Moeller® series

Command and Signalling
Automation

Motor Applications
Power Management

Product Overview for Machinery

Powering Business Worldwide

Powering Business Worldwide

Discover Eaton – a leader in the power management field

Since 1911, when our company began trading as a small truck parts supplier, Eaton® Corporation has come a long way. Today, as a diversified power management company, Eaton has sales of $13.7 billion USD (FY 2010), employs 70,000 people and has customers in more than 150 countries. Everyday, we help companies across the world to manage power, and do more, while consuming less energy.

Eaton’s innovative products, solutions and technologies are designed to help customers to manage power and conserve resources while working more productively, safely and sustainably. Our integrated and diversified business strategy ensures that we remain at the forefront of our industry, decade after decade.

Powering Business Worldwide

Aerospace

A leading global supplier to commercial and military aviation and aerospace industries. An extensive technology portfolio includes hydraulic systems, fuel systems, motion control systems, propulsion sub-systems, cockpit controls and displays and fluid health monitoring systems. Our products improve fuel economy, aircraft performance, reliability and safety.

Truck

A leader in the design, manufacture and marketing of complete line of drivetrain systems and components for medium- and heavy-duty commercial vehicles. Under the ”Roadranger” brand, Eaton also markets lubricants, safety products and service tools. Eaton’s hybrid power systems have earned the company recognition as a global leader in alternative power for commercial vehicles.

Electrical

A global leader in electrical control, power distribution, uninterruptible power supply and industrial automation products and services. Our products provide customer-driven PowerChain Management® solutions to serve the power system needs of the industrial, institutional, government, utility, commercial, residential, IT, mission critical and OEM markets 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.

2011 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, 2009, 2010 and 2011).

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.

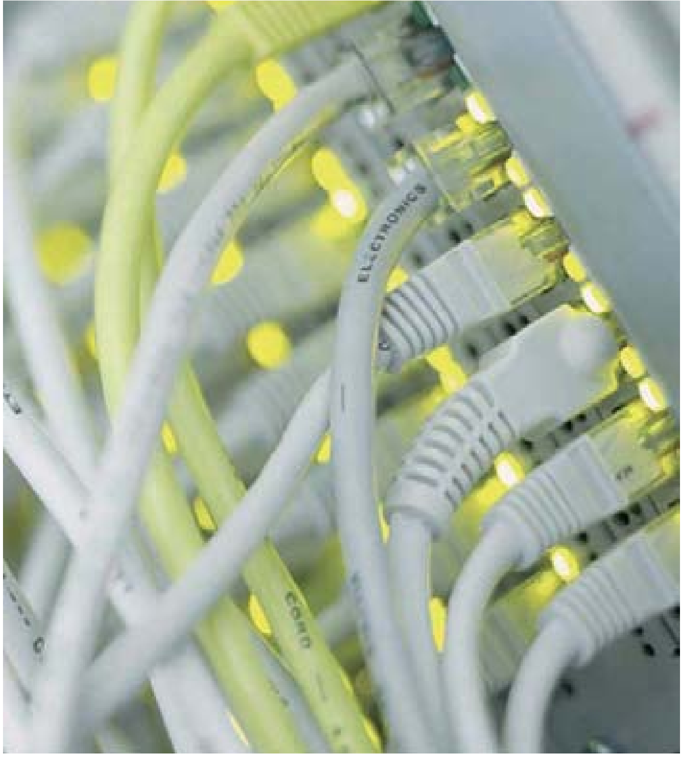
Hydraulics

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

Learn more about Eaton Green Solutions at **www.eaton.com/greensolutions**

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

- Machine building:
  - Food and packaging machines
  - Woodworking and processing machines
- Agriculture
- Construction
- Mining and metals
- Paper industry
- Chemical and pharmaceutical industry
- Automotive industry
- Logistics centers

- 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/public safety

Complete coverage of the market – worldwide in all standards

Local market leader with global competence

In all regions of the world, Eaton's product series stand out on account of the company's strong global presence. Eaton's Moeller® product series has become well-established in markets that adhere to IEC standards, whilst Eaton is a leading supplier in the world of UL/CSA with products such as those of the Cutler-Hammer series. Customers can benefit from first-rate engineering and the combined know-how in R & D – no matter which standards they use.

In the electrical engineering world it is standards that define the boundaries, rather than continents and regions. With its historical roots in the U.S. market, Eaton focused on products compliant with the UL/CSA standards. Consequently, Eaton's Electrical Sector was always strongly geared towards the markets of North and South America as well as the Middle East.

Moeller® series products from Eaton are the customers' first choice in markets adhering to IEC standards for innovative switchgear and pilot devices, controller, drive and HMI systems, as well as sophisticated visualization and communication solutions.

HOLEC
CUTLER-HAMMER
WESTINGHOUSE
BILL
FELTEN & GUILLEAUME
MEM
EATON
CHANGSEN
MOELLER
POWERWARE
SANTAK
MGE OFFICE PROTECTION SYSTEMS
KLÖCKNER MOELLER
The power of fusion
1874
F&G
1886
1893
1899
Klöckner Moeller
1906
BiLL
1908
MEM
1911
1962
POWERWARE
1963
HOLEC
1983
MGE
Office Protection Systems
1990
SANTAK
1998
CHANG SEN
1999
Moeller

There's a certain energy at Eaton. An energy produced by the combination of globally established engineering companies into one brand. One brand that cleverly and efficiently meets all your requirements in the field of power management and industrial automation. Energy for our customers worldwide – That's what we mean by 'Powering Business Worldwide'. From power distribution and control to industrial automation right through to uninterruptible power supply.

Eaton helps you to manage your entire power system proactively and efficiently. For this we offer you electrical solutions that make your applications safer, more reliable and highly efficient. Visit us at www.eaton.com/electrical.

Powering Business Worldwide

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Solutions for all aspects of the machine

Comprehensive solutions for worldwide use

Our components and systems for power distribution and industrial automation are used worldwide and are matched precisely to the specific requirements of different sectors. As a leading supplier of automation solutions and components for machines and plants, we offer our customers end-to-end concepts for automation, solutions for all motor applications and energy management. Eaton's extensive range includes many interesting innovations in addition to the well-established quality products of the Moeller® series. However, machine builders not only benefit from this powerful range but also from the extensive offer of logistics and after sales services.

In this way, machine and system builders are given exactly what they need – single sourced solutions for worldwide use. Our proven consulting and solution expertise in all relevant areas such as safety, automation, international regulations, standards and directives, simplify and optimize your day-to-day business.

Our innovative automation products, system solutions and services reduce the effort for the machine builder and make machines and systems more powerful, flexible and open to future requirements.

ZAHORANSKY GROUP

xCommand
xSystem
xStart
xEnergy

Command and Signalling

- Elegant commanding and signalling: RMQ-Titan
- Safe disconnecting: Emergency-off/emergency-stop
- Mechanical, photoelectric, inductive and capacitive sensors
- Measuring and monitoring: Timing and monitoring relays

Automation

- Connecting and communication: SmartWire-DT
- Controlling machines, visualizing information: XV touch panel
- Compact and modular PLCs: XC and EC4P
- Collecting remote information: Remote I/O

Motor Applications

- Switching and protecting motors: DIL contactors, Z overload relays
- Protecting motors from overloads and short-circuits: PKZ, PKE motor-protective circuit-breakers
- EMT6 thermistor overload relays
- Soft starting motors and speed control: DS7 soft starters and M-Max frequency inverters
- Hydraulic energy for the machine

Power Management

- Switching machines on, safe machine shutdowns and maintenance: T rotary switches and P switch-disconnectors
- Switching power safely and efficient power supply: NZM circuit-breakers with XMC energy metering module
- Protecting cables, disconnecting leakage currents: xPole range of protective switches
- Supplying power reliably, ensuring power quality:
  UPS systems

and open
Efficient planning and engineering
Short development
Lean Connectivity
Lean Automation
High availability

From Lean Connectivity to Lean Automation

The machine building sector, particularly in the area of electrical controls, offers enormous potential for optimization and savings, which we have identified and analysed in collaboration with our customers. Lean connectivity and lean automation are the result of this analysis.

Complex wiring becomes unnecessary, remote intelligence is created, entire device levels are eliminated, including of course the associated procurement and maintenance costs. A small revolution in which Eaton is leading. Two technologies developed by Eaton are at the center of this revolution: The SmartWire technology and the HMI/PLC technology.

With SmartWire-DT Eaton has initiated a new age in the connectivity between the individual switch cabinet components. SmartWire-DT replaces the control wiring in all components right down to the sensor, and enables direct and continuous communication between the central controller and the controlled sections of the plant.

However, we don't just stop at Lean Connectivity: The HMI-PLC combines the most advanced IT technologies with the conventional PLC and HMI technology. Control, visualization and data management tasks are combined with state-of-the-art communication in a single device – the HMI-PLC.

Clear benefits for the customer

Lean is our philosophy for optimizing processes and preventing waste in the production of machines, plants and services. Lean in automation means simple and straightforward concepts with fewer components, pluggable SmartWire-DT connections and direct communication.

Planning

- Reduced planning
- Modular, flexible, seamless concepts
- Secure

Value addition

Improves the overall cost balance by:

- Use of standard components
- Reduced engineering costs, by up to 70%
- Reduced time required for wiring, testing and commissioning by up to 85%

Data transparency

- Transparency from ERP down to the sensor

Performance

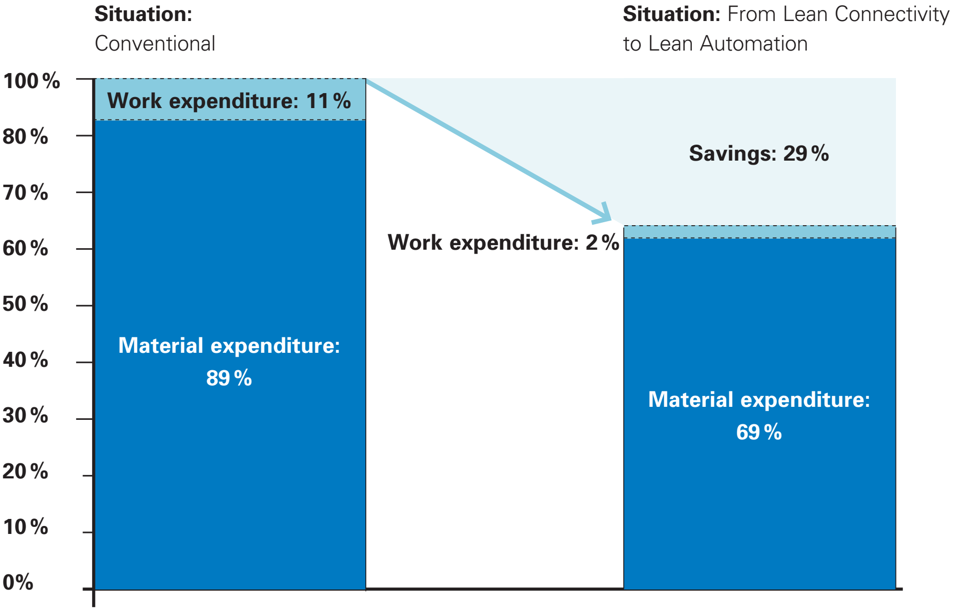
The machine performance is also impressive:

- Minimum downtimes
- Small production batches and high machine cycles
- High reliability
- Intuitive operation
- Easy to expand

Value Calculator – calculate the value addition

With our Value Calculator, we will be glad to calculate for your machine the benefits that you can achieve with Eaton's Lean Connectivity solutions. Contact us for more information.

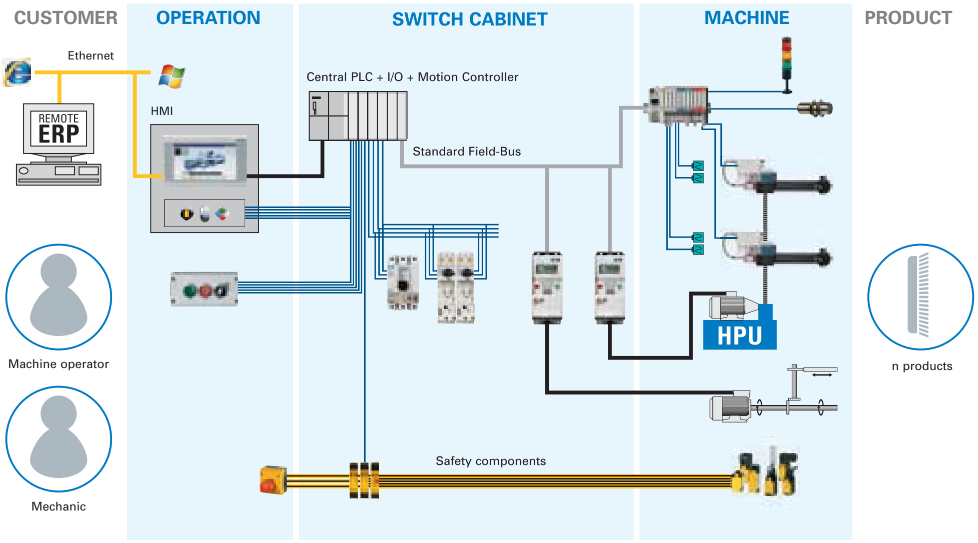
Achieved Value Addition



Concept 01

Touch display – Central PLC – Control wiring – Fieldbus – Remote I/O

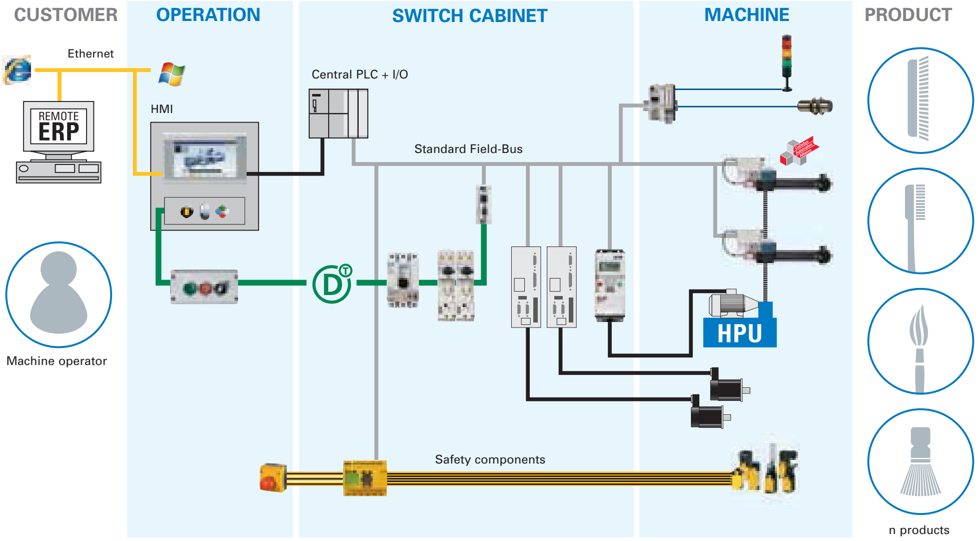
The use of touch displays and remote I/Os eliminates the need for complex wiring to the central PLC. For the first time the touch display offers a communication connection to an ERP system. An onsite production manager is no longer required here, and machine data can now be accessed remotely. Together with the fieldbus, remote I/Os are used to replace complex machine cabling. These types of architectures are nowadays in widespread use. They also integrate components such as hydraulic valves. Data from the machine is made available to a higher-level system.


CUSTOMER
OPERATION
SWITCH CABINET
MACHINE
PRODUCT
Ethernet
REMOTE ERP
HMI
Central PLC + I/O + Motion Controller
Standard Field-Bus
HPU
Machine operator
Mechanic
n products
Safety components

Concept 02

Touch display – Central PLC – Control wiring – Fieldbus – SmartWire-DT™ – Remote I/O

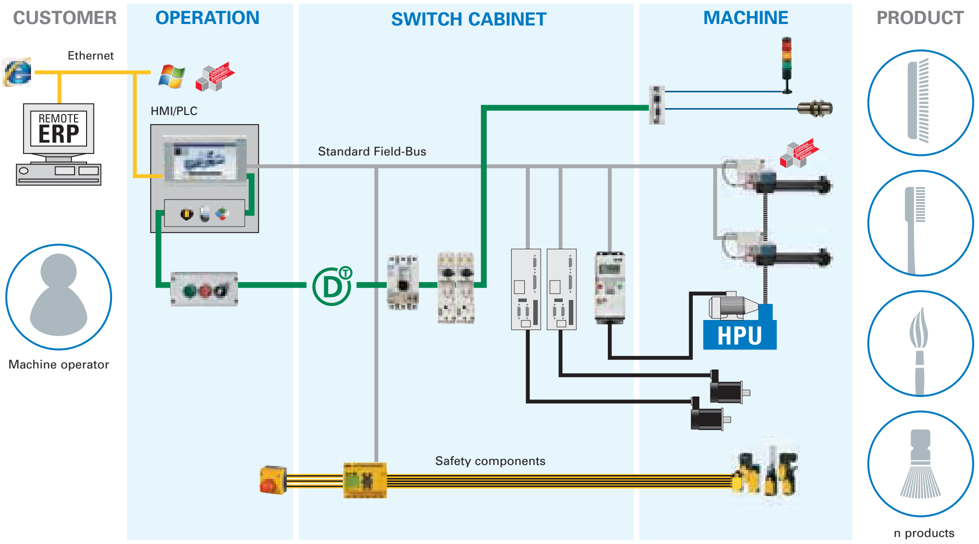
The use of SmartWire-DT considerably reduces the wiring effort for pilot devices, motor starters and circuit-breakers. SmartWire-DT incorporates the slaves into the communication structure and supplies them with the operating current. The clear and simple structure therefore also reduces the test and commissioning phase. SmartWire-DT is connected via gateways to Profibus or CANopen fieldbus systems. The engineering required is considerably reduced in the SmartWire-DT line. Other components such as sensors and actuators are primarily connected via remote I/Os to fieldbus systems.


CUSTOMER
OPERATION
SWITCH CABINET
MACHINE
PRODUCT
Ethernet
REMOTE ERP
HMI
Central PLC + I/O
Standard Field-Bus
HPU
Machine operator
n products
Safety components

Concept 03

HMI/PLC with integrated SmartWire-DT™ – Fieldbus – Remote I/O

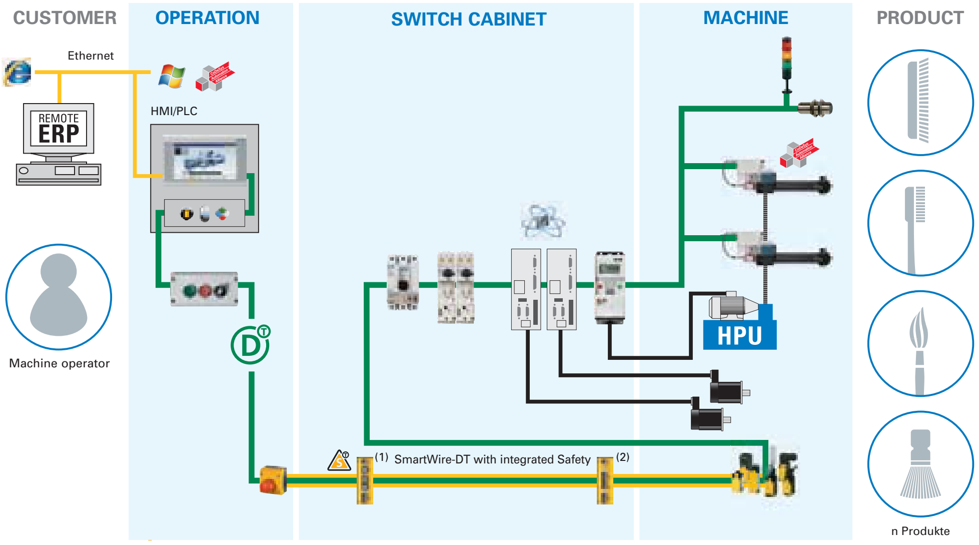
The touch display PLC replaces the central PLC. A gateway to the fieldbus is no longer required, the SmartWire-DT line is connected directly to the HMI-PLC. Operating data of the motor feeders, such as motor current, thermal motor load, switching states and trip indications are transferred to the HMI/PLC via SmartWire-DT. Servo drives, frequency inverters and also Eaton hydraulic components are integrated in the automation structure via standard fieldbuses. Electrical and hydraulic drives replace the mechanical system and enable flexible production. The machine operator selects the production quantities and recipes via a touch display. Downtimes and changeover times become a thing of a past.


CUSTOMER
OPERATION
SWITCH CABINET
MACHINE
PRODUCT
Ethernet
REMOTE ERP
HMI/PLC
Standard Field-Bus
Machine operator
HPU
Safety components
n products

The next step – From Lean Connectivity to Lean Automation

HMI/PLC – Remote intelligence with SmartWire-DT™

The visionary "lean automation" structure eliminates the need for remote I/Os and any signal wiring to sensors or actuators. "Lean connectivity" brings SmartWire technology directly into the devices. The structure consists of an HMI/PLC with integrated SmartWire-DT and intelligent remote components. Starting from the display, SmartWire-DT connects pushbutton actuators, indicator lights, switchgear right up to the sensors. Frequency inverters and safety systems, as well as hydraulic and electrical drives are integrated via SmartWire-DT. "Lean automation" finally brings together the world of hydraulics and the world of electrics in the automation world.


CUSTOMER
OPERATION
SWITCH CABINET
MACHINE
PRODUCT
Ethernet
REMOTE ERP
HMI/PLC
Machine operator
HPU
(1) SmartWire-DT with integrated Safety
(2)
n Produkte

An increasing number of companies are offering products with SmartWire-DT for lean connectivity and are ensuring that switch cabinet designs are increasingly more streamlined, simple and cost-efficient.

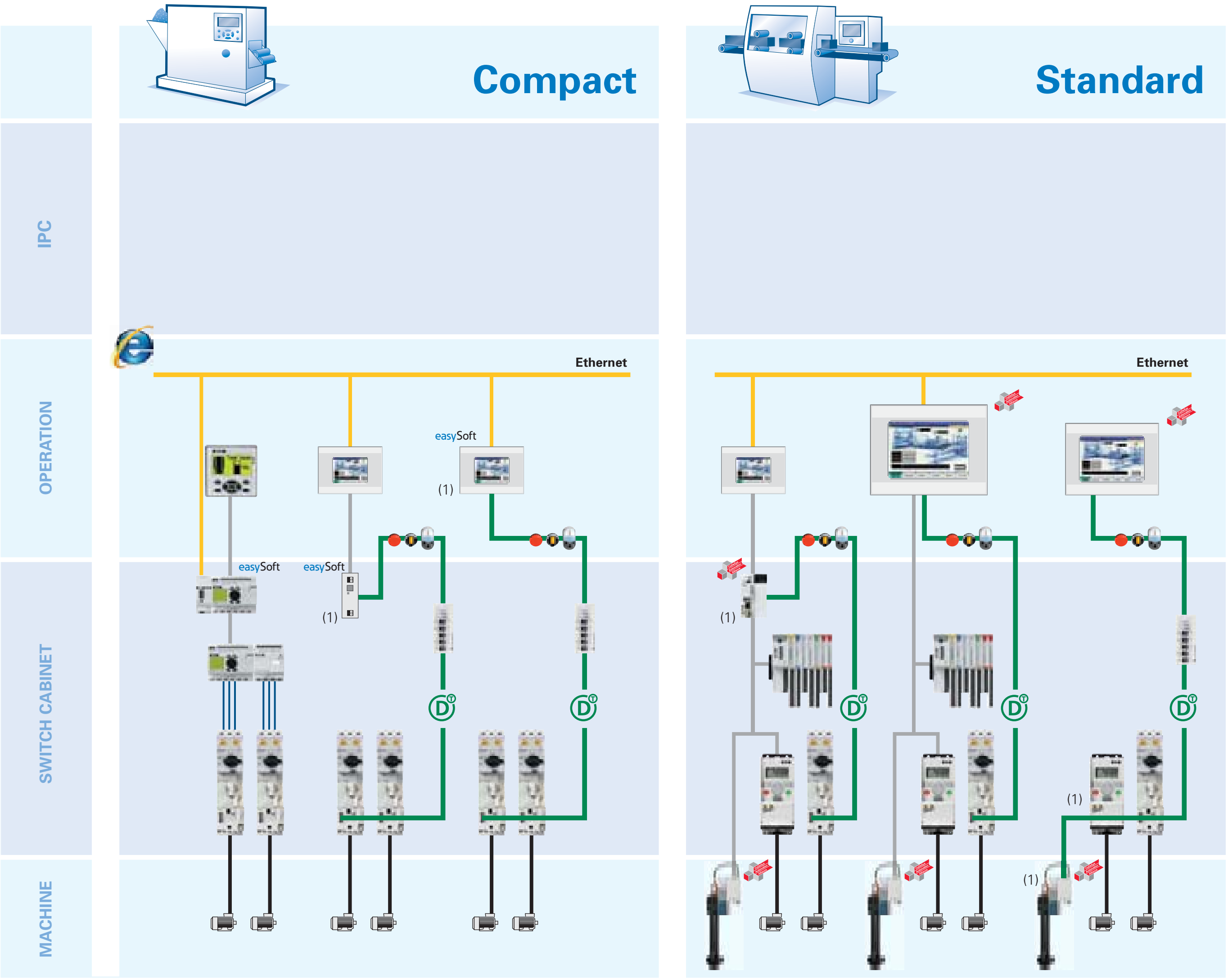
(1) NB: New easySafety logic module in preparation
(2) NB: New easySafety input/output module in preparation

Complete automation solutions from a single source

Eaton offers a large number of automation concepts for your machine. Regardless of whether you are offering machines in the Compact, Standard, Universal or Performance class, you should also include Eaton concepts in your considerations.

Our simple and straightforward automation solutions with fewer components and pluggable SmartWire-DT connections and direct communication offer optimum solutions.

Besides SmartWire-DT and the proven standard switchgear from the Moeller® series, the HMI/PLCs from Eaton are the core of this solution. They offer both different fieldbus interfaces as well as a SmartWire-DT master interface and thus “Lean Connectivity to Lean Automation” solutions. Part of these simple and streamlined concepts are also open automation solutions with Eaton hydraulic components using a CANopen interface.


Compact
Standard
IPC
OPERATION
SWITCH CABINET
MACHINE
Ethernet
Ethernet
easySoft
easySoft
easySoft
(1)
(1)
(1)
(1)
(1)

(1) NB: New products / modules in preparation

The right OEM solution for every requirement

Compact

The Compact class is aimed at machine and plant construction in the low cost price segment without losses in performance.

Standard

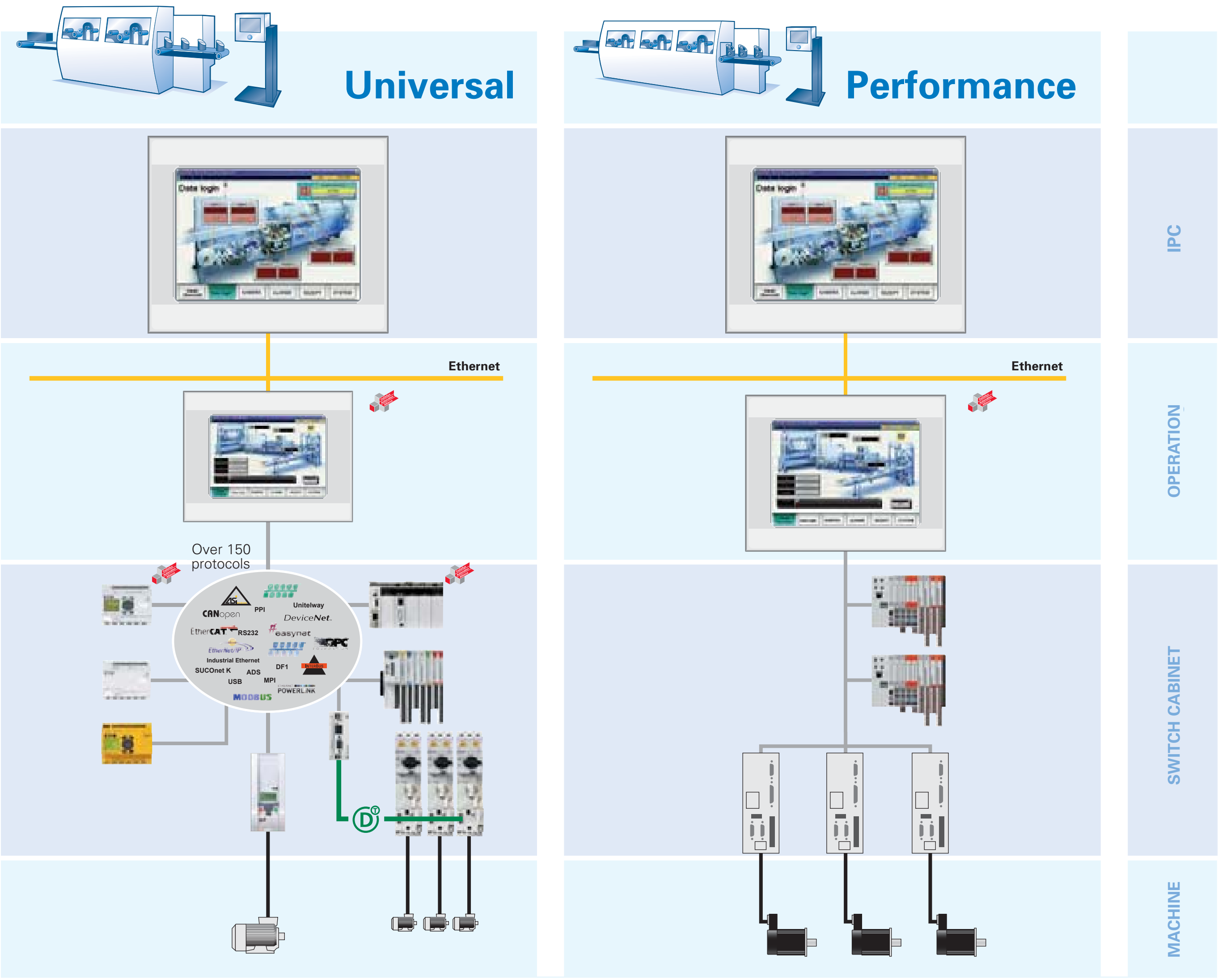
The Standard class covers the performance level required for medium-sized standard machines.

Universal

Thanks to its modular device structure, the Universal class is designed for flexible use in medium-sized and larger OEM machines.

Performance

The Performance class offers open hardware and software platforms for high-end automation tasks.


Universal
Performance
Ethernet
Ethernet
Over 150 protocols
ASi
PPI
Unitelway
CANopen
DeviceNet
EtherCAT
RS232
easynet
OPC
EtherNet/IP
Industrial Ethernet
DF1
INTERBUS
SUCOnet K
ADS
USB
MPI
POWERLINK
MODBUS
IPC
OPERATION
SWITCH CABINET
MACHINE

Functional safety for persons, machine and environment

Safety Technology
Control the unexpected

A machine poses dangers to persons, machinery and the environment over the entire life cycle of a machine – from manufacture to dismantling. It is therefore vital that these dangers are identified already during the design phase of the machine and reduced with suitable measures.

The Machinery Directive 2006/42/EC requires that machines do not pose any dangers. However, as there is no such thing as 100 % safety in engineering, the objective is to reduce these sources of danger to a tolerable level of residual risk. The overall safety of a machine defines the state which is deemed to be free of unwarranted risks for persons or which is deemed to be danger free. The functional safety describes the proportion of the overall safety of a system that is dependent on the correct function of the safety-related systems and external devices in order to reduce the risks.

Risk reduction through the use of safety-related parts of control systems

The elements of machine controls which assume safety-related tasks are designated by international standards as "safety-related parts of control systems" (SRP/CS). Safety-related parts of control systems each incorporate the entire functional chain of a safety function, consisting of the input level (sensor), the logic (safe signal processing) and the output level (actuator).

The general objective is to design these parts so that the safety of the control functions as well as the reaction of the control system in the event of a malfunction complies with the degree of risk reduction determined in the risk analysis. The higher the level of risk reduction to be provided by the safety-related parts of a control system, the higher the safety level or the technical safety performance level demanded of the control section.

Fast and safe detection

Safe monitoring and processing

Reliable disconnection

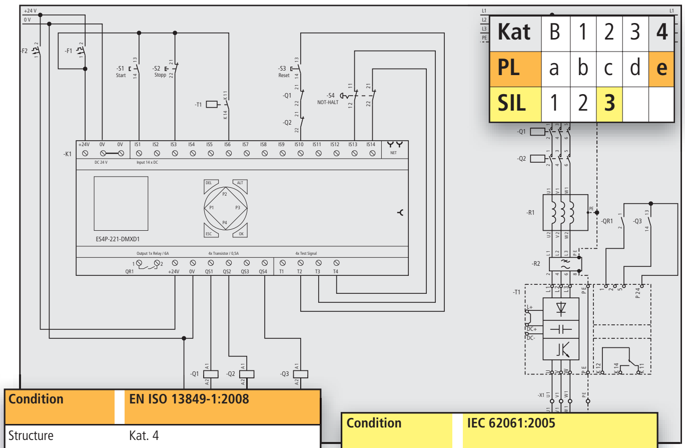
Safety manual for machines and plants in accordance with EN ISO 13849-1 and IEC 62061

Eaton has written the Safety Manual for machine and plant builders, trainers and trainees as well as interested customers having to deal with the issue of "machine and plant safety".

