switching times on manual operation).			ms	–	–	NZM1, PN1, N(S)1: approx. 20 NZM2, PN2, N(S)2: approx. 20 NZM3, PN3, N(S)3: approx. 20 NZM4, N(S)4: approx. 90 With NZM4/N(S)4 the HIV does **not** feature early break.
Terminal capacities						
Solid or flexible conductor with ferrule			mm^2	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.5 – 1.5) 2 x (0.5 – 0.75)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
			AWG	1 x (18 – 14) 2 x (18 – 14)	1 x (20 – 18) 2 x (20 – 18)	1 x (18 – 14) 2 x (18 – 14)
UL/CSA						
Rated operational current		I_e	A	10 A … 600 V AC 1 A – 250 V DC		2.5 A – 240 V AC 1 A – 250 V DC
Heavy Pilot Duty				A600/P300 via 300 V AC same polarity		C300/R300

Maximum equipment and position of the built-in accessories



	③ **-XHIV(2S) or -XA or -XU**	② **HIA**	① **HIN**
NZM1, N(S)1	1	1	1
NZM2, N(S)2	1	1	2
NZM3, N(S)3	1	1	3
NZM4, N(S)4	1	2	3
PN1	1	–	1
PN2	1	–	2
PN3	1	–	3

Time differences ON-OFF



Notes On combination with remote operator NZM-XR..., the right slot for standard auxiliary contacts HIN can be equipped only with single contacts.

	Time difference a (ms)						**Time difference b (ms)**					
	Manual operation			**Motor drive**			**Manual operation**			**Motor drive**		
	HIV	**HIN**		**HIV**	**HIN**		**HIV**	**HIN**		**HIV**	**HIN**	
		K10	K01		K10	K01		K10	K01		K10	K01
NZM1	20[2)]	0	2.5	–	–	–	20[2)]	0	2.5	–	–	–
NZM2	20[2)]	3.5	6.5	Not permissible	2.5	4.5	20[2)]	3	4.5	Not permissible	3	4
NZM3	20[2)]	4	8	Not permissible	2	4	20[2)]	3.5	8	Not permissible	3	6.5
NZM4	90[2)]	7	11	Not permissible	Please inquire	Please inquire	0[1)2)]	12	15	Not permissible	Please inquire	Please inquire

Notes
[1)] With NZM4/N(S)4 the HIV does **not** feature early break.
[2)] Minimum value, as it is dependent on the switching speed.

			NZM1(2/3)-XU…	NZM4-XU…
Undervoltage releases				
Rated control voltage				
AC voltage at 50/60 Hz	U_s	V AC	24...600	24...600
DC voltage	U_s	V DC	12...250	12...250
Operating range				
Drop-out voltage		x U_s	0.35 – 0.7	0.35 – 0.7
Pick-up voltage		x U_s	0.85 – 1.1	0.85 – 1.1
Power consumption				
AC voltage				
AC pick-up rating		VA	1.5	3.6
AC consumption when closed		VA	1.5	3.6
DC voltage				
DC pick-up rating		W	0.8	2.5
DC consumption when closed		W	0.8	2.5
Max. opening delay (response time until the main circuits open)		ms	19	23
Minimum signal duration		ms	10 – 15	10 – 15
Terminal capacities				
Solid or flexible conductor with ferrule		mm²	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
		AWG	1 x (18 – 14) 2 x (18 – 14)	1 x (18 – 14) 2 x (18 – 14)

			UVU-NZM
Undervoltage releases, off-delayed			
Rated operating voltage			
AC voltage at 50/60 Hz	U_e	V AC	24, 220 – 550
DC voltage	U_e	V DC	24
Inrush current (peak value)	I_e	mA	< 500
Power consumption		VA	50
Deceleration time	t_{sd}	ms	70 – 4000
With additional external capacitor 90,000 µF ≧ 35 V		s	To 16
With additional external capacitor 30,000 µF ≧ 35 V		s	To 8
Terminal capacities			
Solid or flexible conductor with ferrule		mm²	1 x (0.5 – 2.5) 2 x (0.5 – 1.5)

			NZM-XCM
Capacitor unit for shunt release			
Rated operating voltage	U_e	V AC	
Rated operational current	I_e	mA	
Inrush current (peak value)	I_e	A	
Terminal capacity			
Solid or flexible conductor with ferrule		mm²	1 x (0.5 – 2.5)
		AW G	1 x (20 – 14) 2 x (20 – 16)

			NZM1(2/3)-XA…	NZM4-XA…	NZM2/3-XA...-MNS	NZM4-XA...-MNS
Shunt releases (for power circuit breaker)						
Rated control voltage						
AC voltage	U_s	V AC	12...440	12...440	230	230
DC voltage	U_s	V DC	12...440	12...440	–	–
Frequency range		Hz	0 – 400	0 – 400	50/60	50/60
Operating range						
AC voltage		x U_s	0.7...1.1	0.7...1.1	0.1...1.1	0.1...1.1
DC voltage		x U_s	0.7...1.1	0.7...1.1	–	–
Power consumption						
AC/DC pick-up rating		VA/W	2.5	2.5	–	–
AC/DC consumption when closed		VA/W	2.5	2.5	–	–
Maximum power consumption at 110 % U_s (230 V 50 Hz)		A	–	–	0.5	1
Max. opening delay (response time until the main circuits open)		ms	20	22	20	22
Max. duty factor		ms	∞	∞	1000 ms	1000 ms
Minimum signal duration		ms	10 – 15	10 – 15	10 – 15	10 – 15
Terminal capacity						
Solid or flexible conductor with ferrule		mm²	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
		AWG	1 x (18 – 14) 2 x (18 – 14)	1 x (18 – 14) 2 x (18 – 14)	1 x (18 – 14) 2 x (18 – 14)	1 x (18 – 14) 2 x (18 – 14)

				NZM2-XRD...	NZM2-XR…	NZM3-XR…	NZM4-XR…
Remote operators							
Rated control voltage							
AC voltage		U_s	V AC	100...440	110...440	110...440	110...440
DC voltage		U_s	V DC	24...250	24...250	24...250	24...250
Operating range							
AC voltage		U_s		0.85...1.1	0.85...1.1	0.85...1.1	0.85...1.1
DC voltage		U_s		0.85...1.1	0.85...1.1	0.85...1.1	0.85...1.1
Rated operational power							
AC voltage	110 V … 130 V AC		VA	550	350	350	350
	208 V … 240 V AC		VA	550	350	350	350
	380 V … 440 V AC		VA	650	350	350	350
DC voltage	24 V … 30 V DC		W	450	250 (max. 17A 30 ms)	250	250
	110 V … 130 V DC		W	450	250	250	250
	220 V … 250 V DC		W	450	250	250	250
Total make time			ms	110-170	60	80	100
Total opening delay			ms	110-170	300	1000	3000
Minimum signal duration							
With switch on			ms	100	30	30	30
With switch off			ms	100	150	250	500
Lifespan, mechanical		Operations		20000	20000	15000	10000
Maximum operating frequency			Ops/h	120	120	60	20
Terminal capacities							
Solid or flexible conductor with ferrule			mm²	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5	0.75 – 2.5
			AWG	18 – 14	18 – 14	18 – 14	18 – 14

			PFR-003	PFR-03	PFR-5
Electrical					
Standards			IEC/EN 60947-2, IEC 755, IEC 1008, IEC 1009		
Sensitivity			Pulse-current sensitive, type A		
Rated control voltage	U_s	V AC	230 ±20% (50/60 Hz)		
Motor rating	P_e	W	3	3	3
Rated fault currents	$I_{\triangle n}$	A	0.03	0.3	0.03, 0.1, 0.3, 0.5, 1, 3, 5
Deceleration time	t_v	s	0.02 (non-delayed)	0.02 (non-delayed)	0.02, 0.1, 0.3, 0.5, 1, 3, 5
Relay contacts			1 built-in changeover contact	1 built-in changeover contact	1 built-in changeover contact
Rated operating voltage of the relay contacts		V AC/DC	250/100	250/100	250/100
Rated operational current of the relay contacts		A	6	6	6
Fault current early warning		Hz	–	–	0.5 = 25% – 50% $I_{\triangle n}$ 1 = 50% – 75% $I_{\triangle n}$ 2 = 75% – 100% $I_{\triangle n}$
Mechanical					
Standard front dimension		mm	45	45	45
Device height		mm	85	85	85
Built-in width		mm	36	36	36
Mounting			Quick attachment for top-hat rail DIN 46277, EN 50022		
Terminals top and bottom			Box terminals		
Terminal protection			Finger and back-of-hand proof BGV A2, VDE 106 Part 100		
Terminal capacities		mm²	2 x 0.75 – 2.5 solid, 2 x 0.75 – 1.5 flexible/with sleeve		
Sealing facility for setting buttons			–	–	Yes



			NZM1(-4)-XFI30R NZM1(-4)-XFI300R NZM1(-4)-XFIR	**NZM1(-4)-XFI30U NZM1(-4)-XFI300U NZM1(-4)-XFIU**	**+NZM2-4-XFI30 +NZM2-4-XFI**	**+NZM2-4-XFIA30 +NZM2-4-XFIA NZMH2...-XFIA30**
Electrical						
Standards			IEC/EN 60947-2			
Sensitivity			Pulse-current sensitive, type A			
Min. operating voltage						
For detecting type A/AC fault currents			80 V (dependent on mains power)	80 V (dependent on mains power)	0 V (independent of mains power)	0 V (independent of mains power)
For detecting type B fault currents			–	–	–	50 V (dependent on mains power)
Suitable for use in			Three- and single-phase systems	Three-phase systems	Three- and single-phase systems	Three- and single-phase systems
Rated operating voltage	U_e	V AC	200…415 (3~)	200…415 (3~)	280…690	50…400 (3~)
Rated frequency	*f*	Hz	50/60	50/60	50/60	50/60
Number of poles			3/4	3/4	3/4	3/4
Rated operational current range	I_n	A	15…160	15…100	15…250	15…250
Rated fault currents	$I_{\triangle n}$	A				
NZM1(-4)-XFI30R			0.03			
NZM1(-4)-XFI300R			0.3			
NZM1(-4)-XFIR			0.03-0.1-0.3-0.5-1-3			
NZM1(-4)-XFI30U				0.03		
NZM1(-4)-XFI300U				0.3		
NZM1(-4)-XFIU				0.03-0.1-0.3-0.5-1-3		
+NZM2-4-XFI30					0.03	
+NZM2-4-XFI					0.1-0.3-1-3	
+NZM2-4-XFIA30						0.03
+NZM2-4-XFIA						0.3-1
NZMH2...-XFIA30						0.03
Detection range of fault current			50/60 Hz	50/60 Hz	50/60 Hz	With AC voltage: 0 – 100 kHz With pulsed DC voltage: 50 Hz
Rated ultimate short-circuit making and rated breaking capacity	$I_{\triangle m}$	A	= I_{CU}	= I_{CU}	= I_{CU}	= I_{CU}
Fault current early warning			≧ 0.3 x $I_{\triangle n}$	≧ 0.3 x $I_{\triangle n}$	–	–
Shock resistance (IEC 60068-2-27)			20 (half-sinusoidal shock 20 ms)			
Lifespan, mechanical (50 % with fault current)	Operations		20000	20000	≧ 2000	≧ 2000 NZMH2: 20000
Mechanical						
Standard front dimension		mm	45	45	96	96
Mounting			On right side	Bottom	Bottom	Bottom
Mounting position			Vertical and 90° in all directions			
Feeder			NZM1 from above	NZM1 from above	Any	Bottom
Degree of protection			IP20 in the operating component area			
Ambient temperature		°C	–5…+40	–5…+40	–25…+70	–25…+70
Terminal capacities						
Flexible without ferrule		mm^2	Same as NZM1 standard terminal			
Flexible with ferrule		mm^2	Same as NZM1 standard terminal			
Sealability			Yes, setting buttons			

			DMI
General			
Dimensions (W x H x D)		mm	107.5 x 90 x 53
Modular spacing (space units)			6 SU (space units) wide
Weight		kg	0.3
Mounting			Top-hat rail IEC/EN 60715, 35 mm
Ambient climatic conditions			
Operating ambient temperature		°C	0 to +55
Built-in position			Horizontal/vertical
Condensation			Prevent condensation by means of suitable measures
LCD display (clearly legible)		°C	0 to +55
Storage/transport		°C	-40 to +70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5...95
Air pressure (in operation)		hPa	795...1080
Corrosion resistance			
IEC/EN 60068-2-42	4 days SO_2	cm^3/m^3	10
IEC/EN 60068-2-43	4 days H_2S	cm^3/m^3	1
Ambient mechanical conditions			
Pollution degree			2
Degree of protection IEC/EN 60529			IP20
Vibrations (IEC/EN 60068-2-6)			
Constant amplitude 0.15 mm		Hz	10...57
Constant acceleration, 2 g		Hz	57...150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11		Shocks	18
Drop IEC/EN 60068-2-31	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1
Power supply			
Rated operating voltage	U_e	V DC	24
Permissible range		V DC	20.4...28.8
Residual ripple		%	≦ 5
Input current at 24 V DC		mA	210
Voltage dips (IEC/EN 61131-2)		ms	10
Power loss at 24 V DC		W	5



			EASY221-CO	EASY222-DN	NZM-XDMI-DPV1
General					
Standards			EN 55011, EN 55022, EN 61000-4, IEC 60068-2-6, IEC 60068-2-27		
Dimensions (W x H x D)		mm	35.5 x 90 x 58 (2 space units)	35.5 x 90 x 58 (2 space units)	35.5 x 90 x 58 (2 space units)
Weight		kg	0.15	0.15	0.15
Mounting			Top-hat rail EN 50022, 35 mm or screw fixing using fixing brackets ZB4-101-GF1 (accessories)		
Terminal capacity					
Solid		mm^2	0.2x4 (AWG 22 – 12)	0.2x4 (AWG 22 – 12)	0.2x4 (AWG 22 – 12)
Flexible with ferrule		mm^2	0.2x2.5 (AWG 22 – 12)	0.2x2.5 (AWG 22 – 12)	0.2x2.5 (AWG 22 – 12)
Standard screwdriver		mm	3.5 x 0.8	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6	0.6
Ambient climatic conditions					
Operating ambient temperature		°C	-25 to 55, low temperatures to IEC 60068-2-1, high temperatures to IEC 60068-2-2		
Condensation			Prevent condensation by means of suitable measures		
Storage		°C	40 – 70	40 – 70	40 – 70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 – 95	5 – 95	5 – 95
Air pressure (in operation)		hPa	795 – 1080	795 – 1080	795 – 1080
Corrosion resistance					
IEC/EN 60068-2-42	4 days SO_2	cm^3/m^3	10	10	10
IEC/EN 60068-2-43	4 days H_2S	cm^3/m^3	1	1	1
Ambient mechanical conditions					
Pollution degree			2	2	2
Degree of protection (IEC/EN 60529)			IP20	IP20	IP20
Vibrations (IEC/EN 60068-2-6)					
Constant amplitude 0.15 mm		Hz	10 – 57	10 – 57	10 – 57
Constant acceleration, 2 g		Hz	57 – 150	57 – 150	57 – 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	18	18	18
Drop (IEC/EN 60 068-2-31)	Drop height	mm	50	50	50
Free fall, packaged (IEC/EN 60068-2-32)		m	1	1	1
Mounting position			horizontal x vertical	horizontal x vertical	horizontal x vertical
Electromagnetic compatibility (EMC)					
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)					
Air discharge		kV	8	8	8
Contact discharge		kV	6	6	6
Electromagnetic fields (IEC/EN 61000-4-3, RFI)		V/m	10	10	10
Radio interference suppression (EN 55011)			EN 55011 Class B EN 55022 Class B		EN 55011 Class A EN 55022 Class A
Burst impulse (IEC/EN 61000-4-4, Level 3)					
Supply cables		kV	2	2	2
Signal cables		kV	2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, Level 2)		kV	0.5 (supply cables, symmetrical)		
Immunity to line-conducted interference (IEC/EN 61000-4-6)		V	10	10	10

			EASY221-CO	EASY222-DN	NZM-XDMI-DPV1
Insulation resistance					
Clearances and creepage distances			EN 50178, UL 508, CSA C22.2, No. 142		
Insulation resistance			EN 50178		
Power supply					
Rated operating voltage	U_e	V	24 (-15/+20 %)	24 (-15/+20 %)	24 (-15/+20 %)
Permissible range		V DC	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8
Ripple		%	< 5	< 5	< 5
At 24 V DC		mA	typ. 200	typ. 200	typ. 200
Voltage dips (IEC/EN 61131-2)		ms	10	10	10
Heat dissipation at 24 V DC		W	4.8	4.8	4.8
Polarity reversal protection					
Power supply			Yes	Yes	Yes
LED indicators					
Power supply			RUN LED (RUN): green	Module status LED (MS): green	Power LED (POW): green
LED display			LED ERROR (ERR): red	Network status LED (NS): red/green	PROFIBUS-DP LED (BUS): red
Network					
Terminal type			RJ45	5 pole, pluggable screw terminal	SUB-D 9 pole, socket
Potential isolation			Between bus and power supply (simple), between bus and power supply and NZM-XDMI612 (safe isolation)	Between bus and power supply (simple), between bus and power supply and NZM-XDMI612 (safe isolation)	Between bus and power supply (simple), between bus and power supply and NZM-XDMI612
Function			CANopen slave	DeviceNet slave	PROFIBUS-DP slave
Interface			CAN	CAN	RS 485
Bus protocol			CANopen	DeviceNet	PROFIBUS-DP
Baud rates			Automatic search up to 1 MBit/s	Automatic search up to 500 kBit/s	Automatic search up to 12 MBit/s
Bus terminating resistors			Separate external bus termination required (120 O) NZM-XDMI612	Separate external bus termination required (120 O) NZM-XDMI612	Separate external bus termination required
Bus addresses			1 – 127 addressed via display	0 – 63 addressed via display	1 – 126 via DMI
Services					
Cyclical			All data R1 – R16, S1 – S8	All data R1 – R16, S1 – S8	Status On/Off, tripped (detailed), load early warnings, phase currents $I_1/I_2/I_3$[A], remote operator acutation, display/ operation NZM-XDMI612, inputs/outputs, motor starter functions
Acyclical			Read/write, real-time, day, summer/winter time, all parameters of the easy function relay	Read/write, real-time, day, summer/winter time, all parameters of the easy function relay	Display/match protection protection settings, event list, identification, hours of operation, switching operations, time

			NZM-XSWD-704
General			
Standards			IEC/EN 61131-2 EN 50178
Dimensions (W x H x D)		mm	35 x 90 x 101
Weight		kg	0.1
Mounting			Top-hat rail IEC/EN 60715, 35 mm
Built-in position			Vertical
Ambient mechanical conditions			
Degree of protection (IEC/EN 60529)			IP20
Vibrations (IEC/EN 61131-2:2008)			
Constant amplitude 3.5 mm		Hz	5 … 8.4
Constant acceleration, 1 g		Hz	8.4 … 150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15 g/11 ms		Shocks	9
Drop (IEC/EN 60068-2-31)	Drop height	mm	50
Free fall, packaged (IEC/EN 60068-2-32)		m	0.3
Electromagnetic compatibility (EMC)			
Overvoltage category			II
Pollution degree			2
Electrostatic discharge (IEC/EN 61131-2:2008)			
Air discharge (Level 3)		kV	8
Contact discharge (Level 2)		kV	4
Electromagnetic fields (IEC/EN 61131-2:2008)			
80 -1000 MHz		V/m	10
1.4-2 GHz		V/m	3
2-2.7 GHz		V/m	1
Radio interference suppression (SmartWire-Darwin)			EN 55011 Class A
Burst (IEC/EN 61131-2:2008, Level 3)			
Supply cables		kV	2
Signal cables		kV	1
SmartWire-Darwin cables		kV	1
Surge (IEC/EN 61131-2:2008, Level 1)			–
Radiated RFI (IEC/EN 61131-2:2008, Level 3)		V	10
Ambient climatic conditions			
Operating ambient temperature (IEC 60068-2)		°C	–25 … +55
Condensation			Prevent with suitable measures
Storage		°C	–40…70
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 … 95
SmartWire-Darwin interface			
Station type			SmartWire-Darwin station (slave)
Baud rate setting			Automatic
SmartWire-Darwin status		LED	Green
Connection			8-pin connector Connection plug: External device plug SWD4-8SF2-5
Power consumption (15 V SWD supply)			See separate table
Supply and I/O connection			
Connection type			Push-In
Solid		mm^2	0.2-1.5 (AWG 24-16)
Flexible with ferrule[1)]		mm^2	0.25-1.5
24 V DC supply for output supply			
Rated operating voltage	U_e	V	–
Input voltage residual ripple		%	–
Polarity reversal protection reversal			–

Notes [1)] Minimum length 8 mm.

			NZM-XSWD-704
Digital inputs			
Number			2
Input current		mA	Typically 4 at 24 V DC
Voltage level to IEC/EN 61131-2			
Limit value type 1			Low < 5 V DC; High > 15 V DC
Input delay			High → Low typically < 0.2 ms Low → High typically < 0.2 ms
Status display inputs		LED	Yellow
Digital semiconductor outputs			
Number			2
Output current		A	0.2 at 24 V DC
Short-circuit tripping current		A	–
Lamp load	R_{LL}	W	–
Overload proof			Yes, with diagnostics
Switching capacity			EN 60947-5-1 utilization category DC-13
Relay outputs			
Number			–
Contact type			–
Operations			
Utilization category AC-1, 250 V, 6 A			–
Utilization category AC-15, 250 V, 3 A			–
Utilization category DC-13, 24 V, 1 A			–
Safe disconnection		V AC	–
Minimum load current		mA	–
Response/reset time		ms	–
Bounce duration		ms	–
Short-circuit protection			–
Status display outputs		LED	–
Potential isolation			
Inputs for SmartWire-Darwin			Yes
Semiconductor outputs to SmartWire-Darwin			Yes
Semiconductor outputs to inputs			–
Relays to SmartWire-Darwin			–
Relays to inputs			–
Relays to relays			–



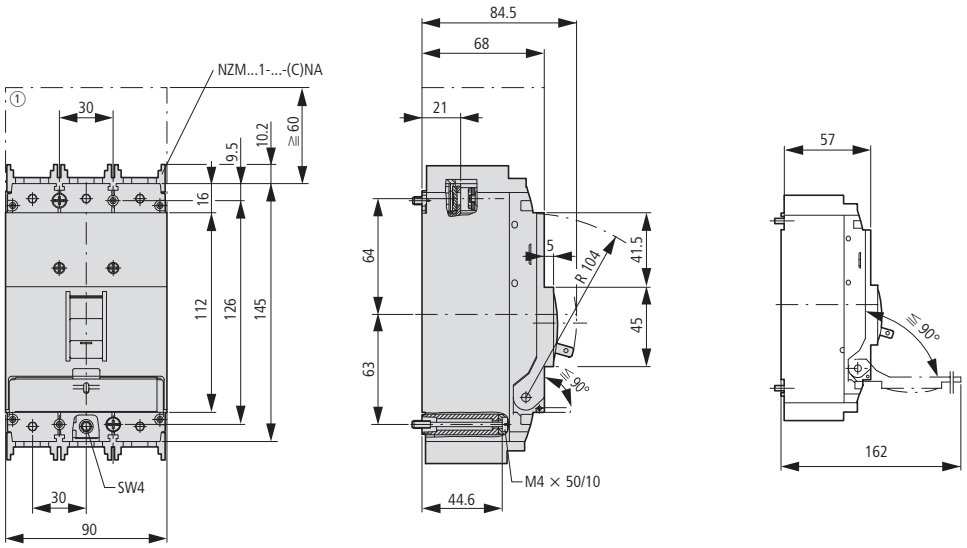
Measuring and communication module

NZM-...XMC

		NZM2-XMC-S0	NZM3-XMC-S0	NZM2/3-XMC-MB
General				
Dimensions	mm	209 × 91 × 132 (3 pole) 251 × 91 × 132 (4 pole)	209 × 91 × 132 (3 pole) 251 × 91 × 132 (4 pole)	209 × 91 × 132 (3 pole) 251 × 91 × 132 (4 pole)
Weight	g	850 (3 pole) 975 (4 pole)	850 (3 pole) 975 (4 pole)	850 (3 pole) 975 (4 pole)
Material characteristic		UL94-V0	UL94-V0	UL94-V0
Environmental conditions				
Operating temperature	°C	-15-+65	-15-+65	-15-+65
Storage temperature	°C	-40-+80	-40-+80	-40-+80
Humidity (non-condensed)	%	5-95	5-95	5-95
Maximum operating altitude	m	2000	2000	2000
IP protection class		IP 20	IP 20	IP 20
Supply				
Voltage	V DC	18 – 36	18 – 36	18 – 36
Maximum current	mA	200	200	200
Conductors		Phoenix Contact GMVSTBR 2.5-2-ST-7.62	Phoenix Contact GMVSTBR 2.5-2-ST-7.62	Phoenix Contact GMVSTBR 2.5-2-ST-7.62
Voltage measurement				
Rated operating voltage	V AC	690	690	690
Maximum surge voltage at 8/20 ms	kV	8	8	8
Maximum voltage	V AC	800	800	800
Surge impedance (impedance)	kohms	1	1	1
Frequency	Hz	45-65	45-65	45-65
Accuracy		0.4 % measured value +0.05 % FS	0.4 % measured value +0.05 % FS	0.4 % measured value +0.05 % FS
Overvoltage category according to EN61010		CAT IV (600 V)	CAT IV (600 V)	CAT IV (600 V)
Current measurement				
Rated operational current	A AC	300	500	300 (NZM2)/500 (NZM3)
Maximum current	A AC	350	740	30
Maximum current impulse 1s	kA	30	30	30
Frequency	Hz	45-200	45-200	45-200
Category EN61010		CAT IV-600 V	CAT IV-600 V	CAT IV-600 V
Power measurement				
Maximum power (per phase)	kWh	-	-	280
Accuracy		-	-	0.95 % measurement + 0.05 % FS
Accuracy, active power		Class 1 (IEC62053-21)	Class 1 (IEC62053-21)	Class 1 (IEC62053-21)
Accuracy, reactive energy		-	-	Class 2 (IEC62053-23)
Pulse output				
Output type		NPN-isolated transistor	NPN-isolated transistor	NPN-isolated transistor
VCE max	V	80	80	80
VCE sat	V	0.4	0.4	0.4
Ic max	mA	50	50	50
Ic recommended	mA	10	10	10
Isolation	kV	3	3	3
Max. switching frequency	Hz	2	2	4
Pulse width	ms	120	120	≥ 20
Pulse rate power	Pulses/kW h	15	7.5	
Digital output				
Type		-	-	
Maximum voltage	V	-	-	350
Maximum current	mA	-	-	120
Isolation	kV	-	-	2.5
Digital input				
Maximum voltage	V	-	-	50
VIHmax	V	-	-	3
MODBUS output-RS485				
Data rate	bit/s	-	-	9600, 19200, 38400, 56000, 57600
Stop bits		-	-	1, 2
Parity		-	-	None, odd, even
Isolation	kV	-	-	3
Output – display				
DC supply voltage	V DC	-	-	5
Maximum current	mA	-	-	180

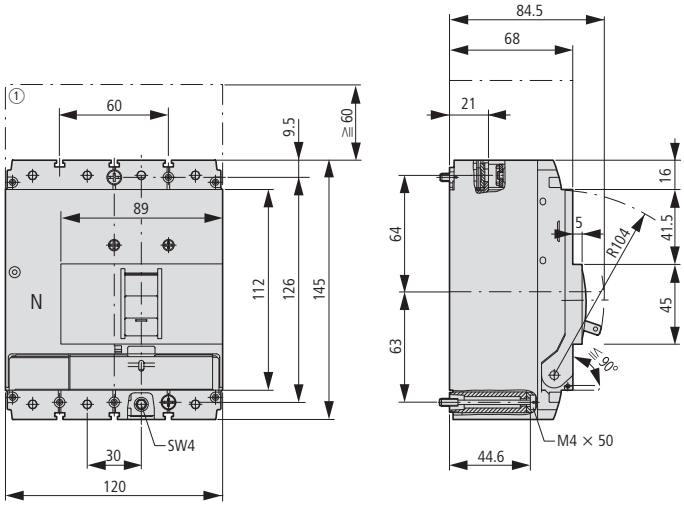
Dimensions

Circuit-breakers
Switch-disconnectors
3 pole
NZMB1
NZMC1
NZMN1
NZMH1
PN1
N1
NS1



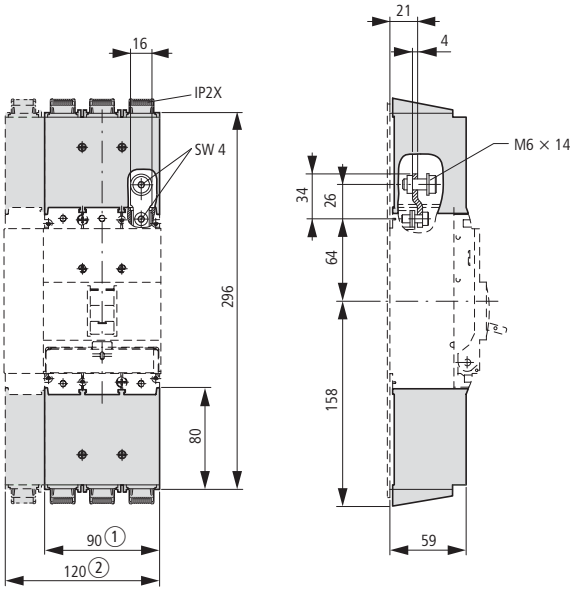
① Blow-out area, minimum distance to other parts ≧ 60 mm

Circuit-breakers
Switch-disconnectors
4 pole
NZMB1-4
NZMC1-4
NZMN1-4
NZMH1-4
PN1-4
N1-4



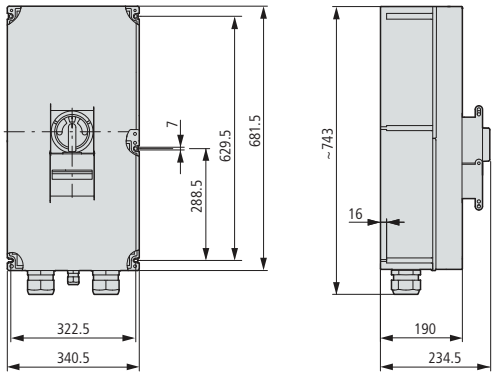
① Blow-out area, minimum distance to other parts ≧ 60 mm

Covers
NZM1(-4)-XKSA
Screw terminals
NZM1(-4)-XKS
IP2X protection against contact with a finger for cover
NZM1(-4)-XIPA



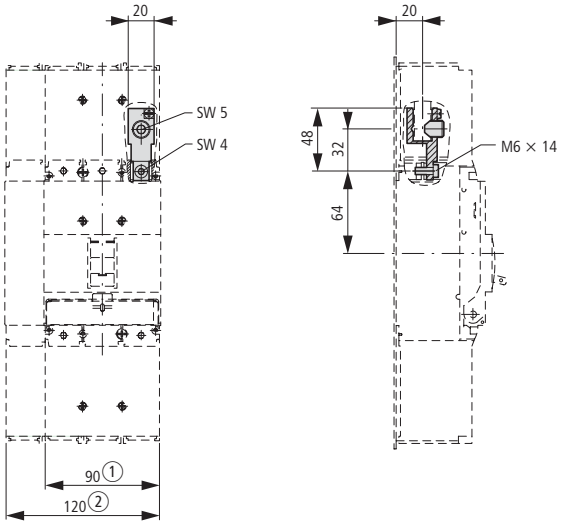
① 3 pole
② 4 pole

Switch-disconnectors
ATEX22-type
3 pole
PN1../ATEX22



Tunnel terminal

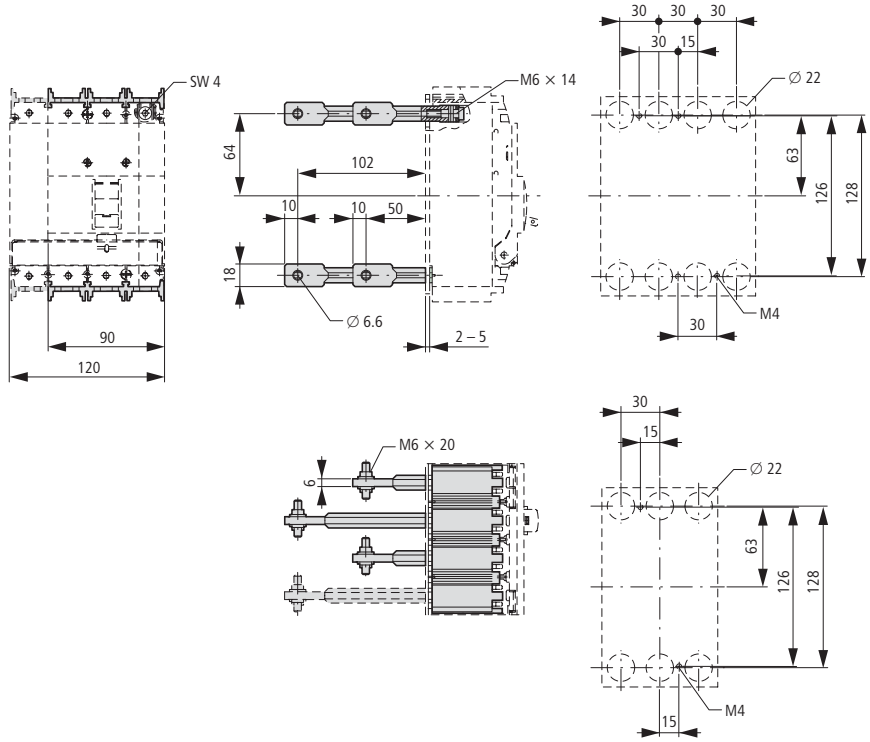
NZM1(-4)-XKA



① 3 pole
② 4 pole

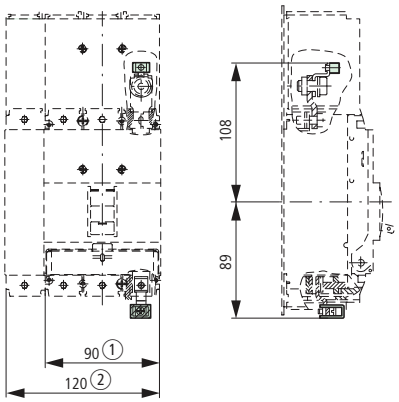
Rear terminal bolts

NZM1(4)-XKR



Control cable terminals

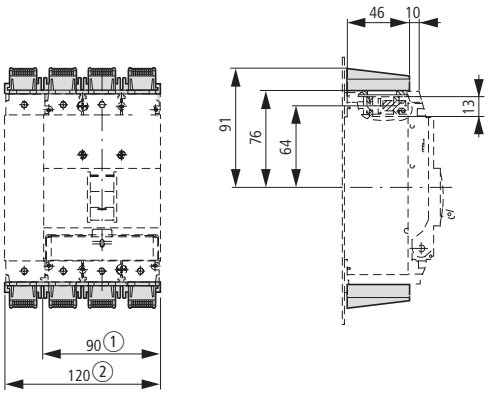
NZM1-XIPK, NZM-XSTK



① 3 pole
② 4 pole

IP2X protection against contact with finger

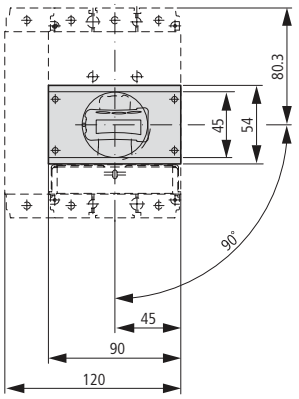
NZM1(-4)-XIPK

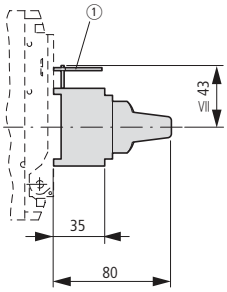


Rotary mechanism

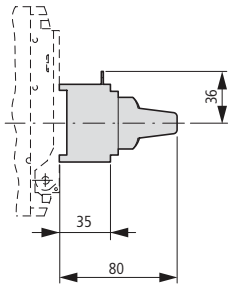
Rotary handle on circuit-breaker

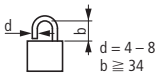
NZM1-XDV
NZM1-XDVR





NZM1-XDTV

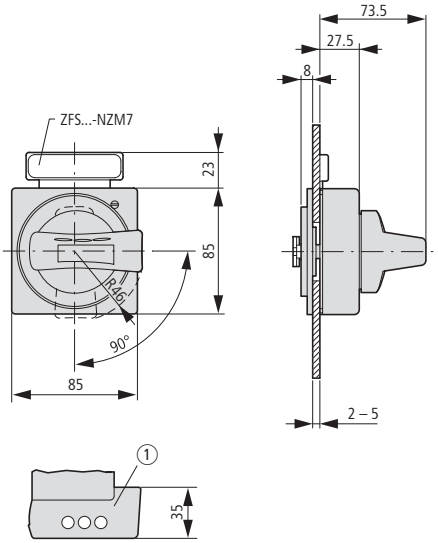


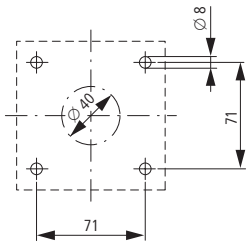


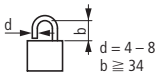
① Up to 3 padlocks

Door coupling rotary handles

NZM1-XTVD(V)(R)(-NA)



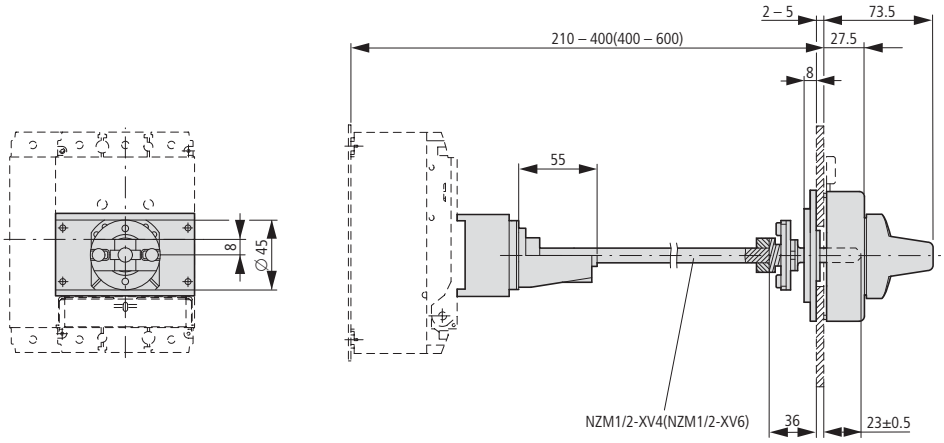




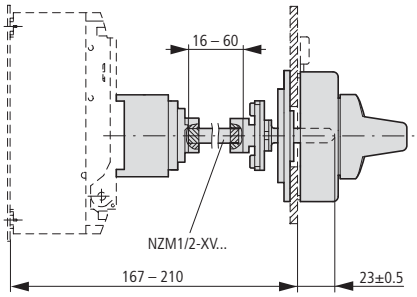
① Up to 3 padlocks

Door coupling rotary handle with extension shaft

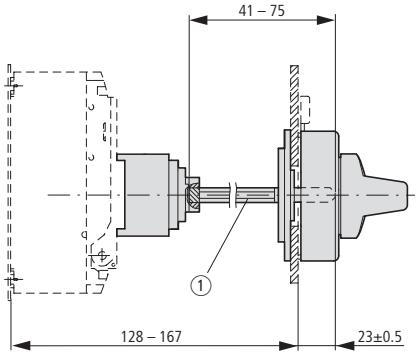
NZM1-XTVD(V)(R)(-NA)
NZM1/2-XV4(6)



NZM1-XTVD(V)(R)-60(-NA)

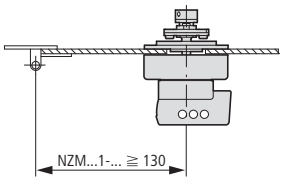


NZM1-XTVD(V)(R)-0(-NA)



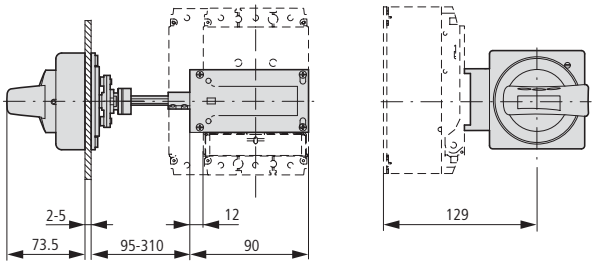
① Special tip

Minimum distance of door coupling rotary handle from door pivot point

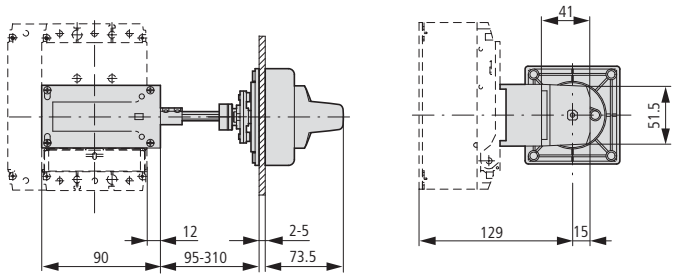


Main switch assembly kit for side wall installation

NZM1-XS(R)-L

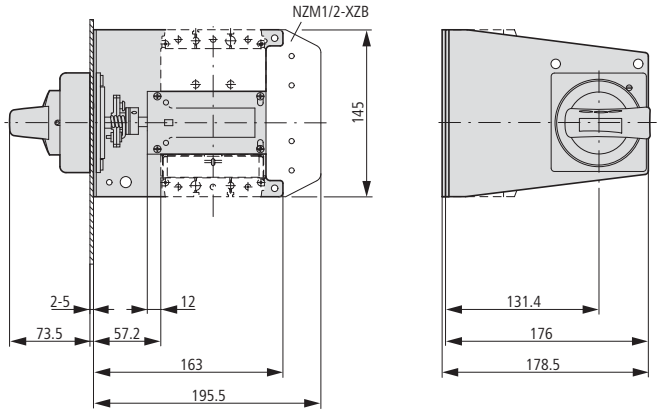


NZM1-XS(R)-R

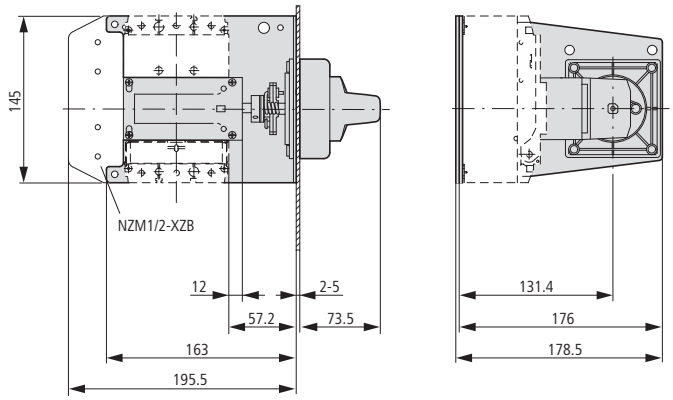


Main switch assembly kit for side wall installation with mounting bracket

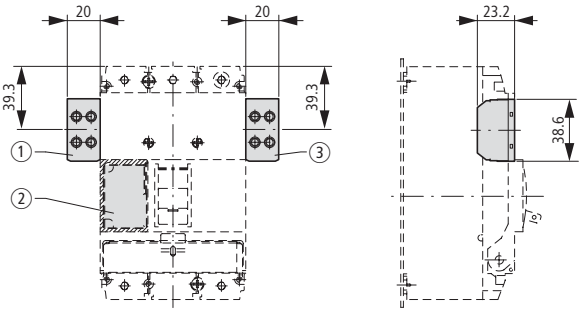
NZM1-XS(R)M-L



NZM1-XS(R)M-R



Undervoltage releases
Shunt releases (for power circuit breaker)
Early-make auxiliary contacts



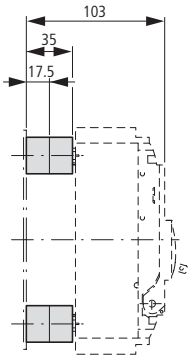
① NZM1-XA(HIV)
NZM1-XU(HIV)(20)
NZM1-XHIV

② NZM1-XA(HIV)(L)
NZM1-XU(V)(HIV)(L)(20)
NZM1-XHIV(L)

③ NZM1-XHIVR

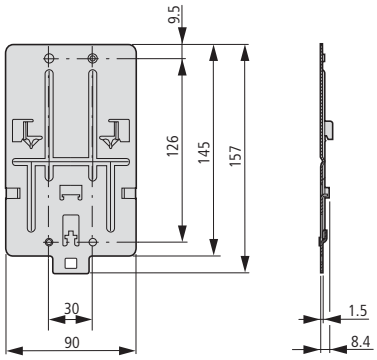
Spacers

NZM1/2-XAB

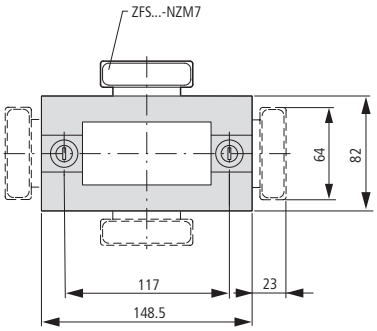


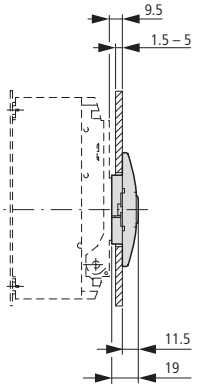
Clip plate

NZM1-XC35

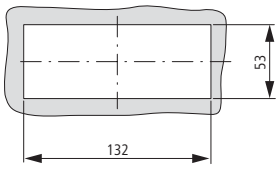


Insulating surround
NZM1-XBR

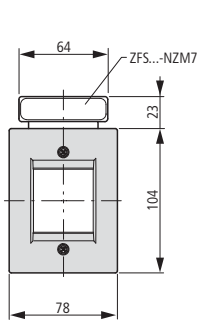


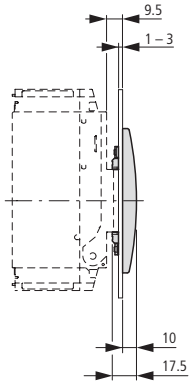


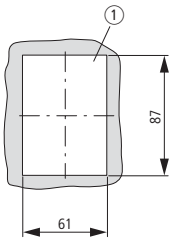
Mounting aperture



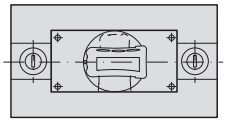
Insulating surround
NZM1-XBRS

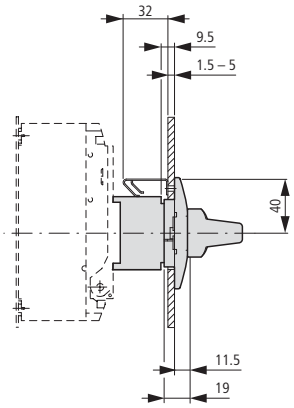




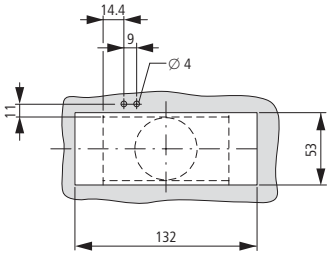


Rotary handle on switch with door interlock
NZM1-XDTV(R)

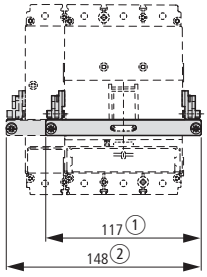


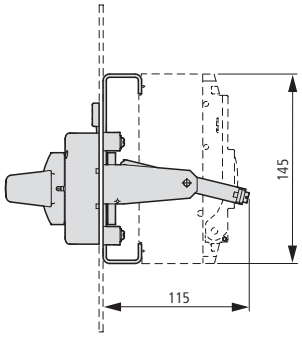


Mounting aperture



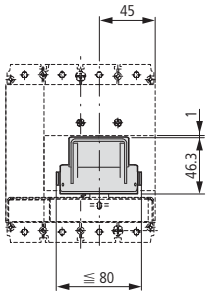
Rear-mounted drives
NZM1-XRAV(R)
NZM1-4-XRAV(R)

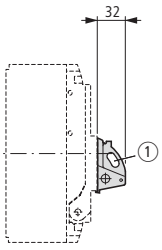


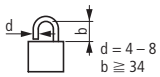


① NZM1-XRAV(R)
② NZM1-4-XRAV(R)

Toggle lever locking device
NZM-XKAV



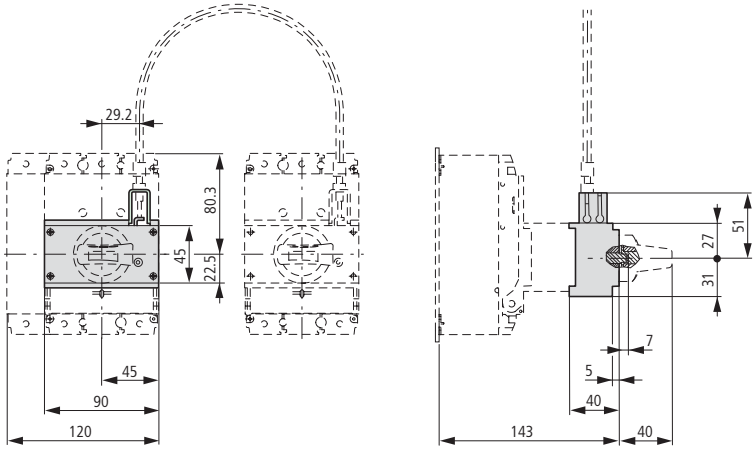




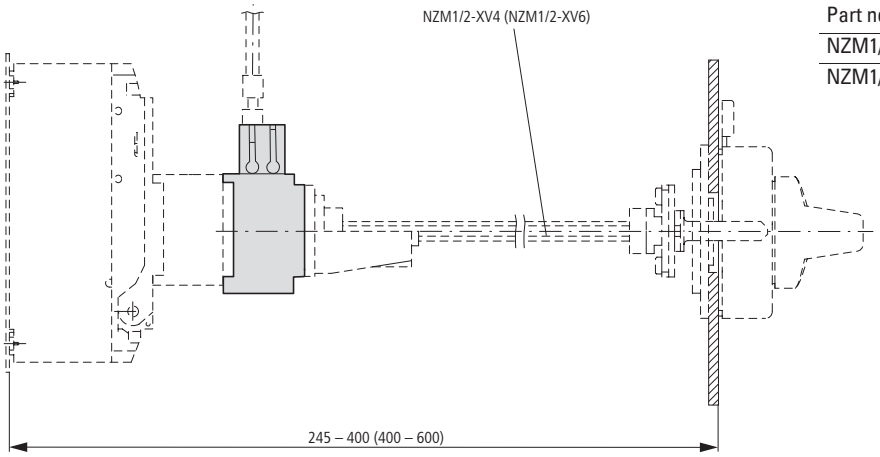
Up to 3 padlocks

Mechanical interlock

NZM1-XMV + NZM1-XDV(R)

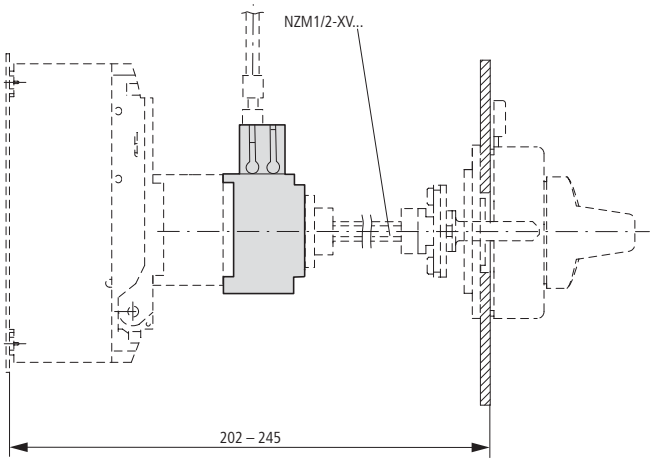


NZM1-XMV + NZM1-XTVD(V)(R)

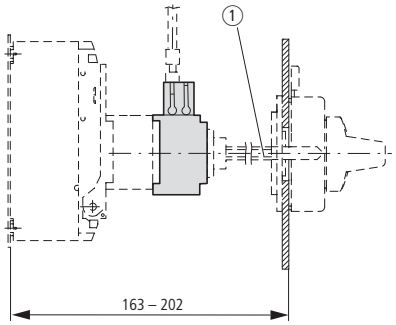


Part no.	x
NZM1/2-XV4	245 – 400
NZM1/2-XV6	400 – 600

NZM1-XMV + NZM1-XTVD(V)(R)-60



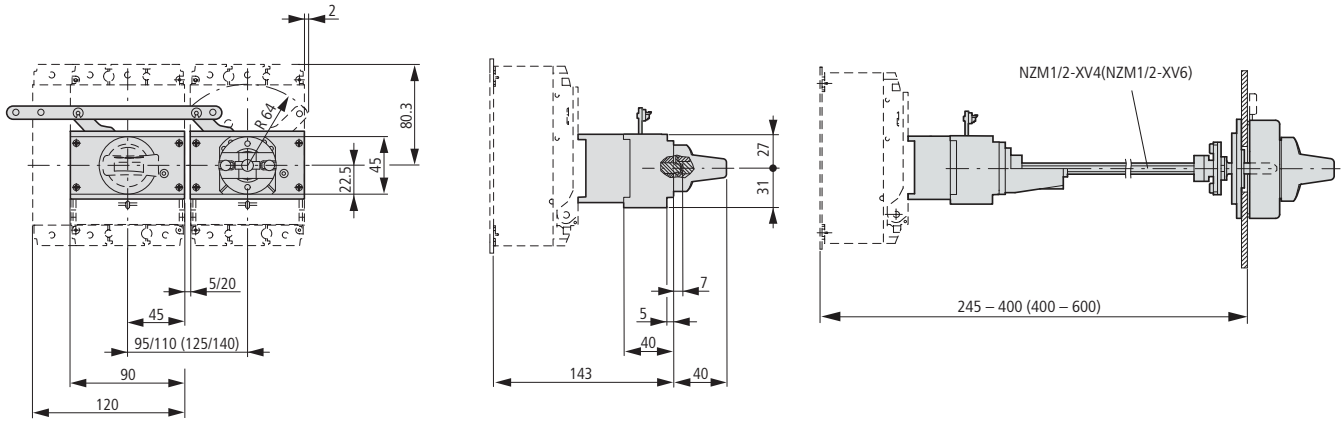
NZM1-XMV + NZM1-XTVD(V)(R)-0



① Special tip

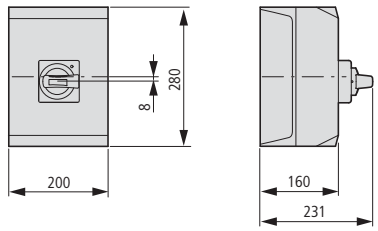
Paralleling mechanism

PN1-XPA

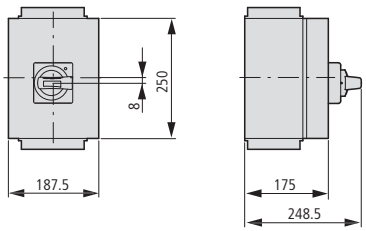


Insulated enclosures

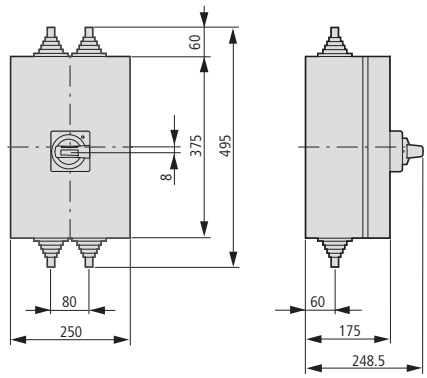
NZM1-XCIK5-T...



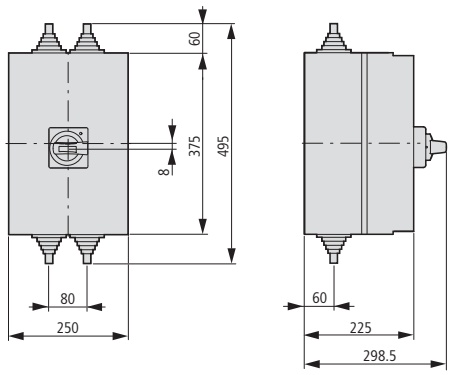
NZM1-XCI23-T...



NZM1-XCI43-T...

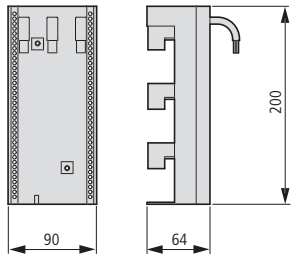


NZM1-XCI43/2-T...



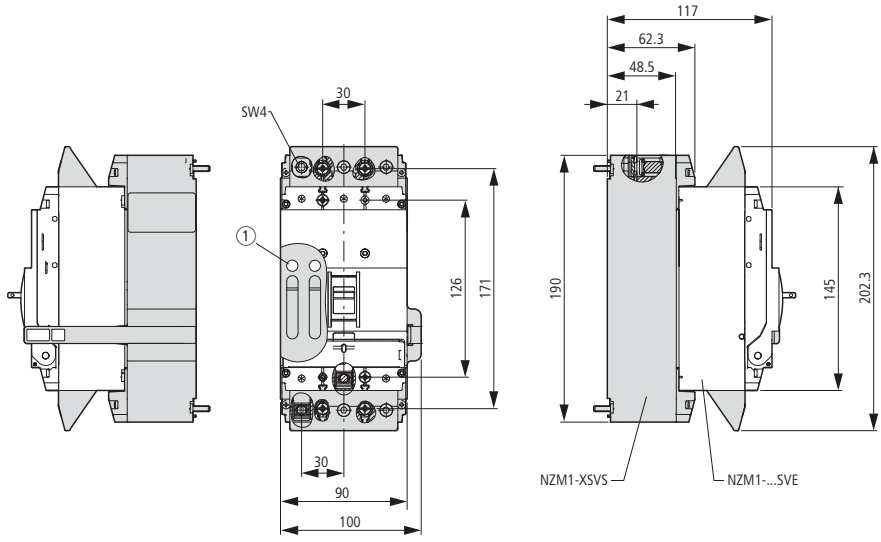
Component adapter

NZM1-XAD160

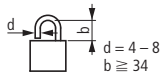


Plug-in units

NZM1-XSVS with
NZM.1-...-SVE
N1-...-SVE

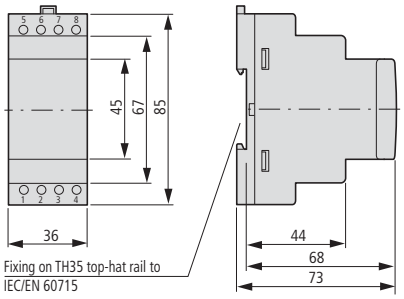


① Up to 2 padlocks



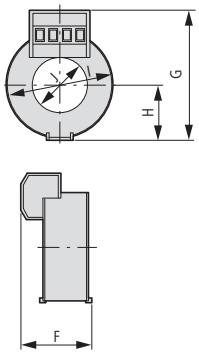
Residual-current relays

PFR-003
PFR-03
PFR-5

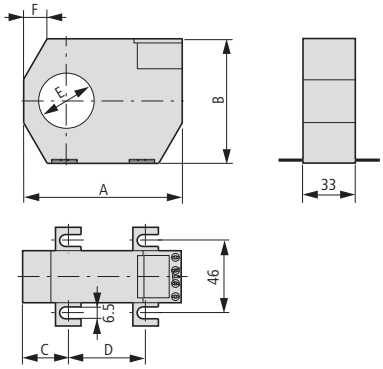


Ring-type transformer

PFR-W-20…30



PFR-W-35...210

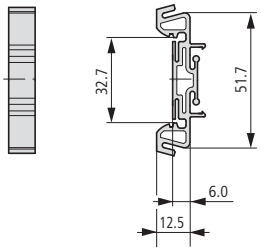


Part no.	F	G	H	I	J
PFR-W-20	32	60	24	46	21
PFR-W-30	32	70	30	59	30

	A	B	C	D	E	F
PFR-W-35	100	79	26	48.5	35	35
PFR-W-70	130	110	32	66	70	52
PFR-W-105	170	146	38	94	105	72
PFR-W-140	220	196	48.5	123	140	97
PFR-W-210	299	284	69	161	210	141

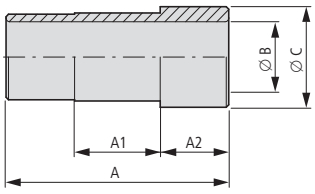
Mounting clip

PFR-WC



Magnetic shielding

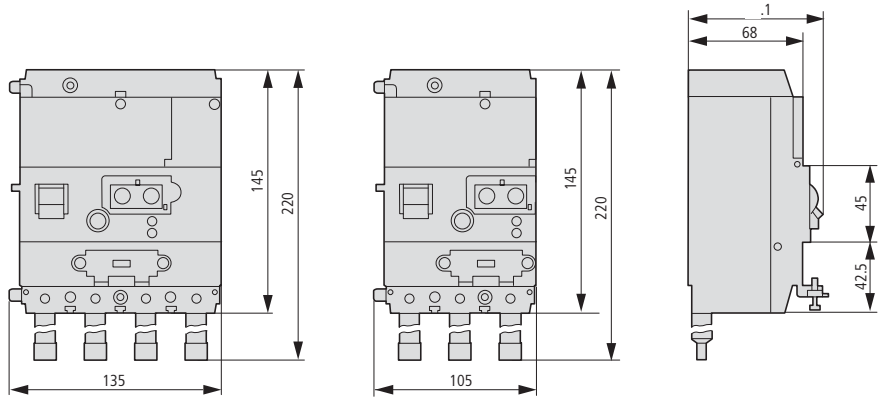
PFR-WMA



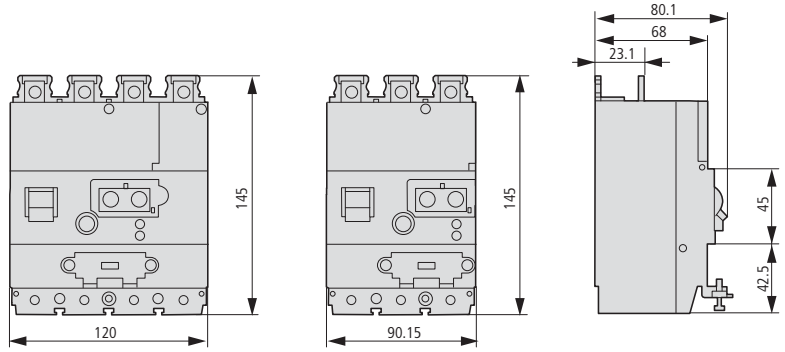
Part no.	A	B	C	A1	A2
PFR-WMA-35	91	28	40	35	28
PFR-WMA-70	105	62	75	35	35
PFR-WMA-105	153	98	110	35	60
PFR-WMA-140	153	133	145	35	60
PFR-WMA-210	153	203	215	35	60

Earth-fault release

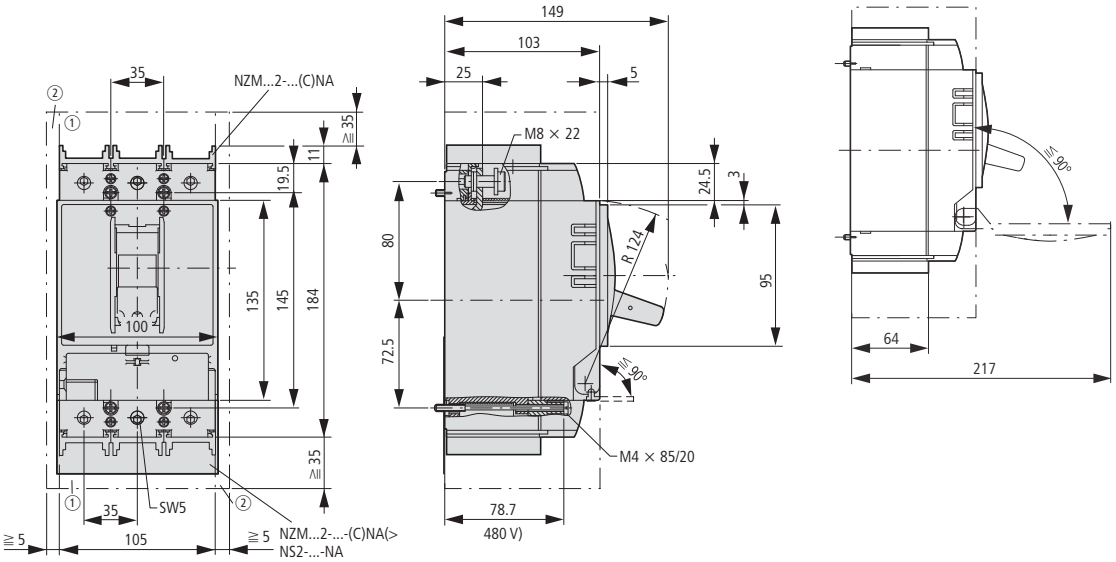
NZM1(-4)-XFI...R



NZM1(-4)-XFI...U

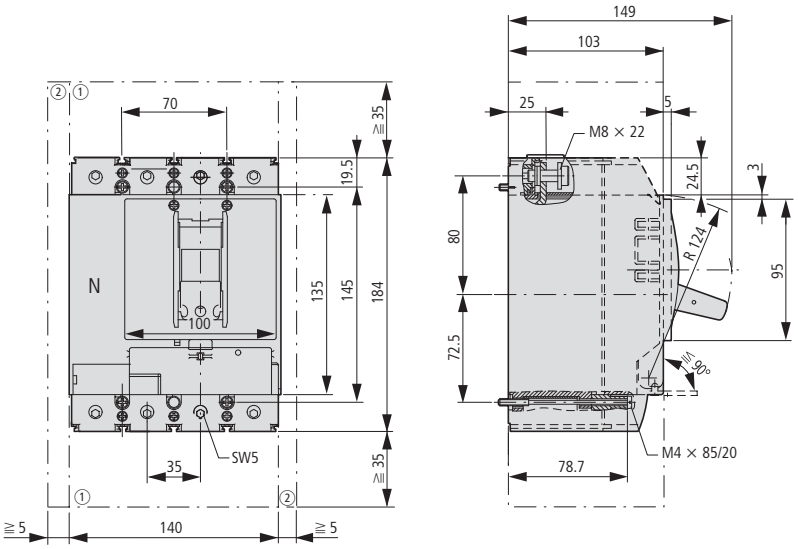


Circuit-breakers
Switch-disconnectors
3 pole
NZMB2
NZMC2
NZMN2
NZMH2
PN2
N2
NS2



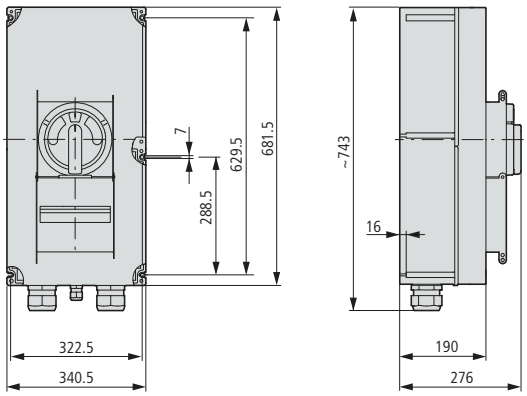
① Blow-out area, minimum distance to other parts ≧ 35 mm
② Minimum distance to adjacent parts ≧ 5 mm

Circuit-breakers
Switch-disconnectors
4 pole
NZMB2-4
NZMC2-4
NZMN2-4
NZMH2-4
PN2-4
N2-4



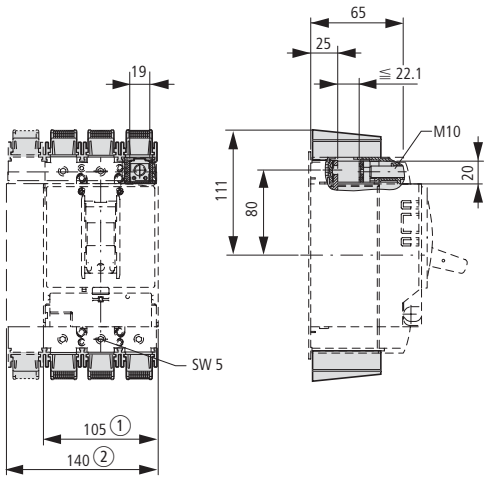
① Blow-out area, minimum distance to other parts ≧ 35 mm
② Minimum distance to adjacent parts ≧ 5 mm

Switch-disconnectors
ATEX22-type
3 pole
PN2.../ATEX22



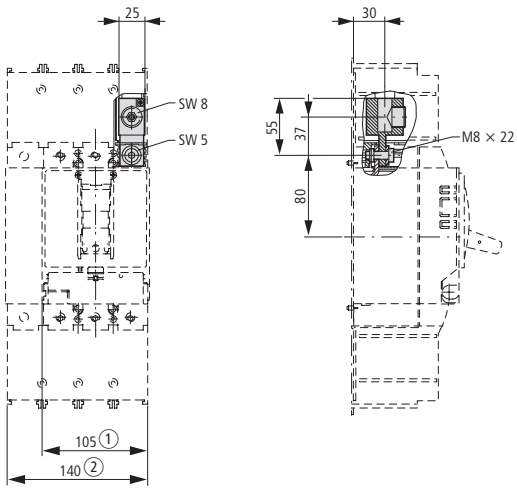
Box terminal
(+)NZM2(-4)-...-XKC(O)(U)

IP2X protection against contact with finger
NZM2(-4)-XIPK



① 3 pole
② 4 pole

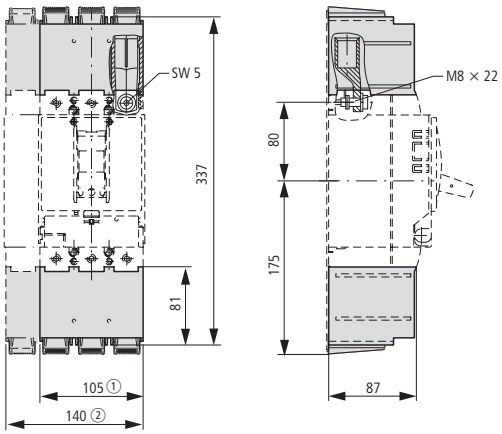
Tunnel terminal
NZM2(-4)-XKA



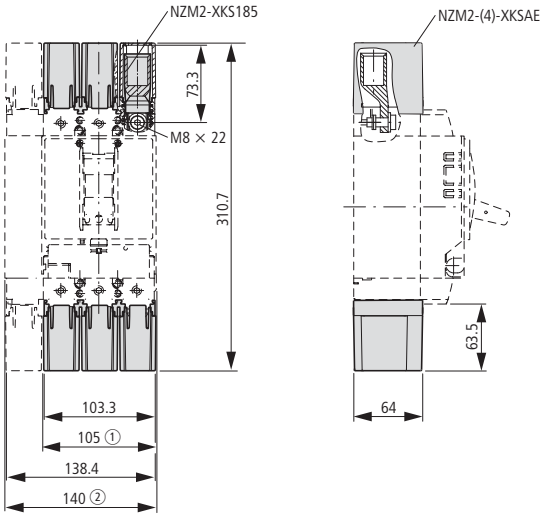
Covers
NZM2(-4)-XKSA

Cable lug
NZM2-XKS185

IP2X protection against contact with a finger for cover
NZM2(-4)-XIPA

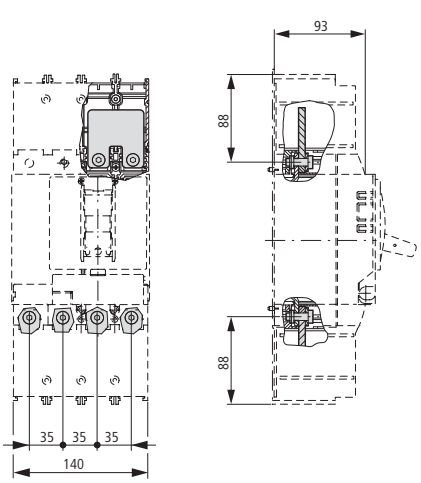


Cable lug cover
NZM2-(4)-XKSAE

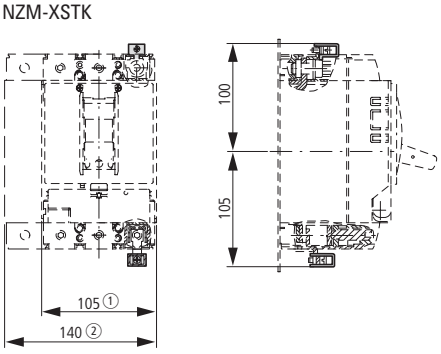


① 3 pole
② 4 pole

Jumper kit
NZM2-4-XKVP



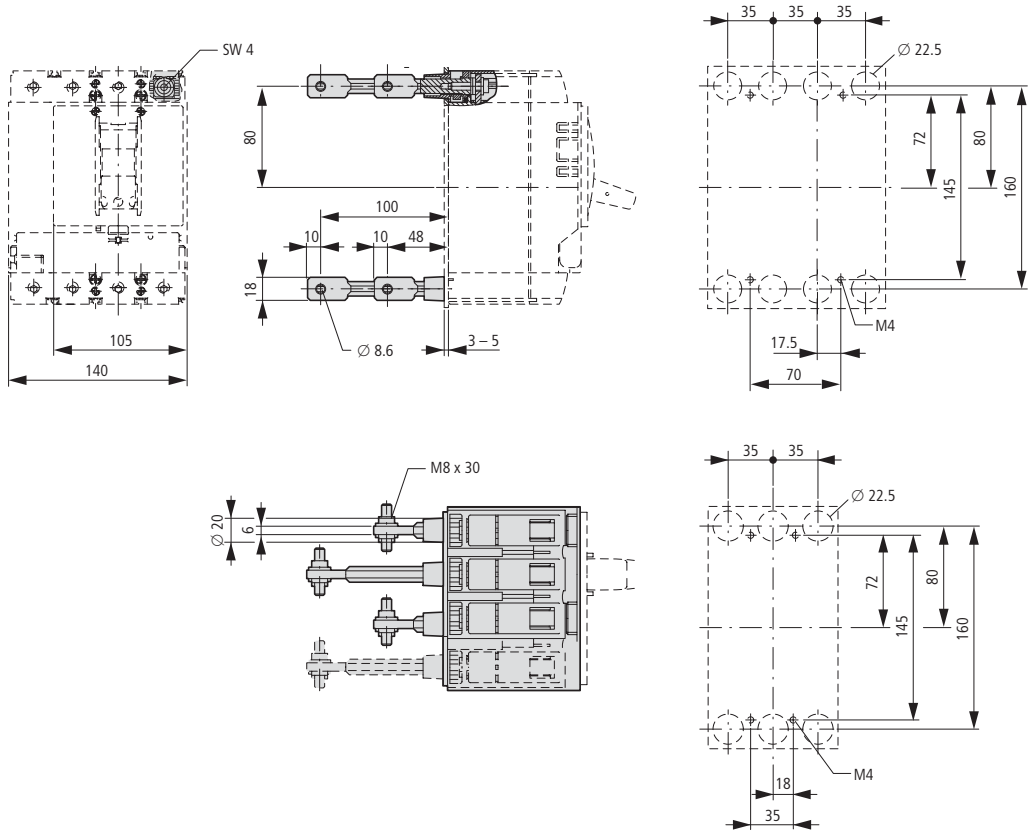
Control cable terminals
NZM2-XSTS
NZM-XSTK



① 3 pole
② 4 pole

Rear terminal bolts

(+)NZM2(-4)-XKR(0)(U)

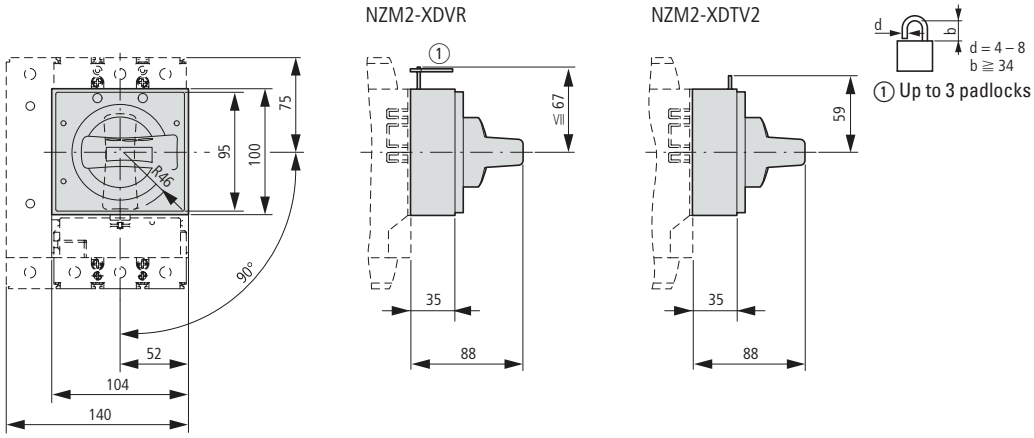


Rotary mechanism

Rotary handle on circuit-breaker

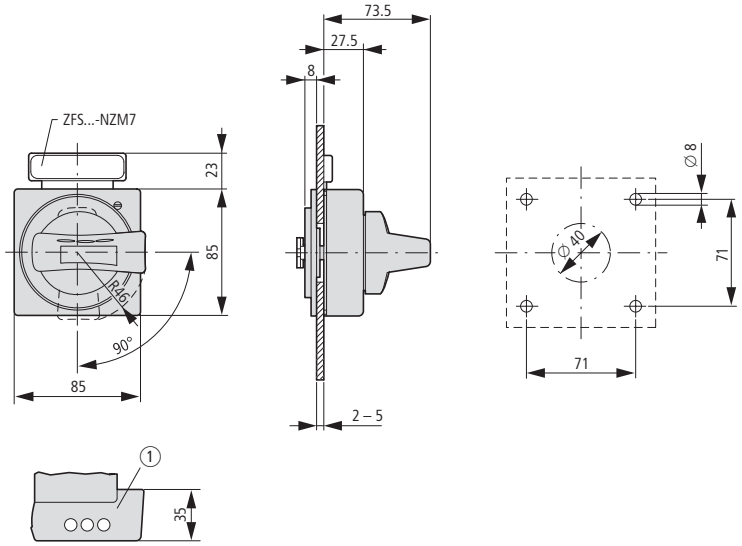
NZM2-XDV
NZM2-XDVR

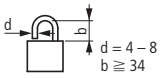
NZM2-XDTV
NZM2-XDTV2



Door coupling rotary handles

NZM2-XTVD(V)(R)...

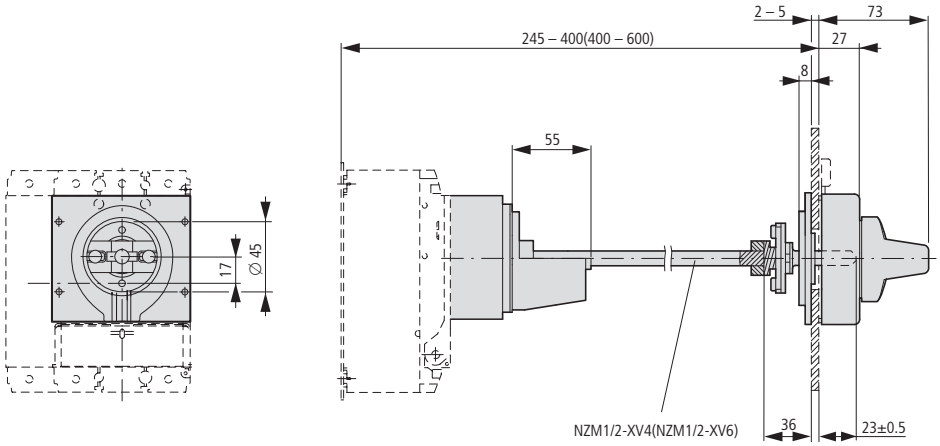




① Up to 3 padlocks

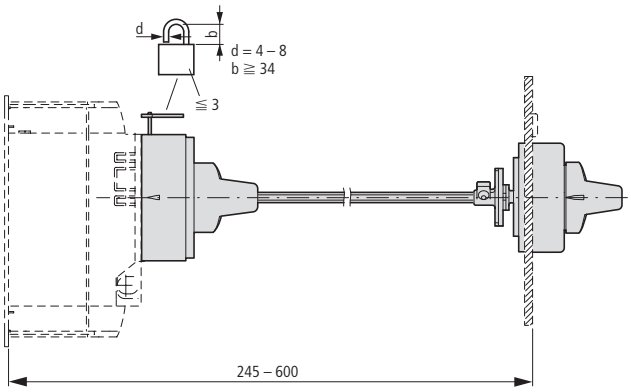
Door coupling rotary handle with extension shaft

NZM2-XTVD(V)(R)(-NA)
NZM1/2-XV4(6)



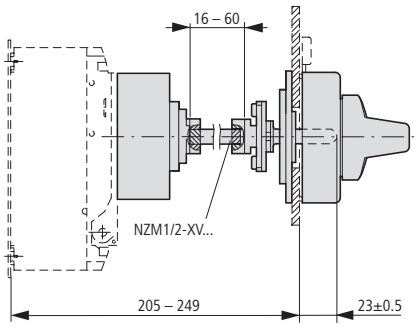
Main switch assembly kit with additional rotary handle

NZM2-XHB-DA(R)(-NA)

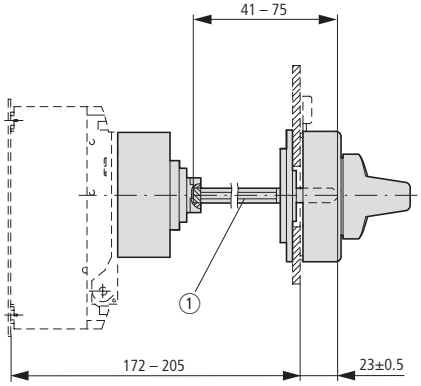


Door coupling rotary handle with extension shaft

NZM2-XTVD(V)(R)-60(-NA)

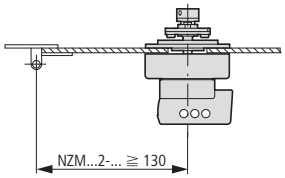


NZM2-XTVD(V)(R)-0(-NA)



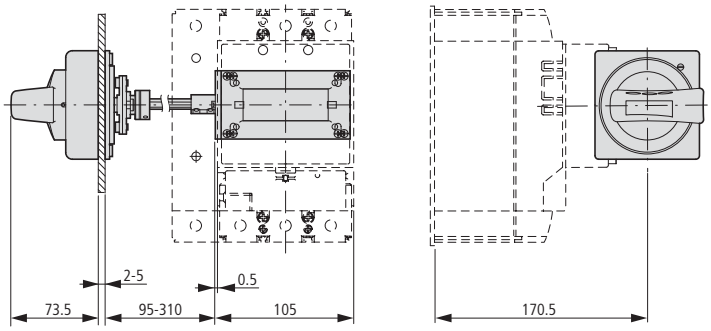
① Special tip

Minimum distance of door coupling rotary handle from door pivot point

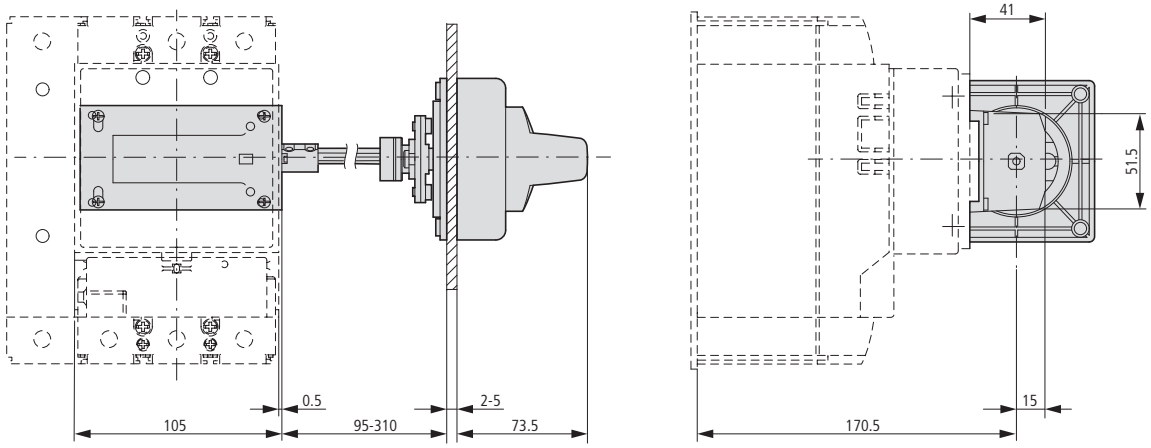


Main switch assembly kit for side wall installation

NZM2-XS(R)-L

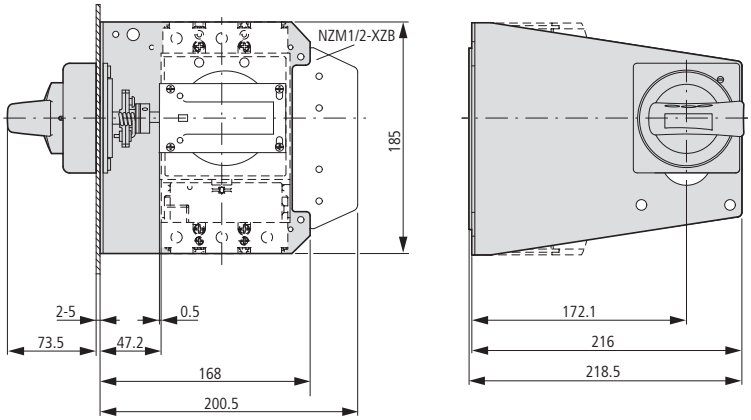


NZM2-XS(R)-R

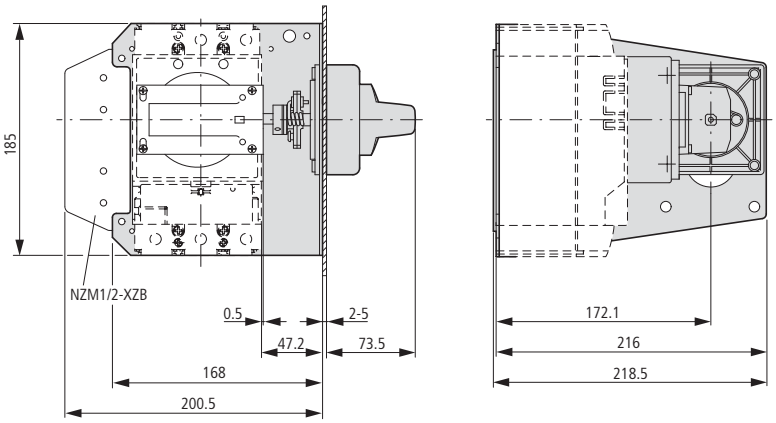


Main switch assembly kit for side wall installation with mounting bracket.

NZM2-XS(R)M-L

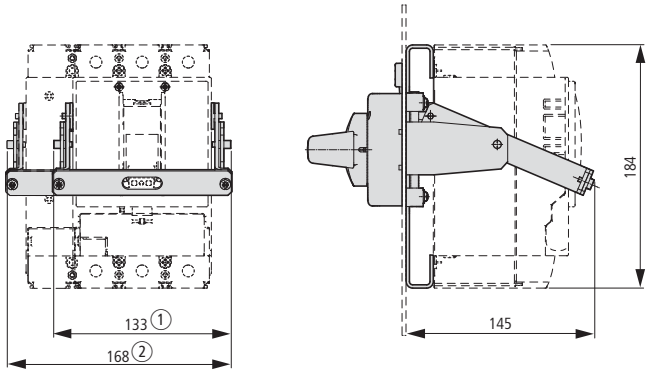


NZM2-XS(R)M-R



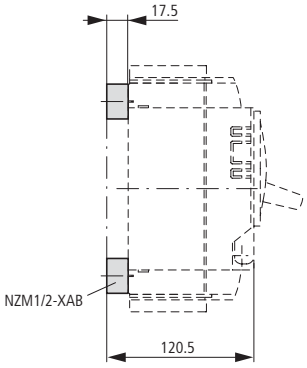
Rear-mounted drives

NZM2(-4)-XRAV(R)

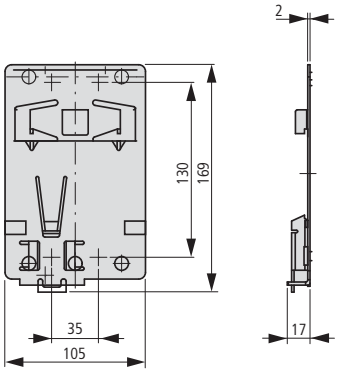


① NZM2-XRAV(R)
② NZM2-4-XRAV(R)

Spacers
NZM1/2-XAB

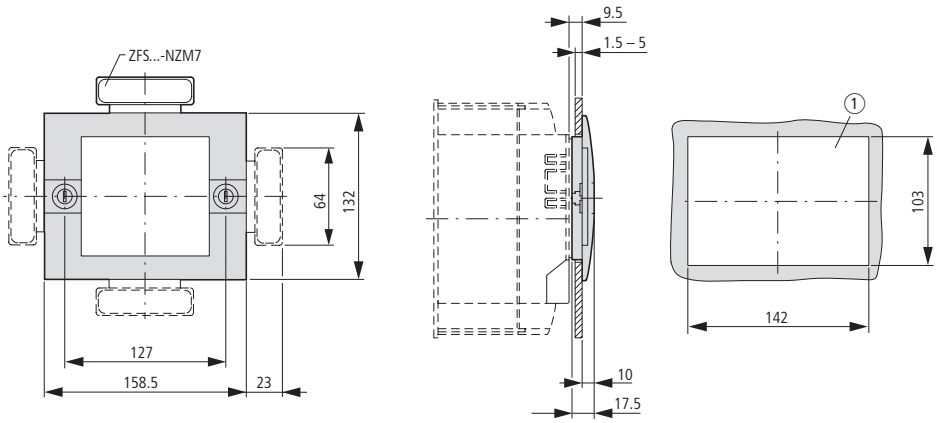


Clip plate
NZM2-XC75



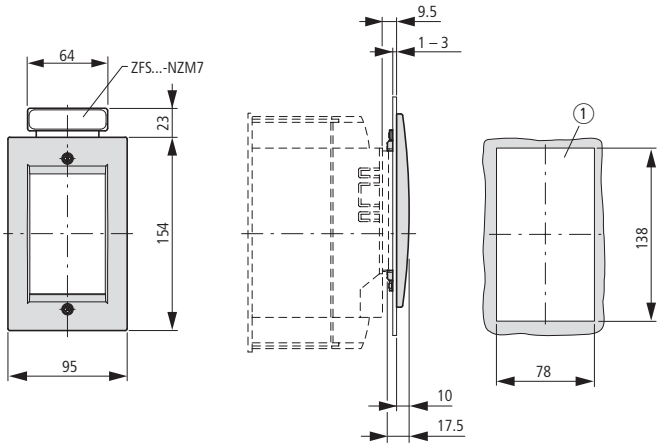
Insulating surround
NZM2-XBR

① Mounting aperture



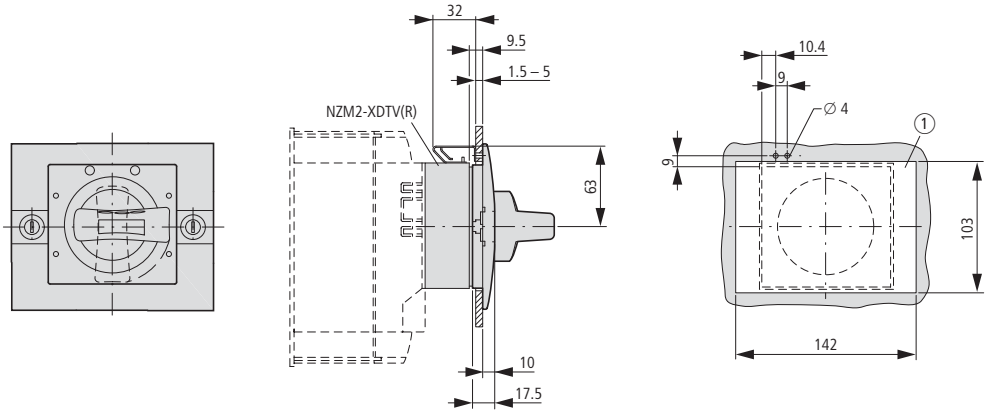
NZM2/3-XBRS

① Mounting aperture



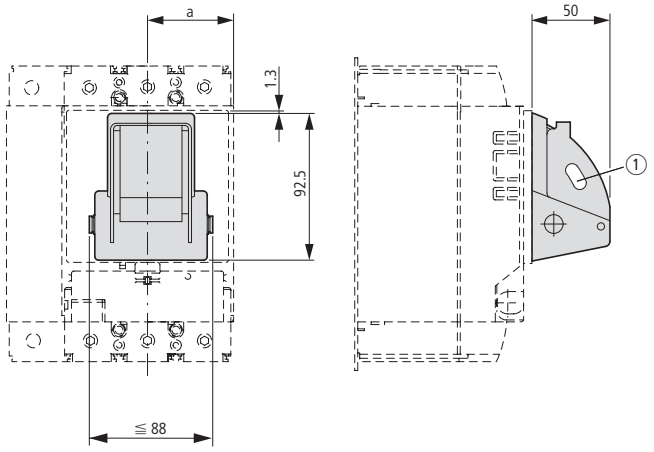
Rotary handle on switch with door interlock
NZM2-XDTV(R)

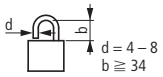
① Mounting aperture



Toggle lever locking device

NZM2/3-XKAV



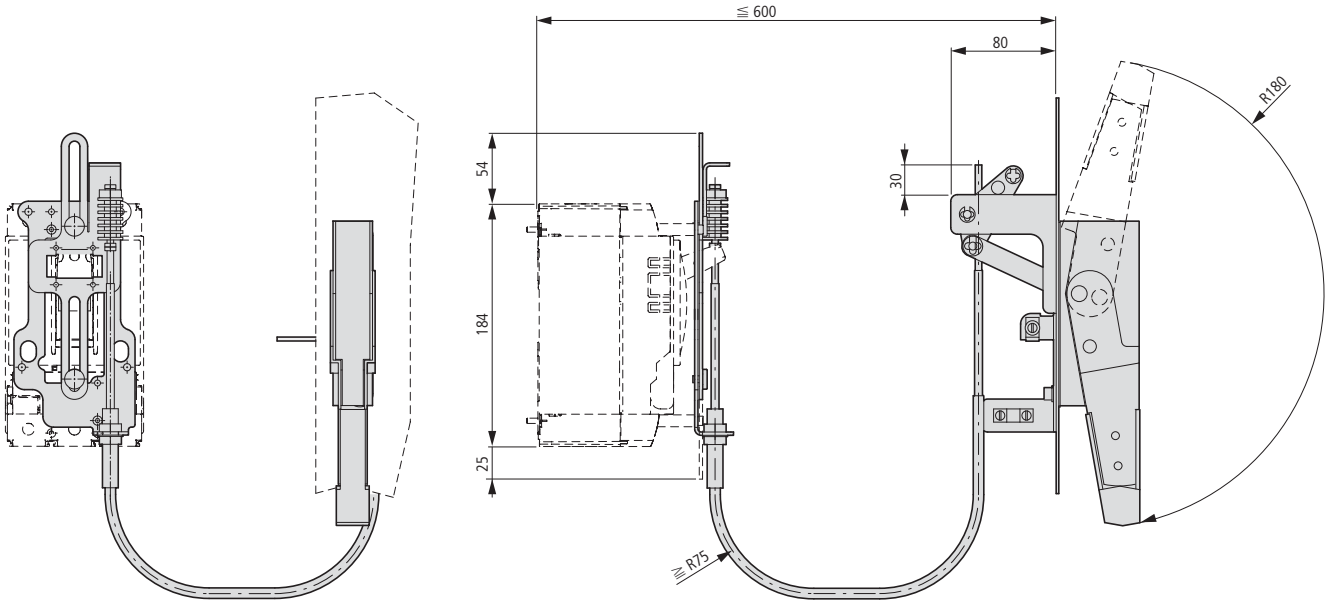


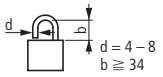
① Up to 3 padlocks

Part no.	a
NZM2, PN2, N2	52.5
NZM3, PN3, N3	70

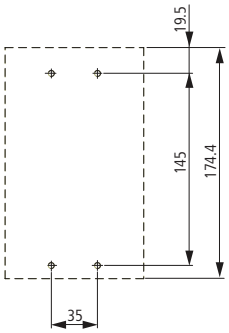
Side-mounted handle

NZM2...-XSH...





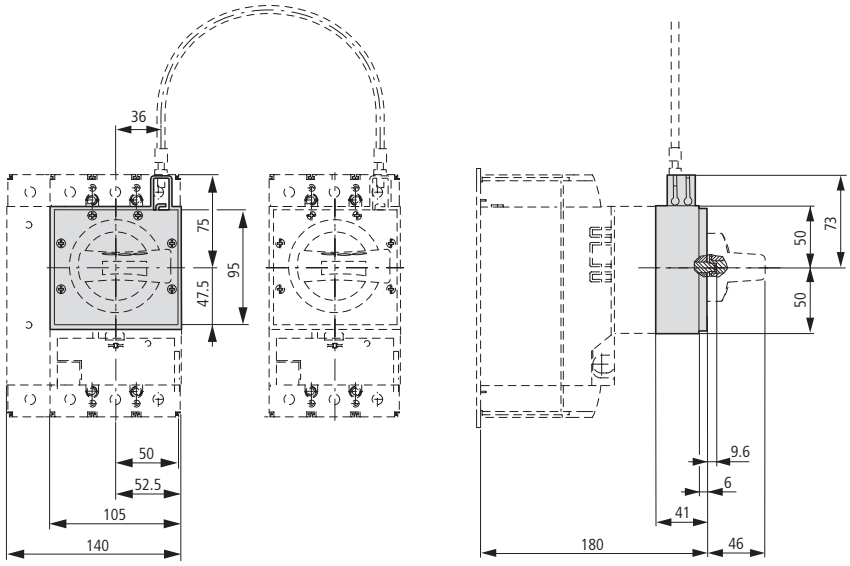
① Up to 3 padlocks



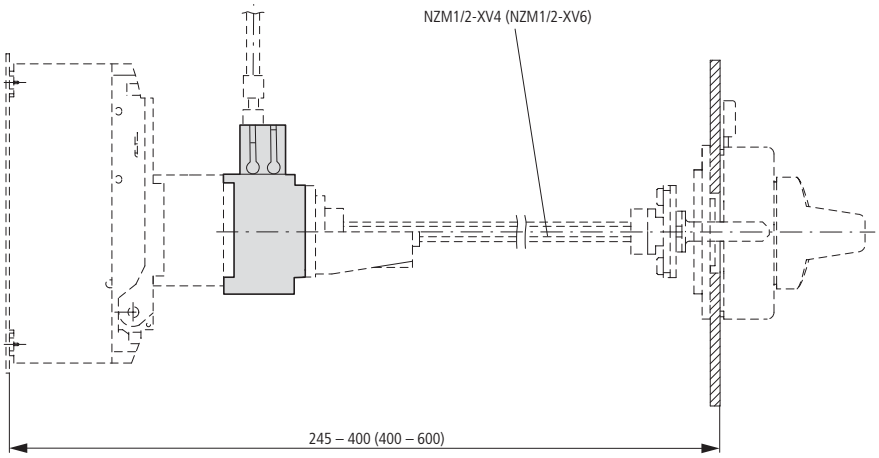
Drilling template

Mechanical interlock

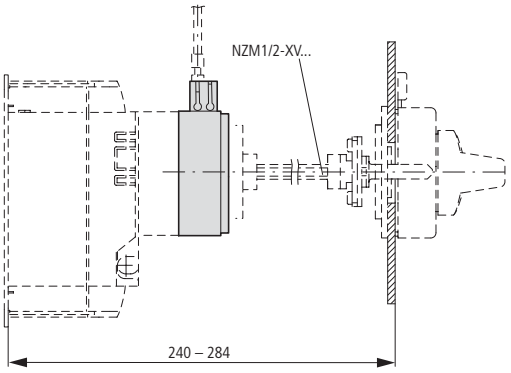
NZM2-XMV + NZM2-XD



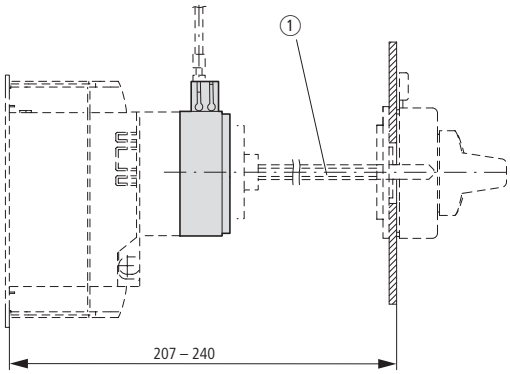
NZM2-XMV + NZM2-XTVD(V)(R)



NZM2-XMV + NZM2-XTVD(V)(R)-60



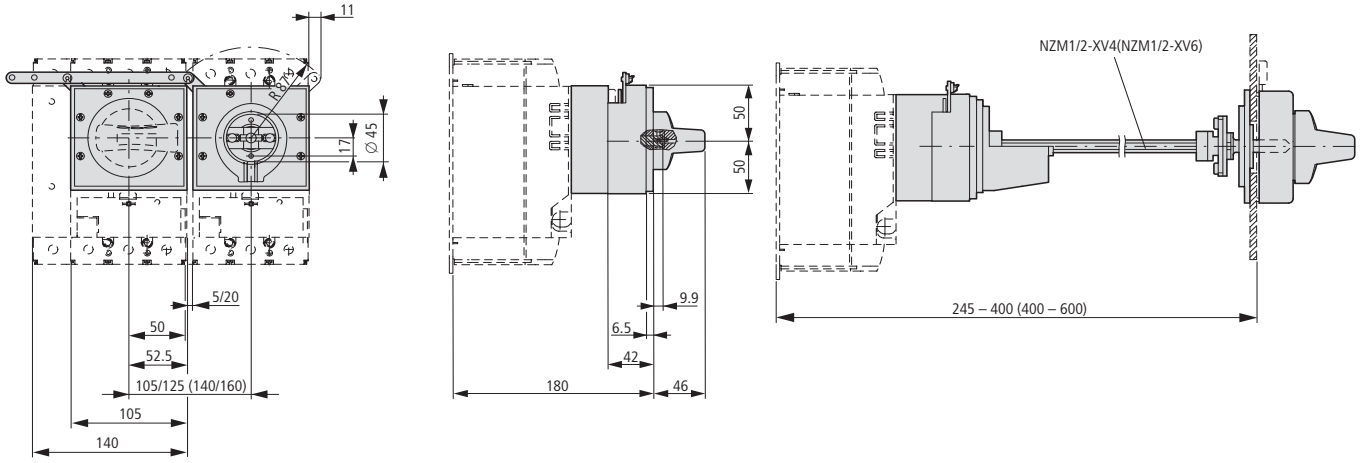
NZM2-XMV + NZM2-XT(V)D(V)(R)-0



① Special tip

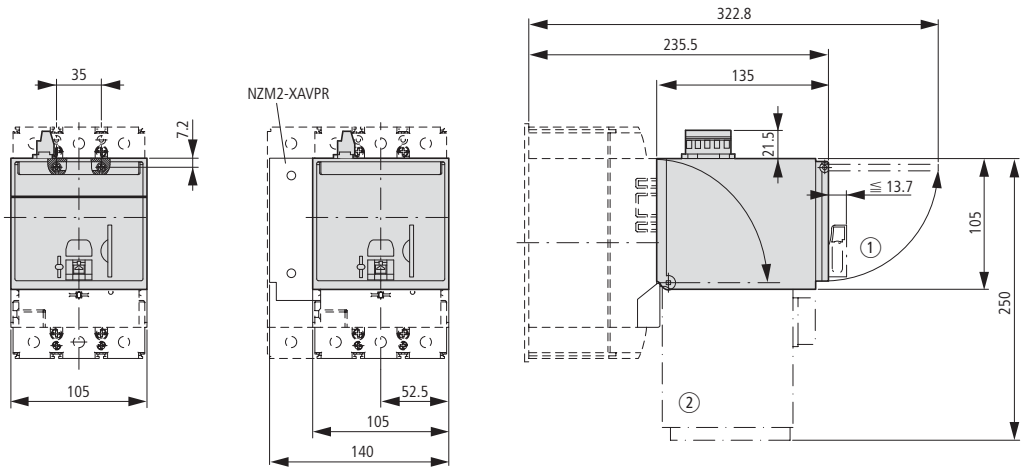
Paralleling mechanism

PN2-XPA

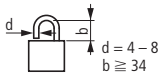


Remote operators

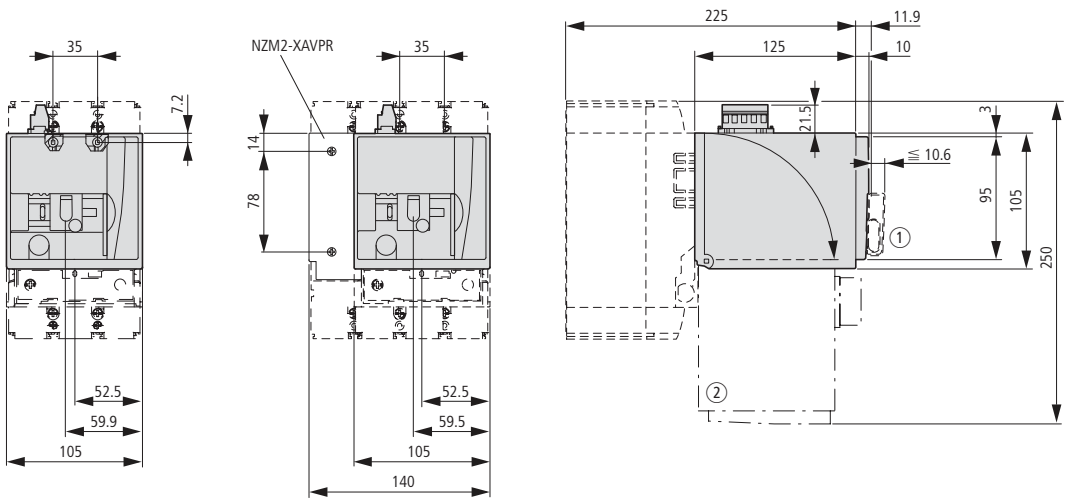
NZM2-XR…



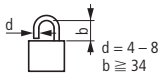
① Up to 3 padlocks
② Remote operator folded



NZM2-XRD…

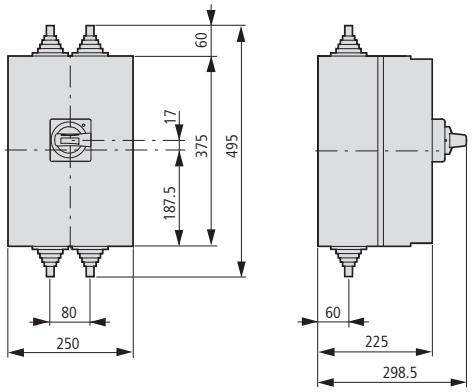


① Up to 3 padlocks
② Remote operator folded

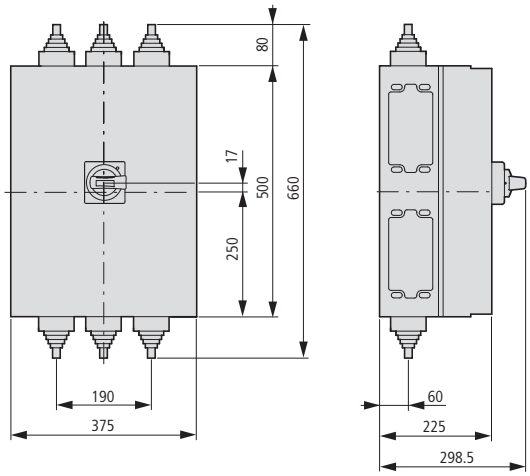


Insulated enclosures

NZM2-XCI43-T...

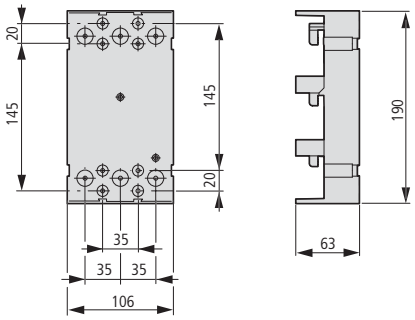


NZM2-XCI45-T...



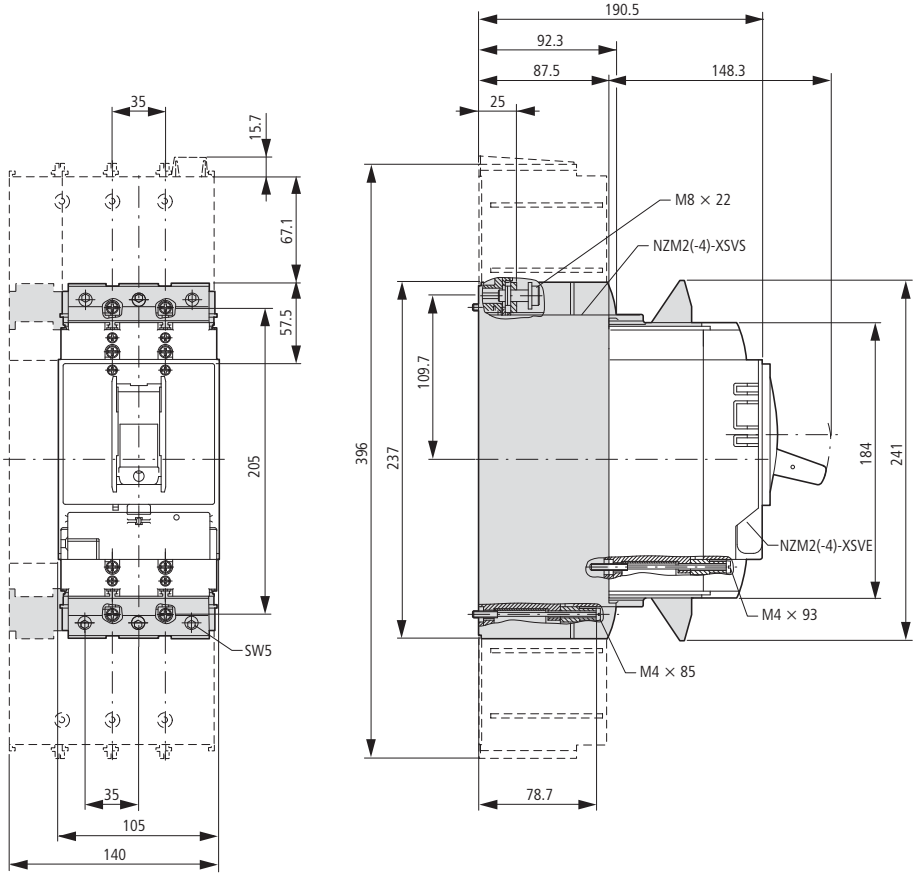
Component adapter

NZM2-XAD250



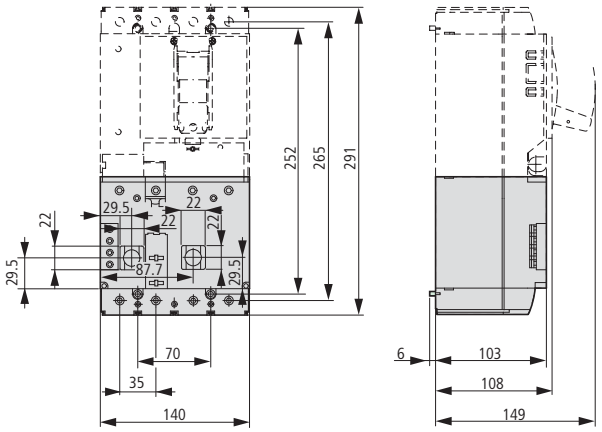
Plug-in units

NZM2-...-SVE
N2-...SVE
NZM2(-4)-XSVS



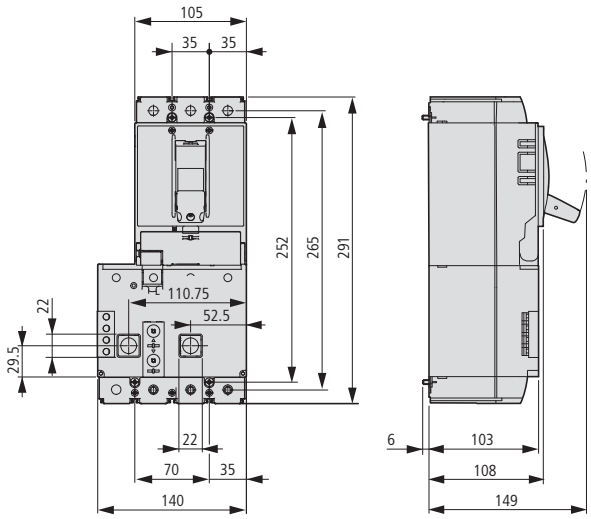
Earth-fault release

NZM2(-4)-XFI...



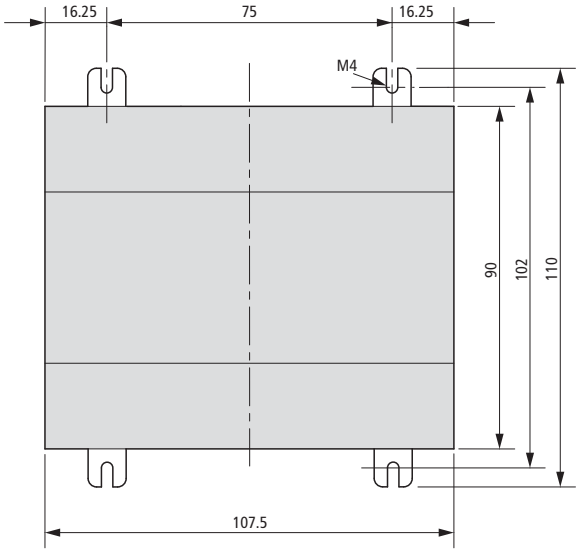
Earth-fault release

NZMH2…-XFIA30

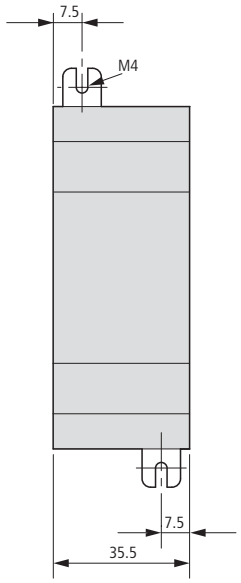


Data management interface (DMI module)

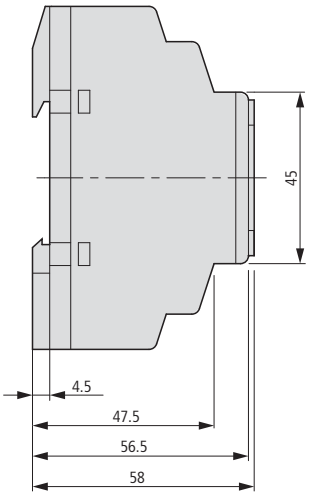
NZM-XDMI612



NZM-XDMI-DPV1
EASY2...



NZM-XDMI...
EASY2...

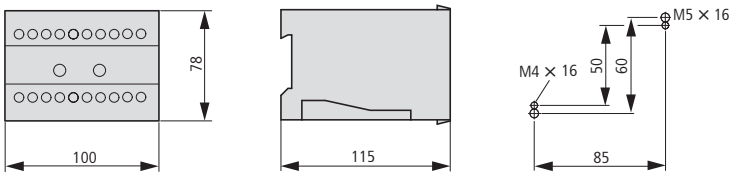


Undervoltage releases, off-delayed

UVU-NZM

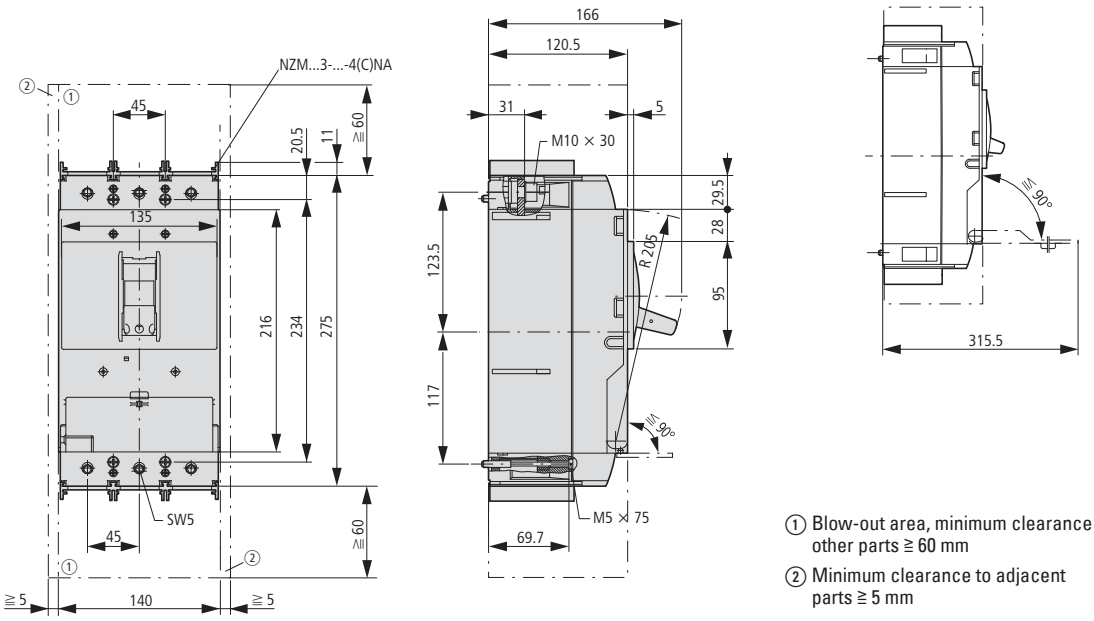
Capacitor unit

NZM-XCM



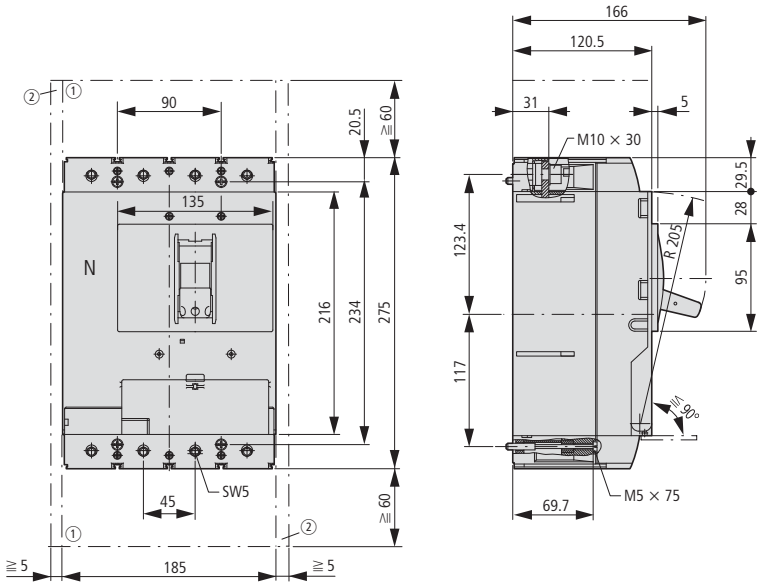
Circuit-breakers
Switch-disconnectors
3 pole
NZMC3

PN3
N3
NS3



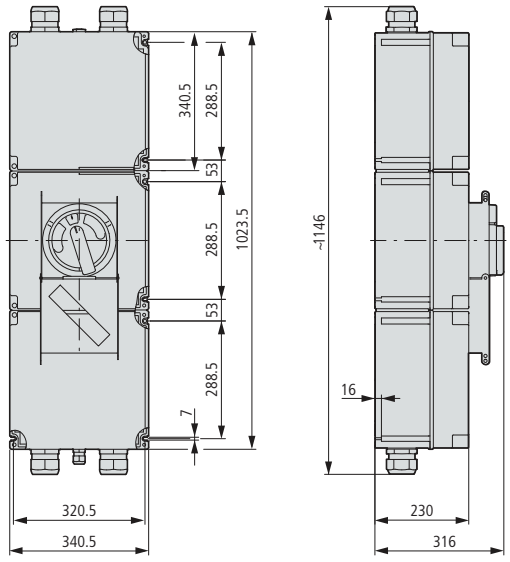
① Blow-out area, minimum clearance to other parts ≧ 60 mm
② Minimum clearance to adjacent parts ≧ 5 mm

Circuit-breakers
Switch-disconnectors
4 pole
NZMC3-4
NZMN3-4
NZMH3-4
PN3-4
N3-4



① Blow-out area, minimum clearance to other parts ≧ 60 mm
② Minimum clearance to adjacent parts ≧ 5 mm

Switch-disconnectors
ATEX22-type
3 pole
PN3.../ATEX22

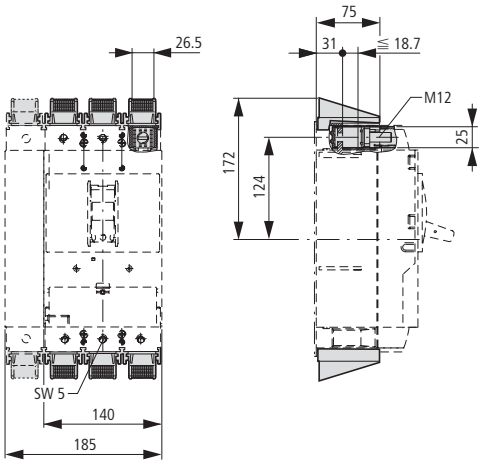


Box terminal

(+)NZM3(-4)-XKC(O)(U)

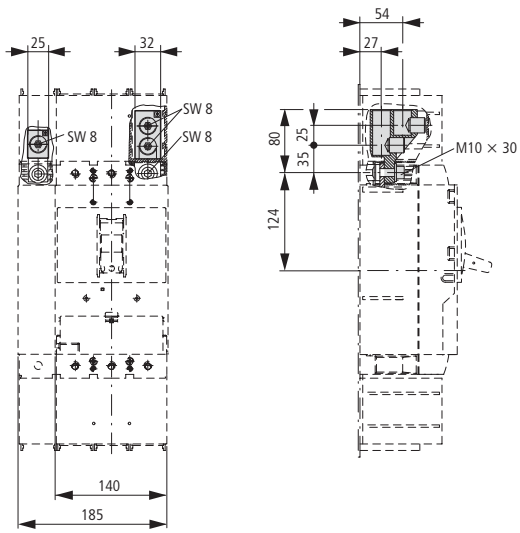
IP2X protection against contact with finger

NZM3(-4)-XIPK



Tunnel terminal

NZM3(-4)-XKA1(2)



Cover

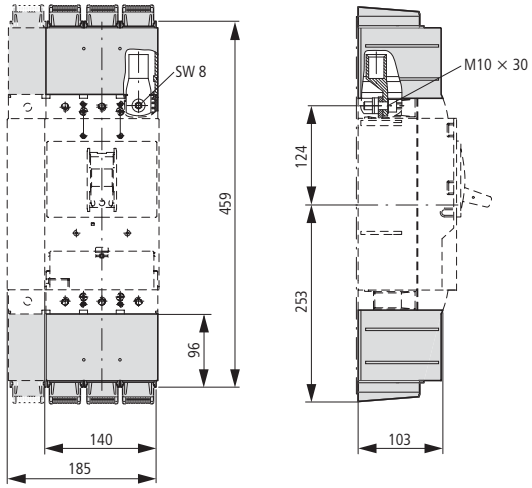
NZM3(-4)-XKSA

Cable lug

NZM3-XKS185

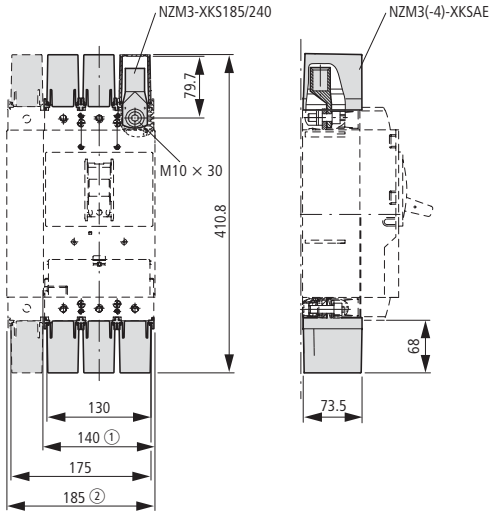
IP2X protection against contact with a finger

NZM3(-4)-XIPA



Cable lug cover

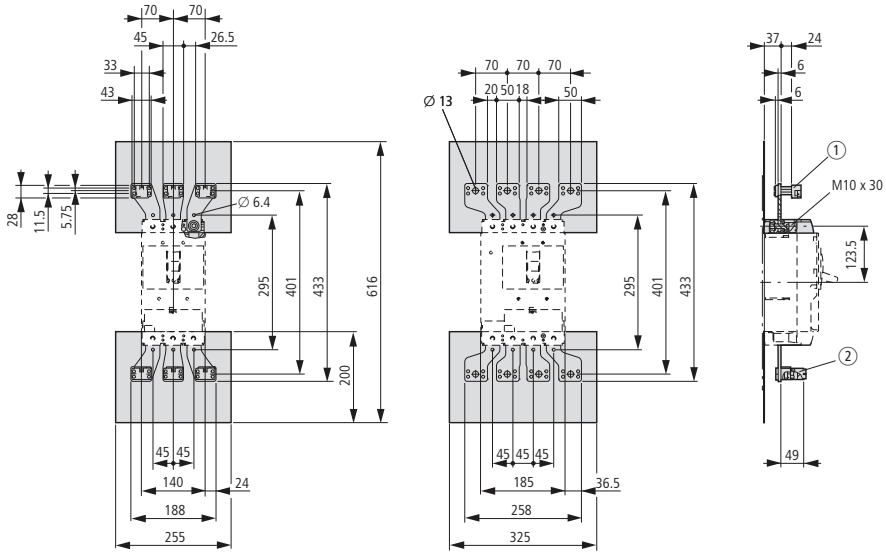
NZM3-(4)-XKSAE



① 3 pole
② 4 pole

Connection width extension
NZM3(-4)-XKV70

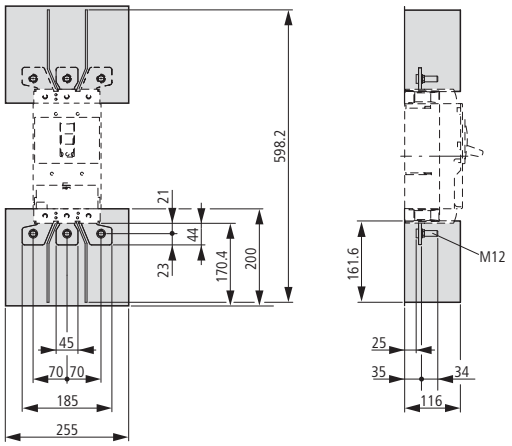
Terminals
NZM3(-4)-XK22X21
NZM3(-4)-XK300



Length with phase isolators approx. 599 mm

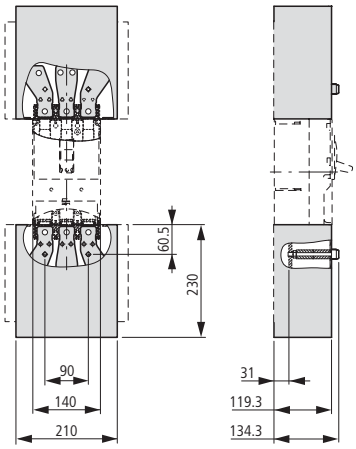
① NZM3(-4)-XK22X21
② NZM3(-4)-XK300

Connection width extension
NZM3-XKV70KB

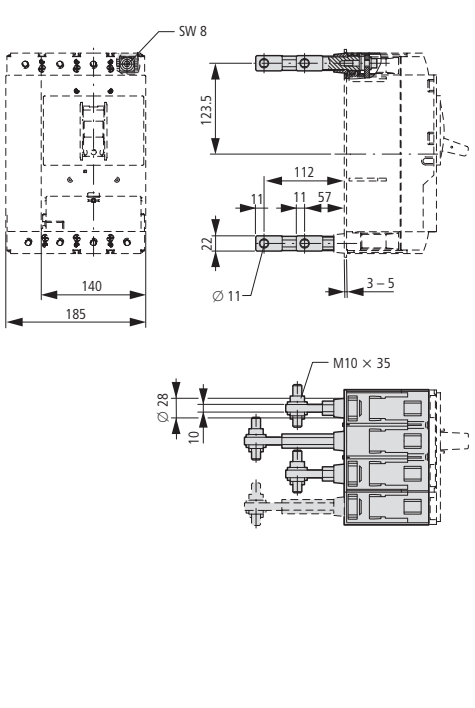


Connection width extension
NZM3-XKV70-2

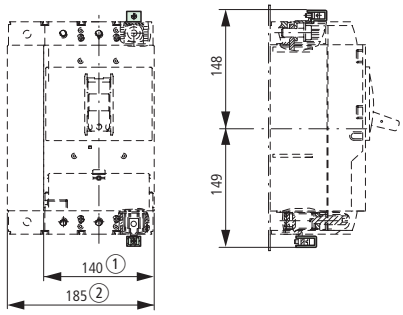
Cover, large
NZM3-XKSAV



Rear terminal bolts
(+)NZM3(-4)-XKR(O)(U)



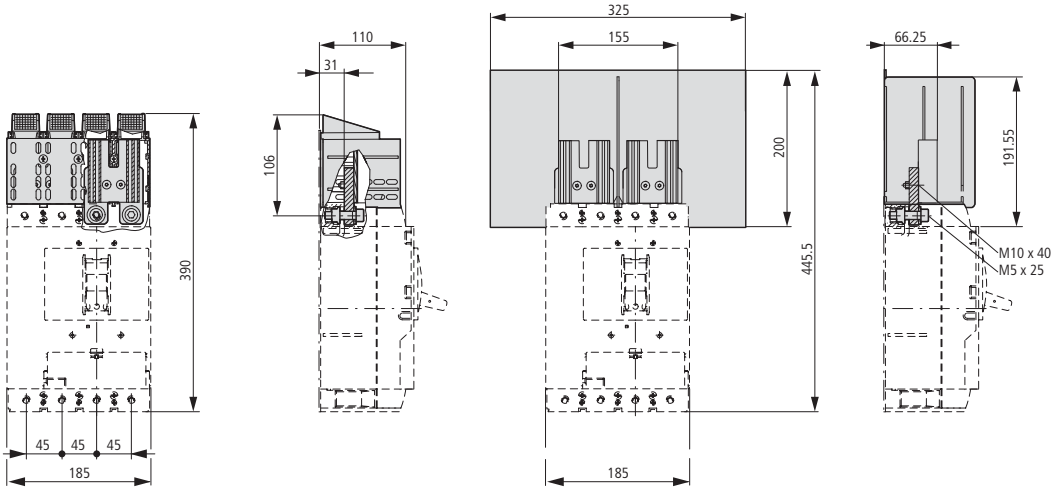
Control cable terminals
NZM3/4-XSTS
NZM-XSTK



① 3 pole
② 4 pole

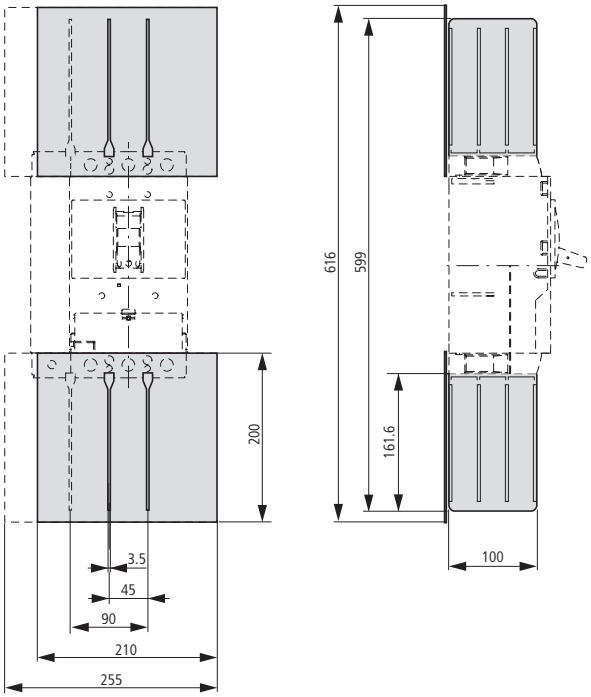
Jumper kit

NZM3(-4)-XKV2P...



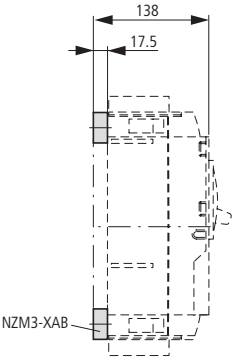
Phase isolators

NZM3-4-XKP



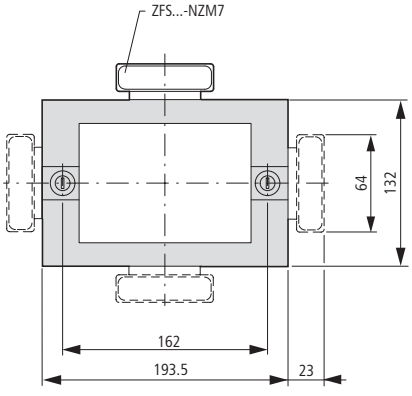
Spacers

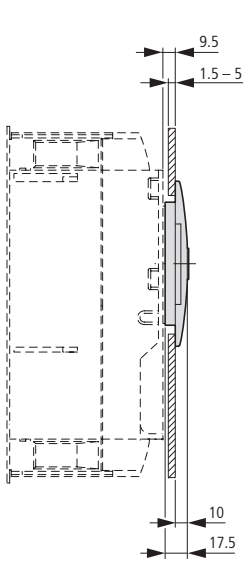
NZM3-XAB



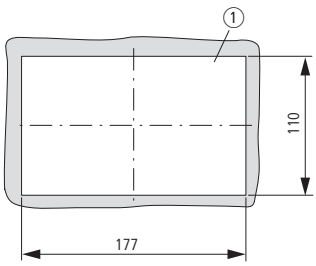
Insulating surround

NZM3-XBR



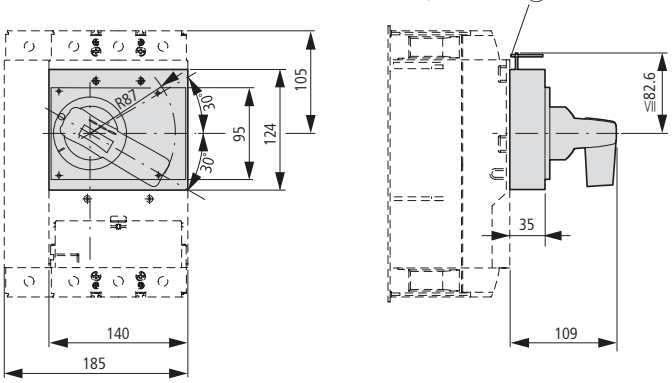


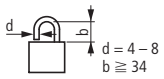
① Mounting aperture



Rotary drive

Rotary handle on circuit-breaker

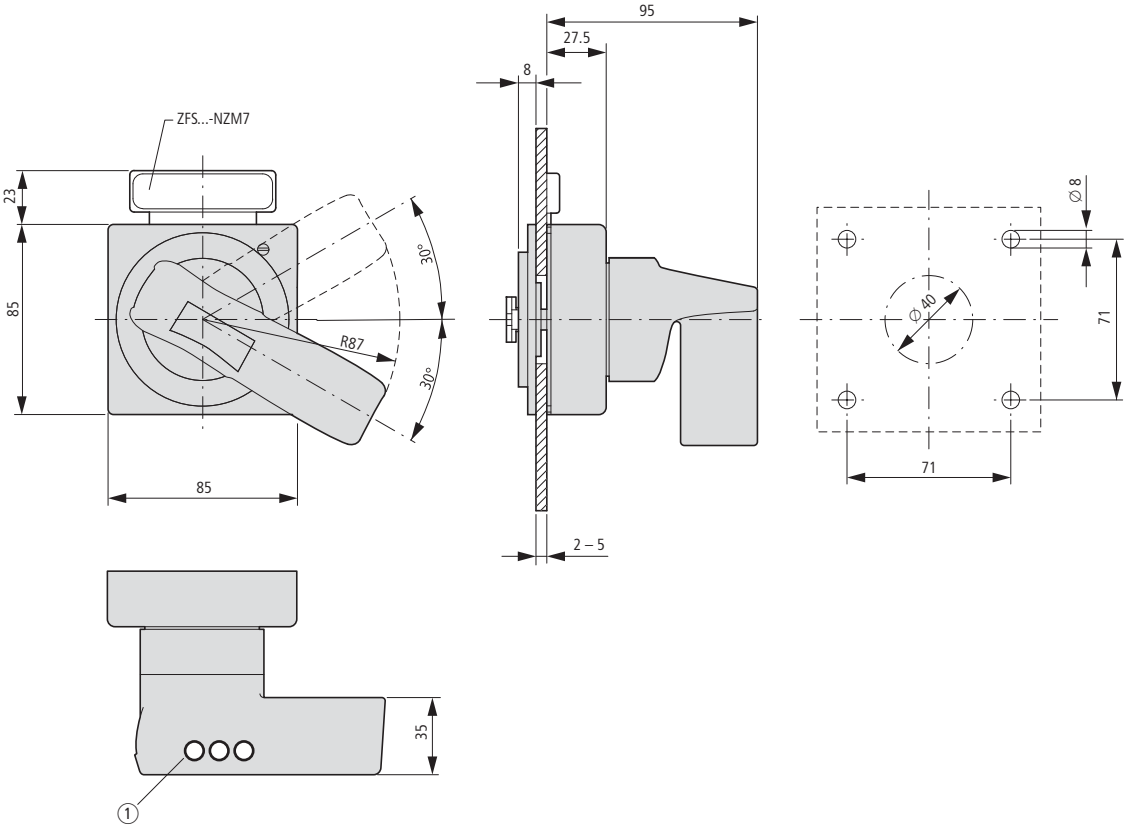


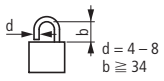


① Up to 3 padlocks

Door coupling rotary handles

NZM3-XTVD(V)(R)...

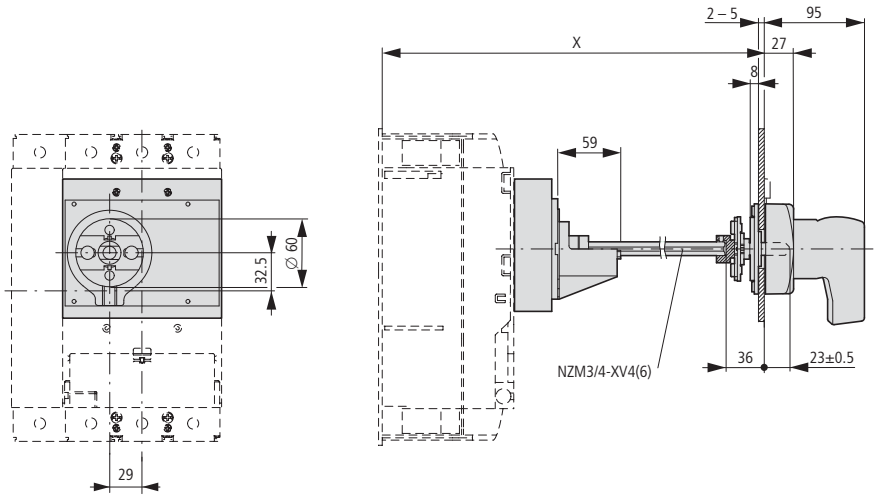




① Up to 3 padlocks

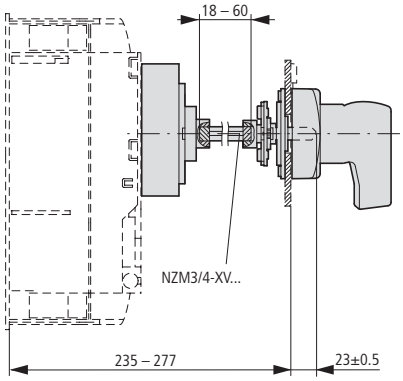
Door coupling rotary handle with extension shaft

NZM3-XTVDV(R)(-NA)
NZM3/4-XV4(6)

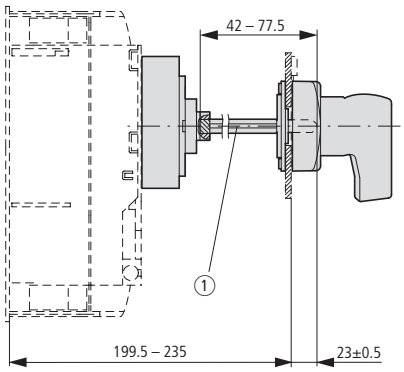


Part no.	x
NZM3/4-XV4	270 – 400
NZM3/4-XV6	400 – 600

NZM3-XTVDV(R)-60(-NA)

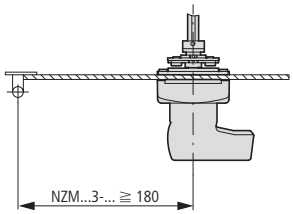


NZM3-XTVDV(R)-0(-NA)



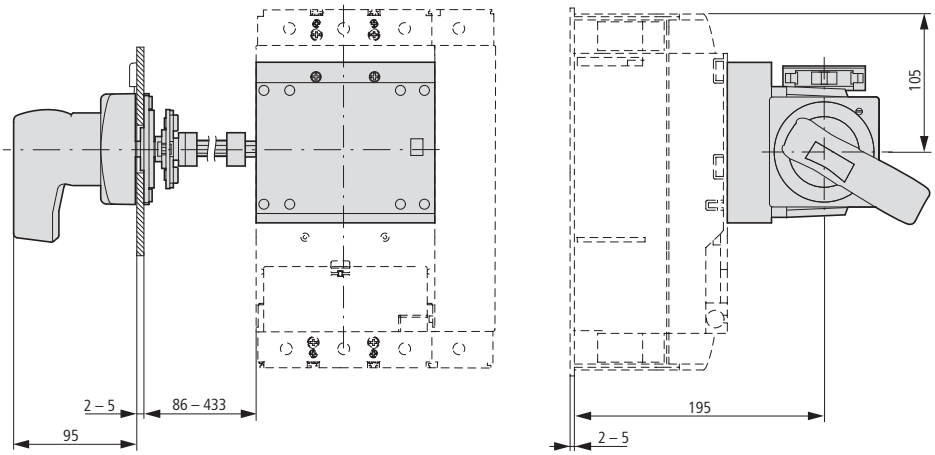
① Special tip

Minimum distance of door coupling rotary handle from door pivot point

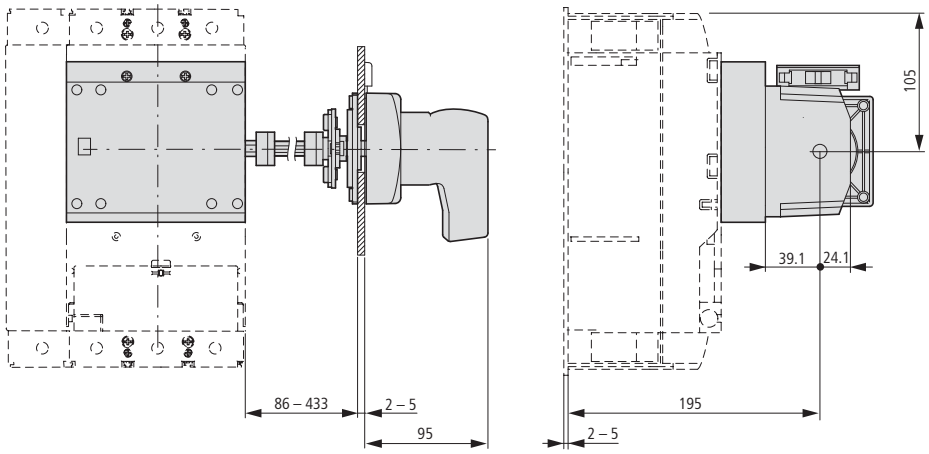


Main switch assembly kit for side wall installation

NZM3-XS(R)-L

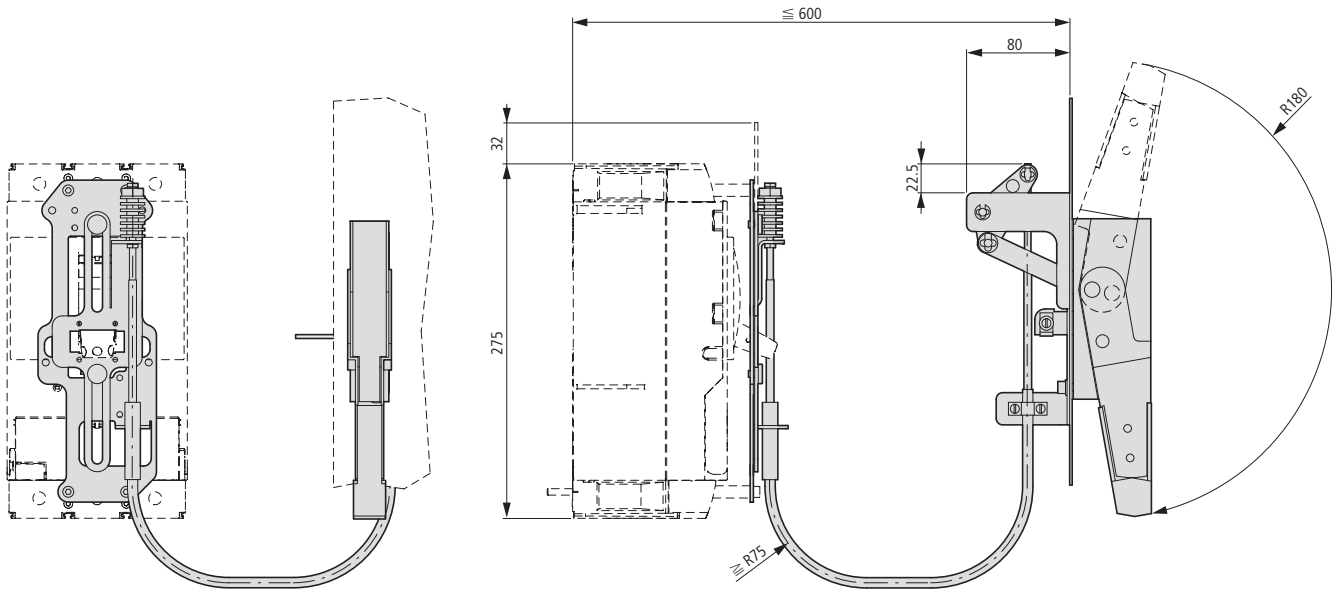


NZM3-XS(R)-R



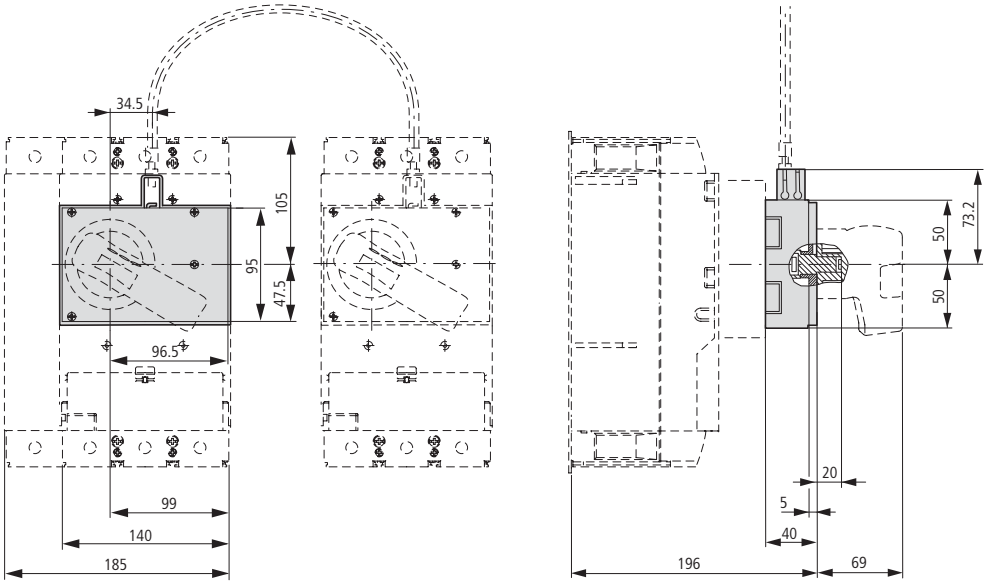
Side-mounted handle

NZM3... XSH...

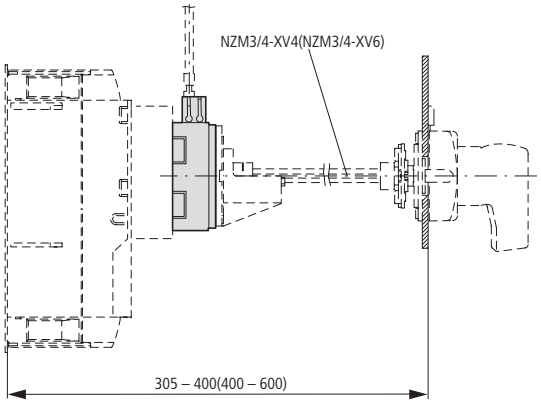


Mechanical interlock

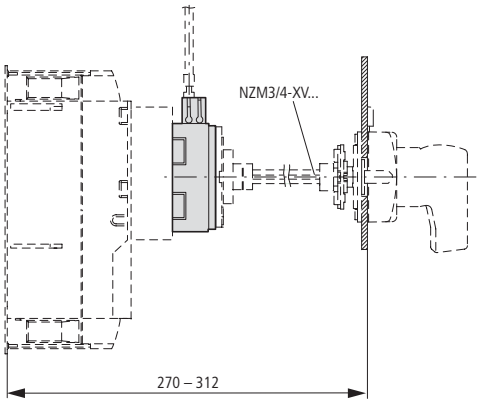
NZM3-XMV + NZM3-XDV(R)



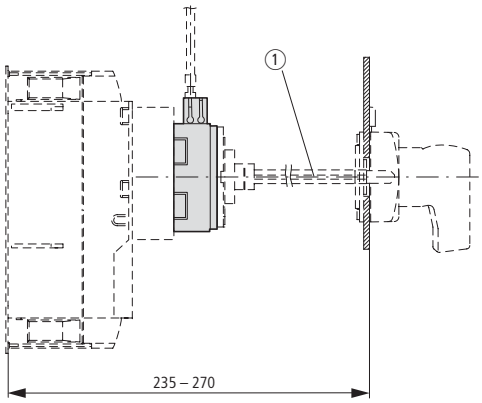
NZM3-XMV + NZM3-XTVD(V)(R)



NZM3-XMV + NZM3-XTVD(V)(R)-60



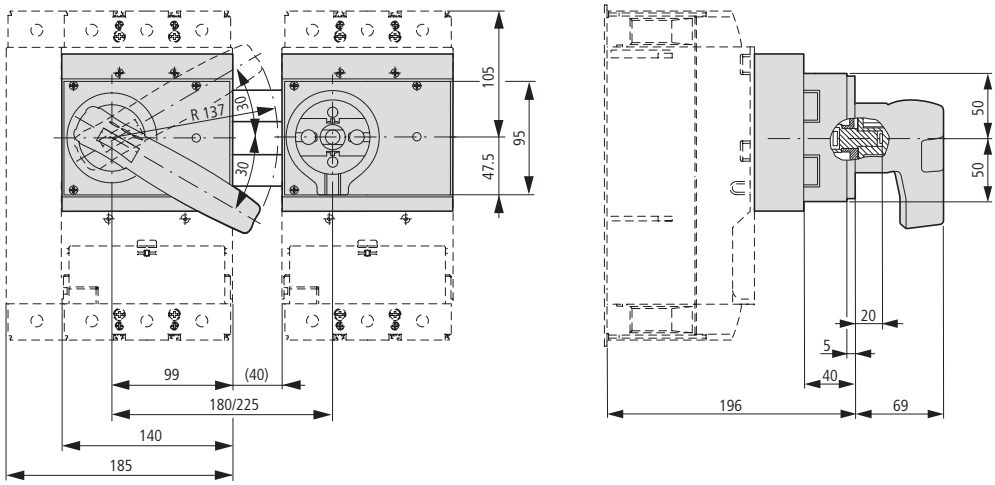
NZM3-XMV + NZM3-XTVD(V)(R)-0



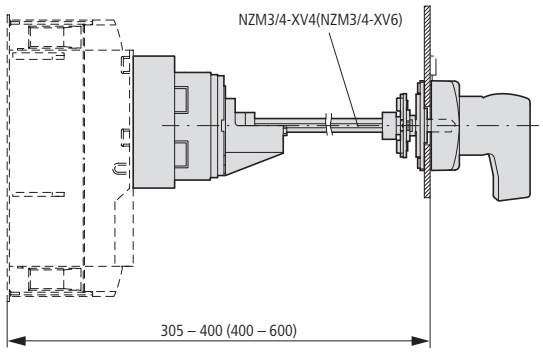
① Special tip

Paralleling mechanism

PN3-XPA

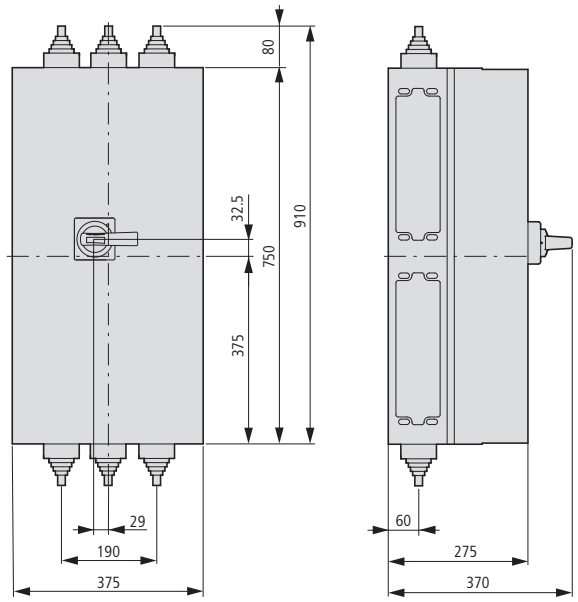


PN3-XPA



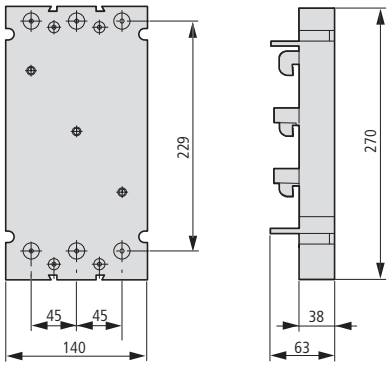
Insulated enclosures

NZM3-XCI48-TD



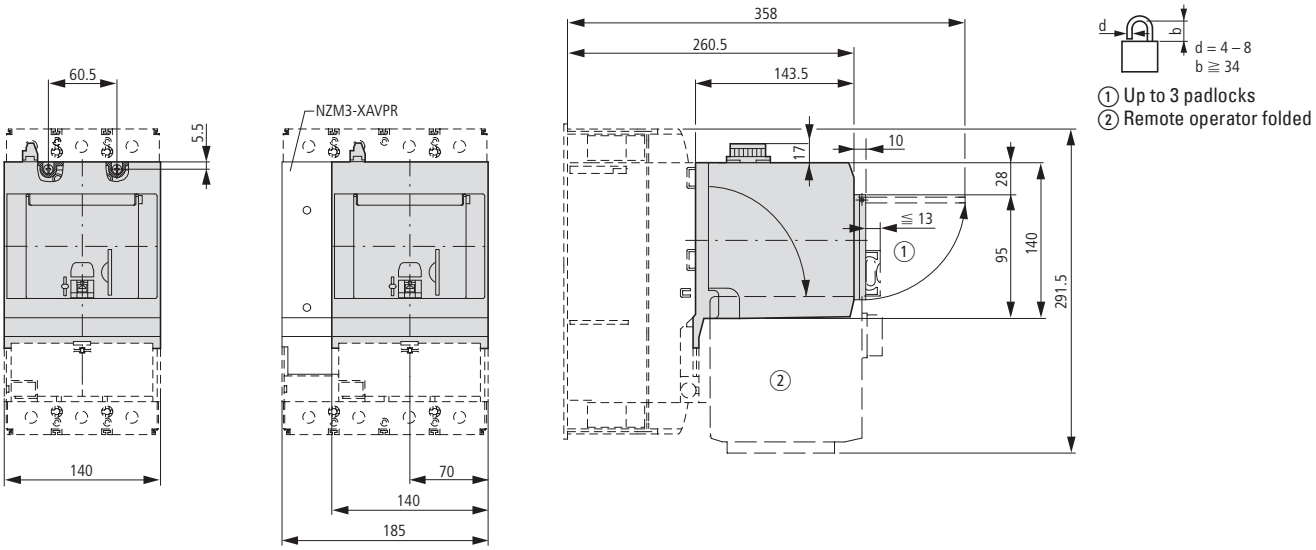
Component adapter

NZM3-XAD550



Remote operators

NZM3-XR…

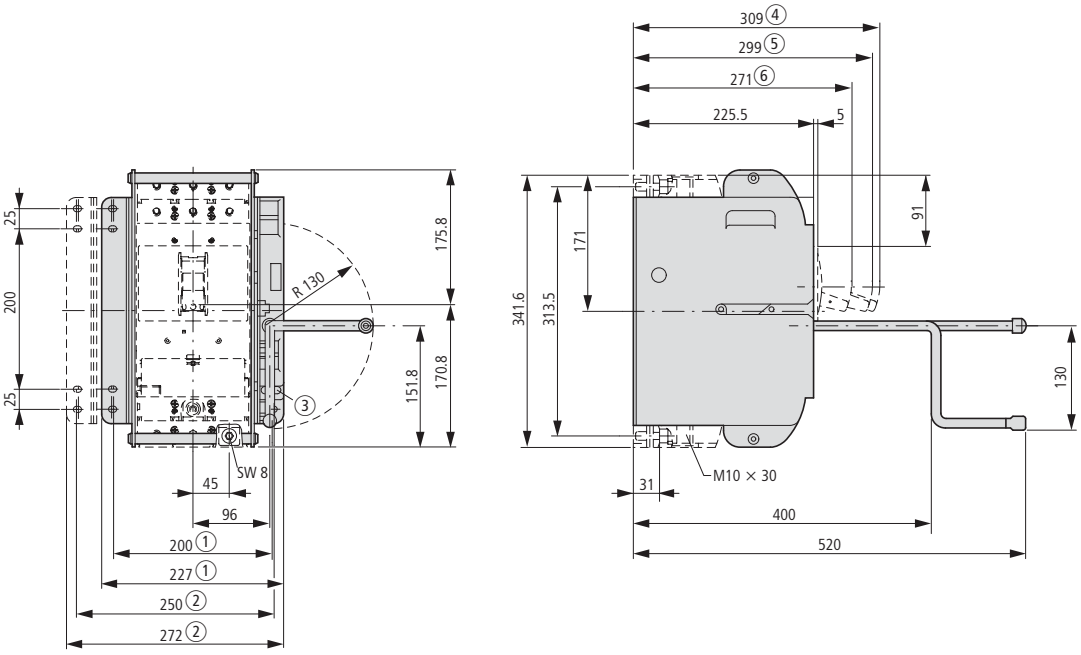


Withdrawable unit with auxiliary plug-in adapter

NZM3-...-SVE

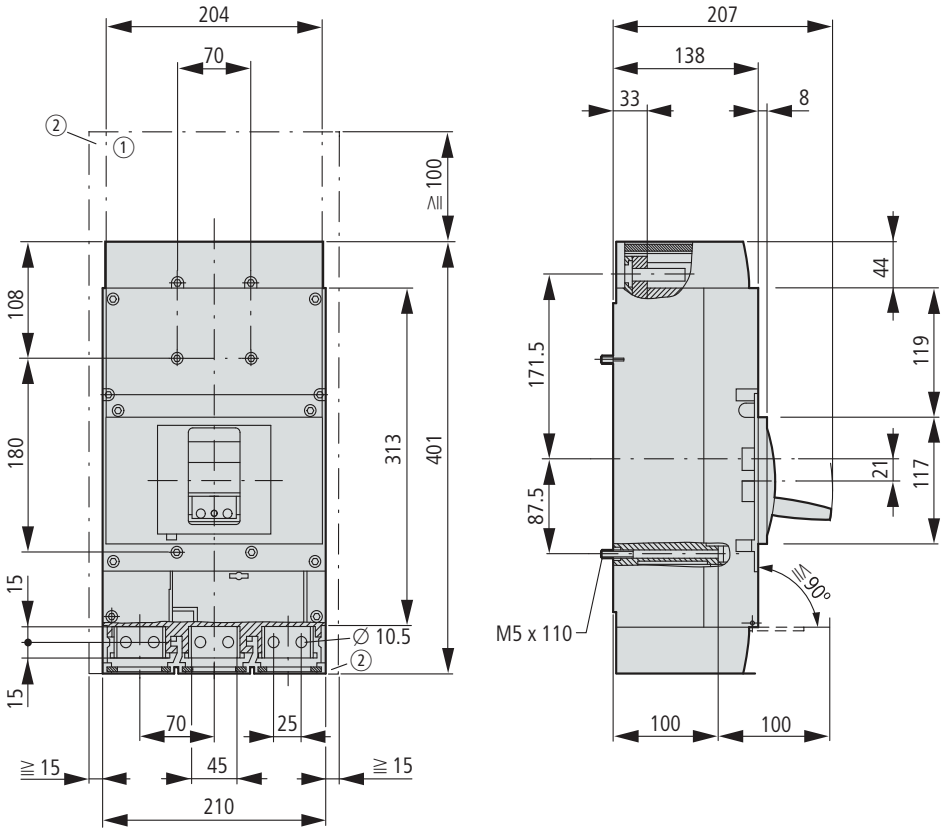
N3...-SVE

NZM3-XSVS



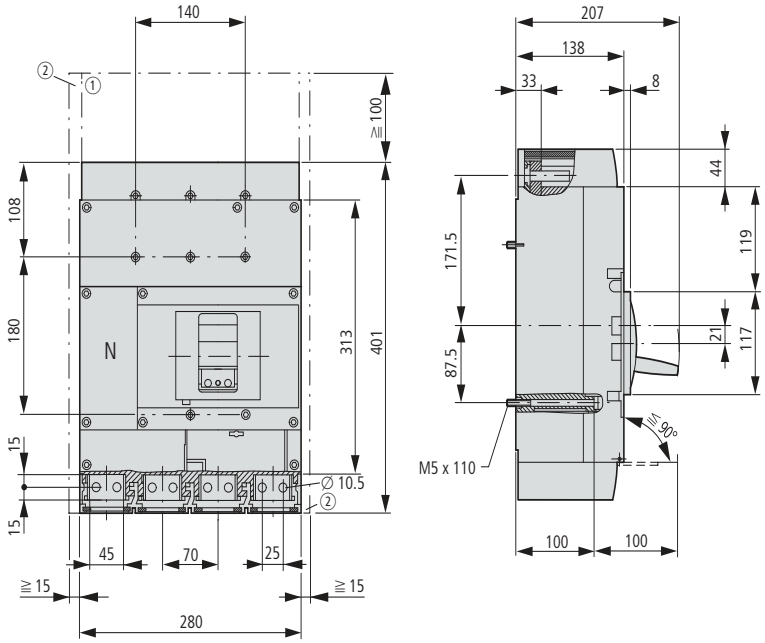
Circuit-breakers
Switch-disconnectors

3 pole
NZMN4
NZMH4
N4
NS4



① Blow-out area, minimum clearance to other parts ≧ 100 mm up to 690 V; ≧ 200 mm up to 1000 V
② Minimum clearance to adjacent parts ≧ 15 mm

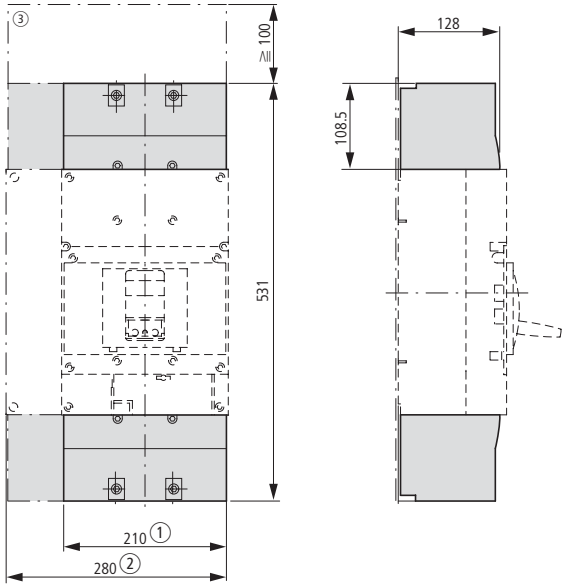
4 pole
NZMN4-4
NZMH4-4
N4-4



① Blow-out area, minimum clearance to other parts ≧ 100 mm
② Minimum clearance to adjacent parts ≧ 15 mm

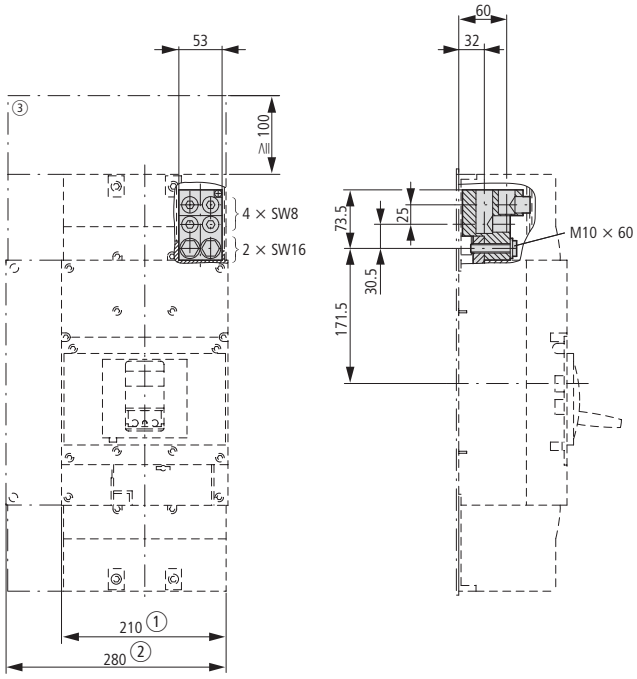
Covers

NZM4(-4)-XKSA



Tunnel terminal

NZM4-4-XKA



① 3 pole
② 4 pole
③ Clearance from conductive parts ≧ 100 mm up to 690 V; ≧ 200 mm up to 1000 V

Screw terminals

Module plate

1-hole

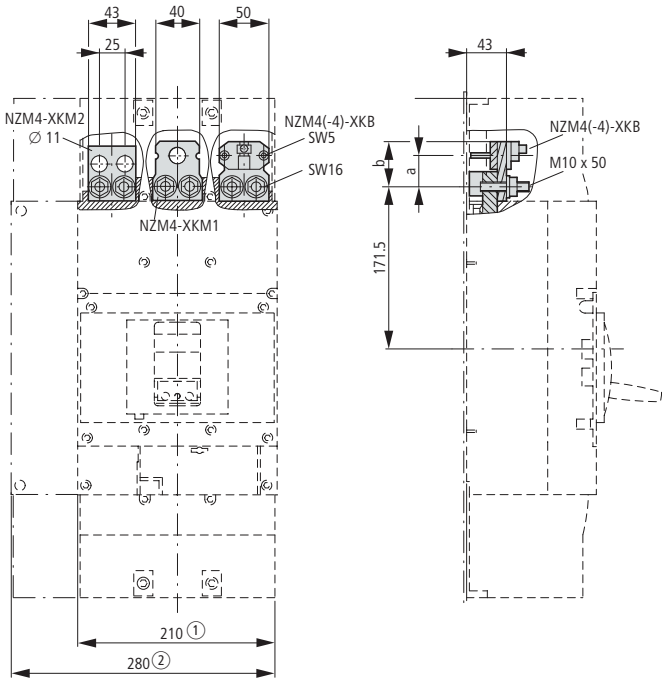
NZM4(-4)-XKM1

2-hole

NZM4(-4)-XKM2

Flat cable terminal

NZM4(-4)-XKB

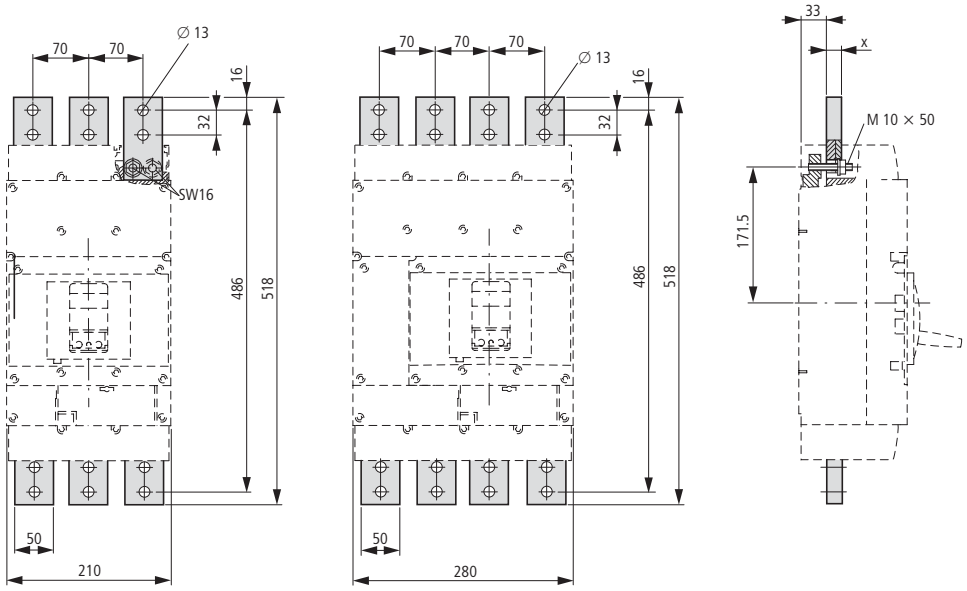


Part no.	a	b
NZM4(-4)-XKM1	36	47
NZM4(-4)-XKM2	32	40
NZM4(-4)-XKB	–	47

① 3 pole
② 4 pole
③ Clearance from conductive parts
≧ 100 mm up to 690 V;
≧ 200 mm up to 1000 V

Module plate
2 hole, vertical

NZM4(-4)-XKM2S...



Part no.	x
NZM4(-4)-XKM2S-1250	12
NZM4(-4)-XKM2S-1600	20

Connection width extension

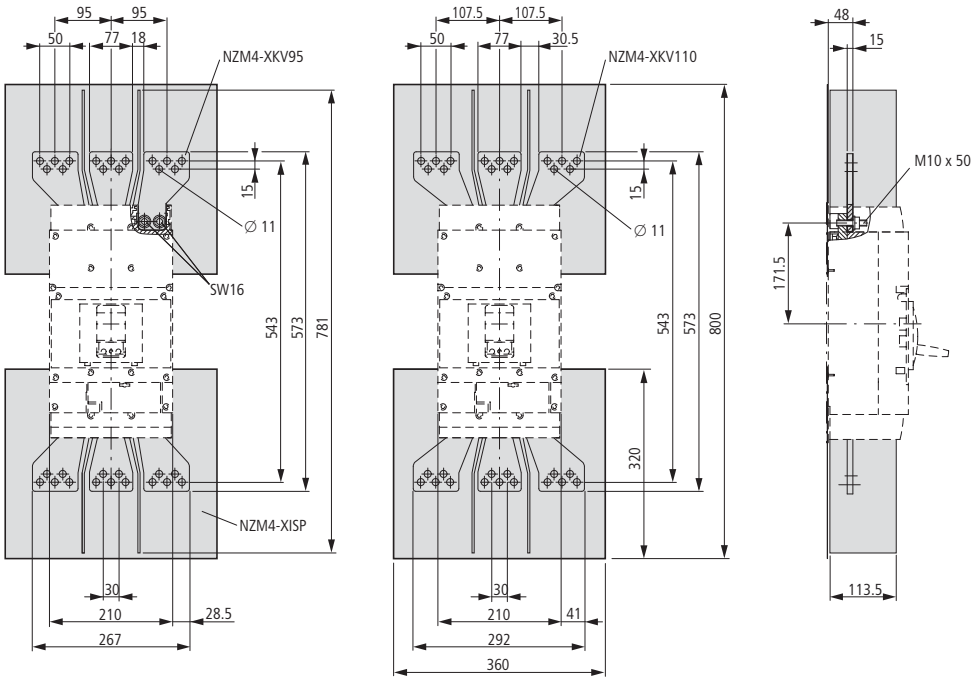
NZM4-XKV95
NZM4-XKV110

Insulation plate

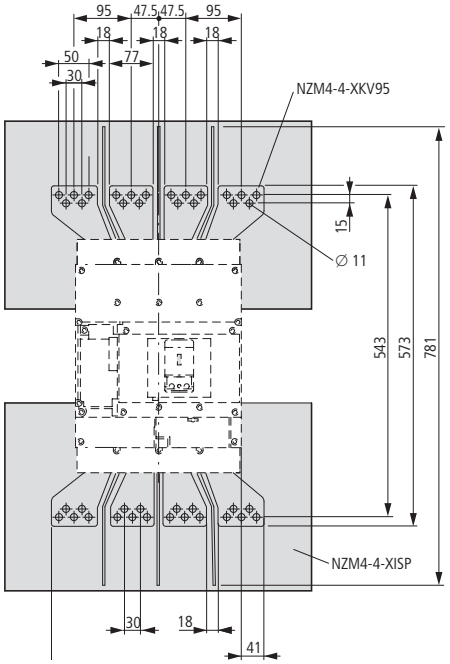
NZM4-XISP

Phase isolators

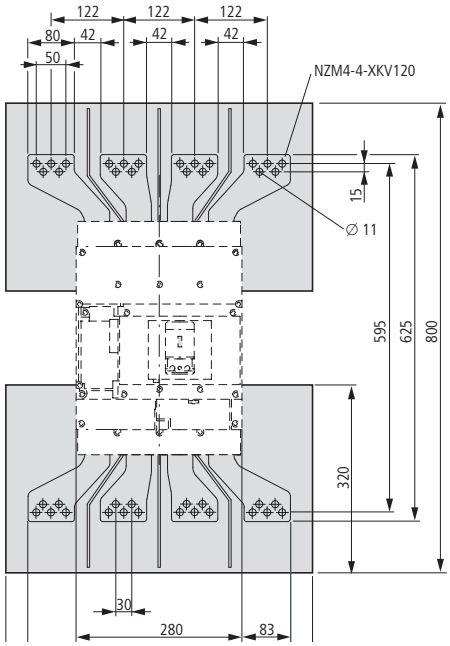
NZM4-XKP



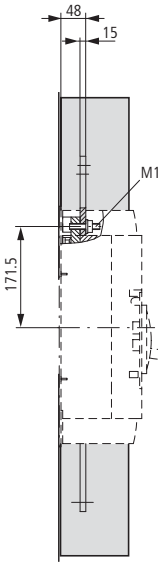
NZM4-4-XKV95



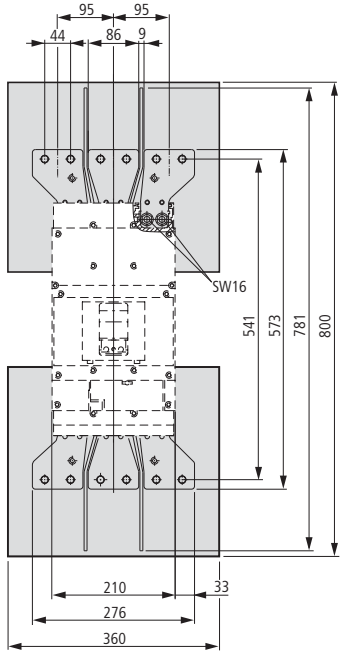
NZM4-4-XKV120

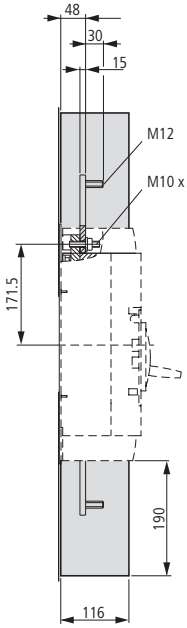


NZM4-4-XISP
NZM4-4-XKP

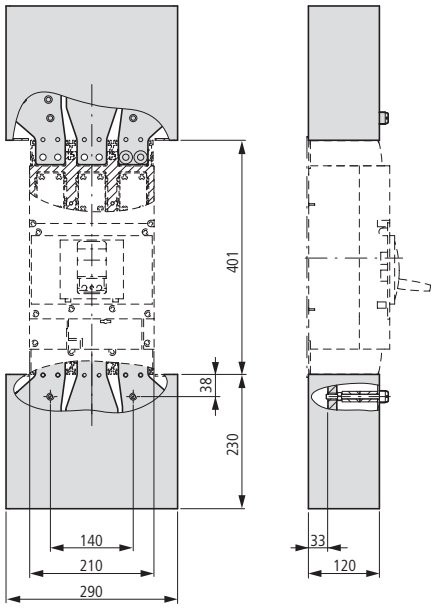


Connection width extension
NZM4-XKV95-2KB



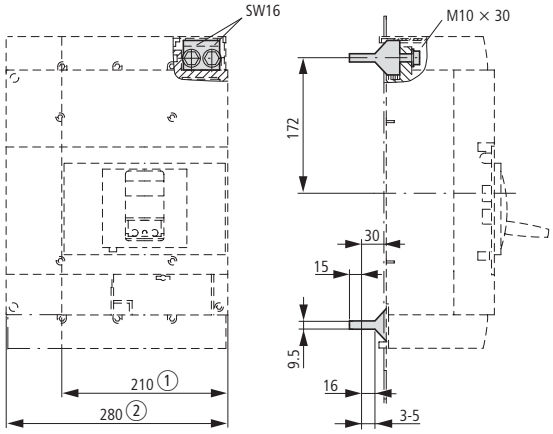


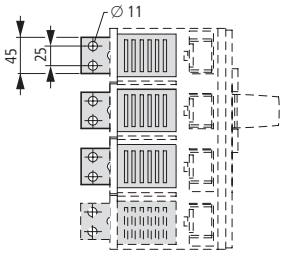
Cover, large
NZM4-XKSAV



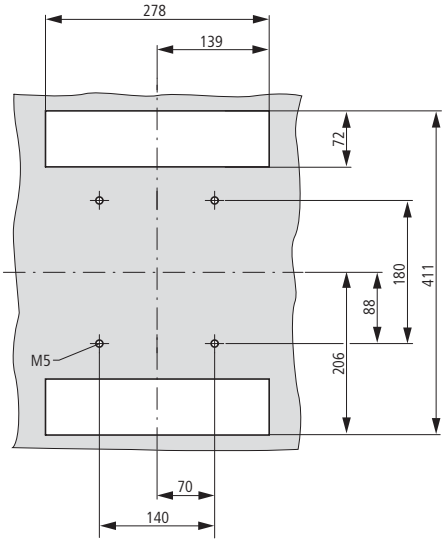
Rear terminal bolts

NZM4(-4)-XKR

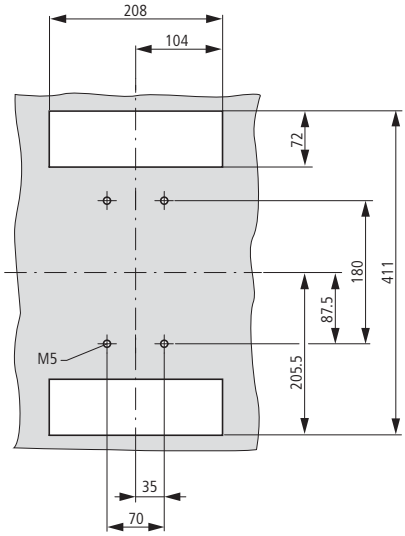




Fitting on mounting plate

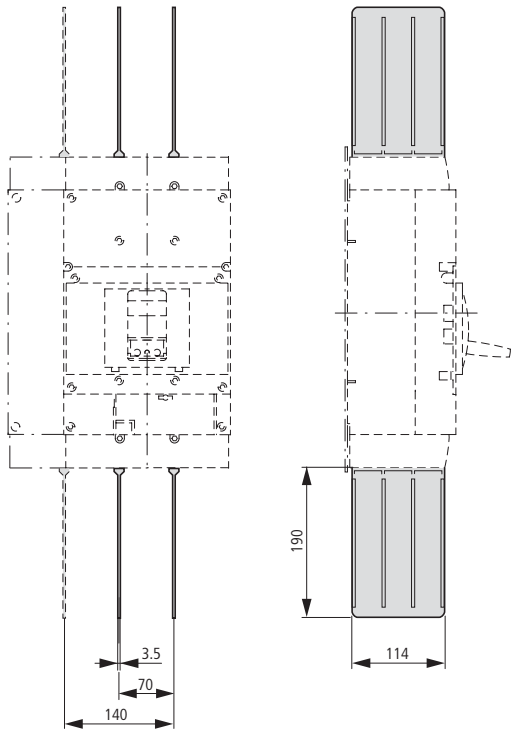


Rear connection possible also rotated by 90°.
① 3 pole
② 4 pole



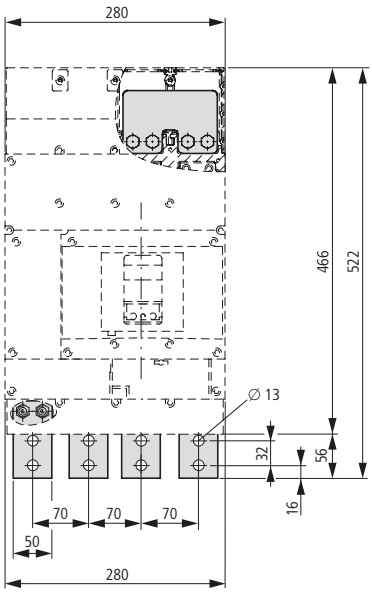
Phase isolators

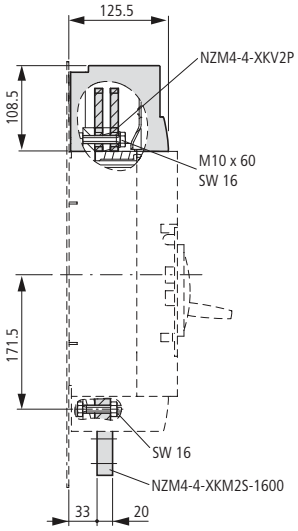
NZM4(-4)-XKP



Jumper kit

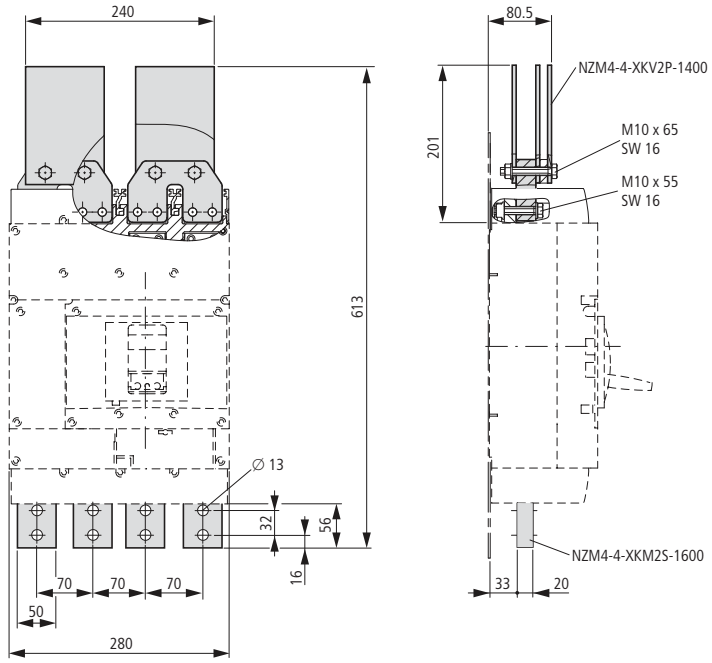
NZM4-4-XKV2P





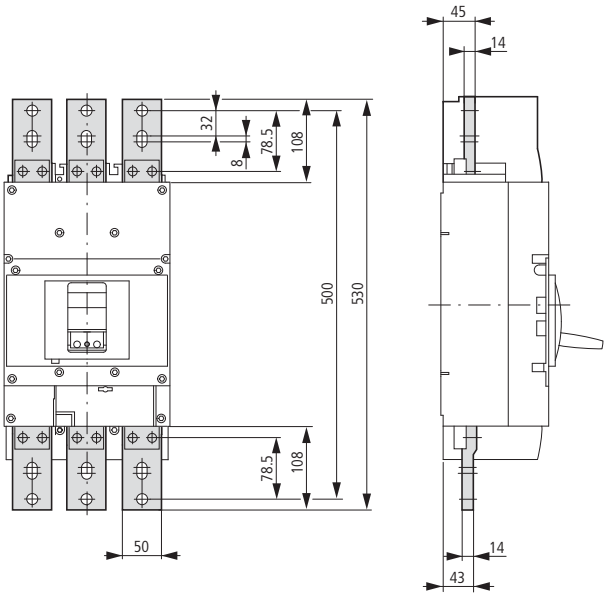
Jumper kit

NZM4-4-XKV2P-1400

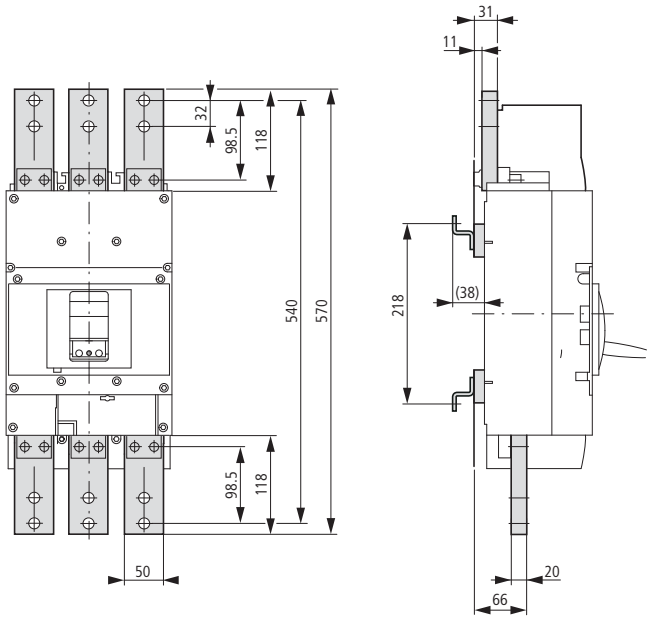


Adapter kit

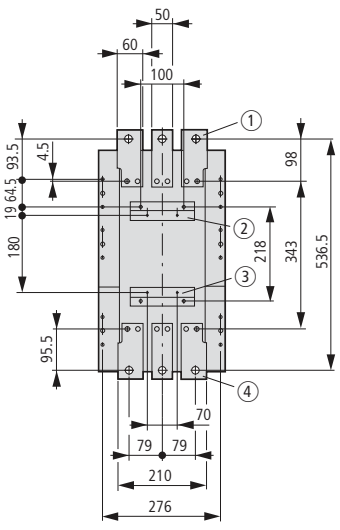
NZM4-XAS14-1250



NZM4-XAS14-1600



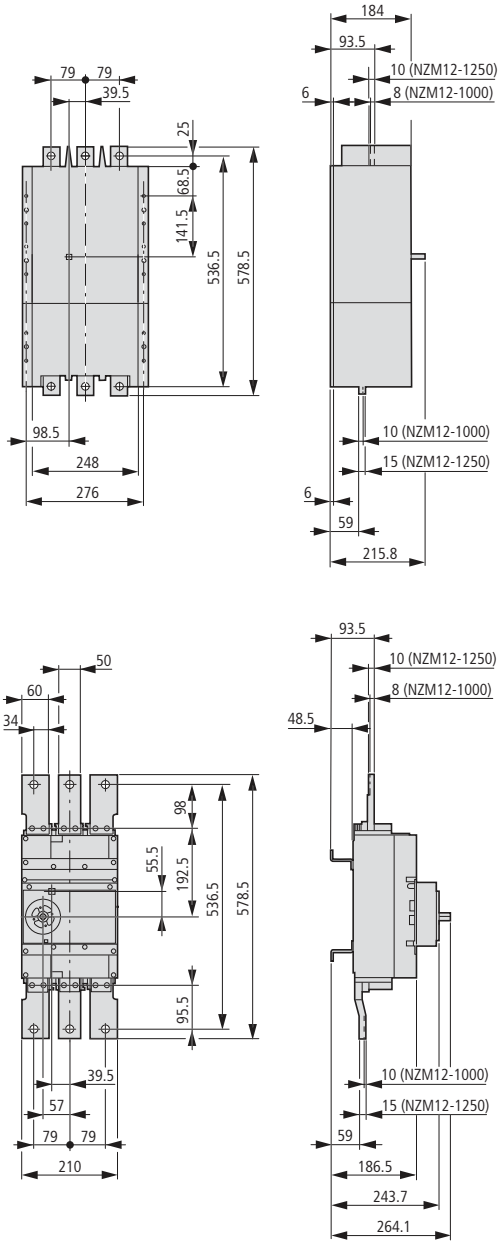
Drilling template NZM12-1000 (1250) conversion to NZM4



① Module plate NZM4-XAS12-1000(1250)
② Holes for mounting bracket NZM4-XAS12(M5)
③ Mounting bracket NZM4-XAS12
④ Mounting rail NZM12

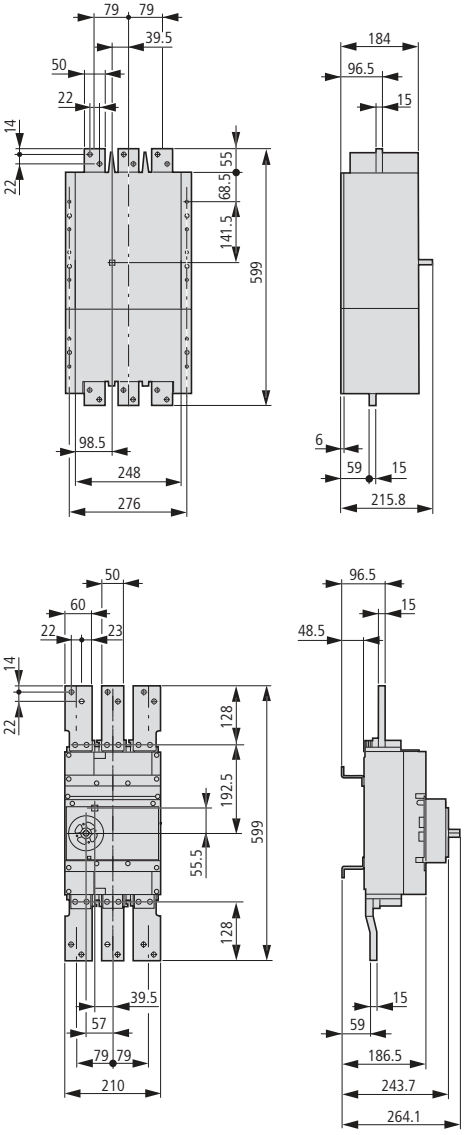
Replacement of NZM12-1000(1250) with NZM4 with module plate, fixed mounting on mounting plate

NZM4-XAS12-1000(1250)



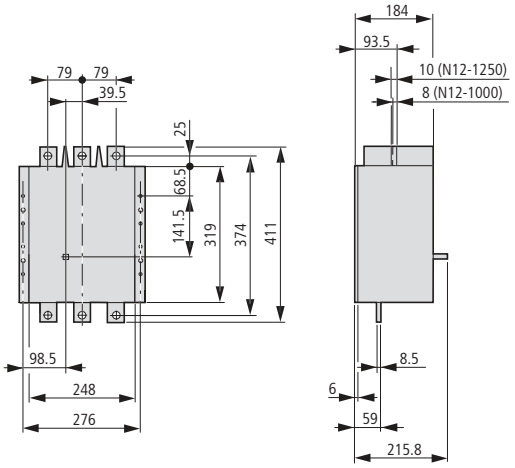
Replacement of NZM12-1600 with NZM4 with module plate, fixed mounting on mounting plate

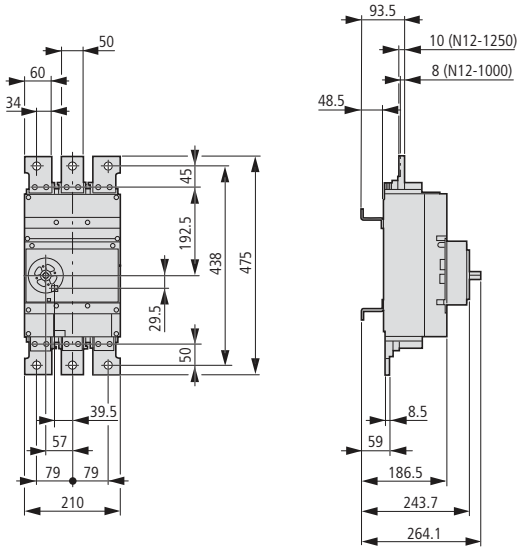
NZM4-XAS12-1600



Replacement of N12-1000(1250) with N4 with module plate, fixed mounting on mounting plate

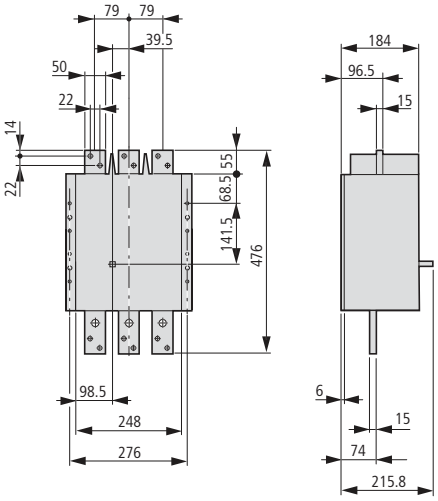
N4-XAS12-1000(1250)

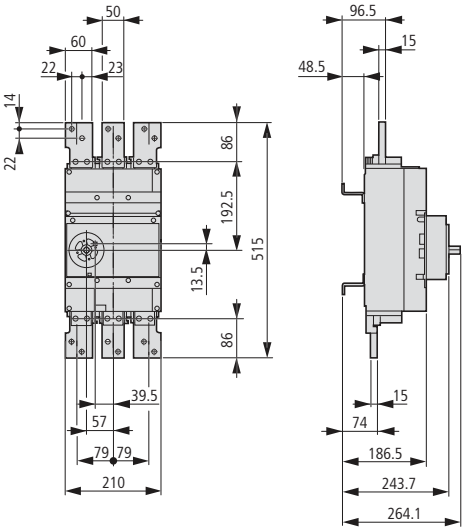




Replacement of N12-1600 with N4 with module plate, fixed mounting on mounting plate

N4-XAS12-1600



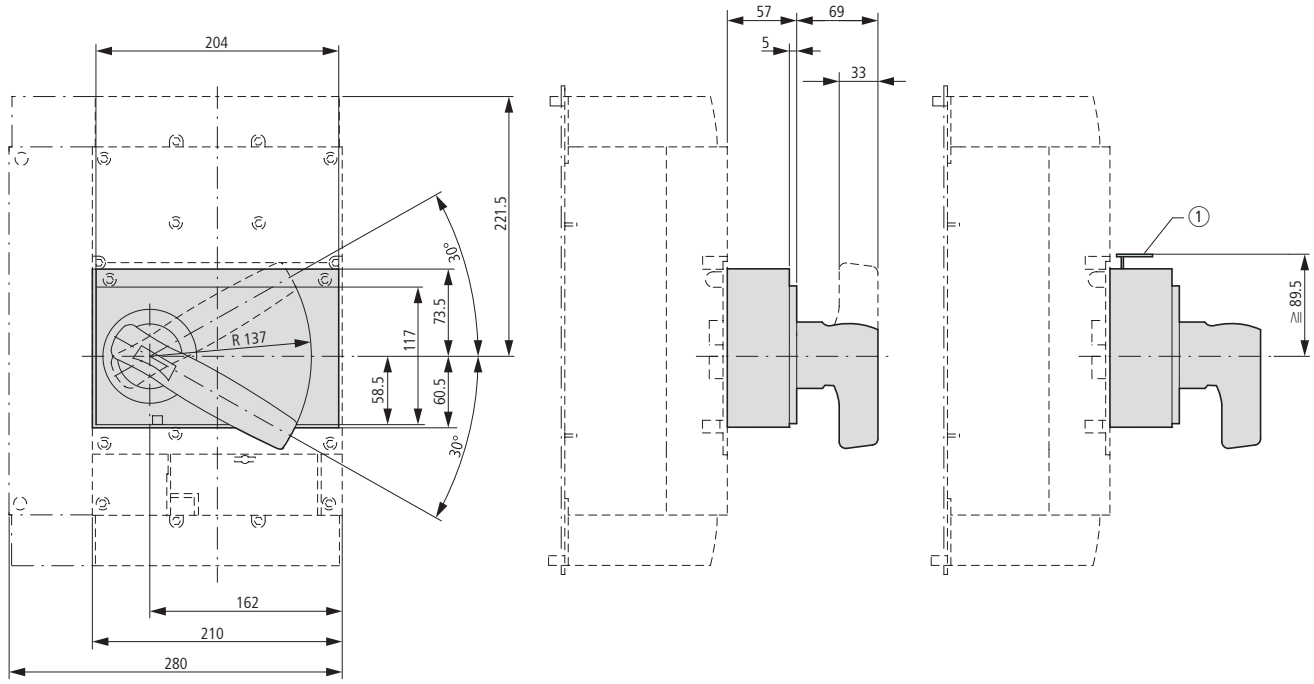


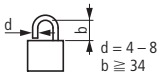
Construction size 4: accessories

NZM4-XDV..., NZM4-XTVD...

Rotary handle on circuit-breaker

NZM4-XDV(R)

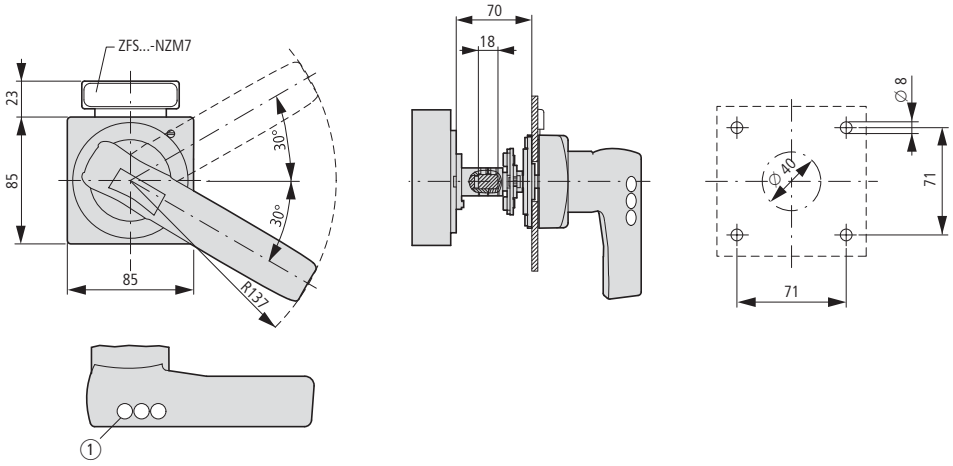


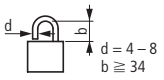


① Up to 3 padlocks

Door coupling rotary handles

NZM4-XTVD(V)(R)...

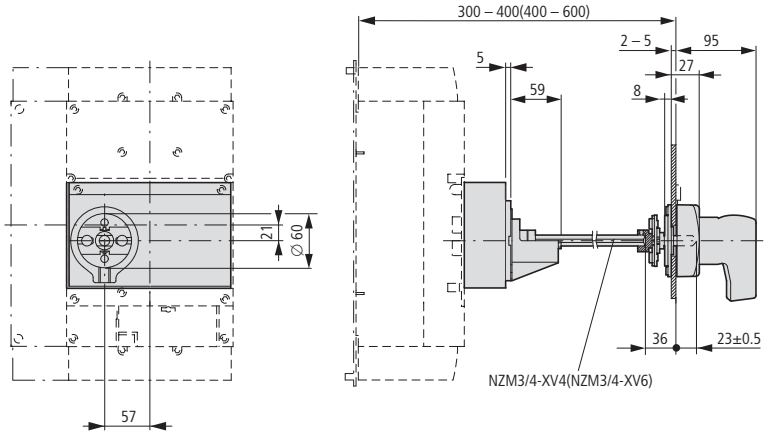




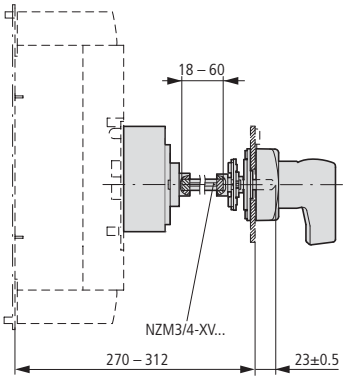
① Up to 3 padlocks

Door coupling rotary handle with extension shaft

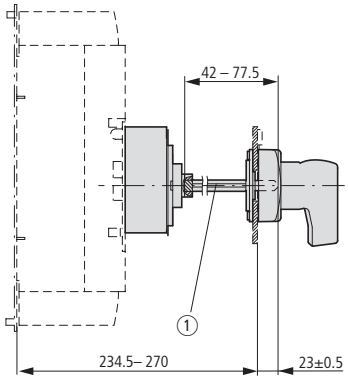
NZM4-XTVD(V)(R)(-NA)
NZM3/4-XV4(6)



NZM4-XTVD(V)(R)-60(-NA)

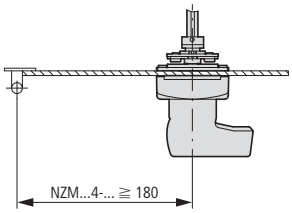


NZM4-XTVD(V)(R)-0(-NA)



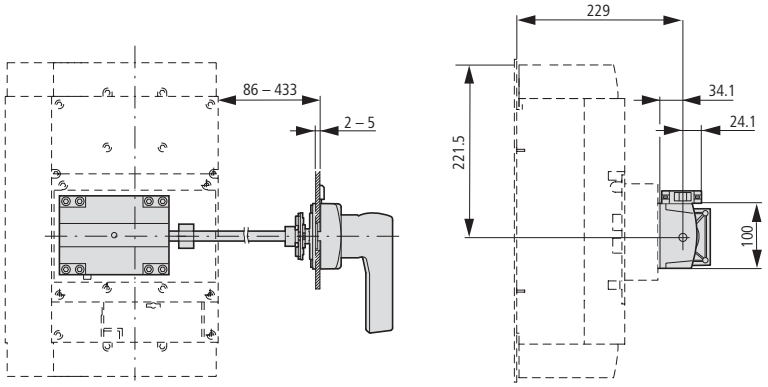
① Special tip

Minimum distance of door coupling rotary handle from door pivot point



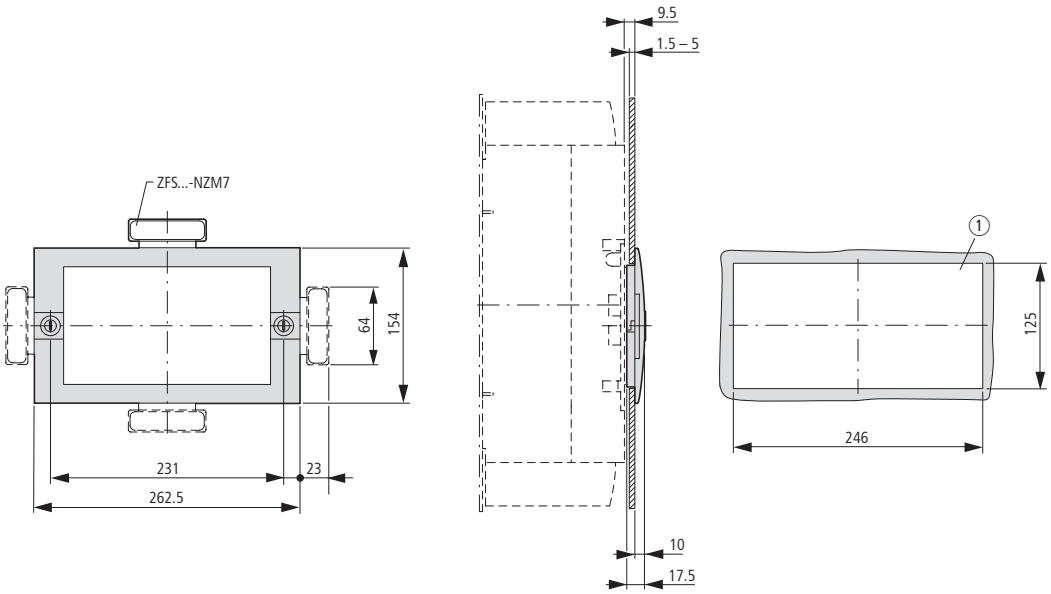
Main switch assembly kit for side wall installation

NZM4-XS(R)-L
NZM4-XS(R)-R

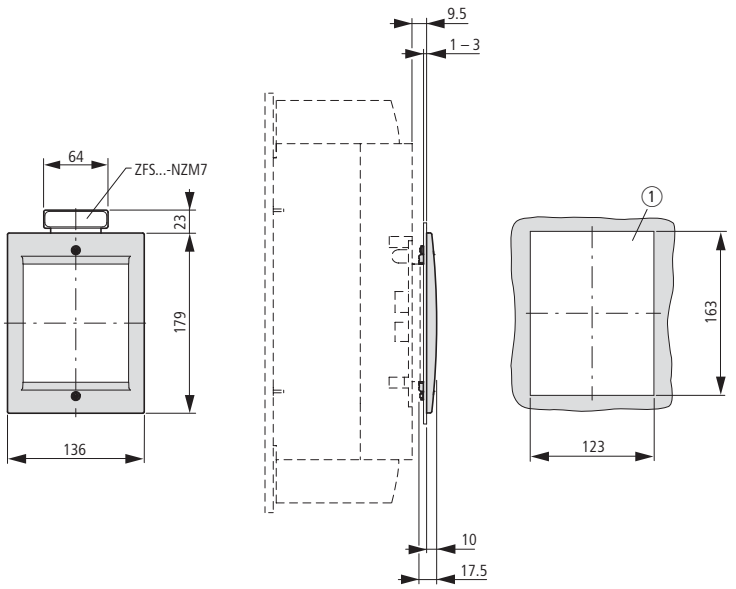


Insulating surround

NZM4-XBR

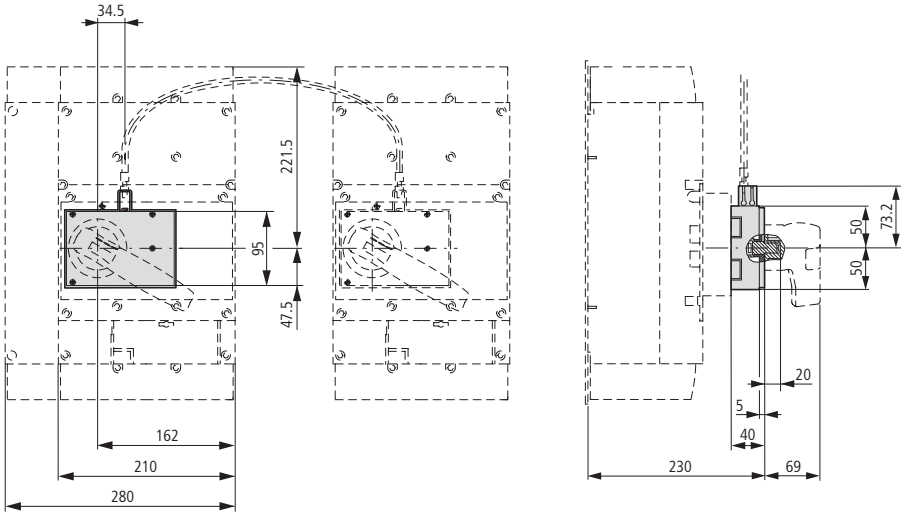


NZM4-XBRS



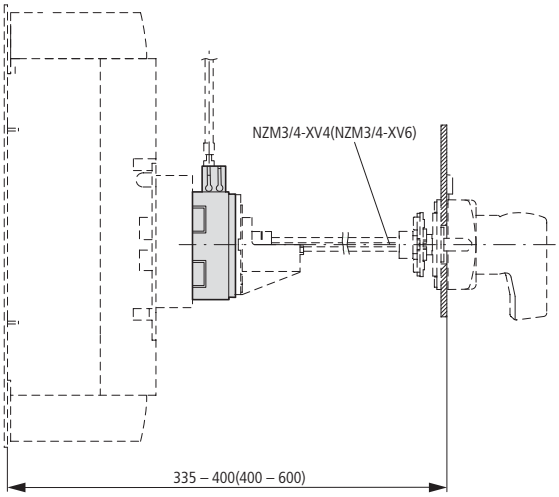
Mechanical interlock

NZM4-XMV + NZM4-XDV(R)

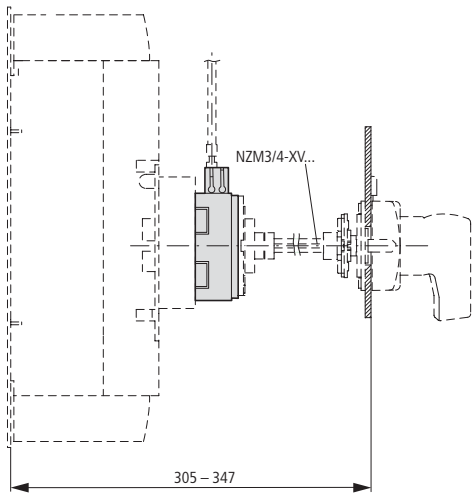


Mechanical interlock

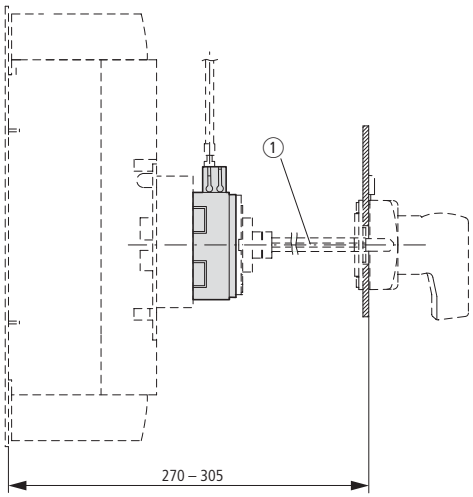
NZM4-XMV + NZM4-XTVD(V)(R)



NZM4-XMV + NZM4-XTVD(V)(R)-60



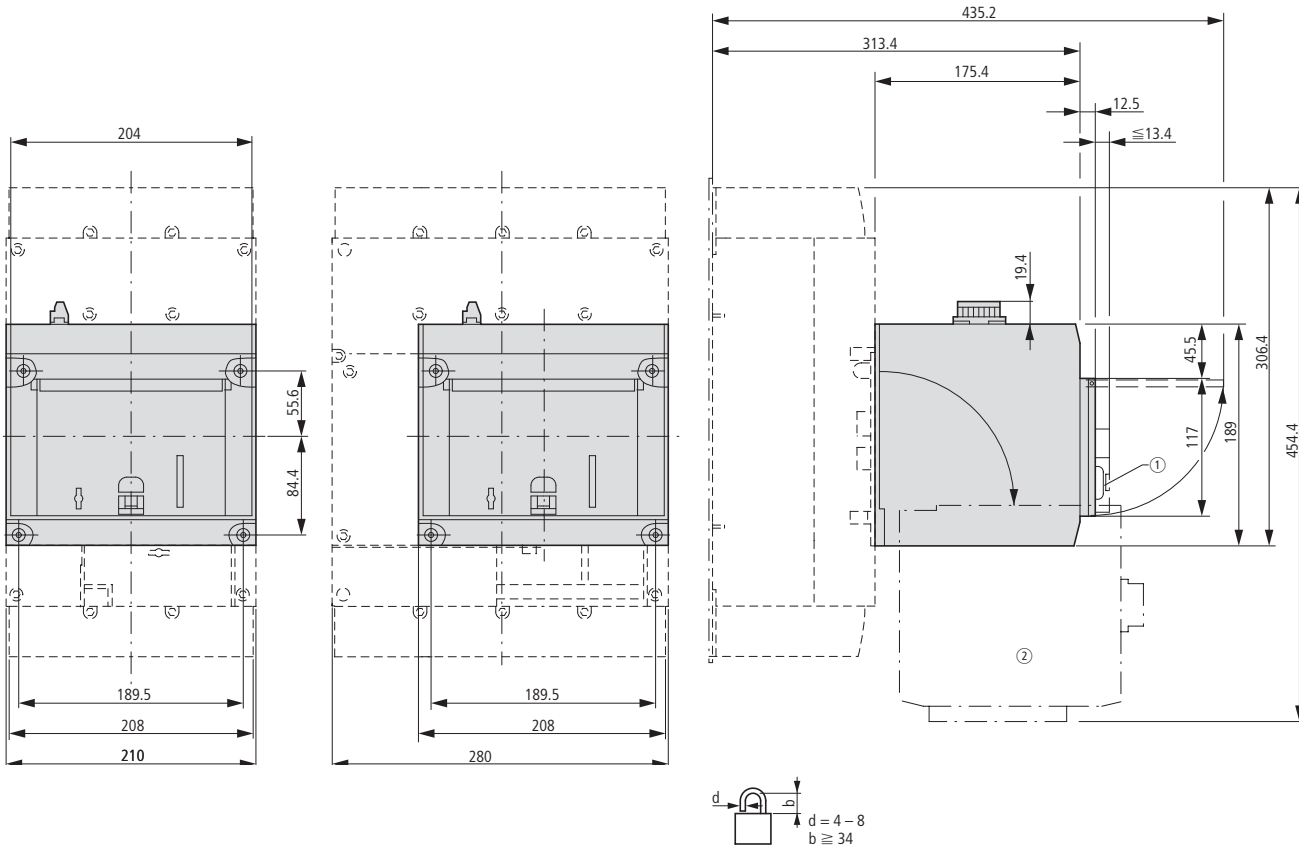
NZM4-XMV + NZM4-XTVD(V)(R)-0



① Special tip

Remote operators

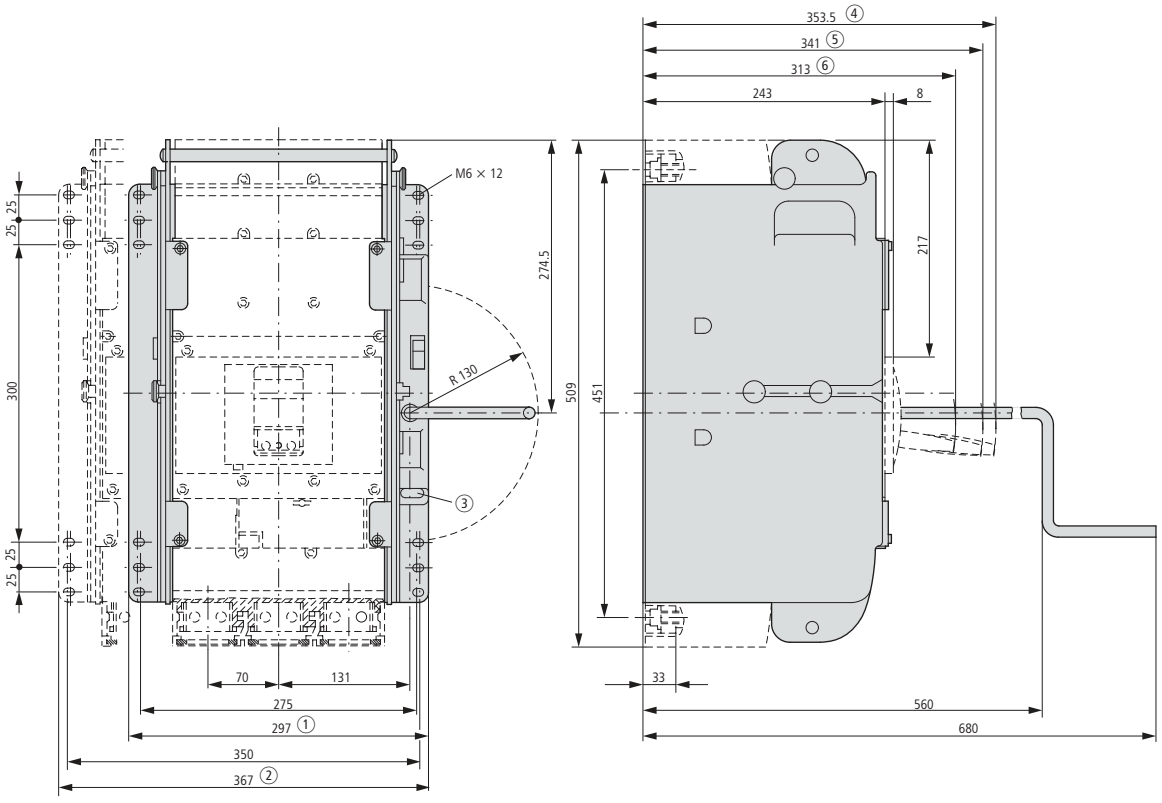
NZM4-XR…



① Up to 3 padlocks
② Remote operator folded

Withdrawable unit

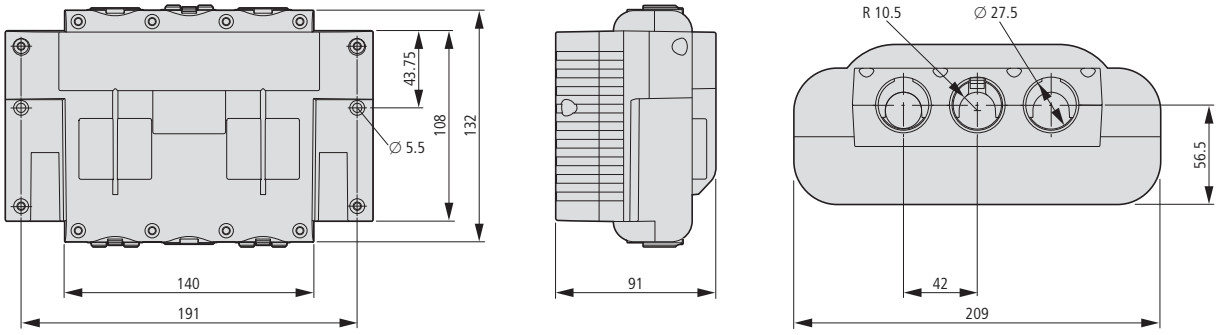
+NZM4-4-XAV



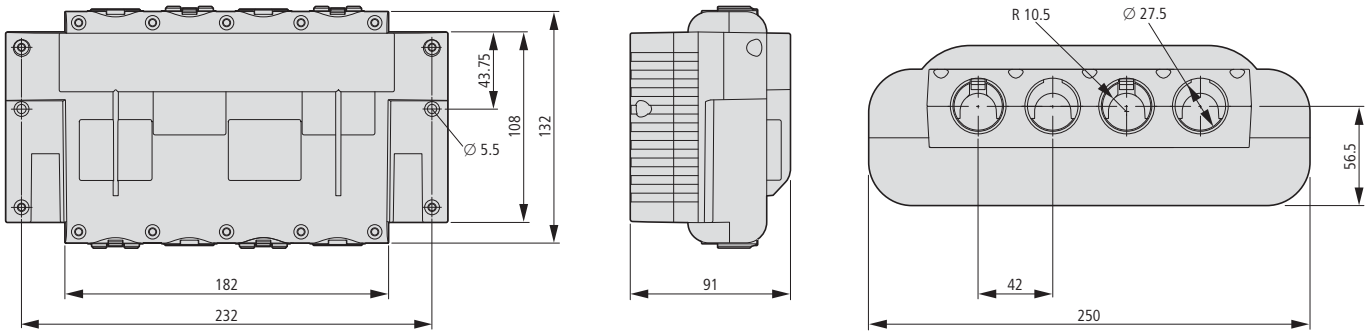
① 3 pole
② 4 pole
③ Up to 3 padlocks
④ Disconnected
⑤ Test
⑥ Connected

Measuring and communication module

NZM2 (3)...XMC-SO(MB)

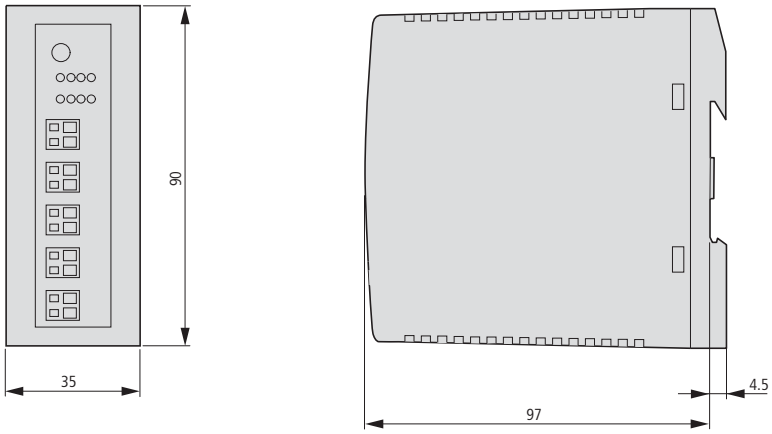


NZM2 (3)(-4)...XMC-SO(MB)



Communication interface for SmartWire-Darwin

NZM-XSWD-704







Circuit-breakers IZM up to 6300 A
Switch-disconnectors IN up to 6300 A

With the new IZM series, Eaton presents a complete offering of air circuit-breakers (ACB) up to 6300 A. Five construction sizes make it possible to select the most economical switch for each project.

The new star is the circuit-breaker IZMX16. This innovative concept allows economical construction of two circuit-breakers within a field width of 600 mm.

There is no greater performance within such small space.



Eaton After Sales Service

Testing switching devices in compliance with regulations applicable to this technology
→ Chapter 22

Basic devices IZM

Switching capacity 440 V AC, $I_{cu} = I_{cs}$ from 42 – 100 kA +++ 3 or 4 pole +++ electronic releases for system protection, selective and universal protection, universal protection with power measurement +++ rated operational current from 630 – 6300 A +++ rated operating voltage U_e 1100 V for IZM32…3200-1100V

High availability

Withdrawable units +IZM-CAS… +++ Main terminal kits IZM-T… +++ mechanical interlocks IZM-MIL…

Comprehensive fixed mounted accessories

Motor operator IZM…M… +++ Shunt release IZM…ST… +++ Closing release IZM…-SR… +++ Undervoltage release IZM…-UV… +++ Auxiliary contact IZM…-AS… +++ Latch check switch IZM…LCS… +++ Trip indicator auxiliary switch IZM…-OTS +++ Mechanical interlocks

Worldwide novelty ARMS™ – greater safety for maintenance personnel

If there is an accidental arc, the ARMS™ system (Arcflash Reduction Maintenance System) shuts down faster than a short circuit trip device. In connection with IZM, additional components from the accidental arc protection system ARCON provide incremental protection against accidental arcing.









Circuit-breakers IZMX16, switch-disconnectors INX16 from 630 A to 1600 A

Technical overview

- IZMX16 air circuit breakers 18/2
- INX16 switch-disconnectors 18/2
- Electronic releases for IZMX16 circuit-breakers 18/3

System overview

- IZMX16 circuit-breakers 18/4
- Key to type references 18/5

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- IZMX16 air circuit-breaker, INX16 switch-disconnector 18/6
- Components for IZMX16 communication 18/8

Ordering

- Basic devices 18/9
  - Compact air circuit-breakers, 3 and 4 pole 18/10
- Withdrawable units 18/13
  - Cassettes, shutter (busbar tag shroud) 18/13
- Electrical accessories 18/13
  - Motor operator 18/13
  - Operations counters, shunt releases 18/14
  - Auxiliary contact 18/15
  - Trip-indicating auxiliary switch, automatic reset 18/16
- Locking facilities and locking devices 18/16
- Options and accessories for trip units 18/17
  - Add-on functions for circuit-breakers Type V 18/17
  - Add-on functions for circuit-breakers Type U 18/17
  - Hand held tester for Digitrip 18/17
  - Communication modules 18/17
  - Rating plugs (Rate current modules) 18/18
  - Current sensor for neutral conductor 18/18
- Main terminal kits, tunnel terminals 18/19
- General accessories 18/19
  - Control circuit terminal blocks 18/19
  - Protective cover, blank cover for door cutout 18/19
  - Replacement coding, basic device to cassette 18/19
  - Replacement hand lever 18/19

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- Tripping characteristics 18/21
- Rating plug combinations for IZMX16 18/25
- Selectivity: incoming circuit-breaker, outgoing circuit-breaker 18/26

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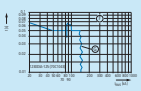
- INX16 switch-disconnectors 18/32
- Accessories for IZMX16 18/36

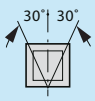
Dimensions

- Circuit-breaker IZMX16, switch-disconnector INX16 18/37









Circuit-breaker IZM26, switch-disconnector IN26 from 800 A to 6300 A

Technical overview

- IZM 26 air circuit breakers 18/38
- IN26 switch-disconnectors 18/39
- Electronic releases for IZM26 circuit-breakers 18/40

System overview

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Ordering

- Basic devices 18/48
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  - Communication module, hand held tester 18/71
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- Main terminal kits 18/75
- General accessories 18/76
  - Control circuit terminal, door escutcheon with gasket 18/76
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- Terminal assignment of control circuit terminals 18/77
- Switching states at mechanical interlock 18/77
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- Accessories for IZM26 18/116
- Communication modules 18/118

Dimensions

- IZM26 circuit-breakers, IN26 switch-disconnectors 18/119
- Minimum clearances 18/122

I_{cu}/I_{cs} at U_e = 440/690 V AC I_{cu}: Rated ultimate short-circuit breaking capacity at rated operational voltage U_e I_{cs}: Rated service short-circuit breaking capacity at rated operational voltage U_e		**Basic switching capacity (B)**		**Normal switching capacity (N)**		**High switching capacity (H)**	
Circuit-breakers	Rated operational current I_n A	440 V AC I_{cu} / I_{cs} kA/kA	690 V AC I_{cu} / I_{cs} kA/kA	440 V AC I_{cu} / I_{cs} kA/kA	690 V AC I_{cu} / I_{cs} kA/kA	440 V AC I_{cu} / I_{cs} kA/kA	690 V AC I_{cu} / I_{cs} kA/kA
IZMX16							
	630 - 1600	42/42	42/42	50/50	42/42	65/50	42/42

I_{cw} at U_e = 440/690 V AC I_{cw} at t = 1 s I_{cw}: Rated short-time withstand current		**Basic switching capacity (B)**	**Normal switching capacity (N)**	**High switching capacity (H)**
Circuit-breaker, switch-disconnector	Rated operational current I_n A	440/690 V AC I_{cw} kA	440/690 V AC I_{cw} kA	440/690 V AC I_{cw} kA
IZMX16				
	630 - 1600	42	42	42

I_cm at U_e = 440/690 V AC I_{cm}: Rated short-circuit making capacity (Peak value) at rated operational voltage U_e		**Basic switching capacity (B)**	**Normal switching capacity (N)**	**High switching capacity (H)**
Switch-disconnector	Rated operational current I_n A	440/690 V AC I_{cm} kA	440/690 V AC I_{cw} kA	440/690 V AC I_{cw} kA
INX 16				
	630 - 1600	88	88	88

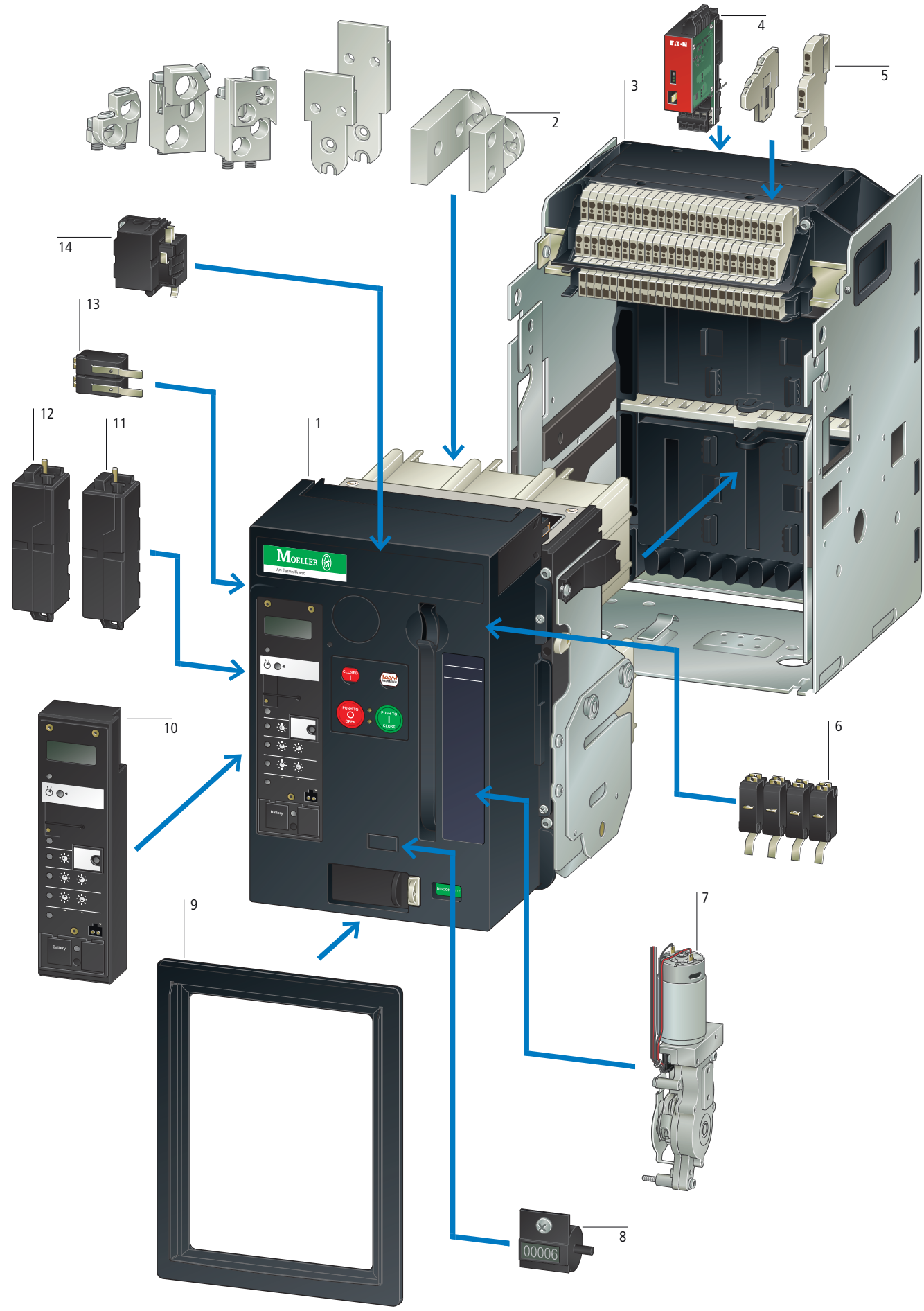
IZMX16

		IZMX16…A… System protection DTA Digitrip 520	IZMX16…V… Selectivity protection DTV Digitrip 520	IZMX16…U… Universal protection DTU Digitrip 520M
				
Current range		200 A - 1600 A	200 A - 1600 A	200 A - 1600 A
RMS value monitoring		●	●	●
Protective functions				
General				
Ordering options		LI	LSI, LSIG	LSI, LSIG, LSIA
Rating plug (I_n)		●	●	●
Overtemperature trip		●	●	●
Overload protection	**L**			
Overload trip		(0.5 - 1.0) x I_n	(0.5 - 1.0) x I_n	(0.5 - 1.0) x I_n
Delay time I^2t at 6 x I_r		2 - 24 s	2 - 24 s	2 - 24 s
Thermal memory		●	●	●
Short-time delayed short-circuit protection	**S**			
Delayed short-circuit protection		-	(2 - 10) x I_r	(2 - 10) x I_r
Short delay time I^2t at 8 x I_r		-	100 - 500 ms	100 - 500 ms
Short delay time, flat characteristic curve		-	100 - 500 ms	100 - 500 ms
Zone selectivity ZSI[1)]		○	○	○
Non-delayed short-circuit protection	**I**			
Non-delayed short-circuit protection		(2 - 10) x I_n	(2 - 12) x I_n	(2 - 12) x I_n
Switch-off function		●	●	●
Closing releases MCR		●	●	●
Optional ground fault protection	**G**			
Ground/fault alarm		-	-	○[1)]
Ground/fault protection release		-	(0.25 - 1.0) x I_n[3)]	(0.25 - 1.0) x I_n[3)]
Short delay time I^2t at 0.625 x I_n		100 - 500 ms	100 - 500 ms	100 - 500 ms
Short delay time, flat characteristic curve		100 - 500 ms	100 - 500 ms	100 - 500 ms
Zone selectivity ZSI[1)]		○	○	○
Thermal memory		●	●	●
Neutral conductor-conductor protection	**N**	●	●	●
System diagnostics				
Status/Overload LED		-	●	●
Cause of trip LEDs		-	●	●
Current at trip point (display indication)		-	-	●[1)]
Ground fault release/alarm remote signaling (relay contact)	**A**	-	-	●[1)]
Overload alarm monitoring	**A**	-	-	●[1)]
System monitor				
Digital display		-	-	4-digit LCD
Field bus communication		-	-	Optional: Modbus, PROFIBUS
Additional functions				
Test possibility[2)]		-	Hand held test unit	Hand held test unit
Maintenance mode ARMS (Arc Flash Reduction Maintenance System™)		-	-	○[1)]

Notes

I_n = rating plug (rate current module) = rated operational current current transformer
I_r = Set value overload trip (= rated operational current of system)
[1)] Requires external 24 V DC control voltage supply.
[2)] Hand-held tester for simulating of secondary current
[3)] In combination with ARMS function limited to 1200 A.
● Standard
○ Optional

System overview



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Main terminal kits 2
Universal terminals
3- and 4 pole,
horizontal/vertical
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Cassette for withdrawable units 3
Cassettes 1600 A
With and without control circuit terminals
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Control circuit terminal units 4
Either 8, 20 or 30 units
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Auxiliary contacts 5
Signalling switch ON-OFF
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Overload trip switch (OTS), 2 C
→ Page 18/16

Closing releases 14
→ Page 18/14

Key to type references

IZM	X16	B	3	-	A	06	W
IN		N	4		V	08	F
		H			U	10	
						12	
						16	

IZM, IN = Product family

Frame size
X16: Compact ACB, 630 - 1600 A

Switching capacity
B = Basic
N = Normal
H = High

Number of poles
3: 3 pole
4: 4 pole

Trip type
A = System protection = Digitrip 520 LI
V = Selective trip = Digitrip 520 LSI(G)
U = Universal protection = Digitrip 520MC LSI(G)

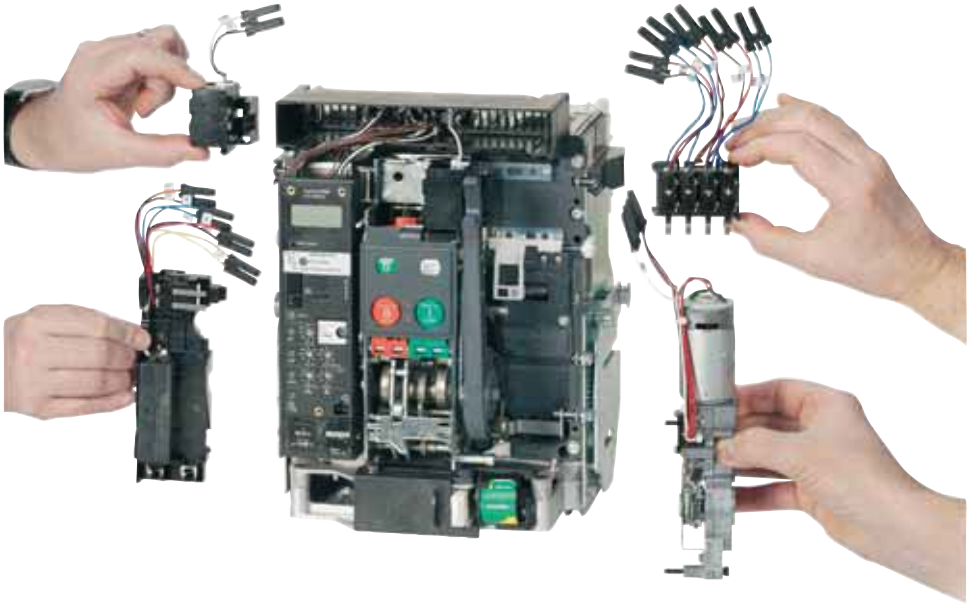
Rated operational current
06: 630 A
08: 800 A
10: 1000 A
12: 1250 A
16: 1600 A

Model
W = Withdrawable units
F = Fixed mounted



IZMX16, INX16

Space-saving circuit-breakers with useful accessories



IZMX16

The innovative concept of the IZMX16 makes it possible to install two withdrawable circuit-breakers in a 600 mm wide section. This enables more economical section design and also saves operating space. This additional performance in a minimum of space goes far beyond the standard available worldwide.

Applications

The circuit-breakers can be used in four main application areas depending on the type of equipment to be protected:
- System protection,
- Motor protection,
- Transformer protection,
- Generator protection.

These key applications make different demands on the switches, which are met with a range of control units.

Switches with closing release
They are particularly suitable for synchronization tasks.

Coupler switches
Beside the IZMX16 circuit-breakers, INX16 switch-disconnectors are available. These are used, for example, as coupler switches between different power supplies.

Modular design

The retrofitting of accessories is made considerably easy thanks to the efficient "plug & work" technology. Accessory drawers and snap-fit mechanisms makes it possible to fit the latest accessories with virtually no tools. This allows you to respond flexibly to changing requirements within your system.

Standard scope of delivery as usual

- With the new IZMX16, you select a basic device that is already fitted with an electronic release.
- The standard mounting is on a horizontal mounting plate or on horizontal traverses in the switching cabinet. The IZMX16 can also be fastened to vertical mounting plates.
- With four-pole devices, the neutral conductor is arranged on the left (front view).
- The neutral conductor can be loaded 100% like the phase conductors.
- The circuit-breakers are provided with a standard mechanical reclosing lockout. After an overload trip, the fault is usually examined first of all. After the fault is identified and rectified, the mechanical reclosing lockout is reset by pressing the red mechanical trip indicator on the front of the circuit-breaker.
- An "Automatic Reset" can be ordered as an option. This enables the circuit-breaker to be restored to operation immediately at any time after the spring-operated stored energy mechanism is retensioned. In these applications compulsory fault analysis is intentionally avoided.
- The number of control cable terminals depends on the accessories fitted.
- If a cassette is ordered without the basic device, this can be already fitted with the maximum number of control cable terminals. For greater economy in large plants, the cassette is also offered without control circuit terminals so that fitting can be carried out later at the installation or when the required accessories are determined at a later time.
- 2 changeover contacts are provided as standard for ON/OFF status indication.
- A coding mechanism between the basic device and the cassette prevents impermissible combinations ("Rejection Interlock").

Expanded standard scope of delivery for IZXM16

Some order types from the past can no longer be found since the following options are now already part of the standard scope of delivery:
- The door escutcheon is now always included in the scope of delivery. With withdrawable designs this is supplied with the cassette (withrawable unit).
- On withdrawable units the circuit-breaker can be pulled out to inspect the arc chutes. With fixed units, it is recommended that sufficient space is provided above the circuit-breaker to enable inspection. An additional cover is not required.
- All basic devices that are provided with universal protection (with Digitrip 520M…), now feature a display.
- On each circuit-breaker the integrated Digitrip electronic release is factory fitted with a sealable protective cover.
- If a motor operator is ordered, the "Spring-operated stored energy mechanism tensioned" indicator switch is automatically provided.

Other benefits of the IZMX16

- The design of the main terminal offers maximum flexibility. The horizontal terminal can be rotated simply at the installation so that it can also be used as a vertical connection. With withdrawable units, additional terminal pieces can even be dispensed with.
  The cassette of the IZMX16 offers an integrated flange terminal to which the system busbars can be connected directly. For this reason, the main terminal pieces for IZMX16 are not part of the standard scope of delivery. Don't forget to order additionally required terminal pieces if needed.
- Thanks to the separate mounting position, a switching operations counter can now be used also independently of a motor operator.
- Withdrawable unit operation:
  The unit is actuated with a hand crank supplied as a standard feature and has a secure position in the basic device. This is now possible also with a standard tool (square drive socket 1/4").

External 24 V supply

- The standard protection functions of the IZMX16 operate generally independently of an external control voltage supply. The power supply of the electronics unit, for example for overload and short-circuit protection, is implemented via the current transformers integrated in the circuit-breaker.
- The universal release unit with display can be fed with a 24 V DC supply if required so that the display function can also be used without a load. An external 24 V DC power supply is needed if communication functions are required.

Communication capability

The communication-capability of the IZMX16 circuit-breakers open up new possibilities in power distribution. It provides all important operational information and passes this on. This increases system transparency and shortens the response times to states such as overcurrent, phase asymmetry and overvoltage.

A rapid intervention in a process can, for example, prevent downtimes and help to schedule maintenance activities and therefore boost plant availability.

A Modbus interface is offered as an alternative in addition to the Profibus interface.

Greater safety for maintenance personnel with ARMS™

If the IZMX16 is fitted with the newly patented ARMS system (Arcflash Reduction Maintenance System™), a non-delayed immediate disconnection is ensured in the event of an arc fault. This disconnection is even faster than that of a non-delayed short-circuit release.

This function can be activated directly on the circuit-breaker or via an external switch, such as when maintenance personnel enter a hazardous area. Other components of the ARCON arc fault protection system, in conjunction with the IZMX16, enable an expansion of arc fault protection in stages.
ARCON on the Internet:
www.moeller.net/arcon

Selection criteria for IZMX16 circuit-breakers

Fundamental criteria for the selection of circuit-breakers:

- Max short-circuit current $I_{k\,max}$ at the circuit-breaker' point of installation: this value determines the short-circuit breaking capacity or the short-circuit current carrying capacity of the circuit-breaker. It is compared with the I_{cu}, I_{cs} and I_{cw} values of the switch and essentially determines its size (see Technical data).
- Rated operational current I_n which should flow through the respective branch circuit:
  This value must not be greater than the maximum switch rated operational current of the circuit-breaker. The rated operational current can be adjusted down using additional rated operational current modules.
- Ambient temperature of the circuit-breaker: This is generally the internal temperature in the control panel. Observe the derating values with increased ambient temperature (see Technical data).
- Circuit-breaker type: fixed mounted or withdrawable units, 3 or 4 pole.
- Minimum short-circuit current, which flows through the switching device: The release must recognize this value as a short-circuit and may react with a trip.
- Protection functions of the circuit-breaker: This is determined by the selection of the respective overcurrent release.

Documentation

Operating manual
AWB1230-1628de (deutsch)
AWB1230-1628en (english)

CurveSelect characteristics program

Display characteristic curves according to specific settings and assess their interaction effectively:
www.moeller.net/de/support



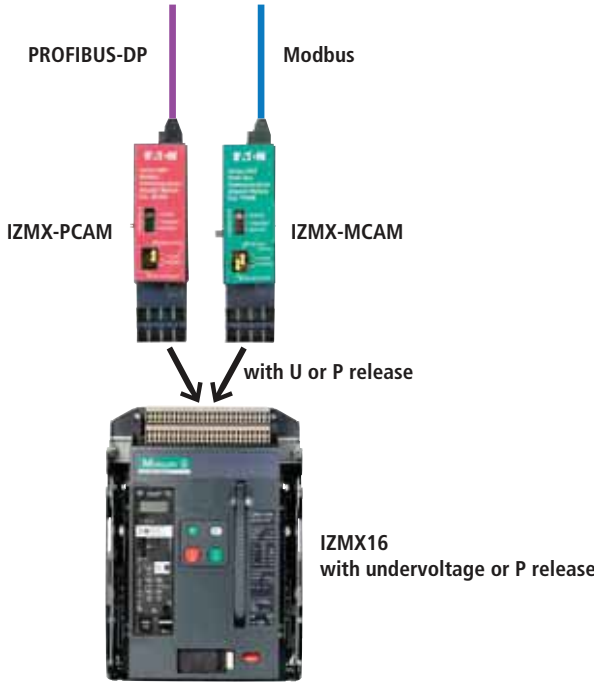
Components for IZMX16 communication

For the IZMX16, PROFIBUS-DP or Modbus RTU are optionally available as fieldbus connections. Communication modules IZMX-PCAM and IZMX-MCAM are compact units for direct mounting in the auxiliary terminal strip. On retrofitting, four modular terminals are replaced with one communication module. This is possible for both for fixed and withdrawable units. The terminals provide all data available in the trip block to the fieldbus, including switching state, current, voltage, power, energy, and diagnostic information such as overcurrent, phase asymmetry and overvoltage. Through the bus the motor operator can also be remotely controlled.

Requirements

The communications modules can be used in combination with IZMX16 circuit-breakers …-U or IZMX16…-P… (in preparation) circuit-breakers.

Configuration



PROFIBUS-DP configuration

Communications module IZMX-PCAM has a 9-pin D-Sub socket for connection to PROFIBUS. The module works as a slave on PROFIBUS-DP; the data is defined through a standardized device master data file, which permits smooth integration of IZMX in a DP line.

- On the PROFIBUS-DP side the module supports automatic baud rate detection; the PROFIBUS-DP bus address is set through the trip unit's display. The maximum cable length is 2.4 km.
- To operate the IZMX-PCAM, a supply voltage of 24 V DC is required.
- The data connection to the circuit-breaker is implemented internally through a serial high--speed data connection.

Data access via PROFIBUS-DP

The data on PROFIBUS-DP are offered according to the profile for low-voltage switchgear (LVSG) of PROFIBUS International (PROFIBUS and PROFINET User Group). Five different data structures with varying numbers of parameters are available through the device master data file. This allows a data filter to be easily implemented, which simplifies integration of the IZM data into the control system.

Modbus configuration

Communications module IZMX-MCAM has a plug-in screw terminal for connection to Modbus. The module operates as a Modbus slave.

- Baud rate, data format and address (max. 247) for Modbus are set with the input keys of the trip unit. The maximum cable length is 1.2 km.
- The Modbus must be terminated with a 120 Ω terminating resistor.
- To operate the IZMX-PCAM, a supply voltage of 24 V DC is required.
- The data connection to the circuit-breaker is implemented internally through a serial high-speed data connection.

Data access via Modbus

The data is contained in comprehensive data tables. Each data point is available as floating-point (IEEE) or fixed-point value. This variance allows the integration of the IZMX to be adapted to the Modbus architecture. This enables a simple means of implementing a data filter, which facilitates the integration of IZMX data in the control system.

Documentation

Operator manual
For device series IZM26:
AWB1230-1621de (deutsch)
AWB1230-1621en (english)
AWB1230-1622de (deutsch)
AWB1230-1622en (english)

For device series IZMX16:
AWB1230-1623de (deutsch)
AWB1230-1623en (english)
AWB1230-1624de (deutsch)
AWB1230-1624en (english)

Ordering

Switching capacity	Rated operational current	Setting range: Overload releases	Short-circuit releases: Delayed	Short-circuit releases: Non-delayed	Fixed: Part no. Article no.	Fixed: Price See price list	Withdrawable: Part no. Article no. Cassette must be ordered separately.	Withdrawable: Price See price list	Std. pack
I_{cu}/I_{cs} kA/kA	$I_n = I_u$ A	I_r A	$I_{sd} = I_r$ x …	$I_i = I_n$ x …					
3 pole									
Circuit-breakers for selective protection (Digitrip 520 M)									
Main terminals must be separately ordered.									
42/42	630	315 - 630	–	2 - 10, OFF	**IZMX16B3-A06F** 123341		**IZMX16B3-A06W** 122818		1 off
	800	400 - 800			**IZMX16B3-A08F** 123342		**IZMX16B3-A08W** 122819		
	1000	500 - 1000			**IZMX16B3-A10F** 123343		**IZMX16B3-A10W** 122820		
	1250	625 - 1250			**IZMX16B3-A12F** 123344		**IZMX16B3-A12W** 122849		
	1600	800 - 1600			**IZMX16B3-A16F** 123345		**IZMX16B3-A16W** 122850		
50/50	630	315 - 630			**IZMX16N3-A06F** 123366		**IZMX16N3-A06W** 123085		
	800	400 - 800			**IZMX16N3-A08F** 123367		**IZMX16N3-A08W** 123087		
	1000	500 - 1000			**IZMX16N3-A10F** 123368		**IZMX16N3-A10W** 123090		
	1250	625 - 1250			**IZMX16N3-A12F** 123369		**IZMX16N3-A12W** 123092		
	1600	800 - 1600			**IZMX16N3-A16F** 123370		**IZMX16N3-A16W** 123094		
65/50	630	315 - 630			**IZMX16H3-A06F** 123391		**IZMX16H3-A06W** 123141		
	800	400 - 800			**IZMX16H3-A08F** 123392		**IZMX16H3-A08W** 123142		
	1000	500 - 1000			**IZMX16H3-A10F** 123393		**IZMX16H3-A10W** 123143		
	1250	625 - 1250			**IZMX16H3-A12F** 123394		**IZMX16H3-A12W** 123144		
	1600	800 - 1600			**IZMX16H3-A16F** 123395		**IZMX16H3-A16W** 123145		
4 pole									
Circuit-breakers for universal protection (Digitrip 520 M)									
Main terminals must be separately ordered.									
42/42	630	315 - 630	–	2 - 10, OFF	**IZMX16B4-A06F** 123466		**IZMX16B4-A06W** 123201		1 off
	800	400 - 800			**IZMX16B4-A08F** 123467		**IZMX16B4-A08W** 123207		
	1000	500 - 1000			**IZMX16B4-A10F** 123468		**IZMX16B4-A10W** 123213		
	1250	625 - 1250			**IZMX16B4-A12F** 123469		**IZMX16B4-A12W** 123219		
	1600	800 - 1600			**IZMX16B4-A16F** 123470		**IZMX16B4-A16W** 123220		
50/50	630	315 - 630			**IZMX16N4-A06F** 123491		**IZMX16N4-A06W** 123241		
	800	400 - 800			**IZMX16N4-A08F** 123492		**IZMX16N4-A08W** 123242		
	1000	500 - 1000			**IZMX16N4-A10F** 123493		**IZMX16N4-A10W** 123243		
	1250	625 - 1250			**IZMX16N4-A12F** 123494		**IZMX16N4-A12W** 123244		
	1600	800 - 1600			**IZMX16N4-A16F** 123495		**IZMX16N4-A16W** 123245		
65/50	630	315 - 630			**IZMX16H4-A06F** 123516		**IZMX16H4-A06W** 123266		
	800	400 - 800			**IZMX16H4-A08F** 123517		**IZMX16H4-A08W** 123267		
	1000	500 - 1000			**IZMX16H4-A10F** 123518		**IZMX16H4-A10W** 123268		
	1250	625 - 1250			**IZMX16H4-A12F** 123519		**IZMX16H4-A12W** 123269		
	1600	800 - 1600			**IZMX16H4-A16F** 123525		**IZMX16H4-A16W** 123270		

Switching capacity	Rated operational current	**Setting range** Overload releases	Short-circuit releases		Fixed **Part no.** Article no.	**Price** See price list	Withdrawable **Part no.** Article no. Cassette must be ordered separately.	**Price** See price list	Std. pack
			Delayed	Non-delayed					
I_{cu}/I_{cs} kA/kA	$I_n = I_u$ A	I_r A	$I_{sd} = I_r$ x …	$I_i = I_n$ x …					
									
3 pole ircuit-breaker for selective protection Main terminals must be separately ordered.									
42/42	630	315 – 630	2 - 10	2 - 12, OFF	**IZMX16B3-V06F** 123346		**IZMX16B3-V06W** 122851		1 off
	800	400 – 800			**IZMX16B3-V08F** 123347		**IZMX16B3-V08W** 122918		
	1000	500 – 1000			**IZMX16B3-V10F** 123348		**IZMX16B3-V10W** 122920		
	1250	625 – 1250			**IZMX16B3-V12F** 123349		**IZMX16B3-V12W** 122922		
	1600	800 – 1600			**IZMX16B3-V16F** 123350		**IZMX16B3-V16W** 122924		
50/50	630	315 – 630			**IZMX16N3-V06F** 123371		**IZMX16N3-V06W** 123097		
	800	400 – 800			**IZMX16N3-V08F** 123372		**IZMX16N3-V08W** 123099		
	1000	500 – 1000			**IZMX16N3-V10F** 123373		**IZMX16N3-V10W** 123101		
	1250	625 – 1250			**IZMX16N3-V12F** 123374		**IZMX16N3-V12W** 123103		
	1600	800 – 1600			**IZMX16N3-V16F** 123375		**IZMX16N3-V16W** 123106		
65/50	630	315 – 630			**IZMX16H3-V06F** 123396		**IZMX16H3-V06W** 123146		
	800	400 – 800			**IZMX16H3-V08F** 123397		**IZMX16H3-V08W** 123147		
	1000	500 – 1000			**IZMX16H3-V10F** 123398		**IZMX16H3-V10W** 123148		
	1250	625 – 1250			**IZMX16H3-V12F** 123399		**IZMX16H3-V12W** 123149		
	1600	800 – 1600			**IZMX16H3-V16F** 123405		**IZMX16H3-V16W** 123150		
4 pole circuit-breakers for universal protection (Digitrip 520 M) Main terminals must be separately ordered.									
42/42	630	315 – 630	2 - 10	2 - 12, OFF	**IZMX16B4-V06F** 123471		**IZMX16B4-V06W** 123221		1 off
	800	400 – 800			**IZMX16B4-V08F** 123472		**IZMX16B4-V08W** 123222		
	1000	500 – 1000			**IZMX16B4-V10F** 123473		**IZMX16B4-V10W** 123223		
	1250	625 – 1250			**IZMX16B4-V12F** 123474		**IZMX16B4-V12W** 123224		
	1600	800 – 1600			**IZMX16B4-V16F** 123475		**IZMX16B4-V16W** 123225		
50/50	630	315 – 630			**IZMX16N4-V06F** 123496		**IZMX16N4-V06W** 123246		
	800	400 – 800			**IZMX16N4-V08F** 123497		**IZMX16N4-V08W** 123247		
	1000	500 – 1000			**IZMX16N4-V10F** 123498		**IZMX16N4-V10W** 123248		
	1250	625 – 1250			**IZMX16N4-V12F** 123499		**IZMX16N4-V12W** 123249		
	1600	800 – 1600			**IZMX16N4-V16F** 123500		**IZMX16N4-V16W** 123250		
65/50	630	315 – 630			**IZMX16H4-V06F** 123531		**IZMX16H4-V06W** 123271		
	800	400 – 800			**IZMX16H4-V08F** 123537		**IZMX16H4-V08W** 123272		
	1000	500 – 1000			**IZMX16H4-V10F** 123543		**IZMX16H4-V10W** 123273		
	1250	625 – 1250			**IZMX16H4-V12F** 123549		**IZMX16H4-V12W** 123274		
	1600	800 – 1600			**IZMX16H4-V16F** 123555		**IZMX16H4-V16W** 123275		

Switching capacity	Rated operational current	**Setting range** Overload releases	Short-circuit releases Delayed	Short-circuit releases Non-delayed	Fixed **Part no.** Article no.	**Price** See price list	Withdrawable **Part no.** Article no. Cassette must be ordered separately.	**Price** See price list	Std. pack
I_{cu}/I_{cs} kA/kA	$I_n = I_u$ A	I_r A	$I_{sd} = I_r$ x …	$I_i = I_n$ x …					
3 pole circuit-breakers for universal protection (Digitrip M) Main terminals must be separately ordered.									
42/42	630	315 – 630	2 - 10	2 - 12, OFF	**IZMX16B3-U06F** 123351		**IZMX16B3-U06W** 122940		1 off
	800	400 – 800			**IZMX16B3-U08F** 123352		**IZMX16B3-U08W** 122941		
	1000	500 – 1000			**IZMX16B3-U10F** 123353		**IZMX16B3-U10W** 122979		
	1250	625 – 1250			**IZMX16B3-U12F** 123354		**IZMX16B3-U12W** 122984		
	1600	800 – 1600			**IZMX16B3-U16F** 123355		**IZMX16B3-U16W** 123020		
50/50	630	315 – 630			**IZMX16N3-U06F** 123376		**IZMX16N3-U06W** 123109		
	800	400 – 800			**IZMX16N3-U08F** 123377		**IZMX16N3-U08W** 123111		
	1000	500 – 1000			**IZMX16N3-U10F** 123378		**IZMX16N3-U10W** 123114		
	1250	625 – 1250			**IZMX16N3-U12F** 123379		**IZMX16N3-U12W** 123129		
	1600	800 – 1600			**IZMX16N3-U16F** 123380		**IZMX16N3-U16W** 123130		
65/50	630	315 – 630			**IZMX16H3-U06F** 123411		**IZMX16H3-U06W** 123151		
	800	400 – 800			**IZMX16H3-U08F** 123417		**IZMX16H3-U08W** 123152		
	1000	500 – 1000			**IZMX16H3-U10F** 123423		**IZMX16H3-U10W** 123153		
	1250	625 – 1250			**IZMX16H3-U12F** 123429		**IZMX16H3-U12W** 123154		
	1600	800 – 1600			**IZMX16H3-U16F** 123435		**IZMX16H3-U16W** 123155		
4 pole circuit-breakers for selective protection (Digitrip 520 M LSI) Main terminals must be separately ordered.									
42/42	630	315 – 630	2 - 10	2 - 12, OFF	**IZMX16B4-U06F** 123476		**IZMX16B4-U06W** 123226		1 off
	800	400 – 800			**IZMX16B4-U08F** 123477		**IZMX16B4-U08W** 123227		
	1000	500 – 1000			**IZMX16B4-U10F** 123478		**IZMX16B4-U10W** 123228		
	1250	625 – 1250			**IZMX16B4-U12F** 123479		**IZMX16B4-U12W** 123229		
	1600	800 – 1600			**IZMX16B4-U16F** 123480		**IZMX16B4-U16W** 123230		
50/50	630	315 – 630			**IZMX16N4-U06F** 123501		**IZMX16N4-U06W** 123251		
	800	400 – 800			**IZMX16N4-U08F** 123502		**IZMX16N4-U08W** 123252		
	1000	500 – 1000			**IZMX16N4-U10F** 123503		**IZMX16N4-U10W** 123253		
	1250	625 – 1250			**IZMX16N4-U12F** 123504		**IZMX16N4-U12W** 123254		
	1600	800 – 1600			**IZMX16N4-U16F** 123505		**IZMX16N4-U16W** 123255		
65/50	630	315 – 630			**IZMX16H4-U06F** 123561		**IZMX16H4-U06W** 123276		
	800	400 – 800			**IZMX16H4-U08F** 123567		**IZMX16H4-U08W** 123277		
	1000	500 – 1000			**IZMX16H4-U10F** 123573		**IZMX16H4-U10W** 123278		
	1250	625 – 1250			**IZMX16H4-U12F** 123579		**IZMX16H4-U12W** 123279		
	1600	800 – 1600			**IZMX16H4-U16F** 123580		**IZMX16H4-U16W** 123285		

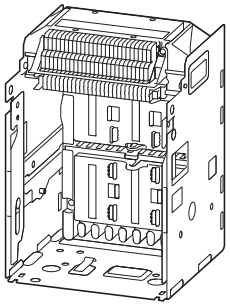
Compact open switch-disconnectors, 3- and 4 pole

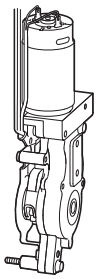
INX16

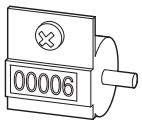
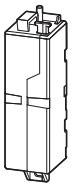
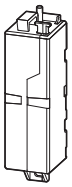
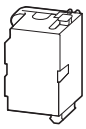
HPL18012EN

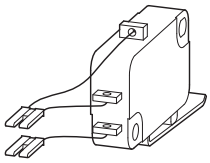
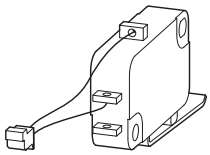
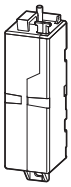
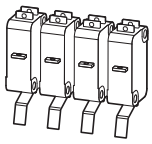
Rated short-circuit making capacity I_{cm} kA	Rated operational current $I_n = I_u$ A	Rated short-time withstand current t = 1 s I_{cw} kA	Fixed **Part no.** Article no.	**Price** See price list	Withdrawable **Part no.** Article no. Cassette must be separately ordered.	**Price** See price list	Std. pack
3 pole switch-disconnectors: Main terminals must be separately ordered.							
88	630	42	**INX16B3-06F** 123361		**INX16B3-06W** 123073		1 off
	800		**INX16B3-08F** 123362		**INX16B3-08W** 123076		
	1000		**INX16B3-10F** 123363		**INX16B3-10W** 123078		
	1250		**INX16B3-12F** 123364		**INX16B3-12W** 123080		
	1600		**INX16B3-16F** 123365		**INX16B3-16W** 123083		
4 pole switch-disconnectors: Main terminals must be separately ordered.							
88	630	42	**INX16B4-06F** 123486		**INX16B4-06W** 123236		1 off
	800		**INX16B4-08F** 123487		**INX16B4-08W** 123237		
	1000		**INX16B4-10F** 123488		**INX16B4-10W** 123238		
	1250		**INX16B4-12F** 123489		**INX16B4-12W** 123239		
	1600		**INX16B4-16F** 123490		**INX16B4-16W** 123240		

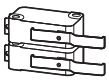


	Rated operational current I_n A	Rated ultimate short-circuit breaking capacity I_{cu} kA	Pole	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Withdrawable units								
Cassettes Equipment supplied: arcing chamber cover, coding to basic device								
	≦ 1600	≦ 65	3	IZMX16…3-...W INX16…3-...W	**IZMX-CAS163-1600** 101537		1 off	Without control circuit terminals
					+IZMX-CAS163-1600 101536			With control circuit terminals according to ordered options
					IZMX-CAS163-1600-SEC 123986			Fully equipped with control circuit terminals
	≦ 1600	≦ 65	4	IZMX16…4-...W INX16…4-...W	**IZMX-CAS164-1600** 101539			Without control circuit terminals
					+IZMX-CAS164-1600 101538			With control circuit terminals according to ordered options
					IZMX-CAS164-1600-SEC 124175			Fully equipped with control circuit terminals
Shutter protection against direct contact When the switch is withdrawn from its connected position, the shutters automatically cover the cassette's live main terminals.								
	800 - 1600	–	3	(+)IZMX-CAS163…	**IZMX-SH163** 101542		1 off	–
					+IZMX-SH163 101541			
			4	(+)IZMX-CAS164…	**IZMX-SH164** 101544			
					+IZMX-SH164 101543			

	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Motor operator						
The motor automatically tensions the spring-operated stored energy mechanism for remote or local actuation. A signaling switch for the "Spring-operated stored energy mechanism tensioned" message is included as standard.						
	24 DC	IZMX16… INX16…	**IZMX-M16-24DC** 123594		1 off	For retrofitting, two additional control circuit terminal blocks are required. → Page 18/19
	24 DC	IZMX16… INX16…	**+IZMX-M16-24DC** 123593			
	48 DC	IZMX16… INX16…	**IZMX-M16-48DC** 123596			
	48 DC	IZMX16… INX16…	**+IZMX-M16-48DC** 123595			
	110 - 125 DC	IZMX16… INX16…	**IZMX-M16-110DC** 123598			
	110 - 125 DC	IZMX16… INX16…	**+IZMX-M16-110DC** 123597			
	220 - 250 DC	IZMX16… INX16…	**IZMX-M16-220DC** 123600			
	220 - 250 DC	IZMX16… INX16…	**+IZMX-M16-220DC** 123599			
	110 - 127 AC	IZMX16… INX16…	**IZMX-M16-110AC** 123602			
	110 - 127 AC	IZMX16… INX16…	**+IZMX-M16-110AC** 123601			
	220 - 240 AC	IZMX16… INX16…	**IZMX-M16-230AC** 123604			
	220 - 240 AC	IZMX16… INX16…	**+IZMX-M16-230AC** 123603			

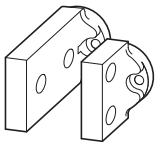
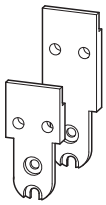
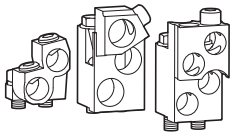
	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Switching operations counter						
Counts the number of On-Off operations. Can also be installed without motor operator.						
	–	IZMX16… INX16…	**IZMX-OC16** 123606		1 off	–
	–	IZMX16… INX16…	**+IZMX-OC16** 123605		1 off	–
Voltage releases						
A closing release can be combined with a voltage release and an undervoltage release or with two voltage releases.						
Shunt releases						
	24 DC	IZMX16… INX16…	**IZMX-ST24DC** 123608		1 off	An additional control circuit terminal block is required for retrofitting. → Page 18/19
			+IZMX-ST24DC 123607			
	48 DC		**IZMX-ST48DC** 123656			
			+IZMX-ST48DC 123616			
	110 - 125 DC 110 - 127 AC		**IZMX-ST110AD** 123728			
			+IZMX-ST110AD 123696			
	220 - 250 DC 208 - 240 AC		**IZMX-ST230AD** 123730			
			+IZMX-ST230AD 123729			
2nd shunt release Cannot be combined with an undervoltage release.						
	24 DC	IZMX16… INX16…	**+IZMX-STS24DC** 123731		1 off	An additional control circuit terminal block is required for retrofitting. → Page 18/19
	48 DC		**+IZMX-STS48DC** 123732			
	110 - 125 DC 110 - 127 AC		**+IZMX-STS110AD** 123733			
	220 - 250 DC 208 - 240 AC		**+IZMX-STS230AD** 123734			
Closing releases without latch check switch						
	24 DC	IZMX16… INX16…	**IZMX-SR24DC** 123736		1 off	An additional control circuit terminal block is required for retrofitting. → Page 18/19
			+IZMX-SR24DC 123735			
	48 DC		**IZMX-SR48DC** 123738			
			+IZMX-SR48DC 123737			
	110 - 125 DC 110 - 127 AC		**IZMX-SR110AD** 123740			
			+IZMX-SR110AD 123739			
	220 - 250 DC 208 - 240 AC		**IZMX-SR230AD** 123742			
			+IZMX-SR230AD 123741			

	Rated control voltage U_s V	For use with	**Part no.** Article no. / **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Voltage releases						
Latch check switch, 1 changeover contact						
	–	IZMX16… INX16…	**IZMX-LCS16** 123885		1 off	For external application
	–		**+IZMX-LCS16** 123884			
	–		**IZMX-LCS16-SR** 123887			For use with closing release IZMX16-SR...
	–		**+IZMX-LCS16-SR** 123886			
Under voltage release Cannot be combined with a second voltage release.						
	24 DC	IZMX16… INX16…	**IZMX-UVR24DC** 123744		1 off	An additional control circuit terminal block is required for retrofitting. → Page 18/19
			+IZMX-UVR24DC 123743			
	48 DC		**IZMX-UVR48DC** 123748			
			+IZMX-UVR48DC 123747			
	110 - 125 DC 110 - 127 AC		**IZMX-UVR110AD** 123801			
			+IZMX-UVR110AD 123761			
	220 - 250 DC 208 - 240 AC		**IZMX-UVR220AD** 123873			
			+IZMX-UVR220AD 123841			
Auxiliary contacts						
Standard auxiliary switch for On-Off signaling The basic device already contains two changeover contacts. Two additional changeover contacts possible.						
	–	IZMX16… INX16…	**IZMX-AS22** 123881		1 off	Three additional control circuit terminal blocks are required for retrofitting. → Page 18/19
			+IZMX-AS22 123880			

	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article No. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Trip indication and reset options					
Trip-indicating auxiliary switch Overcurrent trip switch (OTS) with two changeover contacts.					
	IZMX16…	**IZMX-OTS** 123889		1 off	Three additional control circuit terminal blocks are required for retrofitting.
		+IZMX-OTS 123888			
Automatic reset The switch can be switched on again immediately after a trip. The switch does not contain the mechanical trip-indicator (red pin). Cannot be combined with remote reset.					
	IZMX16…	**IZMX-RA** 123898		1 off	–
		+IZMX-RA 123897			–
Locking facilities					
Locking of ON/OFF buttons Padlockable front cover for On-Off pushbutton.					
	IZMX16… INX16…	**IZMX-PLPC16** 123946		1 off	–
		+IZMX-PLPC16 123906			–
Key locking in safe Off The "Safe Off" locking feature prevents switching on. Neither remote nor local switching on is possible.					
	IZMX16… INX16…	**IZMX-KLP-SO16-CASTELL** 124184		1 off	Castell installation kit without lock cylinder.
		IZMX-KLP-SO16-RONIS 124186			Ronis installation kit without lock cylinder.
		IZMX-KLP-SO16-KIRK 126481			Kirk installation kit without lock cylinder.
		IZMX-KLP-SO16-CES 126479			CES installation kit without lock cylinder.

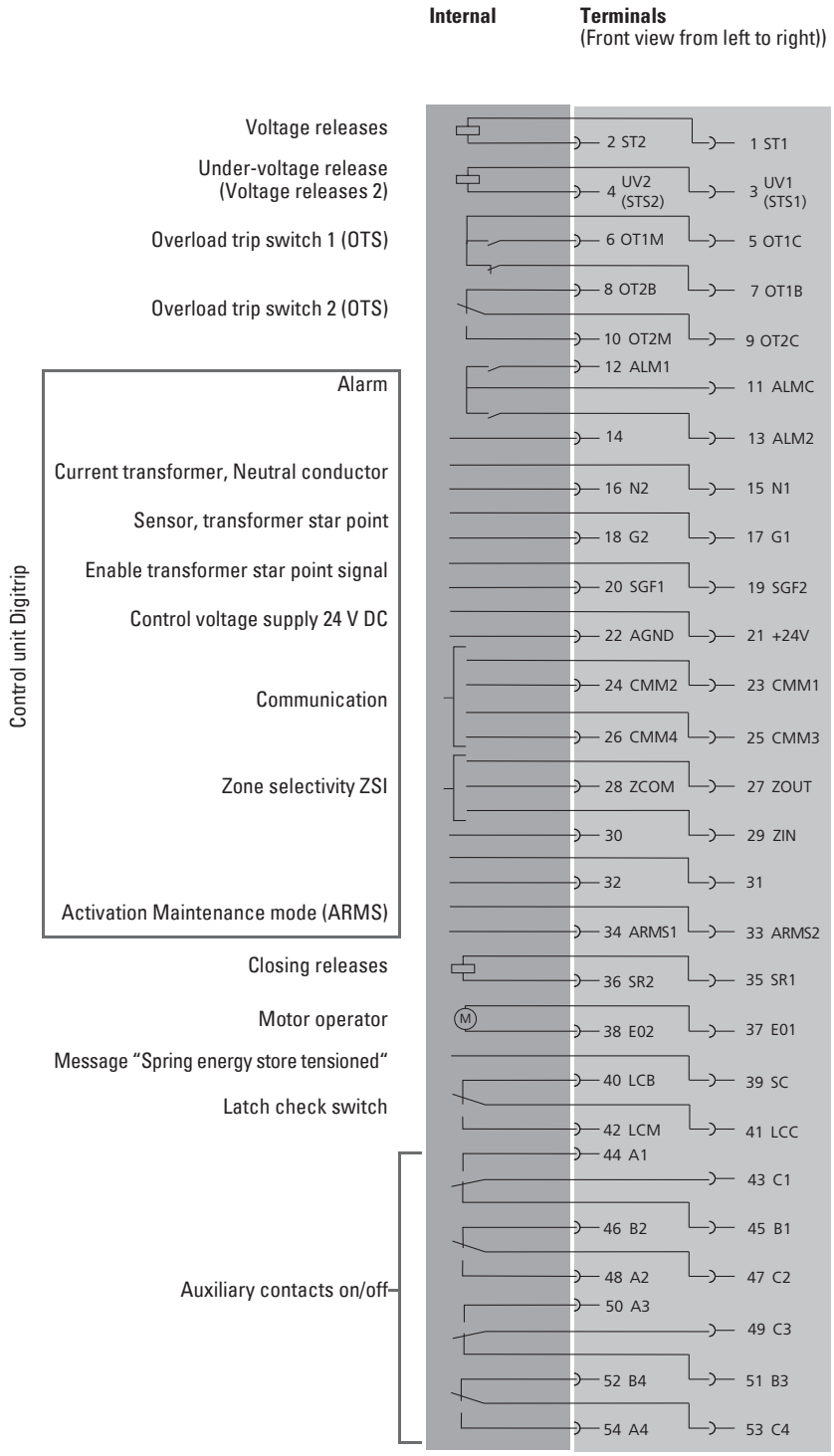
	Rated control voltage U_s V	For use with	Part no. Article no. / Part no. suffix "+IZM..." Article no. for ordering with basic device	Price See price list	Std. pack	Notes
Options and accessories for trip units						
Trip unit for system protection Type A (Digitrip 520)	–		**IZMX-DTA** 124012		1 off	–
Control unit for selective protection	–		**IZMX-DTV** 124013		1 off	–
Add-on functions for Type Vcircuit-breakers (equipped with Digitrip 520LSI)						
Ground fault protection	–	IZMX16…-V… (Digitrip 520LSI)	**+IZMX-DTV-EP** 124016		1 off	–
Zone selectivity Zone selectivity shortens the stagger times in the range of the delayed short-circuit protection.	–	IZMX16…-V… (Digitrip 520LSI)	**+IZMX-DTV-ZSI** 124017		1 off	–
Control unit for universal protection Standard for all circuit-breakers Type U: • Display • Communication-capability • Overload alarm signal Instead of the overload alarm (HLA) either the function ground-fault protection (EP) or ground-fault alarm (EA) can be selected. For fieldbus communications a communications module must be selected in addition.	–		**IZMX-DTU** 124014		1 off	–
Add-on functions for circuit-breakers Type U (equipped with Digitrip 520M)						
Ground fault protection With ground-fault protection instead of overload alarm.	24 DC	IZMX16…-U… (Digitrip 520M)	**+IZMX-DTU-EP** 124018		1 off	24 V DC control voltage required
Ground alarm With ground-fault alarm instead of overload alarm.	24 DC	IZMX16…-U… (Digitrip 520M)	**+IZMX-DTU-EA** 124019		1 off	
ARMS Function The ARMS (Arcflash Reduction Maintenance System™) function enhances personnel safety by reducing the tripping time through a short-circuit protection bypass in the event of an arcing fault.	24 DC	IZMX16…-U… (Digitrip 520M)	**+IZMX-DTU-ARMS** 124020		1 off	
Zone selectivity Zone selectivity decreases the time delays in time selective coordination.	24 DC	IZMX16…-U… (Digitrip 520M)	**+IZMX-DTU-ZSI** 124021		1 off	
Communication modules						
Communication module Modbus	–	IZMX16…	**IZMX-MCAM** 122892		1 off	When retrofitting, four additional control circuit terminal blocks are required. → Page 18/19
Communication module PROFIBUS	–	IZMX16…	**IZMX-PCAM** 122913		1 off	
Test device Hand-held tester for Digitrip Hand-held tester (100 - 240 V AC)	–	IZMX16... IZM26...	**IZM-TEST-KIT** 124161		1 off	–

	Rated operational current I_n A	For use with	Part no. Article no. / Part no. suffix "+IZM..." Article no. for ordering with basic device	Price See price list	Std. pack	Notes
Options and accessories for electronic releases						
Rating plugs (Rate current modules), 3 pole, 4 pole The rated current can be reduced by changing the rating plug, for example, in order to adapt to changed conditions in the application. The rating plug's nominal value must be less than or equal to the basic device's rated current. The rating plug can be replaced on site without replacing the transformer.						
	200	$I_u \leqq 800$ A	**IZMX-RP16A-200** 124027		1 off	–
	200	$I_u \leqq 800$ A	**+IZMX-RP16-200** 124026			
	250	$I_u \leqq 800$ A	**IZMX-RP16A-250** 124029			
	250	$I_u \leqq 800$ A	**+IZMX-RP16-250** 124028			
	300	$I_u \leqq 800$ A	**IZMX-RP16A-300** 124031			
	300	$I_u \leqq 800$ A	**+IZMX-RP16-300** 124030			
	400	$I_u \leqq 800$ A	**IZMX-RP16A-400** 124033			
	400	1000 A $\leqq I_u \leqq$ 1250 A	**IZMX-RP16B-400** 124034			
	400	$I_u \leqq 1250$ A	**+IZMX-RP16-400** 124032			
	500	$I_u \leqq 800$ A	**IZMX-RP16A-500** 124036			
	500	1000 A $\leqq I_u \leqq$ 1250 A	**IZMX-RP16B-500** 124037			
	500	$I_u \leqq 1250$ A	**+IZMX-RP16-500** 124035			
	630	$I_u \leqq 800$ A	**IZMX-RP16A-630** 124039			
	630	1000 A $\leqq I_u \leqq$ 1250 A	**IZMX-RP16B-630** 124040			
	630	800 A $\leqq I_u \leqq$ 1250 A	**+IZMX-RP16-630** 124038			
	800	$I_u \leqq 800$ A	**IZMX-RP16A-800** 124042			
	800	1000 A $\leqq I_u \leqq$ 1250 A	**IZMX-RP16B-800** 124043			
	800	$I_u = 1600$ A	**IZMX-RP16C-800** 124051			
	800	1000 A $\leqq I_u \leqq$ 1600 A	**+IZMX-RP16-800** 124041			
	1000	1000 A $\leqq I_u \leqq$ 1250 A	**IZMX-RP16B-1000** 124131			
	1000	$I_u = 1600$ A	**IZMX-RP16C-1000** 124156			
	1000	1250 A $\leqq I_u \leqq$ 1600 A	**+IZMX-RP16-1000** 124091			
	1250	$I_u \leqq 1250$ A	**IZMX-RP16B-1250** 124158			
	1250	$I_u = 1600$ A	**IZMX-RP16C-1250** 124159			
	1250	$I_u = 1600$ A	**+IZMX-RP16-1250** 124157			
	1600	$I_u = 1600$ A	**IZMX-RP16C-1600** 124160			
Current sensor for neutral conductor						
Measuring current sensor for reading off the N conductor. Allows, for example, ground-fault protection in four-conductor systems with three-pole circuit-breakers.	–	IZMX16…	**IZMX-CT16-N** 124188		1 off	An additional control circuit terminal block is required for retrofitting. → Page 18/19

		Rated operational current I_n A	Pole	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Main terminal kits							
Main terminals are not supplied as standard with the basic devices and cassettes. This universal adapter can be used both as horizontal and as vertical connector. Each set contains the connections for top and bottom. 3 pole = 6 off; 4 pole = 8 off							
	Rear universal connection for fixed/withdrawable mounting	800 - 1600	3	IZMX16…3-W INX16…3-W	**IZMX-THV163** 124181		1 off
			4	IZMX16…4-W INX16…4-W	**IZMX-THV164** 124177		
	Rear universal connection (long) for fixed/withdrawable mounting	800 - 1600	3	IZMX16…3-W INX16…3-W	**IZMX-THVL163** 124233		
			4	IZMX16…4-W INX16…4-W	**IZMX-THVL164** 124234		
	Front universal connection (long) for withdrawable mounting	800 - 1600	3	IZMX16…3-W INX16...3-W	**IZMX-TFL163** 124183		
			4	IZMX16…4-W INX16...4-W	**IZMX-TFL164** 124179		
Tunnel terminals							
For use only in combination with front universal connection IZMX-TFL...							
	For connecting cables with 50-240 mm²	800 - 1600	–	IZMX16…3- INX16…3-	**IZMX-TCA16-2** 124230		1 off
	For connecting cables with 95-185 mm²		–		**IZMX-TCA16-3** 124231		
	For connecting cables with 120-240 mm²		–		**IZMX-TCA16-4** 124232		
General accessories							
Control circuit terminal blocks for fixed mounting							
	Control circuit terminals, 8 blocks	–	–	IZMX16…F INX16…F	**IZMX-SEC16-TB8-F** 124166		1 off
	Control circuit terminals, 20 blocks	–	–	IZMX16…F INX16…F	**IZMX-SEC16-TB20-F** 124167		
	Control circuit terminals, 30 blocks	–	–	IZMX16…F INX16…F	**IZMX-SEC16-TB30-F** 124168		
Control circuit terminal blocks for withdrawable blocks							
	Control circuit terminals, 8 blocks	–	–	IZMX16…W INX16…W	**IZMX-SEC16-TB8-W** 124162		1 off
	Control circuit terminals, 20 blocks	–	–	IZMX16…W INX16…W	**IZMX-SEC16-TB20-W** 124163		
	Control circuit terminals, 30 blocks	–	–	IZMX16…W INX16…W	**IZMX-SEC16-TB30-W** 124165		
Protective cover, IP55							
	The protective cover allows a higher protection type.	–	–	IZMX16… INX16…	**IZMX-DC 16** 124171		1 off
Blank cover for door cutout, IP41							
	Cover for a door cutout (reserved compartment)	–	–	IZMX16… INX16…	**IZMX-BC16** 124172		1 off
Replacement coding, basic device to cassette							
	This is a spare part. The coding is supplied as standard with withdrawable switches.	–	–	IZMX16…W INX16…W	**IZMX-CRB16** 124173		1 off
Replacement hand lever							
	This is a spare part. The hand lever is supplied as standard with withdrawable switches.	–	–	IZMX16…W INX16…W	**IZMX-LT16** 124174		1 off
Spare door seal, IP41							
	This is a spare part. The door sealing frame is supplied as standard with fixed mounting.	–	–	IZMX16…F INX16…F	**IZMX16-DEG-F** 124335		1 off
	This is a spare part. The door sealing frame is supplied as standard with withdrawable units.	–	–	IZMX16…W INX16…W	**IZMX16-DEG-W** 124390		1 off

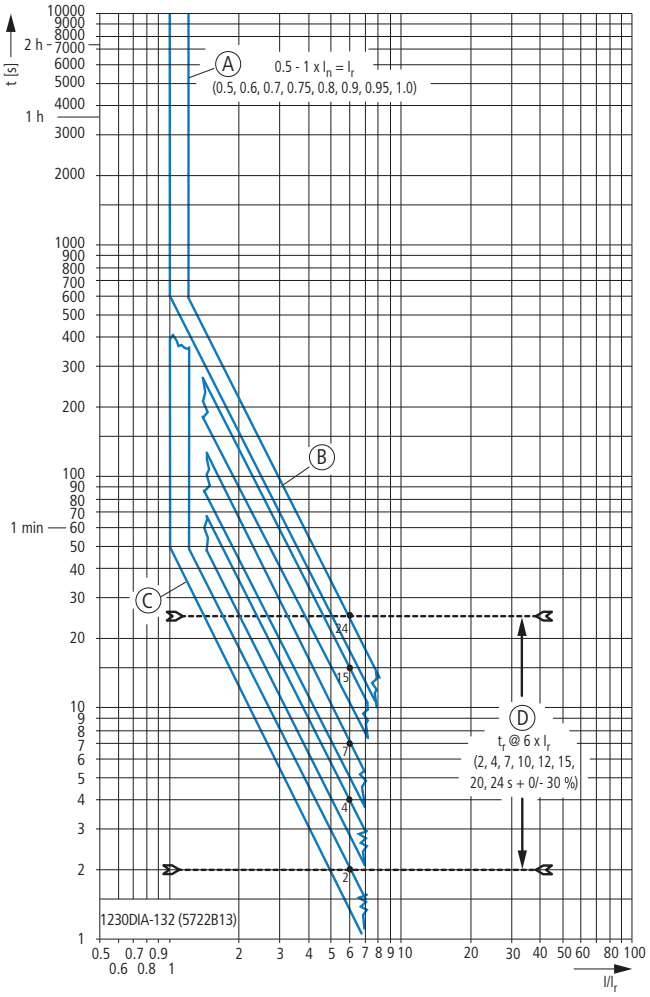
Terminal assignment of control circuit terminals

IZMX16



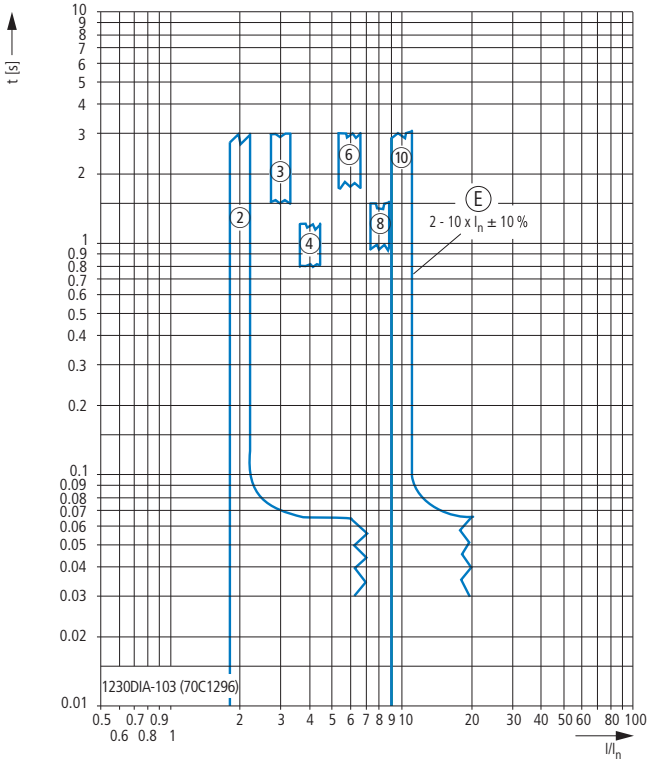
IZMX16…A… Tripping characteristics for selective protection
Overload protection (L) and non-delayed short-circuit protection (I)

L-protection: Adjustable
See Notes 1, 2, 3.



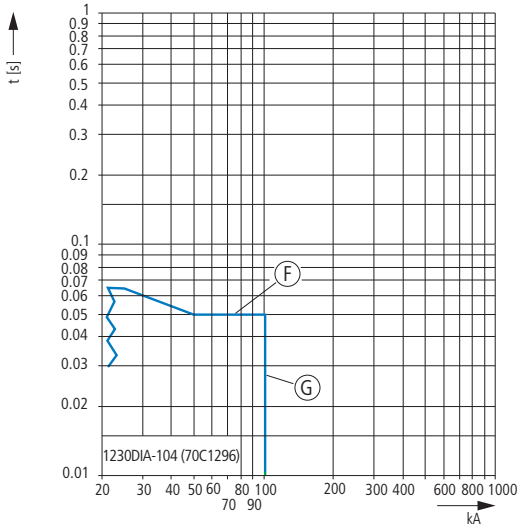
A Set values for overload protection
B Maximum total opening delay
C Minimum total opening delay
D Set values for long delay

I-protection: Adjustable
See Notes 3, 4, 5, 6, 7.



E Set values for non-delayed short-circuit protection

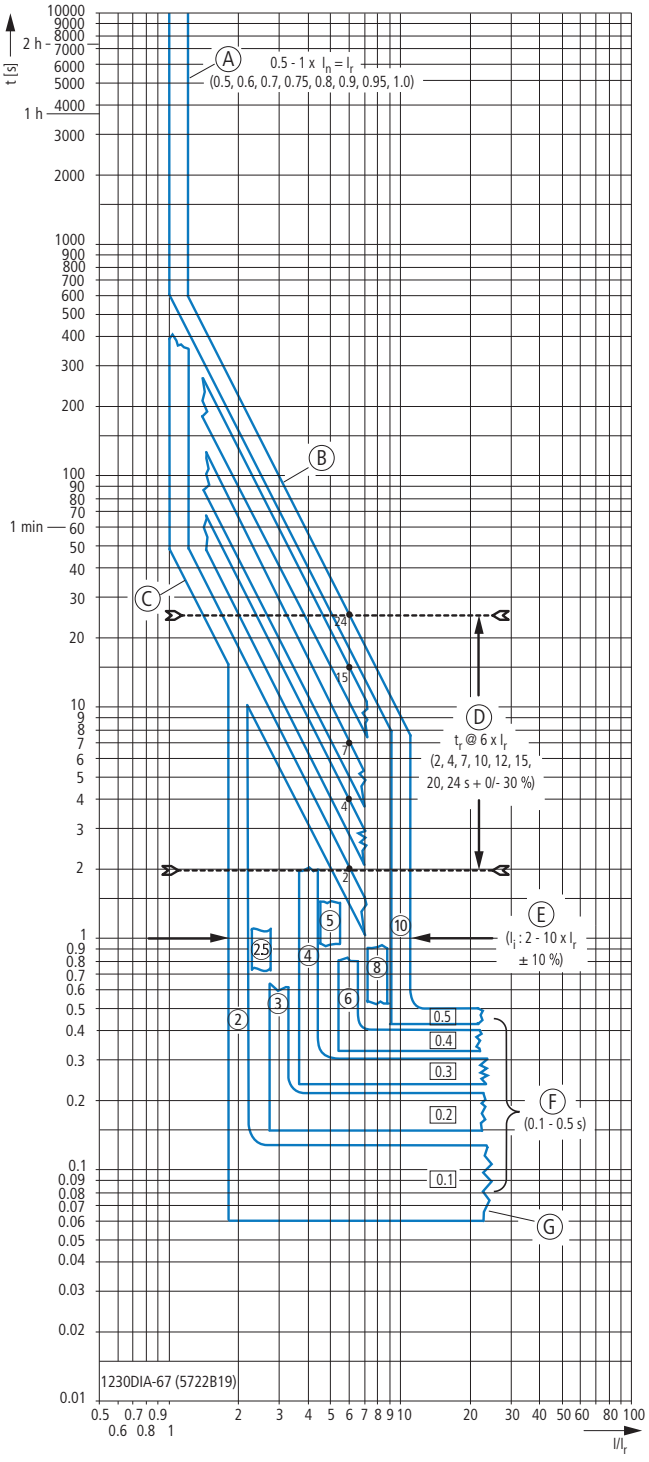
I-protection: For high short-circuit currents
See Notes 3, 4, 5, 6, 7.



F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

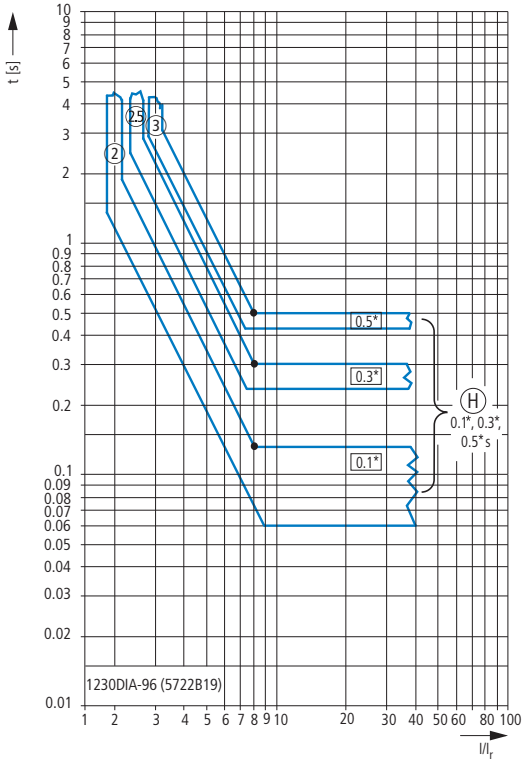
IZMX16…V(U)... Tripping characteristics for selectivity protection and universal protection
Overload protection (L) and short-time delayed short-circuit protection (S)

L-Protection: I²t-Characteristic curve and S-Protection: flat characteristic curve
See Notes 1 to 7.



A Set values for overload protection
B Maximum total opening delay
C Minimum total opening delay
D Set values for long delay
E Set value non-delayed short-circuit protection I_i
F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

S-Protection: I²t-Characteristic curve
See Notes 1 to 7.



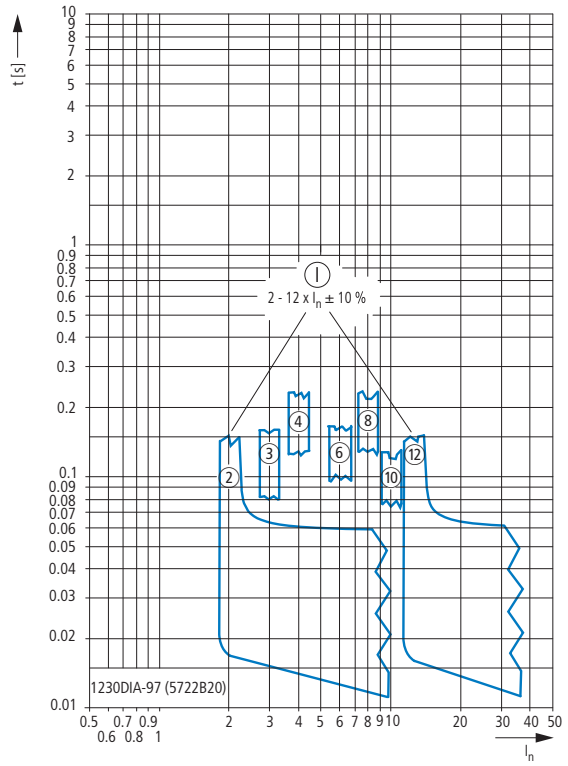
H The characteristic curve for the overload release can extend up to the M1 set value.

IZMX16…V(U)... Tripping characteristics for selectivity protection and universal protection

Non-delayed short-circuit protection (I)

I-protection: Adjustable

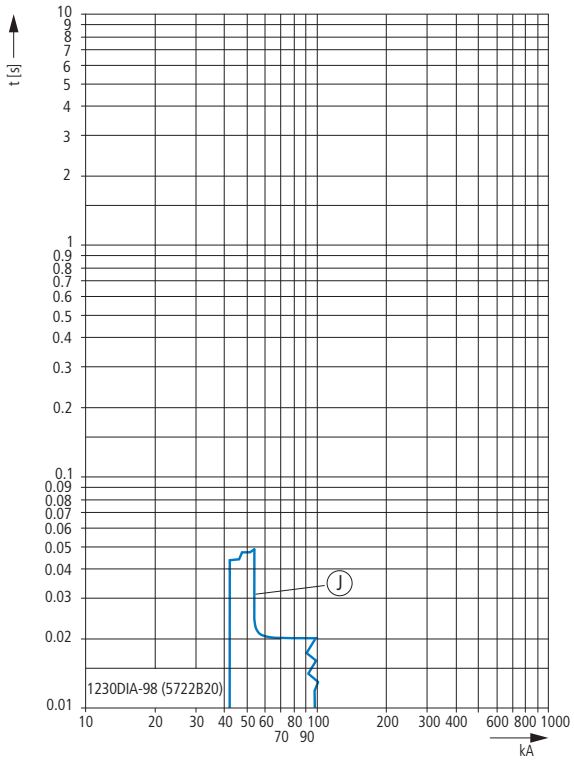
See Notes 2, 6, 8, 9, 10, 11.



I Available set values for non-delayed short-circuit protection I_{sd}

I-protection: For high short-circuit currents

See Notes 2, 6, 8, 9, 10, 11.

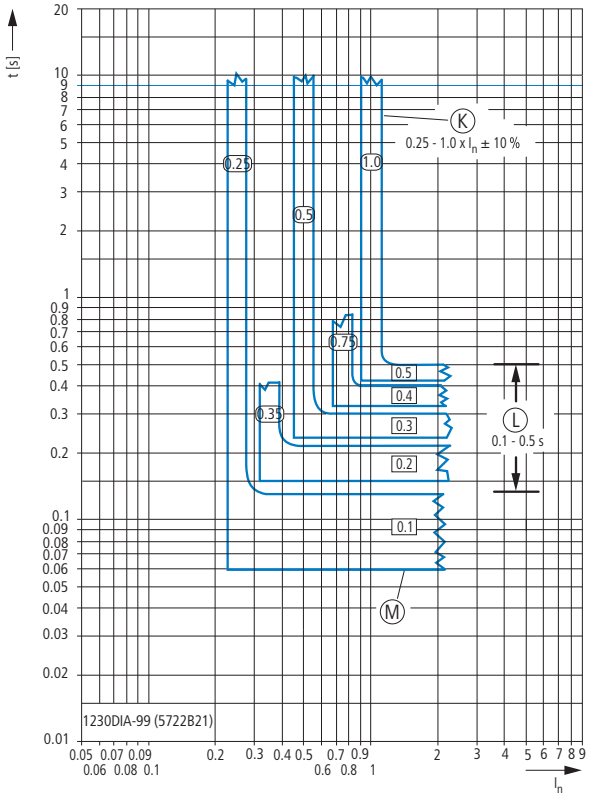


J Short-circuit release for very high currents

IZMX16…V(U)... Option Ground fault protection +IZMX-DTV(U)-EP

G: Ground fault protection, flat characteristic curve

See Notes 2, 6, 12, 13, 14, 15, 16.



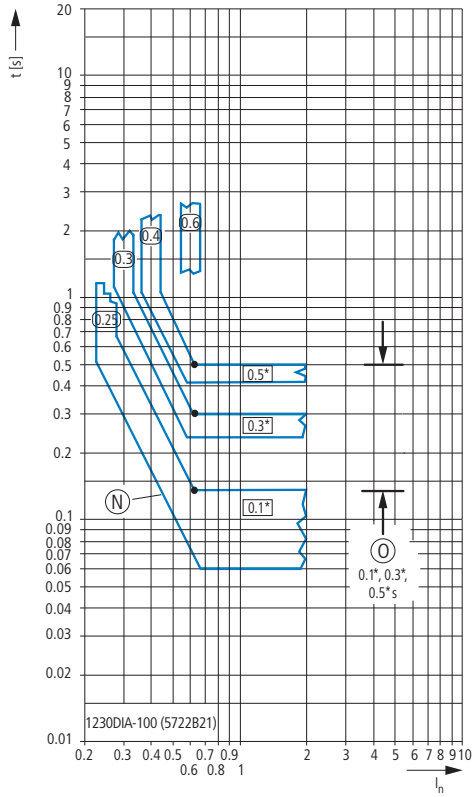
K Set values for short-time delay at I²t characteristic curve

L Set values for ground-fault protection

M Set values for ground-fault protection delay at flat characteristic curve

G: Ground fault protection, I²t-Characteristic curve

See Notes 2, 6, 12, 13, 14, 15, 16.



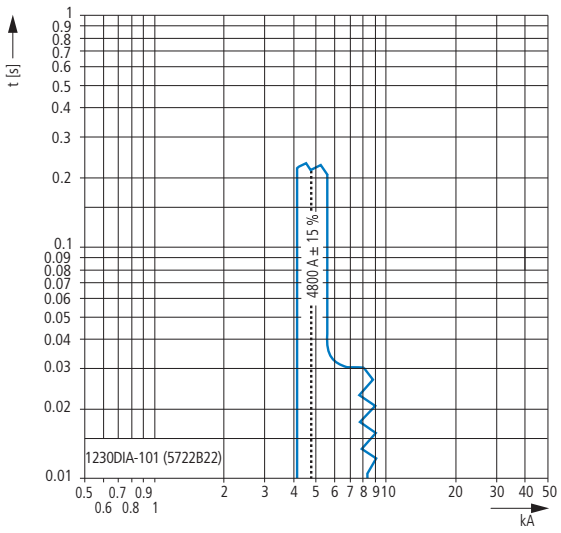
N Flat characteristic curve for the delay time fault protection

O I²t characteristic for ground-fault protection delay time

IZMX16…U... Option Maintenance mode option +IZMX-DTU-ARMS

ARMS-maintenance mode

See Notes 2, 6, 11, 17, 18, 19, 20.



A Set values for overload protection I_r
B Maximum total opening delay
C Minimum total opening delay
D Set value for long delay t_r
E Set value non-delayed short-circuit protection I_i
F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.
H The characteristic curve for the overload release can extend up to the M1 set value.
I Available set values for non-delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
K Set values for short-time delay at I^2t characteristic curve
L Set values for ground-fault protection
M Set values for ground-fault protection delay at flat characteristic curve
N Flat characteristic curve for the delay time fault protection
O I^2t characteristic for ground-fault protection delay time

1 The trip unit has a thermal memory, which can shorten the value in the overload range. This function plays a role whenever a current is higher than the overload release's value and which is then isolated by a downstream circuit-breaker or the circuit-breaker itself. On a subsequent overload current the circuit-breaker will trip more quickly than normal. The reduced value is inversely proportional to the time expired since the last overload. After about five minutes the thermal memory is reset.

2 The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

3 The overload release trips at 110 % I_r with a tolerance of ±10 % (indicated by the "Unit Status" LED). The short-time delayed short-circuit release I_{sd} is activated at a pick-up time of conventionally 100 % with a tolerance of ±10 %.

4 When zone selectivity (ZSI) is activated in the short-time delayed short-circuit release and no blocking signal is applied, the minimum time value (0.10 s) applies irrespective of the short-time delay settings.

5 The upper lines of the I^2t characteristic curves are horizontal from a value of 8 × I_r (indicated by the points).

6 The listed overall switch-off times include the response times of the trip unit, the opening times of the switch and the time required to switch off the current.

7 The characteristic curves apply to applications in a temperature range from -20 °C to +55 °C. Temperatures over +85 °C cause automatic tripping, indicated by an orange-colored LED. The circuit-breaker must be selected according to the temperature-dependent derating values from the table in the technical data.

8 The non-delayed short-circuit release is activated at a response value of conventionally 100 % with a tolerance of ±10 %.

9 The non-delayed short-circuit release can be disabled by the user with an additional Off position.

10 All trip units feature an additional, permanently set non-delayed short-circuit release, which becomes active at a peak value of 90 kA. Tripping by this short-circuit release is indicated by a flashing INST LED. This protective function remains active when non-delayed tripping is set to Off.

11 The listed overall switch-off times are conservative and take into account the trip unit's maximum response times, the circuit-breaker's maximum opening delays and the longest current interruption times with regard to factors that contribute to worst-case conditions, such as maximum rated operational voltage, single-phase interruptions and minimum power factor. Fast breaking times are possible but depend on the system conditions and the circuit-breaker model.

12 The ground-fault release is activated at a response value of conventionally 100 % with a tolerance of ±10 %.

13 Unless otherwise specified, the current value tolerances are ±10 % of the values shown in the diagram.

14 In combination with ARMS function, ground-fault protection is limited to 1200 A.

15 When zone selectivity (ZSI) is activated in ground-fault protection and no blocking signal is applied, the minimum time value (flat characteristic curve) applies irrespective of the settings.

16 The upper lines of the I^2t characteristic curves are horizontal from a value of 0.625 × I_r (indicated by the points).

17 The maintenance mode function (ARMS) must be activated with a switch or through the communications terminals for these characteristic curves to apply. A blue LED indicates that the maintenance mode settings are active.

18 The shown switch-off times apply for connection to an additional auxiliary power supply.

19 Tripping by the ARMS Maintenance Mode Trip is indicated by the non-delayed short-circuit protection LED.

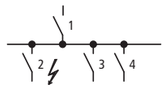
20 The tolerance is ±15 %.

Rating plugs (Plus types)

I_u [A] / I_n [A]	630	800	1000	1250	1600
200	+IZMX-RP16-200				
250	+IZMX-RP16-250				
300	+IZMX-RP16-300				
400	+IZMX-RP16-400				
500	+IZMX-RP16-500				
630	Standard	+IZMX-RP16-630			
800		Standard	+IZMX-RP16-800		
1000			Standard	+IZMX-RP16-1000	
1250				Standard	+IZMX-RP16-1250
1600					Standard

Rating plugs (individual types)

I_u [A] / I_n [A]	630	800	1000	1250	1600
200	IZMX-RP16A-200				
250	IZMX-RP16A-250				
300	IZMX-RP16A-300				
400	IZMX-RP16A-400		IZMX-RP16B-400		
500	IZMX-RP16A-500		IZMX-RP16B-500		
630	IZMX-RP16A-630		IZMX-RP16B-630		
800		IZMX-RP16A-800	IZMX-RP16B-800		IZMX-RP16C-800
1000			IZMX-RP16B-1000		IZMX-RP16C-1000
1250				IZMX-RP16B-1250	IZMX-RP16C-1250
1600					IZMX-RP16C-1600



I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu} : Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit releases

Selectivity 415 V AC
between circuit-breakers enables the separate disconnection of faulty system sections.

Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 remain operational.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, D releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

	Incoming circuit-breaker (1)		**IZMX16...-A**															**IZMX16...-V**					
		I_n [A]	630	630	630	800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600	630	630	630	800	800	800
		I_{cu} [kA]	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65
		I_i [A]	6300	6300	6300	8000	8000	8000	10000	10000	10000	12500	12500	12500	16000	16000	16000	7560	7560	7560	9600	9600	9600
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)																				
NZMB(C)(N)(H)1-A(M)…	20	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	25	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	32	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	40	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	50	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	63	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	80	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	100	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	125	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
	160	25 - 100	6	6	6	9	9	9	15	15	15	T(25)	T(25)	T(25)	T	T	T(50)	T	T	T	T	T	T
NZMB(C)(N)(H)2-A(M)(V)...	20	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	25	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	32	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	40	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	50	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	63	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	80	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	90	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	100	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	125	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	140	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	160	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	200	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	220	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	250	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
	300	25 - 150	8	8	8	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T	T	T	T	T	T	T
NZMC(N)(H)3-A(M)(V)…	220	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	250	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	320	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	350	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	400	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	450	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	500	36 - 150	6	6	6	7	7	7	9	9	9	12	12	12	18	18	18	T	T	T	T	T	T
	630	36 - 150	–	–	–	7	7	7	9	9	9	12	12	12	18	18	18	–	–	–	T	T	T
NZMN(H)4-A(M)(V)…	550	50 - 100	6	6	6	7	7	7	9	9	9	12	12	12	15	15	15	T	T	T	T	T	T
	630	50 - 100	–	–	–	7	7	7	9	9	9	12	12	12	15	15	15	–	–	–	T	T	T
	800	50 - 100	–	–	–	–	–	–	9	9	9	12	12	12	15	15	15	–	–	–	–	–	–
	875	50 - 100	–	–	–	–	–	–	9	9	9	12	12	12	15	15	15	–	–	–	–	–	–
	1000	50 - 100	–	–	–	–	–	–	–	–	–	12	12	12	15	15	15	–	–	–	–	–	–
	1250	50 - 100	–	–	–	–	–	–	–	–	–	–	–	–	15	15	15	–	–	–	–	–	–
	1400	50 - 100	–	–	–	–	–	–	–	–	–	–	–	–	15	15	15	–	–	–	–	–	–
	1600	50 - 100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity

IZMX16...-V									**IZMX16...-U**														
1000	1000	1000	1250	1250	1250	1600	1600	1600	630	630	630	800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600
42	50	65	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65	42	50	65
12000	12000	12000	15000	15000	15000	19200	19200	19200	7560	7560	7560	9600	9600	9600	12000	12000	12000	15000	15000	15000	19200	19200	19200
B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H
Prospective short-circuit current ($I_{cc\ rms}$ in kA)																							
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

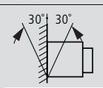
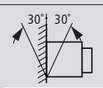
					IZMX16B…06…	IZMX16B…08…	IZMX16B…10…
General							
Standards					IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
Ambient temperature	Storage			°C	-40 - +70 (devices with LCD display -20 - +70)		
	Operation (open)			°C	-25 - +70 (devices with LCD display -20 - +70)		
Mounting position							
Utilization category					B	B	B
Protection type					IP20, IP54 with protective cover		
Direction of incoming supply					Any	Any	Any
Main contacts							
Rated operational current = Rated uninterrupted current		$I_n = I_u$		A	630	800	1000
Rated uninterrupted current at 50 °C[1)]		I_u		A	599	760	950
Rated uninterrupted current at 60 °C[1)]		I_u		A	567	720	900
Rated uninterrupted current at 70 °C[1)]		I_u		A	504	640	800
Rated impulse withstand voltage		U_{imp}		V AC	8000	8000	8000
Rated operational voltage		U_e		V AC	690	690	690
Use in IT electrical power networks up to U = 440 V		I_{IT}		kA	21	21	21
Use in IT electrical power networks up to U = 690 V		I_{IT}		kA	-	-	-
Overvoltage category/pollution degree					III/3	III/3	III/3
Rated insulation voltage		U_i		V	1000	1000	1000
Switching capacity							
Rated short-circuitmaking capacity	Up to 440 V50/60 Hz	I_{cm}		kA	88	88	88
	Up to 690 V 50/60 Hz	I_{cm}		kA	88	88	88
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}		kA	42	42	42
	t = 3 s	I_{cw}		kA	-	-	-
Rated short-circuit breaking capacity I_{cn}							
IEC/EN 60947 Operating sequence I_{cu} O-t-CO							
	Up to 240 V 50/60 Hz	I_{cu}		kA	42	42	42
	Up to 440 V 50/60 Hz	I_{cu}		kA	42	42	42
	Up to 690 V 50/60 Hz	I_{cu}		kA	42	42	42
	Up to 1100 V 50/60 Hz	I_{cu}		kA	-	-	-
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO							
	Up to 240 V 50/60 Hz	I_{cs}		kA	42	42	42
	Up to 440 V 50/60 Hz	I_{cs}		kA	42	42	42
	Up to 690 V 50/60 Hz	I_{cs}		kA	42	42	42
	Up to 1100 V 50/60 Hz	I_{cs}		kA	-	-	-
Switching times							
Total opening delay				ms	20	20	20
Closing delay				ms	25	25	25
Closing delay electrical (via closing release)				ms	30	30	30
Opening delay electrical (via shunt release / undervoltage release)				ms	25/50	25/50	25/50
Opening delay via trip electronics (non-delayed short-circuit release)				ms	25	25	25
Lifespan	Mechanical, without maintenance	Operations			12500	12500	12500
	Mechanical, with maintenance	Operations			20000	20000	20000
	Electrical, without maintenance	Operations			10000	10000	10000
	Electrical, with maintenance	Operations			10000	10000	10000
Maximum operating frequency		Operations/h			60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading	Fixed			W	36	59	92
	Withdrawable			W	50	80	125
Weight							
Fixed	3 pole			kg	15	15	15
	4 pole			kg	20	20	20
Withdrawable	3 pole			kg	39	39	39
	4 pole			kg	47	47	47
Empty cassette	3 pole			kg	18	18	18
	4 pole			kg	21	21	21

Notes [1)] Permissible continuous current for circuit-breakers used at different temperatures within a switchgear assembly.
The expected internal temperatures can be estimated according to the applicable IEC Standards.

IZMX16B…12…	IZMX16B…16…	IZMX16N…06…	IZMX16N…08…	IZMX16N…10…	IZMX16N…12…	IZMX16N…16…
IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
-40 - +70 (devices with LCD display -20 - +70)						
-25 - +70 (devices with LCD display -20 - +70)						
						
B	B	B	B	B	B	B
IP20, IP54 with protective cover						
Any	Any	Any	Any	Any	Any	Any
1250	1600	630	800	1000	1250	1600
1188	1520	599	760	950	1188	1520
1125	1440	567	720	900	1125	1440
1000	1280	504	640	800	1000	1280
8000	8000	8000	8000	8000	8000	8000
690	690	690	690	690	690	690
21	21	21	21	21	21	21
-	-	-	-	-	-	-
III/3	III/3	III/3	III/3	III/3	III/3	III/3
1000	1000	1000	1000	1000	1000	1000
88	88	105	105	105	105	105
88	88	88	88	88	88	88
42	42	42	42	42	42	42
-	-	-	-	-	-	-
42	42	85	85	85	85	85
42	42	50	50	50	50	50
42	42	42	42	42	42	42
-	-	-	-	-	-	-
42	42	50	50	50	50	50
42	42	50	50	50	50	50
42	42	42	42	42	42	42
-	-	-	-	-	-	-
20	20	20	20	20	20	20
25	25	25	25	25	25	25
30	30	30	30	30	30	30
25/50	25/50	25/50	25/50	25/50	25/50	25/50
25	25	25	25	25	25	25
12500	12500	12500	12500	12500	12500	12500
20000	20000	20000	20000	20000	20000	20000
10000	10000	10000	10000	10000	10000	10000
10000	10000	10000	10000	10000	10000	10000
60	60	60	60	60	60	60
132	235	36	59	92	132	235
180	320	50	80	125	180	320
15	15	15	15	15	15	15
20	20	20	20	20	20	20
39	39	39	39	39	39	39
47	47	47	47	47	47	47
18	18	18	18	18	18	18
21	21	21	21	21	21	21

				IZMX16H…06…	**IZMX16H…08…**	**IZMX16H…10…**	**IZMX16H…12…**	**IZMX16H…16…**
General								
Standards				IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
Ambient temperature	Storage		°C	-40 - +70 (devices with LCD display -20 - +70)		-40 - +70 (devices with LCD display -20 - +70)		
	Operation (open)		°C	-25 - +70 (devices with LCD display -20 - +70)		-25 - +70 (devices with LCD display -20 - +70)		
Mounting position								
Utilization category				B	B	B	B	B
Protection type				IP20, IP54 with protective cover		IP20, IP54 with protective cover		
Direction of incoming supply				Any	Any	Any	Any	Any
Main contacts								
Rated operational current = Rated uninterrupted current		$I_n = I_u$	A	630	800	1000	1250	1600
Rated uninterrupted current at 50 °C[1)]		I_u	A	599	760	950	1188	1520
Rated uninterrupted current at 60 °C[1)]		I_u	A	567	720	900	1125	1440
Rated uninterrupted current at 70 °C[1)]		I_u	A	504	640	800	1000	1280
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000	8000	8000
Rated operational voltage		U_e	V AC	690	690	690	690	690
Use in IT electrical power networks up toU = 440 V		I_{IT}	kA	21	21	21	21	21
Use in IT electrical power networks up toU = 690 V		I_{IT}	kA	-	-	-	-	-
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V	1000	1000	1000	1000	1000
Switching capacity								
Rated short-circuit making capacity	Up to 440 V 50/60 Hz	I_{cm}	kA	137	137	137	137	137
	Up to 690 V 50/60 Hz	I_{cm}	kA	88	88	88	88	88
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}	kA	42	42	42	42	42
	t = 3 s	I_{cw}	kA	-	-	-	-	-
Rated short-circuit breaking capacity I_{cn}								
IEC/EN 60947 Operating sequence I_{cu} O-t-CO								
	Up to 240 V 50/60 Hz	I_{cu}	kA	85	85	85	85	85
	Up to 440 V 50/60 Hz	I_{cu}	kA	65	65	65	65	65
	Up to 690 V 50/60 Hz	I_{cu}	kA	42	42	42	42	42
	Up to 1100 V 50/60 Hz	I_{cu}	kA	-	-	-	-	-
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO								
	Up to 240 V 50/60 Hz	I_{cs}	kA	65	65	65	65	65
	Up to 440 V 50/60 Hz	I_{cs}	kA	50	50	50	50	50
	Up to 690 V 50/60 Hz	I_{cs}	kA	42	42	42	42	42
	Up to 1100 V 50/60 Hz	I_{cs}	kA	-	-	-	-	-
Switching times								
Total opening delay			ms	20	20	20	20	20
Closing delay			ms	25	25	25	25	25
Closing delay electrical (via closing release)			ms	30	30	30	30	30
Opening delay electrical (via shunt release / undervoltage release)			ms	25/50	25/50	25/50	25/50	25/50
Opening delay via trip electronics (non-delayed short-circuit release)			ms	25	25	25	25	25
Lifespan								
Mechanical, without maintenance		Operations		12500	12500	12500	12500	12500
Mechanical, with maintenance		Operations		20000	20000	20000	20000	20000
Electrical, without maintenance		Operations		10000	10000	10000	10000	10000
Electrical, with maintenance		Operations		10000	10000	10000	10000	10000
Maximum operating frequency		Operations/h		60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading								
Fixed			W	36	59	92	132	235
Withdrawable			W	50	80	125	180	320
Weight								
Fixed	3 pole		kg	15	15	15	15	15
	4 pole		kg	20	20	20	20	20
Withdrawable	3 pole		kg	39	39	39	39	39
	4 pole		kg	47	47	47	47	47
Empty cassette	3 pole		kg	18	18	18	18	18
	4 pole		kg	21	21	21	21	21

Notes [1)] Permissible continuous current for circuit-breakers used at different temperatures within a switchgear assembly.
The expected internal temperatures can be estimated according to the applicable IEC Standards.

			INX16B…06…	INX16B…08…	INX16B…10…	INX16B…12…	INX16B…16…
General							
Standards			IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947	IEC/EN 60947
Ambient temperature							
Storage		°C	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70
Operation (open)		°C	-25 - +70 (devices with LCD display -20 - +70)				
Mounting position							
Utilization category			B	B	B	B	B
Protection type			IP20, IP54 with protective cover	IP20, IP54 with protective cover	IP20, IP54 with protective cover	IP20, IP54 with protective cover	
Direction of incoming supply			Any	Any	Any	Any	Any
Main contacts							
Rated operational current = Rated uninterrupted current	$I_n = I_u$	A	630	800	1000	1250	1600
Rated uninterrupted current at 50 °C[1)]	I_u	A	599	760	950	1188	1520
Rated uninterrupted current at 60 °C[1)]	I_u	A	567	720	900	1125	1440
Rated uninterrupted current at 70 °C[1)]	I_u	A	504	640	800	1000	1280
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000
Rated operational voltage	U_e	V AC	690	690	690	690	690
Use in IT electrical power networks up toU = 440 V	I_{IT}	kA	21	21	21	21	21
Use in IT electrical power networks up toU = 690 V	I_{IT}	kA	-	-	-	-	-
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V	1000	1000	1000	1000	1000
Switching capacity							
Rated short-circuit making capacity							
Up to 440 V 50/60 Hz	I_{cm}	kA	88	88	88	88	88
Up to 690 V 50/60 Hz	I_{cm}	kA	88	88	88	88	88
Rated short-time withstand current 50/60 Hz							
t = 1 s	I_{cw}	kA	42	42	42	42	42
t = 3 s	I_{cw}	kA	-	-	-	-	-
Switching times							
Total opening delay		ms	20	20	20	20	20
Closing delay		ms	25	25	25	25	25
Closing delay electrical (via closing release)		ms	30	30	30	30	30
Opening delay electrical (via shunt release / undervoltage release)		ms	25/50	25/50	25/50	25/50	25/50
Lifespan							
Mechanical, without maintenance	Operations		12500	12500	12500	12500	12500
Mechanical, with maintenance	Operations		20000	20000	20000	20000	20000
Electrical, without maintenance	Operations		10000	10000	10000	10000	10000
Electrical, with maintenance	Operations		10000	10000	10000	10000	10000
Maximum operating frequency	Operations/h		60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading							
Fixed		W	36	59	92	132	235
Withdrawable		W	50	80	125	180	320
Weight							
Fixed							
3 pole		kg	15	15	15	15	15
4 pole		kg	20	20	20	20	20
Withdrawable							
3 pole		kg	39	39	39	39	39
4 pole		kg	47	47	47	47	47
Empty cassette							
3 pole		kg	18	18	18	18	18
4 pole		kg	21	21	21	21	21

Notes

[1)] Permissible continuous current for circuit-breakers used at different temperatures within a switchgear assembly. The expected internal temperatures can be estimated according to the applicable IEC Standards.

IZMX-AS22, IZMX-OTS, IZMX-S..., IZMX-U...

			Auxiliary contacts IZMX-AS22	Overload trip IZMX-OTS	IZMX-LCS16(-SR)
Rated breaking capacity					
Inductive load					
250 V AC		A	10	10	10
125 V DC		A	0.5	0.5	0.5
250 V DC		A	0.25	0.25	0.25

			Voltage releases				Closing releases			
			IZMX-ST24DC IZMX-STS24DC	IZMX-ST48DC IZMX-STS48DC	IZMX-ST110AD IZMX-STS110AD	IZMX-ST230AD IZMX-STS230AD	IZMX-SR24DC	IZMX-SR48DC	IZMX-SR110AD	IZMX-SR230AD
Rated control voltage										
AC 50/60 Hz	U_s	V	–	–	110 - 127	208 - 240	–	–	110 - 127	208 - 240
DC	U_s	V	24	48	110 - 125	220 - 250	24	48	110 - 125	220 - 250
Power consumption										
AC		VA	–	–	(pick-up 450)	(pick-up 450)	–	–	(pick-up 450)	(pick-up 450)
DC		W	(pick-up 250)	(pick-up 250)	(pick-up 450)	(pick-up 450)	(pick-up 250)	(pick-up 250)	(pick-up 450)	(pick-up 450)
Response time of the circuit-breaker with U_s		ms	35	35	35	35	40	40	40	40
Operating range										
Drop-out voltage										
AC operated, 50/60 Hz	Drop-out	x U_c	–	–	–	–	–	–	–	–
Pick-up voltage										
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

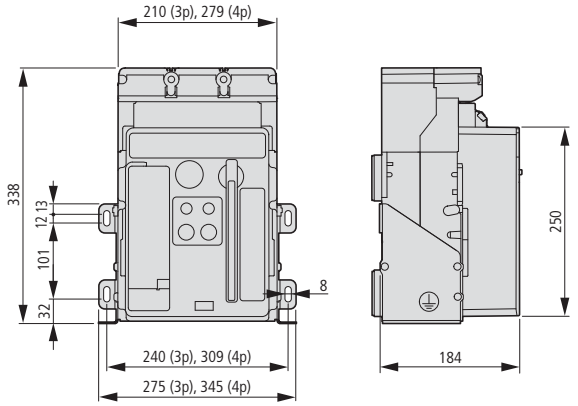
			Under-voltage releases			
			IZMX-UVR24DC	IZMX-UVR48DC	IZMX-UVR110AD	IZMX-UVR220AD
Rated control voltage						
AC 50/60 Hz	U_s	V	–	–	110 - 127	208 - 240
DC	U_s	V	24	48	110 - 125	220 - 250
Power consumption						
AC		VA	–	–	5 (pick-up 890)	5 (pick-up 910)
DC		W	5 (pick-up 500)	5 (pick-up 850)	5 (pick-up 890)	5 (pick-up 910)
Response time of the circuit-breaker with U_s		ms	50	50	50	50
Operating range						
Drop-out voltage						
AC operated, 50/60 Hz	Drop-out	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard
Pick-up voltage						
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

			Motor operator					
			IZMX-M16-24DC	**IZMX-M16-48DC**	**IZMX-M16-110AC**	**IZMX-M16-110DC**	**IZMX-M16-230AC**	**IZMX-M16-220DC**
Rated control voltage								
AC 50/60 Hz	U_s	V	–	–	110 - 127	–	220 - 240	–
DC	U_s	V	24	48	–	110 - 125	–	220 - 250
Necessary time required for charging of the spring-operated stored energy mechanism at 1 x U_s		s	3	3	3	3	4	4
Rated operational current	I_n	A	5	3	2	1	1	1
Starting current		A	25	15	6	5	10	10
Power consumption								
AC 50/60 Hz		VA	–	–	280	280	280	280
DC		W	150	150	150	150	150	280

Dimensions

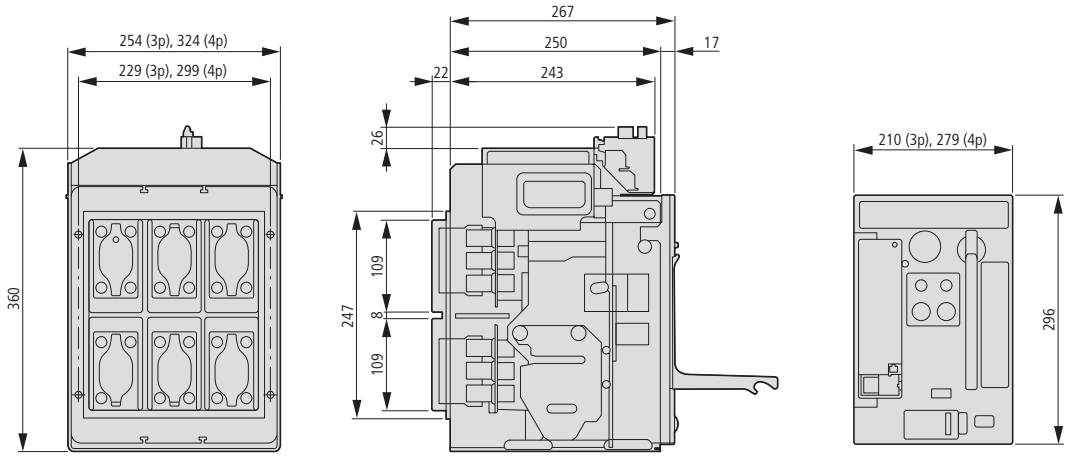
INX16, IZMX16 fixed mounted

INX16…F, IZMX16…F



INX16, IZMX16 withdrawable units

INX16…W, IZMX16…W



IZM26

I_{cu} = I_{cs} at U_e = 440/690 (1100) V AC
I_{cu}: Rated ultimate short-circuit breaking capacity at rated operational voltage U_e
I_{cs}: rated service short-circuit breaking capacity at rated operational voltage U_e

Circuit-breaker	Rated operational current I_n A	Basic switching capacity (B) 440/690 V AC I_{cu} / I_{cs} kA/kA	Normal switching capacity (N) 440/690 V AC I_{cu} / I_{cs} kA/kA	High switching capacity (H) 440/690 V AC I_{cu} / I_{cs} kA/kA	(S) 1100 V AC I_{cu} / I_{cs} kA/kA
IZM20	800 - 1600	50/50	65/65	-	-
IZM20	2000	50/50	65/65	-	-
IZM32	800 - 1600	65/65	85/85	100/85	-
IZM32	2000 - 3200	65/65	85/85	100/85	-
IZM40	4000	-	85/65	100/65	-
IZM63	4000 - 6300	-	85/85	100/100	-
IZM32S	3200	-	-	-	25

I_{cu} = I_{cs} at U_e = 440/690 (1100) V AC
I_{cw} at t = 1 s/t = 3 s
I_{cw}: Rated short-time withstand current

Circuit-breaker	Rated operational current I_n A	Basic switching capacity (B) t = 1 s/t = 3s I_{cw} / I_{cw} kA/kA	Normal switching capacity (N) t = 1 s/t = 3s I_{cw} / I_{cw} kA/kA	High switching capacity (H) t = 1 s/t = 3s I_{cw} / I_{cw} kA/kA
IZM20	800 - 1600	50/-	65/40	-
IZM20	2000	50/30	65/40	-
IZM32	800 - 1600	65/-	85/65	85/65
IZM32	2000 - 3200	65/50	85/65	85/65
IZM40	4000	-	85/65	100/65
IZM63	4000 - 6300	-	85/65	100/65

I_{cm} at Ue = 440/690 V AC I_{cm}: Rated short-circuit making capacity (Peak value) at rated operational voltage U_e		**Basic switching capacity (B)**	**Normal switching capacity (N)**	**High switching capacity (H)**	**(S)**
		440/690 V AC	440/690 V AC	440/690 V AC	1100 V AC
Switch-disconnector	Rated operational current I_n A	I_{cm} kA	I_{cm} kA	I_{cm} kA	I_{cm} kA
IN20	800 - 1600	105	143	-	-
IN20	2000	105	143	-	-
IN32	800 - 1600	143	187	-	-
IN32	2000 - 3200	143	187	-	-
IN40	4000	-	187	220	-
IN63	4000 - 6300	-	187	220	-
IN32S	3200	-	-	-	52

I_{cm} at U_e = 440/690 V AC I_{cw} at t = 1 s/t = 3 s I_{cw}: Rated short-time withstand current		**Basic switching capacity (B)**	**Normal switching capacity (N)**	**High switching capacity (H)**
		t = 1 s/t = 3s	t = 1 s/t = 3s	t = 1 s/t = 3s
Switch-disconnector	Rated operational current I_n A	I_{cw} /I_{cw} kA/kA	I_{cw} /I_{cw} kA/kA	I_{cw} /I_{cw} kA/kA
IN20	800 - 1600	50/-	65/40	-
IN20	2000	50/30	65/40	-
IN32	800 - 1600	65/-	85/65	-
IN32	2000 - 3200	65/50	85/65	-
IN40	4000	-	85/65	100/65
IN63	4000 - 6300	-	85/65	100/65



		IZM26 ...-A... System protection DTA Digitrip 520 LI	**IZM26 ...-V...** Selectivity protection DTV Digitrip 520 LSI(G)	**IZM26 ...-U...** Universal protection DTU Digitrip 520MC LSI(G)	**IZM26 ...-P...** Universal protection with power measurement DTP Digitrip 1150i LSI(G)
					
Current range		200 A – 3200 A	200 A – 6300 A	200 A – 6300 A	200 A – 6300 A
RMS value monitoring		●	●	●	●
Protective functions					
General					
Ordering options		LI	LSI, LSIG	LSI, LSIG, LSIA	LSI, LSIG, LSIA
Rating plug (I_n)		●	●	●	●
Overtemperature trip		●	●	●	●
Overload protection	**L**				
Overload trip		(0.4 - 1.0) x I_n	(0.4 - 1.0) x I_n	(0.4 - 1.0) x I_n	(0.4 - 1.0) x I_n
Long delay time I^2t at 6 x I_r		2 - 24 s	2 - 24 s	2 - 24 s	2 - 24 s
Long delay time I^4t		–	–	–	1 - 5 s
Thermal memory		●	●	●	●
Overload alarm signal		–	–	○[1]	○[1]: (0.5 - 1.0) x I_r
Short-time delayed short-circuit protection	**S**				
Short delay pickup		–	(2 - 10) x I_r and M1[2]	(2 - 10) x I_r and M1[2]	(2 - 10) x I_r and M1[2]
Short delay time I^2t at 8 x I_r		–	100 - 500 ms	100 - 500 ms	100 - 500 ms
Short delay time, flat characteristic curve		–	100 - 500 ms	100 - 500 ms	100 - 500 ms
Zone selectivity ZSI[1]		–	○	○	○
Non-delayed short-circuit protection	**I**				
Non-delayed short-circuit protection		(2 - 10) x I_n	(2 - 10) x I_n and M1[2]	(2 - 10) x I_n and M1[2]	(2 - 10) x I_n and M1[2]
Switch-off function		–	●	●	●
Closing releases MCR		●	●	●	●
Ground operational fault protection	**G**				
Ground/fault alarm		–	–	○1)	○1)
Ground fault protection release		–	(0.25 - 10) x I_n	(0.25 - 10) x I_n[3]	(0.25 - 10) x I_n[3]
Short delay time I^2t at 0.625 x I_n		–	100 - 500 ms	100 - 500 ms	100 - 500 ms
Short delay time, curve		–	100 - 500 ms	100 - 500 ms	100 - 500 ms
Zone selectivity ZSI[1]		–	○	○	○
Thermal memory		–	●	●	●
Neutral conductor-conductor protection	**N**	●	Only for type LSI	Only for type LSI	Only for type LSI

Notes

I_n = rating plug (rated current module) = rated operational current current transformer
I_r = Set value overload trip (= Rated operational current of system)
[1] Requires an external 24 V DC control voltage supply.
[2] Additionally available M1 set values:

IZM20
M1 = 14 x I_n for rated operational currents von 200 A to 1250 A
M1 = 12 x I_n for rated operational currents from 1600 A to 2000 A
IZM32
M1 = 14 x I_n for rated operational currents von 200 A to 1250 A
M1 = 12 x I_n for rated operational current from 1600 A to 2500 A
M1 = 10 x I_n for rated operational currents from 3200 A
IZM40
M1 = 12 x I_n for rated operational currents from 4000 A
IZM63
M1 = 14 x I_n for rated operational currents from 2000 A 2500 A
M1 = 12 x I_n for rated operational currents von 3200 A 5000 A
M1 = 10 x I_n for rated operational currents from 6300 A

[3] In combination with ARMS function limited to 1200 A.

● Standard
○ Optional

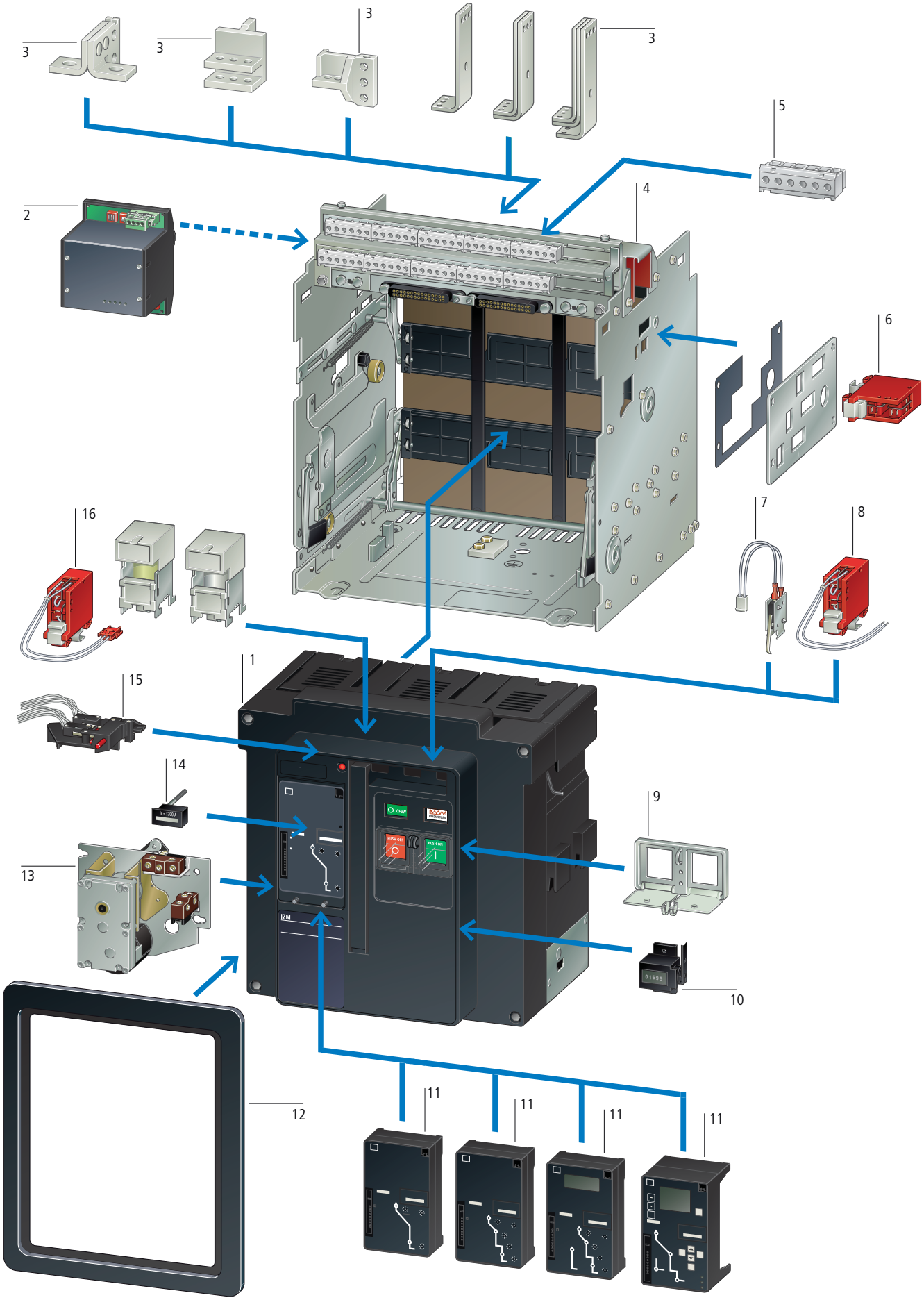
		IZM26 ...-A...	**IZM26 ...-V...**	**IZM26 ...-U...**	**IZM26 ...-P...**
		System protection DTA Digitrip 520 LI	Selectivity protection DTV Digitrip 520 LSI(G)	Universal protection DTU Digitrip 520MC LSI(G)	Universal protection with power measuring DTP Digitrip 1150i LSI(G)
					
System diagnostics					
Cause of trip LEDs		●	●	●	●
Current at trip point		–	–	●[1]	●[1]
Remote signaling contacts	**A**	–	–	●[1]	●[1]
Programmable signal contacts	**A**	–	–	–	●[1]
System monitor					
Digital display		–	–	4-digit LED	24-digit LED
Current display (%)		–	–	●	●
Phase voltage (%)		–	–	–	●
Power and energy (%)		–	–	–	●
Apparent power kVA reference and delivery		–	–	–	●
Reactive power kVAR		–	–	–	●
Power factor		–	–	–	●
Crest factor		–	–	–	●
Power quality, harmonics		–	–	–	●
THD factor (%)		–	–	–	●
Fieldbus communication		–	–	Modbus, PROFIBUS	Modbus, PROFIBUS
Additional functions					
Trip history (3 events)		–	–	–	●
Electronic operations counter		–	–	–	●
Test possibility[2]		Hand held test unit	Hand held test unit	Hand held test unit	Hand held test unit and integrated function
Maintenance mode ARMS		–	–	○[1]	○[1]
Curve-form plotting		–	–	–	●

Notes

I_n = rating plug (rate current module) = rated operational current current transformer
I_r = Set value overload trip (= rated operational current of system)
[1] Requires an external 24 V DC control voltage supply.
[2] Hand-held tester for simulating secondary current

● Standard
○ Optional

System overview



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Key to type references

IZM	20	B	3	-	A	08	W
IN	32	N	4		V	10	F
	40	H			U	12	
	63	S			P	16	
						20	
						25	
						32	
						40	
						50	
						63	

IZM, IN = Product family

Frame size
20: Narrow 800 - 2000 A
32: Standard 800 - 3200 A
40: Double narrow 4000 A
63: Double wide 4000 - 6300 A

Switching capacity
B = Basic
N = Normal
H = High
S = Special type for 1100 V (only for size 32, 3200 A)

Number of poles
3: 3 pole
4: 4 pole

Trip type
A= System protection = Digitrip 520 LI
V= Selective protection = Digitrip 520 LSI(G)
U= Universal protection = Digitrip 520MC LSI(G)
P= Universal protection with power measurement = Digitrip 1150i+ LSI(G)

Rated operational current
08: 800 A
10: 1000 A
12: 1250 A
16: 1600 A
20: 2000 A
25: 2500 A
32: 3200 A
40: 4000 A
50: 5000 A
63: 6300 A

Model
W = Withdrawable
F = Fixed



IZM26: Robust safety

Eaton's IZM26 circuit-breakers offer a proven and complete range of air circuit-breakers up to 6300 A. Four sizes enable the ideal circuit-breaker to be selected economically for any project. In this way, only the module width increases with the required rated operational current, enabling the most compact and economical size to be selected.