This provides an easy entry level into the extensive range of material on safety technology. The Eaton Safety Manual contains an overview of the most important factors involved in directives, standards and regulations that have to be taken into consideration when using safety equipment on machines.

The manual uses example circuits to show how the functional safety can be implemented with electrical, electronic and programmable components and systems in safety applications.

Safety Manual
E·T·N



Kat	B	1	2	3	**4**
PL	a	b	c	d	**e**
SIL	1	2	**3**		

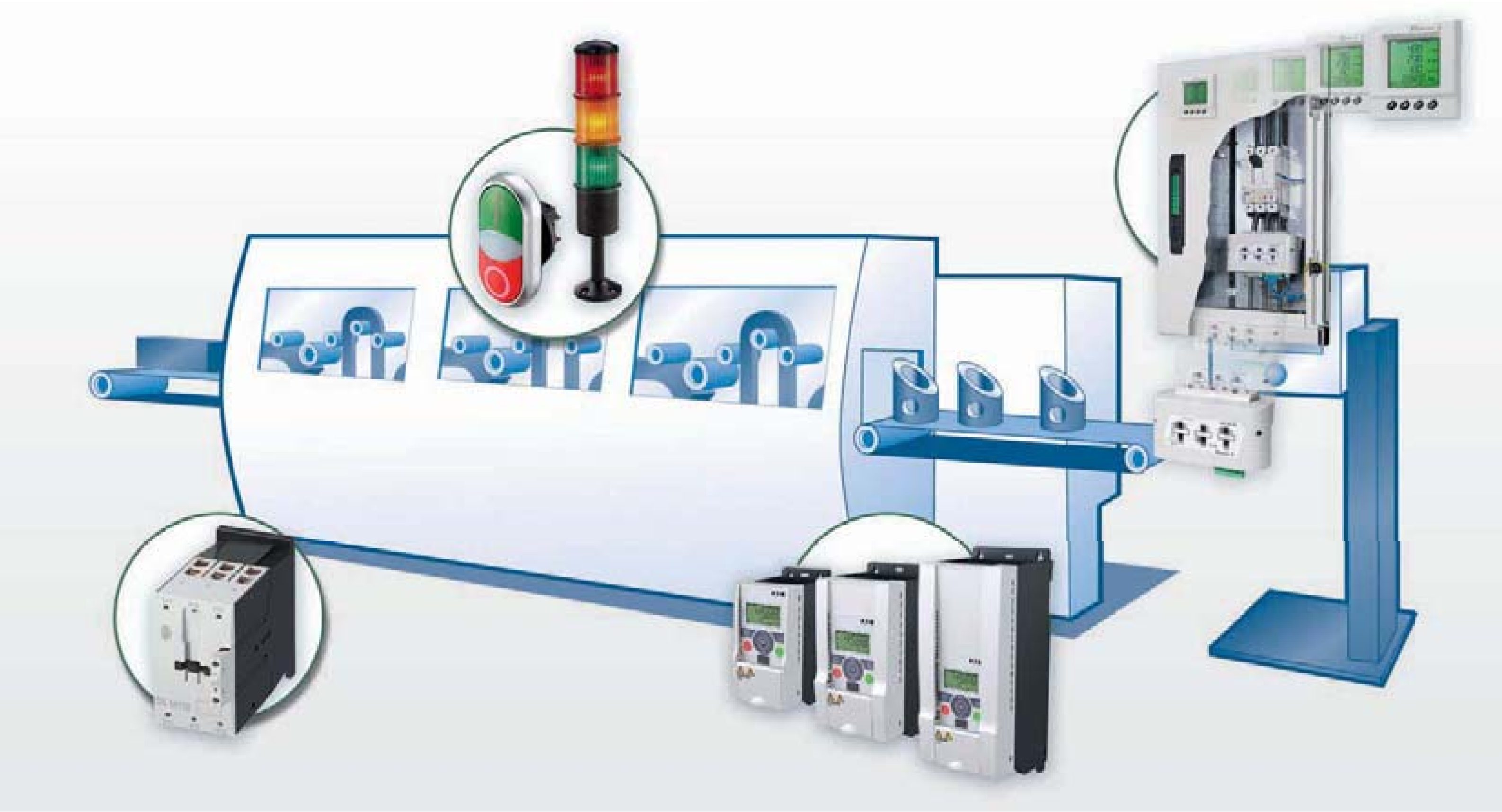
Condition	**EN ISO 13849-1:2008**
Structure	Kat. 4
$MTTF_d$	100 years
$B10_d$	S4: 100000, Q1, Q2: 1300000
n_{op}	1800

Condition	**IEC 62061:2005**
Structure	TS D, symmetrical
PFH_d	1.74×10^{-8}
B10	S4: 20000, Q1, Q2: 975000

The Safety Manual also provides a description of the functions as well as a clear presentation of a possible evaluation of each circuit example.

The calculated characteristic values apply to the assumptions made in the safety applications and the safety-related switchgear in use.

Simply register online at www.eaton.eu/shb and work online with the safety manual or download the safety manual free-of-charge.



Using energy efficiently – counteracting increasing costs

Energy metering and communication modules for compact circuit-breakers and switch-disconnectors make energy consumption transparent.

As the price of energy increases, the power consumption of machines is becoming increasingly more important. Eaton is helping the machine building sector to successfully take steps towards greater energy efficiency with a three-step concept.

The basic problem is the fact that the actual consumption is seldom known, making it impossible to deduce any potential savings. This can be changed by taking measurements at the machine. Eaton offers suitable energy metering modules for analysing energy consumption.

In the second step, we recommend the use of intelligent control components for optimizing the energy consumption of even small machines. Our calculation tool, the Energy Savings Estimator is also helpful for cost-optimized energy management.

The key objective of the third step is the integration of energy-optimized components. At Eaton, energy consumption has been a central consideration in the development of components for years.

Step one:
Energy consumption analysis

Eaton is offering a new range of XMC energy metering and communication modules for circuit-breakers and switch-disconnectors up to 630 A in order to make the consumption of electrical energy for machines more transparent. XMC modules provide all the relevant measuring data required: This includes phase and N conductor currents, rms voltages, active, reactive and apparent power, as well as power factor (cos phi). In this way, a detailed power consumption analysis can be drawn up. If "energy leaks" are identified, users can take specific energy saving measures.

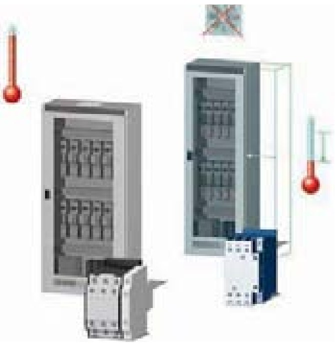
The easy control relay enables a large number of energy consumers to be "reined in" simply and elegantly.

Step two:
Intelligent energy management

Controlling energy use intelligently: Energy is often really wasted. This applies also to standby operation. Considerable savings can be achieved using intelligent controllers that enable a logically selective or complete shutdown of machine components. The small and inexpensive easy control relay is ideal for this task.

Using energy efficient drives: The EU Commission estimates the use of energy-efficient motors and electronic drive controls can achieve potential energy savings in Europe of 135 TWh. Eaton's "Energy Savings Estimator", a free software tool, can be used to determine whether the use of M-Max frequency inverters is worthwhile in each individual case. A small amount of input data, such as motor data, load profile and operating hours, is required to determine the expected energy consumption. The tool also shows: Energy and CO_2 savings, as well as payback times when using alternative drive solutions. The program takes all important factors into account such as running time, output requirements, energy and investment costs. The results are shown clearly in graphs. Free download at: www.moeller.net/support

Not obvious from the outside: The energy saving interface electronics for contactors.



Less heat dissipation in the switch cabinet means less switch cabinet cooling and therefore reduced energy consumption.

Step three:
Using energy efficient components

In the development of its products, Eaton consistently takes energy consumption into account. Examples of this are the DILM DC contactors which, with a sealing power of only 0.5 Watts, are not only very economical themselves, but also make energy consuming fans unnecessary due to the reduced heat dissipation.

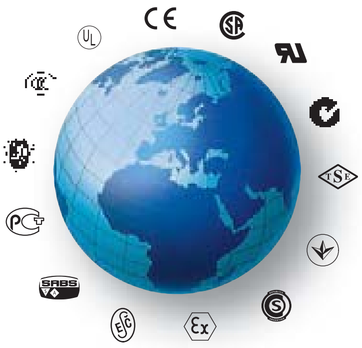
Or the RMQ-Titan pilot devices that use LEDs to achieve an energy saving of 88% compared to conventional products. Durable LEDs only use a fraction of the power and produce considerably less heat than filament lamps. LEDs are also vibration proof. They can function for 100,000 hours nonstop without losing the information of the signal. The values speak for themselves:
LED 0.24 W/24V, filament lamp 2.0 W/24V.

However, energy consumption should also be a factor when choosing touch displays or HMI/PLCs. The innovative HMI/PLCs of the XV 100 series therefore have a power consumption of only 5 or 10 Watts depending on size.

Filament lamps are out: LED indicator lights are extremely robust and offer a high level of luminescence with a low energy consumption.

Worldwide export of machines and plants

European machine and system building and worldwide exports are closely related. Even if you don't export your machines at present, you should be prepared for it in the future. Eaton provides switchgear and protective devices with all the essential approvals and certificates for machine and system building. In most countries around the world, conformity with international standards is the sole requirement for successful exports. This is because components in these locations are governed by compliance with well known and established IEC standards. In this respect, the European CE mark is not only the passport for exports within Europe but also far beyond its borders.



World market equipment for machine building

Nearly all the switchgear and protective devices of Eaton's Moeller® series are world market devices. Each product line thus carries all the approvals and certification marks required for worldwide use.

These product lines include those for

- Pilot devices, limit switches
- Contactors and various timing and special relays
- Motor-protective circuit-breakers and relays
- Electronic components and systems.

With circuit-breakers and switch-disconnectors, Eaton offers IEC devices for use in most countries in the world and NA devices with virtually the same dimensions and the same accessories for the North American market. This considerably simplifies device selection since the North American standards often involve the need for considerably different technical specifications.

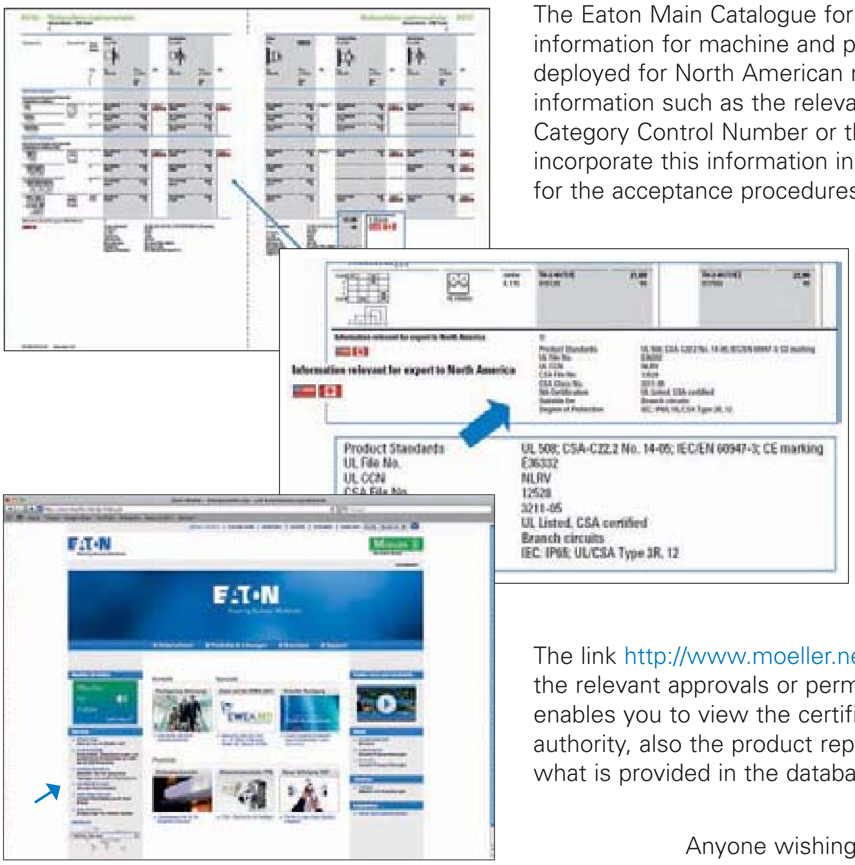
Electrical engineering products and their applications are not harmonized internationally.

IEC
IEC
IEC
IEC
IEC
IEC

The greatest differences to the IEC world are in North America, i.e. the USA and Canada. For many newcomers to the export business, it is initially surprising to experience the very different approaches and solutions.

Special components, such as handles for main switches that can only be operated by the intentional switching of an additional handle when the control panel door is opened, may sometimes be required for export to North America. Likewise, the European motor-protective circuit-breaker is only accepted with an upstream protective device or with larger air and creepage distances at the incoming terminals. Eaton is the competent partner of choice for export-related issues here.

Qualified information is a critical key to success


Information relevant for export to North America
E:T·N

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
	3211-05
	UL Listed, CSA certified
	Branch circuits
	IEC: IP65; UL/CSA Type 3R, 12

The Eaton Main Catalogue for Moeller® series products provides reliable information for machine and panel builders on the approval of components deployed for North American market. Each selection page provides information such as the relevant product standard, the E-File Number, the Category Control Number or the CSA Class Number. Many customers incorporate this information in their parts lists in order to be well prepared for the acceptance procedures.

Up to 13 data items are listed here for each product, such as the suitability for use in feeders or branch circuits, the maximum operating voltage, or the North American degree of protection, such as UL / CSA Type 4X. The Main Catalogue also contains a glossary with explanations of the American terms.

The link http://www.moeller.net/eaton-approbationen/en/index.jsp shows the relevant approvals or permits for each component type. This therefore enables you to view the certificates provided or, depending on the test authority, also the product report. The information given is the same as what is provided in the databases of the authorities.

Product selection for North American exports made easy
Safe Isolation of Main Circuits with Switch-Disconnectors N or with Molded Case Switches NS
Special considerations governing the application of Manual Motor Controllers and Motor Starters in North America
Components and Systems for Global Markets
E:T·N
E:T·N
E:T·N
E:T·N

Anyone wishing to avoid unfortunate experiences, should make use beforehand of the large number of publications that Eaton is offering on the issue of exports to North America. They contain the implementation of the codes & standards and a description of different practices.

These technical articles can be accessed via http://www.moeller.net/en/company/news/publications/index.jsp They can be downloaded or ordered free of charge.

Eaton Catalogs in the App Store – all catalogues close at hand!

In order to meet the needs of increasingly mobile customers and employees, Eaton is offering a mobile solution for communication and product information from June 2011.

Clearly designed shelf view

The Eaton Catalogs app offers an outstandingly clear user interface and several fully developed functions. In the form of a shelf view, the user is provided with a clear overview of Eaton's latest product catalogues. These can be leafed through on the fly or downloaded to the device – for situations when there is no Internet access. Choose for yourself which catalogues are of interest and keep up-to-date using the Update function.

Intuitive browsing, searching and finding

Users can simply browse through the catalogues with intuitive navigation ensured. A linked table of contents, thumbnail views and a rapid search function are also provided for finding information quickly and conveniently.

Linked data sheets

It is often the case that product information is required which is not available in the product catalogues. The "Eaton Catalogs" contain article numbers and type designations that are linked to the Online Catalogue. This enables the user to access highly detailed production information in the form of a technical data sheet. From here other documents such as installation instructions and technical publications can be called up.

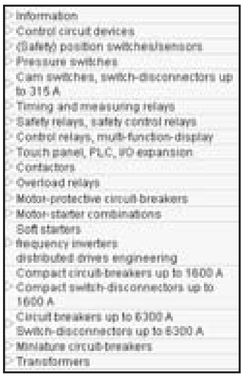
Whether on the building site, at the customer, on the train or at home – "Eaton Catalogs" make sure that all product information is close to hand.

EATON
In the App Store from
June 2011

Scan the QR code with your iPhone or iPad and you will immediately access "Eaton Catalogs".

The Eaton online catalogue

THE PRODUCT GROUP TREE

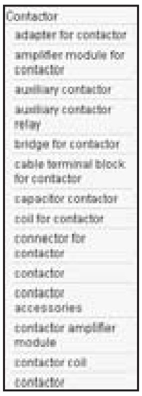


- Information
- Control circuit devices
- (Safety) position switches/sensors
- Pressure switches
- Cam switches, switch-disconnectors up to 315 A
- Timing and measuring relays
- Safety relays, safety control relays
- Control relays, multi-function-display
- Touch panel, PLC, I/O expansion
- Contactors
- Overload relays
- Motor-protective circuit-breakers
- Motor-starter combinations
- Soft starters
- frequency inverters
- distributed drives engineering
- Compact circuit-breakers up to 1600 A
- Compact switch-disconnectors up to 1600 A
- Circuit breakers up to 6300 A
- Switch-disconnectors up to 6300 A
- Miniature circuit-breakers
- Transformers

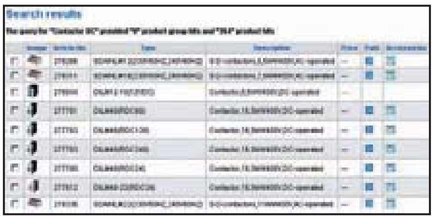
The product group tree: Clear layout of the Eaton products in product groups.

The one-dimensional product structure ensures the user can easily locate the product with a few clicks.

THE SEARCH



Contactor
- adapter for contactor
- amplifier module for contactor
- auxiliary contactor
- auxiliary contactor relay
- bridge for contactor
- cable terminal block for contactor
- capacitor contactor
- coil for contactor
- connector for contactor
- contactor
- contactor accessories
- contactor amplifier module
- contactor coil
- contactor

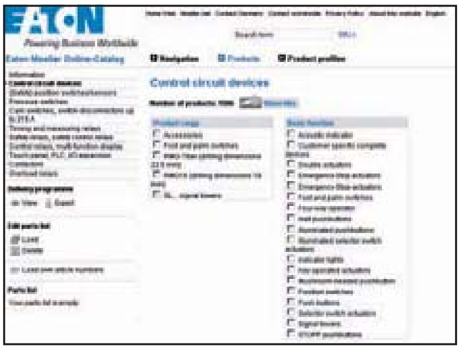


Search results

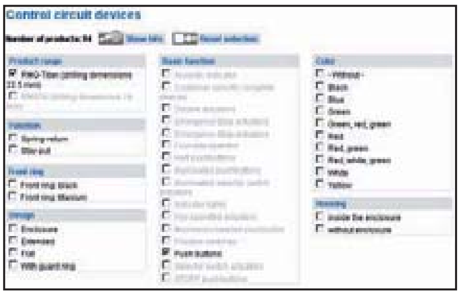
Search/result list: high performance search with suggestion list by “Entry”.

A suggestion list brings the search an above-average success rate, because nothing makes less sense than a 0-hit result.

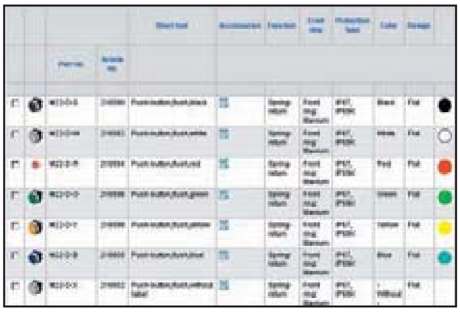
SELECTION AIDS



Control circuit devices



Control circuit devices

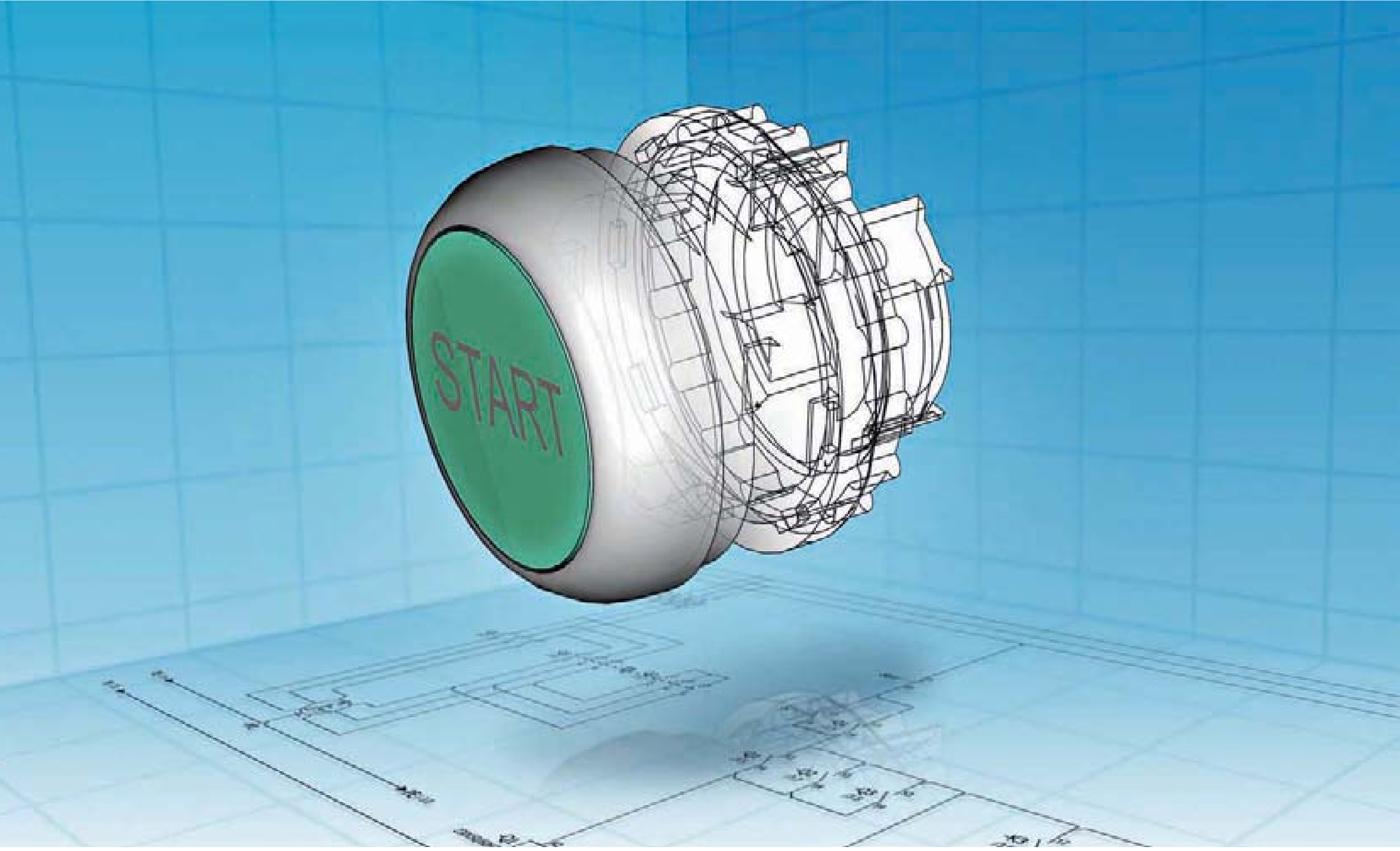


The selection tools: 3 clicks to product

Selection-relevant features allow users to locate their products easily, without problems. From general to specific to product – 3 clicks!

The catalogue portal is the entry page to the Online Catalogue. Important elements include the powerful search function and the graphical navigation. The clearly designed user interface makes the application particularly easy to use.

Continuous updating ensures that you will always find the latest product data and news. http://ecat.moeller.net



Planning safety and process optimization – CAD data at the click of a mouse!

ePLAN®

- 8,000 article data items and macros
- Convenient selection tool
- Version P8

CADENAS

- Models for approx. 9,000 products
- 50 different neutral & native formats

URL
www.moeller.net/cad

Eaton is providing its customers with CAD data to offer optimum support during planning. Both electrical and mechanical design data can be called up quickly and conveniently from the Internet at any time. This reduces processing times, minimizes errors and thus reduces costs already in the engineering phase of control panels, systems and machinery.

eCAD: Eaton makes product data and macros available for the EPLAN planning system and the Electric P8 version. Device data for over 8,000 products can be downloaded from the Eaton website and integrated in customer article databases using a specially developed selector.

mCAD: Eaton makes 2D and 3D data available for more than 9,000 products. Over 50 different neutral and native formats guarantee compatibility with the project engineering systems of the customer. The models can either be integrated directly into the planning software from the Partcommunity Portal on the Internet or via the CADENAS Partsolution software.

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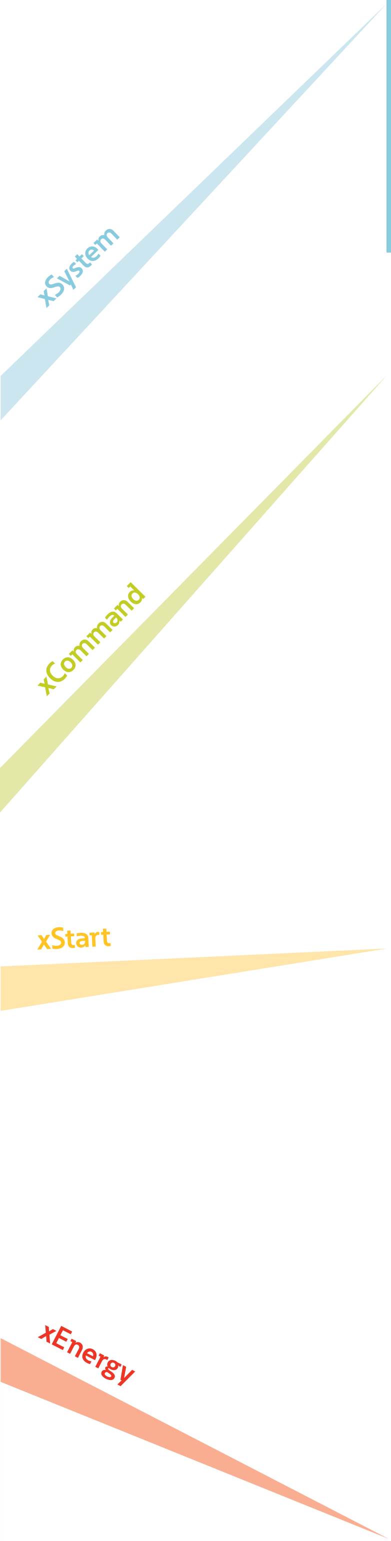
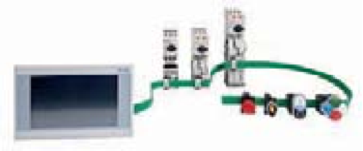


SmartWire-DT™



SmartWire-DT with HMI-PLC
- HMI/PLC with integrated SWD master
- Ethernet and USB interface
- Resistive touch with TFT display in 3.5", 5.7" and 7"
- Optional CAN / Profibus-DP master

Safety Technology

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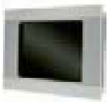
Detect hazards quickly with the RMQ-Titan emergency-stop actuator
- 1 or 2-channel safety circuits, up to SIL 3 to IEC 62061 or PL e to EN ISO 13849-1.
- Self-monitoring contact elements guarantee full operational safety
- Reliable indication of operating state with mechanical switch position indication in the actuating element and/or from a distance with an adjustable illuminated ring

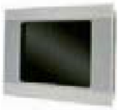
Page 108 ff.

Keeping movement safely under control with the LS-Titan position switch
- Reliably secure and lock guard doors, grills and flaps
- Increased personnel and process protection thanks to electromechanical lock mechanism in the operating head
- Manipulation protection with LSR door flap switch

HMI/PLC, Open HMI



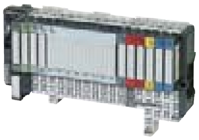
HMI/PLC XV100 - compact and powerful
- Platform concept for a cohesively scalable automation solution
- Display sizes 3.5", 5.7", 7" wide with LED backlight and resistive touch
- Ethernet, CAN, Profibus, RS232, RS485, Smartwire interfaces
- Optimized robust plastic housing for small mounting dimensions
- CoDeSys PLC/TargetVisu/WebVisu



HMI/PLC XV112/150 - high-end aluminum front and metal housing
- High performance display PLC in the compact class
- Display sizes 5.7", 7" widescreen, 8.4", 10" wide with LED backlight and resistive touch
- Ethernet, CAN, Profibus, RS232, RS485, Smartwire interfaces
- OEM rear mounting variant, can be fully integrated
- CoDeSys PLC/TargetVisu/WebVisu

Remote I/O

XI/ON ECO
- Powerful with low space requirements
- Gateways for various fieldbuses, serial or Ethernet-based
- High channel density up to 16 DI/DO on 12.5 mm width
- Multi-function modules reduce the range of types required
- Simple termination with push-in terminals
- Onboard USB diagnostics interface
- Compatible/combinable with the XI/ON standard system



XI/ON standard
- Gateways for various fieldbuses, serial or Ethernet-based
- Multi-functional connection types, spring-loaded or screw terminal
- Base modules for 2, 3 or 4-wire technology
- Toolless module exchange thanks to fixed wiring
- Rapid module exchange thanks to hot swapping, safe exchange thanks to coding

PLC

EC4P compact PLC
- Universal compact PLCs
- Remotely expandable
- Display connection via CAN
- Communication via UDP and Modbus

XC121 compact PLC
- Compact PLC for machine building
- Wide range of programming options
- Low space requirements
- Expandable with XI/OC modules

easyRelay, MFD-Titan

easy500 control relay
- For small-scale applications with up to 12 I/O
- 1:1 electronic circuit diagram entry
- Direct circuit diagram input on the device
- Connection to Ethernet possible

easy700 control relay
- For medium-sized applications with up to 40 I/O
- 1:1 electronic circuit diagram entry
- Locally and remotely expandable
- Connection possible to standard bus systems and Ethernet

MFD-Titan display/operator unit
- Monochrome display with IP65 protection
- Display and enter bitmaps, bar graphs, texts and values
- Remote text display for all easyRelays
- Individual laser inscription (e.g. company name)

MFD-CP8/CP10 MFD-Titan power supply/CPU module
- Functionality of an easy800 plus visualization
- Either with or without easyNet on board

MFD-CP4 MFD-Titan power supply/CPU module
- With display/operator unit as remote text display
- For 24 V DC and 110/240 V AC

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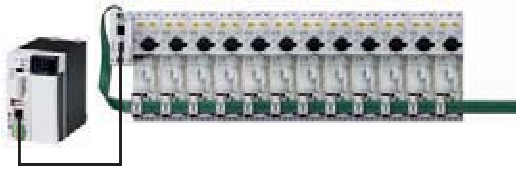
Any PLC



SmartWire-DT with fieldbus interface

- Connection to PLC systems of many manufacturers
- Gateways for Profibus, CAN or Ethernet with integrated SWD master
- Up to 99 SWD slaves can be connected
- Integrated diagnostics interface for commissioning without PLC

Page 34

Secure monitoring and processing with the ESR5 safety relay

- Economical use with suitable safety functions
- Pluggable screw terminals for fast and fault-free exchange
- Multi-voltage versions 24 – 230 V AC/DC for flexible application range
- EN ISO 13849-1: Up to PL e, IEC 62061: Up to SILcl 3, IEC 61508: SIL 3

Safety and standard technology combined effectively with easySafety

- All in One: a host of safety and standard functions in one device
- Small, compact design with integrated display
- Multi-level safety and security concept prevents manipulation and protects know-how
- EN ISO 13849-1: PL e, IEC 62061: SILcl 3, IEC 61508: SIL 3

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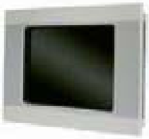
HMI/PLC XV400/XVS400 - wide range of communication options

- The HMI/PLC display PLC as a universal solution
- Display sizes 5.7″, 8.4″, 10.4″, 12.1″ and 15″
- Robust, durable, brilliant infra-red glass touch
- Alternatively also available with resistive touch
- Special versions with stainless steel fronts
- Interfaces Ethernet, CAN, Profibus, RS232
- Can be expanded with multi-protocol board with over 100 protocols



XP700 industrial PC – powerful and robust

- Industrial PC solution as open HMI
- Display sizes 8.4″, 10.4″, 12.1″, 15″
- Robust, durable, brilliant infra-red glass touch
- Powerful processes in two designs
- Windows XP or Windows XP embedded

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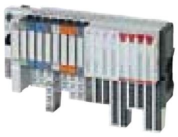

XI/ON PLC

- Programmable CANopen gateway
- Programming/commissioning via CAN with networked systems
- For decentralized automation tasks
- Serial interface onboard
- Integrated service interface

Software

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for HMI/PLC
XI/ON
Compact PLC
Modular PLC

Page 64

XC101 modular PLC

- Modular PLCs for small to medium-sized applications
- Expandable with up to 15 XI/OC modules
- Pluggable SD memory card
- Fiber optic CAN interface

XC201/202 modular PLC

- Modular PLC with high CPU performance
- varied communication possibilities
- Fast parallel backplain bus
- Ethernet, USB, SD, CAN/easyNet interface
- Integrated web server

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easy 800 control relay

- For large open-loop and closed-loop control tasks with up to 328 I/O
- Can be expanded with digital and analog devices
- Integrated communication via easyNet
- Connection possible to standard bus systems and Ethernet

easy Power supply unit

- 24 V DC rated output voltage
- Rated output currents up to 4.2 A

Page 86

MFD-Titan I/O modules

- 12 digital inputs, 4 can be used as analog inputs
- 4 relay or transistor outputs

MFD-Titan I/O modules temperature measuring

- Pt100
- Ni1000

ELC-PS and PSG power supply units

- 1 or 3-phase devices
- Compact design
- Rated output currents up to 20 A
- 22-28 VDC adjustable output voltage range (PSG)

Controlling
Protecting
Operation & monitoring
Switching
Drives
Start
R
Q
Stop

SmartWire-DT™ Communication System – Connecting Instead of Wiring

XV102 with SmartWire-DT master interface

Quicklink Online catalogue to
www.eaton.com/moellerproducts

MBC001

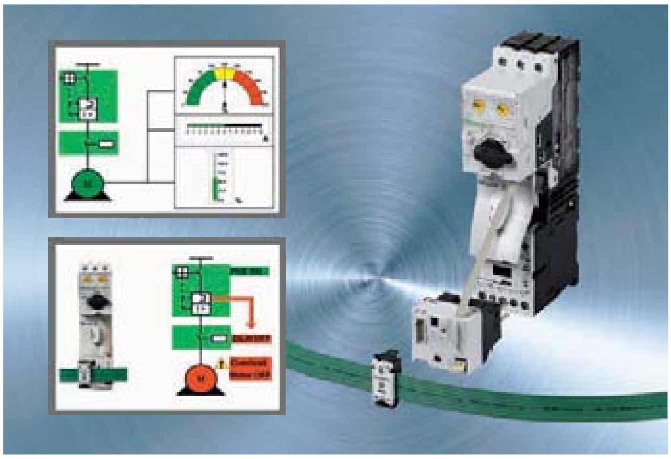
For manufacturers of machines and plants, achieving a balance between maximum functionality and cost optimization is essential. Designed to allow further development, SmartWire-DT is a communication system for industrial switchgear and automation concepts in the control panel and in the periphery. From controlling, protecting, switching, right through to drive actuation, operation and visualization.
SmartWire-DT allows the implementation of lean connectivity solutions that considerably simplify engineering design and reduce the time required for wiring, testing and commissioning by up to 85%. SmartWire-DT uses the proven Eaton industrial switchgear and turns them into communication-enabled devices.
In addition to the fieldbus gateways for connecting the control systems of any manufacturer, the state-of-the-art HMI/PLCs of Eatons XV102 series feature an integrated SmartWire-DT interface for a master connection for lean automation solutions. Lean automation means:

- Efficient planning and engineering
- Rapid commissioning
- Maintenance with direct diagnostics
- Fault-free connection
- Convenient operation
- Simple expansion

SmartWire-DT: The convenient solution for operating and signalling devices

The conventional wiring of pilot devices is very complex and costly. Each contact or indicator light is individually wired and assigned to the I/O modules of the controller. This is very time consuming and harbors several sources for potential wiring faults. SmartWire-DT is simply ingenious – the green ribbon cable connects up pilot devices with a simple click. This saves time and keeps fault sources to a minimum.

An additional benefit is the combination of several functions that previously had to be installed separately. From the simple button element right through to the double actuator with LED indication: You only require one SmartWire-DT function element

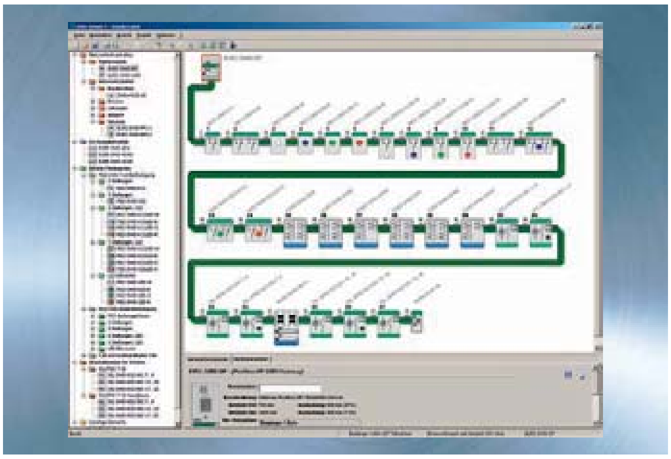


SmartWire-DT: Extensive information from your motor

Motor starters combinations with PKE up to 15 kW are simply integrated via SmartWire-DT into the automation world. The PKE-SWD-32 modular function element enables all the relevant information of the motor feeder to be sent to the controller so that it is available throughout the entire installation. As well as the integrated actuation of the motor starter, the PKD-SWD-32 function element supplies all the switch states and signals about the cause of circuit-breaker tripping, which could previously only be accessed via auxiliary contacts. The additional transfer of the actual motor current and thermal motor load provides advanced information on possible causes of faults and any possible overload disconnection. This therefore increases the availability and serviceability of the system. The module can also be parameterized as an overload relay. In the event of a fault the contactor is disconnected and the motor-protective circuit-breaker is not tripped.

SmartWire-DT: Intelligently logging circuit-breaker data

The SmartWire-DT interface to the NZM circuit-breakers makes it possible to provide all relevant information in order to detect any possible faults and rectify them in advance. The NZM has a graduated system of warning signals that are provided via the SmartWire-DT interface. This includes freely definable warning levels when critical current values are exceeded. The individual phase currents as well as all specific data of the NZM circuit-breaker are made available.
An optional remote operator can also be connected directly to the module. An energy measuring module also enables the logging of energy values and the measuring of energy consumption.

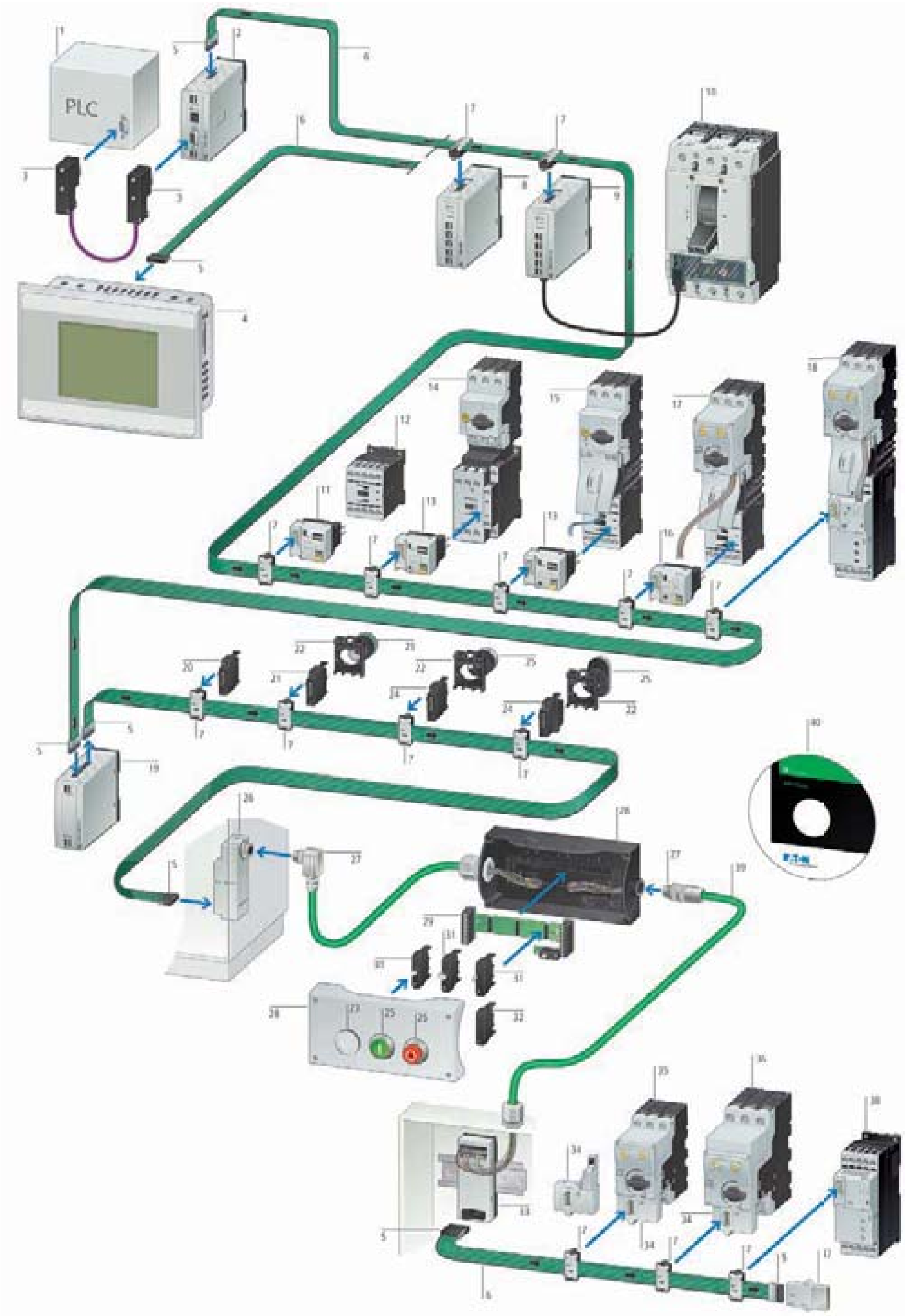


Get things done faster with SWD-Assist

The SWD-Assist software supports the user in planning, designing and commissioning a SmartWire-DT network. You choose the required SmartWire-DT slave from the device catalogue and place it at the required position. You can save the configuration and reuse it for other projects. You can also create fieldbus-specific configuration files directly and transfer them directly in the programming system of your PLC. The configuration interface of the gateways also enables you to access the SmartWire-DT network directly.
In this way, the entire SW-DT network can be commissioned or tested simply without the PLC connected. As well as displaying the configuration and the actual status data, parameters and diagnostics messages are also available.

SmartWire-DT™

System overview



1. PLC
2. SmartWire-DT gateways
3. SUB-D data plug, 9-pole
4. SmartWire-DT HMI-PLC
5. SmartWire-DT blade terminal, 8-pole
6. SmartWire-DT ribbon cable, 8-pole
7. SmartWire-DT device plug, 8-pole
8. SmartWire-DT input/output modules
9. SmartWire-DT interface for NZM
10. NZM circuit-breaker
11. SmartWire-DT contactor module
12. DILM contactors
13. SmartWire-DT contactor module with Manual-0-Automatic switch
14. Motor-protective circuit-breaker
15. MSC motor starter
16. SmartWire-DT, PKE module (motor starter)
17. Motor starter with PKE electronic motor protection
18. DS7 soft starter with PKE electronic motor protection
19. SmartWire-DT power feed module
20. SmartWire-DT universal slave, front fixing
21. SmartWire-DT LED element, front fixing
22. RMQ-Titan fixing adapter for front mounting
23. RMQ-Titan indicator lights
24. SmartWire-DT function element for front fixing
25. SmartWire-DT operating elements
26. SmartWire-DT control panel entry, ribbon to round cable
27. SmartWire-DT plug connector
28. RMQ-Titan surface mounting enclosure
29. SmartWire-DT card for function elements, base fixing
30. SmartWire-DT LED element for base fixing
31. SmartWire-DT function element for base fixing
32. SmartWire-DT universal slave, base fixing
33. SmartWire-DT adapter ribbon/round cable for rail mounting
34. SmartWire-DT PKE module (motor-protective circuit-breaker)
35. PKZ12, PKZ32 motor-protective circuit-breaker
36. PKZ65 motor-protective circuit-breaker
37. SmartWire-DT network termination for 8-pole ribbon cable
38. DS7 soft starter
39. SmartWire-DT round cable, 8-pole
40. SmartWire-DT planning and ordering tool, SWD-Assist

SmartWire-DT-HMI-PLC

- HMI-PLC with integrated SmartWire-DT master interface
- Ethernet and USB interface
- Resistive touch with TFT display, 64K colors

	Display size	Resolution	Interfaces	Termination	**Part no.** Article no.
Plastic housing 	3.5″	320 x 240	-	-	**XV-102-BE-35TQRC-10** 153524
	5.7″	640 x 480	CAN, RS485	SUB-D	**XV-102-E6-57TVRC-10** 153525
	5.7″	640 x 480	Profibus master, RS485	SUB-D	**XV-102-E8-57TVRC-10** 153526
	7″	800 x 480	CAN, RS485	SUB-D	**XV-102-E6-70TWRC-10** 153527
	7″	800 x 480	Profibus master, RS485	SUB-D	**XV-102-E8-70TWRC-10** 153528
Metal housing 	5,7"	640 x 480	CAN, RS485	SUB-D	**XV-152-E6-57TVRC-10** Scheduled for Q3/2011
	5,7"	640 x 480	Profibus Master, RS485	SUB-D	**XV-152-E8-57TVRC-10** Scheduled for Q3/2011
	8,4"	640 x 480	CAN, RS485	SUB-D	**XV-152-E6-84TVRC-10** Scheduled for Q3/2011
	8,4"	640 x 480	Profibus Master, RS485	SUB-D	**XV-152-E8-84TVRC-10** Scheduled for Q3/2011
	10,4"	640 x 480	CAN, RS485	SUB-D	**XV-152-E6-10TVRC-10** Scheduled for Q3/2011
	10,4"	640 x 480	Profibus Master, RS485	SUB-D	**XV-152-E8-10TVRC-10** Scheduled for Q3/2011

SmartWire-DT gateways

- Gateways for connecting the SmartWire-DT communication system to standard fieldbus systems

	Protocol	Baud rate	Number of SWDT slaves	Termination	**Part no.** Article no.
	Profibus DP V1 slave	Up to 12 MBit/s	Max. 58	SUB-D	**EU5C-SWD-DP** 116308
	CANopen	Up to 1 MBit/s	Max. 99	SUB-D	**EU5C-SWD-CAN** 116307
	Ethernet IP / Modbus T	10/100 MBits/s	Max. 99	2*RJ45 (switch)	**EU5C-SWD-EIP-MODTCP** 153163

SmartWire-DT I/O modules

- SmartWire-DT slaves for connecting digital I/O signals

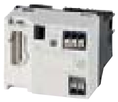
	Digital inputs	Digital outputs	Relay outputs	Short-circuit proof	**Part no.** Article no.
	8	-	-	-	**EU5E-SWD-8DX** 116381
	4 with power supply	-	-	-	**EU5E-SWD-4DX** 144060
	4	4	-	•	**EU5E-SWD-4D4D** 116382
	4	-	2	-	**EU5E-SWD-4D2R** 116383
	-	8	-	•	**EU5E-SWD-X8D** 144061

- SmartWire-DT slaves for connecting analog I/O signals

	Analog inputs	Sensor type	Analog outputs	Sensor type	**Part no.** Article no.
	4	0-10V, 0-20mA	-	-	**EU5C-SWD-4AX** 144062
	2	0-10V, 0-20mA	2	0-10V, 0-20mA	**EU5C-SWD-2A2A** 144063
	4	PT100,PT1000, Ni1000	-	-	**EU5C-SWD-EIP-4PT** 144064

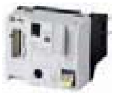
SmartWire-DT contactor modules

- SmartWire-DT module for fitting to contactors

	Contactor actuation, feedback signalling of switch status	Manual-Automatic switch	Digital inputs e.g. for connection to auxiliary contact	**Part no.**	Article no.
	•	-	2	**DIL-SWD-32-001** (Std pack = 5)	118560
	•	•	2	**DIL-SWD-32-002** (Std pack = 5)	118561

SmartWire-DT PKE module

- SmartWire-DT module for fitting to motor starter combination with PKE12, 32

	Contactor actuation, feedback signalling of contactor	Manual-Automatic switch	Status messages, settings	Analog information	**Part no.**	Article no.
	•	•	Overload, short-circuit, phase loss, setting value for overload release and tripping class	Actual current value, thermal motor image	**PKE-SWD-32** (Std pack = 4)	126895

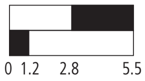
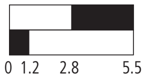
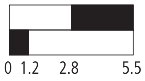
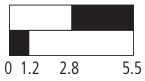
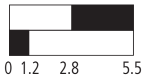
SmartWire-DT PKE module

- SmartWire-DT module for fitting to PKE12, 32, 65 motor-protective circuit-breakers

	Contactor actuation, feedback signalling of contactor	Manual-Automatic switch	Status messages, settings	Analog information	**Part no.**	Article no.
	-	-	Overload, short-circuit, phase loss, setting value for overload release and tripping class, type of trip block	Actual current value, thermal motor image	**PKE-SWD** (Std pack = 4) Scheduled for Q4/2011	150613
					PKE-SWD-SP (Std pack = 1) Scheduled for Q4/2011	150614

SmartWire-DT RMQ function elements

- SmartWire-DT function modules for connecting to M22 pilot devices

	Fixing	Number of contacts	Contact travel diagram	LED color	**Part no.**	Article no.
	Front fixing	1 changeover contact		-	**M22-SWD-K11**	115964
		2 changeover contacts		-	**M22-SWD-K22**	115965
	Base fixing	1 changeover contact		-	**M22-SWD-KC11**	115995
		2 changeover contacts		-	**M22-SWD-KC22**	115996
	Front fixing	1 changeover contact		○	**M22-SWD-K11-LED-W**	115972
		1 changeover contact		🔵	**M22-SWD-K11-LED-B**	115973
		1 changeover contact		🟢	**M22-SWD-K11-LED-G**	115974
		1 changeover contact		🔴	**M22-SWD-K11-LED-R**	115975
		2 changeover contacts		○	**M22-SWD-K22-LED-W**	115978
		2 changeover contacts		🔵	**M22-SWD-K22-LED-B**	115979
		2 changeover contacts		🟢	**M22-SWD-K22-LED-G**	115980
		2 changeover contacts		🔴	**M22-SWD-K22-LED-R**	115981
	Base fixing	1 changeover contact		○	**M22-SWD-K11-LEDC-W**	116003
		1 changeover contact		🔵	**M22-SWD-K11-LEDC-B**	116004
		1 changeover contact		🟢	**M22-SWD-K11-LEDC-G**	116005
		1 changeover contact		🔴	**M22-SWD-K11-LEDC-R**	116006
		2 changeover contacts		○	**M22-SWD-K22-LEDC-W**	116009
		2 changeover contacts		🔵	**M22-SWD-K22-LEDC-B**	116010
		2 changeover contacts		🟢	**M22-SWD-K22-LEDC-G**	116011
		2 changeover contacts		🔴	**M22-SWD-K22-LEDC-R**	116012
	Front fixing	-	-	○	**M22-SWD-LED-W**	115966
		-	-	🔵	**M22-SWD-LED-B**	115967
		-	-	🟢	**M22-SWD-LED-G**	115968
		-	-	🔴	**M22-SWD-LED-R**	115969
	Base fixing	-	-	○	**M22-SWD-LEDC-W**	115997
		-	-	🔵	**M22-SWD-LEDC-B**	115998
		-	-	🟢	**M22-SWD-LEDC-G**	115999
		-	-	🔴	**M22-SWD-LEDC-R**	116000

SmartWire-DT NZM module

- SmartWire-DT interface module for NZM 2,3,4 circuit-breakers

Status messages, settings	Analog information	Outputs	Energy measurements	Part no.	Article no.
Status NZM (ON, OFF, TRIPPED) load warnings, circuit-breaker type	Actual current values, setting values for overload release	2 digital inputs for connecting to remote switching unit	Energy meter in combination with NZM...-XMC energy measuring module	**NZM-XSWD-704**	135530

SmartWire-DT accessories

Description			Part no.	Article no.
Ribbon cable for laying the SmartWire-DT network inside the switch cabinet	100m		**SWD4-100LF8-24**	116026
	3m	Prefabricated with 2 SWD4-8MF2 blade terminals	**SWD4-3LF8-24-2S**	116027
	5m		**SWD4-5LF8-24-2S**	116028
	10m		**SWD4-10LF8-24-2S**	116029
Device plug for connecting SmartWire-DT slaves			**SWD4-8SF2-5**	116022
Blade terminal for connecting the ribbon cable to gateway, power feed module			**SWD4-8MF2**	116023
Link for SWD4-8MF2 device plug for bridging open mounting sockets			**SWD4-SEL8-10**	116021
Coupler for 8-pole SWD4-8MF2 blade terminal			**SWD4-8FF2-5**	116024
Network termination for SmartWire-DT network			**SWD4-RC8-10**	116020
Cable adapter, ribbon cable (plug) to round cable (terminal)			**SWD4-8FRF-10**	121377
Switch cabinet entry from ribbon cable to round cable, both ends pluggable	Connection of round cable via socket		**SWD4-SFL8-20**	121380
	Connection of round cable via plug		**SWD4-SM8-20**	121381
Round cable for laying the SmartWire-DT network outside of the switch cabinet		50m	**SWD4-50LR8-24**	116030
		250m	**SWD4-250LR-24**	144878
Housing bushing for installation in M22-I surface mounted enclosure. 8-pole socket / plug with prefabricated cables		8-pole socket	**SWD4-SF8-20**	116031
		8-pole plug	**SWD4-SM8-20**	116032
Connector for round cables (IP67)	Straight	Socket	**SWD4-SF8-67**	116033
		Plug	**SWD4-SM8-67**	116034
	90° angled	Socket	**SWD4-SF8-67W**	116035
		Plug	**SWD4-SM8-67W**	116036
Pliers for SWD4-8SF2-5 device plug			**SWD4-CRP-1**	116025
Pliers for SWD4-8MF2 blade terminal			**SWD4-CRP-2**	116699
Insert for toggle lever press, SWD4-8SF2-5 device plug			**SWD4-CRPAD-1**	116700
Insert for toggle lever press, SWD4-8SF2 device plug			**SWD4-CRPAD-2**	116701
Universal slave for configured SmartWire-DT slaves that have not yet been installed		Front fixing	**M22-SWD-NOP**	147637
		Base fixing	**M22-SWD-NOPC**	147638

Safe Monitoring and Processing

Machines and plants contain potentially dangerous motion sequences that require a technical solution to make them safe. Safety devices such as emergency-stop pushbuttons, guard doors, light curtains and operating elements for safe setting must be controlled and monitored, and the installation may have to be switched to a safe state. For these tasks, Eaton is offering two safety logic series, the ESR5 electronic safety relay and the easySafety control relay.

Whether on a simple or complex machine, the required protection of personnel and process can be ensured using these Eaton safety products that have been approved by TÜV Rheinland:

- Category 4 to EN 954-1
- Performance Level PL e to EN ISO 13849-1
- Safety Integrity Level SIL CL 3 to IEC 62061
- Safety Integrity Level SIL 3 to IEC 61508

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MBC005

Designing logic processes safely

ESR5 series safety relays monitor the signals of safety devices continuously and reliably and switch off safely and rapidly in the event of an emergency. The internal logic of the safety relays monitors the wired safety circuits and activates the enable paths when no faults are present.

The easySafety control relay monitors all typically used safety devices and also performs the control tasks required for the machine. Armed with a host of conventional safety relays in the form of safety function blocks, easySafety not only integrates safety but also standard functions in a single all-in-one device.

Economical monitoring with the ESR5 safety relay

- Many safety switch contacts with up to 5 enable and 2 signal current paths
- Immediate (Stop category 0) or controlled (Stop category 1) stop
- Duplication as required using contact expansion modules
- Optimum space saving thanks to slim 22.5 mm mounting width
- Pluggable screw terminals for fast and fault-free exchange
- Multi-voltage versions 24 – 230 V AC/DC for flexible application range
- World market devices with UL, cUL and TÜV Rheinland certification

Functional Safety Type Approved
TÜVRheinland
FS

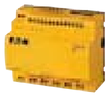
All in one – safety and control relay rolled into one

- Safety circuit diagram and standard circuit diagram integrated in the same device
- TÜV-approved safety function blocks
- 14 safety inputs
- 4 safety transistor outputs and 1 redundant relay output or 4 safety relay outputs
- 4 test signals
- Local expandable via integrated easyLink interface
- Local expandable via integrated easyNet interface
- With and without display
- Additional stand-alone display can be connected via integrated RS232 interface

ESR5 safety relays

ESR5 series safety relays monitor the signals of safety devices continuously and reliably and switch off safely in the event of an emergency.

- Single channel and dual channel designs
- Typical safety functions
- Configuration via wiring to coded plug-in terminals
- Internal logic monitors wired safety circuits
- Activation of enable paths in fault-free state
- After the safety device is actuated or in the event of a fault, the enable paths are deactivated according to the Stop category

	Stopping in an emergency	Safety gate monitoring	Electro-sensitive protective equipment (ESPSE)	ESPE with muting function	Two-hand control	Contact expansion	Overspeed monitoring	Zero speed monitoring
ES4P • Standard and safety circuit diagram • easyNet / easyLink								
	●	●	●	●	●	-	●	●
	●	●	●	●	●	-	●	●
	●	●	●	●	●	-	●	●
	●	●	●	●	●	-	●	●
ESR5								
• Single-channel monitoring 	●	●	-	-	-	-	-	-
	●	●	-	-	-	-	-	-
• Dual-channel monitoring 	●	●	-	-	-	-	-	-
	●	●	-	-	-	-	-	-
	●	●	-	-	-	-	-	-
	●	●	-	-	-	-	-	-
	●	●	●	-	-	-	-	-
	-	●	-	-	●	-	-	-
	-	-	-	-	-	●	-	-
	-	-	-	-	-	●	-	-

easySafety control relay

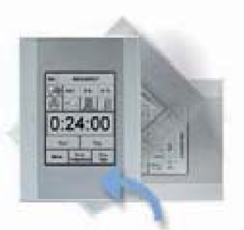
The easySafety control relay monitors all typically used safety devices and also performs the control tasks required for the machine.

- Armed with a host of safety function blocks
- Safety and standard functionality in a single device – all in one
- Expansion and communication options with easyLink and easyNet
- Diagnostics and fieldbus communication via standard expansion modules
- User-friendly programming on the device or via software
- Compact design

Safety timing relay	Mode selection	Enabling switch	Feedback loop	Enable/ signalling contacts	Inputs/ outputs	Display	Mounting width	Safety classifications	**Part no.** Article no.
●	●	●	●	- / -	14 / 5	●	107.5 mm	PL e SIL CL 3 Cat. 4	**ES4P-221-DMXD1** 111017
●	●	●	●	- / -	14 / 4	●	107.5 mm	PL e SIL CL 3 Cat. 4	**ES4P-221-DRXD1** 111019
●	●	●	●	- / -	14 / 5	-	107.5 mm	PL e SIL CL 3 Cat. 4	**ES4P-221-DMXX1** 111016
●	●	●	●	- / -	14 / 4	-	107.5 mm	PL e SIL CL 3 Cat. 4	**ES4P-221-DRXX1** 111018
-	-	-	●	4 / 1	- / -	-	22.5 mm	PL d SIL CL 3 Cat. 2	**ESR5-NO-41-24VAC-DC** 118701
-	-	-	●	3 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NOS-31-230VAC** 153152
-	-	-	●	2 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NO-21-24VAC-DC** 118700
-	-	-	●	3 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NO-31-24VAC-DC** 118702
-	-	-	●	3 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NO-31-230VAC** 119380
-	-	-	●	3 / 1	- / -	-	45 mm	PL e SIL CL 3 Cat. 4	**ESR5-NO-31-AC-DC** 118704
●	-	-	●	4 / 0	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NV3-30** 118705
-	-	-	●	2 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NZ-21-24VAC-DC** 118703
-	-	-	-	5 / 1	- / -	-	22.5 mm	PL e SIL CL 3 Cat. 4	**ESR5-NE-51-24VAC-DC** 118707
●	-	-	-	4 / 2	- / -	-	22.5 mm	PL d SIL CL 2 Cat. 3	**ESR5-VE3-42** 118706

EATON
Data login
KAMERA
ALARME
REZEPT
SYSTEM
Startmaske

XV HMI/PLC: Systematic Visualization and Control



All devices can also be used in portrait format

CoDeSys Automation Alliance

With the XV HMI-PLC touch panels Eaton is offering customers in the machine and system building sector a systematically coordinated range that can be integrated perfectly into different performance classes. The smart implementation of the PLC runtime into a slim and efficient embedded platform strategy in combination with powerful processors creates a state-of-the-art, scalable and cost-efficient automation concept. The openness of the system is demonstrated in the use of the CoDeSys programming standard and the possibility to access over 100 protocols as an HMI. Display sizes from 3.5" to 15", device versions in plastic, metal or stainless steel, as well as the possibility of use with particularly robust infra-red touch technology make a wide range of solutions possible.
Unique on the market: XV panels with an onboard SmartWire-DT master interface. This offers potential savings affecting all aspects of a project, from hardware planning to software creation, to wiring and commissioning.

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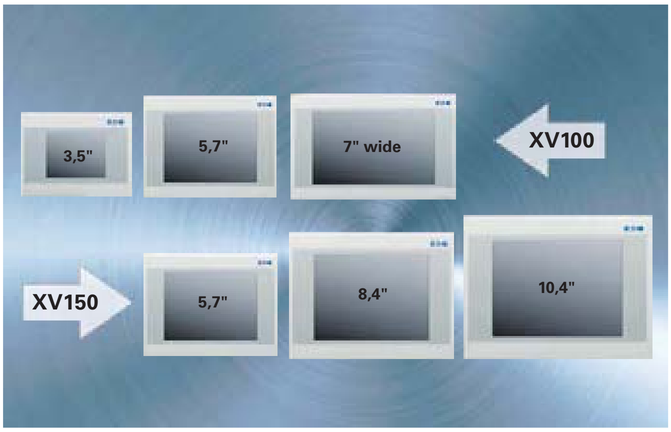
MBC002

XV100 with SmartWire-DT master

High performance display PLC as cost-efficient system solution.

- With 3.5″ or 7″ widescreen TFT in robust plastic housing
- 5.7″, 8.4″ and 10.4″ with high-end aluminum front and metal housing
- Brilliant image display with 65,536 colors
- Slim-line system architecture via I/Os, switching devices up to the pushbutton actuator
- Panels > 3.5″, also with Profibus/MPI or CAN/easyNet master and RS485 interface
- Integrated PLC function
- Simple configuration in CoDeSys
- Low-priced SmartWire-DT I/O modules



XV100

Outstanding functionality and performance in the compact class.