The particularly rugged circuit-breakers are already in use 100,000 times in harsh industrial environments worldwide. Large material thicknesses and a high short-time withstand current are its characteristic features.

Applications

The circuit-breakers can be used in four main application areas depending on the type of equipment to be protected:
- System protection,
- Motor protection,
- Transformer protection,
- Generator protection.

These key applications make different demands on the switches, which are met with a range of trip units.

Switches with closing release
They are particularly suitable for synchronization tasks.

Coupler switches
Beside the IZM26 circuit-breakers, IN26 switch-disconnectors are available. These are used, for example, as coupler switches between different power supplies.

Modular design

Because components are installed from the front, retrofitting accessories is especially quick and easy. This allows flexible response to changing requirements within the system.

Standard scope of delivery as usual

- With the new IZM26, you also select a basic device that is already fitted with an electronic release and horizontal terminal adapters.
- The standard mounting is on a horizontal mounting plate or on horizontal traverses in the switching cabinet.
- With four-pole devices, the neutral conductor is arranged on the left (front view).
- The neutral conductor can be loaded 100% like the phase conductors.
- The circuit-breakers are provided with a standard mechanical reclosing lockout. After an overload trip, the fault is usually examined first of all. After the fault is identified and rectified, the mechanical reclosing lockout is reset by pressing the red mechanical trip indicator on the front of the circuit-breaker.
- An “Automatic Reset” can be ordered as an option. This enables the circuit-breaker to be restored to operation immediately at any time after the spring-operated stored energy mechanism is retensioned. In these applications compulsory fault analysis is intentionally avoided.
- The number of control cable terminals depends on the accessories fitted.
- If a cassette is ordered without the basic device, this is already fitted with the maximum number of control cable terminals.
- The standard consists of 2 NO contacts and 2 NC contacts for ON/OFF status indication.
- A coding mechanism between the basic device and the cassette prevents impermissible combinations (“Rejection Interlock”).

Expansion of Standardequipment supplied for IZM26

Some order types from the past can no longer be found since the following options are now already part of the standard scope of delivery:
- The door escutcheon is now always included in the scope of delivery. With withdrawable designs this is supplied with the cassette (withdrawable unit).
- On withdrawable units the circuit-breaker can be pulled out to inspect the arc chutes. With fixed units, it is recommended that sufficient space is provided above the circuit-breaker to enable inspection. An additional cover is not required.
- All basic devices that are provided with universal protection (with Digitrip 520M…), now feature a display.
- On each circuit-breaker the integrated Digitrip electronic release is factory fitted with a sealable protective cover.
- If a motor operator is ordered, the “Spring-operated stored energy mechanism tensioned” indicator switch is automatically provided.

Other benefits of the IZM26

- There are still four main variants of overcurrent release units. Only the fourth variant was renamed and is now “P” (as in Power Measurement) instead of “D” (as in Digital trip). On each P circuit-breaker (Digitrip 1150) the power measurement is already an integral part of the electronic release.
- The voltage tap-off for power measurement is integrated in the device so that an additional external voltage transformer is unnecessary. This solution saves costs, space and installation effort.
- Certain applications require the use of an interface to the external control voltage supply (see below). A new feature is that the electronic release can be prepared for an external control voltage supply of 120 V AC or 240 V AC (order option).
- A switching operations counter can now be used thanks to the separate mounting position, also independently of a motor operator.
- Withdrawable unit operation: The unit is actuated with a hand crank supplied. This is now possible also with a standard tool (square drive socket 3/8").
- Four sizes are available to ensure the optimum device for any application. As before, the entire rated operational current range from 800 A to 6300 A can be covered with two sizes.
- Sizes IZM40 and IZM63 are produced in simple terms by doubling sizes IZM20 and IZM32. This consequently provides on the IZM40 and IZM63 two terminals for each phase on the incoming side and on the outgoing side. This facilitates the thermal design of the switchboard and in some switchboard systems simplifies production and reduces the number of busbar adapter variants.
- The phase sequence for the IZM40 and IZM63 is as follows: (NN)AABBCC.
- The IZM for 6300 A is now offered with horizontal connection as standard, thus considerably simplifying the busbar connection for most switchboard systems.

External control voltage supply

- The standard protection functions of the IZM26 operate generally independently of an external control voltage supply. The power supply of the electronics unit, for example for overload and short-circuit protection, is implemented via the current transformers integrated in the circuit-breaker.
- The universal release unit with display can be fed with a 24 V DC/48 V DC supply or a 120 V AC or 240 V AC supply if required so that the display function can also be used without a load. An external power supply is needed if communication functions are required.
- The P release unit should always be operated with an external power supply as it is normally selected due to its extensive control voltage dependent functions.

Communication capability

The communication-capability of the IZM26 circuit-breakers enable them to open up new possibilities in power distribution. They can thus provide and transmit all important operational information. This increases system transparency and shortens the response times to states such as overcurrent, phase asymmetry and overvoltage.

A rapid intervention in a process can, for example, prevent downtimes and help to schedule maintenance activities and therefore boost plant availability.

A Modbus interface is offered as an alternative in addition to the Profibus interface.

Greater safety for maintenance personnel with ARMS™

If the IZM26 is fitted with the newly patented ARMS system (Arcflash Reduction Maintenance System™), a non-delayed immediate disconnection is ensured in the event of an arc fault. This disconnection is even faster than that of a non-delayed short-circuit release..

This function can be activated directly on the circuit-breaker or via an external switch, such as when maintenance personnel enter a hazardous area. Other components from the ARCON protective system, in conjunction with the IZM26 enable arc fault protection in stages. ARCON on the Internet: www.moeller.net/arcon

Selection criteria for IZM26 circuit-breakers

Fundamental criteria for the selection of circuit-breakers:

- Max short-circuit current $I_{k\,max}$ at the circuit-breaker’s point of installation: this value determines the short-circuit breaking capacity or the short-circuit current carrying capacity of the circuit-breaker. It is compared to the I_{cu}, I_{cs} and I_{cw} values of the circuit-breaker and determines essentially its size (see Technical data).
- Rated operational current I_n which should flow through the respective branch circuit:
  This value must not be greater than the maximum switch rated operational current of the circuit-breaker. The rated operational current can be adjusted down using additional rated operational current modules.
- Ambient temperature of the circuit-breaker: This is generally the internal temperature in the control panel. Observe the derating values with increased ambient temperature (see Technical data).
- Circuit-breaker type: fixed mounted or withdrawable units, 3 or 4 pole.
- Minimum short-circuit current, which flows through the switching device: The release must recognize this value as a short-circuit and may react with a trip.
- Protection functions of the circuit-breaker: This is determined by the selection of the respective overcurrent release.

Documentation

Operating manual
AWB1230-1605de (deutsch)
AWB1230-1605en (english)

CurveSelect characteristics program

Display tripping characteristics according to user settings and assess their interaction effectively:
www.moeller.net/de/support



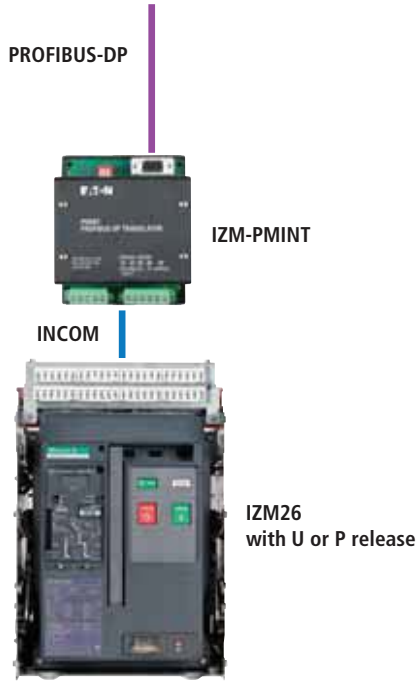
Components for IZM26 communication

The IZM26 series devices can be connected to a PROFIBUS-DP or Modbus RTU filed bus. Interfaces IZM-PMINT and IZM-MMINT are compact devices for mounting on top-hat rails, i.e. independently of the switch. They output all information available in the trip unit to the fieldbus, including switch status, current, voltage, power, and energy, as well as diagnostic information such as overcurrent, phase asymmetry and overvoltage. The fieldbus also facilitates actuation of the motor operator and therefore its remote operation.

Requirements

The communications modules can be used in combination with IZMX26…-U or IZMX26…-P… circuit-breakers.

PROFIBUS-DP configuration



Communications module IZM-PMINT has a 9-pin D-Sub socket for connection to PROFIBUS. The module works as a slave on PROFIBUS-DP; the data is defined through a standardized device master data file, which permits smooth integration of the IZM in a DP line.

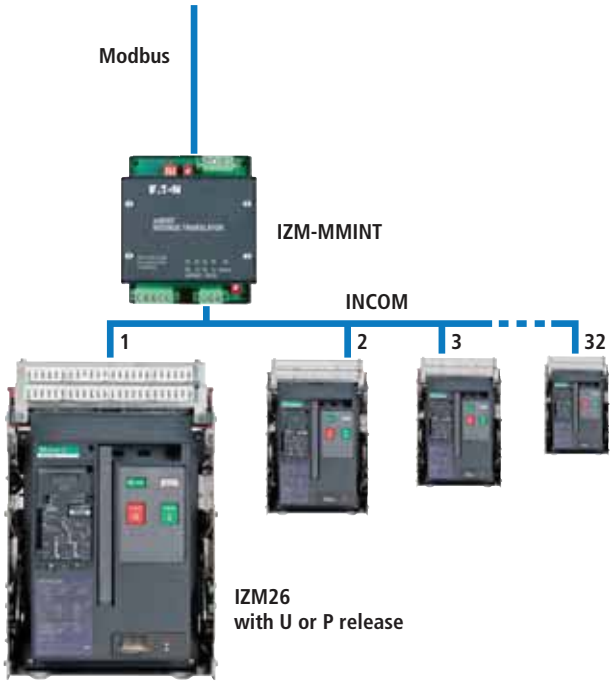
PROFIBUS
- On the PROFIBUS-DP side the module supports automatic baud rate detection; the PROFIBUS-DP bus address is set through the trip unit's display. The maximum cable length is 2.4 km.
- To operate the IZM-PMINT, a supply voltage of 24 V DC or 240 V AC is required.

INCOM
- The data connection to the circuit-breaker is implemented through a serial INCOM data connection. A shielded, twisted-pair data cable (recommended are Belden 9463 or 3073F) can be used.
- The INCOM bus must be terminated with a 100 Ω terminating resistor, connected between the two cable strands at the circuit-breaker end.
- The maximum cable length is 3 km.

Data access via PROFIBUS-DP

The data on PROFIBUS-DP are offered according to the profile for low-voltage switchgear (LVSG) of PROFIBUS International (PROFIBUS and PROFINET User Group). Five different data structures with varying numbers of parameters are available through the device master data file. This allows a data filter to be easily implemented, which simplifies integration of the IZM data into the control system.

Modbus configuration



Communications module IZM-MMINT has a plug-in screw terminal for connection to Modbus. The module operates as a Modbus slave. The interface to the circuit-breaker can be operated as a bus, so that up to 32 IZM26 units can be connected to an IZM-MMINT. This makes the use of the IZM with the Modbus architecture specially efficient.

Modbus
- The baud rate for Modbus communications is selectable with coding switches on the IZM-MMINT; the bus address (up to 247) is set through the display of the trip unit. The maximum cable length is 1.2 km.
- The Modbus must be terminated with a 120 Ω terminating resistor. If the IZM-MMINT is the last device in the network, a built-in terminating resistor can be activated there with a coding switch.
- To operate the IZM-MMINT, a supply voltage of 24 V DC or 240 V AC is required.

INCOM
- The data connection to the circuit-breaker is implemented through a serial INCOM bus connection. A shielded, twisted-pair data cable (recommended are Belden 9463 or 3073F) can be used.
- The INCOM bus must be terminated with a 100 Ω terminating resistor, connected between the two cable strands at the circuit-breaker end.
- The maximum cable length is 3 km.

Data access via Modbus

The data for each circuit-breaker connected to the INCOM bus is contained in comprehensive data tables. Each data point is available as floating-point (IEEE) or fixed--point value. This variance allows the integration of the IZM to be adapted to the Modbus architecture. This allows a data filter to be easily implemented, which simplifies integration of the IZM data into the control system.

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
Circuit-breakers for system protection										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	–	2 - 10	**IZM20B3-A08F** 123400		**IZM20B3-A08W** 123160		1 off
	1000		400 – 1000			**IZM20B3-A10F** 123401		**IZM20B3-A10W** 123161		
	1250		500 – 1250			**IZM20B3-A12F** 123402		**IZM20B3-A12W** 123162		
	1600		640 – 1600			**IZM20B3-A16F** 123403		**IZM20B3-A16W** 123163		
	2000		800 – 2000			**IZM20B3-A20F** 123404		**IZM20B3-A20W** 123164		
65	800		320 – 800			**IZM20N3-A08F** 123430		**IZM20N3-A08W** 123190		
	1000		400 – 1000			**IZM20N3-A10F** 123431		**IZM20N3-A10W** 123191		
	1250		500 – 1250			**IZM20N3-A12F** 123432		**IZM20N3-A12W** 123192		
	1600		640 – 1600			**IZM20N3-A16F** 123433		**IZM20N3-A16W** 123193		
	2000		800 – 2000			**IZM20N3-A20F** 123434		**IZM20N3-A20W** 123194		
	800	IZM32	320 – 800			**IZM32B3-A08F** 123899		**IZM32B3-A08W** 123609		
	1000		400 – 1000			**IZM32B3-A10F** 123900		**IZM32B3-A10W** 123610		
	1250		500 – 1250			**IZM32B3-A12F** 123901		**IZM32B3-A12W** 123611		
	1600		640 – 1600			**IZM32B3-A16F** 123902		**IZM32B3-A16W** 123612		
	2000		800 – 2000			**IZM32B3-A20F** 123903		**IZM32B3-A20W** 123613		
	2500		1000 – 2500			**IZM32B3-A25F** 123904		**IZM32B3-A25W** 123614		
	3200		1280 – 3200			**IZM32B3-A32F** 123905		**IZM32B3-A32W** 123615		
85	800		320 – 800			**IZM32N3-A08F** 123939		**IZM32N3-A08W** 123649		
	1000		400 – 1000			**IZM32N3-A10F** 123940		**IZM32N3-A10W** 123650		
	1250		500 – 1250			**IZM32N3-A12F** 123941		**IZM32N3-A12W** 123651		
	1600		640 – 1600			**IZM32N3-A16F** 123942		**IZM32N3-A16W** 123652		
	2000		800 – 2000			**IZM32N3-A20F** 123943		**IZM32N3-A20W** 123653		
	2500		1000 – 2500			**IZM32N3-A25F** 123944		**IZM32N3-A25W** 123654		
	3200		1280 – 3200			**IZM32N3-A32F** 123945		**IZM32N3-A32W** 123655		
100	800		320 – 800			**IZM32H3-A08F** 123979		**IZM32H3-A08W** 123689		
	1000		400 – 1000			**IZM32H3-A10F** 123980		**IZM32H3-A10W** 123690		
	1250		500 – 1250			**IZM32H3-A12F** 123981		**IZM32H3-A12W** 123691		
	1600		640 – 1600			**IZM32H3-A16F** 123982		**IZM32H3-A16W** 123692		
	2000		800 – 2000			**IZM32H3-A20F** 123983		**IZM32H3-A20W** 123693		
	2500		1000 – 2500			**IZM32H3-A25F** 123984		**IZM32H3-A25W** 123694		
	3200		1280 – 3200			**IZM32H3-A32F** 123985		**IZM32H3-A32W** 123695		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$ kA	$I_n = I_u$ A		I_r A	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
Selectively-opening circuit-breakers										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B3-V08F** 123406		**IZM20B3-V08W** 123166		1 off
	1000		400 – 1000			**IZM20B3-V10F** 123407		**IZM20B3-V10W** 123167		
	1250		500 – 1250			**IZM20B3-V12F** 123408		**IZM20B3-V12W** 123168		
	1600		640 – 1600			**IZM20B3-V16F** 123409		**IZM20B3-V16W** 123169		
	2000		800 – 2000			**IZM20B3-V20F** 123410		**IZM20B3-V20W** 123170		
65	800		320 – 800			**IZM20N3-V08F** 123436		**IZM20N3-V08W** 123196		
	1000		400 – 1000			**IZM20N3-V10F** 123437		**IZM20N3-V10W** 123197		
	1250		500 – 1250			**IZM20N3-V12F** 123438		**IZM20N3-V12W** 123198		
	1600		640 – 1600			**IZM20N3-V16F** 123439		**IZM20N3-V16W** 123199		
	2000		800 – 2000			**IZM20N3-V20F** 123440		**IZM20N3-V20W** 123200		
	800	IZM32	320 – 800			**IZM32B3-V08F** 123907		**IZM32B3-V08W** 123617		
	1000		400 – 1000			**IZM32B3-V10F** 123908		**IZM32B3-V10W** 123618		
	1250		500 – 1250			**IZM32B3-V12F** 123909		**IZM32B3-V12W** 123619		
	1600		640 – 1600			**IZM32B3-V16F** 123910		**IZM32B3-V16W** 123620		
	2000		800 – 2000			**IZM32B3-V20F** 123911		**IZM32B3-V20W** 123621		
	2500		1000 – 2500			**IZM32B3-V25F** 123912		**IZM32B3-V25W** 123622		
	3200		1280 – 3200			**IZM32B3-V32F** 123913		**IZM32B3-V32W** 123623		
85	800		320 – 800			**IZM32N3-V08F** 123947		**IZM32N3-V08W** 123657		
	1000		400 – 1000			**IZM32N3-V10F** 123948		**IZM32N3-V10W** 123658		
	1250		500 – 1250			**IZM32N3-V12F** 123949		**IZM32N3-V12W** 123659		
	1600		640 – 1600			**IZM32N3-V16F** 123950		**IZM32N3-V16W** 123660		
	2000		800 – 2000			**IZM32N3-V20F** 123951		**IZM32N3-V20W** 123661		
	2500		1000 – 2500			**IZM32N3-V25F** 123952		**IZM32N3-V25W** 123662		
	3200		1280 – 3200			**IZM32N3-V32F** 123953		**IZM32N3-V32W** 123663		
	4000	IZM40	1600 – 4000			**IZM40N3-V40F** 124303		**IZM40N3-V40W** 124193		
	4000	IZM63	1600 – 4000			**IZM63N3-V40F** 124304		**IZM63N3-V40W** 124194		
	5000		2000 – 5000			**IZM63N3-V50F** 124305		**IZM63N3-V50W** 124195		
	6300		2520 – 6300			**IZM63N3-V63F** 124306		**IZM63N3-V63W** 124196		

Switching capacity	Rated operational current	Fame size	**Setting range** Overload release	Short-circuit releases		Fixed mounted **Part no.** Article no.	**Price** See price list	Withdrawable units **Part no.** Article no.	**Price** See price list	Std. pack
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$ kA	$I_n = I_u$ A		I_r A	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
										
Selectively-opening circuit-breakers										
Including main terminals at rear and control circuit terminals according to ordered options.										
100	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32H3-V08F** 123987		**IZM32H3-V08W** 123697		1 off
	1000		400 – 1000			**IZM32H3-V10F** 123988		**IZM32H3-V10W** 123698		
	1250		500 – 1250			**IZM32H3-V12F** 123989		**IZM32H3-V12W** 123699		
	1600		640 – 1600			**IZM32H3-V16F** 123990		**IZM32H3-V16W** 123700		
	2000		800 – 2000			**IZM32H3-V20F** 123991		**IZM32H3-V20W** 123701		
	2500		1000 – 2500			**IZM32H3-V25F** 123992		**IZM32H3-V25W** 123702		
	3200		1280 – 3200			**IZM32H3-V32F** 123993		**IZM32H3-V32W** 123703		
	4000	IZM40	1600 – 4000			**IZM40H3-V40F** 124323		**IZM40H3-V40W** 124213		
	4000	IZM63	1600 – 4000			**IZM63H3-V40F** 124324		**IZM63H3-V40W** 124214		
	5000		2000 – 5000			**IZM63H3-V50F** 124325		**IZM63H3-V50W** 124215		
	6300		2520 – 6300			**IZM63H3-V63F** 124326		**IZM63H3-V63W** 124216		
Circuit-breaker for universal protection										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B3-U08F** 123412		**IZM20B3-U08W** 123172		1 off
	1000		400 – 1000			**IZM20B3-U10F** 123413		**IZM20B3-U10W** 123173		
	1250		500 – 1250			**IZM20B3-U12F** 123414		**IZM20B3-U12W** 123174		
	1600		640 – 1600			**IZM20B3-U16F** 123415		**IZM20B3-U16W** 123175		
	2000		800 – 2000			**IZM20B3-U20F** 123416		**IZM20B3-U20W** 123176		
65	800		320 – 800			**IZM20N3-U08F** 123442		**IZM20N3-U08W** 123202		
	1000		400 – 1000			**IZM20N3-U10F** 123443		**IZM20N3-U10W** 123203		
	1250		500 – 1250			**IZM20N3-U12F** 123444		**IZM20N3-U12W** 123204		
	1600		640 – 1600			**IZM20N3-U16F** 123445		**IZM20N3-U16W** 123205		
	2000		800 – 2000			**IZM20N3-U20F** 123446		**IZM20N3-U20W** 123206		
	800	IZM32	320 – 800			**IZM32B3-U08F** 123915		**IZM32B3-U08W** 123625		
	1000		400 – 1000			**IZM32B3-U10F** 123916		**IZM32B3-U10W** 123626		
	1250		500 – 1250			**IZM32B3-U12F** 123917		**IZM32B3-U12W** 123627		
	1600		640 – 1600			**IZM32B3-U16F** 123918		**IZM32B3-U16W** 123628		
	2000		800 – 2000			**IZM32B3-U20F** 123919		**IZM32B3-U20W** 123629		
	2500		1000 – 2500			**IZM32B3-U25F** 123920		**IZM32B3-U25W** 123630		
	3200		1280 – 3200			**IZM32B3-U32F** 123921		**IZM32B3-U32W** 123631		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
Circuit-breaker for universal protection										
Including main terminals at rear and control circuit terminals according to ordered options.										
85	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32N3-U08F** 123955		**IZM32N3-U08W** 123665		1 off
	1000		400 – 1000			**IZM32N3-U10F** 123956		**IZM32N3-U10W** 123666		
	1250		500 – 1250			**IZM32N3-U12F** 123957		**IZM32N3-U12W** 123667		
	1600		640 – 1600			**IZM32N3-U16F** 123958		**IZM32N3-U16W** 123668		
	2000		800 – 2000			**IZM32N3-U20F** 123959		**IZM32N3-U20W** 123669		
	2500		1000 – 2500			**IZM32N3-U25F** 123960		**IZM32N3-U25W** 123670		
	3200		1280 – 3200			**IZM32N3-U32F** 123961		**IZM32N3-U32W** 123671		
	4000	IZM40	1600 – 4000			**IZM40N3-U40F** 124307		**IZM40N3-U40W** 124197		
	4000	IZM63	1600 – 4000			**IZM63N3-U40F** 124308		**IZM63N3-U40W** 124198		
	5000		2000 – 5000			**IZM63N3-U50F** 124309		**IZM63N3-U50W** 124199		
	6300		2520 – 6300			**IZM63N3-U63F** 124310		**IZM63N3-U63W** 124200		
100	800	IZM32	320 – 800			**IZM32H3-U08F** 123995		**IZM32H3-U08W** 123705		
	1000		400 – 1000			**IZM32H3-U10F** 123996		**IZM32H3-U10W** 123706		
	1250		500 – 1250			**IZM32H3-U12F** 123997		**IZM32H3-U12W** 123707		
	1600		640 – 1600			**IZM32H3-U16F** 123998		**IZM32H3-U16W** 123708		
	2000		800 – 2000			**IZM32H3-U20F** 123999		**IZM32H3-U20W** 123709		
	2500		1000 – 2500			**IZM32H3-U25F** 124000		**IZM32H3-U25W** 123710		
	3200		1280 – 3200			**IZM32H3-U32F** 124001		**IZM32H3-U32W** 123711		
	4000	IZM40	1600 – 4000			**IZM40H3-U40F** 124327		**IZM40H3-U40W** 124217		
	4000	IZM63	1600 – 4000			**IZM63H3-U40F** 124328		**IZM63H3-U40W** 124218		
	5000		2000 – 5000			**IZM63H3-U50F** 124329		**IZM63H3-U50W** 124219		
	6300		2520 – 6300			**IZM63H3-U63F** 124330		**IZM63H3-U63W** 124220		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	Std. pack
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$ kA	$I_n = I_u$ A		I_r A	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
Circuit-breaker for universal protection with power monitoring										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B3-P08F** 123418		**IZM20B3-P08W** 123178		1 off
	1000		400 – 1000			**IZM20B3-P10F** 123419		**IZM20B3-P10W** 123179		
	1250		500 – 1250			**IZM20B3-P12F** 123420		**IZM20B3-P12W** 123180		
	1600		640 – 1600			**IZM20B3-P16F** 123421		**IZM20B3-P16W** 123181		
	2000		800 – 2000			**IZM20B3-P20F** 123422		**IZM20B3-P20W** 123182		
65	800		320 – 800			**IZM20N3-P08F** 123448		**IZM20N3-P08W** 123208		
	1000		400 – 1000			**IZM20N3-P10F** 123449		**IZM20N3-P10W** 123209		
	1250		500 – 1250			**IZM20N3-P12F** 123450		**IZM20N3-P12W** 123210		
	1600		640 – 1600			**IZM20N3-P16F** 123451		**IZM20N3-P16W** 123211		
	2000		800 – 2000			**IZM20N3-P20F** 123452		**IZM20N3-P20W** 123212		
	800	IZM32	320 – 800			**IZM32B3-P08F** 123923		**IZM32B3-P08W** 123633		
	1000		400 – 1000			**IZM32B3-P10F** 123924		**IZM32B3-P10W** 123634		
	1250		500 – 1250			**IZM32B3-P12F** 123925		**IZM32B3-P12W** 123635		
	1600		640 – 1600			**IZM32B3-P16F** 123926		**IZM32B3-P16W** 123636		
	2000		800 – 2000			**IZM32B3-P20F** 123927		**IZM32B3-P20W** 123637		
	2500		1000 – 2500			**IZM32B3-P25F** 123928		**IZM32B3-P25W** 123638		
	3200		1280 – 3200			**IZM32B3-P32F** 123929		**IZM32B3-P32W** 123639		
85	800		320 – 800			**IZM32N3-P08F** 123963		**IZM32N3-P08W** 123673		
	1000		400 – 1000			**IZM32N3-P10F** 123964		**IZM32N3-P10W** 123674		
	1250		500 – 1250			**IZM32N3-P12F** 123965		**IZM32N3-P12W** 123675		
	1600		640 – 1600			**IZM32N3-P16F** 123966		**IZM32N3-P16W** 123676		
	2000		800 – 2000			**IZM32N3-P20F** 123967		**IZM32N3-P20W** 123677		
	2500		1000 – 2500			**IZM32N3-P25F** 123968		**IZM32N3-P25W** 123678		
	3200		1280 – 3200			**IZM32N3-P32F** 123969		**IZM32N3-P32W** 123679		
	4000	IZM40	1600 – 4000			**IZM40N3-P40F** 124311		**IZM40N3-P40W** 124201		
	4000	IZM63	1600 – 4000			**IZM63N3-P40F** 124312		**IZM63N3-P40W** 124202		
	5000		2000 – 5000			**IZM63N3-P50F** 124313		**IZM63N3-P50W** 124203		
	6300		2520 – 6300			**IZM63N3-P63F** 124314		**IZM63N3-P63W** 124204		

Switching capacity	Rated operational current	Frame size	**Setting range** Overload release	Short-circuit releases Delayed	Short-circuit releases Non-delayed	Fixed mounted **Part no.** Article no.	Fixed mounted **Price** See price list	Withdrawable units **Part no.** Article no.	Withdrawable units **Price** See price list	Std. pack
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
Circuit-breaker for universal protection with power monitoring										
Including main terminals at rear and control circuit terminals according to ordered options.										
100	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32H3-P08F** 124003		**IZM32H3-P08W** 123713		1 off
	1000		400 – 1000			**IZM32H3-P10F** 124004		**IZM32H3-P10W** 123714		
	1250		500 – 1250			**IZM32H3-P12F** 124005		**IZM32H3-P12W** 123715		
	1600		640 – 1600			**IZM32H3-P16F** 124006		**IZM32H3-P16W** 123716		
	2000		800 – 2000			**IZM32H3-P20F** 124007		**IZM32H3-P20W** 123717		
	2500		1000 – 2500			**IZM32H3-P25F** 124008		**IZM32H3-P25W** 123718		
	3200		1280 – 3200			**IZM32H3-P32F** 124009		**IZM32H3-P32W** 123719		
	4000	IZM40	1600 – 4000			**IZM40H3-P40F** 124331		**IZM40H3-P40W** 124221		
	4000	IZM63	1600 – 4000			**IZM63H3-P40F** 124332		**IZM63H3-P40W** 124222		
	5000		2000 – 5000			**IZM63H3-P50F** 124333		**IZM63H3-P50W** 124223		
	6300		2520 – 6300			**IZM63H3-P63F** 124334		**IZM63H3-P63W** 124224		

Switching capacity	Rated operational current	**Setting range** Overload release	Short-circuit releases Delayed	Short-circuit releases Non-delayed	Fixed mounted **Part no.** Article no.	Fixed mounted **Price** See price list	Withdrawable units **Part no.** Article no.	Withdrawable units **Price** See price list	Std. pack
$I_{cu} = I_{cs}$	$I_n = I_u$	I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A	A							
IZM32 for 1100 V									
Including main terminals at rear and control circuit terminals according to ordered options.									
Circuit-breakers for system protection									
25	3200	1280 – 3200	–	2 - 10	**IZM32S3-A32F-1100V** 123725		**IZM32S3-A32W-1100V** 123721		1 off
Selectively-opening circuit-breakers									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S3-V32F-1100V** 123726		**IZM32S3-V32W-1100V** 123722		1 off
Circuit-breaker for universal protection									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S3-U32F-1100V** 123727		**IZM32S3-U32W-1100V** 123723		1 off
Circuit-breaker with circuit-breaker									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S3-P32F-1100V** 123749		**IZM32S3-P32W-1100V** 123724		1 off

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							

Circuit-breakers for system protection

Including main terminals at rear and control circuit terminals according to ordered options.

50	800	IZM20	320 – 800	–	2 - 10	**IZM20B4-A08F** 123520		**IZM20B4-A08W** 123280		1 off
	1000		400 – 1000			**IZM20B4-A10F** 123521		**IZM20B4-A10W** 123281		
	1250		500 – 1250			**IZM20B4-A12F** 123522		**IZM20B4-A12W** 123282		
	1600		640 – 1600			**IZM20B4-A16F** 123523		**IZM20B4-A16W** 123283		
	2000		800 – 2000			**IZM20B4-A20F** 123524		**IZM20B4-A20W** 123284		
65	800		320 – 800			**IZM20N4-A08F** 123550		**IZM20N4-A08W** 123310		
	1000		400 – 1000			**IZM20N4-A10F** 123551		**IZM20N4-A10W** 123311		
	1250		500 – 1250			**IZM20N4-A12F** 123552		**IZM20N4-A12W** 123312		
	1600		640 – 1600			**IZM20N4-A16F** 123553		**IZM20N4-A16W** 123313		
	2000		800 – 2000			**IZM20N4-A20F** 123554		**IZM20N4-A20W** 123314		
	800	IZM32	320 – 800			**IZM32B4-A08F** 124044		**IZM32B4-A08W** 123754		
	1000		400 – 1000			**IZM32B4-A10F** 124045		**IZM32B4-A10W** 123755		
	1250		500 – 1250			**IZM32B4-A12F** 124046		**IZM32B4-A12W** 123756		
	1600		640 – 1600			**IZM32B4-A16F** 124047		**IZM32B4-A16W** 123757		
	2000		800 – 2000			**IZM32B4-A20F** 124048		**IZM32B4-A20W** 123758		
	2500		1000 – 2500			**IZM32B4-A25F** 124049		**IZM32B4-A25W** 123759		
	3200		1280 – 3200			**IZM32B4-A32F** 124050		**IZM32B4-A32W** 123760		
85	800		320 – 800			**IZM32N4-A08F** 124084		**IZM32N4-A08W** 123794		
	1000		400 – 1000			**IZM32N4-A10F** 124085		**IZM32N4-A10W** 123795		
	1250		500 – 1250			**IZM32N4-A12F** 124086		**IZM32N4-A12W** 123796		
	1600		640 – 1600			**IZM32N4-A16F** 124087		**IZM32N4-A16W** 123797		
	2000		800 – 2000			**IZM32N4-A20F** 124088		**IZM32N4-A20W** 123798		
	2500		1000 – 2500			**IZM32N4-A25F** 124089		**IZM32N4-A25W** 123799		
	3200		1280 – 3200			**IZM32N4-A32F** 124090		**IZM32N4-A32W** 123800		
100	800		320 – 800			**IZM32H4-A08F** 124124		**IZM32H4-A08W** 123834		
	1000		400 – 1000			**IZM32H4-A10F** 124125		**IZM32H4-A10W** 123835		
	1250		500 – 1250			**IZM32H4-A12F** 124126		**IZM32H4-A12W** 123836		
	1600		640 – 1600			**IZM32H4-A16F** 124127		**IZM32H4-A16W** 123837		
	2000		800 – 2000			**IZM32H4-A20F** 124128		**IZM32H4-A20W** 123838		
	2500		1000 – 2500			**IZM32H4-A25F** 124129		**IZM32H4-A25W** 123839		
	3200		1280 – 3200			**IZM32H4-A32F** 124130		**IZM32H4-A32W** 123840		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
										
Selectively-opening circuit-breakers										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B4-V08F** 123526		**IZM20B4-V08W** 123286		1 off
	1000		400 – 1000			**IZM20B4-V10F** 123527		**IZM20B4-V10W** 123287		
	1250		500 – 1250			**IZM20B4-V12F** 123528		**IZM20B4-V12W** 123288		
	1600		640 – 1600			**IZM20B4-V16F** 123529		**IZM20B4-V16W** 123289		
	2000		800 – 2000			**IZM20B4-V20F** 123530		**IZM20B4-V20W** 123290		
65	800		320 – 800			**IZM20N4-V08F** 123556		**IZM20N4-V08W** 123316		
	1000		400 – 1000			**IZM20N4-V10F** 123557		**IZM20N4-V10W** 123317		
	1250		500 – 1250			**IZM20N4-V12F** 123558		**IZM20N4-V12W** 123318		
	1600		640 – 1600			**IZM20N4-V16F** 123559		**IZM20N4-V16W** 123319		
	2000		800 – 2000			**IZM20N4-V20F** 123560		**IZM20N4-V20W** 123320		
	800	IZM32	320 – 800			**IZM32B4-V08F** 124052		**IZM32B4-V08W** 123762		
	1000		400 – 1000			**IZM32B4-V10F** 124053		**IZM32B4-V10W** 123763		
	1250		500 – 1250			**IZM32B4-V12F** 124054		**IZM32B4-V12W** 123764		
	1600		640 – 1600			**IZM32B4-V16F** 124055		**IZM32B4-V16W** 123765		
	2000		800 – 2000			**IZM32B4-V20F** 124056		**IZM32B4-V20W** 123766		
	2500		1000 – 2500			**IZM32B4-V25F** 124057		**IZM32B4-V25W** 123767		
	3200		1280 – 3200			**IZM32B4-V32F** 124058		**IZM32B4-V32W** 123768		
85	800		320 – 800			**IZM32N4-V08F** 124092		**IZM32N4-V08W** 123802		
	1000		400 – 1000			**IZM32N4-V10F** 124093		**IZM32N4-V10W** 123803		
	1250		500 – 1250			**IZM32N4-V12F** 124094		**IZM32N4-V12W** 123804		
	1600		640 – 1600			**IZM32N4-V16F** 124095		**IZM32N4-V16W** 123805		
	2000		800 – 2000			**IZM32N4-V20F** 124096		**IZM32N4-V20W** 123806		
	2500		1000 – 2500			**IZM32N4-V25F** 124097		**IZM32N4-V25W** 123807		
	3200		1280 – 3200			**IZM32N4-V32F** 124098		**IZM32N4-V32W** 123808		
	4000	IZM40	1600 – 4000			**IZM40N4-V40F** 124358		**IZM40N4-V40W** 124248		
	4000	IZM63	1600 – 4000			**IZM63N4-V40F** 124359		**IZM63N4-V40W** 124249		
	5000		2000 – 5000			**IZM63N4-V50F** 124360		**IZM63N4-V50W** 124250		
	6300		2520 – 6300			**IZM63N4-V63F** 124361		**IZM63N4-V63W** 124251		



Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
										
Selectively-opening circuit-breakers										
Including main terminals at rear and control circuit terminals according to ordered options.										
100	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32H4-V08F** 124132		**IZM32H4-V08W** 123842		1 off
	1000		400 – 1000			**IZM32H4-V10F** 124133		**IZM32H4-V10W** 123843		
	1250		500 – 1250			**IZM32H4-V12F** 124134		**IZM32H4-V12W** 123844		
	1600		640 – 1600			**IZM32H4-V16F** 124135		**IZM32H4-V16W** 123845		
	2000		800 – 2000			**IZM32H4-V20F** 124136		**IZM32H4-V20W** 123846		
	2500		1000 – 2500			**IZM32H4-V25F** 124137		**IZM32H4-V25W** 123847		
	3200		1280 – 3200			**IZM32H4-V32F** 124138		**IZM32H4-V32W** 123848		
	4000	IZM40	1600 – 4000			**IZM40H4-V40F** 124378		**IZM40H4-V40W** 124268		
	4000	IZM63	1600 – 4000			**IZM63H4-V40F** 124379		**IZM63H4-V40W** 124269		
	5000		2000 – 5000			**IZM63H4-V50F** 124380		**IZM63H4-V50W** 124270		
	6300		2520 – 6300			**IZM63H4-V63F** 124381		**IZM63H4-V63W** 124271		
Circuit-breaker for universal protection										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B4-U08F** 123532		**IZM20B4-U08W** 123292		1 off
	1000		400 – 1000			**IZM20B4-U10F** 123533		**IZM20B4-U10W** 123293		
	1250		500 – 1250			**IZM20B4-U12F** 123534		**IZM20B4-U12W** 123294		
	1600		640 – 1600			**IZM20B4-U16F** 123535		**IZM20B4-U16W** 123295		
	2000		800 – 2000			**IZM20B4-U20F** 123536		**IZM20B4-U20W** 123296		
65	800		320 – 800			**IZM20N4-U08F** 123562		**IZM20N4-U08W** 123322		
	1000		400 – 1000			**IZM20N4-U10F** 123563		**IZM20N4-U10W** 123323		
	1250		500 – 1250			**IZM20N4-U12F** 123564		**IZM20N4-U12W** 123324		
	1600		640 – 1600			**IZM20N4-U16F** 123565		**IZM20N4-U16W** 123325		
	2000		800 – 2000			**IZM20N4-U20F** 123566		**IZM20N4-U20W** 123326		
	800	IZM32	320 – 800			**IZM32B4-U08F** 124060		**IZM32B4-U08W** 123770		
	1000		400 – 1000			**IZM32B4-U10F** 124061		**IZM32B4-U10W** 123771		
	1250		500 – 1250			**IZM32B4-U12F** 124062		**IZM32B4-U12W** 123772		
	1600		640 – 1600			**IZM32B4-U16F** 124063		**IZM32B4-U16W** 123773		
	2000		800 – 2000			**IZM32B4-U20F** 124064		**IZM32B4-U20W** 123774		
	2500		1000 – 2500			**IZM32B4-U25F** 124065		**IZM32B4-U25W** 123775		
	3200		1280 – 3200			**IZM32B4-U32F** 124066		**IZM32B4-U32W** 123776		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
Circuit-breaker for universal protection										
Including main terminals at rear and control circuit terminals according to ordered options.										
85	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32N4-U08F** 124100		**IZM32N4-U08W** 123810		1 off
	1000		400 – 1000			**IZM32N4-U10F** 124101		**IZM32N4-U10W** 123811		
	1250		500 – 1250			**IZM32N4-U12F** 124102		**IZM32N4-U12W** 123812		
	1600		640 – 1600			**IZM32N4-U16F** 124103		**IZM32N4-U16W** 123813		
	2000		800 – 2000			**IZM32N4-U20F** 124104		**IZM32N4-U20W** 123814		
	2500		1000 – 2500			**IZM32N4-U25F** 124105		**IZM32N4-U25W** 123815		
	3200		1280 – 3200			**IZM32N4-U32F** 124106		**IZM32N4-U32W** 123816		
	4000	IZM40	1600 – 4000			**IZM40N4-U40F** 124362		**IZM40N4-U40W** 124252		
	4000	IZM63	1600 – 4000			**IZM63N4-U40F** 124363		**IZM63N4-U40W** 124253		
	5000		2000 – 5000			**IZM63N4-U50F** 124364		**IZM63N4-U50W** 124254		
	6300		2520 – 6300			**IZM63N4-U63F** 124365		**IZM63N4-U63W** 124255		
100	800	IZM32	320 – 800			**IZM32H4-U08F** 124140		**IZM32H4-U08W** 123850		
	1000		400 – 1000			**IZM32H4-U10F** 124141		**IZM32H4-U10W** 123851		
	1250		500 – 1250			**IZM32H4-U12F** 124142		**IZM32H4-U12W** 123852		
	1600		640 – 1600			**IZM32H4-U16F** 124143		**IZM32H4-U16W** 123853		
	2000		800 – 2000			**IZM32H4-U20F** 124144		**IZM32H4-U20W** 123854		
	2500		1000 – 2500			**IZM32H4-U25F** 124145		**IZM32H4-U25W** 123855		
	3200		1280 – 3200			**IZM32H4-U32F** 124146		**IZM32H4-U32W** 123856		
	4000	IZM40	1600 – 4000			**IZM40H4-U40F** 124382		**IZM40H4-U40W** 124272		
	4000	IZM63	1600 – 4000			**IZM63H4-U40F** 124383		**IZM63H4-U40W** 124273		
	5000		2000 – 5000			**IZM63H4-U50F** 124384		**IZM63H4-U50W** 124274		
	6300		2520 – 6300			**IZM63H4-U63F** 124385		**IZM63H4-U63W** 124275		

Switching capacity	Rated operational current	Frame size	**Setting range**			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$			Cassette must be ordered separately.		
kA	A		A							
										
Circuit-breaker for universal protection with power monitoring										
Including main terminals at rear and control circuit terminals according to ordered options.										
50	800	IZM20	320 – 800	2 - 10	2 - 10, OFF	**IZM20B4-P08F** 123538		**IZM20B4-P08W** 123298		1 off
	1000		400 – 1000			**IZM20B4-P10F** 123539		**IZM20B4-P10W** 123299		
	1250		500 – 1250			**IZM20B4-P12F** 123540		**IZM20B4-P12W** 123300		
	1600		640 – 1600			**IZM20B4-P16F** 123541		**IZM20B4-P16W** 123301		
	2000		800 – 2000			**IZM20B4-P20F** 123542		**IZM20B4-P20W** 123302		
65	800		320 – 800			**IZM20N4-P08F** 123568		**IZM20N4-P08W** 123328		
	1000		400 – 1000			**IZM20N4-P10F** 123569		**IZM20N4-P10W** 123329		
	1250		500 – 1250			**IZM20N4-P12F** 123570		**IZM20N4-P12W** 123330		
	1600		640 – 1600			**IZM20N4-P16F** 123571		**IZM20N4-P16W** 123331		
	2000		800 – 2000			**IZM20N4-P20F** 123572		**IZM20N4-P20W** 123332		
	800	IZM32	320 – 800			**IZM32B4-P08F** 124068		**IZM32B4-P08W** 123778		
	1000		400 – 1000			**IZM32B4-P10F** 124069		**IZM32B4-P10W** 123779		
	1250		500 – 1250			**IZM32B4-P12F** 124070		**IZM32B4-P12W** 123780		
	1600		640 – 1600			**IZM32B4-P16F** 124071		**IZM32B4-P16W** 123781		
	2000		800 – 2000			**IZM32B4-P20F** 124072		**IZM32B4-P20W** 123782		
	2500		1000 – 2500			**IZM32B4-P25F** 124073		**IZM32B4-P25W** 123783		
	3200		1280 – 3200			**IZM32B4-P32F** 124074		**IZM32B4-P32W** 123784		
85	800		320 – 800			**IZM32N4-P08F** 124108		**IZM32N4-P08W** 123818		
	1000		400 – 1000			**IZM32N4-P10F** 124109		**IZM32N4-P10W** 123819		
	1250		500 – 1250			**IZM32N4-P12F** 124110		**IZM32N4-P12W** 123820		
	1600		640 – 1600			**IZM32N4-P16F** 124111		**IZM32N4-P16W** 123821		
	2000		800 – 2000			**IZM32N4-P20F** 124112		**IZM32N4-P20W** 123822		
	2500		1000 – 2500			**IZM32N4-P25F** 124113		**IZM32N4-P25W** 123823		
	3200		1280 – 3200			**IZM32N4-P32F** 124114		**IZM32N4-P32W** 123824		
	4000	IZM40	1600 – 4000			**IZM40N4-P40F** 124366		**IZM40N4-P40W** 124256		
	4000	IZM63	1600 – 4000			**IZM63N4-P40F** 124367		**IZM63N4-P40W** 124257		
	5000		2000 – 5000			**IZM63N4-P50F** 124368		**IZM63N4-P50W** 124258		
	6300		2520 – 6300			**IZM63N4-P63F** 124369		**IZM63N4-P63W** 124259		

Switching capacity	Rated operational current	Frame size	Setting range			Fixed mounted		Withdrawable units		Std. pack
			Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** see price list	
				Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$		I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$					
kA	A		A					Cassette must be ordered separately.		
Circuit-breaker for universal protection with power monitoring										
Including main terminals at rear and control circuit terminals according to ordered options.										
100	800	IZM32	320 – 800	2 - 10	2 - 10, OFF	**IZM32H4-P08F** 124148		**IZM32H4-P08W** 123858		1 off
	1000		400 – 1000			**IZM32H4-P10F** 124149		**IZM32H4-P10W** 123859		
	1250		500 – 1250			**IZM32H4-P12F** 124150		**IZM32H4-P12W** 123860		
	1600		640 – 1600			**IZM32H4-P16F** 124151		**IZM32H4-P16W** 123861		
	2000		800 – 2000			**IZM32H4-P20F** 124152		**IZM32H4-P20W** 123862		
	2500		1000 – 2500			**IZM32H4-P25F** 124153		**IZM32H4-P25W** 123863		
	3200		1280 – 3200			**IZM32H4-P32F** 124154		**IZM32H4-P32W** 123864		
	4000	IZM40	1600 – 4000			**IZM40H4-P40F** 124386		**IZM40H4-P40W** 124276		
	4000	IZM63	1600 – 4000			**IZM63H4-P40F** 124387		**IZM63H4-P40W** 124277		
	5000		2000 – 5000			**IZM63H4-P50F** 124388		**IZM63H4-P50W** 124278		
	6300		2520 – 6300			**IZM63H4-P63F** 124389		**IZM63H4-P63W** 124279		

Switching capacity	Rated operational current	Setting range			Fixed mounted		Withdrawable units		Std. pack
		Overload release	Short-circuit releases		**Part no.** Article no.	**Price** See price list	**Part no.** Article no.	**Price** See price list	
			Delayed	Non-delayed					
$I_{cu} = I_{cs}$	$I_n = I_u$	I_r	$I_{sd} = I_r \times \ldots$	$I_i = I_n \times \ldots$					
kA	A	A					Cassette must be ordered separately.		
IZM32 for 1100 V									
Including main terminals at rear and control circuit terminals according to ordered options.									
Circuit-breakers for system protection									
25	3200	1280 – 3200	–	2 - 10	**IZM32S4-A32F-1100V** 123866		**IZM32S4-A32W-1100V** 123750		1 off
Selectively-opening circuit-breakers									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S4-V32F-1100V** 123867		**IZM32S4-V32W-1100V** 123751		1 off
Circuit-breaker for universal protection									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S4-U32F-1100V** 123868		**IZM32S4-U32W-1100V** 123752		1 off
Circuit-breaker with circuit-breaker									
25	3200	1280 – 3200	2 - 10	2 - 10, OFF	**IZM32S4-P32F-1100V** 123869		**IZM32S4-P32W-1100V** 123753		1 off

3 pole air circuit-breaker

IN26

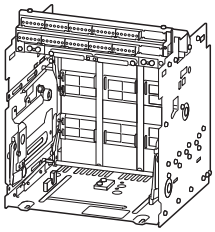
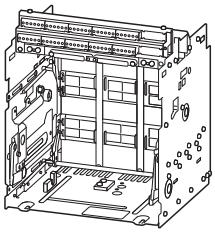
HPL18060EN

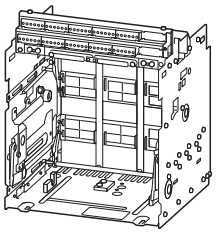
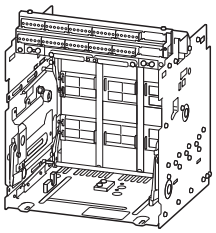
Rated short-circuit making capacity I_{cm} kA	Rated operational current $I_n = I_u$ A	Frame size	Rated short-time withstand current t = 1 s I_{cw} kA	Fixed mounted **Part no.** Article no.	**Price** See price list	Withdrawable units **Part no.** Article no. Cassette must be seperately ordered.	**Price** See price list	Std. pack
Including main terminals at rear and control circuit terminals according to ordered options.								
55	800	IN20	50	**IN20B3-08F** 123424		**IN20B3-08W** 123184		1 off
		IN32	65	**IN32B3-08F** 123931		**IN32B3-08W** 123641		
		IN32	85	**IN32N3-08F** 123971		**IN32N3-08W** 123681		
	1000	IN20	50	**IN20B3-10F** 123425		**IN20B3-10W** 123185		
		IN32	65	**IN32B3-10F** 123932		**IN32B3-10W** 123642		
		IN32	85	**IN32N3-10F** 123972		**IN32N3-10W** 123682		
	1250	IN20	50	**IN20B3-12F** 123426		**IN20B3-12W** 123186		
		IN32	65	**IN32B3-12F** 123933		**IN32B3-12W** 123643		
		IN32	85	**IN32N3-12F** 123973		**IN32N3-12W** 123683		
	1600	IN20	50	**IN20B3-16F** 123427		**IN20B3-16W** 123187		
		IN32	65	**IN32B3-16F** 123934		**IN32B3-16W** 123644		
		IN32	85	**IN32N3-16F** 123974		**IN32N3-16W** 123684		
	2000	IN20	50	**IN20B3-20F** 123428		**IN20B3-20W** 123188		
69	800	IN20	65	**IN20N3-08F** 123454		**IN20N3-08W** 123214		
	1000	IN20	65	**IN20N3-10F** 123455		**IN20N3-10W** 123215		
	1250	IN20	65	**IN20N3-12F** 123456		**IN20N3-12W** 123216		
	1600	IN20	65	**IN20N3-16F** 123457		**IN20N3-16W** 123217		
	2000	IN20	65	**IN20N3-20F** 123458		**IN20N3-20W** 123218		
		IN32	65	**IN32B3-20F** 123935		**IN32B3-20W** 123645		
		IN32	85	**IN32N3-20F** 123975		**IN32N3-20W** 123685		
110	2500	IN32	65	**IN32B3-25F** 123936		**IN32B3-25W** 123646		
	2500	IN32	85	**IN32N3-25F** 123976		**IN32N3-25W** 123686		
	3200	IN32	65	**IN32B3-32F** 123937		**IN32B3-32W** 123647		
	3200	IN32	85	**IN32N3-32F** 123977		**IN32N3-32W** 123687		
138	4000	IN40	85	**IN40N3-40F** 124315		**IN40N3-40W** 124205		
		IN40	100	**IN40H3-40F** 124191		**IN40H3-40W** 124189		
		IN63	85	**IN63N3-40F** 124316		**IN63N3-40W** 124206		
		IN63	100	**IN63H3-40F** 124336		**IN63H3-40W** 124226		
210	3200	IN32	–	**IN32S3-32F-1100V** 123871		**IN32S3-32W-1100V** 123870		
217	5000	IN63	85	**IN63N3-50F** 124317		**IN63N3-50W** 124207		
	5000	IN63	100	**IN63H3-50F** 124337		**IN63H3-50W** 124227		
	6300	IN63	85	**IN63N3-63F** 124318		**IN63N3-63W** 124208		
	6300	IN63	100	**IN63H3-63F** 124338		**IN63H3-63W** 124228		

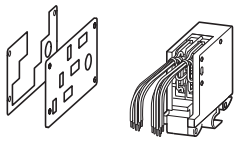
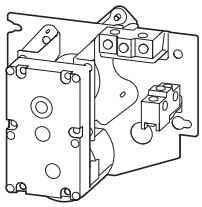


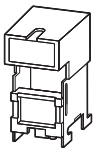
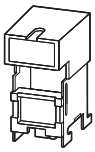
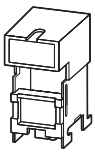
Rated short-circuit making capacity I_{cm} kA	Rated operational current $I_n = I_u$ A	Frame size	Rated short-time withstand current t = 1 s I_{cw} kA	Fixed mounted **Part no.** Article no.	**Price** See price list	Withdrawable units **Part no.** Article no. Cassette must be seperately ordered.	**Price** See price list	Std. pack
Including main terminals at rear and control circuit terminals according to ordered options.								
55	800	IN20	50	**IN20B4-08F** 123544		**IN20B4-08W** 123304		1 off
		IN32	65	**IN32B4-08F** 124076		**IN32B4-08W** 123786		
		IN32	85	**IN32N4-08F** 124116		**IN32N4-08W** 123826		
	1000	IN20	50	**IN20B4-10F** 123545		**IN20B4-10W** 123305		
		IN32	65	**IN32B4-10F** 124077		**IN32B4-10W** 123787		
		IN32	85	**IN32N4-10F** 124117		**IN32N4-10W** 123827		
	1250	IN20	50	**IN20B4-12F** 123546		**IN20B4-12W** 123306		
		IN32	65	**IN32B4-12F** 124078		**IN32B4-12W** 123788		
		IN32	85	**IN32N4-12F** 124118		**IN32N4-12W** 123828		
	1600	IN20	50	**IN20B4-16F** 123547		**IN20B4-16W** 123307		
		IN32	65	**IN32B4-16F** 124079		**IN32B4-16W** 123789		
		IN32	85	**IN32N4-16F** 124119		**IN32N4-16W** 123829		
	2000	IN20	50	**IN20B4-20F** 123548		**IN20B4-20W** 123308		
69	800	IN20	65	**IN20N4-08F** 123574		**IN20N4-08W** 123334		
	1000	IN20	65	**IN20N4-10F** 123575		**IN20N4-10W** 123335		
	1250	IN20	65	**IN20N4-12F** 123576		**IN20N4-12W** 123336		
	1600	IN20	65	**IN20N4-16F** 123577		**IN20N4-16W** 123337		
	2000	IN20	65	**IN20N4-20F** 123578		**IN20N4-20W** 123338		
		IN32	65	**IN32B4-20F** 124080		**IN32B4-20W** 123790		
		IN32	85	**IN32N4-20F** 124120		**IN32N4-20W** 123830		
110	2500	IN32	65	**IN32B4-25F** 124081		**IN32B4-25W** 123791		
	2500	IN32	85	**IN32N4-25F** 124121		**IN32N4-25W** 123831		
	3200	IN32	65	**IN32B4-32F** 124082		**IN32B4-32W** 123792		
	3200	IN32	85	**IN32N4-32F** 124122		**IN32N4-32W** 123832		
138	4000	IN40	85	**IN40N4-40F** 124370		**IN40N4-40W** 124260		
		IN40	100	**IN40H4-40F** 124192		**IN40H4-40W** 124190		
		IN63	85	**IN63N4-40F** 124371		**IN63N4-40W** 124261		
		IN63	100	**IN63H4-40F** 124391		**IN63H4-40W** 124281		
210	3200	IN32	–	**IN32S4-32F-1100V** 123894		**IN32S4-32W-1100V** 123872		
217	5000	IN63	85	**IN63N4-50F** 124372		**IN63N4-50W** 124262		
	5000	IN63	100	**IN63H4-50F** 124392		**IN63H4-50W** 124282		
	6300	IN63	85	**IN63N4-63F** 124373		**IN63N4-63W** 124263		
	6300	IN63	100	**IN63H4-63F** 124393		**IN63H4-63W** 124283		

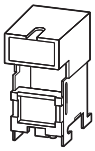


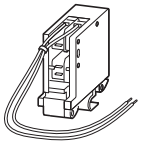
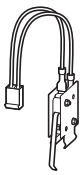
	Rated operational current I_n A	For use with	3 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	4 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
Withdrawable units							
Cassettes in combination with basic device Standard equipment: • Arc chute cover • Coding between cassette and switch • Horizontal Connection • Door seal							
	≦ 1000	IZM20…W IN20…W	**+IZM-CAS203-1000** 124147		**+IZM-CAS204-1000** 124155		1 off
	≦ 2000	IZM20…W IN20…W	**+IZM-CAS203-2000** 122065		**+IZM-CAS204-2000** 122713		
	≦ 2000	IZM32…W IN32…W	**+IZM-CAS323-2000** 122066		**+IZM-CAS324-2000** 122714		
	≦ 2500	IZM32…W IN32…W	**+IZM-CAS323-2500** 124212		**+IZM-CAS324-2500** 124229		
	2500 - 3200	IZM32…W IN32…W	**+IZM-CAS323-3200** 122067		**+IZM-CAS324-3200** 122715		
Cassettes, ordered separately Standard components fitted to separately ordered cassette: • Arc chute cover • Complete set of control circuit terminals • Coding between cassette and switch • Horizontal Connection • Door seal							
	≦ 1000	IZM20…W IN20…W	**IZM-CAS203-1000** 124107		**IZM-CAS204-1000** 124115		1 off
	≦ 2000	IZM20…W IN20…W	**IZM-CAS203-2000** 122855		**IZM-CAS204-2000** 122863		
	≦ 2000	IZM32…W IN32…W	**IZM-CAS323-2000** 122856		**IZM-CAS324-2000** 122864		
	≦ 2500	IZM32…W IN32…W	**IZM-CAS323-2500** 124123		**IZM-CAS324-2500** 124139		
	2500 - 3200	IZM32…W IN32…W	**IZM-CAS323-3200** 122857		**IZM-CAS324-3200** 122865		
	4000	IZM40…W IN40…W	**IZM-CAS403-4000** 122859		**IZM-CAS404-4000** 122867		
	4000	IZM63…W IN63…W	**IZM-CAS633-4000** 122860		**IZM-CAS634-4000** 122868		
	5000 - 6300	IZM63…W IN63…W	**IZM-CAS633-6300** 122861		**IZM-CAS634-6300** 122869		

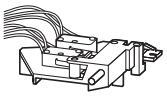
	Rated operational current I_n A	For use with	3 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	4 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
Withdrawable units							
Cassettes 1100 V in combination with basic device Standard equipment: • Arc chute cover • Coding between cassette and switch • Horizontal Connection • Door seal							
	3200	IZM32…W-1100V IN32…W-1100V	**+IZM-CAS323-3200-1100V** 122712		**+IZM-CAS324-3200-1100V** 122720		1 off
Cassettes 1100 V, ordered separately Standard equipment: • Arc chute cover • Complete set of control circuit terminals • Coding between cassette and switch • Horizontal Connection • Door seal							
	3200	IZM32…W-1100V IN32…W-1100V	**IZM-CAS323-3200-1100V** 122862		**IZM-CAS324-3200-1100V** 122870		1 off
Shutter (touch protection) When the switch is moved out of the CONNECT position, the shutters close automatically to cover the primary contacts.							
	–	IZM20…W IN20…W	**IZM-SH203** 122871		**IZM-SH204** 122875		1 off
		IZM20…W IN20…W	**+IZM-SH203** 122721		**+IZM-SH204** 122725		
		IZM32…W IN32…W	**IZM-SH323** 122872		**IZM-SH324** 122876		
		IZM32…W IN32…W	**+IZM-SH323** 122722		**+IZM-SH324** 122726		
		IZM40…W IN40…W	**IZM-SH403** 122873		**IZM-SH404** 122877		
		IZM40…W IN40…W	**+IZM-SH403** 122723		**+IZM-SH404** 122727		
		IZM63…W IN63…W	**IZM-SH633** 122874		**IZM-SH634** 122878		
		IZM63…W IN63…W	**+IZM-SH633** 122724		**+IZM-SH634** 122728		

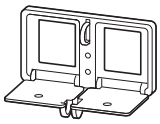
		For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Position signalling switches						
One module each with 4 changeover contacts is possible for indication of each position (extended, Test, retracted). Only one mounting plate is required per withdrawable unit. Each additional auxiliary contact (up to 3) requires 2 secondary terminal blocks IZM-SEC...; alternatively it can be wired directly to external terminals. If a shutter is used, mounting is possible on the right side only.						
	Four changeover contacts: One module without mounting plate	IZM20, 32, 40, 63...W IN20, 32, 40, 63...W	**IZM-CS4** 122879		1 off	–
	Four changeover contacts: One module with mounting plate		**IZM-CS4MB** 122880			
	Eight changeover contacts: Two modules with mounting plate		**IZM-CS8MB** 122881			
	Twelve changeover contacts: Three modules with mounting plate		**IZM-CS12MB** 122882			
Motor drive						
The motor operator electrically tensions the spring-operated stored energy mechanism. For electrical remote On and Off switching, a closing release and a voltage release are required. A signaling switch labeled "Spring-operated stored energy mechanism tensioned" is included as standard.						
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-M24DC** 122927		1 off	If ordered separately a secondary terminal block IZM-SEC-… is necessary for connection. Order separately if required.For terminal assignment, see page 77
			+IZM-M24DC 122729			
			IZM-M48DC 122928			
			+IZM-M48DC 122730			
			IZM-M60DC 123093			
			+IZM-M60DC 123079			
			IZM-M110DC 122929			
			+IZM-M110DC 122731			
			IZM-M220DC 122930			
			+IZM-M220DC 122732			
			IZM-M110AC 122931			
			+IZM-M110AC 122733			
			IZM-M230AC 122932			
			+IZM-M230AC 122734			
Switching cycle counter						
Counts the number of On-Off operations. Can also be used without motor operator.						
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-OC** 122933		1 off	–
			+IZM-OC 122735			

	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Voltage releases						
A closing release can be combined with a shunt release and an undervoltage release or with a second shunt release. (DF: 100%). Suited for uninterrupted operation, which ensures electrical interlocking in Off position.						
Shunt release						
	24 DC	IZM20, 32, 40, 63... IN20, 32,40, 63...	**IZM-ST24DC** 122934		1 off	If ordered separately a secondary terminal block IZM-SEC… is necessary for connection. Order separately if required. For terminal assignment, see page 77
	24 DC		**+IZM-ST24DC** 122736			
	48 DC		**IZM-ST48DC** 122935			
	48 DC		**+IZM-ST48DC** 122737			
	60 DC		**IZM-ST60DC** 122930			
	60 DC		**+IZM-ST60DC** 123914			
	110 - 125 DC 110 - 127 AC		**IZM-ST110AD** 122936			
	110 - 125 DC 110 - 127 AC		**+IZM-ST110AD** 122738			
	220 - 250 DC 208 - 240 AC		**IZM-ST230AD** 122937			
	220 - 250 DC 208 - 240 AC		**+IZM-ST230AD** 122739			
2nd shunt release Can not be combined with an undervoltage release.						
	24 DC	IZM20, 32, 40, 63... IN20, 32,40, 63...	**+IZM-STS24DC** 122740		1 off	If ordered separately a secondary terminal block IZM-SEC… is necessary for connection. Order separately if required. For terminal assignment, see page 77
	48 DC		**+IZM-STS48DC** 122741			
	60 DC		**+IZM-STS60DC** 123922			
	110 - 127 DC 110 - 127 AC		**+IZM-STS110AD** 122742			
	208 - 250 DC 208 - 250 AC		**+IZM-STS230AD** 122743			
Closing releases						
	24 DC	IZM20, 32, 40, 63... IN20, 32,40, 63...	**IZM-SR24DC** 122942		1 off	If ordered separately a secondary terminal block IZM-SEC… is necessary for connection. Order separately if required. For terminal assignment, see page 77
	24 DC		**+IZM-SR24DC** 122744			
	48 DC		**IZM-SR48DC** 122943			
	48 DC		**+IZM-SR48DC** 122745			
	60 VDC		**IZM-SR60DC** 123954			
	60 VDC		**+IZM-SR60DC** 123938			
	110 - 125 DC 110 - 127 AC		**IZM-SR110AD** 122944			
	110 - 125 DC 110 - 127 AC		**+IZM-SR110AD** 122746			
	220 - 250 DC 208 - 240 AC		**IZM-SR230AD** 122945			
	220 - 250 DC 208 - 240 AC		**+IZM-SR230AD** 122747			

		Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Voltage releases							
Undervoltage release Can not be combined with a second shunt release.							
	–	24 DC	IZM20, 32, 40, 63... IN20, 32,40, 63...	**IZM-UVR24DC** 122946		1 off	If ordered separately a secondary terminal block IZM-SEC-… is necessary for connection. Order separately if required. Terminal assignment page 77
		24 DC		**+IZM-UVR24DC** 122748			
		32 DC		**IZM-UVR32DC** 122947			
		32 DC		**+IZM-UVR32DC** 122749			
		48 DC		**IZM-UVR48DC** 122948			
		48 DC		**+IZM-UVR48DC** 122750			
		60 DC		**IZM-UVR60DC** 123970			
		60 DC		**+IZM-UVR60DC** 123962			
		110 - 125 DC		**IZM-UVR110DC** 122949			
		110 - 125 DC		**+IZM-UVR110DC** 122751			
		220 - 250 DC		**IZM-UVR220DC** 122950			
		220 - 250 DC		**+IZM-UVR220DC** 122752			
		110 - 127 AC		**IZM-UVR110AC** 122951			
		110 - 127 AC		**+IZM-UVR110AC** 122753			
		208 - 240 AC		**IZM-UVR230AC** 122952			
		208 - 240 AC		**+IZM-UVR230AC** 122754			
		380 - 415 AC		**IZM-UVR400AC** 122953			
		380 - 415 AC		**+IZM-UVR400AC** 122755			
Time delay modules For combination with an undervoltage release. Delay times: 0.1 s, 0.5 s, 1.0 s, 2.0 s							
	Only in combination with IZM-UVR110AC	120 AC	IZM20, 32, 40, 63... IN20, 32,40, 63...	**IZM-UVR-TD-120AC** 122956		1 off	–
	Only in combination with IZM-UVR230AC	230 AC		**IZM-UVR-TD-230AC** 122957		1 off	

		For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Auxiliary contacts						
Standard auxiliary switch for On-Off signaling 2 NC contacts/N/O contacts are already contained in the basic device. Maximum for IZM20, IN20: 4 N/O or NC contacts (corresponds with an additional AS22). Maximum, for IZM32, IZM40, IZM63: 6 N/O or NC contacts (corresponds with an additional AS44). 6 N/O or NC contacts are possible only when no second shunt release is installed.						
	Additionally 2 NC contact/ NO contact	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**+IZM-AS22** 122758		1 off	–
	Additionally 4 NC contacts/ N/O contacts		**+IZM-AS44** 122759			Cannot be combined with a second shunt release; can not be combined with IZM20, IN20.
	Additionally 2 NC contact/ N/O contact		**IZM-AS22** 122958			If ordered separately a secondary terminal block IZM-SEC-… is necessary for connection. Order separately if required. Terminal assignment page 77
Latch check switch Latch check switch with one changeover contact.						
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-LCS-SR** 122974		1 off	for internal wiring with closing release
			+IZM-LCS-SR 122760			
			IZM-LCS 122959			for external keypad Indication
			+IZM-LCS 122761			

	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Trip indication and reset options						
Trip-indicating auxiliary switch (OTS) Two changeover contacts						
	–	IZM20, 32, 40, 63...	**IZM-OTS** 122960		1 off	If ordered separately a secondary terminal block IZM-SEC-… is necessary for connection. Order separately if required. Terminal assignment page 77
			+IZM-OTS 122762			
Automatic reset The circuit-breaker is immediately ready to close again. Not fitted with mechanical trip indicator (red pin). Can not be combined with remote reset.						
	–	IZM20, 32, 40, 63...	**IZM-RA** 122964		1 off	–
			+IZM-RA 122766			

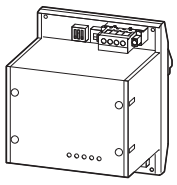
		For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
Locking facilities					
Padlockable cover of ON/OFF buttons ON-Off pushbutton cover sealable with lead seal and lockable with padlock.					
	Metal, On pushbutton blocked	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**+IZM-PLPC-CB-M** 125820		1 off
	Plastic, On pushbutton blocked		**+IZM-PLPC-CB-P** 125649		
	Metal		**IZM-PLPC-M** 122966		
			+IZM-PLPC-M 122768		
	Plastic		**IZM-PLPC-P** 122965		
			+IZM-PLPC-P 122767		
Key locking in safe Off					
	CES installation kit, without lock cylinder and key	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-KLP-SO-CES** 122968		1 off
			+IZM-KLP-SO-CES 122770		
	Kirk installation kit, without lock cylinder and key		**IZM-KLP-SO-KIRK** 122969		
			+IZM-KLP-SO-KIRK 122771		
	Castell installation kit, without lock cylinder and key		**IZM-KLP-SO-CASTELL** 122970		
			+IZM-KLP-SO-CASTELL 122772		
	Ronis installation kit, without lock cylinder and key		**IZM-KLP-SO-RONIS** 122971		
			+IZM-KLP-SO-RONIS 122773		
Cassette key locking facility This device is fitted to the cassette and prevents a switch being switched on in its operating (Connected) position.					
	Installation on right, without lock cylinder and key	IZM20, 32, 40, 63...W IN20, 32, 40, 63...W	**IZM-KLP-CASS-R** 122972		1 off
	Installation on left, without lock cylinder and key		**IZM-KLP-CASS-L** 122973		1 off

		For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Locking facilities					
Mechanical interlock, fixed mounting					
	Type 2, for 2 circuit-breakers: A normal power supply (A) and an emergency mains supply (B). 1 set of cables also required.	IZM20, 32, 40, 63...F IN20, 32, 40, 63...F	**IZM-MIL2C-F** 122980		1 off
	Type 31, for 3 circuit-breakers: Two normal power supplies (A, C) and an emergency network supply (B). When B in Off, A and C can be switched on. B can be switched on only when A and C are in Off. Two sets of cables required in addition.		**IZM-MIL31C-F** 122981		
	Type 32, for 3 circuit-breakers: Two normal power supplies (A, C) and a coupling (B). Any one or two circuit-breakers can be closed at the same time. Three sets of cables are required in addition.		**IZM-MIL32C-F** 122982		
	Type 33, for 3 circuit-breakers: Three power supplies (A, B, C), normal or emergency network. Only one of the three circuit-breakers can be switched on at any one time. Three sets of cables are required in addition.		**IZM-MIL33C-F** 122983		
Mechanical interlock, withdrawable units					
	Type 2, for 2 circuit-breakers: A normal power supply (A) and an emergency network supply (B). 1 set of cables also required.	IZM20, 32, 40, 63...W IN20, 32, 40, 63...W	**IZM-MIL2C-W** 122985		1 off
	Type 31, for 3 circuit-breakers: Two normal power supplies (A, C) and an emergency network supply (B). When B in Off, A and C can be switched on. B can be switched on only when A and C are in Off. Two sets of cables required in addition.		**IZM-MIL31C-W** 122986		
	Type 32, for 3 circuit-breakers: Two normal power supplies (A, C) and a coupling (B). Any one or two circuit-breakers can be closed at the same time. Three sets of cables are required in addition.		**IZM-MIL32C-W** 122987		
	Type 33, for 3 circuit-breakers: Three power supplies (A, B, C), normal or emergency network. Only one of the three circuit-breakers can be switched on at any one time. Three sets of cables are required in addition.		**IZM-MIL33C-W** 122988		
Cable sets for mechanical interlock Depending on the type of interlock, a particular number of cable connectors is required. With the flexible cable connectors, various different switch arrangements can be implemented. Each set contains two cables.					
	1520 mm long	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-MIL-CAB1520** 122975		1 off
	1830 mm long		**IZM-MIL-CAB1830** 122976		
	2440 mm long		**IZM-MIL-CAB2440** 122977		
	3050 mm long		**IZM-MIL-CAB3050** 122978		

Instruction
For possible switching states, → Page 77

	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack	**Notes**
Options and accessories for electronic releases						
One of the following overcurrent releases (DT = Digitrip) is supplied as standard with every IZM circuit-breaker: • Type A: DT-520LI • Type V: DT-520LSI • Type U: DT-520MC • Type P: DT-1150						
Trip unit for Type A circuit-breaker (equipped with Digitrip 520LI)						
System protection		IZM…-A… (Digitrip 520LI)	**IZM-DTA** 122774		1 off	
Trip unit for Type V circuit-breaker (equipped with Digitrip 520LSI)						
Selectivity protection		IZM…-V… (Digitrip 520MC)	**IZM-DTV** 122775		1 off	
Add-on function for Type V circuit-breaker						
Ground fault protection	–	IZM…-V… (Digitrip 520LSI)	**+IZM-DTV-EP** 122776		1 off	–
Trip unit for Type U circuit-breaker (equipped with Digitrip 520M)						
Universal protection Type U contains the following as standard: • Communication interface • Overload alarm with signalling contact • Prepared for external 24/48 V DC supply (e.g. for display) • (A14 = +24 VDC/A15 = -24 VDC) Only one of the following three options can be selected at a time: Ground-fault protection, ground-fault alarm or overload alarm. For fieldbus communications an interface module IZM-PMINT/IZM-MMINT is required in addition.		IZM…-U… (Digitrip 520LSI)	**IZM-DTU** 122777		1 off	
	240 AC	IZM…-U… (Digitrip 520MC)	**+IZM-DTU-HA2** 122779		1 off	Not in combination with ground-fault protection or alarm
With ground-fault protection instead of overload alarm, prepared for 24/48 V DC.	24/48 DC		**+IZM-DTU-EP** 122780		1 off	Not in combination with overload or ground-fault alarm
With ground-fault protection instead of overload alarm, prepared for 240 V AC.	240 AC		**+IZM-DTU-EP2** 122782		1 off	Not in combination with overload or ground-fault alarm
With ground-fault alarm instead of overload alarm, prepared for 24/48 V DC.	24/48 DC		**+IZM-DTU-EA** 122783		1 off	Not in combination with overload alarm or ground-fault protection
With ground-fault alarm instead of overload alarm, prepared for 240 V AC.	240 AC		**+IZM-DTU-EA2** 122785		1 off	Not in combination with overload alarm or ground-fault protection
Through a simple, reliable means, the ARMS (Arcflash Reduction Maintenance System™) function can reduce the Off time for enhanced safety. Must be specifically activated.	–		**+IZM-DTU-ARMS** 122791		1 off	–
NC-reduced: The Type U electronics are supplied without communications interface.	–		**+IZM-DTU-NC** 122790		1 off	Cannot be combined with: • IZM-DTU-NPC • IZM-DTU-ARMS
NPC-reduced: The Type U electronics are supplied without communications interface and without interface to the external supply.	–		**+IZM-DTU-NPC** 122788		1 off	Only in combination with IZM-DTU-EP. Can not be combined with other options.

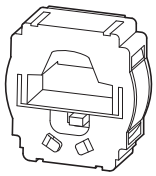
	Rated control voltage U_s V	For use with	**Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
Options and accessories for electronic releases					
Trip unit for Type P circuit-breakers					
Power measurement		IZM…-P… (Digitrip 1150)	**IZM-DTP** 122894		1 off
Type P contains the following as standard: • Power measurement • Communication interface • Overload alarm with signalling contact • Prepared for external 24/48 V DC supply (e.g. for display) • (A14 = +24 VDC/A15 = -24 VDC). Ground-fault protection and alarm are combined in a single option (IZM-DTP-EPA), which can be combined with overload alarm. For field bus communications a corresponding interface module IZM-PMINT/IZM-MMINT is required in addition.					
Add-on function for Type P circuit-breaker					
With overload alarm, prepared for external 240 V AC supply instead of 24/48 V DC.	240 AC	IZM…-P… (Digitrip 1150)	**+IZM-DTP2** 122906		1 off
With additional ground-fault protection and alarm, prepared for 24/48 V DC.	24/48 DC		**+IZM-DTP-EPA** 122915		
With additional ground-fault protection and alarm, prepared for 240 V AC.	240 AC		**+IZM-DTP-EPA2** 122938		
Through a simple, reliable means, the ARMS (Arcflash Reduction Maintenance System™) function can reduce the Off time for enhanced safety. Must be specifically activated.	–		**+IZM-DTP-ARMS** 122939		
Voltage tap on power supply at bottom: Internally, voltage is tapped at the lower (instead of the upper) contacts. Voltage tapping is relevant for power monitoring.	–		**+IZM-DTP-PFBT** 122990		
TripLink transmits all protection parameters from one switch to the other, for example when replacing a device for maintenance.	–		**IZM-DTP-TL** 122989		
Digital relay module for circuit-breakers (Type P) power measurement			**IZM-DTP-RM** 101534		

		Rated control voltage U_s V	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Communication modules						
Fieldbus interfaces for Digitrip IZM-...-U... and IZM...-P...						
	The PROFIBUS communication interface is mounted on top-hat rails.	–	IZM…-U… (Digitrip 520MC) IZM…-P… (Digitrip 1150)	**IZM-PMINT** 124235		1 off
	The Modbus communication interface is mounted on top-hat rails.			**IZM-MMINT** 124236		1 off
Hand held test unit for Digitrip						
	IZM…-A… (Digitrip 520LI) IZM…-V… (Digitrip 520LSI) IZM…-U… (Digitrip 520M)		Testing device for IZM26	**IZM-SIM-KIT** 101535		1 off

Rating plug sensor and current transformer

This combination is required when a circuit-breaker's rated operational current is to be reduced.



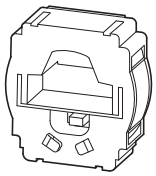


Rated operational current I_n A	For use with	3 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	4 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
200	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-200** 122995		**IZM-RP204-200** 123026		1 off
200	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-200** 122793		**+IZM-RP204-200** 122824		
250	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-250** 122996		**IZM-RP204-250** 123027		
250	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-250** 122794		**+IZM-RP204-250** 122825		
300	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-300** 122997		**IZM-RP204-300** 123028		
300	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-300** 122795		**+IZM-RP204-300** 122826		
400	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-400** 122998		**IZM-RP204-400** 123029		
400	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-400** 122796		**+IZM-RP204-400** 122827		
630	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-630** 122999		**IZM-RP204-630** 123030		
630	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-630** 122797		**+IZM-RP204-630** 122828		
800	IZM20… 800 A ≦ I_u ≦ 2000 A	**IZM-RP203-800** 123000		**IZM-RP204-800** 123031		
800	IZM20… 800 A ≦ I_u ≦ 2000 A	**+IZM-RP203-800** 122798		**+IZM-RP204-800** 122829		
1000	IZM20… 1000 A ≦ I_u ≦ 2000 A	**IZM-RP203-1000** 123001		**IZM-RP204-1000** 123032		
1000	IZM20… 1000 A ≦ I_u ≦ 2000 A	**+IZM-RP203-1000** 122799		**+IZM-RP204-1000** 122830		
1250	IZM20… 1250 A ≦ I_u ≦ 2000 A	**IZM-RP203-1250** 123002		**IZM-RP204-1250** 123033		
1250	IZM20… 1250 A ≦ I_u ≦ 2000 A	**+IZM-RP203-1250** 122800		**+IZM-RP204-1250** 122831		
1600	IZM20… 1600 A ≦ I_u ≦ 2000 A	**IZM-RP203-1600** 123003		**IZM-RP204-1600** 123034		
1600	IZM20… 1600 A ≦ I_u ≦ 2000 A	**+IZM-RP203-1600** 122801		**+IZM-RP204-1600** 122832		
2000	IZM20… 2000 A	**IZM-RP203-2000** 123004		**IZM-RP204-2000** 123035		
200	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-200** 123005		**IZM-RP324-200** 123036		
200	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-200** 122803		**+IZM-RP324-200** 122834		
250	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-250** 123006		**IZM-RP324-250** 123037		
250	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-250** 122804		**+IZM-RP324-250** 122835		
300	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-300** 123007		**IZM-RP324-300** 123038		
300	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-300** 122805		**+IZM-RP324-300** 122836		
400	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-400** 123008		**IZM-RP324-400** 123039		
400	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-400** 122806		**+IZM-RP324-400** 122837		
630	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-630** 123009		**IZM-RP324-630** 123040		
630	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-630** 122807		**+IZM-RP324-630** 122838		
800	IZM32… 800 A ≦ I_u ≦ 3200 A	**IZM-RP323-800** 123010		**IZM-RP324-800** 123041		
800	IZM32… 800 A ≦ I_u ≦ 3200 A	**+IZM-RP323-800** 122808		**+IZM-RP324-800** 122839		

Rating plug sensor and current transformer

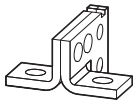
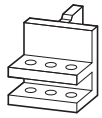
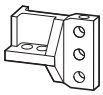
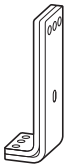
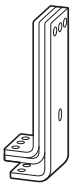
This combination is required when a circuit-breaker's rated operational current is to be reduced.





Rated operational current I_n A	For use with	3 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	4 pole **Part no.** Article no. **Part no. suffix "+IZM..."** Article no. for ordering with basic device	**Price** See price list	Std. pack
1000	IZM32… 1000 A ≦ I_u ≦ 3200 A	**IZM-RP323-1000** 123011		**IZM-RP324-1000** 123042		1 off
1000	IZM32… 1000 A ≦ I_u ≦ 3200 A	**+IZM-RP323-1000** 122809		**+IZM-RP324-1000** 122840		
1250	IZM32… 1250 A ≦ I_u ≦ 3200 A	**IZM-RP323-1250** 123012		**IZM-RP324-1250** 123043		
1250	IZM32… 1250 A ≦ I_u ≦ 3200 A	**+IZM-RP323-1250** 122810		**+IZM-RP324-1250** 122841		
1600	IZM32… 1600 A ≦ I_u ≦ 3200 A	**IZM-RP323-1600** 123013		**IZM-RP324-1600** 123044		
1600	IZM32… 1600 A ≦ I_u ≦ 3200 A	**+IZM-RP323-1600** 122811		**+IZM-RP324-1600** 122842		
2000	IZM32… 2000 A ≦ I_u ≦ 3200 A	**IZM-RP323-2000** 123014		**IZM-RP324-2000** 123045		
2000	IZM32… 2000 A ≦ I_u ≦ 3200 A	**+IZM-RP323-2000** 122812		**+IZM-RP324-2000** 122843		
2500	IZM32… 2500 A ≦ I_u ≦ 3200 A	**IZM-RP323-2500** 123015		**IZM-RP324-2500** 123046		
2500	IZM32… 2500 A ≦ I_u ≦ 3200 A	**+IZM-RP323-2500** 122813		**+IZM-RP324-2500** 122844		
3200	IZM32... 3200 A	**IZM-RP323-3200** 123016		**IZM-RP324-3200** 123047		
2000	IZM40… 2000 A ≦ I_u ≦ 4000 A	**IZM-RP403-2000** 123017		**IZM-RP404-2000** 123048		
2000	IZM40… 2000 A ≦ I_u ≦ 4000 A	**+IZM-RP403-2000** 122815		**+IZM-RP404-2000** 122846		
2500	IZM40… 2500 A ≦ I_u ≦ 4000 A	**IZM-RP403-2500** 123018		**IZM-RP404-2500** 123049		
2500	IZM40… 2500 A ≦ I_u ≦ 4000 A	**+IZM-RP403-2500** 122816		**+IZM-RP404-2500** 122847		
3200	IZM40… 3200 A ≦ I_u ≦ 4000 A	**IZM-RP403-3200** 123019		**IZM-RP404-3200** 123050		
3200	IZM40… 3200 A ≦ I_u ≦ 4000 A	**+IZM-RP403-3200** 122817		**+IZM-RP404-3200** 122848		
4000	IZM40… 4000 A	**IZM-RP403-4000** 122802		**IZM-RP404-4000** 122814		
2000	IZM63… 4000 A	**IZM-RP633-2000** 124244		**IZM-RP634-2000** 124321		
2000	IZM63… 4000 A	**+IZM-RP633-2000** 124319		**+IZM-RP634-2000** 124264		
2500	IZM63… 4000 A ≦ I_u ≦ 5000 A	**IZM-RP633-2500** 124320		**IZM-RP634-2500** 124211		
2500	IZM63… 4000 A ≦ I_u ≦ 5000 A	**+IZM-RP633-2500** 124209		**+IZM-RP634-2500** 124299		
3200	IZM63… 4000 A ≦ I_u ≦ 6300 A	**IZM-RP633-3200** 124210		**IZM-RP634-3200** 124322		
3200	IZM63… 4000 A ≦ I_u ≦ 6300 A	**+IZM-RP633-3200** 124374		**+IZM-RP634-3200** 124354		
4000	IZM63… 4000 A ≦ I_u ≦ 6300 A	**IZM-RP633-4000** 123023		**IZM-RP634-4000** 123054		
4000	IZM63… 4000 A ≦ I_u ≦ 6300 A	**+IZM-RP633-4000** 122821		**+IZM-RP634-4000** 122852		
5000	IZM63… 5000 A ≦ I_u ≦ 6300 A	**IZM-RP633-5000** 123024		**IZM-RP634-5000** 123055		
5000	IZM63… 5000 A ≦ I_u ≦ 6300 A	**+IZM-RP633-5000** 122822		**+IZM-RP634-5000** 122853		
6300	IZM63… 6300 A	**IZM-RP633-6300** 123025		**IZM-RP634-6300** 123056		

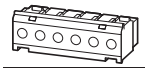
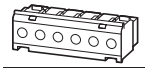
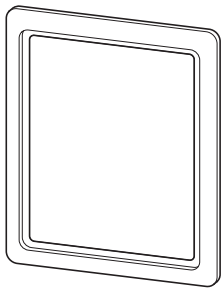
Rated operational current I_n A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Current sensors for Neutral conductor				
For neutral conductor protection or comprehensive ground-fault protection of 3 pole circuit-breakers an external converter is required for current monitoring in the neutral conductor.				
200	IZM20... IZM32…	**IZM-CTN-200** 123057		1 off
250	IZM20... IZM32…	**IZM-CTN-250** 123058		
300	IZM20... IZM32…	**IZM-CTN-300** 123059		
400	IZM20... IZM32…	**IZM-CTN-400** 123060		
630	IZM20... IZM32…	**IZM-CTN-630** 123061		
800	IZM20... IZM32…	**IZM-CTN-800** 123062		
1000	IZM20... IZM32…	**IZM-CTN-1000** 123063		
1250	IZM20... IZM32…	**IZM-CTN-1250** 123064		
1600	IZM20... IZM32…	**IZM-CTN-1600** 123065		
2000	IZM20... IZM32…	**IZM-CTN-2000** 123066		
2500	IZM32…	**IZM-CTN-2500** 123067		
3200	IZM32…	**IZM-CTN-3200** 123068		
4000	IZM40... IZM63...	**IZM-CTN-4000** 123069		
5000	IZM63…	**IZM-CTN-5000** 123070		
6300	IZM63…	**IZM-CTN-6300** 123071		

	Rated operational current I_n A	Rated ultimate short-circuit breaking capacity I_{cu} kA	Pole	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Main terminal kits							
Each basic device of the IZM26 series is supplied with horizontal connections as standard.[1]							
Vertical connections for fixed mounting or cassette							
	≦ 2000	≦ 65	3	IZM20… IN20…	**IZM-TV203N-2000** 123072		1 off
	4000	≦100	3	IZM40… IN40…	**IZM-TV403H-4000** 123081		
	≦ 2000	≦ 65	4	IZM20… IN20…	**IZM-TV204N-2000** 123086		
	4000	≦100	4	IZM40… IN40…	**IZM-TV404H-4000** 123095		
	≦ 1600	≦ 65	3	IZM32… IN32…	**IZM-TV323B-1600** 123074		
	≦ 2000	≦ 100	3	IZM32B…20 IN32B…20 IZM32H…, IN32H…	**IZM-TV323H-2000** 123075		
	2500 - 3200	100	3	IZM32… IN32…	**IZM-TV323H-3200** 123077		
	≦ 1600	≦ 65	4	IZM32… IN32…	**IZM-TV324B-1600** 123088		
	≦ 2000	≦ 100	4	IZM32B…20 IN32B…20 IZM32H…, IN32H…	**IZM-TV324H-2000** 123089		
	2500 - 3200	100	4	IZM32… IN32…	**IZM-TV324H-3200** 123091		
	4000	100	3	IZM63… IN63…	**IZM-TV633H-4000** 123082		
	5000 - 6300	100	3	IZM63… IN63…	**IZM-TV633H-6300** 123084		
	4000	100	4	IZM63… IN63…	**IZM-TV634H-4000** 123096		
	5000 - 6300	100	4	IZM63… IN63…	**IZM-TV634H-6300** 123098		
Front connections for fixed mounting or cassette							
	≦ 1250	≦ 65	3	IZM20… IN20…	**IZM-TF203N-1250** 123100		1 off
	≦ 1250	≦ 65	4	IZM20… IN20…	**IZM-TF204N-1250** 123108		
	1600 - 2000	≦ 65	3	IZM20… IN20…	**IZM-TF203N-2000** 123102		
	4000	≦100	3	IZM40… IN40… IZM63N(H)3...40[2]	**IZM-TF403H-4000** 123107		
	≦ 2000	≦ 65	4	IZM20… IN20…	**IZM-TF204N-2000** 123110		
	4000	≦100	4	IZM40… IN40… IZM63N(H)4...40[2]	**IZM-TF404H-4000** 123115		
	≦ 1250	≦ 65	3	IZM32B… IN32B…	**IZM-TF323B-1250** 124225		
	1600 - 2500	≦ 65	3	IZM32B… IN32B…	**IZM-TF323B-2500** 123104		
	≦ 3200	≦ 100	3	IZM32B…32... IN32B…32… IZM32N…, IN32N… IZM32H…, IN32H… IZM63N(H)3...50 (63)[2]	**IZM-TF323H-3200** 123105		
	≦ 1250	≦ 65	4	IZM32B… IN32B…	**IZM-TF324B-1250** 124280		
	≦ 2500	≦ 65	4	IZM32B… IN32B…	**IZM-TF324B-2500** 123112		
	≦ 3200	≦ 100	4	IZM32B…32... IN32B…32… IZM32N…, IN32N… IZM32H…, IN32H… IZM63N(H)4...50 (63)[2]	**IZM-TF324H-3200** 123113		

Notes

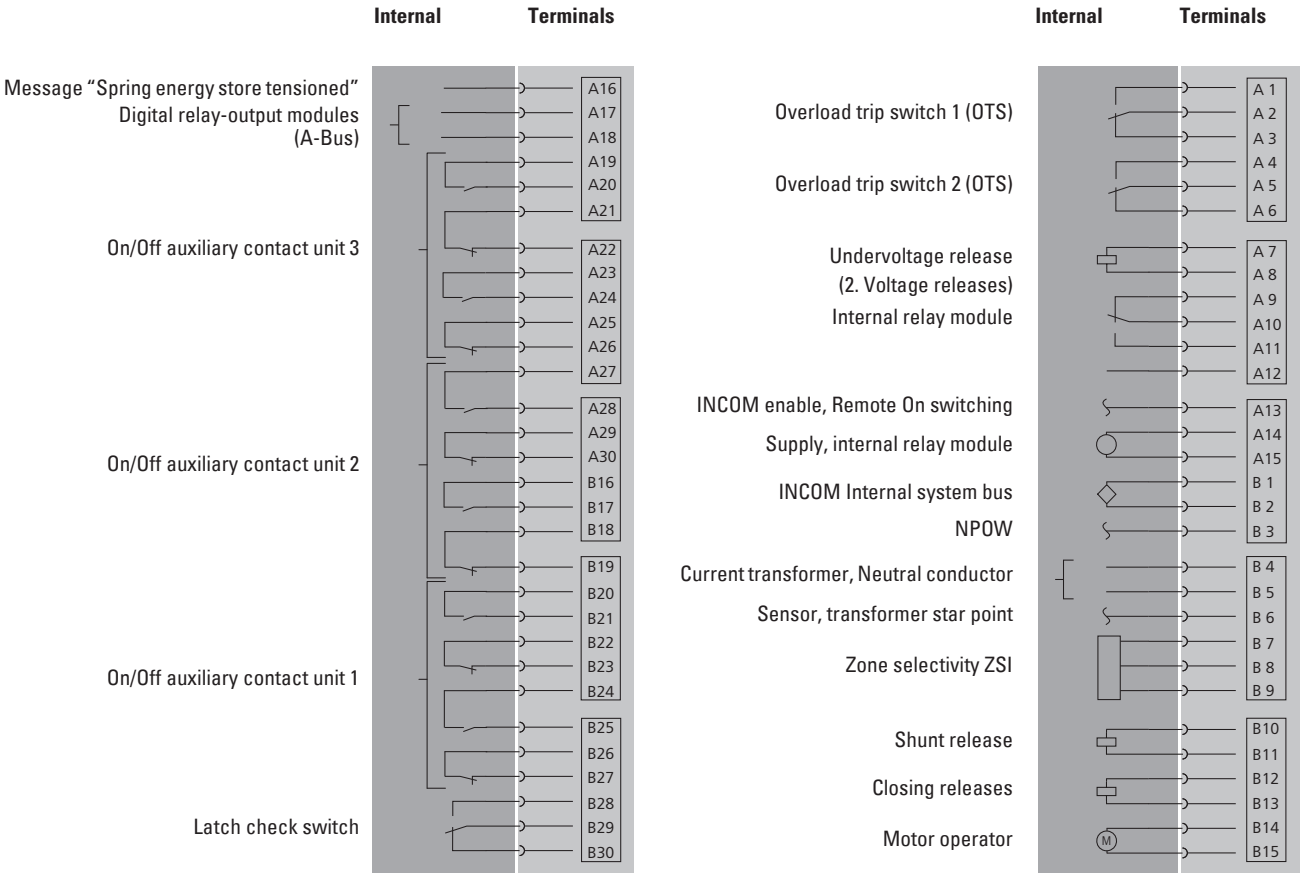
[1] For 3 pole switches: 6 off; for 4 pole switches: 8 off.
IZM40: For 3 pole switches: 12 off, for 4 pole switches: 16 off

[2] For use with this type, you must order the corresponding article twice.

	Rated control voltage U_s V	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
General accessories					
Control circuit terminal, 2 blocks Two terminal blocks, each for six control circuit terminals, complete with labels; AMP tool (AMP No. 305183) and internal wiring.					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-SEC-TB2** 123116		1 off
Control circuit terminal, 15 blocks 15 terminal blocks, each for six control circuit terminals, with labels. Order wiring set separately.					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-SEC-TB15** 123117		1 off
Wiring set for control circuit terminals Wiring material (built into switch), 90 wires for 15 terminal blocks.					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-SEC-WR90** 122789		1 off
Spare door escutcheon, IP41 Spare part; the door escutcheon is supplied as standard with the basic unit or cassette.					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-DEG** 122925		1 off
Protective cover, IP55					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-DC** 122926		1 off
Lifting yoke for lifting Consists of two specially shaped steel hooks that engage in the molded lifting handles in the basic unit of the switch closure.					
	3	IZM20… IN20…	**IZM203-8651C91G09** 124237		1 off
	3	IZM32… IN32…	**IZM323-8651C91G02** 124239		
	3	IZM40… IN40…	**IZM403-2A10886G03** 124241		
	3	IZM63… IN63…	**IZM633-8651C91G05** 124243		
	4	IZM20… IN20…	**IZM204-8651C91G10** 124238		
	4	IZM32… IN32…	**IZM324-8651C91G07** 124240		
	4	IZM40… IN40…	**IZM404-2A10886G07** 124242		
	4	IZM63… IN63…	**IZM634-8651C91G08** 124245		
Trolley Allows lifting of the switch basic unit in combination with the lifting yoke.					
	–	IZM20, 32, 40, 63... IN20, 32, 40, 63...	**IZM-6727D63H20** 124246		1 off

Terminal assignment of control circuit terminals, Switch states.

IZM26

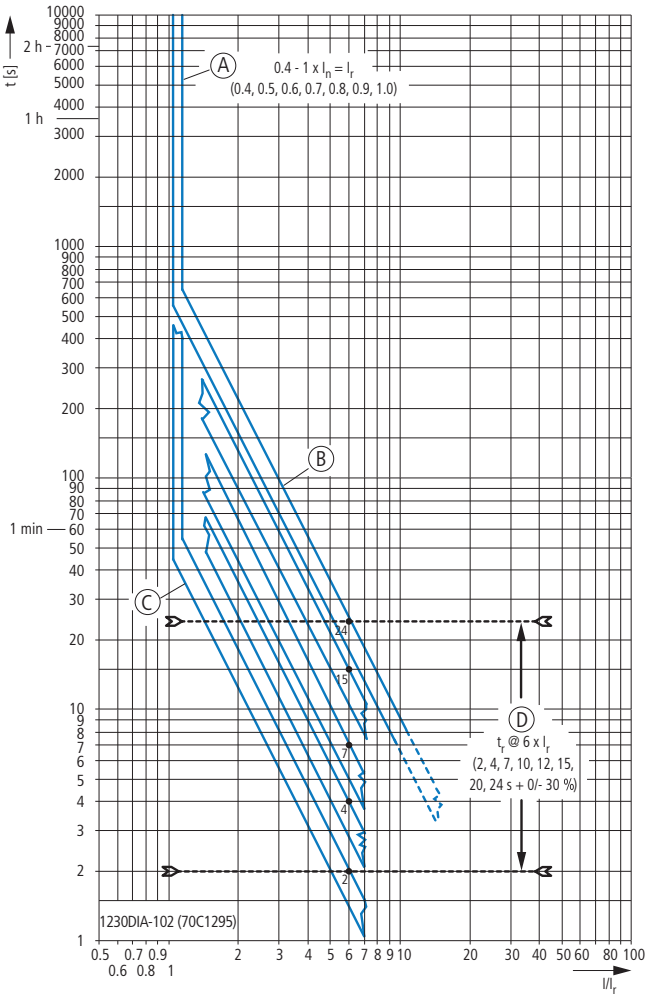


Switching states at mechanical interlock

Mechanical interlock	Possible switching states		
	Switch A	Switch B	
Part no. 2	0	0	
	1	0	
	0	1	
Part no. 31	Switch A	Switch B	Switch C
	0	0	0
	1	0	0
	0	1	0
	0	0	1
	1	0	1
Part no. 32	Switch A	Switch B	Switch C
	0	0	0
	1	0	0
	0	1	0
	0	0	1
	1	1	0
	0	1	1
	1	0	1
Part no. 33	Switch A	Switch B	Switch C
	0	0	0
	1	0	0
	0	1	0
	0	0	1

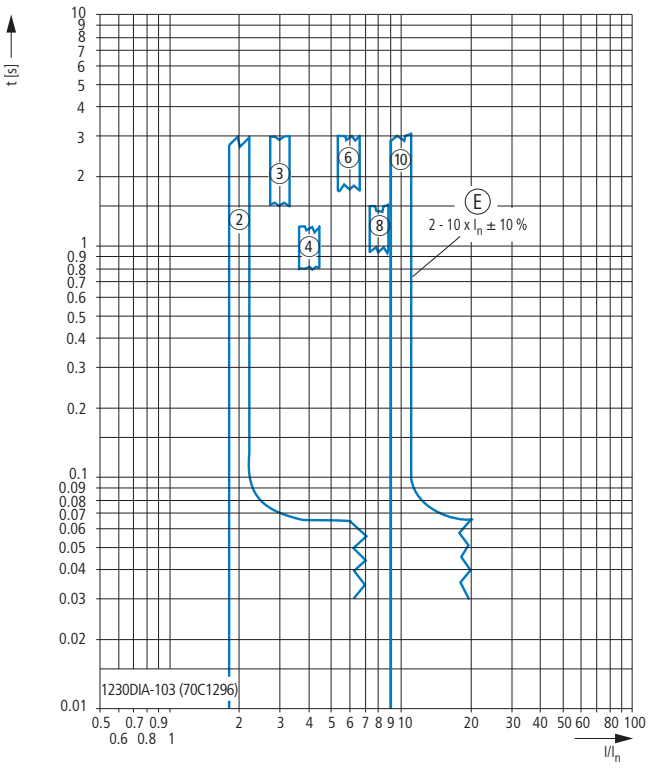
IZM26…A...Tripping characteristics for selective protection
Overload protection (L) and non-delayed short-circuit protection (I)

L-Protection: Adjustable
See Notes 1, 2, 3.



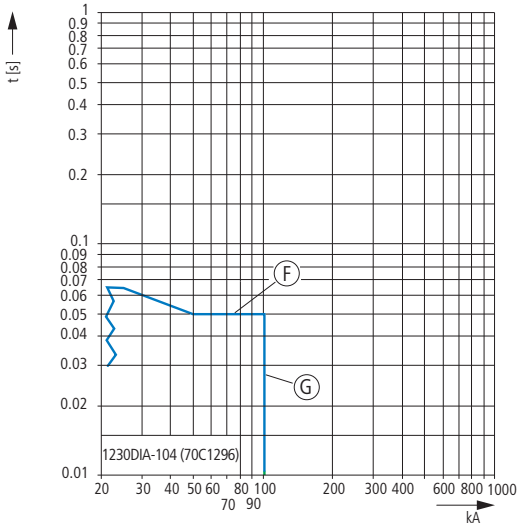
A Set values for overload protection
B Maximum total opening delay
C Minimum total opening delay
D Set values for long delay

I-protection: Adjustable
See Notes 3, 4, 5, 6, 7.



E Set values for short-time delayed short-circuit protection

I-protection: For high short-circuit currents
See Notes 3, 4, 5, 6, 7.

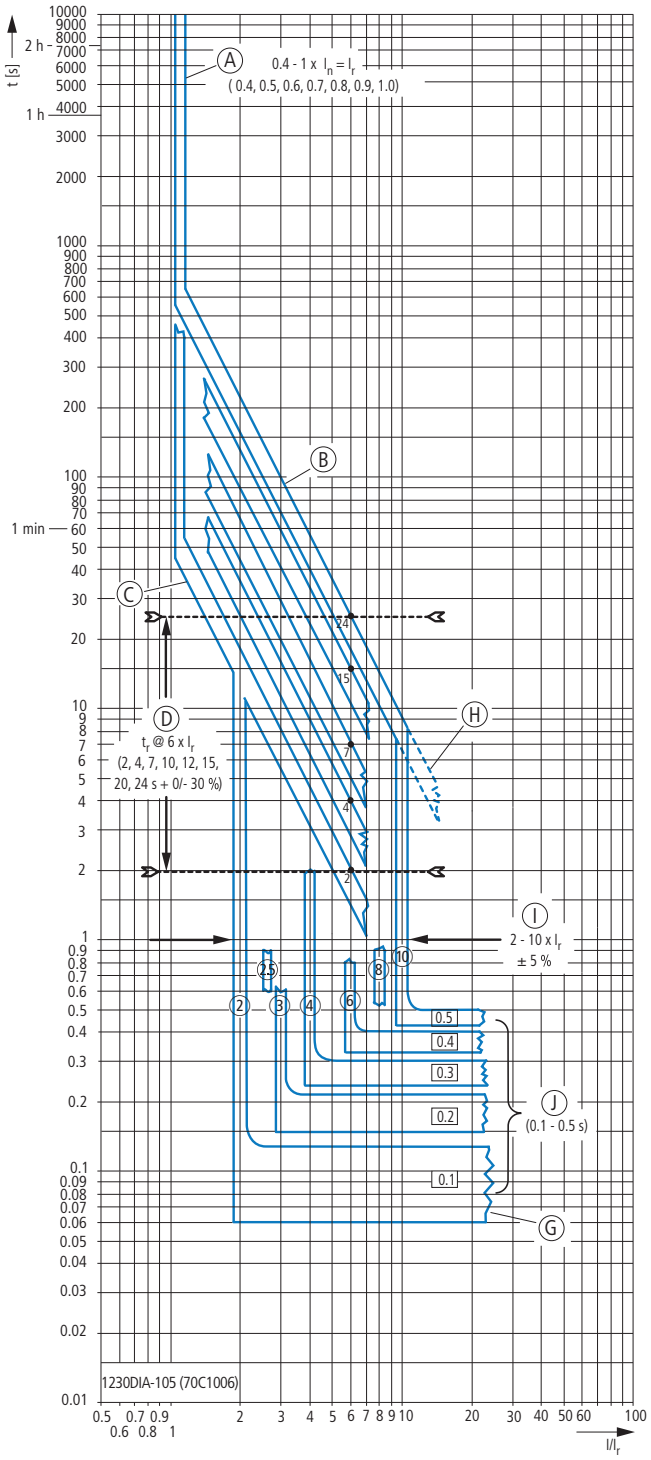


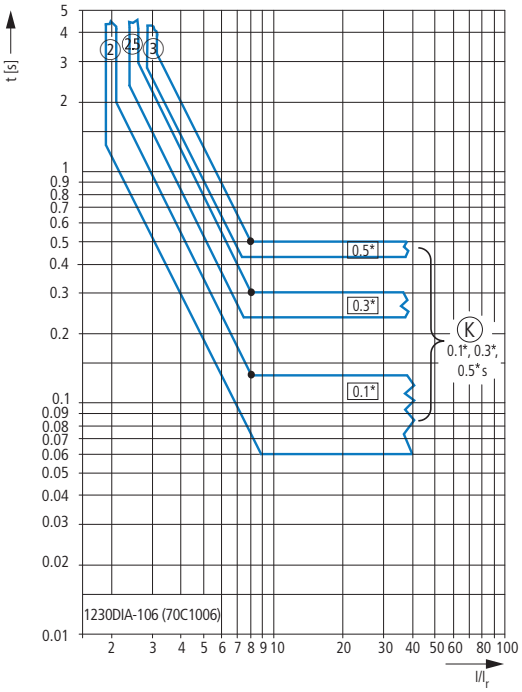
F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

IZM26…V(U)... Tripping characteristics for selectivity protection and universal protection
Overload protection (L) and short-time delayed short-circuit protection (S)

L-Protection: I^2t characteristic curve and S protection: flat characteristic curve
See Notes 1, 3, 4, 6, 7, 8, 9, 10.

S protection: I^2t characteristic curve
See Notes 1, 3, 4, 6, 7, 8, 9, 10.



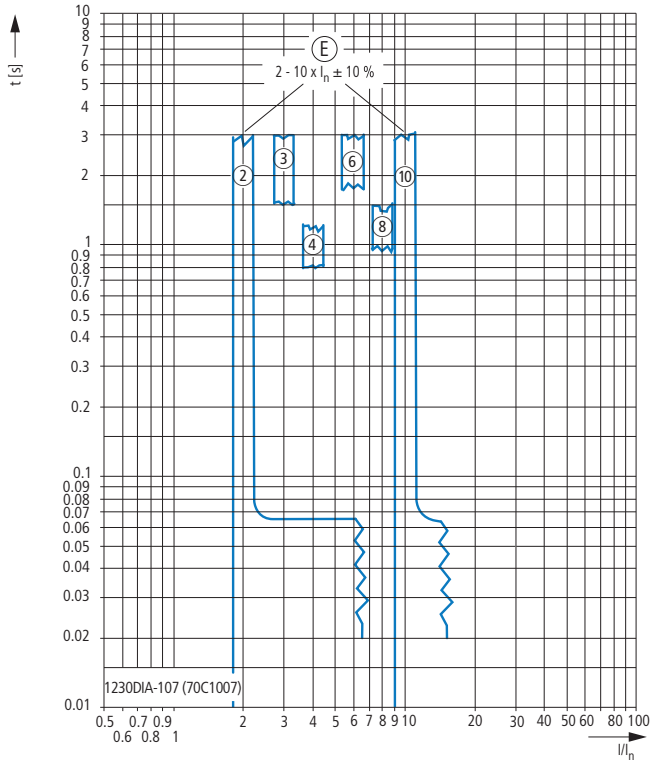


A Set values for overload protection
B Maximum total opening delay
C Minimum total opening delay
D Set values for long delay
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.
H The characteristic curve for the overload release can extend up to the M1 set value.
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents

K Set values for ground fault protection

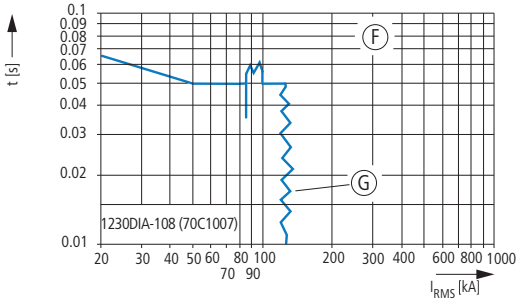
IZM26…V(U)... Tripping characteristics for selectivity protection and universal protection
Non-delayed short-circuit protection (I)

I-protection: Adjustable
See Notes 4, 5, 6, 7, 11, 12.



E Set values for short-time delayed short-circuit protection

I-protection: For high short-circuit currents
See Notes 4, 5, 6, 7, 11, 12.

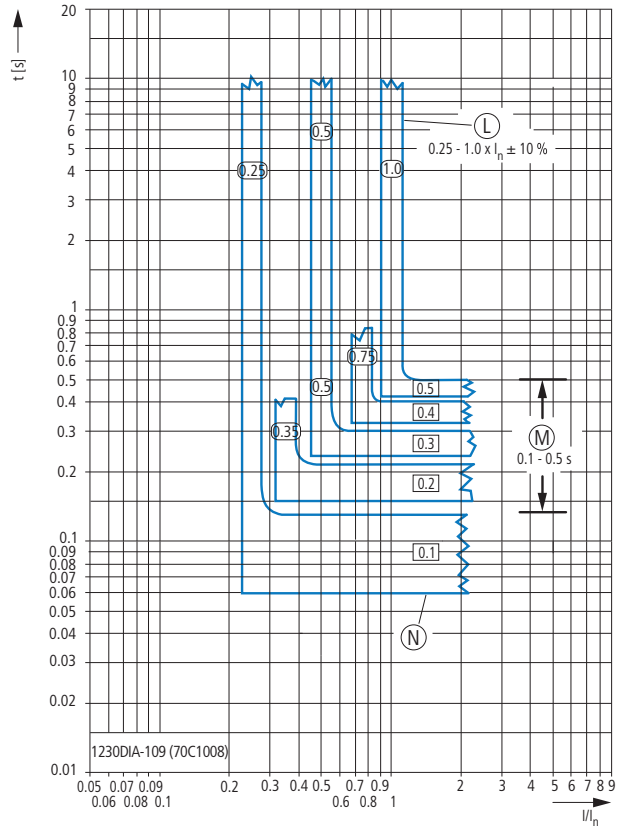


F Set values for short-time delayed short-circuit protection with flat characteristic curve

G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

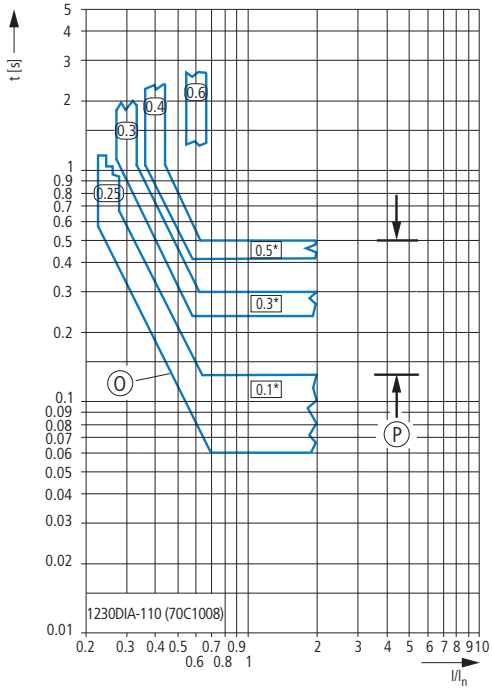
IZM26…V(U)... Option ground-fault protection +IZM-DTV(U)-E…

G: Ground fault protection, flat characteristic curve
See Notes 4, 6, 13, 14, 15, 16, 17.



L Set values for ground-fault protection
M Set values for ground-fault protection delay at flat characteristic curve
N Flat characteristic curve for the delay time fault protection

G: Ground fault protection, I^2t-Characteristic curve
See Notes 4, 6, 13, 14, 15, 16, 17.

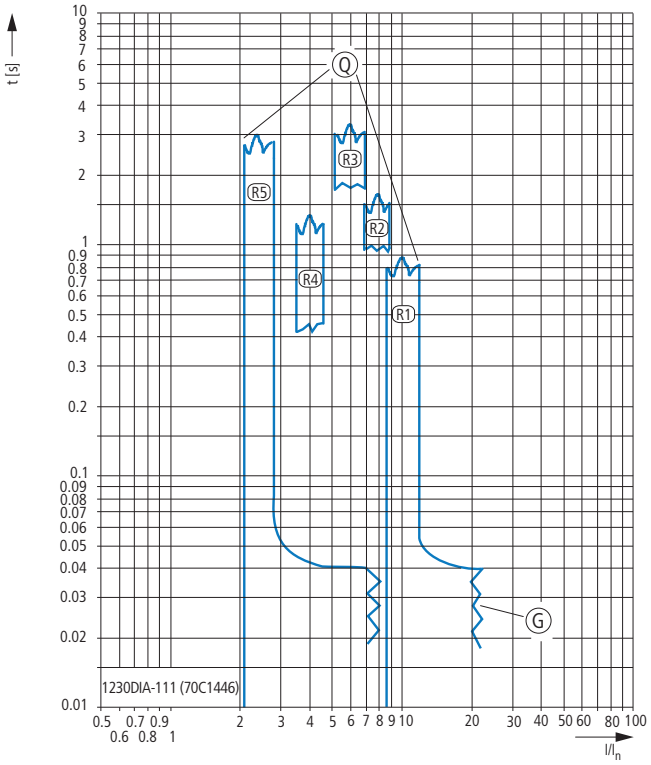


O I^2t characteristic for ground-fault protection delay time

P Set values for ground-fault protection delay with I^2t characteristic

IZM26…U... Option Maintenance mode option +IZM-DTU-ARMS

ARMS-maintenance mode
See Notes 4, 6, 12, 18, 19, 20, 21.

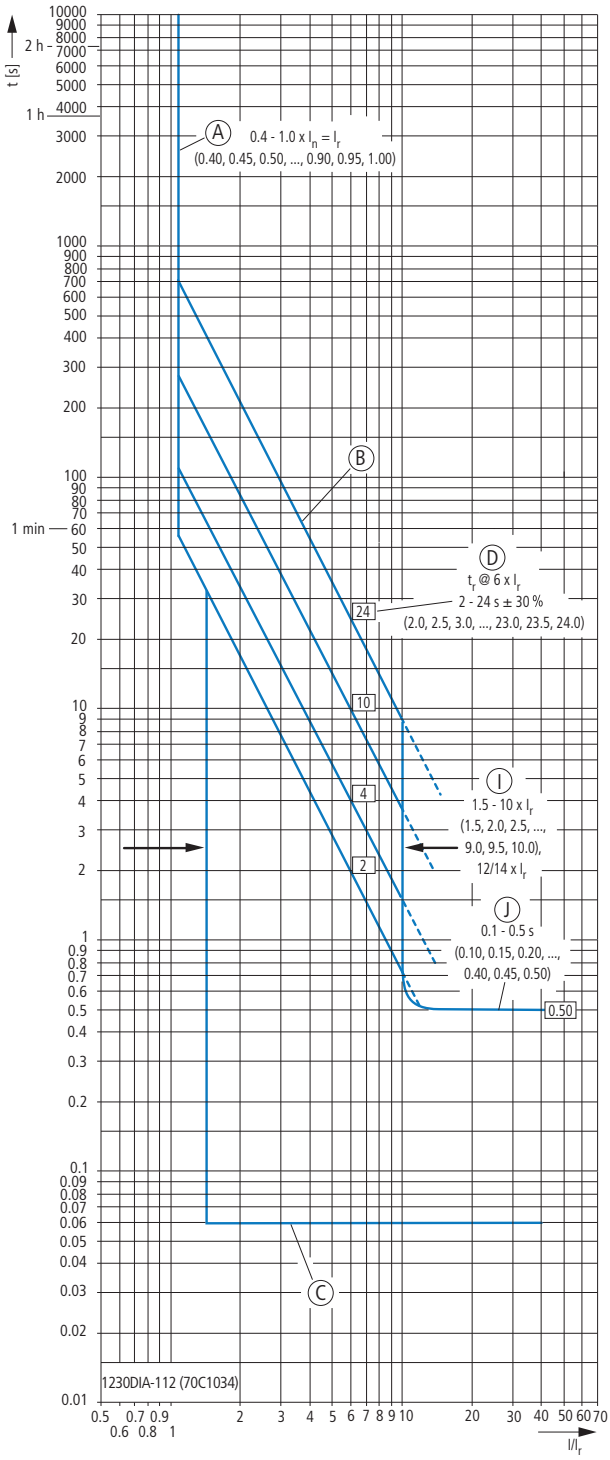


G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

Q Set values for maintenance mode (ARMS):
R5 = max. reduction,
R1 = min. reduction

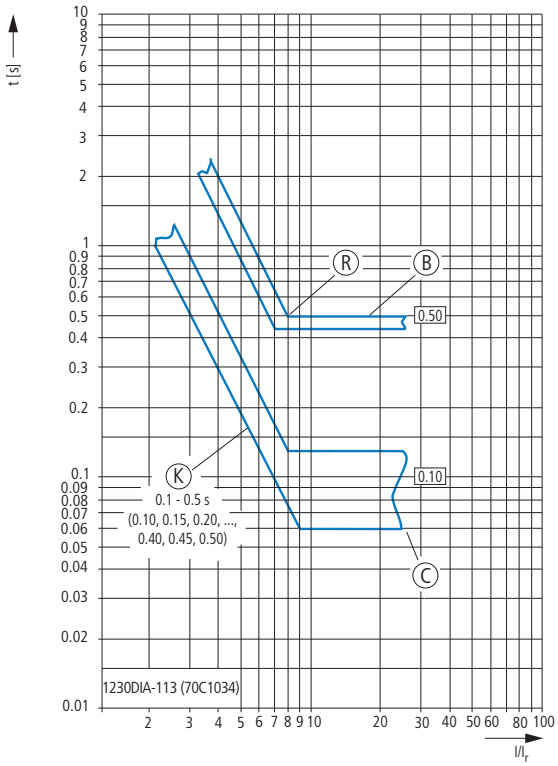
IZM26…P... Tripping characteristics for universal protection with power measurement
Overload protection (L) and short-time delayed short-circuit protection (S)

L-Protection: I^2t characteristic curve and S protection: flat characteristic curve
See Notes 1, 3, 7, 9, 22, 23, 24, 25, 26.



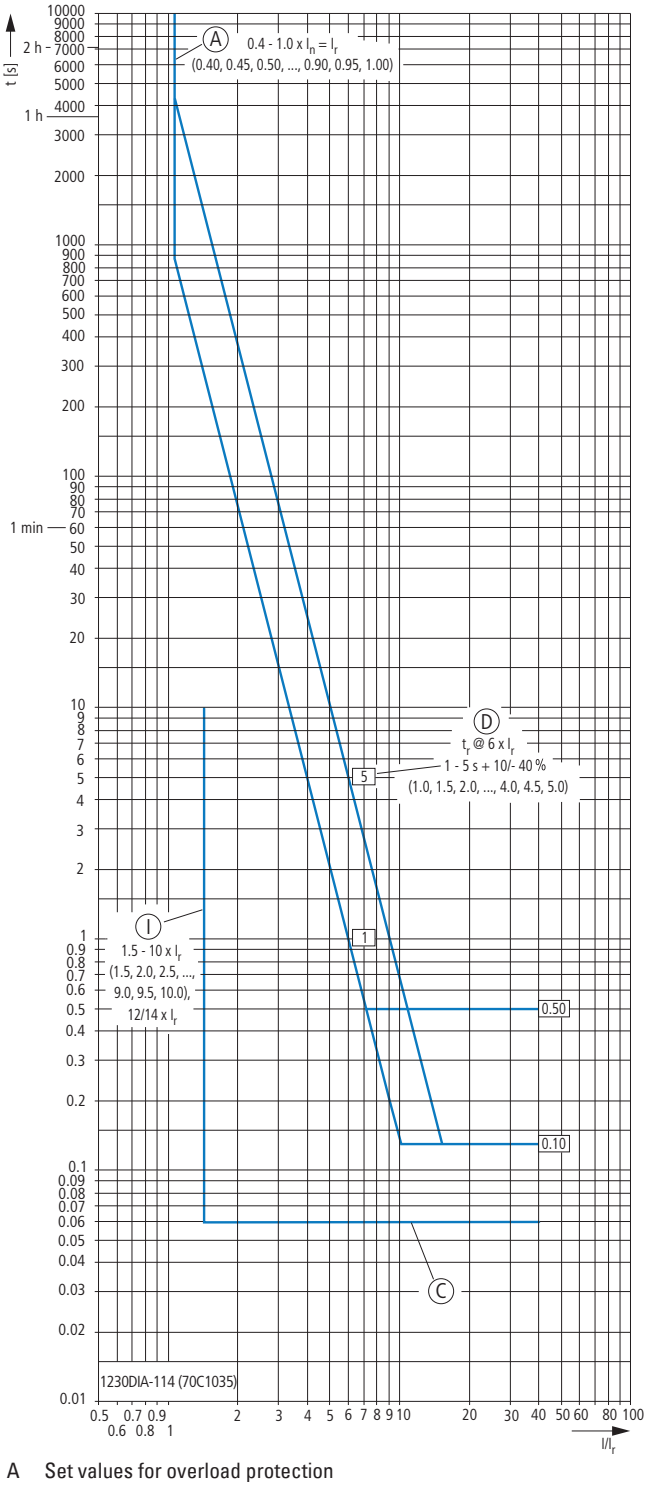
A Set values for overload protection
B Maximum total opening delay
C Minimum total opening delay
D Set values for long delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents

S protection: I^2t characteristic curve
See Notes 1, 3, 7, 9, 22, 23, 24, 25, 26.



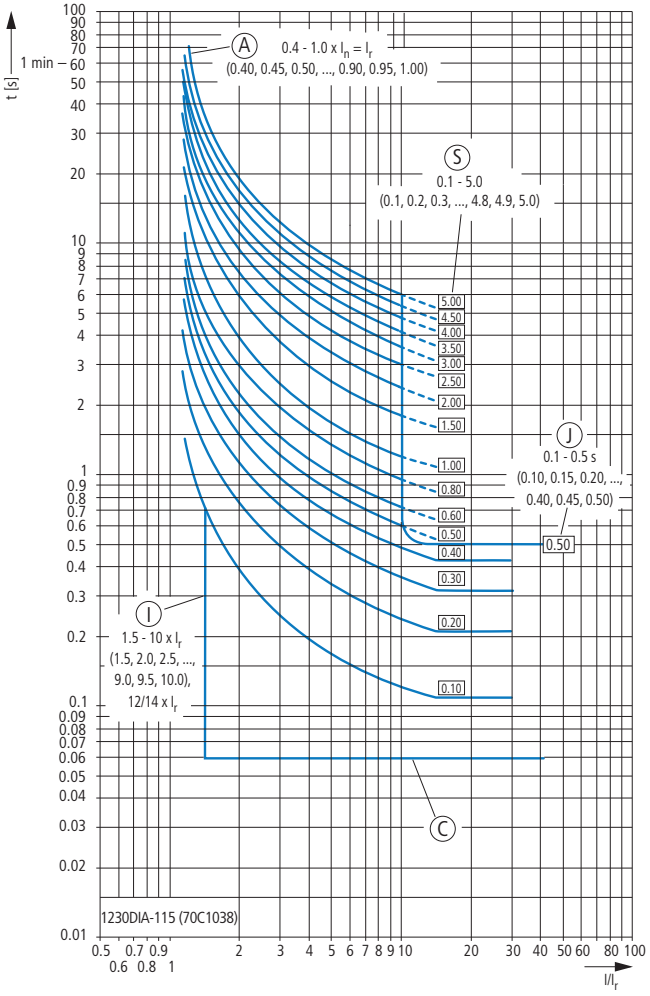
B Maximum total opening delay
C Minimum total opening delay
K Set values for ground fault protection
R Characteristic curve turning point

L protection: I^4t characteristic curve and S protection: flat characteristic curve
See Notes 1, 3, 7, 9, 22, 23, 24, 25, 27.



A Set values for overload protection
C Minimum total opening delay
D Set values for long delay
I Available set values for short-time delayed short-circuit protection I_{sd}

L protection: IEEE standard inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.

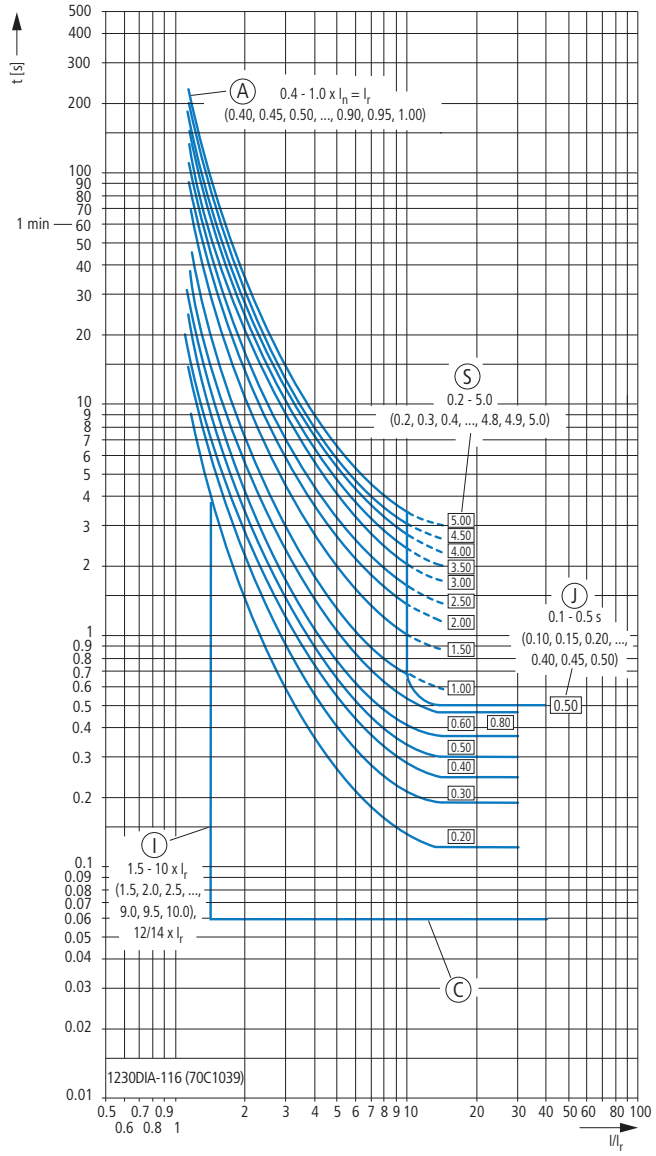


A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

IZM26 tripping characteristics

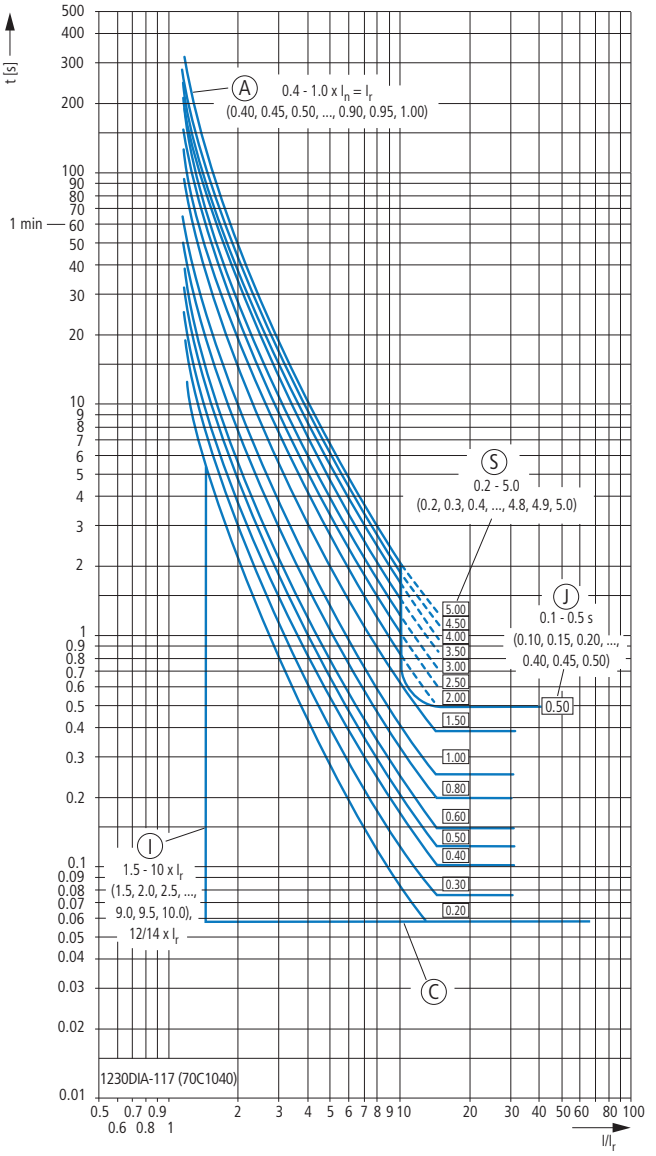
IZM26…(P)…

L protection: IEEE high inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.



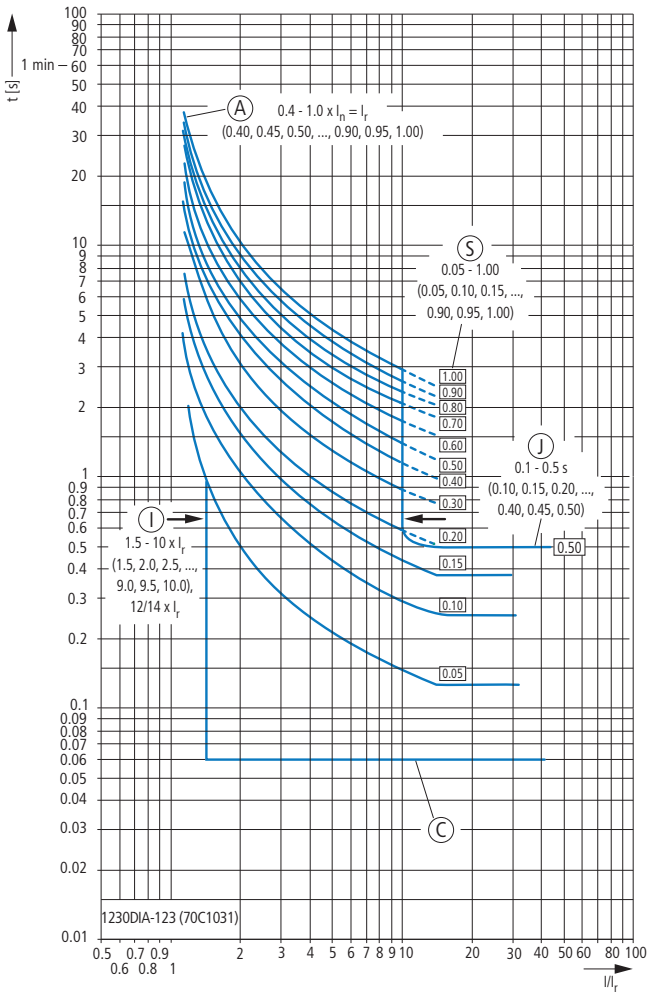
A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

L protection: IEEE extreme inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.



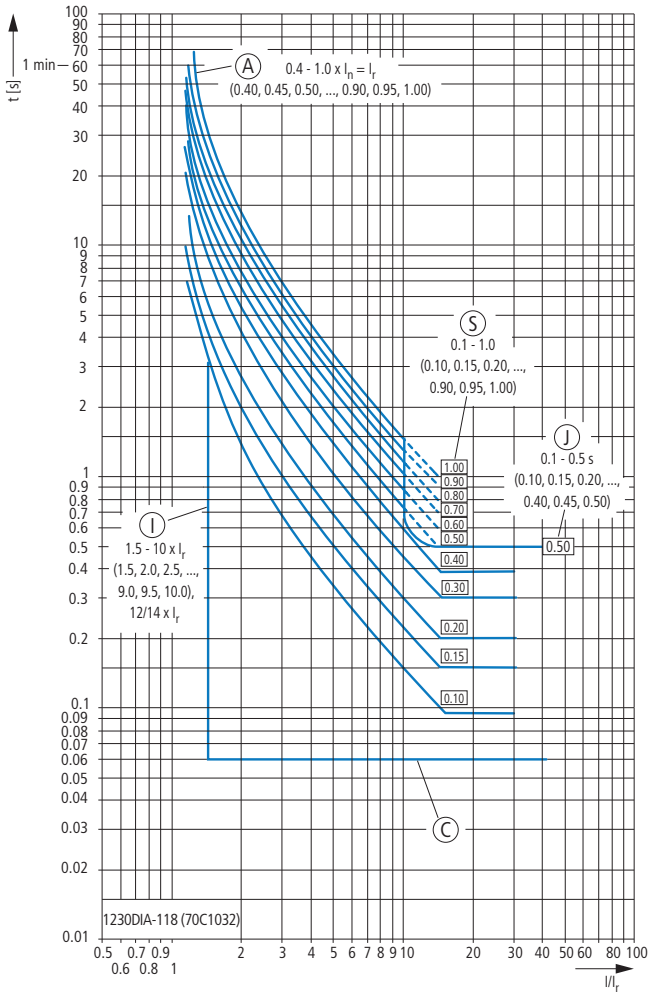
A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

L protection: IEC-A standard inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.



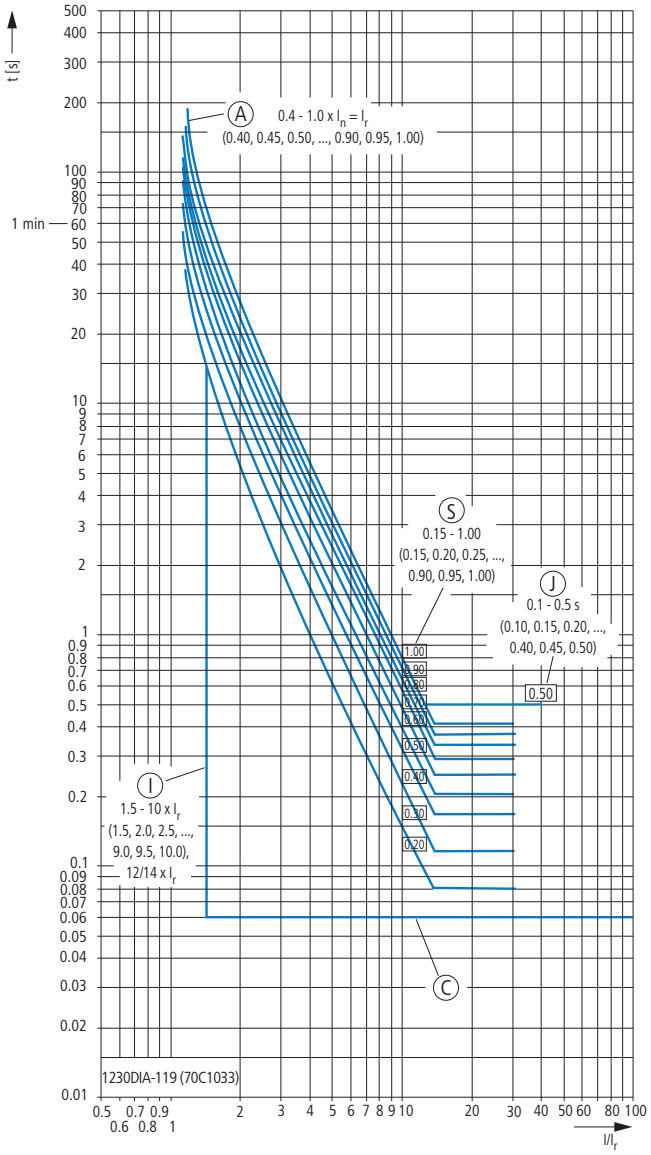
A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

L protection: IEC-B high inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.



A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

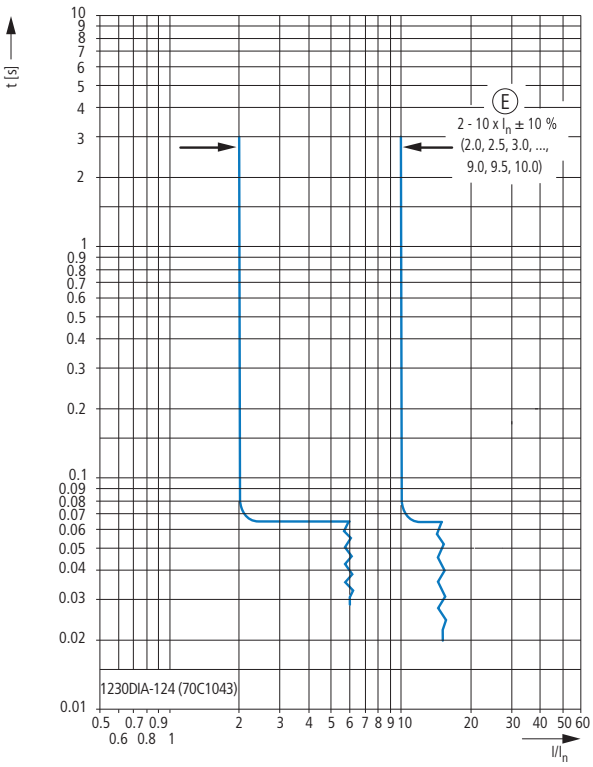
L protection: IEC-C extreme inverse tripping, and S protection: flat characteristic curve
See Notes 3, 7, 8, 9, 23, 25, 28, 29.



A Set values for overload protection
C Minimum total opening delay
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
S Long delay time at 14 × I_r

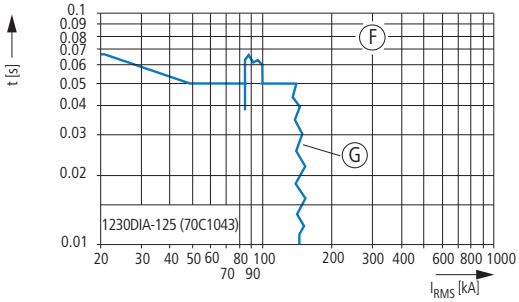
IZM26…P... Tripping characteristics for trip units with power measurement
Non-delayed short-circuit protection (I)

I-protection: Adjustable
See Notes 1, 4, 5, 6, 7, 11, 12.



E Set values for short-time delayed short-circuit protection

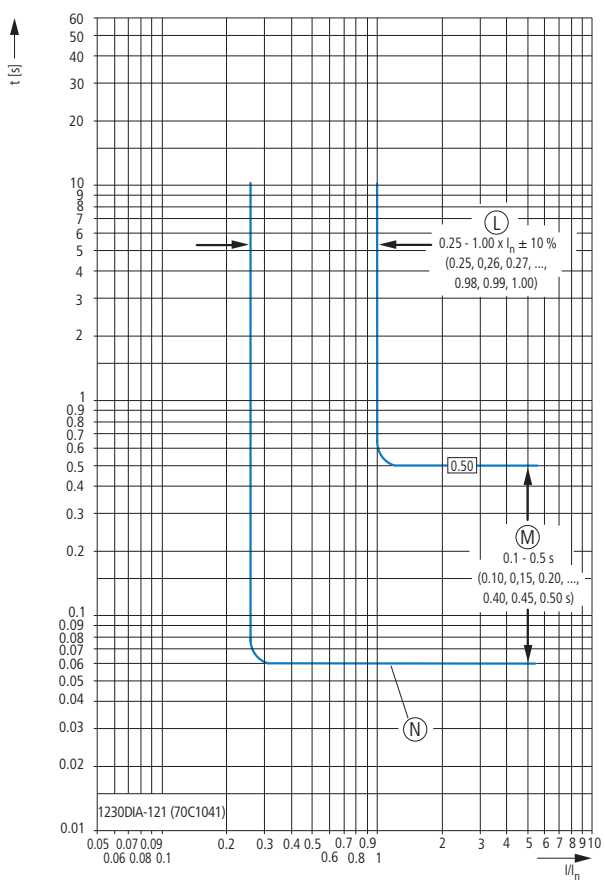
I-protection: For high short-circuit currents



F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.

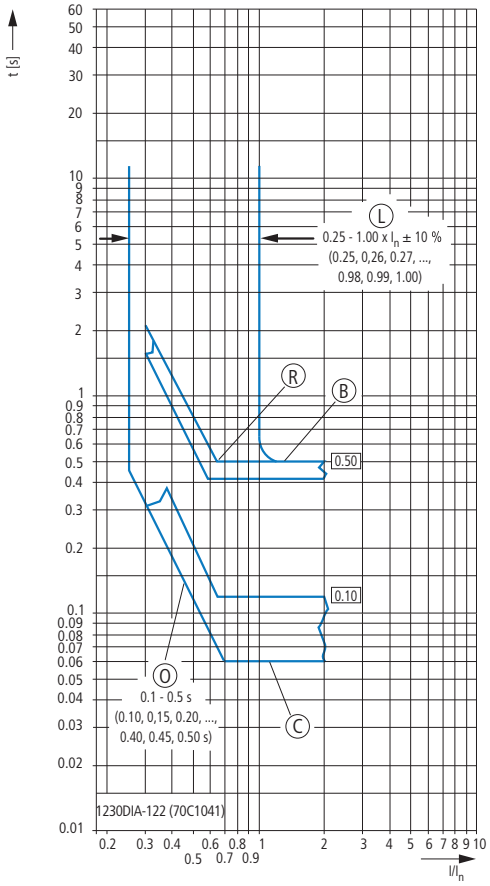
IZM26…P... Option Ground fault protection +IZM-DTP-E…

G: Ground fault protection, flat characteristic curve
See Notes 4, 6, 13, 14, 15, 16, 25, 26, 30.



L Set values for ground-fault protection
M Set values for ground-fault protection delay at flat characteristic curve
N Flat characteristic curve for the delay time fault protection

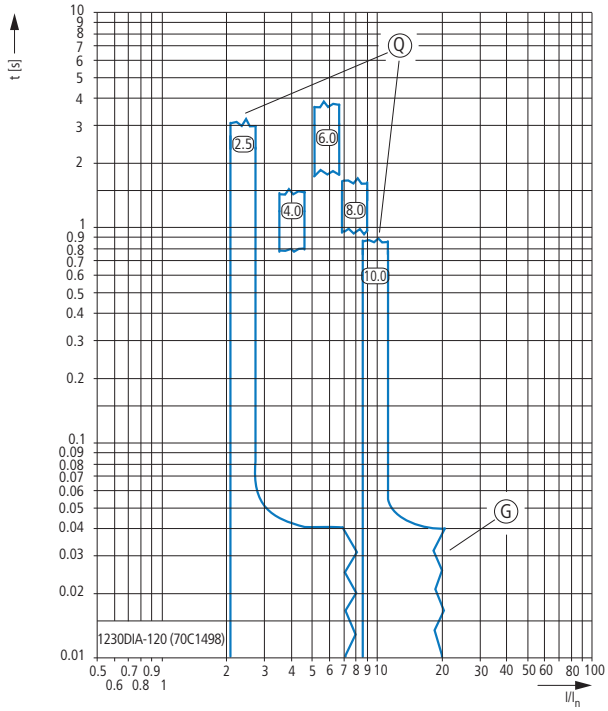
G: Ground fault protection, I²t-characteristic curve
See Notes 4, 6, 13, 14, 15, 16, 25, 26, 30.



B Maximum total opening delay
C Minimum total opening delay
L Set values for ground-fault protection
O I²t characteristic for ground-fault protection delay time
R Characteristic curve turning point

IZM26…P... Option Maintenance mode option +IZM-DTP-ARMS

ARMS-maintenance mode
See Notes 4, 6, 12, 18, 19, 20, 21.



G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.
Q Set values for maintenance mode (ARMS):
R5 = max. reduction, R1 = min. reduction

IZM26 tripping characteristics

IZM26...A(V)(U)(P)...

1 The trip unit has a thermal memory, which can shorten the tripping time in the overload range.

This function plays a role whenever a current is higher than the overload release's tripping time and which is then isolated by a downstream circuit-breaker or the circuit-breaker itself. On a subsequent overload current the circuit-breaker will trip more quickly than normal.

The reduced tripping time is inversely proportional to the time expired since the last overload. After about five minutes the thermal memory is reset.

2 The overload release is activated at a pick-up time of 110 % I_r with a tolerance of ±5 % (indicated by the lit "Unit Status" LED).

3 The characteristic curves apply to applications in a temperature range from -20 °C to +55 °C. Temperatures over +85 °C cause automatic tripping. The circuit-breaker must be selected according to the temperature-dependent derating values from the table in the technical data.

4 The end of the characteristic curve is determined by the type of application and the switching capacity of the selected circuit-breaker.

5 The non-delayed short-circuit release is activated at a response value of conventionally 100 % with a tolerance of ±10 %.

6 The listed overall switch-off times include the response times of the trip unit, the opening times of the switch and the time required to switch off the current.

7 Additional setting "max M1":

IZM20
M1 = 14 × I_n for nominal currents of 200 A to 1250 A
M1 = 12 × I_n for nominal currents of 1600 A to 2000 A

IZM32
M1 = 14 × I_n for nominal currents of 200 A to 1250 A
M1 = 12 × I_n for nominal currents of 1600 A to 2500 A
M1 = 10 × I_n for nominal currents of 3200 A

IZM40
M1 = 12 × I_n for nominal currents of 4000 A

IZM63
M1 = 14 × I_n for nominal currents of 2000 A to 2500 A
M1 = 12 × I_n for nominal currents of 3200 A to 5000 A
M1 = 10 × I_n for nominal currents of 6300 A

8 The overload release trips at 110 % I_r with a tolerance of ±5 % (indicated by the "Unit Status" LED).

The short-time delayed short-circuit release I_{sd} is activated at a pick-up time of conventionally 100 % with a tolerance of ±5 %.

9 When zone selectivity (ZSI) is activated in the short-time delayed short-circuit release and no blocking signal is applied, the minimum time value (0.10 s) applies irrespective of the short-time delay settings.

10 The upper lines of the I^2t characteristic curves are horizontal from a value of 8 × I_r (indicated by the points).

11 IZM circuit-breakers32 feature an additional, permanently set non-delayed short-circuit release, which is set to a peak value of 170 kA with a tolerance of ±10 %.

This protective function remains active when the non-delayed short-circuit release is switched off.

12 The listed overall switch-off times are conservative and take into account the trip unit's maximum response times, the circuit-breaker's maximum opening delays and the longest current interruption times with regard to factors that contribute to worst-case conditions, such as maximum rated operational voltage, single-phase interruptions and minimum power factor.

Fast disconnecting times are possible but depend on the system conditions and the circuit-breaker model.

13 The ground-fault release is activated at a response value of conventionally 100 % with a tolerance of ±10 %.

14 Unless otherwise specified, the current value tolerances are ±10 % of the values shown in the diagram.

15 In combination with ARMS function, ground-fault protection is limited to 1200 A.

16 When zone selectivity (ZSI) is activated in ground-fault protection and no blocking signal is applied, the minimum time value (flat characteristic curve) applies irrespective of the settings.

17 The upper lines of the I^2t characteristic curves are horizontal from a value of 0.625 × I_n (indicated by the points).

18 The maintenance mode function must be activated with a switch or through the communications terminals for these characteristic curves to apply. A blue LED indicates that the maintenance mode settings are active.

19 The shown switch-off times apply for connection to an additional auxiliary power supply.

20 Tripping by the Maintenance Mode Trip is indicated by the non-delayed short-circuit protection LED.

21 The nominal reduction values (response values), with a tolerance of ±15 % are:
2.5 x I_n (= R5), 4 x I_n (= R4), 6 x I_n (= R3), 8 x I_n (= R2), 10 x I_n (= R1)

22 This characteristic curve is shown as a multiple of the overload release setting I_r. The overload release trips at 110 % Ir with a tolerance of ±5 % (indicated by the "Unit Status" LED).

23 The delayed short-circuit release I_{sd} also has an "M1" setting, which may increase the response threshold when I_{sd} is active (at the curves' point of overlap).

24 The delayed short-circuit release I_{sd} trips at 100 %, with a tolerance of ±5 %.

25 Delay tolerances in the area of the flat characteristic curve:
The tolerance is +0/-80 ms of the set values, with the following exceptions:
At 100 ms the tolerance is 6 to 13 ms
At 150 ms the tolerance is 10 to 17 ms
At 200 ms the tolerance is 15 to 22 ms

26 I^2t-function
The upper lines of the I^2t characteristic curves are horizontal from a value of 8 × I_r (for ground-fault protection 0.625 × I_n), the lower limit value of the band following the line.

The characteristic curve has a tolerance of +0/-30 % for all settings except the following ones:
For 0.10 s +30 %/-25 %
For 0.15 s +20 %/-25 %
For 0.20 s +10 %/-25 %

For all characteristic curves the lower, minimum time value, which merges with the I^2t line, determines the break point and the shape of the upper characteristic curve.

27 In the time range ≦ 0.5 s the I^4t characteristic curve becomes horizontal. Tripping does not take place faster than the set short-time delay t_{sd}. (In the drawing a displacement of the characteristic curve is avoided.)

28 This characteristic curve is shown as a multiple of the overload release setting I_r.

This so-called "E-/IEC-... inverse" characteristic curve results from the time setting "TimeDial" in combination with the delayed short-circuit release I_{sd} and the delay t_{sd} (shown as thick lines). The non-delayed short-circuit release I_i, shown as a separate characteristic curve, can be disabled (Off position).

29 For each current > 1.2 × I_r the tolerance is [±15 %] or [-15 %, +90 ms], whichever is greater.

This characteristic curve flattens out for smaller time settings ("TimeDial": 0.1 to 0.4) at 14 × I_r and, if the curves overlap, merges with the characteristic curve for short-term delay I_{sd} for larger time settings ("TimeDial": 0.5 to 1.0).

The delay of the short-circuit release and the "TimeDial" time setting are applied independently of each other. The IEC-B (very inverse) characteristic curve always remains active, even when the lines cross over.

30 With Digitrip 1150 trip unit without ARMS function the ground-fault protection settings already begin at 0.1 × I_n.

A Set values for overload protection I_r
B Maximum total opening delay
C Minimum total opening delay
D Set value for long delay t_r
E Set value non-delayed short-circuit protection I_i
F Set values for short-time delayed short-circuit protection with flat characteristic curve
G The end of the characteristic curve is determined by the type of application and the switching capacity of the selected switch.
H Setting values for short time delay with i2t characteristic.
I Available set values for short-time delayed short-circuit protection I_{sd}
J Short-circuit release for very high currents
KP Set values for short-time delay at I^2t characteristic
L Set values for ground fault protection
M Set values for ground-fault protection delay at flat characteristic curve
N Flat characteristic curve for the deceleration time Ground fault protection
O I^2t characteristic for ground-fault protection delay time
P Set values for ground-fault protection delay with I^2t characteristic
q Set values for maintenance mode (ARMS):
R5 = max. reduction,
R1 = min. reduction
R Characteristic curve turning point
S Long delay time with 14 x I_r

Rating-Plug-Combinations for IZM20…

Rating plugs (plus types, 3 pole)

I_u [A]	800	1000	1250	1600	2000
I_n [A]					
200	+IZM-RP203-200				
250	+IZM-RP203-250				
300	+IZM-RP203-300				
400	+IZM-RP203-400				
630	+IZM-RP203-630				
800	Standard	+IZM-RP203-800			
1000		Standard	+IZM-RP203-1000		
1250			Standard	+IZM-RP203-1250	
1600				Standard	+IZM-RP203-1600
2000					Standard

Rating plugs (plus types, 4 pole)

I_u [A]	800	1000	1250	1600	2000
I_n [A]					
200	+IZM-RP204-200				
250	+IZM-RP204-250				
300	+IZM-RP204-300				
400	+IZM-RP204-400				
630	+IZM-RP204-630				
800	Standard	+IZM-RP204-800			
1000		Standard	+IZM-RP204-1000		
1250			Standard	+IZM-RP204-1250	
1600				Standard	+IZM-RP204-1600
2000					Standard

Rating-Plug-Combinations for IZM32…

Rating plugs (plus types, 3 pole)

I_u [A]	800	1000	1250	1600	2000	2500	3200
I_n [A]							
200	+IZM-RP323-200						
250	+IZM-RP323-250						
300	+IZM-RP323-300						
400	+IZM-RP323-400						
630	+IZM-RP323-630						
800	Standard	+IZM-RP323-800					
1000		Standard	+IZM-RP323-1000				
1250			Standard	+IZM-RP323-1250			
1600				Standard	+IZM-RP323-1600		
2000					Standard	+IZM-RP323-2000	
2500						Standard	+IZM-RP323-2500
3200							Standard

Rating plugs (plus types, 4 pole)

I_u [A]	800	1000	1250	1600	2000	2500	3200
I_n [A]							
200	+IZM-RP324-200						
250	+IZM-RP324-250						
300	+IZM-RP324-300						
400	+IZM-RP324-400						
630	+IZM-RP324-630						
800	Standard	+IZM-RP324-800					
1000		Standard	+IZM-RP324-1000				
1250			Standard	+IZM-RP324-1250			
1600				Standard	+IZM-RP324-1600		
2000					Standard	+IZM-RP324-2000	
2500						Standard	+IZM-RP324-2500
3200							Standard

Rating-Plug-Combinations for IZM40…

Rating plugs (plus types, 3- and 4 pole)

	3 pole	4 pole
I_u [A]	4000	4000
I_n [A]		
2000	+IZM-RP403-2000	+IZM-RP404-2000
2500	+IZM-RP403-2500	+IZM-RP404-2500
3200	+IZM-RP403-3200	+IZM-RP404-3200
4000	Standard	Standard

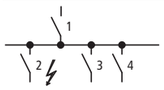
Rating-Plug-Combinations for IZM63…

Rating plugs (plus types, 3 pole)

I_u [A]	4000	5000	6300
I_n [A]			
2000		+IZM-RP633-2000	
2500		+IZM-RP633-2500	
3200		+IZM-RP633-3200	
4000	Standard	+IZM-RP633-4000	
5000		Standard	+IZM-RP633-5000
6300			Standard

Rating plugs (plus types, 4 pole)

I_u [A]	4000	5000	6300
I_n [A]			
2000		+IZM-RP634-2000	
2500		+IZM-RP634-2500	
3200		+IZM-RP634-3200	
4000	Standard	+IZM-RP634-4000	
5000		Standard	+IZM-RP634-5000
6300			Standard



I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu}: Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit releases

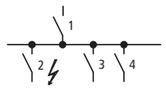
Selectivity 415 V AC
between circuit-breakers enables the separate isolation of faulty system sections.
Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing circuit-breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 remain operational.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, P releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

	Incoming circuit-breaker (1)		**IZM...20-A**										**IZM...20-V**						
		I_n [A]	800	800	1000	1000	1250	1250	1600	1600	2000	2000	800	800	1000	1000	1250	1250	1600
		I_{cu} [kA]	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50
		I_i [A]	8000	8000	10000	10000	12500	12500	16000	16000	20000	20000	11200	11200	14000	14000	17500	17500	19200
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)										Prospective short-circuit current ($I_{cc\ rms}$ in kA)						
NZMB(C)(N)(H)1-A(M)…	20	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	25	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	32	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	40	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	50	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	63	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	80	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	100	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	125	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
	160	25 - 100	9	9	15	15	T(25)	T(25)	T	T(50)	T	T	T	T	T	T	T	T	T
NZMB(C)(N)(H) 2-A(M)(V)…	20	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	25	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	32	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	40	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	50	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	63	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	80	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	90	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	100	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	125	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	140	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	160	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	200	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	220	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	250	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
	300	25 - 150	10	10	18	18	T(30)	T(30)	T	T	T	T	T	T	T	T	T	T	T
NZMC(N)(H)3-A(M)(V)…	220	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	250	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	320	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	350	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	400	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	450	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	500	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
	630	36 - 150	7	7	9	9	12	12	18	18	25	25	T	T	T	T	T	T	T
NZMN(H)4-A(M)(V)…	550	50 - 100	7	7	9	9	12	12	15	15	18	18	T	T	T	T	T	T	T
	630	50 - 100	7	7	9	9	12	12	15	15	18	18	T	T	T	T	T	T	T
	800	50 - 100	-	-	9	9	12	12	15	15	18	18	-	-	T	T	T	T	T
	875	50 - 100	-	-	9	9	12	12	15	15	18	18	-	-	T	T	T	T	T
	1000	50 - 100	-	-	-	-	12	12	15	15	18	18	-	-	-	-	T	T	T
	1250	50 - 100	-	-	-	-	-	-	15	15	18	18	-	-	-	-	-	-	T
	1400	50 - 100	-	-	-	-	-	-	15	15	18	18	-	-	-	-	-	-	T
	1600	50 - 100	-	-	-	-	-	-	-	-	18	18	-	-	-	-	-	-	-

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity

			IZM...20-U										**IZM20...-P**									
			1600	2000	2000	800	800	1000	1000	1250	1250	1600	1600	2000	2000	800	800	1000	1000	1250	1250	1600
			65	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50
			19200	24000	24000	11200	11200	14000	14000	17500	17500	19200	19200	24000	24000	11200	11200	14000	14000	17500	17500	19200
			N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B	N	B
						Prospective short-circuit current ($I_{cc\ rms}$ in kA)										Prospective short-circuit current ($I_{cc\ rms}$ in kA)									
			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T



I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu}: Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit releases

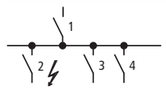
Selectivity 415 V AC
between circuit-breakers enables the separate isolation of faulty system sections.
Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 continue to operate.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, P releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

	Incoming circuit-breaker (1)		**IZM...32-A**																			
		I_n [A]	800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600	2000	2000	2000	2500	2500	2500	3200
		I_{cu} [kA]	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65
		I_i [A]	8000	8000	8000	10000	10000	10000	12500	12500	12500	16000	16000	16000	20000	20000	20000	25000	25000	25000	32000
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)																		
NZMB(C)(N)(H)1-A(M)…	20	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	25	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	32	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	40	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	50	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	63	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	80	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	100	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	125	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
	160	25 - 100	9	9	9	15	15	15	T(25)	T(25)	T(25)	T(50)	T(50)	T(50)	T	T	T(85)	T	T	T	T
NZMB(C)(N)(H)2-A(M)(V)…	20	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	25	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	32	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	40	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	50	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	63	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	80	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	90	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	100	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	125	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	140	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	160	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	200	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	220	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	250	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
	300	25 - 150	10	10	10	18	18	18	T(30)	T(30)	T(30)	T	T	T(85)	T	T	T	T	T	T	T
NZMC(N)(H)3-A(M)(V)…	220	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	250	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	320	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	350	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	400	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	450	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	500	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
	630	36 - 150	7	7	7	9	9	9	12	12	12	18	18	18	20	20	20	T(40)	T(40)	T(40)	T(60)
NZMN(H)4-A(M)(V)…	550	50 - 100	7	7	7	9	9	9	12	12	12	15	15	15	18	18	18	22	22	22	29
	630	50 - 100	7	7	7	9	9	9	12	12	12	15	15	15	18	18	18	22	22	22	29
	800	50 - 100	–	–	–	9	9	9	12	12	12	15	15	15	18	18	18	22	22	22	29
	875	50 - 100	–	–	–	9	9	9	12	12	12	15	15	15	18	18	18	22	22	22	29
	1000	50 - 100	–	–	–	–	–	–	12	12	12	15	15	15	18	18	18	22	22	22	29
	1250	50 - 100	–	–	–	–	–	–	–	–	–	15	15	15	18	18	18	22	22	22	29
	1400	50 - 100	–	–	–	–	–	–	–	–	–	15	15	15	18	18	18	22	22	22	29
	1600	50 - 100	–	–	–	–	–	–	–	–	–	–	–	–	18	18	18	22	22	22	29

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity

			IZM...32-V																			
3200	3200		800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600	2000	2000	2000	2500	2500	2500	3200	3200	3200
85	100		65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100
32000	32000		11200	11200	11200	14000	14000	14000	17500	17500	17500	19200	19200	19200	24000	24000	24000	30000	30000	30000	32000	32000	32000
N	H		B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)																				
T	T		T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T



I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu}: Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit releases

Selectivity 415 V AC
between circuit-breakers enables the separate isolation of faulty system sections.
Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 continue to operate.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, P releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

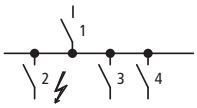
			Incoming circuit-breaker (1)	**IZM...32-U**																			
			I_n [A]	800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600	2000	2000	2000	2500	2500	2500	3200
			I_{cu} [kA]	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65
			I_i [A]	11200	11200	11200	14000	14000	14000	17500	17500	17500	19200	19200	19200	24000	24000	24000	30000	30000	30000	32000
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)																			
NZMB(C)(N)(H)1-A(M)…	20	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMB(C)(N)(H)2-A(M)(V)…	20	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	90	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	140	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	200	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	220	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	300	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMC(N)(H)3-A(M)(V)…	220	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	320	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	350	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	400	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	450	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	500	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	630	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMN(H)4-A(M)(V)…	550	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	630	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	800	50 - 100	–	–	–	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	875	50 - 100	–	–	–	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1000	50 - 100	–	–	–	–	–	–	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1250	50 - 100	–	–	–	–	–	–	–	–	–	T	T	T	T	T	T	T	T	T	T	T
	1400	50 - 100	–	–	–	–	–	–	–	–	–	T	T	T	T	T	T	T	T	T	T	T
	1600	50 - 100	–	–	–	–	–	–	–	–	–	–	–	–	T	T	T	T	T	T	T	T

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity

IZM32...-P																							
3200	3200	800	800	800	1000	1000	1000	1250	1250	1250	1600	1600	1600	2000	2000	2000	2500	2500	2500	3200	3200	3200
85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100	65	85	100
32000	32000	11200	11200	11200	14000	14000	14000	17500	17500	17500	19200	19200	19200	24000	24000	24000	30000	30000	30000	32000	32000	32000
N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H	B	N	H
Prospective short-circuit current ($I_{cc\ rms}$ in kA)																						
T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Selectivity: incoming circuit-breaker, outgoing circuit-breaker

IZM40...



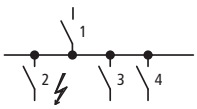
I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu}: Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit release

Selectivity 415 V AC
between circuit-breakers enables the separate isolation of faulty system sections.
Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 remain operational.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, P releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

	Incoming circuit-breaker		**IZM...40-V**		**IZM...40-U**		**IZM40...-P**	
	I_n [A]		4000	4000	4000	4000	4000	4000
	I_{cu} [kA]		85	100	85	100	85	100
	I_i [A]		48000	48000	48000	48000	48000	48000
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	N	H	N	H	N	H
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)					
NZMB(C)(N)(H)1-A(M)…	20	25 - 100	T	T	T	T	T	T
	25	25 - 100	T	T	T	T	T	T
	32	25 - 100	T	T	T	T	T	T
	40	25 - 100	T	T	T	T	T	T
	50	25 - 100	T	T	T	T	T	T
	63	25 - 100	T	T	T	T	T	T
	80	25 - 100	T	T	T	T	T	T
	100	25 - 100	T	T	T	T	T	T
	125	25 - 100	T	T	T	T	T	T
	160	25 - 100	T	T	T	T	T	T
NZMB(C)(N)(H)2-A(M)(V)…	20	25 - 150	T	T	T	T	T	T
	25	25 - 150	T	T	T	T	T	T
	32	25 - 150	T	T	T	T	T	T
	40	25 - 150	T	T	T	T	T	T
	50	25 - 150	T	T	T	T	T	T
	63	25 - 150	T	T	T	T	T	T
	80	25 - 150	T	T	T	T	T	T
	90	25 - 150	T	T	T	T	T	T
	100	25 - 150	T	T	T	T	T	T
	125	25 - 150	T	T	T	T	T	T
	140	25 - 150	T	T	T	T	T	T
	160	25 - 150	T	T	T	T	T	T
	200	25 - 150	T	T	T	T	T	T
	220	25 - 150	T	T	T	T	T	T
	250	25 - 150	T	T	T	T	T	T
	300	25 - 150	T	T	T	T	T	T
NZMC(N)(H)3-A(M)(V)…	220	36 - 150	T	T	T	T	T	T
	250	36 - 150	T	T	T	T	T	T
	320	36 - 150	T	T	T	T	T	T
	350	36 - 150	T	T	T	T	T	T
	400	36 - 150	T	T	T	T	T	T
	450	36 - 150	T	T	T	T	T	T
	500	36 - 150	T	T	T	T	T	T
	630	36 - 150	T	T	T	T	T	T
NZMN(H)4-A(M)(V)…	550	50 - 100	T	T	T	T	T	T
	630	50 - 100	T	T	T	T	T	T
	800	50 - 100	T	T	T	T	T	T
	875	50 - 100	T	T	T	T	T	T
	1000	50 - 100	T	T	T	T	T	T
	1250	50 - 100	T	T	T	T	T	T
	1400	50 - 100	T	T	T	T	T	T
	1600	50 - 100	T	T	T	T	T	T

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity



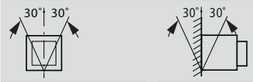
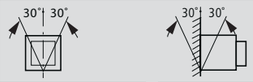
I_n: Rated operational current
I_u: Rated uninterrupted current
I_{cu}: Rated short-circuit breaking capacity
I_i: Set value non-delayed short-circuit releases

Selectivity 415 V AC
between circuit-breakers enables the separate isolation of faulty system sections.
Selectivity exists between incoming circuit-breaker 1 and outgoing circuit-breaker 2 if, only outgoing breaker 2 trips at position 2 during a short-circuit.
System sections 3 and 4 continue to operate.