- With 3.5″ or 7″ widescreen TFT in robust plastic housing
- 5.7″, 8.4″ and 10.4″ with high-end aluminum front and metal housing
- LED backlight
- Profibus/MPI or CAN/easyNet master and RS485/RS232 depending on type
- HMI and HMI/PLC variants
- Special OEM variants

XV400

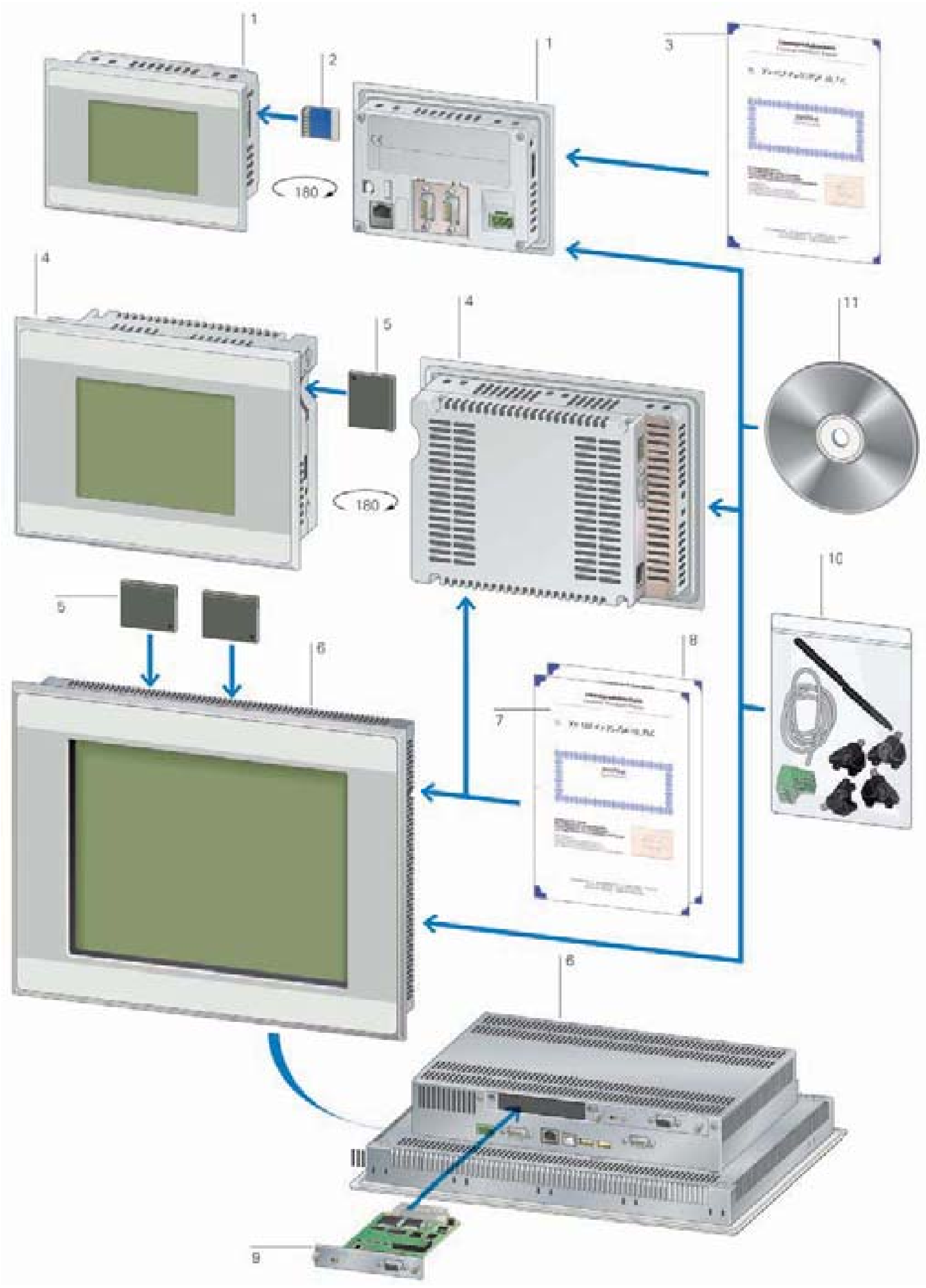
Additional functions make the XV400 a universal solution.

- 5.7″, 8.4″, 10.4″, 12.1″ and 15″ TFT with high-end aluminum or stainless steel front and metal housing
- Infra-red or resistive touch
- Optional multiprotocol board (> 100 protocols)
- Profibus/MPI or CAN/easyNet and RS485 /RS232
- Universal type for HMI and HMI/PLC with license system
- Special approvals such as Ex Zone 1, IP69K available

Software

Flexibility through market standards.

- The visualization is created with the intuitive Galileo design tool
- CoDeSys PLC with integrated I/Oassistant
- CoDeSys TargetVisu
- CoDeSys WebVisu
- Windows CE



1. XV100 HMI/PLC with touch display: Fully graphical 3.5″, 5.7″, 7″ widescreen, 8.4" and 10.4" devices
2. SD memory card
3. XV license certificate: Increased device functionality by assigning license points
4. XV200 HMI/PLC with touch display: Fully graphical 5.7″ devices
5. CompactFlash memory card
6. XV400 HMI/PLC with touch display: 5.7″, 8.4″, 10.4″, 12.1″, 15″ devices with infra-red or resistive touch
7. XV license certificate: Increased device functionality by assigning license points
8. OS upgrade license
9. Communication modules for XV400
10. Fixing kit
11. Software

Overview of HMI/PLC Devices

Device series	XV100	XV112	XV150	XVS400	XV400
	• Resistive touch • Plastic housing • Ethernet onboard • CAN/easyNet, Profibus/MPI, RS232, RS485 and SmartWire-DT depending on type	• Resistive touch • Without front • Metal housing • Ethernet onboard • CAN/easyNet, Profibus/MPI, RS232 and RS485 depending on type	• Resistive touch • Metal housing • Ethernet onboard • CAN/easyNet, Profibus/MPI, RS232, RS485 and SmartWire-DT depending on type	• Resistive or infra-red touch • Metal housing • Ethernet, RS232 and Profibus/MPI onboard	• Resistive or infra-red touch • Metal housing • Ethernet, RS232 and CAN/easyNet onboard • Over 100 communication protocols possible thanks to optional communication modules
Display size **Touch**					
3.5″ Resistive		 In preparation			
5.7″ Resistive					
Infra-red					
7″ wide, resistive					
8.4″ Resistive					
Infra-red					
10.4″ Resistive					
Infra-red					
12.1″ Resistive					
Infra-red					
15″ Infra-red					

Note: Standard front delivered with neutral front membrane (without logo)

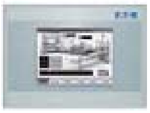
XV100

HMI/PLC with touch display

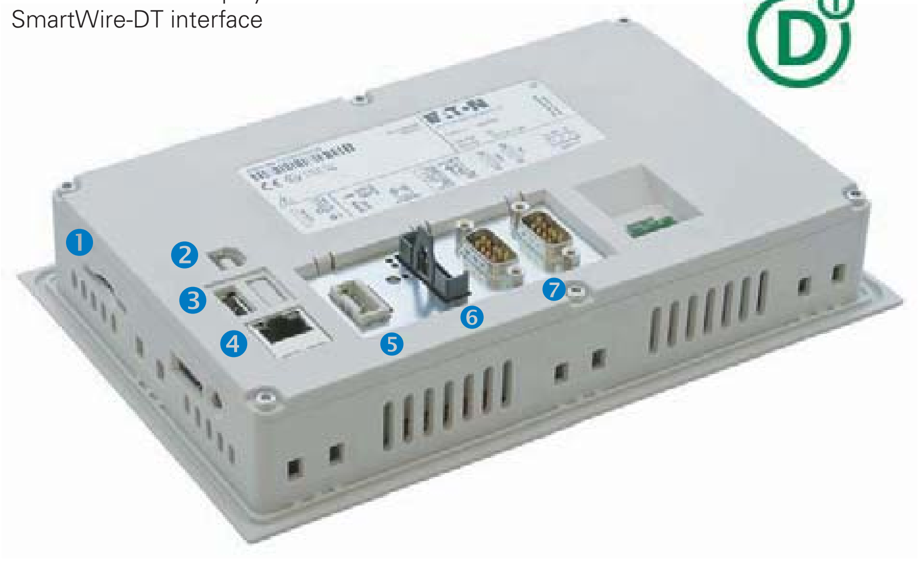
XV100

Despite its compact design, the XV100 offers maximum performance. Thanks to the small mounting depth the panels can also be installed where space is limited.

- Display sizes 3.5”, 5.7” and 7” widescreen
- Small mounting depth
- Ethernet interface onboard
- USB device
- Communication interfaces depending on type: RS232, RS485, Profibus/MPI and CAN/easyNet
- SmartWire-DT interface depending on type
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64MB
- External memory: 1 x SD card slot
- Resistive touch

	PLC function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	**Part no.** Article no.	**Part no.** Article no.
XV100 3.5” • Ethernet interface • Approval UL508, cUL		• Mounting dimensions 123 x 87mm • Resolution 320 x 240						
	No	32 gray-scales	-	-	-	-	**XV-102-A0-35MQR-10** 141759	
			-	-	●	-	**XV-102-A2-35MQR-10** 141820	
			●	-	-	-	**XV-102-A3-35MQR-10** 141821	
			-	●	-	-	**XV-102-A4-35MQR-10** 141822	
			●	-	-	●	**XV-102-A5-35MQR-10** 141823	
	Can be retrofitted	64k colors	-	-	-	-	**XV-102-B0-35TQR-10** 140007	
			-	-	●	-	**XV-102-B2-35TQR-10** 140008	
			●	-	-	-	**XV-102-B3-35TQR-10** 140009	
			-	●	-	-	**XV-102-B4-35TQR-10** 140010	
			●	-	-	●	**XV-102-B5-35TQR-10** 140011	
	Integra-ted	32 gray-scales	-	-	-	-	**XV-102-B0-35MQR-10- PLC** 140012	
			●	-	-	-	**XV-102-B3-35MQR-10- PLC** 140013	
			-	●	-	-	**XV-102-B4-35MQR-10- PLC** 140014	
			●	-	-	●	**XV-102-B5-35MQR-10- PLC** 140015	
			-	●	-	●	**XV-102-B6-35MQR-10- PLC** 140016	
			-	●	●	-	**XV-102-B8-35MQR-10- PLC** 140017	
	Integra-ted	64k colors	-	-	-	-	**XV-102-B0-35TQR-10- PLC** 140018	**XV-102-BE-35TQRC-10** 153524
			●	-	-	-	**XV-102-B3-35TQR-10- PLC** 140019	
			-	●	-	-	**XV-102-B4-35TQR-10- PLC** 140020	
			●	-	-	●	**XV-102-B5-35TQR-10-PLC** 140021	
			-	●	-	●	**XV-102-B6-35TQR-10-PLC** 140022	
			-	●	●	-	**XV-102-B8-35TQR-10-PLC** 140023	

XV100 with a 7″ display and SmartWire-DT interface



- ❶ SD memory card
- ❷ USB device
- ❸ USB host
- ❹ Ethernet
- ❺ POW and AUX 24 V power supplies
- ❻ SmartWire-DT interface
- ❼ Onboard interfaces, depending on type

	PLC function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	**Part no.** Article no.	**Part no.** Article no.
XV100 5.7″ • Ethernet and USB host interface • Approval UL508, cUL		• Mounting dimensions 157 x 117 mm • Resolution 640 x 480						
	Can be retrofitted	64 k	●		-	-	**XV-102-D0-57TVR-10** 142530	
			●	●	-	-	**XV-102-D4-57TVR-10** 150620	
			●	●	-	●	**XV-102-D6-57TVR-10** 142531	
			●	●	●	-	**XV-102-D8-57TVR-10** 142532	
	Integrated	64 k	● / -	●	-	●	**XV-102-D6-57TVRC-10** 142533	**XV-102-E6-57TVRC-10** 153525
			● / -	●	●	-	**XV-102-D8-57TVRC-10** 142534	**XV-102-E8-57TVRC-10** 153526
Variant without front frame from rear mounting 	Integrated	64 k	●	●	-	●	**XV-112-D6-57TVRC-00** 153469	
XV100 7″ widescreen • Ethernet and USB host interface • Approval UL508, cUL		• Mounting dimensions 197 x 122 mm • Resolution 800 x 480						
	Can be retrofitted	64 k	●	-	-	-	**XV-102-D0-70TWR-10** 142535	
			●	●	-	-	**XV-102-D4-70TWR-10** 150621	
			●	●	-	●	**XV-102-D6-70TWR-10** 142536	
			●	●	●	-	**XV-102-D8-70TWR-10** 142537	
	Integrated	64 k	● / -	●	-	●	**XV-102-D6-70TWRC-10** 142538	**XV-102-E6-70TWRC-10** 153527
			● / -	●	●	-	**XV-102-D8-70TWRC-10** 142539	**XV-102-E8-70TWRC-10** 153528
Variant without front frame from rear mounting 	Integrated	64 k	●	-	-	2 x	**XV-112-DB-70TWRC-00** 153470	

XV150

HMI/PLC with touch display

E·T·N
CoDeSys Automation Alliance

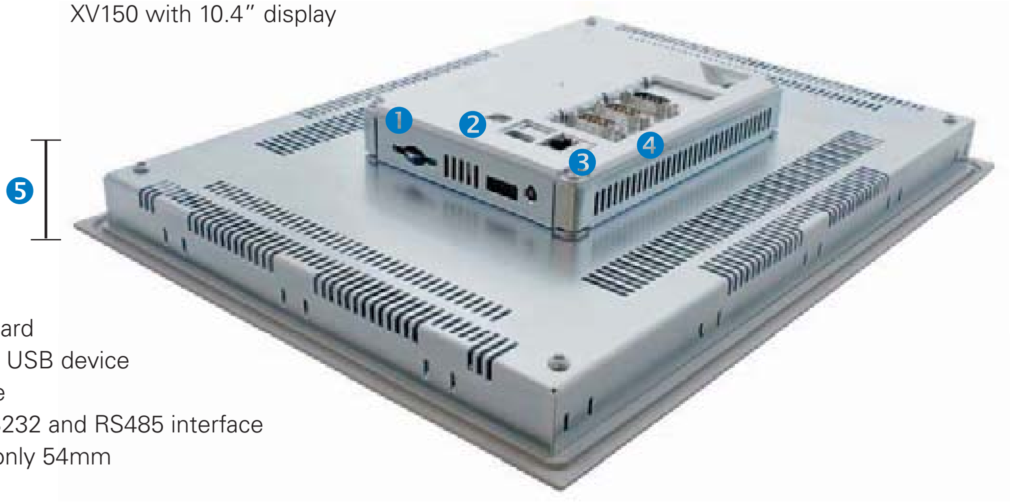
XV150

The small mounting depth, the robust metal housing the comprehensive basic features of the XV150 devices make for an impressive range. The standard panels offer a USB host, Ethernet and RS232 interface and have the same mounting dimensions as the XV400 devices.

- Display sizes 5,7", 8,4" and 10,4"
- Small mounting depth
- Ethernet and RS232 interface onboard
- USB host
- Communication interface depending on type: RS232, RS485, Profibus/MPI and CAN/easyNet
- SmartWire-DT interface depending on type
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64MB
- External memory: 1 x SD card slot
- Resistive touch

	PLC function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	**Part no.** Article no.	**Part no.** Article no.
XV150 5.7" • Ethernet interface • USB host • Approval UL508, cUL • Mounting dimensions 198 x 142mm • Resolution 640 x 480								
	Can be retrofitted	64k colors	●	-	-	-	**XV-152-D0-57TVR-10** 150525	
			●	●	-	-	**XV-152-D4-57TVR-10** 150526	
			●	●	-	●	**XV-152-D6-57TVR-10** 150527	
			●	●	●	-	**XV-152-D8-57TVR-10** 150528	
	Integrated	64k colors	● / -	●	-	●	**XV-152-D6-57TVRC-10** 150529	**XV-152-E6-57TVRC-10** Scheduled for Q3/2011
			● / -	●	●	-	**XV-152-D8-57TVRC-10** 150600	**XV-152-E8-57TVRC-10** Scheduled for Q3/2011
XV150 8.4" • Ethernet interface • USB host • Approval UL508, cUL • Mounting dimensions 261 x 194mm • Resolution 640 x 480								
	Can be retrofitted	64k colors	●	-	-	-	**XV-152-D0-84TVR-10** 150601	
			●	●	-	-	**XV-152-D4-84TVR-10** 150602	
			●	●	-	●	**XV-152-D6-84TVR-10** 150603	
			●	●	●	-	**XV-152-D8-84TVR-10** 150604	
	Integrated	64k colors	● / -	●	-	●	**XV-152-D6-84TVRC-10** 150605	**XV-152-E6-84TVRC-10** Scheduled for Q3/2011
			● / -	●	●	-	**XV-152-D8-84TVRC-10** 150606	**XV-152-E8-84TVRC-10** Scheduled for Q3/2011

XV150 with 10.4” display



1. 1 x SD memory card
2. 1 x USB host, 1 x USB device
3. Ethernet interface
4. CAN/easyNet, RS232 and RS485 interface
5. Mounting depth only 54mm

	PLC function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	**Part no.** Article no.	**Part no.** Article no.
XV150 10.4” • Ethernet interface • USB host • Approval UL508, cUL • Mounting dimensions 329 x 238mm • Resolution 640 x 480								
	Can be retrofitted	64k colors	●	-	-	-	**XV-152-D0-10TVR-10** 150607	
			●	●	-	-	**XV-152-D4-10TVR-10** 150608	
			●	●	-	●	**XV-152-D6-10TVR-10** 150609	
			●	●	●	-	**XV-152-D8-10TVR-10** 150610	
	Integrated	64k colors	● / -	●	-	●	**XV-152-D6-10TVRC-10** 150611	**XV-152-E6-10TVRC-10** Scheduled for Q3/2011
			● / -	●	●	-	**XV-152-D8-10TVRC-10** 150612	**XV-152-E8-10TVRC-10** Scheduled for Q3/2011

XV200

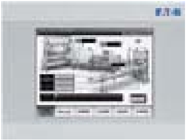
HMI/PLC with touch display

CoDeSys
Automation
Alliance

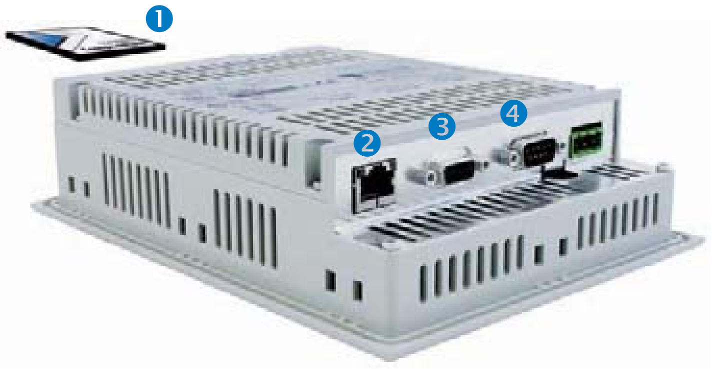
XV200

The XV200 devices are available with either a fully graphical monochrome or color display and offer a wide range of communication and networking options.

- Display size 5.7″
- Ethernet interface onboard
- USB device
- Communication interface depending on type: RS232, Profibus/MPI and CAN/easyNet
- Processor: RISC CPU, 32-bit, 200 MHz
- OS, program and data memory: 32MB
- External memory: 1 x CompactFlash card slot
- Resistive touch

	PLC function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	**Part no.** Article no.
XV200 5.7″ • Ethernet interface • Approval UL, cUL • Mounting dimensions 198 x 142mm • Resolution 320 x 240							
	Can be retrofitted	256 grayscales	-	-	-	●	**XV-230-57CNN-1-10** 139951
			-	-	●	-	**XV-230-57MPN-1-10** 139952
			●	-	-	-	**XV-232-57BAS-1-10** 139950
	Can be retrofitted	256 colors	●	-	-	●	**XV-252-57CNN-1-10** 139956
			●	-	●	-	**XV-252-57MPN-1-10** 139957

XV200 with two communication interfaces



1. CompactFlash memory card
2. Ethernet
3. CAN/easyNet or Profibus/MPI interface
4. RS232 interface

EATON
CoDeSys Automation Alliance

XV400

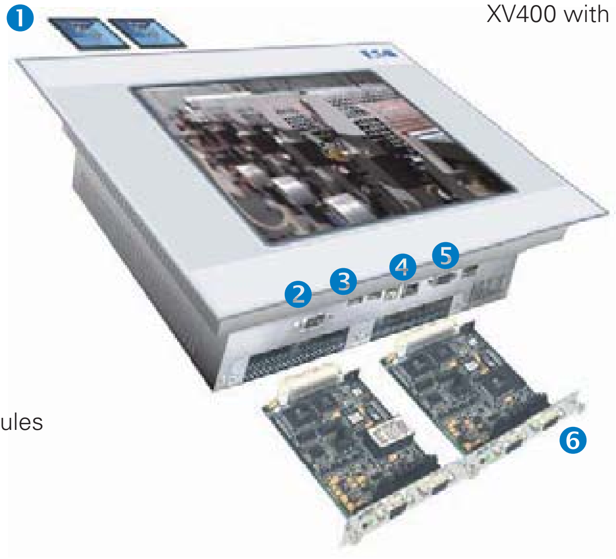
With one or two communication modules, the devices of the XV400 series offer a wide range of communication options. The robust infra-red touch technology enables use even in the harshest environments.

- Display sizes 5.7", 8.4", 10.4", 12.1" and 15"
- Ethernet, USB host, RS232 and CAN/easyNet onboard
- Over 100 communication protocols possible thanks to optional communication modules
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64MB
- External memory: 1 or 2 x CompactFlash card slot
- 5.7" devices with stainless steel front, suitable for high-pressure cleaning (degree of protection IP69K)
- 10.4" and 12.1" devices with stainless steel front for use in explosive atmospheres (Ex Zone 1)
- Infra-red or resistive touch

	PLC function	Touch / Front	Optional communication modules	RS232	CAN/ easyNet	**Part no.** Article no.
XV400 5.7" • Ethernet and USB host interface • Adjustable 256 or 65,536 colors • Approval UL, cUL • Mounting dimensions 198 x 142mm • Resolution 320 x 240						
	Can be retro-fitted	Resistive / Standard	1 x	●	●	**XV-450-57TQB-1-10** 139899
	Can be retro-fitted	Infra-red / Standard	1 x	●	●	**XV-460-57TQB-1-10** 139897
	Can be retro-fitted	Infra-red / Stainless steel	1 x	●	●	**XV-460-57TQB-1-50** 139898
XV400 8.4" • Ethernet and USB host interface • Adjustable 256 or 65,536 colors • Approval UL, cUL • Mounting dimensions 261 x 194mm • Resolution 640 x 480						
	Can be retro-fitted	Infra-red / Standard	1 x	●	●	**XV-460-84TVB-1-10** 139900

XV400

HMI/PLC with touch display

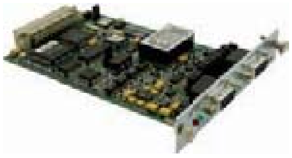


XV400 with 10.4” display

- ❶ 2 x CompactFlash memory card
- ❷ CAN/easyNet interface
- ❸ 2 x USB host, 1 x USB device
- ❹ Ethernet interface
- ❺ RS232 interface
- ❻ 2 x slot for communication modules

	PLC function	Touch / Front	Optional communication modules	RS232	CAN/ easyNet	**Part no.** Article no.
XV400 10.4” • Ethernet and USB host interface • Adjustable 256 or 65’536 colors • Approval UL, cUL	• Mounting dimensions 329 x 238mm • Resolution 640 x 480					
	Can be retro-fitted	Resistive / Standard	2 x	●	●	**XV-430-10TVB-1-10** 139902
	Can be retro-fitted	Infra-red / Standard	2 x	●	●	**XV-440-10TVB-1-10** 139904
	Can be retro-fitted	Infra-red / Stainless steel	2 x	●	●	**XV-440-10TVB-1-50** 139908
XV400 12.1” • Ethernet and USB host interface • Adjustable 256 or 65’536 colors • Approval UL, cUL	• Mounting dimensions 344 x 262mm • Resolution 800 x 600					
	Can be retro-fitted	Resistive / Standard	2 x	●	●	**XV-430-12TSB-1-10** 139909
	Can be retro-fitted	Infra-red / Standard	2 x	●	●	**XV-440-12TSB-1-10** 139911
	Can be retro-fitted	Infra-red / Stainless steel	2 x	●	●	**XV-440-12TSB-1-50** 139915

	PLC function	Touch / Front	Optional communication modules	RS232	CAN/ easyNet	**Part no.** Article no.
## XV400 15" - Ethernet and USB host interface - Adjustable 256 or 65,536 colors - Approval UL, cUL - Mounting dimensions 410 x 315mm - Resolution 1024 x 768						
	Can be retro-fitted	Infra-red / Standard	2 x	●	●	**XV-460-15TXB-1-10** 139916
	Can be retro-fitted	Infra-red / Stainless steel	2 x	●	●	**XV-460-15TXB-1-50** 139918

	Protocol	**Part no.** Article no.
## Optional communication modules - Extract of the latest protocols		
	EIB (3rd release)	**COM-EIB2-TP** 139852
	Matushita FP Series Mitsubishi A Series / F Series Eaton Suconet Omron C, H, K Series Telemecanique Unitelway new	**COM-MPB1-TP** 139850 **COM-MPB2-TP** 139847
	Profibus DP master (12MBaud)	**COM-DPM-MC2** 139853
	Profibus DP slave (12MBaud)	**COM-PDP-TP** 139849
	Siemens MPI	**COM-MPB2-TP** 139847

XVS400

HMI/PLC with touch display

Data login
KAMERA
ALARME
REZEPT
SYSTEM
CoDeSys Automation Alliance

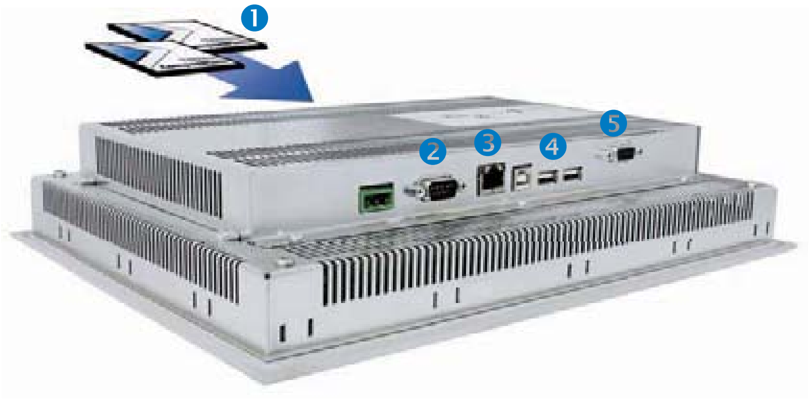
XVS400

The compact XVS400 devices are designed for worldwide use. With the Profibus master interface provided as standard, and the infra-red touch, the devices offer a high degree of flexibility.

- Display sizes 5.7″, 8.4″, 10.4″, 12.1″ and 15″
- Compact
- Ethernet, USB host, RS232 and Profibus/MPI interface onboard
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64MB
- External memory: 1 or 2 x CompactFlash card slot
- Infra-red or resistive touch

	PLC function	Touch / Front	Optional communication modules	RS232	Profibus/ MPI	**Part no.** Article no.
XVS400 5.7″ • Ethernet and USB host interface • Adjustable 256 or 65’536 colors • Approval UL, cUL • Mounting dimensions 198 x 142mm • Resolution 320 x 240						
	Can be retro-fitted	Resistive / Standard	–	●	●	**XVS-450-57MPI-1-10** 139969
	Can be retro-fitted	Infra-red / Standard	–	●	●	**XVS-460-57MPI-1-10** 139970
XVS400 8.4″ • Ethernet and USB host interface • Adjustable 256 or 65’536 colors • Approval UL, cUL • Mounting dimensions 261 x 194mm • Resolution 640 x 480						
	Can be retro-fitted	Infra-red / Standard	–	●	●	**XVS-460-84MPI-1-10** 139971
XVS400 10.4″ • Ethernet and USB host interface • Adjustable 256 or 65’536 colors • Approval UL, cUL • Mounting dimensions 329 x 238mm • Resolution 640 x 480						
	Can be retro-fitted	Resistive / Standard	–	●	●	**XVS-430-10MPI-1-10** 139972
	Can be retro-fitted	Infra-red / Standard	–	●	●	**XVS-440-10MPI-1-10** 139973

XVS400 with 12.1” display



- ❶ 2 x CompactFlash memory card
- ❷ RS232 interface
- ❸ Ethernet interface
- ❹ 2 x USB host, 1 x USB device
- ❺ Profibus/MPI interface

	PLC function	Touch / Front	Optional communication modules	RS232	Profibus/ MPI	**Part no.** Article no.
XVS400 12.1” • Ethernet and USB host interface • Adjustable 256 or 65,536 colors • Approval UL, cUL • Mounting dimensions 344 x 262mm • Resolution 800 x 600						
	Can be retro-fitted	Resistive / Standard	–	●	●	**XVS-430-12MPI-1-10** 139974
	Can be retro-fitted	Infra-red / Standard	–	●	●	**XVS-440-12MPI-1-10** 139975
XVS400 15” • Ethernet and USB host interface • Adjustable 256 or 65,536 colors • Approval UL, cUL • Mounting dimensions 410 x 315mm • Resolution 1024 x 768						
	Can be retro-fitted	Infra-red / Standard	–	●	●	**XVS-460-15MPI-1-10** 139976

XVM400

HMI mobile panel

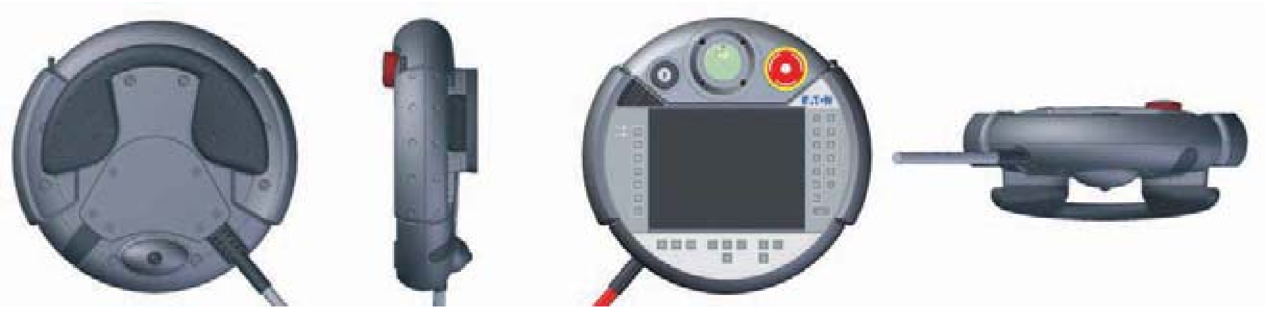
XVM400

The XV400 manual device is a portable HMI panel for industrial applications. A large number of protocols to the most popular controllers are available via the Ethernet interface.

- Display size 6.5″
- Portable and robust
- Drop safe up to a drop height of 1.5m
- Ethernet, USB host and RS232 interface onboard
- Processor: Xscale PXA 270, 416MHz
- OS, program and data memory: 64MB
- Resistive touch

	PLC function	3-stage Enable button, dual-circuit	Keyswitch actuator (3 positions)	Emergency-stop button, dual-circuit	Hand-wheel	**Part no.** Article no.
XVM400 6.5″ • Ethernet, USB host and RS232 interface • 65,536 colors • Approval UL, cUL • Diameter 250mm • Resolution 680 x 480						
	No	●	-	●	-	**XVM-430-65TVB-1-11** 139996
	No	●	●	●	●	**XVM-450-65TVB-1-11** 139998
	No	●	●	-	●	**XVM-410-65TVB-1-11** 139997

XVM-450 with keyswitch, emergency-stop button and handwheel



XVC100

HMI/PLC with text display

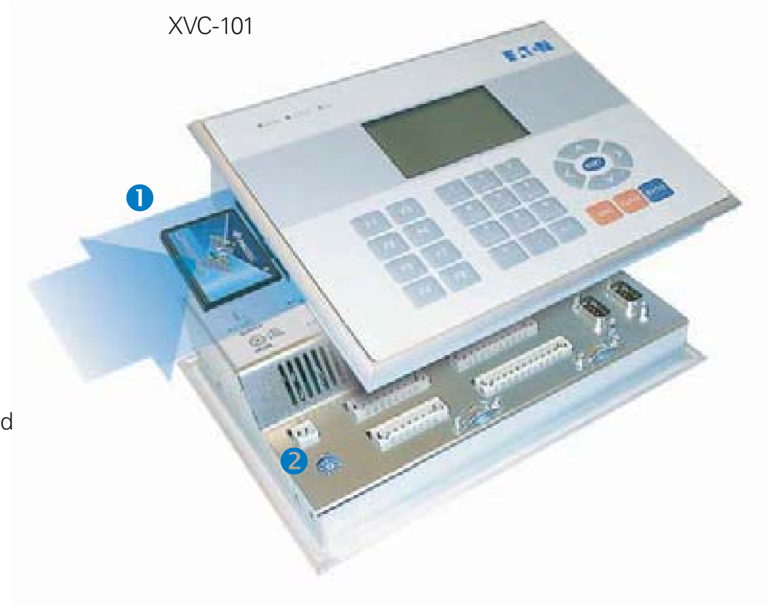
XVC-100
E·T·N
CoDeSys Automation Alliance

XVC100

The XVC100 compact display PLC combines an operator panel with a text display and a compact PLC in a single device. This device concept offers a wide range of automation and network options.

- Text display with 8 x 20 characters
- Membrane keyboard
- Integrated CAN bus
- CAN/easyNet and RS232 interface onboard
- Processor: c166
- OS, program and data memory: 56KB / 384KB
- External memory: 1 x CompactFlash card

	Inputs / outputs onboard	RS232	CAN/ easyNet	**Part no.** Article no.
XVC100 • Text display with 8 x 20 characters • Membrane keyboard • Approval UL, cUL • Dimensions 212 x 156 x 60mm				
	10 digital inputs 8 digital outputs, 24 V/0.5 A 8 configurable digital inputs/outputs 2 analog inputs, 0 – 10 V/10-bit 2 analog outputs, +/-10 V/12-bit 2 counter inputs, 50 kHz 2 interrupt inputs 1 encoder input, 50 kHz	●	●	**XVC-101-C192K-K82** 139929



❶ 1 x CompactFlash memory card
❷ Plug, accessible from rear

EATON
Data login
KAMERA
ALARME
REZEPT
SYSTEM
Overview
Data login
KAMERA
ALARME
REZEPT
SYSTEM

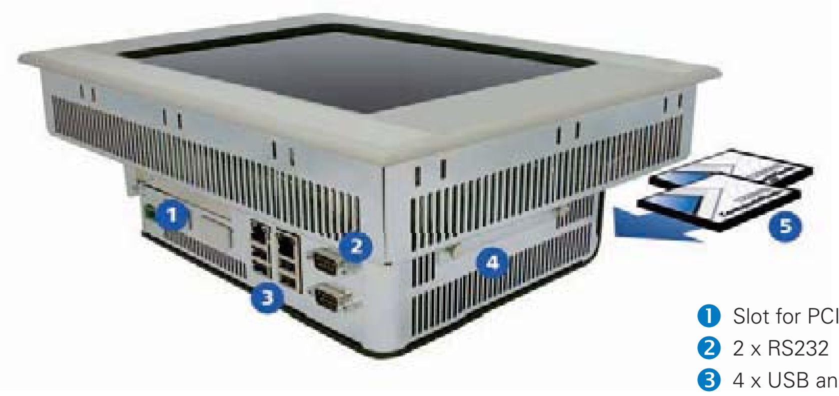
XP700 Industrial PC

The XP700 industrial PC series is suitable for installation in the front of a switch cabinet and also as a box PC for mounting inside the switch cabinet. The robust design, combined with the uniquely rugged infrared touch technology in safety glass, makes it suitable for use even in the harshest industrial environment. The highly integrated mother board in different processor versions, different display sizes, the choice between Windows XP or Windows XP Embedded and the free PCI slot enables the right solution to be found for any application. Equipped with a Compact-Flash memory and a 1GHz processor, an XP700 does not contain any rotating parts. A hard disk is also available as an alternative.

This powerful version is equipped with a fan that can be easily mounted externally. The powerful combination of infra-red touch technology and industrial PC stands out on account of the compact housing design and small mounting dimensions. Whether for machine building, system building or individual applications, industrial PCs from Eaton offer a maximum degree of openness and excellent performance specifications.

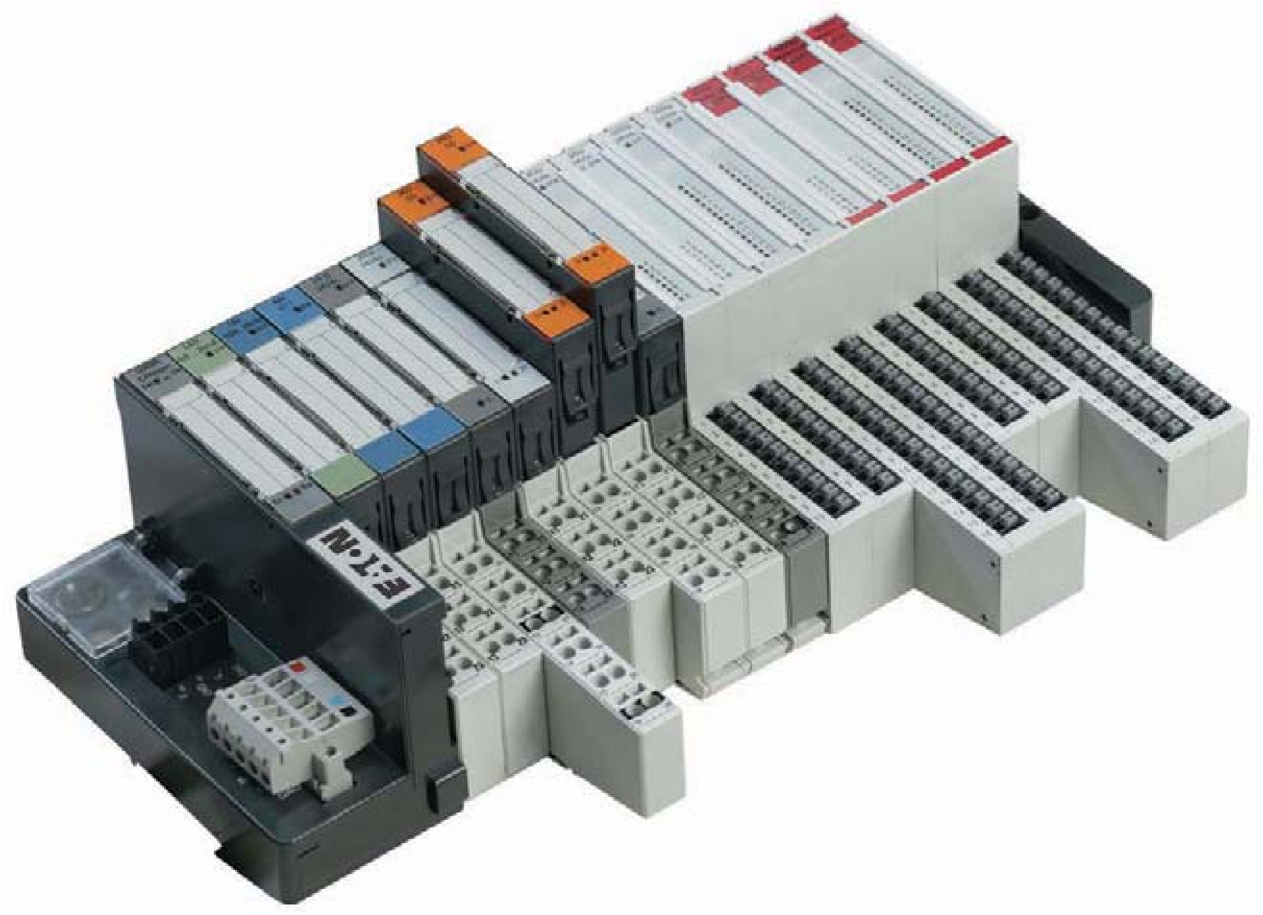
XP700

Industrial PC



❶ Slot for PCI module
❷ 2 x RS232
❸ 4 x USB and 2 x Ethernet
❹ Slot for optional hard disk
❺ Slot for up to 2 optional CompactFlash cards

	Resolution	Processor	Memory	Video Interface	Fan	**Part no.** Article no.
XP700 8.4” • Infra-red TFT-LCD color display • Approval UL, cUL	• 2 x Ethernet interface • Mounting dimensions 261 x 194mm					
	SVGA 800 x 800	Pentium 1GHz	1024MB	VGA	-	**XP-702-C0-84TSI-10** 140024
	SVGA 800 x 800	Pentium 1.8GHz	2048MB	VGA	●	**XP-702-D0-84TSI-10** 140029
XP700 10.4” • Infra-red TFT-LCD color display • Approval UL, cUL	• 2 x Ethernet interface • Mounting dimensions 329 x 238mm					
	SVGA 800 x 600	Pentium 1GHz	1024MB	VGA	-	**XP-702-C0-10TSI-10** 140025
	SVGA 800 x 600	Pentium 1.8GHz	2048MB	VGA	●	**XP-702-D0-10TSI-10** 140030
XP700 12.1” • Infra-red TFT-LCD color display • Approval UL, cUL	• 2 x Ethernet interface • Mounting dimensions 344 x 262mm					
	XGA 1024 x 768	Pentium 1GHz	1024MB	VGA	-	**XP-702-C0-12TXI-10** 140026
	XGA 1024 x 768	Pentium 1.8GHz	2048MB	VGA	●	**XP-702-D0-12TXI-10** 140031
XP700 15” • Infra-red TFT-LCD color display • Approval UL, cUL	• 2 x Ethernet interface • Mounting dimensions 410 x 315mm					
	XGA 1024 x 768	Pentium 1GHz	1024MB	VGA	-	**XP-702-C0-15TXI-10** 140027
	XGA 1024 x 768	Pentium 1.8GHz	2048MB	VGA	●	**XP-702-D0-15TXI-10** 140032
XP700 Box • 2 x Ethernet interface • Approval UL, cUL • Dimensions 262 x 194mm						
	-	Pentium 1GHz	1024MB	VGA / DVI	-	**XP-702-Ca0-BOX-00** 140028
	-	Pentium 1.8GHz	2048MB	VGA / DVI	●	**XP-702-D0-BOX-00** 140033



XI/ON - The Modular I/O System

CoDeSys Automation Alliance

CANopen
DeviceNet™
Ethernet
PROFIBUS

Whether for controlling movements, measuring temperature or speed, or logging currents and voltagesl the application ranges for remote I/Os are as extensive as the different applications involved. They are used wherever decentralized signal processing is the essential element of the automation concept.

Thanks to the high modularity of the XI/ON system and the wide range of functions, Eaton is able to offer the right I/O solution for every application. XI/ON: A modular concept with simple handling – adaptable to any application, intelligent and ready for future developments.

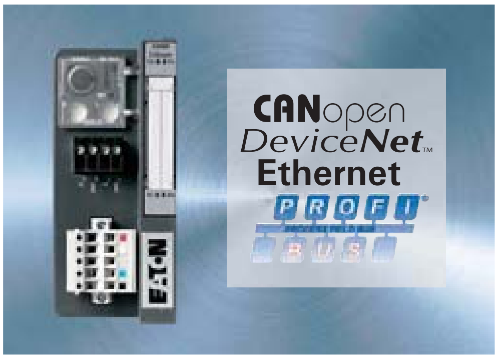
Quicklink Online catalogue to
www.eaton.com/moellerproducts

MBC003

XI/ON ECO gateways and ECO modules

XI/ON ECO completes the XI/ON I/O system with price and space optimized I/O modules and gateways. The ECO gateways use the CANopen, PROFIBUS DP and Ethernet bus systems.

- ECO gateways with integrated bus terminating resistors
- Full compatibility with the standard XI/ON system
- No base module required
- High channel density (up to 16 DI/DO on 12.5 mm width)
- "Push-In" spring-loaded terminals
- Multi-functional slices
- Diagnostics interface



XI/ON standard gateways and standard modules

The standard gateways use the CANopen, PROFIBUS DP, DeviceNet and Ethernet bus systems.

- The use of pluggable I/O modules is independent of the fieldbus used
- Wiring is implemented on the base module, fixed wiring
- Fast module exchange (hot swapping)
- Generation of diagnostics information to higher-level controller
- Up to 74 slice modules can be connected per gateway
- Mechanical coding of modules
- Diagnostics interface

CoDeSys
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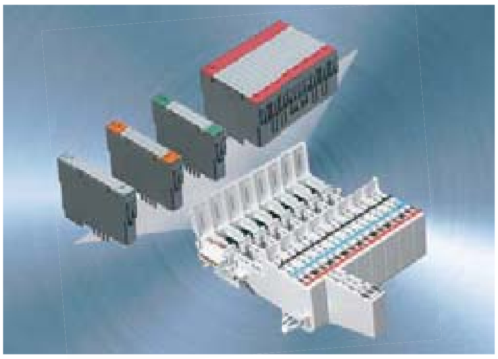
Alliance

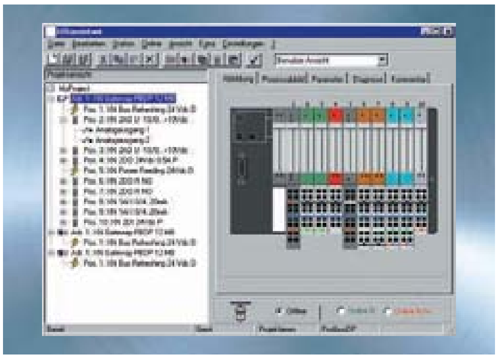
Programmable CANopen gateway

The programmable CANopen gateway brings the power of the PLC directly to the fieldbus terminal. The device is ideal for handling decentralized automation tasks and thus for relieving the load of a higher-level PLC.
The serial onboard interface is used for local programming access and as an interface for the I/Oassistant configuration and diagnostics tool. Alternatively, this interface can also be used as a free user interface. The gateway is programmed with XSOFT-CODESYS-2.



Base modules for every requirement

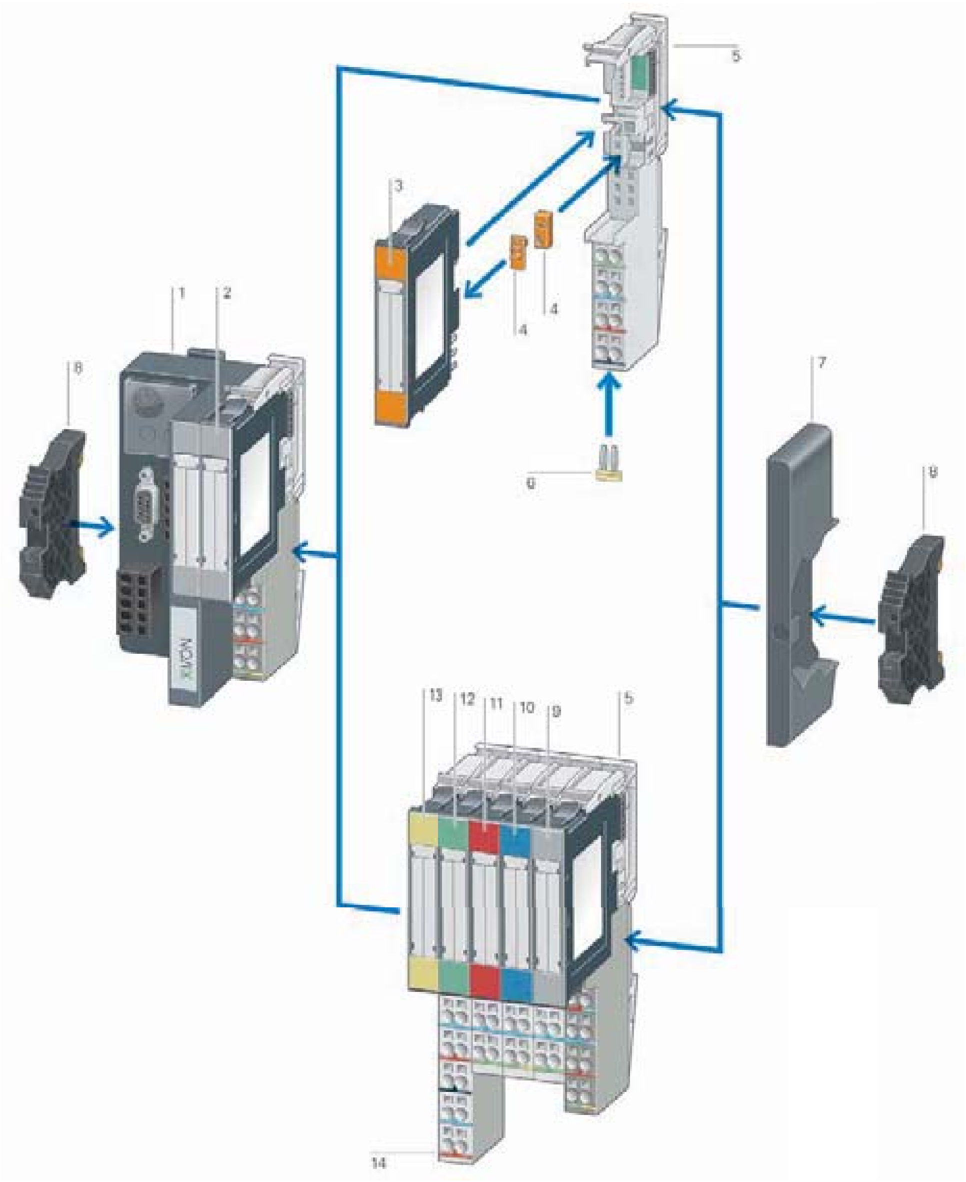
The base modules are used to connect the field wiring for the standard XI/ON modules. They are available for 2, 3 and 4-wire connections, as block or slice modules, with either spring-loaded terminals or screw terminals – the right format for every application.



I/Oassistant – the universal configuration and diagnostics tool

The I/Oassistant provides you with a universal tool that offers interactive support with the entire planning and implementation of your XI/ON installation.
The I/Oassistant is integrated in XSOFT-CODESYS-2.
A project is first of all created and structured on the screen. For this you choose gateways, electronic and base modules as well as the appropriate accessories. The individual stations are then configured offline or online. Once everything is set to your satisfaction, you simply put your installation into operation. The I/Oassistant also automatically generates a parts list for your order.

I/Oassistant checks the station, reads the process data, outputs values and visualizes the diagnostics data of the channel. This enables you to commission your station without a higher-level PLC and ensure that a section of the system is functioning correctly.



1. Gateway
2. Digital input module
3. Relay module
4. Coding element
5. Base module
6. Relay jumper
7. End plate
8. End bracket
9. Power supply module
10. Analog input module
11. Digital output module
12. Analog output module
13. Technology module
14. Marker

XI/ON

As many as needed, as few as possible – this is the principle on which the XI/ON modular I/O system was built. An extensive range of digital and analog I/Os as well as technology modules are available.

- High level of modularity
- Fieldbuses: CANopen, Profibus-DP, DeviceNet and Ethernet
- Bus-independent, pluggable modules
- Low wiring requirement
- Precise diagnostics
- Space and cost saving with ECO modules
- Programmable CANopen gateway
- Standard and ECO modules can be mixed

XI/ON ECO gateways

- Push-in spring-loaded terminals
- System power supply 24 V DC/5 V DC
- Ripple < 5% (to EN 61131-2)
- Approvals UL508, cUL

	Fieldbus / Protocol	Data transfer rate	Connections, fieldbus	Addressing	**Part no.** Article no.
	Profibus DP / Profibus DPV0, Profibus DPV1	9.6 - 12,000 Kbit/s	Push-in spring-loaded terminals	Via DIP switch	**XNE-GWBR-PBDP** 140045
	CANopen / CANopen	20, 50, 125, 250, 500, 800, 1,000 Kbit/s	Push-in spring-loaded terminals	Via DIP switch	**XNE-GWBR-CANOPEN** 140044
	Ethernet / Ethernet IP	10,000, 100,000 Kbit/s	2x RJ45 socket	Via DIP switch, BootP, DHCP or PGM	**XNE-GWBR-2ETH-IP*** 140047
	Ethernet / Modbus TCP	10,000, 100,000 Kbit/s	RJ45 Ethernet switch	Via DIP switch, BootP, DHCP or PGM	**XNE-GWBR-2ETH-MB*** 152279

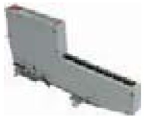
XI/ON ECO digital input modules

- Base module integrated
- Approvals UL508, cUL

	Channels	Rated voltage via power supply terminal	Input delay trise / tfall	Input voltage high signal	**Part no.** Article no.
	8	24 V DC	< 100 / < 200 µs	11 V - U_L	**XNE-8DI-24VDC-P** 140035
	16	24 V DC	< 150 / < 300 µs	11 V - U_L	**XNE-16DI-24VDC-P** 140040

XI/ON ECO digital output modules

- Base module integrated
- Resistive, inductive and lamp load connectable
- Approvals UL508, cUL

	Channels	Rated voltage via power supply terminal	Switching frequency with resistive load in Hz	Utilization factor g in %	**Part no.** Article no.
	8	24 V DC	<100	100	**XNE-8DO-24VDC-0.5A-P** 140036
	16	24 V DC	<100	50%, max. 4 A	**XNE-16DO-24VDC-0.5A-P** 140039

XI/ON ECO analog input modules

- Base module integrated
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL

	Channels	Measured variables	Measuring ranges	Value representation	Limit frequency in Hz	**Part no.** Article no.
	8 (U/I) / 4 (PT/NI/R)	Voltage, current temperature (PT, NI), resistance R	-10...10 V DC / 0...10 V DC PT100, 200, 500, 1000, Ni100, 1000 2/3-wire	Standard, 16-bit/12-bit (flush-left) Extended range, 16-bit/12-bit (flush-left) PA (NE43), 16-bit/12-bit (flush-left)	1.5	**XNE-8AI-U/I-4PT/NI** 140037

XI/ON ECO analog output modules

- Base module integrated
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL

	Channels	Measured variables	Output variables	Value representation	**Part no.** Article no.
	4	Voltage, current	-10 - 10 V DC / 0 - 10 V DC 0 – 20 mA 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	**XNE-4AO-U/I*** 140034

*** Approval UL508, cUL applied for**

XI/ON ECO technology module: Counter module

- Base module integrated
- Rated voltage via power supply terminal: 24 V DC
- Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple
- Approvals UL508, cUL

	Chan-nels	Operating modes	Pulse duration	PWM module	Resolution	**Part no.** Article no.
	2	Continuous, once only and periodic counting	32-bit / max. 120 s	●	32-bit	**XNE-2CNT-2PWM*** 140038

XI/ON standard gateways with integrated power supply module

- Spring-loaded terminal/screw terminal
- System power supply 24 V DC/5 V DC
- Ripple < 5% (to EN 61131-2)
- Approvals UL508, cUL

	Fieldbus / Protocol	Data transfer rate	Connections, fieldbus	Addressing	**Part no.** Article no.
	Profibus DP / Profibus DPV0	9.6 - 12,000 Kbit/s	1 x SUB-D socket, 9-pole	2 decimal rotary coding switches	**XN-GWBR-PBDP** 140154
	Profibus DP / Profibus DPV1	9.6 - 12,000 Kbit/s	1 x SUB-D socket, 9-pole	2 decimal rotary coding switches	**XN-GWBR-DPV1** 148561
	CANopen / CANopen	10, 20, 50, 125, 250, 500, 800, 1,000 Kbit/s	Open style connector	2 decimal rotary coding switches	**XN-GWBR-CANOPEN** 140155
	DeviceNet / DeviceNet	125, 250, 500 Kbit/s	Open style connector	2 decimal rotary coding switches	**XN-GWBR-DNET** 140156
	Ethernet / Modbus-TCP	10,000, 100,000 Kbit/s	RJ45 socket	Decimal rotary coding switch, BootP, DHCP or I/Oassistant	**XN-GWBR-MODBUS-TCP*** 140162
	CANopen / CANopen	10, 20, 50, 125, 250, 500, 800, 1,000 Kbit/s	Open style connector	Software	**XN-PLC-CANOPEN** 140157

XI/ON standard power supply module

- Number of diagnostics bits: 4
- Ripple < 5% (to EN 61131-2)
- Approvals UL508, cUL

	Operating and field voltage	System power supply	Rated current consumption from Modbus	Max. system supply current	**Part no.** Article no.
	24 V DC	24 V DC	–	1.5 A	**XN-BR-24VDC-D** 140071
	24 V DC	–	≤ 28 mA	–	**XN-PF-24VDC-D** 140070
	120/230 V AC	–	≤ 25 mA	–	**XN-PF-120/230VAC-D** 140072

XI/ON standard digital input modules

- Base module required
- Approvals UL508, cUL

	Channels	Rated voltage via power supply terminal	Input delay trise / tfall	Input voltage high signal	**Part no.** Article no.
	2	24 V DC	< 200 / < 200 µs	11 - 30 V	**XN-2DI-24VDC-P** 140056
	2	24 V DC	< 200 / < 200 µs	0 - 5 V	**XN-2DI-24VDC-N** 140057
	2	120/230 V AC	< 20000 / < 20000 µs	79 V AC - 265 V AC	**XN-2DI-120/230VAC** 140058
	4	24 V DC	< 200 / < 200 µs	15 - 30 V	**XN-4DI-24VDC-P** 140052
	4	24 V DC	< 200 / < 200 µs	0 - 5 V	**XN-4DI-24VDC-N** 140059
	16	24 V DC	< 200 / < 200 µs	15 - 30 V	**XN-16DI-24VDC-P** 140142
	32	24 V DC	< 200 / < 200 µs	15 - 30 V	**XN-32DI-24VDC-P** 140147

XI/ON standard digital output modules

- Base module required
- Resistive, inductive and lamp load connectable
- Approvals UL508, cUL

	Channels	Rated voltage via power supply terminal	Switching frequency with resistive load in Hz	Utilization factor g in %	**Part no.** Article no.
	2	24 V DC	< 5000 (R_{LO} < 1 kΩ)	100	**XN-2DO-24VDC-0.5A-P** 140053
	2	24 V DC	< 100 (R_{LO} < 1 kΩ)	100	**XN-2DO-24VDC-0.5A-N** 140060
	2	120-230 V AC (45 - 65 Hz)	–	100 (observe derating requirements)	**XN-2DO-120/230VAC-0.5A** 140150
	2	24 V DC	< 5000 (R_{LO} < 1 kΩ)	100	**XN-2DO-24VDC-2A-P** 140055
	4	24 V DC	< 1000 (R_{LO} < 1 kΩ)	100	**XN-4DO-24VDC-0.5A-P** 140148
	16	24 V DC	< 100 (R_{LO} < 1 kΩ)	100	**XN-16DO-24VDC-0.5A-P** 140141
	32	24 V DC	< 100 (R_{LO} < 1 kΩ)	See total module current	**XN-32DO-24VDC-0.5A-P** 140161

XI/ON standard analog input modules

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL

	Channels	Measured variables	Measuring range	Value representation	Limit frequency in Hz	**Part no.** Article no.
	1	Current	0 - 20 mA / 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	–	**XN-1AI-I(0/4...20MA)** 140063
	2	Current	0 - 20 mA / 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	–	**XN-2AI-I(0/4...20MA)** 140144
	1	Voltage	-10...10 V DC / 0...10 V DC	Standard, 16-bit/12-bit (flush-left)	200	**XN-1AI-U(-10/0...+10VDC)** 140064
	2	Voltage	-10...10 V DC / 0...10 V DC	Standard, 16-bit/12-bit (flush-left)	50	**XN-2AI-U(-10/0...+10VDC)** 140145
	4	Voltage, current	-10...10 V DC / 0...10 V DC	Standard, 16-bit/12-bit (flush-left)	20	**XN-4AI-U/I** 140158

XI/ON standard temperature modules

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL

	Channels	Connectable sensors	Measuring ranges ° C	Value representation	Part no.	**Part no.** Article no.
	2	Type B, E, J, K, N, R, S, T thermocouples	See technical documentation	Standard, 16-bit/12-bit (flush-left)	2-wire, cold junction compensation	**XN-2AI-THERMO-PI*** 140068
	2	PT100, 200, 500, 1000, Ni100, Ni1000	Platinum sensors: -200...850/-200...150 Nickel sensors: -60...250/-60...150	Standard, 16-bit/12-bit (flush-left)	2/3-wire	**XN-2AI-PT/NI-2/3** 140067

XI/ON standard analog output modules

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL

	Channels	Measured variables	Output variables	Value representation	**Part no.** Article no.
	1	Current	0 - 20 mA / 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	**XN-1AO-I(0/4...20MA)** 140065
	2	Current	0 - 20 mA / 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	**XN-2AO-I(0/4...20MA)** 140146
	2	Voltage	-10 - 10 V DC / 0 - 10 V DC	Standard, 16-bit/12-bit (flush-left)	**XN-2AO-U(-10/0...+10VDC)** 140066

*** Approval UL508, cUL applied for**

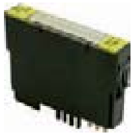
XI/ON standard relay modules

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Resistive, inductive and lamp load connectable
- Approvals UL508, cUL

	Channels	Contact type	Rated load voltage	Max. continuous current per channel/230 VAC resistive load	**Part no.** Article no.
	2	NC contact	230 V AC, 30 V DC	5 A	**XN-2DO-R-NC** 140061
	2	NO contacts	230 V AC, 30 V DC	5 A	**XN-2DO-R-NO** 140062
	2	Changeover contacts	230 V AC, 30 V DC	5 A	**XN-2DO-R-CO** 140054

XI/ON standard technology module: Counter module

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple
- Approvals UL508, cUL

	Channels	Operating modes	Pulse duration	PWM module	Resolution	**Part no.** Article no.
	1	Continuous, once only and periodic counting	8-bit / max. 0.51 s		32-bit	**XN-1CNT-24VDC** 140069

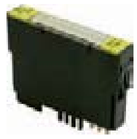
Maximum system configuration

	XNE-GWBR-PBDP		XNE-GWBR-CANOPEN		XNE-GWBR-2ETH-IP		XNE-GWBR-2ETH-MP	
Module	Channels	Module	Channels	Module	Channels	Module	Channels	Module
XN-4DI-24VDC-P	136	34	244	61	288	72	288	72
XN-4DI-24VDC-N	136	34	244	61	288	72	288	72
XN-16DI-24VDC-P	128	8	128	8	128	8	128	8
XN-32DI-24VDC-P	256	8	256	8	256	8	256	8
XNE-8DI-24VDC-P	384	48	512	64	512	64	512	64
XNE-16DI-24VDC-P	768	48	512	32	512	32	512	32
XN-4DO-24VDC-0.5A-P	132	33	244	61	288	72	288	72
XN-16DO-24VDC-0.5A-P	128	8	128	8	128	8	128	8
XN-32DO-24VDC-0.5A-P	256	8	256	8	256	8	256	8
XNE-8DO-24VDC-0.5A-P	384	48	488	61	512	64	512	64
XNE-16DO-24VDC-0.5A-P	640	40	512	32	512	32	512	32
XN-2DO-R-…	70	35	122	61	144	72	144	72
XN-2AI-I(0/4…20MA)	56	28	100	50	126	63	144	72
XN-2AI-U(-10/0…+10VDC)	56	28	100	50	126	63	144	72
XN-2AI-PT/NI-2/3	44	22	98	49	126	63	144	72
XN-2AI-THERMO-PI	44	22	98	49	126	63	144	72
XN-4AI-U/I	64 (132)	16 (33)	108	27	124	31	144	36
XNE-8AI-U/I-4PT/NI	72 (120)	9 (15)	144	18	128	16	144	18
XN-2AO-I(0/4…20MA)	50	25	70	35	126	63	144	72
XN-2AO-U(-10/0…+10VDC)	46	23	70	35	126	63	144	72
XNE-4AO-U/I	64 (76)	16 (19)	108	27	64	16	284	71
XN-1CNT-24VDC	13	13	27	27	31	31	72	72
XNE-2CNT-2PWM	16 (20)	8 (10)	72	36	32	16	32	16
XN-1RS232	7	7	27	27	31	31	68	68
XN-1RS485/422	16	16	27	27	31	31	72	72
XN-1SSI	20	20	27	27	31	31	72	72

Notes: Numerical values in brackets: Maximum number if the diagnostics messages are deactivated.
The XN-BR-24VDC-D power supply module must be fitted directly next to the XN-GW-... gateway in order to supply it.

XI/ON standard technology module: Interfaces

- Base module required
- Rated voltage via power supply terminal: 24 V DC
- Approvals UL508, cUL



Type	Transfer channels	Bit transfer rate	Cable length	**Part no.** Article no.
RS232	RxD, TxD, RTS, CTS	Max. 115,200 bit/s (adjustable)	Max. 15m	**XN-1RS232** 140151
RS485/RS422	RxD, TxD	Max. 115,200 bit/s (adjustable)	Max. 30m	**XN-1RS485/422** 140152
SSI	CL, D	Max. 1 MHz (adjustable)	Max. 30m	**XN-1SSI** 140153

XN-GWBR-PBDP		XN-GWBR-DPV1		XN-GWBR-CANOPEN		XN-GWBR-DNET		XN-GWBR-MODBUS-TCP		XN-PLC-CANOPEN		
Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Module
288	72	256	64	288	72	288	72	288	72	288	72	XN-4DI-24VDC-P
288	72	256	64	288	72	288	72	288	72	288	72	XN-4DI-24VDC-N
128	8	128	8	128	8	128	8	128	8	128	8	XN-16DI-24VDC-P
256	8	256	8	256	8	256	8	256	8	256	8	XN-32DI-24VDC-P
592	74	512	64	512	64	576	72	512	64	576	72	XNE-8DI-24VDC-P
1184	74	1024	64	512	32	1152	72	512	32	1008	63	XNE-16DI-24VDC-P
288	72	256	64	288	72	128	32	288	72	288	72	XN-4DO-24VDC-0.5A-P
128	8	128	8	128	8	128	8	128	8	128	8	XN-16DO-24VDC-0.5A-P
256	8	256	8	256	8	256	8	256	8	256	8	XN-32DO-24VDC-0.5A-P
592	74	512	64	512	64	256	32	512	64	576	72	XNE-8DO-24VDC-0.5A-P
1168	73	1024	64	512	32	512	32	512	32	1008	63	XNE-16DO-24VDC-0.5A-P
144	72	128	64	144	72	64	32	144	72	144	72	XN-2DO-R-…
78	39	78	39	144	72	32	16	144	72	144	72	XN-2AI-I(0/4…20MA)
78	39	78	39	144	72	32	16	144	72	144	72	XN-2AI-U(-10/0…+10VDC)
46	23	44	22	144	72	32	16	144	72	142	71	XN-2AI-PT/NI-2/3
58 (76)	29 (38)	58 (76)	29 (38)	144	72	32	16	144	72	142	71	XN-2AI-THERMO-PI
112	28	64 (132)	16 (33)	144	36	64	16	144	36	288	72	XN-4AI-U/I
-	-	72 (120)	9 (15)	144	18	128	16	144	18	-	-	XNE-8AI-U/I-4PT/NI
38	19	38	19	144	72	32	16	144	72	144	72	XN-2AO-I(0/4…20MA)
38	19	38	19	144	72	32	16	144	72	144	72	XN-2AO-U(-10/0…+10VDC)
36	9	64 (76)	16 (19)	144	36	64	16	124	31	260	65	XNE-4AO-U/I
7	7	13	13	72	72	16	16	72	72	71	71	XN-1CNT-24VDC
-	-	16 (20)	8 (10)	72	36	32	16	32	16	-	-	XNE-2CNT-2PWM
22	22	22	22	68	68	8	8	68	68	68	68	XN-1RS232
22	22	22	22	72	72	8	8	72	72	72	72	XN-1RS485/422
22	22	22	22	72	72	8	8	72	72	72	72	XN-1SSI

CoDeSys
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Modular and Compact PLCs

The XC100 and XC200 modular PLCs stand out on account of their highly scalable design. Different CPU performance classes and a wide range of expansion modules are available. An important feature is their ability to be integrated in modern communication concepts. Innovative solutions can be created thanks to the possibility to exchange data with OPC clients via the Ethernet interface and the integrated web server.