Selection:
Provided that the short-circuit current does not exceed those values specified ($I_{cc\ rms}$).
These details represent the limits of selectivity.
Both circuit-breakers will switch off with higher short-circuit currents.
On IZM circuit-breakers with V, U, P releases, the delay time t_{sd} must be at least 100 ms longer than the delay time of the next downstream levels (2, 3, 4).

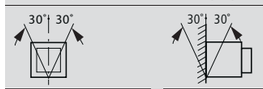
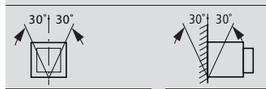
	Incoming circuit-breaker (1)		**IZM...63-V**						**IZM...63-U**						**IZM63...-P**					
		I_n [A]	4000	4000	5000	5000	6300	6300	4000	4000	5000	5000	6300	6300	4000	4000	5000	5000	6300	6300
		I_{cu} [kA]	85	100	85	100	85	100	85	100	85	100	85	100	85	100	85	100	85	100
		I_i [A]	48000	48000	60000	60000	63000	63000	48000	48000	60000	60000	63000	63000	48000	48000	60000	60000	63000	63000
Outgoing circuit-breaker (2)	I_u [A]	$I_{cu2(415V)}$ [kA]	N	H	N	H	N	H	N	H	N	H	N	H	N	H	N	H	N	H
			Prospective short-circuit current ($I_{cc\ rms}$ in kA)																	
NZMB(C)(N)(H) 1-A(M)…	20	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	25 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMB(C)(N)(H) 2-A(M)(V)…	20	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	32	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	50	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	63	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	80	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	90	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	100	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	125	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	140	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	160	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	200	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	220	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	300	25 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMC(N)(H) 3-A(M)(V)…	220	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	250	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	320	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	350	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	400	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	450	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	500	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	630	36 - 150	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
NZMN(H) 4-A(M)(V)…	550	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	630	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	800	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	875	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1000	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1250	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1400	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	1600	50 - 100	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Notes B = Basic switching capacity, N = Normal switching capacity, H = High switching capacity, T = Total selectivity

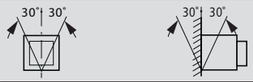
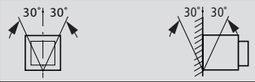
				IZM20B…08…	IZM20B…10…	IZM20B…12…	IZM20B…16…	IZM20B…20…	IZM20N…08…	IZM20N…10…	IZM20N…12…	IZM20N…16…	IZM20N…20…
General													
Standards				IEC/EN 60947			IEC/EN 60947						
Ambient temperature	Storage		°C	-40 - +70 (Devices with LCD display -20 - +70)			-40 - +70 (Devices with LCD display -20 - +70)						
	Operation (open)		°C	-25 - +70 (Devices with LCD display -20 - +70)			-25 - +70 (Devices with LCD display -20 - +70)						
Built-in position													
Utility category				B	B	B	B	B	B	B	B	B	B
Protection type				IP20, IP54 with protective cover			IP20, IP54 with protective cover						
Direction of incoming supply				Any			Any						
Main contacts													
Rated operational current = Rated uninterrupted current		$I_n = I_u$	A	800	1000	1250	1600	2000	800	1000	1250	1600	2000
Rated uninterrupted current at 50 °C[1)]		I_u	A	800	1000	1250	1600	2000	800	1000	1250	1600	2000
Rated uninterrupted current at 60 °C[1)]		I_u	A	800	1000	1100	1500	1800	800	1000	1100	1500	1800
Rated uninterrupted current at 70 °C[1)]		I_u	A	800	1000	1000	1350	1650	800	1000	1000	1350	1650
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage		U_e	V AC	690	690	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V		I_{IT}	kA	21	21	21	23	32	21	21	21	23	32
Use in IT electrical power networks up to U = 690 V		I_{IT}	kA	–	–	–	–	–	–	–	–	–	–
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity													
Rated short-circuit making capacity	Up to 440 V 50/60 Hz	I_{cm}	kA	105	105	105	105	105	137	137	137	137	137
	Up to 690 V 50/60 Hz	I_{cm}	kA	105	105	105	105	105	137	137	137	137	137
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}	kA	50	50	50	50	50	65	65	65	65	65
	t = 3 s	I_{cw}	kA	–	–	–	–	30	40	40	40	40	40
Rated short-circuit breaking capacity I_{cn}													
IEC/EN 60947 Operating sequence I_{cu} O-t-CO													
Up to 240 V 50/60 Hz		I_{cu}	kA	50	50	50	50	50	65	65	65	65	65
Up to 440 V 50/60 Hz		I_{cu}	kA	50	50	50	50	50	65	65	65	65	65
Up to 690 V 50/60 Hz		I_{cu}	kA	50	50	50	50	50	65	65	65	65	65
Up to 1100 V 50/60 Hz		I_{cu}	kA	–	–	–	–	–	–	–	–	–	–
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO													
Up to 240 V 50/60 Hz		I_{cs}	kA	50	50	50	50	50	65	65	65	65	65
Up to 440 V 50/60 Hz		I_{cs}	kA	50	50	50	50	50	65	65	65	65	65
Up to 690 V 50/60 Hz		I_{cs}	kA	50	50	50	50	50	65	65	65	65	65
Up to 1100 V 50/60 Hz		I_{cs}	kA	–	–	–	–	–	–	–	–	–	–
Switching times													
Total opening delay			ms	30	30	30	30	30	30	30	30	30	30
Closing delay			ms	35	35	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Opening delay via trip electronics (non-delayed short-circuit release)			ms	35	35	35	35	35	35	35	35	35	35
Durability													
Mechanical, without maintenance		Operations		12500	12500	12500	12500	10000	12500	12500	12500	12500	10000
Mechanical, with maintenance		Operations		20000	20000	20000	20000	16000	20000	20000	20000	20000	16000
Electrical, without maintenance		Operations		10000	10000	10000	10000	8000	10000	10000	10000	10000	8000
Electrical, with maintenance		Operations		10000	10000	10000	10000	8000	10000	10000	10000	10000	8000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading	Fixed		W	60	95	150	240	280	45	70	110	180	280
	Withdrawable		W	110	170	260	420	560	90	140	220	360	560
Weight													
Fixed	3 pole		kg	43	43	43	43	43	43	43	43	43	43
	4 pole		kg	54	54	54	54	54	54	54	54	54	54
Withdrawable	3 pole		kg	48	48	48	48	48	48	48	48	48	48
	4 pole		kg	62	62	62	62	62	62	62	62	62	62
Empty cassette	3 pole		kg	34	34	34	34	34	34	34	34	34	34
	4 pole		kg	38	38	38	38	38	38	38	38	38	38

Notes

[1)] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

				IZM32B…08…	IZM32B…10…	IZM32B…12…	IZM32B…16…	IZM32B…20…	IZM32B…25…	IZM32B…32…	IZM32N…08…	IZM32N…10…	IZM32N…12…
General													
Standards				IEC/EN 60947			IEC/EN 60947						
Ambient temperature	Storage		°C	-40 - +70 (Devices with LCD display -20 - +70)			-40 - +70 (Devices with LCD display -20 - +70)						
	Operation (open)		°C	-25 - +70 (Devices with LCD display -20 - +70)			-25 - +70 (Devices with LCD display -20 - +70)						
Built-in position													
Utility category				B	B	B	B	B	B	B	B	B	B
Protection type				IP20, IP54 with protective cover			IP20, IP54 with protective cover						
Direction of incoming supply				Any			Any						
Main contacts													
Rated operational current = Rated uninterrupted current		$I_n = I_u$	A	800	1000	1250	1600	2000	2500	3200	800	1000	1250
Rated uninterrupted current at 50 °C[1)]		I_u	A	800	1000	1250	1600	2000	2500	3100	800	1000	1250
Rated uninterrupted current at 60 °C[1)]		I_u	A	800	1000	1250	1600	2000	2500	2800	800	1000	1250
Rated uninterrupted current at 70 °C[1)]		I_u	A	800	1000	1250	1600	2000	2500	2550	800	1000	1250
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage		U_e	V AC	690	690	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V		I_{IT}	kA	13	13	13	23	28	39	39	13	13	13
Use in IT electrical power networks up to U = 690 V		I_{IT}	kA	13	13	13	23	28	39	39	13	13	13
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity													
Rated short-circuit making capacity	Up to 440 V 50/60 Hz	I_{cm}	kA	137	137	137	137	137	137	137	179	179	179
	Up to 690 V 50/60 Hz	I_{cm}	kA	137	137	137	137	137	137	137	179	179	179
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}	kA	65	65	65	65	65	65	65	85	85	85
	t = 3 s	I_{cw}	kA	–	–	–	–	50	50	50	65	65	65
Rated short-circuit breaking capacity I_{cn}													
IEC/EN 60947 Operating sequence I_{cu} O-t-CO													
	Up to 240 V 50/60 Hz	I_{cu}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 440 V 50/60 Hz	I_{cu}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 690 V 50/60 Hz	I_{cu}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 1100 V 50/60 Hz	I_{cu}	kA	–	–	–	–	–	–	–	–	–	–
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO													
	Up to 240 V 50/60 Hz	I_{cs}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 440 V 50/60 Hz	I_{cs}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 690 V 50/60 Hz	I_{cs}	kA	65	65	65	65	65	65	65	85	85	85
	Up to 1100 V 50/60 Hz	I_{cs}	kA	–	–	–	–	–	–	–	–	–	–
Switching times													
Total opening delay			ms	30	30	30	30	30	30	30	30	30	30
Closing delay			ms	35	35	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Opening delay via trip electronics (non-delayed short-circuit release)			ms	35	35	35	35	35	35	35	35	35	35
Durability													
Mechanical, without maintenance		Operations		12500	12500	12500	12500	10000	8000	8000	10000	10000	10000
Mechanical, with maintenance		Operations		20000	20000	20000	20000	16000	12800	12800	16000	16000	16000
Electrical, without maintenance		Operations		10000	10000	10000	10000	10000	8000	8000	10000	10000	10000
Electrical, with maintenance		Operations		10000	10000	10000	10000	10000	8000	8000	10000	10000	10000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading	Fixed		W	40	60	90	150	190	200	320	35	50	70
	Withdrawable		W	85	130	200	330	330	500	800	70	95	140
Weight													
Fixed	3 pole		kg	58	58	58	58	63	68	68	68	68	68
	4 pole		kg	72	72	72	72	78	86	86	86	86	86
Withdrawable	3 pole		kg	70	70	70	70	75	86	86	80	80	80
	4 pole		kg	88	88	88	88	94	112	112	102	102	102
Empty cassette	3 pole		kg	34	34	34	34	58	58	60	34	34	34
	4 pole		kg	38	38	38	38	60	60	73	38	38	38

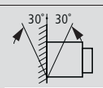
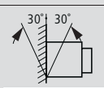
Notes [1)] Permissible continuous current for circuit-breakers used at different temperatures within switchgear.
The expected internal temperatures can be estimated according to the applicable IEC regulations.

				IZM32N…16…	IZM32N…20…	IZM32N…25…	IZM32N…32…	IZM32H…08…	IZM32H…10…	IZM32H…12…	IZM32H…16…	IZM32H…20…	IZM32H…25…
General													
Standards				IEC/EN 60947			IEC/EN 60947						
Ambient temperature	Storage		°C	-40 - +70 (Devices with LCD display -20 - +70)			-40 - +70 (Devices with LCD display -20 - +70)						
	Operation (open)		°C	-25 - +70 (Devices with LCD display -20 - +70)			-25 - +70 (Devices with LCD display -20 - +70)						
Built-in position													
Utility category				B	B	B	B	B	B	B	B	B	B
Protection type				IP20, IP54 with protective cover			IP20, IP54 with protective cover						
Direction of incoming supply				Any			Any						
Main contacts													
Rated operational current = Rated uninterrupted current		$I_n = I_u$	A	1600	2000	2500	3200	800	1000	1250	1600	2000	2500
Rated uninterrupted current at 50 °C[1)]		I_u	A	1600	2000	2500	3100	800	1000	1250	1600	2000	2500
Rated uninterrupted current at 60 °C[1)]		I_u	A	1600	2000	2500	2800	800	1000	1250	1600	2000	2500
Rated uninterrupted current at 70 °C[1)]		I_u	A	1600	2000	2500	2550	800	1000	1250	1600	2000	2500
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage		U_e	V AC	690	690	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V		I_{IT}	kA	23	28	39	39	13	13	13	23	28	39
Use in IT electrical power networks up to U = 690 V		I_{IT}	kA	23	28	39	39	13	13	13	23	28	39
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity													
Rated short-circuit making capacity	Up to 440 V 50/60 Hz	I_{cm}	kA	179	179	179	179	210	210	210	210	210	210
	Up to 690 V 50/60 Hz	I_{cm}	kA	179	179	179	179	179	179	179	179	179	179
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}	kA	85	85	85	85	85	85	85	85	85	85
	t = 3 s	I_{cw}	kA	65	65	65	65	65	65	65	65	65	65
Rated short-circuit breaking capacity I_{cn}													
IEC/EN 60947 Operating sequence I_{cu} O-t-CO													
Up to 240 V 50/60 Hz		I_{cu}	kA	85	85	85	85	100	100	100	100	100	100
Up to 440 V 50/60 Hz		I_{cu}	kA	85	85	85	85	100	100	100	100	100	100
Up to 690 V 50/60 Hz		I_{cu}	kA	85	85	85	85	85	85	85	85	85	85
Up to 1100 V 50/60 Hz		I_{cu}	kA	–	–	–	–	–	–	–	–	–	–
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO													
Up to 240 V 50/60 Hz		I_{cs}	kA	85	85	85	85	100	100	100	100	100	100
Up to 440 V 50/60 Hz		I_{cs}	kA	85	85	85	85	100	100	100	100	100	100
Up to 690 V 50/60 Hz		I_{cs}	kA	85	85	85	85	85	85	85	85	85	85
Up to 1100 V 50/60 Hz		I_{cs}	kA	–	–	–	–	–	–	–	–	–	–
Switching times													
Total opening delay			ms	30	30	30	30	30	30	30	30	30	30
Closing delay			ms	35	35	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Opening delay via trip electronics (non-delayed short-circuit release)			ms	35	35	35	35	35	35	35	35	35	35
Durability													
Mechanical, without maintenance		Operations		10000	10000	8000	8000	10000	10000	10000	10000	10000	8000
Mechanical, with maintenance		Operations		16000	16000	12800	12800	16000	16000	16000	16000	16000	12800
Electrical, without maintenance		Operations		10000	10000	8000	8000	10000	10000	10000	10000	10000	8000
Electrical, with maintenance		Operations		10000	10000	8000	8000	10000	10000	10000	10000	10000	8000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading	Fixed		W	120	190	200	320	30	50	70	120	190	200
	Withdrawable		W	240	380	500	800	60	95	140	240	380	500
Weight													
Fixed	3 pole		kg	68	68	70	70	68	68	68	68	68	70,
	4 pole		kg	86	86	89	89	86	86	86	86	86	89
Withdrawable	3 pole		kg	80	80	88	88	80	80	80	80	80	88
	4 pole		kg	102	102	115	115	102	102	102	102	102	115
Empty cassette	3 pole		kg	34	34	58	60	34	34	34	34	58	58
	4 pole		kg	38	38	60	73	38	38	38	38	60	60

Notes [1)] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

				IZM32H…32…	IZM32S…	IZM40N…40…	IZM40H…40…	IZM63N…40…	IZM63N…50…	IZM63N…63…	IZM63H…40…	IZM63H…50…	IZM63H…63…
General													
Standards				IEC/EN 60947									
Ambient temperature	Storage		°C	-40 - +70 (Devices with LCD display -20 - +70)									
	Operation (open)		°C	-25 - +70 (Devices with LCD display -20 - +70)									
Built-in position													
Utility category				B	B	B	B	B	B	B	B	B	B
Protection type				IP20, IP54 with protective cover									
Direction of incoming supply				Any									
Main contacts													
Rated operational current = Rated uninterrupted current		$I_n = I_u$	A	3200	3200	4000	4000	4000	5000	6300	4000	5000	6300
Rated uninterrupted current at 50 °C[1)]		I_u	A	3100	3100	4000	4000	4000	5000	6200	4000	5000	6200
Rated uninterrupted current at 60 °C[1)]		I_u	A	2800	2800	4000	4000	4000	5000	5600	4000	5000	5600
Rated uninterrupted current at 70 °C[1)]		I_u	A	2550	2550	3776	3776	4000	5000	5100	4000	5000	5100
Rated impulse withstand voltage		U_{imp}	V AC	8000	8000	12000	12000	8000	8000	8000	8000	8000	8000
Rated operational voltage		U_e	V AC	690	1100	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V		I_{IT}	kA	39	–	48	48	–	–	–	–	–	–
Use in IT electrical power networks up to U = 690 V		I_{IT}	kA	39	39	–	–	–	–	–	–	–	–
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage		U_i	V	1000	1100	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity													
Rated short-circuit making capacity	Up to 440 V 50/60 Hz	I_{cm}	kA	210	210	179	210	179	179	179	210	210	210
	Up to 690 V 50/60 Hz	I_{cm}	kA	179	210	137	137	179	179	179	210	210	210
Rated short-time withstand current 50/60 Hz	t = 1 s	I_{cw}	kA	85	–	85	100	85	85	85	100	100	100
	t = 3 s	I_{cw}	kA	65	–	65	65	65	65	65	65	65	65
Rated short-circuit breaking capacity I_{cn}													
IEC/EN 60947 Operating sequence I_{cu} O-t-CO													
	Up to 240 V 50/60 Hz	I_{cu}	kA	100	–	85	100	85	85	85	100	100	100
	Up to 440 V 50/60 Hz	I_{cu}	kA	100	–	85	100	85	85	85	100	100	100
	Up to 690 V 50/60 Hz	I_{cu}	kA	85	–	65	65	85	85	85	100	100	100
	Up to 1100 V 50/60 Hz	I_{cu}	kA	–	25	–	–	–	–	–	–	–	–
IEC/EN 60947 Operating sequence I_{cs} O-t-CO-t-CO													
	Up to 240 V 50/60 Hz	I_{cs}	kA	100	–	85	100	85	85	85	100	100	100
	Up to 440 V 50/60 Hz	I_{cs}	kA	100	–	85	100	85	85	85	100	100	100
	Up to 690 V 50/60 Hz	I_{cs}	kA	85	–	65	65	85	85	85	100	100	100
	Up to 1100 V 50/60 Hz	I_{cs}	kA	–	25	–	–	–	–	–	–	–	–
Switching times													
Total opening delay			ms	30	30	30	30	40	40	40	40	40	40
Closing delay			ms	35	35	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Opening delay via trip electronics (non-delayed short-circuit release)			ms	35	35	35	35	35	35	35	35	35	35
Durability													
Mechanical, without maintenance		Operations		8000	8000	5000	5000	5000	5000	5000	5000	5000	5000
Mechanical, with maintenance		Operations		12800	12800	8000	8000	8000	8000	8000	8000	8000	8000
Electrical, without maintenance		Operations		8000	8000	3000	3000	3000	3000	3000	3000	3000	3000
Electrical, with maintenance		Operations		8000	8000	3000	3000	3000	3000	3000	3000	3000	3000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading	Fixed		W	320	320	560	560	380	400	620	380	400	620
	Withdrawable		W	800	800	1100	1100	750	1000	1550	750	1000	1550
Weight													
Fixed	3 pole		kg	70	70	83	83	108	125	125	108	125	125
	4 pole		kg	89	89	105	105	145	163	163	145	163	163
Withdrawable	3 pole		kg	88,	88	98	98	139	157	157	139	157	157
	4 pole		kg	115	115	121	121	166	200	200	166	200	200
Empty cassette	3 pole		kg	60	60	60	60	60	60	60	60	60	60
	4 pole		kg	73	73	73	73	73	73	73	73	73	73

Notes [1)] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

				IN20B…08…	IN20B…10…	IN20B…12…	IN20B…16…	IN20B…20…	IN20N…08…	IN20N…10…	IN20N…12…	IN20N…16…	IN20N…20…
General													
Standards				IEC/EN 60947			IEC/EN 60947						
Ambient temperature													
Storage			°C	-40 - +70			-40 - +70						
Operation (open)			°C	-25 - +70			-25 - +70						
Built-in position													
Utility category				B	B	B	B	B	B	B	B	B	B
Protection type				IP20, IP54 with protective cover			IP20, IP54 with protective cover						
Direction of incoming supply				Any			Any						
Main contacts													
Rated operational current = Rated uninterrupted current	$I_n = I_u$		A	800	1000	1250	1600	2000	800	1000	1250	1600	2000
Rated uninterrupted current at 50 °C [1]	I_u		A	800	1000	1250	1600	2000	800	1000	1250	1600	2000
Rated uninterrupted current at 60 °C [1]	I_u		A	800	1000	1100	1500	1800	800	1000	1100	1500	1800
Rated uninterrupted current at 70 °C [1]	I_u		A	800	1000	1000	1350	1650	800	1000	1000	1350	1650
Rated impulse withstand voltage	U_{imp}		V AC	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage	U_e		V AC	690	690	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V	I_{IT}		kA	21	21	21	23	32	21	21	21	23	32
Use in IT electrical power networks up to U = 690 V	I_{IT}		kA	–	–	–	–	–	–	–	–	–	–
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i		V	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity													
Rated short-circuit making capacity													
Up to 440 V 50/60 Hz	I_{cm}		kA	105	105	105	105	105	143	143	143	143	143
Up to 690 V 50/60 Hz	I_{cm}		kA	105	105	105	105	105	143	143	143	143	143
Rated short-time withstand current 50/60 Hz													
t = 1 s	I_{cw}		kA	50	50	50	50	50	65	65	65	65	65
t = 3 s	I_{cw}		kA	–	–	–	–	30	40	40	40	40	40
Switching times													
Total opening delay			ms	30	30	30	30	30	30	30	30	30	30
Closing delay			ms	35	35	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Durability													
Mechanical, without maintenance		Operations		12500	12500	12500	12500	10000	12500	12500	12500	12500	10000
Mechanical, with maintenance		Operations		20000	20000	20000	20000	16000	20000	20000	20000	20000	16000
Electrical, without maintenance		Operations		10000	10000	10000	10000	8000	10000	10000	10000	10000	8000
Electrical, with maintenance		Operations		10000	10000	10000	10000	8000	10000	10000	10000	10000	8000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading													
Fixed			W	60	95	150	240	280	45	70	110	180	280
Withdrawable			W	110	170	260	420	560	90	140	220	360	560
Weight													
Fixed													
3 pole			kg	43	43	43	43	43	43	43	43	43	43
4 pole			kg	54	54	54	54	54	54	54	54	54	54
Withdrawable													
3 pole			kg	48	48	48	48	48	48	48	48	48	48
4 pole			kg	62	62	62	62	62	62	62	62	62	62
Empty cassette													
3 pole			kg	34	34	34	34	34	34	34	34	34	34
4 pole			kg	38	38	38	38	38	38	38	38	38	38

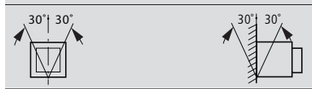
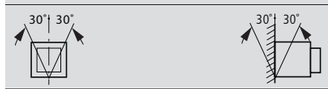
Notes

[1] Permissible continuous current for circuit-breakers used at different temperatures within switchgear.
The expected internal temperatures can be estimated according to the applicable IEC regulations.

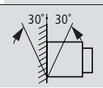
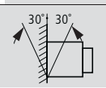
			IN32B…08…	IN32B…10…	IN32B…12…	IN32B…16…	IN32B…20…	IN32B…25…	IN32B…32…
General									
Standards			IEC/EN 60947			IEC/EN 60947			
Ambient temperature									
Storage		°C	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70
Operation (open)		°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Built-in position									
Utility category			B	B	B	B	B	B	B
Protection type			IP20, IP54 with protective cover			IP20, IP54 with protective cover			
Direction of incoming supply			Any			Any			
Main contacts									
Rated operational current = Rated uninterrupted current	$I_n = I_u$	A	800	1000	1250	1600	2000	2500	3200
Rated uninterrupted current at 50 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	3100
Rated uninterrupted current at 60 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	2800
Rated uninterrupted current at 70 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	2550
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage	U_e	V AC	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V	I_{IT}	kA	13	13	13	23	28	39	39
Use in IT electrical power networks up to U = 690 V	I_{IT}	kA	13	13	13	23	28	39	39
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V	1000	1000	1000	1000	1000	1000	1000
Switching capacity									
Rated short-circuit making capacity									
Up to 440 V 50/60 Hz	I_{cm}	kA	143	143	143	143	143	143	143
Up to 690 V 50/60 Hz	I_{cm}	kA	143	143	143	143	143	143	143
Rated short-time withstand current 50/60 Hz									
t = 1 s	I_{cw}	kA	65	65	65	65	65	65	65
t = 3 s	I_{cw}	kA	–	–	–	–	50	50	50
Switching times									
Total opening delay		ms	30	30	30	30	30	30	30
Closing delay		ms	35	35	35	35	35	35	35
Closing delay electrical (via closing release)		ms	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)		ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Durability									
Mechanical, without maintenance	Operations		12500	12500	12500	12500	10000	8000	8000
Mechanical, with maintenance	Operations		20000	20000	20000	20000	16000	12800	12800
Electrical, without maintenance	Operations		10000	10000	10000	10000	10000	8000	8000
Electrical, with maintenance	Operations		10000	10000	10000	10000	10000	8000	8000
Maximum operating frequency	Operations/h		60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading									
Fixed		W	40	60	90	150	190	200	320
Withdrawable		W	85	130	200	330	330	500	800
Weight									
Fixed									
3 pole		kg	58	58	58	58	63	68	68
4 pole		kg	72	72	72	72	78	86	86
Withdrawable									
3 pole		kg	70	70	70	70	75	86	86
4 pole		kg	88	88	88	88	94	112	112
Empty cassette									
3 pole		kg	34	34	34	34	58	58	60
4 pole		kg	38	38	38	38	60	60	73

Notes

[1] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

			IN32N…08…	IN32N…10…	IN32N…12…	IN32N…16…	IN32N…20…	IN32N…25…	IN32N…32…	IN32S…
General										
Standards			IEC/EN 60947			IEC/EN 60947				
Ambient temperature										
Storage		°C	-40 - +70			-40 - +70				
Operation (open)		°C	-25 - +70			-25 - +70				
Built-in position										
Utility category			B			B				
Protection type			IP20, IP54 with protective cover			IP20, IP54 with protective cover				
Direction of incoming supply			Any			Any				
Main contacts										
Rated operational current = Rated uninterrupted current	$I_n = I_u$	A	800	1000	1250	1600	2000	2500	3200	3200
Rated uninterrupted current at 50 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	3100	3100
Rated uninterrupted current at 60 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	2800	2800
Rated uninterrupted current at 70 °C [1]	I_u	A	800	1000	1250	1600	2000	2500	2550	2550
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000	8000
Rated operational voltage	U_e	V AC	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V	I_{IT}	kA	13	13	13	23	28	39	39	39
Use in IT electrical power networks up to U = 690 V	I_{IT}	kA	13	13	13	23	28	39	39	39
Overvoltage category/degree of pollution			III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V	1000	1000	1000	1000	1000	1000	1000	1100
Switching capacity										
Rated short-circuit making capacity										
Up to 440 V 50/60 Hz	I_{cm}	kA	187	187	187	187	187	187	187	53
Up to 690 V 50/60 Hz	I_{cm}	kA	187	187	187	187	187	187	187	53
Rated short-time withstand current 50/60 Hz										
t = 1 s	I_{cw}	kA	85	85	85	85	85	85	85	–
t = 3 s	I_{cw}	kA	65	65	65	65	65	65	65	–
Switching times										
Total opening delay		ms	30	30	30	30	30	30	30	30
Closing delay		ms	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)		ms	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)		ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Durability										
Mechanical, without maintenance	Operations		10000	10000	10000	10000	10000	8000	8000	8000
Mechanical, with maintenance	Operations		16000	16000	16000	16000	16000	12800	12800	12800
Electrical, without maintenance	Operations		10000	10000	10000	10000	10000	8000	8000	8000
Electrical, with maintenance	Operations		10000	10000	10000	10000	10000	8000	8000	8000
Maximum operating frequency	Operations/h		60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading										
Fixed		W	35	50	70	120	190	200	320	320
Withdrawable		W	70	95	140	240	380	500	800	800
Weight										
Fixed										
3 pole		kg	68	68	68	68	68	70	70	70
4 pole		kg	86	86	86	86	86	89	89	89
Withdrawable										
3 pole		kg	80	80	80	80	80	88	88	88
4 pole		kg	102	102	102	102	102	115	115	115
Empty cassette										
3 pole		kg	34	34	34	34	58	58	60	60
4 pole		kg	38	38	38	38	60	60	73	73

Notes [1] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

				IN40N…40…	IN40H…40…	IN63N…40…	IN63N…50…	IN63N…63…	IN63H…40…	IN63H…50…	IN63H…63…
General											
Standards				IEC/EN 60947			IEC/EN 60947				
Ambient temperature											
Storage			°C	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70	-40 - +70
Operation (open)			°C	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70	-25 - +70
Built-in position											
Utility category				B			B				
Protection type				IP20, IP54 with protective cover			IP20, IP54 with protective cover				
Direction of incoming supply				Any			Any				
Main contacts											
Rated operational current = Rated uninterrupted current	$I_n = I_u$		A	4000	4000	4000	5000	6300	4000	5000	6300
Rated uninterrupted current at 50 °C [1]	I_u		A	4000	4000	4000	5000	6200	4000	5000	6200
Rated uninterrupted current at 60 °C [1]	I_u		A	4000	4000	4000	5000	5600	4000	5000	5600
Rated uninterrupted current at 70 °C [1]	I_u		A	3776	3776	4000	5000	5100	4000	5000	5100
Rated impulse withstand voltage	U_{imp}		V AC	12000	12000	8000	8000	8000	8000	8000	8000
Rated operational voltage	U_e		V AC	690	690	690	690	690	690	690	690
Use in IT electrical power networks up to U = 440 V	I_{IT}		kA	48	48	–	–	–	–	–	–
Use in IT electrical power networks up to U = 690 V	I_{IT}		kA	–	–	–	–	–	–	–	–
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i		V	1000	1000	1000	1000	1000	1000	1000	1000
Switching capacity											
Rated short-circuit making capacity											
Up to 440 V 50/60 Hz	I_{cm}		kA	187	220	187	187	187	220	220	220
Up to 690 V 50/60 Hz	I_{cm}		kA	187	220	187	187	187	220	220	220
Rated short-time withstand current 50/60 Hz											
t = 1 s	I_{cw}		kA	85	100	85	85	85	100	100	100
t = 3 s	I_{cw}		kA	65	65	65	65	65	65	65	65
Switching times											
Total opening delay			ms	30	30	40	40	40	40	40	40
Closing delay			ms	35	35	35	35	35	35	35	35
Closing delay electrical (via closing release)			ms	40	40	40	40	40	40	40	40
Opening delay electrical (via shunt release / undervoltage release)			ms	35/70	35/70	35/70	35/70	35/70	35/70	35/70	35/70
Durability											
Mechanical, without maintenance		Operations		5000	5000	5000	5000	5000	5000	5000	5000
Mechanical, with maintenance		Operations		8000	8000	8000	8000	8000	8000	8000	8000
Electrical, without maintenance		Operations		3000	3000	3000	3000	3000	3000	3000	3000
Electrical, with maintenance		Operations		3000	3000	3000	3000	3000	3000	3000	3000
Maximum operating frequency		Operations/h		60	60	60	60	60	60	60	60
Heat dissipation at rated operational current I_n 3-phase symmetric loading											
Fixed			W	560	560	380	400	620	380	400	620
Withdrawable			W	1100	1100	750	1000	1550	750	1000	1550
Weight											
Fixed											
3 pole			kg	83	83	108	125	125	108	125	125
4 pole			kg	105	105	145	163	163	145	163	163
Withdrawable											
3 pole			kg	98	98	139	157	157	139	157	157
4 pole			kg	121	121	166	200	200	166	200	200
Empty cassette											
3 pole			kg	55	55	103	103	103	103	103	103
4 pole			kg	64	64	103	103	103	103	103	103

Notes

[1] Permissible continuous current for circuit-breakers used at different temperatures within switchgear. The expected internal temperatures can be estimated according to the applicable IEC regulations.

IZM-AS, IZM-OTS, IZM-CS, IZM-S...

			Auxiliary contact, overload trip switch and cell signalling switch		
			IZM-AS…	IZM-OTS	IZM-CS…
Rated breaking capacity					
Inductive load					
250 V AC		A	10	10	10
125 V DC		A	0.5	0.5	0.5
250 V DC		A	0.25	0.25	0.25

			Voltage releases				
			IZM-ST24DC IZM-STS24DC	IZM-ST48DC IZM-STS48DC	IZM-ST60DC	IZM-ST110AD IZM-STS110AD	IZM-ST230AD IZM-STS230AD
Rated control voltage							
AC 50/60 Hz	U_s	V	–	–	–	110 - 127	208 - 240
DC	U_s	V	24	48	60	110 - 125	220 - 250
Power consumption							
AC		VA	–	–	–	(pick-up 450)	(pick-up 450)
DC		W	(pick-up 250)	(pick-up 250)	(pick-up 250)	(pick-up 450)	(pick-up 450)
Response time of the circuit-breaker with U_s		ms	35	35	35	35	35
Operating range							
Drop-out voltage							
AC operated 50/60 Hz	Drop-out	x U_c	–	–	–	–	–
pick-up voltage							
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

			Closing releases				
			IZM-SR24DC	IZM-SR48DC	IZM-SR60DC	IZM-SR110AD	IZM-SR230AD
Rated control voltage							
AC 50/60 Hz	U_s	V	–	–	–	110 - 127	208 - 240
DC	U_s	V	24	48	60	110 - 125	220 - 250
Power consumption							
AC		VA	–	–	–	(pick-up 450)	(pick-up 450)
DC		W	(pick-up 250)	(pick-up 250)	(pick-up 250)	(pick-up 450)	(pick-up 450)
Response time of the circuit-breaker with U_s		ms	40	40	40	40	40
Operating range							
Drop-out voltage							
AC operated 50/60 Hz	Drop-out	x U_c	–	–	–	–	–
pick-up voltage							
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

			Under-voltage releases			
			IZM-UVR24DC	**IZM-UVR32DC**	**IZM-UVR48DC**	**IZM-UVR60DC**
Rated control voltage						
AC 50/60 Hz	U_s	V	–	–	–	–
DC	U_s	V	24	32	48	60
Power consumption						
AC		VA	–	–	–	–
DC		W	18 (pick-up 250)	15 (pick-up 275)	18 (pick-up 275)	18 (pick-up 275)
Response time of the circuit-breaker with U_s		ms	70	70	70	70
Operating range						
Drop-out voltage						
AC operated 50/60 Hz	Drop-out	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard
pick-up voltage						
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

			Under-voltage releases				
			IZM-UVR110AC	**IZM-UVR110DC**	**IZM-UVR220DC**	**IZM-UVR230AC**	**IZM-UVR400AC**
Rated control voltage							
AC 50/60 Hz	U_s	V	110 - 127	–	–	208 - 240	380 - 415
DC	U_s	V	–	110 - 125	220 - 250	–	–
Power consumption							
AC		VA	10 (pick-up 450)	–	–	10 (pick-up 400)	10 (pick-up 480)
DC		W	–	10 (pick-up 450)	10 (pick-up 450)	–	–
Response time of the circuit-breaker with U_s		ms	70	70	70	70	70
Operating range							
Drop-out voltage							
AC operated 50/60 Hz	Drop-out	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard
pick-up voltage							
	pick-up	x U_c	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard	Acc. to IEC standard

			Motor operator						
			IZM-M24DC	**IZM-M48DC**	**IZM-M60DC**	**IZM-M110DC**	**IZM-M220DC**	**IZM-M110AC**	**IZM-M230AC**
Rated control voltage									
AC 50/60 Hz	U_s	V	–	–	–	–	–	110 - 127	208 - 240
DC	U_s	V	24	48	60	110 - 125	220 - 250	–	–
Necessary time required for charging of the spring-operated stored energy mechanism at 1 x U_s		s	5	5	5	5	5	5	5
Rated operational current	I_n	A	12	5	5	2	1	2	1
Starting current		A	36	25	25	12	6	12	6
Power consumption									
AC 50/60 Hz		VA	300	250	250	250	250	250	250
DC		W	300	250	250	250	250	250	250

IZMX-PCAM, IZMX-MCAM, IZM-PMINT, IZM-MMINT

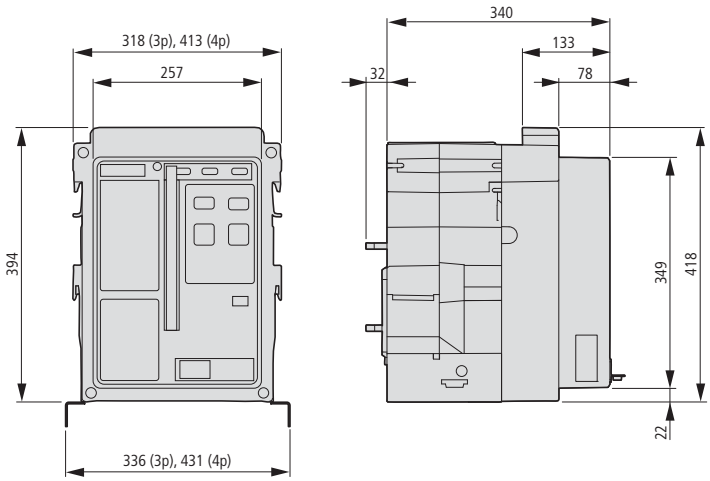
	IZMX-PCAM	IZMX-MCAM	IZM-PMINT	IZM-MMINT
General				
Dimensions (W x H x D)	24 x 105 x 80 mm	24 x 105 x 80 mm	91 x 111 x 88 mm	92 x 111 x 88 mm
Mounting	Auxiliary contact strip or 35 mm top-hat rail	Auxiliary contact strip or 35 mm top-hat rail	DIN rail (top hat rail) 35 mm	DIN rail (top hat rail) 35 mm
Protection type	IP20	IP20	IP20	IP20
Mounting position	–	–	horizontal	horizontal
Power supply	24 V DC	24 V DC	24 - 150 V DC or 100 - 240 V AC (50/60 Hz)	24 - 125 V DC or 120 V AC (50/60 Hz)
LED indicators	DP Tx Rx Status	Modbus Tx Rx Status	DP Status INCOM Rx Tx Status	Modbus Tx Rx INCOM Rx Tx Status
Network				
INCOM	–	–	Plug-in screw terminals	Plug-in screw terminals
PROFIBUS	SUB-D 9-pole, socket	–	SUB-D 9-pole, socket	–
Modbus	–	Plug-in screw terminals	–	Plug-in screw terminals
Function	Slave	Slave	Slave	Slave
Interface	RS484	RS485	RS484	RS485
Protocol	PROFIBUS-DP	Modbus-RTU	PROFIBUS-DP	Modbus-RTU
Baud rate	Automatic search up to 12 MBit/s	1200/4800/9600/19200 Bit/s, adjustable via Digitrip	Automatic search up to 12 MBit/s	1200/9600/19200 bits/s, adjustable through coding switch
Bus terminating resistors	In plug as required	121 Ω, externally switch-able	In plug as required	121 Ω, activated through coding switch
INCOM[1)]	–	–	100 Ω, activated through coding switch	100 Ω, activated through coding switch
Bus addresses	1 - 127, can be set through Digitrip	1 - 247, can be set through Digitrip	1 - 127	1 - 127
Number of IZM26 devices on INCOM	–	–	1	32
Maximum distance	2.4 km	1.2 km	2.4 km	1.2 km
INCOM	–	–	3	3
Supported functions	Cyclical data transfer	Function code: 03 = read register 04 = read word variables 08 = connection test, 16 = write register	Cyclical data transfer	Function code: 03 = read register 04 = read word variables 08 = connection test, 16 = write register

Notes [1)] INCOM = system bus (communication connection between Digitrip and fieldbus module)



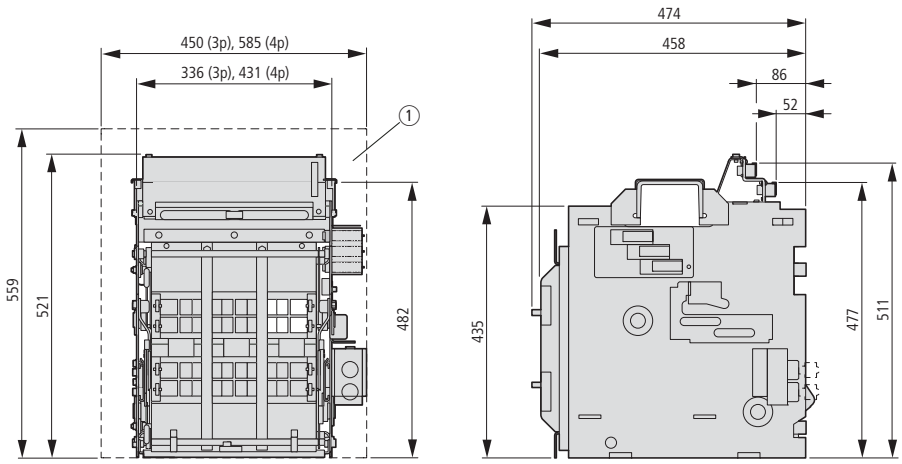
IN20, IZM20 Fixed mounted

IN20…F, IZM20…F



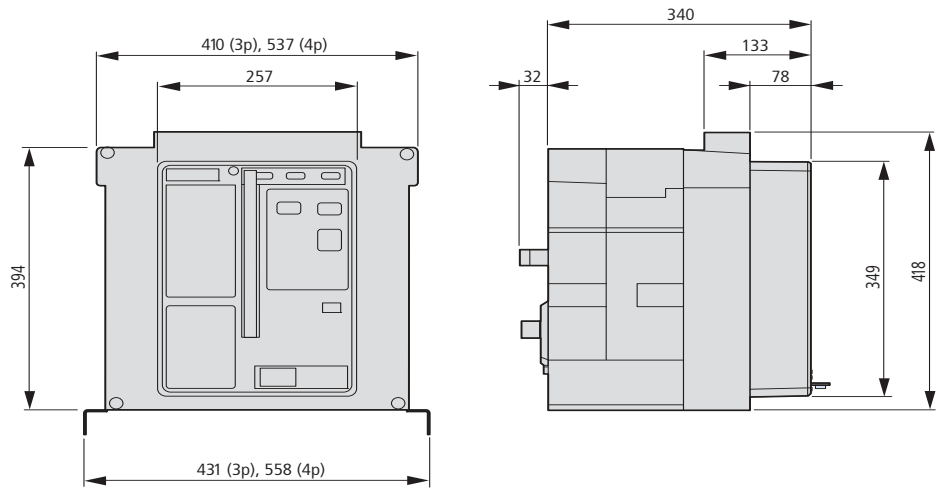
IN20, IZM20 Withdrawable units

IN20…W, IZM20…W



IN32, IZM32 Fixed mounted

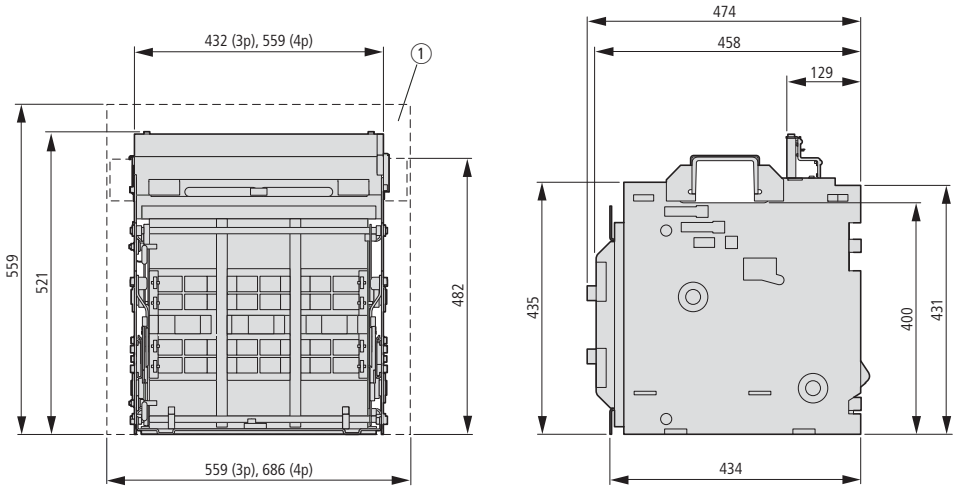
IN32…F, IZM32…F…



① Recommended minimum enclosure size (not shown to scale)

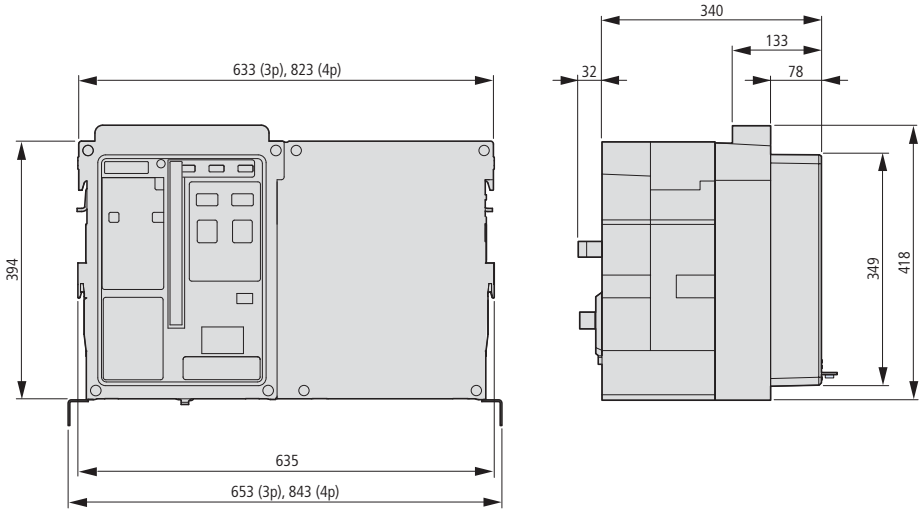
IN32, IZM32 Withdrawable units

IN32…W, IZM32…W…



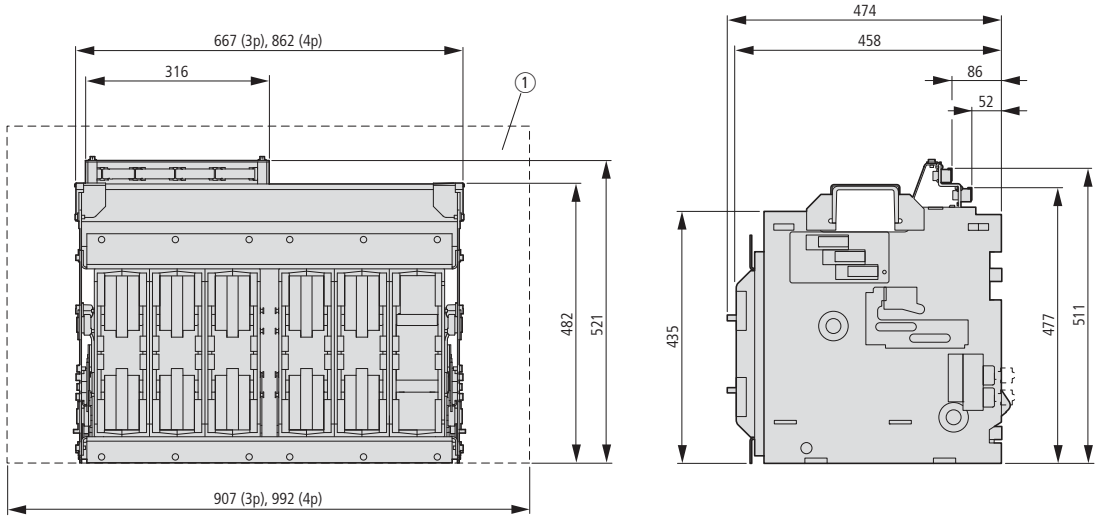
IN40, IZM40 Fixed mounted

IN40…F, IZM40…F



IN40, IZM40 Withdrawable units

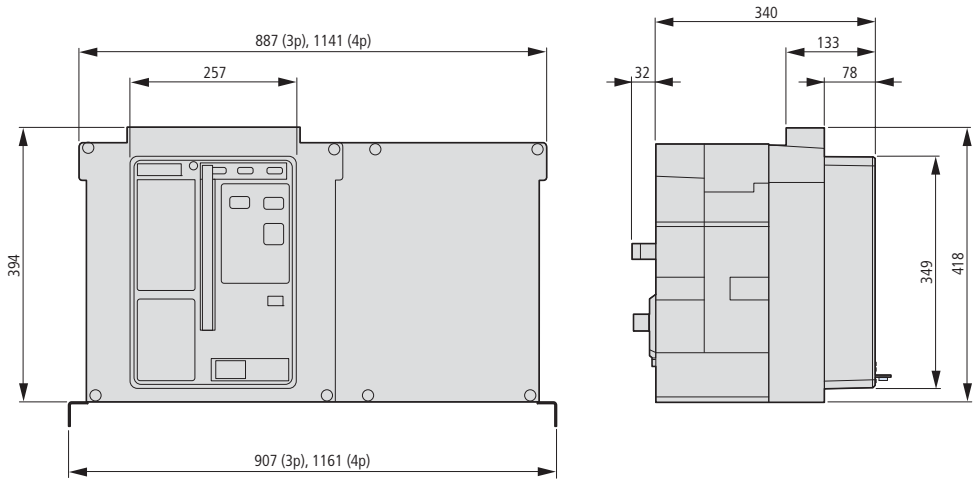
IN40…W, IZM40…W



① Recommended minimum enclosure size (not shown to scale)

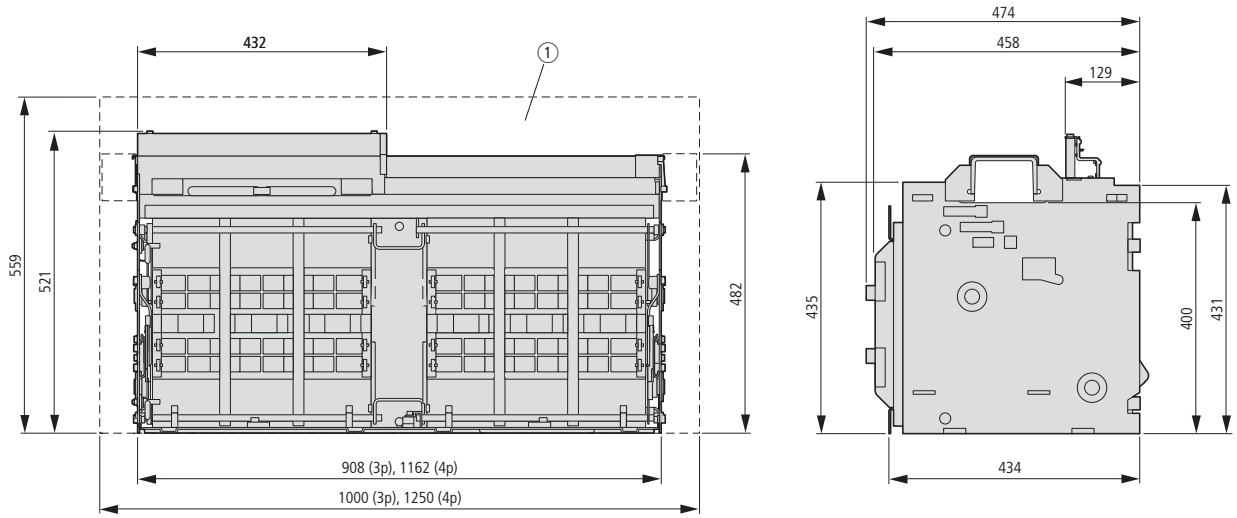
IN63, IZM63 Fixed mounted

IN63…F, IZM63…F



IN63, IZM63 Withdrawable units

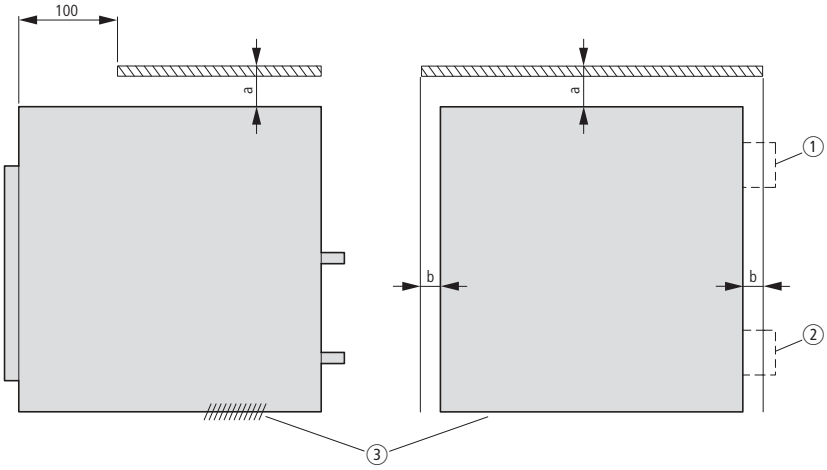
IN63…W, IZM63…W



① Recommended minimum enclosure size (not shown to scale)

Recommended safety clearances

The following information about safety distances is intended to provide a guideline for the installation of circuit-breakers in an enclosure.

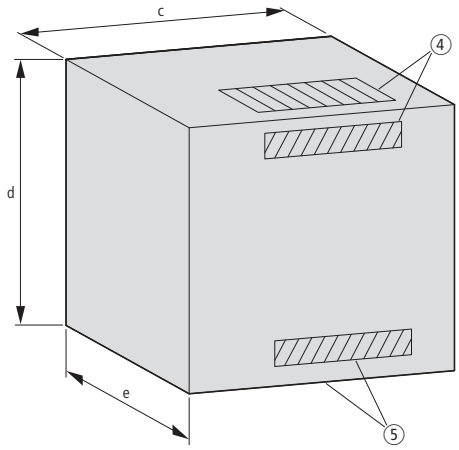


① Cell switch (optional)
② Locking facilities (optional)
③ Ventilation openings (do not cover!)

	Enclosure clearance	To insulated surface	To grounded metal surface	With cell switch or locking facilities
		mm	mm	mm
Withdrawable units	a	0	0	0
	b	25	25	25/75
Fixed mounted	a	150	250	–
	b	30	70	–

Recommended enclosure clearance and ventilation

The illustration shows a typical enclosure.
The table below lists the associated minimum distances between enclosures and ventilation openings.
This information is intended as a guideline for constructing a suitable circuit-breaker enclosure.



Width	Width of cassette + 75 mm
Height	550 mm
Depth	450 mm (front control panel bay)
Ventilation holes	160 cm² (800 - 3200 A) 320 cm² (4000 - 6300 A)

④ Top or rear vent
⑤ Rear or lower vent



Circuit-breakers, fuses

Tested quality, approvals and shipping classifications represent the functionality and safety suitable for world markets with industrial miniature circuit-breakers. Besides a comprehensive range of residual current devices, LV h.b.c. fuse bases and fuse switch-disconnectors is provided.

FAZ miniature circuit-breakers
Height 80 mm only +++ Installation and removal without disassembly of the rails +++ Double comfort terminal lift/claw +++ Terminal with rear plug protection → Page 19/4

Digital residual current device
Preventive information +++ Warning before tripping +++ Integrated auxiliary contact +++ Display for earth-fault release → Page 19/21

Fuse base
Integrated terminal covers +++ Double terminals → Page 19/42

Cylindrical fuse switch-disconnectors
With flash function on tripped fuse +++ can be sealed → Page 19/45

Fuse switch-disconnectors (empty) C10-FD
Cord protection for photovoltaic generator +++ Trip indicator signals tripped fuse link: 50 – 400 V: blinking, 400 – 1000 V: continuous light +++ Nominal current voltage 1000 V DC +++ For cylindrical fuse inserts in photovoltaic applications +++ Sealable → Page 19/48













Circuit-breaker

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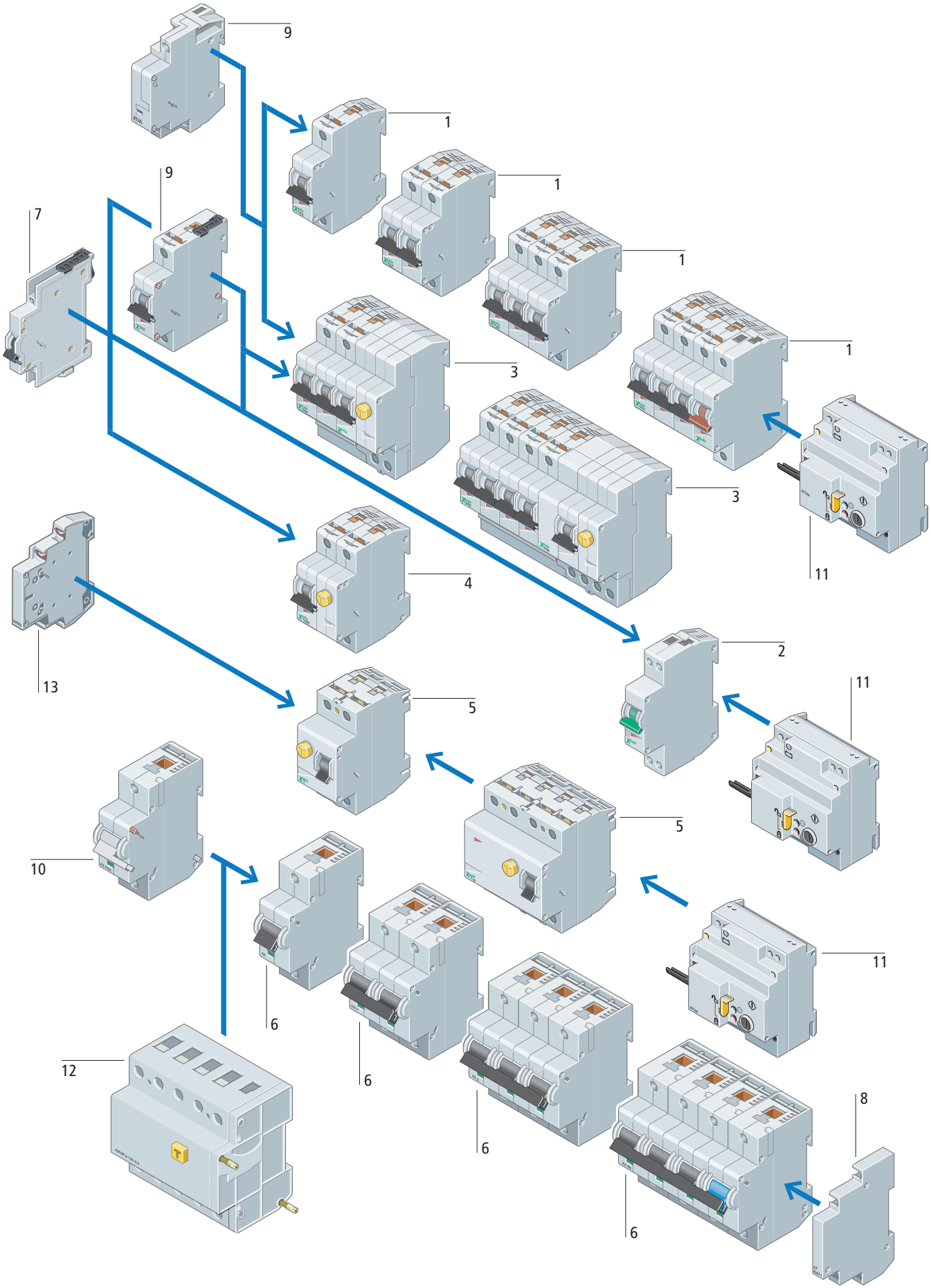
System overview



Basic devices

FAZ miniature circuit-breakers 1
Characteristic/rated operational current ranges
B/4 – 63 A; C/0.5 – 63 A; D/6 – 40 A; K/0.5 - 63 A; S/1 - 40 A; Z/0.5 - 63 A
Switching capacity:
15 kA to IEC/EN 60947-2
B, C, D, K, S, Z characteristic
1-, 1N-, 2-, 3-, 3N-, 4 pole
Special miniature circuit-breaker for control circuits (1, 2 pole)
Special miniature circuit-breaker for DC applications up to 500 V DC
→ Page 19/4

FAZT miniature circuit-breakers 1
Characteristic/rated operational current ranges
B/1 - 25 A; C/1 - 25 A; D/1 - 16 A
Switching capacity:
25 kA to IEC/EN 60947-2
→ Page 19/10

FAZ-PN miniature circuit-breaker 2
Characteristic/rated operational current ranges
B/6 – 40 A; C/2 – 40 A
Switching capacity:
6 kA to IEC/EN 60898
B, C characteristic
1 N pole
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Residual-current protective modules for fitting to FAZ 3
Protection in the event of fault current
Rated current ranges 40 – 63 A
Rated fault current 30 mA, 300 mA
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Residual-current protective modules for fitting to AZ 12
Protection in the event of fault current
Rated current ranges 80 – 125 A
Rated fault current 30 mA, 300 mA
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PKNM combined device 4
Overload and short-circuit protection, and protection in the event of fault currents
Characteristic/rated operational current ranges
B/6-40 A; C/6-40 A; 1N pole
Switching capacity:
10 kA to IEC/EN 60898
Rated fault current 30 mA, 300 mA
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Residual-current circuit-breaker (RCCB) 5
AC current sensitive
2 pole, 16 – 80 A
4 pole, 25 – 80 A
Pulsed current sensitive
2 pole, 16 – 40 A
4 pole, 25 – 125 A
AC/DC sensitive
4 pole, 40 – 125 A
Rated fault current
30 mA, 100 mA, 300 mA, 500 mA
4 pole, selective, 63 – 80 A
Rated fault current
100 mA, 300 mA
4 pole suitable for frequency inverters 40, 63 A, 100 mA, 300 mA
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AZ miniature circuit-breakers 6
Characteristic/rated operational current ranges C/20-125 A; D/50-100 A
Switching capacity: 15 – 25 kA to IEC/EN 60947-2, 1-, 2-, 3-, 3N-, 4 pole
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Standard auxiliary contact
Trip-indicating auxiliary contacts
Auxiliary contacts
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AZ auxiliary contact 8
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Undervoltage release
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FI auxiliary contact 13
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Remote switching module 11
Suitable for remote switching and automatic restart of a miniature circuit-breaker or RCCB, for remote trip testing of an RCCB in conjunction with a remote test module
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Ordering

	Rated operational current I_n A	**1 pole** **Part no.** Article no.	**Price** See price list	Std. pack	**2 pole** With 2 protected poles **Part no.** Article no.	**Price** See price list	Std. pack	**3 pole** With 3 protected poles **Part no.** Article no.	**Price** See price list	Std. pack
FAZ miniature circuit-breakers										
Characteristic B Instantaneous release response current 3 - 5 x I_n Switching capacity 15 kA (IEC/EN 60947-2)	4	**FAZ-B4/1-HS** 279274		12 off	**FAZ-B4/2-HS** 279275		1 off			
	5	**FAZ-B5/1** 278528		12 off						
	6	**FAZ-B6/1** 278529			**FAZ-B6/2** 278728		1 off	**FAZ-B6/3** 278841		1 off
	8	**FAZ-B8/1** 278530			**FAZ-B8/2** 278729			**FAZ-B8/3** 278842		
	10	**FAZ-B10/1** 278531			**FAZ-B10/2** 278730			**FAZ-B10/3** 278843		
	12	**FAZ-B12/1** 278532			**FAZ-B12/2** 278731			**FAZ-B12/3** 278844		
	13	**FAZ-B13/1** 278533			**FAZ-B13/2** 278732			**FAZ-B13/3** 278845		
	15	**FAZ-B15/1** 278534			**FAZ-B15/2** 278733			**FAZ-B15/3** 278846		
	16	**FAZ-B16/1** 278535			**FAZ-B16/2** 278734			**FAZ-B16/3** 278847		
	20	**FAZ-B20/1** 278536			**FAZ-B20/2** 278735			**FAZ-B20/3** 278848		
	25	**FAZ-B25/1** 278537			**FAZ-B25/2** 278736			**FAZ-B25/3** 278849		
	32	**FAZ-B32/1** 278538			**FAZ-B32/2** 278737			**FAZ-B32/3** 278850		
	40	**FAZ-B40/1** 278539			**FAZ-B40/2** 278738			**FAZ-B40/3** 278851		
	50	**FAZ-B50/1** 278540			**FAZ-B50/2** 278739			**FAZ-B50/3** 278852		
	63	**FAZ-B63/1** 278541			**FAZ-B63/2** 278740			**FAZ-B63/3** 278853		
Characteristic C Instantaneous release response current 5 - 10 x I_n Switching capacity 15 kA (IEC/EN 60947-2)	0.5	**FAZ-C0,5/1** 278544		12 off	**FAZ-C0.5/2** 278743		1 off	**FAZ-C0.5/3** 278856		1 off
	1	**FAZ-C1/1** 278546			**FAZ-C1/2** 278745			**FAZ-C1/3** 278858		
	1.6	**FAZ-C0,5/1** 278548			**FAZ-C1.6/2** 278747			**FAZ-C1.6/3** 278860		
	2	**FAZ-C2/1** 278549			**FAZ-C2/2** 278748			**FAZ-C2/3** 278861		
	3	**FAZ-C3/1** 278551			**FAZ-C3/2** 278750			**FAZ-C3/3** 278863		
	4	**FAZ-C4/1** 278553			**FAZ-C4/2** 278752			**FAZ-C4/3** 278865		
	6	**FAZ-C6/1** 278555			**FAZ-C6/2** 278754			**FAZ-C6/3** 278867		
	8	**FAZ-C8/1** 278556			**FAZ-C8/2** 278755			**FAZ-C8/3** 278868		
	10	**FAZ-C10/1** 278557			**FAZ-C10/2** 278756			**FAZ-C10/3** 278869		
	13	**FAZ-C13/1** 278559			**FAZ-C13/2** 278758			**FAZ-C13/3** 278871		
	16	**FAZ-C16/1** 278561			**FAZ-C16/2** 278760			**FAZ-C16/3** 278873		
	20	**FAZ-C20/1** 278562			**FAZ-C20/2** 278761			**FAZ-C20/3** 278874		
	25	**FAZ-C25/1** 278563			**FAZ-C25/2** 278762			**FAZ-C25/3** 278875		
	32	**FAZ-C32/1** 278564			**FAZ-C32/2** 278763			**FAZ-C32/3** 278876		
	40	**FAZ-C40/1** 278565			**FAZ-C40/2** 278764			**FAZ-C40/3** 278877		
	50	**FAZ-C50/1** 278566			**FAZ-C50/2** 278765			**FAZ-C50/3** 278878		
	63	**FAZ-C63/1** 278567			**FAZ-C63/2** 278766			**FAZ-C63/3** 278879		

	4 pole With 4 protected poles **Part no.** Article no.	**Price** See price list	Std. pack	**2 pole** With 1 protected pole, N switching with pole **Part no.** Article no.	**Price** See price list	Std. pack	**4 pole** With 3 protected poles, N switching with poles **Part no.** Article no.	**Price** See price list	Std. pack
	FAZ-B6/4 279029		1 off	**FAZ-B6/1N** 278642		1 off	**FAZ-B6/3N** 278943		1 off
	FAZ-B8/4 279030			**FAZ-B8/1N** 278643			**FAZ-B8/3N** 278944		
	FAZ-B10/4 279031			**FAZ-B10/1N** 278644			**FAZ-B10/3N** 278945		
	FAZ-B12/4 279032			**FAZ-B12/1N** 278645			**FAZ-B12/3N** 278946		
	FAZ-B13/4 279033			**FAZ-B13/1N** 278646			**FAZ-B13/3N** 278947		
	FAZ-B15/4 279034			**FAZ-B15/1N** 278647			**FAZ-B15/3N** 278948		
	FAZ-B16/4 279035			**FAZ-B16/1N** 278648			**FAZ-B16/3N** 278949		
	FAZ-B20/4 279036			**FAZ-B20/1N** 278649			**FAZ-B20/3N** 278950		
	FAZ-B25/4 279037			**FAZ-B25/1N** 278650			**FAZ-B25/3N** 278951		
	FAZ-B32/4 279038			**FAZ-B32/1N** 278651			**FAZ-B32/3N** 278952		
	FAZ-B40/4 279039			**FAZ-B40/1N** 278652			**FAZ-B40/3N** 278953		
	FAZ-B50/4 279040			**FAZ-B50/1N** 278653			**FAZ-B50/3N** 278954		
	FAZ-B63/4 279041			**FAZ-B63/1N** 278654			**FAZ-B63/3N** 278955		
	FAZ-C0.5/4 279044		1 off	**FAZ-C0.5/1N** 278657		1 off	**FAZ-C0.5/3N** 278958		1 off
	FAZ-C1/4 279046			**FAZ-C1/1N** 278659			**FAZ-C1/3N** 278960		
	FAZ-C1.6/4 279048			**FAZ-C1.6/1N** 278661			**FAZ-C1.6/3N** 278962		
	FAZ-C2/4 279049			**FAZ-C2/1N** 278662			**FAZ-C2/3N** 278963		
	FAZ-C3/4 279051			**FAZ-C3/1N** 278664			**FAZ-C3/3N** 278965		
	FAZ-C4/4 279053			**FAZ-C4/1N** 278666			**FAZ-C4/3N** 278967		
	FAZ-C6/4 279055			**FAZ-C6/1N** 278668			**FAZ-C6/3N** 278969		
	FAZ-C8/4 279056			**FAZ-C8/1N** 278669			**FAZ-C8/3N** 278970		
	FAZ-C10/4 279057			**FAZ-C10/1N** 278670			**FAZ-C10/3N** 278971		
	FAZ-C13/4 279059			**FAZ-C13/1N** 278672			**FAZ-C13/3N** 278973		
	FAZ-C16/4 279061			**FAZ-C16/1N** 278674			**FAZ-C16/3N** 278975		
	FAZ-C20/4 279062			**FAZ-C20/1N** 278675			**FAZ-C20/3N** 278976		
	FAZ-C25/4 279063			**FAZ-C25/1N** 278676			**FAZ-C25/3N** 278977		
	FAZ-C32/4 279064			**FAZ-C32/1N** 278677			**FAZ-C32/3N** 278978		
	FAZ-C40/4 279065			**FAZ-C40/1N** 278678			**FAZ-C40/3N** 278979		
	FAZ-C50/4 279066			**FAZ-C50/1N** 278679			**FAZ-C50/3N** 278980		
	FAZ-C63/4 279067			**FAZ-C63/1N** 278680			**FAZ-C63/3N** 278981		

Notes

Switching capacity (IEC/EN 60898) 10 kA
Switching capacity (IEC/EN 60947-2) 15 kA

Accessories	**Page**
Auxiliary contacts	→ 19/24
Shunt releases	
Mounting accessories	→ 19/25

FAZ-B4/1-HS, FAZ-B4/2-HS
Special miniature circuit-breakers with much reduced let-through energy to prevent contact weld of **auxiliary contacts**

1 pole
Depth 71 mm
Width 17.5 mm



2 pole; 1 pole + N
Depth 71 mm
Width 35 mm



3 pole
Depth 71 mm
Width 52.5 mm



4 pole; 3 pole + N
Depth 71 mm
Width 70 mm



Information relevant for export to North America

Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2, QVNU8
CSA File No.	204453
CSA Class No.	3215-30
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Supplementary Protector only
Suitable for	Branch Circuits; not as BCPD
Max. Voltage Rating	1 pole: 277 V AC; 48 V DC 2 pole: 480 Y/277 V AC; 96 V DC 3 pole: 480 Y/277 V AC
Degree of Protection	IEC: IP20; UL/CSA Type: -

Short Circuit Current Rating
≦ 40 A 10 kA
≧ 50 A 5 kA

	Rated operational current I_n A	**1 pole**  **Part no.** Article no.	**Price** See price list	Std. pack	**2 pole** With 2 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack	**3 pole** With 3 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack
FAZ miniature circuit-breakers										
Characteristic D Instantaneous release response current 10 - 20 x I_n Switching capacity 15 kA (IEC/EN 60947-2)	6	**FAZ-D6/1** 278578		12 off	**FAZ-D6/2** 278777		1 off	**FAZ-D6/3** 278890		1 off
	8	**FAZ-D8/1** 278579			**FAZ-D8/2** 278778			**FAZ-D8/3** 278891		
	10	**FAZ-D10/1** 278580			**FAZ-D10/2** 278779			**FAZ-D10/3** 278892		
	13	**FAZ-D13/1** 278582			**FAZ-D13/2** 278781			**FAZ-D13/3** 278894		
	16	**FAZ-D16/1** 278584			**FAZ-D16/2** 278783			**FAZ-D16/3** 278896		
	20	**FAZ-D20/1** 278585			**FAZ-D20/2** 278784			**FAZ-D20/3** 278897		
	25	**FAZ-D25/1** 278586			**FAZ-D25/2** 278785			**FAZ-D25/3** 278898		
	32	**FAZ-D32/1** 278587			**FAZ-D32/2** 278786			**FAZ-D32/3** 278899		
	40	**FAZ-D40/1** 278588			**FAZ-D40/2** 278787			**FAZ-D40/3** 278900		
Characteristic K Instantaneous release response current 8 - 12 x I_n Switching capacity 15 kA (IEC/EN 60947-2)	0.5	**FAZ-K0,5/1** 278589		12 off	**FAZ-K0.5/2** 278788		1 off	**FAZ-K0.5/3** 278901		1 off
	1	**FAZ-K1/1** 278590			**FAZ-K1/2** 278789			**FAZ-K1/3** 278902		
	1.6	**FAZ-K0,5/1** 278591			**FAZ-K1.6/2** 278790			**FAZ-K1.6/3** 278903		
	2	**FAZ-K2/1** 278592			**FAZ-K2/2** 278791			**FAZ-K2/3** 278904		
	3	**FAZ-K3/1** 278593			**FAZ-K3/2** 278792			**FAZ-K3/3** 278905		
	4	**FAZ-K4/1** 278594			**FAZ-K4/2** 278793			**FAZ-K4/3** 278906		
	6	**FAZ-K6/1** 278595			**FAZ-K6/2** 278794			**FAZ-K6/3** 278907		
	8	**FAZ-K8/1** 278596			**FAZ-K8/2** 278795			**FAZ-K8/3** 278908		
	10	**FAZ-K10/1** 278597			**FAZ-K10/2** 278796			**FAZ-K10/3** 278909		
	13	**FAZ-K13/1** 278598			**FAZ-K13/2** 278797			**FAZ-K13/3** 278910		
	16	**FAZ-K16/1** 278599			**FAZ-K16/2** 278798			**FAZ-K16/3** 278911		
	20	**FAZ-K20/1** 278600			**FAZ-K20/2** 278799			**FAZ-K20/3** 278912		
	25	**FAZ-K25/1** 278601			**FAZ-K25/2** 278800			**FAZ-K25/3** 278913		
	32	**FAZ-K32/1** 278602			**FAZ-K32/2** 278801			**FAZ-K32/3** 278914		
	40	**FAZ-K40/1** 278603			**FAZ-K40/2** 278802			**FAZ-K40/3** 278915		
	50	**FAZ-K50/1** 278604			**FAZ-K50/2** 278803			**FAZ-K50/3** 278916		
	63	**FAZ-K63/1** 278605			**FAZ-K63/2** 278804			**FAZ-K63/3** 278917		

	4 pole With 4 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack	**4 pole** With 3 protected poles, N switching with poles  **Part no.** Article no.	**Price** See price list	Std. pack
	FAZ-D6/4 279078		1 off	**FAZ-D6/3N** 278992		1 off
	FAZ-D8/4 279079			**FAZ-D8/3N** 278993		
	FAZ-D10/4 279080			**FAZ-D10/3N** 278994		
	FAZ-D13/4 279082			**FAZ-D13/3N** 278996		
	FAZ-D16/4 279084			**FAZ-D16/3N** 278998		
	FAZ-D20/4 279085			**FAZ-D20/3N** 278999		
	FAZ-D25/4 279086			**FAZ-D25/3N** 279000		
	FAZ-D32/4 279087			**FAZ-D32/3N** 279001		
	FAZ-D40/4 279088			**FAZ-D40/3N** 279002		
	FAZ-K0.5/4 279089		1 off	**FAZ-K0.5/3N** 279003		1 off
	FAZ-K1/4 279090			**FAZ-K1/3N** 279004		
	FAZ-K1.6/4 279091			**FAZ-K1.6/3N** 279005		
	FAZ-K2/4 279092			**FAZ-K2/3N** 279006		
	FAZ-K3/4 279093			**FAZ-K3/3N** 279007		
	FAZ-K4/4 279094			**FAZ-K4/3N** 279008		
	FAZ-K6/4 279095			**FAZ-K6/3N** 279009		
	FAZ-K8/4 279096			**FAZ-K8/3N** 279010		
	FAZ-K10/4 279097			**FAZ-K10/3N** 279011		
	FAZ-K13/4 279098			**FAZ-K13/3N** 279012		
	FAZ-K16/4 279099			**FAZ-K16/3N** 279013		
	FAZ-K20/4 279100			**FAZ-K20/3N** 279014		
	FAZ-K25/4 279101			**FAZ-K25/3N** 279015		
	FAZ-K32/4 279102			**FAZ-K32/3N** 279016		
	FAZ-K40/4 279103			**FAZ-K40/3N** 279017		
	FAZ-K50/4 279104			**FAZ-K50/3N** 279018		
	FAZ-K63/4 279105			**FAZ-K63/3N** 279019		

Notes

Switching capacity (IEC/EN 60898)	10 kA
Switching capacity (IEC/EN 60947-2)	15 kA

Accessories	**Page**
Auxiliary contacts	→ 19/24
Shunt releases	
Mounting accessories	→ 19/25

1 pole
Depth 71 mm
Width 17.5 mm



2 pole; 1 pole + N
Depth 71 mm
Width 35 mm



3 pole
Depth 71 mm
Width 52.5 mm



4 pole; 3 pole + N
Depth 71 mm
Width 70 mm



Information relevant for export to North America

Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2, QVNU8
CSA File No.	204453
CSA Class No.	3215-30
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Supplementary Protector only
Suitable for	Branch Circuits; not as BCPD
Max. Voltage Rating	1 pole: 277 V AC; 48 V DC 2 pole: 480 Y/277 V AC; 96 V DC 3 pole: 480 Y/277 V AC
Degree of Protection	IEC: IP20; UL/CSA Type: -
Short Circuit Current Rating	
≦ 40 A	10 kA
≧ 50 A	5 kA

	Rated current I_n A	**1 pole**  **Part no.** Article no.	**Price** See price list	Std. pack	**2 pole** With 2 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack
FAZ miniature circuit-breakers							
Characteristic S Instantaneous release response current 13 - 17 x I_n Switching capacity 10 kA (IEC/EN 60947-2)	1	**FAZ-S1/1** 278606		12 off	**FAZ-S1/2** 278805		1 off
	2	**FAZ-S2/1** 278607			**FAZ-S2/2** 278806		
	3	**FAZ-S3/1** 278608			**FAZ-S3/2** 278807		
	4	**FAZ-S4/1** 278609			**FAZ-S4/2** 278808		
	6	**FAZ-S6/1** 278610			**FAZ-S6/2** 278809		
	10	**FAZ-S10/1** 278611			**FAZ-S10/2** 278810		
	16	**FAZ-S16/1** 278612			**FAZ-S16/2** 278811		
	20	**FAZ-S20/1** 278613			**FAZ-S20/2** 278812		
	25	**FAZ-S25/1** 278614			**FAZ-S25/2** 278813		
	32	**FAZ-S32/1** 278615			**FAZ-S32/2** 278814		
	40	**FAZ-S40/1** 278616			**FAZ-S40/2** 278815		
Characteristic Z Instantaneous release response current 2 - 3 x I_n Switching capacity 10 kA (IEC/EN 60947-2)	0.5	**FAZ-Z0,5/1** 278617		12 off	**FAZ-Z0.5/2** 278816		1 off
	1	**FAZ-Z1/1** 278618			**FAZ-Z1/2** 278817		
	1.6	**FAZ-Z1,6/1** 278619			**FAZ-Z1.6/2** 278818		
	2	**FAZ-Z2/1** 278620			**FAZ-Z2/2** 278819		
	3	**FAZ-Z3/1** 278621			**FAZ-Z3/2** 278820		
	4	**FAZ-Z4/1** 278622			**FAZ-Z4/2** 278821		
	6	**FAZ-Z6/1** 278623			**FAZ-Z6/2** 278822		
	8	**FAZ-Z8/1** 278624			**FAZ-Z8/2** 278823		
	10	**FAZ-Z10/1** 278625			**FAZ-Z10/2** 278824		
	16	**FAZ-Z16/1** 278626			**FAZ-Z16/2** 278825		
	20	**FAZ-Z20/1** 278627			**FAZ-Z20/2** 278826		
	25	**FAZ-Z25/1** 278628			**FAZ-Z25/2** 278827		
	32	**FAZ-Z32/1** 278629			**FAZ-Z32/2** 278828		
	40	**FAZ-Z40/1** 278630			**FAZ-Z40/2** 278829		
	50	**FAZ-Z50/1** 278631			**FAZ-Z50/2** 278830		
	63	**FAZ-Z63/1** 278632			**FAZ-Z63/2** 278831		

	3 pole With 3 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack	**4 pole** With 4 protected poles  **Part no.** Article no.	**Price** See price list	Std. pack
	FAZ-Z0.5/3 278918		1 off	**FAZ-Z0.5/4** 279106		1 off
	FAZ-Z1/3 278919			**FAZ-Z1/4** 279107		
	FAZ-Z1.6/3 278920			**FAZ-Z1.6/4** 279108		
	FAZ-Z2/3 278921			**FAZ-Z2/4** 279109		
	FAZ-Z3/3 278922			**FAZ-Z3/4** 279110		
	FAZ-Z4/3 278923			**FAZ-Z4/4** 279111		
	FAZ-Z6/3 278924			**FAZ-Z6/4** 279112		
	FAZ-Z8/3 278925			**FAZ-Z8/4** 279113		
	FAZ-Z10/3 278926			**FAZ-Z10/4** 279114		
	FAZ-Z16/3 278927			**FAZ-Z16/4** 279115		
	FAZ-Z20/3 278928			**FAZ-Z20/4** 279116		
	FAZ-Z25/3 278929			**FAZ-Z25/4** 279117		
	FAZ-Z32/3 278930			**FAZ-Z32/4** 279118		
	FAZ-Z40/3 278931			**FAZ-Z40/4** 279119		
	FAZ-Z50/3 278932			**FAZ-Z50/4** 279120		
	FAZ-Z63/3 278933			**FAZ-Z63/4** 279121		

Notes

Switching capacity (IEC/EN 60898)	10 kA
Switching capacity (IEC/EN 60947-2)	15 kA

Accessories	**Page**
Auxiliary contacts	→ 19/24
Shunt releases	
Mounting accessories	→ 19/25

1 pole
Depth 71 mm
Width 17.5 mm



2 pole; 1 pole + N
Depth 71 mm
Width 35 mm



3 pole
Depth 71 mm
Width 52.5 mm



4 pole; 3 pole + N
Depth 71 mm
Width 70 mm



Information relevant for export to North America

Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2, QVNU8
CSA File No.	204453
CSA Class No.	3215-30
NA Certification	UL Recognized, CSA certified
Conditions of Acceptability	Supplementary Protector only
Suitable for	Branch Circuits; not as BCPD
Max. Voltage Rating	1 pole: 277 V AC; 48 V DC 2 pole: 480 Y/277 V AC; 96 V DC 3 pole: 480 Y/277 V AC
Degree of Protection	IEC: IP20; UL/CSA Type: -
Short Circuit Current Rating	
≦ 40 A	10 kA
≧ 50 A	5 kA

	Rated operational current I_n A	1 pole Part no. Article no.	Price See price list	Std. pack	1 pole+N Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack	3 pole Part no. Article no.	Price See price list	Std. pack	3 pole+N Part no. Article no.	Price See price list	Std. pack	4 pole Part no. Article no.	Price See price list	Std. pack
FAZT miniature circuit-breakers																			
Characteristic B Switching capacity 25 kA (IEC/EN 60947-2)	1	**FAZT-B1/1** 240770		12 off	**FAZT-B1/1N** 240994		1 off	**FAZT-B1/2** 240820		1 off	**FAZT-B1/3** 240874		1 off	**FAZT-B1/3N** 241060		1 off	**FAZT-B1/4** 240922		1 off
	2	**FAZT-B2/1** 240771			**FAZT-B2/1N** 240995			**FAZT-B2/2** 240821			**FAZT-B2/3** 240875			**FAZT-B2/3N** 241065			**FAZT-B2/4** 240927		
	3	**FAZT-B3/1** 240772			**FAZT-B3/1N** 240996			**FAZT-B3/2** 240822			**FAZT-B3/3** 240876			**FAZT-B3/3N** 241070			**FAZT-B3/4** 240930		
	4	**FAZT-B4/1** 240777			**FAZT-B4/1N** 240997			**FAZT-B4/2** 240823			**FAZT-B4/3** 240877			**FAZT-B4/3N** 241075			**FAZT-B4/4** 240931		
	6	**FAZT-B6/1** 240782			**FAZT-B6/1N** 240998			**FAZT-B6/2** 240824			**FAZT-B6/3** 240878			**FAZT-B6/3N** 241080			**FAZT-B6/4** 240932		
	10	**FAZT-B10/1** 240787			**FAZT-B10/1N** 240999			**FAZT-B10/2** 240825			**FAZT-B10/3** 240879			**FAZT-B10/3N** 241085			**FAZT-B10/4** 240933		
	12	**FAZT-B12/1** 240792			**FAZT-B12/1N** 241000			**FAZT-B12/2** 240826			**FAZT-B12/3** 240880			**FAZT-B12/3N** 241090			**FAZT-B12/4** 240934		
	13	**FAZT-B13/1** 240793			**FAZT-B13/1N** 241001			**FAZT-B13/2** 240827			**FAZT-B13/3** 240881			**FAZT-B13/3N** 241095			**FAZT-B13/4** 240935		
	15	**FAZT-B15/1** 240794			**FAZT-B15/1N** 241005			**FAZT-B15/2** 240828			**FAZT-B15/3** 240882			**FAZT-B15/3N** 241100			**FAZT-B15/4** 240936		
	16	**FAZT-B16/1** 240795			**FAZT-B16/1N** 241009			**FAZT-B16/2** 240829			**FAZT-B16/3** 240883			**FAZT-B16/3N** 241105			**FAZT-B16/4** 240937		
	20	**FAZT-B20/1** 240796			**FAZT-B20/1N** 241015			**FAZT-B20/2** 240830			**FAZT-B20/3** 240884			**FAZT-B20/3N** 241110			**FAZT-B20/4** 240938		
	25	**FAZT-B25/1** 240797			**FAZT-B25/1N** 241019			**FAZT-B25/2** 240831			**FAZT-B25/3** 240885			**FAZT-B25/3N** 241115			**FAZT-B25/4** 240939		
	32[1)]	**FAZT-B32/1** 141907			**FAZT-B32/1N** 142509			**FAZT-B32/2** 142485			**FAZT-B32/3** 142493			**FAZT-B32/3N** 142517			**FAZT-B32/4** 142501		
	40[1)]	**FAZT-B40/1** 141908			**FAZT-B40/1N** 142510			**FAZT-B40/2** 142486			**FAZT-B40/3** 142494			**FAZT-B40/3N** 142518			**FAZT-B40/4** 142502		
Characteristic C Switching capacity 25 kA (IEC/EN 60947-2)	1	**FAZT-C1/1** 240798		12 off	**FAZT-C1/1N** 241022		1 off	**FAZT-C1/2** 240832		1 off	**FAZT-C1/3** 240886		1 off	**FAZT-C1/3N** 241120		1 off	**FAZT-C1/4** 240940		1 off
	2	**FAZT-C2/1** 240799			**FAZT-C2/1N** 241023			**FAZT-C2/2** 240833			**FAZT-C2/3** 240887			**FAZT-C2/3N** 241125			**FAZT-C2/4** 240941		
	3	**FAZT-C3/1** 240800			**FAZT-C3/1N** 241024			**FAZT-C3/2** 240838			**FAZT-C3/3** 240888			**FAZT-C3/3N** 241130			**FAZT-C3/4** 240945		
	4	**FAZT-C4/1** 240801			**FAZT-C4/1N** 241025			**FAZT-C4/2** 240843			**FAZT-C4/3** 240889			**FAZT-C4/3N** 241135			**FAZT-C4/4** 240949		
	6	**FAZT-C6/1** 240802			**FAZT-C6/1N** 241026			**FAZT-C6/2** 240850			**FAZT-C6/3** 240890			**FAZT-C6/3N** 241140			**FAZT-C6/4** 240955		
	10	**FAZT-C10/1** 240803			**FAZT-C10/1N** 241027			**FAZT-C10/2** 240855			**FAZT-C10/3** 240891			**FAZT-C10/3N** 241145			**FAZT-C10/4** 240959		
	12	**FAZT-C12/1** 240804			**FAZT-C12/1N** 241028			**FAZT-C12/2** 240858			**FAZT-C12/3** 240892			**FAZT-C12/3N** 241150			**FAZT-C12/4** 240962		
	13	**FAZT-C13/1** 240805			**FAZT-C13/1N** 241029			**FAZT-C13/2** 240859			**FAZT-C13/3** 240893			**FAZT-C13/3N** 241155			**FAZT-C13/4** 240963		
	15	**FAZT-C15/1** 240806			**FAZT-C15/1N** 241030			**FAZT-C15/2** 240860			**FAZT-C15/3** 240894			**FAZT-C15/3N** 241160			**FAZT-C15/4** 240964		
	16	**FAZT-C16/1** 240807			**FAZT-C16/1N** 241034			**FAZT-C16/2** 240861			**FAZT-C16/3** 240895			**FAZT-C16/3N** 241165			**FAZT-C16/4** 240965		
	20	**FAZT-C20/1** 240808			**FAZT-C20/1N** 241038			**FAZT-C20/2** 240862			**FAZT-C20/3** 240896			**FAZT-C20/3N** 241170			**FAZT-C20/4** 240966		
	25	**FAZT-C25/1** 240809			**FAZT-C25/1N** 241044			**FAZT-C25/2** 240863			**FAZT-C25/3** 240897			**FAZT-C25/3N** 241175			**FAZT-C25/4** 240967		
	32[1)]	**FAZT-C32/1** 141909			**FAZT-C32/1N** 142511			**FAZT-C32/2** 142487			**FAZT-C32/3** 142495			**FAZT-B32/3N** 142519			**FAZT-C32/4** 142503		
	40[1)]	**FAZT-C40/1** 142480			**FAZT-C40/1N** 142512			**FAZT-C40/2** 142488			**FAZT-C40/3** 142496			**FAZT-B40/3N** 142520			**FAZT-C40/4** 142504		
Characteristic D Switching capacity 25 kA (IEC/EN 60947-2)	1	**FAZT-D1/1** 240810		12 off	**FAZT-D1/1N** 241048		1 off	**FAZT-D1/2** 240864		1 off	**FAZT-D1/3** 240898		1 off	**FAZT-D1/3N** 241180		1 off	**FAZT-D1/4** 240968		1 off
	2	**FAZT-D2/1** 240811			**FAZT-D2/1N** 241051			**FAZT-D2/2** 240865			**FAZT-D2/3** 240899			**FAZT-D2/3N** 241181			**FAZT-D2/4** 240969		
	3	**FAZT-D3/1** 240812			**FAZT-D3/1N** 241052			**FAZT-D3/2** 240866			**FAZT-D3/3** 240900			**FAZT-D3/3N** 241182			**FAZT-D3/4** 240970		
	4	**FAZT-D4/1** 240813			**FAZT-D4/1N** 241053			**FAZT-D4/2** 240867			**FAZT-D4/3** 240901			**FAZT-D4/3N** 241183			**FAZT-D4/4** 240971		
	6	**FAZT-D6/1** 240814			**FAZT-D6/1N** 241054			**FAZT-D6/2** 240868			**FAZT-D6/3** 240902			**FAZT-D6/3N** 241184			**FAZT-D6/4** 240975		

Notes

Switching capacity (IEC/EN 60947-2) 25 kA

Accessories	Page
Auxiliary contacts	→ 19/24
Shunt releases	
Mounting accessories	→ 19/25

1 pole
Depth 71 mm
Width 17.5 mm



2 pole; 1 pole + N
Depth 71 mm
Width 35 mm



3 pole
Depth 71 mm
Width 52.5 mm



4 pole; 3 pole + N
Depth 71 mm
Width 70 mm



[1)] For additional Technical Data and Characteristic Curves see "Installation Products for Industrial Application FAZ-T": www.moeller.net/cn/support/pdf_Katalog.jsp

	Rated operational current I_n A	1 pole **Part no.** Article no.	**Price** See price list	Std. pack	1 pole+N **Part no.** Article no.	**Price** See price list	Std. pack	2 pole **Part no.** Article no.	**Price** See price list	Std. pack
FAZT miniature circuit-breakers										
Characteristic D Switching capacity 25 kA (IEC/EN 60947-2)	10	**FAZT-D10/1** 240815		12 off	**FAZT-D10/1N** 241055		1 off	**FAZT-D10/2** 240869		1 off
	12	**FAZT-D12/1** 240816			**FAZT-D12/1N** 241056			**FAZT-D12/2** 240870		
	13	**FAZT-D13/1** 240817			**FAZT-D13/1N** 241057			**FAZT-D13/2** 240871		
	15	**FAZT-D15/1** 240818			**FAZT-D15/1N** 241058			**FAZT-D15/2** 240872		
	16	**FAZT-D16/1** 240819			**FAZT-D16/1N** 241059			**FAZT-D16/2** 240873		
	20[1)]	**FAZT-D20/1** 142481			**FAZT-D20/1N** 142513			**FAZT-D20/2** 142489		
	25[1)]	**FAZT-D25/1** 142482			**FAZT-D25/1N** 142514			**FAZT-D25/2** 142490		
	32[1)]	**FAZT-D32/1** 142483			**FAZT-D32/1N** 142515			**FAZT-D32/2** 142491		
	40[1)]	**FAZT-D40/1** 142484			**FAZT-D40/1N** 142516			**FAZT-D40/2** 142492		

	Rated operational current I_n A	2 pole With 1 protected pole, N switching with pole **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
FAZ-PN miniature circuit-breaker					
Characteristic B Instantaneous release response current 3 - 5 x I_n Switching capacity 6 kA (IEC/EN 60898)	6	**FAZ-PN-B6/1N** 279146		12 off	**Accessories** **Page** Auxiliary contacts → 19/24 Shunt releases 1 N pole Depth 71 mm Width 17.5 mm
	10	**FAZ-PN-B10/1N** 279147			
	13	**FAZ-PN-B13/1N** 279148			
	16	**FAZ-PN-B16/1N** 279149			
	20	**FAZ-PN-B20/1N** 279150			
	25	**FAZ-PN-B25/1N** 279151			
	32	**FAZ-PN-B32/1N** 279152			
	40	**FAZ-PN-B40/1N** 279153			
Characteristic C Instantaneous release response current 5 - 10 x I_n Switching capacity 6 kA (IEC/EN 60898)	2	**FAZ-PN-C2/1N** 279154		12 off	
	4	**FAZ-PN-C4/1N** 279155			
	6	**FAZ-PN-C6/1N** 279156			
	10	**FAZ-PN-C10/1N** 279157			
	13	**FAZ-PN-C13/1N** 279158			
	16	**FAZ-PN-C16/1N** 279159			
	20	**FAZ-PN-C20/1N** 279160			
	25	**FAZ-PN-C25/1N** 279161			
	32	**FAZ-PN-C32/1N** 279162			
	40	**FAZ-PN-C40/1N** 279163			

	Rated operational current I_n A	3 pole **Part no.** Article no.	**Price** See price list	Std. pack	3 pole+N **Part no.** Article no.	**Price** See price list	Std. pack	4 pole **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
	10	**FAZT-D10/3** 240903		1 off	**FAZT-D10/3N** 241185		1 off	**FAZT-D10/4** 240979		1 off	Switching capacity (IEC/EN 60947-2) 25 kA **Accessories** **Page** Auxiliary contacts → 19/24 Shunt releases Mounting accessories → 19/25 1 pole Depth 71 mm Width 17.5 mm 2 pole; 1 pole + N Depth 71 mm Width 35 mm 3 pole Depth 71 mm Width 52.5 mm 4 pole; 3 pole + N Depth 71 mm Width 70 mm → Graphics, Page 19/11 [1)] For additional Technical Data and Characteristic Curves see "Installation Products for Industrial Application FAZ-T": www.moeller.net/cn/support/pdf_Katalog.jsp
	12	**FAZT-D12/3** 240904			**FAZT-D12/3N** 241186			**FAZT-D12/4** 240985			
	13	**FAZT-D13/3** 240905			**FAZT-D13/3N** 241187			**FAZT-D13/4** 240989			
	15	**FAZT-D15/3** 240910			**FAZT-D15/3N** 241188			**FAZT-D15/4** 240992			
	16	**FAZT-D16/3** 240915			**FAZT-D16/3N** 241189			**FAZT-D16/4** 240993			
	20	**FAZT-D20/3** 142497			**FAZT-D20/3N** 142521			**FAZT-D20/4** 142505			
	25	**FAZT-D25/3** 142498			**FAZT-D25/3N** 142522			**FAZT-D25/4** 142506			
	32	**FAZT-D32/3** 142499			**FAZT-D32/3N** 142523			**FAZT-D32/4** 142507			
	40	**FAZT-D40/3** 142500			**FAZT-D40/3N** 142524			**FAZT-D40/4** 142508			

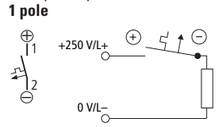
	Rated operational current I_n A	1 pole **Part no.** Article no.	**Price** See price list	Std. pack	2 pole With 2 protected poles **Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
FAZ miniature circuit-breakers for DC applications								
Characteristic C Instantaneous release response current 5 - 10 x I_n Switching capacity 10 kA (IEC/EN 60947-2) (L/R = 4 ms) Rated operating voltage 250 V DC per pole	2	**FAZ-C2/1-DC** 279122		12 off	**FAZ-C2/2-DC** 279134		1 off	**Accessories** **Page** Auxiliary contacts → 19/24 Shunt releases Mounting accessories → 19/25 1 pole Depth 71 mm Width 17.5 mm 2 pole; 1N pole Depth 71 mm Width 35 mm
	3	**FAZ-C3/1-DC** 279123			**FAZ-C3/2-DC** 279135			
	4	**FAZ-C4/1-DC** 279124			**FAZ-C4/2-DC** 279136			
	6	**FAZ-C6/1-DC** 279125			**FAZ-C6/2-DC** 279137			
	10	**FAZ-C10/1-DC** 279126			**FAZ-C10/2-DC** 279138			
	13	**FAZ-C13/1-DC** 279127			**FAZ-C13/2-DC** 279139			
	16	**FAZ-C16/1-DC** 279128			**FAZ-C16/2-DC** 279140			
	20	**FAZ-C20/1-DC** 279129			**FAZ-C20/2-DC** 279141			
	25	**FAZ-C25/1-DC** 279130			**FAZ-C25/2-DC** 279142			
	32	**FAZ-C32/1-DC** 279131			**FAZ-C32/2-DC** 279143			
	40	**FAZ-C40/1-DC** 279132			**FAZ-C40/2-DC** 279144			
	50	**FAZ-C50/1-DC** 279133			**FAZ-C50/2-DC** 279145			

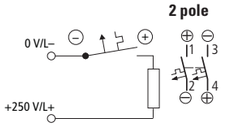


Notes

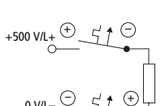
Circuit design notes
Note polarity!

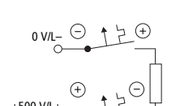
1 pole





2 pole





	Rated operational current I_n A	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole With 2 protected poles Part no. Article no.	Price See price list	Std. pack	3 pole With 3 protected poles Part no. Article no.	Price See price list	Std. pack	4 pole With 4 protected poles Part no. Article no.	Price See price list	Std. pack	4 pole With 3 protected poles, N switching with poles Part no. Article no.	Price See price list	Std. pack	Notes
AZ miniature circuit-breakers																	
Characteristic C Response current of short-circuit release 5 - 10 x I_n Switching capacity 15 - 25 kA (IEC/EN 60947-2)	20	**AZ-C20** 211769		12 off	**AZ-2-C20** 211770		2 off	**AZ-3-C20** 211771		1 off	**AZ-4-C20** 211772		1 off	**AZ-3N-C20** 211773		1 off	For switching capacity refer to Technical Data
	25	**AZ-C25** 211774		12 off	**AZ-2-C25** 211775		2 off	**AZ-3-C25** 211776		1 off	**AZ-4-C25** 211777		1 off	**AZ-3N-C25** 211778		1 off	
	32	**AZ-C32** 211779		12 off	**AZ-2-C32** 211780		2 off	**AZ-3-C32** 211781		1 off	**AZ-4-C32** 211782		1 off	**AZ-3N-C32** 211783		1 off	
	40	**AZ-C40** 211784		12 off	**AZ-2-C40** 211785		2 off	**AZ-3-C40** 211786		1 off	**AZ-4-C40** 211787		1 off	**AZ-3N-C40** 211788		1 off	
	50	**AZ-C50** 211789		12 off	**AZ-2-C50** 211790		2 off	**AZ-3-C50** 211791		1 off	**AZ-4-C50** 211792		1 off	**AZ-3N-C50** 211793		1 off	
	63	**AZ-C63** 211794		12 off	**AZ-2-C63** 211795		2 off	**AZ-3-C63** 211796		1 off	**AZ-4-C63** 211797		1 off	**AZ-3N-C63** 211798		1 off	
	80	**AZ-C80** 211799		12 off	**AZ-2-C80** 211800		2 off	**AZ-3-C80** 211801		1 off	**AZ-4-C80** 211802		1 off	**AZ-3N-C80** 211803		1 off	
	100	**AZ-C100** 211804		12 off	**AZ-2-C100** 211805		2 off	**AZ-3-C100** 211806		1 off	**AZ-4-C100** 211807		1 off	**AZ-3N-C100** 211808		1 off	
	125	**AZ-C125** 211809		12 off	**AZ-2-C125** 211810		2 off	**AZ-3-C125** 211811		1 off	**AZ-4-C125** 211812		1 off	**AZ-3N-C125** 211813		1 off	
Characteristic D Instantaneous release response current 10 - 20 x I_n Switching capacity 15 - 25 kA (IEC/EN 60947-2)	50	**AZ-D50** 211814		12 off	**AZ-2-D50** 211815		2 off	**AZ-3-D50** 211816		1 off				**AZ-3N-D50** 211817		1 off	
	63	**AZ-D63** 211818		12 off	**AZ-2-D63** 211819		2 off	**AZ-3-D63** 211820		1 off				**AZ-3N-D63** 211821		1 off	
	80	**AZ-D80** 211822		12 off	**AZ-2-D80** 211823		2 off	**AZ-3-D80** 211824		1 off				**AZ-3N-D80** 211825		1 off	
	100	**AZ-D100** 211826		12 off	**AZ-2-D100** 211827		2 off	**AZ-3-D100** 211828		1 off				**AZ-3N-D100** 211829		1 off	

Accessories **Page**

Auxiliary contacts, shunt releases → 19/24

Mounting accessories → 19/25

1 pole
Depth 75 mm
Width 27 mm



2 pole
Depth 75 mm
Width 54 mm

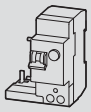
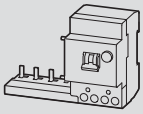


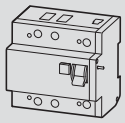
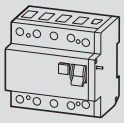
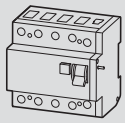
3 pole
Depth 75 mm
Width 81 mm



4 pole; 3 pole + N
Depth 75 mm
Width 108 mm

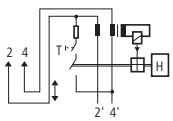


	Rated uninterrupted current I_u A	2 pole  **Part no.** Article no.	**Price** See price list	4 pole  **Part no.** Article no.	**Price** See price list			Std. pack
Residual-current protective modules for FAZ								
Rated fault current $I_{\Delta N}$ = 30 mA	40	**FIM-40/2/0.03-A** 278510		**FIM-40/4/0.03-A** 278514				1 off
Rated fault current $I_{\Delta N}$ = 30 mA	63	**FIM-63/2/0.03-A** 278512		**FIM-63/4/0.03-A** 278516				
Rated fault current $I_{\Delta N}$ = 300 mA	40	**FIM-40/2/0.3-A** 278511		**FIM-40/4/0.3-A** 278515				
Rated fault current $I_{\Delta N}$ = 300 mA	63	**FIM-63/2/0.3-A** 278513		**FIM-63/4/0.3-A** 278517				

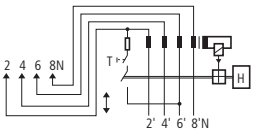
	Rated uninterrupted current I_u A	2 pole  **Part no.** Article no.	**Price** See price list	4 pole  **Part no.** Article no.	**Price** See price list	4 pole Selective  **Part no.** Article no.	**Price** See price list	Std. pack
Residual-current protective modules for AZ								
Rated fault current $I_{\Delta N}$ = 30 mA	80			**AZFIMP-4-80-0,03** 255484				1 off
Rated fault current $I_{\Delta N}$ = 30 mA	125			**AZFIMP-4-125-0,03** 255488				
Rated fault current $I_{\Delta N}$ = 300 mA	80	**AZFIMP-2-80-0,3** 255477		**AZFIMP-4-80-0,3** 255485		**AZFIMS-4-80-0,3** 255492		
Rated fault current $I_{\Delta N}$ = 300 mA	125	**AZFIMP-2-125-0,3** 255481		**AZFIMP-4-125-0,3** 255489		**AZFIMS-4-125-0,3** 255495		

Notes

FIM-…/2/…



FIM-…/4/…



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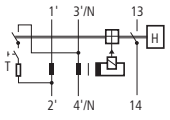
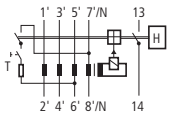
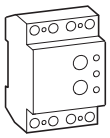
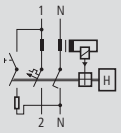
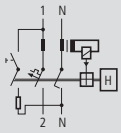
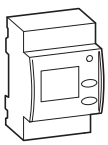


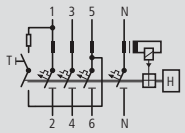
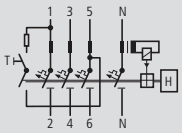
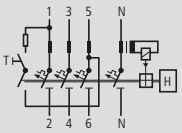
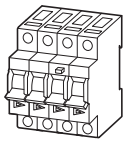
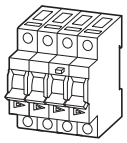
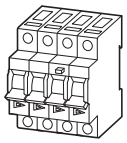
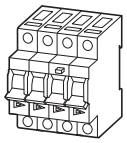
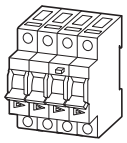
AZFIMP-4-…
AZFIMS-4-…

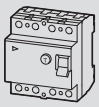


	Pole	Rated operational current I_n A	Response value Earth-fault release $I_{\Delta n}$ A	**Part no.** Article no.	**Price** See price list	Std. pack
Leakage current meter						
• 4 pole, can also be used as 2 and 3 pole • Electronic operation (independent of mains voltage) •  , non-delayed • Type G or part no. S can be set • → 19/55						
	4 pole	40	0.03 0.1 0.3 0.5 1.0	**PDIM-40/4** 111760		1 off
	4 pole	100	0.03 0.1 0.3 0.5 1.0	**PDIM-100/4** 111761		1 off

	Rated operational current I_n A	2 pole  **Part no.** Article no. Rated fault current $I_{\Delta N}$ = 30 mA	**Price** See price list	2 pole  **Part no.** Article no. Rated fault current $I_{\Delta N}$ = 300 mA	**Price** See price list	Std. pack
PKNM combination switches, type A						
Characteristic B Switching capacity 10 kA	6	**PKNM-6/1N/B/003-A-DW** 238580		**PKNM-6/1N/B/03-A-DW** 238582		1 off
	10	**PKNM-10/1N/B/003-A-DW** 238640		**PKNM-10/1N/B/03-A-DW** 238642		
	13	**PKNM-13/1N/B/003-A-DW** 238701		**PKNM-13/1N/B/03-A-DW** 238703		
	16	**PKNM-16/1N/B/003-A-DW** 238773		**PKNM-16/1N/B/03-A-DW** 238775		
	20	**PKNM-20/1N/B/003-A-DW** 238807		**PKNM-20/1N/B/03-A-DW** 238809		
	25	**PKNM-25/1N/B/003-A-DW** 238837		**PKNM-25/1N/B/03-A-DW** 238839		
	32	**PKNM-32/1N/B/003-A-DW** 238867		**PKNM-32/1N/B/03-A-DW** 238869		
	40	**PKNM-40/1N/B/003-A-DW** 238896		**PKNM-40/1N/B/03-A-DW** 238898		
Characteristic C Switching capacity 10 kA	6	**PKNM-6/1N/C/003-A-DW** 238590		**PKNM-6/1N/C/03-A-DW** 238592		
	10	**PKNM-10/1N/C/003-A-DW** 238650		**PKNM-10/1N/C/03-A-DW** 238652		
	13	**PKNM-13/1N/C/003-A-DW** 238713		**PKNM-13/1N/C/03-A-DW** 238715		
	16	**PKNM-16/1N/C/003-A-DW** 238785		**PKNM-16/1N/C/03-A-DW** 238787		
	20	**PKNM-20/1N/C/003-A-DW** 238817		**PKNM-20/1N/C/03-A-DW** 238819		
	25	**PKNM-25/1N/C/003-A-DW** 238847		**PKNM-25/1N/C/03-A-DW** 238849		
	32	**PKNM-32/1N/C/003-A-DW** 238877		**PKNM-32/1N/C/03-A-DW** 238879		
	40	**PKNM-40/1N/C/003-A-DW** 238906		**PKNM-40/1N/C/03-A-DW** 238908		

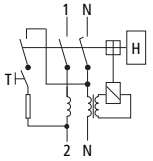
	Pole	Description	Rated operational current I_n A	**Part no.** Article no.	**Price** See price list	Std. pack
Power meter						
Power meter to IEC/EN 62053 for sub measurements • For active/reactive energy • Three-phase models also suitable for unbalanced load • Programmable through 2 keys on device front • Front plate and terminal area can be sealed						
	3 + N	Connection through current transformer	5	**KWZ-3PH** 110825		1 off
	3 + N	Connection through current transformer	63	**KWZ-3PH-63** 110826		

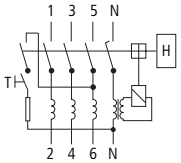
	Rated operational current I_n A	3 pole + N  **Part no.** Article no. Rated fault current $I_{\Delta N}$ = 30 mA	3 pole + N  **Part no.** Article no. Rated fault current $I_{\Delta N}$ = 100 mA	3 pole + N  **Part no.** Article no. Rated fault current $I_{\Delta N}$ = 300 mA	**Price** See price list	Std. pack
FI/LS combination switches mRB6						
• Conditionally surge-proof 250 A • Pulse-current sensitive, Type A • Depth 75 mm • Width 70 mm						
Characteristic B Switching capacity 6 kA 	13	**mRB6-13/3N/B/003-A** 120651	**mRB6-13/3N/B/01-A** 120653	**mRB6-13/3N/B/03-A** 120655		1 off
	16	**mRB6-16/3N/B/003-A** 120652	**mRB6-16/3N/B/01-A** 120654	**mRB6-16/3N/B/03-A** 120656		1 off
Characteristic C Switching capacity 6 kA 	6	**mRB6-6/3N/C/003-A** 120657	**mRB6-6/3N/C/01-A** 120661	**mRB6-6/3N/C/03-A** 120665		1 off
	10	**mRB6-10/3N/C/003-A** 120658	**mRB6-10/3N/C/01-A** 120662	**mRB6-10/3N/C/03-A** 120666		1 off
	13	**mRB6-13/3N/C/003-A** 120659	**mRB6-13/3N/C/01-A** 120663	**mRB6-13/3N/C/03-A** 120667		1 off
	16	**mRB6-16/3N/C/003-A** 120660	**mRB6-16/3N/C/01-A** 120664	**mRB6-16/3N/C/03-A** 120668		1 off
Characteristic D Switching capacity 6 kA 	6	**mRB6-6/3N/D/003-A** 120669	**mRB6-6/3N/D/01-A** 120673			1 off
	10	**mRB6-10/3N/D/003-A** 120670	**mRB6-10/3N/D/01-A** 120674			1 off
	13	**mRB6-13/3N/D/003-A** 120671	**mRB6-13/3N/D/01-A** 120675			1 off
	16	**mRB6-16/3N/D/003-A** 120672	**mRB6-16/3N/D/01-A** 120676			1 off
FI-LS combination switches mRB4						
• Conditionally surge-proof 250 A • Pulse-current sensitive, Type A • Depth 75 mm • Width 70 mm						
Characteristic C Switching capacity 4.5 kA 	20	**mRB4-20/3N/C/003-A** 120677	**mRB4-20/3N/C/01-A** 120679	**mRB4-20/3N/C/03-A** 120681		1 off
	25	**mRB4-25/3N/C/003-A** 120678	**mRB4-25/3N/C/01-A** 120680	**mRB4-25/3N/C/03-A** 120682		1 off
Characteristic D Switching capacity 4.5 kA 	20	**mRB4-20/3N/D/003-A** 120683	**mRB4-20/3N/D/01-A** 120684			1 off

	Rated uninterrupted current I_u A	2 pole  Part no. Article no.	Price See price list	Std. pack	4 pole  Part no. Article no.	Price See price list	Std. pack
Residual-current devices FI, type A							
Rated fault current $I_{\Delta N}$ = 30 mA	16	**FI-16/2/003-A** 279183		1 off			1 off
	25	**FI-25/2/003-A** 279184		1 off	**FI-25/4/003-A** 279213		
	40	**FI-40/2/003-A** 279187		1 off	**FI-40/4/003-A** 279217		
	63				**FI-63/4/003-A** 279221		
	80				**FI-80/4/003-A** 279225		
	100				**FI-100/4/003-A/-** 102936		
	125				**FI-125/4/003-A** 279165		
Rated fault current $I_{\Delta N}$ = 100 mA	25	**FI-25/2/01-A** 279185		1 off	**FI-25/4/01-A** 279214		
	40	**FI-40/2/01-A** 279188		1 off	**FI-40/4/01-A** 279218		
	63				**FI-63/4/01-A** 279222		
Rated fault current $I_{\Delta N}$ = 300 mA	25	**FI-25/2/03-A** 279186		1 off	**FI-25/4/03-A** 279215		
	40	**FI-40/2/03-A** 279189		1 off	**FI-40/4/03-A** 279219		
	63				**FI-63/4/03-A** 279223		
	80				**FI-80/4/03-A** 279226		
	100				**FI-100/4/03-A/-** 102937		
	125				**FI-125/4/03-A** 279167		
Rated fault current $I_{\Delta N}$ = 500 mA	25				**FI-25/4/05-A** 279216		
	40				**FI-40/4/05-A** 279220		
	63				**FI-63/4/05-A** 279224		
	80				**FI-80/4/05-A** 279227		
	100				**FI-100/4/05-A/-** 102938		
	125				**FI-125/4/05-A** 279169		

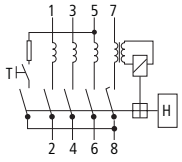
Notes

≦ 100 A

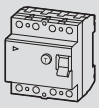


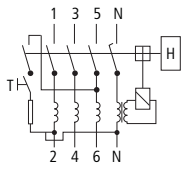
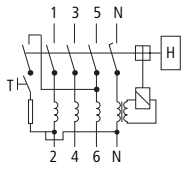
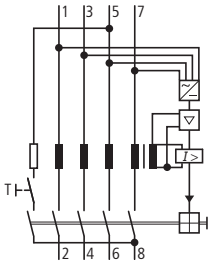


125 A



4 pole

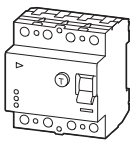


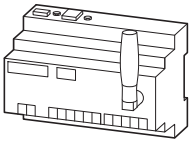
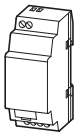
	Rated uninterrupted current I_u A	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Suitable for frequency inverters, type U					
Rated fault current $I_{\Delta N}$ = 100 mA	40	**FI-40/4/01-U** 279234		1 off	
	63	**FI-63/4/01-U** 279236		1 off	
Rated fault current $I_{\Delta N}$ = 300 mA	40	**FI-40/4/03-U** 279235		1 off	
	63	**FI-63/4/03-U** 279237		1 off	
Selective and surge-proof 5 kA, type S/A					
Rated fault current $I_{\Delta N}$ = 100 mA	63	**FI-63/4/01-S/A** 279228		1 off	
Rated fault current $I_{\Delta N}$ = 300 mA	63	**FI-63/4/03-S/A** 279229		1 off	
	80	**FI-80/4/03-S/A** 279230		1 off	
AC/DC sensitive, Type B					
Rated fault current $I_{\Delta N}$ = 30 mA	40	**FI-40/4/003-B** 240710		1 off	
	63	**FI-63/4/003-B** 240711		1 off	
	80	**FI-80/4/003-B** 240712		1 off	
	125[1)]	**FI-125/4/003-B** 240717		1 off	
Rated fault current $I_{\Delta N}$ = 100 mA	40	**FI-40/4/01-B** 279170		1 off	
	63	**FI-63/4/01-B** 279171		1 off	
	80	**FI-80/4/01-B** 279172		1 off	
	125[1)]	**FI-125/4/01-B** 240722		1 off	
Rated fault current $I_{\Delta N}$ = 300 mA	40	**FI-40/4/03-B** 279173		1 off	
	63	**FI-63/4/03-B** 279174		1 off	
	80	**FI-80/4/03-B** 279175		1 off	
	125[1)]	**FI-125/4/03-B** 240727		1 off	
AC/DC sensitive, selective, S/B type					
Rated fault current $I_{\Delta N}$ = 300 mA	40	**FI-40/4/03-S/B** 281022		1 off	
	63	**FI-63/4/03-S/B** 281023		1 off	
	80	**FI-80/4/03-S/B** 281024		1 off	

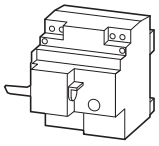
For use in 50 Hz AC current systems with electrical equipment such as frequency inverters, UPS systems or switched-mode power supply units. During a malfunction electrical equipment can cause AC fault currents and pulsed DC fault currents as well as smoothed d.c. fault currents, where residual-current devices of type C will not trip. The residual-current devices FI-B detect all fault current types in accordance with the trip characteristic of IEC 60755, i.e. even pulsating d.c. fault current.

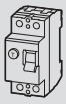
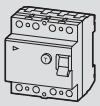
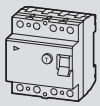
- Caution: In some countries the insurance companies place special demands on residual-current devices.
- Contact position display red-green
- Position independent function
- Trip occurs independent of the mains voltage (currents type AC and A)
- 30 V AC necessary for detection of type B current
- Mains connection side at top
- Type S/B 40 ms delay and selective switch off
- Auxiliary contacts on request

Notes [1)] Neutral conductor right, with 125 A neutral conductor on left

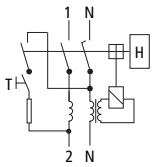
		Rated operational current I_n A	**Part no.** Article no.	**Price** See price list	Std. pack
Residual-current devices dRCM, digital					
• 4 pole • Contact position display red-green • Trip indication white/blue					
	Surge-proof 3 kA, pulse-current sensitive, Type G/A				
	Rated fault current $I_{\Delta N}$ = 30 mA	25	**dRCM-25/4/003-G/A+** 120834		1 off
		40	**dRCM-40/4/003-G/A+** 120836		1 off
		63	**dRCM-63/4/003-G/A+** 120838		1 off
		80	**dRCM-80/4/003-G/A+** 120840		1 off
	Rated fault current $I_{\Delta N}$ = 300 mA	25	**dRCM-25/4/03-G/A+** 120835		1 off
		40	**dRCM-40/4/03-G/A+** 120837		1 off
		63	**dRCM-63/4/03-G/A+** 120839		1 off
		80	**dRCM-80/4/03-G/A+** 120841		1 off
	Surge-proof 3 kA, X-ray applications, Type R				
	Rated fault current $I_{\Delta N}$ = 30 mA	63	**dRCM-63/4/003-R+** 120842		1 off
	Selective and surge-proof typ. 5 kA, pulse-current sensitive, Type S/A				
	Rated fault current $I_{\Delta N}$ = 300 mA	40	**dRCM-40/4/03-S/A+** 120843		1 off
		63	**dRCM-63/4/03-S/A+** 120844		1 off
		80	**dRCM-80/4/03-S/A+** 120845		1 off
	Selective and surge-proof typ. 5 kA, suitable for frequency inverters, Type U				
	Rated fault current $I_{\Delta N}$ = 300 mA	40	**dRCM-40/4/03-U+** 120851		1 off
		63	**dRCM-63/4/03-U+** 120847		1 off
		80	**dRCM-80/4/03-U+** 120848		1 off
	Short-time delayed and surge-proof 3 kA, suitable for frequency inverters, Type U				
	Rated fault current $I_{\Delta N}$ = 30 mA	40	**dRCM-40/4/003-U+** 120850		1 off
		63	**dRCM-63/4/003-U+** 120846		1 off

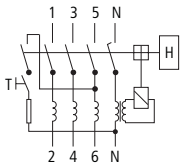
		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Remote monitoring unit					
• GSM-based universal remote monitoring and control through SMS • Configuration and status monitoring through SMS • Built-in modem monitoring and associated status indication through front-mounted LEDs • 2 changeover contacts • 4 digital inputs, 2 relay outputs					
	–	**Z-CC/2CO** 119383		1 off	
Accessories for remote monitoring unit					
Power adaptor 	24 V, 0.2 A	**EASY200-POW** 229424		1 off	Product Standards: IEC/EN see Technical Data; UL 508; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987; CE marking UL File No.: E135462 UL CCN: NRAQ CSA File No.: 012528 CSA Class No.: 2252-01 + 2258-02 NA Certification: UL Listed, CSA certified Degree of Protection: IEC: IP20, UL/CSA Type: -
Temperature sensor		**Z-CC/2CO-SE** 119430		1 off	

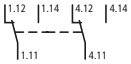
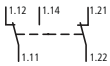
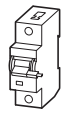
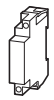
		Part no. Article no.	Price See price list	Std. pack
Remote switching modules				
• IEC/EN 60669-2-2 • For remote switching and automatic restart of FAZ miniature circuit-breakers and FI residual-current devices up to 80 A, except Type B • Mechanically lockable and sealable • LED indication of operational status and alarm status • Mechanical switching capacity up to FAZ-...63 and up to FI-80..., except Type B (-XFSM) • -25 °C/+40 °C • Rated operating voltage 24 - 240 V AC, 24 - 48 V DC • Terminal capacity 2 x 1.5 mm², 1 x 2.5 mm²; 0.4 Nm • Mechanical/electrical lifespan 10 000 switching operations • Power consumption 5 W				
	220 - 240 V AC	**FAZ/FIP-XAWM** 262514		1 off
	48 V DC	**FAZ/FIP-XDWM** 274404		1 off
Remote test module				
• External test module with test resistor for RCCB devices • Version adapted for rated fault currents with stipulated “external” test button function				
–	0.01 A	**Z-FW/001** 248297		4 off
	0.03 A	**Z-FW/003** 248298		4 off
	0.1 A	**Z-FW/010** 248299		4 off
	0.3 A	**Z-FW/030** 248300		4 off
	0.5 A	**Z-FW/050** 248301		4 off

	Rated uninterrupted current I_u A	2 pole  **Part no.** Article no.	**Price** See price list	Std. pack	4 pole  **Part no.** Article no.	**Price** See price list	Std. pack	4 pole Selective and surge-proof 5 kA  **Part no.** Article no.	**Price** See price list	Std. pack
FI residual-current devices, only for export (AC type)										
Rated fault current $I_{\Delta N}$ = 30 mA	16	**FI-16/2/003** 279176		1 off						
	25	**FI-25/2/003** 279177			**FI-25/4/003** 279196		1 off			
	40	**FI-40/2/003** 279180			**FI-40/4/003** 279200					
	63	**FI-63/2/003** 279190			**FI-63/4/003** 279204					
	80	**FI-80/2/003** 279192			**FI-80/4/003** 279208					
Rated fault current $I_{\Delta N}$ = 100 mA	25	**FI-25/2/01** 279178			**FI-25/4/01** 279197					
	40	**FI-40/2/01** 279181			**FI-40/4/01** 279201					
	63	**FI-63/2/01** 279191			**FI-63/4/01** 279205			**FI-63/4/01-S** 279210		1 off
	80	**FI-80/2/01** 279193			**FI-80/4/01** 279231					
Rated fault current $I_{\Delta N}$ = 300 mA	25	**FI-25/2/03** 279179			**FI-25/4/03** 279198					
	40	**FI-40/2/03** 279182			**FI-40/4/03** 279202					
	80				**FI-63/4/03** 279206			**FI-63/4/03-S** 279211		1 off
	25				**FI-80/4/03** 279209			**FI-80/4/03-S** 279212		1 off
Rated fault current $I_{\Delta N}$ = 500 mA	40				**FI-25/4/05** 279199					
	63				**FI-40/4/05** 279203					
	16				**FI-63/4/05** 279207					

Notes





	For use with		Contacts Number	Contact sequences	Space units, 1 space unit = 18 mm Space unit	**Part no.** Article no.	**Price** See price list	Std. pack
Auxiliary contacts and shunt releases								
Auxiliary contacts for FAZ, AZ, PKNM								
	FAZ... PKNM...	to 63 A	1 N/O/ 1 NC		0.5	**FAZ-XHIN11**[3] 286054		10 off
	FAZ... PKNM...	to 63 A	1 C		0.5	**FAZ-XHINW1**[4] 286055		10 off
	AZ...	to 125 A	1 N/O/ 1 NC		0.5	**AZ-XHI11** 212067		8 off
Trip-indicating auxiliary contact/auxiliary contact for FAZ, PKNM[1]								
	FAZ... PKNM...	to 63 A	2 C		0.5	**FAZ-XAM002**[5] 262414		10 off
Auxiliary contacts for FI								
	FI...	16 - 100 A, except type B	1 N/O/ 1 NC		0.5	**FIP-XHI11** 225121		10 off
	FI...[2]	125 A and all type B	1 NC / 1 N/O		0.5	**FIPA-XAM011** 262578		1 off
Shunt releases for FAZ, PKNM, AZ								
	FAZ... PKNM...	to 63 A	–		1	**FAZ-XAA-C-12-110VAC** 278518		1 off
	FAZ... PKNM...	to 63 A	–		1	**FAZ-XAA-C-110-415VAC** 278519		1 off
	AZ...	to 125 A	–		1.5	**AZ-XAA(110-415VAC)** 212059		8 off
	AZ...	to 125 A	–		1.5	**AZ-XAA(12-60VAC)** 212061		8 off
Undervoltage releases for FAZ								
	FAZ...	–	–		1	**FAZ-XUA(115VAC)** 212049		7 off
	FAZ...	–	–		1	**FAZ-XUA(230VAC)** 212051		7 off
	FAZ...	–	–		1	**FAZ-XUA(400VAC)** 212053		7 off
MCB lock for FAZ/FIP								
	FAZ... FIP...	–	–	–	–	**IS/SPE-1TE** 101911		5 off

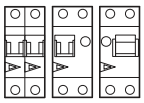
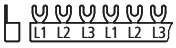
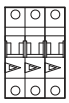
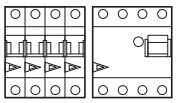
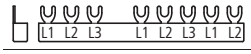
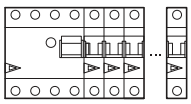
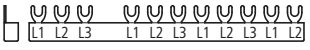
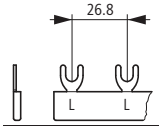
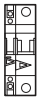
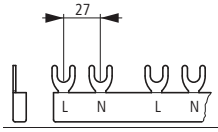
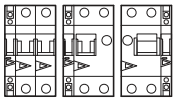
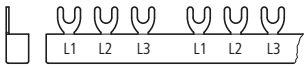
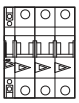
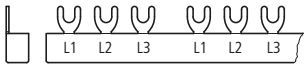
Notes

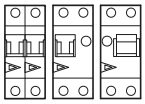
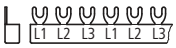
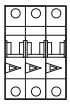
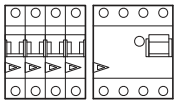
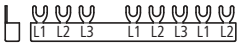
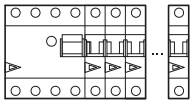
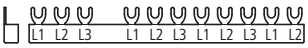
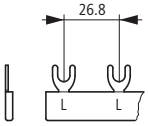
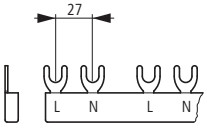
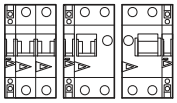
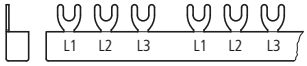
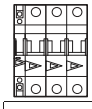
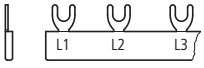
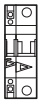
[1] The device is supplied with the groove in the yellow selector button in the horizontal: Changeover contact 4.11 – 4.12/4.14 switches when tripped manually or electrically. Turning the yellow selector button by 90° results in contact 4.11 – 4.12/4.14 responding only to electrical tripping: the contact 4.11 – 4.12/4.14 remains closed when tripped by hand.

[2] The device is supplied with the "Auxiliary contacts" function set such that both contacts switch on manual **and** electrical tripping. A change of function to "Signalling switch" means that both contacts switch **only** under fault conditions.

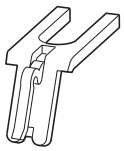
Information relevant for export to North America

[3] Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2, QVNU9
CSA File No.	–
CSA Class No.	3215-30
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20; UL/CSA Type: -
[4] Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2
NA Certification	UL Recognized, request filed for CSA
Degree of Protection	IEC: IP20; UL/CSA Type: -
[5] Product Standards	IEC/EN 60947-2; IEC/EN 60898; UL 1077; CSA-C22.2 No. 235; CE marking
UL File No.	E177451
UL CCN	QVNU2, QVNU8
CSA File No.	–
CSA Class No.	3215-30
NA Certification	UL Recognized, certified by UL for use in Canada
Degree of Protection	IEC: IP20; UL/CSA Type: -

	Phases Number	Devices Number	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Euro-Vario busbars (fork connector)						
• No end caps required • Do not shorten						
10 mm²						
• Rated operational current 63 A						
For PXL, PXF, PXK, PFIM-U, PFNM						
	1	2	**EVG-1PHAS/2MODUL** 215646		40 off	
	1	6	**EVG-1PHAS/6MODUL** 215638		40 off	
	1	12	**EVG-1PHAS/12MODUL** 215637		40 off	
	2	4	**EVG-2PHAS/4MODUL** 268220		20 off	
	2	6	**EVG-2PHAS/6MODUL** 215642		20 off	
	2	12	**EVG-2PHAS/12MODUL** 215641		20 off	
	3	6	**EVG-3PHAS/6MODUL** 215640		20 off	
	3	9	**EVG-3PHAS/9MODUL** 215645		20 off	
	3	12	**EVG-3PHAS/12MODUL** 215639		20 off	
	3	16	**EVG-3PHAS/16MODUL** 285381		20 off	
	3	20	**EVG-3PHAS/20MODUL** 285383		10 off	
	4	8	**EVG-4PHAS/8MODUL** 215644		10 off	
	4	12	**EVG-4PHAS/12MODUL** 215643		10 off	
	4	16	**EVG-3P+3N/16MODUL** 105215		20 off	
	4	18	**EVG-3P+3N/18MODUL** 274161		20 off	
For 2 pole combination RCCB/circuit-breaker with a width of 3 space units						
	1	2 - 5	**EVG-1PHAS/2-5MODUL/FILS** 285384		40 off	
For combined use of 4 pole residual-current devices with miniature circuit-breakers						
	3	4 + 5	**EVG-3PHAS/N/5MODUL/LS** 215659		20 off	
	3	4 + 8	**EVG-3PHAS/N/8MODUL/LS** 215660		20 off	
For use with auxiliary contacts						
	1	2.5	**EVG-1PHAS/2MODUL/HI** 215655		40 off	
	1	13	**EVG-1PHAS/9MODUL/HI** 215656		40 off	
	2	4.5	**EVG-2PHAS/4MODUL/HI** 219573		20 off	
	2	12	**EVG-2PHAS/10MODUL/HI** 215657		20 off	
	3	6.5	**EVG-3PHAS/6MODUL/HI** 216411		20 off	
	3	13.5	**EVG-3PHAS/12MODUL/HI** 215658		20 off	

	Phases Number	Devices Number	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Euro-Vario busbars (fork connector)						
• No end caps required • Do not shorten						
16 mm²						
• Rated operational current 100 A						
For FAZ…, FI…						
	1	2	**EVG-16/1PHAS/2MODUL** 291464		40 off	
	1	6	**EVG-16/1PHAS/6MODUL** 291465		40 off	
	1	12	**EVG-16/1PHAS/12MODUL** 291466		40 off	
	2	4	**EVG-16/2PHAS/4MODUL** 291467		20 off	
	2	6	**EVG-16/2PHAS/6MODUL** 291468		20 off	
	2	12	**EVG-16/2PHAS/12MODUL** 291469		20 off	
	3	6	**EVG-16/3PHAS/6MODUL** 291470		20 off	
	3	9	**EVG-16/3PHAS/9MODUL** 291471		20 off	
	3	12	**EVG-16/3PHAS/12MODUL** 291472		20 off	
	3	16	**EVG-16/3PHAS/16MODUL** 291473		20 off	
	3	20	**EVG-16/3PHAS/20MODUL** 291474		10 off	
	4	8	**EVG-16/4PHAS/8MODUL** 291475		10 off	
	4	12	**EVG-16/4PHAS/12MODUL** 291476		10 off	
For combined use of 4 pole residual-current devices with miniature circuit-breakers						
	3	4 + 5	**EVG-16/3PHAS/N/5MODUL/LS** 291477		20 off	
	3	4 + 8	**EVG-16/3PHAS/N/8MODUL/LS** 291478		20 off	
For use with auxiliary contacts						
	1	2	**EVG-16/1PHAS/2MODUL/HI** 291479		20 off	
	1	6	**EVG-16/1PHAS/6MODUL/HI** 291480		40 off	
	1	9	**EVG-16/1PHAS/9MODUL/HI** 291481		40 off	
	2	2	**EVG-16/2PHAS/4MODUL/HI** 291482		20 off	
	2	3	**EVG-16/2PHAS/6MODUL/HI** 291483		20 off	
	2	5	**EVG-16/2PHAS/10MODUL/HI** 291484		20 off	
	3	2	**EVG-16/3PHAS/6MODUL/HI** 291485		20 off	
	3	4	**EVG-16/3PHAS/12MODUL/HI** 291486		20 off	
	3 x 1	6	**EVG-16/3X1PHAS/6MODUL/HI** 291487		20 off	
	3 x 1	8	**EVG-16/3X1PHAS/8MODUL/HI** 291488		20 off	
	3 x 1	9	**EVG-16/3X1PHAS/9MODUL/HI** 291489		20 off	

HPL19027EN

	Pole	Rated operational current I_e A	Cross section mm²	Length m	**Part no.** Article no.	**Price** See price list	Std. pack
Comb-shaped phase busbar							
1-phase, 80 A	1	80	16	1	**Z-GV-16/1P-1TE** 271061		50 off
3-phase, 63 A	3	63	10	1	**Z-GV-10/3P-3TE** 271060		20 off
3-phase, 80 A	3	80	16	1	**Z-GV-16/3P-3TE** 271064		20 off
4-phase, 80 A	4	80	16	1	**Z-GV-16/3P+N-4TE** 271066		15 off
End caps	3	–	10	–	**Z-AK-10/2+3P** 271069		10 off
	3	–	16	–	**Z-AK-16/2+3P** 271070		10 off
	4	–	16	–	**Z-AK-16/4P** 271071		10 off
Incoming terminals							
4.3 Nm, touch-proof busbar connection to miniature circuit-breaker	–	–	25	–	**FAZ-XK25** 212116		50 off
M5: 3.0 Nm, M8: 4.3 Nm touch-proof connection to FAZ-XIS... busbar	–	–	35	–	**FAZ-XK35** 212119		10 off
Busbar tag shroud							
For masking of unused connections on the busbar	–	–	–	–	**ZV-BS-G** 104903		10 off
Bracket for securing of covers 2 required per row of MCBs	–	–	–	–	**REG-BB** 212106		20 off
Terminal bracket, 80 A							
Same extension terminal, turned by 180°							
	L1, N	80	–	–	**ZV-L1/N-80A-10** 263950		10 off
	L1, N	80	–	–	**ZV-L1/N-80A-36** 263951		36 off
	L1, N	80	–	–	**ZV-L1/N-80A-100** 263952		100 off
	L2, L3	80	–	–	**ZV-L2/L3-80A-10** 263953		10 off
	L2, L3	80	–	–	**ZV-L2/L3-80A-36** 263954		36 off
	L2, L3	80	–	–	**ZV-L2/L3-80A-100** 263955		100 off
Busbars							
1 m long.							
	–	50	–	1	**ZV-SS** 263956		10 off
	–	80	–	1	**ZV-SS-80A** 263957		10 off
Shroud section							
1 m long, for 50 and 80 A.							
	–	–	–	–	**ZV-ADP** 263958		1 off
End cap for shroud section							
	–	–	–	–	**ZV-AEK** 263959		10 off

Miniature circuit-breakers FAZ-NA

- Characteristic B
- Switching capacity 15 kA IEC

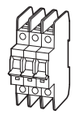
Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack	3 pole Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	Notes
1	10	AWG 18	**FAZ-B1/1-NA**[1] 132414		2 off	**FAZ-B1/2-NA**[1] 132693		1 off	**FAZ-B1/3-NA**[1] 132712		1 off	[1] Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking; UL File No.: E235139; UL CCN: DIVQ; CSA File No.: 204453; CSA Class No.: 1432-01; NA Certification: UL Listed, CSA certified; Suitable for: Feeder circuits, branch circuits; Current Limiting CB: ✓; Max. Voltage Rating: ≦ 32 A, 1 pole: 277 V AC, 48 V DC, 2 pole: 480 Y/277 V AC, 96 V DC, 3 pole: 480 Y/277 V AC; Degree of Protection: IEC: IP20, UL/CSA Type: -	Accessories → 19/40
1.5	10	AWG 18	**FAZ-B1,5/1-NA**[1] 132415			**FAZ-B1,5/2-NA**[1] 132694			**FAZ-B1.5/3-NA**[1] 132713				1 pole Depth 75 mm Width 17.7 mm
2	10	AWG 18	**FAZ-B2/1-NA**[1] 132416			**FAZ-B2/2-NA**[1] 132695			**FAZ-B2/3-NA**[1] 132714				
3	10	AWG 18	**FAZ-B3/1-NA**[1] 132417			**FAZ-B3/2-NA**[1] 132696			**FAZ-B3/3-NA**[1] 132715				
4	10	AWG 18	**FAZ-B4/1-NA**[1] 132418			**FAZ-B4/2-NA**[1] 132697			**FAZ-B4/3-NA**[1] 132716				
5	10	AWG 18	**FAZ-B5/1-NA**[1] 132419			**FAZ-B5/2-NA**[1] 132698			**FAZ-B5/3-NA**[1] 132717				
6	10	AWG 18	**FAZ-B6/1-NA**[1] 132680			**FAZ-B6/2-NA**[1] 132699			**FAZ-B6/3-NA**[1] 132718				
7	10	AWG 18	**FAZ-B7/1-NA**[1] 132681			**FAZ-B7/2-NA**[1] 132700			**FAZ-B7/3-NA**[1] 132719				
8	10	AWG 16	**FAZ-B8/1-NA**[1] 132682			**FAZ-B8/2-NA**[1] 132701			**FAZ-B8/3-NA**[1] 132720				
10	10	AWG 16	**FAZ-B10/1-NA**[1] 132683			**FAZ-B10/2-NA**[1] 132702			**FAZ-B10/3-NA**[1] 132721				
13	10	–	**FAZ-B13/1-NA**[1] 132684			**FAZ-B13/2-NA**[1] 132703			**FAZ-B13/3-NA**[1] 132722				
15	14	–	**FAZ-B15/1-NA**[1] 132685			**FAZ-B15/2-NA**[1] 132704			**FAZ-B15/3-NA**[1] 132723				
16	14	–	**FAZ-B16/1-NA**[1] 132686			**FAZ-B16/2-NA**[1] 132705			**FAZ-B16/3-NA**[1] 132724				
20	14	–	**FAZ-B20/1-NA**[1] 132687			**FAZ-B20/2-NA**[1] 132706			**FAZ-B20/3-NA**[1] 132725				
25	14	–	**FAZ-B25/1-NA**[1] 132688			**FAZ-B25/2-NA**[1] 132707			**FAZ-B25/3-NA**[1] 132726				
30	10	–	**FAZ-B30/1-NA**[1] 132689			**FAZ-B30/2-NA**[1] 132708			**FAZ-B30/3-NA**[1] 132727				
32	10	–	**FAZ-B32/1-NA**[1] 132690			**FAZ-B32/2-NA**[1] 132709			**FAZ-B32/3-NA**[1] 132728				
35	10	–	**FAZ-B35/1-NA**[2] 132691			**FAZ-B35/2-NA**[2] 132710			**FAZ-B35/3-NA**[2] 132729				
40	10	–	**FAZ-B40/1-NA**[2] 132692			**FAZ-B40/2-NA**[2] 132711			**FAZ-B40/3-NA**[2] 132730				

[2] Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking; UL File No.: E235139; UL CCN: DIVQ; CSA File No.: 204453; CSA Class No.: 1432-01; NA Certification: UL Listed, CSA certified; Suitable for: Feeder circuits, branch circuits; Current Limiting CB: ✓; Max. Voltage Rating: > 32 A, 1 pole: 240 V AC, 48 V DC, 2 pole: 240 V AC, 96 V DC, 3 pole: 240 V AC; Degree of Protection: IEC: IP20, UL/CSA Type: -

FAZ-NA can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.

2 pole
Depth 75 mm
Width 35.4 mm

3 pole
Depth 75 mm
Width 53.1 mm



Miniature circuit-breakers FAZ-NA

- Characteristic C
- Switching capacity 15 kA IEC

Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack
0.5	10	AWG 18	**FAZ-C0,5/1-NA**[1] 102077		2 off	**FAZ-C0.5/2-NA**[1] 102157		1 off
1	10	AWG 18	**FAZ-C1/1-NA**[1] 102078			**FAZ-C1/2-NA**[1] 102158		
1.5	10	AWG 18	**FAZ-C0,5/1-NA**[1] 102079			**FAZ-C1.5/2-NA**[1] 102159		
2	10	AWG 18	**FAZ-C2/1-NA**[1] 102080			**FAZ-C2/2-NA**[1] 102160		
3	10	AWG 18	**FAZ-C3/1-NA**[1] 102081			**FAZ-C3/2-NA**[1] 102161		
4	10	AWG 18	**FAZ-C4/1-NA**[1] 102082			**FAZ-C4/2-NA**[1] 102162		
5	10	AWG 18	**FAZ-C5/1-NA**[1] 102083			**FAZ-C5/2-NA**[1] 102163		
6	10	AWG 18	**FAZ-C6/1-NA**[1] 102084			**FAZ-C6/2-NA**[1] 102164		
7	10	AWG 18	**FAZ-C7/1-NA**[1] 102085			**FAZ-C7/2-NA**[1] 102165		
8	10	AWG 16	**FAZ-C8/1-NA**[1] 102086			**FAZ-C8/2-NA**[1] 102166		
10	10	AWG 16	**FAZ-C10/1-NA**[1] 102087			**FAZ-C10/2-NA**[1] 102167		
13	10	–	**FAZ-C13/1-NA**[1] 102088			**FAZ-C13/2-NA**[1] 102168		
15	14	–	**FAZ-C15/1-NA**[1] 102089			**FAZ-C15/2-NA**[1] 102169		
16	14	–	**FAZ-C16/1-NA**[1] 102090			**FAZ-C16/2-NA**[1] 102170		
20	14	–	**FAZ-C20/1-NA**[1] 102091			**FAZ-C20/2-NA**[1] 102171		
25	14	–	**FAZ-C25/1-NA**[1] 102092			**FAZ-C25/2-NA**[1] 102172		
30	10	–	**FAZ-C30/1-NA**[1] 102093			**FAZ-C30/2-NA**[1] 102173		
32	10	–	**FAZ-C32/1-NA**[1] 102094			**FAZ-C32/2-NA**[1] 102174		
35	10	–	**FAZ-C35/1-NA**[2] 102095			**FAZ-C35/2-NA**[2] 102175		
40	10	–	**FAZ-C40/1-NA**[2] 102096			**FAZ-C40/2-NA**[2] 102176		

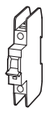
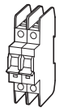
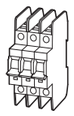
3 pole Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	Notes
FAZ-C0.5/3-NA[1] 102237		1 off	[1]	Accessories → 19/40
FAZ-C1/3-NA[1] 102238			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: ≦ 32 A 1 pole: 277 V AC, 48 V DC 2 pole: 480 Y/277 V AC, 96 V DC 3 pole: 480 Y/277 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	1 pole Depth 75 mm Width 17.7 mm
FAZ-C1.5/3-NA[1] 102239				
FAZ-C2/3-NA[1] 102240				
FAZ-C3/3-NA[1] 102241				
FAZ-C4/3-NA[1] 102242				
FAZ-C5/3-NA[1] 102243				
FAZ-C6/3-NA[1] 102244				
FAZ-C7/3-NA[1] 102245				
FAZ-C8/3-NA[1] 102246				
FAZ-C10/3-NA[1] 102247				
FAZ-C13/3-NA[1] 102248				
FAZ-C15/3-NA[1] 102249				
FAZ-C16/3-NA[1] 102250				
FAZ-C20/3-NA[1] 102251				
FAZ-C25/3-NA[1] 102252				
FAZ-C30/3-NA[1] 102253				
FAZ-C32/3-NA[1] 102254				
FAZ-C35/3-NA[2] 102255			[2]	2 pole Depth 75 mm Width 35.4 mm
FAZ-C40/3-NA[2] 102256			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: > 32 A 1 pole: 240 V AC, 48 V DC 2 pole: 240 V AC, 96 V DC 3 pole: 240 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	3 pole Depth 75 mm Width 53.1 mm

FAZ-NA can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.

Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack
Miniature circuit-breakers FAZ-NA								
• Characteristic D • Switching capacity 15 kA IEC								
0.5	10	AWG 18	**FAZ-D0,5/1-NA**[1] 102097		2 off	**FAZ-D0.5/2-NA**[1] 102177		1 off
1	10	AWG 18	**FAZ-D1/1-NA**[1] 102098			**FAZ-D1/2-NA**[1] 102178		
1.5	10	AWG 18	**FAZ-D0,5/1-NA**[1] 102099			**FAZ-D1.5/2-NA**[1] 102179		
2	10	AWG 18	**FAZ-D2/1-NA**[1] 102100			**FAZ-D2/2-NA**[1] 102180		
3	10	AWG 18	**FAZ-D3/1-NA**[1] 102101			**FAZ-D3/2-NA**[1] 102181		
4	10	AWG 18	**FAZ-D4/1-NA**[1] 102102			**FAZ-D4/2-NA**[1] 102182		
5	10	AWG 18	**FAZ-D5/1-NA**[1] 102103			**FAZ-D5/2-NA**[1] 102183		
6	10	AWG 18	**FAZ-D6/1-NA**[1] 102104			**FAZ-D6/2-NA**[1] 102184		
7	10	AWG 18	**FAZ-D7/1-NA**[1] 102105			**FAZ-D7/2-NA**[1] 102185		
8	10	AWG 16	**FAZ-D8/1-NA**[1] 102106			**FAZ-D8/2-NA**[1] 102186		
10	10	AWG 16	**FAZ-D10/1-NA**[1] 102107			**FAZ-D10/2-NA**[1] 102187		
13	10	–	**FAZ-D13/1-NA**[1] 102108			**FAZ-D13/2-NA**[1] 102188		
15	14	–	**FAZ-D15/1-NA**[1] 102109			**FAZ-D15/2-NA**[1] 102189		
16	14	–	**FAZ-D16/1-NA**[1] 102110			**FAZ-D16/2-NA**[1] 102190		
20	14	–	**FAZ-D20/1-NA**[1] 102111			**FAZ-D20/2-NA**[1] 102191		
25	14	–	**FAZ-D25/1-NA**[1] 102112			**FAZ-D25/2-NA**[1] 102192		
30	10	–	**FAZ-D30/1-NA**[1] 102113			**FAZ-D30/2-NA**[1] 102193		
32	10	–	**FAZ-D32/1-NA**[1] 102114			**FAZ-D32/2-NA**[1] 102194		
35	10	–	**FAZ-D35/1-NA**[2] 102115			**FAZ-D35/2-NA**[2] 102195		
40	10	–	**FAZ-D40/1-NA**[2] 102116			**FAZ-D40/2-NA**[2] 102196		

3 pole Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	Notes
FAZ-D0.5/3-NA[1] 102257		1 off	[1]	Accessories → 19/40
FAZ-D1/3-NA[1] 102258			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: ≦ 32 A 1 pole: 277 V AC, 48 V DC 2 pole: 480 Y/277 V AC, 96 V DC 3 pole: 480 Y/277 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	1 pole Depth 75 mm Width 17.7 mm
FAZ-D1.5/3-NA[1] 102259				
FAZ-D2/3-NA[1] 102260				
FAZ-D3/3-NA[1] 102261				
FAZ-D4/3-NA[1] 102262				
FAZ-D5/3-NA[1] 102263				
FAZ-D6/3-NA[1] 102264				
FAZ-D7/3-NA[1] 102265				
FAZ-D8/3-NA[1] 102266				
FAZ-D10/3-NA[1] 102267				
FAZ-D13/3-NA[1] 102268				
FAZ-D15/3-NA[1] 102269				
FAZ-D16/3-NA[1] 102270				
FAZ-D20/3-NA[1] 102271				
FAZ-D25/3-NA[1] 102272				
FAZ-D30/3-NA[1] 102273				
FAZ-D32/3-NA[1] 102274				
FAZ-D35/3-NA[2] 102275			[2]	2 pole Depth 75 mm Width 35.4 mm
FAZ-D40/3-NA[2] 102276			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: > 32 A 1 pole: 240 V AC, 48 V DC 2 pole: 240 V AC, 96 V DC 3 pole: 240 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	3 pole Depth 75 mm Width 53.1 mm

FAZ-NA can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.

Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack	3 pole Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	Notes
Miniature circuit-breakers FAZ-RT													
• With ring cable lug connection • Characteristic B • Switching capacity 15 kA IEC													
1	10	AWG 18	**FAZ-B1/1-RT**[1] 132731		2 off	**FAZ-B1/2-RT**[1] 132750		1 off	**FAZ-B1/3-RT**[1] 132769		1 off	[1] Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: ≦ 32 A 1 pole: 277 V AC, 48 V DC 2 pole: 480 Y/277 V AC, 96 V DC 3 pole: 480 Y/277 V AC Degree of Protection: IEC: IP20, UL/CSA Type: - [2] Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: > 32 A 1 pole: 240 V AC, 48 V DC 2 pole: 240 V AC, 96 V DC 3 pole: 240 V AC Degree of Protection: IEC: IP20, UL/CSA Type: - FAZ-RT can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.	Accessories → 19/40 1 pole Depth 75 mm Width 17.7 mm  2 pole Depth 75 mm Width 35.4 mm  3 pole Depth 75 mm Width 53.1 mm 
1.5	10	AWG 18	**FAZ-B1,5/1-RT**[1] 132732			**FAZ-B1,5/2-RT**[1] 132751			**FAZ-B1.5/3-RT**[1] 132770				
2	10	AWG 18	**FAZ-B2/1-RT**[1] 132733			**FAZ-B2/2-RT**[1] 132752			**FAZ-B2/3-RT**[1] 132771				
3	10	AWG 18	**FAZ-B3/1-RT**[1] 132734			**FAZ-B3/2-RT**[1] 132753			**FAZ-B3/3-RT**[1] 132772				
4	10	AWG 18	**FAZ-B4/1-RT**[1] 132735			**FAZ-B4/2-RT**[1] 132754			**FAZ-B4/3-RT**[1] 132773				
5	10	AWG 18	**FAZ-B5/1-RT**[1] 132736			**FAZ-B5/2-RT**[1] 132755			**FAZ-B5/3-RT**[1] 132774				
6	10	AWG 18	**FAZ-B6/1-RT**[1] 132737			**FAZ-B6/2-RT**[1] 132756			**FAZ-B6/3-RT**[1] 132775				
7	10	AWG 18	**FAZ-B7/1-RT**[1] 132738			**FAZ-B7/2-RT**[1] 132757			**FAZ-B7/3-RT**[1] 132776				
8	10	AWG 16	**FAZ-B8/1-RT**[1] 132739			**FAZ-B8/2-RT**[1] 132758			**FAZ-B8/3-RT**[1] 132777				
10	10	AWG 16	**FAZ-B10/1-RT**[1] 132740			**FAZ-B10/2-RT**[1] 132759			**FAZ-B10/3-RT**[1] 132778				
13	10	–	**FAZ-B13/1-RT**[1] 132741			**FAZ-B13/2-RT**[1] 132760			**FAZ-B13/3-RT**[1] 132779				
15	14	–	**FAZ-B15/1-RT**[1] 132742			**FAZ-B15/2-RT**[1] 132761			**FAZ-B15/3-RT**[1] 132780				
16	14	–	**FAZ-B16/1-RT**[1] 132743			**FAZ-B16/2-RT**[1] 132762			**FAZ-B16/3-RT**[1] 132781				
20	14	–	**FAZ-B20/1-RT**[1] 132744			**FAZ-B20/2-RT**[1] 132763			**FAZ-B20/3-RT**[1] 132782				
25	14	–	**FAZ-B25/1-RT**[1] 132745			**FAZ-B25/2-RT**[1] 132764			**FAZ-B25/3-RT**[1] 132783				
30	10	–	**FAZ-B30/1-RT**[1] 132746			**FAZ-B30/2-RT**[1] 132765			**FAZ-B30/3-RT**[1] 132784				
32	10	–	**FAZ-B32/1-RT**[1] 132747			**FAZ-B32/2-RT**[1] 132766			**FAZ-B32/3-RT**[1] 132785				
35	10	–	**FAZ-B35/1-RT**[2] 132748			**FAZ-B35/2-RT**[2] 132767			**FAZ-B35/3-RT**[2] 132786				
40	10	–	**FAZ-B40/1-RT**[2] 132749			**FAZ-B40/2-RT**[2] 132768			**FAZ-B40/3-RT**[2] 132787				

Miniature circuit-breakers FAZ-RT

- With ring cable lug connection
- Characteristic C
- Switching capacity 15 kA IEC

Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	1 pole Price See price list	1 pole Std. pack	2 pole Part no. Article no.	2 pole Price See price list	2 pole Std. pack
0.5	10	AWG 18	**FAZ-C0,5/1-RT**[1] 102117		2 off	**FAZ-C0.5/2-RT**[1] 102197		1 off
1	10	AWG 18	**FAZ-C1/1-RT**[1] 102118			**FAZ-C1/2-RT**[1] 102198		
1.5	10	AWG 18	**FAZ-C0,5/1-RT**[1] 102119			**FAZ-C1.5/2-RT**[1] 102199		
2	10	AWG 18	**FAZ-C2/1-RT**[1] 102120			**FAZ-C2/2-RT**[1] 102200		
3	10	AWG 18	**FAZ-C3/1-RT**[1] 102121			**FAZ-C3/2-RT**[1] 102201		
4	10	AWG 18	**FAZ-C4/1-RT**[1] 102122			**FAZ-C4/2-RT**[1] 102202		
5	10	AWG 18	**FAZ-C5/1-RT**[1] 102123			**FAZ-C5/2-RT**[1] 102203		
6	10	AWG 18	**FAZ-C6/1-RT**[1] 102124			**FAZ-C6/2-RT**[1] 102204		
7	10	AWG 18	**FAZ-C7/1-RT**[1] 102125			**FAZ-C7/2-RT**[1] 102205		
8	10	AWG 16	**FAZ-C8/1-RT**[1] 102126			**FAZ-C8/2-RT**[1] 102206		
10	10	AWG 16	**FAZ-C10/1-RT**[1] 102127			**FAZ-C10/2-RT**[1] 102207		
13	10	–	**FAZ-C13/1-RT**[1] 102128			**FAZ-C13/2-RT**[1] 102208		
15	14	–	**FAZ-C15/1-RT**[1] 102129			**FAZ-C15/2-RT**[1] 102209		
16	14	–	**FAZ-C16/1-RT**[1] 102130			**FAZ-C16/2-RT**[1] 102210		
20	14	–	**FAZ-C20/1-RT**[1] 102131			**FAZ-C20/2-RT**[1] 102211		
25	14	–	**FAZ-C25/1-RT**[1] 102132			**FAZ-C25/2-RT**[1] 102212		
30	10	–	**FAZ-C30/1-RT**[1] 102133			**FAZ-C30/2-RT**[1] 102213		
32	10	–	**FAZ-C32/1-RT**[1] 102134			**FAZ-C32/2-RT**[1] 102214		
35	10	–	**FAZ-C35/1-RT**[2] 102135			**FAZ-C35/2-RT**[2] 102215		
40	10	–	**FAZ-C40/1-RT**[2] 102136			**FAZ-C40/2-RT**[2] 102216		

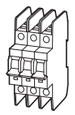
3 pole Part no. Article no.	3 pole Price See price list	3 pole Std. pack	Information relevant for export to North America	Notes
FAZ-C0.5/3-RT[1] 102277		1 off	[1]	Accessories → 19/40
FAZ-C1/3-RT[1] 102278			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: ≦ 32 A 1 pole: 277 V AC, 48 V DC 2 pole: 480 Y/277 V AC, 96 V DC 3 pole: 480 Y/277 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	1 pole Depth 75 mm Width 17.7 mm
FAZ-C1.5/3-RT[1] 102279				
FAZ-C2/3-RT[1] 102280				
FAZ-C3/3-RT[1] 102281				
FAZ-C4/3-RT[1] 102282				
FAZ-C5/3-RT[1] 102283				
FAZ-C6/3-RT[1] 102284				
FAZ-C7/3-RT[1] 102285				
FAZ-C8/3-RT[1] 102286				
FAZ-C10/3-RT[1] 102287				
FAZ-C13/3-RT[1] 102288				
FAZ-C15/3-RT[1] 102289				
FAZ-C16/3-RT[1] 102290				
FAZ-C20/3-RT[1] 102291				
FAZ-C25/3-RT[1] 102292				
FAZ-C30/3-RT[1] 102293				
FAZ-C32/3-RT[1] 102294				
FAZ-C35/3-RT[2] 102295				
FAZ-C40/3-RT[2] 102296				

[2]
Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking
UL File No.: E235139
UL CCN: DIVQ
CSA File No.: 204453
CSA Class No.: 1432-01
NA Certification: UL Listed, CSA certified
Suitable for: Feeder circuits, branch circuits
Current Limiting CB: ✓
Max. Voltage Rating: > 32 A
1 pole: 240 V AC, 48 V DC
2 pole: 240 V AC, 96 V DC
3 pole: 240 V AC
Degree of Protection: IEC: IP20, UL/CSA Type: -

FAZ-RT can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.

2 pole
Depth 75 mm
Width 35.4 mm

3 pole
Depth 75 mm
Width 53.1 mm



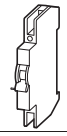
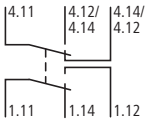
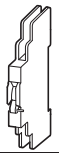
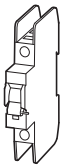
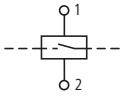
Miniature circuit-breakers FAZ-RT

- With ring cable lug connection
- Characteristic D
- Switching capacity 15 kA IEC

Rated operational current I_n A	Interrupting capacity (SCCR) kA	Special approval for protection of AWG 18 or AWG 16 to NFPA70 (NEC) and NFPA 79	1 pole Part no. Article no.	Price See price list	Std. pack	2 pole Part no. Article no.	Price See price list	Std. pack
0.5	10	AWG 18	**FAZ-D0,5/1-RT**[1] 102137		2 off	**FAZ-D0.5/2-RT**[1] 102217		1 off
1	10	AWG 18	**FAZ-D1/1-RT**[1] 102138			**FAZ-D1/2-RT**[1] 102218		
1.5	10	AWG 18	**FAZ-D0,5/1-RT**[1] 102139			**FAZ-D1.5/2-RT**[1] 102219		
2	10	AWG 18	**FAZ-D2/1-RT**[1] 102140			**FAZ-D2/2-RT**[1] 102220		
3	10	AWG 18	**FAZ-D3/1-RT**[1] 102141			**FAZ-D3/2-RT**[1] 102221		
4	10	AWG 18	**FAZ-D4/1-RT**[1] 102142			**FAZ-D4/2-RT**[1] 102222		
5	10	AWG 18	**FAZ-D5/1-RT**[1] 102143			**FAZ-D5/2-RT**[1] 102223		
6	10	AWG 18	**FAZ-D6/1-RT**[1] 102144			**FAZ-D6/2-RT**[1] 102224		
7	10	AWG 18	**FAZ-D7/1-RT**[1] 102145			**FAZ-D7/2-RT**[1] 102225		
8	10	AWG 16	**FAZ-D8/1-RT**[1] 102146			**FAZ-D8/2-RT**[1] 102226		
10	10	AWG 16	**FAZ-D10/1-RT**[1] 102147			**FAZ-D10/2-RT**[1] 102227		
13	10	–	**FAZ-D13/1-RT**[1] 102148			**FAZ-D13/2-RT**[1] 102228		
15	14	–	**FAZ-D15/1-RT**[1] 102149			**FAZ-D15/2-RT**[1] 102229		
16	14	–	**FAZ-D16/1-RT**[1] 102150			**FAZ-D16/2-RT**[1] 102230		
20	14	–	**FAZ-D20/1-RT**[1] 102151			**FAZ-D20/2-RT**[1] 102231		
25	14	–	**FAZ-D25/1-RT**[1] 102152			**FAZ-D25/2-RT**[1] 102232		
30	10	–	**FAZ-D30/1-RT**[1] 102153			**FAZ-D30/2-RT**[1] 102233		
32	10	–	**FAZ-D32/1-RT**[1] 102154			**FAZ-D32/2-RT**[1] 102234		
35	10	–	**FAZ-D35/1-RT**[2] 102155			**FAZ-D35/2-RT**[2] 102235		
40	10	–	**FAZ-D40/1-RT**[2] 102156			**FAZ-D40/2-RT**[2] 102236		

3 pole Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	Notes
FAZ-D0.5/3-RT[1] 102297		1 off	[1]	Accessories → 19/40
FAZ-D1/3-RT[1] 102298			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: ≦ 32 A 1 pole: 277 V AC, 48 V DC 2 pole: 480 Y/277 V AC, 96 V DC 3 pole: 480 Y/277 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	1 pole Depth 75 mm Width 17.7 mm
FAZ-D1.5/3-RT[1] 102299				
FAZ-D2/3-RT[1] 102300				
FAZ-D3/3-RT[1] 102301				
FAZ-D4/3-RT[1] 102302				
FAZ-D5/3-RT[1] 102303				
FAZ-D6/3-RT[1] 102304				
FAZ-D7/3-RT[1] 102305				
FAZ-D8/3-RT[1] 102306				
FAZ-D10/3-RT[1] 102307				
FAZ-D13/3-RT[1] 102308				
FAZ-D15/3-RT[1] 102309				
FAZ-D16/3-RT[1] 102310				
FAZ-D20/3-RT[1] 102311				
FAZ-D25/3-RT[1] 102312				
FAZ-D30/3-RT[1] 102313				
FAZ-D32/3-RT[1] 102314				
FAZ-D35/3-RT[2] 102315			[2]	2 pole Depth 75 mm Width 35.4 mm
FAZ-D40/3-RT[2] 102316			Product Standards: IEC/EN 60947-2; UL 489; CSA-C22.2 No. 5-09; CE marking UL File No.: E235139 UL CCN: DIVQ CSA File No.: 204453 CSA Class No.: 1432-01 NA Certification: UL Listed, CSA certified Suitable for: Feeder circuits, branch circuits Current Limiting CB: ✓ Max. Voltage Rating: > 32 A 1 pole: 240 V AC, 48 V DC 2 pole: 240 V AC, 96 V DC 3 pole: 240 V AC Degree of Protection: IEC: IP20, UL/CSA Type: -	3 pole Depth 75 mm Width 53.1 mm

FAZ-RT can also be used where FAZ Supplementary Protectors to UL 1077 are sufficient.