The compact class with the EC4P controllers now offer the performance of a PLC in the housing of the renowned easy control relay. This enables the convenient creation of solutions for small and medium-sized control tasks.

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MBC004

EC4P – Universal compact PLCs

The compact EC4P PLC system offers a host of functions for covering the automation tasks of small-scale applications in one device.

- Remotely expandable via CANopen or easyNet (e.g with EC4E modules)
- Locally expandable via the easyLink interface
- Remote programming via a network
- Communication via UDP and Modbus
- MFD-80-P display connection via CANopen or RS232
- Pluggable memory modules for data archiving

XC121 - the compact PLC for machine building

This PLC is particularly suitable for applications where space is at premium and with high communication requirements.

- Two serial and two CAN interfaces enable:
  a) the coupling of two CAN networks
  b) Modbus master/slave coupling (RS232 or RS485) – CAN
  c) RS232 – CAN coupling
- I/O expansion with 18 digital and 8 analog inputs/outputs
- 6 interrupt inputs
- Expandable with standard XI/OC modules

XC100 – modular PLCs

The modular PLCs of the XC100 series are universal automation devices for small and medium-sized applications.

- Locally expandable with up to 15 XI/OC modules
- Data storage on SD card
- CAN interface
- The XC-CPU101-FC has a fiber optic CAN interface
  → particularly suitable for environments with demanding EMC requirements

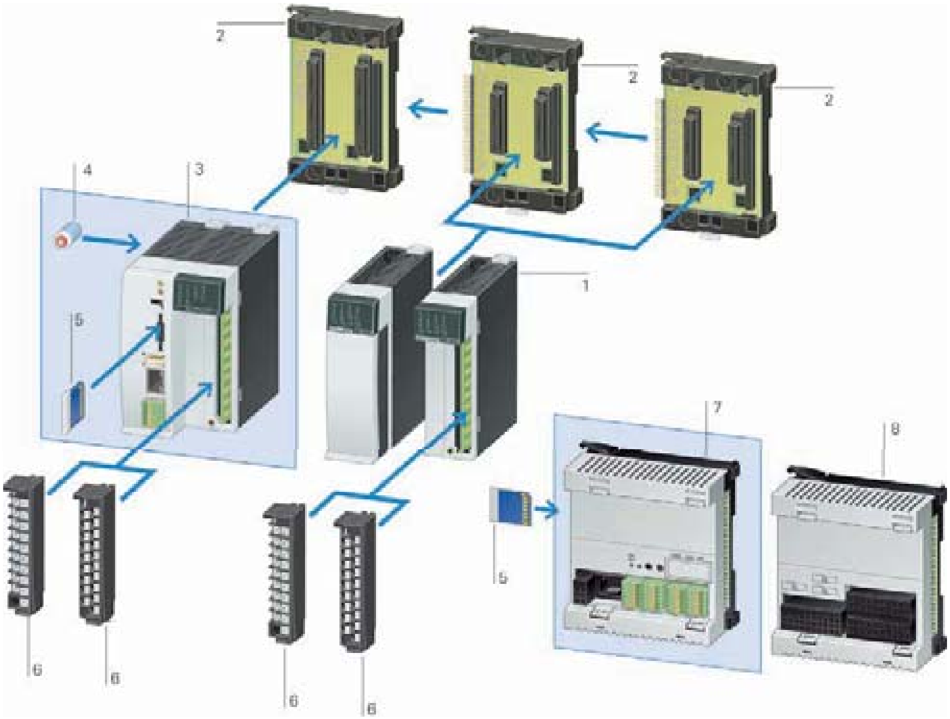
XC200 modular PLCs

The modular PLCs of the XC200 series offer a high CPU performance, a high speed and a wide range of communication options.

- Locally expandable with up to 15 XI/OC modules
- Ethernet interface for communication and programming
- CAN interface
- Data storage on SD card or USB stick
- WEB server enables visualization via CoDeSys
- Up to 3 IP addresses can be configured (XC202)
- Operating system update via Ethernet (with XC202), SD card or USB
- 29-bit CAN identifier (XC202)

Modular PLCs

System overview



1. XI/OC I/O modules, communication modules
2. Racks
3. XC100 / XC200
4. Battery
5. Memory card
6. XI/OC terminal block
7. XC121
8. EXT121-1

XC100

The modular PLC of the XC100 series is a powerful automation system for small and medium-sized applications. Locally expandable with up to 15 XI/OC modules.

XC-CPU101-FC

The XC-CPU101-FC is a modular PLC with an integrated CANopen fiber optic fieldbus interface. This makes it particularly suitable for use in environments with demanding EMC requirements.

XC200

The modular PLCs of the XC200 series offer a high CPU performance and outstanding communication options. These include the integrated Ethernet interface, as well as an RS232 interface and a CANopen fieldbus interface. All XV versions come with an integrated web server.

	Program memory size	Cycle time	Ethernet	CAN	Serial interface	Web server	**Part no.** Article no.

XC100

- 24 V power supply • Locally expandable with 15 XI/OC modules and remotely expandable
- The following accessories are required: Terminals, rack, battery
- PLC with 8 digital inputs (4 interrupt inputs) • 6 digital outputs • RS232 interface for programming and communication • CANopen interface • Slot for memory card • RUN/STOP switch and LED indication
- UL/CSA approval

	64 KByte	< 0.5 ms	-	1	1 x RS232	-	**XC-CPU101-C64K-8DI-6DO** 262152
	128 KByte	< 0.5 ms	-	1	1 x RS232	-	**XC-CPU101-C128K-8DI-6DO** 262146
	256 KByte	< 0.5 ms	-	1	1 x RS232	-	**XC-CPU101-C256K-8DI-6DO** 274399
	128 KByte	< 0.5 ms	-	1 fiber optic	1 x RS232	-	**XC-CPU101-FC128K-8DI-6DO** 289169

XC200

- 24 V power supply • Locally expandable with 15 XI/OC modules and remotely expandable
- The following accessories are required: Terminals, rack, battery
- PLC with 8 digital inputs (2 counters, 2 interrupt inputs, 1 incremental input) • 6 digital outputs • Ethernet and RS232 interface for programming and communication • CANopen interface • Slot for memory card • USB interface • RUN/STOP switch and LED indication
- UL/CSA approval

	256 KByte	< 0.15 ms	●	1	1 x RS232	-	**XC-CPU201-EC256K-8DI-6DO** 262155
	2 MB	< 0.15 ms	●	1	1 x RS232	-	**XC-CPU201-EC512K-8DI-6DO** 262157
	256 KByte	< 0.15 ms	●	1	1 x RS232	●	**XC-CPU201-EC256K-8DI-6DO-XV** 262156
	2 MB	< 0.15 ms	●	1	1 x RS232	●	**XC-CPU201-EC512K-8DI-6DO-XV** 262158
	4 MB	< 0.025 ms	●	1	1 x RS232	●	**XC-CPU202-EC4M-8DI-6DO-XV** 134238

XC121

- PLC in compact design • 24 V power supply • 2 CANopen interfaces • RS232 interface programming and communication • Second RS232/RS485 interface • Slot for memory card • Connections via spring-loaded terminal blocks • OPC server
- UL/CSA approval
- Approval for shipboard use (DNV, GL, ABS, BV, LR)

	256 KByte	< 0.3 ms	-	2	1 x RS232 1 x RS232/ RS485	-	**XC-CPU121-2C256K** 290446

	Description	**Part no.** Article no.

I/O expansion for XC121

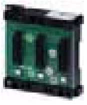
- Expansion device with digital and analog inputs/outputs • Expandable with XI/OC signal modules (apart from XIOC-NET-DP-M)
- Pluggable spring-loaded terminals
- UL/CSA approval
- Approval for shipboard use (DNV, GL, ABS, BV, LR)

	Local I/O expansion for XC121 PLC 10 digital 24V DC inputs, of which 6 interrupt 8 24 V DC, 0.5 A 2 analog inputs 0 - V 2 analog inputs 0 - 20 mA 2 analog inputs Pt100 2 analog outputs 0 - 10 V	**XIO-EXT121-1** 290450

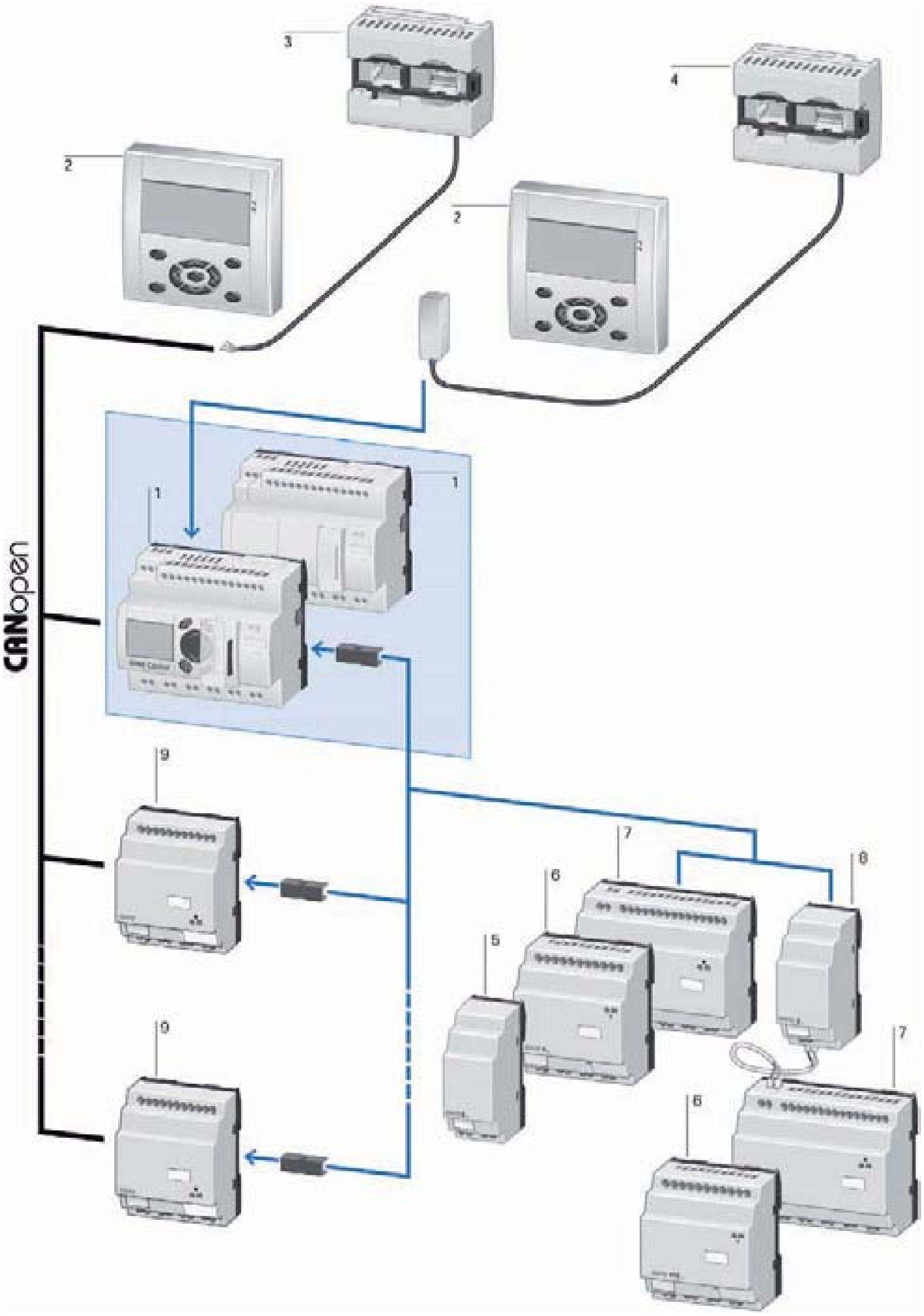
XI/OC

- Compact I/O system for connecting to XC100/200 modular PLCs
- XC100/200 expandable with max. 15 XI/OC modules
- Optional screw terminals or spring-loaded terminals for digital/analog modules
- UL/CSA approvals

	Description	**Part no.** Article no.
Digital modules 	8 inputs 24 V DC	**XIOC-8DI** 257891
	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 configurable 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 	Inputs 8 inputs 4 - 20 mA	**XIOC-8AI-I2** 262549
	Inputs 8 voltage inputs 8 - 10 V	**XIOC-8AI-U1** 257899
	Inputs 8 voltage inputs ± 10 V	**XIOC-8AI-U2** 257900
	Inputs 4 inputs for temperature measuring, 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, individually selectable	**XIOC-2AI-1AO-U1-L1** 281545
	Combination modules, 4 inputs and 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, individually selectable	**XIOC-4AI-2AO-U1-I1** 281544
Counter modules 	1 input up to 100 kHz, (24 V DC, 5 V DC), 2 digital transistor outputs, opto-isolated, 24 V DC 30-pole plug connector required for counter module	**XIOC-1CNT-100KHZ** 257906
	2 inputs up to 100 kHz, (24 V DC or 5 V diff.), 4 digital transistor outputs, opto-isolated, 24 V DC 30-pole plug 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
Communication modules 	PROFIBUS-DP master module	**XIOC-NET-DP-M** 257908
	PROFIBUS-DP slave module	**XIOC-NET-DP-S** 286419
	Suconet K master module	**XIOC-NET-SK-M** 289982
	RS232C, RS485, RS422 serial interface Operating mode: Transparent mode, MODBUS master/slave, SUCOM-A, Suconet K slave	**XIOC-SER** 267191
	RS232C, RS485, RS422 serial interface Operating modes: Transparent mode, MODBUS master/slave, SUCOM-A, DNP3 protocol	**XIOC-TC1** 135265

	Description	**Part no.** Article no.
Accessories		
Terminals An 18-pole terminal plug connector is required for each digital and analog module. 	18-pole terminal plug connector with spring-loaded terminals for digital or analog I/Os	**XIOC-TERM-18T** 258104
	18-pole terminal plug connector with screw terminals for digital or analog I/Os	**XIOC-TERM-18S** 258102
	30-pole plug connector for counter modules with cable, 4 m XIOC-1CNT-100KHZ XIOC-2CNT-100KHZ	**XIOC-TERM30-CNT4** 262248
	40-pole plug connector for digital modules with cable, 4 m XIOC-32DI XIOC-32DO	**XIOC-TERM32** 267414
Racks 	Base rack for mounting XC100/200 on top-hat rail, suitable for expansion Width: 2 slots for PLC	**XIOC-BP-XC** 260792
	Expansion rack for mounting XI/OC modules on top-hat rail, suitable for expansion Width: 2 slots for XI/OC modules	**XIOC-BP-2** 260794
	Base rack for mounting XC100/200 on top-hat rail, suitable for expansion Width: 3 slots for PLC and one XI/OC module	**XIOC-BP-XC1** 260793
	Expansion rack for mounting XI/OC modules on top-hat rail, suitable for expansion Width: 3 slots for XI/OC modules	**XIOC-BP-3** 260795
	Expansion rack for mounting XI/OC modules on top-hat rail, suitable for expansion Width: 3 slots for XI/OC modules Note: Rack for expansion up to max. 15 modules, must be fitted on the 6th slot	**XIOC-BP-EXT** 274291
Memory card for storing programs, data, recipes for XC100, XC121, XC200 	SD memory card with min. 512 MB	**XT-MEM-MM512M** 138257
	SD memory card with min. 256 MB	**XT-MEM-MM32M** 262731
Battery 	For battery-backup of real-time clock and retentive data on the MFD4	**XT-CPU-BAT1** 256209
Programming cables 	2 m SUB-D, 9-pole, serial	**XT-SUB-D/RJ45** 262186
	2 m Ethernet cross	**XT-CAT5-X-2** 256487
	5 m Ethernet cross	**XT-CAT5-X-5** 256488
	Programming cable for XC, EC4P, EU5C via USB interface	**EU4A-RJ45-USB-CAB1** 115735
Connection cable	0.3 m Connection cable from XC200 to interface port	**EASY-NT-30** 256283
	0.8 m Connection cable from XC200 to interface port	**EASY-NT-80** 256284
	1.5 m Connection cable from XC200 to interface port	**EASY-NT-150** 256285
CAN cable to ISO 11898 Recommendation: UNITRONIC Bus LD, from LAPPKABEL, 2 x 2 x 0.22mm" Impedance: 100 - 120 Ω, Capacitance: 800 Hz, max. 60 nF/km		
Dummy module 	Dummy module for covering empty XIOC slots	**XIOC-NOP** 288894
Interface port 	Interface adapter for splitting the combined RS232/Ethernet interface of the XC200 on two RJ45 sockets. EASY-NT-30/80/150 connection cable can be used for connecting to XC200.	**XT-RJ45-ETH-RS232** 289170
Filter 	RFI suppression of the external 24 V DC power supply of the XC100/200. Max. current consumption: 2.2 A	**XT-FIL-1** 285316
	RFI suppression of the power supply for input/output modules of the XC100/200. Max. current consumption: 12 A	**XT-FIL-2** 118980

System overview



1. EC4P compact PLC
2. MFD-80-B display/operator unit
3. MFD-CP4-CO CANopen interface
4. Power supply/communication module, including connection cable for EC4P
5. EASY202-RE output expansion
6. EASY410… input/output expansion, digital
7. EASY6… input/output expansion, digital
8. EASY200-EASY coupling module
9. EC4E-221-... CANopen expansion

EC4P

EC4P controllers offer the performance of a PLC in the housing of the renowned easy control relays. This enables the convenient creation of solutions for small and medium-sized control tasks. Simple programming to IEC61131 using CoDeSys is the basis for this, in conjunction with a powerful CPU.

The Ethernet interface and the serial interface are used for programming, communication via UDP and Modbus as well as for connecting OPC clients.

CANopen and easyNet enable communication with other fieldbus components.

	Inputs		Digital outputs		Analog outputs	Ethernet	Display + keypad	**Part no.** Article no.
	Digital	Of which usable as analog	Relay	Transistor				
EC4P • CANopen/easyNet interface • UL/CSA approvals • Approvals for shipboard use DNV, GL, ABS, BV, LR								
	12	4	-	8	-	-	●	**EC4P-221-MTXD1** 106391
	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
	12	4	-	8	-	●	●	**EC4P-222-MTXD1** 106399
	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

EC4P Expansions, MFD-80

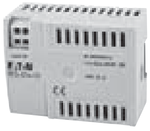
	Digital inputs	Outputs		Power supply	**Part no.** Article no.
		Relay 10 A (UL)	Transistor		
Input/output expansions					
Can be used via easyLink	12	6	-	100-240 V AC	**EASY618-AC-RE** 212314
	12	-	8	24 V DC	**EASY620-DC-TE** 212313
	12	6	-	24 V DC	**EASY618-DC-RE** 232112
	-	2	-	24 V DC	**EASY202-RE** 232186
	6	4	-	24 V DC	**EASY410-DC-RE** 114293
	6	-	4	24 V DC	**EASY410-DC-TE** 114294
	For the remote connection of a digital I/O expansion up to 30m away				**EASY200-EASY** 212315
Can be used via CANopen for: XC100/200, EC4P, XV	6	4	-	24 V DC	**EC4E-221-6D4R1** 114296
	6	-	4	24 V DC	**EC4E-221-6D4T1** 114297

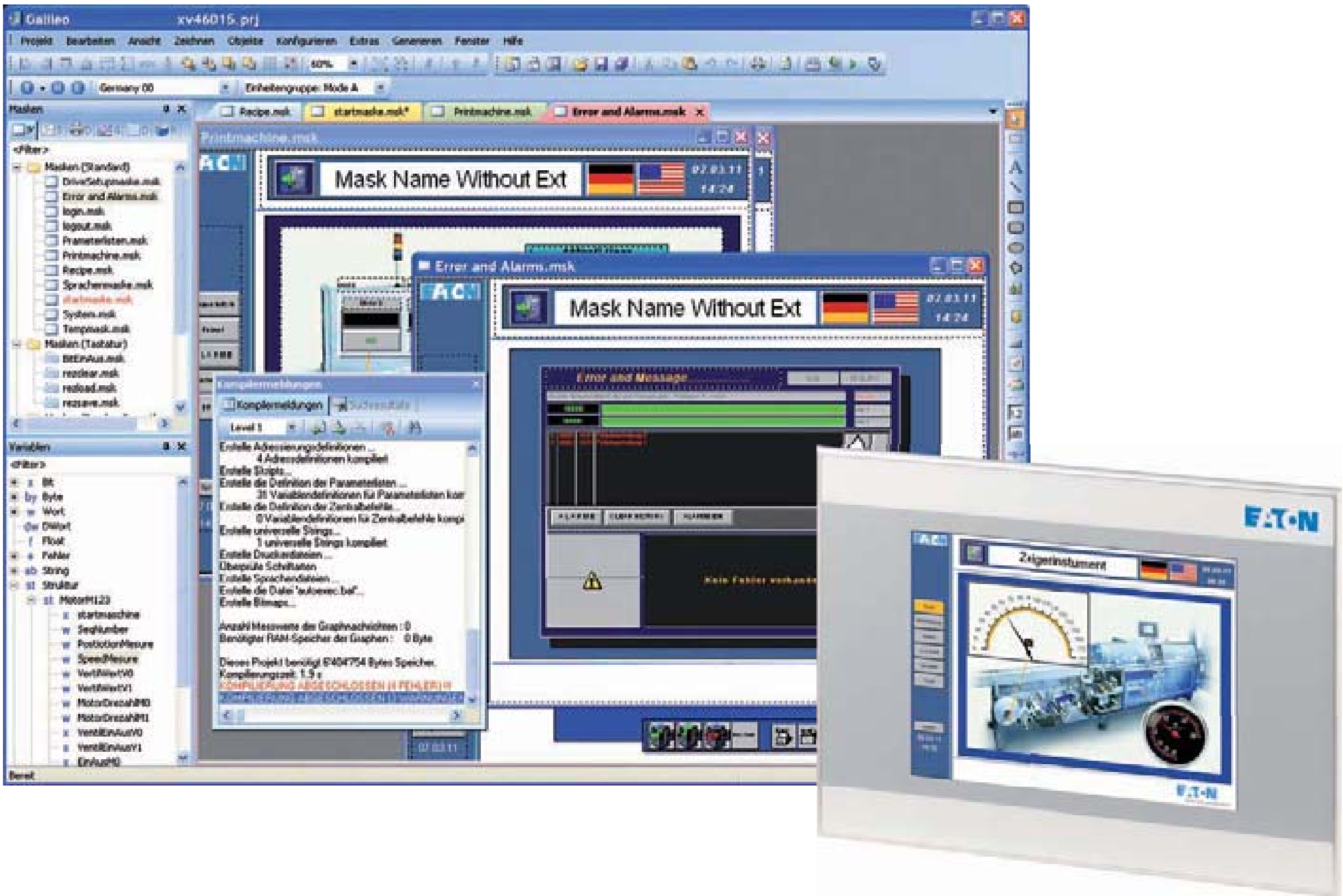
	Inputs		Digital outputs		Analog outputs	Power supply	**Part no.** Article no.
	Digital/ analog	Of which usable as digital	Relay 10 A (UL)	Transistor			
Input/output expansions							
Can be used via easyLink	1 / 2	2	-	2	1	24 V DC	**EASY406-DC-ME** 114295
	1 / 6	2	-	2	2	24 V DC	**EASY411-DC-ME** 116567

	Description	**Part no.** Article no.
Remote text display • Display / operator unit • Monochrome display 132 x 64 pixels with switchable backlight • IP65, removable Titan front frame		
	With keypad, with Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	**MFD-80-B** 265251
	With keypad, without Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	**MFD-80-B-X** 284905

EC4P Accessories

	Description	Power supply	**Part no.** Article no.
Power supply/communication modules IP20, combinable with MFD-80-.. display/operator unit			
	Without connection cable	24 V DC	**MFD-CP4** 280888
	Without connection cable	100 - 240 V AC	**MFD-AC-CP4** 286822

	Description	**Part no.** Article no.
CANopen communication module Communication module with CANopen interface for use with MFD-80-B(-X) display/operator unit and EU4A-RJ45-CAB2 connection cable Automatic baud rate setting up to 1 MBaud; can store up to 64 display pages.		
	24 V DC power supply	**MFD-CP4-CO** 115736
Programming cables		
	SUB-D, 9-pole, serial, 2 m	**EU4A-RJ45-CAB1** 106726
	For EU5C, XC and EC4P via USB interface	**EU4A-RJ45-USB-CAB1** 115735
	2 m Ethernet cross	**XT-CAT5-X-2** 256487
	5 m Ethernet cross	**XT-CAT5-X-2** 256488
Modem cable		
	Configurable modem, printer and programming cable, possible transfer rates 56 KBaud, 9-pole SUB-D connector (plug + socket for connection by user)	**EASY800-MO-CAB** 286079
Connection cables		
	For connecting the EC4P (RJ45) to MFD-CP4-CO or EC4E (terminal block)	**EU4A-RJ45-CAB2** 115387
Memory cards		
	Adapter with at least 128 MByte memory card	**EU4A-MEM-CARD1** 106409
	Adapter with at least 128 MByte memory card and battery for backing up the clock	**EU4A-MEM-CARD2** 144724


Galileo
xv46015.prj
Printmachine.msk
Error and Alarms.msk
Mask Name Without Ext
Zeigerinstrument

Galileo - The Intuitive Visualization Tool

Galileo is an easy-to-learn, and nevertheless powerful and extensive project design environment, ideally suited for all machine and process-oriented applications in system and machine building. With its non-sector specific concept, Galileo offers seamless project designing for all XP/XV operator units from the Eaton Automation HMI product range as well as for PC runtime solutions. Galileo always provides the project designer with the full functionality without any graduated restrictions on tags (variables) or screens, depending on the performance specifications of the panel used.

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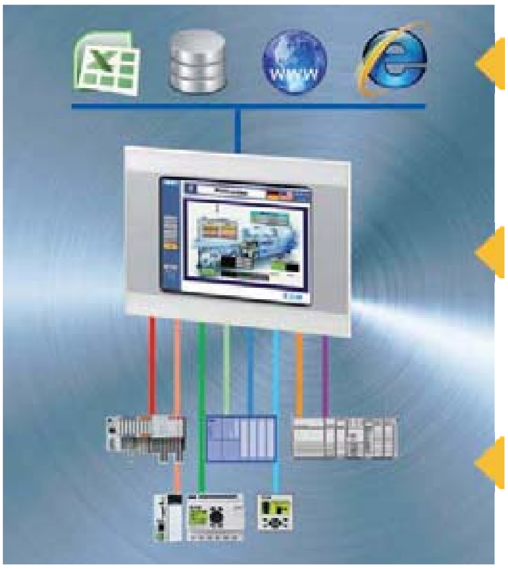
MBC004

Highlights

- Easy to learn and intuitive graphical user interface with a project overview window
- User-friendly project design with project simulation on development PC
- Different user interface styles
- Drag & drop positioning of objects, WYSIWYG (what you see is what you get)
- Simple, clear user guidance
- Tabular object properties, easy and fast assignment of attributes - copy & paste
- Convenient series assignment of texts and images to tags
- Many graphical objects such as bar graph, slide adjuster, graph plotter, curve chart, camera
- Anti-aliased gauge display
- Enhanced password handling with complex password and aging
- Extensive recipe handling
- Alarm handling with time stamp, history and diagnostics support with image display
- Multi-line display of alarm entries
- Online language selection
- Unicode support (also Asian character sets)
- Text import / export in XML format e.g. Excel
- Brilliant image display, up to 65536 colors
- Import of 15 different image formats
- Dynamic objects
- Object parameter list, any number of data objects in a screen
- Dynamic unit of measure selection (e.g. °C <-> °F, inch <-> mm)
- Direct printing on panel (reports, forms)
- Many specific objects and system functions
- Simple import of PLC variables
- Full functionality always available, no graduated performance level



Safe and simple linking to the control level and office world

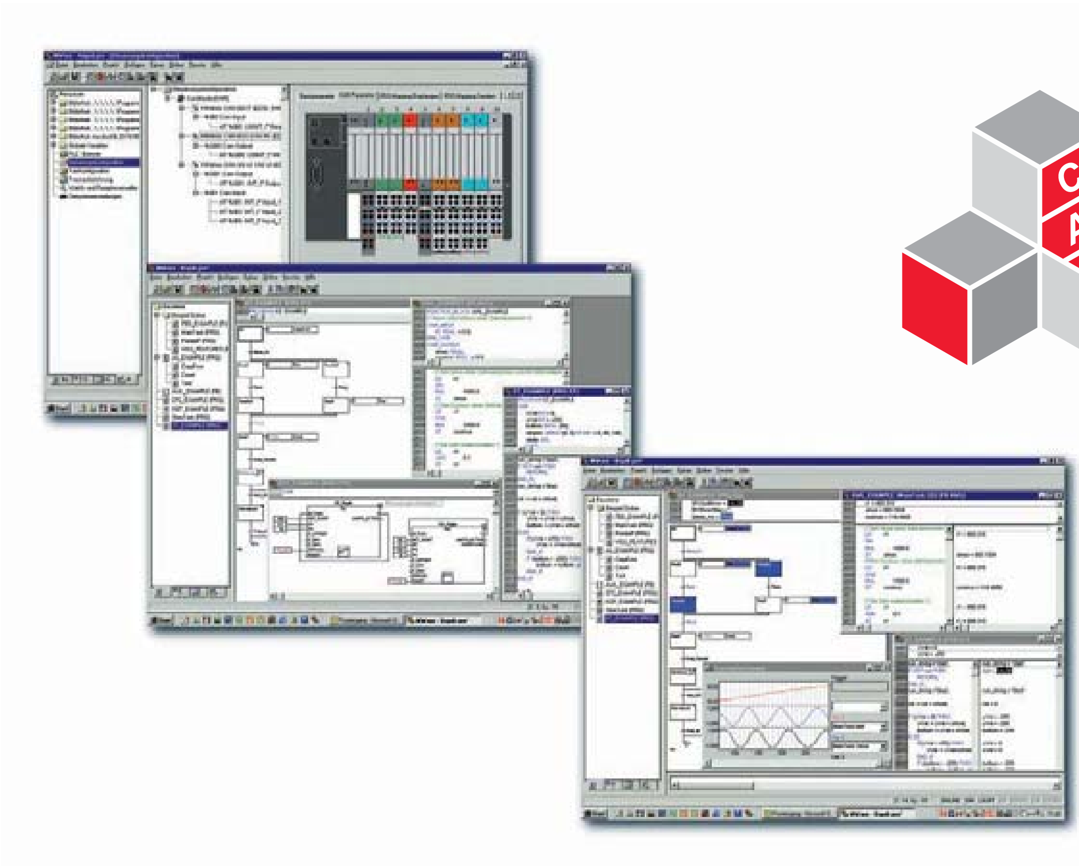
Seamless project design of all graphical panels, including PC control station

Up to 8 simultaneous communications, with data bridge function

Sample of over 100 protocols available for all popular PLCs:

A. BRADLEY	DF1 / EtherNet/IP
BECKHOFF	TwinCAT ADS
EIB	EIB-ETS2
MITSUBISHI	A Series
Eaton	easy / SucomA / Suconet K / CANopen / CoDeSys
OMRON	C- H- K- Series
SAIA	S-Bus / MPI
SIEMENS	PPI / MPI / DP Slave / Industrial Ethernet
TELEMECH.	Unitelway new
Various	OPC / Modbus RTU / Modbus TCP/IP / CoDeSys (SymArti) / CANopen (SDO/PDO) / 3964R

	Description	**Part no.** Article no.
Galileo		
	Galileo development software MS-Windows^{TM}-based, intelligent and intuitive visualization tool	**SW-GALILEO** 140379
	GalileoOpen license for PC For continuous unrestricted operation of the GALILEO runtime system on a standard PC.	**LIC-GALILEO-OPEN-PC** 140385



CoDeSys Automation Alliance

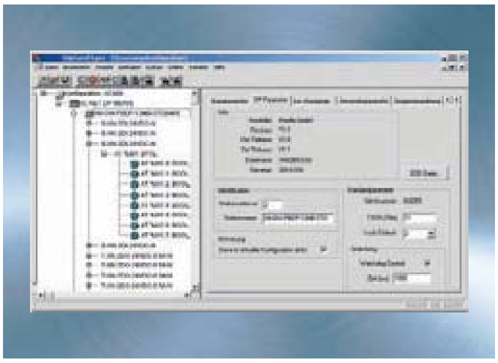
XSoft-CoDeSys-2 - PLC Programming to International Standards

All Eaton Automation controllers are programmed with XSoft-CoDeSys-2. XSoft-CoDeSys-2 is based on the CoDeSys standard of 3S. Matured technical features, simple handling and the widespread use of this software in the automation components of different manufacturers make it a guarantee for success.