	Contacts C = Changeover contact N/O = normally open contact NC = normally closed contact	Contact sequences	Space units 1 PLE = 18 mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Accessories for FAZ-NA, FAZ-RT							
Tripping signal contact • The function of one of the two changeover contacts can be changed from “auxiliary contact” to “tripping signal contact”.							
	2 C		0.5	FAZ-NA FAZ-RT	**Z-NHK** 248434		4 off
Auxiliary contacts • Suitable for FAZ-NA > 480Y/277 V AC							
	1 N/O 1 NC		0.5	FAZ-NA FAZ-RT	**Z-IHK-NA** 113895		1 off
Shunt releases • Standard auxiliary contacts can be fitted in addition • Position indicator red/green							
	–		1	FAZ-NA FAZ-RT	**FAZ-XAA-NA110-415VAC** 102036		1 off
	–		1	FAZ-NA FAZ-RT	**FAZ-XAA-NA12-110VAC** 102037		1 off

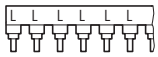
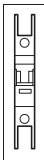
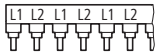
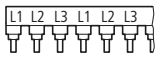
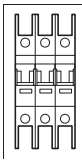
Information relevant for export to North America

Product Standards	IEC/EN 60898; UL 489; CSA-C22.2 No. 5-09; CE marking
UL File No.	E257181
UL CCN	DIHS, DIHS7
CSA File No.	204453
CSA Class No.	1437-01
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP20, UL/CSA Type: -

Accessories for FAZ-NA, FAZ-RT

Busbars (pin), UL 489

- 16 mm²
- Rated operational current 80 A
- For FAZ-NA, FAZ-RT
- Do not shorten

	Phases Number	Devices Number	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
	1	6	**Z-SV/UL-16/1P-1TE/6** 104892		10 off	
	1	12	**Z-SV/UL-16/1P-1TE/12** 104893			
	1	18	**Z-SV/UL-16/1P-1TE/18** 104894			
	2	6	**Z-SV/UL-16/2P-2TE/6** 104895			
	2	12	**Z-SV/UL-16/2P-2TE/12** 104896			
	2	18	**Z-SV/UL-16/2P-2TE/18** 104897			
	3	6	**Z-SV/UL-16/3P-3TE/6** 104898			
	3	12	**Z-SV/UL-16/3P-3TE/12** 104899			
	3	18	**Z-SV/UL-16/3P-3TE/18** 104900			

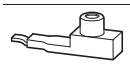
Information relevant for export to North America

Product Standards	IEC/EN 60898; UL 489; CE marking
UL File No.	E257181
UL CCN	NMTR2, DIHS2
CSA File No.	–
CSA Class No.	–
NA Certification	UL Recognized
Suitable for	Feeder Circuit, Branch Circuit
Max. Voltage Rating	Refer to main components FAZ, FAZ-NA, FAZ-RT
Degree of Protection	IEC: IP20, UL/CSA Type: -

Accessories for FAZ-NA, FAZ-RT

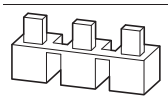
Connecting bracket

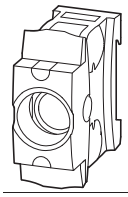
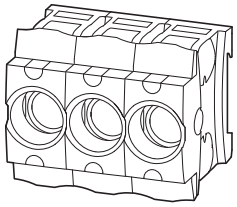
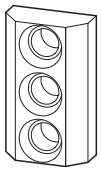
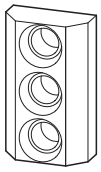
- 2.5 - 35 mm², AWG 14-2
- UL 489

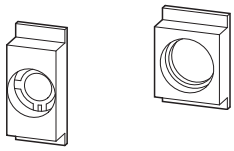
	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
	FAZ-NA FAZ-RT	**Z-EK/35/UL** 104901		3 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for Max. Voltage Rating Degree of Protection	IEC/EN 60898; UL 489; CE marking E257181 NMTR2, DIHS2 – – UL Recognized Feeder circuits, branch circuits Refer to main components FAZ, FAZ-NA, FAZ-RT IEC: IP20, UL/CSA Type: -

Busbar cover

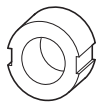
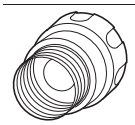
- for 3 pins
- UL 489

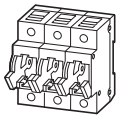
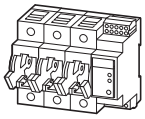
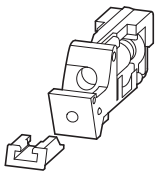
	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
	FAZ-NA FAZ-RT	**ZV-BS-UL** 104904		10 off	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Degree of Protection	IEC/EN 60898; UL 489; CE marking E257181 NMTR2, DIHS2 – – UL Recognized IEC: IP20, UL/CSA Type: -

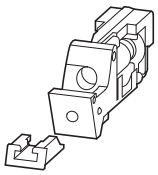
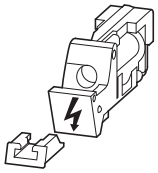
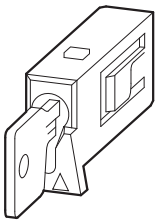
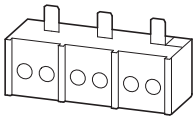
	Pole	Rated operational current I_e A	Rated operational voltage U_e V AC	Fuse-link Size	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Fuse bases								
	1 pole	16	–	D01	**D01-SO/16/1** 102752		9 off	Equipment supplied: Empty, without screw on cover
	1 pole	63	–	D02	**D02-SO/63/1** 102675		9 off	
	3 pole	16	–	D01	**D01-SO/16/3** 102674		3 off	
	3 pole	63	–	D02	**D02-SO/63/3** 102676		3 off	
Fuse bases, 1 pole								
For gauge ring system (gauge screw: /FORMP)								
Screw fixing (holes for M4 screws)								
	1 pole	25	500	E27, DII	**S27-1** 045865		10 off	Gauge rings/gauge screws, fuse links and fuse caps are **not** included.
		25	500	E27, DII	**S27-1/FORMP** 020327		10 off	
		63	660 690	E33, DIII	**S33-1** 069595		2 off	
		63	660 690	E33, DIII	**S33-1/FORMP** 022700		2 off	
Can be snap fitted on top-hat rail to IEC/EN 60715 (35 mm)								
	1 pole	25	500	E27, DII	**S27-1/C** 048238		20 off	
		25	500	E27, DII	**S27-1/C/FORMP** 025073		20 off	
		63	660 690	E33, DIII	**S33-1/C** 071968		2 off	
		63	660 690	E33, DIII	**S33-1/C/FORMP** 027446		2 off	
Fuse bases, 3 pole								
For gauge ring system (gauge screw: /FORMP)								
Screw fixing (holes for M4 screws)								
	3 pole	25	500	E27, DII	**S27** 043492		4 off	Gauge rings/gauge screws, fuse links and fuse caps are **not** included.
		25	500	E27, DII	**S27/FORMP** 034565		4 off	
		63	660 690	E33, DIII	**S33** 067222		2 off	
		63	660 690	E33, DIII	**S33/FORMP** 036938		2 off	
Can be snap fitted on top-hat rail to IEC/EN 60715 (35 mm)								
	3 pole	25	500	E27, DII	**S27/C** 050611		4 off	
		25	500	E27, DII	**S27/C/FORMP** 032192		4 off	
		63	660 690	E33, DIII	**S33/C** 081460		2 off	
		63	660 690	E33, DIII	**S33/C/FORMP** 029819		2 off	

		For use with	Part no. Article no.	Price See price list	Std. pack
Covers for 1 pole fuse bases					
Standard front dimension 45 mm					
		S…-1/…	**P-E27** 090928		10 off
		S…-1/…	**P-E33** 093301		10 off
Transparent shroud					
	With cable entry knockouts top and bottom	–	**H-S27-1** 029118		10 off
Busbar connector 63 A					
	For fuse bases, 3 pole	D0…/3	**Z-SV-16/3P** 271072		20 off
End cap					
	For busbar block	Z-SV-16/3P	**Z-AK-16/2+3P** 271070		10 off
Notched phase busbars, can be cut to desired length					
For gauge ring system (gauge screw: /FORMP)					
	980 mm long, for max. 22 fuse bases, Rated operational current 100 A	S27-1/C	**KS27** 055248		5 off
	960 mm long, for max. 18 fuse bases, rated operational current 160 A	S33-1/C	**KS33** 059994		5 off
Terminal					
	For gauge ring system (gauge screw: /FORMP) For round conductor up to 35 mm² or flat cable conductor 6 x 9 x 0.8	KS14 - KS33	**K35-AB** 064339		20 off

	Rated operational current I_e A	Fuse-link Size	Part no. Article no. **Utilization category gG (gL)**	Price See price list	Part no. Article no. **Utilization category DZ**	Price See price list	Std. pack
Fuse links Z-D…/SE							
Rated operating voltage 500 V AC/400 V DC							
	2	DII E27	**Z-DII/SE-2A/GG** 112125		**Z-DII/SE-2A/DZ** 112028		5 off
	4	DII E27	**Z-DII/SE-4A/GG** 112126		**Z-DII/SE-4A/DZ** 112029		
	6	DII E27	**Z-DII/SE-6A/GG** 112127		**Z-DII/SE-6A/DZ** 112120		
	10	DII E27	**Z-DII/SE-10A/GG** 112128		**Z-DII/SE-10A/DZ** 112121		
	16	DII E27	**Z-DII/SE-16A/GG** 112129		**Z-DII/SE-16A/DZ** 112122		
	20	DII E27	**Z-DII/SE-20A/GG** 112130		**Z-DII/SE-20A/DZ** 112123		
	25	DII E27	**Z-DII/SE-25A/GG** 112131		**Z-DII/SE-25A/DZ** 112124		
	35	DIII E33	**Z-DIII/SE-35A/GG** 112135		**Z-DIII/SE-35A/DZ** 112132		
	50	DIII E33	**Z-DIII/SE-50A/GG** 112136		**Z-DIII/SE-50A/DZ** 112133		
	63	DIII E33	**Z-DIII/SE-63A/GG** 112137		**Z-DIII/SE-63A/DZ** 112134		

	Rated operational current I_e A	Rated operational voltage U_e V AC	Fuse link Size	**Part no.** Article no.	**Price** See price list	Std. pack
Gauge screws Z-DII.../PS						
	2	–	DII E27	**Z-DII/PS-2A** 112138		25 off
	4	–	DII E27	**Z-DII/PS-4A** 112139		
	6	–	DII E27	**Z-DII/PS-6A** 112140		
	10	–	DII E27	**Z-DII/PS-10A** 112141		
	16	–	DII E27	**Z-DII/PS-16A** 112142		
	20	–	DII E27	**Z-DII/PS-20A** 112143		
	25	–	DII E27	**Z-DII/PS-25A** 112144		
	35	–	DIII E33	**Z-DIII/PS-35A** 112145		
	50	–	DIII E33	**Z-DIII/PS-50A** 112146		
	63	–	DIII E33	**Z-DIII/PS-63A** 112147		
Z-DII.../PE push-in gauge rings						
	2	–	DII E27	**Z-DII/PE-2A** 110396		50 off
	4	–	DII E27	**Z-DII/PE-4A** 110397		
	6	–	DII E27	**Z-DII/PE-6A** 110398		
	10	–	DII E27	**Z-DII/PE-10A** 110399		
	16	–	DII E27	**Z-DII/PE-16A** 110790		
	20	–	DII E27	**Z-DII/PE-20A** 110791		
	2	–	DIII E33	**Z-DIII/PE-2A** 110792		
	4	–	DIII E33	**Z-DIII/PE-4A** 110793		
	6	–	DIII E33	**Z-DIII/PE-6A** 110794		
	10	–	DIII E33	**Z-DIII/PE-10A** 110795		
	16	–	DIII E33	**Z-DIII/PE-16A** 110796		
	20	–	DIII E33	**Z-DIII/PE-20A** 110797		
	25	–	DIII E33	**Z-DIII/PE-25A** 110798		
	35	–	DIII E33	**Z-DIII/PE-35A** 110799		
	50	–	DIII E33	**Z-DIII/PE-50A** 110800		
Z-DII.../SK screw caps						
	–	500	DII E27	**Z-DII/SK** 112148		50 off
	–	500	DIII E33	**Z-DIII/SK** 112149		30 off
	–	690	DIII E33	**Z-DIII/SK-690** 118904		3 off

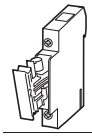
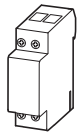
	Pole	Rated uninterrupted current I_u A	Fuse link Size	**Part no.** Article no.	**Price** See price list	Std. pack
Fuse switch-disconnectors						
Standard, empty 	1	63	D02, D01	**Z-SLS/NEOZ/1** 248235		12 off
	1 + N			**Z-SLS/NEOZ/1+N** 248237		6 off
	2			**Z-SLS/NEOZ/2** 248233		6 off
	3			**Z-SLS/NEOZ/3** 248234		4 off
	3 + N			**Z-SLS/NEOZ/3+N** 248236		3 off
With fuse monitoring, empty 	1 + HS			**Z-SLK/NEOZ/1** 248238		6 off
	1 + N + HS			**Z-SLK/NEOZ/1+N** 248242		4 off
	2 + HS			**Z-SLK/NEOZ/2** 248239		4 off
	3 + HS			**Z-SLK/NEOZ/3** 248240		3 off
	3 + N + HS			**Z-SLK/NEOZ/3+N** 248241		2 off
Fuse sets						
• For Z-SLS/NEOZ, Z-SLK/NEOZ, Z-SLS/CEK • With flashing function • Snap-fit on DIN rail • 1 set consists of: 3 fuse links, 3 current codings, 1 plastic box in the color of the indicator						
	Rated operational voltage 24 V AC/DC	1	–	**Z-SLS/B-24-1A** 268994		12 off
		2	–	**Z-SLS/B-24-2A** 268995		
		4	–	**Z-SLS/B-24-4A** 268996		
		6	–	**Z-SLS/B/24-6A** 268997		
		10	–	**Z-SLS/B/24-10A** 268998		
		13	–	**Z-SLS/B/24-13A** 289975		
		16	–	**Z-SLS/B/24-16A** 268999		
		20	–	**Z-SLS/B/24-20A** 269000		
		25	–	**Z-SLS/B/24-25A** 269001		
		32	–	**Z-SLS/B/24-32A** 289976		
		35	–	**Z-SLS/B/24-35A** 269002		
		40	–	**Z-SLS/B/24-40A** 289977		
		50	–	**Z-SLS/B/24-50A** 269003		
		63	–	**Z-SLS/B/24-63A** 269004		

		Rated uninterrupted current I_u A	**Part no.** Article no.	**Price** See price list	Std. pack
Fuse sets					
	Rated operational voltage 60 - 400 V AC	1	**Z-SLS/B-1A** 268983		12 off
		2	**Z-SLS/B-2A** 268984		
		4	**Z-SLS/B-4A** 268985		
		6	**Z-SLS/B-6A** 268986		
		10	**Z-SLS/B-10A** 268987		
		13	**Z-SLS/B-13A** 289972		
		16	**Z-SLS/B-16A** 268988		
		20	**Z-SLS/B-20A** 268989		
		25	**Z-SLS/B-25A** 268990		
		32	**Z-SLS/B-32A** 289973		
		35	**Z-SLS/B-35A** 268991		
		40	**Z-SLS/B-40A** 289974		
		60	**Z-SLS/B-50A** 268992		
		63	**Z-SLS/B-63A** 268993		
Disconnector kit					
• For Z-SLS/NEOZ, Z-SLK/NEOZ, Z-SLS/CEK • Snap-fit on DIN rail • 1 set consists of: 3 switch conversion sets, 3 current codings, 1 plastic box • The fuse switch-disconnector is thus converted to a switch-disconnector.					
	–	63	**Z-SLS/TR-SET** 100660		12 off
Switch-on inhibits					
• For Z-SLS/NEOZ, Z-SLK/NEOZ, Z-SLS/CEK, Z-SLK/D0 • Only 1 inhibit required per device					
	Stop with metal lock	–	**Z-SLZ/SC** 268980		12 off
	Stop with plastic lock	–	**Z-SLZ/SP** 268981		12 off
Incoming double terminal					
• For Z-SLS/NEOZ, Z-SLK/NEOZ, Z-SLS/CEK, Z-SLK/D0 • 2 x 3 x 35 mm²					
	–	–	**Z-SLZ/KL** 268982		15 off

		Rated uninterrupted current I_u A	Fuse link Size	**Part no.** Article no.	**Price** See price list	Std. pack
Fuse links utilization category gG (gL)						
	• Snap-fit on DIN rail • In a plastic box in the color of the indicator	2	D01	**Z-D01/SE-2** 288934		12 off
		4		**Z-D01/SE-4** 288935		
		6		**Z-D01/SE-6** 288936		
		10		**Z-D01/SE-10** 288937		
		13		**Z-D01/SE-13** 288938		
		16		**Z-D01/SE-16** 288939		
		20		**Z-D02/SE-20** 288940		
		25		**Z-D02/SE-25** 288941		
		32		**Z-D02/SE-32** 288942		
		35		**Z-D02/SE-35** 288943		
		40		**Z-D02/SE-40** 288944		
		50		**Z-D02/SE-50** 288945		
		63		**Z-D02/SE-63** 288946		
Adapter sleeves						
	• Snap-fit on DIN rail • In a plastic box in the color of the indicator	2	D01	**Z-D01/PE-2** 288909		12 off
		4		**Z-D01/PE-4** 288910		
		6		**Z-D01/PE-6** 288911		
		10, 13		**Z-D01/PE-10** 288912		
		20		**Z-D02/PE-20** 288913		
		25		**Z-D02/PE-25** 288914		
		35, 32		**Z-D02/PE-35** 288915		
		40		**Z-D02/PE-40** 288916		
		50		**Z-D02/PE-50** 288917		
	• D01 for fuse base D02 and fuse switch-disconnector D02	2	D02-D01	**Z-D02-D01/PE-2** 263112		
		4		**Z-D02-D01/PE-4** 263113		
		6		**Z-D02-D01/PE-6** 263150		
		10, 13		**Z-D02-D01/PE-10** 263151		
		16		**Z-D02-D01/PE-16** 263152		
Screw caps						
	–	Max. 16	D01	**Z-D01/SK** 100650		20 off
		Max. 63	D02	**Z-D02/SK** 100651		20 off
Retaining spring						
	• For inserting D01 fuses links in the screw cap Z-D02/SK		D02-D01	**Z-D02/SIKA-HF** 263149		50 off

Fuse switch-disconnectors (empty)

- Line protection of photovoltaic generator
- The trip indication signals that a fuse link has tripped:
  – 50 - 400 V flashing
  – 400 - 1000 V continuous light
- Rated operational voltage 1000 V DC
- Size 10 x 38, rated operational current 20 A DC
- For cylindrical fuse links for photovoltaic applications
- Sealable

		Pole	Part no. Article no.	Price See price list	Std. pack
	Without flashing function	1	**C10-FD/20/1** 119024		12 off
	Without flashing function	2	**C10-FD/20/2** 119025		6 off
	With flashing function	1	**C10-FD/20/1-L** 119026		12 off
	With flashing function	2	**C10-FD/20/2-L** 119027		6 off

Cylindrical fuse links Z-C…/SE for photovoltaic applications

- Maximum DC rated operating voltage of fuse link 1.2 × V_{cc} of line (V_{cc} … open circuit voltage of line)
- Rated operational current I_n of Fuse link must be greater than or equal to 1.5 × I_{sc} (I_{sc} … short circuit current of PV module)

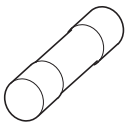
	Size	Rated operational current I_e A	Rated operating voltage U_e V DC	Part no. Article no.	Price See price list	Std. pack
	10 x 38	2	1000	**Z-C10/SE-2A/PV** 131700		10 off
	10 x 38	4	1000	**Z-C10/SE-4A/PV** 131701		
	10 x 38	6	1000	**Z-C10/SE-6A/PV** 122009		
	10 x 38	8	1000	**Z-C10/SE-8A/PV** 122070		
	10 x 38	10	1000	**Z-C10/SE-10A/PV** 122071		
	10 x 38	12	1000	**Z-C10/SE-12A/PV** 131702		
	10 x 38	16	1000	**Z-C10/SE-16A/PV** 122072		
	10 x 38	20	1000	**Z-C10/SE-20A/PV** 122073		
	10 x 38	25	900	**Z-C10/SE-25A/PV** 131703		

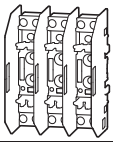
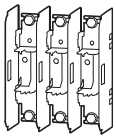
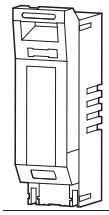
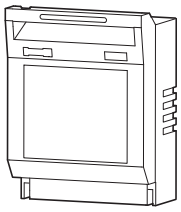
		Pole	**Part no.** Article no.	**Price** See price list	Std. pack
Fuse switch-disconnectors, empty					
• For cylindrical fuses					
	Size 14 x 51, to 50 A				
	Without flashing function	1	**VLC14-1P** 285361		12 off
		1 + N	**VLC14-1P+N** 285362		6 off
		2	**VLC14-2P** 285363		6 off
		3	**VLC14-3P** 285364		4 off
		3 + N	**VLC14-3P+N** 285365		3 off
	With flashing function	1	**VLC14-1P/L** 285371		12 off
		1 + N	**VLC14-1P+N/L** 285372		6 off
		2	**VLC14-2P/L** 285373		6 off
		3	**VLC14-3P/L** 285374		4 off
		3 + N	**VLC14-3P+N/L** 285375		3 off
	Size 22 x 58, to 100 A				
	Without flashing function	1	**VLC22-1P** 285366		3 off
		1 + N	**VLC22-1P+N** 285367		2 off
		2	**VLC22-2P** 285368		2 off
		3	**VLC22-3P** 285369		1 off
		3 + N	**VLC22-3P+N** 285370		1 off
	With flashing function	1	**VLC22-1P/L** 285376		3 off
		1 + N	**VLC22-1P+N/L** 285377		2 off
		2	**VLC22-2P/L** 285378		2 off
		3	**VLC22-3P/L** 285379		1 off
		3 + N	**VLC22-3P+N/L** 285380		1 off

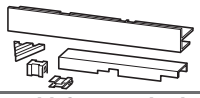
Cylindrical fuse inserts

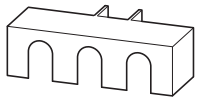
Z-C.../SE-...GG, Z-C.../SE...AM

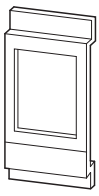
HPL19050EN

	Size	Rated operational current I_e A	Rated operational voltage U_e V AC	**Part no.** Article no. **Utilization category gG (gL)**	**Price** See price list	Rated operational voltage U_e V AC	**Part no.** Article no. **Utilization category aM**	**Price** See price list	Std. pack
Cylindrical fuse inserts Z-C…/SE									
	10 x 38	1	500	**Z-C10/SE-1A/GG** 112156		500	**Z-C10/SE-1A/AM** 112188		10 off
		2	500	**Z-C10/SE-2A/GG** 112157		500	**Z-C10/SE-2A/AM** 112189		
		4	500	**Z-C10/SE-4A/GG** 112158		500	**Z-C10/SE-4A/AM** 112190		
		6	500	**Z-C10/SE-6A/GG** 112159		500	**Z-C10/SE-6A/AM** 112191		
		8	500	**Z-C10/SE-8A/GG** 112160		500	**Z-C10/SE-8A/AM** 112192		
		10	500	**Z-C10/SE-10A/GG** 112161		500	**Z-C10/SE-10A/AM** 112193		
		12	500	**Z-C10/SE-12A/GG** 112162		500	**Z-C10/SE-12A/AM** 112194		
		16	500	**Z-C10/SE-16A/GG** 112163		500	**Z-C10/SE-16A/AM** 112195		
		20	500	**Z-C10/SE-20A/GG** 112164		400	**Z-C10/SE-20A/AM** 112196		
		25	500	**Z-C10/SE-25A/GG** 112165		400	**Z-C10/SE-25A/AM** 112197		
		32	400	**Z-C10/SE-32A/GG** 112166		400	**Z-C10/SE-32A/AM** 112198		
	14 x 51	2	690	**Z-C14/SE-2A/GG** 112167		690	**Z-C14/SE-2A/AM** 112199		
		4	690	**Z-C14/SE-4A/GG** 112168		690	**Z-C14/SE-4A/AM** 112200		
		6	690	**Z-C14/SE-6A/GG** 112169		690	**Z-C14/SE-6A/AM** 112201		
		8	690	**Z-C14/SE-8A/GG** 112170		690	**Z-C14/SE-8A/AM** 112202		
		10	690	**Z-C14/SE-10A/GG** 112171		690	**Z-C14/SE-10A/AM** 112203		
		12	690	**Z-C14/SE-12A/GG** 112172		690	**Z-C14/SE-12A/AM** 112204		
		16	690	**Z-C14/SE-16A/GG** 112173		690	**Z-C14/SE-16A/AM** 112205		
		20	690	**Z-C14/SE-20A/GG** 112174		690	**Z-C14/SE-20A/AM** 112206		
		25	690	**Z-C14/SE-25A/GG** 112175		690	**Z-C14/SE-25A/AM** 112207		
		32	690	**Z-C14/SE-32A/GG** 112176		500	**Z-C14/SE-32A/AM** 112208		
		40	500	**Z-C14/SE-40A/GG** 112177		500	**Z-C14/SE-40A/AM** 112209		
		50	500	**Z-C14/SE-50A/GG** 112178		500	**Z-C14/SE-50A/AM** 112210		
	22 x 58	16	690	**Z-C22/SE-16A/GG** 112179		690	**Z-C22/SE-16A/AM** 112211		
		20	690	**Z-C22/SE-20A/GG** 112180		690	**Z-C22/SE-20A/AM** 112212		
		25	690	**Z-C22/SE-25A/GG** 112181		690	**Z-C22/SE-25A/AM** 112213		
		32	690	**Z-C22/SE-32A/GG** 112182		690	**Z-C22/SE-32A/AM** 112214		
		40	690	**Z-C22/SE-40A/GG** 112183		690	**Z-C22/SE-40A/AM** 112215		
		50	500	**Z-C22/SE-50A/GG** 112184		690	**Z-C22/SE-50A/AM** 112216		
		63	500	**Z-C22/SE-63A/GG** 112185		500	**Z-C22/SE-63A/AM** 112217		
		80	500	**Z-C22/SE-80A/GG** 112186		500	**Z-C22/SE-80A/AM** 112218		
		100	500	**Z-C22/SE-100A/GG** 112187		500	**Z-C22/SE-100A/AM** 112219		

		Rated operating current I_e A	Max. fuse link 500 V A	Max. fuse link 690 V A	Size	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
LV h.b.c. fuse bases									
3 pole									
		160	160	100	NH00	**GS00-160** 026741		1 off	–
		250	250	200	NH1	**GSU1** 289016		1 off	–
		400	400	315	NH2	**GSU2** 289017		1 off	–
		630	630	500	NH3	**GSU3** 289018		1 off	–
LV h.b.c. fuse switch-disconnectors									
For fitting on mounting plate									
	1 pole without hand guard	160	160	100	NH00	**GSTA00-160-1P** 225000		1 off	For fitting to GSTA00-160 for four pole LV h.b.c. fuse switch-disconnector, two devices can be combined to two pole LV h.b.c. fuse switch-disconnector
	3 pole without hand guard	160	160	100	NH00	**GSTA00-160** 095558		1 off	–
		250	250	200	NH1	**GSTA1** 017250		1 off	–
		400	400	315	NH2	**GSTA2** 021996		1 off	–
		630	630	500	NH3	**GSTA3** 026742		1 off	–

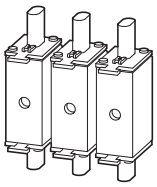
	Rated operational voltage U_e V	Fuse link Size	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Set of connecting links						
	–	00	GSTA00-160-1P	**V-GSTA00-1P** 228173		1 off
Cover with fuse monitoring						
• One green operation indicator LED, three red error indication LEDs (F1, F2, F3) • Error message through relay contacts (floating) 1 N/O + 1 NC AC15: 24 V/4 A, 230 V/3 A AC13: 24 V/1 A, 220 V/0.5 A, terminal capacity 0.25 – 1.5 mm²						
	400 - 690 V AC / 50 - 60 Hz	00	GSTA00…	**GST00-DSI** 107956		1 off
	400 - 690 V AC / 50 - 60 Hz	1	GSTA1…	**GST1-DSI** 107957		1 off
	400 - 690 V AC / 50 - 60 Hz	2	GSTA2…	**GST2-DSI** 107958		1 off
	400 - 690 V AC / 50 - 60 Hz	3	GSTA3…	**GST3-DSI** 107959		1 off

	Fuse link Size	For use with	Connection	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar tag shroud 1 pole						
	00	GSTA00-160-1P	Connection top or bottom	**ZBS-GSTA00-1P** 119006		2 off
	1	GSTA1-1P	Connection top or bottom	**ZBS-GSTA1-1P** 119007		2 off
	3	GSTA3-1P	Connection top or bottom	**ZBS-GSTA3-1P** 119008		2 off
Busbar tag shroud 3 pole						
	00	GSTA00-160	Connection top or bottom	**ZBS-GSTA00** 014411		10 off
	1	GSTA1	Connection at the top	**ZBS-GSTA1** 082800		10 off
	1	GSTA1	Connection at the bottom	**ZBSU-GSTA1** 082804		10 off
	2	GSTA2	Connection at the top	**ZBS-GSTA2** 082801		5 off
	2	GSTA2	Connection at the bottom	**ZBSU-GSTA2** 082805		10 off
	3	GSTA3	Connection at the top	**ZBS-GSTA3** 082802		1 off
	3	GSTA3	Connection at the bottom	**ZBSU-GSTA3** 082806		10 off

		For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Clip set					
able to be fitted later, adjustable snap fitting to two top hat rails to IEC/EN 60715 (35 mm) For intervals between busbar centres of 100 - 125 mm					
	–	GSTA00-160	**C-GSTA00** 040922		5 off
One set comprises 3 clamp-type terminals.					
	Terminal range 1 x (70 - 150) mm² Cu/Al	GSU1, GST…1	**PSK1** 038734		1 off
	Terminal range 1 x (120 - 240) mm² Cu/Al	GSU2, GST…2	**PSK2** 043480		1 off
	Terminal range 1 x (120 - 300) mm² Cu/Al	GSU3, GST…3	**PSK3** 048226		1 off
Sets of double clamp-type terminals					
One set comprises 3 double clamp-type terminals					
	Terminal range 2 x (70 - 95) mm² Cu/Al	GSU1, GST…1	**PSK12** 041107		1 off
	Terminal range 2 x (120 - 150) mm² Cu/Al	GSU2, GST…2	**PSK22** 045853		1 off
	Terminal range 2 x (120-240) mm² Cu/Al	GSU3, GST…3	**PSK32** 050599		1 off
Insulating surround for fuse switch-disconnectors					
For compensation between the GA... protective cover and the device (for use in the CI insulated distribution board system)					
	–	GST00	**B-GST00-40-60/CI/1** 224553		5 off

LV h.b.c. fuse links

- Insulation body made from Steatite/Corderite
- Copper contact blade with silver coating, corrosion proof
- Pivoting and central indicator, live grip tabs
- Selectivity from 1:1.6



Size	Rated operational current I_e A	Part no. Article no.	Price See price list	Std. pack
00	10	**Z-NH-00/10** 289998		3 off
00	16	**Z-NH-00/16** 289999		3 off
00	20	**Z-NH-00/20** 290000		3 off
00	25	**Z-NH-00/25** 290001		3 off
00	35	**Z-NH-00/35** 290002		3 off
00	40	**Z-NH-00/40** 290003		3 off
00	50	**Z-NH-00/50** 290004		3 off
00	63	**Z-NH-00/63** 290005		3 off
00	80	**Z-NH-00/80** 290006		3 off
00	100	**Z-NH-00/100** 290007		3 off
00	125	**Z-NH-00/125** 290008		3 off
00	160	**Z-NH-00/160** 290009		3 off
1	50	**Z-NH-1/50** 290010		3 off
1	63	**Z-NH-1/63** 290011		3 off
1	80	**Z-NH-1/80** 290012		3 off
1	100	**Z-NH-1/100** 290013		3 off
1	125	**Z-NH-1/125** 290014		3 off
1	160	**Z-NH-1/160** 290015		3 off
1	200	**Z-NH-1/200** 290016		3 off
1	250	**Z-NH-1/250** 290017		3 off
2	100	**Z-NH-2/100** 290018		3 off
2	125	**Z-NH-2/125** 290019		3 off
2	160	**Z-NH-2/160** 290020		3 off
2	200	**Z-NH-2/200** 290021		3 off
2	250	**Z-NH-2/250** 290022		3 off
2	315	**Z-NH-2/315** 290023		3 off
2	400	**Z-NH-2/400** 290024		3 off
3	250	**Z-NH-3/250** 290025		3 off
3	315	**Z-NH-3/315** 290026		3 off
3	400	**Z-NH-3/400** 290027		3 off
3	500	**Z-NH-3/500** 290028		3 off
3	630	**Z-NH-3/630** 290029		3 off

Engineering

Influence of the ambient temperature on the thermal trip behavior

Corrected values of the rated operational current dependent on the ambient temperature

FAZ..., FAZT...

	Ambient temperature T [°C]																	
I_n [A]	–40	–30	–20	–10	0	10	20	30	35	40	45	50	55	60	65	70	75
0.16	0.20	0.20	0.19	0.19	0.18	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.13
0.25	0.32	0.31	0.30	0.29	0.28	0.27	0.26	0.25	0.25	0.24	0.24	0.23	0.23	0.22	0.22	0.21	0.21
0.5	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.48	0.47	0.46	0.45	0.44	0.43	0.42	0.41
0.75	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75	0.74	0.73	0.71	0.69	0.68	0.66	0.65	0.64	0.62
1	1.3	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.99	0.97	0.95	0.93	0.90	0.89	0.87	0.85	0.83
1.5	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2
1.6	2.0	2.0	1.9	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3
2	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.7
2.5	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1
3	3.8	3.7	3.6	3.5	3.4	3.3	3.1	3.0	3.0	2.9	2.8	2.8	2.7	2.7	2.6	2.5	2.5
3.5	4.5	4.4	4.2	4.1	3.9	3.8	3.7	3.5	3.4	3.4	3.3	3.2	3.2	3.1	3.0	3.0	2.9
4	5.1	5.0	4.8	4.7	4.5	4.3	4.2	4.0	3.9	3.9	3.8	3.7	3.6	3.5	3.5	3.4	3.3
5	6.4	6.0	6.0	5.8	5.6	5.4	5.2	5.0	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1
6	7.7	7.5	7.2	7.0	6.7	6.5	6.3	6.0	5.9	5.8	5.7	5.6	5.4	5.3	5.2	5.1	5.0
8	10.2	9.9	9.6	9.3	9.0	8.7	8.4	8.0	7.9	7.7	7.6	7.4	7.2	7.1	6.9	6.8	6.6
10	13	12	12	12	11	11	10	10	9.9	9.7	9.5	9.3	9.0	8.9	8.7	8.5	8.3
12	15	15	14	14	13	13	13	12	12	12	11	11	11	11	10	10	10
13	17	16	16	15	15	14	14	13	13	13	12	12	12	12	11	11	11
15	19	19	18	17	17	16	16	15	15	15	14	14	14	13	13	13	12
16	20	20	19	19	18	17	17	16	16	15	15	15	14	14	14	14	13
20	26	25	24	23	22	22	21	20	20	19	19	19	18	18	17	17	17
25	32	31	30	29	28	27	26	25	25	24	24	23	23	22	22	21	21
32	41	40	38	37	36	35	33	32	32	31	30	30	29	28	28	27	26
40	51	50	48	47	45	43	42	40	39	39	38	37	36	35	35	34	33
50	64	62	60	58	56	54	52	50	49	48	47	46	45	44	43	42	41
63	81	78	76	73	71	68	66	63	62	61	60	58	57	56	55	53	52

FAZ-...-NA, FAZ-...-RT

	Ambient temperature T [°C]							
I_n [A]	15	20	25	30	40	50	55	60
0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.0	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9
1.5	1.7	1.6	1.6	1.6	1.5	1.4	1.4	1.4
2.0	2.2	2.2	2.1	2.1	2.0	1.9	1.9	1.8
3.0	3.3	3.2	3.2	3.1	3.0	2.9	2.9	2.8
4.0	4.4	4.3	4.2	4.2	4.0	3.8	3.8	3.7
5.0	5.5	5.4	5.3	5.2	5.0	4.8	4.7	4.6
6.0	6.6	6.5	6.4	6.2	6.0	5.8	5.6	5.5
7.0	7.7	7.6	7.4	7.3	7.0	6.7	6.6	6.4
8.0	8.8	8.6	8.5	8.3	8.0	7.7	7.5	7.4
10.0	11.0	10.8	10.6	10.4	10.0	9.6	9.4	9.2
13.0	14.3	14.0	13.8	13.5	13.0	12.5	12.5	12.0
15.0	16.5	16.2	15.9	15.6	15.0	14.4	14.1	13.8
16.0	17.6	17.3	17.0	16.6	16.0	15.4	15.0	14.7
20.0	22.0	21.6	21.2	20.8	20.0	19.2	18.8	18.4
25.0	27.5	27.0	26.5	26.0	25.0	24.0	23.3	23.0
30.0	33.0	32.4	31.8	31.2	30.0	28.8	28.2	27.6
32.0	35.2	34.6	33.9	33.3	32.0	30.7	30.1	29.4
40.0	44.0	43.2	42.4	41.6	40.0	38.4	37.6	36.8

Heat dissipation FAZT

Depending on rated operational current I_u

	Characteristic C			Characteristic D		
	Pole			Pole		
	1	2	3	1	2	3
I_n [A]	P [W]	P [W]	P [W]	P [W]	P [W]	P [W]
0.5	1.6	3.2	4.7	1.6	3.2	4.8
1	1.1	2.2	3.4	0.8	1.5	2.3
1.5	1.3	2.6	3.9	1.0	2.1	3.1
2	1.4	2.8	4.3	1.0	2.1	3.1
3	1.2	2.4	3.6	1.2	2.4	3.6
4	1.4	2.9	4.3	1.4	2.9	4.3
5	1.9	3.7	5.6	1.5	2.9	4.4
6	1.2	2.3	3.5	1.2	2.3	3.5
7	1.4	2.8	4.3	1.4	2.8	4.3
8	1.4	2.8	4.2	1.2	2.4	3.7
10	1.9	3.6	5.3	1.5	3.0	4.5
13	2.4	4.7	7.1	2.0	4.1	6.1
15	1.9	3.8	5.6	1.5	3.1	4.6
16	2.1	4.3	6.4	1.7	3.5	5.2
20	2.9	5.8	8.7	1.8	3.7	5.5
25	3.1	6.2	9.3	2.6	5.1	7.7
30	3.0	6.0	9.0	2.7	5.4	8.1
32	3.4	6.8	10.2	3.1	6.2	9.3
35	3.7	7.4	11.0	3.8	7.6	11.3
40	4.0	8.1	12.1	3.9	7.8	11.6

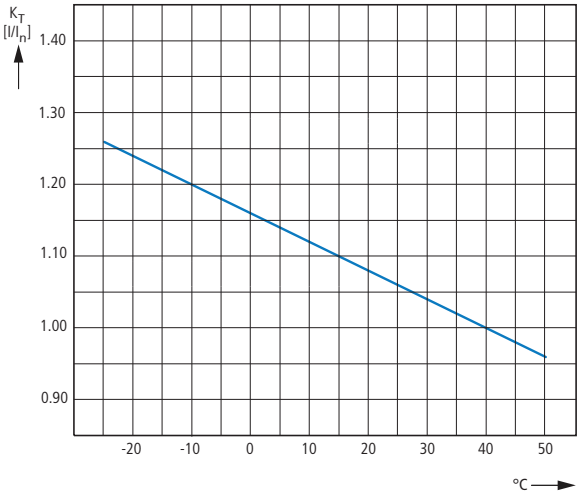
Heat dissipation FAZ-...-NA, FAZ-...-RT

Depending on rated operational current I_u

	Characteristic C			Characteristic D		
	Pole			Pole		
	1	2	3	1	2	3
I_n [A]	P [W]	P [W]	P [W]	P [W]	P [W]	P [W]
0.5	1.6	3.2	4.7	1.6	3.2	4.8
1	1.1	2.2	3.4	0.8	1.5	2.3
1.5	1.3	2.6	3.9	1.0	2.1	3.1
2	1.4	2.8	4.3	1.0	2.1	3.1
3	1.2	2.4	3.6	1.2	2.4	3.6
4	1.4	2.9	4.3	1.4	2.9	4.3
5	1.9	3.7	5.6	1.5	2.9	4.4
6	1.2	2.3	3.5	1.2	2.3	3.5
7	1.4	2.8	4.3	1.4	2.8	4.3
8	1.4	2.8	4.2	1.2	2.4	3.7
10	1.8	3.6	5.3	1.5	3.0	4.5
13	2.4	4.7	7.1	2.0	4.1	6.1
15	1.9	3.8	5.6	1.5	3.1	4.6
16	2.1	4.3	6.4	1.7	3.5	5.2
20	2.9	5.8	8.7	1.8	3.7	5.5
25	3.1	6.2	9.3	2.6	5.1	7.7
30	3.0	6.0	9.0	2.7	5.4	8.1
32	3.4	6.8	10.2	3.1	6.2	9.3
35	3.7	7.4	11.0	3.8	7.6	11.3
40	4.0	8.1	12.1	3.9	7.8	11.6

Influence of the ambient temperature on the tripping behavior

FAZ-...-NA, FAZ-...-RT,



K_T = rated diversity factor

PDIM leakage current meters

Contour and rail mounting compatible with other devices of the P series
Freely selectable rail arrangement top and bottom
Free terminal compartment despite fitted busbar
Power supply through ordering of the four conductors
Electronic operation (independent of mains voltage)

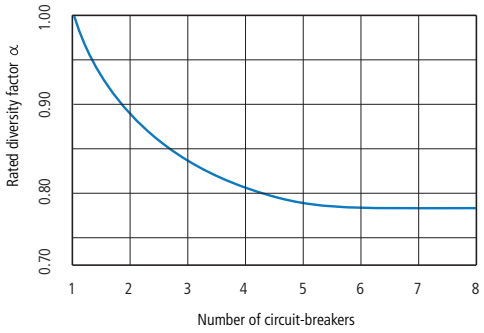
Mains connection on either side.
The 4 pole switch can also be used as 3 pole switch.
To do this, use terminals 1-2, 3-4 and 5-6.
The 4 pole switch can also be used as 2 pole switch.
To do this, use terminals 5-6 and N-N.
2 relays (N/O, parallel to yellow and red LED), floating
(up to 10 A/230 V~)

Function
Green LED lit on 0 – 30 % of set $I_{\Delta n}$.
Yellow LED lit on 30 – 50 % of set $I_{\Delta n}$.
Red LED lit on > 50 % of set $I_{\Delta n}$.
The yellow LED goes out when tripped if the measured fault current < 30 % of the set $I_{\Delta n}$.
The red LED goes remains lit when tripped, even if when the measured fault current < 50 % of the set $I_{\Delta n}$.
The red LED goes out only when the Reset button is pressed.
Only one LED lights up at any one time.
An output relay is always connected parallel to the yellow or red LED.
Depending on the set RCCB (non-delayed, G, or S) the fault current must flow for a specific time before an action takes place.

Test function
Rotary coding switch for RCCB function set to “TEST”.
A fault current of 30 % and 50 % $I_{\Delta n}$ is simulated in alternation.
The yellow and red LED flash alternately (1 Hz); both output relays are continually picked up.

Load carrying capacity with side-by-side miniature circuit-breakers

FAZ...



Influence of the mains frequency

Influence of the mains frequency on the tripping behavior I_{MA} of the instantaneous release

	Mains frequency f [Hz]						
	16 ⅔	50	60	100	200	300	400
$I_{MA}(f)/I_{MA}$ (50 Hz) [%]	91	100	101	106	115	134	141

Tripping characteristics for miniature circuit-breakers

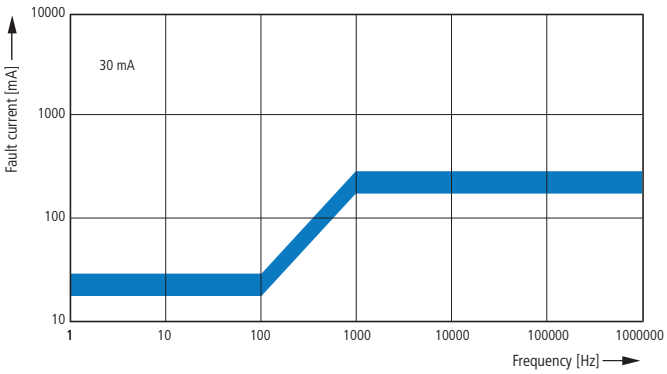
FAZ, FI

Residual-current devices

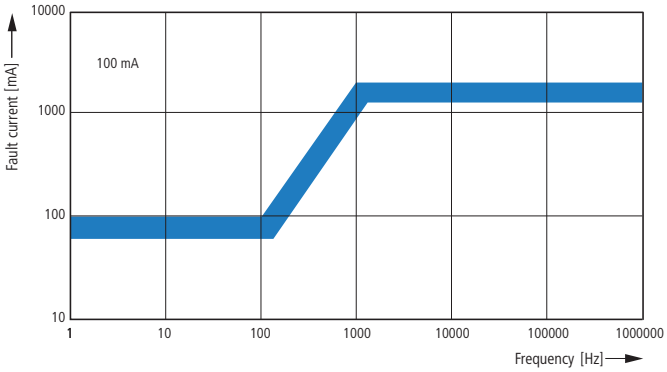
FI-...-B

Frequency response of the tripping current

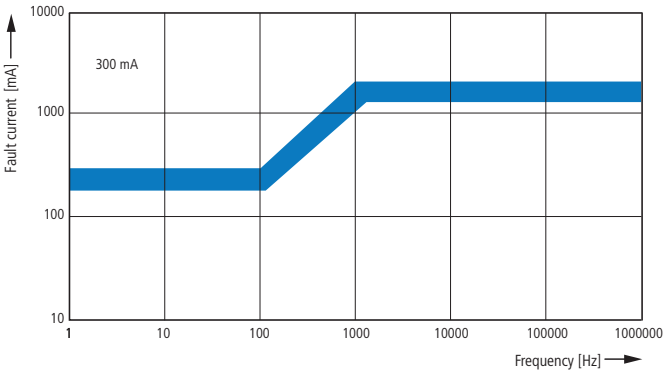
30 mA



100 mA



300 mA

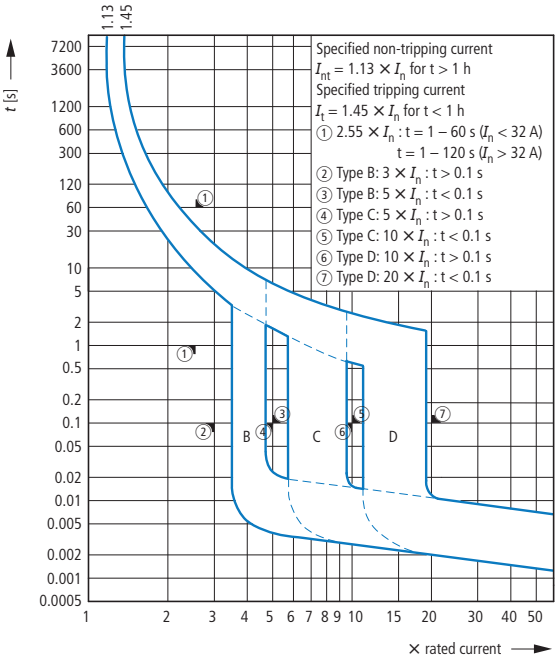


Miniature circuit-breakers (MCB)

FAZ...

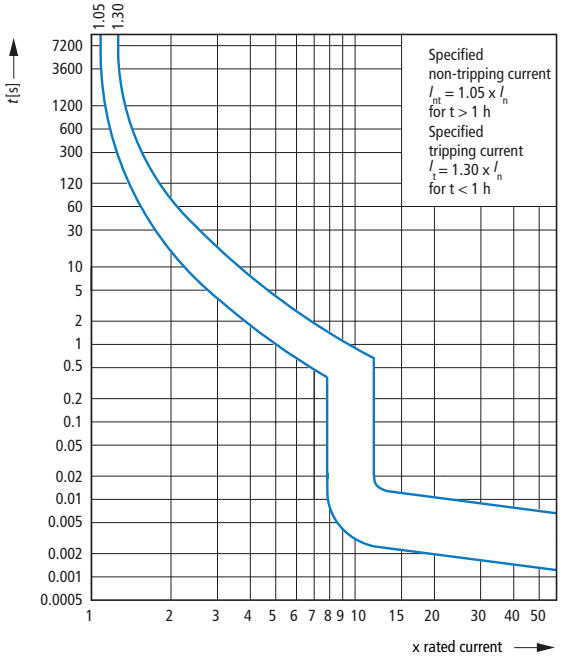
Tripping characteristics at 30 °C:

B, C, D to IEC/EN 60898



Tripping characteristics at 30 °C:

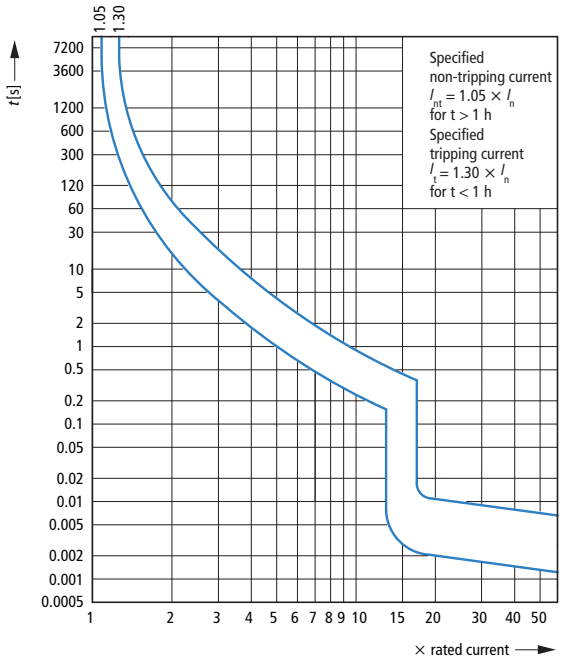
K according to IEC/EN 60947



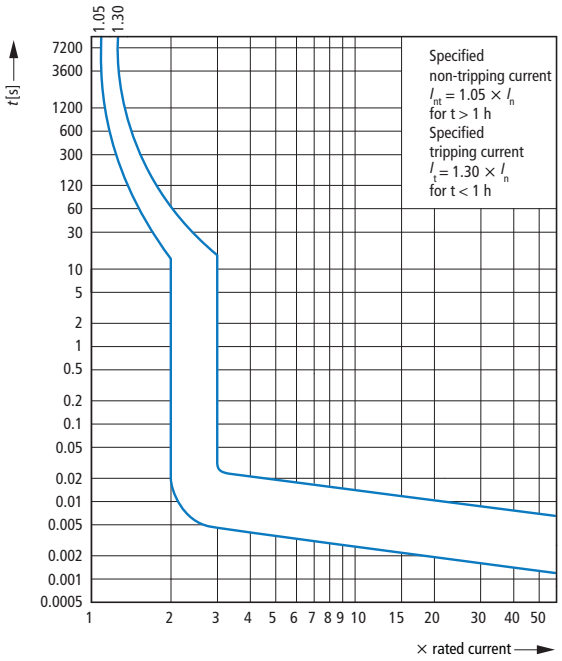
Miniature circuit-breakers (MCB)

FAZ...

Tripping characteristics at 30 °C:
S according to IEC/EN 60947

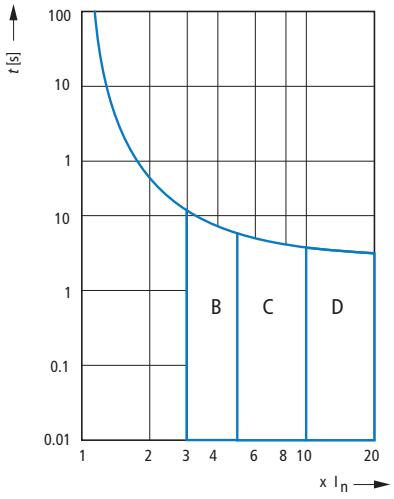


Tripping characteristics at 30 °C:
Z according to IEC/EN 60947



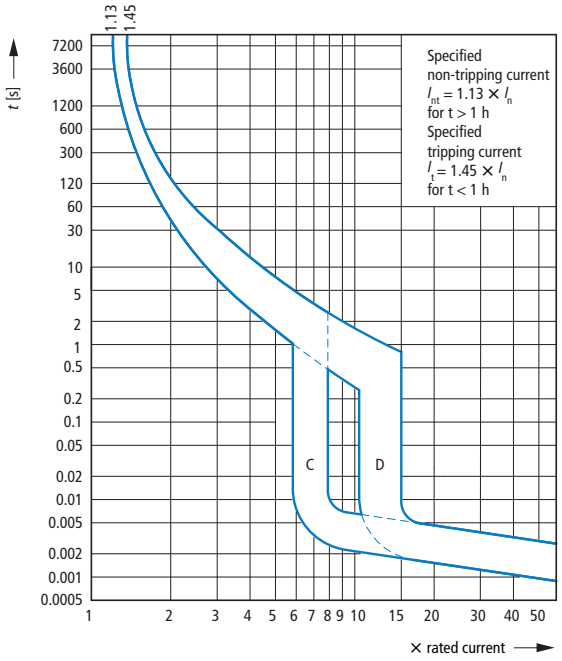
FAZT

Tripping characteristics FAZ at 30 °C
B, C, D to IEC/EN 60898



AZ...

Tripping characteristics at 30 °C:
C, D according to IEC/EN 60898



Tripping characteristics for miniature circuit-breakers

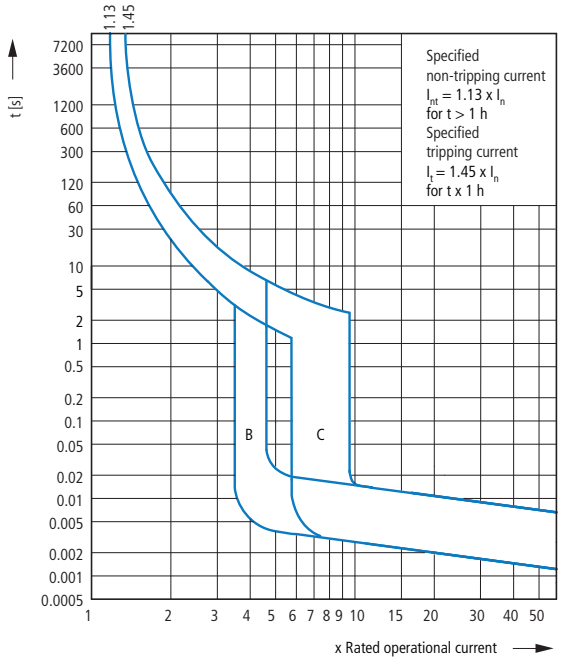
PKNM, mRB, FAZ-NA, FAZ-RT

Combination switches

PKNM...

Tripping characteristics at 30 °C:

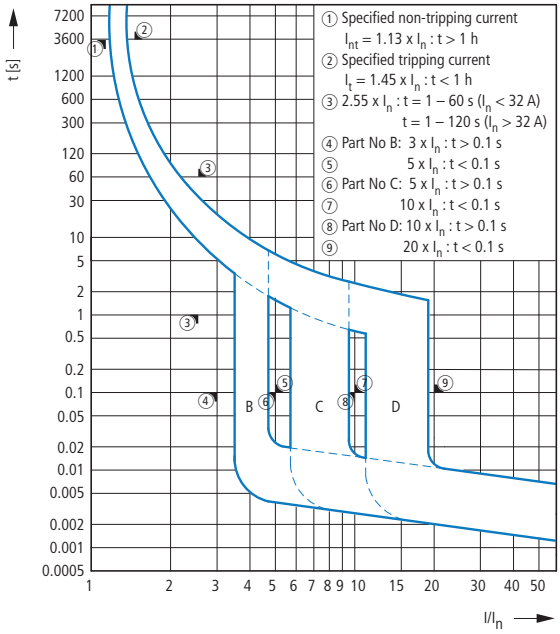
B, C according to IEC/EN 61009



mRB6..., mRB4...

Tripping characteristics

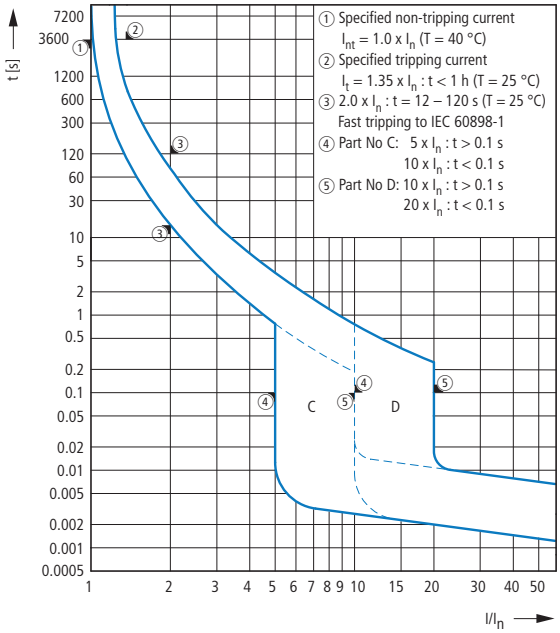
B, C, D according to IEC/EN 61009



Miniature circuit-breakers (MCB)

FAZ-...-NA, FAZ-...-RT

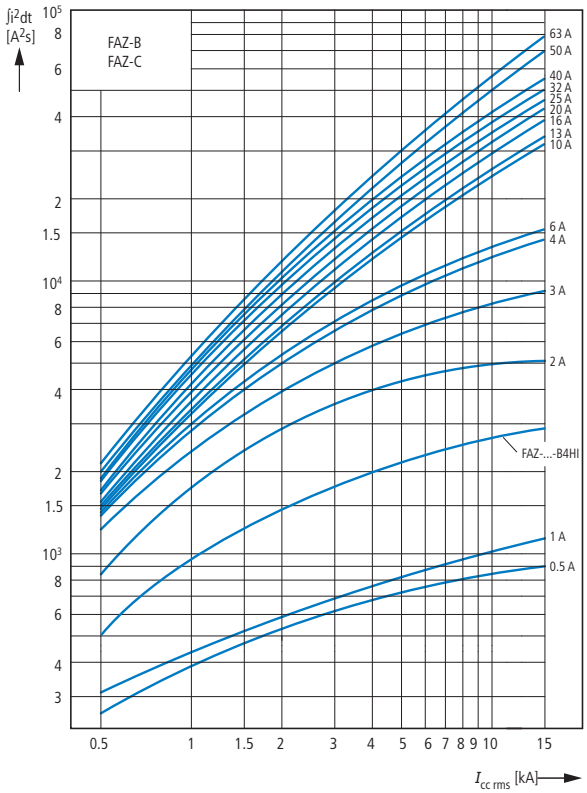
Tripping characteristics according to UL 489



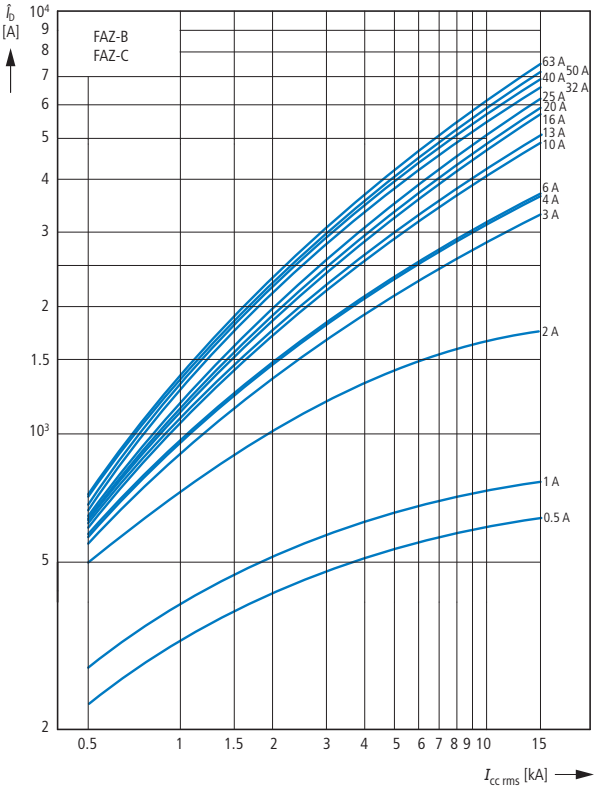
Miniature circuit-breakers (MCB)

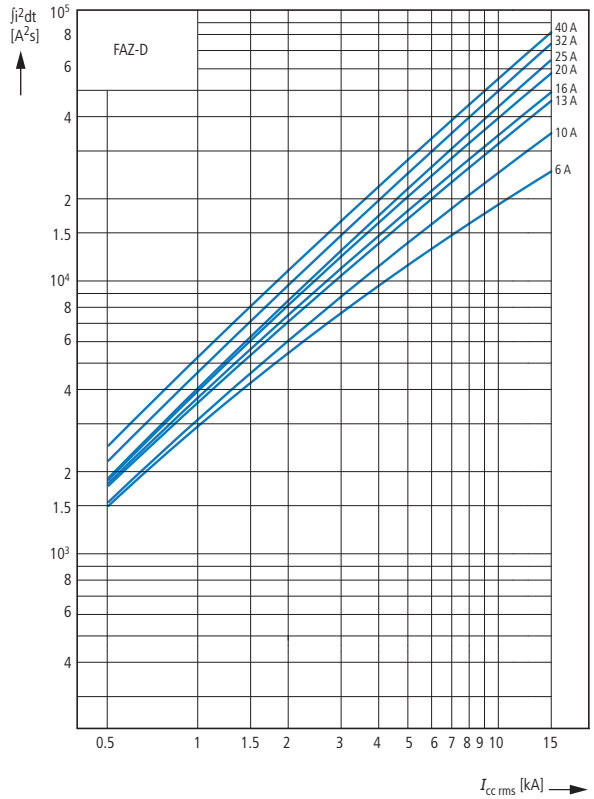
FAZ...

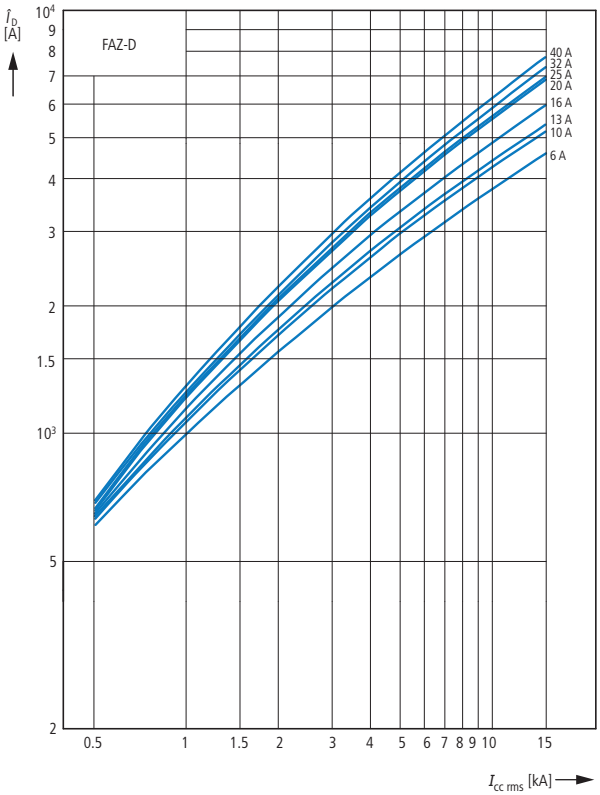
Let-through energy I^2t
According to IEC/EN 60898



Let-through current I_D
According to IEC/EN 60898



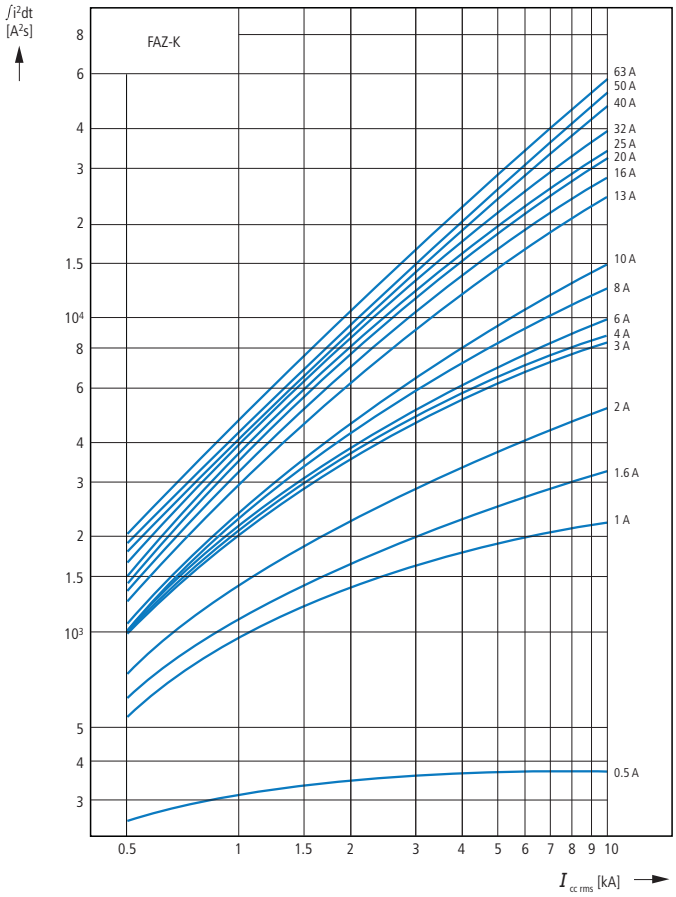




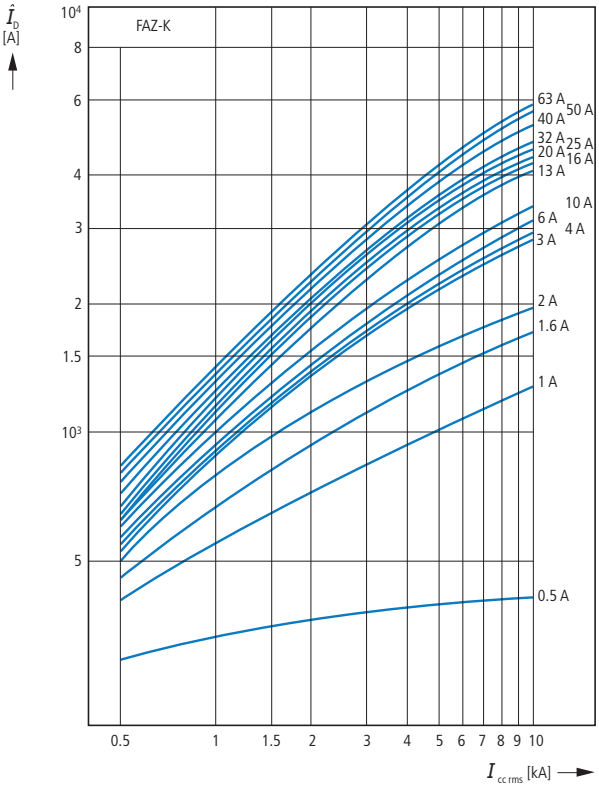
Miniature circuit-breakers (MCB)

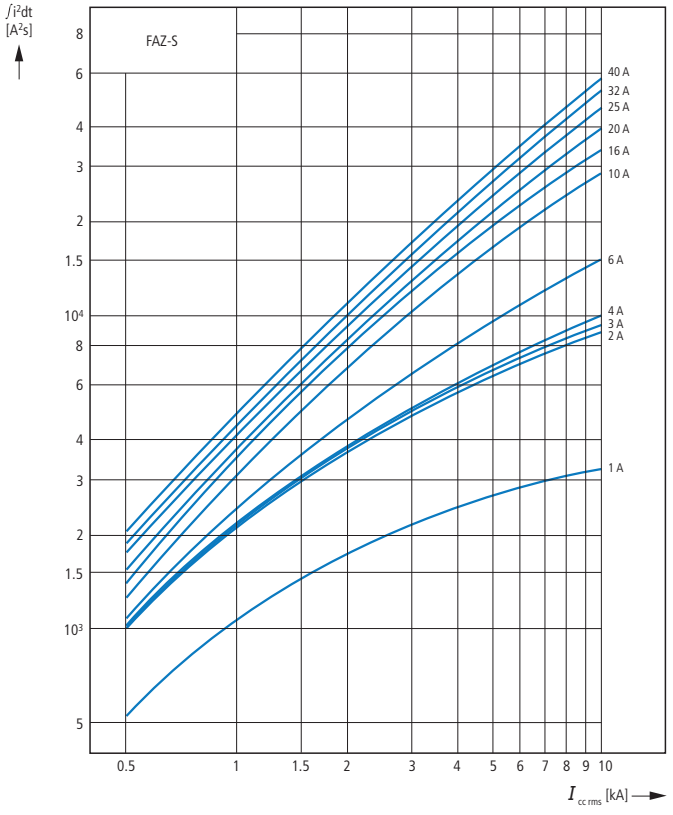
FAZ...

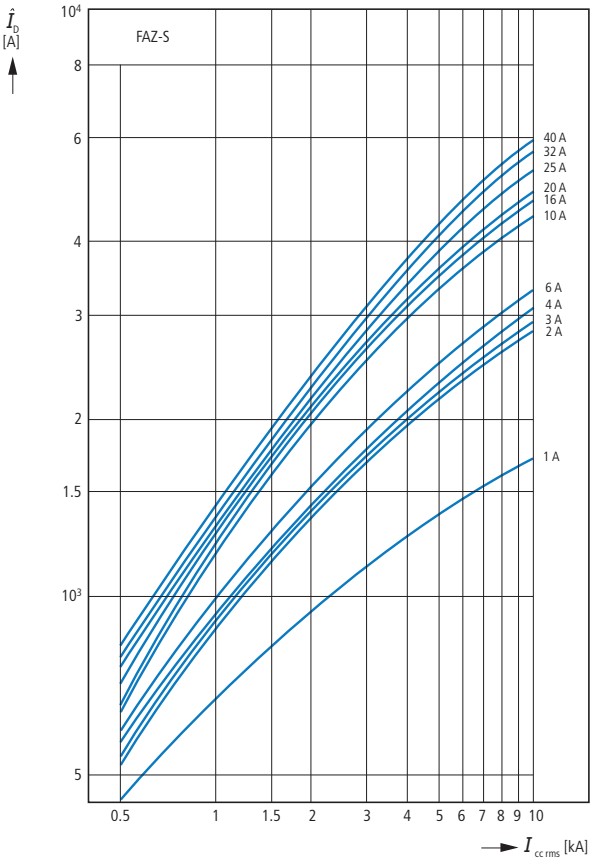
Let-through energy I^2t
According to IEC/EN 60898



Let-through current I_D
According to IEC/EN 60898



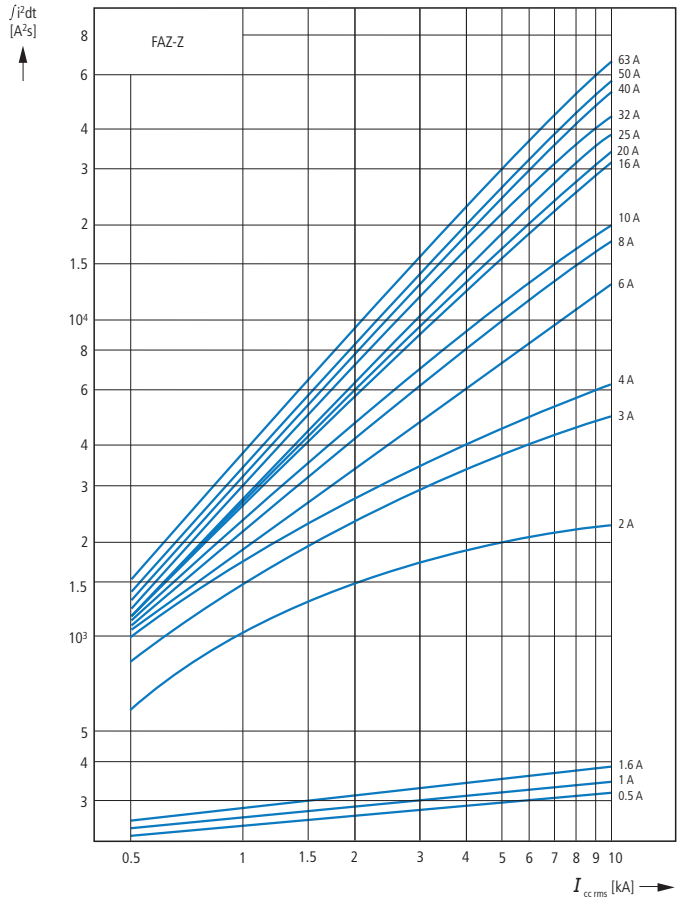




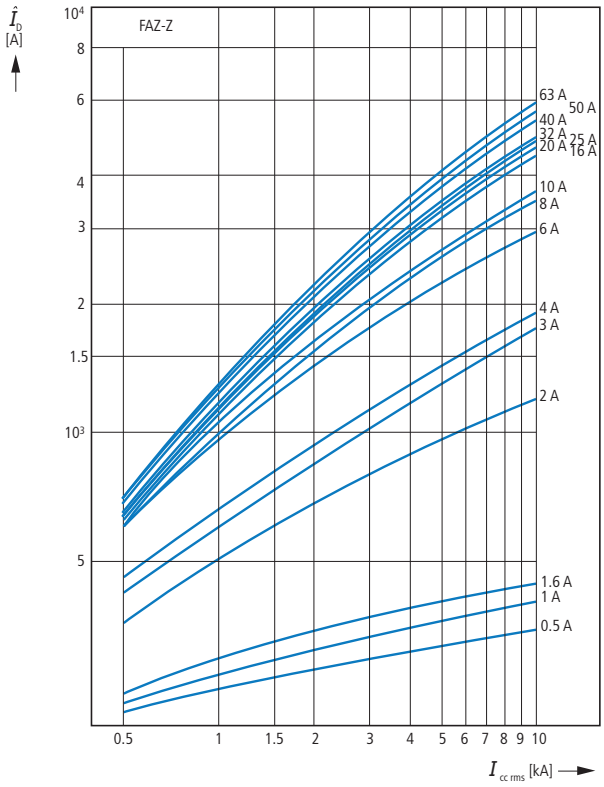
Miniature circuit-breakers (MCB)

FAZ...

Let-through energy I^2t
According to IEC/EN 60898

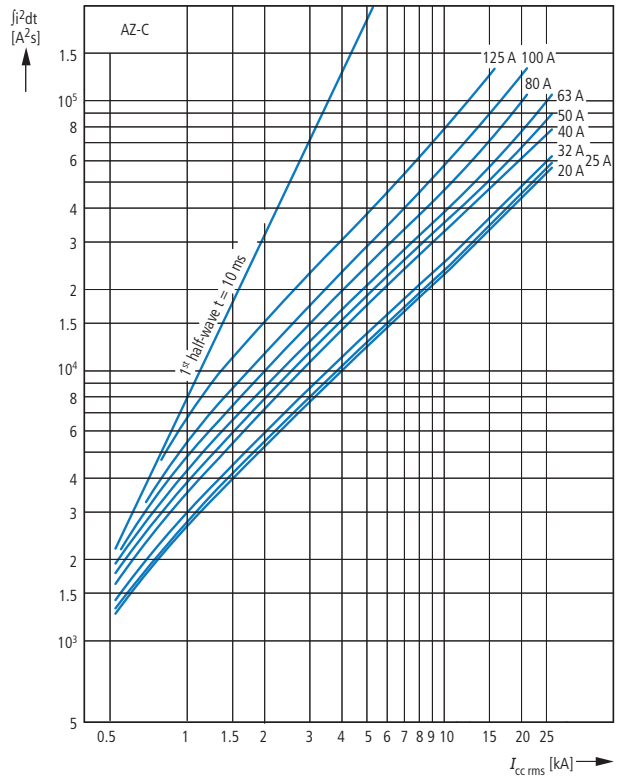


Let-through current I_D
According to IEC/EN 60898

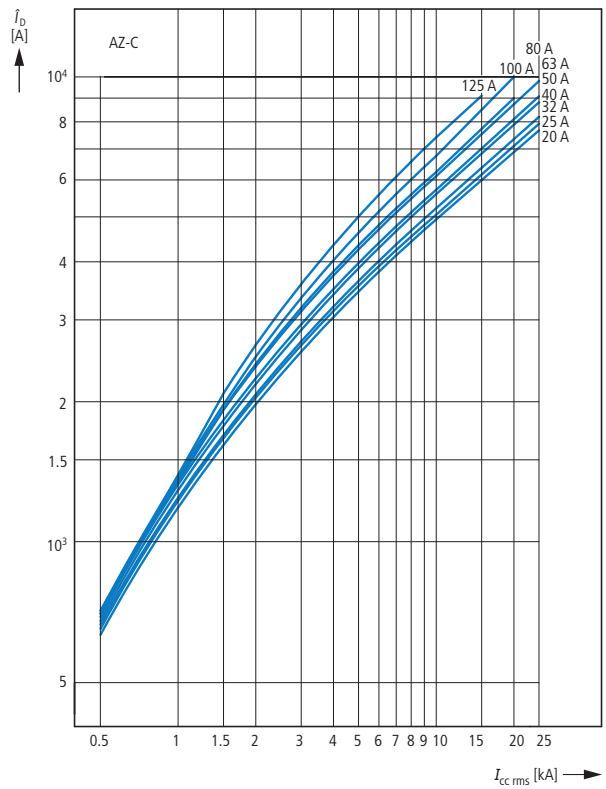


AZ...

Let-through energy I^2t



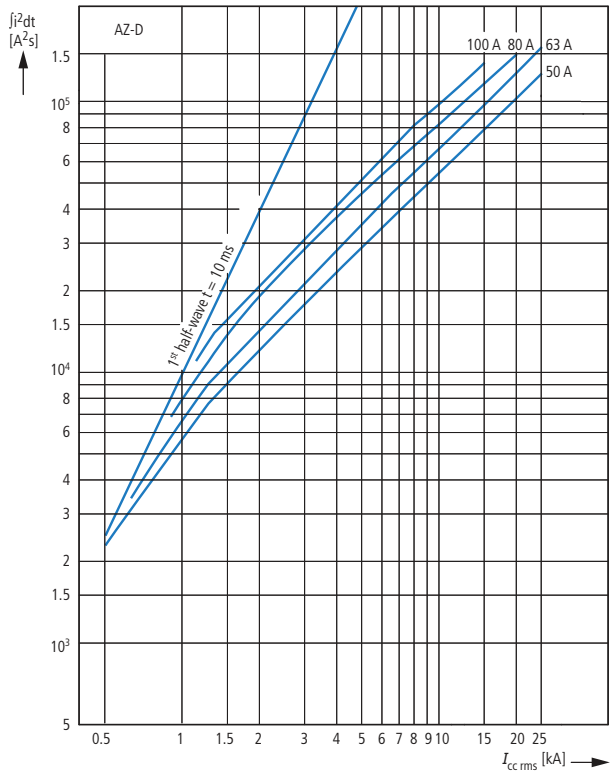
Let-through current I_D



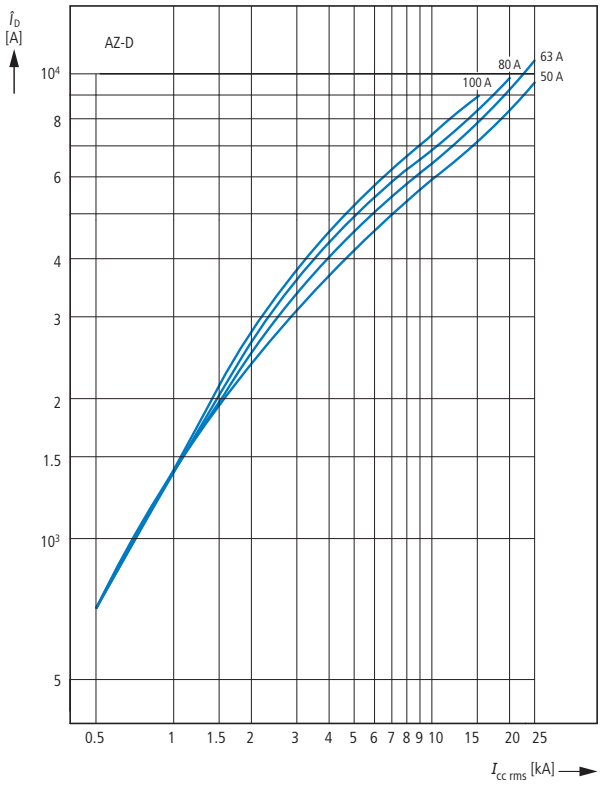
Miniature circuit-breakers

AZ...

Let-through energy I^2t



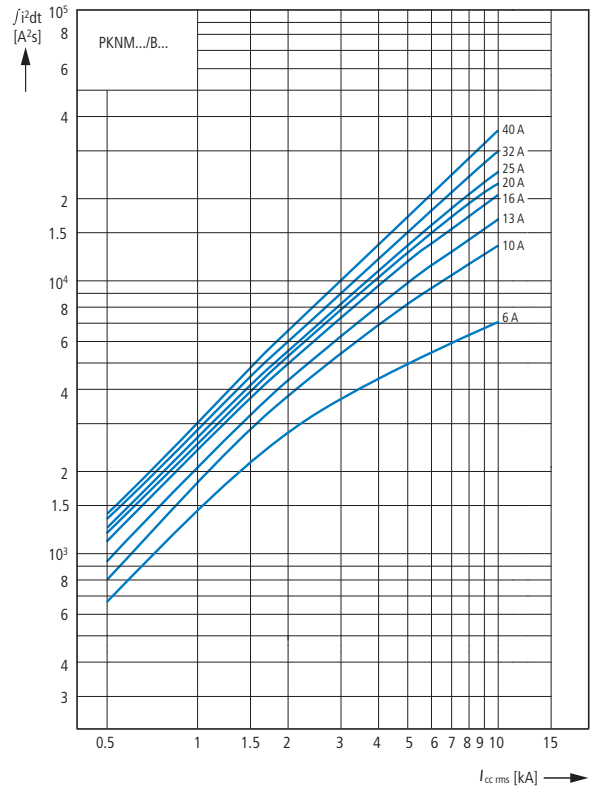
Let-through current I_D



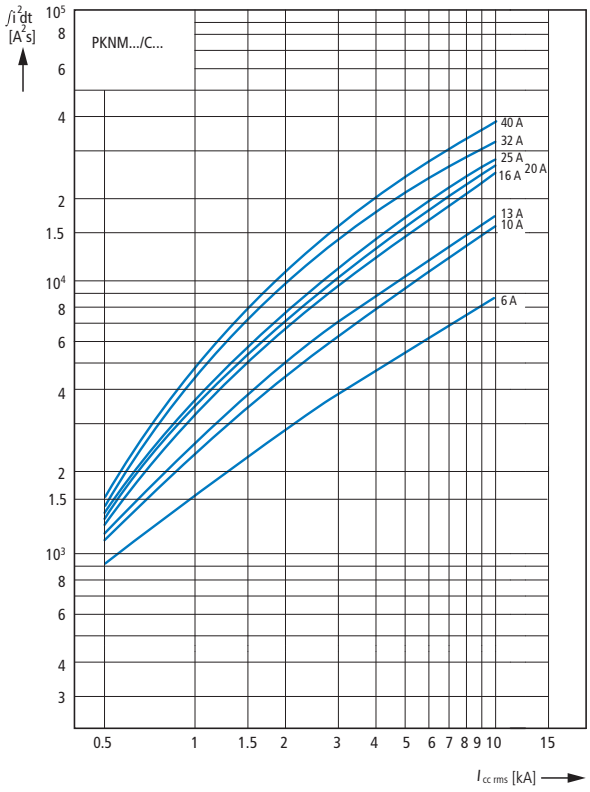
Combination switches

PKNM-...

Let-through energy I^2t
According to IEC/EN 60898



Let-through current I_D
According to IEC/EN 60898

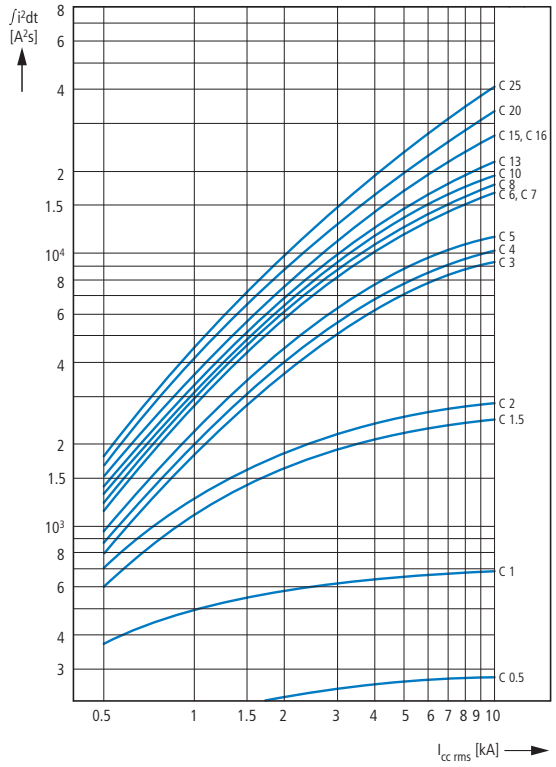


Miniature circuit-breakers (MCB)

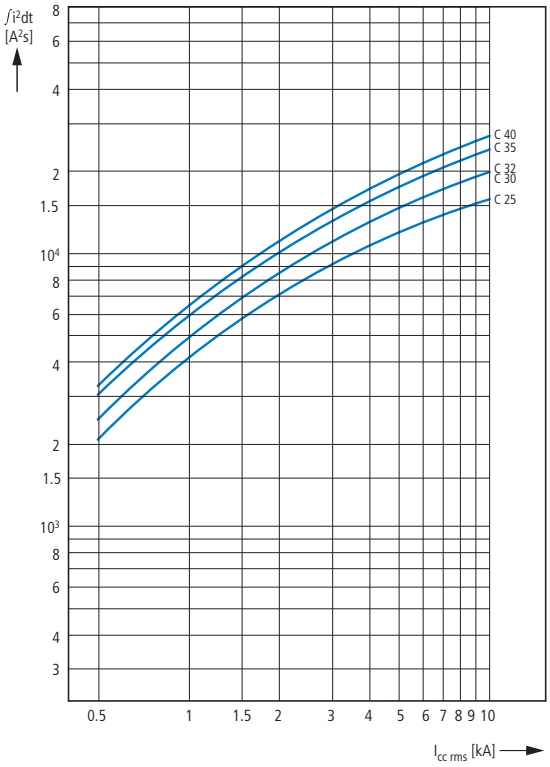
FAZ-...NA, FAZ-...RT

Let-through energy I^2t

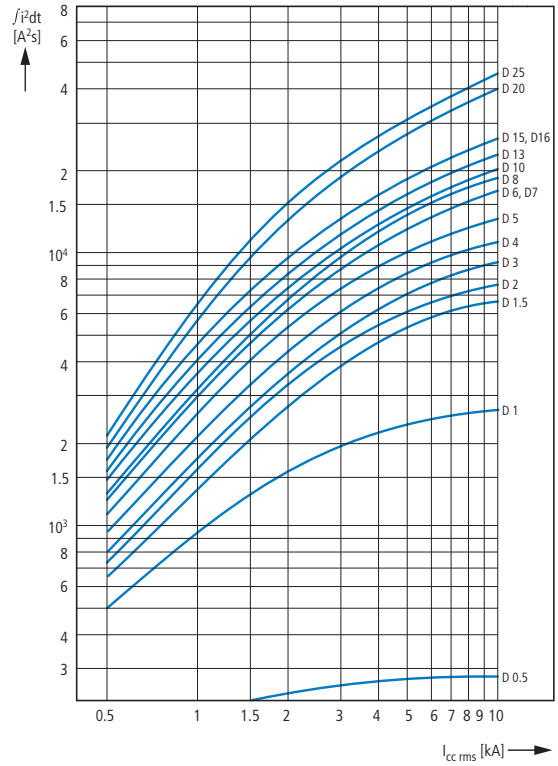
Characteristic C (0.5 - 20 A), 277 V



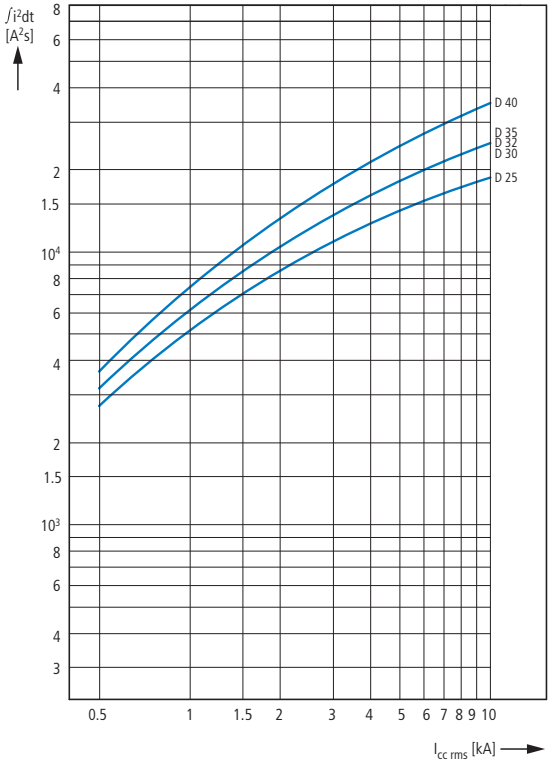
Characteristic C (25 - 40 A), 240 V



Characteristic D (0.5 - 20 A), 277 V



Characteristic D (25 - 40 A), 240 V



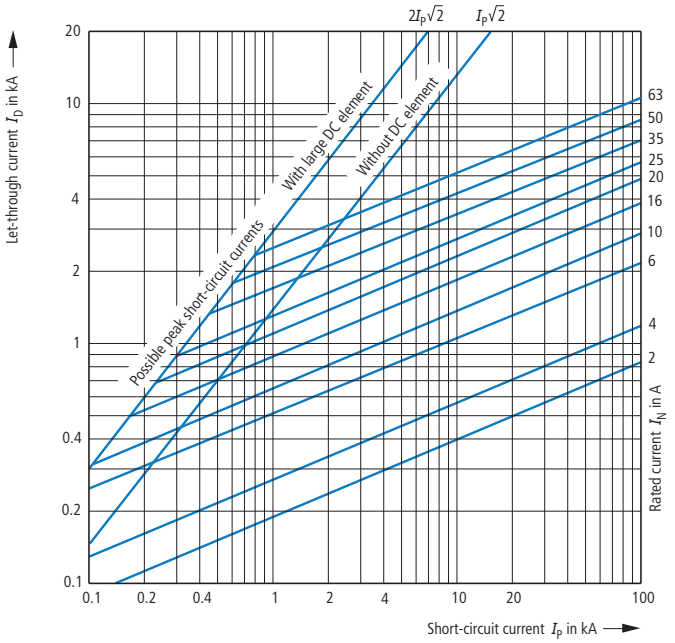
Let-through characteristics miniature circuit-breakers

Z-DO, Z-NH

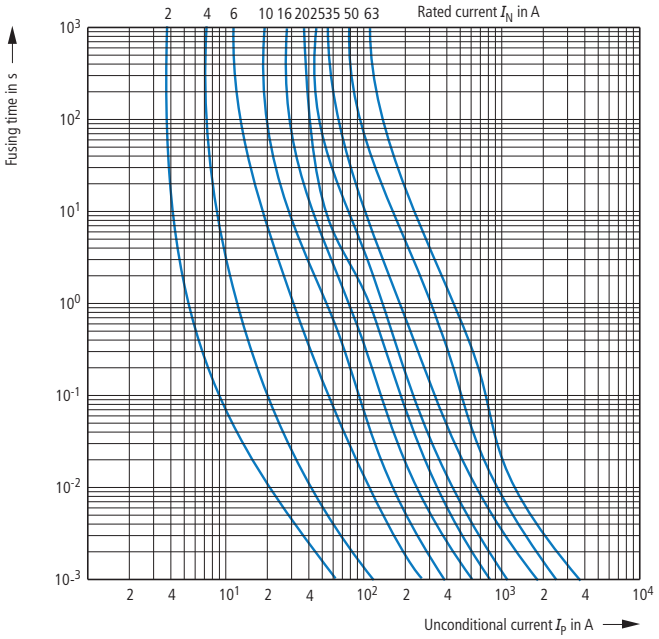
Fuse links

Z-DO.../S...

Let-through current



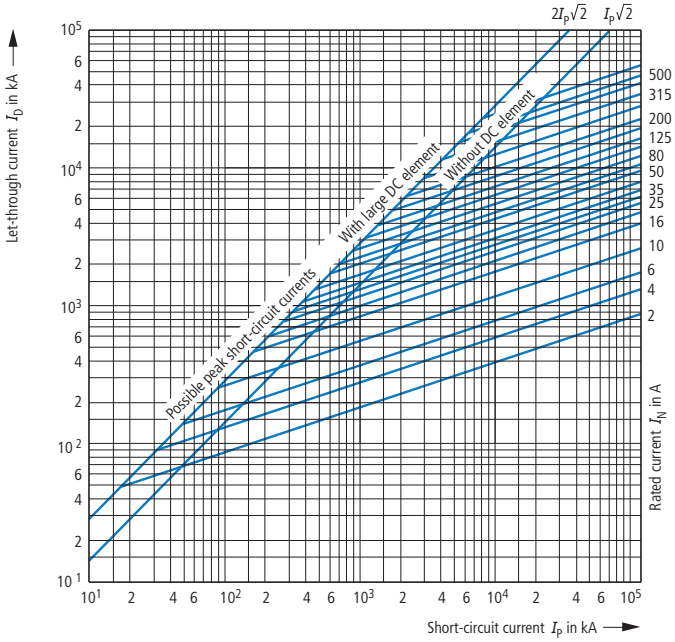
Time/current characteristics



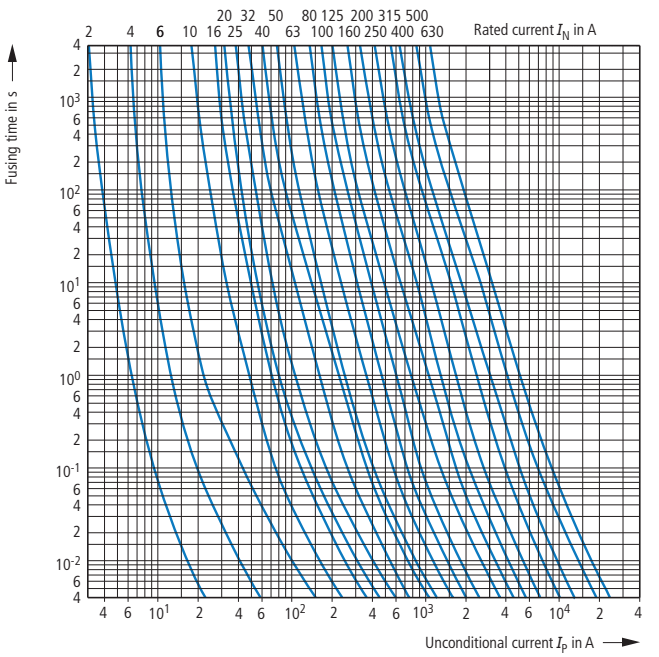
LV h.b.c. fuse links

Z-NH-...

Let-through current



Time/current characteristics



Technical data

			FAZ	FAZ-...-DC	FAZ-PN	AZ
Electrical						
Standards			IEC/EN 60947-2 IEC/EN 60898	IEC/EN 60947-2	IEC/EN 60898	IEC/EN 60947-2
Rated operating voltage						
		V AC	230/400	-	230	230/400
		V DC	48 (per pole)	250 (per pole)	48 (per pole)	60 (per pole)
Rated switching capacity		kA	15	10	6	25
Operational switching capacity		kA	7.5	-	-	20
Characteristic			B, C, D, K, S, Z	C	B, C	Similar: D, C
Max. back-up fuse		A gL/gG	125	100	100	200
Selectivity class			3	3	3	Compliant with Class 3
Lifespan		Operations	> 10000	> 10000	> 4000	> 10000
Direction of incoming supply			Any	Polarized	Any	Any
Mechanical						
Standard front dimension		mm	45			
Device height		mm	80	80	80	90
Terminal protection			Finger and back-of-hand proof to BGV A2			
Mounting width per pole		mm	17.5	17.5	17.5	27
Mounting			Top-hat rail to IEC/EN 60715			
Protection type			IP20, IP40 (enclosed)			
Terminals top and bottom			Twin-purpose terminals			Lift terminals
Terminal capacity						
Solid		mm^2	1 x 25	1 x 25	1 x 16	2.5 - 50
Flexible		mm^2	2 x 10	2 x 10	-	-
Thickness of busbar material		mm	0.8 - 2	0.8 - 2	-	-
Mounting position			Any		-	-

			FAZT
Electrical			
Standards			IEC/EN 60947-2
Rated voltage		V AC	240/415
		V DC	60 V per pole; up to two poles in series
Rated frequency	*f*	Hz	50/60
Rated switching capacity			
B, C (to 13 kA); D (to 10 kA)		kA	25
B, C (16-25 kA); D (12-16 kA)		kA	20
Characteristic			B, C, D
Lifespan	Operations		20000
Direction of incoming supply			Any
Mechanical			
Standard front dimension		mm	45
Device height		mm	80
Mounting width per pole		mm	17.5
Mounting			Quick attachment with three engagement positions for top-hat rail to IEC/EN 60715
Protection type			IP20
Terminals top and bottom			Twin-purpose terminals
Terminal protection			Finger and back-of-hand proof to BGV A3, ÖVE-EN 6
Terminal capacity		mm^2	1 - 25
Tightening torque		Nm	2 - 2.4
Thickness of busbar material		mm	0.8 - 2 (except N 0.5 space unit)
Mounting position			Any

			PKNM	FIM	AZFIMP	FI ≦ 100 A	FI 125 A and Type B
Electrical							
Standards and regulations			IEC/EN 61009	IEC/EN 61009	IEC/EN 60947-2	IEC/EN 61008	IEC/EN 61008
Tripping		A	250 (8/20 µ) non-delayed surge resistant			Non-delayed, S	
Rated operational voltage	U_e	V AC	230	230/400	230/400	230/400	230/400
Operating limit values		V AC	196 - 253	196 - 440	196 - 440	184 - 440	184 - 440
Rated frequency	f	Hz	50				
Rated fault currents	$I_{\triangle n}$	mA	30, 300	30, 300	30, 300	30, 100, 300, 500	30, 100, 300, 500
Rated non-tripping current			0.5 x $I_{\triangle n}$	0.5 x $I_{\triangle n}$	0.5 x $I_{\triangle n}$	0.5 x $I_{\triangle n}$	0.5 x $I_{\triangle n}$
Rated fault switching capacity	$I_{\triangle n}$	A	-	-	-	I_n = 16-40 A: 500 I_n = 63 A: 630 I_n = 80 A: 800 I_n = 100A: 1000	I_n = 125 A: 1250 for type B: 60, 80 A: 800 40 A: 500 125 A: 1250
230 V		kA	6	-	-	-	-
400 V		kA	3	-	-	-	-
Sensitivity			DC and pulsed current				Pulsed current and AC/DC
Rated switching capacity	I_{cn}	kA	10	As fitted FAZ	As fitted AZ	10	10
Operational switching capacity	I_{cs}	kA	-	As fitted FAZ	-	-	-
Rated ultimate breaking capacity	I_{cu}		-	As fitted AZ	As fitted AZ	-	-
Rated short-circuit switching capacity			-	-	= I_{cu}	-	-
Rated operational current	I_e	A	6 - 40	40, 63	80, 125	16 - 100	40 - 125
Rated impulse withstand voltage	U_{imp}	kV	6 (1.2/50 µs)	-	4 (1.2/50 µs)	6	6
Characteristic			B, C	-	-	-	-
Maximum back-up fuse as short-circuit protective device		A gL	100	-	-	I_n = 16 - 63 A: 63 I_n= 80 A: 80 I_n= 100 A: 100	I_n = 125 A: 125 for type B: I_n ≦ 80: 100 I_n = 125: 125
Selectivity class			3	-	-	-	-
Lifespan							
Electrical		Operations	> 4000	-	> 1500	> 4000	> 2000
Mechanical		Operations	-	-	> 10000	> 20000	> 5000
Mechanical							
Standard front dimension		mm	45	45	45	45	45
Device height		mm	80	90	90	80	85
Terminal protection			Busbar tag shroud to BGV A2				
Mounting width		mm	35 (2 SU)	70 (2 pole), 125 (4 pole)	95 (5.5 SU)	35 (2 space unit), 70 (4 space units)	70 (4 SU)
Mounting			-	Permanently screw-connected to FAZ	Screwed on to AZ (2 to 4 pole)	IEC/EN 60715 top-hat rail	IEC/EN 60715 top-hat rail
Protection type							
Circuit-breaker			IP20	-	-	-	-
Enclosed			IP40	IP40	IP40	IP40	IP40
Terminals top and bottom			Twin-purpose terminals	Lift terminals	Lift terminals	Twin-purpose terminals	Twin-purpose terminals
Terminal capacity							
Solid		mm^2	1 x 25	1 x (1 - 25)	2.5 - 50	1.5 - 35	1.5 - 50
Flexible		mm^2	-	1 x (0.75 - 16)	-	2 x 16	2 x (1.5 - 16)
Thickness of busbar material		mm	0.8 - 2	0.8 - 2	-	0.8 - 2	0.8 - 2
Admissible ambient temperature range		°C	-25 - +40	-25 - +40	-25 - +40	-25 - +40	-25 - +40
Climatic proofing			IEC/EN 61009	IEC/EN 61009	IEC/EN 60068-2	IEC/EN 61008	IEC/EN 61008

			mRB6...	mRB4...
Electrical				
Standards			IEC/EN 61009	IEC/EN 61009
Tripping		A	250 (8/20µ) non-delayed surge resistant	
Rated operating voltage	U_e	V AC	230/400	230/400
Rated frequency	f	Hz	50	50
Rated fault currents	$I_{\Delta n}$	mA	30, 100, 300	30, 100, 300
Rated fault non-tripping current			0.5 x $I_{\Delta n}$	0.5 x $I_{\Delta n}$
Sensitivity			DC and pulsed current	
Rated switching capacity	I_{cn}	kA	6	4.5
Rated operational current	I_e	A	6 - 25	6 - 25
Rated impulse withstand voltage	U_{imp}	kV	4 (1.2/50 µs)	4 (1.2/50 µs)
Characteristic			B, C, D	C, D
Maximum back-up fuse as short-circuit protective device		A gL	100	100
Selectivity class			3	3
Lifespan				
Electrical		Operations	> 4000	> 4000
Mechanical		Operations	> 20000	> 20000
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	80	80
Terminal protection			Busbar tag shroud to VBG4	
Mounting width		mm	70 (4 SU)	70 (4 SU)
Mounting			Tristable slide catch allows removal from an existing assembly.	
Protection type				
Circuit-breaker			IP20	IP20
Enclosed			IP40	IP40
Terminals top and bottom			Twin-purpose terminals	Twin-purpose terminals
Terminal capacity				
Solid		mm^2	1 - 25	1 - 25
Thickness of busbar material		mm	0.8 - 2	0.8 - 2
Admissible ambient temperature range		°C	-25 - +40	-25 - +40
Climatic proofing			According to IEC 68-2 (25 – 55 °C, 90 – 95 % rel. humidity)	

			Z-CC/2CO
Electrical			
Power supply		VDC	12 - 24 (≧ 10 - ≦ 30)
Power consumption		W	1.5 - 6
Temperature sensor			Incl. 9 pole Sub-D plug (for RS232 interface) Measurement range -10 °C – +50 °C, accuracy: ± 2 °C
Outputs			2 floating relay outputs AC: 5 A at 250 AC DC: 5 A at 30 V DC, 0.3 A at 110 V DC and 0.12 A at 220 V DC Max. switching duty AC15 at 230 V DC: 500 VA
Inputs			4; max. 12 – 24 V DC (2 – 4 mA) isolated (optocoupler)
Ethernet interface			Required for parameterization with a PC (web browser). For connecting PC and Z-CC/2CO a crossover network cable is required (DNW-PX/0200/RJ45/RJ45).
RS232 interface			9 pole Sub-D plug for connecting an external temperature sensor
Green LED ON			Modem status LED (on registration in the GSM network the LED flashes every 3 seconds)
Red LED ON			Modem activity LED (flashes when SMS is being sent or received)
Mechanical			
Standard front dimension		mm	45
Device height		mm	97
Mounting width		mm	105
Mounting			Quick attachment for top-hat rail EN 50022
Protection type			
Enclosed			IP40

			dRCM...
Electrical			
Standards and regulations			IEC/EN 61008, Type G and G/A to ÖVE E 8601 Current approvals as labeled
Tripping			Non-delayed
Type G, R			10 ms delayed
Type S			40 ms delay - selective switch off
Type U (only 30 mA)			10 ms delayed
Type U (except 30 mA)			40 ms delay - selective switch off
Rated voltage	U_n	V AC	230/400, 240/415
Rated frequency	f	Hz	50/60
Operational voltage electronic		V AC	50 - 254
Operational voltage test circuit		V AC	184 - 440
Rated fault currents	$I_{\Delta n}$	mA	30, 300
Sensitivity			DC and pulsed current
Rated insulation voltage	U_i	V	440
Rated impulse withstand voltage	U_{imp}	kV	4 (1.2/50 µs)
Rated short-circuit strength	I_{nc}	kA	10
Surge current capacity			
Type G, G/A, R, U (30 mA)		kA	3 (8/20 µs) surge-proof
Type S/A, U (except 30 mA)		kA	Part no. 5 (8/20 µs) selective and surge-proof
Electrical isolation			> 4 mm contact spacing
Max. admissible back-up fuse			Short-circuit and overload
I_n = 16 - 63 A		A gG/gL	63
I_n = 80 A		A gG/gL	80
I_n = 100 A		A gG/gL	100
Lifespan			
Electrical		Operations	≧ 4000
Mechanical		Operations	≧ 20000
Mechanical			
Standard front dimension		mm	45
Device height		mm	80
Mounting width		mm	70 (4 SU)
Mounting			Quick attachment with two engagement positions for top-hat rail to IEC/EN 60715
Protection type			
Enclosed			IP40
In moisture-proof enclosure			IP54
Terminals top and bottom			Twin-purpose terminals
Terminal protection			Busbar tag shroud to BGV A3
Terminal capacity			
Solid		mm^2	1 - 35
Stranded		mm^2	2 x 16
Terminal screws			M5 (Pozidriv PZ2)
Tightening torque terminal screws		Nm	2 - 2.4
Thickness of busbar material		mm	0.8 - 2
Admissible ambient temperature range		°C	-25 - +40
Climatic proofing			According to IEC/EN 61008



			PDIM
Electrical			
Standards			Conforming with DIN/EN 62020
Rated operational current	I_e	A	40, 100
Response behavior (adjustable)			Non-delayed
Type G			10 ms delayed
Type S			40 ms delayed - selective
Rated operating voltage	U_e	V AC	230/400 50/60 Hz 240/415 50/60 Hz
Rated fault currents	$I_{\triangle n}$	mA	30, 100, 300, 500, 1000
Sensitivity			Alternating and pulsed current
Rated insulation voltage	U_i	V	440
Rated short-circuit strength	I_{nc}	kA	10
Max. admissible back-up fuse			
I_n = 40 A		A gG/gL	Short-circuit: 63 overload: 40
I_n = 100 A		A gG/gL	Short-circuit: 100 A Overload: 63 A
Switching contacts			Potential-free 10 A / 230 ~
Response behavior of contacts			1: 30 - 50 % $I_{\triangle n}$ 2: > 50 % $I_{\triangle n}$
Lifespan			
Electrical		Operations	≧ 4000
Mechanical		Operations	≧ 20000
Mechanical			
Standard front dimension		mm	45
Device height		mm	80
Mounting width		mm	70 (4 SU)
Mounting position			Any
Mounting			Quick attachment with two engagement positions for top-hat rail to IEC/EN 60715
Protection type			
Enclosed			IP40
Protection type In moisture-proof enclosure			IP54
Terminals top and bottom			Twin-purpose terminals
Terminal protection			Busbar tag shroud to BGV A3, ÖVE-EN 6
Terminal capacity (1, 2, 3, 4, 5, 6, N, N)			
Solid		mm^2	1.5 - 35
Stranded		mm^2	2 x 16
Terminal cross-section of switching contacts		mm^2	0.25 - 1.5
Thickness of busbar material		mm	0.8 - 2
Admissible ambient temperature range		°C	-25 to +40
Climatic proofing			According to IEC/EN 61008

			FAZ-XHIN11	FAZ-XHINW1	FAZ-XAM002	FAZ-XAA-C	FAZ-XUA
Electrical							
Rated operating voltage	U_e	V AC	250	250	250	-	115, 230, 400
Contact function			1 N/O + 1 NC	1 C	2 C	-	-
Voltage range		V AC	-	-	-	12 - 110 110 - 415	-
Closing threshold	x U_n		-	-	-	-	0.8
Tripping threshold	x U_n		-	-	-	-	0.5
Rated frequency	f	Hz	50/60	50/60	50/60	50/60	50/60
Rated operational current	I_e	A	6	6	4	-	-
Thermal rated operational current	I_{th}	A	6	6	4	-	-
Rated operational current							
AC-12	I_e	A	3 (250 V AC)	3 (250 V AC)	3 (250 V AC)	-	-
AC-15	I_e	A	2 (250 V AC)	2 (250 V AC)	2 (250 V AC)	-	-
DC-13	I_e	A	0.5 (110 V DC)	0.5 (110 V DC)	0.5 (110 V DC)	-	-
Rated insulation voltage	U_i	V AC	250	250	250	-	-
Minimum operating voltage per contact	U_{min}	V DC	5	5	5	-	-
Rated impulse withstand voltage (1.2/ 50 µ)	U_{imp}	kV	2.5	2.5	2.5	-	-
Rated conditional short-circuit current with 6 A back-up fuse	I_k	kA	1	1	1	-	-
Max. admissible back-up fuse		A gL	6	6	4		
Mechanical							
Standard front dimension		mm	45	45	45	45	45
Device height		mm	80	80	80	80	80
Mounting width		mm	8.8 (0.5 SU)	8.8 (0.5 SU)	8.8 (0.5 SU)	17.5 (1 SU)	17.5 (1 SU)
Mounting			Max. 2 × on switching device	Max. 2 × on switching device	On switching device	IEC/EN 60715 top-hat rail	IEC/EN 60715 top-hat rail
Protection type							
Enclosed			IP40				
Terminal protection			Busbar tag shroud to BGV A2				
Terminals			Lift terminals	Lift terminals	Lift terminals	Twin-purpose terminals	Twin-purpose terminals
Terminal capacity							
Solid		mm^2	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	1 - 2.5	2 x (1 - 2.5)
Flexible		mm^2	0.5 - 2.5	0.5 - 2.5	0.5 - 2.5	1 - 2.5	2 x (1 - 2.5)
Tightening torque of terminal screws		Nm	≦ 1.2	≦ 1.2	0.8 - 1.0	2.4	0.8



				AZ-XHI11	AZ-XAA	FI-XHI11 ≦ 100 A	FIPA-XAM011 125 A FI and Type B
Electrical							
Contact function				1 N/O + 1 NC	-	1 N/O + 1 NC	1 C/O + 1 NC
Voltage range			V AC	-	12 - 110 110 - 415	-	-
Voltage range			V DC	-	12 - 60 110 - 220	-	-
Min. operating voltage		U_e	V/mA	24/50	-	24/50	12/100
Rated operational current							
AC-11							
	230 V	I_e	A	6	-	6	6
AC-13							
	250 V	I_e	A	6	-	6	-
	400 V	I_e	A	2	-	2	-
DC-11							
	230 V	I_e	A	4	-	-	1
DC-13							
	60 V	I_e	A	4	-	4	-
	110 V	I_e	A	2	-	2	-
	230 V	I_e	A	0.5	-	0.5	-
Rated insulation voltage		U_i	V AC	440	440	440	440
Minimum operating voltage per contact		U_{min}	V DC	-	-	-	-
Rated impulse withstand voltage		U_{imp}	kV	-	-	-	-
Rated conditional short-circuit current with 6 A back-up fuse		I_k	kA	-	-	-	-
Max. admissible back-up fuse			A gL	6	Inherently short-circuit-proof	6	6
Lifespan							
Mechanical			Operations	> 6000	> 4000	> 6000	-
Inrush current							
AC			A	-	38	-	-
Duty factor AC			ms	-	2.1	-	-
DC			A	-	34	-	-
Duty factor DC			ms	-	2	-	-
Mechanical							
Standard front dimension			mm	45	45	45	45
Device height			mm	90	90	90	90
Mounting width			mm	8.8 (0.5 SU)	17.5 (1 SU)	8.8 (0.5 SU)	8.8 (0.5 SU)
Mounting				Top-hat rail to IEC/EN 60715			
Protection type							
Enclosed				IP40			
Circuit-breaker				IP20			
Terminal capacity							
Solid			mm^2	1 x (1 - 25) 2 x (1 - 4)	1 x (1 - 25) 2 x (1 - 4)	2 x (0.5 - 2.5) 1 x (0.5 - 2.5)	1 x 2.5 2 x 1.5
Flexible			mm^2	1 x (1 - 25) 2 x (1 - 4)	1 x (1 - 25) 2 x (1 - 4)	2 x (0.5 - 2.5) 1 x (0.5 - 2.5)	1 x 2.5 2 x 1.5
Tightening torque of the terminal screws			Nm	0.8	3	0.8	0.8

Power meter

KWZ-3PH

			KWZ-3PH	KWZ-3PH-65
Electrical				
Rated operating voltage	U_e	V AC	230 - 240/400-415	
Voltage range		V AC	110 - 254/190-440	
Rated operational current	I_e	A	1, 5	10
Max. current	I_{max}	A	6	63
Rated frequency	*f*	Hz	50, 60	
Limiting frequency		Hz	47 - 63	
Own consumption per phase (current path)		VA	≦ 0.5 (each phase)	≦ 4 (each phase)
Overload, short-term			20 x $I_{max.}$ / 0.5 s	30 x $I_{max.}$ / 10 ms
Auxilliary voltage			From measurement	
Input signal			Sine-shaped	
Accuracy class			1	
LED signal			1 pulse / 0.1 Wh	1 pulse / Wh
Pulse output				
Rated value			Max. 110 V AC/DC, 50 mA	
Switching contact (potential-free)			Optocoupler	
Pulse value (selectable)			1 pulse / 10 Wh, 100 Wh, 1 kWh, 10 kWh optional 1Imp. / 10 VArh, 100 VArh, 1 kVArh, 10 kVArh	1 pulse / 1 Wh, 10 - 100 Wh, 1 kWh, 10 kWh optional 1Imp. / 10 VArh, 100 VArh, 1 kVArh, 10 kVArh
Pulse duration (selectable)		ms	50, 100, 150, 200, 300, 400, 500	
Programmable parameters			Network types (single-phase, 3-phase, 3- or 4-conductor), External current and voltage transformers, mean performance, pulse output	Network types (3-phase, 3- or 4-conductor), Partial energy and double tariff, mean performance, pulse output
Overvoltage category			III	
Insulation voltage (phase - phase)		V	450	300
Rated impulse withstand voltage (1.2/50) µs		kV	5	
Test voltage				
Input/pulse output		kV	2.75	
All circuits and ground		kV	4	
Protection class			II	
Mechanical				
Standard front dimension		mm	45	
Device height		mm	89	
Mounting width		mm	71.2	
Weight		g	260	
Display			LCD 8 digit	
Digit height		mm	6	
Maximum display			Adjustable	999999.99 kWh
Resolution			Adjustable	10 W
Measurement display			arranged into 6 pages	arranged into 7 pages
Mounting			Quick attachment for top-hat rail IEC/EN 60715	
Protection type device front/ terminals			IP52/IP20	
Terminals top and bottom			Screw terminals	
Terminal capacities				
Current connections				
Solid		mm^2	0.05 - 4	1 - 10
Stranded		mm^2	0.05 - 2.5	1 - 13
Voltage connections				
Solid		mm^2	0.05 - 4	1 - 4
Stranded		mm^2	0.05 - 2.5	1 - 3
Admissible relative humidity			Also suitable for tropical conditions	
Reference temperature		°C	23 ± 2	
Temperature range		°C	-5 - +55	
Storage and transportation temperature range		°C	-25 - +70	
Pollution degree			2	

			FAZ/FIP-XAWM	FAZ/FIP-XDWM
Electrical				
Operating voltage range				
V AC			220 - 240	-
V DC			-	48
Rated frequency	f	Hz	50/60	-
Relay output for alarm, 250 V AC, floating		A	5	5
Function			Automatic control	
Function selector			Automatic 5 ×, OFF/RESET	
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	80	80
Mounting width		mm	70	70
Mounting			Top-hat rail to IEC/EN 60715	
Protection type				
Enclosed			IP40	
Terminal protection			Busbar tag shroud to BGV A2	
Terminals			Lift terminals	
Terminal capacity				
Solid		mm^2	2 x 1.5 1 x 2.5	2 x 1.5 1 x 2.5
Flexible		mm^2	2 x 1.5 1 x 2.5	2 x 1.5 1 x 2.5

			FAZ-...-NA FAZ-...-RT
Electrical			
Standards			UL 489, CSA C22.2 No.5, IEC 60947-2
Rated operating voltage			
UL/CSA 0.5 - 25 A		V AC	277/480 Y
UL/CSA 32 - 40 A		V AC	240
UL/CSA (per pole)		V DC	48
IEC		V AC	240/415
Rated frequency	f	Hz	50/60
Rated breaking capacity			
IEC		kA	15
Characteristic			B, C, D
Lifespan		Operations	> 20000
Mains voltage connection			Any (top/bottom)
Mechanical			
Standard front dimension		mm	45
Device height		mm	105
Mounting width per pole		mm	17.7
Mounting			Quick attachment with two engagement positions for top-hat rail to IEC/EN 60715
Terminals top and bottom			Twin-purpose terminals
Terminal capacity			
Solid		AWG	18 - 6
Flexible		AWG	18 - 10
Mounting position			Any
Calibration temperature			
UL 489, CSA C22.2 No. 5		°C	40
IEC 60947-2		°C	30

Z-NHK, Z-IHK-NA, FAZ-XAA-NA...

			Z-NHK	Z-IHK-NA
Electrical				
Standards			IEC/EN 60947-5-1, IEC/EN 62019	IEC/EN 60947-5-1, IEC/EN 62019
Rated voltage		V AC	230	250
Contact function			2 C	1 N/O + 1 NC
Rated frequency	f	Hz	50/60	50/60
Rated operational current	I_e	A	2	6
Thermal rated operational current	I_{th}	A	2	6
Rated operational current				
AC-13	I_e	A	3 (250 V AC)	3 (250 V AC)
AC-15	I_e	A	2 (250 V AC)	2 (250 V AC)
DC-12	I_e	A	0.5 (110 V DC)	0.5 (110 V DC)
Rated insulation voltage	U_i	V AC	250	250
Minimum operating voltage per contact	U_{min}	V DC	5	5
Minimum operating current	I_{min}	mA	10 (DC)	10 (AC/DC)
Rated impulse withstand voltage (1.2/ 50 µ)	U_{imp}	kV	2.5	4
Rated conditional short-circuit current with 6 A back-up fuse	I_k	kA	1	1
Max. admissible back-up fuse		A gL	6	
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	80	80
Mounting width		mm	8.8 (0.5 SU)	8.8 (0.5 SU)
Mounting			For fitting to to left side of FAZ-...-NA, FAZ-...-RT, FAZ-XAA-NA...	-
Protection type				
Enclosed			IP40	IP40
Terminal protection			Busbar tag shroud to BGV A3	Busbar tag shroud to BGV A3
Terminals			Lift terminals	Lift terminals
Terminal capacity				
		AWG	20 - 14	-
		mm^2		0.5 - 2.5
Terminal screws			M3 (Pozidriv Z0)	M3 (Pozidriv Z0)
Tightening torque of the terminal screws		Nm	-	≦ 1.2

			FAZ-XAA-NA12-110VAC	FAZ-XAA-NA110-415VAC
Electrical				
Voltage range		V AC	12 - 110	110 - 415
		V DC	12 - 60	110 - 230
Rated frequency	f	Hz	50/60	50/60
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	105	105
Mounting width		mm	17.5	17.5
Mounting			Quick attachment with two engagement positions for top-hat rail to EN 50022	Quick attachment with two engagement positions for top-hat rail to EN 50022
Protection type				
Enclosed			IP40	IP40
Terminal protection			Busbar tag shroud to BGV A3	Busbar tag shroud to BGV A3
Terminals top and bottom			Twin-purpose terminals	Twin-purpose terminals
Terminal capacity				
Solid		AWG	18 - 10	18 - 10
Two-wire		AWG	18 - 10	18 - 10

Z-NH-..., Z-SLS/B, Z-D0

			Z-NH-...	Z-NH-1/	Z-NH-2/	Z-NH-2/
Electrical						
Standards			IEC 60269, VDE 0636, SEV 1086			
Nominal voltage						
AC		V AC	500	500	500	500
DC		V DC	230	440	440	440
Rated operational current		A	10 - 160	50 - 250	100 - 400	250 - 630
Rated frequency	f	Hz	45 - 62	45 - 62	45 - 62	45 - 62
Rated breaking capacity						
AC		kA	120	120	120	120
DC		kA	25	25	25	25
Max. heat dissipation						
I_n = 10 A		W	1.1	-	-	-
I_n = 16 A		W	1.6	-	-	-
I_n = 20 A		W	1.7	-	-	-
I_n = 25 A		W	1.9	-	-	-
I_n = 35 A		W	3.0	-	-	-
I_n = 40 A		W	3.5	-	-	-
I_n = 50 A		W	4.6	5.4	-	-
I_n = 63 A		W	5.4	6.3	-	-
I_n = 80 A		W	5.1	7.2	-	-
I_n = 100 A		W	6.9	8.6	8.8	-
I_n = 125 A		W	10.3	11.9	12.1	-
I_n = 160 A		W	11.0	13.9	14.0	-
I_n = 200 A		W	-	15.2	15.2	-
I_n = 250 A		W	-	21.8	21.8	19.4
I_n = 315 A		W	-	-	23.7	23.7
I_n = 400 A		W	-	-	30.5	30.5
I_n = 500 A		W	-	-	-	42.0
I_n = 630 A		W	-	-	-	47.0

			Z-SLS/B	Z-SLS/B24
Electrical				
Rated operating voltage				
Rated operating voltage	U_e	V AC	60 - 400	24 - 60
		V DC	60 - 220	24 - 60
Utilization category			gG (gL)	gG (gL)
Test voltage		kV	5	5
Mechanical				
Size			D01: 1, 2, 4, 6, 10, 13, 16 A D02: 20, 25, 32, 35, 40, 50, 63 A	

			Z-D0./SE
Electrical			
Standards			DIN VDE 0636, DIN 49522
Utilization category			gG (gL)
Rated voltage			
AC	U_n	V	400
DC	U_n	V	220
Rated frequency	f	Hz	45 - 65
Rated insulation voltage	U_i	V	2500
Rated short-circuit switching capacity			
AC		kA	50
DC		kA	8

Fuse material

D01-S, D02-S..., Z-DII-/SE

			D01-S0/	D02-S0/
Electrical				
Number of poles			1P 3P	1P 3P
Rated operating voltage		V AC	400	400
		V DC	250	250
Rated conditional short-circuit current tested with links	I_e	kA	50 (AC) / 8 (DC)	50 (AC) / 8 (DC)
Rated frequency	f	Hz	-	-
Rated operational current	I_e	A	16	63
Conventional thermal current with fuse links	I_{th}	A	-	-
Rated operating mode			-	-
Overvoltage category			-	-
Utilization category			-	-
Rated impulse withstand voltage	U_{imp}	kV	-	-
Current heat loss per contact at I_e		W	-	-
Heat dissipation				
Heat dissipation per contact with fuse link at I_e		W	-	-
Max. permissible heat dissipation of the fuse links		W	-	-
Utilization category			gG (gL)	gG (gL)
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	68	68
Mounting width		mm	27 (per pole)	27 (per pole)
Weight		g	1P 76 3P 230	1P 76 3P 230
Electrical thread			E14	E18
Mounting			Quick attachment for top-hat rail IEC/EN 60715	
Protection type				
Enclosed			-	-
Terminals			Double function terminals	
Terminal capacity				
Solid		mm^2	1.5 - 35	1.5 - 35
Temperature range		°C	-	-
Terminal screw tightening torque		Nm	2.5 - 3	2.5 - 3
Pollution degree			-	-
Track resistance			CTI 200	CTI 200

			Z-DII./SE
Electrical			
Standards			DIN EN 60269-1 (VDE 0636 part 10), DIN EN 60269-3 (VDE 0636 part 30), DIN VDE 0636-301, CEE 16, IEC/EN 60269-1, IEC/EN 60269-3
Utilization category			gG (gL), DZ
Rated voltage			
AC	U_n	V	500
DC	U_n	V	400
Rated frequency	f	Hz	45 - 65
Insulation class			C-VDE0110
Rated short-circuit breaking capacity at 1.1 x U_n			
AC		kA	50/cosφ = 0.2
DC		kA	8/τ = 15 ms



			Z-SLS/NE0Z	Z-SLK/NE0Z
Electrical				
Number of poles			1P 1P+N 2P 3P 3P+N	1P 1P+N 2P 3P 3P+N
Rated operating voltage		V DC	1P up to 110V / 2P up to 220V	
Rated operating voltage		V AC	400	400
Rated operational current	I_e	A	63	63
Rated uninterrupted current	I_u	A	63	63
Rated short-circuit making capacity			50 kArms	50 kArms
Normally open contact			-	5A/250V
Switching category			AC 22 B, DC 21 B	AC 22 B, DC 21 B
Overvoltage category			IV	IV
Rated impulse withstand voltage	U_{imp}	kV	6	6
Current heat loss per current path at I_e		W	0.5	0.5
Heat dissipation				
Heat dissipation per contact with fuse link at I_e		W	7.5	7.5
Relay section electrical				
Operating voltage range		V AC	-	24 - 240
Operational voltage tolerance			-	±10%
Power consumption		VA	-	5
Frequency		Hz	-	50-60
Function display			-	Mains: 1 LED Fault: 1 LED
Duty factor		%	-	100
Response delay		ms	-	Approx. 100
Recovery time	t_W	ms	-	Approx.100
Relay contacts			-	2 changeover contacts, 5A/250V
Overvoltage category			-	III
Auxiliary contacts				
Rated impulse withstand voltage	U_{imp}	kV	-	4
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	86	86
Mounting width		mm	27/per pole (1.5 SU)	27/per pole (1.5SU) + 27
Weight		g	1P 113 1P+N 225 2P 224 3P 450 3P+N 472	1P 224 2P 345 3P 450 3P+N 472
Mounting			Quick attachment for top-hat rail IEC/EN 60715	
Protection type in fitted state			IP20	IP20
Terminals			Lift terminals	Lift terminals
Terminal capacity				
Solid		mm^2	1.5 - 35	1.5 - 35
Temperature range		°C	-25 ... +60	-25 ... +60
Flammability classification to EN 60730			V0, glow-wire test 960°C	
Terminal screw tightening torque		Nm	Max. 4.5	Max. 4.5
Pollution degree			3	3
Track resistance			CTI 600	CTI 600
Relay section mechanical				
Terminals			Lift terminals	Lift terminals
Terminal capacity				
Solid		mm^2	-	0.14 - 4
Flexible		mm^2	-	0.14 - 2.5
Terminal screw tightening torque		Nm		0.5 - 0.7

			VLC14	VLC22
Electrical				
Number of poles			1P 1P+N 2P 3P 3P+N	1P 1P+N 2P 3P 3P+N
Rated operating voltage		V AC	690	690
Rated operational current	I_e	A	50	100
Rated conditional short-circuit current	I_e	kA	100	100
Rated frequency	f	Hz	50	50
Utilization category			AC 22 B	AC 21 B
Rated impulse withstand voltage	U_{imp}	kV	8	8
Max. permissible heat dissipation of the fuse		W	gG: 5, aM: 3	gG: 9.5, aM: 7
Mechanical				
Standard front dimension		mm	45	45
Device height		mm	94	121
Mounting width		mm	27/per pole	36/per pole
Weight		g	1P 100 1P+N 222 2P 201 3P 308 3P+N 437	1P 160 1P+N 355 2P 310 3P 480 3P+N 680
Mounting			Quick attachment for top-hat rail IEC/EN 60715	
Protection type				
Enclosed			IP20	
Terminals			Lift terminals	
Terminal capacity				
Solid		mm^2	1.5-10	2.5-35
Temperature range		°C	-25 ... +60	-25 ... +60
Terminal screw tightening torque				
Tightening torque		Nm	Max. 2	Max. 2.5
Pollution degree			1	1
Track resistance			CTI 400	CTI 400

			Z-D01/SE	Z-D02/SE
Electrical				
Rated operating voltage		V AC	400	400
		V DC	220	220
Utilization category			gG (gL)	gG (gL)
Rated frequency	f	Hz	45-65	45-65
Rated insulation voltage	U_i	V	2500	2500
Rated short-circuit switching capacity			50 kA (AC) 8 kA (DC)	50 kA (AC) 8 kA (DC)

			Z-SLS/B	Z-SLS/B24	Z-SLS/TR-SET
Electrical					
Rated operating voltage		V DC	-	24	-
Rated operating voltage		V AC	60 - 400	24	400
Utilization category			gG (gL)	gG (gL)	-
Test voltage		kV	5	5	5
Rated uninterrupted current	I_u	A	-	-	63

			C10-FD/...
Electrical			
Standards			IEC/EN 60947-1 Ed. 4.0, EN 60947-1:1999+A1:2000+A2:2001 IEC/EN 60947-3 Ed. 2.1, EN 60947-3:1999+A1:2001
No. of poles			1, 2
Rated voltage	U_e	V DC	1000
Rated operational current	I_e	A	20
Rated conditional short-circuit current		kA	10
Utilization category			DC 20 B
Rated insulation voltage	U_i	V DC	1000
Overvoltage category			II
Rated impulse withstand voltage	U_{imp}	kV	4
Current heat loss per contact without fuse		W	0.9
Max. heat dissipation of fuse		W	3
Mechanical			
Standard front dimension		mm	45
Device height		mm	83.3
Mounting width		mm	17.5/pole
Weight			
1P		g	58
2P		g	70
Mounting			Quick attachment for top-hat rail IEC/EN 60715
Protection type			IP20
Terminals top and bottom			Lift terminals
Terminal cross-section			0.5 - 10 mm² AWG 20 - 8
Tightening torque of the terminal screws		Nm	1.5
Ambient temperature range		°C	-25 - +40
Flammability classification			Glow wire 960 °C
Pollution degree			2
Track resistance			CTI 450

			Z-C10/SE 10 x 38	Z-C12/SE 14 x 51	Z-C22/SE 22 x 58
Electrical					
Standards			IEC 60269-1 and IEC 60269-2-1		
Utilization category			gG (gL)	gG (gL)	gG (gL)
Rated voltage	U_n	V AC	1 - 25 A/500 32 A/400	2 - 32 A/690 40 - 50 A/500	16 - 40 A/690 50 - 100 A/500
Utilization category			aM	aM	aM
Rated voltage	U_n	V AC	1 - 16 A/500 20 - 32 A/400	2 - 25 A/690 32 - 50 A/500	16 - 50 A/690 80 - 100 A/500
Rated frequency	f	Hz	50	50	50
Rated short-circuit breaking capacity		kA	100	100	100

			Z-C10/SE-.../PV 10 x 38
Electrical			
Standards			IEC 60269-1 and IEC 60269-4
Rated voltage	U_n	V DC	6 - 20 A/1000 25 A/900
Rated short-circuit breaking capacity		kA	30
τ = L/R		ms	2

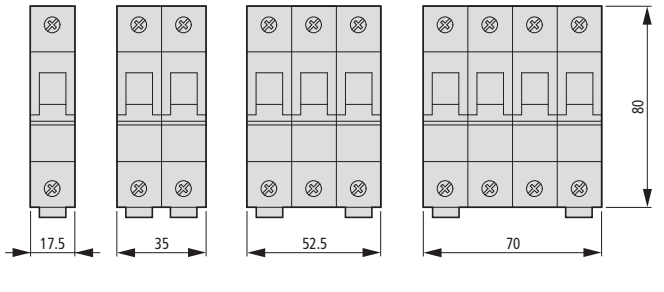
				GST...00-160	GST…1	GST…2	GST…3
General							
Standards				IEC/EN 60947-3			
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature			°C	-25 ... +55	-25 ... +55	-25 ... +55	-25 ... +55
Installation altitude			m	max. 2000	max. 2000	max. 2000	max. 2000
Mounting position				Vertical, horizontal			
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Busbar tag shroud at the front							
Operational status				IP20	IP20	IP20	IP20
Front cover open				IP10	IP10	IP10	IP10
Direction of incoming supply				Any			
Weight			kg	0.72 GSTA 0.93 GST	2.5 GSTA 4.4 GST	3.3 GSTA 5.3 GST	4.6 GSTA 6.6 GST
Contacts							
Rated operating voltage		U_e	V AC	500 690	500 690	500 690	500 690
Rated operating voltage		U_e	V DC	220 440	220 440	220 440	220 440
Rated operational current		I_e	A	160 100	250 200	400 315	630 500
Rated frequency			Hz	40 - 60	40 - 60	40 - 60	40 - 60
Rated conditional short-circuit current AC			kA_{rms}	50	50	50	50
Rated conditional short-circuit current, DC			kA_{rms}	25	25	25	25
Utilization category AC-22B							
Rated making capacity			A	480 300	750 600	1200 945	1890 1500
Rated breaking capacity			A	480 300	750 600	1200 945	1890 1500
Utilization category DC-21B							
Rated making capacity			A	150	300	475	750
Rated breaking capacity			A	150	300	475	750
Lifespan, electrical	Operations			300	200	200	200
Lifespan, mechanical	Operations			1700	1400	800	800
Heat dissipation at I_{th} AC, without NH-SE			W	6.9 2.7	12.9 8.3	27 16.7	52 32.8
Heat dissipation at I_{th} DC, without NH-SE			W	4.6 1.8	8.6 5.5	18 11.2	34.7 21.8
Rated insulation voltage		U_i	V AC	750	750	750	750
Max. fuse link							
Size				NH00	NH1	NH2	NH3
Max. rated operational current, gL/gG			A	160	250	400	630
Max. admissible heat dissipation, NH-SE		P_v	W	12	23	34	48
Terminal capacity							
Box terminal							
Stranded			mm^2	1.5 - 70	-	-	-
Copper strip	Number of layers x width x thickness		mm	6 x 9 x 0.8	-	-	-
Tightening torque			Nm	2.6	-	-	-
Flange connection							
Bolt diameter				-	M10	M10	M10
Cable lug			mm	-	1 x 25 - 150	1 x 25 - 240	1 x 25 - 300
Flat rail			mm	-	30 x 10	30 x 10	40 x 10
Tightening torque			Nm	-	30 - 35	30 - 35	30 - 35
Box terminal							
Stranded copper			mm^2	1.5 - 70	25 - 150	25 - 240	25 - 300
Copper strip	Number of layers x width x thickness		mm	-	6 x 16 x 0.8	10 x 16 x 0.8	11 x 21 x 1
Tightening torque			Nm	-	9.5	23	23
Clamp-type cable terminal							
Stranded aluminum/copper			mm^2	-	70 - 150	120 - 240	120 - 300
Tightening torque			Nm	-	4.5	11	11
Double clamp-type terminal							
Stranded aluminum/copper			mm^2	-	2 x (70 - 95)	2 x (120 - 150)	2 x (120 - 240)
Tightening torque			Nm	-	4.5	11	11

				GS00-160	GSU1	GSU2	GSU3
General							
Standards				IEC/EN 60 269-2-1; VDE0636-201			
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature			°C	-25 ... +55	-25 ... +55	-25 ... +55	-25 ... +55
Installation altitude			m	max. 2000	max. 2000	max. 2000	max. 2000
Mounting position				Vertical, horizontal	Vertical, horizontal	Vertical, horizontal	Vertical, horizontal
Overvoltage category/degree of pollution				III/3	III/3	III/3	III/3
Busbar tag shroud at the front							
Operational status				IP00	IP00	IP00	IP00
Direction of incoming supply				Any	Any	Any	Any
Weight			kg	0.4	1.7	2.1	2.7
Contacts							
Rated operating voltage		U_e	V AC	690	690	690	690
Rated operating voltage		U_e	V DC	440	440	440	440
Rated operational current		I_e	A	160	250	400	630
Rated frequency			Hz	40 - 60	40 - 60	40 - 60	40 - 60
Heat dissipation at I_{th} AC, without NH-SE			W	6.9	12.9	27	52
Heat dissipation at I_{th} DC, without NH-SE			W	4.6	8.6	18	34.7
Rated insulation voltage		U_i	V AC	750	750	750	750
Max. fuse link							
Size				NH00	NH1	NH2	NH3
Max. rated operational current, gL/gG			A	160	250	400	630
Max. admissible heat dissipation NH-SE		P_v	W	12	23	34	48
Terminal capacity							
Box terminal							
Stranded			mm^2	-	-	-	-
Copper strip	Number of layers x width x thickness		mm	-	-	-	-
Tightening torque			Nm	-	-	-	-
Flange connection							
Bolt diameter				-	M10	M10	M10
Cable lug			mm	-	1 x 25 - 150	1 x 25 - 240	1 x 25 - 300
Flat rail			mm	-	30 x 10	30 x 10	40 x 10
Tightening torque			Nm	-	30 - 35	30 - 35	30 - 35
Box terminal							
Stranded copper			mm^2	1.5 - 70	25 - 150	25 - 240	25 - 300
Copper strip	Number of layers x width x thickness		mm	6 x 9 x 0.8	6 x 16 x 0.8	10 x 16 x 0.8	11 x 21 x 1
Tightening torque			Nm	2.6	9.5	23	23
Clamp-type cable terminal							
Stranded aluminum/copper			mm^2	-	70 - 150	120 - 240	120 - 300
Tightening torque			Nm	-	4.5	11	11
Double clamp-type terminal							
Stranded aluminum/copper			mm^2	-	2 x 70 - 95	2 x 120 - 150	2 x 120 - 240
Tightening torque			Nm	-	4.5	11	11

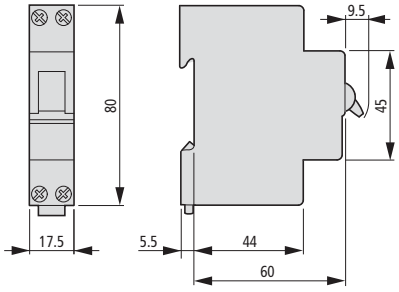
Dimensions

Miniature circuit-breakers (MCB)

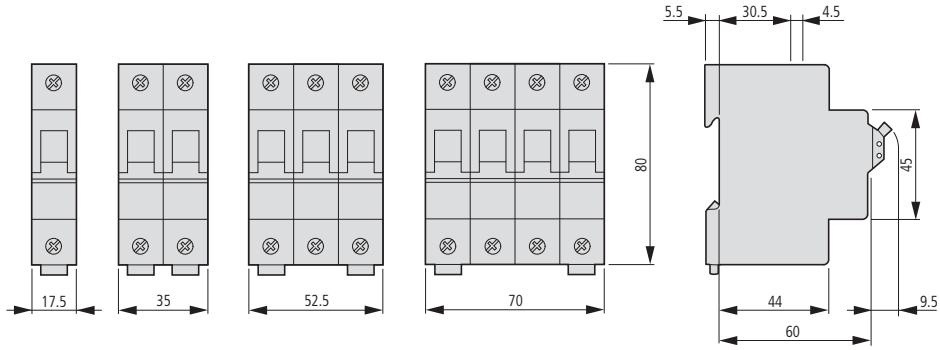
FAZ...



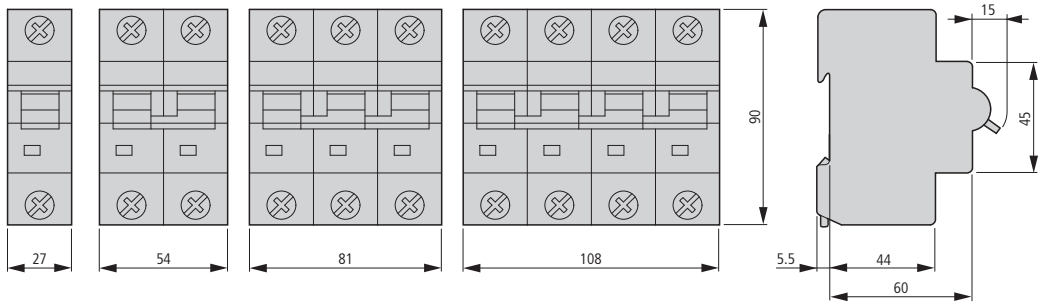
FAZ-PN-...



FAZT

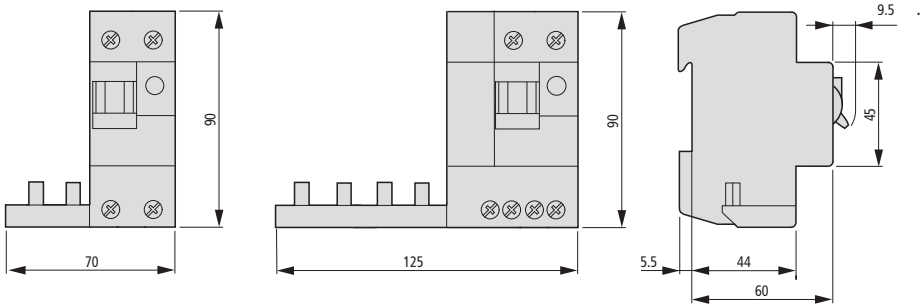


AZ...



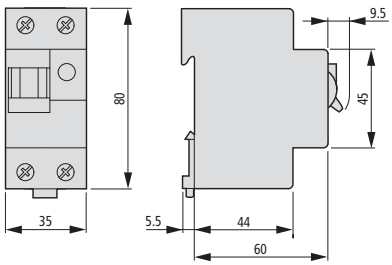
Residual-current protective modules

FIM-...



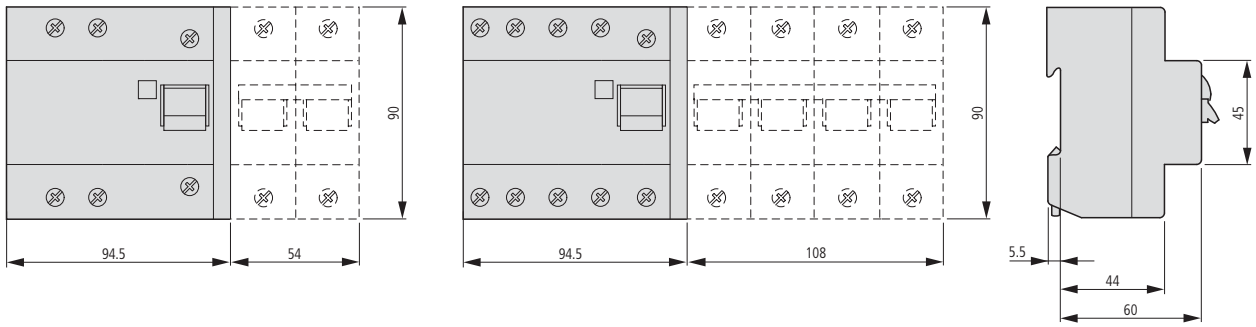
Combination switches

PKNM-...



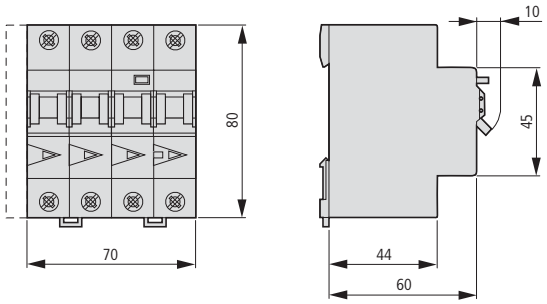
Residual-current protective modules

AZFIM...



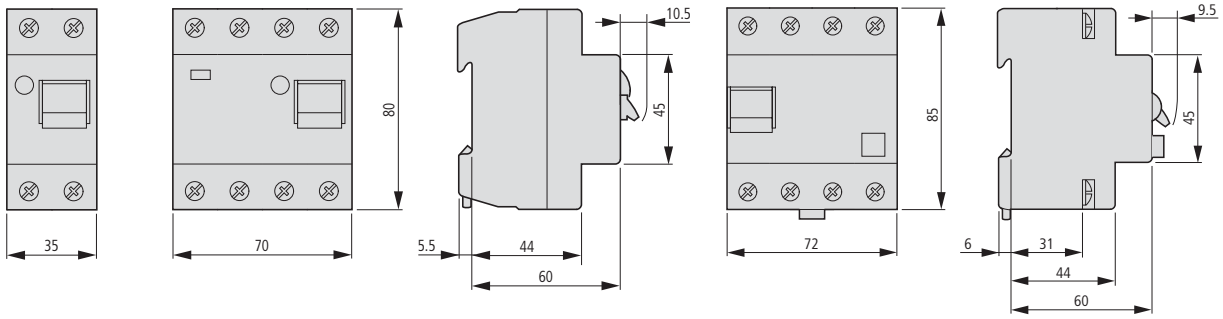
Combination FI/LS switches

mRB6..., mRB4...



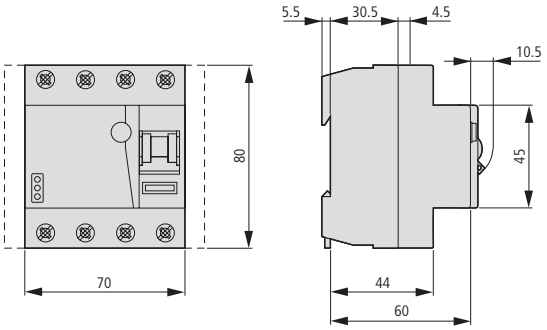
Residual-current devices

FI-...



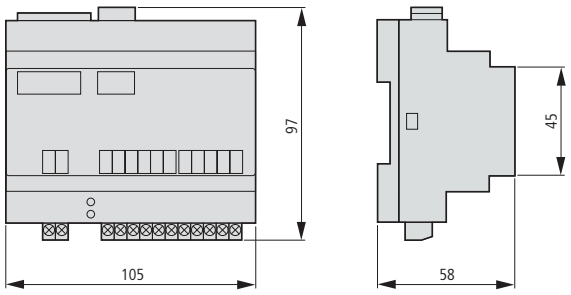
Residual-current devices

dRCM...



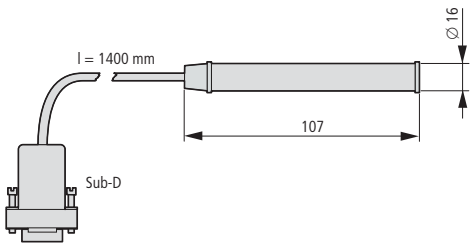
Remote monitoring unit

Z-CC/2CO



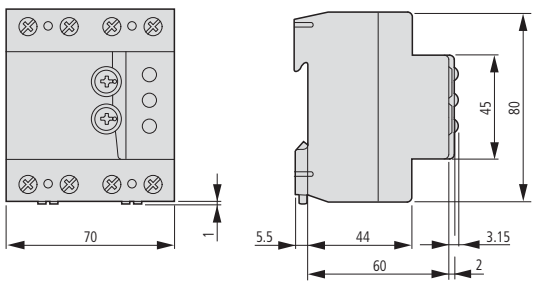
Temperature sensor

Z-CC/2CO-SE



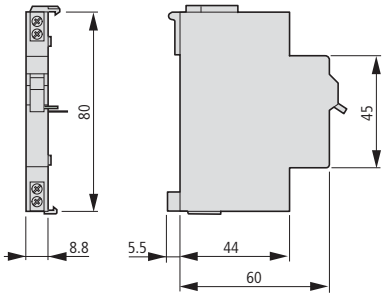
Leakage current meter

PDIM

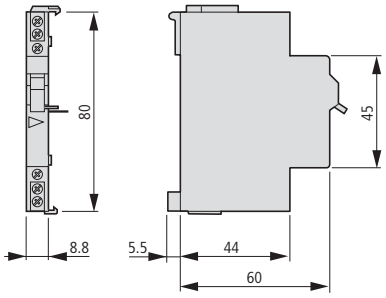


Auxiliary contacts

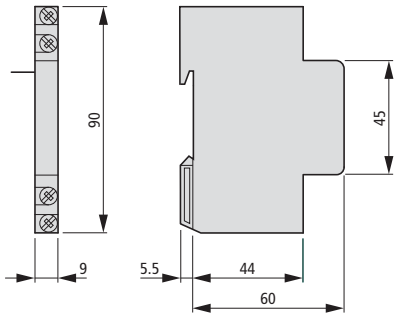
FAZ-XHIN11



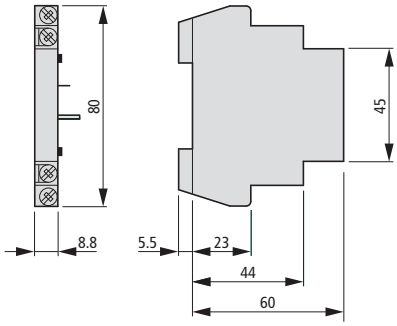
FAZ-XAM002



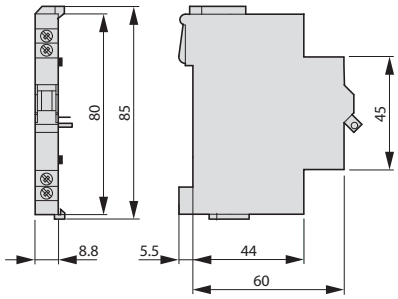
AZ-XHI11



FIP-XHI11

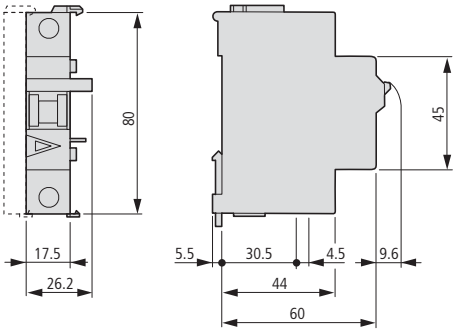


FIPA-XAM011



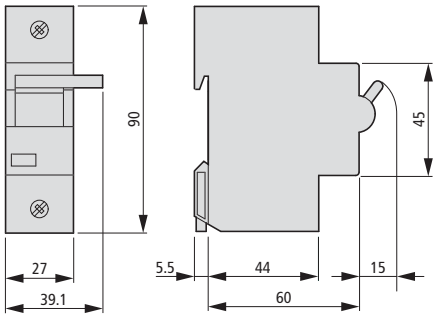
Shunt release

FAZ-XAA-C...



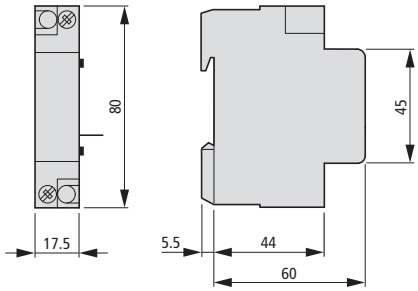
Shunt release

AZ-XAA...



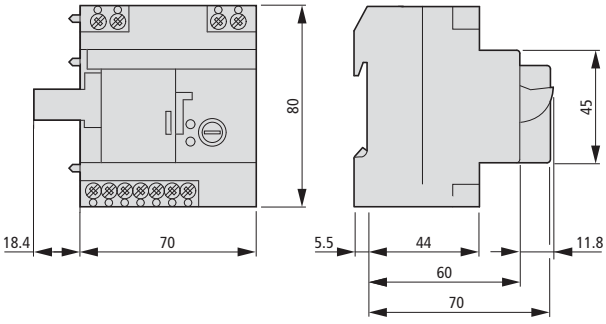
Under voltage release

FAZ-XUA...

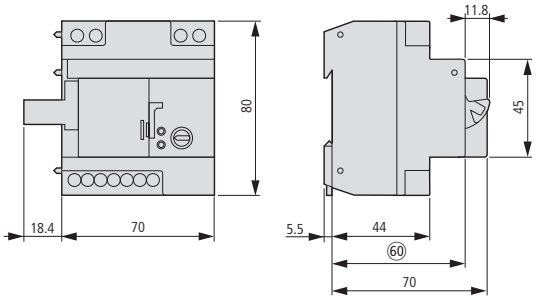


Remote switching modules

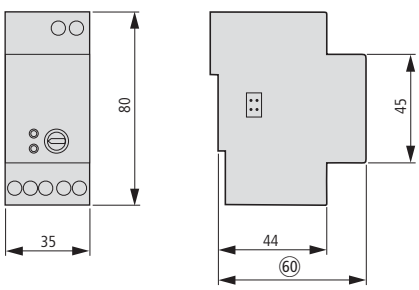
FAZ/FIP-...



Z-FW-LP
Z-FW-LPD

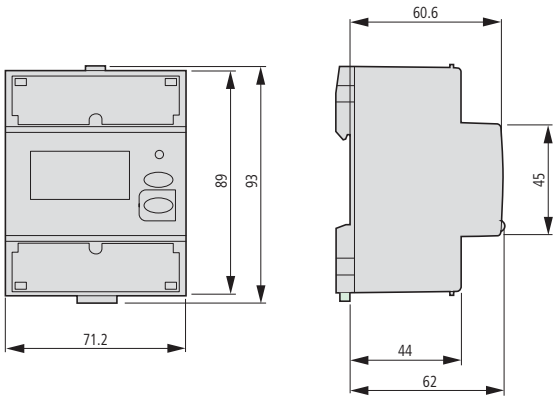


Z-FW-M0



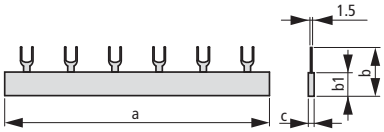
Power meter

KWZ-3PH...



Euro-Vario busbars

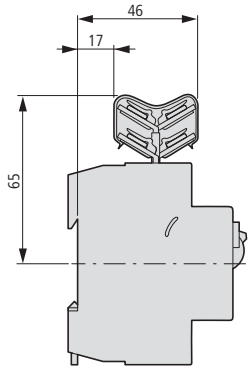
EVG-10(16)/...



Part no.	a	b	b1	c
EVG-(16)/1PHAS/2MODUL	33	25.9	14	3.4
EVG-(16)/1PHAS/6MODUL	105	25.9	14	3.4
EVG-(16)/1PHAS/12MODUL	210	25.9	14	3.4
EVG-(16)/2PHAS/4MODUL	75.5	30.9	19	7.3
EVG-(16)/2PHAS/6MODUL	105	30.9	19	7.3
EVG-(16)/2PHAS/12MODUL	209.5	30.9	19	7.3
EVG-(16)/3PHAS/6MODUL	102.5	30.9	19	10.3
EVG-(16)/3PHAS/9MODUL	156	30.9	19	10.3
EVG-(16)/3PHAS/12MODUL	209.5	30.9	19	10.3
EVG-(16)/3PHAS/16MODUL	285	30.9	19	10.3
EVG-(16)/3PHAS/20MODUL	353	30.9	19	10.3
EVG-(16)/4PHAS/8MODUL	138	30.9	19	13.3
EVG-(16)/4PHAS/12MODUL	209.5	30.9	19	13.3
EVG-(16)/3PHAS/N/5MODUL/LS	156	30.9	19	10.3
EVG-(16)/3PHAS/N/8MODUL/LS	209.5	30.9	19	10.3
EVG-(16)/1PHAS/2MODUL/HI	60	25.9	14	3.4
EVG-(16)/1PHAS/6MODUL/HI	156.5	25.9	14	3.4
EVG-(16)/1PHAS/9MODUL/HI	237	25.9	14	3.4
EVG-(16)/2PHAS/4MODUL/HI	75.5	30.9	19	7.3
EVG-(16)/2PHAS/6MODUL/HI	120	30.9	19	7.3
EVG-(16)/2PHAS/10MODUL/HI	209.5	30.9	19	7.3
EVG-(16)/3PHAS/6MODUL/HI	115	30.9	19	10.3
EVG-(16)/3PHAS/12MODUL/HI	237	30.9	19	10.3
EVG-(16)/3x 1PHAS/6MODUL/HI	152	30.9	19	10.3
EVG-(16)/3x 1PHAS/8MODUL/HI	209.5	30.9	19	10.3
EVG-(16)/3x 1PHAS/9MODUL/HI	229	30.9	19	10.3

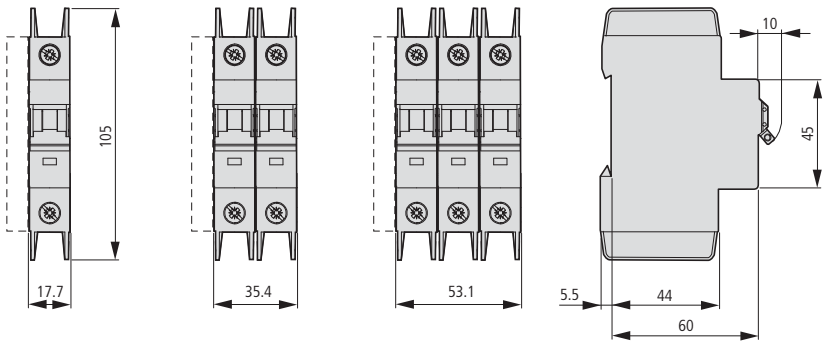
Connecting bracket

ZV-...-80A-...



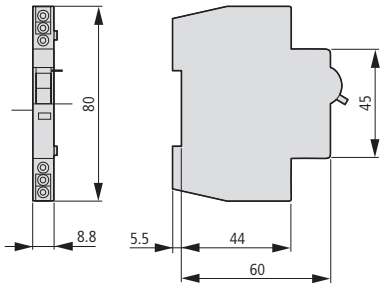
Miniature circuit-breakers (MCB)

FAZ-...-NA, FAZ-...-RT



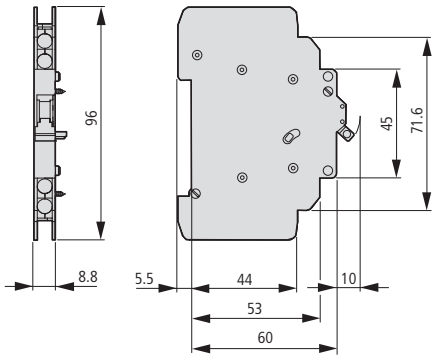
Tripping signal contact

Z-NHK



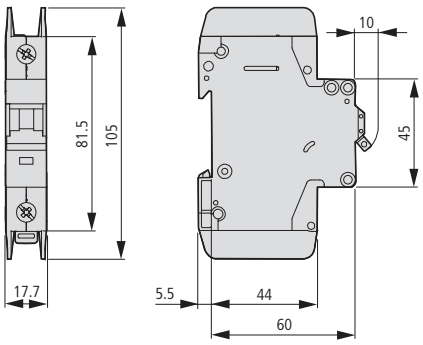
Auxiliary contacts

Z-IHK-NA



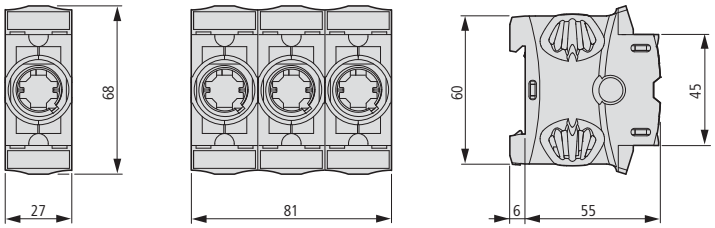
Shunt release

FAZ-XAA-NA...



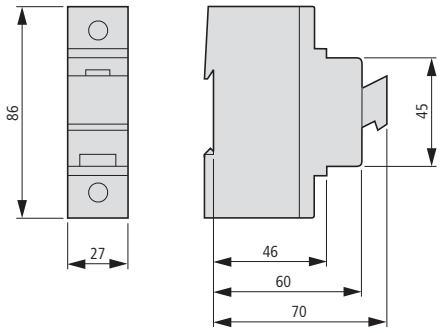
Fuse bases

D01-SO/...
D02-SO/...



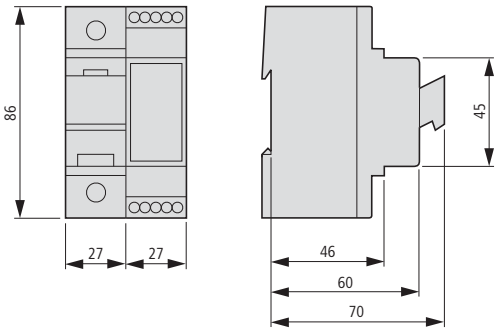
Fuse switch-disconnectors

Z-SLS/NEOZ/...



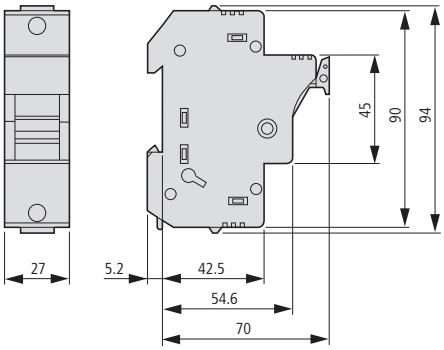
With fuse monitoring, empty

Z-SLK/NEOZ/...

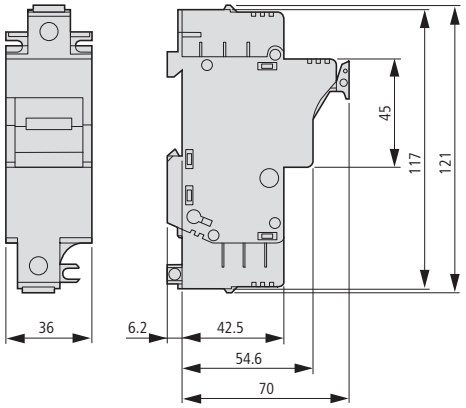


Fuse switch-disconnectors, empty

VLC14...

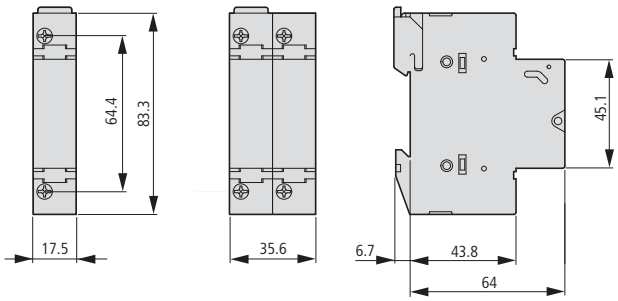


VLC22...



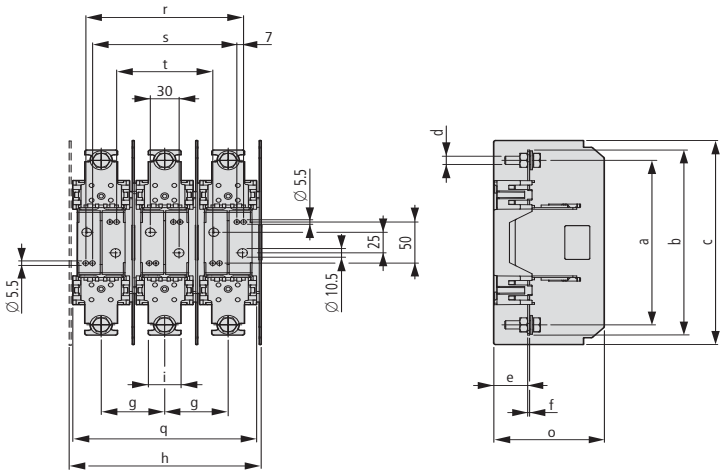
Fuse switch-disconnectors

C10-FD/20/...

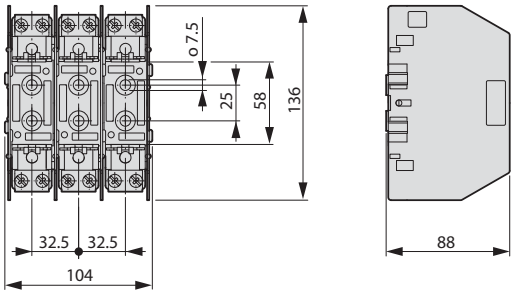


LV h.b.c. fuse bases

GSU1 GSU2 GSU3



GS00-160

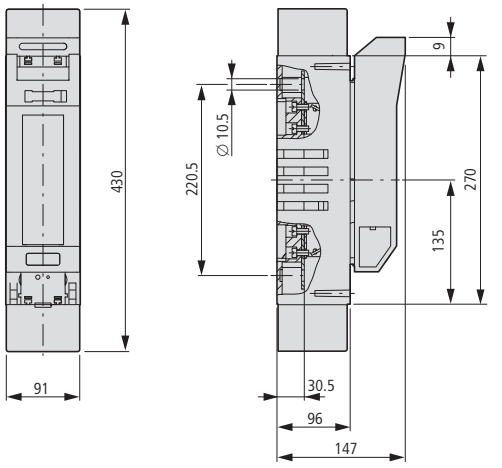


Part no.	a	b	c	d	e	f	g	h	l	o	q	r	s	t
GSU1	175	200	248	M10	35	2	66	200	34	107	191	164	150	100
GSU2	200	225	248	M10	35	2	66	200	34	115	191	164	150	100
GSU3	210	250	273	M10	35	3	84	254	40	132.5	245	200	186	136

LV h.b.c. fuse switch-disconnectors

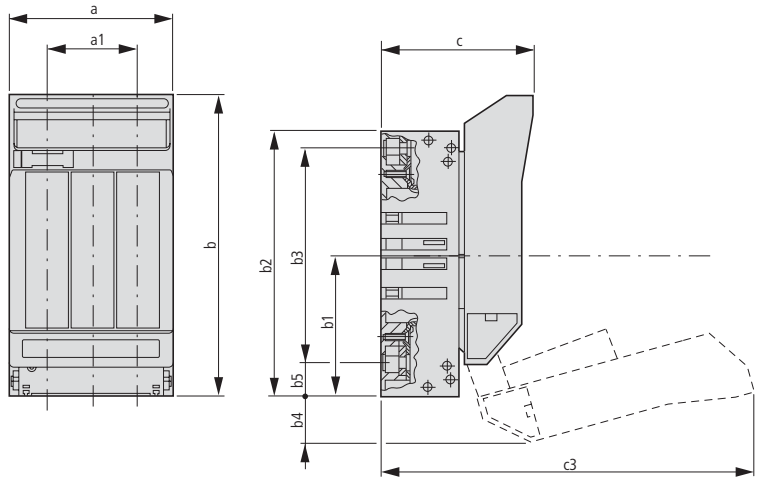
1 pole

GSTA00-160-1P



3 pole

GSTA00-160 GSTA1 GSTA2 GSTA3

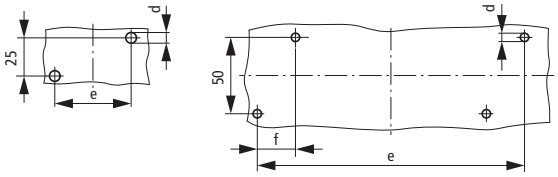


Part no.	a	a1	b	b1	b2	b3	b4	b5	c	c3	d	e	f
GSTA00-160-1P	49	-	169	79	149	120	-	-	86.5	-	7	-	-
GSTA00-160	106	66	169	79	149	120	25	26	86.5	197	7	50	-
GSTA1	182	116	250	115	230	184	30	23	111	294	5.5	150	-
GSTA2	208	132	275	128	256	217	30	19.5	125	330.5	5.5	175	25
GSTA3	254	164	283	135	270	238	30	16	142	348	5.5	200	50

LV h.b.c. fuse switch-disconnectors, drilling dimensions

GSTA00-160 GSTA2

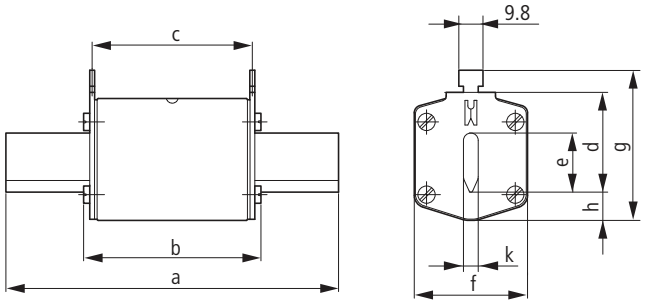
GSTA1 GSTA3



Part no.	a	a1	b	b1	b2	b3	b4	b5	c	c3	d	e	f
GSTA00-160-1P	49	-	169	79	149	120	25	-	86.5	197	7	-	-
GSTA00-160	106	66	169	79	149	120	25	26	86.5	197	7	50	-
GSTA1	182	116	250	115	230	184	30	23	111	294	5.5	150	-
GSTA2	208	132	275	128	256	217	30	19.5	125	330.5	5.5	175	25
GSTA3	254	164	283	135	270	238	30	16	142	348	5.5	200	50

LV h.b.c. fuse links

Z-NH-...



Part no.		a	b	c	d	e	f	g	h	k
Z-NH-00/	Up to 100 A	79	53	47	35	15	21	52	7.5	6
	125-160 A	79	53	47	35	15	28	56	12	6
Z-NH-1/	Up to 160 A	135	68	65	40	15	28	61	12	6
	200-250 A	135	72	65	40	20	46	65	14	6
Z-NH-2/	to 250 A	150	72	65	48	20	46	73	14	6
	315-400 A	150	72	65	48	26	54	73	14	6
Z-NH-3/	to 400 A	150	72	65	60	26	54	84	14	6
	500-630 A	150	72	65	60	33	65	84	14	6







CI insulated enclosures

Exposed areas place high demands on housing systems for energy and control distribution, to guarantee operational safety.

Complete insulating encapsulation of all operating equipment up to 1600 A offers personnel and operational safety and protects against corrosion. The high protection type IP65 permits universal application. Transparent covers ease maintenance and visual checks.

totally insulated

Individual enclosures E- C/...
Integrated pressure relief when switching off short-circuits +++ Metric cable entry knockouts in all side walls +++ Faster installation of individual housing to distribution board enclosure
→ Page 20/6

Basic enclosures for NZM... circuit-breaker/N... - CCB... switch-disconnector
Ready to accept circuit-breakers +++ Circuit-breakers switchable from outside +++ Protects against sprayed water, dust, agressive vapors
→ Page 20/34

CI distribution board terminal enclosure – K.../KST...
Connection terminals pre-mounted to mounting plate +++ Housing with sectional gland plate +++ Cable installs easily from the front
→ Page 20/38

Cover fasteners with cylinder lock – DVZ...- C/
Spring loaded enclosure bolts +++ Fitted by user for each CI cover +++ With closed condition display
→ Page 20/18

Enclosure cover for socket devices – D...- STV...
Ready for Mennekes socket devices +++ for CEE and Schuko sockets up to 125 A +++ Sealable cover fasteners
→ Page 20/19

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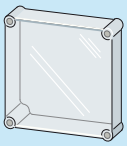







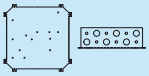

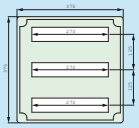



CI insulated enclosures

System overview

Technical overview – CI insulated enclosures 20/2

System overview - CI insulated enclosures 20/4

Ordering

Basic enclosures

Individual enclosures 20/6

Individual enclosure for North America 20/9

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Distribution board enclosures for North America 20/14

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Prepared enclosures

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Busbar housing 20/40

Accessories for busbar enclosures 20/41

Modular busbar system 20/44

Module for fuse enclosures 20/46

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Enclosures with devices fitted

Individual fuse enclosures without/with door in cover 20/50

Panel enclosures for fuses 20/52

Individual enclosures with LV h.b.c. fuse bases 20/54

Distribution board enclosure with LV h.b.c. fuse bases 20/57

Individual enclosure with LV h.b.c. fuse switch-disconnectors 20/59

Distribution board enclosure with LV h.b.c. fuse switch-disconnector 20/62

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Mounting frames 20/64

Accessories 20/67

Engineering

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Modular busbar system 20/73

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Dimensions

CI insulated enclosures 20/87

CI-K small enclosures

System overview

CI-K small enclosures 20/92

Ordering

CI-K basic enclosures 20/93

CI-K accessories 20/96

CI small enclosures 20/98

Technical data

CI-K small enclosures 20/99

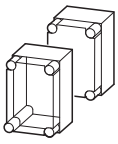
Dimensions

CI-K small enclosures 20/100

CI..., AE..., MCCB..., ZG...

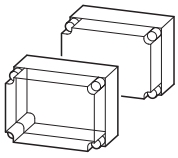
Technical overview

Basic enclosures	Prepared enclosures	Prepared enclosures
CI... individual enclosure Distribution board enclosure with gland plates fitted KST... CI: → Page 20/6 KST...: CI: → Page 20/10	**MCB enclosures** - With PE/N terminals - For flush mounting devices with size 1 to DIN 43880 → Page 20/31	**Meter enclosures** → Page 20/36
	Enclosure MCCB... - For circuit-breaker NZM... - Switch-disconnector N... - 3- and 4 pole → Page 20/34	**Distribution board enclosure KST with terminals K...** → Page 20/38

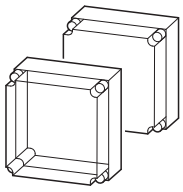


CI23.-125...
Transparent cover
Non-transparent cover
CI23.-150...
Transparent cover
Non-transparent cover

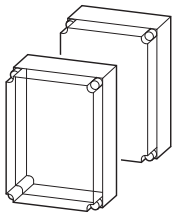
KST32-125 (-150)
Transparent cover
KST34-125 (-150, -200)
Transparent cover



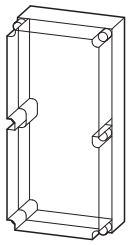
CI43.-125...
Transparent cover
Non-transparent cover
KST43-125
Transparent cover
CI43.-150...
Transparent cover
Non-transparent cover
KST43-150
Transparent cover
CI43.-200...
Transparent cover
Non-transparent cover
KST43-200
Transparent cover



CI44.-125...
Transparent cover
Non-transparent cover
KST44-125
Transparent cover
CI44.-150...
Transparent cover
Non-transparent cover
KST44-150
Transparent cover
CI44,200...
Transparent cover
Non-transparent cover
KST44-200
Transparent cover
CI44.-250
Transparent cover
KST44-250
Transparent cover



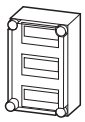
CI45.-200
Transparent cover
Non-transparent cover



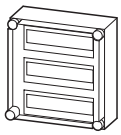
CI48-200...
Transparent cover
KST48-200
Transparent cover
CI48-250...
Transparent cover
KST48-250
Transparent cover



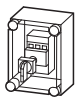
AE/IE...
AV/123-125
AV/123-150
9 x 1-pole



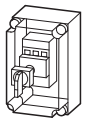
AE43E...I
AV/143-125
AV/143-200
27 x 1-pole



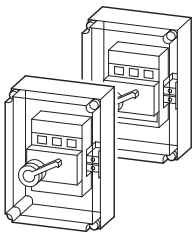
AE/I44E...
AV/144-125
AV/144-200
45 x 1-pole



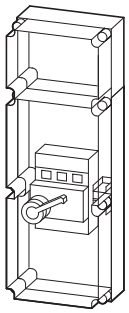
MCCB1-63/I23E-150
1 x 63 A



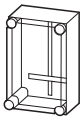
MCCB1-125/I43E-150
1 x 125 A
MCCB1-160/I43E-200
1 x 160 A
MCCB2-200/I43E-200
1 x 200 A



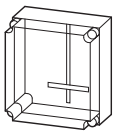
MCCB2-250/I45E-200
1 x 250 A
MCCB3-400/I45E-200
1 x 400 A



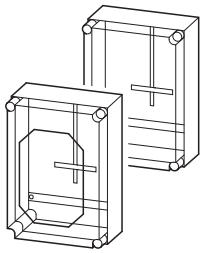
MCCB3-630/I48/I43E-200
1 x 630 A



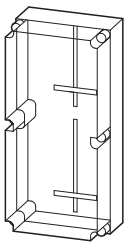
ZG/I43E-G-150
Transparent cover
ZG/I43E-G-200
Transparent cover



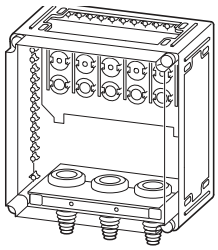
ZG/I44E-150
Transparent cover
ZG/I44E-200
Transparent cover



ZG/I45E-200-T
Transparent door
ZG/I45E-200
Transparent cover



ZG/I48-200
Transparent cover



Enclosure depth 175 mm:
K...KST32

Enclosure depth 225 mm:
K...KST34
K...KST43
K...KST44
K...KST48

SKA..., E...I(U), RSK...., RPEN..., RS..., GS...

Prepared enclosures

Busbar enclosures

-250 A, 400 A, 630 A

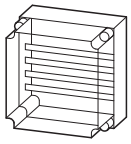
→ Page 20/40

Corner enclosures

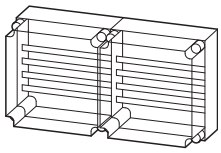
- E...I, in corner: → Page 20/48
- E...U, around corner: → Page 20/48

Distribution boards back-to-back

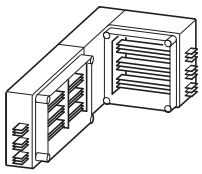
RSK..., RPEN...: → Page 20/49



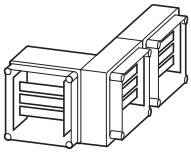
SKA254-I44
250 A, 4 pole
SKA404-I44
400 A, 4 pole
SKA634-I44
630 A, 4 pole
SKA255-I44
250 A, 5 pole
SKA405-I44
400 A, 5 pole
SKA635-I44
630 A, 5 pole



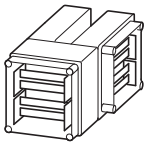
SKA254-2I44
250 A, 4 pole
SKA404-2I44
400 A, 4 pole
SKA634-2I44
630 A, 4 pole
SKA255-2I44
250 A, 5 pole
SKA405-2I44
400 A, 5 pole
SKA635-2I44
630 A, 5 pole



ESKI...
250-1600 A
3 main conductors
1 or 2 PE/N
EPENI...
1000-1600 A
1 or 2 PE/N



ESKU...
250-1600 A
3 main conductors
1 or 2 PE/N
EPENU...
1000-1600 A
1 or 2 PE/N



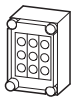
RSK...
250-1600 A
3 main conductors
1 or 2 PE/N

Enclosures with components fitted

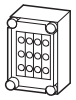
Fuse enclosure

- With PE/N terminals
- DII/E27, D02/E18, DIII/E33

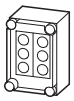
→ Page 20/50



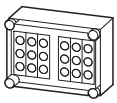
RS27/I23E
RS27/I23-125
RS27/I23-150
3 x 3 x 25 A
DII/E27



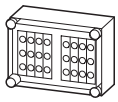
RS18/I23E
RS18/I23-125
RS18/I23-150
4 x 3 x 63 A
D02/E18



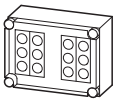
RS33/I23E
RS33/I23-125
RS33/I23-150
2 x 3 x 63 A
DIII/E33



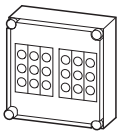
RS27/I43E
RS27/I43-125
RS27/I43-200
6 x 3 x 25 A
DII/E27



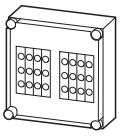
RS18/I43E
RS18/I43-125
RS18/I43-200
8 x 3 x 63 A
D02/E18



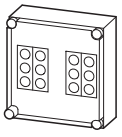
RS33/I43E
RS33/I43-125
RS33/I43-200
4 x 3 x 63 A
DIII/E33



RS27/I44E
6 x 3 x 25 A
DII/E27



RS18/I44E
8 x 3 x 63 A
D02/E18



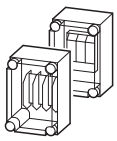
RS33/I44E
4 x 3 x 63 A
DIII/E33

Enclosures with components fitted

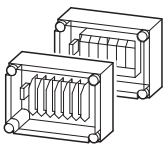
Enclosures with LV h.b.c. fuse bases GS

Enclosures with LV h.b.c. fuse switch-disconnectors GSTA...
- With PE/N terminals
- 5th terminal can be retrofitted
NH00, NH1, NH2

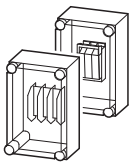
GS, GSTA: → Page 20/54



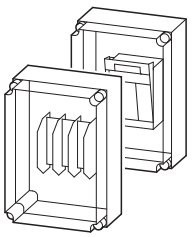
GS00/I23E
1 x 100 A, 1 X NH00
GSTA00/I23E
1 x 100 A, 1 X NH00



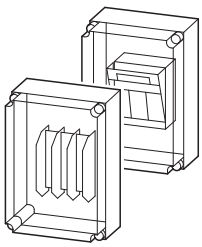
2GS00/I43E
2 x 100 A, 2 X NH00
2GSTA00/I43E
2 x 100 A, 2 X NH00



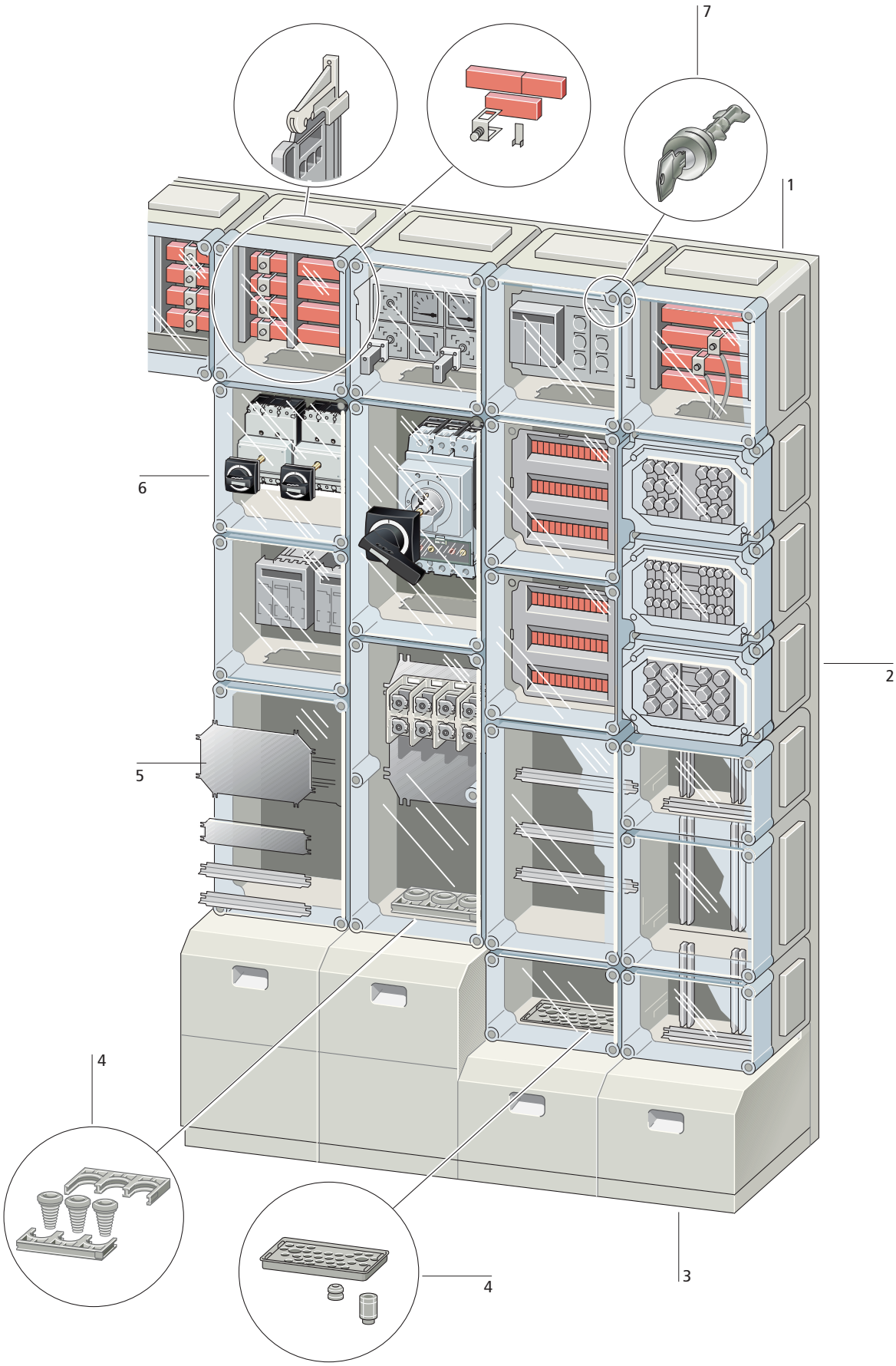
GS00-160/I43E-G
1 x 160 A, 1 X NH00
GSTA00-160/I43E-G
1 x 160 A, 1 X NH00



GS1/I45E
1 x 250 A, 1 X NH1
GSTA1/I45E
1 x 250 A, 1 X NH1



GS2/I45E
1 x 400 A, 1 X NH2
GSTA2/I45E
1 x 400 A, 1 X NH2


7
1
6
2
5
4
4
3

Basic enclosures

Five sizes can be combined
Width ≧ 187.5 ≦ 375 mm
Height ≧ 250 ≦ 750 mm
Depth ≧ 150 ≦ 275 mm

Metric cable entry knockouts in the sides

Cover fasteners with I/0 status indication, sealable, pressure relief through built-in spring

Cover
transparent, with/without door
Non-transparent, RAL 7032

→ Page 20/17

Product features

- Totally insulated
- Protection type IP65
- Safety class 2
- Distribution board system with 25 mm grid
- Modular system
- Captive, sponge-rubber gaskets
- Insulating wedge-lock fastener for connecting the enclosures with each other
- Enclosure of self-extinguishing, -halogen free polycarbonate

Standards

- IEC/EN 60439-1
- VDE 0660 Part 500
- BS 5486 Part 1
- NF EN 60439-1
- SN EN 60439-1

Busbar systems 1

5-conductor systems

Rated operational current up to 630 A

Tinned copper busbars up to 630 A

Busbar terminals

→ Page 20/40

Fixing 2

Support frames for wall-mounted and floor-standing distribution boards

Wall fixing bracket

Fixing straps

→ Page 20/64

Cable compartment 3

Plinths

Cable compartment cladding

→ Page 20/68 → Page 20/70

Cable entries 4

Gland plates for large cross-sections

Flanges

Metric cable glands/cable grommets

→ Page 20/23 → Page 20/29

Terminals, copper band

→ Chapter 16, Accessories for control panel building

Mounting systems for basic enclosures 5

Sheet steel mounting plates and insulating material

Pre-drilled mounting plate for surface mounting standard devices

→ Online catalogue

Mounting rails and module mounting rails to IEC/EN 60715

Mounting depths 125 to 250 mm

Meter equipment

→ Page 20/26

Enclosures with components fitted/ service distribution boards (TTA) 6

MCB enclosures

Fuse enclosures

→ Page 20/52

Enclosures with LV h.b.c. fuse bases

→ Page 20/57

Enclosures with LV h.b.c. fuse switch-disconnectors
→ Page 20/62

CI enclosures for NZM1, 2, 3 circuit-breakers and N1, 2, 3, PN1, 2, 3 switch-disconnectors

→ Page 20/34

Meter enclosures

→ Page 20/37

Cover fasteners 7

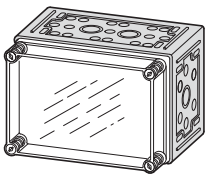
Fixable or with cylinder lock

→ Page 20/22

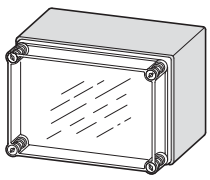
Enclosure styles

The enclosure cover is identical for all three construction types.

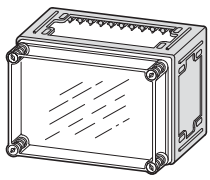
CI...E-... individual enclosure
- Metric cable entry knockouts in all sides
- All enclosure sides can also be knocked out
- Also for use in CI distribution board systems



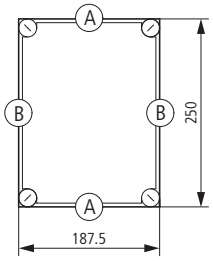
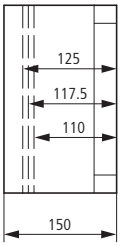
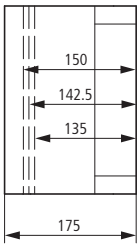
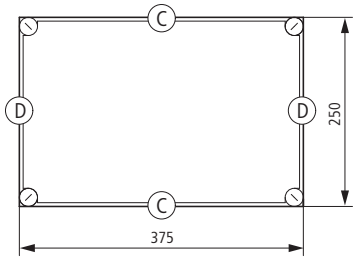
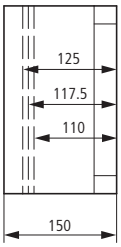
CI...X-... individual enclosure
- All four enclosure side plates walls smooth without knockouts



CI...-... panel enclosure
- Horizontal enclosure sides open
- Vertical enclosure sides with large knockouts
- Suitable for surface mounting CI distribution board systems



Ordering

Dimensions mm	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth mm	Type cover / Type Enclosure base	**Part no.** Article no.	**Price** See price list	Std. pack
Individual enclosures E and X • Protection type IP65 • Cover transparent or non-transparent (RAL 7032, pebble grey) • Fixing straps for wall fixing • Sealable cover fasteners E individual enclosures • With metric knockouts in all enclosure side plates; see illustrations A to F • Full-area knockouts in the sides • Can be converted to distribution board enclosure X individual enclosures • Smooth side plates, without knockouts					
		Transparent /knockout	**CI23E-125** 019570		1 off
		Non-transparent /knockout	**CI23E-125-RAL7032** 090152		
		Transparent /plain	**CI23X-125** 010408		
		Transparent /knockout	**CI23E-150** 021943		
		Non-transparent /knockout	**CI23E-150-RAL7032** 090153		
		Transparent /plain	**CI23X-150** 015154		
		Transparent /knockout	**CI43E-125** 093133		1off
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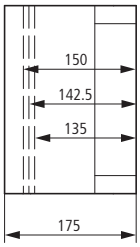
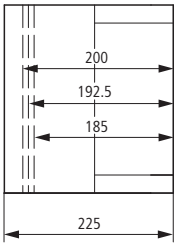
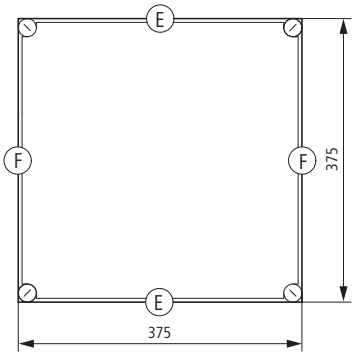
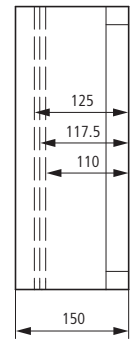
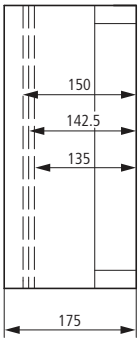
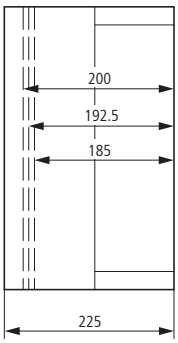
		Transparent /plain	**CI43X-125** 019900		
		Transparent /knockout	**CI43E-150** 095506		
		Non-transparent /knockout	**CI43E-150-RAL7032** 090155		
		Transparent /plain	**CI43X-150** 024646		
		Transparent /knockout	**CI43E-200** 097879		
		Non-transparent /knockout	**CI43E-200-RAL7032** 090156		
		Transparent /plain	**CI43X-200** 029392		

Dimensions mm	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth mm	Type cover / Type Enclosure base	**Part no.** Article no.	**Price** See price list	Std. pack
		Transparent /knockout	**CI44E-125** 031436		1off
		Non-transparent /knockout	**CI44E-125-RAL7032** 090157		
		Transparent /plain	**CI44X-125** 031765		
		Transparent /knockout	**CI44E-150** 033809		
		Non-transparent /knockout	**CI44E-150-RAL7032** 090158		
		Transparent /plain	**CI44X-150** 034138		
		Transparent /knockout	**CI44E-200** 036182		
		transparent with transparent door /knockout	**CI44E-200-T** 090147		
		Non-transparent /knockout	**CI44E-200-RAL7032** 090159		
		Transparent /plain	**CI44X-200** 036511		

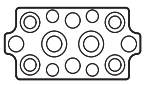
Notes

A



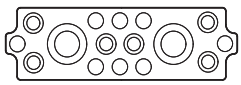
1 x M32/20
6 x M20
2 x M16

B



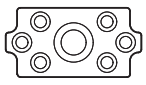
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C



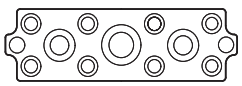
2 x M50/20
6 x M25/16
8 x M20

D



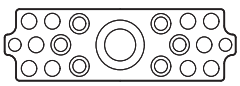
1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

F



1 x M63/40
6 x M25/16
10 x M20
2 x M16

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth	Type cover / Type Enclosure base	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm				

Individual enclosures E and X

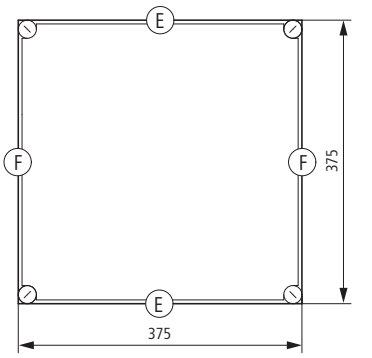
- Protection type IP65
- Cover transparent or non-transparent (RAL 7032, pebble grey)
- Fixing straps for wall fixing
- Sealable cover fasteners

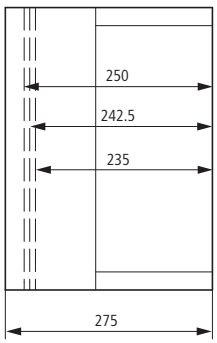
E individual enclosures

- With metric knockouts in all enclosure side plates; see illustrations A to F
- Full-area knockouts in the sides
- Can be converted to distribution board enclosure

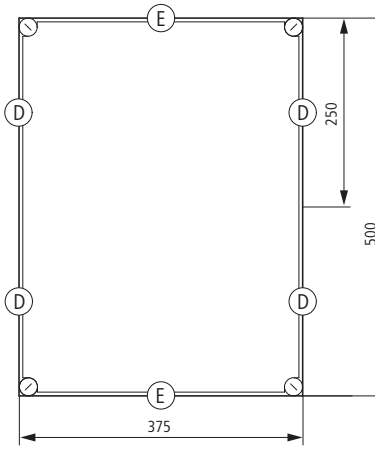
X individual enclosures

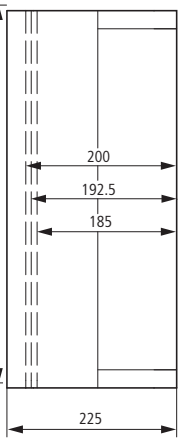
- Smooth side plates, without knockouts





Transparent /knockout	**CI44E-250** 038555			1 off
Transparent /plain	**CI44X-250** 038884			





Transparent /knockout	**CI45E-200** 001891			
Non-transparent /knockout	**CI45E-200-RAL7032** 090160			
Transparent /plain	**CI45X-200** 098469			

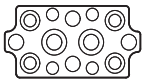
Notes

A



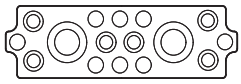
1 x M32/20
6 x M20
2 x M16

B



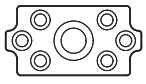
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C



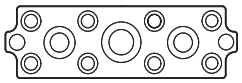
2 x M50/20
6 x M25/16
8 x M20

D



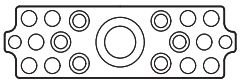
1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

F



1 x M63/40
6 x M25/16
10 x M20
2 x M16

Dimensions Width mm	Height mm	Depth mm	Mounting depth mm	**Part no.** Article no.	**Price** See price list	Std. pack
Individual enclosures						
• Protection type IP65 • Enclosure base RAL 7032 with smooth sides • Fixing straps for wall fixing						
Individual enclosures without/with door in cover						
• Transparent cover, cover locks can be sealed						
187.5	250	150	125	**CI23X-125-NA** 002209		1 off
		175	150	**CI23X-150-NA** 002212		
375	250	150	125	**CI43X-125-NA** 002213		
		175	150	**CI43X-150-NA** 002232		
		225	200	**CI43X-200-NA** 002217		
	375	150	125	**CI44X-125-NA** 002218		
		175	150	**CI44X-150-NA** 002219		
		225	200	**CI44X-200-NA** 002220		
		275	250	**CI44X-250-NA** 002224		
	500	225	200	**CI45X-200-NA** 264023		
Individual enclosures with cover and doors						
• Transparent cover with door, cover fasteners can be sealed • Transparent door, with handle latches and 180° door opening angle • Door hinges can be subsequently changed to left, right, top or bottom.						
187.5	250	166	125	**CI23X-125/T-NA** 002210		1 off
		191	150	**CI23X-150/T-NA** 002211		
375	250	166	125	**CI43X-125/T-NA** 002214		
		191	150	**CI43X-150/T-NA** 002215		
		241	200	**CI43X-200/T-NA** 002216		
	375	241	200	**CI44X-200/T-NA** 002221		
		191	150	**CI44X-150/T-NA** 002222		
		291	200	**CI44X-250/T-NA** 002223		
		166	125	**CI44X-125/T-NA** 002233		

Notes

Information relevant for export to North America

Product Standards	UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking
UL File No.	E54120, E337418
UL CCN	NITW
CSA File No.	27130
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Industrial Control Panels
Degree of Protection	IEC: IP65; UL/CSA Types 1, 12, 13, 4X, indoor only

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth	Cable entry outer diameter	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	mm			

Distribution board with/without gland plates fitted

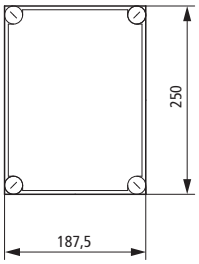
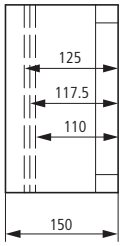
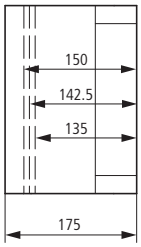
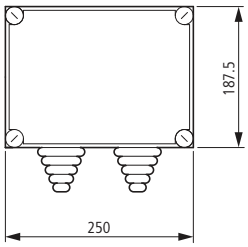
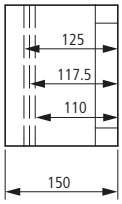
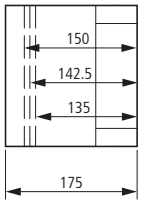
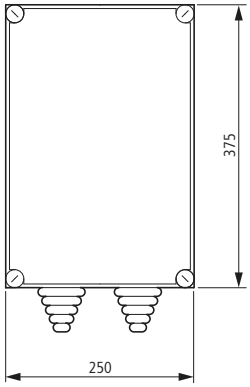
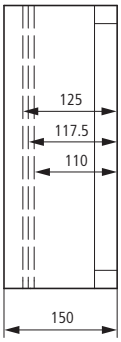
- Transparent cover, cover fasteners can be sealed.

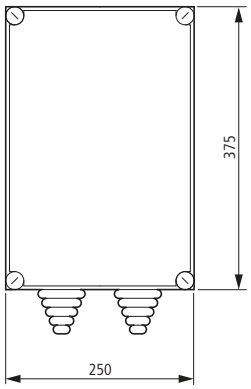
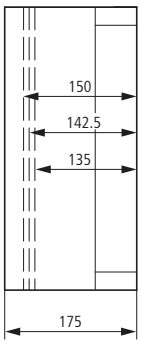
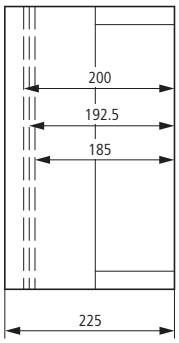
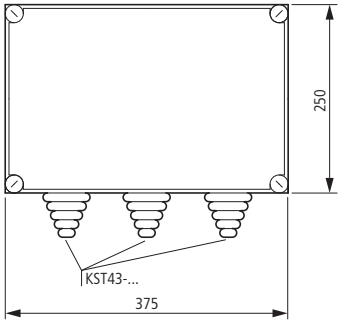
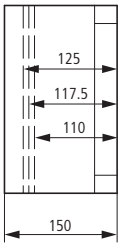
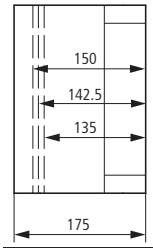
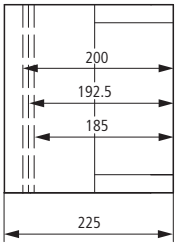
CI distribution board enclosure without cable gland plates

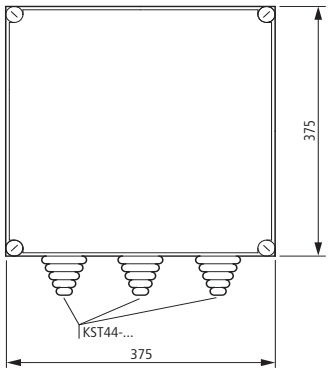
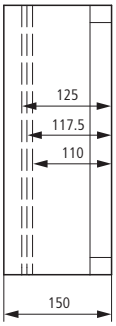
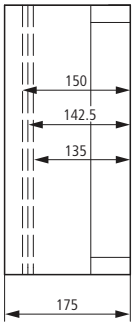
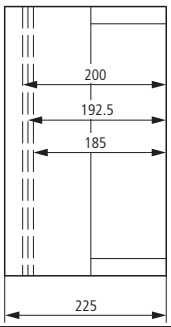
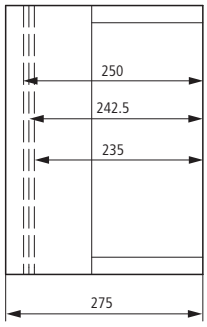
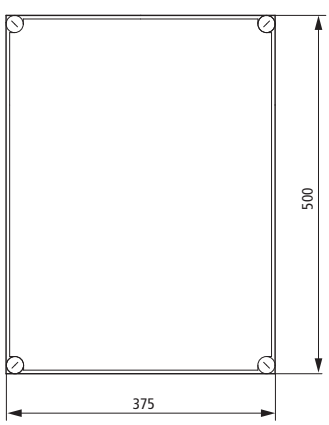
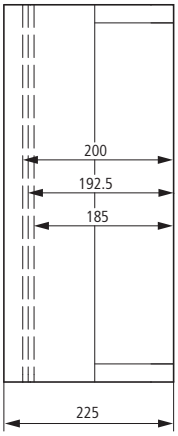
- Protection type IP65
- Sides closed, but with full area knockout, open top and bottom

KST distribution board enclosure with cable gland plates fitted

- Protection type IP65 (from bottom)
- Sides closed, but with full area knockout, open at top
- Mounting of cable supports in the distribution board with wedge-lock fastener
- Gland plate can be split, cables can be inserted from the front

Dimensions	Enclosure depth	Cable entry outer diameter	**Part no.** Article no.	**Price** See price list	Std. pack
		–	**CI23-125** 098208		1 off
		–	**CI23-150** 012781		
		2 x 14 - 54	**KST32-125** 069774		
		2 x 14 - 54	**KST32-150** 072147		
		2 x 14 - 54	**KST34-125** 076893		

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth	Cable entry outer diameter	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	mm			
		2 x 14 - 54	**KST34-150** 074520		1 off
		2 x 14 - 54	**KST34-200** 079266		
		– 3 x 14 - 68	**CI43-125** 017527 **KST43-125** 081639		
		– 3 x 14 - 68	**CI43-150** 022273 **KST43-150** 084012		
		– 3 x 14 - 68	**CI43-200** 027019 **KST43-200** 086385		

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth	Cable entry outer diameter	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	mm			
		–	**CI44-125** 012452		1 off
		3 x 14 - 68	**KST44-125** 088758		
		–	**CI44-150** 017198		
		3 x 14 - 68	**KST44-150** 091131		
		–	**CI44-200** 021944		
		3 x 14 - 68	**KST44-200** 093504		
		–	**CI44-250** 026690		
		3 x 14 - 68	**KST44-250** 095877		
		–	**CI45-200** 001896		

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth for mounting rail 15 mm height 4. Enclosure depth	Cable entry outer diameter	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	mm			

Distribution board with/without gland plates fitted

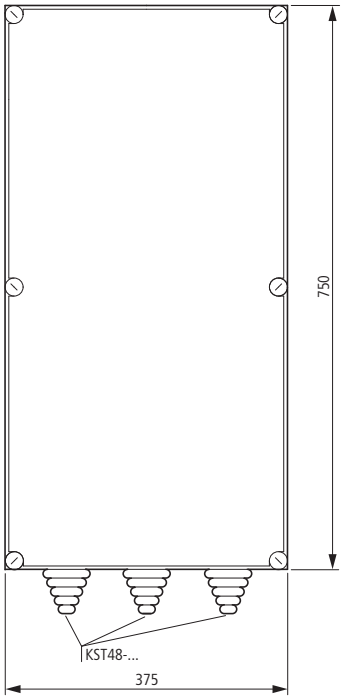
- Transparent cover, cover fasteners can be sealed.

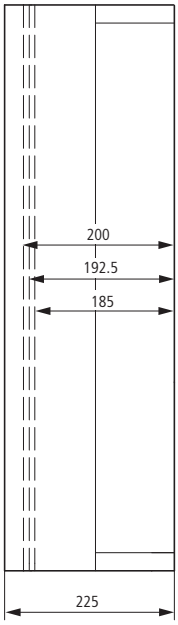
CI distribution board enclosure without cable gland plates

- Protection type IP65
- Sides closed, but with full area knockout, open top and bottom

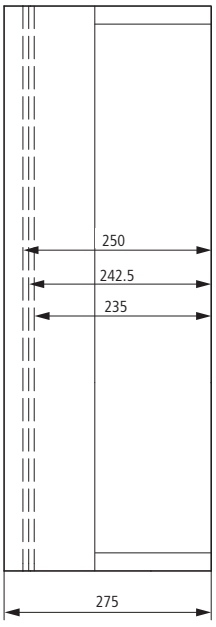
KST distribution board enclosure with cable gland plates fitted

- Protection type IP65 (from bottom)
- Sides closed, but with full area knockout, open at top
- Mounting of cable supports in the distribution board with wedge-lock fastener
- Gland plate can be split, cables can be inserted from the front





–	**CI48-200** 078896		1 off
3 x 14 - 68	**KST48-200** 098250		



–	**CI48-250** 083642		
3 x 14 - 68	**KST48-250** 010450		

Dimensions Width mm	Height mm	Depth mm	Mounting depth mm	**Part no.** Article no.	**Price** See price list	Std. pack
• Protection type IP65 • Base color RAL7032, fitted with removable smooth flanges on all four sides • Fixing straps for wall fixing						
Panel enclosures with cover and flanges • Transparent cover, cover fasteners can be sealed.						
234	296	150	125	**CI23-125-NA** 002234		1 off
234	296	175	150	**CI23-150-NA** 002237		
421	296	150	125	**CI43-125-NA** 002238		
421	296	175	150	**CI43-150-NA** 002241		
421	296	225	200	**CI43-200-NA** 002242		
421	421	150	125	**CI44-125-NA** 002245		
421	421	175	150	**CI44-150-NA** 002246		
421	421	225	200	**CI44-200-NA** 002249		
421	421	275	225	**CI44-250-NA** 002250		
421	546	225	200	**CI45-200-NA** 264024		
421	796	225	200	**CI48-200-NA**[1)] 002253		
421	796	275	250	**CI48-250-NA**[1)] 002254		
Panel enclosures with door and flanges[1)] • Transparent cover with door, cover fasteners can be sealed • Transparent door with quick-release fasteners and 180° door opening angle • Door hinges can be subsequently changed to left, right, top or bottom.						
234	296	166	125	**CI23-125/T-NA** 002235		1 off
234	296	191	150	**CI23-150/T-NA** 002236		
421	296	166	125	**CI43-125/T-NA** 002239		
421	296	191	150	**CI43-150/T-NA** 002240		
421	296	241	200	**CI43-200/T-NA** 002243		
421	421	166	125	**CI44-125/T-NA** 002244		
421	421	191	150	**CI44-150/T-NA** 002247		
421	421	241	200	**CI44-200/T-NA** 002248		
421	421	291	250	**CI44-250/T-NA** 002251		
421	796	241	200	**CI48-200/T-NA** 002252		
421	796	291	250	**CI48-250/T-NA** 002255		
421	796	241	200	**CI48-200/2T-NA** 002256		
421	796	291	250	**CI48-250/2T-NA** 002257		

Notes

Information relevant for export to North America

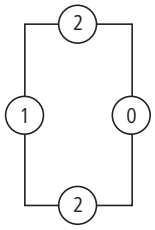
Product Standards	UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking
UL File No.	E54120, E337418
UL CCN	NITW
CSA File No.	27130
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Industrial Control Panels
Degree of Protection	IEC: IP65; UL/CSA Types 1, 12, 13, 4X, indoor only

[1)] IEC: IP65; UL/CSA Types 1, 12,13, indoor only

Dimensions Width mm	Height mm	Depth mm	Mounting depth mm	Base design	Part no. Article no.	Price See price list	Std. pack
Distribution board enclosures with cover and preassembled side walls							
• Protection type IP65 • Base RAL 7032, with different side plates on all four sides • Transparent cover, cover fasteners can be sealed.							
234	296	175	150	1 × without knockouts 1 x side plates knockout 2 × side plates with knockout	**CI23-2210-150-NA** 234059		1 off
421	296	175	150	2 × without knockouts 2 × side plates with knockout	**CI43-2200-150-NA** 234060		
421	296	175	150	3 × without knockouts 1 × side plates with knockout	**CI43-2000-150-NA** 234061		
421	296	175	150	1 × without knockouts 3 × side plates with knockout	**CI43-2022-150-NA** 234062		
421	296	225	200	2 × without knockouts 2 × side plates with knockout	**CI43-2200-200-NA** 234063		
421	421	175	150	2 × without knockouts 2 × side plates with knockout	**CI44-2200-150-NA** 234064		
421	421	175	150	1 × without knockouts 3 × side plates with knockout	**CI44-2220-150-NA** 234065		
421	421	225	200	2 × without knockouts 2 × side plates with knockout	**CI44-2200-200-NA** 234066		
421	421	275	225	2 × without knockouts 2 × side plates with knockout	**CI44-2200-250-NA** 234067		

Notes

Ordering example:



0 = without knockouts
1 = knockout
2 = knocked out

CI23-2210-150-NA

Features of the two short base sides

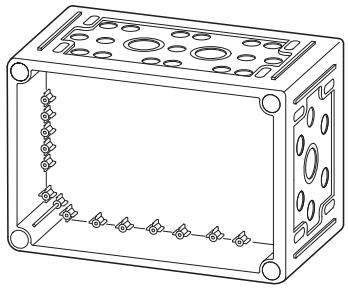
Features of the two long base sides

Information relevant for export to North America

Product Standards	UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking
UL File No.	E54120, E337418
UL CCN	NITW
CSA File No.	27130
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Industrial Control Panels
Degree of Protection	IEC: IP65; UL/CSA Types 1, 12, 13, 4X, indoor only

Bases for E-type individual enclosures

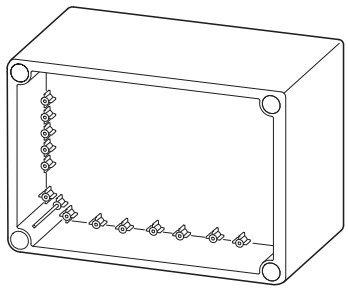
- Metric cable entry knockouts in all sides
- Full-area knockouts in the sides



Dimensions Width mm	Height mm	Cable entry Top and bottom	Sideways	Part no. Article no.	Price See price list	Std. pack
187.5	250	1 x M32/20 6 x M20 2 x M16	2 x M32/20 4 x M25/16 4 x M20 4 x M16	**U-CI23E** 038793		1 off
375	250	2 x M50/32 6 x M25/16 8 x M20	1 x M50/32 6 x M25/16	**U-CI43E** 064896		
	375	1 x M50/32 2 x M40/25 8 x M25/16 2 x M20	1 x M63/40 6 x M25/16 10 x M20 2 x M16	**U-CI44E** 069642		
	500	1 x M50/32 2 x M40/25 8 x M25/16 2 x M20	On each 2: 1 x M50/32 6 x M25/16	**U-CI45E** 001893		

Bases for X type individual enclosures

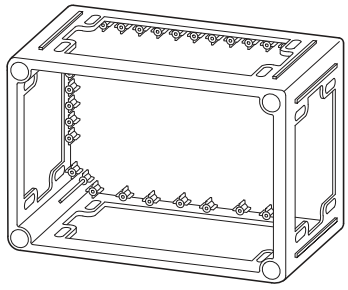
- Smooth side plates, without knockouts



Dimensions Width mm	Height mm	Cable entry Top and bottom	Sideways	Part no. Article no.	Price See price list	Std. pack
187.5	250	Drill as required	Drill as required	**U-CI23X** 057909		1 off
375	250			**U-CI43X** 062655		
	375			**U-CI44X** 067401		
	500			**U-CI45X** 098470		

Bases for panel enclosures

- Sides closed, but with full area knockout
- Open tip and bottom

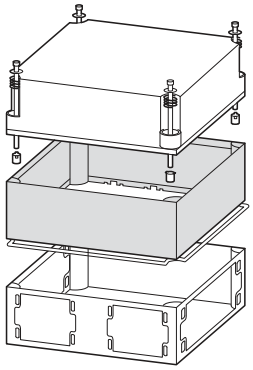


Dimensions Width mm	Height mm	Cable entry Top and bottom	Sideways	Part no. Article no.	Price See price list	Std. pack
187.5	250	Via FL2... flange	Via FL3... flange	**U-CI23** 060282		1 off
375	250	Via FL4... flange	Via FL3... flange	**U-CI43** 065028		
	375	Via FL4... flange	Via FL4... flange	**U-CI44** 067269		
	500	Via FL4... flange	Via FL3... flange	**U-CI45** 001894		
	750	Via FL4... flange	Via FL4... flange	**U-CI48** 083880		

Notes Flange → Page 20/23

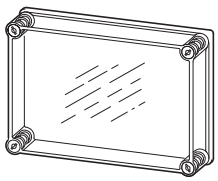
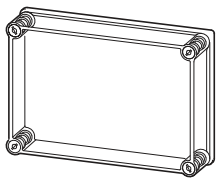
Enclosure intermediate frame

- For increased mounting depth
- Smooth side plates, without knockouts
- Color RAL 7032, pebble grey
- Screw-fitting cover fastener
- Equipment supplied: gasket, mounting accessories



Dimensions Width mm	Height mm	Mounting depth[1] mm	For use with	Part no. Article no.	Price See price list	Std. pack
375	500	275	U-CI45... D200-CI45 CI45...	**U-CI45-DR** 110103		1 off

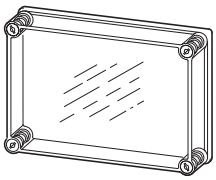
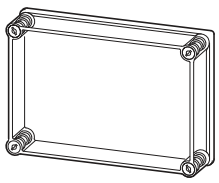
Notes [1] with cover D200-CI45

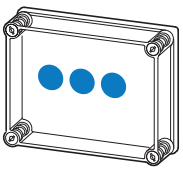
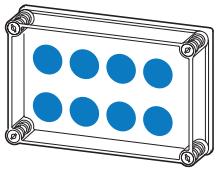
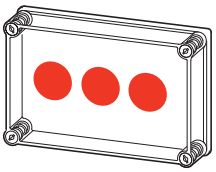
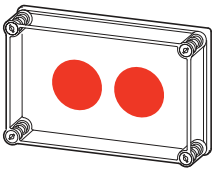
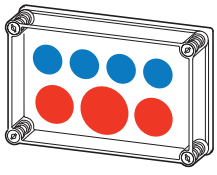
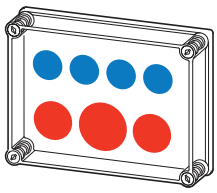
	Dimensions Width mm	Height mm	Mounting depth mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Enclosure covers without openings							
• Sealable cover fasteners • Sealing							
Cover, transparent							
	187.5	250	125	U-CI23…	**D125-CI23** 014830		10 off
			150	U-CI23…	**D150-CI23** 024322		4 off
	375	250	125	U-CI43…	**D125-CI43** 017203		5 off
			150		**D150-CI43** 038560		2 off
			200		**D200-CI43** 074155		2 off
		375	125	U-CI44…	**D125-CI44** 019576		5 off
			150		**D150-CI44** 040933		2 off
			200		**D200-CI44** 076528		2 off
			250		**D250-CI44** 081274		1 off
		500	200	U-CI45…	**D200-CI45** 001895		2 off
		750	200	U-CI48…	**D200-CI48** 078901		2 off
			250	U-CI48…	**D250-CI48** 083647		1 off
Enclosure covers without openings							
Cover, non-transparent ; color RAL 7032, pebble grey							
	187.5	250	125	U-CI23…	**D125-CI23-RAL7032** 098471		10 off
			150	U-CI23…	**D150-CI23-RAL7032** 098472		4 off
	375	250	125	U-CI43…	**D125-CI43-RAL7032** 002843		5 off
			200		**D200-CI43-RAL7032** 005216		2 off
			150		**D150-CI43-RAL7032** 098473		2 off
		375	125	U-CI44…	**D125-CI44-RAL7032** 007589		5 off
			200		**D200-CI44-RAL7032** 009962		2 off
			150		**D150-CI44-RAL7032** 098474		2 off
			250		**D250-CI44-RAL7032** 098475		1 off
		500	200	U-CI45…	**D200-CI45-RAL7032** 098476		2 off
		750	200	U-CI48…	**D200-CI48-RAL7032** 098477		2 off
		750	250	U-CI48…	**D250-CI48-RAL7032** 098478		1 off

Enclosure cover

D...-CI...-DVZ

HPL20018EN

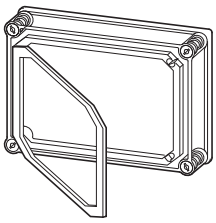
	Dimensions		Mounting depth	For use with	Number Cylindrical locks	**Part no.** Article no.	**Price** See price list	Std. pack
	Width	Height						
	mm	mm	mm					
Lockable enclosure covers without openings								
• Two or four lockable cover fasteners, diagonal with cylinder lock • Cylindrical locks, uniformly locking • Two diagonal lead-sealable cover locks. When also replacing all DV...-CI with DVZ...-CI, the sealing function is not available. • Equipment supplied: gasket, key								
Transparent cover								
	187.5	250	125	U-CI23...	2	**D125-CI23-DVZ** 138354		4 off
	187.5	250	150	U-CI23...	2	**D150-CI23-DVZ** 138355		4 off
	375	250	125	U-CI43...	2	**D125-CI43-DVZ** 138356		2 off
			150	U-CI43...	2	**D150-CI43-DVZ** 138357		
			200	U-CI43...	2	**D200-CI43-DVZ** 138358		
		375	125	U-CI44...	2	**D125-CI44-DVZ** 138359		
			150	U-CI44...	2	**D150-CI44-DVZ** 138520		
			200	U-CI44...	2	**D200-CI44-DVZ** 138521		
			250	U-CI44...	2	**D250-CI44-DVZ** 138522		
		500	200	U-CI45...	2	**D200-CI45-DVZ** 138523		
		750	200	U-CI48...	4	**D200-CI48-DVZ** 138524		
		750	250	U-CI48...	4	**D250-CI48-DVZ** 138525		
Non-transparent cover RAL7032								
	187.5	250	125	U-CI23...	2	**D125-CI23-RAL7032-DVZ** 138526		4 off
	187.5	250	150	U-CI23...	2	**D150-CI23-RAL7032-DVZ** 138527		4 off
	375	250	125	U-CI43...	2	**D125-CI43-RAL7032-DVZ** 138528		2 off
			150	U-CI43...	2	**D150-CI43-RAL7032-DVZ** 138529		
			200	U-CI43...	2	**D200-CI43-RAL7032-DVZ** 138530		
		375	125	U-CI44...	2	**D125-CI44-RAL7032-DVZ** 138531		
			150	U-CI44...	2	**D150-CI44-RAL7032-DVZ** 138532		
			200	U-CI44...	2	**D200-CI44-RAL7032-DVZ** 138533		
			250	U-CI44...	2	**D250-CI44-RAL7032-DVZ** 138534		
		500	200	U-CI45...	2	**D200-CI45-RAL7032-DVZ** 138535		
		750	200	U-CI48...	4	**D200-CI48-RAL7032-DVZ** 138536		
		750	250	U-CI48...	4	**D250-CI48-RAL7032-DVZ** 138537		

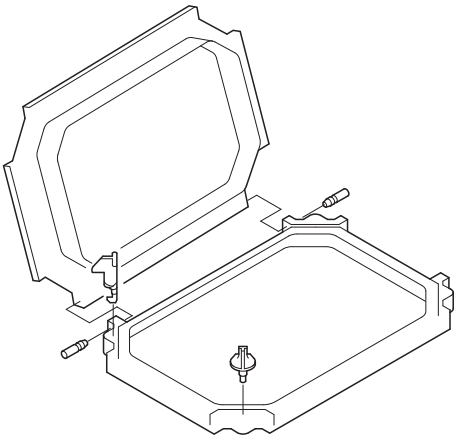
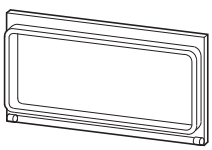
	For use with	Dimensions Width	Height	Mounting depth	Plug-in units Number of openings	For use with	Part no. Article no.	Price See price list	Std. pack
		mm	mm	mm					
Enclosure cover prepared for 16 to 125 A plug-in units									
• For individual enclosures or in distribution boards • For distribution board applications observe the characteristic data of the other apparatus. • Cover with knockouts for standardized 5-pole plug-in units • Plug-in units not included as standard • Order plug-in units separately, e.g. from Mennekes • Sealable cover fasteners • For retrofitting for various lockable covers, order also DVZ...-CI • Protection type IP44, gasket									
	Schuko socket 16 A	187.5	250	125	3	U-CI23...	**D125-CI23-RAL7032-STV3/16A** 138545		4 off
	Schuko socket 16 A	187.5	250	150	3	U-CI23...	**D150-CI23-RAL7032-STV3/16A** 138546		4 off
	Schuko socket 16 A	375	250	125	8	U-CI43...	**D125-CI43-RAL7032-STV8/16A** 138547		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV8/16A** 138548		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV8/16A** 138549		2 off
	CEE 16 A	375	250	125	3	U-CI43...	**D125-CI43-RAL7032-STV3/16A** 138550		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV3/16A** 138551		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV3/16A** 138552		2 off
	CEE 32 A			125		U-CI43...	**D125-CI43-RAL7032-STV3/32A** 138553		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV3/32A** 138554		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV3/32A** 138555		2 off
	CEE 63 A			125		U-CI43...	**D125-CI43-RAL7032-STV3/63A** 138556		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV3/63A** 138557		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV3/63A** 138558		2 off
	CEE 125 A	375	250	125	2	U-CI43...	**D125-CI43-RAL7032-STV2/125A** 138559		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV2/125A** 138560		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV2/125A** 138561		2 off
	4 x Schuko sockets 16 A 2 x CEE 16 A 1 CEE 32 A	375	250	125	7	U-CI43...	**D125-CI43-RAL7032-STV7/16-32A**		2 off
				150		U-CI43...	**D150-CI43-RAL7032-STV7/16-32A**		2 off
				200		U-CI43...	**D200-CI43-RAL7032-STV7/16-32A** 138564		2 off
	4 x Schuko sockets 16 A 2 x CEE 16 A 1 CEE 32 A	375	375	125	7	U-CI44...	**D125-CI44-RAL7032-STV7/16-32A**		2 off
				150		U-CI44...	**D150-CI44-RAL7032-STV7/16-32A**		2 off
				200		U-CI44...	**D200-CI44-RAL7032-STV7/16-32A**		2 off
				250		U-CI44...	**D250-CI44-RAL7032-STV7/16-32A**		2 off

Enclosure covers and doors

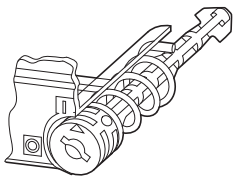
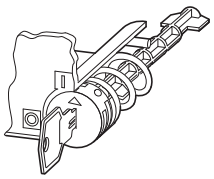
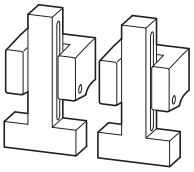
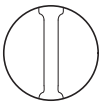
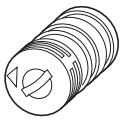
D...-CI...T, T-CI...

HPL20020EN

	Mounting depth mm	For use with	Part no. Article no.	Price See price list	Std. pack
Enclosure covers with door					
• Protection type IP65 • Transparent door, with quick-release fasteners and 180° door opening angle • Door hinges can be subsequently changed to left, right, top or bottom.					
	125	U-CI23…	**D125-CI23/T** 072476		10 off
	150	U-CI23…	**D150-CI23/T** 074849		4 off
	125	U-CI43…	**D125-CI43/T** 077222		2 off
	150	U-CI43…	**D150-CI43/T** 079595		2 off
	200	U-CI43…	**D200-CI43/T** 081968		2 off
	125	U-CI44…	**D125-CI44/T** 084341		2 off
	150	U-CI44…	**D150-CI44/T** 086714		2 off
	200	U-CI44…	**D200-CI44/T** 089087		2 off
	250	U-CI44…	**D250-CI44/T** 091460		1 off

	For use with	Part no. Article no.	Price See price list	Std. pack
Doors				
• Protection type IP65 • Door opening angle to 180° • Door hinges can be subsequently changed to right, left, top or bottom. • Adhesive film for marking the cutout • Fixing screws • Transparent				
	CI23…, D…-CI23	**T-CI23** 093833		2 off
	CI43…, D…-CI43 CI45…, D…-CI45	**T-CI43** 096206		1 off
	CI44…, D…-CI44 CI48…, D…-CI48	**T-CI44** 098579		
Hinged flaps				
• For positioning on cover, change as required • Protection type IP55 • Opening angle to 180° • Hinge on one side cannot be changed • Transparent				
	D...-CI... 145 x 80 mm	**K-A** 043372		
	D...-CI... 185 x 90 mm	**KG-A** 055244		

For use with	Mounting depth mm	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**	
Cover						
• Transparent • Sealable cover fasteners • Gaskets						
U-CI23…	125	**D125-CI23-NA** 014286		10 off	Product Standards	UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking
	150	**D150-CI23-NA** 014334		4 off	UL File No.	E54120, E337418
U-CI43…	125	**D125-CI43-NA** 014433		5 off	UL CCN	NITW
	150	**D150-CI43-NA** 014480		2 off	CSA File No.	27130
	200	**D200-CI43-NA** 014771		2 off	CSA Class No.	3211-07
U-CI44…	125	**D125-CI44-NA** 014838		5 off	NA Certification	UL Listed, CSA certified
	150	**D150-CI44-NA** 010937		2 off	Specially designed for NA	Yes
	200	**D200-CI44-NA** 010985		2 off	Suitable for	Refer to main component information
	250	**D250-CI44-NA** 011049		1 off		
U-CI45...	200	**D200-CI45-NA** 264022		2 off		
U-CI48…	200	**D200-CI48-NA** 011878		1 off		
	250	**D250-CI48-NA** 011906		1 off		
Covers with door						
• Transparent • Protection type IP65						
U-CI23…	125	**D125-CI23/T-NA** 012038		1 off	Product Standards	UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking
	150	**D150-CI23/T-NA** 012097			UL File No.	E54120, E337418
U-CI43…	125	**D125-CI43/T-NA** 012115			UL CCN	NITW
	150	**D150-CI43/T-NA** 012147			CSA File No.	27130
	200	**D200-CI43/T-NA** 012195			CSA Class No.	3211-07
U-CI44…	125	**D125-CI44/T-NA** 012335			NA Certification	UL Listed, CSA certified
	150	**D150-CI44/T-NA** 012357			Specially designed for NA	Yes
	200	**D200-CI44/T-NA** 012780			Suitable for	Refer to main component information
	250	**D250-CI44/T-NA** 012809				
U-CI48…	200	**D200-CI48/T-NA** 012842				
	250	**D250-CI48/T-NA** 012863				
	200	**D200-CI48/2T-NA** 012392				
	250	**D250-CI48/2T-NA** 012411				

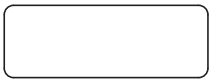
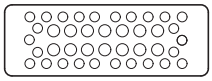
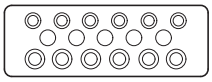
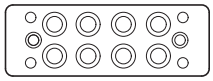
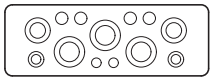
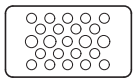
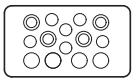
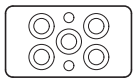
	For use with	Part no. Article no.	Price See price list	Std. pack
Cover fasteners for CI enclosures				
	CI23: 4 off CI43: 4 off CI44: 4 off	**DV125-CI** 001923		10 off
	CI23: 4 off CI43: 4 off CI44: 4 off CI45: 4 off CI48: 6 off	**DV150-250-CI** 001924		10 off
Cover fasteners with cylinder lock for CI enclosures[1)]				
• Lockable cover fasteners with cylinder lock, uniform locking • Key				
	CI23... max. 4 off CI43... max. 4 off CI44... max. 4 off	**DVZ125-CI** 133100		2 off
	CI23... max. 4 off CI43... max. 4 off CI44... max. 4 off CI45... max. 4 off CI48... max. 6 off	**DVZ150-250-CI** 133101		2 off
Set of cover hinges				
• For CI...E, CI...X individual enclosures • For CI... panel enclosure on the sides if a flange is not installed				
	CI23: 1 set CI43: 1 set CI44: 1 set CI45: 1 set CI48: 1 set Each set consists of 2 hinges.	**DSCH-CI** 034224		5 off
Handgrip				
• Quick-release fastener for opening enclosures manually • Higher cover in conjunction with the extension for the handle				
	CI23(…)-125, 150: 4 off CI43(…)-125, 150: 4 off CI44(…)-125, 150: 4 off	**HG-CI** 046382		20 off
Extension for handle				
• Can be fitted to cover				
	CI43-200/(D200-CI43): 4 off CI44-200/(D200-CI44): 4 off CI48-200/(D200-CI48): 6 off	**VHG50-CI** 044880		8 off
Sealing kit				
• At the top edge of cover with D200-...				
	Use one set diagonally per enclosure. One set consists of 2 sealable locks.	**PLV200-CI** 044881		5 off

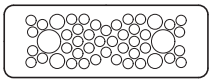
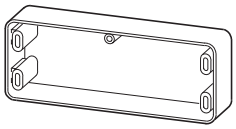
Notes

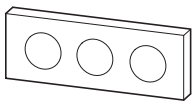
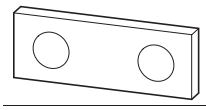
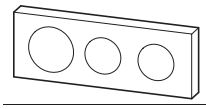
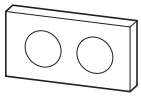
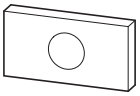
[1)] For sealing, use at least one cover fastener DV125-CI or DV150-250-CI.

Information relevant for export to North America

Product Standards	UL 508A; CSA-C22.2 No.94; IEC/ EN 60529; CE marking
UL File No.	E54120, E337418
UL CCN	NITW
CSA File No.	27130
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Suitable for	Industrial Control Panels
Degree of Protection	IEC: IP65; UL/CSA Types 1, 12, 13, 4X, indoor only

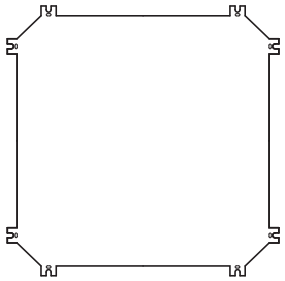
	Cable entry	Part no. Article no.	Price See price list	Std. pack
Flanges				
• Captive, sponge-rubber gaskets • Quick mounting using wedge lock fasteners (included as standard)				
For enclosure dimension 375 mm				
	Drill as required	**FL4-X** 024355		10 off
	26 x M16, 14 x M20	**FL4-2** 014863		
	5 x M25, 6 x M25/16, 6 x M32/20	**FL4-3** 017236		
	4 x M16, 2 x M25/16, 8 x M40/25	**FL4-4** 019609		
	2 x M16, 4 x M20, 2 x M25/16, 2 x M40/25, 3 x M50/32	**FL4-5** 021982		
For enclosure dimension 250 mm				
	Drill as required	**FL3-X** 093171		10 off
	18 x M16, 4 x M20	**FL3-1** 088425		
	6 x M20, 4 x M25, 4 x M25/16	**FL3-2** 090798		
	1 x M16, 5 x M40/25	**FL3-3** 022644		
For enclosure dimension 187.5 mm				
	Drill as required	**FL2-X** 086052		10 off
	10 x M16, 3 x M20	**FL2-2** 017898		
	6 x M20, 2 x M25/16	**FL2-3** 020271		
For enclosure dimension 125 mm				
	Drill as required	**FL1-X** 078933		10 off

	External diameter of cable mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Sponge-rubber flange IP54					
• Protection type IP54 • For enclosure dimension 375 mm					
	42 x 10 - 13 4 x 15 - 19 2 x 20 - 30	NYY, NYM 3 x 1.5 mm^2 - 5 x 2.5 mm^2 NYY, NYM 4 x 4 mm^2 - 5 x 10 mm^2 NYY, NYM 4 x 10 mm^2 - 4 x 50 mm^2	**FL4-D** 044879		10 off
Spacers					
• To enlarge the connection compartment by 25 mm					
	–	For fitting to enclosure side, 250 mm for FL3-... flange	**ZRF3** 067734		2 off
	–	For fitting to enclosure side, 375 mm for FL4-... flange	**ZRF4** 070107		2 off

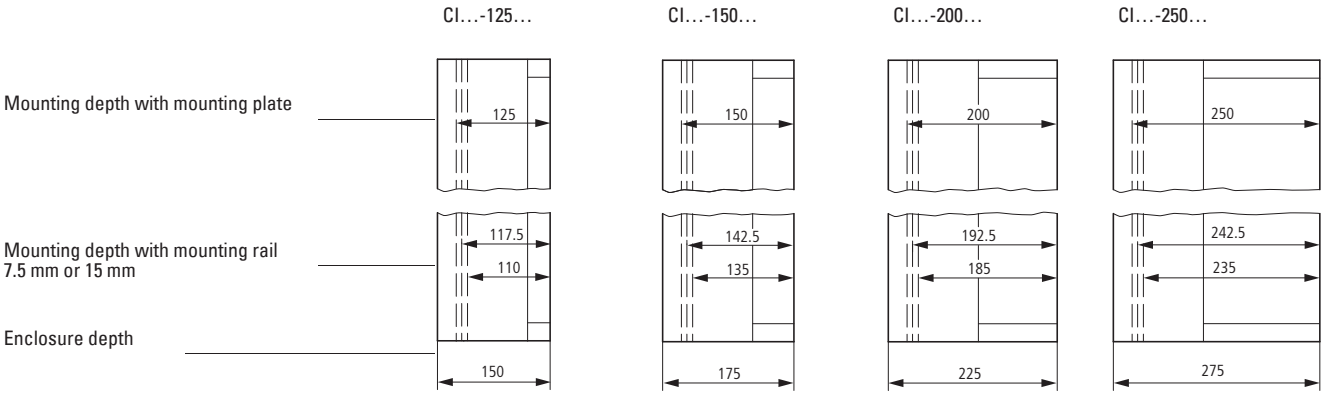
	For use with enclosure size	Plug-in units Number of openings	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Flanges prepared for Schuko or high-voltage sockets up to 32 A						
• Flange non-transparent RAL7032 • Captive, sponge-rubber gaskets • Quick mounting using wedge lock fasteners (included as standard) • Flanges milled out and predrilled for standardized 5-pole plug-in units • Order plug-in units separately, e.g. from Mennekes • Protection type IP44						
	375 mm	3	Schuko sockets 16 A	**FL4-STV3/16A** 138569		2 off
	375 mm	2	Schuko sockets 16 A	**FL4-STV2/16A** 138570		
	375 mm	3	1 x CEE 32 A 2 x Schuko sockets 16 A	**FL4-STV3/16-32A** 138571		
	250 mm	2	Schuko sockets 16 A	**FL3-STV2/16A** 138572		
	250 mm	1	1 x CEE 16 A	**FL3-STV/1/16A** 138573		

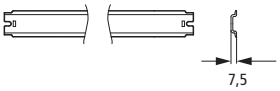
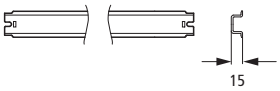
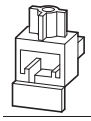
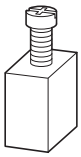
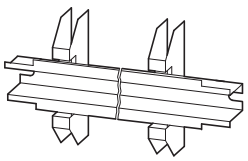
For use with	Mounting depth mm	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Doors					
• Protection type IP65 • Door opening angle 180° • Door hinges can be subsequently changed to left, right, top or bottom. • Adhesive film for marking the cutout • Fixing screws • Transparent					
Mounting on all enclosure covers D…-CI23-NA		**T-CI23-NA** 011925		1 off	Product Standards: UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking UL File No.: E54120, E337418 UL CCN: NITW CSA File No.: 27130 CSA Class No.: 3211-07 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Refer to main component information
Mounting on all enclosure covers D…-CI43-NA		**T-CI43-NA** 011957			
Mounting on all enclosure covers D…-CI44-NA and D…-CI48-NA		**T-CI44-NA** 012001			

For use with enclosure size	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Flanges				
187.5 mm	**FL2-X-NA** 208310		10 off	Product Standards: UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking UL File No.: E54120, E337418 UL CCN: NITW CSA File No.: 27130 CSA Class No.: 3211-07 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Refer to main component information
250 mm	**FL3-X-NA** 012462			
375 mm	**FL4-X-NA** 208309			
Spacers				
For enlarging the cable entry space, in conjunction with flange FL3-X-NA	**ZRF3-NA** 012479		2 off	Product Standards: UL 508A; CSA-C22.2 No.94; IEC/EN 60529; CE marking UL File No.: E54120, E337418 UL CCN: NITW CSA File No.: 27130 CSA Class No.: 3211-07 NA Certification: UL Listed, CSA certified Specially designed for NA: Yes Suitable for: Refer to main component information

	For use with	Thread	**Part no.** Article no.	**Price** See price list	Std. pack
Mounting plates					
Including 4 captive fixing screws Galvanized steel, 3 mm thick					
	CI23	–	**M3-CI23** 019709		5 off
	CI43...: 1 x CI45...: 2 x	–	**M3-CI43** 029201		
	CI44	–	**M3-CI44** 031574		
	CI45	–	**M3-CI45** 003036		
	CI48	–	**M3-CI48** 036320		
Glass-fibre reinforced insulating material, 4 mm thick Devices are secured using hank nuts					
	CI23	–	**IM4-CI23** 086081		5 off
	CI43...: 1 x CI45...: 2 x	–	**IM4-CI43** 088454		
	CI44	–	**IM4-CI44** 090827		
	CI48	–	**IM4-CI48** 093200		
Hank nuts for insulating material mounting plate					
		M4	**EM4-CI** 002293		100 off
	–	M5	**EM5-CI** 002294		
	–	M6	**EM6-CI** 002295		

Notes



	For use with	Part no. Article no.	Price See price list	Std. pack
Module mounting rail				
• Useful length 330 mm for enclosure dimension 375 mm • Galvanized steel, 3 mm thick • Including fixing screws				
	Horizontal CI43 CI44 CI45 CI48 Vertical CI44	**ML4** 041069		10 off
Mounting rails according to IEC/EN 60715				
• Galvanized sheet steel • Including 2 captive fixing screws				
Height 7.5 mm				
	Useful length 145 mm for enclosure dimension 187.5 mm	**CL2** 029064		20 off
	Useful length 207 mm for enclosure dimension 250 mm	**CL3** 033810		
	Useful length 332 mm for enclosure dimension 375 mm	**CL4** 038556		
Height 15 mm				
	Useful length 145 mm for enclosure dimension 187.5 mm	**CL2-15** 031437		10 off
	Useful length 207 mm for enclosure dimension 250 mm	**CL3-15** 036183		
	Useful length 332 mm for enclosure dimension 375 mm	**CL4-15** 040929		
Accessories for mounting systems				
Spacers • For raising the mounting systems • (4 off required for mounting plate, 2 off required for mounting rail)				
	by 25 mm	**HS25-CI** 002291		25 off
	by 50 mm	**HS50-CI** 002292		25 off
	by 10 mm	**ADT200-190** 002289		10 off
	by 15 mm	**ADT125-110** 002290		10 off
Captive screw • For fixing the mounting systems • Spare parts				
–	Mounting plates, pre-drilled mounting plates, mounting rails, module mounting rails	**UBS4.8** 002288		25 off
Mounting rail support				
	CL4-15 Weight without TS… ≦ 4 kg, with TS… ≦ 10 kg, without TS… with HS25… ≦ 3 kg, without TS… with HS50… ≦ 1.5 kg	**TSCL4-15** 098480		10 off

Fitting of meters

GA...I..., AH-GA, HBA-..., BFS-...

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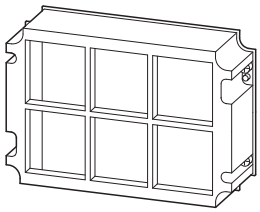
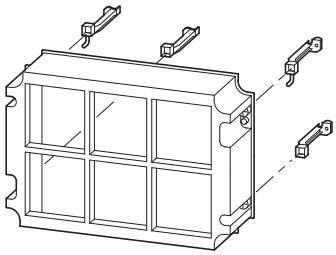
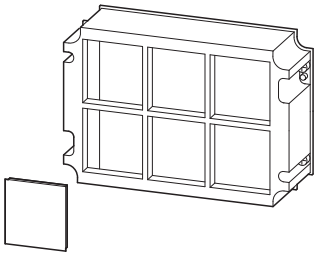
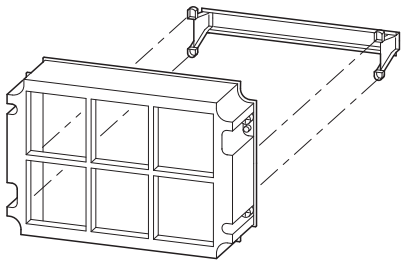
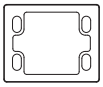
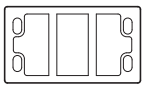
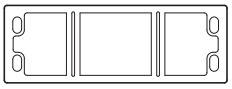
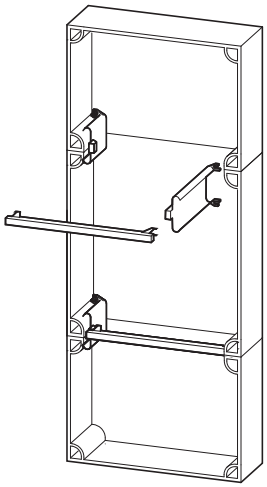
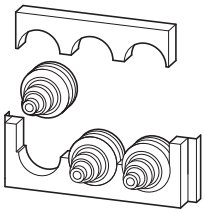
	For use with	Part no. Article no.	Price See price list	Std. pack
Meter covers				
In CI43E-200, CI44E-250 enclosures For up to six 96 × 96 mm snap-on metering devices. The meter shroud is secured using AH-GA support brackets.				
	CI43E-200, CI44E-200 enclosures	**GA-MS-I43** 053502		1 off
	CI44E-250 enclosure	**GA-MS-I44** 055875		1 off
Set of support brackets				
	For meter and protective shrouds (order meter shroud GA-MS-I43 separately). Each set consists 4 brackets.	**AH-GA** 002305		10 off
Retaining frame				
	To cover unused spaces: Also required as an adapter with snap-on 72 × 72 mm meters and when fitting PKZM0 (voltmeters) as well as T0-... (meter changeover switch). (Order GA-MS-I43 meter shroud separately)	**HBA-4344** 002316		10 off
Fixing kits				
	For mounting up to two PKZM0, T0 Fitting parallel to 250 mm side of the enclosure. (Order GA-MS-I43 meter shroud separately)	**BFS-PT3** 002317		5 off
	For mounting up to three PKZM0, T0 Fitting parallel to 375 mm side of the enclosure. (Order GA-MS-I43 meter shroud separately)	**BFS-PT4** 002318		5 off

	For use with For use with enclosure size	**Part no.** Article no.	**Price** See price list	Std. pack
Connection kits				
Insulating wedge-lock fastener for connecting the enclosures with each other				
	187.5 mm	**BS2-CI** 090750		10 off
	250 mm 500 mm Use two off	**BS3-CI** 097869		
	375 mm 750 mm Use two off	**BS4-CI** 014815		
Flange adapters				
For connecting enclosures with sides of different lengths				
	–	**FT-CI** 002319		10 off
Cross strut kits				
Enables fitting of cables or busbars from the front				
	250 mm	**STB3-CI** 219217		1 off
	375 mm	**STB4-CI** 034223		1 off
Stepped cable grommets				
Enables fitting of cables or busbars from the front				
	250 mm For 2 cables of 14 – 54 mm	**KS3-CI** 057621		1 off
	375 mm For 3 cables of 14 – 68 mm	**KS4-CI** 062367		1 off

Accessories for enclosure assembly

BL...CI, W..., LT284..., VS...CI, K...CI, D...CI

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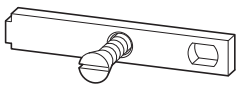
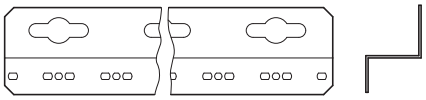
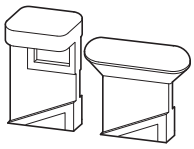
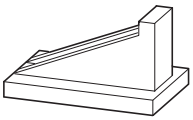
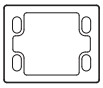
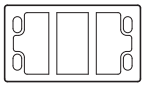
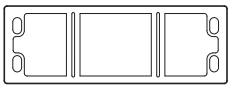
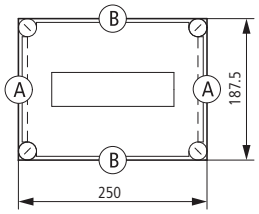
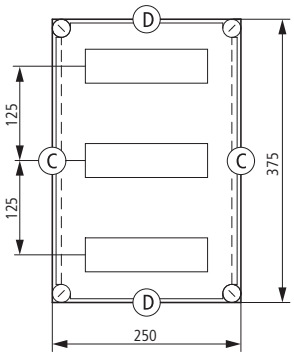
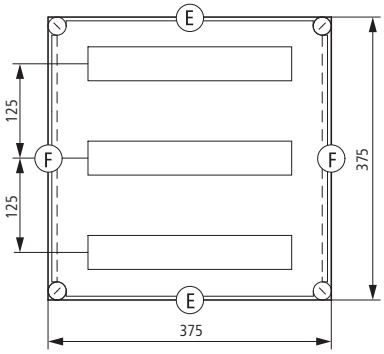
	For use with	Part no. Article no.	Price See price list	Std. pack
Fixing strap kits				
• For securing CI enclosures directly to the wall • For max. 4 CI43... enclosures				
	Each set contains 4 straps.	**BL-CI** 036168		5 off
	Steel type V2A Each set contains 4 straps.	**BL-CI-VA** 038541		5 off
Wall fixing bracket				
• For securing CI enclosures directly to the wall with a clearance of 50 mm • Fit one wall fixing bracket to every second enclosure across the width, for transport purposes add more brackets at the bottom				
	Section length 2125 mm, cut to fit.	**W16/32** 090146		1 off
	Max. 2 × CI43 one above the other	**W4/8** 048755		
	Max. 2 × CI44 one above the other	**W6/12** 051128		
	Max. 4 × CI43 one above the other	**W8/16** 053501		
	Max. 5 × CI43 one above the other	**W10/20** 055874		
Fixing screw				
	For securing CI enclosures to wall fixing brackets W... For fixing CI enclosures on WS..., WW... profiles	**LT284-M6X20-C** 050325		100 off
Coupling piece				
	Enclosure assembly and flange connection, K-CI required	**VS-CI** 002315		100 off
	For attatching gland plates, K-CI required	**VS-KS-CI** 038460		25 off
Wedge				
	With VS-CI or VS-KS-CI for enclosure assembly and attaching flanges and gland plates	**K-CI** 002314		100 off
Bracket				
	Enclosure assemblies, enclosure dimension 375 mm	**KD4-CI** 002313		25 off
Gaskets				
For enclosure assembly				
	Enclosure dimension 187.5 mm	**D2-CI** 002310		20 off
	Enclosure dimension 250 mm	**D3-CI** 002311		
	Enclosure dimension 375 mm	**D4-CI** 002312		

Dimensions mm	Single-pole miniature circuit-breakers (space unit) Number	PE and N terminals Number x cross-section mm²	Model Type cover	 Type door	**Part no.** Article no.	**Price** See price list	Std. pack
MCB individual enclosures							
• Metric cable entry knockouts in all sides • Protection type IP65 • For flush mounting devices with size 1 to DIN 43880 • Transparent cover with quick-release fasteners, transparent door for operator access to devices fitted • Mounting rails for snap-fitting the devices • Blanking strip for unused locations, protective shroud with inscription label • PE/N bars • Fixing straps for wall mounting, cover fasteners can be sealed • Enclosure depth 150 mm							
	9	On each 2 x (6 - 16) On each 7 x (1 - 4)	Transparent	–	**AE/I23E** 029766		1 off
	9	On each 2 x (6 - 16) On each 7 x (1 - 4)	–	Transparent	**AE/I23E/T** 032139		
	27	On each 4 x (6 - 35) On each 20 x (1 - 4)	Transparent	–	**AE/I43E** 000239		
	27	On each 4 x (6 - 35) On each 20 x (1 - 4)	–	Transparent	**AE/I43E/T** 002612		
	45	On each 4 x (6 - 35) On each 20 x (1 - 4)	Transparent	–	**AE/I44E** 004985		
	45	On each 4 x (6 - 35) On each 20 x (1 - 4)	–	Transparent	**AE/I44E/T** 061937		

Notes

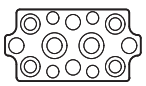
- - - PE/N bars

A



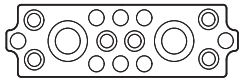
1 x M32/20
6 x M20
2 x M16

B



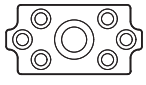
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C



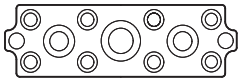
2 x M50/20
6 x M25/16
8 x M20

D



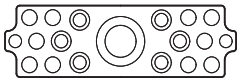
1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

F

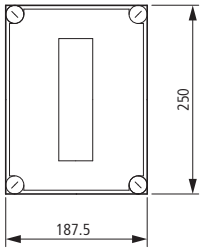
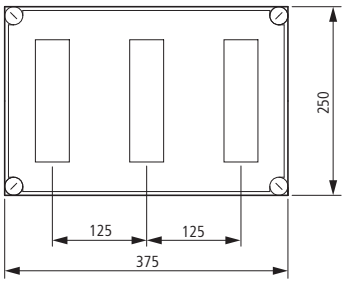
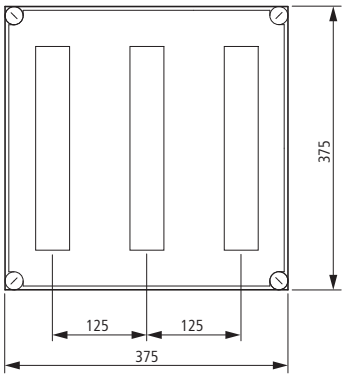


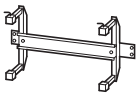
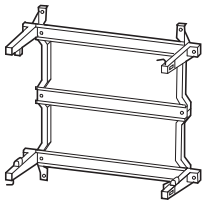
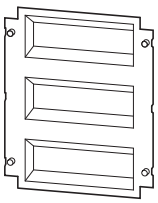
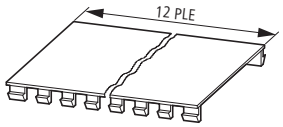
1 x M63/40
6 x M25/16
10 x M20
2 x M16

Enclosures for miniature circuit-breakers

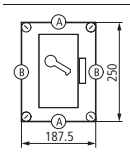
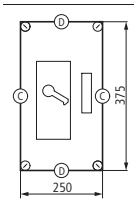
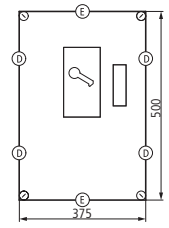
AV/I...

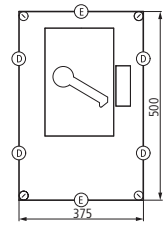
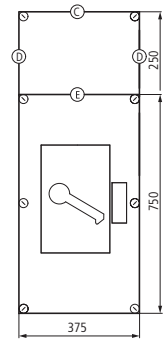
HPL20032EN

Dimensions mm	Enclosure depth mm	Single-pole miniature circuit-breakers (space unit) Number	**Part no.** Article no.	**Price** See price list	Std. pack
Enclosures for miniature circuit-breakers					
• Sides closed, but with full area knockout, open top and bottom • Protection type IP65 • For flush mounting devices with size 1 to DIN 43880 • Transparent cover with quick-release fasteners • Mounting rails for snap-fitting the devices • Blanking strip for unused locations, protective shroud with inscription label • Fixing straps for wall mounting, cover fasteners can be sealed					
	150	9	**AV/I23-125** 036089		1 off
	175	9	**AV/I23-150** 043208		
	150	27	**AV/I43-125** 047954		
	225	27	**AV/I43-200** 045581		
	150	45	**AV/I44-125** 059819		
	225	45	**AV/I44-200** 062192		

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Mounting rail supports					
One row					
	CI23	**TG23** 044004		1 off	162 mm busbar lengths For 9 space units
Three rows					
	CI43	**TG43** 046377		1 off	162 mm busbar lengths for 3 x 9 space units
	CI44	**TG44** 048750		1 off	270 mm busbar lengths for 3 x 15 space units
Protective shroud					
Busbar tag shroud with inscription label					
	TG23	**GA-0/I23** 051123		5 off	–
	TG43	**GA-0/I43** 053496			–
	TG44	**GA-0/I44** 055869			–
Blanking strips					
For blanking off unused locations					
	GA-0/I…	**VST12** 002322		10 off	For 12 space units

	PE and N terminals Quantity x Cross-section mm²	Gauge pin IEC/EN 60947-1	For use with	Part no. Article no.	Price See price list	Std. pack
N bars						
	2 x 6 - 35 7 x 1 - 4	B8, A3	TG23	**N23AE** 058242		1 off
	4 x 6 - 35 20 x 1 - 4	B8, A3	TG43 TG44	**N434AE** 060615		1 off
PE (PEN) bars						
	4 x 6 - 35 20 x 1 - 4	B8, A3	TG43 TG44	**PEN434AE** 062988		1 off
	2 x 6 - 35 7 x 1 - 4	B8, A3	TG23	**PEN23AE** 065361		1 off

	Rated uninterrupted current I_u A	Can be used for basic device	Can be used with terminals[2]	Basic enclosure	**Part no.** Article no.	**Price** See price list	Std. pack
Enclosures for NZM... circuit-breakers/N... switch-disconnectors, 3- and 4-pole							
• For use as individual enclosures[1] or in distribution boards • For distribution board applications observe the characteristic data of other apparatus. • Protection type IP65, when enclosures closed throughout • Metric cable entry knockouts in all sides. Exception: CI48...: Side panels without knockouts, open at bottom • Sidewalls with knockouts; can be grouped with other devices • With door coupling rotary handle **NZM...-XTVD** and extension shaft • Transparent cover, predrilled • Mounting plate predrilled for switches and one PE and N terminal each • Mounting plate, 3 mm sheet steel • Sealable cover fasteners • Fixing material for fixing material • Fixing strap BL-CI • Can not be combined with remote operator NZM...-XR, plug-in unit NZM...-XSV or withdrawable unit NZM...-XAV. • Rated operating voltage 690 V AC							
	63	NZM1(-4) N1(-4) N(S)1(-4)	K10/1 K25/1 K50/1 K95/1N...	CI23E-150	**MCCB1-63/I23E-150** 138538		1 off
	125	NZM1(-4) N1(-4) N(S)1(-4)	K10/1 K25/1 K50/1 K95/1N...	CI43E-150	**MCCB1-125/I43E-150** 138539		
	160	NZM1(-4) N1(-4) N(S)1(-4)	K10/1 K25/1 K50/1 K95/1N...	CI43E-200	**MCCB1-160/I43E-200** 138540		
	200	NZM2(-4) N2(-4) N(S)2(-4)	K10/1 K25/1 K50/1 K95/1N... K150/1N...	CI43E-200	**MCCB2-200/I43E-200** 138541		
	250	NZM2(-4) N2(-4) N(S)2(-4)	K10/1 K25/1 K50/1 K95/1N... K150/1N...	CI45E-200	**MCCB2-250/I45E-200** 138542		

	Rated uninterrupted current I_u A	Can be used for basic device	Can be used with terminals[2]	Basic enclosure	**Part no.** Article no.	**Price** See price list	Std. pack
	400	NZM3(-4) N3(-4) N(S)3(-4)	K50/1 K95/1N... K150/1N... K240/1N...	CI45E-200	**MCCB3-400/I45E-200** 138543		1 off
	630	NZM3(-4) N3(-4) N(S)3(-4)	K50/1 K95/1N... K150/1N... K240/1N... K2X240/1N...	CI combination of CI48-200 + CI43E-200 + STB4-CI	**MCCB3-630/I48/I43E-200** 138544		

Notes

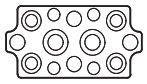
[1] Order insulated additional terminal for fourth or fifth pole separately → Chapter 16, Accessories for control panels
[2] Observe short-circuit values of individual enclosures → Chapter 17: Compact circuit-breakers NZM, compact switch-disconnectors N up to 1600 A

A



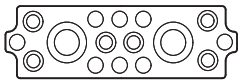
1 x M32/20
6 x M20
2 x M16

B



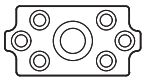
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C



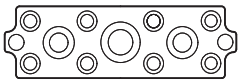
2 x M50/20
6 x M25/16
8 x M20

D

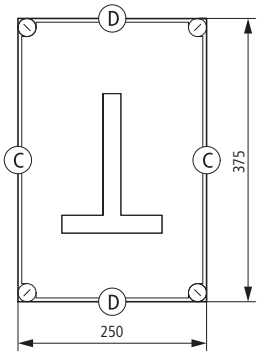
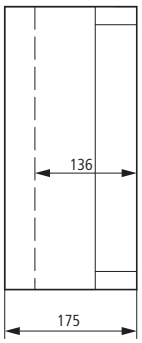
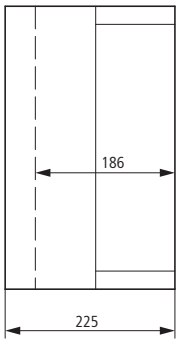
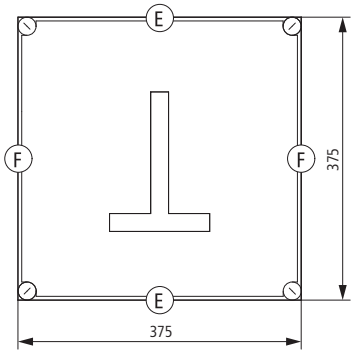
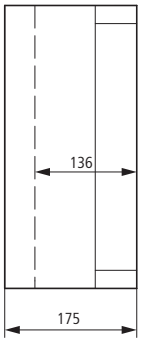
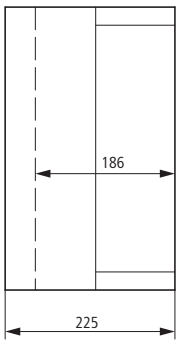


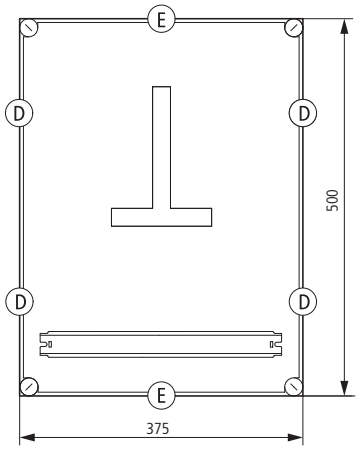
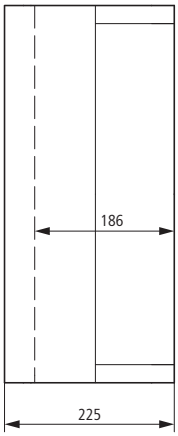
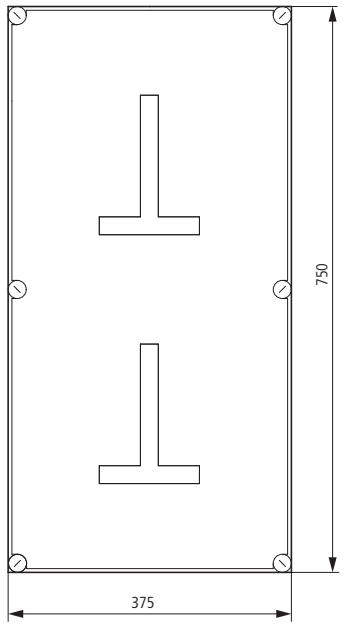
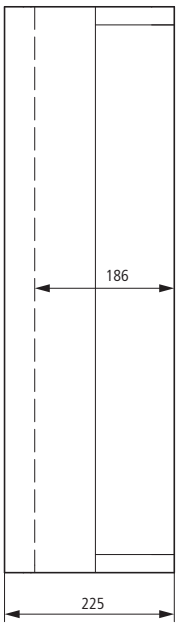
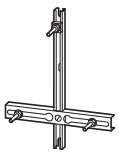
1 x M50/32
6 x M25/16

E



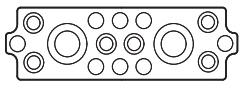
1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

Dimensions mm	Enclosure depth: dimensions from top: 1. Meter rail 2. Enclosure depth mm	Type cover	**Part no.** Article no.	**Price** See price list	Std. pack
Meter enclosures , meter rail					
• Metric cable entry knockouts in all sides (exception: ZG/I48-200) • Protection type IP65 • Cover/door transparent • ZG/I48-200 top and bottom with full area knockouts for FL4... flange • Meter rail to DIN 43853 including meter fixing screws and nuts • Fixing straps for wall fixing • Sealable fasteners at the top edge of the cover					
		Transparent	**ZG/I43E-G-150** 013151		1 off
		Transparent	**ZG/I43E-G-200** 015524		
		Transparent	**ZG/I44E-150** 017897		
		Transparent	**ZG/I44E-200** 020270		

Dimensions mm	Enclosure depth: dimensions from top: 1. Meter rail 2. Enclosure depth mm	Type cover/ Type door	**Part no.** Article no.	**Price** See price list	Std. pack
Meter enclosures , meter rail					
		Transparent	**ZG/I45E-200-T** 090145		1 off
		Transparent	**ZG/I45E-200** 098479		
		Transparent	**ZG/I48-200** 022643		
Meter rail					
	–	To DIN 43853, including three counter fixing bolts with nuts to DIN 46300. For fitting on mounting plates, sealing → Page 20/22 → Page 20/26	**ZK1** 001892		5 off

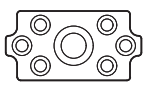
Notes

C



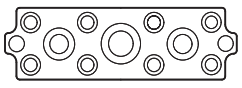
2 x M50/20
6 x M25/16
8 x M20

D



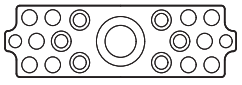
1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

F

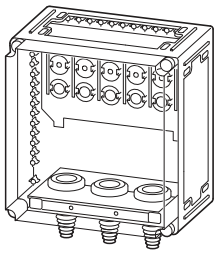


1 x M63/40
6 x M25/16
10 x M20
2 x M16

Distribution board terminal enclosure

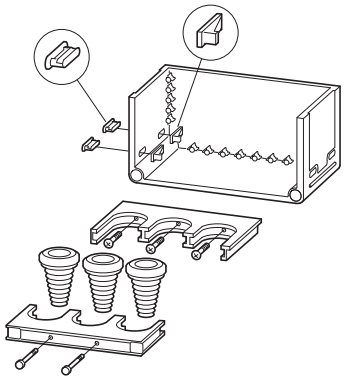
K...KST

HPL20038EN

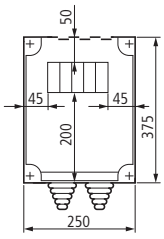
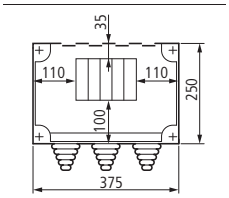
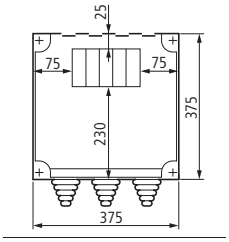


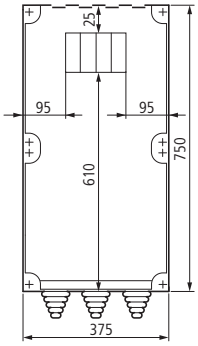
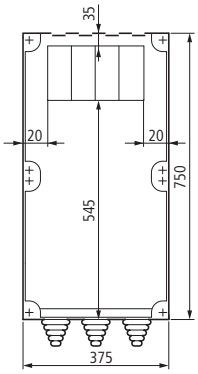
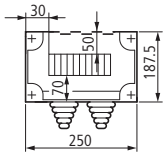
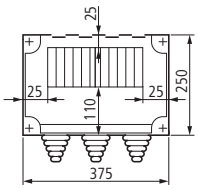
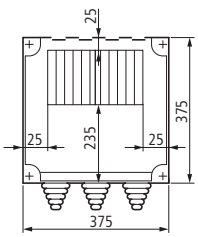
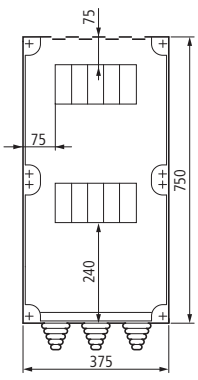
Distribution board terminal enclosure

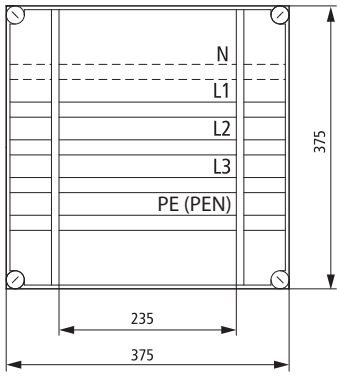
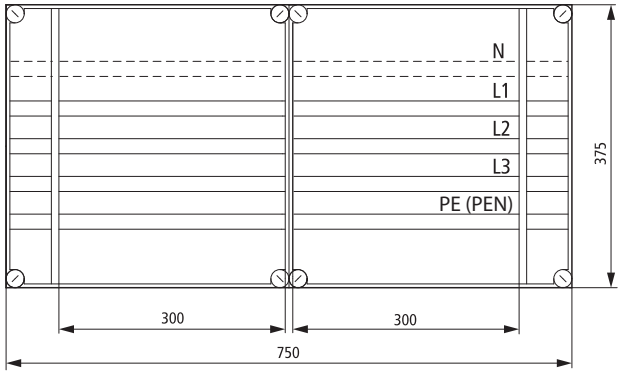
- Distribution board enclosure with terminals and fitted gland plate
- External connection for round and solid sector conductors, internal for copper strip, conversion kits to round and solid sector conductors → Chapter 16: Accessories for control panels
- Large knockouts at top, and apertures for wedge-lock fasteners
- Closed side walls with full area knockouts
- Fitting of cable supports in the distribution board with wedge-lock fastener
- Protection type IP65 (gland plates at bottom)



- Stepped cable grommet
- Split gland plate
- Cables can be inserted from the front
- Enclosure KST... with fitted gland plate
- Subsequent conversion of CI distribution board enclosures and CI individual enclosures possible

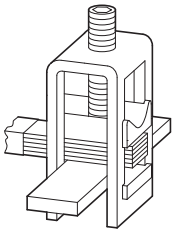
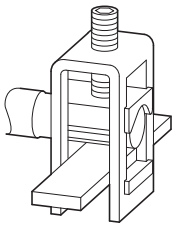
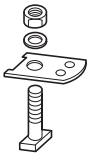
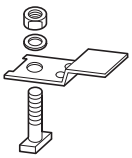
	Rated uninterrupted current I_u	Pole	Enclosure depth	Terminal capacity (stranded conductors) mm² **Strip terminal (max.) mm**	Basic enclosure Mounting system Devices (Number)	**Part no.** Article no.	**Price** See price list	Std. pack
	A		mm	mm²				
	160	4	225	1 x 16...95 **6 x 9 x 0.8**	KST34-200 L5-CI43 K95/... (4 or 5)	**K95/4/KST34** 025031		1 off
		5				**K95/5/KST34** 027404		
	250	4		1 x 35...150 2 x 16...70 **6 x 16 x 0.8**	KST34-200 L5-CI43 K150/... (4 or 5)	**K150/4/KST34** 029777		
		5				**K150/5/KST34** 032150		
	160	4	225	1 x 16...95 **6 x 9 x 0.8**	KST43-200 L5-CI43 K95/... (4 or 5)	**K95/4/KST43** 041642		
		5				**K95/5/KST43** 039269		
	250	4		1 x 35...120 2 x 16...70 **6 x 16 x 0.8**	KST43-200 L5-CI43 K150/... (4)	**K150/4/KST43** 034523		
	400	4	225	1 x 50...240 2 x 25 x 120 **10 x 16 x 0.8**	KST44-200 L5-CI43 K240/... (4 or 5)	**K240/4/KST44** 044015		
		5				**K240/5/KST44** 046388		

	Rated uninterrupted current I_u	Pole	Enclosure depth	Terminal capacity (stranded conductors) mm² **Strip terminal (max.) mm**	Basic enclosure Mounting system Devices (Number)	**Part no.** Article no.	**Price** See price list	Std. pack
	A		mm	mm²				
	400	4	225	1 x 50...240 2 x 25 x 120 **10 x 16 x 0.8**	KST48-200 L5-CI43 K240/... (4 or 5)	**K240/4/KST48** 048761		1 off
		5				**K240/5/KST48** 051134		
	630	4		1 x 150...300 2 x 50 x 240 **11 x 21 x 1.0**	KST48-200 L5-CI43 K2x240/... (4 or 5)	**K2X240/4/KST48** 055880		
		5				**K2X240/5/KST48** 053507		
	800	4		2 x 120...240 3 x 50 x 185 **2 x (21 x 11 x 1)**	KST48-200 L5-CI43 K3x185/4	**K3X185/4/KST48** 058253		
	1000	4	225	2 x 150...300 3 x 50...240 **50 x 12**	KST48-200 L5-CI43 K3x240/4	**K3X240/4/KST48** 060626		
	2 x 100	2 x 4	175	1 x 16...50 **3 x 9 x 0.8**	CI23E-150 L3/5-CI23 K50/1	**2K50/4/KST32** 067745		
		2 x 5				**2K50/5/KST32** 070118		
	2 x 160	2 x 4	225	1 x 16...95 **6 x 9 x 0.8**	KST43-200 L3/5-CI23 K95/... (4 or 5)	**2K95/4/KST43** 074864		
		2 x 5				**2K95/5/KST43** 072491		
	2 x 250	2 x 4	225	1 x 35...150 2 x 16x70 **6 x 16 x 0.8**	KST44-200 L5-CI43 K150/... (4 or 5)	**2K150/4/KST44** 077237		
		2 x 5				**2K150/5/KST44** 079610		
	2 x 400	2 x 4	275	1 x 50...240 2 x 25 x 120 **10 x 16 x 0.8**	KST48-200 L5-CI43 K240/... (4 or 5)	**2K240/4/KST48** 062999		
		2 x 5				**2K240/5/KST48** 065372		

Dimensions mm	Rated operational current I_e A	Features	Copper factor[1]	**Part no.** Article no.	**Price** See price list	Std. pack
Busbar enclosures						
• Protection type IP65 • Transparent cover • Top and bottom with full area knockouts • Sides closed, but with full area knockout • Fixing straps for wall fixing • Sealable cover fasteners • Enclosure depth 225 mm • 50 mm between busbar centres						
	250	L1, L2, L3, PEN		**SKA254-I44** 034221		1 off
	400	L1, L2, L3, PEN		**SKA404-I44** 034220		
	630	L1, L2, L3, PEN		**SKA634-I44** 090135		
	250	L1, L2, L3, PE, N		**SKA255-I44** 034209		
	400	L1, L2, L3, PE, N		**SKA405-I44** 034208		
	630	L1, L2, L3, PE, N		**SKA635-I44** 090138		
	250	L1, L2, L3, PEN		**SKA254-2I44** 034207		
	400	L1, L2, L3, PEN		**SKA404-2I44** 034204		
	630	L1, L2, L3, PEN		**SKA634-2I44** 090141		
	250	L1, L2, L3, PE, N		**SKA255-2I44** 034203		
	400	L1, L2, L3, PE, N		**SKA405-2I44** 034202		
	630	L1, L2, L3, PE, N		**SKA635-2I44** 090144		
Busbar coupling kits						
Including sealing and fixing material						
	250 - 630	L1, L2, L3, PE, N		**SVS250630-5** 002066		1 off
	1000	L1, L2, L3 for copper busbars 2 × 30 × 10 mm		**AVS30L** 093842		3 off
	500	PE, N, PEN for copper busbar 30 × 10 mm		**AVS30PEN** 096215		2 off
	1600	L1, L2, L3 for copper busbars 3 × 40 × 10 mm		**AVS40** 098588		3 off

Notes

[1] Calculation of additional material cost → Page 23/2
Selection of busbar cross-section and usable device → Page 20/73

	For use with busbars mm	Terminal capacity for flat strip mm	Operating current of the flat strip I_e A	Terminal capacity Round conductor mm^2	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Busbar terminals								
For connection of flat strip or round conductor								
	Cu 12 x 5	3 x 9 x 0.8	100	⊙ 16 - 35 ⊜ 16 - 25	**K12X5-1** 002281		10 off	
	Cu 12 x 5	3 x 9 x 0.8 10 x 16 x 0.8	100 400	⊙ 25 - 120 ⊜ 25 - 95	**K12X5-2** 002282			
	Cu 20 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8	100 160 200 250	⊙ 35 - 70 ⊜ 35 - 50	**K20X5** 002286			
	Cu 20 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	100 160 200 250 400 630	⊙ 35 - 240 ⊜ 35 - 185	**K20X10** 002283			
	Cu 20 x 10	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	100 160 200 250 400 630	⊙ 35 - 185 ⊜ 35 - 95				
	Cu 20 x 15	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	100 160 200 250 400 630	⊙ 35 - 70 ⊜ 35 - 50				
	Cu 20 x 10-15 Cu 20 x 5-15	3 x 9 x 0.8 11 x 21 x 1	100 630	⊙ 35 - 300 ⊜ 35 - 240	**K20X15** 002284			
Connection for flat strip and copper busbar								
	Cu 2 x 30 x 10	2 x 50 x 12	–	–	**K30X10L** 081977		3 off	For main conductor L1, L2, L3
	Cu 1 x 30 x 10	50 x 12	–	–	**K30X10PEN** 084350		2 off	For protective or neutral conductor PE, N, PEN
	Cu 3 x 40 x 10	2 x 50 x 12	–	–	**K40X10** 086723		3 off	For main conductor L1, L2, L3
	Cu 1 x 30 x 10	3 x 9 x 0.8 - 11 x 21 x 1	100 630	–	**AW3040L-K20** 089096		5 off	In combination with busbar terminals K20X5, K20X10, K20X15
	Cu 2 x 30 x 10 Cu 2 x 40 x 10	3 x 9 x 0.8 - 11 x 21 x 1	100 630	–	**AW30PEN-K20** 091469		5 off	In combination with busbar terminals K20X5, K20X10, K20X15

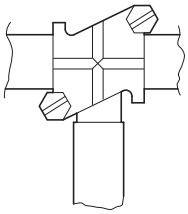
Notes

[1] Terminal capacity:
⊙ solid
⊙ stranded
⊜ flexible with ferrule
Terminals AK... → Chapter 16, Accessories for control panels

Accessories for busbar enclosures

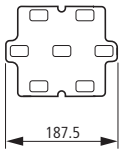
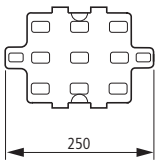
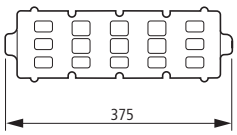
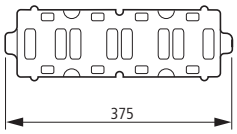
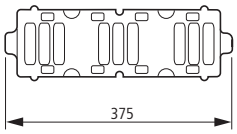
K...X

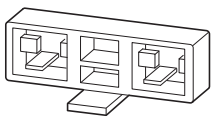
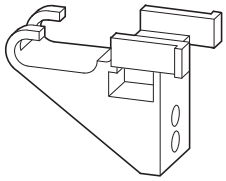
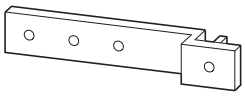
HPL20042EN

	For use with busbars mm	Terminal capacity for flat strip mm	Operating current of the flat strip I_e A	Terminal capacity for round conductor[1] mm^2	**Part no.** Article no.	**Price** See price list	Std. pack
Connection flat strip							
	Cu 12 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8	100 160 200 250	○ 1.5 - 10 ⊛ 1.5 - 6	**K12X5/25** 002324		10 off
	Cu 20 x 5	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8	100 160 200 250	○ 1.5 - 10 ⊛ 1.5 - 6	**K20X5/25** 002327		10 off
	Cu 20 x 5 Cu 20 x 10	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8	100 160 200 250 400	○ 1.5 - 10 ⊛ 1.5 - 6	**K20X10/35** 002325		10 off
	Cu 20 x 5 Cu 20 x 10	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8	100 160 200 250 400	○ 1.5 - 10 ⊛ 1.5 - 6	**K20X15/40** 002285		10 off
	Cu 20 x 10 Cu 20 x 15	3 x 9 x 0.8 6 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	100 160 200 250 400 630	○ 1.5 - 10 ⊛ 1.5 - 6	**K20X15/40** 002285		10 off
	Cu 20 x 15	11 x 21 x 1 2 x (11 x 21 x 1)	630 800	○ 1.5 - 10 ⊛ 1.5 - 6	**K20X15/50** 002326		5 off

Notes

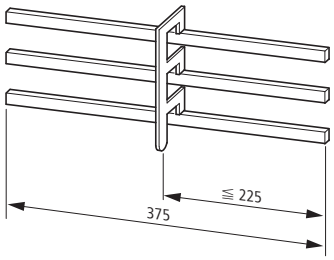
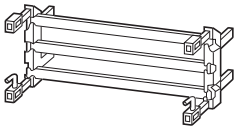
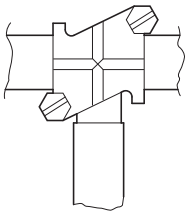
[1] Terminal capacity:
○ solid
⊙ stranded
⊛ flexible with ferrule

	Rated operational current I_e A	For use with	Part no. Article no.	Price See price list	Std. pack
Busbar support					
For use between two enclosures • Component mounting possible on busbar, → Page 20/46 • Interval between busbar supports max. 375 mm					
Interval between busbar centres 40 mm					
	160	L1, L2, L3, PE, N: 12 x 5	**SH0165/2** 010774		5 off
Interval between busbar centres 50 mm					
	250 400 630	L1, L2, L3, PE, N: 20 x 5 L1, L2, L3: 20 x 10; PE, N, PEN: 20 x 5 L1, L2, L3, PE, N: 20 x 15	**SH0635/3** 058247		5 off
	250 400 630	L1, L2, L3, PE, N, PEN: 20 x 5 L1, L2, L3: 20 x 10; PE, N, PEN: 20 x 5 L1, L2, L3: 20 x 10 + 20 x 5; PE, N, PEN: 20 x 10	**SH0635/4** 060620		
	1000	L1, L2, L3: 2 x 30 x 10; PE, N: 30 x 10	**SH1005/4** 062993		
	1600	L1, L2, L3: 3 x 40 x 10	**SH1603/4** 065366		

	Rated operational current I_e A	Supplied in lengths of mm	For use with	Copper factor	Dimensions mm	**Part no.** Article no.	**Price** See price list	Std. pack
Busbars								
Flat copper busbars								
Tinned	160	1500	SH0165/2		12 x 5	**CU12X5** 034121		10 off
Tinned	160	2250	SH0165/2		12 x 5	**CU12X5-2250** 005093		10 off
Tinned	250	1500	SH0635/3		20 x 5	**CU20X5** 044092		10 off
Tinned	250	2250	SH0635/4 SH0632		20 x 5	**CU20X5-2250** 007466		10 off
Tinned	400	1500	SH0635/3		20 x 10	**CU20X10** 041719		5 off
Tinned	400	2250	SH0635/4 SH0632		20 x 10	**CU20X10-2250** 009839		5 off
Untreated	–	1500	SH1005/4		30 x 10	**CU30X10** 051211		1 off
Untreated	–	1500	SH1603/4		40 x 10	**CU40X10** 063076		3 off
PE/N busbar supports								
For relocating PE/N bars from the busbar enclosure to the terminal compartment (floor-standing distribution boards)								
	250 400 630	–	–		20 x 5 20 x 10 20 x 15	**SH0632** 067739		5 off
Support bracket for busbar supports								
To secure busbar supports in the first and last enclosures when using busbar links and transport splits								
	–	–	SH0635/…		–	**HSH-CI** 002320		5 off
	–	–	SH0165/2 to SH0632		–	**HSH0632** 002321		5 off

Notes

Calculation of additional material cost → Page 23/2
Selection of busbar cross-section and usable device → Page 20/73

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Busbar bracing					
Fitting in the centre between two SH0635/... busbar supports when fitting RS...3-50 busbar mounting fuses on 20 x 5 copper busbars					
	–	**SVCU20X5** 002323		10 off	–
Busbar assemblies					
• For mounting busbar mounting fuse bases • 3 pole, for 250 A rated operational current					
	CI23	**SE-RS-I23** 041632		1 off	Set of connecting links → Page 20/47
	CI43	**SE-RS-I43** 044005			
	CI44	**SE-RS-I44** 001890			
Cross terminal					
For fuse enclosure and busbar fuse enclosures as well as SE-RS-I43 busbar assemblies					
	CU20X5 CU20X10 CU20X15	**K20X15/40-A** 012783		10 off	Terminal capacity for flat strip: from 3 x 9 x 0.8 mm Up to 10 x 16 x 0.8 mm ∅ 4 - 10 mm² (solid)

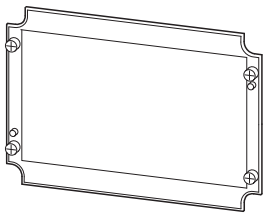
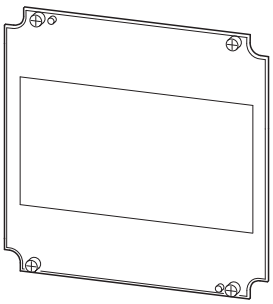
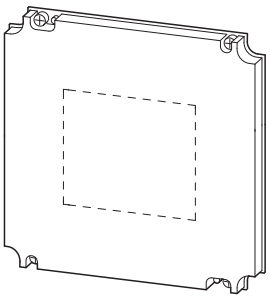
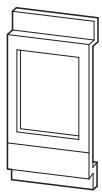
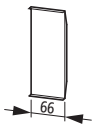
Notes LV h.b.c. fuse switch-disconnector, Insulating surround → Chapter 19: Circuit-breakers, fuses
Busbar mounting fuse bases, covers for busbar mounting fuse bases → Online Catalog

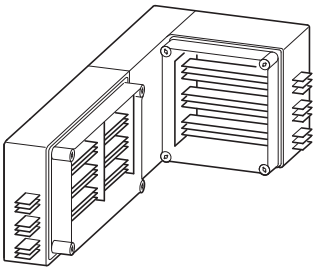
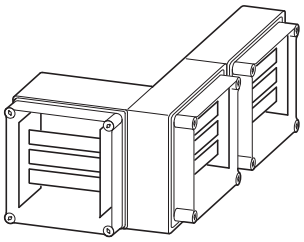
Modular busbar system, modules for fuse enclosures

N...RS..., PEN...RS...

HPL20046EN

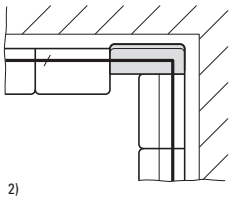
	Conductor cross section solid mm²	stranded mm²	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
N bars						
	2 x 2.5 - 35 6 x 1.5 - 16	2 x 2.5 - 25 6 x 1.5 - 16	SE-RS-I23 (RS18/I23)	**N23RS18** 055870		1 off
	2 x 2.5 - 35 9 x 0.5 - 6	2 x 2.5 - 25 9 x 0.5 - 4	SE-RS-I23 (RS27/I23)	**N23RS27** 058243		
	2 x 2.5 - 35 2 x 1.5 - 16	2 x 2.5 - 25 2 x 1.5 - 16	SE-RS-I23 (RS33/I23)	**N23RS33** 060616		
	2 x 2.5 - 35 12 x 1.5 - 16	2 x 2.5 - 25 12 x 1.5 - 16	SE-RS-I43 (I44) RS18/I43 (I44)	**N43RS18** 067735		
	2 x 2.5 - 35 18 x 0.5 - 6	2 x 2.5 - 25 18 x 0.5 - 4	SE-RS-I43 (I44) RS27/I43 (I44)	**N43RS27** 065362		
	2 x 2.5 - 35 4 x 1.5 - 16	2 x 2.5 - 25 4 x 1.5 - 16	SE-RS-I43 (I44) RS33/I43 (I44)	**N43RS33** 062989		
PE (PEN) bars						
	2 x 2.5 - 35 6 x 1.5 - 16	2 x 2.5 - 25 6 x 1.5 - 16	SE-RS-I23 (RS18/I23)	**PEN23RS18** 081973		1 off
	2 x 2.5 - 35 9 x 0.5 - 6	2 x 2.5 - 25 9 x 0.5 - 4	SE-RS-I23 (RS27/I23)	**PEN23RS27** 079600		
	2 x 2.5 - 35 2 x 1.5 - 16	2 x 2.5 - 25 2 x 1.5 - 16	SE-RS-I23 (RS33/I23)	**PEN23RS33** 077227		
	2 x 2.5 - 35 12 x 1.5 - 16	2 x 2.5 - 25 12 x 1.5 - 16	SE-RS-I43 (I44) RS18/I43 (I44)	**PEN43RS18** 070108		
	2 x 2.5 - 35 18 x 0.5 - 6	2 x 2.5 - 25 18 x 0.5 - 4	SE-RS-I43 (I44) RS27/I43 (I44)	**PEN43RS27** 072481		
	2 x 2.5 - 35 4 x 1.5 - 16	2 x 2.5 - 25 4 x 1.5 - 16	SE-RS-I43 (I44) RS33/I43 (I44)	**PEN43RS33** 074854		

	For use with	Permissible devices	Part no. Article no.	Price See price list	Std. pack
Protective shroud					
Always also order fixing kit AH-GA.					
	CI23…	RS...3-50 busbar mounting fuse base	**GA-RS-I23** 046378		1 off
	CI43…	RS...3-50 busbar mounting fuse base GSTA00-160-40-60-AOU fuse switch-disconnector	**GA-RS-I43** 048751		1 off
	CI43…	RS...3-50 busbar mounting fuse base GSTA00-160-40-60-AOU fuse switch-disconnector	**GA-RS-I43-G** 017907		1 off
	CI44…	RS...3-50 busbar mounting fuse base GSTA00-160-40-60-AOU fuse switch-disconnector	**GA-RS-I44** 022653		2 off
	CI43…	RS...3-50 busbar mounting fuse base GSTA1 fuse switch-disconnector, with A-GSTA1/...adapter plate	**GA-1-I43-G** 020280		4 off
	CI44…	Fuse switch-disconnector with A-GSTA1/... adapter plate, GSTA1	**GA-1-I44** 025026		2 off
	CI44…	Fuse switch-disconnector with A-GSTA2/... adapter plate, GSTA2	**GA-2-I44** 027399		4 off
Insulating surround for fuse switch-disconnectors					
For compensation between the GA... protective cover and the device (for use in the CI insulated distribution board system)					
	GST00	–	**B-GST00-40-60/CI/1** 224553		5 off
Blanking strips					
To cover unused spaces					
	GA-RS-I43 GA-RS-I44	–	**AS-RS-CI** 002304		10 off
Set of connecting links					
For connection of the busbars for RS…/I23, RS…/I43, RS…/I44E, 250 A for L1, L2, L3. Each set contains 3 links					
	RS.../I23E RS.../I43E RS.../I44E	–	**VBS-RS** 002307		5 off

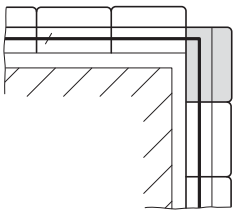
		Rated operational current I_e A	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Corner enclosures						
• Protection type IP65 • Up to 5-pole and up to 1000 A • 3 pole 1600 A • For 1600 A busbars additional enclosure for PE/N bars						
	**Design "In the corner"[1)]** • Connection material (transport split) • Busbars pre-bent • Non-transparent cover	250 400 630	**ESKI630-310/I44** 002144		1 off	For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			ESKI630-320/I44 002169			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1000	**ESKI1000-310/I44** 002171			For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			ESKI1000-320/I44 002170			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1600	**ESKI1600-300/I44** 002172			For main conductor L1, L2, L3
		1000	**EPENI1000-010/I44** 002173			For protective or neutral conductor PE, PEN
			EPENI1000-020/I44 002174			For protective or neutral conductor PE, N
		1600	**EPENI1600-010/I44** 002176			For protective or neutral conductor PE, PEN
			EPENI1600-020/I44 002175			For protective or neutral conductor PE, N
	**Design "Around the corner"[2)]** • Connection material (transport split) • Busbars pre-bent • Transparent cover	250 400 630	**ESKU630-310/I44** 002178			For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			ESKU630-320/I44 002179			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1000	**ESKU1000-310/I44** 002181			For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			ESKU1000-320/I44 002180			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1600	**ESKU1600-300/I44** 002182			For main conductor L1, L2, L3
		1000	**EPENU1000-010/I44** 002183			For protective or neutral conductor PE, PEN
			EPENU1000-020/I44 002184			For protective or neutral conductor PE, N
		1600	**EPENU1600-010/I44** 002186			For protective or neutral conductor PE, PEN
			EPENU1600-020/I44 002185			For protective or neutral conductor PE, N

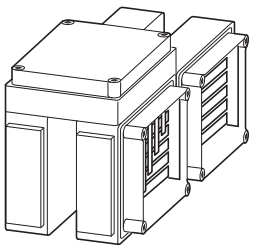
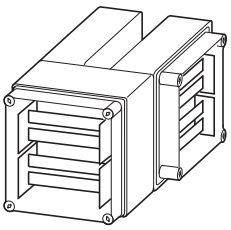
Notes

1)



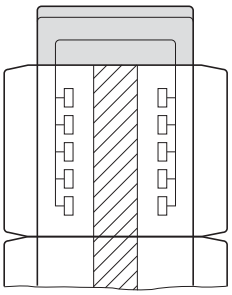
2)



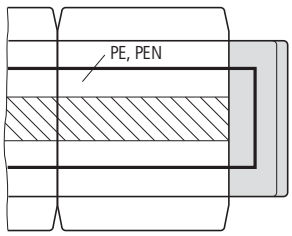
		Rated operational current I_e A	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
Design "Back-to-back"						
• Protection type IP65 • Connection material • Transparent cover • For 1600 A busbars additional enclosure for PE/N bars						
	630 A busbar[1]	250 400 630	**RSK630-310/I44** 002154		1 off	For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			RSK630-320/I44 002195			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1000	**RSK1000-310/I44** 002197			For main conductor L1, L2, L3 For protective or neutral conductor PE, PEN
			RSK1000-320/I44 002196			For main conductor L1, L2, L3 For protective or neutral conductor PE, N
		1600	**RSK1600-300/I44** 002198			For main conductor L1, L2, L3
	PE/N busbars[2]	1000	**RPEN1000-010/I44** 002199			For protective or neutral conductor PE, PEN
			RPEN1000-020/I44 002200			For protective or neutral conductor PE, N
		1600	**RPEN1600-010/I44** 002202			For protective or neutral conductor PE, PEN
			RPEN1600-020/I44 002201			For protective or neutral conductor PE, N

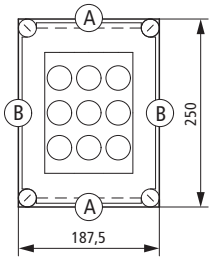
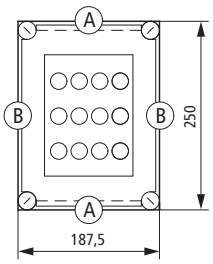
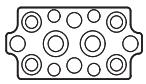
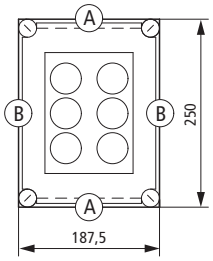
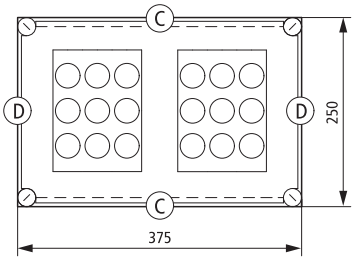
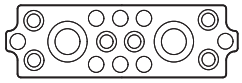
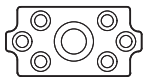
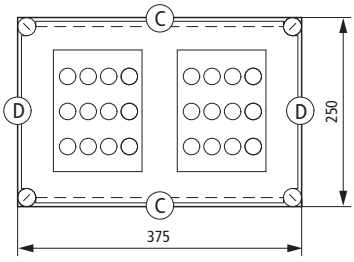
Notes

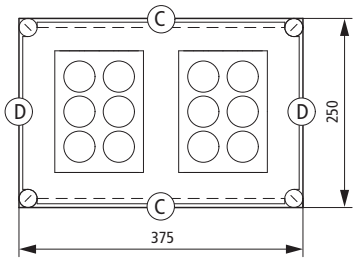
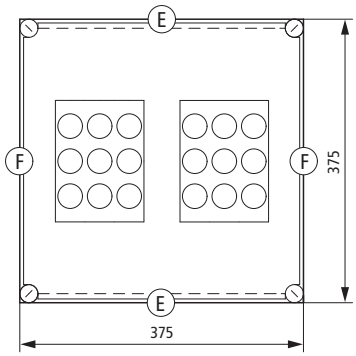
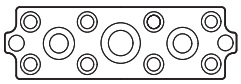
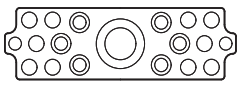
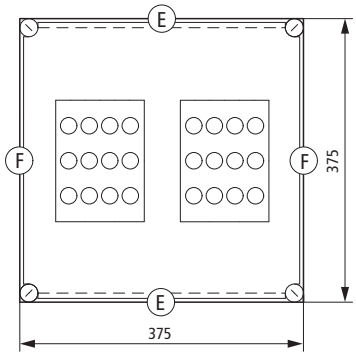
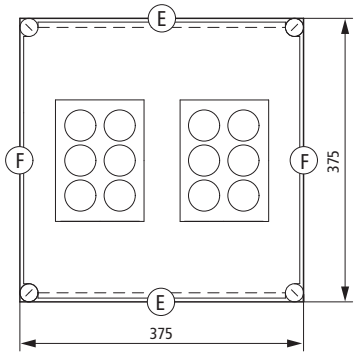
1)



2)



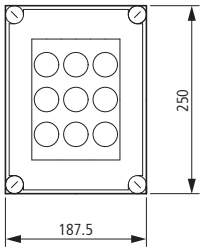
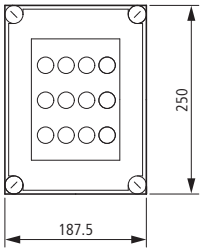
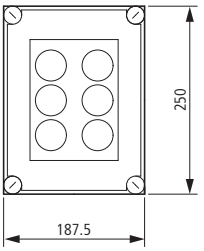
Dimensions	Rated operational current	Rated operating voltage	Max. fuse-link	Fused circuits	PE and N terminals Number x Cross-section	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
	I_e	U_e							
mm	A	V AC	A	Number	mm²				
Individual fuse enclosures (RS...E: cover without opening, RS...T: cover with door)									
• Metric cable entry knockouts in all sides • Protection type IP65 • With 3-pole busbar mounting fuse base on busbars, replaceable from front • Transparent cover with quick-release fasteners • PE/N bars, protective shroud with inscription label • Fixing straps for wall fixing • Cover fasteners can be sealed, enclosure depth 150 mm									
	25	500	25, DII/ E27	9 x 1-pole 3 x 3 pole	On each 2 x (6 - 35) On each 9 x (1 - 6)	**RS27/ I23E** 013156		1 off	**A**  1 x M32/20 6 x M20 2 x M16
			25, DII/ E27	9 x 1-pole 3 x 3 pole	On each 2 x (6 - 35) On each 9 x (1 - 6)	**RS27/ I23E/T** 015529			
	63	400	35, D02/ E18	6 x 1-pole 4 x 3 pole	On each 2 x (6 - 35) On each 6 x (4 - 25)	**RS18/ I23E** 020275			**B**  2 x M32/20 4 x M25/16 4 x M20 4 x M16
			35, D02/ E18	6 x 1-pole 4 x 3 pole	On each 2 x (6 - 35) On each 6 x (4 - 25)	**RS18/ I23E/T** 017902			
	63	690	35, DIII/ E33	2 x 3 pole	On each 2 x (6 - 35) On each 2 x (4 - 25)	**RS33/ I23E** 022648			
			35, DIII/ E33	2 x 3 pole	On each 2 x (6 - 35) On each 2 x (4 - 25)	**RS33/ I23E/T** 025021			
	25	500	25, DII/ E27	18 x 1-pole 6 x 3 pole	On each 2 x (6 - 35) On each 18 x (1 - 6)	**RS27/ I43E** 029767			**C**  2 x M50/20 6 x M25/16 8 x M20
			25, DII/ E27	18 x 1-pole 6 x 3 pole	On each 2 x (6 - 35) On each 18 x (1 - 6)	**RS27/ I43E/T** 027394			**D**  1 x M50/32 6 x M25/16
	63	400	35, D02/ E18	12 x 1-pole 8 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS18/ I43E** 032140			
			35, D02/ E18	12 x 1-pole 8 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS18/ I43E/T** 034513			

Dimensions	Rated operational current	Rated operating voltage	Max. fuse-link	Fused circuits	PE and N terminals Number x Cross-section	Part no. Article no.	Price See price list	Std. pack	Notes
	I_e	U_e							
mm	A	V AC	A	Number	mm²				
Individual fuse enclosures (RS...E: cover without opening, RS...T: cover with door)									
	63	690	35, DIII/ E33	4 x 3 pole	On each 2 x (6 - 35) On each 4 x (4 - 25)	**RS33/ I43E** 039259		1 off	
			35, DIII/ E33	4 x 3 pole	On each 2 x (6 - 35) On each 4 x (4 - 25)	**RS33/ I43E/T** 036886			
	25	500	25, DII/ E27	18 x 1-pole 6 x 3 pole	On each 2 x (6 - 35) On each 18 x (1 - 6)	**RS27/ I44E** 001884			**E**  1 x M50/32 2 x M40/25 8 x M25/16 2 x M20
			25, DII/ E27	18 x 1-pole 6 x 3 pole	On each 2 x (6 - 35) On each 18 x (1 - 6)	**RS27/ I44E/T** 001885			**F**  1 x M63/40 6 x M25/16 10 x M20 2 x M16
	63	400	63, D02/ E18	12 x 1-pole 8 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS18/ I44E** 001886			---PE/N bars
			63, D02/ E18	12 x 1-pole 8 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS18/ I44E/T** 001887			Accessories for fuse enclosures → Page 20/46
	63	690	63, DIII/ E33	4 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS33/ I44E** 001888			Fuses, fuse adapters and screw-on caps → Chapter 19: Circuit-breakers, fuses
			63, DIII/ E33	4 x 3 pole	On each 2 x (6 - 35) On each 12 x (4 - 25)	**RS33/ I44E/T** 001889			
Accessories									
Set of connecting links For connection of the busbars for RS…/I23, RS…/I43, RS…/I44E, 250 A for L1, L2, L3. Each set contains 3 links									
	250	–	–	–	–	**VBS-RS** 002307		5 off	

Panel enclosures for fuses

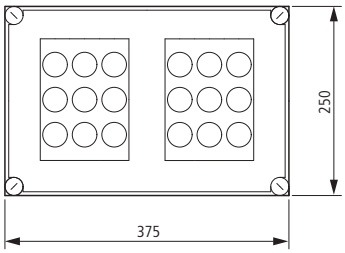
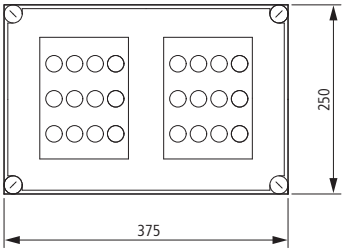
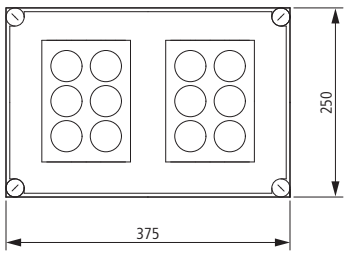
RS...I...

HPL20052EN

Dimensions	Enclosure depth	Rated operational current I_e	Rated operating voltage U_e	Max. fuse-link	Fused circuits	**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	A	V AC	A	Number			
Panel enclosures for fuses								
• Sides closed, but with full area knockout, open top and bottom • Protection type IP65 • With 3-pole busbar mounting fuse base on busbars, replaceable from front • Transparent cover with quick-release fasteners • Protective shroud with inscription label • Sealable cover fasteners								
	150	25	500	25 A DII/E27	9 x 1-pole 3 x 3 pole	**RS27/I23-125** 074056		1 off
	175	25	500	25 A DII/E27	9 x 1-pole 3 x 3 pole	**RS27/I23-150** 005240		
	150	63	400	35 A D02/E18	6 x 1-pole 4 x 3 pole	**RS18/I23-125** 081175		
	175	63	400	35 A D02/E18	6 x 1-pole 4 x 3 pole	**RS18/I23-150** 007613		
	150	63	690	35 A DIII/E33	2 x 3 pole	**RS33/I23-125** 083548		
	175	63	690	35 A DIII/E33	2 x 3 pole	**RS33/I23-150** 014732		

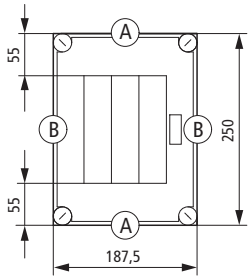
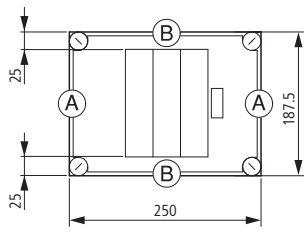
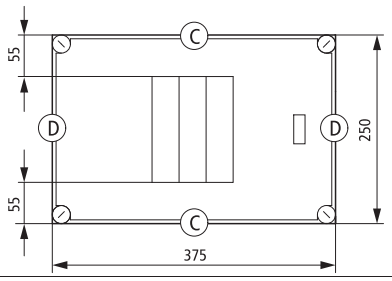
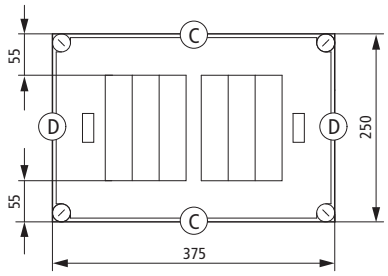
Notes

Accessories for fuse enclosures → Page 20/46
Fuses, fuse adapters and screw-on cap
→ Chapter 19: Circuit-breakers, fuses

Dimensions	Enclosure depth	Rated operational current	Rated operating voltage	Max. fuse-link	Fused circuits	**Part no.** Article no.	**Price** See price list	Std. pack
		I_e	U_e					
mm	mm	A	V AC	A	Number			
Panel enclosures for fuses								
	150	25	500	25 A DII/E27	18 x 1-pole 6 x 3 pole	**RS27/I43-125** 090667		1 off
	225	25	500	25 A DII/E27	18 x 1-pole 6 x 3 pole	**RS27/I43-200** 024224		
	150	63	400	35 A D02/E18	12 x 1-pole 8 x 3 pole	**RS18/I43-125** 093040		
	225	63	400	35 A D02/E18	12 x 1-pole 8 x 3 pole	**RS18/I43-200** 026597		
	150	63	690	35 A DIII/E33	4 x 3 pole	**RS33/I43-125** 097786		
	225	63	690	35 A DIII/E33	4 x 3 pole	**RS33/I43-200** 033716		
Accessories								
Set of connecting links For connection of the busbars for RS…/I23, RS…/I43, RS…/I44E, 250 A for L1, L2, L3. Each set contains 3 links								
–	–	250	–	–	–	**VBS-RS** 002307		5 off

Notes

Accessories for fuse enclosures → Page 20/46
Fuses, fuse adapters and screw-on cap
→ Chapter 19: Circuit-breakers, fuses

Dimensions mm	Rated operational current I_e A	Rated operational voltage U_e V AC	Fuse-link Sizes	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
Individual enclosures with LV h.b.c. fuse bases • Metric cable entry knockouts in all sides • Protection type IP65 • Transparent cover • Enclosure depth 150 mm • Terminal for connecting the 4th conductor (PEN) • Fuse base fitted to steel mounting plate • Fixing straps for wall fixing • Sealable cover fasteners							
	100	690	NH00	K50/1	**GS00/I23E** 027395		1 off
	100	690	NH00	K50/1	**GS00/I23E-G** 029768		1 off
	100	690	NH00	K50/1	**GS00/I43E** 032141		1 off
	160 100	500 690	NH00	K95/1N/BR	**GS00-160/I43E** 034514		1 off
	2 x 100	690	NH00	K50/1	**2GS00/I43E** 044006		1 off

Notes

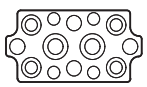
Fuse-links → Chapter 19: Circuit-breakers, fuses

A



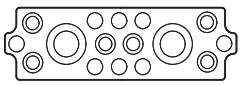
1 x M32/20
6 x M20
2 x M16

B



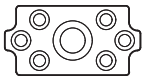
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C

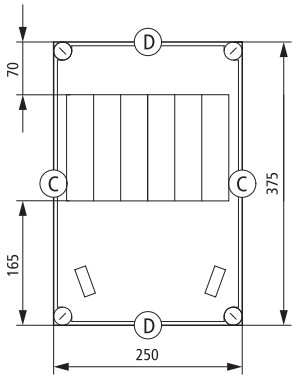
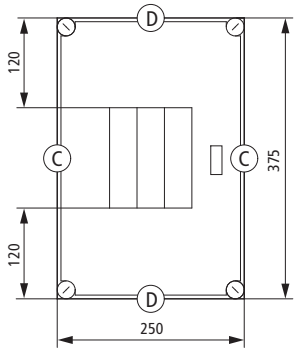


2 x M50/20
6 x M25/16
8 x M20

D



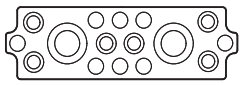
1 x M50/32
6 x M25/16

Dimensions mm	Rated operational current I_e A	Rated operational voltage U_e V AC	Fuse-link Sizes	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
Individual enclosures with LV h.b.c. fuse bases							
	2 x 100	690	NH00	K50/1	**2GS00/I43E-G** 041633		1 off
	100	690	NH00	K50/1	**GS00/I43E-G** 039260		1 off
	160 100	500 690	NH00	K95/1N/BR	**GS00-160/I43E-G** 036887		1 off

Notes

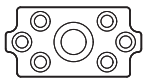
Fuse-links → Chapter 19: Circuit-breakers, fuses

C

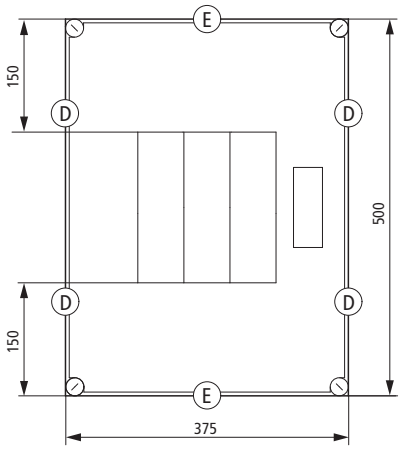
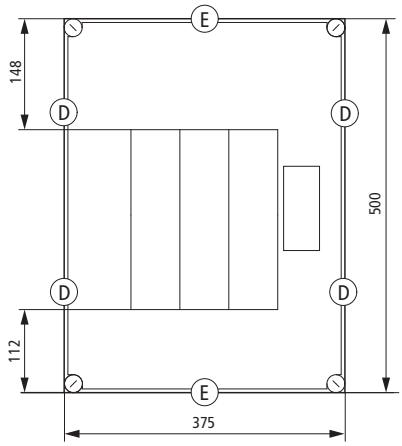
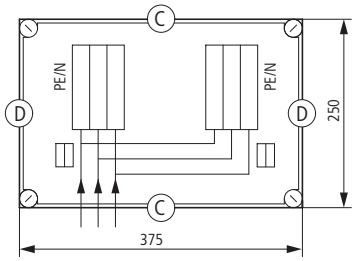


2 x M50/20
6 x M25/16
8 x M20

D



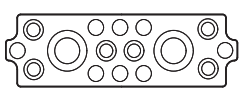
1 x M50/32
6 x M25/16

Dimensions mm	Rated operational current I_e A	Rated operational voltage U_e V AC	Fuse-link Sizes	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
Individual enclosures with LV h.b.c. fuse bases							
	250 200	500 690	NH1	K150/1	**GS1/I45E** 090148		1 off
	400 315	500 690	NH2	K240/1	**GS2/I45E** 090149		1 off
Two-way fuse box							
With parallel link between the incoming sides Incoming cable max. 35 mm² Max. fuse-link 63 A							
	2 x 100	690	NH00	–	**2GS00/I43E-V2K** 046379		1 off

Notes

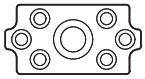
Fuse-links → Chapter 19: Circuit-breakers, fuses

C



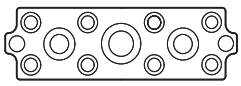
2 x M50/20
6 x M25/16
8 x M20

D

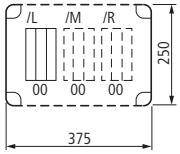
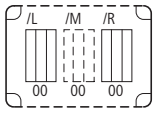
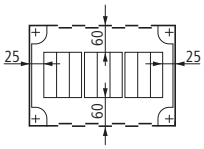
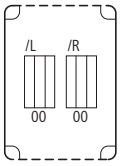
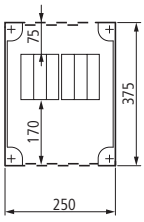


1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

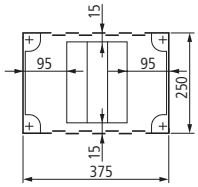
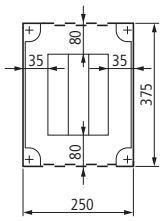
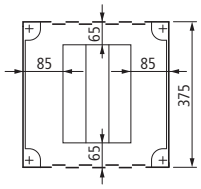
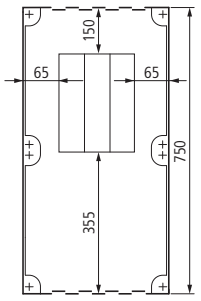
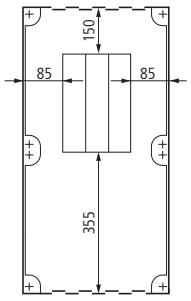
Dimensions mm	Fuse-link Sizes	Rated operational current I_e A	Rated operational voltage U_e V AC	**Part no.** Article no.	**Price** See price list	Std. pack	NH component Location	Basic enclosure Mounting system Basic unit W x H x D Other
Distribution board enclosures with LV h.b.c. fuse bases without PE/N terminals • Sides closed, but with full area knockout, open top and bottom • Transparent cover, cover fasteners can be sealed. • Protection type IP65 • Fuse base fitted to steel mounting plate • Mounting plate brought forward by 50 mm • Terminal for connecting the 4th conductor (PEN) • Stepped cable grommets → Page 20/29								
	NH00	100	690	**GS00/I43/L** 067740		1 off	Left	CI43-200 L3-CI43 GS00(-160) HS 50-CI
				GS00/I43/M 070113			Centre	
				GS00/I43/R 072486			Right	
		160	500	**GS00-160/I43/L** 086724			Left	
				GS00-160/I43/M 089097			Centre	
				GS00-160/I43/R 091470			Right	
	NH00	2 x 100	690	**2GS00/I43/L/R** 020281			Left Right	CI43-200 L3-CI43 GS00(-160) HS 50-CI
				2GS00/I43/L/M 022654			Left Centre	
				2GS00/I43/M/R 025027			Centre Right	
		2 x 160	500	**2GS00-160/I43/L/R** 010789			Left Right	
				2GS00-160/I43/L/M 013162			Left Centre	
				2GS00-160/I43/M/R 015535			Centre Right	
	NH00	3 x 100	690	**3GS00/I43** 029773			–	CI43-200 L3-CI43 GS00(-160) HS 50-CI
		3 x 160	500	**3GS00-160/I43** 017908			–	
		100	690	**GS00/I43-G/L** 074859			Left	CI43-200 (rotated 90°) L3-CI43 GS00(-160) HS 50-CI
		100	690	**GS00/I43-G/R** 077232			Right	
		160	500	**GS00-160/I43-G/L** 093843			Left	
		160	500	**GS00-160/I43-G/R** 096216			Right	
	NH00	2 x 100	690	**2GS00/I43-G** 027400			–	CI43-200 (rotated 90°) L3-CI43 GS00(-160) HS 50-CI
		2 x 160	500	**2GS00-160/I43-G** 098589			–	

Notes Fuse-links → Chapter 19: Circuit-breakers, fuses

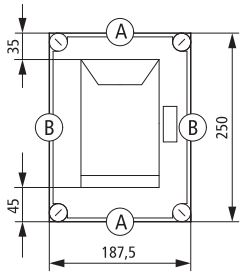
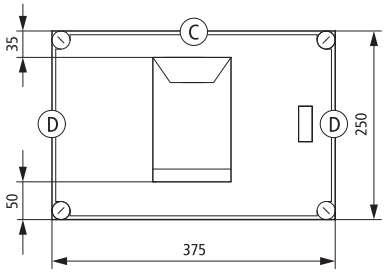
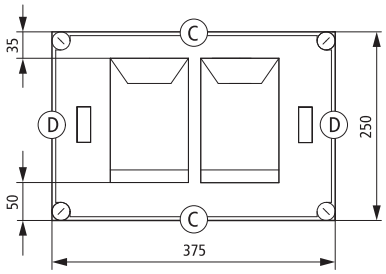
Distribution board enclosures with LV h.b.c. fuse bases

GS...I...

HPL20058EN

Dimensions mm	Fuse-link Sizes	Rated operational current I_e A	Rated operational voltage U_e V AC	**Part no.** Article no.	**Price** See price list	Std. pack	Basic enclosure Mounting system Basic unit W x H x D Other
Distribution board enclosures with LV h.b.c. fuse bases without PE/N terminals							
• Sides closed, but with full area knockout, open top and bottom • Transparent cover, cover fasteners can be sealed. • Protection type IP65 • Fuse base fitted to steel mounting plate • Mounting plate brought forward by 50 mm • Terminal for connecting the 4th conductor (PEN) • Stepped cable grommets → Page 20/29							
	NH1	250 200	500 660 690	**GS1/I43** 034519		1 off	CI43-200 L3-CI43 GS1 HS 50-CI
	NH1	250 200	500 660 690	**GS1/I43-G** 036892			CI43-200 (rotated 90°) L3-CI43 GS1 HS 50-CI
	NH2	315 315	500 660 690	**GS2/I44** 039265			CI44-200 L3-CI43 GS2 HS 50-CI
	NH2	400 315	500 660 690	**GS2/I48** 041638			CI48-200 L3-CI43 GS2 HS 50-CI
	NH3	500 400	500 660 690	**GS3/I48** 044011			CI48-200 L3-CI43 GS3 HS 50-CI

Notes Fuse-links → Chapter 19: Circuit-breakers, fuses

Dimensions	Enclosure depth	Rated operational current	Rated operational voltage	Fuse-link	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
		I_e	U_e					
mm	mm	A	V AC	Sizes				
Individual enclosures with LV h.b.c. fuse switch-disconnector								
• Metric cable entry knockouts in all sides • Protection type IP65 • Transparent cover • Terminal for connecting the 4th conductor (PEN) • Fuse switch-disconnector fitted to steel mounting plate • Fixing straps for wall fixing • Sealable cover fasteners								
	150	100	690	NH00	K50/1	**GSTA00/I23E** 048752		1 off
	150	100	690	NH00	K50/1	**GSTA00/I43E** 051125		
	150	160 100	500 690	NH00	K95/1N/BR	**GSTA00-160/I43E** 053498		
	150	2 x 100	690	NH00	K50/1	**2GSTA00/I43E** 070109		

Notes

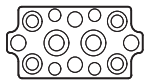
Fuse-links → Chapter 19: Circuit-breakers, fuses

A



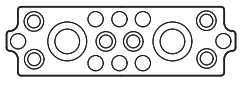
1 x M32/20
6 x M20
2 x M16

B



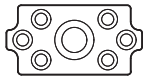
2 x M32/20
4 x M25/16
4 x M20
4 x M16

C



2 x M50/20
6 x M25/16
8 x M20

D

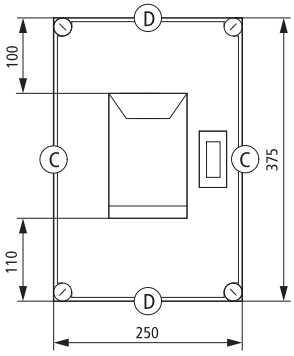
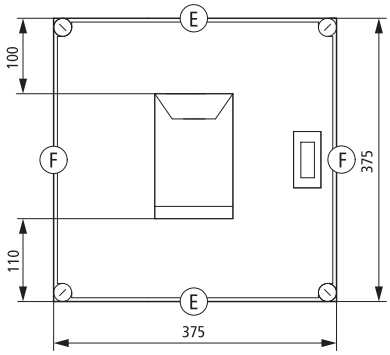
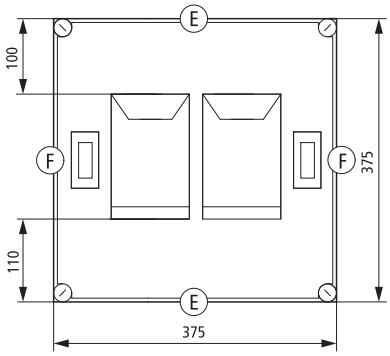


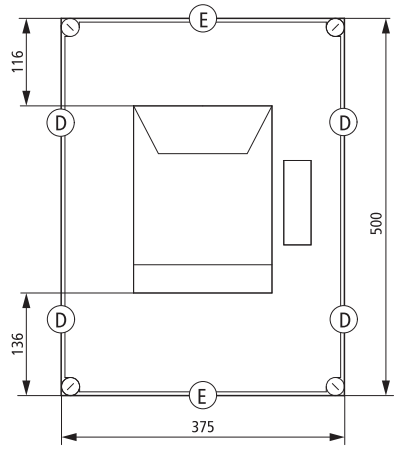
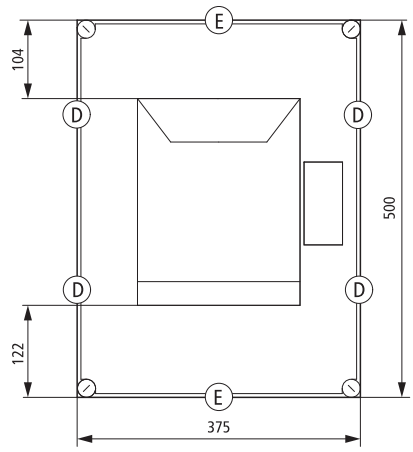
1 x M50/32
6 x M25/16

Individual enclosures with LV h.b.c. fuse switch-disconnectors

GSTA00/I..., 2GSTA00/I...

HPL20060EN

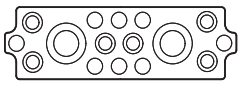
Dimensions	Enclosure depth	Rated operational current	Rated operational voltage	Fuse-link	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
		I_e	U_e					
mm	mm	A	V AC	Sizes				
Individual enclosures with LV h.b.c. fuse switch-disconnector								
• Metric cable entry knockouts in all sides • Protection type IP65 • Transparent cover • Terminal for connecting the 4th conductor (PEN) • Fuse switch-disconnector fitted to steel mounting plate • Fixing straps for wall fixing • Sealable cover fasteners								
	150	100	690	NH00	K50/1	**GSTA00/I43E-G** 058244		1 off
	150	160 100	500 690	NH00	K95/1N/BR	**GSTA00-160/I43E-G** 055871		
	150	100	690	NH00	K50/1	**GSTA00/I44E** 060617		
	150	160 100	500 690	NH00	K95/1N/BR	**GSTA00-160/I44E** 062990		
	150	2 x 100	690	NH00	K50/1	**2GSTA00/I44E** 067736		
	150	2 x 160 2 x 100	500 690	NH00	K95/1N/BR	**2GSTA00-160/I44E** 065363		

Dimensions	Enclosure depth	Rated operational current	Rated operational voltage	Fuse-link	5th terminal can be retrofitted (neutral conductor)	**Part no.** Article no.	**Price** See price list	Std. pack
		I_e	U_e					
mm	mm	A	V AC	Sizes				
Individual enclosures with LV h.b.c. fuse switch-disconnector								
	225	250 200	500 690	NH1	K150/1	**GSTA1/I45E** 090150		1 off
	225	400 315	500 690	NH2	K240/1	**GSTA2/I45E** 090151		1 off

Notes

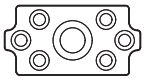
Fuse-links → Chapter 19: Circuit-breakers, fuses

C



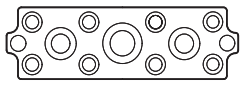
2 x M50/20
6 x M25/16
8 x M20

D



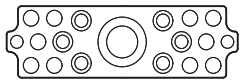
1 x M50/32
6 x M25/16

E



1 x M50/32
2 x M40/25
8 x M25/16
2 x M20

F

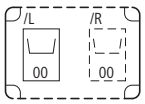
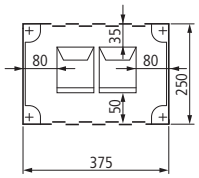
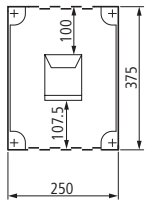
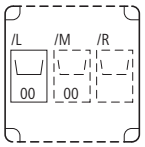
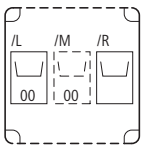
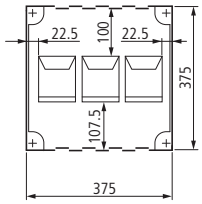


1 x M63/40
6 x M25/16
10 x M20
2 x M16

Distribution board enclosure with LV h.b.c. fuse switch-disconnector

GSTA00/I..., 2GSTA00/I..., 3GSTA00/I...

HPL20062EN

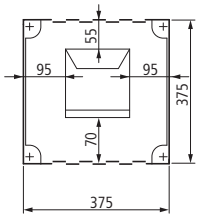
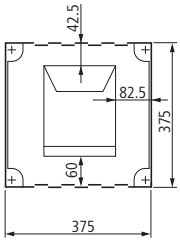
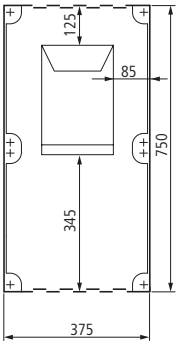
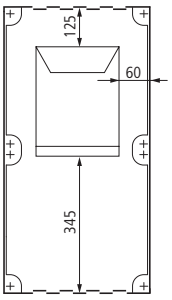
Dimensions mm	Fuse-link Sizes	Rated operational current I_e A	Rated operational voltage U_e V AC	**Part no.** Article no.	**Price** See price list	Std. pack	NH component Location	Basic enclosure Mounting system Basic unit W x H x D Other
Distribution board enclosures with LV h.b.c. fuse switch-disconnectors								
• Sides closed, but with full area knockout, open top and bottom • Transparent cover, cover fasteners can be sealed. • Protection type IP65 • Fuse base fitted to steel mounting plate • Mounting plate brought forward by 50 mm • Terminal for connecting the fourth conductor (PEN) • Stepped cable grommets → Page 20/29								
	NH00	100	660	**GSTA00/I43/L** 046384		1 off	Left	CI43-200 L3-CI43 GSTA00(-160) HS 50-CI
		100	690	**GSTA00/I43/R** 048757			Right	
		160	500	**GSTA00-160/I43/L** 034520			Left	
		160	500	**GSTA00-160/I43/R** 036893			Right	
	NH00	2 x 100	660	**2GSTA00/I43** 060622			Left Right	CI43-200 L3-CI43 GSTA00(-160) HS 50-CI
		2 x 160	500	**2GSTA00-160/I43** 053504			Left Right	
	NH00	100	660	**GSTA00/I43-G** 058249			Centre	CI43-200 (rotated 90°) L3-CI43 GSTA00(-160) HS 50-CI
		160	500	**GSTA00-160/I43-G** 055877			Centre	
	NH00	100	660	**GSTA00/I44/L** 051130			Left	CI44-200 L3-CI43 GSTA00(-160) HS 50-CI
				GSTA00/I44/M 053503			Centre	
				GSTA00/I44/R 055876			Right	
		160	500	**GSTA00-160/I44/L** 039266			Left	
				GSTA00-160/I44/M 041639			Centre	
				GSTA00-160/I44/R 044012			Right	
	NH00	2 x 100	660	**2GSTA00/I44/L/R** 062995			Left Right	CI44-200 L3-CI43 GSTA00(-160) HS 50-CI
				2GSTA00/I44/L/M 065368			Left Centre	
				2GSTA00/I44/M/R 067741			Centre Right	
		2 x 160	500	**2GSTA00-160/I44/L/R** 046385			Left Right	
				2GSTA00-160/I44/L/M 048758			Left Centre	
				2GSTA00-160/I44/M/R 051131			Centre Right	
	NH00	3 x 100	660	**3GSTA00/I44** 070114			Left Centre Right	CI44-200 L3-CI43 GSTA00(-160) HS 50-CI
	NH00	3 x 160	500	**3GSTA00-160/I44** 058250			Left Centre Right	

Notes Fuse-links → Chapter 19: Circuit-breakers, fuses

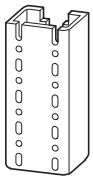
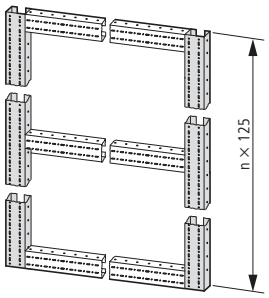
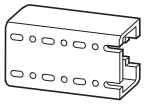
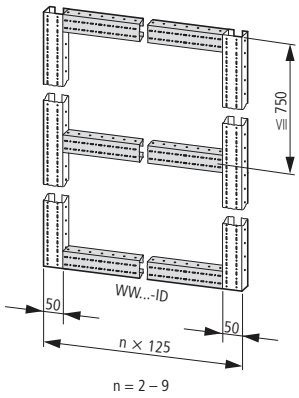
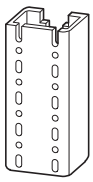
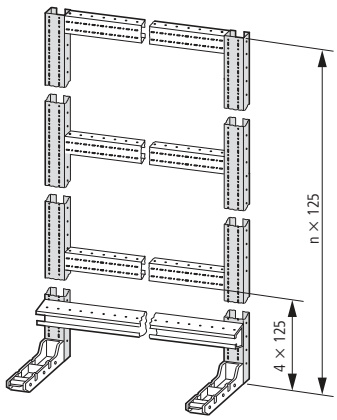
Distribution board enclosure with LV h.b.c. fuse switch-disconnector

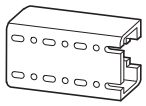
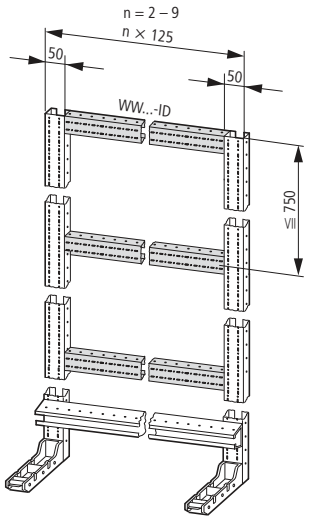
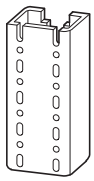
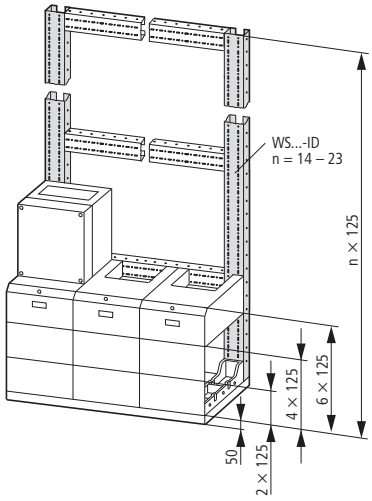
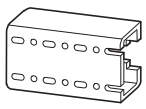
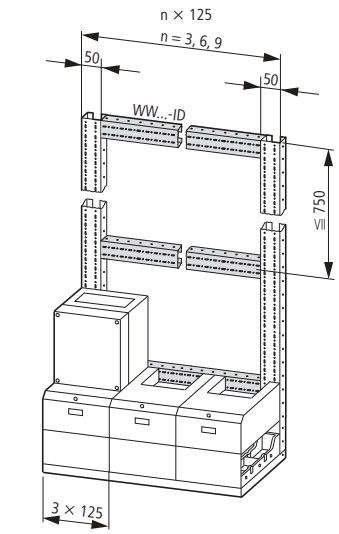
HPL20063EN

GSTA...I...