Programming languages: Instruction list (IL), structured text (ST), function block diagram (FBD), continuous function chart (CFC), ladder diagram (LD) and sequential function chart (SFC)

Engineering features: Automatic variable declaration, automatic formatting and coloring of code/declaration text, user-friendly project comparison, offline simulation

Debugging and commissioning: XSoft-CoDeSys-2 offers you a host of important functions to debug, test and commission your PLC applications quickly and efficiently.

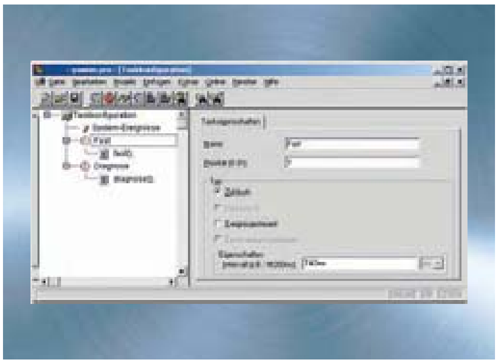


Fieldbus configurator included

The PLC configurator shows all the local I/Os and the remote periphery (Profibus, CANopen or SWD-Master) on one user interface. The inputs and outputs can be directly configured, parameterized and assigned to the appropriate symbolic PLC variables. This prevents the possibility of assignment errors between the periphery and the PLC program. The variables can also be tested in online mode.

Multitasking

The structuring of the application into several user-defined runtime programs (multitasking) optimizes your PLC's resources and simplifies the implementation of time-critical requirements. Give high-speed processes priority and slower processes as much processing time as is necessary.

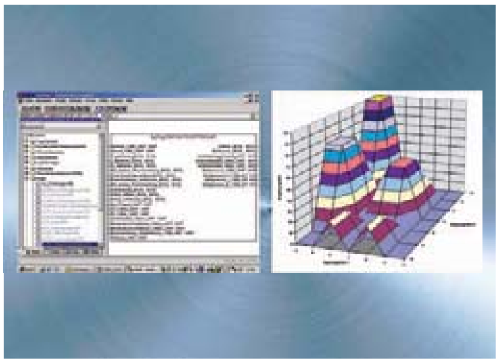


Web visualization (only XV100, XV150, XVS400, XV400 and XC200):

If required, XSoft-CoDeSys-2 can generate an XML description from the visualization data, which can be stored on the PLC together with a Java applet and run via TCP/IP on a browser.

Target visualization (only XV100, XV150, XVS400 and XV400):

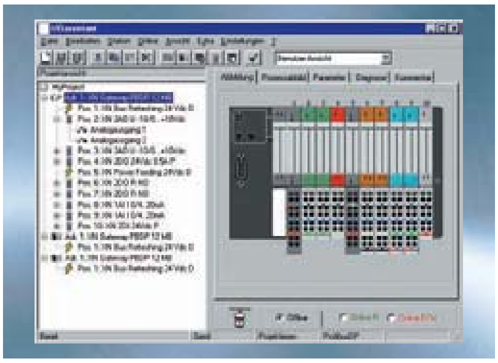
The visualization integrated in XSoft-CoDeSys-2 can be displayed if required directly on the panel.



Application libraries

Eaton Automation offers several ready-to-use libraries for programming PLCs with XSoft-CoDeSys-2 for a wide range of applications:

- Control technology toolbox
- Motion control toolbox
- FTP server
- FTP client
- UDP and TCP/IP
- Modbus RTU/TCP master/slave
- OS functions
- File handling



I/Oassistant - immediately online, immediately viewed, immediately tested

The I/Oassistant integrated in XSoft-CoDeSys-2 provides you with the tailor-made project design tool for XI/ON directly inside XSoft-CoDeSys-2.

Without leaving XSoft-CoDeSys-2, you can utilize the full functionality of the I/Oassistant for planning and implementing your remote CAN XI/ON station interactively. For this you choose gateways, electronic and base modules as well as the appropriate accessories. The tool automatically checks the correct structure. The individual stations are then configured offline or online. Once everything is set to your satisfaction, you simply put your installation into operation.

	Description	**Part no.** Article no.
XSoft-CoDeSys-2 Programming to IEC 61131-1, supports XV, XC, XN, EC4P		
	Single user license	**SW-XSOFT-CODESYS-2-S** 142582
	Multi-user license	**SW-XSOFT-CODESYS-2-M** 142583

EATON
easy512-AB-RC
article: 246

easyRelay Control Relays
MFD-Titan Multi-Function Display

The easy500/easy700/800 control relays as well as the MFD-Titan multi-function display come with a full range of technical resources to implement applications for industrial and building automation, machine building or plant construction. A host of different device versions with various functions, voltage types, expansion and networking options are available for implementing the right solution. As well as offering the main functions of the easy500/easy700 such as multi-function timing relays, counters, analog value comparators, time switches etc., the easy800 and MFD-Titan offer a host of function blocks such as PID controllers, maths and value scaling function blocks and many more. The MFD-Titan also offers user-friendly operator and visualization options such as button functions, bitmaps or bar graphs as well as text displays, value entry and display functions. Protection to IP65 means that the display can be used in aggressive environments.

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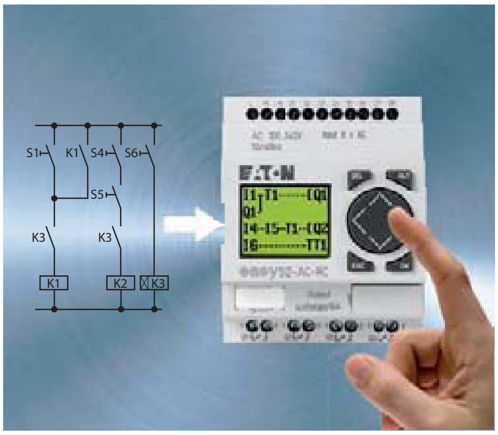
MBC006



easy500

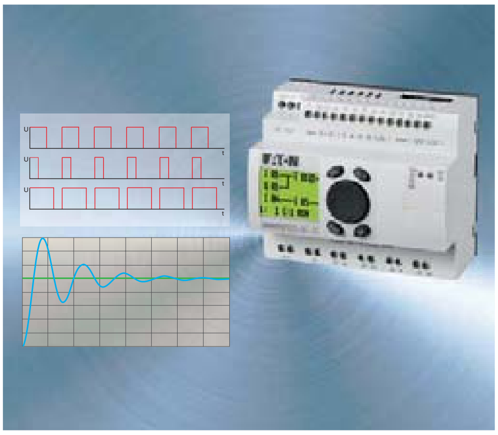
For small-scale applications with up to 12 I/O:

- 1:1 electronic circuit diagram entry
- Circuit diagram entry directly on the device possible
- 128 rungs with 3 contacts each and 1 coil in series
- Functions such as multi-function timing relays, impulse relays, counters, analog value comparators, week and year time switches, value entry, value display...
- Connection possible to Ethernet (programming and OPC functionality)

easy700

For solving medium-sized control tasks up to 40 I/O:

- Full functional range of an easy500
- 128 rungs with 3 contacts each and 1 coil in series
- Local and remote expansion possible for flexibility in the application
- Connection possible to standard bus systems (Profibus, CANopen, DeviceNet, Asi) and Ethernet (programming and OPC functionality)



easy800

Ideal for large open-loop and closed-loop control tasks with up to 328 I/O:

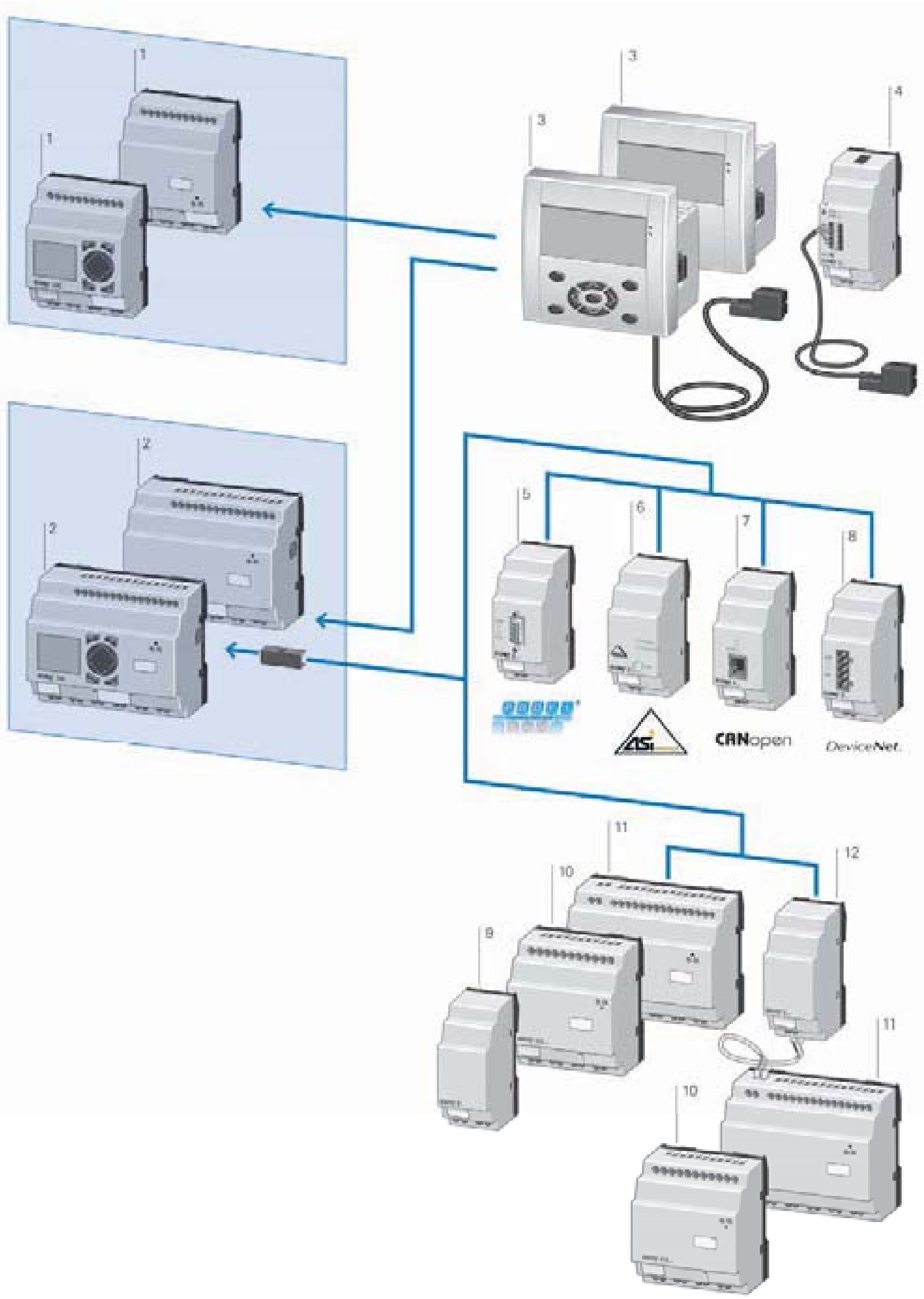
- Full functional range of an easy700
- A host of additional functions such as PID controller, maths functions, pulse width modulation, value scaling, high-speed counters (5 kHz),…
- 256 rungs with 4 contacts each and 1 coil in series
- Digital and analog expandability
- Integrated communication via easyNet (up to 8 stations – up to 1000 m)
- Connection possible to standard bus systems (Profibus, CANopen, DeviceNet, Asi) and Ethernet (programming and OPC functionality)

Company name
temperature:
act: 22°C
max: 55°C
min: -5°C
22.5mm

MFD-Titan

Combines the functions of an easy800 with user-friendly visualization for large-scale applications with more than 300 I/O:

- Display, operation, open and closed-loop control as well as communication in a single device
- Fast and easy to install in 22.5 mm standard fixing holes
- I/O modules for direct temperature measuring (Pt100 / Ni1000)
- Individual laser inscription of devices, for example with own company logo
- Digital and analog expandability
- Communication via easyNet possible (up to 8 stations – up to 1000 m)
- Connection possible to standard bus systems (Profibus, CANopen, DeviceNet, Asi) and Ethernet (programming and OPC functionality)



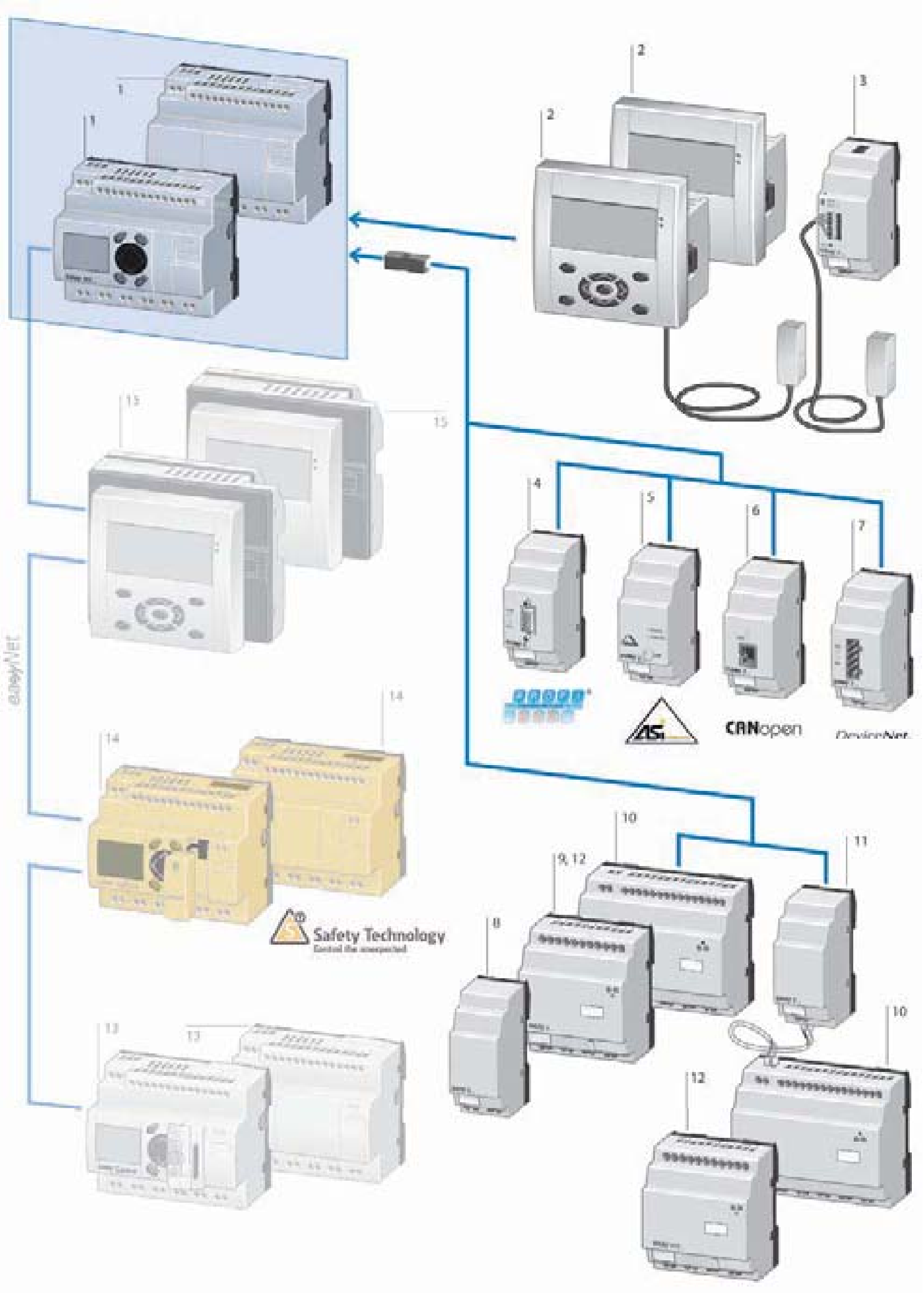
1. easy500 control relay
2. easy700 control relay
3. Removable text display: MFD-80(-B) display/operator unit,+ power supply/communication module incl. MFD-(AC)-CP4-500 connection cable
4. EASY209-SE Ethernet gateway + MFD-CP4-500-CAB5 connection cable
5. EASY204-DP Profibus-DP bus module
6. ASi EASY205-ASI bus module
7. EASY221-CO CANopen bus module
8. EASY222-DN DeviceNet bus module
9. EASY202-RE output expansion
10. EASY410… I/O expansion, digital
11. EASY6… I/O expansion, digital
12. EASY200-EASY coupling module

Functions

- 16 x counter relays (0 to 32000, up/down)
- 2 x frequency counters (max. 1 kHz)
- 2 x high-speed counters (max. 1 kHz)
- 4 x operating hours counters (operating hours value is super retentive, i.e. also retained with program change)
- 8 x week time switches (4 channels per time switch, 1 on/off point per channel)
- 8 x year time switches
- 16 x timing relays (0.01 s – 99h 59 min, on-delayed and/or off-delayed (optional random switching), single pulse, flashing)
- 8 x jump function blocks
- 3 x master reset function blocks
- 16 x analog value comparators
- 16 x comparators
- 16 x text displays (4 x 12 characters, can be edited via programming software)
- Value entry (counter values, setpoints, …)
- Value display (actual values, …)
- Date and time entry
- Date and time display

	Inputs		Outputs		Other features		Supply voltage	**Type** Article no.
	Digital	Of which usable as analog	Relay 10 A (UL)	Transistor	Display + Keypad	Real-time clock		
easy500 Stand alone								
	8	2	4	-	●	●	24 V AC	**EASY512-AB-RC** 274101
	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
easy700 Expandable: Digital inputs/outputs and AS-Interface, PROFIBUS DP, CANopen, DeviceNet bus systems								
	12	4	6	-	●	●	24 V AC	**EASY719-AB-RC** 274113
	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

	Description	**Type** Article no.
easy500/700 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
easy500/700 programming cables		
	SUB-D, 9-pole, serial, 2 m	**EASY-PC-CAB** 202409
	USB, 2 m	**EASY-USB-CAB** 107926



1. easy800 control relay
2. Removable text display: MFD-80(-B) display/operator unit + power supply/communication module incl. MFD-(AC)-CP4-800 connection cable
3. EASY209-SE Ethernet gateway + MFD-CP4-800-CAB5 connection cable
4. EASY204-DP Profibus-DP bus module
5. ASi EASY205-ASI bus module
6. EASY221-CO CANopen bus module
7. EASY222-DN DeviceNet bus module
8. EASY202-RE output expansion
9. EASY406-DC-ME / EASY411-DC-ME I/O expansion, analog
10. EASY6… I/O expansion, digital
11. EASY200-EASY coupling module
12. EASY410… I/O expansion, digital
13. easyControl compact PLC
14. easySafety control relay
15. MFD-Titan Multi-function display

Functions

- 32 x counter relays (+/-2^{31}, up/down)
- 4 x frequency counters (max. 5 kHz)
- 4 x high-speed counters (max. 5 kHz)
- 2 x incremental value counters (max. 3 kHz)
- 4 x operating hours counters (operating hours value is super retentive, i.e. also retained with program change)
- 32 x week time switches (4 channels per time switch, 1 on/off point per channel)
- 32 x year time switches
- 1 x set cycle time function block
- 32 x timing relays (0.005 s – 2^{32} min, on-delayed and/or off-delayed (optional random switching), single pulse, flashing)
- 32 x jump function blocks
- 32 x conditional jump function blocks
- 32 x master reset function blocks
- 32 x analog value comparators
- 32 x comparators (ADD, SUB, MUL, DIV)
- 32 x PID controllers
- 32 x PT1 signal smoothing filters
- 32 x value scaling function blocks
- 32 x numerical converters
- 2 x pulse output function blocks
- 2 x pulse width modulation function blocks
- 32 x value limitation function blocks
- 32 x block comparison function blocks
- 32 x block transfer function blocks
- 32 x Boolean operations (AND, OR, NOT)
- 32 x comparators
- 32 x data function blocks
- 32 x data multiplexers
- 32 x shift registers
- 32 x table functions
- 32 x get value from NET function blocks
- 32 x put value to NET function blocks
- 32 x bit output via NET function blocks
- 32 x bit input via NET function blocks
- 9 x diagnostic alarms
- 32 x serial protocol function blocks
- 1 x synchronize clock via NET function block
- 32 x text displays (4 x 16 characters, can be edited via programming software)
- Value entry (counter values, setpoints...)
- Value display (actual values…)
- Date and time entry
- Date and time display

	Inputs		Outputs			Other features		Supply voltage	**Type** Article no.
	Digital	Of which usable as analog	Relay 10 A (UL)	Transistor	Analog	Display + Keypad	Real-time clock		

easy 800

Expandable: Digital, analog inputs/outputs, AS-Interface, CANopen, PROFIBUS DP, DeviceNet, easyNet bus systems onboard
Customized laser inscription with EASY-COMBINATION-* possible

	Digital	Of which usable as analog	Relay 10 A (UL)	Transistor	Analog	Display + Keypad	Real-time clock	Supply voltage	**Type** Article no.
	12	-	6	-	-	●	●	100-240 V AC	**EASY819-AC-RC** 256267
	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

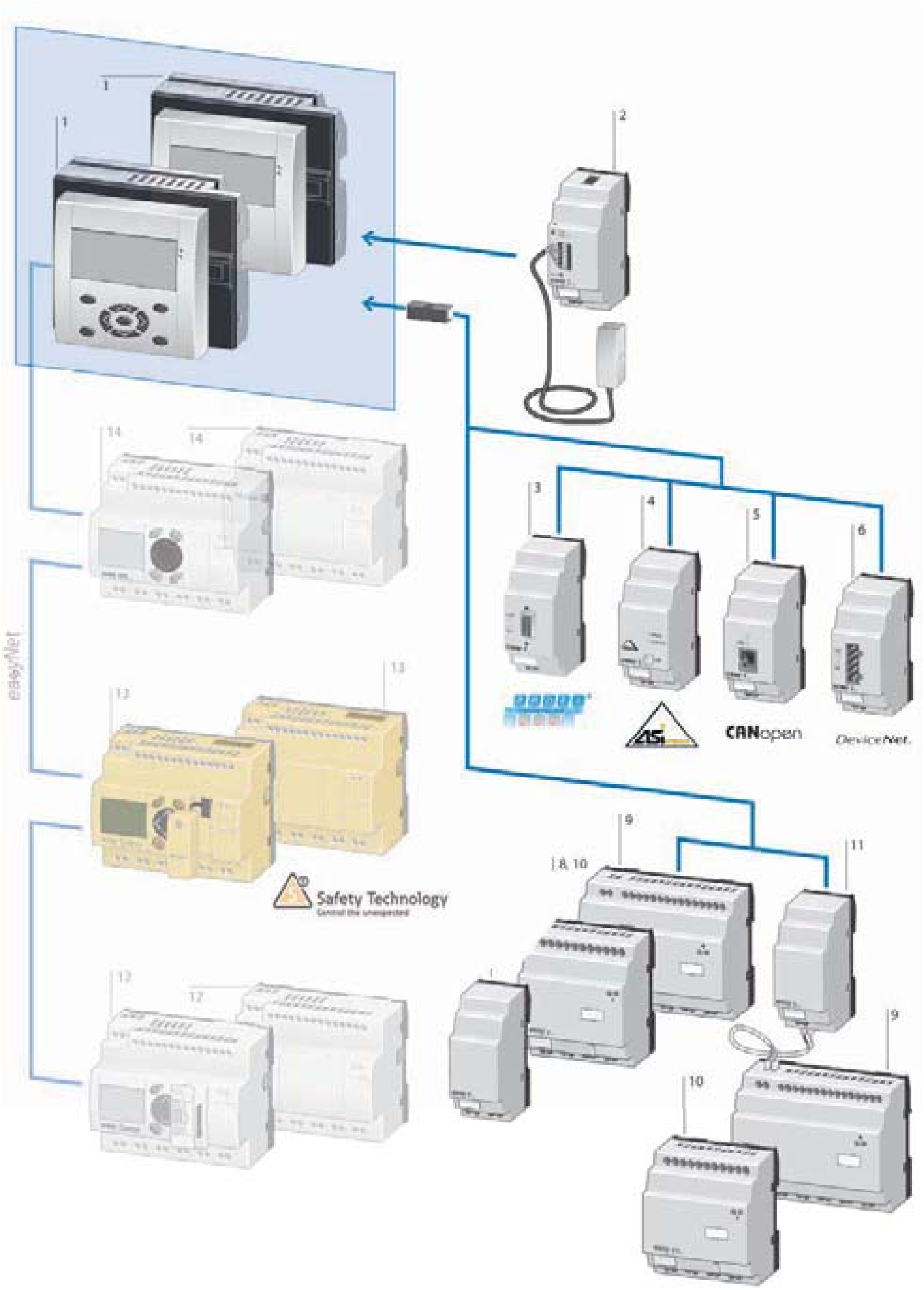
easy 500/700/800/MFD-Titan programming software

	Description	**Type** Article no.
	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

easy 800/MFD-Titan programming cables

	Description	**Type** Article no.
	SUB-D, 9-pole, serial, 2 m	**EASY800-PC-CAB** 256277
	USB, 2 m	**EASY800-USB-CAB** 106408

MFD-Titan



1. MFD-Titan multi-function display possible in the following combinations:

   Power supply/CPU module
   Power supply/CPU module + I/O modules
   Power supply/CPU module + Display/operator unit
   Power supply/CPU module + Display/operator unit + I/O modules
2. EASY209-SE Ethernet gateway + MFD-CP4-800-CAB5 connection cable
3. EASY204-DP Profibus-DP bus module
4. ASi EASY205-ASI bus module
5. EASY221-CO CANopen bus module
6. EASY222-DN DeviceNet bus module
7. EASY202-RE output expansion
8. EASY406-DC-ME / EASY411-DC-ME I/O expansion, analog
9. EASY6… I/O expansion, digital
10. EASY410… I/O expansion, digital
11. EASY200-EASY coupling module
12. easyControl compact PLC
13. easySafety control relay
14. easy800 control relay

Functions

- 32 x counter relays ($+/-2^{31}$, up/down)
- 4 x frequency counters (max. 3 kHz)
- 4 x high-speed counters (max. 3 kHz)
- 2 x incremental value counters (max. 3 kHz)
- 4 x operating hours counters (operating hours value is super retentive, i.e. also retained with program change)
- 32 x week time switches (4 channels per time switch, 1 on/off point per channel)
- 32 x year time switches
- 1 x set cycle time FB
- 32 x timing relays (0.005 s – 2^{32} min, on-delayed and/or off-delayed (optional random switching), single pulse, flashing)
- 32 x jump function blocks
- 32 x conditional jump FBs
- 32 x master reset FBs
- 32 x analog value comparators
- 32 x comparators (ADD, SUB, MUL, DIV)
- 32 x PID controllers
- 32 x PT1 signal smoothing filters
- 32 x value scaling FBs
- 32 x numerical converters
- 2 x pulse width modulation FBs
- 32 x value limitation FBs
- 32 x block comparison FBs
- 32 x block transfer FBs
- 32 x boolean operations (AND, OR, NOT)
- 32 x comparators
- 32 x data function blocks
- 32 x data multiplexers (for MFD-CP10..)
- 32 x shift registers
- 32 x table functions
- 32 x get value from NET FBs
- 32 x put value to NET FBs
- 32 x bit output via NET FBs
- 32 x bit input via NET FBs
- 9 x diagnostic alarms
- 1 x synchronize clock via NET FB

Visualization elements

- Static text
- Message text
- Screen menu
- Running text
- Rolling text
- Date and time display
- Numerical value display (actual values, …)
- Timing relay value display
- Value entry (counter values, setpoints, …)
- Timing relay value entry
- Date and time entry
- Week time switch entry
- Year time switch entry
- Latching button
- Button field
- Bit display
- Bitmap
- Message bitmap
- Bar graph

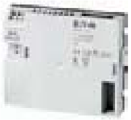
Display / operator unit

Monochrome display 132 x 64 pixels with switchable backlight
IP65, removable Titan front frame

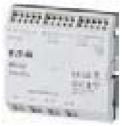
	Description	**Type** Article no.
	with keypad, with Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	**MFD-80-B** 265251
	with keypad, without Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	**MFD-80-B-X** 284905
	without keypad, with Eaton logotype NEMA 4x	**MFD-80** 265250
	without keypad, without Eaton logotype NEMA 4x	**MFD-80-X** 284904

Power supply/CPU modules

Combinable with MFD-80-.. display/operator unitand I/O module; Expandable: Digital/analog inputs/outputs and bus systems AS-Interface, CANopen, PROFIBUS-DP, DeviceNet; easyNet bus system optional on board, IP20, spring-loaded terminals

	Supply voltage	Description	**Type** Article no.
	100 - 240 V AC	Program and screen memory	**MFD-AC-CP8-ME** 274091
	100 - 240 V AC	Program and screen memory, with easyNet	**MFD-AC-CP8-NT** 274092
	24 V DC	Program and screen memory	**MFD-CP8-ME** 267164
	24 V DC	Program and screen memory, with easyNet	**MFD-CP8-NT** 265253
	24 V DC	Double program and screen memory	**MFD-CP10-ME** 133801
	24 V DC	Double program and screen memory, with easyNet	**MFD-CP10-NT** 133800

I/O modules

	Power supply	Can be use for	Inputs			Outputs			Temperature ranges	**Type** Article no.
			Digital	Of which usable as analog	Pt100	Relay 10 A (UL)	Transistor	analog		
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	4	-	-	-	**MFD-R16** 265254
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	-	4	-	-	**MFD-T16** 265255
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	4	-	1	-	**MFD-RA17** 265364
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	-	4	1	-	**MFD-TA17** 265256
	100-240 V DC	MFD-AC-CP8...	12	-	-	4	-	-	-	**MFD-AC-R16** 274093

I/O modules with temperature measuring

	Power supply	Can be use for	Inputs			Outputs			Temperature ranges	**Type** Article no.
			Digital	Of which usable as analog	Pt100	Relay 10 A (UL)	Transistor	analog		
	24 V DC	MFD-CP8... from device version 08, MFD-CP10	6	2	2	-	4	-	-40...+90°C 0...+250°C 0...+400°C	**MFD-TP12-PT-A** 106042
			6	2	2	-	4	-	-200...+200°C 0...+850°C	**MFD-TP12-PT-B** 106043
			6	2	-	-	4	-	-40...+90°C 0...+250°C	**MFD-TP12-NI-A** 106044
			6	2	2	-	4	1	-40...+90°C 0...+250°C 0...+400°C	**MFD-TAP13-PT-A** 106045
			6	2	2	-	4	1	-200...+200°C 0...+850°C	**MFD-TAP13-PT-B** 106046
			6	2	-	-	4	1	-40...+90°C 0...+250°C	**MFD-TAP13-NI-A** 106047

Note: For programming software and programming cable see easy800

EATON
easy400-POW
EATON
ELC-PS02
EATON
Catalog Number:
PSG480F
EATON

easyPower, ELC-PS and PSG Power Supply Units

Whether at the machine or plant, in the control cabinet or service distribution board – the easyPower, ELC-PS and PSG 24 V DC power supply units provide the right solution and design for any requirement. These rail-mounted power supply units provide a reliable 1-phase and 3-phase supply for efficient operation. In addition to the wide range inputs and approvals for worldwide use, these devices stand out on account of their optimum efficiency and large temperature range. The short-circuit proof design and overload withstand capability ensure a safe power supply. The compact housing saves space and costs. The adjustable output voltage range of the PSG power supply units ensures optimum adaptability. With an output current of 1 A to 40 A, the power supply units are designed to supply machines and plants with low power requirements as well as large current loads.