Dimensions mm	Fuse-link Sizes	Rated operational current I_e A	Rated operational voltage U_e V AC	**Part no.** Article no.	**Price** See price list	Std. pack	Basic enclosure Mounting system Basic unit W x H x D Other
Distribution board enclosures with LV h.b.c. fuse switch-disconnectors							
	NH1	250 200	500 660 690	**GSTA1/I44** 013163		1 off	CI44-200 L3-CI43 GSTA1 HS 50-CI
	NH2	315 315	500 660 690	**GSTA2/I44** 015536			CI44-200 L3-CI43 GSTA2 HS 50-CI
	NH2	400 315	500 660 690	**GSTA2/I48** 017909			CI48-200 L3-CI43 GSTA2 HS 50-CI
	NH3	500 400	500 660 690	**GSTA3/I48** 020282			CI48-200 L3-CI43 GSTA3 HS 50-CI

Notes Fuse-links → Chapter 19: Circuit-breakers, fuses

	125 mm grid spacing Quantity	Length mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Section for mounting frames						
• Galvanized C sections • Order fixing screws separately						
For wall-mounting distribution system						
Vertical section (outside)						
	6 x 125	750		**WS6-ID** 098594		1 off
	7 x 125	875		**WS7-ID** 010794		1 off
	8 x 125	1000		**WS8-ID** 013167		1 off
	9 x 125	1125		**WS9-ID** 015540		1 off
	10 x 125	1250		**WS10-ID** 017913		1 off
	11 x 125	1375		**WS11-ID** 020286		1 off
	12 x 125	1500		**WS12-ID** 022659		5 off
	13 x 125	1625		**WS13-ID** 025032		1 off
	14 x 125	1750		**WS14-ID** 027405		1 off
	15 x 125	1875		**WS15-ID** 029778		1 off
Horizontal profiles						
	2 x 125	150		**WW2-ID** 041643		5 off
	3 x 125	275		**WW3-ID** 044016		5 off
	4 x 125	400		**WW4-ID** 046389		5 off
	5 x 125	525		**WW5-ID** 048762		5 off
	6 x 125	650		**WW6-ID** 051135		1 off
	7 x 125	775		**WW7-ID** 053508		5 off
	8 x 125	900		**WW8-ID** 055881		1 off
	9 x 125	1025		**WW9-ID** 058254		1 off
For wall-mounting distribution system supported on the floor						
Vertical section (outside)						
	10 x 125	1250		**WS10-ID** 017913		1 off
	11 x 125	1375		**WS11-ID** 020286		1 off
	12 x 125	1500		**WS12-ID** 022659		5 off
	13 x 125	1625		**WS13-ID** 025032		1 off
	14 x 125	1750		**WS14-ID** 027405		1 off
	15 x 125	1875		**WS15-ID** 029778		1 off
	16 x 125	2000		**WS16-ID** 032151		1 off
	17 x 125	2125		**WS17-ID** 034524		1 off
	18 x 125	2250		**WS18-ID** 036897		1 off
	19 x 125	2375		**WS19-ID** 039270		1 off

	125 mm grid spacing Quantity	Length mm	For use with	Part no. Article no.	Price See price list	Std. pack
Section for mounting frames						
• Galvanized C sections • Order fixing screws separately						
Horizontal profiles						
	2 x 125	150		**WW2-ID** 041643		5 off
	3 x 125	275		**WW3-ID** 044016		5 off
	4 x 125	400		**WW4-ID** 046389		5 off
	5 x 125	525		**WW5-ID** 048762		5 off
	6 x 125	650		**WW6-ID** 051135		1 off
	7 x 125	775		**WW7-ID** 053508		5 off
	8 x 125	900		**WW8-ID** 055881		1 off
	9 x 125	1025		**WW9-ID** 058254		1 off
For floor-standing distribution boards, 3 panels wide						
Vertical section (outside)						
	14 x 125	1750		**WS14-ID** 027405		1 off
	15 x 125	1875		**WS15-ID** 029778		1 off
	16 x 125	2000		**WS16-ID** 032151		1 off
	17 x 125	2125		**WS17-ID** 034524		1 off
	18 x 125	2250		**WS18-ID** 036897		1 off
	19 x 125	2375		**WS19-ID** 039270		1 off
	20 x 125	2500		**WS20-ID** 034525		1 off
	21 x 125	2625		**WS21-ID** 036898		5 off
	22 x 125	2750		**WS22-ID** 039271		5 off
	23 x 125	2875		**WS23-ID** 041644		1 off
Horizontal profiles						
	3 x 125	275		**WW3-ID** 044016		5 off
	6 x 125	650		**WW6-ID** 051135		1 off
	9 x 125	1025		**WW9-ID** 058254		1 off

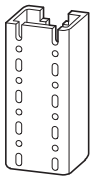
125 mm grid spacing Quantity	Length mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack

Section for mounting frames

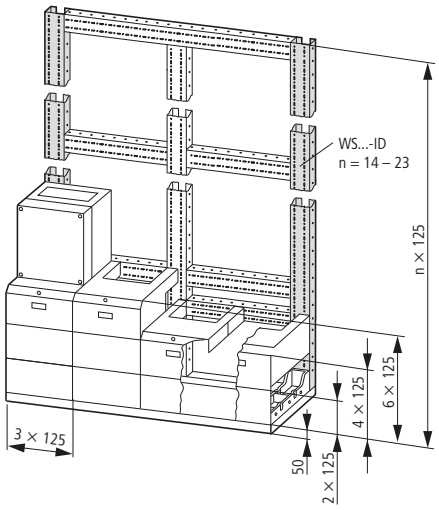
- Galvanized C sections
- Order fixing screws separately

For floor-standing distribution boards, 4 panels wide

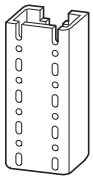
Vertical section (outside)



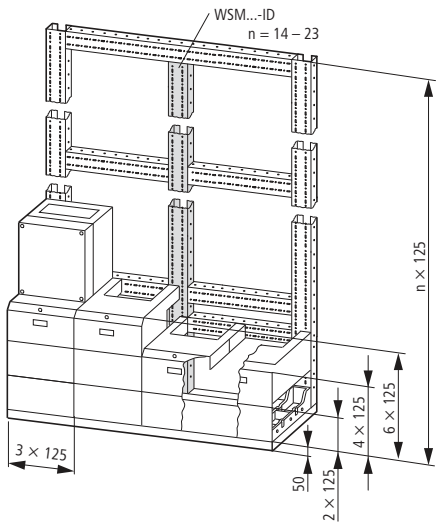
14 x 125	1750	**WS14-ID** 027405	1 off
15 x 125	1875	**WS15-ID** 029778	1 off
16 x 125	2000	**WS16-ID** 032151	1 off
17 x 125	2125	**WS17-ID** 034524	1 off
18 x 125	2250	**WS18-ID** 036897	1 off
19 x 125	2375	**WS19-ID** 039270	1 off
20 x 125	2500	**WS20-ID** 034525	1 off
21 x 125	2625	**WS21-ID** 036898	5 off
22 x 125	2750	**WS22-ID** 039271	5 off
23 x 125	2875	**WS23-ID** 041644	1 off



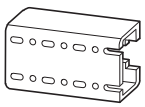
Vertical section (centre)



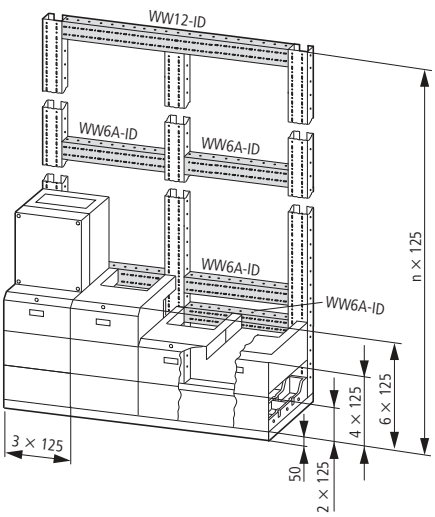
14 x 125	1700	**WSM14-ID** 044017	5 off
15 x 125	1825	**WSM15-ID** 046390	5 off
16 x 125	1950	**WSM16-ID** 048763	5 off
17 x 125	2075	**WSM17-ID** 051136	5 off
18 x 125	2200	**WSM18-ID** 053509	5 off
19 x 125	2325	**WSM19-ID** 055882	5 off
20 x 125	2450	**WSM20-ID** 058255	5 off
21 x 125	2575	**WSM21-ID** 060628	5 off
22 x 125	2700	**WSM22-ID** 063001	5 off
23 x 125	2825	**WSM23-ID** 065374	5 off

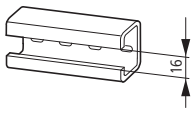
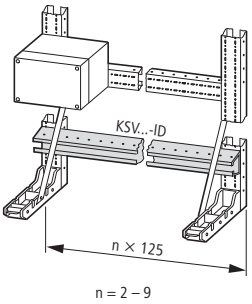


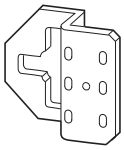
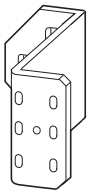
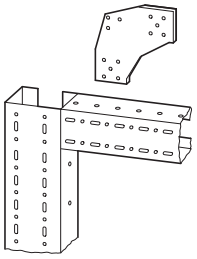
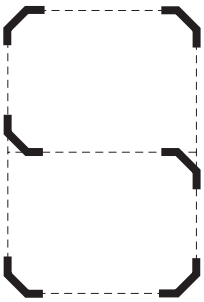
Horizontal profiles

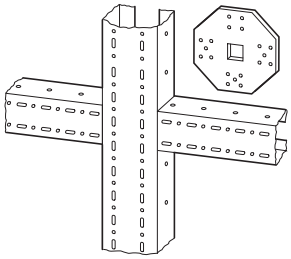
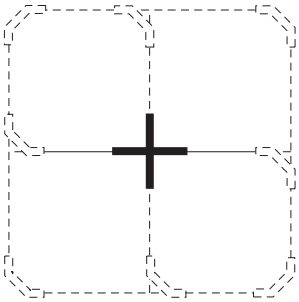
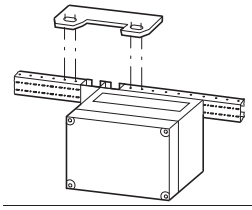
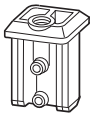
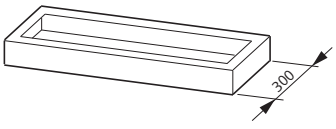


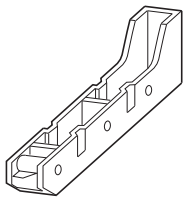
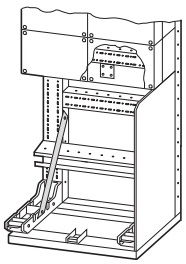
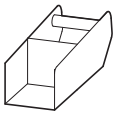
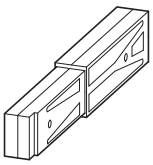
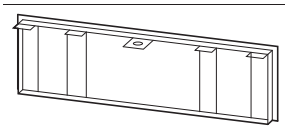
6 x 125	675	**WW6A-ID** 067747	1 off
12 x 125	1400	**WW12-ID** 070120	1 off

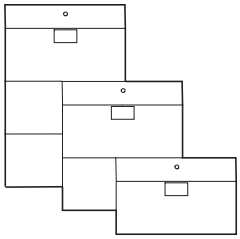
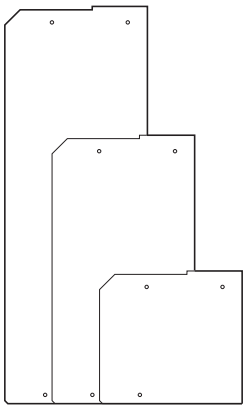
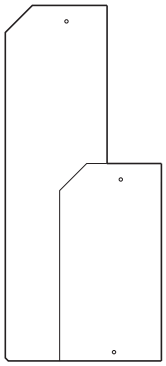
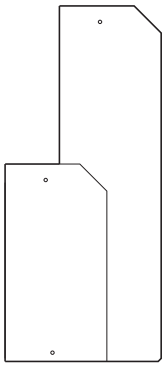


	125 mm grid spacing Quantity	Length mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Cable anchoring rails						
For T-slot cleats						
	2 x 125	250	 n = 2 – 9	**KSV2-ID** 060627		1 off
	3 x 125	375		**KSV3-ID** 063000		1 off
	4 x 125	500		**KSV4-ID** 065373		1 off
	5 x 125	625		**KSV5-ID** 067746		1 off
	6 x 125	750		**KSV6-ID** 070119		5 off
	7 x 125	875		**KSV7-ID** 072492		1 off
	8 x 125	1000		**KSV8-ID** 074865		1 off
	9 x 125	1125		**KSV9-ID** 077238		5 off

	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Wall fixing bracket				
• Including fixing material • For wall-mounting distribution system				
	To secure the mounting frame at a distance of 12 mm from the wall	**WBW12-ID** 001925		4 off
	To secure the mounting frame at a distance of 25 mm from the wall Floor-standing distribution board top mount	**WBW25-ID** 081983		10 off
	To secure the mounting frame at a distance of 100 mm from the wall Floor-standing distribution board top mount	**WBW100-ID** 084356		10 off
Corner plate for wall-mounting and floor-standing distribution boards				
• For the connection of horizontal and vertical sections • Including fixing material				
		**EVB-ID** 002299		10 off

	For use with	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Cross plates for wall-mounting and floor-standing distribution boards					
• For the connection of horizontal and vertical sections • Including fixing material					
	–		**KVB-ID** 002300		10 off
Assembly bracket					
• For the connection of distribution boards and for transport units • Including fixing material					
	Wall-mounting distribution board top and bottom on WW... section Wall-mounting distribution board 2 off, floor-standing distribution board 1 off		**ARB-ID** 002302		10 off
	For enclosure assembly at transport splits	–	**VS-TR-CI** 002330		25 off
Lifting eye fixing					
For securing TOR-GG eyebolts, M12 thread					
	Wall-mounting distribution boards, floor-standing distribution boards Mounting in WS... vertical profiles	–	**TOB-ID** 093848		10 off
Lifting eyes kit					
For lift eye fix, M12 thread					
	Wall-mounting distribution boards, floor-standing distribution boards For fixing using TOB-ID to the vertical sections One set consists of 4 lifting eyes	–	**TOR-GG** 048276		1 off
Fixing screw					
For securing CI enclosures to the sections					
	For securing CI enclosures to wall fixing brackets W... and to profiles WS..., WW...	–	**LT284-M6X20-C** 050325		100 off
Plinths					
For mounting floor-standing distribution boards					
	Width 375 mm	–	**SS5-ID0375** 079611		1 off
	Width 750 mm	–	**SS5-ID0750** 081984		1 off
	Width 1125 mm	–	**SS5-ID1125** 084357		1 off
	Width 1500 mm	–	**SS5-ID1500** 086730		1 off
Spray can for CI enclosure covers					
For painting covers, color RAL 7032 Contents 400 ml/300 g		–	**SP-CI-RAL7032** 005741		1 off

	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Foot				
For fixing to the floor				
	Left and right on base SS5-ID (on SS5-ID1500 also in middle)	**FHF-ID** 089103		2 off
Support struts				
For floor-standing distribution boards to support the vertical section on the floor				
	For plinth height 50 cm	**STR50-ID** 072493		1 off
	For plinth height 75 cm	**STR75-ID** 074866		1 off
Strap				
For the connection of distribution boards (and with transport splits)				
	In the base, 1 off for base heights ≦ 50 cm 2 off for plinth heights 75 cm	**LPS-ID** 086731		5 off
Foot prop				
Supports for the front plate (bottom) • 1 off per section width				
	Between the externally fitted FHF-ID feet	**SLHF-ID** 091476		5 off
Support brackets				
Support bracket for the top plate • 2 off per section width				
	–	**HDP-ID** 093849		5 off
Support bracket				
Additional fixing for the HPD-ID holder				
	For SS5-ID0375: 0 off For SS5-ID0750: 1 off For SS5-ID1125: 2 off For SS5-ID1500: 2 off	**SWHDP-ID** 032152		5 off
Top plate				
• Simultaneous support for the front plate (top) • 1 off per section width				
	–	**DP-ID** 096222		5 off

	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
Cable compartment cladding				
Front plates • For covering the plinth area (cabling area) • 1 off per section width				
	Height 750 mm	**FP75-ID** 013168		2 off
	Height 500 mm	**FP50-ID** 010795		4 off
	Height 250 mm	**FP25-ID** 098595		4 off
Enclosure side plates • Cover for external sides • Can be fitted to left or right				
	Height 750 mm	**SWRL75-ID** 020287		1 off
	Height 500 mm	**SWRL50-ID** 017914		1 off
	Height 250 mm	**SWRL25-ID** 015541		1 off
Intermediate plates • For cover between base of different heights				
Right side				
	Between plinth heights 750 mm - 250 mm	**ZPR50-ID** 022660		1 off
	Between plinth heights of 750 mm - 500 mm or 500 mm - 230 mm	**ZPR25-ID** 025033		1 off
Left side				
	Between plinth heights 750 mm - 250 mm	**ZPL50-ID** 029779		1 off
	Between plinth heights of 750 mm - 500 mm or 500 mm - 230 mm	**ZPL25-ID** 027406		1 off

Engineering

Enclosure size selection

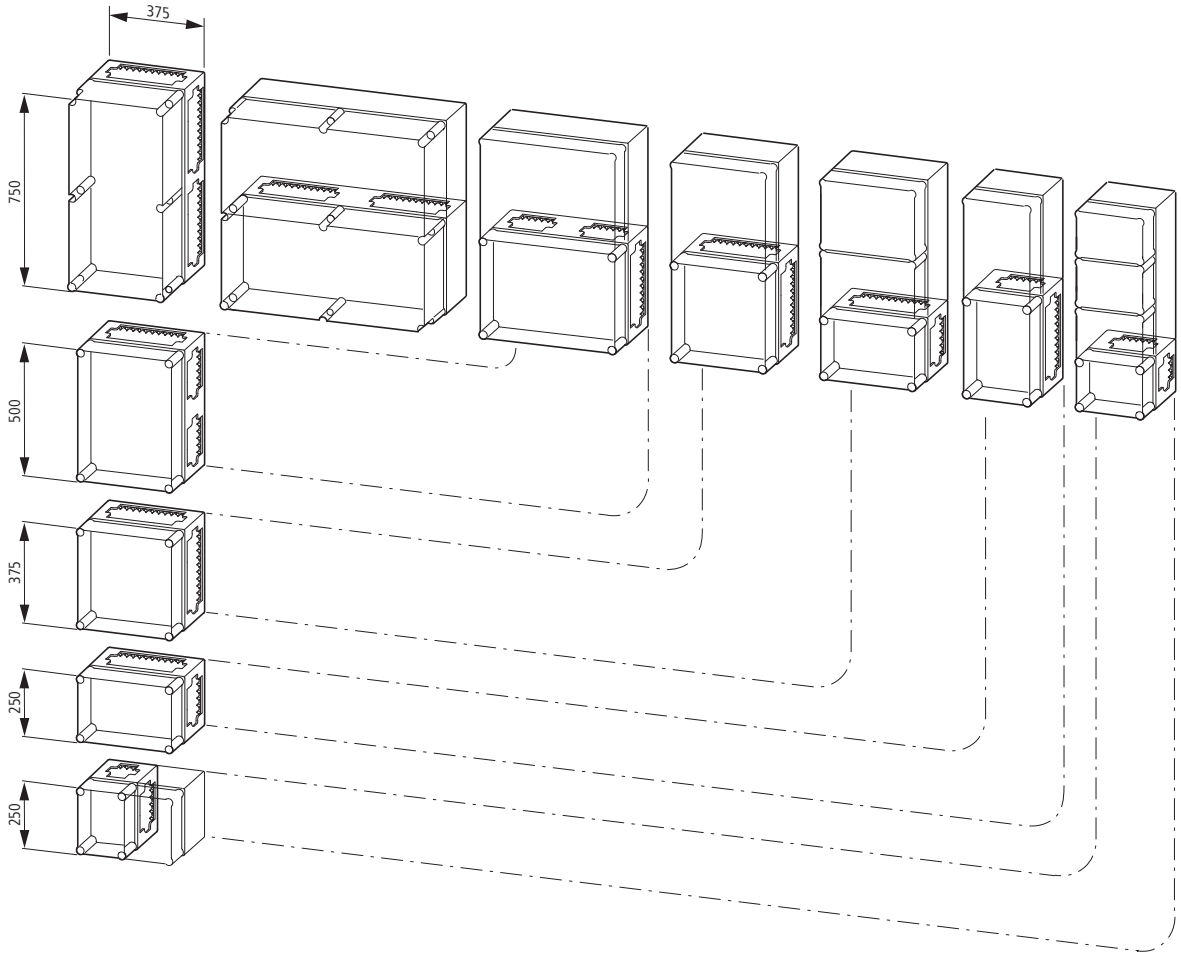
Enclosure measurements

Width:
187.5 mm
375 mm

Height:
250 mm
375 mm
500 mm
750 mm

Suitable for distribution board systems with section widths in 375 mm grid. Rotation of enclosure by 90° allows section widths in 250 mm grid.

With various cover depths, four standardized mounting depths can be implemented in a 25 mm grid (upper edge of mounting plate to lower edge of cover):
125 mm
150 mm
200 mm
250 mm



Mounting of switchgear in distribution board enclosures

To install LV h.b.c. fuse bases, switch-disconnectors and circuit-breakers, pre-drilled mounting plates are available. In some cases, additional spacers HS50-CI are required.
The following table gives the largest number of devices that can be installed.
PE and N terminals for the distribution board enclosures have not been included.

Device	Rated operational current	Max. no. of devices installable in distribution board combinations						Pre-drilled mounting plate or mounting plate	Spacer
									
		CI43(E)-200	CI43(E)-200 (rotated by 90°)	CI44(E)-200	CI45(E)-200	CI48(E)-200	CI48(E)-250		
	A	Number	Number	Number	Number	Number	Number		
LV h.b.c. fuse bases									
GS00-160	100, 160	3	2	3	3			L3-CI43	HS50-CI
GS1	250	1	1	1	1			L3-CI43	HS50-CI
GS2	400	-	-	1	1	1		L3-CI43	HS50-CI
GS3	500	-	-	-	1	1		L3-CI43	HS50-CI
LV h.b.c. fuse switch-disconnectors									
GSTA00-160	100, 160	2	1	3	3			L3-CI43	HS50-CI
GSTA1	250	-	-	1	1			L3-CI43	HS50-CI
GSTA2	400	-	-	1	1	1		L3-CI43	HS50-CI
GSTA3	500	-	-	-	1	1		L3-CI43	HS50-CI
Switch-disconnectors, circuit-breakers[1)]									
NZM1	160	2	1	2	2			M3-CI...	-
NZM2	250	1	1	2	2			M3-CI...	-
NZM3	630	-	-	-	1	1	1	M3-CI...	-
NZM4	1600	-	-	-	-	-	1	M3-CI...	-

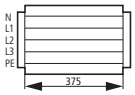
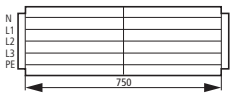
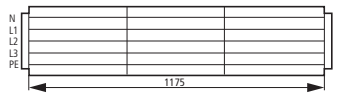
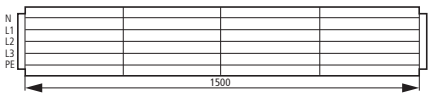
Notes [1)] Switches and accessories → Chapter 17: Compact circuit-breakers NZM, compact switch-disconnectors N up to 1600 A

Overview of busbar systems up to 1600 A (CI…, RS…, SKA…)

Rated operational current I_e	Busbar cross-section		**Busbar center-to-center distance**	**Surface-mounting devices**		
A	L1, L2, L3 mm	PE, N, PEN mm	mm	**RS..3-50**	**GST…00**	**GSTA…**
160	12 x 5	12 x 5	40	-	●	-
250	20 x 5	20 x 5	50	●	●	●
400	20 x 10	20 x 5	50	●	●	●
630	20 x 15	20 x 10	50	●	●	●
1000	2 x 30 x 10	30 x 10	-	-	-	-
1600	3 x 40 x 10	2 x 20x15	-	-	-	-

- 5-conductor system up to 400 A with 1/1 cross-section possible
- 5-conductor system up to 630 A L1 - L3 with 1/1 cross-section, PE/N with 1/2 cross-section
- 25 A to 400 A fuses for mounting on busbar system up to 630 A
- Tinned copper busbars from 160 A to 630 A

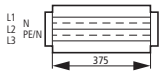
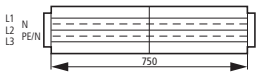
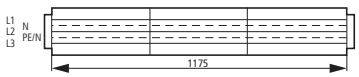
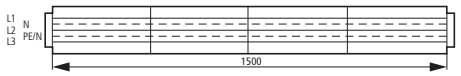
Selection diagrams up to 630 A
up to 5-pole (with or without fitted components)
(CI…, SKA…)

Busbar system in CI enclosure: Assembled from individual components for 1 up to 4 CI enclosures	Rated operational current A	**Part no.**						
		CI44-200	**SH0635/4**	**CU20X5**[1]	**CU20X10**[1]	**CU20X15**[1][2]	**FL4-X**	**BS4-CI**
	250	1	2	1.875	-	-	2	-
	400	1	2	0.75	1.125	-	2	-
	630	1	2	-	0.75	1.125	2	-
	250	2	3	3.75	-	-	2	1
	400	2	3	1.50	2.25	-	2	1
	630	2	3	-	1.50	2.25	2	1
	250	3	4	5.625	-	-	2	2
	400	3	4	2.25	3.375	-	2	2
	630	3	4	-	2.25	3.375	2	2
	250	4	5	7.50	-	-	2	3
	400	4	5	3.00	4.50	-	2	3
	630	4	5	-	3.00	4.50	2	3

Notes

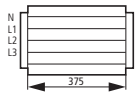
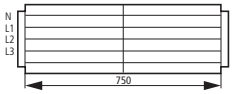
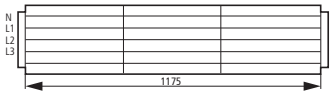
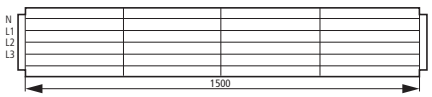
[1] In meters; applies for 5-pole system
[2] Assemble from CU20X10 and CU20X5

3-pole with fitted components
(5-pole without fitted components possible)
630 A-system max. 3 pole
(CI…, SKA…)

Busbar system in CI enclosure: Assembled from individual components for 1 up to 4 CI enclosures	Rated operational current A	Part no. CI43-200	SH0635/3	CU20X5[1]	CU20X10[1]	CU20X15[1][2]	FL4-X	BS4-CI
	250	1	2	1.875	-	-	2	-
	400	1	2	0.75	1.125	-	2	-
	630	1	2	-	-	1.125	2	-
	250	2	3	3.75	-	-	2	1
	400	2	3	1.50	2.25	-	2	1
	630	2	3	-	-	2.25	2	1
	250	3	4	5.625	-	-	2	2
	400	3	4	2.25	3.375	-	2	2
	630	3	4	-	-	3.375	2	2
	250	4	5	7.50	-	-	2	3
	400	4	5	3.00	4.50	-	2	3
	630	4	5	-	-	4.50	2	3

Notes
[1] In meters; applies for 5-pole system
[2] Assemble from CU20X10 and CU20X5 → 630 A system 3-pole only

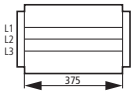
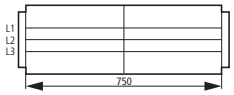
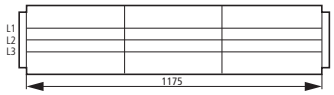
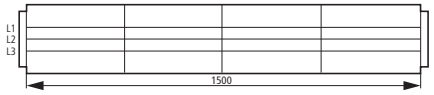
Selection diagrams up to 1000 A
up to 5 pole (CI…, SKA…)

Busbar system in CI enclosure: Assembled from individual components for 1 up to 4 CI enclosures	Rated operational current A	Part no. CI44-200	SH1005/4	CU30X10[1]	FL4-X	BS4-CI[1]
	1000	1	2	3.00	2	-
	1000	2	3	6.00	2	1
	1000	3	4	9.00	2	2
	1000	4	5	12.00	2	3

Notes
[1] In meters; applies for 5-pole system

To achieve even current loading (and heating) of the individual busbars, they must be connected in parallel with busbar terminals at a maximum spacing of 375 mm. Incoming and outgoing terminals are parallel switching points.

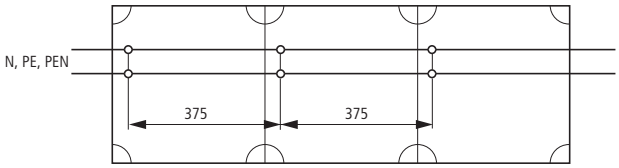
Selection diagrams up to 1600 A
3 pole

Busbar system in CI enclosure: Assembled from individual components for 1 up to 4 CI enclosures	Operating current A	Part no. CI44-200	SH1603/4	CU40X10[1)]	FL4-X	BS4-CI
	1600	1	2	3.375	2	-
	1600	2	3	6.75	2	1
	1600	3	4	10.125	2	2
	1600	4	5	13.50	2	3

Notes [1)] In meters; applies for 5-pole system

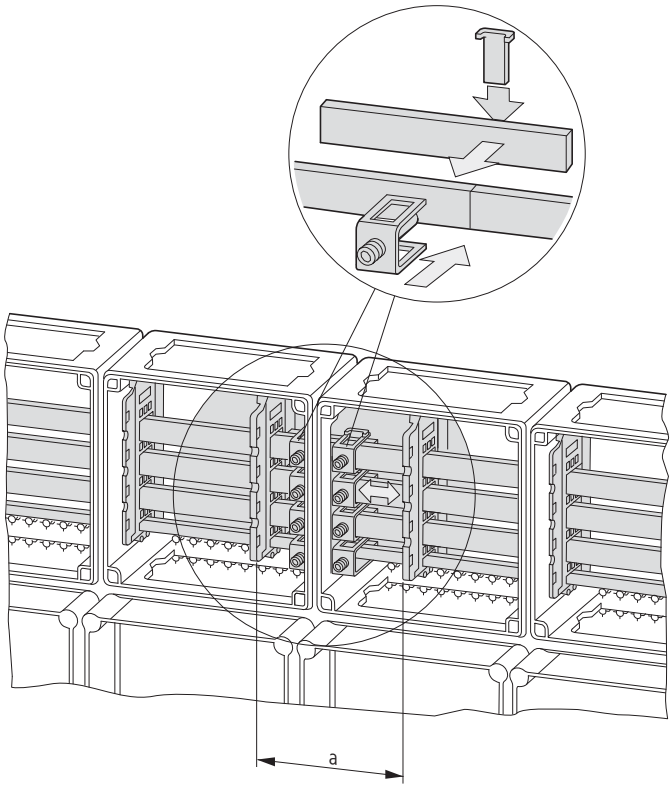
To achieve even current loading (and heating) of the individual busbars, they must be connected in parallel with busbar terminals at a maximum spacing of 375 mm. Incoming and outgoing terminals are parallel switching points.

N, PE, PEN at 1600 A
In the 1600 A busbar system, two CU20X15 are each used as N, PE and PEN conductor. For an even current load, connect the busbars in parallel with a spacing of no more than 375 mm.



Transport split, busbar connection
With transport splits the busbar supports are offset from the knockouts to the enclosure inner and secured with an additional holder.
This reduces the mounting area for components fitted on the busbars by distance 'a' between the busbar supports.

In end enclosures, transport splits should always be fitted to facilitate subsequent expansion.

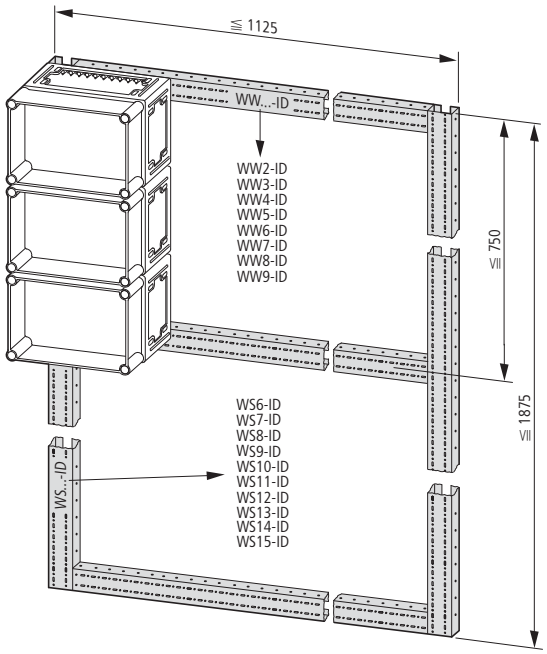


Clearance between busbar supports with transport split, busbar coupling kits

Busbar support	Busbar system	Additional support bracket for busbar support	Clearance between busbar support mm	Terminal L1, L2, L3	N, PE, PEN
SH0165/2	160 A, 5 pole	HSH0632	125	K12X5-1	K12X5-1
SH0635/3	250 A, 5 pole	HSH-CI	175	K20X5	K20X5
	400 A, 5 pole	HSH-CI	175	K20X10	K20X5
	630 A, 3 pole	HSH-CI	125	K20X10	-
SH0635/4	250 A, 5 pole	HSH-CI	125	K20X5	K20X5
	400 A, 5 pole	HSH-CI	125	K20X10	K20X5
	630 A, 5 pole	HSH-CI	125	K20X10	K20X10
SH1005/4	1000 A, 5 pole	HSH-CI	125	AVS30L	AVS30PEN
SH1603/4	1600 A, 3 pole	HSH-CI	125	AVS40	-
SH0632		HSH0632	~170	-	K12X5, K20X5

For fitting a busbar support outside the knockouts, 2 × HSH-CI or 2 × HSH0632 are required. Exception: For SH0632 only 1 × HSH0632 is required.

Wall-mounted distributor



Profiles are selected in a 125 mm grid according to enclosure widths or heights.

Vertical sections:

WS…-ID

Number of 125 mm "steps"
= 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Vertical **w**all profile

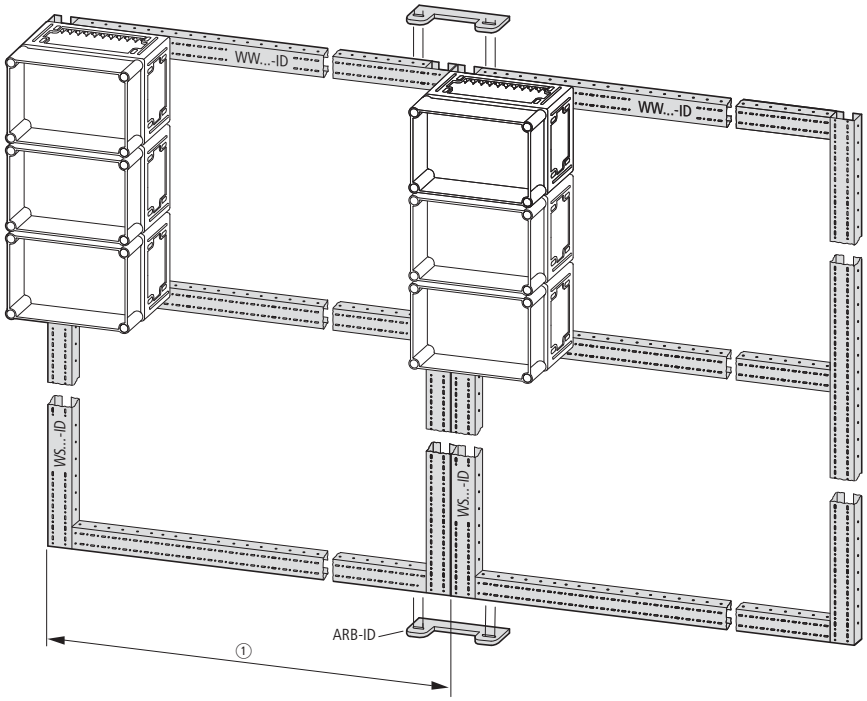
Horizontal section:

WW…-ID

Number of 125 mm "steps"
= 2, 3, 4, 5, 6, 7, 8, 9
Horizontal **w**all profile

Vertical and horizontal profiles are connected with corner plates EVB-ID and cross plates KVB-ID (order separately).

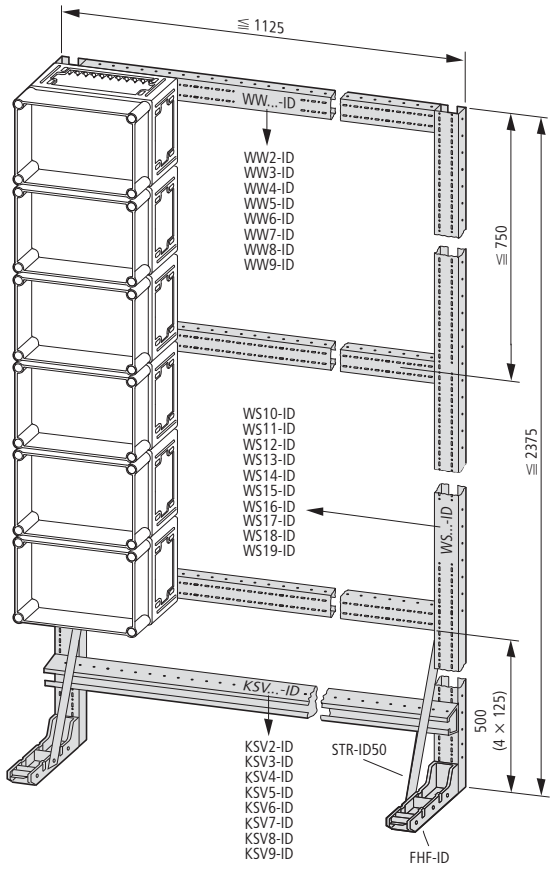
The vertical profiles of the supporting frame are wall-mounted with two wall fixing brackets WBW…-ID each (order separately).



Where wall-mounted distribution boards wider than 1125 mm are required, these are split into several transportation units. The wall-mounted profiles are mechanically interconnected at the top or bottom with the help of an assembly bracket ARB-ID.

① Transport unit

Wall-mounting distribution board, supported on the floor



Profiles are selected in a 125 mm grid according to enclosure widths or heights. For vertical profiles, an additional 500 mm (4 × 125 mm) must be added (for KSV…).

Vertical sections:

WS…-ID

Number of 125 mm "steps"
= 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
Vertical **w**all profile

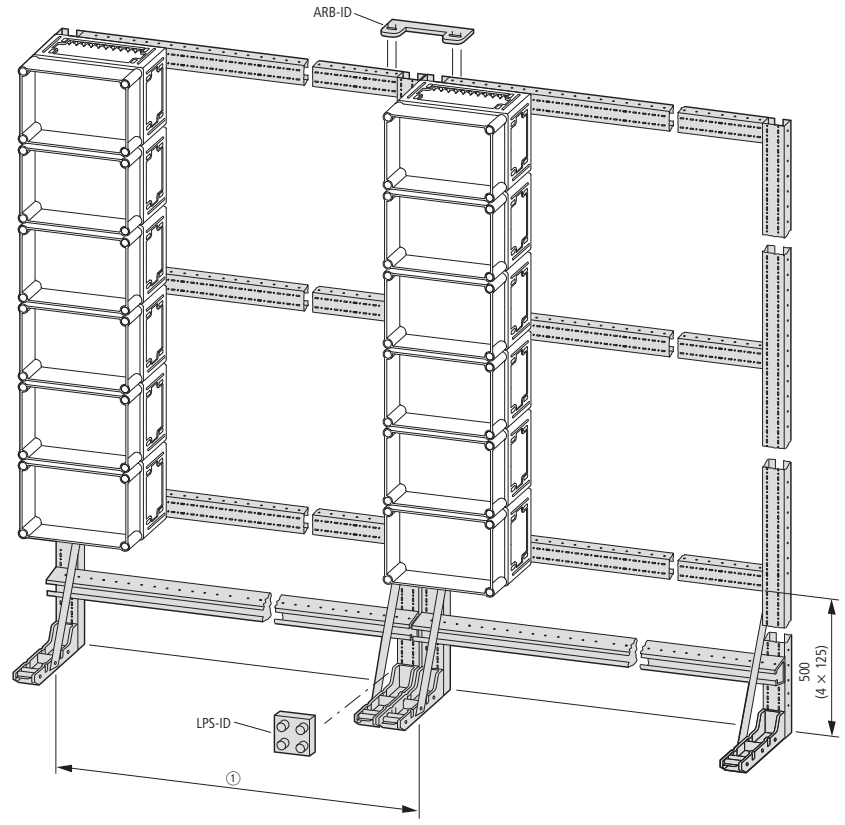
Horizontal section:

WW…-ID

Number of 125 mm "steps"
= 2, 3, 4, 5, 6, 7, 8, 9
Horizontal **w**all profile

Vertical and horizontal profiles are connected with corner plates EVB-ID and cross plates KVB-ID (order separately).

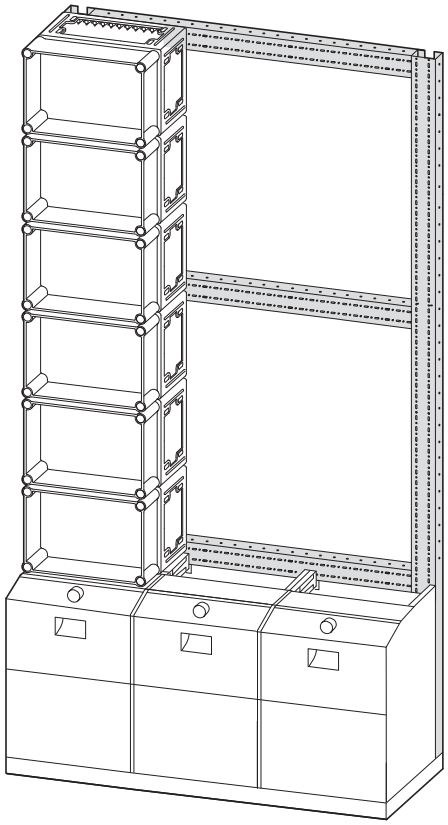
The vertical profiles of the supporting frame are wall-mounted with two wall fixing brackets WBW…-ID each (order separately).



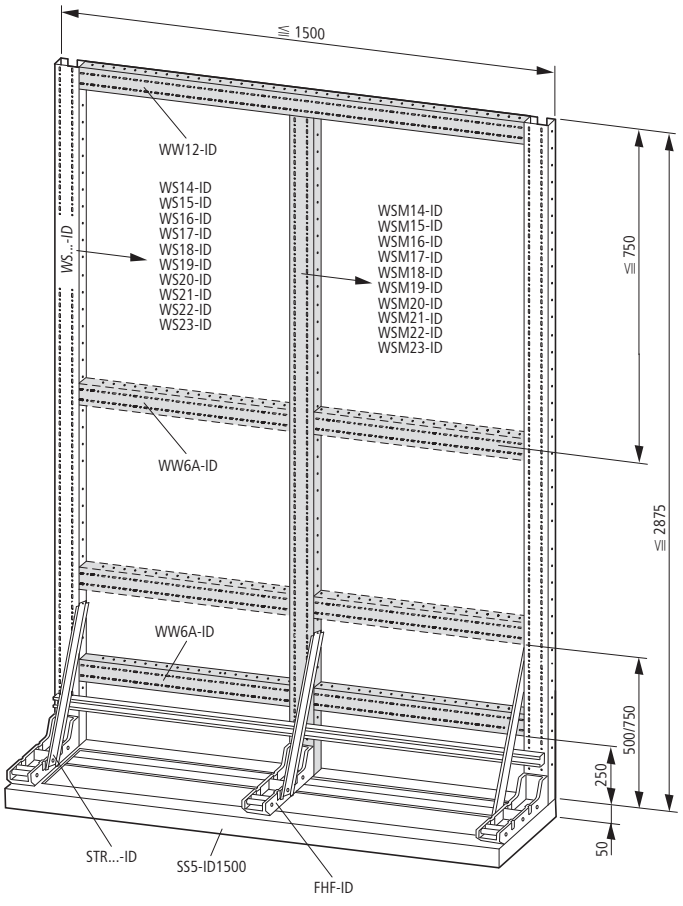
Where larger wall-mounted distribution boards are required, these are split into several transportation units. The wall-mounted profiles are mechanically interconnected with the help of an assembly bracket ARB-ID and straps LPS-ID.

① Transport unit

Floor-standing distributor
Larger distribution systems are assembled on support frames and laid out as floor-standing distribution boards with cable compartment cladding.



Floor-standing distribution board with 4 section width



Profiles are selected in a 125 mm grid according to enclosure widths or heights.

Vertical sections:
WS…-ID

Number of 125 mm "steps"
= 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
Vertical **w**all profile

Horizontal section:
WW…-ID

Number of 125 mm "steps"
= 2, 3, 4, 5, 6, 7, 8, 9
Horizontal **w**all profile

For distribution boards wider than 1500 mm a vertical center profile is required in addition. The horizontal profiles are then correspondingly smaller.

WSM…-ID

Number of 125 mm "steps"
= 14, 15, 16, 17, 18, 19, 20, 21, 22, 23
Vertical **c**enter **w**all profile

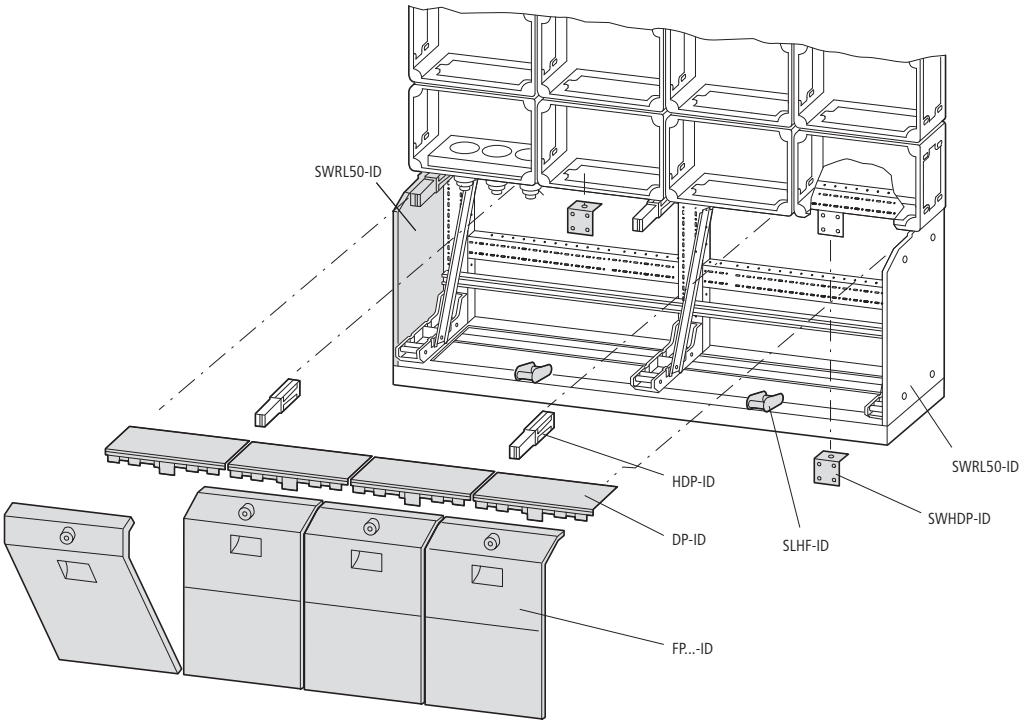
Vertical and horizontal profiles are connected with corner plates EVB-ID and cross plates KVB-ID (order separately).

The vertical profiles of the supporting frame are wall-mounted with two wall fixing brackets WBW…-ID each (order separately).

When mounting very heavy devices, e.g. NZM4, a reinforced framework is recommended. This can be achieved with the addition of a further center profile WSM…-ID and a foot FHF-ID.

WW...-ID, WS...-ID

Cable compartement cladding for floor-standing distribution board



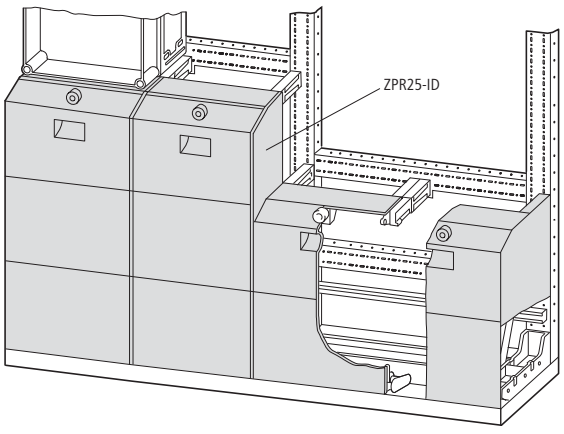
Floor-standing distribution boards are mounted on a base. Three cable compartment heights (250 mm, 500 mm and 750 mm plus 50 mm for the base) are available for inserting, sorting and marshalling cables. In addition, the base contains internal cable anchoring rails for T-foot clips. The front of the cable compartments is closed off with insulating front plates.

Combinability:

In addition, cable compartments of different heights can be combined. The side openings are closed off with intermediate plates. Left and righthand versions are available. The height is the difference of the different front plates.

ZP… …-ID

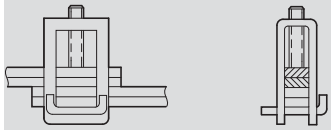
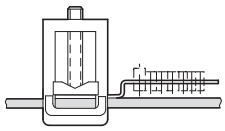
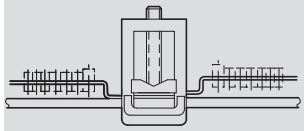
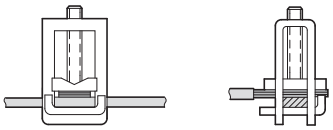
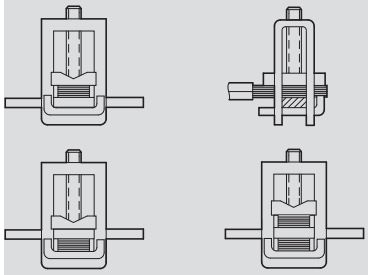
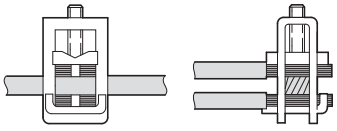
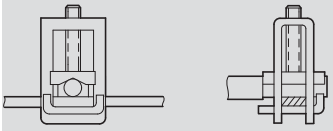
- R = right-hand intermediate plate
- 25 = 250 mm high intermediate plate
- 25 = 500 mm high intermediate plate
- L = left-hand intermediate plate



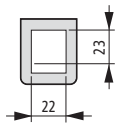
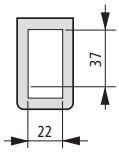
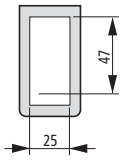
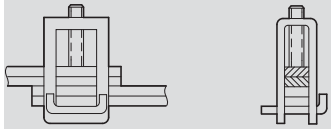
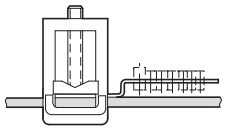
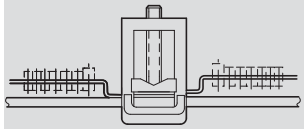
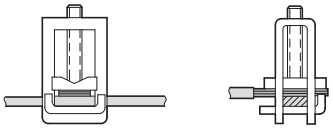
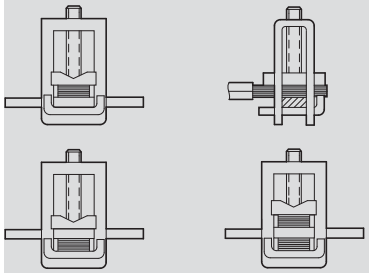
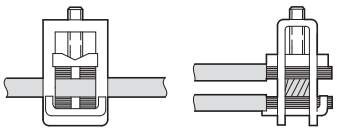
Tested to EN 60 439-4

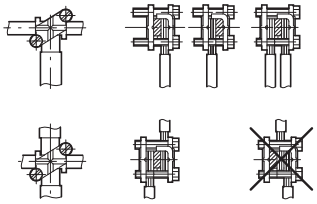
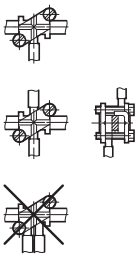
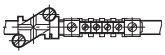
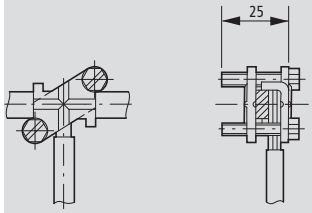
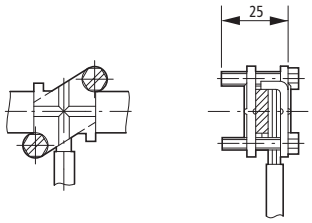
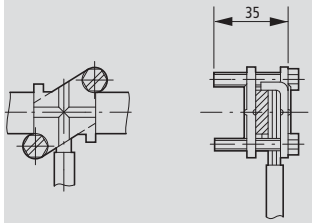
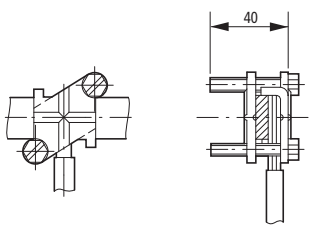
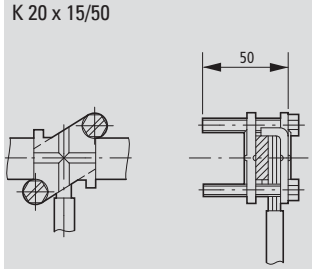
Individual enclosure CI…X-… and distribution board assembled from CI enclosures up to 630 A fulfil the additional requirements of EN 60 439-4. They are therefore suited for socket combinations and as system components for site distribution boards.

Connections to busbars

Type of connection	**Terminal type K 12 x 5-1**		**K 12 x 5-2**	
Copper busbar with Copper busbar 	(2x) 12 x 5		(2x) 12 x 5 (3x) 12 x 5	
Copper busbar with (1x) strap L-KL-R (can be fitted with AK 16, AK 35) 	(1x) 12 x 5	+ L-KL-R	(1x) 12 x 5 (2x) 12 x 5	+ L-KL-R
Copper busbar with (2x) strap L-KL-R (can be fitted with AK 16, AK 35) 	-		(1x) 12 x 5 (2x) 12 x 5	+ (2x) L-KL-R
Copper busbar with copper strip 	12 x 5	+ 3 x 9 x 0.8 6 x 9 x 0.8	12 x 5	3 x 9 x 0.8 6 x 9 x 0.8 9 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8
Copper busbar with (2x) copper strip 	-		12 x 5	+ (2x) 3 x 9 x 0.8 (2x) 4 x 16 x 0.8
Copper busbar with (4x) copper strip 	-		12 x 5	+ (4x) 3 x 9 x 0.8
Copper busbar with round copper conductor[1] 	12 x 5	+ 16^2 … 25^2	12 x 5	+ 25^2

[1] Flexible with ferrule

Type of connection	Terminal type K 20 x 5		K 20 x 10		K20 x 15	
						
Copper busbar with Copper busbar 	(2x) 20 x 5 (2x) 20 x 10		(2x) 20 x 5 (2x) 20 x 10 (2x) 20 x 15		(2x) 20 x 10 (2x) 20 x 15	
Copper busbar with (1x) strap L-KL-R (can be fitted with AK 16, AK 35) 	(1x) 20 x 5 (2x) 20 x 5 (1x) 20 x 10	+ L-KL-R	(1x) 20 x 5 (2x) 20 x 5 (1x) 20 x 10 (2x) 20 x 10 (1x) 20 x 15	+ L-KL-R	(2x) 20 x 10 (1x) 20 x 15 (2x) 20 x 15	+ L-KL-R
Copper busbar with (2x) strap L-KL-R (can be fitted with AK 16, AK 35) 	(1x) 20 x 5	+ (2x) L-KL-R	(1x) 20 x 5 (2x) 20 x 5 (1x) 20 x 10 (2x) 20 x 10 (1x) 20 x 15	+ (2x) L-KL-R	(2x) 20 x 10 (1x) 20 x 15 (2x) 20 x 15	+ (2x) L-KL-R
Copper busbar with copper strip 	20 x 5	+ 3 x 9 x 0.8 6 x 9 x 0.8 9 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8	20 x 5 20 x 10 20 x 15	+ 3 x 9 x 0.8 6 x 9 x 0.8 9 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1	20 x 5 20 x 10 20 x 15	+ 10 x 16 x 0.8 11 x 21 x 1 + 3 x 9 x 0.8 6 x 9 x 0.8 9 x 9 x 0.8 4 x 16 x 0.8 6 x 16 x 0.8 10 x 16 x 0.8 11 x 21 x 1
Copper busbar with (2x) copper strip 	20 x 5	+ 2x) 3 x 9 x 0.8 (2x) 4 x 16 x 0.8	20 x 5 20 x 10 20 x 15	+ 2x) 3 x 9 x 0.8 (2x) 6 x 9 x 0.8 (2x) 9 x 9 x 0.8 (2x) 4 x 16 x 0.8 (2x) 6 x 16 x 0.8 (2x) 10 x 16 x 0.8 + (2x) 3 x 9 x 0.8 (2x) 6 x 9 x 0.8 (2x) 9 x 9 x 0.8 (2x) 4 x 16 x 0.8 (2x) 6 x 16 x 0.8 + (2x) 3 x 9 x 0.8 (2x) 6 x 9 x 0.8 (2x) 4 x 16 x 0.8 (2x) 6 x 16 x 0.8	20 x 5 20 x 10 20 x 15	+ (2x) 6 x 9 x 0.8 (2x) 9 x 9 x 0.8 (2x) 6 x 16 x 0.8 (2x) 10 x 16 x 0.8 (2x) 11 x 21 x 1 + (2x) 3 x 9 x 0.8 (2x) 6 x 9 x 0.8 (2x) 9 x 9 x 0.8 (2x) 4 x 16 x 0.8 (2x) 6 x 16 x 0.8 (2x) 10 x 16 x 0.8 (2x) 11 x 21 x 1
Copper busbar with (4x) copper strip 	20 x 5	+ (4x) 3 x 9 x 0.8	20 x 5 20 x 10 20 x 15	+ 4x) 3 x 9 x 0.8 (4x) 6 x 9 x 0.8 (4x) 9 x 9 x 0.8 + (4x) 3 x 9 x 0.8 (4x) 6 x 9 x 0.8	20 x 5 20 x 10 20 x 15	+ (4 x) 6 x 9 x 0.8 (4 x) 9 x 9 x 0.8

Terminal type	Type of connection Copper busbar with copper strip		Copper busbar with round conductor[1]		Copper busbar with strap L-KL-R (can be fitted with AK 16, AK 35)	
					 **(1x) L-KL-R max. 200A**  **(2x) L-KL-R max. (2x) 200A**	
K 12 x 5/25 	12 x 5	+ (1x) 3 x 9 x 0.8 (2x) 3 x 9 x 0.8 (1x) 6 x 9 x 0.8 (2x) 6 x 9 x 0.8 (1x) 4 x 16 x 0.8 (2x) 4 x 16 x 0.8 (1x) 6 x 16 x 0.8 (2x) 6 x 16 x 0.8	12 x 5	+ 1.5² … 6²	12 x 5	+ (1x) L-KL-R (2x) L-KL-R
K 20 x 5/25 	20 x 5	+ (1x) 3 x 9 x 0.8 (2x) 3 x 9 x 0.8 (1x) 6 x 9 x 0.8 (2x) 6 x 9 x 0.8 (1x) 4 x 16 x 0.8 (2x) 4 x 16 x 0.8(1x) 6 x 16 x 0.8 (2x) 6 x 16 x 0.8	20 x 5	+ 1.5² … 6²	20 x 5	+ (1x) L-KL-R (2x) L-KL-R
K 20 x 10/35 	20 x 5 20 x 10	+ (1x) 3 x 9 x 0.8 (2x) 3 x 9 x 0.8 (1x) 6 x 9 x 0.8, (2x) 6 x 9 x 0.8 (1x) 9 x 9 x 0.8 (2x) 9 x 9 x 0.8 (1x) 4 x 16 x 0.8 (2x) 4 x 16 x 0.8 (1x) 6 x 16 x 0.8 (2x) 6 x 16 x 0.8 (1x) 10 x 16 x 0.8 (2x) 10 x 16 x 0.8	20 x 10	+ 1.5² … 6²	20 x 10	+ 1x) L-KL-R (2x) L-KL-R
K 20 x 15/40 	20 x 5 20 x 10 20 x 15	+ (1x) 3 x 9 x 0.8 (2x) 3 x 9 x 0.8 (1x) 6 x 9 x 0.8 (2x) 6 x 9 x 0.8 (1x) 9 x 9 x 0.8 (2x) 9 x 9 x 0.8 (1x) 4 x 16 x 0.8 (2x) 4 x 16 x 0.8 (1x) 6 x 16 x 0.8 (2x) 6 x 16 x 0.8 (1x) 10 x 16 x 0.8 (2x) 10 x 16 x 0.8 + (1x) 11 x 21 x 1	20 x 5 20 x 10 20 x 15	+ 1.5² … 6²	20 x 5 20 x 10 20 x 15	+ (1x) L-KL-R (2x) L-KL-R
K 20 x 15/50 	20 x 15	+ (1x) 11 x 21 x 1 (2x) 11 x 21 x 1	20 x 15	+ 1.5² … 6²	20 x 15	+ (1x) L-KL-R (2x) L-KL-R

[1] Flexible with ferrule

Technical data

		CI23…	CI43…	CI44…	CI45…	CI48…
General						
Standards		IEC/EN 60529 EN 50262 DIN 43656 DIN 43660 EN 60439-4 for individual CI...X enclosures and distribution boards assembled from CI enclosures up to 680 A. Can therefore be used for socket combinations and as components for site distribution boxes.				
Climatic proofing		Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30				
Ambient temperature	°C	-40 - 80				
Protection type		IP65				
Radiated heat dissipation						
		→ Page 20/86				
Additional technical data for UL/CSA approved devices		See UL report File No. E54120 → Chapter 23				
Material properties						
Material						
Base		Glass-fibre reinforced polycarbonate				
Cover		Non-reinforced polycarbonate				
Surface treatment		Corrosion-resistant				
Color						
Base		RAL 7032, pebble grey				
Cover		Transparent, opaque or RAL 7032, pebble grey				
Material properties						
Electrical						
Creepage resistance to IEC 60112						
Base		KB160, KC175				
Cover		KB100, KC200				
Surface treatment to IEC 60093	Ω x 10^{13}	> 1				
Dielectric strength to IEC 60243-1	kV/mm	30				
Thermal						
Continuous thermal stability						
Housing	°C	-40…120				
Enclosure bolt	°C	85				
Sealing	°C	80				
Mechanical						
IK code to EN 50102		Please enquire				
Load bearing capacity	kg	5	10	20	30	40
Chemical resistance						
Resistant		Acids < 10 %, mineral oil, alcohol, petrol, grease, saline solutions				
Partially resistant		Acids > 10 %				
Non-resistant		Alkalis, paraffin				
Atmospheric						
Saline spray		IEC 60068-2-11				
UV resistance		Beneath protective canopy				
Water absorption to EN ISO 62	%	0.29				
Flammability characteristics						
Glow wire to VDE 0471 Part 2	°C	960				
UL						
Base		UL94V1				
Cover		UL94V2				
Halogen free		Yes (lower section and cover)				

				CI...					
General									
Components				Components of switchgear assemblies are type-tested. They are suitable for self-assembly of switchgear installations, distribution boards and control panels.					
Mounting units				The reference values stated apply to the basic elements of the distribution board. For devices fitted, terminals etc., their reference and rated values apply.					
Standards									
TTA – Type Tested Assemblies				IEC/EN 60439-1, VDE 0660 Part 500					
Low-voltage fuses				IEC/EN 60269, VDE 0636					
Type test				VDE 0660 Part 500, IEC/EN 60439-1					
Creepage and clearance distances				III/3 to IEC/EN 60439-1					
Flammability characteristics - Glow rod test				VDE 0304 Part 3 level IIb, level IIb to IEC 60707					
Regulations for fire-resistance tests of electrical products, their modules and components, glow wire test				VDE 0471 Part 2					
Operating and environmental conditions to VDE 0660 Part 500									
Ambient temperature									
Mean value over 24 hours			°C	35					
Limit values			°C	-5…40					
Indoor installation									
Relative humidity									
at 20 °C			%	90					
at 40 °C			%	50					
Installation altitude			m	max. 2000					
Protection type									
CI enclosure				IP65					
KST cable entry from below				IP65					
KST cable entry from above				IP64					
Cable entry open				IP00					
Modular grid (enclosure basic dimensions)			mm	25 (DIN 43660)					
Color									
Base				RAL 7032, pebble grey					
Cover				Transparent, opaque or RAL 7032, pebble grey					
				CI...-NA: Transparent cover, opaque					
Surface protection with metals				Galvanized, passivated					
Radiated heat dissipation				→ Page 20/86					
Electrical characteristics									
Busbar system									
Rated operating voltage	U_e	V AC		690	690	690	690	690	690
Rated insulation voltage									
AC	U_i	V AC		690	690	690	690	690	690
DC	U_i	V DC		800	800	800	800	800	800
Rated operational current	**I_e**	**A**		**160**	**250**	**400**	**630**	**1000**	**1600**
Rated short-time withstand current									
t = 0.1 s cos φ = 0.2	I_{cw}	kA		20	25	35	40	80	80
Rated short-time withstand current t = 1 s	I_{cw}	kA		4	7	14	28	50	66
Rated peak withstand current	I_{pk}	kA		40	52.5	73.5	84	176	176
Distance between busbar supports		mm		≦ 375	≦ 375	≦ 375	≦ 375	≦ 375	≦ 375

Radiated heat dissipation

CI...

		CI...		
Radiated heat dissipation of the insulated enclosures CI		**Part no.**	**Dimensions W x H x D** mm	**Heat dissipation** W
Max. radiated heat dissipation of the CI insulated enclosures with separate mounting, ambient air temperature +20 °C		CI23...-125	187.5 x 250 x 150	33
		CI23...-150	187.5 x 250 x 175	36
		CI43...-125	375 x 250 x 150	46
		CI43...-150	375 x 250 x 175	50
		CI43...-200	375 x 250 x 225	56
		CI44...-125	375 x 375 x 150	66
		CI44...-150	375 x 375 x 175	68
		CI44...-200	375 x 375 x 225	72
		CI44...-250	375 x 375 x 275	78
		CI45...-200	375 x 500 x 225	89
		CI48...-200	375 x 750 x 225	138
		CI48...-250	375 x 750 x 275	164
Max. radiated heat dissipation of the CI insulated enclosures with use in distribution boards to VDE 0660 Part 500		CI23-...	187.5 x 250 x 150 187.5 x 250 x 175	25
		CI43-...	375 x 250 x 150 375 x 250 x 175 375 x 250 x 225	42
		CI44-...	375 x 375 x 150 375 x 375 x 175 375 x 375 x 225 375 x 375 x 275	54
		CI45-...	375 x 500 x 225	67
		CI48-...	375 x 750 x 225 375 x 750 x 275	93

Notes

When calculating the heat dissipation, the quadratic relationship of current with the rated diversity factor α must be considered.

$P_v = I^2 \times R$

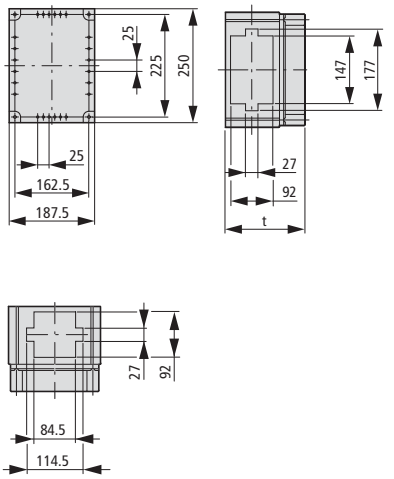
$P_v' = P_v \times \alpha^2$

If no data is available concerning the load relationships of the individual circuits, the rated diversity factor is selected conform to VDE 0660 Part 500.

Dimensions

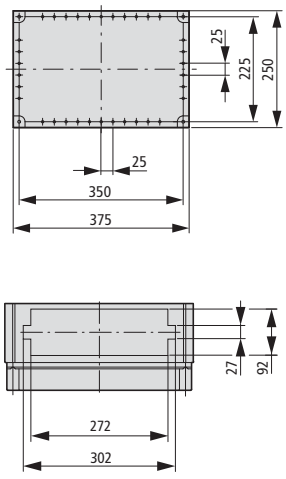
Insulated enclosures

CI123...
RS.../I23...
GS00/I23...
GSTA00/I23E



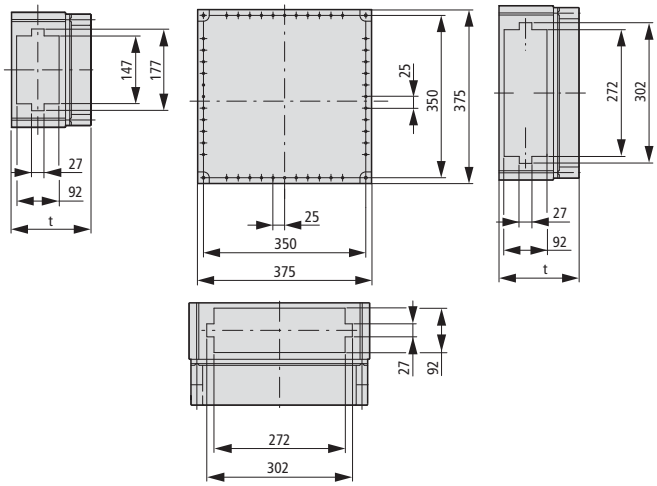
t = 150/175 mm

CI43...
KST43..., Dimension with gland plates → Page 20/11
K...KST43..., Dimension with gland plates → Page 20/38
ZG/I43E-G-...
RS.../I43...
GS00-.../I43...
GSTA00-../I43...



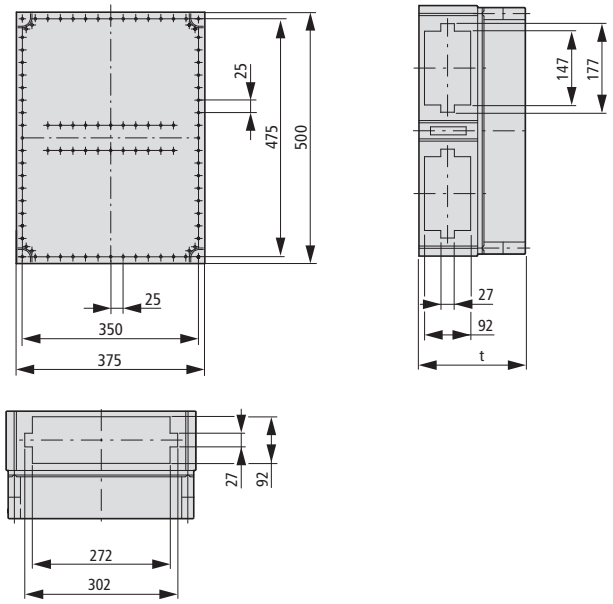
t = 150/175/225 mm

CI44...
KST44..., Dimension with gland plates → Page 20/12
K...KST44..., Dimension with gland plates → Page 20/39
SKA...-I44, ZG/I44E-...
ESK.../I44, EPEN.../I44
RSK.../I44, RS.../I44...
GS2/I44, GSTA.../I44...



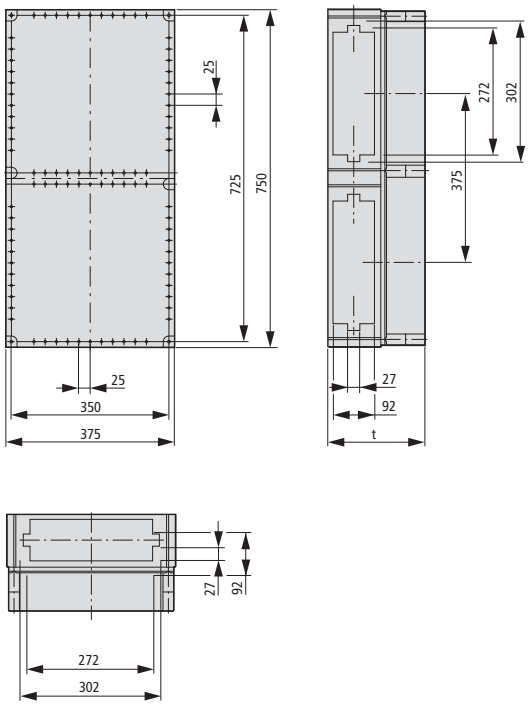
t = 150/175/225//275 mm

CI45...
ZG/I45E-...
GS.../I45E
GSTA.../I45E



t = 225 mm

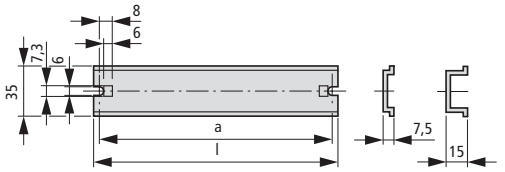
CI48...
KST48..., Dimension with gland plates → Page 20/13
K...KST48..., Dimension with gland plates → Page 20/39
ZG/I48-...
GSTA.../I48E GS.../I48E



t = 225/275 mm

Mounting rails

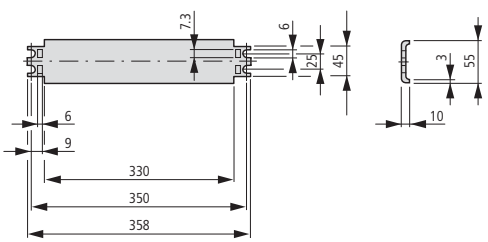
CL...



Part no.	l	a
CL2	170.5	162.5
CL3	233	225
CL4	358	350
CL2-15	170.5	162.5
CL3-15	233	225
CL4-15	358	350

Module mounting rail

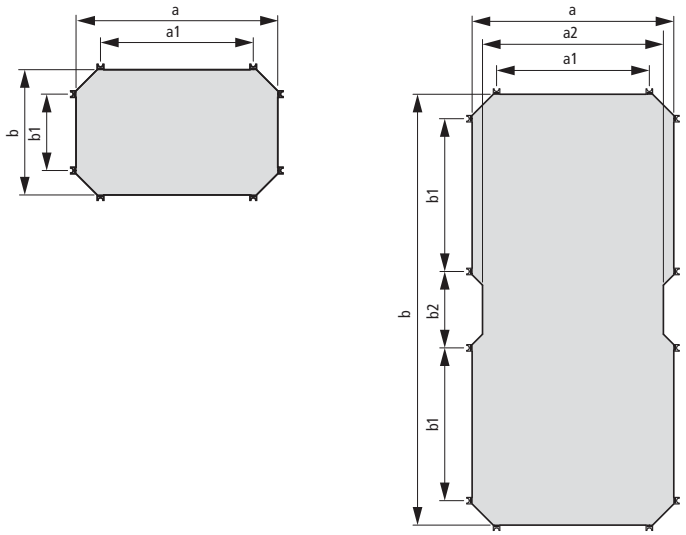
ML...



M3-CI..., IM4-CI..., W..., FL..., ZRF..., AE/..., AV/...

Mounting plates

M3-CI-… IM4-CI… M3-CI48 IM4-CI48

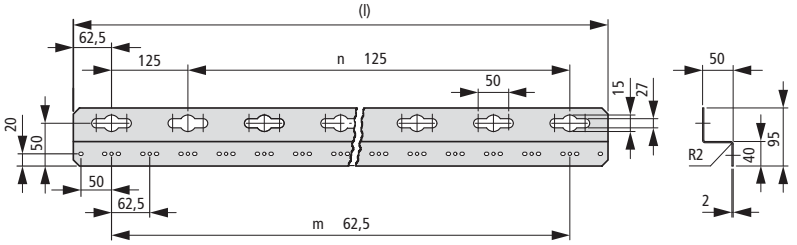


Part no.	a	b	a1	b1	a2	b2
M3-CI23, IM4-CI23	142.5	205	62.5	125	-	-
M3-CI43, IM4-CI43	330	205	250	125	-	-
M3-CI44, IM4-CI44	330	330	250	250	-	-
M3-CI45	330	455	250	375	-	-
M3-CI48, IM4-CI48	330	705	250	250	296	125

Insulated mounting plate IM4-...: 4 mm thick
Mounting plate M3-... 3 mm thick

Wall fixing bracket

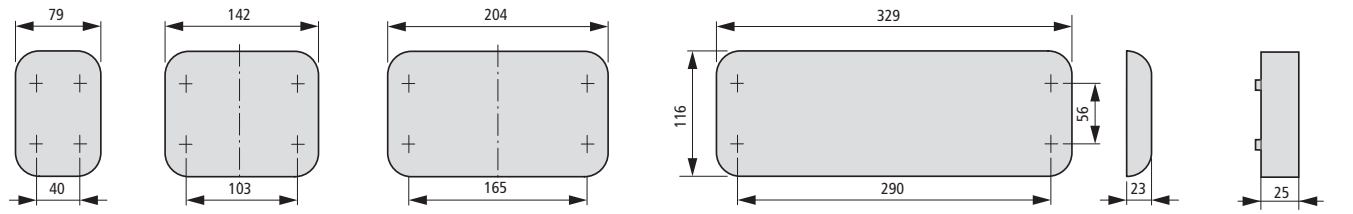
W…/…



Part no.	l	n	m
W4/8	625	4	8
W6/8	875	6	12
W8/16	1125	8	16
W10/20	1375	10	20
W16/32	2125	16	32

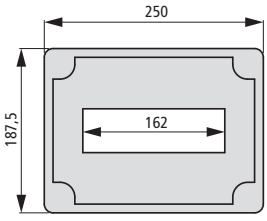
Flanges spacers

FL1-... FL2-... FL3-... ZRF3 FL4-... ZRF4 FL… ZRF3 ZRF4

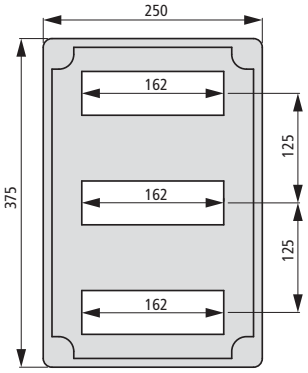


MCB enclosure
MCB distribution board enclosure

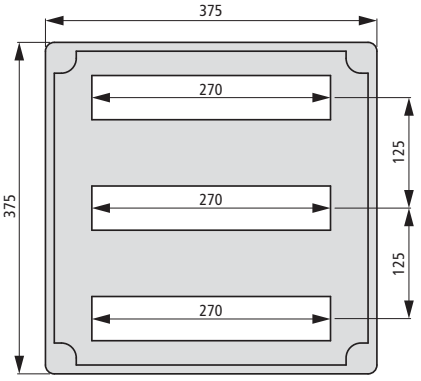
AE/I23
AV/I23 Dimensions identical but rotated by 90°



AE/I43
AV/I43 Dimensions identical but rotated by 90°



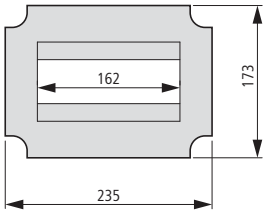
AE/I44
AV/I44 Dimensions identical but rotated by 90°



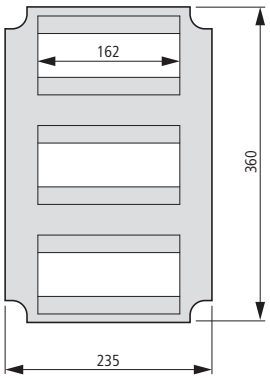
GA-..., MCCB1-..., MCCB2-...

Protective cover

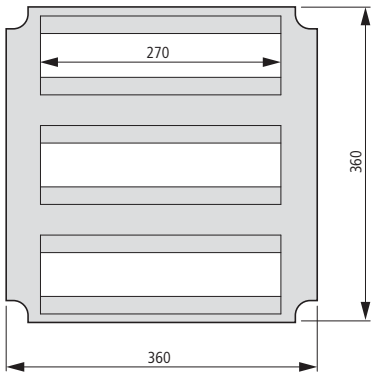
GA-0/I23



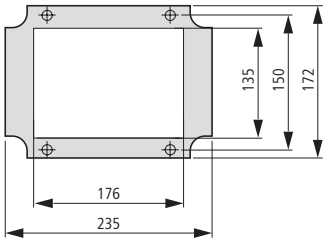
GA-0/I43



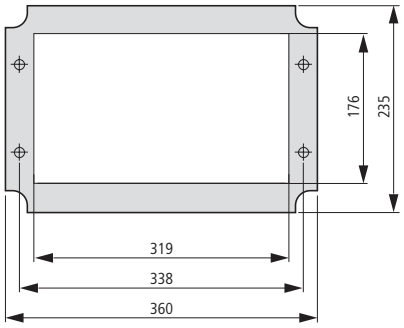
GA-0/I44



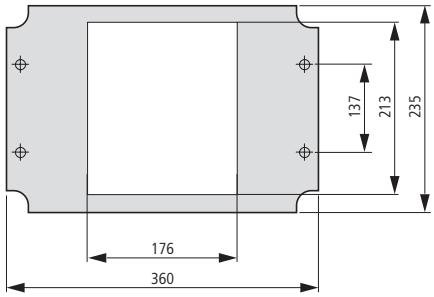
GA-RS-I23



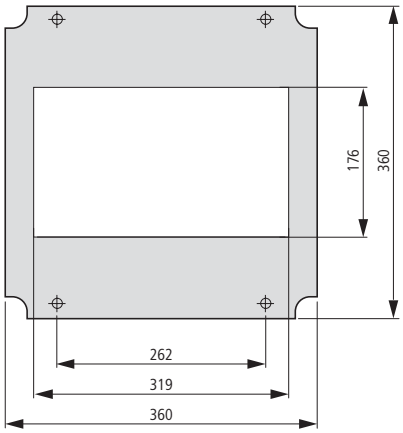
GA-RS-I43



GA-RS-I43-G

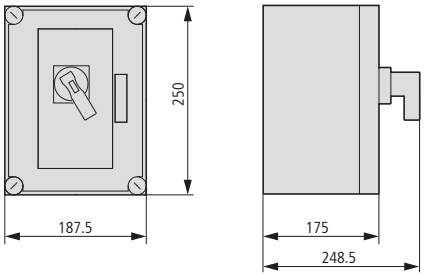


GA-RS-I44

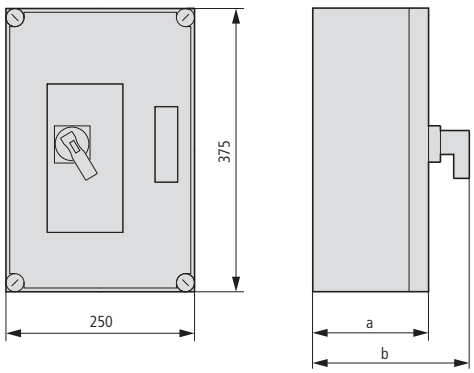


Prepared MCCB enclosures

MCCB1-63/I23E-150



MCCB.../I43E-...

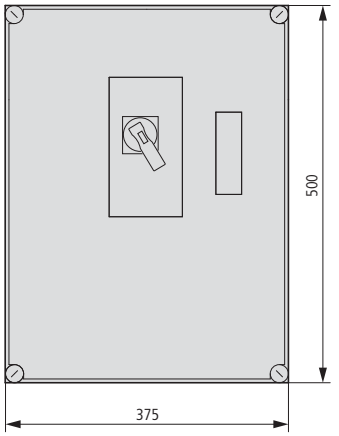


Part no.	a	b
MCCB1-125/I43E-150	175	248.5
MCCB1-160/I43E-200	225	298.5
MCCB2-200/I43E-200	225	298.5

MCCB2-..., MCCB3-..., T-CI..., K...-A

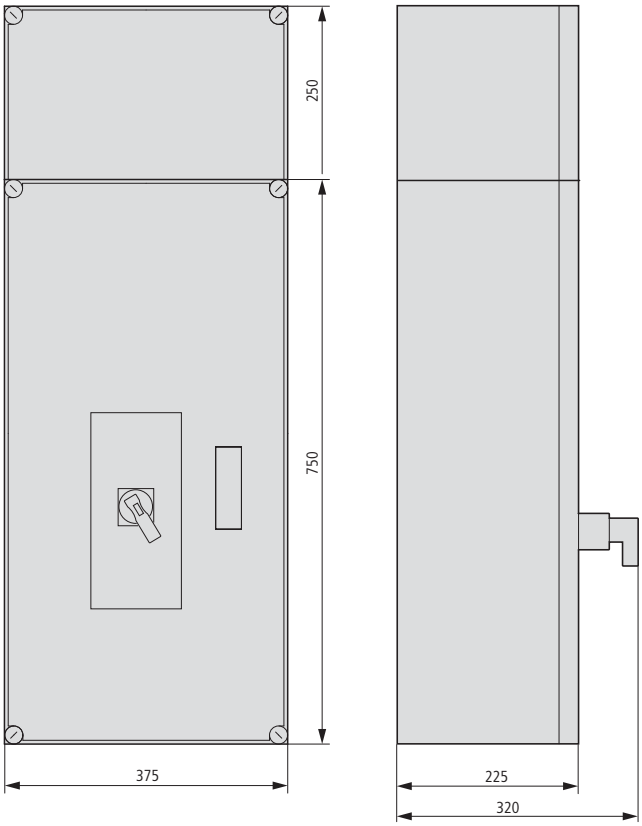
Prepared MCCB enclosures

MCCB.../I45E-200



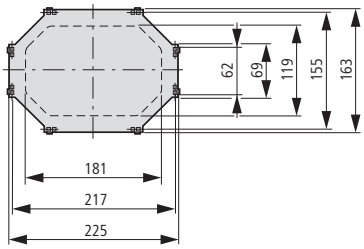
Part no.	b
MCCB2-250/I45E-200	298.5
MCCB3-400/I45E-200	320

MCCB3-630/I48/I43E-200

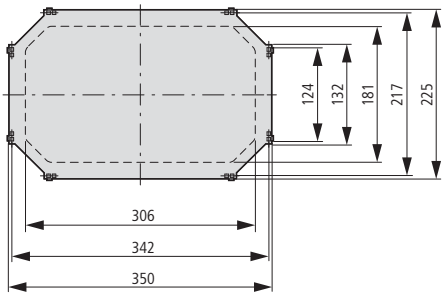


Doors

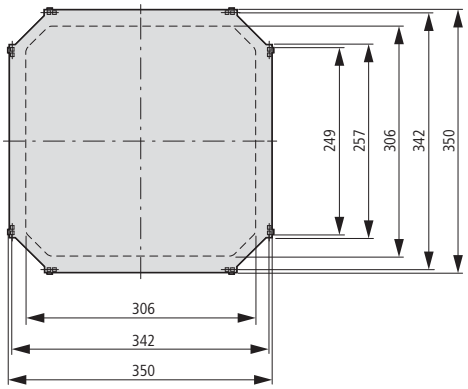
T-CI23



T-CI43

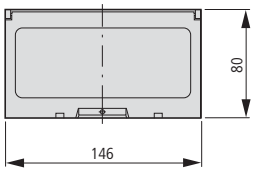


T-CI44

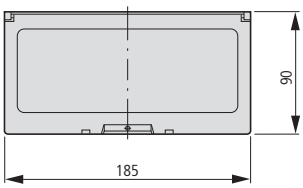


Hinged flaps

K-A

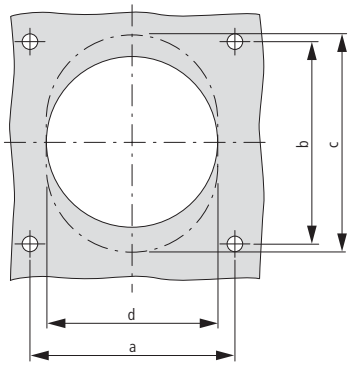


KG-A



D...-Ci...-RAL7032-STV, FL... STV..., K...

Openings of covers (D...STV) and flanges (FL...) for socket devices



European socket (Schuko) with grounding provisions, 16 A, 5-pole

Part no.	a mm	b mm	c mm	d mm
Cover 16 A	45	45	-	47
Flange 16 A	52	52	-	57

CEE, 16–125 A, 5-pole

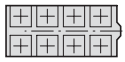
Part no.	a mm	b mm	c mm	d mm
16 A	90	90	-	78
32 A	90	90	-	87
63 A	90	90	98	92
125 A	90	90	107	94

Terminals

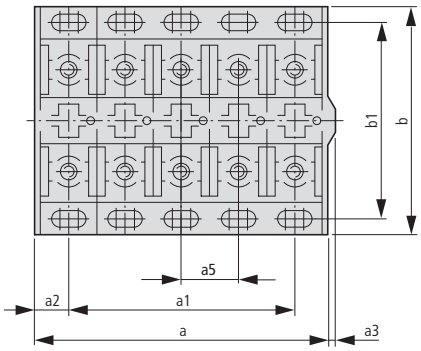
K.../1

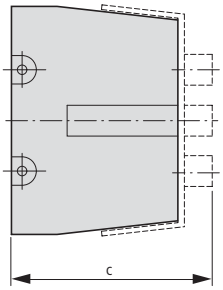


K.../4

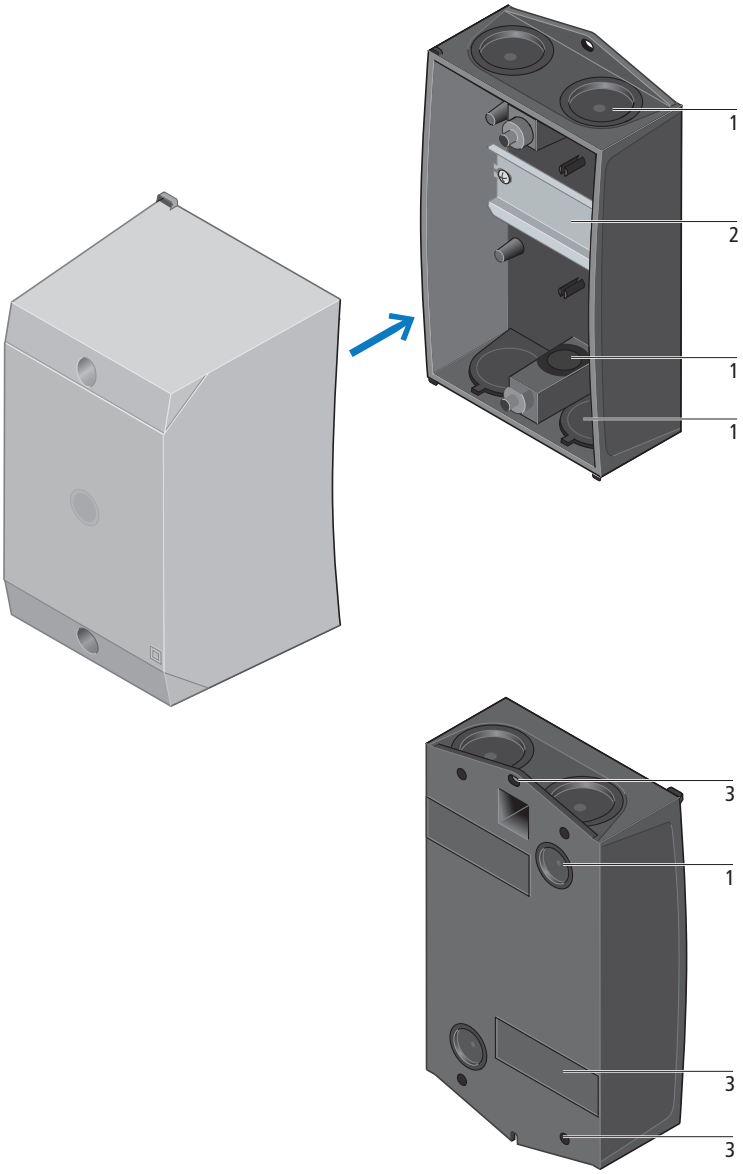


Part no.	a	a1	a2	a3	b	b1	c	a5
K95/1/N	37	-	18.5	3	115	100	88	-
K95/4	130	100	15	3	115	100	88	31
K150/1	37	-	18.5	3	115	100	105	-
K150/4	130	100	15	3	115	100	105	31
K240/1	52	-	26	3	115	100	120	-
K240/4	190	150	20	3	115	100	120	46
K2X240/1	68	-	34	4	140	125	127	-
K2X240/4	254	200	27	4	140	125	127	62





System overview



General
Protection type IP65 (except CI-K2-80-A)
Five basic sizes (floor area of enclosure lower section)
Two overall depths per base surface (exception: CI-K1 enclosure depth always 95 mm, CI-K2-80-... enclosure depth always 80 mm)
Enclosure made of glass-fibre reinforced with self-extinguishing polycarbonate, halogen free
Captive gasket
Enclosure base RAL 9005)
Black (matt)
Enclosure cover RAL 7035, light grey (matt)

Metric cable entries	1
CI-K1 and CI-K2:
metric cable entry knockouts with push-through cable entry diaphragm in the sides, top and bottom and also in the rear wall
CI-K1H, CI-K2H:
metric cable entry knockouts in the enclosure sides, top and bottom
CI-K3 to CI-K5:
metric cable entry knockouts in the sides, top and bottom and also in the rear wall
Control cable entry with CI-K2
Metric cable glands to EN 50 262
Push-through metric cable grommets
→ Page 20/95, → Chapter 16: Accessories for control panel building

Mounting systems for basic enclosures	2
Mounting rails to IEC/EN 60 715
Sheet steel mounting plates
Accessories for mounting systems
→ Page 20/97

Mounting	3
Horizontal and vertical slot apertures for wall-mounting enclosures
Captive cover screws
Rubber feet on the back plate to compensate for uneven walls for CI-K1 and CI-K2
External fixing bracket for CI-K4 and CI-K5
→ Page 4/67

Mounting units
Miniature circuit breakers (MCB)
Rotary switches
Switch-disconnectors
Contactors
easy control relays
Timing relay
Pilot devices

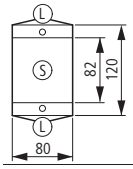
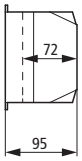
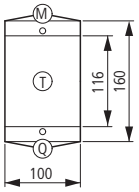
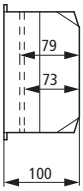
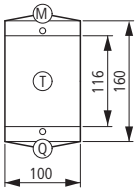
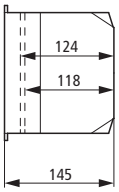
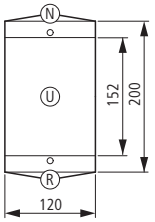
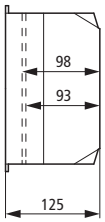
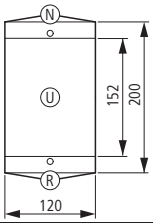
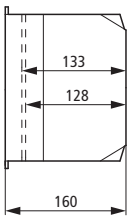
- Laser labelling

We can label the cover surface
of the small enclosures CI-K according to your specifications.
Washable and permanent with modern laser inscription.
Please contact:
Technical information/product advice
Tel. +49 (0)228 602-3704
Fax. +49 (0)0228 602-69403
E-mail: Technik-Bonn@eaton.com
CI-K-Combination-* → Page 20/94
Approved enclosures for use in UL/CSA → Page 20/96

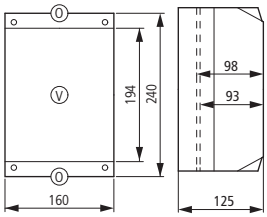
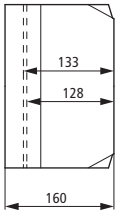
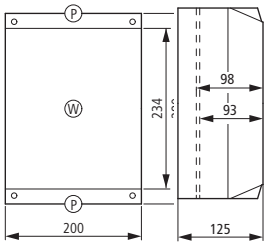
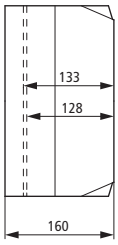
- Cutouts in enclosure covers

We can drill cutouts in enclosure covers to your requirements.
Please contact:
Technical information/product advice
Tel. +49 (0)228 602-3704
Fax. +49 (0)0228 602-69403
E-mail: Technik-Bonn@eaton.com

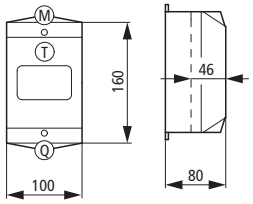
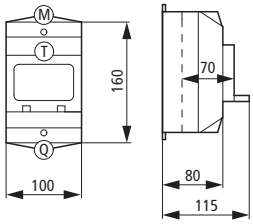
Ordering

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth	Mounting depth		Features	**Part no.** Article no.	**Price** See price list	Std. pack
		For mounting plate	For 7.5 mm mounting rail				
mm	mm	mm	mm				
CI-K basic enclosures							
• Protection type IP65 (exception: CI-K2-80-A), material characteristic glass-fibre reinforced polycarbonate • Enclosure base RAL 9005, black/enclosure top only RAL 7035, light grey • Metric cable entry knockouts top, bottom and in the back plate • Push-through cable membrane with CI-K1 and CI-K2 • Hard metric knockouts with CI-K1H and CI-K2H • Hard metric knockouts with CI-K3 to CI-K5 • Control cable entry with CI-K2 • Indicator light L-. can be mounted in base knock out M20/M25							
		–	72	With mounting rail	**CI-K1-95-TS** 206881		1 off
		–	72	With mounting rail	**CI-K1H-95-TS** 105853		1 off
		–	73	With mounting rail	**CI-K2-100-TS** 206882		1 off
		–	73	With mounting rail	**CI-K2H-100-TS** 229304		1 off
		79	–	With mounting plate	**CI-K2-100-M** 206893		1 off
		79	–	With mounting plate	**CI-K2H-100-M** 229306		1 off
		–	118	With mounting rail	**CI-K2-145-TS** 206883		1 off
		–	118	With mounting rail	**CI-K2H-145-TS** 229305		1 off
		124	–	With mounting plate	**CI-K2-145-M** 206894		1 off
		124	–	With mounting plate	**CI-K2H-145-M** 229307		1 off
		124	–	With adapter plate for contactor DILE with overload relay ZE	**CI-K2-145-AD** 207632		1 off
		124	–	With adapter plate for contactor DILE with overload relay ZE	**CI-K2H-145-AD** 229308		1 off
		–	93	With mounting rail	**CI-K3-125-TS** 206884		1 off
		98	–	With mounting plate	**CI-K3-125-M** 206895		1 off
		–	128	With mounting rail	**CI-K3-160-TS** 206885		1 off
		133	–	With mounting plate	**CI-K3-160-M** 206896		1 off

Notes Number and size of cable entries → Page 20/95

Dimensions	Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth	Mounting depth		Features	**Part no.** Article no.	**Price** See price list	Std. pack
		For mounting plate	For 7.5 mm mounting rail				
mm	mm	mm	mm				
CI-K basic enclosures							
• Protection type IP65 (exception: CI-K2-80-A), material characteristic glass-fibre reinforced polycarbonate • Enclosure base RAL 9005, black/enclosure top only RAL 7035, light grey • Metric cable entry knockouts top, bottom and in the back plate • Push-through cable membrane with CI-K1 and CI-K2 • Hard metric knockouts with CI-K1H and CI-K2H • Hard metric knockouts with CI-K3 to CI-K5 • Control cable entry with CI-K2 • Indicator light L-. can be mounted in base knock out M20/M25							
		–	93	With mounting rail	**CI-K4-125-TS** 206886		1 off
		98	–	With mounting plate	**CI-K4-125-M** 206897		1 off
		–	128	With mounting rail	**CI-K4-160-TS** 206890		1 off
		133	–	With mounting plate	**CI-K4-160-M** 206898		1 off
		–	93	With mounting rail (Weight of fitted components max. 0.65 kg)	**CI-K5-125-TS** 206891		1 off
		98	–	With mounting plate (weight of fitted components max. 1.7 kg)	**CI-K5-125-M** 206899		1 off
		–	128	With mounting rail (Weight of fitted components max. 0.65 kg)	**CI-K5-160-TS** 206892		1 off
		133	–	With mounting plate (weight of fitted components max. 1.7 kg)	**CI-K5-160-M** 206900		1 off
Customised cutouts and laser inscriptions							
• Only with operator only • The necessary data (laser data, symbols, text and their respective positions) as well as the position of the cutouts must be provided as a DXF file.							
					CI-K1-COMBINATION-* 102060		1 off
					CI-K2-COMBINATION-* 102061		1 off
					CI-K3-COMBINATION-* 102062		1 off
					CI-K4-COMBINATION-* 102063		1 off
					CI-K5-COMBINATION-* 102064		1 off

Notes Number and size of cable entries → Page 20/95

Dimensions Enclosure depth: Dimensions from top: 1. Mounting depth for mounting plate 2. Mounting depth for mounting rail 7.5 mm height 3. Enclosure depth	Mounting depth For mounting plate	 For 7.5 mm mounting rail	Features		**Part no.** Article no.	**Price** See price list	Std. pack
mm	mm	mm					
CI-K2 basic enclosures							
• Protection type IP30, material characteristic glass-fibre reinforced polycarbonate • Enclosure base RAL 9005, black/enclosure top only RAL 7035, light grey • Metric cable entry knockouts top, bottom and in the back plate • Push-through cable entry diaphragm with CI-K2 • Hard metric knockouts with CI-K2H • Control cable entry • Indicator light L-. can be mounted in base knock out M20/M25							
–							
	–	46	With standard cutout dimensions	Standard cutout dimensions and mounting rail for mounting devices requiring 2 to 4 space units. Push-through cable entry membrane. Close off of unused space units (max. 2) using blanking strips VST1, → Page 20/98	**CI-K2-80-A** 211107		1 off
	–	46	With standard cutout dimensions	Standard cutout dimensions and mounting rail for mounting devices requiring 2 to 4 space units. Hard metric knockouts. Close off of unused space units (max. 2) using blanking strips VST1, → Page 20/98	**CI-K2H-80-A** 229309		1 off
	–	70	With hinged cover	Transparent hinged cover for mounting devices requiring 2 to 4 space units. Push-through cable entry diaphragm.	**CI-K2-80-K** 211108		1 off
	–	70	With hinged cover	Transparent hinged cover for mounting devices requiring 2 to 4 space units. Hard metric knockouts.	**CI-K2H-80-K** 229310		1 off

Notes Diaphragm grommets, cable glands → Chapter 16: Accessories for panel construction

L



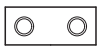
Knockouts
2 X M20 or push-through membrane up to max. ∅ 12 mm

M



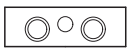
Knockouts
2 x M25 or push-through membrane up to max. ∅ 16 mm
CI-K2H: 2 x M25/20

N



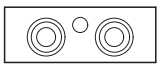
Knockouts
2 x M25/20

O



Knockouts
2 x M32/25
1 x M20

P



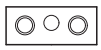
Knockouts
2 x M50/40/25
1 x M20

q



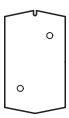
Knockouts
2 x M25 or push-through membrane up to max. ∅ 16 mm and 1 push-through membrane up to max. ∅ 8 mm
CI-K2H: 2 x M25/20

R



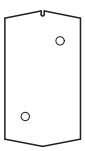
Knockouts
2 x M25/20
1 x M20

S



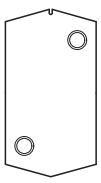
Back plate:
2 x push-through membrane up to max. ∅ 8mm

T



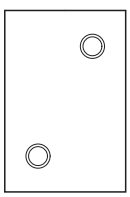
Back plate:
2 x push-through membrane up to max. ∅ 11mm
(not for CI-K2H)

U



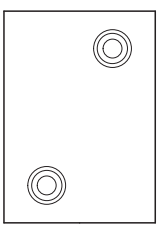
Back plate:
2 x M25/20

V



Back plate:
2 x M32/25

W



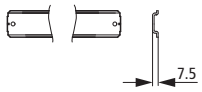
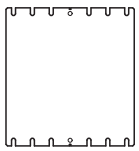
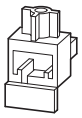
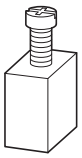
Back plate:
2 x M50/40/25

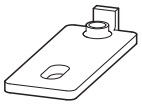
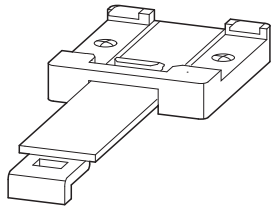
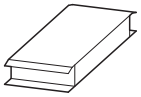
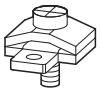
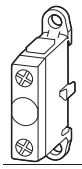
CI-K...-NA

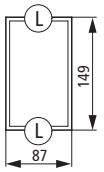
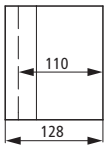
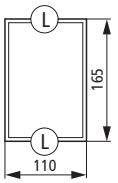
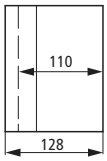
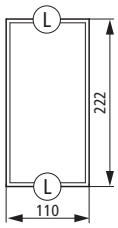
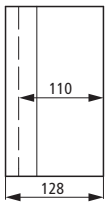
Dimensions Width mm	Height mm	Depth mm	Mounting depth mm	Features	Part no. Article no.	Price See price list	Std. pack
CI-K basic enclosures							
• Protection type IP65 • Enclosure base RAL 9005, black/enclosure top only RAL 7035, light grey • Approved for UL, CSA • CI-K2X…: 4 x ½ inch knockouts • CI-K3X…, CI-K4X…, CI-K5X…: smooth overall with sharp corners							
100	160	100	73	With mounting rail	**CI-K2X-100-TS-NA** 231220		1 off
			79	With mounting plate	**CI-K2X-100-M-NA** 231228		
		145	118	With mounting rail	**CI-K2X-145-TS-NA** 231221		
			124	With mounting plate	**CI-K2X-145-M-NA** 231229		
120	200	125	93	With mounting rail	**CI-K3X-125-TS-NA** 231222		
			98	With mounting plate	**CI-K3X-125-M-NA** 231230		
		160	128	With mounting rail	**CI-K3X-160-TS-NA** 231223		
			133	With mounting plate	**CI-K3X-160-M-NA** 231231		
160	240	125	93	With mounting rail	**CI-K4X-125-TS-NA** 231224		
			98	With mounting plate	**CI-K4X-125-M-NA** 231232		
		160	128	With mounting rail	**CI-K4X-160-TS-NA** 231225		
			133	With mounting plate	**CI-K4X-160-M-NA** 231233		
200	280	125	93	With mounting rail	**CI-K5X-125-TS-NA** 231226		
		160	128	With mounting rail	**CI-K5X-160-TS-NA** 231227		
	280	125	98	With mounting plate	**CI-K5X-125-M-NA** 231234		
		160	133	With mounting plate	**CI-K5X-160-M-NA** 231236		

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94; IEC/EN 60947-3; CE marking
UL File No.	E54120, E337418
UL CCN	MITW2
CSA File No.	12528
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified
Specially designed for NA	Yes
Degree of Protection	IEC: IP65; UL/CSA Type 1, 3R, 4X, 12, 13 – indoor and outdoor use

	For use with	Mounting position	Features	Useful length	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Mounting rails								
Height 7.5 mm, with fixing screws								
	CI-K1	Crosswise	–	60 mm	**TS-CI-K1** 206901		10 off	UL/CSA certification not required
	CI-K2	Crosswise	–	82 mm	**TS-CI-K2** 206902			
	CI-K3	Lengthwise and cross-wise	–	98 mm	**TS-CI-K3** 206903			
	CI-K4	Crosswise	–	133 mm	**TS-CI-K4** 206904			
	CI-K5	Lengthwise and cross-wise, CI-K4 lengthwise	–	173 mm	**TS-CI-K5** 206905			
Mounting plates								
2 mm sheet steel with fixing screws								
	CI-K2	–	–	–	**M-CI-K2** 206906		10 off	UL/CSA certification not required
	CI-K3	–	–	–	**M-CI-K3** 206907			
	CI-K4	–	–	–	**M-CI-K4** 206908			
	CI-K5	–	–	–	**M-CI-K5** 206909			
Accessories for mounting systems								
Spacers • For raising the mounting systems • (4 off required for mounting plate, 2 off required for mounting rail)								
	–	–	by 25 mm	–	**HS25-CI** 002291		25 off	UL/CSA certification not required
	–	–	by 50 mm	–	**HS50-CI** 002292			
	–	–	by 10 mm	–	**ADT200-190** 002289		10 off	UL/CSA certification not required
	–	–	by 15 mm	–	**ADT125-110** 002290			

	For use with	Terminal capacity Flexible mm²	**Part no.** Article no.	**Price** See price list	Std. pack	**Information relevant for export to North America**
Accessories for small enclosures CI-K						
Set of external fixing brackets To secure CI-K4 and CI-K5 directly on the wall. Each set contains four brackets.						
	T5B-…/I4, T5-…/I5, P3-63/I4, P3-100/I5,	–	**AB-CI-K4/5** 206914		1 off	UL/CSA certification not required
Mounting rail adapter, screw fixing To secure enclosure on mounting rails to IEC/EN 60715						
	CI-K1	–	**TB-CI-K** 206918		1 off	UL/CSA certification not required
Blanking strips To blank off one space unit; cannot be removed from outside						
	CI-K2-80-A	–	**VST1** 211258		5 off	UL/CSA certification not required
N terminals, PE terminals Screwed onto support bosses in the enclosure base plate						
	CI-K2-PKZ0- … CI-K1/2	1 - 4 mm²	**K-CI-K1/2** 207451		20 off	UL/CSA certification not required
Insulated individual terminals • With PE, N adhesive labels • For snap-fitting onto mounting rail						
	CI-K3	1 - 10 mm²	**K-CI-K3** 206915		20 off	UL/CSA certification not required
	CI-K4 T5B-.../I4 CI-K4-T5B-... P3-.../I4	1.5 - 16 mm²	**K-CI-K4** 206916		20 off	UL/CSA certification not required
	CI-K5 T5-.../I5 CI-K5-T5-... P3-.../I5	10 - 35 mm²	**K-CI-K5** 218488		20 off	UL/CSA certification not required
Protective covers for push-through cable membrane with CI-K1(2) To cover push-through cable membranes						
–	CI-K1 (M20)	–	**SK-CI-K1** 226766		100 off	
–	CI-K1 (M25)	–	**SK-CI-K2** 226767		100 off	

	Dimensions	For use with	Enclosure depth: Dimensions from top 1. Mounting depth for mounting plate 2. Mounting depth	Mounting depth	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
	Dimensions mm		Enclosure depth mm	For mounting plate mm				
CI-B, C, D basic enclosures								
• Transparent cover • Metric knockouts top, bottom • With PEN terminal • IP55 individual enclosure with pre-drilled mounting plate								
		DIL00AM		110	**CI-B** 024315		1 off	**L**  Knockouts 2 x M20
		S27		110	**CI-C** 031434		1 off	
		DIL0AM S27		110	**CI-D** 038553		1 off	
PE terminal (fifth conductor)								
Rated operational current 25 A for ∅ 1.5 - 6 mm² solid								
	–	CI-B CI-C CI-D	–	–	**K6/1** 002270		100 off	

Information relevant for export to North America

UL/CSA certification not required

Technical data

		CI-K1	CI-K2	CI-K2...-80-A CI-K2...-80-K	CI-K3	CI-K4	CI-K5
General							
Standards		IEC/EN 60529 DIN 43660 EN 50262					
Climatic proofing		Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30					
Ambient temperature	°C	-25 - 70					
Ambient air temperature with push-through cable entry	°C	-25…40					
Protection type		Front IP65		Front IP30	Front IP65		
		The degree of protection specifications do not apply to CI-K2-80-A					
Protection type with push-through cable entry		IP65		IP30	IP65		
Radiated heat dissipation							
		→ Page 20/101					
Material properties							
Material							
Base, cover		Glass-fibre reinforced polycarbonate					
Surface treatment		Corrosion-resistant					
Color							
Base		RAL 9005, black (matt)					
Cover		Enclosure cover RAL 7035, light grey (matt)					
Material properties							
Electrical							
Creepage resistance to IEC 60112							
Base		CTI 175					
Cover		CTI 175					
Surface treatment to IEC 60093	Ω x 10^{13}	> 1					
Dielectric strength to IEC 60243-1	kV/mm	30					
Thermal							
Continuous thermal stability							
Housing	°C	-40…120					
Sealing	°C	-40…80					
Mechanical							
IK code to EN 50102		04	06	06	06	06	06
Weight of fitted components							
Per mounting rail	kg	0.2	0.7	0.7	0.85	0.75	0.65
With mounting plate	kg	–	–	0.7	0.85	0.9	1
Chemical resistance							
Base, cover							
Resistant		Acids < 10 %, mineral oil, petrol, grease, saline solutions					
Partially resistant		Acids > 10 %, Alcohol					
Non-resistant		Alkalis, benzol					
Push-through membrane (CI-K1/CI-K2) and sealing material							
Resistant		Acids < 10 %, alkalis, alcohol, saline solutions			–	–	–
Partially resistant		Acids < 10 %, grease, benzene			–	–	–
Non-resistant		Mineral oil, petrol			–	–	–
Atmospheric							
Saline spray		IEC 60068-2-11					
UV resistance		Beneath protective canopy					
Water absorption to EN ISO 62	%	0.29					
Flammability characteristics							
Glow-wire test							
Base, cover							
Glow wire to VDE 0471 Part 2	°C	960/1 mm thick					
According to UL 94		VO/1.5 mm thickness					
Push-through membrane (CI-K1/CI-K2) and sealing material							
To VDE 0471 Part 2	°C	650/1 mm thick			–	–	–
According to UL 94		HB			–	–	–
Halogen free		Yes			–	–	–

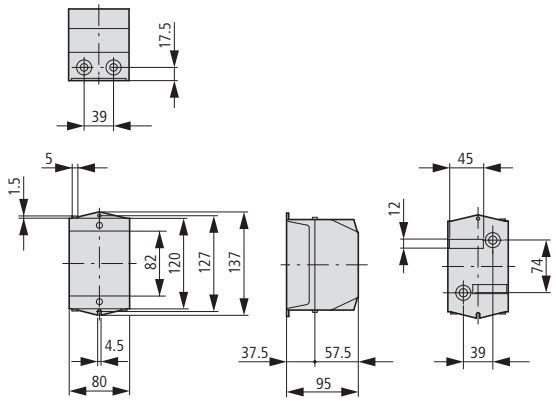
Notes The degree of protection specifications do not apply to CI-K2-80-A

Small enclosures CI-K	CI-K...		
Radiated heat dissipation	**Part no.**	**Dimensions W x H x D mm**	**Heat dissipation W**
Max. radiated heat dissipation of the insulated enclosures CI-K with separate mounting, ambient air temperature +20 °C	CI-K1-95	80 x 137 x 95	10
	CI-K2-100 CI-K2-145	100 x 181 x 100 100 x 181 x 145	12.5 18.5
	CI-K3-125 CI-K3-160	120 x 222 x 125 120 x 222 x 160	21.5 25.5
	CI-K4-125 CI-K4-160	160 x 240 x 125 160 x 240 x 160	26 29.5
	CI-K5-125 CI-K5-160	200 x 280 x 125 200 x 280 x 160	35 41

Dimensions

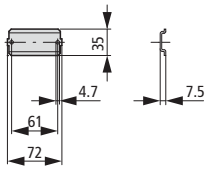
Small insulated material enclosures

CI-K1...-95-TS

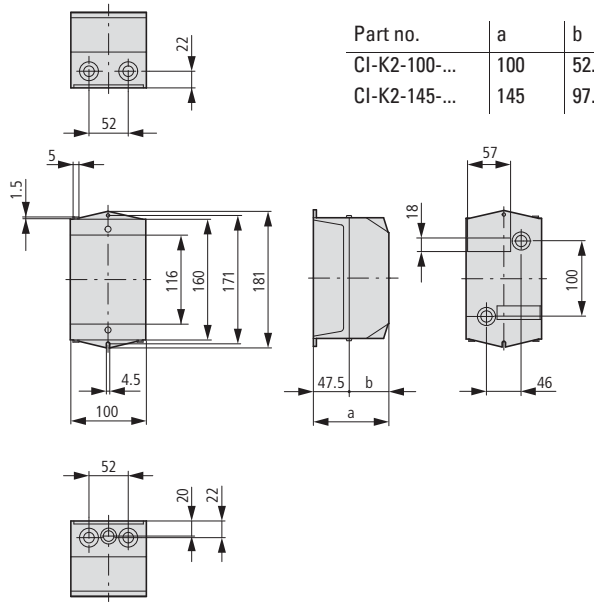


Mounting rails

TS-CI-K1



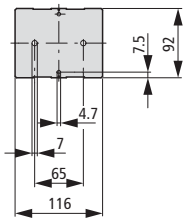
CI-K2-...



Part no.	a	b
CI-K2-100-...	100	52.5
CI-K2-145-...	145	97.5

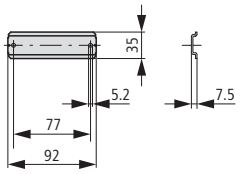
Mounting plates

M-CI-K2

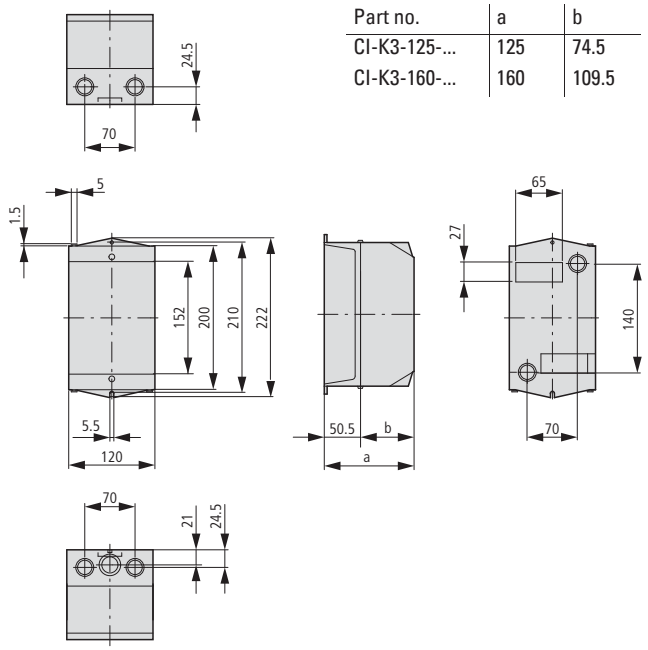


Mounting rails

TS-CI-K2



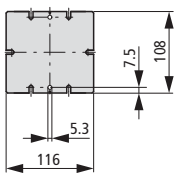
CI-K3-...



Part no.	a	b
CI-K3-125-...	125	74.5
CI-K3-160-...	160	109.5

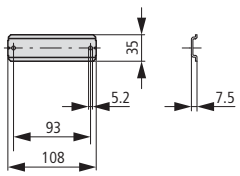
Mounting plates

M-CI-K3



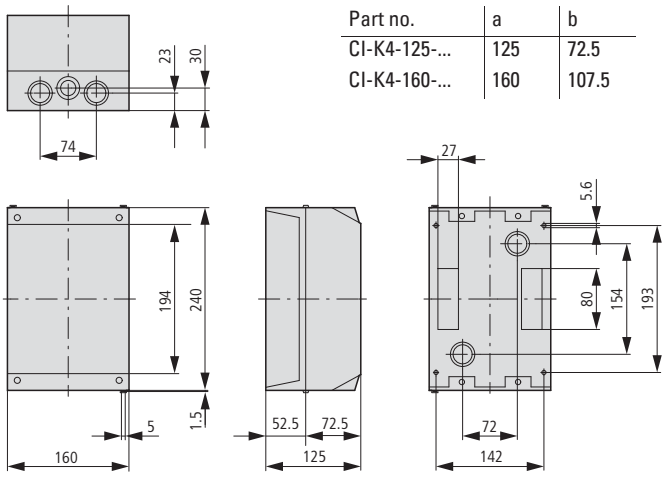
Mounting rails

TS-CI-K3



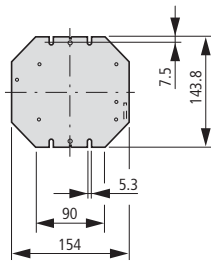
Small insulated material enclosures

CI-K4-...

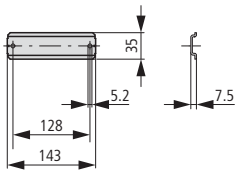


Part no.	a	b
CI-K4-125-...	125	72.5
CI-K4-160-...	160	107.5

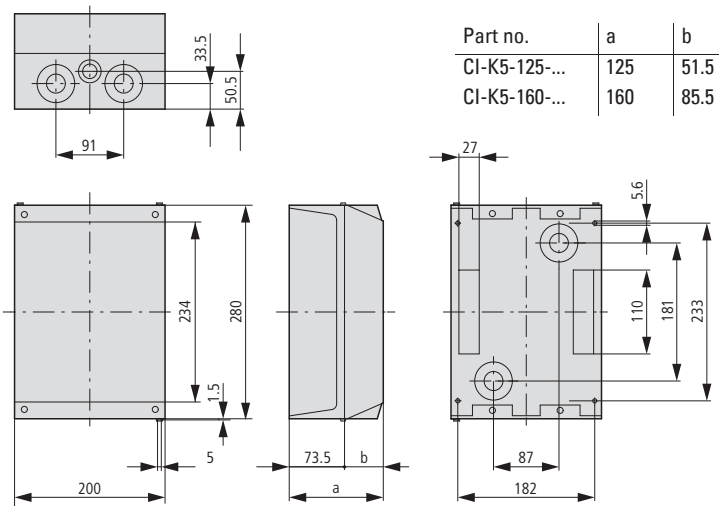
Mounting plates
M-CI-K4



Mounting rails
TS-CI-K4

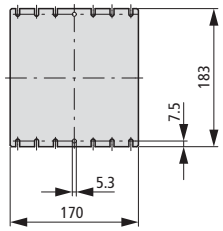


CI-K5-...

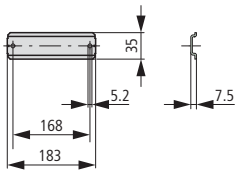


Part no.	a	b
CI-K5-125-...	125	51.5
CI-K5-160-...	160	85.5

Mounting plates
M-CI-K5

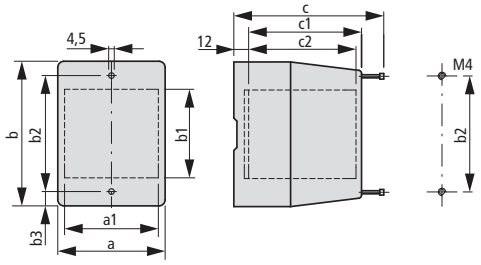


Mounting rails
TS-CI-K5



Basic enclosures

CI-B, CI-C, CI-D



Part no.	a	a1	b	b1	b2	b3	c	c1	c2
CI-B	87	71	149	106	128	10.5	128	115	84.4
CI-C	110	95	165	122	144	10.5	128	115	84.4
CI-D	110	97	222	179	201	10.5	128	115	84.4







CS sheet steel wall-mounting enclosure

The stable CS housing series is used wherever effective protection against contact with active components is required. 45 housing sizes in protection type IP66 and an efficient range of accessories for interior and exterior installation make this housing series a universal genius.

Moeller Systempartner Schaltanlagen

Sheet steel wall-mounting enclosure CS – CS-86/200
Hinge pins with quick-change technology for simple door mounting +++ Base plate with foam gasket, ready-to-mount +++ Fasteners from corrosion-resistant metal → Page 21/4

Sheet steel wall-mounting enclosure CS – CS-1210/300
Mounting plate with 4-fold bevel provides more stability +++ 3-point rod closure for smooth opening +++ Door stabilizer for heavy door installations such as touch panels → Page 21/5

Locks with inserts – LC-DBIT5-CS
Shockproof, corrosion-resistant metal system +++ Easily extended with bar +++ Customized colors and inserts upon request → Page 21/10

Bar accepts profile semi-cylinders – PHZ-A-ADD-ON
For all market-typical profile semi-cylinders +++ Metal system with integrated closing condition display +++ Mount in minutes without drilling, stamping or sawing the door → Page 21/10

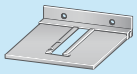
Wall fixing bracket – WFB-SET-CS
Horizontal and vertical mounting +++ Housing hangs easily on wall bolts +++ Simple assembly with few individual parts → Page 21/10

Mounting bars for door profile moldings and cable ducts – MTR-D6-CS
Quick and easy cable channel clamping +++ Length matched to door profile +++ For individual removal of door interior side → Page 21/6

Prefabricated energy and control distribution
Our system partner switchgear systems operate prefabricated energy and control distributions worldwide
www.moeller-systempartner-schaltanlagen.net

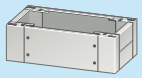
CS sheet steel wall-mounting enclosure

















System overview

Sheet steel wall-mounting enclosure CS 21/2

Ordering

Sheet steel wall-mounting enclosure CS with mounting plate 21/4

Accessories 21/6

Internal configuration 21/6

Door detent 21/6

Universal brackets for door position switches, cable conduit holders 21/6

Mounting bracket, inclined 21/6

Mounting rail module for soft starters 21/6

Quick-C 21/6

Mounting bars for door profile moldings and cable ducts 21/6

Depth adjustment elements for mounting plates 21/7

Mounting plate, perforated, for cage nuts 21/7

Cage nuts for perforated mounting plates 21/7

Mounting plate, without apertures RAL2000 21/8

Mounting plate, without apertures, galvanized 21/8

Door for internal partitions 21/9

External configuration 21/10

Wall fixing brackets 21/10

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Comfort rotary handle 21/10

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Mast fastening 21/14

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Sheet steel wall-mounting enclosure CS, a general dat 21/22

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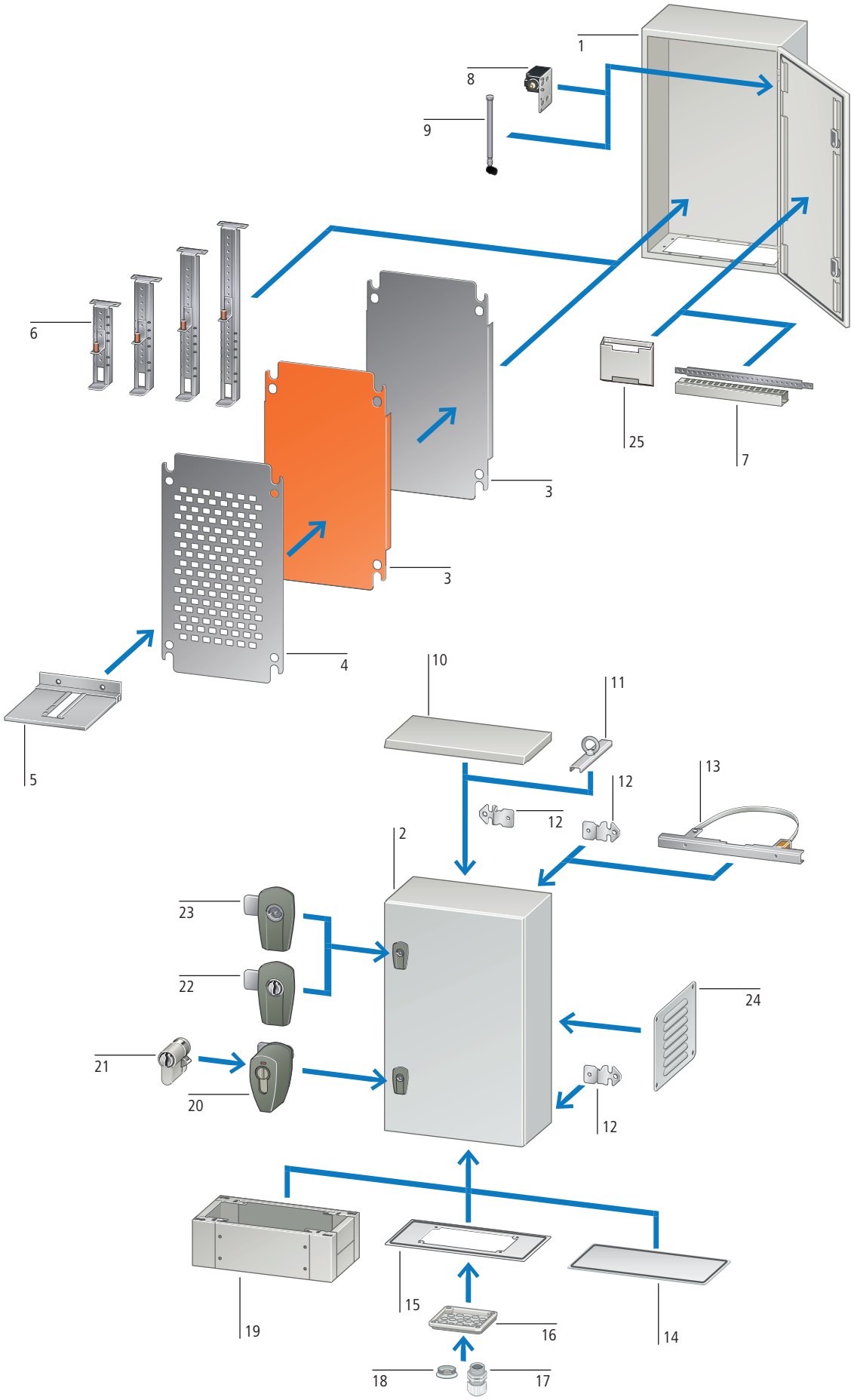
External configuration 21/31

System overview



Indoor installation

CS sheet steel wall-mounting enclosure 1

Internal concealed horizontal door hinge pins with quick change technology so that the door can be rapidly taken off its hinges to perform further processing or to change the door stop

Door profile molding with perforation at 25 mm intervals for fastening DIN mounting rails or for fixing cable conduits and leads

The supplied galvanized sheet steel mounting plate permits safe installation of the switchgear and basic EMC protection. Slots facilitate insertion of the equipped mounting plate into the control panel.

In the case of enclosure dimensions larger than 600 x 400 mm bended sides increase the stability of the mounting plates when heavy built-in devices units are being used.

Optional internal door for additional personal and system protection

→ Page 21/4

Mounting plate, unperforated, galvanized or RAL 2000 3

→ Page 21/8

Mounting plate, perforated, galvanized, for cage nuts 4

For quick mounting of switchgear and protective devices without drilling

→ Page 21/7

Mounting rail module for soft starters 5

Allows convenient connection and operation of Eaton soft starter through pivoting in and out

→ Page 21/6

Depth adjustment elements for mounting plates 6

Depth adjustment in a 25 mm grid for tailored surface-mounting on front or back of mounting plate

→ Page 21/7

Mounting bars for door profile moldings and cable ducts 7

For screw- and hole-less mounting of Eaton cable ducts KL...

→ Page 21/6, → 21/21

Universal brackets for door contact switches and cable conduit holders 8

→ Page 21/6

Quick-C hinge pin 9

Door hinge pin with quick-change technology for retrofitting or as spare part

→ Page 21/6

Outdoor installation

CS sheet steel wall-mounting enclosure 2

Degree of protection IP66, resistance of impact IK09, UL/CSA Type 1 and 12

45 enclosure sizes from 250 x 200 x 150 mm to 1200 x 1200 x 250 mm (h x w x d) also with an enclosure depth of 300 mm.

Impact-resistant designer metal locks, standard 3 mm two-way key bit

Rain gutter profile

Foamed polyurethane sealing throughout.

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Rain canopy 10

With edge sloping toward rear.

→ Page 21/13

Lift eye kit with profile bracket 11

Stable profile bracket for internal enclosure reinforcement for lifting eye

→ Page 21/14

Wall fixing bracket 12

Elongated holes simplify mounting the equipped enclosures on the wall bolts.

Simple subsequent alignment of enclosure

Vertical and horizontal mounting possible

→ Page 21/10

Mast fastening 13

For stable, reliable fixing on round or rectangular masts

→ Page 21/14

Bottom panels without apertures 14

Sheet steel bottom panels with foamed gasket for assembly by user

Suitable for indoor or outdoor installation.

The enclosure can be turned through 180° for cable entry from above or below.

The flange aperture is in the rear area of the enclosure, enabling easy wiring onto the mounting plate.

→ Page 21/11

Bottom panels with apertures for F3A flanges 15

Sheet steel bottom panels with foamed gasket, preassembled for Eaton F3A flanges

→ Page 21/11

F3A flanges 16

Insulating material flanges with metric knockouts, cable grommets or push-through seals.

→ Page 21/12

Metric cable glands to EN 50262, metric ventilation cable glands 17

Innovative ventilating cable glands

Protection type IP69K

→Page 21/17, → 21/18

Metric diaphragm grommets, cable grommet 18

Protection type up to IP66

→ Page 21/19

Cable interconnect frame 19

Cable clamp rails can be fitted at an adjustable height and depth

→ Page 21/12

Lock for half-cylinder comfort rotary handle 20

Standard locks can be quickly equipped with cylinder locks.

New and unique on the market: With built-in "closed" position indication; rugged metal design

No complicated drilling, punching or sawing of the door required

The standard lock does not even have to be dismounted.

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Cylinder locks 21

High-grade cylinder locks with adjustable hammer

→ Page 21/10

Locks with inserts, lock cylinder 22

Lock for retrofitting

→Page 21/10

Locks with inserts, two-way key bit 23

Lock for retrofitting with 3 mm or 5 mm two-way key bit

Made completely of pressure-cast zinc, therefore suitable for indoor and outdoor installation

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Ventilating louvers 24

For passive control panel ventilation

→ Page 21/14

Circuit diagram pockets insulating material 25

→ Page 21/17



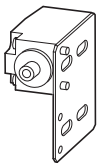
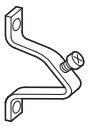
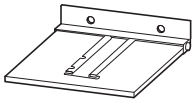
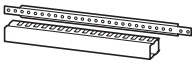
Ordering

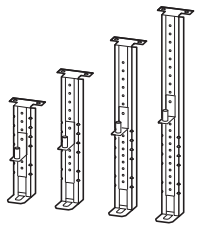
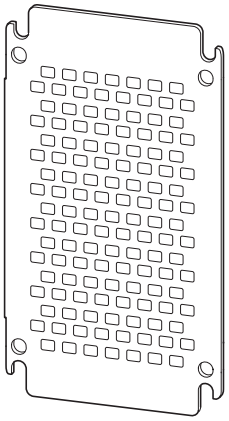
Dimensions			Locks	Hinges	Door profile molding	Flange plates		Max. F3A flanges	Mounting plates		Weight	**Part no.** Article no.	**Price** See price list	Std. pack
Height	Width	Depth	Number	Number	Number	Width	Depth	Number	Height	Width				
mm	mm	mm				mm	mm		mm	mm	kg			
CS wall-mounting enclosure with mounting plate														
• Protection type IP66. • Foamed polyurethane sealing throughout. • Resistance to impact regarding IK09 to EN 62262. • Sheet steel mounting plate • Bottom panel with foamed gasket. CS-1212/250 with two apertures for bottom panel. • Single door, hinges on the right, door opening angle 120°. • Door hinge pins with quick change technology. • Standardized locking system with two-way key bit. From enclosure height 1000 mm: 3-point locking system. • Equipment supplied: Lock, 3 mm two-way key bit • Powder coating (textured surface) in the colour RAL 7035 inside and outside.														
250	200	150	1	2	1	112	182	-	220	150	3.4	**CS-2520/150** 111646		1 off
300	200	150	1	2	1	112	182	-	270	150	3.9	**CS-32/150** 111647		
300	300	150	1	2	2	112	232	-	270	250	5.2	**CS-33/150** 111648		
300	300	200	1	2	2	172	262	1	270	250	6.1	**CS-33/200** 111649		
300	400	200	1	2	2	172	332	1	270	350	7.4	**CS-34/200** 111680		
400	300	150	1	2	2	112	232	-	370	250	6.6	**CS-43/150** 111681		
400	300	200	1	2	2	172	262	1	370	250	7.6	**CS-43/200** 111682		
400	400	150	1	2	2	112	332	-	370	350	8.7	**CS-44/150** 111683		
400	400	200	1	2	2	172	332	1	570	350	9.7	**CS-44/200** 111684		
400	600	200	1	2	2	172	532	2	370	550	13.4	**CS-46/200** 111685		
400	600	250	1	2	2	172	532	2	370	550	14.3	**CS-46/250** 111686		
400	600	300	1	2	2	172	532	2	370	550	15.7	**CS-46/300** 111687		
500	400	150	2	2	2	112	332	-	470	350	10.1	**CS-54/150** 111688		
500	400	200	2	2	2	172	332	1	470	350	10.9	**CS-54/200** 111689		
500	400	250	2	2	2	172	332	1	470	350	11.9	**CS-54/250** 111690		
500	500	250	2	2	2	172	432	1	470	450	14.5	**CS-55/250** 111691		
600	400	150	2	2	2	112	332	-	570	350	12.4	**CS-64/150** 111692		
600	400	200	2	2	2	172	332	1	570	350	13.2	**CS-64/200** 111693		
600	400	250	2	2	2	172	332	1	570	350	14.5	**CS-64/250** 111694		
600	500	150	2	2	2	112	332	-	570	450	15.4	**CS-65/150** 111695		
600	500	200	2	2	2	172	432	1	570	450	16.8	**CS-65/200** 111696		
600	500	250	2	2	2	172	432	1	570	450	17.1	**CS-65/250** 111697		
600	600	200	2	2	2	172	532	2	570	550	21.8	**CS-66/200** 111698		
600	600	250	2	2	2	172	532	2	570	550	23.1	**CS-66/250** 111699		
600	600	300	2	2	2	172	532	2	570	550	24.5	**CS-66/300** 111700		
600	800	300	2	2	2	172	732	3	570	750	34.8	**CS-68/300** 111701		
700	500	200	2	2	2	172	432	1	670	450	21.1	**CS-75/200** 111702		
700	500	250	2	2	2	172	432	1	670	450	21.6	**CS-75/250** 111703		
800	400	200	2	3	2	172	332	1	770	350	21.7	**CS-84/200** 111704		

Dimensions			Locks	Hinges	Door profile molding	Flange plates		Max. F3A flanges	Mounting plates		Weight	**Part no.** Article no.	**Price** See price list	Std. pack
Height	Width	Depth	Number	Number	Number	Width	Depth	Number	Height	Width				
mm	mm	mm				mm	mm		mm	mm	kg			
CS wall-mounting enclosure with mounting plate														
800	400	250	2	3	2	172	332	1	770	350	23.2	**CS-84/250** 111705		1 off
800	600	200	2	3	2	172	532	2	770	550	30.2	**CS-86/200** 111706		
800	600	250	2	3	2	172	532	2	770	550	32.8	**CS-86/250** 111707		
800	600	300	2	3	2	172	532	2	770	550	34.9	**CS-86/300** 111708		
800	800	200	2	3	2	172	732	3	770	750	39.0	**CS-88/200** 111709		
800	800	300	2	3	2	172	732	3	770	750	42.8	**CS-88/300** 111710		
800	1000	300	2	3	2	172	932	3	770	950	54.2	**CS-810/300** 111711		
1000	600	250	1 (3-point)	3	2	172	532	2	970	550	43.2	**CS-106/250** 111712		
1000	600	300	1 (3-point)	3	2	172	532	2	970	550	45.4	**CS-106/300** 111713		
1000	800	250	1 (3-point)	3	2	172	732	3	970	750	55.5	**CS-108/250** 111714		
1000	800	300	1 (3-point)	3	2	172	732	3	970	750	56.1	**CS-108/300** 111715		
1000	1000	300	1 (3-point)	3	2	172	932	3	970	950	68.0	**CS-1010/300** 111716		
1200	600	250	1 (3-point)	3	2	172	532	2	1170	550	50.2	**CS-126/250** 111717		
1200	800	300	1 (3-point)	3	2	172	732	3	1170	750	67.7	**CS-128/300** 111718		
1200	1000	300	1 (3-point)	3	2	172	932	3	1170	950	83.2	**CS-1210/300** 111719		
1200	1200	250	1 (3-point)	3	2	2 x 172	532	4 (2x2)	1170	1150	94.2	**CS-1212/250** 111720		

Information relevant for export to North America

Product Standards	UL 508A; CSA-C22.2 No.14; IEC/EN 60529; CE marking
UL File No.	E336299
UL CCN	NITW
CSA File No.	–
CSA Class No.	–
NA Certification	Request filed for UL and CSA
Conditions of Acceptability	Series CS may be provided with metal sub-panel. No back mounted components are allowed between sub-panel and the back sheet metal enclosure
Suitable for	Industrial Control Panels
Degree of Protection	IEC: IP66, indoor and outdoor; UL/CSA Types 1, 12, indoor only.

	Dimensions Enclosure Width mm	Part no. Article no.	Price See price list	Std. pack
Door retainer				
• For retaining the door in a defined position • Galvanized sheet steel • Including fixing material				
	500 600 800 1000 1200	**DOOR-RET-CS** 138737		1 off
Universal brackets for door contact switches and cable conduit holders				
• For fixing door contact switches or cable conduit holders • Galvanized sheet steel				
	300 400 500 600 800 1000 1200	**UNI-BRA-CS** 140535		2 off
Mounting bracket, inclined				
• For fitting mounting rails TS35X7.5 or TS35X15 in inclined position • Galvanized sheet steel				
	–	**TS1-BRA-CS** 138772		2 off
Mounting rail module for soft starters				
• Pivoting module for soft starters up to and including construction size DS4 • Soft starters pivoted into vertical position require less enclosure depth. • Including fixing material for fitting on mounting plate				
	–	**TS35-DS4-CS** 140537		1 off
Quick-C hinge pin				
• With Quick-Change technology for tool-less removal				
	–	**QUICK-C-CS** 138773		6 off
Mounting bars for door profiles and cable ducts				
• For fitting to vertical door profiles • For screwless mounting of cabling ducts KL... through snap fitting of cable duct covers on rear • Fixing holes M6 spaced at 25 mm • Galvanized sheet steel				
	300	**MTR-D3-CS** 140530		2 off
	400	**MTR-D4-CS** 140531		
	500	**MTR-D5-CS** 140532		
	600	**MTR-D6-CS** 140533		
	800	**MTR-D8-CS** 140534		

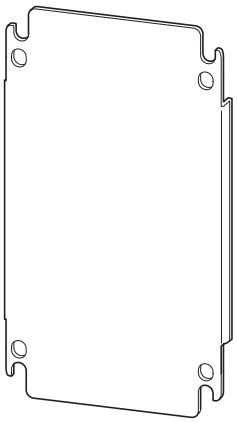
	Dimensions Enclosure Height mm	Width mm	Depth mm	Thread	**Part no.** Article no.	**Price** See price list	Std. pack
Depth adjustment elements for mounting plates							
• Depth-adjustable in 25 mm grid • Galvanized sheet steel • Including fixing material							
	–	–	150	–	**DAS-SET/150-CS** 138656		1 off
	–	–	200	–	**DAS-SET/200-CS** 138657		
	–	–	250	–	**DAS-SET/250-CS** 138658		
	–	–	300	–	**DAS-SET/300-CS** 138659		
Mounting plate, perforated, for cage nuts							
• Galvanized sheet steel • Perforated for cage nuts M6 or M8 • without fixing material	250	200	–	–	**MPP-2520-CS** 138685		1 off
	300	200	–	–	**MPP-3020-CS** 138686		
	300	300	–	–	**MPP-3030-CS** 138687		
	300	400	–	–	**MPP-3040-CS** 138688		
	400	300	–	–	**MPP-4030-CS** 138689		
	400	400	–	–	**MPP-4040-CS** 138690		
	400	600	–	–	**MPP-4060-CS** 138691		
	500	400	–	–	**MPP-5040-CS** 138692		
	500	500	–	–	**MPP-5050-CS** 138693		
	600	400	–	–	**MPP-6040-CS** 138694		
	600	500	–	–	**MPP-6050-CS** 138695		
	600	600	–	–	**MPP-6060-CS** 138696		
	600	800	–	–	**MPP-6080-CS** 138697		
	700	500	–	–	**MPP-7050-CS** 138698		
	800	400	–	–	**MPP-8040-CS** 138699		
	800	600	–	–	**MPP-8060-CS** 138700		
	800	800	–	–	**MPP-8080-CS** 138701		
	800	1000	–	–	**MPP-80100-CS** 138702		
	1000	600	–	–	**MPP-10060-CS** 138703		
	1000	800	–	–	**MPP-10080-CS** 138704		
	1000	1000	–	–	**MPP-100100-CS** 138705		
	1200	600	–	–	**MPP-12060-CS** 138706		
	1200	800	–	–	**MPP-12080-CS** 138707		
	1200	1000	–	–	**MPP-120100-CS** 138708		
	1200	1200	–	–	**MPP-120120-CS** 138709		
Cage nuts for perforated MPP... mounting plates							
	–	–	–	M6	**CANU-M6-CS** 138710		100 off
	–	–	–	M8	**CANU-M8-CS** 138711		

MPL-CS, MPL-RAL2000-CS

HPL21008EN

Mounting plates without apertures

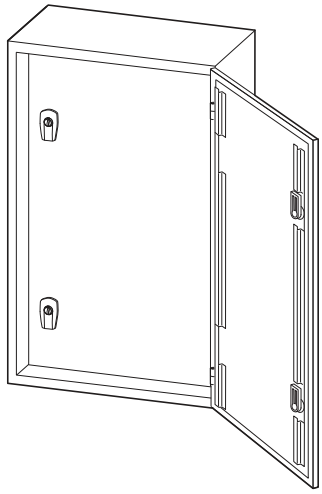
- Sheet steel
- Without fixing material



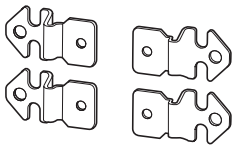
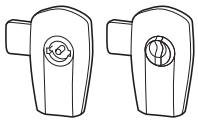
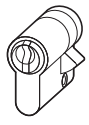
Dimensions Enclosure Height mm	Width mm	Part no. Article no. without apertures RAL2000 With powder coating	Price See price list	Part no. Article no. without apertures, galvanized	Price See price list	Std. pack
250	200	**MPL-2520/RAL2000-CS** 138712		**MPL-2520-CS** 138747		1 off
300	200	**MPL-3020/RAL2000-CS** 138713		**MPL-3020-CS** 138748		
300	300	**MPL-3030/RAL2000-CS** 138714		**MPL-3030-CS** 138749		
300	400	**MPL-3040/RAL2000-CS** 138715		**MPL-3040-CS** 138750		
400	300	**MPL-4030/RAL2000-CS** 138716		**MPL-4030-CS** 138751		
400	400	**MPL-4040/RAL2000-CS** 138717		**MPL-4040-CS** 138752		
400	600	**MPL-4060/RAL2000-CS** 138718		**MPL-4060-CS** 138753		
500	400	**MPL-5040/RAL2000-CS** 138719		**MPL-5040-CS** 138754		
500	500	**MPL-5050/RAL2000-CS** 138720		**MPL-5050-CS** 138755		
600	400	**MPL-6040/RAL2000-CS** 138721		**MPL-6040-CS** 138756		
600	500	**MPL-6050/RAL2000-CS** 138722		**MPL-6050-CS** 138757		
600	600	**MPL-6060/RAL2000-CS** 138723		**MPL-6060-CS** 138758		
600	800	**MPL-6080/RAL2000-CS** 138724		**MPL-6080-CS** 138759		
700	500	**MPL-7050/RAL2000-CS** 138725		**MPL-7050-CS** 138760		
800	400	**MPL-8040/RAL2000-CS** 138726		**MPL-8040-CS** 138761		
800	600	**MPL-8060/RAL2000-CS** 138727		**MPL-8060-CS** 138762		
800	800	**MPL-8080/RAL2000-CS** 138728		**MPL-8080-CS** 138763		
800	1000	**MPL-80100/RAL2000-CS** 138729		**MPL-80100-CS** 138764		
1000	600	**MPL-10060/RAL2000-CS** 138730		**MPL-10060-CS** 138765		
1000	800	**MPL-10080/RAL2000-CS** 138731		**MPL-10080-CS** 138766		
1000	1000	**MPL-100100/RAL2000-CS** 138732		**MPL-100100-CS** 138767		
1200	600	**MPL-12060/RAL2000-CS** 138733		**MPL-12060-CS** 138768		
1200	800	**MPL-12080/RAL2000-CS** 138734		**MPL-12080-CS** 138769		
1200	1000	**MPL-120100/RAL2000-CS** 138735		**MPL-120100-CS** 138770		
1200	1200	**MPL-120120/RAL2000-CS** 138736		**MPL-120120-CS** 138771		

Door for internal partitions

- Sheet steel with powder coating RAL 7035
- Internal door for operator control and display units
- Depth adjustment elements for mounting plates required in addition

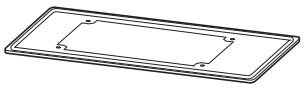


Dimensions Enclosure Height mm	Width mm	Part no. Article no.	Price See price list	Std. pack
250	200	**DI-2520-CS** 138660		1 off
300	200	**DI-3020-CS** 138661		
300	300	**DI-3030-CS** 138662		
300	400	**DI-3040-CS** 138663		
400	300	**DI-4030-CS** 138664		
400	400	**DI-4040-CS** 138665		
400	600	**DI-4060-CS** 138666		
500	400	**DI-5040-CS** 138667		
500	500	**DI-5050-CS** 138668		
600	400	**DI-6040-CS** 138669		
600	500	**DI-6050-CS** 138670		
600	600	**DI-6060-CS** 138671		
600	800	**DI-6080-CS** 138672		
700	500	**DI-7050-CS** 138673		
800	400	**DI-8040-CS** 138674		
800	600	**DI-8060-CS** 138675		
800	800	**DI-8080-CS** 138676		
800	1000	**DI-80100-CS** 138677		
1000	600	**DI-10060-CS** 138678		
1000	800	**DI-10080-CS** 138679		
1000	1000	**DI-100100-CS** 138680		
1200	600	**DI-12060-CS** 138681		
1200	800	**DI-12080-CS** 138682		
1200	1000	**DI-120100-CS** 138683		
1200	1200	**DI-120120-CS** 138684		

			Part no. Article no.	**Price** See price list	Std. pack
Wall fixing brackets sets					
• For fixing on the wall • Vertical or horizontal mounting • Bracket material: 3 mm galvanized sheet steel • One set contains 4 wall fixing brackets with fixing material and gasket IP66.					
			**WFB-SET-CS** 112639		1 off
Universal locks					
• Lock label made from high-grade, impact-resistant pressure-cast zinc • Metal lock and inserts • Powder coated RAM 7037 • For indoor and outdoor applications • Metal lock nut, notched • Compatible with standard latches • For standardized door cutouts 22.5 × 20.4 mm					
	–	3 mm two-way key bit	**LC-DBIT3-CS** 133102		1 off
	–	5 mm two-way key bit	**LC-DBIT5-CS** 133103		1 off
	Common locking mechanism	Key with two-way key bit	**LC-ZSBIT-CS** 133104		1 off
Comfort rotary handle					
• Rotary handle for standardized cylinder locks • With built-in “locked” indication • As retrofitting or complete kit • Handle made from high-grade, impact-resistant pressure-cast zinc • Suitable for all universal locks LC-... • For standardized door cutouts 22.5 × 20.4 mm • Powder coated RAL 7037 • Order cylinder locks separately					
	Complete kit	Cylinder lock	**PHZ-A-COMP** 133105		1 off
	Retrofitting kit	Cylinder lock	**PHZ-A-ADD-ON** 133106		1 off
Cylinder locks for comfort handles					
• For comfort rotary and toggle handles • Lock cylinder designed to DIN 18252 and DIN EN 1303 • Cylinder locks 10/30 with nickel silver pin tumblers • Lock bit with eight adjustment positions, five pin pairs • Common locking or individual key mechanism • One key included per cylinder					
	keyed alike	–	**PHZ-E10/30-GS** 138574		1 off
	keyed different	–	**PHZ-E10/30-VS** 138575		1 off
Spare key for cylinder lock					
• For cylinder lock PHZ-E…-GS					
	keyed alike	Cylinder lock	**KEY-E10/30-GS** 138576		4 off

Bottom panels with flange cutouts

- Not suitable for enclosure CS-…/150
- For flange F3A-…
- With foamed gasket, maximum protection type IP66 for proper application with F3A-…
- Material: sheet steel with powder coating RAL 7035
- Usable as a top panel by turning the enclosure through 180°



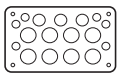
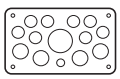
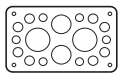
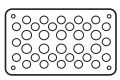
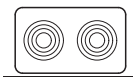
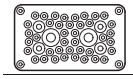
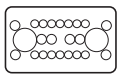
For enclosure dimensions Width mm	Flange apertures Number	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
300	1	CS-33/200 CS-43/200	**AFP-3-CS** 112914		1 off
400	1	CS-34-200 CS-44/200 CS-54/200 CS-54/250 CS-64/200 CS-64/250 CS-84/200 CS-84/250	**AFP-4-CS** 112915		1 off
500	1	CS-55/250 CS-65/200 CS-65/250 CS-75/200 CS-75/250	**AFP-5-CS** 112916		1 off
600	2	CS-46/200 CS-46/250 CS-46/300 CS-66/200 CS-66/250 CS-66/300 CS-86/200 CS-86/250 CS-86/300 CS-106/250 CS-106/300 CS-126/250	**AFP-6-CS** 112917		1 off
800	3	CS-68/300 CS-88/200 CS-88/300 CS-108/250 CS-108/300 CS-128/300	**AFP-8-CS** 112918		1 off
1000	3	CS-810/300 CS-1010/300 CS-1210/300	**AFP-10-CS** 112919		1 off
1200	2 x 2	CS-1212/250	**AFP-12-CS** 112920		1 off

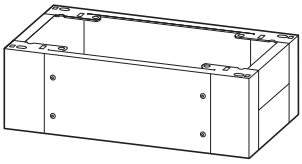
Bottom panels without apertures

- Enclosure protection type IP66
- With continuous foamed gasket
- Gasket protected in deep-drawn area
- With powder coating RAL 7035



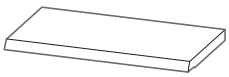
Dimensions Enclosure Width mm	Depth mm	**Part no.** Article no.	**Price** See price list	Std. pack
182	112	**SFP-112X182-CS** 138738		1 off
232	112	**SFP-112X232-CS** 138739		1 off
332	112	**SFP-112X332-CS** 138740		1 off
262	172	**SFP-172X262-CS** 138741		1 off
332	172	**SFP-172X332-CS** 138742		1 off
432	172	**SFP-172X432-CS** 138743		1 off
532	172	**SFP-172X532-CS** 138744		1 off
732	172	**SFP-172X732-CS** 138745		1 off
932	172	**SFP-172X932-CS** 138746		1 off

	Material	Features	Cable entry	**Part no.** Article no.	**Price** See price list	Std. pack
Flanges						
	Insulation material	Blank plate	-	**F3A-0** 074182		10 off
	Insulation material	With metric cable entry knockouts	6 x M25/16; 8 x M32/20, 4 x M16	**F3A-4** 081301		10 off
	Insulation material	With metric cable entry knockouts	2 x M20 8 x M25/16 4 x M32/20 1 x M50/32	**F3A-8** 091468		10 off
	Insulation material	With metric cable entry knockouts	12 x M20, 2 x M16 2 x M40/25 2 x M50/32	**F3A-12** 076555		10 off
	Insulation material	With metric cable entry knockouts	24 x M16 13 x M20	**F3A-34** 078928		10 off
	Insulation material	With cable grommets	2 cables up to 70 mm ∅	**F3A-KTD** 083674		5 off
	Insulation material	Sponge-rubber flange	40 cables, 10 – 13 mm ∅ 4 cables, 17 - 21 mm ∅ 2 cables, 27 - 30 mm ∅	**F3A-D** 010145		10 off
	Sheet steel	Blank plate 2 mm, with powder coating RAL 7035, sponge-rubbed gasket	-	**F3A-XP** 113426		1 off
	Insulation material	Diaphragm flange for cabling	14 x 11 mm ∅ 8 x 15 mm ∅ 2 x 28 mm ∅	**ZSD-2K/FLA** 272166		1 off

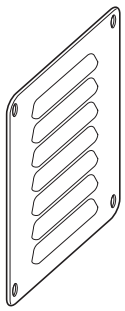
	Dimensions Enclosure Width mm	Depth mm	**Part no.** Article no.	**Price** See price list	Std. pack
Cable interconnect frame • Height 200 mm • Sheet steel, with powder coating RAL 7035 • Including fixing material • Cable clamp rail not included as standard					
	600	250	**PLI-6/250-200-CS** 140472		1 off
	600	300	**PLI-6/300-200-CS** 140473		1 off
	800	250	**PLI-8/250-200-CS** 140474		1 off
	800	300	**PLI-8/300-200-CS** 140475		1 off
	1000	300	**PLI-10/300-200-CS** 140476		1 off
	1200	250	**PLI-12/250-200-CS** 140477		1 off

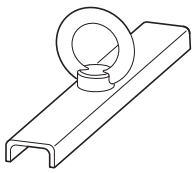
Rain canopies

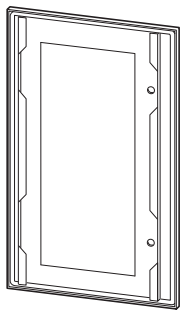
- For direct fastening to the body of the enclosure
- Material properties: sheet steel with powder coating RAL 7035
- Delivery with fixing material and drilling template



Dimensions Enclosure Width mm	Depth mm	Cover Height mm	For use with	**Part no.** Article no.	**Price** See price list	Std. pack
200	150	30	CS-2520/150 CS-32/150	**CNP-2/150-CS** 112890		1 off
300	150	30	CS-33/150 CS-43/150	**CNP-3/150-CS** 112891		1 off
300	200	34	CS-33/200 CS-43/200	**CNP-3/200-CS** 112892		1 off
400	150	30	CS-44/150 CS-54/150 CS-64/150	**CNP-4/150-CS** 112893		1 off
400	200	34	CS-34/200 CS-44/200 CS-54/200 CS-64/200 CS-84/200	**CNP-4/200-CS** 112894		1 off
400	250	38	CS-54/250 CS-64/250 CS-84/250	**CNP-4/250-CS** 112895		1 off
500	150	30	CS-65/150	**CNP-5/150-CS** 112896		1 off
500	200	34	CS-65/200 CS-75/200	**CNP-5/200-CS** 112897		1 off
500	250	38	CS-55/250 CS-65/250 CS-75/250	**CNP-5/250-CS** 112898		1 off
600	200	34	CS-46/200 CS-66/200 CS-86/200	**CNP-6/200-CS** 112899		1 off
600	250	38	CS-46/250 CS-66/250 CS-86/250 CS-106/250 CS-126/250	**CNP-6/250-CS** 112900		1 off
600	300	42	CS-46/300 CS-66/300 CS-86/300 CS-106/300	**CNP-6/300-CS** 112901		1 off
800	200	34	CS-88/200	**CNP-8/200-CS** 112902		1 off
800	250	38	CS-108/250	**CNP-8/250-CS** 112903		1 off
800	300	42	CS-68/300 CS-88/300 CS-108/300 CS-128/300	**CNP-8/300-CS** 112904		1 off
1000	300	42	CS-810/300 CS-1010/300 CS-1210/300	**CNP-10/300-CS** 112905		1 off
1200	250	38	CS-1212/250	**CNP-12/250-CS** 112906		1 off

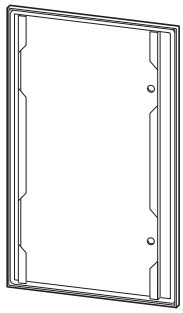
	Dimensions Height mm	Width mm	**Part no.** Article no.	**Price** See price list	Std. pack
Ventilating louvers					
• For direct fastening to the body of the enclosure • Protection type IP23 • Material: sheet steel with powder coating RAL 7035 • Delivery with fixing material					
 Arrangement of the ventilation slits vertically	157	105	**LVP-20V12-CS** 112907		1 off
Arrangement of the ventilation slits horizontally	164	105	**LVP-20H12-CS** 112908		1 off
Arrangement of the ventilation slits vertically	180	130	**LVP-30V15-CS** 112909		1 off
Arrangement of the ventilation slits horizontally	250	130	**LVP-30H15-CS** 112910		1 off

	Length mm	Dimensions Enclosure Width mm	**Part no.** Article no.	**Price** See price list	Std. pack
Mast fastening					
• For fixing on round or rectangular masts • Set consisting of profiled busbar, clamping strap and clamping screw • Sheet steel, galvanized, stainless steel clamping strap • For mast diameters from 150 mm to 215 mm					
	–	300 400 500 600 800	**MAST-FIT-CS** 140478		1 off
Lift eye kit with profile bracket					
• For internal enclosure reinforcement for lifting eye • Eyebolts with thread M12 • Profile bracket of rigid 3 mm sheet steel • For protection type IP66 • Each set contains 2 lifting eyes, profiles and gaskets					
	135	–	**TOR-SET/135-CS** 140479		2 off

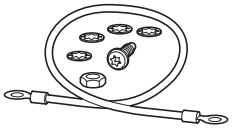
	Dimensions Enclosure Height mm	Width mm	Part no. Article no.	Price See price list	Std. pack
Doors with inspection window					
• Enclosure protection type IP65 • Frame: sheet steel with powder coating, transparent window: safety glass • Without hinges, without lock					
	250	200	**DT-2520-CS** 140480		1 off
	300	200	**DT-3020-CS** 140481		
	300	300	**DT-3030-CS** 140482		
	300	400	**DT-3040-CS** 140483		
	400	300	**DT-4030-CS** 140484		
	400	400	**DT-4040-CS** 140485		
	400	600	**DT-4060-CS** 140486		
	500	400	**DT-5040-CS** 140487		
	500	500	**DT-5050-CS** 140488		
	600	400	**DT-6040-CS** 140489		
	600	500	**DT-6050-CS** 140490		
	600	600	**DT-6060-CS** 140491		
	600	800	**DT-6080-CS** 140492		
	700	500	**DT-7050-CS** 140493		
	800	400	**DT-8040-CS** 140494		
	800	600	**DT-8060-CS** 140495		
	800	800	**DT-8080-CS** 140496		
	800	1000	**DT-80100-CS** 140497		
	1000	600	**DT-10060-CS** 140498		
	1000	800	**DT-10080-CS** 140499		
	1000	1000	**DT-100100-CS** 140500		
	1200	600	**DT-12060-CS** 140501		
	1200	800	**DT-12080-CS** 140502		
	1200	1000	**DT-120100-CS** 140503		
	1200	1200	**DT-120120-CS** 140504		

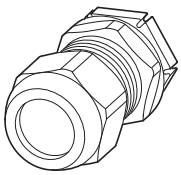
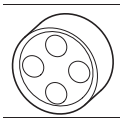
Doors closed

- Enclosure protection type IP66
- Sheet steel with powder coating
- Without hinges, without lock

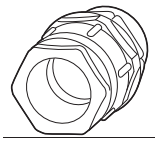
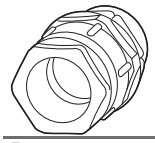
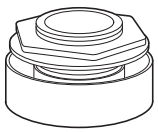
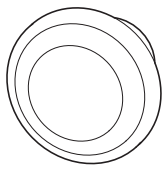


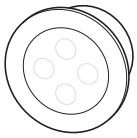
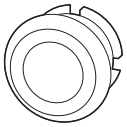
Dimensions Enclosure Height mm	Width mm	Part no. Article no.	Price See price list	Std. pack
250	200	**DS-2520-CS** 140505		1 off
300	200	**DS-3020-CS** 140506		
300	300	**DS-3030-CS** 140507		
300	400	**DS-3040-CS** 140508		
400	300	**DS-4030-CS** 140509		
400	400	**DS-4040-CS** 140510		
400	600	**DS-4060-CS** 140511		
500	400	**DS-5040-CS** 140512		
500	500	**DS-5050-CS** 140513		
600	400	**DS-6040-CS** 140514		
600	500	**DS-6050-CS** 140515		
600	600	**DS-6060-CS** 140516		
600	800	**DS-6080-CS** 140517		
700	500	**DS-7050-CS** 140518		
800	400	**DS-8040-CS** 140519		
800	600	**DS-8060-CS** 140520		
800	800	**DS-8080-CS** 140521		
800	1000	**DS-80100-CS** 140522		
1000	600	**DS-10060-CS** 140523		
1000	800	**DS-10080-CS** 140524		
1000	1000	**DS-100100-CS** 140525		
1200	600	**DS-12060-CS** 140526		
1200	800	**DS-12080-CS** 140527		
1200	1000	**DS-120100-CS** 140528		
1200	1200	**DS-120120-CS** 140529		

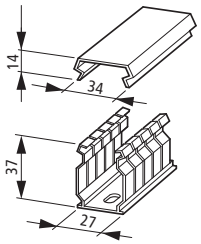
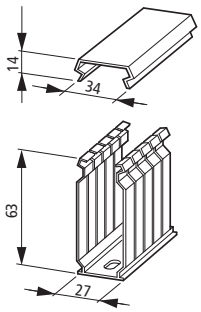
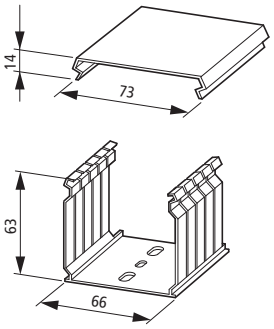
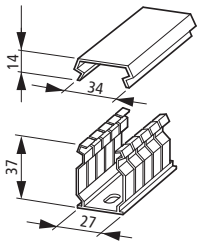
	Features	**Part no.** Article no.	**Price** See price list	Std. pack
Door earthing set				
• Cross-section 6 mm² • Including installation accessories				
	–	**BFZ-DES** 101665		1 off
Paint finish				
• Brush bottle • For repairing paint damage				
–	RAL 7035	**BPZ-CPS-7035** 286771		1 off
Circuit diagram pockets				
• Plastic with self-adhesive rear side • RAL 7035 light grey				
	DIN A4 landscape	**SPT4** 002275		10 off
	DIN A5 landscape	**SPT5** 002276		
	DIN A6 landscape	**SPT6** 002277		

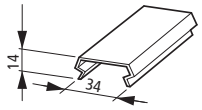
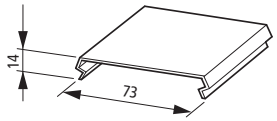
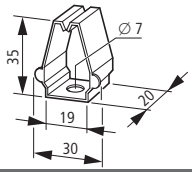
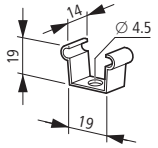
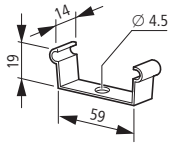
	Cable entry	Drilling diameter mm	External diameter of cable mm	For use with NYM/NYY cable, 4-core mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Metric cable glands to EN 50262							
• With lock nut and built-in strain relief • IP68 up to 5 bar, polyamide, halogen-free • Flammability classification V2 according to UL94 • Colour RAL 7035							
	M12	12.5	3 - 7	H03VV-F3 x 0.75 mm², NYM 1 x 2.5 mm²	**V-M12** 215078		20 off
	M16	16.5	4.5 - 10	H05VV-F3 x 1.5 mm², NYM 1 x 16/3 x 1.5 mm²	**V-M16** 215077		20 off
	M20	20.5	6 - 13	H05VV-F4 x 2.5/3 x 4 mm², NYM 5 x 1.5/5 x 2.5 mm²	**V-M20** 206910		20 off
	M25	25.5	9 - 17	H05VV-F5 x 2.5/5 x 4 mm², NYM 5 x 2.5/5 x 6 mm²	**V-M25** 206911		20 off
	M32	32.5	13 - 21	NYM 5 x 10 mm²	**V-M32** 206912		10 off
	M40	40.5	16 - 28	NYM 5 x 16 mm²	**V-M40** 209668		10 off
	M50	50.5	21 - 35	NYM 4 x 35/5 x 25 mm²	**V-M50** 206913		5 off
	M63	63.5	34 - 48	NYM 4 x 35 mm²	**V-M63** 214835		3 off
Multiple gaskets for V-M... cable glands, metric							
	M25	–	4 x 5 - 6	H03VV-F2 x 0.75/3 x 0.75 mm²	**MFD25** 215451		50 off
	M32	–	4 x 3.5 - 7	H03VV-F4 x 0.75 mm²	**MFD32** 215452		25 off
Stoppers for unused apertures in MFD... multiple gaskets							
	M25	–	6	–	**MFV25-6** 215453		50 off
	M32	–	7	–	**MFV32-7** 215454		50 off

	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
PG cable glands				
• Conduit union and lock nut with earthing screw • Suitable for normal commercial conduit • Suitable for all CI...-NA enclosures → Page 20/9				
½ "	**STB1/2ZOLL** 045878		1 off	Product Standards: UL 467; UL 514B; CSA-C22.2 No. 18 UL File No.: E23018, E3060 UL CCN: DWTT, KDER CSA File No.: LR 2884 CSA Class No.: 4412-03, 4414-04 NA Certification: UL Listed, CSA certified Conditions of Acceptability: Only used in combination with CI-…-NA enclosures Specially designed for NA: Yes Suitable for: Conduit, Tubing, and Cable Fittings, Grounding and Bonding Equipment Degree of Protection: Refer to main component information See also: Refer to basic component information
¾ "	**STB3/4ZOLL** 060116			
1 "	**STB1ZOLL** 052997			
1 ¼ "	**STB1-1/4ZOLL** 043505			
1 ½ "	**STB1-1/2ZOLL** 041132			
2 "	**STB2ZOLL** 002203			

	Cable entry	Drilling diameter mm	External diameter of cable mm	For use with NYM/NYY cable, 4-core mm²	Part no. Article no.	Price See price list	Std. pack
Ventilation cable gland							
• Colour RAL 7035							
Ventilation cable gland IP69K							
	M20	20.5	6 - 13	H05VV-F 4 x 2.5/3 x 4 mm², NYM 5 x 1.5/5 x 2.5 mm2	**V-M20-VENT** 120814		1 off
Ventilation cable gland IP56 • Permeable to air, impermeable to dust • For the prevention of condensation For use in the enclosure bottom or sides, polyamide, halogen free							
	M20	20.5	–	–	**STB-M20F** 224557		20 off
	M25	25.5	–	–	**STB-M25F** 224558		20 off
Pressure compensating plug							
Pressure compensating plug, IP66, metric Colour RAL 7035							
	M40 x 1.5	–	–	–	**DAV-M40** 107225		2 off
Pressure compensating plug, IP66, PG Colour RAL 7032							
	PG29	–	–	–	**DA412** 079219		2 off

	Cable entry	Drilling diameter mm	External diameter of cable mm	For use with NYM/NYY cables, 4-core mm²	Part no. Article no.	Price See price list	Std. pack
Cable grommets, metric							
• IP66, with integrated push-through diaphragm • PE and thermoplastic elastomer, halogen free • Colour RAL 7035							
	M16	16.5	1 - 9	H03VV-F3 x 0.75 mm², NYM 1 x 16/3 x 1.5 mm²	**KT-M16** 216983		100 off
	M20	20.5	1 - 13	H03VV-F3 x 0.75 mm², NYM 5 x 1.5/5 x 2.5 mm²	**KT-M20** 207602		
	M25	25.5	1 - 18	H03VV-F3 x 0.75 mm², NYM 4 x 10 mm²	**KT-M25** 207603		
	M32	32.5	1 - 25	H03VV-F3 x 0.75 mm², NYM 4 x 16/5 x 10 mm²	**KT-M32** 207604		
PG cable grommets							
• For wall thickness 2 - 8 mm • Soft PVC, cadmium and lead-free • Colour similar to RAL 7035							
	PG13.5	21.5	7 - 16	1.5 - 4	**KT13.5** 019658		100 off
	PG16	23.5	7 - 17	1.5 - 10	**KT16** 022031		100 off
	PG21	29.5	12.5 - 20	1.5 - 16	**KT21** 026777		100 off
	PG29	38	12.5 - 31	1.5 - 35	**KT29** 029150		50 off
	PG36	48	18 - 40	10 - 70	**KT36** 033896		20 off
	PG42	55	18 - 47	10 - 95	**KT42** 038642		10 off
Stepped cable grommets							
• For wall thickness 2 - 3 mm, • PVC • Colour RAL 7035							
	–	58	14 - 54		**KT3** 031523		2 off
	–	75	14 - 68		**KT4** 036269		3 off
Pressure compensating grommet							
• Ventilation grommet with filter • Fitting below or on side of enclosure • PE and PVC • Colour RAL 7035 • Metric and PG							
	M25	25.5	–		**KT-M25F** 224556		100 off
	PG16	23.5	–		**KT16F** 024404		100 off

	Length mm	Loading capacity max. no. of cables (recommended value)	Type and cross-section H 0… V-K mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Cable ducts						
Screwable						
	1500	60 40 25 15	0.75 1.5 2.5 4	**KL25/35** 012531		60 off
	1500	100 70 45 30 25	0.75 1.5 2.5 4 6	**KL25/60** 017277		40 off
	1500	260 180 120 80 65	0.75 1.5 2.5 4 6	**KL60/60** 029142		20 off
Self-adhesive max. ambient temperature +55°C						
	650	60 40 25 15	0.75 1.5 2.5 4	**KL25/35K** 014904		50 off

	Length mm	Loading capacity max. no. of cables (recommended value)	Type and cross-section H 0… V-K mm²	**Part no.** Article no.	**Price** See price list	Std. pack
Cable duct cover						
Supplied as spares						
	1500	–	–	**KD25** 019649		200 off
	1500	–	–	**KD60** 024395		100 off
Cable support bracket						
• Can be used in KL25/35 (K) cable ducts • Screw fixing						
	–	15	4	**KH25/35** 078974		20 off
Clamping brackets for cable ducts						
KL25/…: Mounting spacing: ≦ 500 mm						
	–	–	–	**KK25** 081347		100 off
KL60/60: Mounting spacing: ≦ 300 mm						
	–	–	–	**KK60** 083720		100 off

Technical data

			CS-...
General			
Standards			IEC/EN 60529, IEC 62262, IEC/EN 62208
RoHS			In accordance with Directive 2002/95/EC of the European Parliament and Council
Climatic proofing			Damp heat constant to IEC 60068-2-78; Damp heat, cyclical to IEC 60068-2-30
Ambient temperature		°C	-40 - +70
Protection type			IP66
Protection type with ventilating louvers			IP23
Installation site conditions			Installation indoor/outdoor
Mounting grid		mm	25
Heat dissipation			See separate table
Material properties			
Material			Sheet steel
Surface treatment			Structured powder spray polyester based paint finish
Colour			RAL 7035, light grey
Surface			Semi-textured
Gloss			Brilliant
Body		mm	≤ CS-65/...: 1.2; ≥ CS-66/...: 1.5
Mounting plate		mm	2; from height 800 × width 400 mm: 3
Door		mm	≤ CS-43/...: 1.0; ≤ CS-64/...: 1.2; ≤ CS-88/...: 1.5; ≤ CS-1212/...: 2.0
Bottom panel		mm	1.5
Material properties			
Mechanical			
Impact resistance			IK09 according to EN 62262
Total assembly weight of switch cabinet			See separate table
Assembly weight of door			See separate table
Assembly weight of mounting plate			See separate table
Assembly weight of wall fixing bracket			See separate table
Description/standard features			
Construction			Canted and seam welded, including two M6 threaded bolts for earth conductor connections inside the enclosure.
Rear panel			9 mm drilling dimensions for wall mounting
Enclosure side panels			Closed
Top plate flanges			Closed
Bottom panel			Enclosed, foamed gasket, can be unscrewed for F3A flanges -... or for assembly by user
Mounting panel			Basic features, sheet steel, sendzimir galvanized. Distance from back plate 15 mm. Mounted on M8 copper threaded welded studs on inside of back plate. An additional earth conductor connection is therefore not imperative.
Door			Including 1 one threaded welded stud M6 for earth conductor connections in the door. **If electrical apparatus is to be installed in the door, a continuous, permanent protective contactor connection must be established with a protective ground cable. The threaded welded studs on the door and on the cabinet side wall must be used as connecting points for the ground leads.**
Hinge position			On the right, can be converted by user
Door opening angle		°	120
Locking system			Twist lock with protective insulation. Standard locking 3 mm two-way key bit.
Locks	Number		See Ordering pages

Heat dissipation

Dissipatable heat P_v [W] for fully-enclosed CS sheet steel enclosures without internal partitioning walls for wall mounting.
Example: max. ambient air temperature 35 °C; overtemperature ΔT = 20 K; relative humidity = 75%.

Part no.	Maximum heat dissipation P_v Individual enclosure for wall mounting P_V W	Starting enclosure for wall mounting P_V W	Middle enclosure for wall mounting P_V W
CS-2520/150	11	10	9
CS-32/150	13	11	10
CS-33/150	16	15	14
CS-33/200	19	18	16
CS-34/200	23	22	21
CS-43/150	21	19	18
CS-43/200	24	22	20
CS-44/150	25	24	22
CS-44/200	29	27	25
CS-46/200	39	37	35
CS-46/250	44	42	39
CS-46/300	49	46	43
CS-54/150	30	28	27
CS-54/200	35	32	30
CS-54/250	39	36	33
CS-55/250	45	42	39
CS-64/150	35	33	31
CS-64/200	40	37	34
CS-64/250	45	42	38
CS-65/150	42	39	37
CS-65/200	47	44	41
CS-65/250	55	49	45
CS-66/200	54	51	48
CS-66/250	60	56	52
CS-66/300	65	61	57
CS-68/300	81	76	72
CS-75/200	53	50	47
CS-75/250	59	55	51
CS-84/200	51	47	44
CS-84/250	57	53	48
CS-86/200	68	64	60
CS-86/250	75	70	65
CS-86/300	82	76	70
CS-88/200	85	81	77
CS-88/300	101	95	89
CS-810/300	120	113	108
CS-106/250	91	85	79
CS-106/300	99	91	84
CS-108/250	112	106	100
CS-108/300	121	113	106
CS-1010/300	143	136	128
CS-126/250	106	99	92
CS-128/300	141	132	123
CS-1210/300	166	158	149
CS-1212/250	180	173	166

Technical data: Weights of fitted components

CS-...

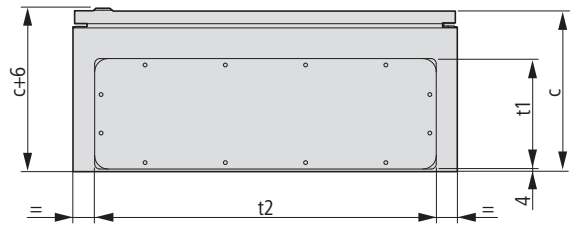
Max. assembly weights

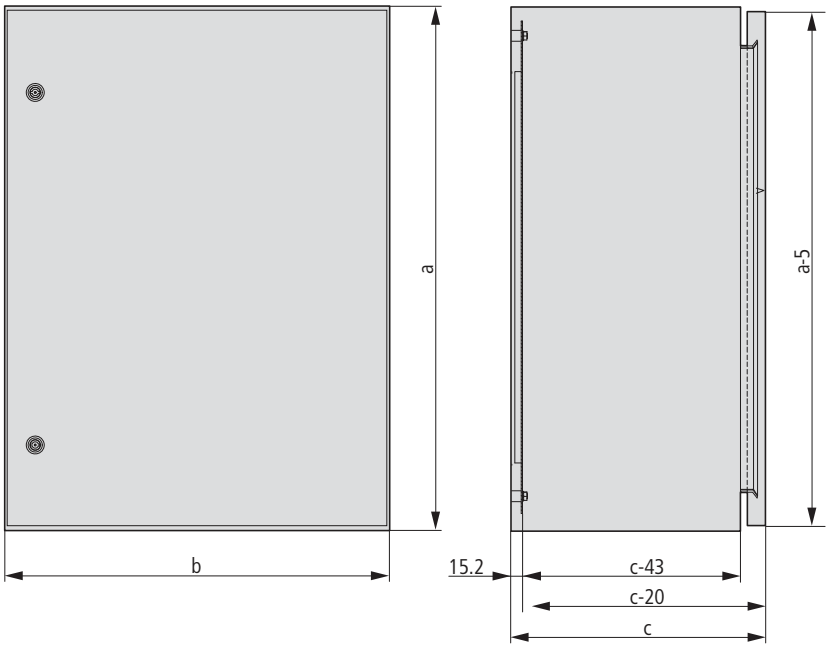
Part no.	Total assembly weight kg	Assembly weight mounting plate kg	Assembly weight door kg	
WFB-SET-CS 1 set (4 off) wall fixing brackets	–	–	–	500 kg payload, when brackets fitted in all four enclosure corners (vertically or horizontally) and the weights are symmetrically distributed within the enclosure.
CS-2520/150	150	125	25	–
CS-32/150	150	125	25	–
CS-33/150	150	125	25	–
CS-33/200	150	125	25	–
CS-34/200	175	150	25	–
CS-43/150	175	150	25	–
CS-43/200	175	150	25	–
CS-44/150	225	200	25	–
CS-44/200	225	200	25	–
CS-46/200	225	200	25	–
CS-46/250	225	200	25	–
CS-46/300	225	200	25	–
CS-54/150	225	200	25	–
CS-54/200	225	200	25	–
CS-54/250	225	200	25	–
CS-55/250	225	200	25	–
CS-64/150	225	200	25	–
CS-64/200	225	200	25	–
CS-64/250	225	200	25	–
CS-65/150	275	250	25	–
CS-65/200	275	250	25	–
CS-65/250	275	250	25	–
CS-66/200	275	250	25	–
CS-66/250	275	250	25	–
CS-66/300	275	250	25	–
CS-68/300	275	250	25	–
CS-75/200	275	250	25	–
CS-75/250	275	250	25	–
CS-84/200	325	300	25	–
CS-84/250	325	300	25	–
CS-86/200	325	300	25	–
CS-86/250	325	300	25	–
CS-86/300	325	300	25	–
CS-88/200	325	300	25	–
CS-88/300	325	300	25	–
CS-810/300	390	350	40	–
CS-106/250	390	350	40	–
CS-106/300	390	350	40	–
CS-108/250	390	350	40	–
CS-108/300	390	350	40	–
CS-1010/300	390	350	40	–
CS-126/250	390	350	40	–
CS-128/300	390	350	40	–
CS-1210/300	390	350	40	–
CS-1212/250	390	350	40	–

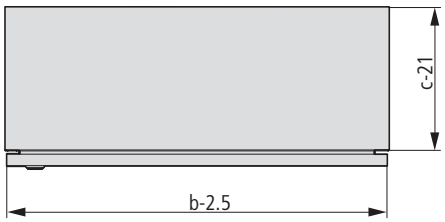
Dimensions

CS wall-mounting enclosures with door and blank plate

CS-...

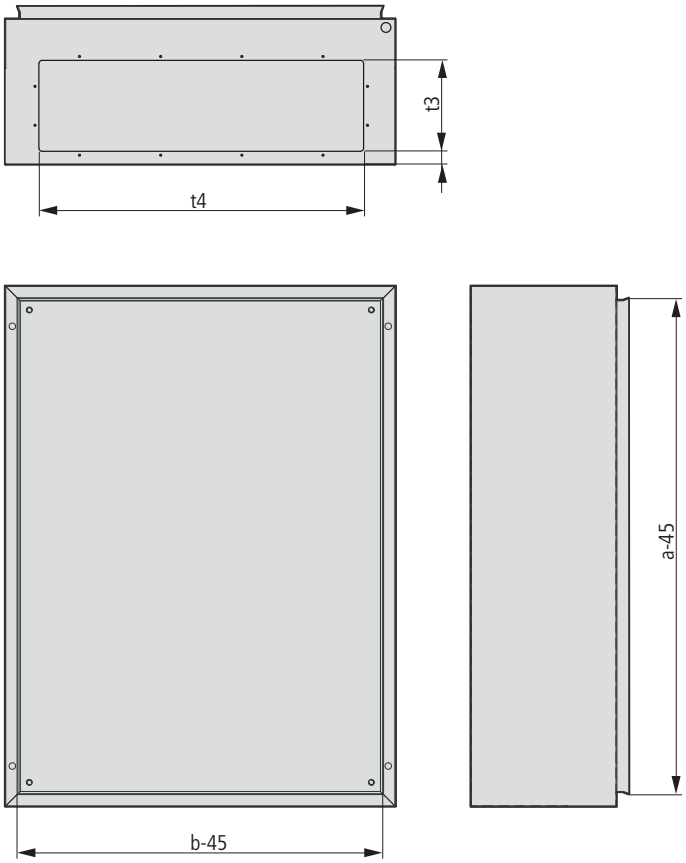






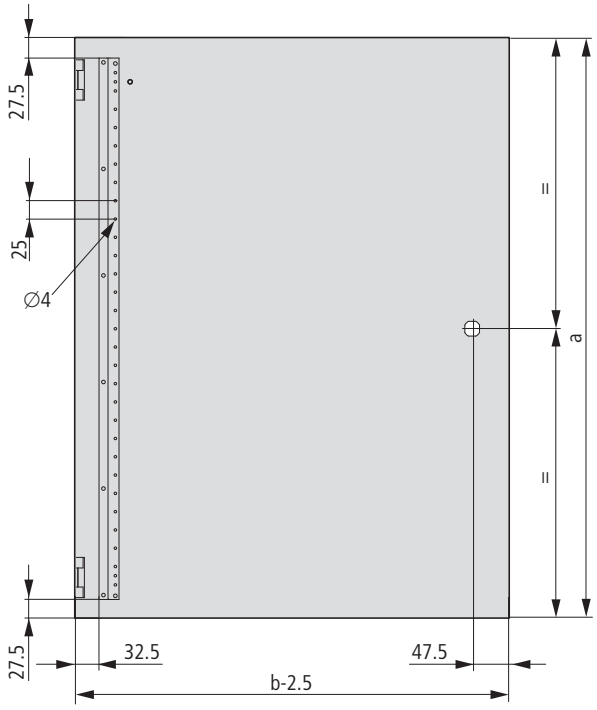
CS wall-mounting enclosures without door, without blank plate

CS-...

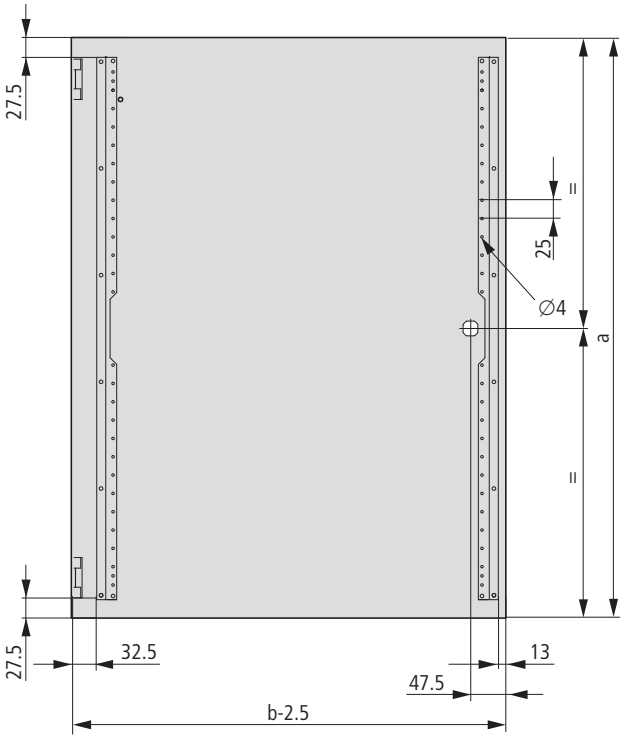


Internal view, door without enclosure

CS-2520/150, CS-32/150
DT-2520-CS, DT-3020-CS
DS-2520-CS, DS-3020-CS



CS-33/..., CS-34/..., CS-4.../...
DT-3030-CS, DT-3040-CS, DT-4...-CS
DS-3030-CS, DS-3040-CS, DS-4...-CS



Enclosure dimensions

Part no.	a	b	c	t1	t2	t3	t4
CS-2520/150	250	200	150	112	182	80	150
CS-32/150	300	200	150	112	182	80	150
CS-33/150	300	300	150	112	232	80	200
CS-33/200	300	300	200	172	262	140	230
CS-34/200	300	400	200	172	332	140	300
CS-43/150	400	300	150	112	232	140	200
CS-43/200	400	300	200	172	262	140	230
CS-44/150	400	400	150	112	332	140	300
CS-44/200	400	400	200	172	332	140	300
CS-46/200	400	600	200	172	532	140	500
CS-46/250	400	600	250	172	532	140	500
CS-46/300	400	600	300	172	532	140	500
CS-54/150	500	400	150	112	332	80	300
CS-54/200	500	400	200	172	332	140	300
CS-54/250	500	400	250	172	332	140	300
CS-55/250	500	500	250	172	432	140	400
CS-64/150	600	400	150	112	332	80	300
CS-64/200	600	400	200	172	332	140	300
CS-64/250	600	400	250	172	332	140	300
CS-65/150	600	500	150	112	332	80	300
CS-65/200	600	500	200	172	432	140	400
CS-65/250	600	500	250	172	432	140	400
CS-66/200	600	600	200	172	532	140	500
CS-66/250	600	600	250	172	532	140	500
CS-66/300	600	600	300	172	532	140	500
CS-68/300	600	800	300	172	732	140	700
CS-75/200	700	500	200	172	432	140	400
CS-75/250	700	500	250	172	432	140	400
CS-84/200	800	400	200	172	332	140	300
CS-84/250	800	400	250	172	332	140	300
CS-86/200	800	600	200	172	532	140	500
CS-86/250	800	600	250	172	532	140	500
CS-86/300	800	600	300	172	532	140	500
CS-88/200	800	800	200	172	732	140	700
CS-88/300	800	800	300	172	732	140	700
CS-810/300	800	1000	300	172	932	140	900
CS-106/250	1000	600	250	172	532	140	500
CS-106/300	1000	600	300	172	532	140	500
CS-108/250	1000	800	250	172	732	140	700
CS-108/300	1000	800	300	172	732	140	700
CS-1010/300	1000	1000	300	172	932	140	900
CS-126/250	1200	600	250	172	532	140	500
CS-128/300	1200	800	300	172	732	140	700
CS-1210/300	1200	1000	300	172	932	140	900
CS-1212/250	1200	1200	250	2 x 172	532	2 x 140	500

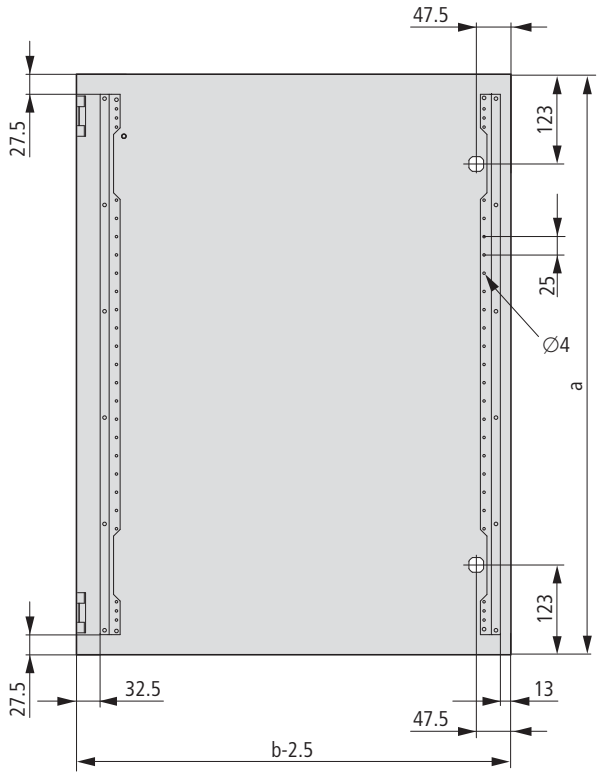
Door dimensions

Housing		Door	
Height	Width	Height	Width
250	200	248	197.5
300	200	298	197.5
300	300	298	297.5
300	400	298	397.5
400	300	398	297.5
400	400	398	397.5
400	600	398	597.5
500	400	498	397.5
500	500	498	497.5
600	400	598	397.5
600	500	598	497.5
600	600	598	597.5
600	800	598	797.5
700	500	698	497.5
800	400	798	397.5
800	600	798	597.5
800	800	798	797.5
800	1000	798	997.5
1000	600	998	597.5
1000	800	998	797.5
1000	1000	998	997.5
1200	600	1198	597.5
1200	800	1198	797.5
1200	1000	1198	997.5
1200	1200	1198	1197.5

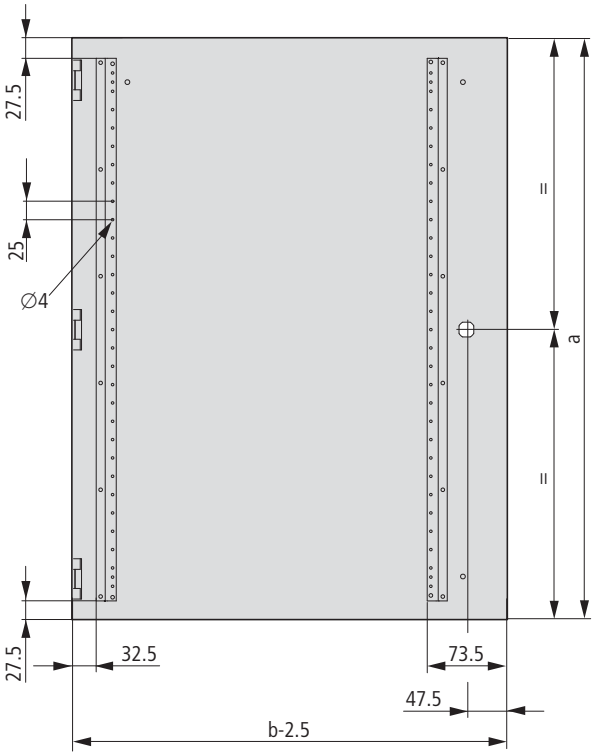


Internal view, door without enclosure

CS-5.../..., CS-6.../..., CS-7.../...
DT-5...-CS, DT-6...-CS, DT-7...-CS
DS-5...-CS, DS-6...-CS, DS-7...-CS

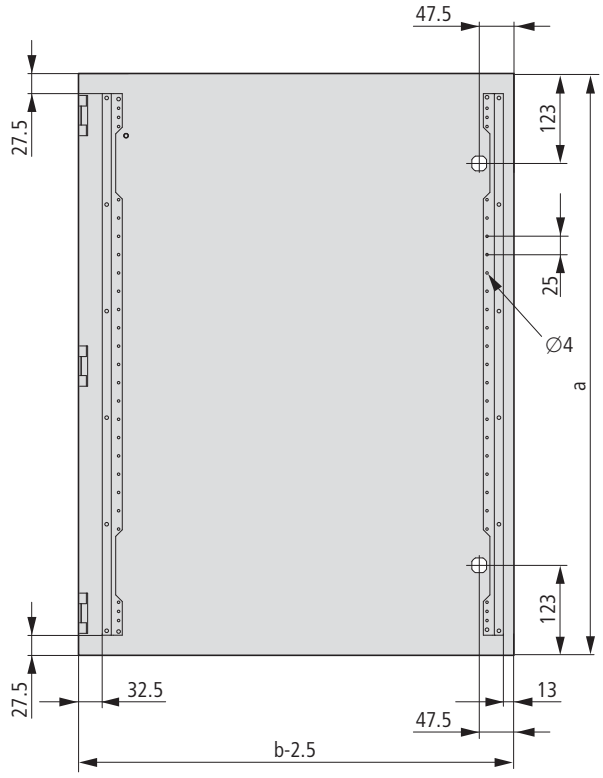


CS-10.../..., CS-12.../...
DT-10...-CS, DT-12...-CS
DS-10...-CS, DS-12...-CS



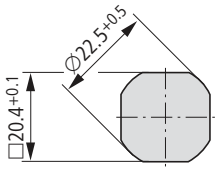
Internal view, door without enclosure

CS-8.../...
DT-8...-CS
DS-8...-CS



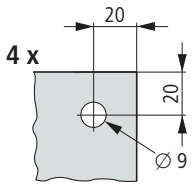
Mounting aperture

CS-...



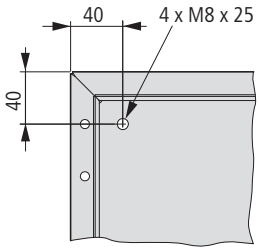
Position of the 4 drilling dimensions for wall fixing in the enclosure rear panel

CS-...



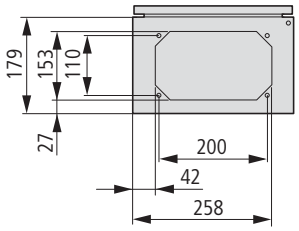
Position of the 4 threaded studs in the enclosure rear panel

CS-...

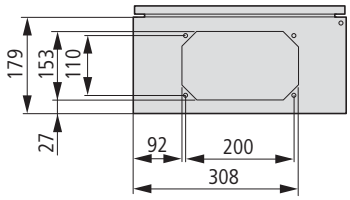


F3A enclosure base with flange apertures

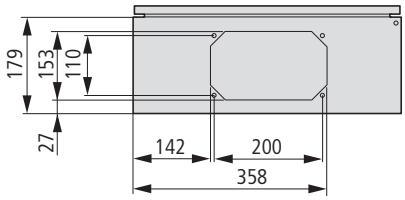
300 x 200



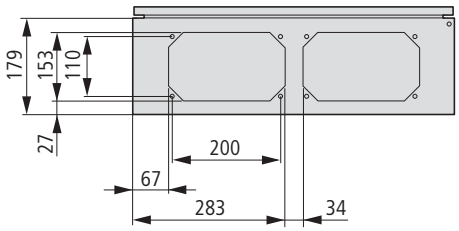
400 x 200



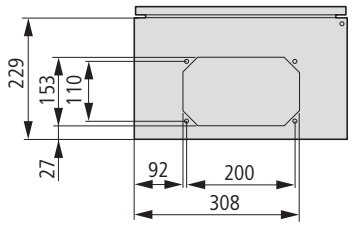
500 x 200



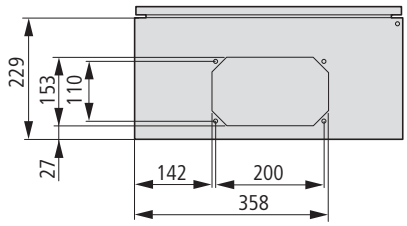
600 x 200



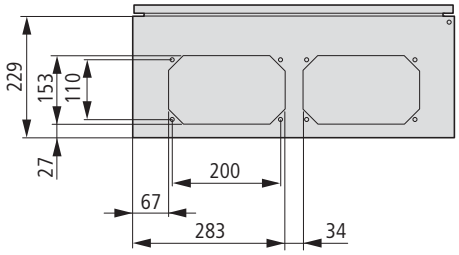
400 x 250



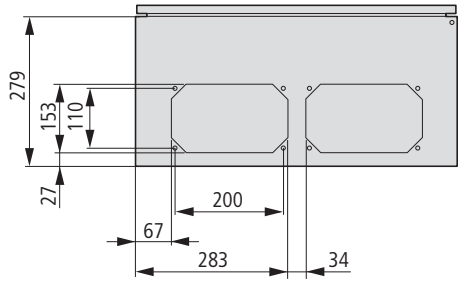
500 x 250



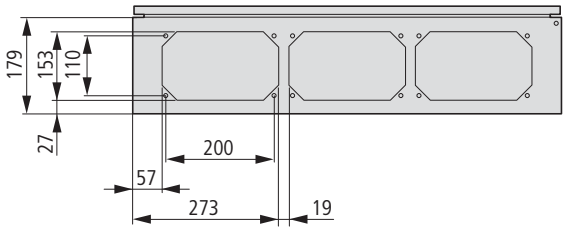
600 x 250



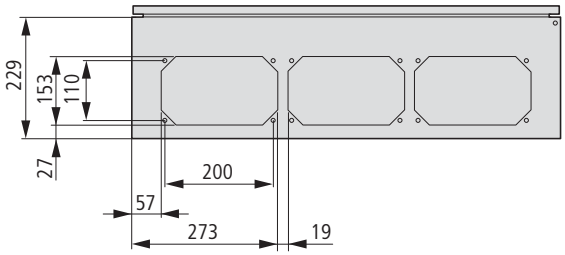
600 x 300



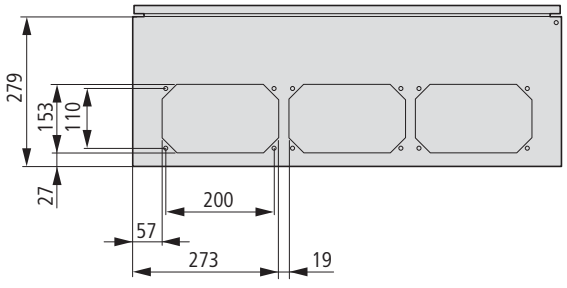
800 x 200



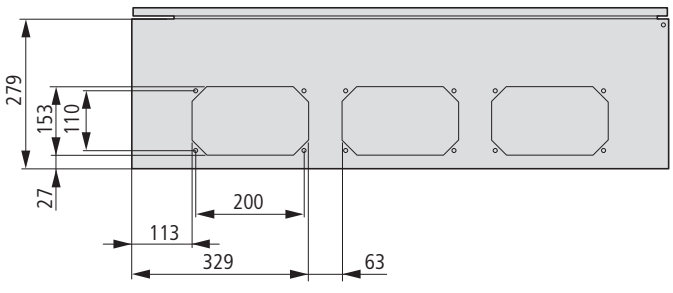
800 x 250



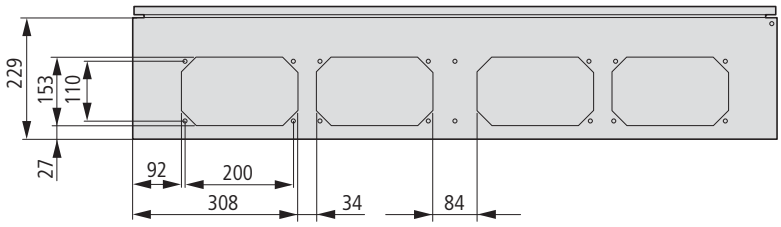
800 x 300



1000 x 300

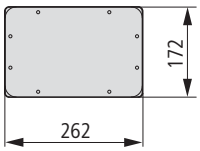


1200 x 250

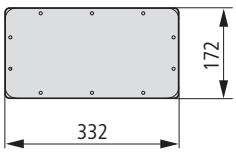


Blank plate (equipment supplied)

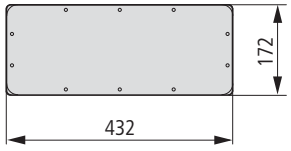
300 x 200



400 x 200



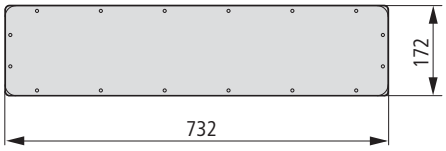
500 x 200



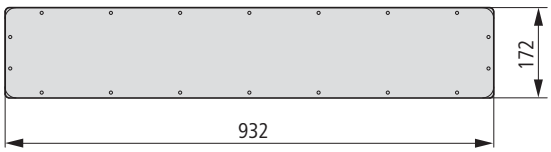
600 x 200



800 x 200

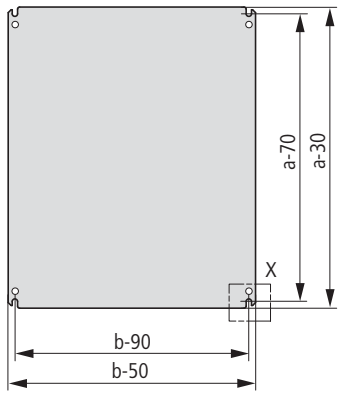


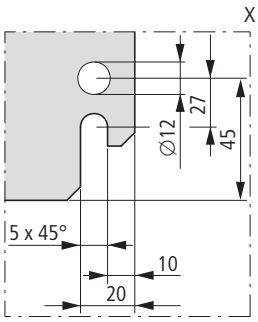
1000 x 200



Mounting plates

MPP-...-CS
MPL-.../RAL2000-CS
MPL-...-CS



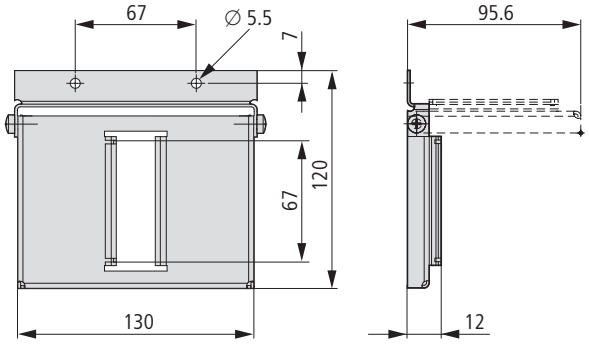


a, b = Enclosure dimensions

Part no.	Mounting plate	
	Height	Width
CS-2520/150	220	150
CS-32/150	270	150
CS-33/150	270	250
CS-33/200	270	250
CS-34/200	270	350
CS-43/150	370	250
CS-43/200	370	250
CS-44/150	370	350
CS-44/200	370	350
CS-46/200	370	550
CS-46/250	370	550
CS-46/300	370	550
CS-54/150	470	350
CS-54/200	470	350
CS-54/250	470	350
CS-55/250	470	450
CS-64/150	570	350
CS-64/200	570	350
CS-64/250	570	350
CS-65/150	570	450
CS-65/200	570	450
CS-65/250	570	450
CS-66/200	570	550
CS-66/250	570	550
CS-66/300	570	550
CS-68/300	550	770
CS-75/200	670	450
CS-75/250	670	450
CS-84/200	770	350
CS-84/250	770	350
CS-86/200	770	550
CS-86/250	770	550
CS-86/300	770	550
CS-88/200	770	750
CS-88/300	770	750
CS-810/300	770	950
CS-106/250	970	550
CS-106/300	970	550
CS-108/250	970	750
CS-108/300	970	750
CS-1010/300	970	950
CS-126/250	1170	550
CS-128/300	1170	750
CS-1210/300	1170	950
CS-1212/250	1170	1150

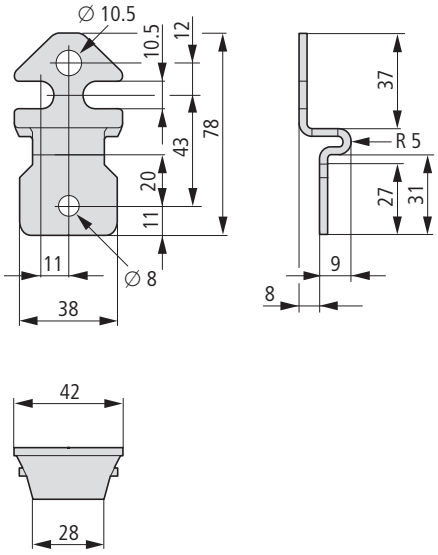
Mounting rail module for soft starters

TS35-DS4-CS



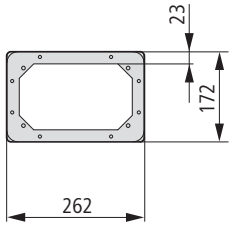
Wall fixing bracket

WFB-SET-CS

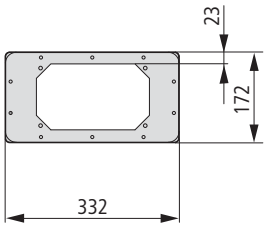


Base panels with flange apertures (for F3A-...flange)

AFP-3-CS

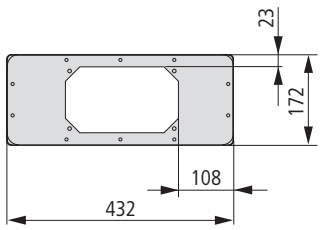


AFP-4-CS



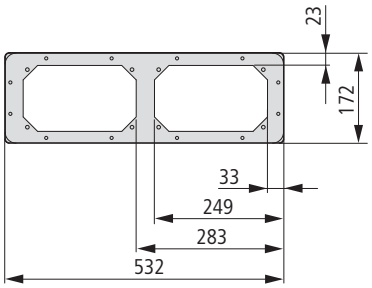
Base panels with flange apertures (for F3A-...flange)

AFP-5-CS

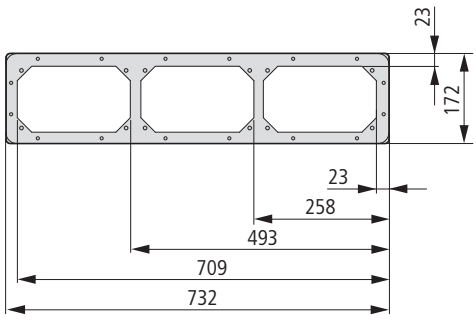


AFP-6-CS

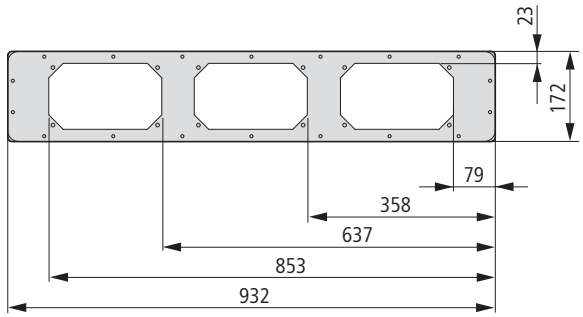
AFP-12-CS = 2 x AFP-6-CS



AFP-8-CS

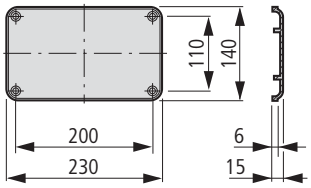


AFP-10-CS

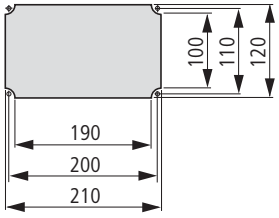


Flanges

F3A-..., ZSD-2K/FLA

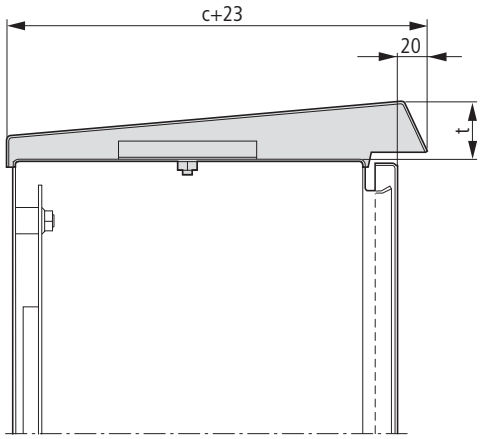


Flange aperture



Rain canopies

CNP-...-CS

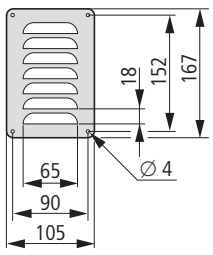


c = Enclosure depth

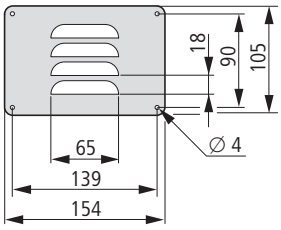
Part no.	c + 23	t
CNP-2/150-CS	173	30
CNP-3/150-CS	173	30
CNP-3/200-CS	223	34
CNP-4/150-CS	173	30
CNP-4/200-CS	223	34
CNP-4/250-CS	273	38
CNP-5/150-CS	173	30
CNP-5/200-CS	223	34
CNP-5/250-CS	273	38
CNP-6/200-CS	223	34
CNP-6/250-CS	273	38
CNP-6/300-CS	323	42
CNP-8/200-CS	223	34
CNP-8/250-CS	273	38
CNP-8/300-CS	323	42
CNP-10/300-CS	323	42
CNP-12/250-CS	273	38

Ventilating louvers

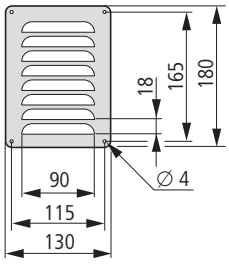
LVP-20V12-CS



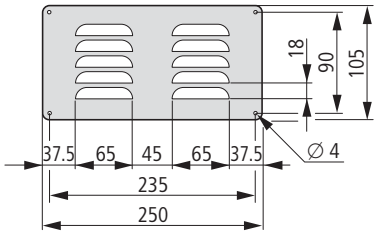
LVP-20H12-CS



LVP-30V15-CS



LVP-30H15-CS



Cable glands, ventilation cable glands, cable grommet

→ See chapter 16, Accessories for panel building



Approvals, directories After Sales Service

This closing chapter of the Main Catalog Industry 2010 from Eaton contains all the essential information that does not refer directly to specific products or product groups. The details are found to the right in the table of contents.

Technical instructions
Terminal capacities +++ Power Conversion Equipment nach UL +++ Rated motor currents of three-phase motors

After Sales Service
Fast and competent help when devices or installations fail +++ Support during commissioning minimizes risk of failure +++ Extended warranty minimizes damage in case of malfunction +++ Inspection and maintenance minimize risk of failure

Switchgear for North America
Everything you need to know to deploy devices in North America +++ Substantial safety increase through selection of the correct devices +++ Valuable tips for the correct documentation of devices, machinery and installations intended for deployment in North America +++ A comprehensive, complete description of the subject that has yet to find its equal

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You may find the current addresses of Eaton representatives worldwide on the Internet:
www.moeller.net/address



Eaton After Sales Service
Testing switching devices in compliance with regulations applicable to this technology
→ 22/02





mm²

Appendix

After Sales Service	22/2
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Protection types	22/18
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Glossary	22/22
Electrical engineering terminology	22/22
North American approval terminology	22/24
Type directory	22/27
Alphabetical index	22/34
Power Conversion Equipment	22/38
Rated motor currents of three-phase motors	Inside cover

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Fax: **+49 (0)228 602 61400**

Online diagnostics

We can provide special assistance if you wish to analyze and rectify faults on products. You can carry out interactive troubleshooting via the Internet with direct access to the After Sales Service database.

http://www.moeller.net/aftersales

Onsite Service

Troubleshooting onsite

You can also obtain onsite troubleshooting. Qualified service technicians and specialists can visit you to rectify faults quickly and reliably.

Installation and commissioning support

Contact us for expert support with installation and commissioning. Specialists are at hand to support you with hardware and software issues.

Conversions and expansions

Whether automation equipment, circuit breakers or other components: we help you make sure that your machines and plants are always up-to-date. This applies specially for equipment that can no longer be repaired. A failure of these components would result in costly production downtimes.

Inspection and maintenance

Reliable operation of power distribution systems is vital for uninterrupted production and personnel protection. Our experiences team supports you with the inspection and maintenance of low-voltage distribution systems and the testing of circuit breakers.

For flatrate prices please inquire.

Thermography

At low cost and using specialist hardware, our specially trained experts locate weak spots in running operation to help you avoid expensive production downtimes. This saves you the cost of expensive measuring equipment and personnel training.

Measurement and system testing

Every technician knows that electronic controllers can fail, or circuit breakers trip without apparent reason. And replacing the offending device does not solve the problem.

To avoid lengthy, expensive troubleshooting, it makes sense to perform a network analysis over a longer period of time. We can support you with this.

Repairs

Direct exchange

Unexpected machine and system downtimes incurring considerable costs can arise on account of device failures. Replacing defective components on time can help significantly cut these costs.

Selected products of current and discontinued ranges are available with the Direct Exchange service of our After Sales Service.

Repair

The repair of products in our Service Center is an inexpensive option for fault rectification.

Service agreements

Telephone fault advice

Installation and commissioning support

Conversions and expansions

Inspection and maintenance

Spare parts

Basic agreements for all contract types according to customer requirements.

Extended warranty

Our After Sales Service offers two versions of the Extended Warranty service product. It extends the standard warranty for drives and soft starters by 12 months if the devices have been commissioned by our After Sales Service or an authorized service provider. The flat-rate commissioning charge depends on the device's rating.

The Extended Warranty can be extended up to 24 months.

Working on live equipment

To carry out testing on systems that must remain live for operational reasons, our After Sales Service cooperates with a service partner.

Hourly charges

Charges are calculated according to the hourly or daily rates listed below and, where applicable, according to the relevant regulations of the federal wage agreement for the special working conditions of installation personnel in the iron, metal and electrical industries (BMTV), and the associated wage agreement for subsistence allowances and aggravation bonuses.

The remaining time is calculated as working time.

All listed rates are net without deductions.

Germany

(Other countries please enquire)

Standard rates, personnel	€/hour
Installation and commissioning support in power distribution systems	85.00 €
Inspection and maintenance of plants and circuit breakers	107.00 €
Repairs and troubleshooting of circuit breakers/Arcon	127.00 €
Software creation for drives and automation	127.00 €
Commissioning/troubleshooting for automation equipment and drives, application optimization	142.00 €

Normal working hours

Workdays Monday to Friday, 7 hours each between 7:00 and 19:00 hours.

Overtime and aggravation surcharges

For working times or working conditions requiring surcharges, the following surcharges apply for commissioning and installation:

25%	for the first two hours of overtime per day beyond the normal working times, and from 6:00 to 7:00 hours and from 19:00 to 20:00 hours
25%	Saturdays for the first two hours
50%	for any further remaining overtime
50%	for overtime between the hours of 20:00 and 6:00 (night-time work)
50%	for overtime worked following night-time work up to the start of the normal day-time shift
70%	for work on Sundays
100%	for work on Good Friday, Easter Monday, Ascension Day, Pentecost, Corpus Christi, 3 October, 1 November, and 26 December
150%	for work on 1 January, Easter Sunday, 1 May, Whitsunday, 25 December, late work on 24 December between the hours of 17:00 and 20:00, and night-time work in the nights immediately preceding 25 December and 1 January.

Tripping

According to the applicable tax regulations within Germany/abroad.

Accommodation costs are charged at flat rate or on evidence.

The starting point for the calculation of subsistence allowances is the business location.

Travel costs

Car	0.80 € per kilometer traveled, calculated from the business location.
Rail	First class ticket plus any surcharges
Air	Business Class

Plus any costs for regional/local transport, telephone and costs related directly with the journey

Return journeys

For return journeys scheduled according to tariff, the rates for other travel days plus additional expenses for reserving accommodation apply.

Abroad: Charges contractually agreed.

Transport costs

For transport of travel luggage, tools, measuring instruments and other material generally 20.00 €

Surcharges for air travel on verification of costs.

Instruments

The above rates include the furnishing of simple measuring instruments and standard tools. For measuring and other instruments exceeding the normal equipment, a flat rate of 360.00 € is charged per started week. The evaluation of measurement results is charged separately.

Emergency service flat rate

Outside normal working hours 165.00 € plus material costs.

Courier journeys are charged separately.

Important: Goods ordered and delivered as part of the emergency service can not be returned!

Hired equipment

For hired equipment, a flat rate depending on the equipment is charged for the first week, and thereafter 2.1 % of the gross list price per started week.

Cost estimate

Cost estimates for on-site equipment repairs are calculated at a rate of 165.00 €. For all other cost estimates please inquire.

Warranty

The warranty period for all repairs, replacement devices and services provided is 12 months from the date of delivery or performance.

In their basic version, the Moeller-branded Eaton devices are approved for use throughout the world, including the USA and Canada. As such, they can be used without restriction as devices for world markets.
The standard versions of some devices, such as circuit breakers, can be used worldwide except in the USA and Canada.
For export to North America, numerous devices are available in special UL- and CSA-approved versions.
For currently available approvals, see our website:
https://wss.moeller.net/approbationen/step1.do

Eaton's Moeller-branded low-voltage switchgear and switchgear assemblies conform to national and international specifications, making it possible to construct control systems that will conform to the national and international specifications of any country in the world.
This, of course, means that due consideration must be given to the national standards of the respective country, such as those concerning installation, operation, installation materials and methods, as well as any pertaining to circumstances such as severe environmental conditions.
The device rating data given in this catalog for 220 – 240 V, 380 – 440 V, 500 V, 600 V, and 690 V covers virtually all existing three-phase systems worldwide.
Deviating requirements for the USA and Canada are given in detail in each chapter of this catalog. Read also the detailed description "Switchgear for North America" from Page 22/13.
For the worldwide use of switchgear, special installation standards and approval requirements must also be observed in addition to the widely differing system conditions:
Where screw fuses are used in a control system, some European countries – such as Denmark, Finland, the Netherlands, Norway and Sweden – require gage screws. In this case, "FORM P" fuse bases must be used. Switzerland no longer requires the use of gage screws, but they are still often requested by customers.
The majority of countries permit the import of switchgear assemblies and devices on the manufacturer's undertaking that they have been constructed in accordance with the pertinent specifications. In some countries, such as the USA and Canada, however, there is a legal obligation to obtain official approval. In these countries, devices and enclosures – sometimes even complete control systems – are tested and approved by independent bodies.
In Scandinavia and in Switzerland, an official approval for low-voltage switchgear and controlgear had to be sought to some extent. For industrial switchgear, this legal obligation has now been abolished, provided the devices have been manufactured and tested in accordance with harmonized European standards (such as IEC/EN 60947). There is then no longer a requirement for them to carry their country's own approval mark. Eaton develops switchgear to international standards, such as IEC/EN 60947 and applies the corresponding marks. Devices that conform to the European Low-Voltage Directive and are sold within the European Union must contain the CE mark.

Europe, Conformité Européen (CE)

The CE mark indicates that the device corresponds with all relevant requirements and standards. Mandatory marking allows unrestricted use of marked devices within the European economic area.
Devices sold within the European union must comply with the Electromagnetic Compatibility (EMC) Directive. Eaton has performed the required tests for all Moeller-branded products subject to this Directive and applied the CE mark, which demonstrates compliance with the EMC Directive.
Because devices bearing the CE mark comply with the harmonized standards, approval and the associated marking is no longer required in the following countries: Belgium, Denmark, Finland, France, the Netherlands, Norway, Sweden, and Switzerland.

An exception is installation material. In some areas, miniature circuit breakers and residual current device must still be labeled and therefore carry the corresponding approval mark.

Belgien, Comité Electrotechnique Belge/Belgisch Elektrotechnisch Comité (CEBEC)

Germany, Verband Deutscher Elektrotechniker (VDE)

France, Union Technique de l'Electricité (UTE)

Austria, Österreichischer Verband für Elektrotechnik (ÖVE)

Switzerland, Schweizerischer Elektrotechnischer Verein (SEV)

Devices for export to the USA and Canada have either additional UL and CSA approval or are available in a separate version with UL and CSA approval.

USA, Underwriters Laboratories (UL) - Listing

USA, Underwriters Laboratories (UL) - Recognition

Canada, Canadian Standards Association (CSA)

Approval for electrical products is also required in Argentina, China, Russia, South Africa, and the Ukraine. Marking is partly mandatory for these countries. As in other European countries, the IEC rating data is accepted here.
Romania requires that components that are to be used in public buildings must be approved by the Romanian test authority ICECON.

Russia
Devices for Russia must bear the appropriate marking.

Russia, Goststandart (GOST-R)

Ukraine
Devices for the Ukraine must bear the appropriate marking.

Ukraine, Goststandart (Ukrain-GOST)

China
Devices for China must bear the appropriate marking.

China, China Compulsory Certification (CCC)

South Africa
In South Africa approval is mandatory for circuit breakers and busbar trunking systems: These devices must bear the appropriate marking.

South Africa, South African Bureau of Standards (SABS)

Argentina
In Argentina, mandatory approval is based on Resolution 92/98. From April 01, 2001, miniature circuit breakers and residual-current circuit breakers are subject to mandatory approval. As of this date, circuit breakers up to I_e = 63 A and $U_{e\ max}$ = 440 V must carry the following marks:

Argentinien, Instituto Argentino de Normalización y Certificación (IRAM)

Selection of devices
In addition to the required approvals and conformance with applicable regulations, the design of devices and systems themselves must be suitable for the target market.
Points to keep in mind when selecting switchgear for export include:

Motor-protective circuit breakers
Use auto-protected circuit breakers, which are capable of controlling the highest prospective fault levels at the point of installation without the need for back-up protection.

Advantages
Can be positioned anywhere and are fully independent of the local circuit-protection system; no spare part problems

Circuit-breakers
Use makes with visible contacts, and quick-make and quick-break operation as standard. For high short-circuit levels, use current-limiting circuit breakers. Selective switches are recommended for the selective graduation of networks.

Advantages
Independence from local accident prevention regulations requiring visible contacts, and safety from faults caused by inexperienced operating personnel. The effects of short-circuits are kept to a minimum. Fuseless installations offer greater safety and reliability in plant operation. In the event of a fault, only the faulty section of the system is isolated.

Contactors
Use contactors whose entire range provides consistently reliable operation in the event of voltage drops (80 % Un should be aimed for) and whose contact system will not assume an indeterminate position on closing or opening under these conditions.

Advantages
During the electrification work in areas such as Africa and the Middle East, an insufficient voltage stability is – at least for a certain time – likely in many applications (for example due to long spur lines or small local generators). The use of devices that fulfil the above requirements will eliminate one of the main failure causes related to contactors.

Enclosures
Use insulated enclosures with transparent covers (i.e. "totally insulated" enclosures).

Advantages
Total insulation is the best possible protective measure from the user's point of view, avoiding, reliance on the possibly doubtful skills of unknown installation personnel. Furthermore, protective measures based on grounding are often extremely difficult, if not impossible (in the Middle East, for example, due to the dryness of the ground).
Insulated enclosures completely eliminate the need for any additional protection against corrosion. The transparent covers contribute significantly to the correct operation of a system, because switchgear operation can be monitored even with the doors or covers closed, thus virtually eliminating the possibility of these being left open through carelessness. The transparent cover is an important contribution to safety, especially where exports to areas of uncertain skills are concerned.

Overcurrent protection devices
Always use circuit breakers or motor-protective circuit breakers and avoid fuses wherever possible.

Advantages
The operational reliability of a system is especially important for export contracts. Circuit-breakers and motor-protective circuit breakers provide this reliability in full measure since they can be immediately reclosed once a fault has been cleared, they disconnect all poles, they have ideal protection through high tripping accuracy and they can be used for selective operation. Because they have no fuses or other consumables, they also greatly reduce the problem of obtaining replacement parts. The advantages of fuseless design for export are especially evident in this case. No complicated investigation is needed to find out which fusing system is used in the respective location and which specifications have to be followed to select the correct fuses. Often several different fuse systems with widely varying characteristics are used side-by-side in the same country. For the uninitiated, it may be almost impossible to find the right fuse in these circumstances. These problems do not arise where a circuit-breaker is used.

Main switch and safety switch
Use devices with positive contact separation and clear switch position indication.

Advantages
The mechanical coupling of the actuating element with the contacts ensures that the Off position is indicated only when all main contacts are separated by the prescribed distance, and only in this position can the switch be padlocked. This ensures safety when carrying out maintenance and repair work on the installation or machinery.

Shipping classifications
Many Moeller-branded Eaton devices are approved by all important shipping associations: Germanischer Lloyd, Lloyd's Register of Shipping, Bureau Veritas, Russian Maritime Register of Shipping, Registro Italiano Navale, Det Norske Veritas, Polski Rejestr Statków, etc.
Because the status of currently valid shipping approvals is subject to significant variations, this Catalog does not provide an overview, as this would quickly be out of date.

Please see our corresponding, up-to-date information on the Internet.
https://wss.moeller.net/approbationen/schiff.do

	Country Test authorities				
	USA **UL**	CDN **CSA**	RUS **GOST-R**	PRC **CCC**	UA **Ukrain -GOST**
SmartWire-Darwin					
EU5…	○	○	–	N	–
SWD…	○	○	–	N	–
M22-SWD…	○	○	●	N	–
Pilot devices					
FAK…/I	●	●	●	●	●
RMQ16	●	●	●	●	●
RMQ-Titan	●	●	●	●	●
SL signal towers	●	●	●	●	●
Position switches					
LS...	●	●	–	–	–
LS-...-...-ZB	●	●	●	●	●
LS-...-...-ZBZ/...	●	●	●	●	●
Pressure switches					
MCS…	–	●[1]	N	N	●
Cam switches					
T…	●	●	●	●	●
Contactor relays					
DILER	●	●	●	●	●
DILA	●	●	●	●	●
DILA-XHI	●	●	●	N	●
Contactors					
DILM7, DILM9, DILM12, DILM15	●	●	●	●	●
DILM17, DILM25, DILM32, DILM38	●	●	●	●	●
DILM40, DILM50, DILM65, DILM72	●	●	●	●	●
DILM80, DILM95, DILM115, DILM150, DILM170	●	●	●	●	●
DILMP20	●	●	●	●	–
DILMP32, DILMP45	●	●	●	●	–
DILMP63, DILMP80	●	●	●	●	–
DILMP125, DILMP160, DILMP200	●	●	●	●	–
DILM…-XHI	●	●	●	N	●
DILM…-XMV	●	●	●	N	●
DILM...-XS1	●	●	●	N	●
DILM...-XP1	●	●	●	N	●
DILEM(-12)(-G)	●	●	●	●	●
DILM250, DILM300A	●	●	●	●	●
DILM185, DILM225, DILM250	●	●	●	●	●
DILM300, DILM400, DILM500	●	●	●	●	●
DILM580, DILM650, DILM750, DILM820, DILM1000	●	●	●	●	●
DILL	●	●	●	–	–
DILMF	●	●	●	–	–
DILK12 … DILK50	●	●	●	–	–
Overload relays					
ZB32	●	●	●	●	●
ZB65	●	●	●	●	●
ZB150	●	●	●	●	●
ZE-...	●	●	●	●	●
Z5-…	●	●	●	●	●
Z5-.../FF225A	●	●	●	–	●
Z5-.../FF250	●	●	●	–	●

	Country Test authorities				
	USA **UL**	CDN **CSA**	RUS **GOST-R**	PRC **CCC**	UA **Ukrain -GOST**
ZW7-...	●	●	●	–	–
ZEB	●	●	–	–	–
ZEV	●	●	–	●	●
Thermistor relay for machine protection					
EMT 6	●	●	●	●	●
Motor-protective circuit-breakers					
PKZM01	●	●	●	●	●
PKZM0...	●	●	●	●	●
PKZM0-T	●	●	●	–	●
PKE	○	○	●	●	–
PKZ2.../ZM...	●	●	●	●	●
PKZ2/.../S-SP...	●[2]	●[2]	●	●	●
PKZM4-...	●	●	●	●	●
P-SOL…	○	○	–	N	–
PKZ-SOL...	○	○	–	N	–
Soft starters and accessories					
DS4-340	●	●	–	N	●
DS6-340	●	●	–	N	●
DE4-KEY-2	●	●	–	N	●
DE4-COM-2X	●	●	–	N	●
DE4-NET-DP2	●	●	–	N	●
Electronic timing relays					
ETR 4-...	●	●	–	N	●
DIL ET	●	●	●	N	●
EMR4-...	●	●	–	N	●
Measuring and monitoring relays					
EMR4...	●	●	–	N	●
Control relays easyRelay					
easy...	●	●	●	N	●
Programmable logic controllers					
EC4P-…	●	●	●	N	–
I/O expansion easy					
EASY618-AC-RE	●	●	●	N	●
EASY618-DC-RE	●	●	●	N	●
EASY620-DC-TE	●	●	●	N	●
EASY202-RE	●	●	●	N	●
Coupling modules easy					
EASY2…	●	●	●	N	●
Ethernet module					
EASY209-SE	●	●	●	N	●
Multi-function displays					
MFD-80...	●	●	–	N	●
MFD..CP8...	●	●	–	N	●
MFD..CP4...	●	●	–	N	●
MFD..R...	●	●	–	N	●
MFD-T...	●	●	–	N	●
MFD-T(A)P...	●	●	–	N	●
Switched-mode power supply units easy					
EASY200-POW	●	●	●	N	●
EASY400-POW	●	●	●	N	●
Series-connected device					
EASY256-HCI	●	●	●	N	●

Notes

● Approved or accepted
○ Applied for
N Approval or acceptance not required
– Not approved or accepted

1) Form CDN.
2) Switchgear for North America.
3) Approved devices please enquire.
4) Switchgear for North America in surface mounting enclosure
5) As supplementary protectors up to 40 A only.
6) Applies only for standard CI types; not for North America versions

	Country Test authorities				
	USA **UL**	CDN **CSA**	RUS **GOST-R**	PRC **CCC**	UA **Ukrain -GOST**
Safety relays					
ESR...	●	●	–	N	●
Control relay suitable for safety circuits					
easySafety	–	●	●	N	●
I/O systems					
XIOC	●	●	●	N	●
XIO-EXT121-1			●	N	●
Transformers					
STI/STZ	●	●	N	N	N
DTI/DTZ	●	●	N	N	N
UTI	●	●	N	N	N
SASY60i	●	●	–	–	–
Circuit breakers					
NZM1-4	●[2]	●[2]	●	●	●
IZM	–[3]	–[3]	–	–	–
Switch-disconnectors					
N1-4	●[2]	●[2]	●	●	●
IN	–[3]	–[3]	–	–	–

	Country Test authorities				
	USA **UL**	CDN **CSA**	RUS **GOST-R**	PRC **CCC**	UA **Ukrain -GOST**
P1, P3	●[4]	●[4]	●	●	●
P5	●	●	–[3]	–[3]	–
Supplementary protectors					
FAZB..., FAZC..., FAZR..., FAZS...	●	●	–	–	–
Circuit-breakers					
FAZ…	●	●	●	●	●
FAZ-HK	●	●	●	●	●
FI...	●	●	●	●	●
ASA, USA	●	●	–	–	–
FAZ-NA, FAZ-RT	●	●	–	–	–
FAZ-K/S/Z	●	●	–	–	–
Combination circuit breakers PKNM	–	–	●	–	–
Fuse-switches VLC14, VLC22	●	●	–	–	–
Insulated enclosures CI					
CI..-...-NA, CI..-.../(2)T-NA	●	●	N[6]	–	●[6]
CI..X-...-NA, CI..X-.../T-NA	●	●	N[6]	–	●[6]
Small enclosures CI-K					
CI-K...-NA	●	●	N[6]	–	●[6]

Notes

● Approved or accepted
○ Applied for
N Approval or acceptance not required
– Not approved or accepted

1) Form CDN.
2) Switchgear for North America.
3) Approved devices please enquire.
4) Switchgear for North America in surface mounting enclosure
5) As supplementary protectors up to 40 A only.
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Eaton's Moeller devices - Shipping classifications

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Because the status of currently valid shipping approvals is subject to significant variations, this Catalog does not provide an overview, as this would quickly be out of date. Please see our corresponding, up to date information on the Internet.
https://wss.moeller.net/approbationen/schiff.do

The reason that the selection pages for all product groups and this chapter of the main catalog contain specific information about approvals and devices for use in North America is that:

- through the activities of machine and panel builders a large percentage of the products are indirectly destined for export;
- North American codes and standards that are less well known and that deviate significantly from the IEC and EN standards must be observed;
- for export projects, devices approved for NA must always be used;
- NA-approved devices often have different ratings and sizes and are often used and combined in ways that differ from usual IEC and EN practice;
- the customs and standard practices in the North American market must also be taken into consideration;
- with the information in this catalog customers striving to build machines for the world market can see that they can largely use the same Eaton devices for all markets;
- interesting new products are now available for this field of business;
- customers expect or are demanding a supportive business relationship.

Because Eaton wants to make export as simple as possible for its customers, we have made comprehensive improvements to this catalog following intensive discussions with our exporting customers. Although the catalog contains mainly Moeller products, Eaton's sales companies can, in some cases – for example circuit breakers – supply other **Eaton-branded products** approved for North America.

This article provides only a summary of this topic[1]. For further information about approvals for export to North America, see Moeller's detailed Technical Essays[2]. For an explanation of special terminology, see the glossary in this catalog on page 22/22. "North America" or "NA" always refers to the USA and Canada.

In the USA the legally binding OSHA[3] and the NEC[4] require an approval of devices and plants. The necessary testing and certification can be performed by various "Nationally Recognized Testing Laboratories" (NRTL), of which the Underwriters Laboratories (UL)[5] are the best-known and most widely accepted. Alternatively, approvals and approval marks can be issued by approved subsidiaries of German Technische Überwachungsvereine (TUV)[6] or by ETL-Intertek[7], which is also active within Germany. Approvals can not be based on testing by the manufacturer only. Testing and approval by an independent third-party is always required.

In Canada, all electrical apparatus must comply with the CEC[8], which requires that all equipment and installations have been approved by CSA[1] or equivalent bodies.

In addition to the normal UL and CSA approvals, the trade regulations resulting from the NAFTA agreements[10] allow vendors to apply for a joint UL and CSA approval at all approval organizations. The devices then carry a logo that should be recognized in both countries. To date, Eaton, and previously Moeller, have rarely made use of this approval method because these combined approvals are still not fully recognized by local inspectors and end users. Eaton strives to help its customers avoid problems with approved devices in North America.

A special characteristic of the North American market is that, with few exceptions, electrical equipment must be acceptance-tested on-site by so-called Authorities Having Jurisdiction (AHJ). These authorities check that all components have the required approvals. In addition, the components must be approved for their application according to the standard applicable in each case, i.e. they must be correctly dimensioned, combined and used according to the NEC or CEC codes as well as any applicable standards. Device combinations approved on behalf of the component manufacturer – for example motor starter combinations – usually exhibit better technical data than combinations of individual devices that are not tested as combinations. The reason for this is that the components support each other in their switching tasks. This is an important aspect, for example, for the "Overall Short Circuit Current Rating"[11]. Many machine and panel builders have their end products (such as machines)approved already at the point of manufacture, while some even have their own approved workshops.

The codes and standards of the USA and Canada differ – to some extent significantly – from those of other industrial countries, which use the IEC/EN standards[12]. Keep in mind that the USA and Canada publish their own, independent standards, which do not always have an identical content, and which may require different approvals. Eaton offers two groups of electronic, switching and protective devices approved for North America:

1) Preferably as **world-market devices** with the following key characteristics:

World-market devices fulfil all device and product standards and feature all relevant approvals (see approvals overview from page 22/5), including the North American approvals, and can be used throughout the world.

World-market devices have rating plates with all important technical data for worldwide use and for use in in the USA and Canada. IEC/EN rating data has no relevance for use in North America.

For unrestricted sale in European Union member states, world-market devices contain the CE mark.

Examples of **world-market devices** include:

Pilot (control circuit) devices, cam switches, position switches, contactors, motor-protective circuit breakers, overload relays, measurement and protective relays, electronic devices and systems, user-programmable PLCs. These are, on the whole, the devices covered by standards UL 508 and CSA C22.2 No. 14-05.

2) **Device versions** for North America

Where the combination of the requirements of all codes and standards in a single product range is uneconomical or not possible, these devices have been developed by modifying existing IEC/EN devices. In some cases, the cost of approval depends on the devices' production quantity, which is viable only for products that will be exported.

The devices Eaton terms **"NA devices"** (Listed Components) or **"CNA devices"** (Recognized Components) have the following key characteristics:

These products have been approved to UL and CSA and can be used in the USA and Canada as well as in other countries if the end client requires UL and CSA approvals or conformance with the North American standards[13].

They have ratings plates containing at least all important data for use in the USA and in Canada. But because these devices will also be exported from the USA or Canada, their rating plates usually also contain data to IEC and EN standards. Devices with IEC/EN data also carry the CE mark and the CCC mark for China.

They are largely identical with the IEC/EN devices of the same series but differ in their detail design or feature slightly lower ratings, depending on the approval requirements. If the reduced technical data does not present a problem, these devices can, like world-market devices, be used throughout the world. Some major customer do this to reduce the number of versions.

With rare exceptions, the IEC/EN and the NA versions have the same external dimensions and can usually (depending on approvals) be equipped with the same accessories, such as auxiliary contacts or shunt releases.

The existing approvals for the USA and Canada are included in the devices' part numbers as a part number suffixes, and are indicated on rating plates by the corresponding approval marks as follows:

Part no. suffix	Type of approval	Approval mark
-NA	For use in the USA the device is approved as a single device as **"Listed Component"**; in Canada it is a **"Certified Component".**	
-CNA	For use in the USA the device is approved as a **"Recognized Component"**; for Canada as a single device it is a **"Certified Component".** For use in the USA, additional **"Conditions of Acceptability (CoA)"** must often be adhered to according to North American standards.	

Eaton has special **North America versions** for:

Circuit breakers NZM, molded case switches NS…-NA and miniature circuit-breakers FAZ (see additional information about FAZ, FAZ-NA, FAZ-RT in Chapter 19 of this catalog).

Recognized Components are frequently and incorrectly used without regard for the additional Conditions of Acceptability (CoA) contained in the product standards. This is known to the inspectors, who, for this reason, are particularly thorough in checking the correct use of these devices. Incorrect usage of Recognized Components is likely to be noticed and will result in a denial of commissioning until corrective measures have been taken. Special care should therefore be taken here.

Technical data and approval status for North America

This main catalog contains all approved technical data for the North American market for engineering switchgear systems, such as control panels for the electrical equipment of machines and plants[14]. Power distribution systems are rarely exported, and further approvals would be required for them[15]. When engineering switchgear systems for North America, the applicable North American standards should be obtained under all circumstances.

For the first time in this catalog, the selection pages include a clear, precise indication of each product approved for the North American market, using flag symbols for the USA and Canada. This level of attention is paid to the approvals for North

Notes

1) Date of described Codes and Standards, and development and approval status: January 2010
2) See: http://www.moeller.net/de/company/news/publications/index.jsp, The papers are also available free of charge in print
3) Occupational Safety and Health Administration, http://www.osha.gov
4) National Electrical Code
5) UL, http://www.ul.com
6) e.g. TUV Rheinland of North America, Inc., http://www.tuv.com/us
7) http://www.intertek.com, http://www.intertek.de
8) Canadian Electrical Code
9) Canadian Standards Association, http://www.csa.ca
10) North American Free Trade Agreement, between USA, Canada and Mexico
11) SCCR, short-circuit strength of the switchgear systems
12) International Electrical Commission, http://www.iec.ch, EN = European standards
13) e.g. in offshore area, or if the plant is to be used in different locations throughout the world
14) e.g. Industrial Control Panels for Machinery, UL 508A and NFPA 79
15) For example testing in specific distribution board enclosures

America because of the significant export share of these devices and because standards, selection and usage criteria that differ from IEC and EN must be specially considered. In engineering, North American practices must often be observed (for example regarding operating elements for main switches). Where all articles on a page or double page are approved, the whole page or double page is marked only once with the flag symbols in the page header. If a page or double page also contains articles that are not approved for North America, the approved articles are indicated with flags as groups or per article in column "Std. pack". In this column, articles are sometimes grouped together with stylized parentheses.

Unfortunately mere marking with flags and approval marks on the devices is not always sufficient proof of approval for inspectors. Occasionally, doubts may arise as to the admissibility of the use of the approved devices for specific tasks. In such cases, the the numbers of the certification reports, or even the reports themselves, must be available. To facilitate this, the ordering pages of this catalog provide information relevant for export to North America, which include the UL and CSA certification report numbers as well as the relevant Category Control Numbers (UL)[1] or Classes (CSA)[2].

Customers can find the most important excerpts from the certification reports for most of the NA-approved articles by entering the product group, e.g. DILM..., and the approval organization in the approvals database for Eaton's Moeller-branded products[3]. Unfortunately the approval records not drawn up by Eaton Moeller are often poorly structured and hard to read. In some cases, the part numbers of the approved products are given with varying degrees of accuracy. The approval organizations' Inspectors can also access the full approval records through their organizations.

In the event of difficulties, which often arise out of misunderstandings, please contact Eaton. We are continually working to improve and complete the approvals situation, which will therefore change in this catalog's validity period. Eaton Electric's database and online catalog[4] will, however, be regularly updated with all changes. In the online catalog, you can dynamically create up-to-date data sheets for products to save as PDF files and print out.

You can also access the certification reports through the databases of the approvals organizations:

- Access to the UL database is through the address http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.html
- For CSA , visit http://directories.csa-international.org/.

For CSA, the certification report numbers in the CSA database do not always correspond with the numbers of the approval records issued to Eaton or Moeller. To find the required record, you should therefore always enter the name "Moeller" and the Class Number (from the selection page in the catalog).. Do not use "Eaton" here yet.

For products with approvals s world-market devices, the technical data is given at the end of each chapter of the catalog, where you can also find the IEC/EN data. Although the contactors and motor starters are also approved as world-market devices, they have special selection pages to take into account the North American voltages and HP ratings. Because motors rated in kW are often used for exported plants and machines, it must be remembered that inspectors convert kW into HP ratings[5] and reading the standard currents for the next largest standard motors rated in HP from the NEC or CEC. This can result in the need to use larger conductor cross-sections. Design engineers should also follow this practice when dimensioning systems. When working to North American codes and standards, further correction factors for dimensioning components and cables must also be observed.

For the North America versions of circuit breakers NZM and molded case switches NS...-NA the main catalog contains comprehensive selection information. Those pages contain, for example, switches with fixed overload releases (NZM…-AF…-NA), which, in the USA, are combined to motor starters for higher-rated motors with a contactor and overload relay. Switches of this kind are not common in IEC/EN countries. The switches of construction size NZM...2…-NA also cover the current ranges of switches NZM...1…-NA. In all, the range of models for the North American market is greater than that for the IEC/EN market. The selection pages for the special devices for the NA market contain the data required for selecting the appropriate switches. Further, less frequently required data for engineering is included under "Technical data" at the end of the chapter. Because more information is required for the complex circuit breakers than for other devices, the information for North America contains further important details, such as whether their use in feeder and/or branch circuits is permissible, or whether the switches are approved as current-limiting devices. For circuit breakers with part number suffix "-CNA" (Recognized Component), a stated Condition of Acceptability (CoA) is that these devices must always be combined with a contactor and an overload relay. See also the motor starter selection table (page 8/30). Only these complete combinations have a specified, stated short-circuit current rating (SCCR).

Voltage types and network configurations in North America

For the use of some devices, such as motor-protective circuit breakers and some motor starters, the maximum permissible "full voltage"[6] (e.g. 480 V, 600 V) or "slash voltage"[7] (e.g. 480Y/277 V, 600Y/347 V) must be observed. Devices for which slash voltages are mandatory, must be used only with star networks with solid grounding. These networks can be installed with or without neutral conductor. In North America three-phase networks are usually three-pole. Devices for full voltages can be used in star and delta networks, irrespective of the type of grounding. In combination, some devices can also be approved for smaller full voltages and larger slash voltages. The decisive factor for the permitted network configuration in this case is the actually used voltage. If only a single device in a switchgear system can be used for a slash voltage, this slash voltage must be stated on the switchgear system's rating plate.

Some devices can not be used with the 600 V often found in Canada. This may be true even if these devices are IEC/EN-approved for up to 690 V. This restriction is due to the differing test conditions specified by the North American standards. For exports to Canada, many customers use 600/480 V or 600/400 V matching transformers to avoid any restrictions due to the high voltage of 600 V at the engineering stage. When using transformers with separate windings, a separate, grounded star network can be connected to the transformer's output side to allow the use of devices approved only for slash voltages.

Most North American component standards currently specify a maximum of 600 V for l.v. systems. It has become apparent that these voltages are no longer sufficient for new technologies with high ratings, such as photovoltaics or wind power. New standards are currently being developed that will, in future, allow higher voltages. These changes will also have to be made, for example, in the UL 489.

When using switching and protective devices, the voltage indications, such as 115 V or 120 V, 230 V or 240 V, 460 V or 480 V, 575 V or 600 V, often cause irritation. The higher of the two stated voltages in each case is the rated service voltage[8]. The lower of the two values is the Utilization Voltage[9], which is the voltage between the point of connection[10] to the consumer system to the point at which the apparatus is connected. To a mains supply with a rated voltage of, for example,**480 V** motors dimensioned for **460 V** can be connected. The same applies for the other voltage pairs. To simplify device selection, Eaton has included both voltage values in its NA motor starter tables, even though motors with, for example, 480 V are not usual.

In connection with approvals, a great deal of information must be made available to users. The most important information is contained on the devices' rating plates and in the catalog. For some devices, further details that are relevant mainly for installation, are included in the installation instructions[11] included with the devices. The required information is specified in the standards or, in some individual cases, by the approval organizations in the approval documents. To ensure the large clearances and creepage distances for feeder circuits, circuit breakers must always be fitted with insulating components and covers. To limit the vendor's liability, the installation instructions for the device and for the switchgear systems in which it is installed should be handed on to the end customer and the operator.

Codes and standards in North America

As with IEC and European standards, North American standards can be divided into those that apply to individual products and those that apply to assembled installations. Product-related standards, such as UL 489, UL 508, UL 508C, and UL 1077) apply mainly to component manufacturers, while system-related standards, such as UL 508A and NFPA 79 are relevant mainly for companies that process these components. Canada dos not have installation-related standards in some cases. The statutory requirements are not incorporated in the CEC and CSA standards as clearly. In these cases, it is advisable to use the US installation-related standards as a guideline for engineering, as these have similar requirements. Component manufacturers and machine/system builders that use third-party components should each be familiar with the respective other type of standard. Note that, in addition to the national US and Canadian standards, member states or provinces and larger cities may have additional legal requirements that must be met by system builders when supplying to these regions. In the USA, the latest NEC standards do not always apply in all states.

Device types in North America

This main catalog takes into account the fact that a distinction is made in Canada and the USA between Distribution Equipment and Industrial Control Equipment:

Distribution equipment

This includes for example:

- Circuit-breakers (UL 489, CSA-C22.2 No. 5-09).
- Load interrupters (UL 489, CSA-C22.2 No. 5-09).
- Switch-disconnectors (UL98, CSA-C22.2 No. 4-04).
- Fuses (UL 248, CSA-C22.2 No.248).
- Fuse switch-disconnectors (UL98, CSA-C22.2 No. 4-04).

Notes

1) System of categorization in the USA, corresponds with UL White Book, UL 508A
2) System of categorization in Canada, corresponds with CSA
3) **https://wss.moeller.net/approbationen**
4) **de.ecat.moeller.net**
5) HP = horse-power
6) Voltage between phases
7) Voltage between phase and neutral
8) Service Voltage
9) Point of Connection, Point of Common Coupling
10) Utilization Voltage
11) AWA = Moeller nomenclature: Installation instructions, IL = Eaton nomenclature: Instructional Leaflet

These devices are of a rugged design and have larger insulating clearances than other switching devices (for 301 to 600 V: 1 inch = 25.4 mm air distance and 2 inches = 50.8 mm creepage distance).

In power distribution equipment (switchgear, switchboards, panelboards), only these devices must be used for power supply and tap-off. In addition, these components are also used, for example, as main switches or circuit breakers in motor and other load circuits in industrial control systems.

Testing of these devices is specially stringent, with running production being subject to regular checks by test authority inspectors. The type tests for UL- and CSA-approved circuit breakers are among the world's strictest. Eaton's NA circuit breakers have passed all of these tests.

Industrial control equipment

These include, for example, devices to UL 508, CSA-C22.2 No. 14-05:

- Contactors.
- Contactor relays.
- Overload relays.
- Motor protective circuit breaker.
- Cam switch.
- Pilot devices.
- Electronic devices and systems.
- User-programmable PLCs

These devices have smaller physical dimensions and the insulating clearances are not as great as those of power distribution devices. Here, too, running production is monitored by test authority inspectors, but the inspection requirements are not as extensive as those for circuit breakers.

This industrial control equipment is used mainly in industrial control panels, motor circuits and consumer circuits of all types, in motor control centers (MCC) and in power distribution systems. In industrial control panels, it can be combined directly with power distribution devices, for example with circuit breakers as main switches or in a motor feeder.

Circuit types in North America

In North America, main circuits are classified into "feeder circuits"[1] and "branch circuits"[2]. In feeder circuits, large clearances and creepage distances are required, for example according to UL 489. The boundary between these two circuit types is the "branch circuit protective device (BCPD)"[3], which are required to have large clearances and creepage distances at least on their feeder side. Typical BCPDs are circuit breakers NZM…-NA, PKZM4…-CB, FAZ…-NA, and FAZ…-RT, and fuses. In North America, circuit breakers must be marked with their conduction direction (LINE or LOAD) unless they are approved for both conduction directions. The circuit breakers must then be fed only from above and the specified infeed side must be marked "LINE". The Eaton circuit breakers do not have this limitation. We often receive inquiries about this, even though it is stated in the technical data. As BCPDs, motor starters of UL 508 Types E and F can be used only for individual motors, not for any other load type. In motor control centers (MCC) the control voltage is often generated per withdrawable unit.

Ratings data for industrial switchgear

Note that the IEC/EN rating data on devices or in this catalog must not be used for selecting devices for use in North America. Use only the approved data. As with the IEC and European standards, which define utilization categories for l.v. switchgear, US and Canadian standards define "duty types" for various types of switched loads. The type of load for each duty type is indicated on the device's ratings plate or in its technical specifications and defines is application purpose. The following table provides an overview of these assignments:

Contactors

In North America, Contactors are classified as industrial control equipment according to UL 508 and CSA-C 22-2 No. 14-05). For the North American market, contactors must have so-called "NEMA-sizes"[4], unless they are used for switching motors, for which orders will specify ratings in HP. For the NEMA-sizes, corresponding HP motor ratings and continuous thermal currents are assigned to all North American standard voltages.

Chapters 5 and 8 of this catalog list the contactors and motor starters with the HP ratings approved for North America. The table on a Page 5/84 provides an overview of the NEMA sizes in relation to the HP ratings and continuous currents.

Combination "contactor and overload relay" ("Non Combination Motor Starter")

First of all, it is important to know that when North American customers speak of "non-combination motor starters" they mean what in Europe is referred to as a "contactor and overcurrent relay" combination and will give the same ordering information as for contactors. Complete contactor and overcurrent relay combinations can be assembled as per page 8/30. In addition, a short-circuit protection device, i.e. a fuse or circuit-breaker is required. The highest permissible rating for this protective device is given in each case in this catalog.

Motor starters ("Combination Motor Starters")

The European-type motor starter that contains all devices for short-circuit protection, overload protection and operational switching of the motor (such as circuit-breaker, contactor and overload relay), is called "combination motor starter" in North America. This type of motor starter must be engineered like a small control system complete with all associated individual devices. The contactor and overload relay are selected as described on page 8/xx.

With its devices, Eaton offers different versions for electrical, and to some extent also for mechanical connection of the motor starters' components. The most convenient connection method is provided by the tool-less plug connection wiring kits. All connection methods with wires or elements of different types are approved for North America. This also goes for surface mounting the motor starters on busbar adapters of the SASY 60i system.

IEC/EN motor protective circuit breakers

In North America, motor-protective circuit breakers can not be used irrespective of make, as is customary in IEC and EN standard systems. According to current US and Canadian standards, these devices are classified merely as "manual motor controllers" or "manual motor protectors". These devices are subject to the special conditions described below, which must be observed.

The integrated short-circuit protection function and the isolating functions of these motor-protective circuit breakers is not recognized in North America. According to UL 508 and CSA C 22.2 No. 14-05, approved motor-protective circuit breakers must be protected against short circuits with UL- or CSA-approved circuit breakers or fuses. In the event of a short-circuit, the motor-protective circuit-breaker's short-circuit release will, of course, also trip.

The additional short-circuit protective device can protect individual motor starters or – if approved for use in "group installations" – a group of motor starters. Motor-protective circuit breakers PKZM0, PKZM4 and PKE are additionally approved as "tap conductor protectors".

Motor protective circuit breakers PKZ, PKE (Chapter 7)

In North America, these devices are industrial control equipment to UL 508 and CSA-C 22.2 No. 14-05) and are used as manually operated motor starters in controllers or separately as

Duty type

		Load marking on the apparatus/device
1)	**Motors**	Horsepower (HP)
2)	**Coils** (in auxiliary and control circuits)	Coils: Volts, Frequency Control Circuit Contacts: Standard Pilot Duty or Heavy Pilot Duty.
3)	**Resistance (heating)**	Amperes, resistance only
4)	**Incandescent lamps**	Amperes or Watts, Tungsten
5)	**Ballast** (electric discharge lamps)	Amperes, ballast (A, reactors)
6)	**General Use**[1]	Amperes (A)

[1] The "General Use" group corresponds with IEC/EN Category AC-1.

Notes

1) In NA, the term "feeder circuits" is used in the widest sense
2) Feeder circuits
3) BCPD = branch circuit protective device
4) NEMA = National Electrical Manufacturers Association (USA, http://www.NEMA.org)

discrete devices. They are rated in HP and – if they are equipped with auxiliary contacts – they contain duty type information for use as controlgear (pilot duties). The devices have fixed or adjustable magnetic or electronic short-circuit releases[1] and adjustable bimetallic or electronic releases for motor overload protection. They can be used for switching motor circuits, and their auxiliary contacts for switching control circuits. In the PKE system, the modular plug-in trip blocks can be exchanged depending on the size of the connected motor. The electronic releases have a wide adjustment range. The PKE system also allows motor starters to be networked through the NA-approved SmartWire-Darwin system. PKZ and PKE must be used only for protecting and switching motors in North America and not, like in IEC/EN, for other types of load. The circuit breakers can optionally equipped with undervoltage or shunt releases.

Although PKZ motor-protective circuit breakers have an inherent short-circuit withstand capability at small currents, they must, according to North American standards, always be operated with an upstream short-circuit protection device (exceptions: UL 508 Types E and F). For most devices the specifies short-circuit protection can also be used to protect a group of motor-protective circuit breakers. In North America this characteristic is referred to as group protection. When forming groups and choosing cables, special rules of the codes and standards must be observed. If the motor starters' cable dimensions vary significantly, the groups are difficult to coordinate and some devices can be used only with separate protective devices in this case. Motor-protective circuit breakers with upstream protection can also be used without limitation in delta and ungrounded star networks.

Motor starters without additional short-circuit protection, UL 508 type E starters

According to a supplement to UL 508, motor starters can be tested as "type E combination motor controllers"[2], for which an additional short-circuit protection is not required (self-protected combination motor controller). This starter type is also CSA-recognized for Canada. Type E starters must be used only in solidly grounded star networks, for example at slash voltage 480Y/277 V. They must be used only for switching and protecting motors and for no other load types.

For the protection of motors and frequency inverters, the frequency inverters must be tested and approved by their manufacturers together with these Type E starters (at the time of print, this possibility is being planned and not yet officially included in the standards).

All components for a complete motor starter, including full short-circuit protection, are contained in a single device. This reduces the required space and eliminates the wiring between the components. These devices are used in motor control centres (MCC), in controllers and enclosed discrete equipment. Up to the specified switching capacity, these devices do not need additional short-circuit protection.

In the PKZ2 system, these devices are available with type designation PKZ2/ZM-.../S-SP. These devices feature large clearances and creepage distances. In individual motor outgoers they can perform the BCPD function without additional upstream protection. They can be tripped by optional undervoltage or shunt releases and remotely switched on and off with optional remote operators. The PKZ2 system also includes a trip block version that actuates a relay output on overload instead of tripping the circuit-breaker through the breaker mechanism[3]. This version allows separate signaling of overloads and short-circuits. On overload, the circuit-breaker does not have to be closed again after the fault is rectified. These breakers are used when the overload is self-canceling or can be easily remedied by operating personnel. This avoids the need to call in an electrician.

UL 508 manual Type E starters

In addition, the "type E combination motor controllers" comprise the "manual self-protected starters", which, if no upstream short-circuit protective devices are used, require larger clearances and creepage distances, for example according to UL 489 or CSA-C 22.2 No. 5-09. These devices are suitable only for manual switching of motors. They must be used only in solidly grounded star networks, for example at slash voltage 480Y/277 V. In individual motor outgoers they can perform the BCPD function without additional upstream protection. They must be used only for switching and protecting motors and for no other load types.

Manual self-protected combination motor controllers are implemented as a modular system with a PKZM0, PKZM4 or PKE with a special additional incoming terminal BK25/3-PKZ0-E or BK50/3-PKZ4-E. For use in Canada these devices must, in addition, be lockable, i.e. the starters must be fitted with operating handle AK-PKZ0. It is permissible to connect several PKZM at their input side with three-phase commoning links, for example B3…-PKZ0, and to connect this group through only a single incoming terminal BK….

UL 508 Type F remote-switchable starters

By combining a "manual type E starter" with a contactor, a "type F combination motor controller" can be constructed. These starters also do not need additional short-circuit protection. Type F starters can be combined and used as shown on page 8/xx. These combinations can also be used exclusively in solidly grounded star networks, for example at slash voltage 480Y/277 V. They must be used only to switch motors and no other types of load. Type F starters are accepted in Canada, although they are not yet described in the standards there.

Here, too, three-phase commoning links with a single incoming terminal can be used. Alternatively, the devices can be mounted on busbar adapters and busbar systems. The adapters and busbar systems SASY 60i are also approved for use in North America. The Eaton devices offer this very effective "two-component starter" with up to 52 A. Up to the specified switching capacity, these starters do not need additional short-circuit protection.

Motor starters for higher-rated motors

At their basic equipment level, circuit breakers are not suitable for motor protection in North America. Like the conventional IEC/EN-standard circuit breakers, these breakers lack a motor protection characteristic for overload releases that meets the requirements of current North American codes and standards. Later in this section, a new circuit-breaker as motor-protective circuit-breaker NZM… -ME…-NA will be introduced, with a motor protection characteristic that comforms to UL 508.

In North America, motor starters for higher-rated motors (for Eaton devices > 52 A) are assembled from three components: A circuit-breaker, a contactor and an additional overload relay. The circuit breakers used have

- with fixed overload releases (NZM…-AF…-NA)
- or with adjustable overload releases (NZM…-A…-NA)
- or without overload release (NZM..-S…-NA).

The overload relays optionally feature thermal bimetallic or electronic trip blocks. The configurable tripping behavior of electronic overload relays can be optimized for the motors' startup behavior under adverse load, for example for heavy starting duty.

Motor-protective circuit breakers NZM…-ME…-NA

These novel devices are fully-featured circuit breakers in North America (molded-case circuit breakers to UL 489 and CSA-C22.2 No. 5-09) and, in addition, like overload relays contain an overload release calibration (to UL 508 and CSA-C22.2 No. 14-05). They are used mainly in controllers and motor control centers (MCC). They are short-circuit rated in kA and – if they are equipped with auxiliary contacts – contain duty type information (pilot duties). These circuit breakers can optionally be equipped with and tripped by shunt or undervoltage releases or be switched on and off with remote operators.

These devices feature adjustable electronic short-circuit releases and adjustable electronic wide-range releases for motor overload protection[4]. The adjustable tripping class allows the devices to be adapted to the starting characteristics of various different motors and load types. They can be used as separate, manual breakers, for protecting and switching motor circuits, and their auxiliary contacts for switching control circuits.

In combination with a downstream contactor, they are classified as a "Type C combination motor starter", in which the contactor, acting as motor controller, switches and regulates the motor current with a high, reliable operating frequency and the NZM provides protection. For these Type C combination motor starters the HP ratings indicated on the contactors then apply. These combinations then form "two-component motor starters", which require less space and fewer components and engineering resources, and have lower thermal losses than three-component motor starters. This is specially advantageous for the compact withdrawable MCCs.

Motor-protective circuit breakers NZM…-ME…-NA can be used with or without contactor in motor circuits up to the stated switching capacity without additional short-circuit protection. With just three models, they cover a current range from 45 to 200 A. The circuit breakers are "100 % rated", meaning that their entire current range can be utilized. Their setting ranges overlap with the two-component motor starters up to 52 A that are formed with the Type E or Type F versions of circuit breakers PKZM0, PKZM4 or PKE. Covering currents up to 200 A, the two-component motor starters can now be used to cost-effectively protect and switch more than 95 percent of all motors.

Circuit-breakers without overload protection, NZM..-S(E)..-CNA

In North America, these devices are circuit breakers (instantaneous-trip only molded-case circuit breakers according to UL 489 and CSA-C 22.2 No. 5-09) and are used mainly in motor control centres (MCC), controllers and enclosed discrete equipment. They are rated in amperes and – if they are equipped with auxiliary contacts – contain duty type information (pilot duties).

The devices have adjustable magnetic or electronic short-circuit releases, no overload releases and can be used for switching motor circuits, and their auxiliary contacts for switching control circuits. They also provide short-circuit protection in motor circuits. They can optionally be tripped by shunt or undervoltage releases or be switched on and off with remote operators.

Circuit-breakers NZM..-S(E)..-CNA are UL-approved as Recognized Components. They are not used as discrete devices; they are always combined to a "combination motor starter" with a downstream contactor and overload relay, in which the contactor performs operational switching and regulation of the motor current, the overload relay acts as overload protective device and the circuit-breaker acting as short-circuit protection device. This combination has the added benefit of allowing a separate tripped indication on overload through the overload relay's auxiliary contacts or on short-

Notes

1) Observe previous paragraph
2) Motor starter construction Type E
3) ZMR-…-PKZ2, overload is signaled only; the circuit-breaker does not trip
4) The overload releases are, in addition, calibrated like overload relays in compliance with UL 508 and CSA-C 22.2 No. 14-05

circuit through the circuit-breaker's auxiliary contacts. In North America, combinations of this type are used in motor control centres (MCC) and as discrete starters in separate enclosures. Electronic overload relays also provide protection for motors with heavy starting duty. For this duty type, such combinations are also used in IEC/EN-standard switchgear systems.

For the switches alone, no short-circuit rating is given. At locations with short-circuit currents up to the switching capacity specified for the complete "combination motor starter", they can be used without upstream short-circuit protection device.

Circuit-breakers NZM...A(E)…-NA, NZM…A(E)F…-NA, NZM…VE…-NA, NZM…V(E)F…-NA

In North America these devices are inverse-time molded-case circuit breakers to UL 489 and CSA-C22.2 No. 5-09)[1]. They are the normal switches for power distribution systems, but can also be used in motor control centres (MCC) and controllers. All versions of construction sizes NZM1…-NA, NZM2…-NA[2] and NZM3…-NA are approved as current-limiting devices and marked accordingly on their rating plate. They are rated in A, their short-circuit switching capacity is given in amperes and – if they are equipped with auxiliary contacts – contain duty type information (pilot duties).

These devices have adjustable magnetic or electronic short-circuit releases and fixed-current or adjustable bimetallic or electronic trip blocks for overload protection for non-motor outgoing circuits. They can be used as short-circuit protection devices and for switching motor circuits[3], and their auxiliary contacts for switching control circuits. At mounting locations with short-circuit currents up to their switching capacity, they can be used without upstream short-circuit protection device.

In main current outgoing and incoming lines, they can be used as main switches. The letter "E" in the part number indicates versions with electronic releases. The letter "V" indicates electronic releases with adjustable, tripping times with adjustable delay. They can optionally be tripped by shunt or undervoltage releases or be switched on and off with remote operators. In North America circuit breakers with fixed overload releases are often used to reduce the required cable cross-sections. Example: A circuit is to carry 150 A. If the adjustable switch has a rated operational current of 250 A, it must be wired for 250 A in North America (for the highest adjustable current). A switch permanently set to 150 A must be wired only for 150 A. At least for large currents and long lines, this consideration can also be of interest for IEC/EN-standard systems.

Circuit-breakers PKZM4- …-CB

From motor-protective circuit-breaker PKZM4 a fully-featured circuit-breaker to UL 489 has been derived. These circuit breakers are larger than their motor-protective counterparts because of the large clearances and creepage distances required at their input- and output-side main power connections. These devices can be used as branch circuit protective devices.

This circuit-breaker has been developed with the aim of offering devices for smaller rated operational currents than are possible with circuit breakers NZM yet with a high switching capacity. These circuit breakers have a switching capacity that is comparable with that of circuit breakers FAZ…-NA. The need for these protective devices is that non-motor loads must be protected with fuses or with circuit breakers. These loads often have only low currents. This also applies for the protection of frequency inverters, although here, too, the load is a motor. Exporters prefer the use of circuit breakers and similar fuseless solution, which is also Eaton's recommendation. In North America, systems commonly contain a large number of fuses, even though standard NFPA 70 E[4] presacribes very complex safety measures for replacing defective fuses.

Switch-disconnectors N, PN

For North America the switch-disconnectors N and PN, which are derived from circuit breakers NZM and which have a proven track record in the IEC/EN market, have been replaced with molded-case switches NS…-NA to comply with North American practices.

Molded case switches NS…-NA

Molded-case switches NS…-NA, to UL 489 and CSA-C22.2 No. 5-09 are the typical North American switch-disconnectors. They are the normal switches for power distribution systems, but can also be used in motor control centres (MCC) and controllers, for example as main switches. where they are the normal switches for power distribution systems, but can also be used in motor control centres (MCC) and controllers. They are rated in amperes, their short-circuit switching capacity is given in kA and – if they are equipped with auxiliary contacts – contain duty type information (pilot duties).

These devices feature fixed short-circuit releases and no overload release. The short-circuit releases are intended only for intrinsic protection of the circuit-breaker. They can not be used as short-circuit protection for downstream protecting and switching devices. Their auxiliary contacts can be used for switching control circuits. At mounting locations with short-circuit currents up to their switching capacity, they can be used without upstream short-circuit protection device. They can optionally be tripped by shunt or undervoltage releases or be switched on and off with remote operators. The North American standards regard these devices are switch-disconnectors, while the IEC/EN standards consider them circuit breakers of category CBI-X[5]. It should be noted that molded-case switches NS…-NA have a tripped position that the switch-disconnectors do not have. After tripping, they must be reset.

Current limitation

Current limitation is a feature of modern circuit breakers that interrupt short-circuit currents very quickly and of some fuse types. With specially developed contact systems, these circuit breakers interrupt short-circuit currents before the breaker mechanism can respond. The current is interrupted long before it reaches its limit value. This is referred to as dynamic contact disengagement through magnetic force fields around the conducting parts of the breaker mechanism. The fast interruption of the short-circuit currents results in much lower let-through currents and energies.

According to IEC/EN the switching and protective elements connected downstream of a current limiter are dimensioned only for these reduced let-through characteristics. According to the North American standards the current-limiting effect in industrial control panels for machinery can be used only partially to UL 508A Part 2 and NFPA 79. Annex SB of UL 508A does mention these current-limiting protective devices in the context of the determining the short-circuit current rating (SCCR), but demands that all branch circuit protective devices (BCPD)[6] downstream of the current-limiting protective device have at least the same switching capacity as the current limiter itself. This, in effect, ignores the physical effect, making the plants unnecessarily expensive. In reality, the load on the entire installation after the current limiter is significantly reduced. For dimensioning apparatus in the control panel arranged on the consumer side downstream of the BCPD[7] the let-through characteristic of the current limiter can then be expected again.

All circuit breakers of construction sizes NZM1…-NA, NZM2…-NA[8] and NZM3…-NA, and the small circuit breakers FAZ…-NA and FAZ...-RT are designed and approved as current limiters and marked accordingly on their rating plate.

Circuit-breakers NZM4…-NA have single-pole-interrupting contact systems that are optimized for current selectivity. For selectivity at higher currents and for installation away from short-circuits, contacts that remain closed as long as possible are required. The selectivity requirements exclude the current-limiting effect.

Series connection of circuit breakers, back-up protection (series rating)

If, according to IEC/EN standards, the switching capacity of a circuit-breaker is not sufficient for short-circuit currents that may occur in specific applications, a further protective device with a higher switching capacity is connected upstream of the circuit-breaker. Together, the two series-connected circuit breakers can handle the higher short-circuit currents. If the additional protective device protects or supports a group of lower-rated protective devices, this is referred to as group protection.

According to the North American standards, this interaction of several protective devices in power distribution systems (distribution equipment) is also permissible. For the industrial control panels for machinery (ICP) to UL 508A and NFPA 79 that are dealt with here, a series connection of circuit breakers, fuses or a combination of the two is not permissible if the series connection is intended to increase switching capacity. Circuit-breakers FAZ…-NA and FAZ…RT, which are popular in IEC/EN installations, have a rated current dependent switching capacity of 10 or 14 kA. These circuit breakers are often used in ICPs. According to the North American standards it is not currently possible to increase the switching capacity with a series-connected protective device (circuit-breaker or fuse). In an ICP a circuit-breaker must always provide the required switching capacity by itself. While it is possible to connect two circuit breakers in series as main switch and outgoing circuit-breaker, this does not increase the overall switching capacity. The switching capacity of every protective device must always be equal to or greater than the highest expected short-circuit current.

Operating elements for circuit breakers and molded case switches

Operating elements of the upstream switches that are used in industrial control equipment for machines currently attract the particular attention of inspectors. This applies specially to the operation of main switches with door coupling rotary handles and to door interlocks. Here follows a brief explanation of the complex requirements. A more detailed Technical Essay on this subject is also available[9].

North American standards UL 508A, Part 2, Industrial Machinery[10] and NFPA 79[11] demand that the operating elements of main switches (supply circuit disconnecting (isolating) means)[12] are permanently connected with these switches to allow switch operation at any time and irrespective of the control panel door's position. The operating elements must also be lockable to prevent their operation (closing). A further requirement is that

Notes

1) The term "inverse time" is usually omitted. It expresses that the tripping time is inversely proportional to the current.
2) Except NZM…2-ME…-NA
3) In combination with an overload relay
4) NFPA 70 E, "Standard for Electrical Safety in the Workplace"
5) Category CBI-X circuit breakers are molded case circuit-breakers without overload release. According to IEC/EN switch-disconnectors must not contain a current-dependent trip block.
6) Circuit-breakers for individual branches
7) e.g. contactors or frequency inverters
8) Except NZM…2-ME…-NA]]
9) http://www.moeller.net/binary/ver_techpapers/ver966de.pdf
10) UL 508A, UL Standard for Industrial Control Panels
11) NFPA 79, Electrical Standard for Industrial Machinery; subject comparable with IEC/EN 60204-1
12) Supply Circuit Disconnecting (Isolating) Means

the main switch can be switched on only when all control panel doors are closed and that all doors are mechanically and/or electrically interlocked with the switch that the doors can not be opened when the main switch is closed[1].

A simple interlock with a shunt release that simply trips the main switch when a door is opened should be avoided, as this can lead to critical or dangerous situations for plant and personnel[2]. A defeat mechanism, with which specialists can temporarily disable the door interlock to correct faults is permissible[3], as faults can often be determined only in a live system. If more comprehensive measures are required to rectify faults, the plant should be shut down for the duration of the work.

To ensure the permanent connection between operating elements and switches, main switches with handle mechanisms are the preferred choice. The switch handles are fitted directly to the sides of the switches or more flexibly connected with a bowden cable. The fronts of North American control panels typically feature a fixed flange over the panel's entire height, into which the handle is installed, so that they can also be operated when the panel door is open. These handles are referred to an flange-mounted handle[4] in North America. These handles are, in addition, connected to all control panel doors with a mechanical interlock. Eaton supplies these handles[5] with a standard drilling template and with bowden cables of various lengths – see page 17/xx. Lever handles do not fulfil the requirements of IEC/EN standards and do not contain the CE mark. They must therefore be used only in North America. Panel builders working to IEC/EN standards normally use these operating elements and the special control panels only by customer request.

In distribution equipment switches with toggle lever mechanisms are often used, while in industrial control panels[6] switches with rotary mechanisms are preferred. For main switches, door coupling rotary handles with a high protection type are usually used, since these must be operable when the control panel door is closed. With the panel door open, the handle is on the outside of the door so that the switch can not be operated without tools. An additional handle[7] can therefore be fitted to the switch axis inside the panel. According to the standards, this handle must be operable only through deliberate action[8]. To fulfil this requirement, Eaton's handles must, with the panel door opened, be rotated through about 15 degrees, then pushed and at the same time turned further to close the switch. Switching off does not require any special measures.

With this unique solution, Eaton's offers a clear competitive advantage on the European market because the high degree of protection[9] of the door coupling handles and control panels are preserved. With the approved additional handle, the switch contains two operating elements, two switch position indicators and two locking facilities – one each for closed and for open doors. These handles are also recommended for IEC/EN standard panels, to which the described issues also apply.

When using switches with door coupling rotary handles and several control panel doors, an electrical door interlock is required. This interlock can be defeated by specialists and must automatically become active again when the last door is closed. For the electrical door interlock, our customers prefer position switches with mechanical locks. This solution more closely resembles a mechanical door interlock and provides a high level of safety. On control panels with only one door, this door can be directly mechanically interlocked with the switch through the door coupling rotary handle. The mechanical door interlock can also contain a defeat mechanism[10].

As alternative to door coupling rotary handles, Eaton offers side-wall and rear-mounted switch mechanisms, which provide a permanent mechanical connection between handles and switches. Because of the versatile installation options of these mechanisms, an electrical door interlock must be provided for each switch[11].

Door coupling rotary handles for North America

With door coupling rotary handles NZM..-XTVDV.. for NZM and NS…-NA, used mainly outside North America, the mechanically interlocked control panel door can be opened when handle and switch are in their OFF position. With the NA version of these handles – NZM..-XTVDV..**-NA**, the interlocked panel door can not be opened in the OFF position: The handle must be rotated further, beyond the OFF position to release the door. This is standard North American practice. Both door coupling rotary handle types are approved for North America.

Cam switches T, switch-disconnectors P1 and P3

In North America, these switches are industrial control equipment according to UL 508 and CSA-C 22.2 No. 14-05). Switch-disconnectors P1 and P3 are a 3-pole design and have two switch positions. They are used mainly in controllers and as single devices in motor circuits. They are rated in HP and – if they are equipped with auxiliary contacts – they contain duty type information (pilot duties). The switches have no short-circuit switching capacity and must therefore be fuse-protected. They can be used for switching motor circuits and other main circuits, and their auxiliary contacts for switching control circuits. Cam switches T can be manufactured with up to eleven contact units[12] and with more than two switch positions. They are therefore used mainly as control switches, for example as operating mode or measuring device selector switches. They are rated in HP and can also be used in motor circuits.

According to UL 508 the devices described above can be used as locally installed switch-disconnectors if the control panel contains a branch circuit protective device (BCPD) and the switch is, in addition, regarded as motor disconnect according to UL 508 and CSA-C22.2 No. 14-05 and marked accordingly on its rating plate. Eaton's T- and P-type switches fulfil these requirements. For the required line fuse ratings, see the catalog or the rating plates of the switches.

Fuse bases and fuses

For the following reasons, the use of circuit breakers, selected according to the above criteria, is preferable to the use of fuses:

- In North America only North American fuse types must be used; IEC/EN standard fuses are not acceptable.
- Fuse bases for North American fuses are very large and take up a lot of space.
- NZM circuit breakers provide current isolation, short-circuit protection, overload protection and fault signaling in a single device and are much less expensive and smaller than a combination of fuse base, fuses and overload relay.

If the use of fuses is unavoidable, we recommend that you observe the following points:

- North American fuses are classified according to physical size, breaking capacity and current–time characteristics. The above table provides a rough overview.
- Motor circuits:
  When using time delay fuses[13]:
  Rated current of the max. line fuse= 1.75 × motor rated current or next higher fuse current rating (max. 2.25 × motor rated current).
  When using non-time delay fuses[14]:
  Rated current of max. line fuse = 3 × motor rated current or next higher fuse current rating (max. 4 × motor rated current).
- "Circuits with non-motor loads:
  For these consumers line fuses are to be selected according to the consumer manufacturer's instructions. This also applies for frequency inverters, even if motors are connected to the frequency inverters. In these cases the frequency inverters are regarded as consumers.
- "Switchgear:
  For switchgear requiring line fuses for inherent short-circuit protection, the fuse ratings are to be obtained from the technical data in the catalog or from the devices's rating plates. For short-circuit protection of the combination of Eaton contactor and overcurrent relay, see page 8/35 for the max. line fuse ratings.

To ensure both trouble-free motor starting and short-circuit protection of all devices within a circuit, select the smallest fuse required according to criteria 2b), 2c) and 2d). Regarding the short-circuit current rating (SCCR) non-time delay fuses can have advantages over circuit breakers.

Supplementary protectors FAZ

In North America, these devices are industrial control equipment and protectors (supplementary protectors according to UL 1077 and CSA-C22.2 No. 235)[15]. They are used mainly in controllers. They can also be used as additional protective device in electrical devices whose incomer is already short-circuit protected. Eaton also provides an approved DC switching capacity in addition to the switch's AC switching capacity. They can therefore also be used in DC circuits.

Supplementary protectors FAZ are Recognized Components according to UL standards. This type of protective element is often used incorrectly. FAZ must be used only as additional protective device and never for branch circuit protection (BCPD). They have non-adjustable magnetic short-circuit releases for short-circuit protection and fixed-current overload relays for overload protection. Eaton supplies supplementary protectors with a range of IEC/EN-compliant tripping characteristics. The characteristic is selected according to the protected load type.

Supplementary protectors FAZ are specially suitable for fuseless protection of control circuits on the output side of control transformers. These protectors can also be used for input-side protection of control transformers, but not on the input side of power transformers.

Circuit-breakers FAZ…-NA, FAZ…-RT (Miniature Moulded Case Circuit Breakers, MCCB)

Circuit-breakers FAZ…-NA and FAZ…-RT are a further development of supplementary protectors FAZ. They feature large clearances and creepage distances in the connection area. and, as miniature molded-case circuit breakers (MCCB), comply with standards UL 489 and CSA-C22.2 No. 5-09. They are Listed Components according to the UL standards and

Notes

1) In North America, electrical switching and protective devices are not generally designed with protection against accidental contact
2) The Stop categories to IEC/EN and NFPA 79 must be observed
3) Defeat mechanisms are usually operated with a tool (screwdriver)
4) Also referred to as "side-mounted handle"
5) e.g. NZM-XSHGVR12-NA, plus further components
6) Industrial Control Panels to UL 508A and NFPA 79
7) e.g. NZM…-XHB-…-NA
8) Deliberate action
9) Or protection type – an important aspect with regard to the approval of switchgear systems/panels
10) Operated by turning a screw on the handle with a screwdriver
11) Also on panels with only one door
12) Eleven contact units correspond with 22 contacts
13) Also called "dual element time delay fuses"
14) "Non-time-delay fuses"
15) Protective devices for additional protection (in addition to a BCPD), e.g. splitting of circuits after a BCPD

Classified Components according to CSA. They have non-adjustable magnetic short-circuit releases for short-circuit protection and fixed-current overload relays for overload protection. They are approved as

Available accessories are auxiliary contacts, shunt releases and three-phase commoning links with large clearances and creepage distances are available.

manufacturers and users reduce their parts stock and provide optimized solutions more quickly.

The standardized continuous currents and switching duties for AC and DC for auxiliary switches are assigned

Motor protection must be provided by an overload relay. For dimensioning the motor outgoer with soft starter, use the selection tables in this catalog.

Eaton's soft starters (DS4, DS6, DS7) are UL-listed and CSA-certified (DS7

Part no. or design in: USA	Canada	Standards UL, CSA	Fuse characteristics	SCCR	Typical values in A	Fields of application		Notes
Class **H**, "Code"	Class **H**, No. 59 "Code"	UL 248-6/7, C22.2 248-6/7	Fast	10 kA, 250 VAC 10 kA, 600 VAC	0…600	Primarily domestic		Types H, K and No. 59 "Code" fit the same bases and are therefore interchangeable. There is therefore a risk that they may be incorrectly used! See also note on K.
Class **CC**	Class **CC**	UL 248-4, C22.2 248-4	Fast Time-lag	200 kA, 600 VAC	0.5…30	**Fast**: Protection from resistive and inductive loads. Circuits for heating, lighting, feeders and branches for mixed loads.	**Time-lag:** Protection from inductive and highly inductive loads. Circuits for motors, transformers, lighting etc.	Extremely compact design. **Current limiter** to UL/CSA.
Class **G**	Class **G**	UL 248-5, C22.2 248-5	Fast Time-lag	100 kA, 480 VAC	21…60			Compact design. **Current limiter** to UL/CSA. All other fuse types do not fit into bases.
				100 kA, 600 VAC	0.5…20			
Class **J**	Class **J** HRCI-J	UL 248-8, C22.2 248-8	Fast Time-lag	200 kA, 600 VAC	1…600			Compact design. **Current limiter** to UL/CSA. All other fuse types do not fit into bases.
Class **K** K1, K5	Class **K** K1, K5	UL 248-9, C22.2 248-9	Fast Time-lag	50 kA/100 kA/ 200 kA, 600VAC	0…600			**Not current limiter** to UL/CSA. In the USA, the K types are therefore being increasingly replaced by the RK part numbers.
Class **L**	Class **L**	UL 248-10, C22.2 248-10	Fast Time-lag	200 kA, 600 VAC	601…6000			**Current limiter** to UL/CSA. All other fuse types do not fit into bases.
Class **R** RK1, RK5	Class **R** HRCI-R RK1, RK5	UL 248-12, C22.2 248-12	Fast Time-lag	50 kA/100 kA/ 200 kA, 600VAC	0…600			**Current limiter** to UL/CSA. Types RK1, RK5 and HRCI-R fit the same bases. All other fuse types do not fit into these bases. RK1 fuses have lower let-through values than RK5.
Class **T**	Class **T**	UL 248-15, C22.2 248-15	Fast	200 kA, 300 VAC 200 kA, 600 VAC	0…1200		–	Extremely compact design. **Current limiter** to UL/CSA. All other fuse types do not fit into bases.

current limiters and marked accordingly on their rating plates. This means that their rated current can be fully utilized. They are rated in amperes, their short-circuit switching capacity is given in kA and – if they are equipped with auxiliary contacts – contain duty type information (pilot duties). Eaton also provides an approved DC switching capacity for single-pole 48 V and two-pole 96 V in addition to the switches' AC switching capacity[1].

These miniature circuit breakers can be used as branch circuit protective devices (BCPD) in feeder circuits and branch circuits. Up to a rated current of 32 A, FAZ…-NA and FAZ…-RT must be used only in star networks with solid grounding and a slash voltage of up to 480Y/277V. FAZ…-NA and FAZ…-RT for higher current values can be used up to 240 V AC, irrespective of network configuration and grounding. Part number suffix "-RT" stands for Ring Terminal. On these versions the terminal screws can be fully turned out to allow the connection of ring cable lugs.

These circuit breakers are available with one, two or three poles and with IEC/EN tripping characteristics B, C and D. The characteristic is selected according to the protected load type.

Accessories, such as auxiliary contacts and shunt releases

In North America, approvals were, for a long time, available only for complete, unalterable devices. For the practice common in Europe of allowing customers to retrofit devices with auxiliary contacts, undervoltage releases, shunt releases and other accessories, the corresponding UL and CSA approvals can now be issued. This applies even for changes in the main current area, for example different main current terminal types. The permissible versions must, of course, have been described, tested and approved. Permissible alternative connection blocks must be indicated on the device's rating plate. Observe the installation instructions and do not omit any parts only because their purpose is not clear. These parts ensure the required clearances and creepage distances, prevent short-circuits between phases due to faulty insulation and improve protected against accidental contact.

The tried-and-tested modular design method allows the field of application of contactors, circuit breakers, motor-protective circuit breakers, position switches and control circuit devices to be cost-effectively extended with add-on functions. It also helps reduce

according to the standards to the characteristic values and switching duty types indicated in the devices' technical specifications and on their ratings plates. These pilot duties are given in the table for auxiliary contacts in AC and DC circuits on page 5/xx. Auxiliary contacts are approved mainly for heavy pilot duty, and on some devices for standard pilot duty. For detailed information, see the technical data for the device groups. The ratings plate on some auxiliary switches contains information such as "600 V, same polarity". This means that adjacent auxiliary contacts of the same auxiliary switch or switch block must be connected only to the same control voltage source.

Soft starters and frequency inverters

Soft starters DS4, DS6, DS7

Like IEC/EN 60947, North American standards regard soft starters largely like contactors. These devices are developed, tested and approved to UL 508, CSA-C22.2 No. 14-05 and CSA-C22.2 No. 0-M91. Circuit-breakers or fuses provide short-circuit protection. The North American standards do not currently include protection through UL 508 Type E starters or the treatment of these devices as contactors, i.e. as UL 508 Type F starters.

as of Summer 2010) for an operational voltage of up to 480 V 50/60 Hz (full voltage). They are used in branch circuits. In practice, the soft starters are bypassed with a built-in bypass after the motor has started up. This reduces heat losses and thyristor load. Any short-circuit currents in the motor outgoer do not flow through the thyristors in the event of a fault. This increases the soft starters' reliability. On some models the soft starters switch two phases and the third phase is fed through. One of of the competitive advantage of Eaton's soft starters is that they have terminal types that are adapted to the switchgear. At currents up to 41 A the same terminal types are used as for circuit breakers, whose accessories can therefore also be used.

Frequency inverters M-Max and H-Max

Frequency inverters are developed, tested and approved according to North American standards UL 508C and CSA-C22.2 No.14-05. Short-circuit protection is provided by circuit breakers or fuses. It is currently not yet clear whether UL 508 Type E or Type F starters can be used as protective devices. Frequency inverters can be used only in combination with the tested, manufacturer-assigned

Notes

[1] For additional approved versions for single-pole 125 V DC and two-pole 250 V DC please enquire

protective devices. Overload protection of a single, directly connected motor can be provided directly by the frequency. For drives with several motors and bypass circuits the motors must be individually overload-protected with overload relays.

The frequency inverters are used in branch circuits. They can be used with three-phase rated operating voltages of up to 480Y/277 V, 50/60 Hz. Because of their suppressor circuit, solidly grounded star networks with neutral conductor are always required.

Radio interference suppression measures (EMC) in frequency-controlled power drive systems (PDS) are not specified in the North American standards. To ensure interference-free operation, the EMC measures laid out in IEC/EN 81600-3 should be carried out for machines and plants for export to North America.

Control relays easyRelay and MFD silver

Electronic control relays easyRelay and multi-function displays MFD-Titan have all UL 508 and CSA-C22.2 No.142 approvals. They are also approved to CSA (Class 1, Div. 2) for use in hazardous locations to CSA-C22.2 No. 213-M1987(R2008)[1].

All technical details for the North American market in this catalog, in the installation instructions and in the manuals are also given in American units, such as inches, lb, and degrees Fahrenheit. The relay data are given in pilot duties B300, R300, and make/break. The operational DC voltage of 24 V is also the common voltage for electronic components and systems in North America.

easyRelay and MFD-Titan are programmed in programming language ladder diagram. The easySoft software is also capable of representing North American ANSI contact sequences.

Control relays easyRelay and multi-function displays MFD-Titan are therefore fully equipped as control components/systems for the North American market.

Protection types for enclosures (degree of protection)

- The binding design and degree of protection requirements for enclosures for the USA are defined in NEC = NFPA 70, in UL 508(A) and in UL 50(E). For Canada they are specified in CSA-22.2 No. 14-05 and in CSA-C 22.2 No. 94. The degrees of protection are given as NEMA types or as identical UL/CSA types. Because the UL/CSA types must be third-party certified, they have largely superceded the NEMA types. Many inspectors demand UL/CSA types. Where products with third-party certified UL/CSA types are available, they should be used in preference.
- The enclosures used by Eaton are accepted for use in North America, since they are approved with UL/CSA types and meet the requirements regarding contact protection, corrosion protection and ingress protection against solids and liquids. See the information about degree of protection on the selection pages or in the technical specifications for the product groups.
- The IEC/EN standard ingress protection (IP) types include protection against ingress of solids and water. The comparable standards in Canada and the USA go further, also covering protection against ingress of oil and coolant, and corrosion protection of the enclosure; they therefore also define its place of installation. The table on a Page 22/xx ((17/18)) provides an overview of the requirements in Canada and the USA and a comparison with the IP ratings.
- IP protection type information has no relevance for use in North America and can not replace missing information about NEMA/UL/CSA types. The NEMA/UL/CSA types cover the corresponding IP ratings but not the other way round.

When exporting to North America, particular attention must be paid to the selection and implementation of the correct degree of protection for enclosures and installed apparatus. The inspectors are known to check very thoroughly for adherence to the degrees of protection. In almost every case, plants fail the inspection on this aspect and must be rectified. This results in lost time and additional costs. Always choose enclosures with the right degree of protection from the start. Every opening subsequently made in an enclosure puts its degree of protection into question. The degree of protection remains intact only when each of these enclosures is sealed again to the same degree. This can be done, for example, by installing a control circuit device or switch handle with the same or a higher degree of protection. Likewise, all openings that are not immediately apparent because they are hidden by other components must be sealed. In most cases the assembly personnel knows exactly where work was performed with less than 100 percent accuracy. Hoping that this will not be noticed will usually result in severe problems. To obtain acceptance, these locations will later have to be improved at great cost. Improvements carried out at the customer's site are specially expensive. Here, too, it should be remembered that this work has to often be performed by a North American vendor and can not be carried out by the manufacturer, who can then, at best, take on the role of supervisor.

Sheet-steel enclosures and installation technique

Sheet steel enclosures can be used for all types of controllers. In North America, and specially in power distribution systems cables are commonly laid in metal conduits. Into these conduits, individual strands, not whole cables, are laid. The conduits are bolted together along their entire length to act as continuous grounding conductor. They are connected to the enclosure flanges with suitable metal glands. Enclosures with metal flanges ensure an uninterrupted conducting connection between incoming and outgoing conduits, so that the enclosures are included in the grounding measure. Sheet steel enclosures with metal or insulating flanges are also suitable for connecting plastic conduits and cables, which are connected with commercial glands. In this configuration, protective grounding must be provided with a ground conductor routed with the cabling. This cable routing type has established itself in many modern installations and is today the preferred choice, for example for machines. On machines, only the input wiring to the main switch is often installed with metal conduits. Regarding the configuration and space utilization of cable trays, cable ducts and wiring ducts in control panels, the limitations imposed by the Electrical Codes must be observed. The permissible space utilization lies some way below that usually specified by the IEC/EN standards. Inspectors usually investigate this aspect in great detail. Where cable trays and ducts are secured to the building, extensive regulations of the Electrical Codes must be observed. Consistent grounding of all components that must be included in the grounding system will be thoroughly inspected and objections are not infrequent. The required grounding conductor cross-sections must be adhered to under all circumstances.

Another important aspect is the protection of the insulation of electrical cables where the cables are routed through openings or are exposed to movement during machine operation (for example trailing cables). Cables that are mechanically protected in IEC/EN installations must, of course, also be protected in plants destined for export to North America. The cables as well as all materials used for routing and securing them must be verifiably approved. Always observe the installation and dimensioning instructions of the Electrical Codes.

Wall-mounting enclosures CS

Eaton now supplies a new enclosure system with approvals for the USA and Canada. Wall-mounted enclosures in 45 enclosure sizes ranging from 250 × 200 × 150 mm (h × w × d) to 1200 × 800 × 300 mm are available. The smaller enclosures are ideal for enclosing individual devices or small combinations, such as motor-starter combinations or frequency inverters complete with the additionally required components. The larger enclosures are suitable for constructing small to medium-sized machine controllers. It is advisable, wherever possible to fix the enclosures to the machine. This has the added advantage that the machine can be delivered ready for connection and fully function-tested. If the enclosures and installation are mounted on the building, the extensive installation regulations of the Electrical Codes must be observed. The enclosures have a high degree of protection (IP65 UL/CSA Types 1 and 12, indoor use only). The surrounding rain channel profile offers protection against the ingress of liquid such as water or oil as well as dirt when the door is opened. A powder-coated textured surface provides abrasion-resistant corrosion protection. The enclosures feature galvanized sheet steel mounting plates. Sheet steel bottom plates for self-assembly are available. The enclosure can be turned through 180° for cable entry from above or below.

Insulated enclosures CI-...-NA

Enclosures CI-…-NA fulfil the statutory North American requirements for the construction and degree of protection, which is laid out in UL 508(A) for the USA and in CSA-C22.2 No. 14-05 for Canada. They are therefore suitable for enclosing motor starters and miniature and small controllers for installations and machinery. With their complete corrosion-resistance they are ideally suited for humid or corrosive environments. The enclosures are suitable for the connection of cables and both metal and plastic conduits, which are connected with commercial screwed glands. Because the "total insulation" that Eaton offers for its enclosures is not recognized for insulating enclosures in the USA and Canada, the enclosures must be grounded according to the enclosed installation instructions.

Enclosures CI-...-NA are approved both with and without insulated flanges. For the full range of CI enclosures with UL/CSA approvals see Chapter 20.

Busbar systems SASY60i

Busbar systems are an essential part of IEC/EN installations and of modern control systems. In North America they are still relatively new. There, power distribution to switching and protective devices is frequently still implemented using power distribution blocks, which are less well known in the rest of the world. In 2007, when Moeller began to introduce the busbar system SASY 60i, the system's components received only approvals as UL Recognized Components and CSA Certified Components. In the meantime, most of the system's key components are approved as UL Listed and CSA Certified Components – see the markings on the selection pages. This was an important step, as Listed Components no longer have to be included at additional cost into the certification reports for switchgear systems. In the next edition of UL 508A the busbar system are expected to also be included in "Component Requirements" SA1, Table SA1.1.

Initially, the busbars were approved only for peak loads of 1000 A/inch² or 1.55 A/cm², which is about half of the load capability according to IEC/EN. In the meantime, the busbars have been tested and approved with IEC/EN loads. This was a major step for machine and panel builders that want to supply world-market machines and control panels.

Notes

[1] Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations]

Summary

This chapter of the main catalog briefly introduced the topic of approvals for North America as well as the various switchgear and protective devices and their normal usage in conformance with the North American codes and standards. Further information about equipping machines and installations to UL 508A and NFPA 79 is available from Eaton in a range of technical essays. Eaton also holds workshops on this subject.

Some users still think that they can avoid compliance with the North American standards and codes. There may be a few exceptions, in which an installation is not inspected for compliance, and in even fewer cases adherence to the North American codes and standards is not required. If you have experienced such a case, you should not assume it to be the normal situation. The electrical codes have the same status as to North American law.

We regularly receive calls from machine and panel builders whose products are not accepted in North America and who are desperately looking for solutions for their sometimes serious mistakes. Rectifying these can be very expensive, cost a considerable amount of time and results in lost image. What is more, in North America some modifications must be performed by North American companies and can not, therefore be carried out by the manufacturer.

For companies that supply the North American market only occasionally and who do not wish to expand this market region, it may be more efficient to commission an experienced subcontractor with supplying and installing the electrical equipment. These vendors can re-engineer IEC/EN installations to North American codes and standards and build installations that are already accepted and approved at the place of manufacture. Eaton Electric GmbH itself does not provide engineering services because we do not want to compete with our customers.

This information does not replace the detailed study and implementation of the North American codes and standards. It has been compiled by Wolfgang Esser and other Eaton specialists to our best knowledge and belief based on the product situation and state of the standards at the beginning of 2010.

The binding documents are always the original North American codes and standards and, for the described products, the applicable Eaton main catalog and Eaton's approval documents for its products.

Switching duty of auxiliary contacts, rating data for three-phase contactors to NEMA

	Code number[1]	Conventional free air thermal current I_{th}	Maximum switching duty									
			120 V AC		240 V AC		480 V AC		600 V AC		≦ 600 V AC	
			ON	Off	ON	Off	ON	Off	ON	Off	ON	Off
		A	A	A	A	A	A	A	A	A	VA	VA
Auxiliary contacts in AC control circuits												
Heavy pilot duty[2]	A 150	10	60	6	–	–	–	–	–	–	7200	720
	A 300	10	60	6	30	3	–	–	–	–	7200	720
	A 600	10	60	6	30	3	15	1.5	12	1.2	7200	720
Standard pilot duty[3]	B 150	5	30	3	–	–	–	–	–	–	3600	360
	B 300	5	30	3	15	1.5	–	–	–	–	3600	360
	B 600	5	30	3	15	1.5	7.5	0.75	6	0.6	3600	360
	E150	0.5	1.8	0.3	–	–	–	–	–	–	216	36

	Code number[1]	Conventional free air thermal current I_{th}	Maximum switching duty			
			125 V DC On/Off	250 V DC On/Off	310 ≦ 600 V DC On/Off	< 600 V DC On/Off
		A	A	A	A	VA
Auxiliary contacts in DC circuits						
Heavy pilot duty[2]	N 150	10	2.2	–	–	275
	N 300	10	2.2	1.1	–	275
	N 600	10	2.2	1.1	0.4	275
Standard pilot duty[3]	P 150	1.1	–	–	138	–
	P 300	5	1.1	0.55	–	138
	P 600	5	1.1	0.55	0.2	138
–	Q 150	2.5	0.55	–	–	69
	Q 300	2.5	0.55	0.27	–	69
	Q 600	2.5	0.55	0.27	0.1	69
–	R 150	1	0.22	–	–	28
	R 300	1	0.22	0.11	–	28

Notes

1) The values 150, 300 and 600 indicate die maximum voltage for which an auxiliary contact can be used.

2) "Heavy Pilot Duty" = High switching duty

3) "Standard Pilot Duty" = normal switching duty

4) Rating data for 3-phase contactors, for single-speed motors, without inching, reversing or regenerative braking.

Type[1]	construction[1] in USA	Canada	Tripping characteristic[1]	Switching capacity $kArm_s$	Applications[1]	For use in	
H		–	Fast	10	Primarily domestic	USA, Canada	Types H, K and No. 59 "Code" fit the same bases and are therefore interchangeable. In the USA, the K types are therefore being increasingly replaced by the RK types. Rated operational current: 1 … 600 A
		No. 59 "Code"	Fast	10	Primarily domestic	Canada, USA	
K P	K1/K5	–	Fast	100 – 200	Protection of circuits for heating, lighting and feeders and outgoers for mixed loads.	USA	
		–	Time-lag	100 – 200	Protection of circuits for motors, transformers, heating and lighting.	USA	
J		–	Fast	200	See item 2 above.	USA, Canada	Compact design. Types J and HRCI-J fit the same bases, all other types numbers do not fit into these bases. Rated operational current: 1 … 600 A
		–	Time-lag	200	See item 3 above.	USA, Canada	
		HRCI-J	Fast	200	See item 2 above.	USA, Canada	
			Time-lag	200	See item 3 above.	USA, Canada	
RK	RK1/RK5	–	Fast	100 – 200	See item 2 above.	USA, Canada	Types RK1, RK5 and HRCI-R fit the same bases, all other types numbers do not fit into these bases. Rated operational current: 1 … 600 A
		–	Time-lag	100 – 200	See item 3 above.	USA, Canada	
		HRCI-R	Fast	100 – 200	See item 2 above.	Canada, USA	
			Time-lag	100 – 200	See item 3 above.	Canada, USA	
		HRCII-R	Time-lag – Fast	100 – 200	5. Protection of motor circuits	Canada	All other fuse types do not fit into bases for HRCII-R.
CC(CD)		–	Fast	200	See item 2 above.	USA, Canada	Very compact design; all other fuse types do not fit into these bases. Rated operational current: CC 1 … 30 ACD 31 … 60 A
			Time-lag	200	See item 3 above.	USA, Canada	
L		–	Fast	200	See item 2 above.	USA, Canada	"Code" fuses for higher ratings Rated operational current: 601 … 6000 A
			Time-lag	200	See item 3 above.	USA, Canada	

Notes

[1] The trip types data and the assigned field of applications are a rough overview only. In practice, it is always advisable to find out both this information and the required fuse type from the North American end customer.

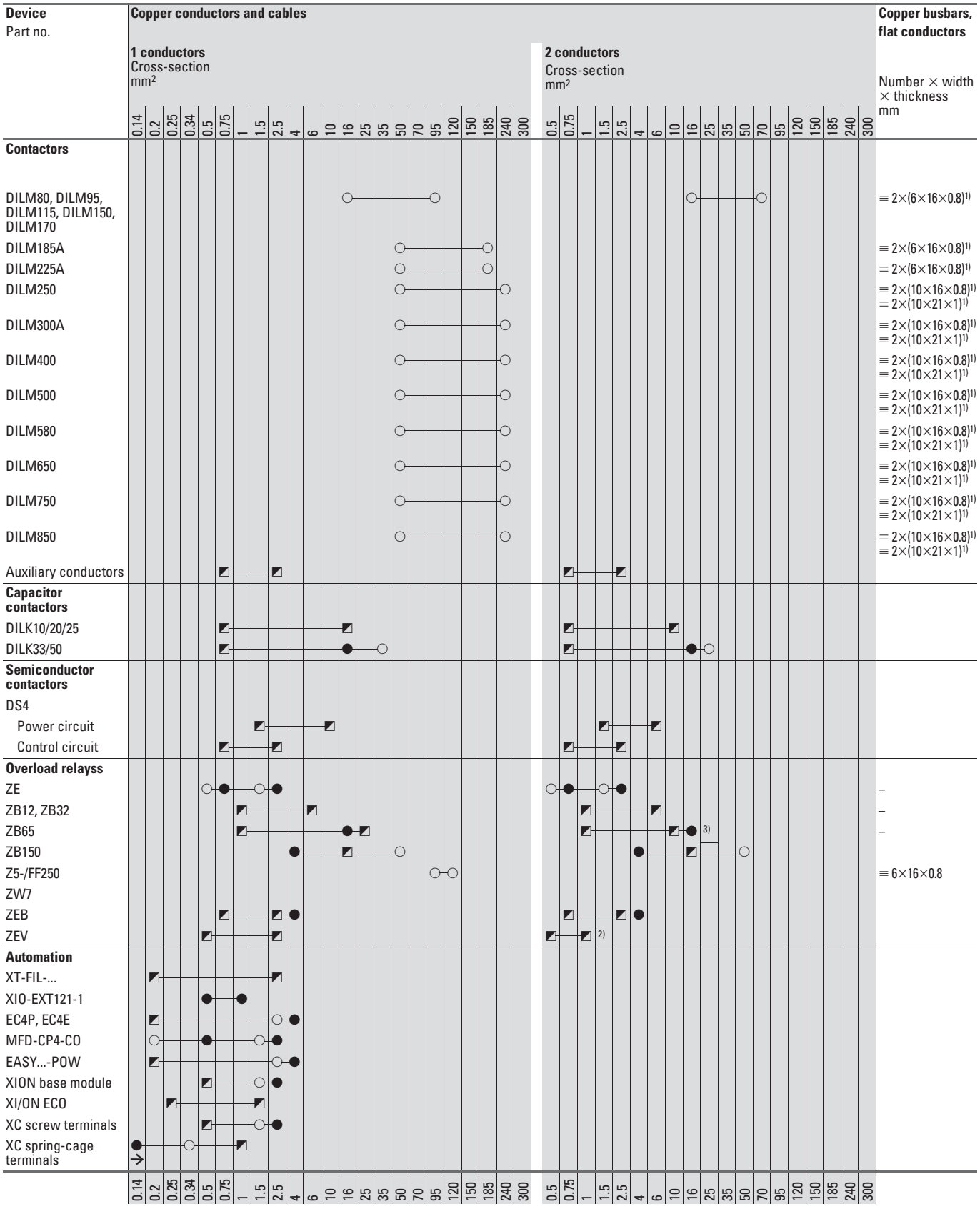
Degrees of protection of enclosures to NEC (NFPA 70), UL, CSA, NEMA

Enclosure Enclosure and protection type marking to NEC NFPA 70[1] NEMA No. 250–1997, Appendix A[2] UL 50 CSA-C 22.2 No. 94	Location	Type of protection	Comparable degree of protection IP[3]
Type 1 General purpose	Indoor installation	Protection against accidental contact with live parts and against a limited amount of falling dirt.	IP20
Type 2 Drip-proof	Indoor installation	Protection against limited amounts of falling water and dirt	IP22
Type 3 Dust-tight, rain-tight, resistant to sleet and ice	Outdoor installation	Protection against wind-blown dust and wind-blown rain. Undamaged by formation of ice on the enclosure	IP54
Type 3R Rain-tight, resistant to hail and ice, dust-tight	Outdoor installation	Protection against falling rain; undamaged by formation of ice on the enclosure	IP54
Type 3S Dust-tight, rain-tight, resistant to sleet and ice	Outdoor installation	Protection against hail wind-blown dust and wind-blown rain. External mechanisms remain operable while ice laden.	IP54
Type 4 Dust-tight, water-tight, rain-tight	Indoor or outdoor installation	Protection against falling rain, splashing water and hosed water. Undamaged by formation of ice on the enclosure	IP56
Type 4X Dust-tight, water-tight,corrosion-resistant, rain-tight	Indoor or outdoor installation	Protection against falling rain, splashing water and hosed water. Undamaged by formation of ice on the enclosure, corrosion protection	IP56
Type 6 Rain-tight, water-tight, immersible, resistant to hail and ice	Indoor or outdoor installation	Protection against dust and hosed water. Protection against entry of water during temporary limited submersion. Undamaged by formation of ice on the enclosure.	IP67
Type 6P Rain-tight, water-tight, immersible, corrosion-resistant	Indoor or outdoor installation	Protection against entry of water during prolonged submersion at limited depths; corrosion-resistant.	IP67
Type 5 Drip-tight, dust-tight, corrosion-resistant	Indoor installation	Protection against limited amounts of falling water and dust, corrosion-resistant.	IP52
Type 12 For use in industry, drip-tight, dust-tight	Indoor installation	Protection against dust and dripping water	IP52
Type 12K[4] As type 12	Indoor installation	As part no. 12	IP52
Type 13 Dust-tight, oil-tight	Indoor installation	Protection against entry of dust, splashing water, oil and non-corrosive fluids.	IP54

Notes

1) NEC = National Electrical Code
2) NEMA = National Electrical Manufacturers Association
3) The IP rating provided as an approximate comparison. A more accurate comparison is not possible, since different ingress protection tests and assessment criteria apply.
The NEMA types cover the corresponding IP ratings but not the other way round. In general, NEMA/UL enclosure protection testing is subject to stricter criteria.
4) For enclosures with knockouts.

| Device
Part no. | Copper conductors and cables
1 conductors
Cross-section mm² | | |



Instructions

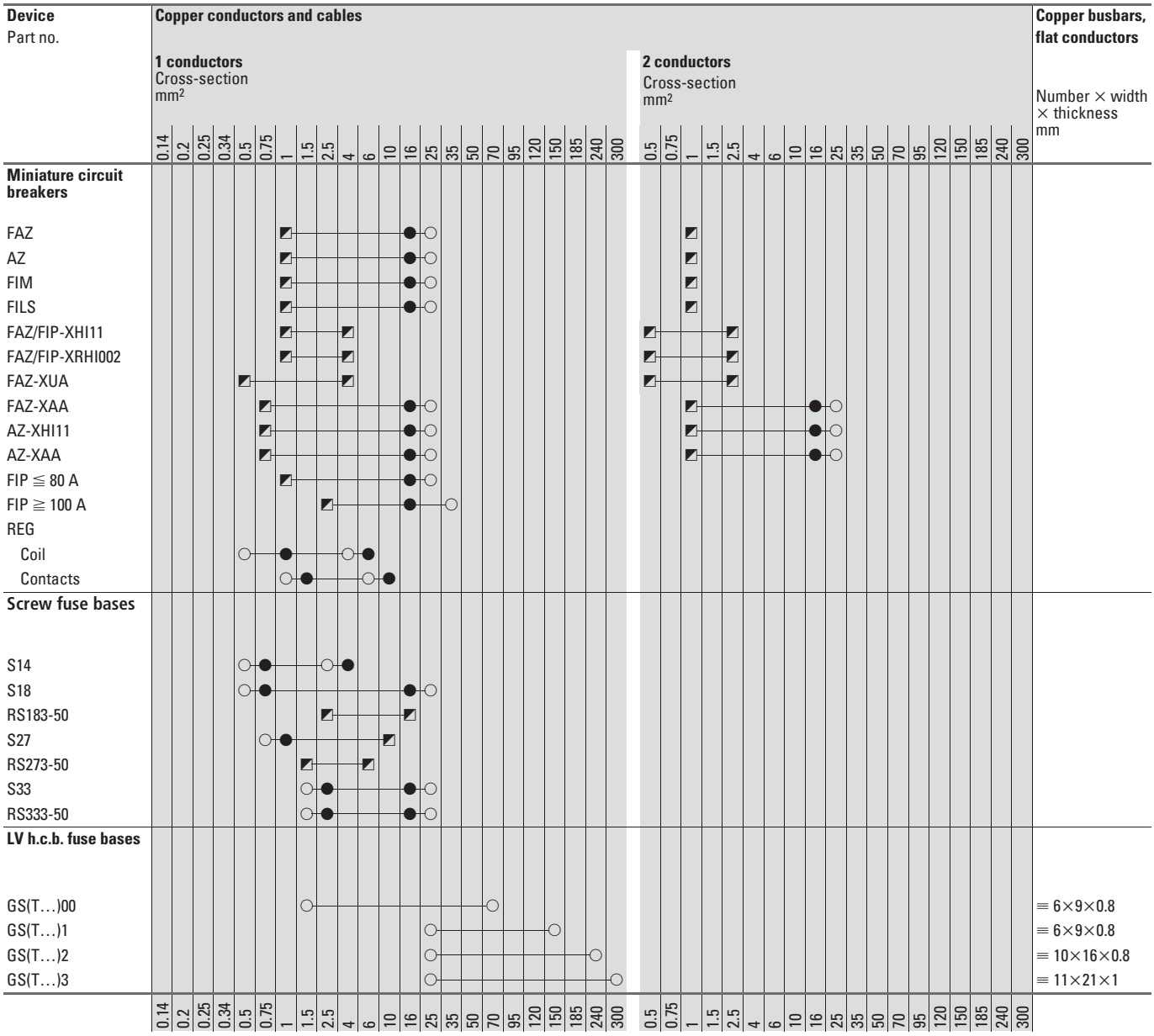
- ● Solid (s)
- ○ Stranded (st)
  Flexible (f)
- ◩ Solid or stranded or flexible

min. max.

- ■ Busbar
- ≡ Flat conductor

Flexible with ferrule up to 16 mm² to DIN 46 228

1) Use box terminals
2) When connecting two conductors, only the following combinations are permitted:
0.5 and 0.75 mm², 0.75 and 1 mm², 1 and 1.5 mm²
3) With two conductors, use the same cross-section.



Instructions

● Solid (s)
○ Stranded (st)
Flexible (f)
◩ Solid or stranded or flexible

min. max.

Busbar
= Flat conductor

Flexible with ferrule up to 16 mm² to DIN 46 228

This glossary contains short definitions of technical terms used in this catalog. Because the terms used in IEC/EN 60947 can be open to interpretation, it is always advisable to also refer to the relevant standard. This applies in particular to the American National Electrical Code (NEC, NFPA 70) and the US standards UL 508, UL 489, UL 508A, and NFPA 79.

The Canadian Electrical Code (CEC) contains equivalent terms in standards CSA-C 22.2 No. 5 and CSA-C 22.2 No. 14.
The American English terms are appended to the glossary in a new block. The German equivalents of the American terms are not definitive equivalents; they are intended merely as an aid to understanding. Because these terms often describe concepts that are not defined in the IEC world, there is no authorized German equivalent for them. The explanations apply to the use of components in particular in industrial control panels for machinery to UL 508A and NFPA 79. Each technical term contains a reference to the corresponding standard, e.g. IEC/EN 60947-1. For the correct translation, the IEV No. of the electrotechnical glossary (IEC 50: International Electrotechnical Vocabulary) is specified, e.g. IEV 441-17-31.

Altitude

The density of air decreases with increasing altitude, and this reduces its insulating capacity as well as its heat transfer capability. This affects the rated operational voltage and rated operational current of switching devices, conductors and motors, as well as the tripping behavior of thermal overload relays. On request, Eaton can supply information about the suitability of equipment for operation at altitudes above the standard-specified 2000 m.

Ambient temperature, enclosed

(cf. IEV 441-11-13) Temperature at which the switchgear is capable of being operated within a closed housing. The elevated temperature inside the enclosure due to the switchgear's heat dissipation must be taken into account here.

Ambient temperature, open

(cf. IEV 441-11-13) Room temperature (for example of the shopfloor or control room) in which the switching device is located.

Auxiliary contact

(IEC 60947-1/IEV 441-15-10) A contact which is included in an auxiliary circuit and is mechanically operated by the switching device.

Auxiliary switch

(IEC 60947-1/IEV 441-15-11) Switch containing one or more control or auxiliary contacts and which is mechanically operated by a switching device. Auxiliary switches can be retrofitted in modular systems of contactors, circuit breakers and motor-protective circuit breakers, or they are a fixed component of a switching device, e.g. contactor relay.
They are designated according the functions
- Making contact as a normally closed contact, normally open contact, changeover contact or fleeting contact.
- Function as normal, early, late, drive or trip indicator switches.

Back-of-hand proof

Switchgear is considered as back-of-hand proof if its conductive parts cannot be touched with a ball with a diameter of 50 mm.

Busbar tag shroud

Design measures incorporated into equipment to prevent direct contact (i.e. without tools) with live parts of a system (finger-proof, back-of-hand proof).

Clearance in air

(cf. IEC/EN 60947-1; 2.5.46/IEV 441-17-31) The distance between the two conductive parts at the point at which they are closest to each other. The clearance in air is determined by the rated impulse withstand voltage, the overvoltage category and the pollution degree.

Closing delay

The interval of time between the instant of command and the first make operation of the contacts of the first pole to close. The closing delay is made up of the response time and the closing time.

Control circuit reliability

The probability with which switching states arise during the lifespan of a contact that would be interpreted as faults by downstream electronic controllers (PLCs). Control circuit reliability is expressed in values based on tests using standard limit values for signals to IEC/EN 61131-2.

Conventional thermal current I_{th}

(cf. IEC/EN 60947-1; 4.3.2.1) The maximum value of current that a device is capable of carrying for a maximum of 8 hours without thermal overloading. As a rule, it corresponds to the maximum rated operational current.

Coordination type

State of a switchgear assembly (motor starter) during and after testing at rated conditional short-circuit current:

Type “1” coordination:

- No hazard to persons and systems.
- No immediate operational readiness necessary.
- Damage to the starter permissible.

Type “2” coordination:

- No hazard to persons and systems.
- Starter is suitable for further operation.
- No damage to the starter except slight welding of the switch contacts if these can be separated easily without significant deformation.

Creepage path/distance

(cf. IEC/EN 60947-1; 2.5.51/IEV 151-03-37) Shortest distance between two conducting parts along an insulating material. Is determined by the material’s rated insulating voltage, the pollution degree and the creepage resistance.

Damp heat, constant

This test subjects the equipment to an ambient temperature of 40 °C at a constant humidity of 93 %. At set intervals during the test, the electrical and mechanical function of the equipment are examined.

Damp heat, cyclic

This test subjects the equipment to cyclically changing climatic conditions. A cycle applies 40 °C at 93 % relative humidity for 12 hours, followed by 12 hours of 25 °C ambient temperature. At set intervals during the test, the electrical and mechanical function of the switching device are examined.

Emergency stop

(cf. Machinery Safety Directive 2006/42/EC) Stopping in an emergency; an action that stops a process or motion that causes danger.

Emergency stop system

Arrangement of components to avert arising or to reduce existing hazards to persons, damage to machinery or to work in progress. The Emergency-Stop function must be designed such that machine operation and dangerous machine motion are halted in an appropriate manner without causing additional danger and without further action being required from any person. (emergency stop function EN ISO 13850)

Emergency stop system

(EN ISO 13850) Manually operated controlgear used for manually triggering an emergency stop function.

Emergency switching off

Switches off the electrical energy supply to a complete installation or part of an installation as soon as there is a risk of electric shock or an other risk caused by electric current.

Finger-proof

A switching device is to be considered as finger-proof if its live parts cannot be touched when actuating the operating elements. This also applies when operating adjacent switchgear. The finger-proof area of a push-actuated operating medium is a circular area of at least 30 mm radius around the actuating element, and vertical to the direction of actuation. Within this area, hazardous parts should be fitted at least 80 mm below the level of the actuating area.

Interlocked opposing contacts

(cf. IEC/EN 60947-5-1, Appendix L) Combination of N/O and N/C contacts in contactor relays that are mechanically connected in such a way that N/C and N/O can never be closed at the same time. A contact spacing of at least 0.5 mm must be maintained throughout the contacts’ entire lifespan, even in the event of a fault (for example welded contacts).

Isolating function

(cf. IEC/EN 60947-1; 2.1.19) Devices are deemed to possess this isolating function if, in the open position, their switching contacts achieve the separation distance specified for the isolation of electrical circuits, and their creepage paths and clearance distances are of the required magnitude. This allows the power supply of the entire installation or a section of the installation to be isolated for safety reasons, for example during maintenance.

Losses

(cf. IEV 151-03-18) The difference between the input power and the output power of a device. The main type of loss in switching devices and electrical power distribution equipment is current heat loss.

Main switches

Correctly called “mains isolating device”. Hand-operatable switch. Mandatory for machines with electrical equipment. Its purpose is to disconnect the electrical equipment in order to exclude hazards occurring when cleaning, repairing or maintaining the machine or during longer downtimes. A power disconnecting device must:
- Be an operating element that is externally accessible.
- Have only one OFF and one ON position with assigned limit stops.

- Have the switch positions marked “0” and “I”.
- Be lockable in the OFF position.
- Cover the connection terminals against accidental contact.
- Have a minimum switching capacity for load disconnectors and motor switches for AC-23.

Mechanical shock resistance

The ability of a device to withstand pulse-like movement without changing its operating state or sustaining damage. No contact lifting must take place on devices in the On position, the main contacts must not knock against one another in the Off position. A circuit-breaker must not trip, and control circuit switches must not change their switching state.

Minimum command time

Minimum period of time for which a trip-initiating factor (such as a control pulse or a short-circuit current) must be present to cause the corresponding reaction, for example the short-circuit duration necessary to initiate tripping.

Mirror contact

(cf. IEC/EN 60947-4-1 appendix F) A mirror contact is an auxiliary break contact that can not be closed at the same time as the contactor's main make contacts.

Motor rating

(cf. IEC/EN 60947-1; 4.3.2.3) Motor output that can be switched by a switching device at the assigned rated operational voltage, depending on the utilization category, e.g. a contactor of utilization category AC-3: 37 kW at 400 V.

Opening delay

(cf. IEV 441-17-36) The interval of time between the specified instant of initiation of the opening operation and the instant when the arcing contacts have separated in all poles. The opening delay is the sum of the tripping delay and the inherent delay of the contacts.

Overvoltage category

(cf. IEC/EN 60947-1; 2.5.60) Classification for prospective overvoltages at the point of installation, such as might be caused by the effect of lightning or switching processes. The overvoltage category for industrial switchgear is III. According to the overvoltage categories, the use of switchgear is permissible in the following areas:

Overvoltage category I:

Apparatus for connection to circuits with overvoltage protection, e.g. electronic devices.

Overvoltage category II:

Consumers for connection to fixed installations, such as household appliances or electrical tools.

Overvoltage category III:

Apparatus with special serviceability requirements for connection in fixed installations that are protected by overvoltage diverters, e.g. switches in low-voltage distribution systems or in control systems for industrial use.

Overvoltage category IV:

Use immediately at the the connection point of the installation (direct lightning impact possible), for example on an overhead power line connection.

Pollution degree

(cf. IEC/EN 60947-1; 5.5.58) Classification for the likely amount of conductive dust and humidity, which can lead to a reduced electric strength of a switching device. The pollution degree is described by the following influencing factors:

Pollution degree 1:

If soiling occurs, pollutants are usually only dry or non-conductive. The soiling does not affect electric strength.

Pollution degree 2:

Usually only non-conductive pollutants. Temporary conductivity due to condensation is to be expected, however.

Pollution degree 3:

(Switchgear for industrial use) Conductive pollution or dry, non-conductive pollution that is made conductive through condensation.

Pollution degree 4:

Pollution leading to continuous conductivity, for example conductive dust, rain or snow.

Positive/enforced operation/actuation

This describes an arrangement where a mechanical link between the actuator and the switching element ensures that the force exerted on the actuator is exerted directly, onto the switching element, i.e. without the use of spring-loaded parts.

Positive opening

(cf. IEC/EN 60947-1; 2.4.10 / IEV 441-16-11) An opening operation which ensures that the main contacts of a mechanical switching device have attained the open position when the actuator is in the Off position.

Power disconnecting device

→ Main switch

Rated actuating voltage U_c

(cf. IEC/EN 60947-1; 4.5.1) Voltage applied to the actuation N/O contact in a control circuit. May deviate from the rated control voltage due to the presence of transformers or resistors in the control circuit.

Rated breaking capacity

(cf. IEC/EN 60947-1; 4.3.5.3) The r.m.s. value that a switching device is capable of breaking according to its utilization category. This value refers to the rated operational voltage and the rated operational current. Equipment must be capable of breaking of current up to and including its specified rated breaking capacity.

Rated conditional short-circuit current I_q

(cf. IEC/EN 60947-1; 2.5.29/IEV 441-17-20) The short-circuit current that a switching device, e.g. a contactor, protected by a short-circuit protective device, such as a motor-protective circuit-breaker, can carry for the duration of the tripping delay of the protective mechanism.

Rated control voltage U_s

(cf. IEC/EN 60947-1; 4.5.1) The voltage applied to the input terminals of the control circuit of a switching device. Due to the presence of transformers or resistors in the control circuit, this voltage may differ from the rated control circuit voltage.

Rated frequency

(cf. IEC/EN 60947-1; 4.3.3) The frequency for which a switching device is designed and to which the other characteristics relate.

Rated impulse withstand voltage U_{imp}

(cf. IEC/EN 60947-1; 4.3.1.3) Measure of the stability of the internal clearances of a switching device against overvoltage peaks. The utilization of suitable switchgear can ensure that overvoltages are prevented from transferring from the mains to de-energized system sections within it.

Rated insulation voltage U_i

(cf. IEC/EN 60947-1; 4.3.1.2) Voltage to which insulation tests and clearances relate. The highest rated operational voltage must not be greater than the rated insulation voltage.

Rated making capacity

(cf. IEC/EN 60947-1; 4.3.5.2).The current that a device is capable of making in accordance with the utilization category and at the rated operational voltage.

Rated operational current I_e

(cf. IEC/EN 60947-1; 4.3.2.3) The current that a switching device is capable of carrying, taking into account the rated operational voltage, duration of operation, utilization category and ambient air temperature.

Rated operational current I_n (of a circuit-breaker)

(cf. IEC/EN 60947-2; 4.3.2.3) For circuit breakers, this current value is equal to the rated uninterrupted current and the conventional free air thermal current.

Rated operational voltage U_e

(cf. IEC/EN 60947-1; 4.3.1.1) Voltage to which the characteristic values of a switching device relate. The highest rated operational voltage must not be greater than the rated insulation voltage.

Rated service short-circuit breaking capacity I_{cs}

(cf. IEC/EN 60947-2; 4.3.5.2.2) The short-circuit current that a circuit-breaker is able to interrupt repeatedly; dependent on the rated operational voltage (test O-CO-CO, previously P-2). After breaking the short-circuit, the circuit-breaker is able to carry the rated uninterrupted current again with increased self-heating, and to trip in the event of an overload.

Rated short-circuit breaking capacity I_{cn}

(cf. IEC/EN 60947-1; 4.3.6.3) The maximum current that a switching device can break at rated operational voltage and frequency without sustaining damage. It is expressed as an r.m.s. value.

Rated short-circuit making capacity I_{cm}

(cf. IEC/EN 60947-1; 4.3.6.2) The maximum current that a switching device can make at a certain rated operational voltage and frequency without sustaining damage. In contrast to other characteristic values, it is expressed as maximum prospective peak value.

Rated short-time withstand current I_{cw}

(cf. IEC/EN 60947-1; 4.3.6.1) The short-time withstand current that a device is capable of carrying for a specified time without damage, e.g. due to excessive heating.

Rated ultimate short-circuit breaking capacity I_{cu}

(cf. IEC/EN 60947-2; 4.3.5.2.1) Maximum short-circuit current that a circuit-breaker can interrupt (test O-CO; formerly P-1). After short-circuit breaking, the circuit-breaker is able to trip in the event of an overload with increased tolerances.

Rated uninterrupted current I_u

(cf. IEC/EN 60947-1; 4.3.2.4) Current that a switching device can carry in continuous operation (for weeks, months or years).

Rating

(cf. IEC/EN 60947-1; 4.3.2.3) The power output of a motor at its rated operational voltage.

Safe isolation

(cf. IEC 536) Isolation of circuits not carrying hazardous voltage, e.g. protective extra-low voltage, from circuits in which hazardous voltage flows. Such isolation is achieved by means of reinforced or double insulation, which reliably prevents voltage transfer from one circuit to another, for example between main and auxiliary switchgear circuits or the primary and secondary sides of a safety transformer. Safe isolation is required mainly for safety and functional extra-low voltage circuits.

Stopping in case of emergency

(EN ISO 13850) Function intended to prevent hazards or minimize existing risks for people or of damage to machines or running processes, and which is triggered by a single action by one person.

Tamper-proof

An Emergency-Stop switching device is regarded as tamper-proof if it cannot be reset without tools or using specified procedures after tripping. The switching device locks in its tripped position. Accidental or controlled manipulation (inching) is not possible.

Utilization category

cf. IEC/EN 60947-1; 2.1.18/IEV 441-17-19) A combination of specified requirements relating to the condition in which the switching device or fuse fulfills its purpose and selected to represent a characteristic group of real-life applications. The specified requirements may, for example, relate to the values of making and breaking capacity and other characteristic values, data concerning associated circuits and the applicable conditions of use and operational behavior.
(cf. IEC/EN 60947-2; 4.4) For circuit breakers, the utilization category denotes whether the equipment is designed for selectivity using time delay (category B) or not (category A).

Accessible, Readily

NEC, Article 100) Readily accessible for operations, replacement or inspection without having to breach or remove obstacles or having to use steps, etc.

Ampacity

(NEC, Article 100) Current in amperes that a conductor can continuously carry under operational conditions without exceeding its permissible temperature.

Approved

(NFPA 79, Chapter 3) Acceptable for the Authority having Jurisdiction (AHJ).

Authority Having Jurisdiction

(NEC, Article 100) Organization, authority or person responsible for implementing the stipulations of the Codes or Standards, or for approving equipment, materials, installations or procedures.

Branch Circuit

Here the applicable standards deviate. NEC has highest priority, but the UL definition appears to be closer to reality. In any case, "branch circuit" denotes everything that comes after the last overcurrent protective element.
(NEC, Article 100) Conductor in a circuit between the last overcurrent protection element that protects the circuit and the apparatus.
(UL 508A, Part 1, Introduction, 2) Conductors and components after the last overcurrent protection element that protects a load.

Branch Circuit Overcurrent Device (BCOD)

(NEC, Article 100) Device suitable for protecting supply, feed and outgoer circuits or apparatus across the whole range of overcurrents between the rated current and its switching capacity. BCODs must have a breaking capacity appropriate for its use, but no less than 5 kA.

Branch Circuit Protective Device

(UL 508A, Part 1, Introduction, 2) Fuses or circuit breakers that have been assessed according to a safety standard with respect to the provision of overcurrent protection.

Circuit Breaker, CB

(NEC, Article 100) Device developed for non-automated opening and closing of a circuit and which automatically opens a circuit at a fixed overcurrent without itself being damaged if used correctly within its rated data.

Adjustable (if applicable for the circuit-breaker)

A qualifying term which indicates that the CB can be adjusted to variable trip values of current, time or both within a particular range.

Instantaneous Trip (if applicable for the circuit-breaker)

A qualifying term which indicates that the CB is designed to trip without a delay.

Inverse Time (if applicable for the circuit-breaker)

A qualifying term which indicates that the CB is designed to trip with a delay such that the delay decreases with increasing current.

Non adjustable (if applicable for the circuit-breaker)

A qualifying term which indicates that the CB's tripping current or delay can not be adjusted.

Setting (of circuit breakers)

The set current or time value, or both, at which an adjustable circuit-breaker is to trip.

Combination Motor Controller

(UL 508A, Part 1, Introduction, 2) One or several devices that have been fitted to be able to isolate the conductors of a circuit from their power supply (disconnecting means), to protect the branch circuit (branch circuit protection), to switch the motor (motor control) and to provide motor over-load protection for an individual motor circuit.

Device

(NEC, Article 100) Assembly within an electrical system whose primary function is to carry or control electrical energy.

Disconnecting means

(NEC, Article 100) Device or group of devices or other means through which the conductors of a circuit can be isolated from their power supply.

Emergency Switching Off

(NFPA 79, Chapter 3) Emergency actuation that switches off the electrical power supply to the installation or parts thereof.

Enclosed Industrial Control Panel

(UL 508A, Part 1, Introduction, 2) Factory-provided industrial control system supplied within an enclosure or control panel.

Feeder

(NEC, Article 100) All conductors of a circuit between the incoming unit of the source of a separate system or other power supply equipment and the last branch circuit overcurrent device (unofficial definition, not from NEC: viewed from consumer to energy source).

Feeder Circuit

(UL 508A, Part 1, Introduction, 2) Conductor and switchgear on the supply side of a branch circuit protective device (BCPD).

Field Installed Equipment

(UL 508A, Part 1, Introduction, 2) Devices that have been installed only after the production of an indust-rial control panel and the application of an approval label.

Field Wiring

Conductors that are connected (on-site) by other persons to connect the industrial control panel with power sources, remote control devices (local devices) and consumers.

Fuse, Branch Circuit Type

(UL 508A, Part 1, Introduction, 2) Fuses of Classes CC, G, H, J, K, L, R and T. Can provide branch circuit protection.

Fuse, Semiconductor Type

(UL 508A, Part 1, Introduction, 2) Fuses developed for protecting semiconductor devices. Can protect motor circuits containing frequency inverters (Low Voltage Fuses - Part 13: Semiconductor Fuses, UL 248-13).

Fuse, Supplementary Type

(UL 508A, Part 1, Introduction, 2) Various different fuses and device protection fuses (fine-wire or micro fuses). Can be used only in addition to branch circuit protective devices.

General Use Rating

(UL 508A, Part 1, Introduction, 2) Rated operational data expressed in V and A and assigned to a device designed for switching a load with a continuous current or peak inrush current whose rated values do not exceed the device's rated operational current.
With AC the load can have a power factor between 0.75 and 0.8 (inductive).
With DC the load must be resistive (non-inductive).

Industrial Machinery (Machine)

(NFPA 79, Chapter 3) Powered machine (or group of machines that work together in a coordinated fashion) that is not portable while in operation and which is used to process material by cutting, forming, pressing, by electrical, thermal or optical means, coating or through a combination of these processes. The machine can include associated equipment used for material transport, tool provision, securing, joining, disassembling, inspection or testing, or packaging. (The full associated electrical equipment, including software, sensors and actuators, is to be regarded as part of the machine.)

Industrial Manufacturing System

(NFPA 79, Chapter 3) Systematic arrangement of one or more industrial machines that is not transportable by hand and which encompasses conveying of the associated material, processing, calibration, measurement, or inspection and testing equipment.

Interrupting Rating

(NEC, Article 100) The highest current at rated operating voltage which the device is designed to interrupt under standard test conditions.

Labeled

(NEC, Article 100) Apparatus or materials with applied markings, symbols or other identification signs of organizations that are acceptable for AHJs are termed "labeled". The term "labeled" includes the inspection and testing of products as well as periodic inspection of their production. With labeling the manufacturer indicates the product's conformance with applicable standards or its production by defined means.

Listed

(NEC, Article 100) Apparatus, materials or services contained in a list published by an organization that is acceptable for AHJs and which confirms that the products or services have been tested and that the production of the listed products or performance of the listed services is subject to periodic investigation. The listing verifies that the products, materials or services comply with the applicable standards or that they have been tested and deemed suitable for specific purposes.

Load

(UL 508A, Part 1, Introduction, 2) Device (load) that is connected with the main circuit outside the indust-rial control panel.

Low-Voltage Limited Energy Circuit

(UL 508A, Part 1, Introduction, 2) Control circuit with a peak voltage in the open circuit of not more than 42.4 V (DC or peak). Is supplied from a battery or an insulated secondary circuit whose current is limited by an overcurrent protective device. This can be a fuse, the power of a transformer's secondary side, or a power supply unit, a secondary winding and an impedance.
A current being tapped by a mains voltage circuit through a resistor, and which is intended to limit the current and voltage in a series connection with power supply circuit is not regarded as low-voltage limited energy circuit.

Mandatory Rules

(NEC, Article 90) Mandatory rules in the Code, which identify actions that are specifically prescribed or prohibited. Identified with the terms "shall" or "shall not".

Motor Starter

(UL 508A, Part 1, Introduction, 2) Combination of a contactor and an overload relay.

Overcurrent

(NEC, Article 100) Any current exceeding the rated current of apparatus or the load rating of cables. The overcurrent can result from an overload, a short circuit or a ground fault.

Overload

(NEC, Article 100) Operation of equipment above its normal full-load rating or the rated capacity of cables. If the overload condition persists for a certain time, damage or dangerous heating occurs. Faults such as short circuits or ground fault are not over-loads.

Permissive Rules

(NEC, Article 90) Rules in the Code, which identify actions that are allowed but are not mandatory. They normally describe options or alternative methods. Identified with the terms "shall be permitted" or "shall not be required".
For further definitions see Article 100, Definitions, of the National Electrical Codes of the USA (NEC, NFPA 70), Standards NFPA 79, Chapter 3 and UL 508A.

Pilot Duty Rating

(UL 508A, Part 1, Introduction, 2) Rated values assigned to a relay or auxiliary contact that actuates the coil of another relay or switchgear.

Power Circuit

(UL 508A, Part 1, Introduction, 2) Conductors and components of branch circuits (load branch circuits) or feeder circuits.

Self-Protected Combination Motor Controller

(UL 508A, Part 1, Introduction, 2) Combination motor controller incorporating coordinated short-circuit and overload protection, an isolating function and a remote-controllable motor switch (e.g. a contactor). If it does not already exist, coordinated protection must be implemented through the correct selection of components or additional parts according to the manufacturer's instructions.

Shall

(NFPA 79, Chapter 3) Mandatory condition.

Short-Circuit Current

(NFPA 79, Chapter 3) Overcurrent resulting from a short-circuit, which, in turn, is caused by a fault or a faulty connection in an electrical circuit.

Short-Circuit current rating (SCCR)

(NEC, Article 100) Prospective symmetrical fault current at nominal voltage at which a device or a system can be connected without incurring damage that exceeds defined acceptance criteria.

Should

(NFPA 79, Chapter 3) Identifies a recommended characteristic that is not mandatory.

Supplementary Overcurrent Protective Device

(NEC, Article 100) Device intended to provide limited overcurrent protection for particular applications and apparatus, such as lighting and non-industrial consumers. This limited protection is provided in the load circuit in addition to the protection provided by the branch circuit protective device (BCPD).

Supplementary Protection

(UL 508A, Part 1, Introduction, 2) Device arranged behind a branch circuit protection device to provide additional protection. Such devices are not, themselves, regarded as branch circuit protective devices (BCPD).

Voltage, Nominal

(NEC, Article 100) Rating assigned to a circuit or system to indicates its voltage in a suitable manner (e.g. 120/240 V, 480Y/277 V, 600 V). The actual voltage with which the circuit works may deviate from the nominal voltage within a range that permits satisfactory operation of the equipment.

Symbol	Meaning
DF	Duty factor
I_{cm}	Rated short-circuit making capacity
I_{cn}	Rated short-circuit breaking capacity
I_{cs}	Rated service short-circuit breaking capacity
I_{cu}	Rated ultimate short-circuit breaking capacity
I_{cw}	Rated short-time withstand current
$I_{\Delta n}$	Response value of earth-fault release
I_e	Rated operational current
I_g	Response value of earth-fault release
I_i	Response value of non-delayed short-circuit release
I_{sc}	Transformer initial short-circuit AC current
I_L	Load monitoring response value
I_n	Rated operational current
I_{NT}	Transformer rated operational current
I_{PK}	Rated peak withstand current
I_q	Rated conditional short-circuit current
I_r	Overcurrent release set value
I_{rm}	Response value of non-delayed short-circuit release
I_{rmf}	Response value of fixed, non-delayed short-circuit release
I_{rmv}	Response value of short-time delayed short-circuit release
I_{sd}	Response value of short-time delayed short-circuit release
I_T	Response value of earth-fault release
I_{th}	Conventional free air thermal current
I_{the}	Conventional thermal current of enclosed devices
I_u	Rated uninterrupted current
S_{NT}	Transformer rating
t_g	Delay time when the earth-fault release trips
t_r	Delay time when the overload release responds
t_T	Delay time when the earth-fault release trips
t_v	Time delay of short-circuit release response
U_c	Rated excitation voltage
U_e	Rated operational voltage
U_{imp}	Rated insulation voltage
U_{imp}	Rated surge voltage invariability
u_k	Transformer short-circuit voltage
U_s	Rated control voltage

Meaning	Symbol
Conventional free air thermal current	I_{th}
Conventional thermal current of enclosed devices	I_{the}
Delay time when the earth-fault release trips	t_g
Delay time when the earth-fault release trips	t_T
Delay time when the overload release responds	t_r
Load monitoring response value	I_L
Overcurrent release set value	I_r
Rated conditional short-circuit current	I_q
Rated control voltage	U_s
Rated excitation voltage	U_c
Rated insulation voltage	U_{imp}
Rated operational current	I_e
Rated operational current	I_n
Rated operational voltage	U_e
Rated peak withstand current	I_{PK}
Rated service short-circuit breaking capacity	I_{cs}
Rated short-circuit breaking capacity	I_{cn}
Rated short-circuit making capacity	I_{cm}
Rated short-time withstand current	I_{cw}
Rated surge voltage invariability	U_{imp}
Rated ultimate short-circuit breaking capacity	I_{cu}
Rated uninterrupted current	I_u
Response value of earth-fault release	$I_{\Delta n}$, I_g, I_T
Response value of fixed, non-delayed short-circuit release	I_{rmf}
Response value of non-delayed short-circuit release	I_i
Response value of non-delayed short-circuit release	I_{rm}
Response value of short-time delayed short-circuit release	I_{rmv}
Response value of short-time delayed short-circuit release	I_{sd}
Time delay of short-circuit release response	t_v
Transformer initial short-circuit AC current	I_{sc}
Transformer rated operational current	I_{NT}
Transformer rating	S_{NT}
Transformer short-circuit voltage	u_k

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Full-load motor-running currents in amperes corresponding to various AC horsepower ratings

HP	110 - 120 V			220 - 240 V[a,b]			360 - 380 V		440 - 480 V			550 - 600 V		
	Single phase	Two phase	Three phase	Single phase	Two phase	Three phase	Single phase	Three phase	Single phase	Two phase	Three phase	Single phase	Two phase	Three phase
1/10	3.0	–	–	1.5	–	–	1.0	–	–	–	–	–	–	–
1/8	3.8	–	–	1.9	–	–	1.2	–	–	–	–	–	–	–
1/6	4.4	–	–	2.2	–	–	1.4	–	–	–	–	–	–	–
1/4	5.8	–	–	2.9	–	–	1.8	–	–	–	–	–	–	–
1/3	7.2	–	–	3.6	–	–	2.3	–	–	–	–	–	–	–
1/2	9.8	4.0	4.4	4.9	2.0	2.2	3.2	1.3	2.5	1.0	1.1	2.0	0.8	0.9
3/4	13.8	4.8	6.4	6.9	2.4	3.2	4.5	1.8	3.5	1.2	1.6	2.8	1.0	1.3
1	16.0	6.4	8.4	8.0	3.2	4.2	5.1	2.3	4.0	1.6	2.1	3.2	1.3	1.7
1-1/2	20.0	9.0	12.0	10.0	4.5	6.0	6.4	3.3	5.0	2.3	3.0	4.0	1.8	2.4
2	24.0	11.8	13.6	12.0	5.9	6.8	7.7	4.3	6.0	3.0	3.4	4.8	2.4	2.7
3	34.0	16.6	19.2	17.0	8.3	9.6	10.9	6.1	8.5	4.2	4.8	6.8	3.3	3.9
5	56.0	26.4	30.4	28.0	13.2	15.2	17.9	9.7	14.0	6.6	7.6	11.2	5.3	6.1
7-1/2	80.0	38.0	44.0	40.0	19.0	22.0	27.0	14.0	21.0	9.0	11.0	16.0	8.0	9.0
10	100	48.0	56.0	50.0	24.0	28.0	33.0	18.0	26.0	12.0	14.0	20.0	10.0	11.0
15	135	72.0	84.0	68.0	36.0	42.0	44.0	27.0	34.0	18.0	21.0	27.0	14.0	17.0
20	–	94.0	108	88.0	47.0	54.0	56.0	34.0	44.0	23.0	27.0	35.0	19.0	22.0
25	–	118	136	110	59.0	68.0	70.0	44.0	55.0	29.0	34.0	44.0	24.0	27.0
30	–	138	160	136	69.0	80.0	87.0	51.0	68.0	35.0	40.0	54.0	28.0	32.0
40	–	180	208	176	90.0	104	112	66.0	88.0	45.0	52.0	70.0	36.0	41.0
50	–	226	260	216	113	130	139	83.0	108	56.0	65.0	86.0	45.0	52.0
60	–	–	–	–	133	154	–	103	–	67.0	77.0	–	53.0	62.0
75	–	–	–	–	166	192	–	128	–	83.0	96.0	–	66.0	77.0
100	–	–	–	–	218	248	–	165	–	109	124	–	87.0	99.0
125	–	–	–	–	–	312	–	208	–	135	156	–	108	125
150	–	–	–	–	–	360	–	240	–	156	180	–	125	144
200	–	–	–	–	–	480	–	320	–	208	240	–	167	192
250	–	–	–	–	–	602	–	403	–	–	302	–	–	242
300	–	–	–	–	–	–	–	482	–	–	361	–	–	289
350	–	–	–	–	–	–	–	560	–	–	414	–	–	336
400	–	–	–	–	–	–	–	636	–	–	477	–	–	382
500	–	–	–	–	–	–	–	786	–	–	590	–	–	472

[a] To obtain full-load currents for 200 and 208 V motors, increase corresponding 220 - 240 V ratings by 15 and 10 percent, respectively.
[b] To obtain full-load currents for 265 and 277 V motors, decrease corresponding 220 - 240 V ratings by 13 and 17 percent, respectively.

Quote from "Power Conversion Equipment - UL 508C, May 3, 2002".
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