Quicklink Online catalogue to
www.eaton.com/moellerproducts

MBC007

	Input voltage range	Rated output voltage	Setting range of output voltage	Rated output power	Rated output current	**Type** Article no.
Power supply units, 1-phase • Rated input voltage: 100 - 240 V AC						
	85 - 264 V AC	24 V DC / 12 V DC	-	8 W	0.35 A / 20 mA	**EASY200-POW** 229424
	85 - 264 V AC	24 V DC	-	30 W	1.25 A	**EASY400-POW** 212319
	85 - 264 V AC	24 V DC	-	60 W	2.5 A	**EASY500-POW** 110941
	85 - 264 V AC	24 V DC	-	100 W	4.2 A	**EASY600-POW** 262399
	85 - 264 V AC	24 V DC	-	24 W	1 A	**ELC-PS01** 135239
	85 - 264 V AC	24 V DC	-	48 W	2 A	**ELC-PS02** 135240
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	60 W	2.5 A	**PSG60E** 131673
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	120 W	5 A	**PSG120E** 131318
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	240 W	10 A	**PSG240E** 131670
	(120 - 375 V DC)	24 V DC	22 - 28 V DC	480 W	20 A	**PSG480E** 135227

	Input voltage range	Rated output voltage	Setting range of output voltage	Rated output power	Rated output current	**Type** Article no.
Power supply units, 3-phase • Rated input voltage 3 x 400 - 500 V AC						
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	60 W	2.5 A	**PSG60F** 135226
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	120 W	5 A	**PSG120F** 131319
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	240 W	10 A	**PSG240F** 131671
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	480 W	20 A	**PSG480F** 131672

Control Circuit Devices RMQ Titan, 22 mm Range

Page 94

Push-button

⚫ ⚪ 🔴 🟢 🟡 🔵

flush,
titanium ring
IP 67, IP 69K –
spring-return /
stay-put

⚫ ⚪ 🔴 🟢 🟡 🔵

extended,
titanium ring
IP 67, IP 69K –
spring-return /
stay-put

Mushroom actuator

⚫ ⚪ 🔴 🟢 🟡

IP 67, IP 69K –
spring-return /
stay-put

Double actuator

⬛ ⬛ ⬜ ⬛ 🟩 🟥

IP 66
extended / flush

4 position push-button

IP 66
– opposing buttons not mechanically interlocked
– opposing buttons mechanically interlocked

Indicator lights

⚪ 🔴 🟢 🟡 🔵

flush
IP 67, IP 69K

extended
IP 67, IP 69K

Illuminated push-button actuators

⚪ 🔴 🟢 🟡 🔵

flush,
titanium ring
IP 67, IP 69K
spring-return /
stay-put

⚪ 🔴 🟢 🟡 🔵

extended,
titanium ring
IP 67, IP 69K
spring-return /
stay-put

Thumb-grip selector switch

IP 66
spring-return /
stay-put

Illuminated thumb-grip selector switch

⚪ 🔴 🟢 🟡 🔵

IP 66
spring-return /
stay-put

Key-operated actuator

IP 66
spring-return /
stay-put
2 / 3 positions

Selector switch

IP 66
spring-return /
stay-put
2 / 3 / 4 positions

Joystick

IP 66
spring-return /
stay-put
2 and 4 positions
horizontal and vertical

Control Circuit Devices RMQ 16

See Industry Main Catalogue

Push-button actuators

🟦 🟨 🟥 🟩 ⬜ ⬛

IP 65
spring-return /
stay-put
18 x 18 mm and
25 x 25 mm

Illuminated actuators

🟦 🟨 🟥 🟩 ⬜

IP 65
flush / extended
18 x 18 mm and
25 x 25 mm

Illuminated push-button actuators

🟦 🟨 🟥 🟩 ⬜

IP 65
spring-return /
stay-put
18 x 18 mm and
25 x 25 mm

Selector switch actuators

🟥 🟩 ⬜

IP 65
spring-return /
stay-put
2 / 3 positions
18 x 18 mm and
25 x 25 mm

Key-operated actuators

IP 65
spring-return /
stay-put
2 / 3 positions
18 x 18 mm and
25 x 25 mm

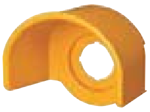
EMERGENCY-STOP/OFF actuators

Mushroom actuator, 38 mm
IP 66, IP 69K
illuminated,
non-illuminated, pull or turn to reset

Palm switch 45 and 60 mm
IP 66, IP 69K
turn to reset,
mechanical switch position indication

Accessories

Sealable shroud



Guard ring

Illuminated ring

Built-in sockets

for USB 2.0 A/A with connection cable
IP65 with closed cover
IP20 with plug in plugged position

RJ45
IP65 with closed cover
IP20 with plug in plugged position

Potentiometer

IP 66

Contact and LED elements

○ 🔴 🟢 🔵

Front and base fixing, screw / spring-loaded terminals,
LED elements

SW-DT interface

○ 🔴 🟢 🔵

Front and base fixing with and without LED

Signel Towers SL

Page 103

Complete unit

Continuous light / flashing module

○ 🔴 🟢 🟡 🔵

without bulbs

Acoustic module

IP 20
continuous and pulsed sound

Base module

IP 54
black with cover

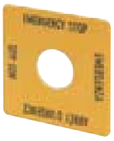
Stand with spacer

Stand with spacer, fixing bracket 90° for wall mounting

EMERGENCY-STOP/OFF buttons

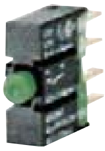
IP 65, 25 x 25 mm
illuminated / not-illuminated

Emergency-Stop labels



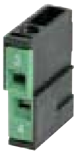
in four languages / blank

Contact blocks



NO / NC

Screw adapter

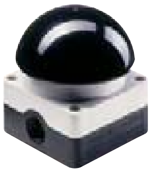


for NO / NC and lamp sockets

FAK switch

Page 105

Foot and palm switch



IP 67, IP 67K

Emergency-Stop button

IP 67, IP 67K
tamper proof

Machanical Position Detection

Page 108 ff.

Position switches LS-Titan

Operating heads

Roller lever

Adjustable roller lever

Actuating rod

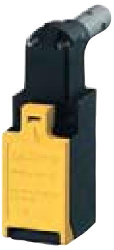
Analog electronic position switch

Safe Mechanical Position Detection

Page 112 ff.

Door flap safety switch

Door hinge safety switch



Safety position switch

Spring-powered or magnet-powered interlock

Complete unit

Optical Product Recognition

Page 116 ff.

Comet series photoelectric sensors / emitters

E58 Harsh Duty

Intelligent and compact E65-SM series

Optional fiber-glass extension

Inductive Metal Detection

Page 114 ff.

Premium Plus series

Miniature series

Global series

E52 and E56 series

Intelligent Sensor Adaption

Page 114

iProx series

ProxView software

Checking Capacitive Fill Levels

Seite 115

E 53 series

Monitoring Pressure

See Industry Main Catalogue

Pressure switch

Monitoring of liquid and gaseous media

Detection of Times, Fill Levels and Currents

Page 120 ff.

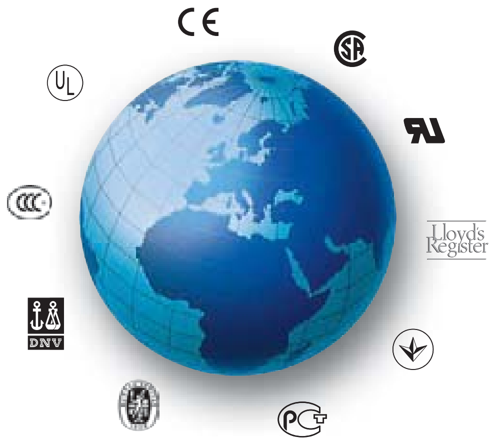
Electronic timing relay DIL ET

Electronic timing relay ETR 2

Electronic timing relay ETR 4

Electronic measuring and monitoring relays EMR4

In Great Shape: The Ergonomic Control Dircuit Devices RMQ-Titan®



Modem styling has been combined with an optimum range of functions. The perfect outfit for use at machines and on panels. The ergonomically shaped button elements are matched to the shape of a fingertip for even more comfortable operation.

Control circuit devices RMQ-Titan emit light non-stop for over 100 000 hours. Special lenses and coloured LEDs offer enduring safety and reliability at a very attractive price.

The Emergency-STOP buttons[1] for the worldwide usable control circuit device product range RMQ-Titan are available as palm switches/ mushroom actuators with a diameter of 38, 45 or 60 mm.

National approvals are necessary for world-wide application of industrial switchgear in many countries and for use on ships.

Control circuit devices RMQ-Titan are ingeniously simple to connect with SmartWire-DT.

SmartWire-DT™
The easy way to connect

Quicklink Online catalogue to
www.eaton.com/moellerproducts

MBC008

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[1] The EMERGENCY-STOP devices from Eaton can also be used as EMERGENCY-OFF devices.

Safety at a glance

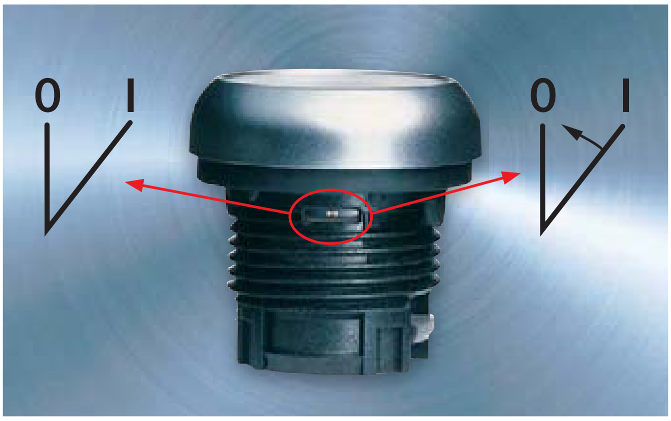
The signal tower SL from the control circuit devices range RMQ-Titan from Eaton indicates the respective state of the machine both acoustically and/or optically in five colours with a continuous, flashing or strobe light. Available for harsh environmental conditions in degrees of protection IP 54 / IP67.

Safe shutdown with RMQ-Titan

The EMERGENCY-STOP or EMERGENCY-OFF buttons are available with and without a key, turn-release, non-illuminated, illuminated with standard LED or with mechanical switch position display (green/red) in the centre of the actuation element. Self-monitoring contact blocks guarantee comprehensive operational safety: even with incorrect installation or after unduly powerful actuation.

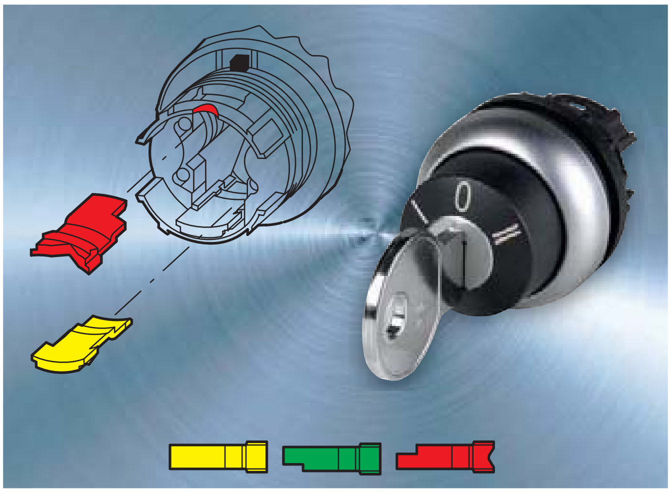
SmartWire-DT – simply ingenious

Conventional wiring of control circuit devices involves a lot of effort and expense. SmartWire-DT is simply ingenious – the flat green cable connects control circuit devices with just a click.



Spring-return/stay-put – flexible adjustment

By a simple “flick of a switch” the stay-put pushbutton can be converted to a spring-return pushbutton. This reduces inventory costs and enhances flexibility on-site.



Simple function coding

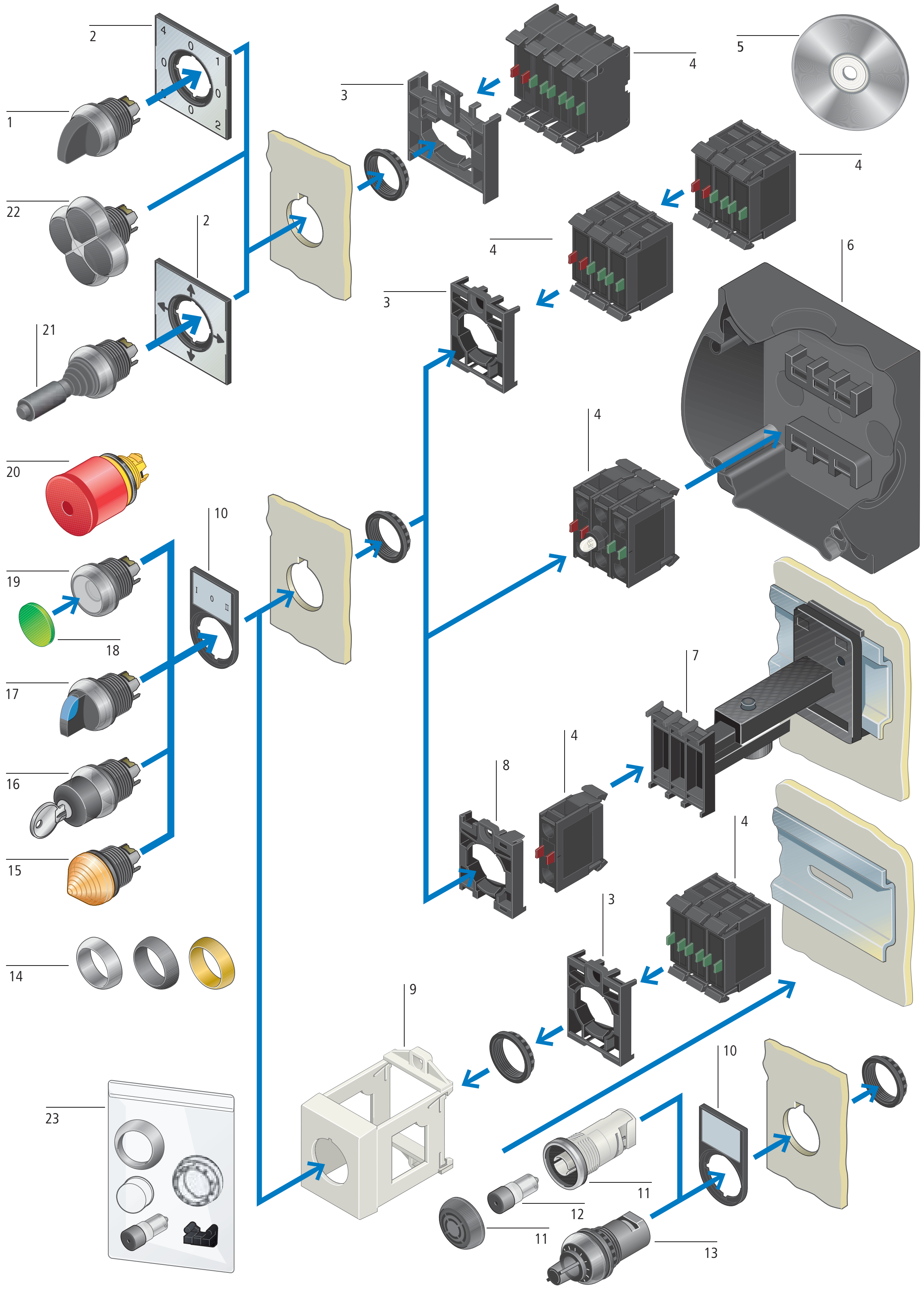
The coding adapter allows you to set the key-operated button to spring-return / stay-put functions. The option for withdrawal of the key can be set with the coding adapter.

Fast, flexible labelling – The Labeleditor

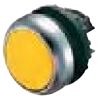
Labeleditor software enables you to create your own company and project-related inscriptions as well as symbols and images for the RMQ and easy products. Special characters are also possible. Download free of charge at www.moeller.net/de/support/index.jsp Search term: Labeleditor

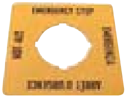
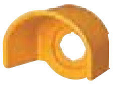
RMQ-Titan pilot devices

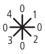
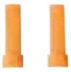
System overview



1	4-way selector switch actuators
2	Labels with label mounts
3	Fixing adapters
4	Contact-/LED elements
5	Customized inscription
6	Surface mounting enclosure
7	Telescopic clip
8	Centring adapter
9	IVS top-hat rail adapter
10	Label mounts
11	Acoustic device
12	Buzzers
13	Potentiometer
14	Bezels
15	Indicator lights
16	Key-operated buttons
17	Selector switch actuators
18	Button plates/lenses
19	Pushbutton actuators
20	Emergency stop pushbuttons/ Emergency switching off pushbuttons
21	Joystick
22	4-way pushbutton
23	Accessories

	Description	Button plate	**Part no.**	Article no.
Pushbutton actuators, IP67, IP69K				
Flush actuator 	momentary	●	**M22-D-S**	216590
		○	**M22-D-W**	216592
		🔴	**M22-D-R**	216594
		🟢	**M22-D-G**	216596
		🟡	**M22-D-Y**	216598
		🔵	**M22-D-B**	216600
		O	**M22-D-R-X0**	216605
		I	**M22-D-G-X1**	216607
		O	**M22-D-S-X0**	216609
		without	**M22-D-X**	216602
Actuator extended	momentary	●	**M22-DH-S**	216636
		○	**M22-DH-W**	216638
		🔴	**M22-DH-R**	216641
		🟢	**M22-DH-G**	216643
		🟡	**M22-DH-Y**	216646
		🔵	**M22-DH-B**	216649
Illuminated pushbutton actuator, IP67, IP69K				
Flush	momentary	○	**M22-DL-W**	216922
		🔴	**M22-DL-R**	216925
		🟢	**M22-DL-G**	216927
		🟡	**M22-DL-Y**	216929
		🔵	**M22-DL-B**	216931
Actuator extended,	momentary	○	**M22-DLH-W**	216965
		🔴	**M22-DLH-R**	216967
		🟢	**M22-DLH-G**	216969
		🟡	**M22-DLH-Y**	216971
		🔵	**M22-DLH-B**	216973
Double actuator pushbuttons with indicator light, IP66				
White lens	momentary	I 0	**M22-DDL-GR-X1/X0**	216700
		START STOP	**M22-DDL-GR-GB1/GB0**	216702
		I 0	**M22-DDL-WS-X1/X0**	216706
Mushroom actuator, IP67, IP69K				
	momentary	●	**M22-DP-S**	216712
		🔴	**M22-DP-R**	216714
		🟢	**M22-DP-G**	216716
		🟡	**M22-DP-Y**	216718
		O	**M22-DP-R-X0**	216720

	Description/inscription	Color	**Part no.** Article no.	**Part no.** Article no.
Emergency stop pushbuttons/ Emergency switching off pushbuttons				
Mushroom-shaped, IP66, IP69K			**Diameter = 38 mm**	
	Unlock by pulling without illumination		**M22-PV** 216876	–
	Unlock by pulling illuminated with LED element M22-LED...		**M22-PVL** 216878	–
	Unlock by turning Without illumination		**M22-PVT** 263467	–
	Unlock by turning illuminated with LED element M22-LED...		**M22-PVLT** 263469	–
	Unlock with key without illumination		**M22-PVS** 216879	–
Palm-tree shape, IP67, IP69K			**Diameter = 45 mm**	**Diameter = 60 mm**
	Unlock by turning Without illumination		**M22-PVT45P** 121462	**M22-PVT60P** 121464
	Unlock by turning illuminated with LED element M22-LED...		**M22-PVLT45P** 121460	**M22-PVLT60P** 121461
	With mechanical switch position indication		**M22-PVT45P-MPI** 121463	**M22-PVT60P-MPI** 121465
	Unlock by key MS1		**M22-PVS45P-MS1** 121468	**M22-PVS60P-MS1** 121469
	Unlock by key Ronis 455		**M22-PVS45P-RS** 121466	**M22-PVS60P-RS** 121467
Emergency stop/ switching off labels yellow, with black lettering				
33 x 50 mm 	Emergency stop		**M22-XZK1-D99** 121089	–
	Emergency switching off		**M22-XZK-D99** 216471	–
	Blank		**M22-XZK** 216470	–
50 x 50 mm 	Emergency stop quadrilingual: de, en, fr, it		**M22-XYK11** 121373	–
	Emergency switching off quadrilingual: de, en, fr, it		**M22-XYK1** 216484	–
Diameter 90 mm 	Emergency stop quadrilingual: de, en, fr, it		**M22-XAK11** 121085	–
	Emergency switching off quadrilingual: de, en, fr, it		**M22-XAK1** 216465	–
	Blank		**M22-XAK** 216464	–
Diameter 60 mm	Emergency stop quadrilingual: de, en, fr, it		**M22-XBK11** 121372	–
	Emergency switching off quadrilingual: de, en, fr, it		**M22-XBK1** 216483	–
	Blank		**M22-XBK** 269580	–
Guard-ring, IP65				
	protection against accidental actuation	🟡	**M22-XGPV** 231273	–
	protection against accidental actuation	⚪	**M22G-XGPV** 271610	–
Sealable shroud, IP65				
33 x 50 mm 	For emergency stop/emergency switching off actuators M22-PV, PVL, PVS		**M22-PL-PV** 216397	–
LED-Luminous ring				
	24 V AC/DC 3 separately actuatable LED series (e.g. for continuous light)		**M22-XPV60-Y-24** 121477	–
	120 V AC		**M22-XPV60-Y-120** 121476	–
	230 V AC		**M22-XPV60-Y-230** 138280	–

	Description		**Part no.** Article no.
Selector switch actuators, 2 positions, IP66			
With rotary head 	momentary		**M22-W** 216853
	maintained		**M22-WR** 216855
With thumb-grip 	momentary		**M22-WK** 216865
	maintained		**M22-WRK** 216867
Selector switch actuators, 3 positions, IP66			
With rotary head 	momentary		**M22-W3** 216861
	maintained		**M22-WR3** 216863
With thumb-grip 	momentary		**M22-WK3** 216870
	maintained		**M22-WRK3** 216872
Selector switch actuators, 4 positions, IP66 Not suitable for coding adapters Use M22-A4 fixing adapter			
With rotary head	maintained		**M22-WR4** 279419
With thumb-grip	maintained		**M22-WRK4** 279431
Key-operated buttons, 2 positions, IP66			
2 positions 	momentary		**M22-WS** 216881
	maintained		**M22-WRS** 216887
3 positions 	maintained		**M22-WRS3** 216900
Coding kit 	to change key withdraw functionality		**M22-XC-R** 216406
	to change stay-put/ spring-return functionality		**M22-XC-Y** 216407

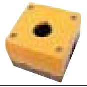
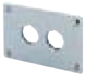
RMQ-Titan pilot devices

Indicator lights, illuminated selector switch actuators, contact elements

	Description	Color	**Part no.** Article no.	**Part no.** Article no.
Indicator lights IP67, IP69K				
			Flat	**Extended, conical**
		○	**M22-L-W** 216771	**M22-LH-W** 216778
		🔴	**M22-L-R** 216772	**M22-LH-R** 216779
		🟢	**M22-L-G** 216773	**M22-LH-G** 216780
		🟡	**M22-L-Y** 216774	**M22-LH-Y** 216781
		🔵	**M22-L-B** 216775	**M22-LH-B** 216782
Illuminated selector switch actuators, thumb-grip, IP66				
			momentary	**maintained**
	Two positions	○	**M22-WLK-W** 216812	**M22-WRLK-W** 216823
		🔴	**M22-WLK-R** 216814	**M22-WRLK-R** 216825
		🟢	**M22-WLK-G** 216816	**M22-WRLK-G** 216827
		🟡	**M22-WLK-Y** 216818	**M22-WRLK-Y** 216829
		🔵	**M22-WLK-B** 216820	**M22-WRLK-B** 216831
	three positions		**momentary**	**maintained**
		○	**M22-WLK3-W** 216833	**M22-WRLK3-W** 216843
		🔴	**M22-WLK3-R** 216835	**M22-WRLK3-R** 216845
		🟢	**M22-WLK3-G** 216837	**M22-WRLK3-G** 216847
		🟡	**M22-WLK3-Y** 216839	**M22-WRLK3-Y** 216849
		🔵	**M22-WLK3-B** 216841	**M22-WRLK3-B** 216851
Fixing adapter, front mount				
	for 3 contact and LED elements		**M22-A** 216374	
	for 4 contact elements (4-way position starter)		**M22-A4** 279437	
Contact elements				
Front mount 	1 N/O		**M22-K10** 216376	
	1 N/C		**M22-K01** 216378	
Base fixing 	1 N/O		**M22-KC10** 216380	
	1 N/C		**M22-KC01** 216382	
Self-monitoring contact elements				
Front mount 	1 N/O, 1 N/C		**M22-K01SMC10** 121472	
	1 N/O, 2 N/C		**M22-K02SMC10** 121474	
Base fixing 	1 N/O, 1 N/C		**M22-KC01SMC10** 121474	
	1N/O, 2 N/C		**M22-KC02SMC10** 121720	

RMQ-Titan pilot devices

LED elements, housing

	Description	Color	**Part no.** Article no.
LED elements with screw terminals			
Front mount	12 - 30 V AC/DC	○	**M22-LED-W** 216557
		🔴	**M22-LED-R** 216558
		🟢	**M22-LED-G** 216559
		🔵	**M22-LED-B** 218057
	85 - 264 V AC	○	**M22-LED230-W** 216563
		🔴	**M22-LED230-R** 216564
		🟢	**M22-LED230-G** 216565
		🔵	**M22-LED230-B** 218059
Base fixing	12 - 30 V AC/DC	○	**M22-LEDC-W** 216560
		🔴	**M22-LEDC-R** 216561
		🟢	**M22-LEDC-G** 216562
		🔵	**M22-LEDC-B** 218058
	85 - 264 V AC	○	**M22-LEDC230-W** 216566
		🔴	**M22-LEDC230-R** 216567
		🟢	**M22-LEDC230-G** 216568
		🔵	**M22-LEDC230-B** 218060
Surface mounting enclosure IP67, IP69K With high-grade steel screws Enclosure base anthracite			
for emergency-stop buttons	Number of mounting locations		
	1	🟡	**M22-IY1** 216536
	1	●	**M22-I1** 216535
	2		**M22-I2** 216537
	3		**M22-I3** 216538
	4		**M22-I4** 216539
	6 (IP66)		**M22-I6** 216540
Flush mounting plates IP65			
	1	●	**M22-E1** 216541
	2		**M22-E2** 216543
	3		**M22-E3** 216544

RMQ-Titan pilot devices

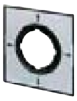
Complete devices, potentiometer, acoustic device

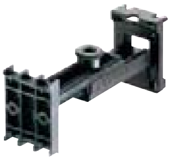
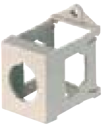
Moeller® series

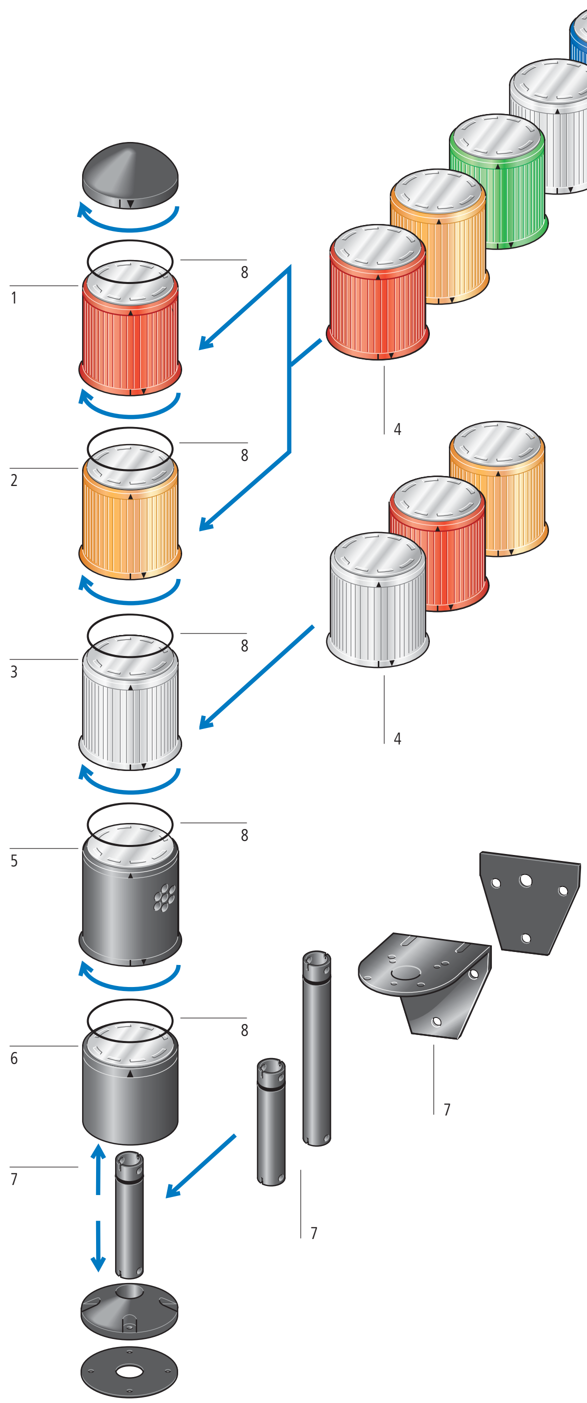
	Description	Button plate	Enclosure protection	**Part no.** Article no.
Emergency-stop button				
Front mount 	1 N/O, 1 N/C		IP66, IP69K	**M22-PV/KC11/IY** 216525
Emergency-Stop key-release mushroom pushbuttons				
	1 N/O, 1 N/C		IP67, IP69K	**M22-PVS/KC11/IY** 216523
Pushbutton actuators				
1 number of locations 	1 N/O, 1 N/C	I	IP67, IP69K	**M22-D-G-X1/KC11/I** 216522
	1 N/O, 1 N/C	O		**M22-D-R-X0/KC11/I** 216521
2 numbers of locations	2 N/O, 2 N/C	O I		**M22-I2-M1** 216529
3 numbers of locations	3 N/O, 3 N/C	I O II		**M22-I3-M1** 216532
Key-operated button				
	1 N/O, 1 N/C		IP66	**M22-WRS/KC11/I** 216526
Potentiometer				
	R = 1 kΩ		IP66	**M22-R1K** 229489
	R = 4.7 kΩ			**M22-R4K7** 229490
	R = 10 kΩ			**M22-R10K** 229491
	R = 47 kΩ			**M22-R47K** 229492
	R = 100 kΩ			**M22-R100K** 229493
	R = 470 kΩ			**M22-R470K** 229494
Compact acoustic device				
	Front black, without buzzer, BA 9s lamp socket		IP40	**M22-AMC** 229015
Buzzer for acoustic device				
	Continuous tone, 18 - 30 V AC/DC			**M22-XAM** 229025
	Pulsed tone, 24 V DC (+10 %/-15 %)			**M22-XAMP** 229028

RMQ-Titan pilot devices

Four-way operator, button plate

	Description	Color	**Part no.**	Article no.	**Part no.**	Article no.
Joystick, IP66						
2 positions	momentary, horizontal		**M22-WJ2H**	289195		
	maintained, horizontal		**M22-WRJ2H**	289199		
	momentary, vertical		**M22-WJ2V**	289196		
	maintained, vertical		**M22-WRJ2V**	289240		
4 positions	maintained, in every position		**M22-WRJ4**	279415		
	momentary, in every position		**M22-WJ4**	279417		
Labels for joysticks						
	No inscription		**M22-XCK**	279433		
	4 direction arrows		**M22-XCK1**	279434		
	2 direction arrows, can be turned through 90°		**M22-XCK3**	290260		
4-way pushbutton, IP66						
Momentary in every position	No inscription		**M22-D4-S**	279411		
	4 direction arrows		**M22-D4-S-X7**	286336		
Complete legend holders, IP66						
30 x 50 mm, round, black	STOP		**M22S-ST-GB0**	216494		
	START		**M22S-ST-GB1**	216495		
	OFF		**M22S-ST-GB5**	218300		
	ON		**M22S-ST-GB6**	216496		
	FAULT		**M22S-ST-GB8**	216498		
	RUN		**M22S-ST-GB7**	216497		
	MAN. AUTO		**M22S-ST-GB11**	216500		
	OFF ON		**M22S-ST-GB10**	216499		
	MAN. 0 AUTO		**M22S-ST-GB12**	216501		
IP66, legend holders, without label mount						
round, black	for pushbuttons 30 x 50 mm		**M22S-ST-X**	216392		
	for double actuator pushbuttons 30 x 75 mm		**M22S-STDD-X**	216394		
Insert labels for label mount						
	Aluminium-coloured, no inscription		**M22-XST**	216480		
Button plates for pushbutton actuators						
			Design: flush		**Design: raised**	
		●	**M22-XD-S**	216421	**M22-XDH-S**	216428
		○	**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
		O	**M22-XD-R-X0**	218153	**M22-XD-R-X0**	218153
		I	**M22-XD-G-X1**	218165	**M22-XDH-G-X1**	218210

	Description	**Part no.** Article no.	**Part no.** Article no.
Mounting ring tools			
	Threaded ring, can be fitted on to electric screwdriver	**M22-MS** 216402	–
Blanking plugs, IP67, IP69K			
	For closing off of spare mounting locations	**M22-B** 216388	–
Pushbutton diaphragm for IP67, IP69K, silicone			
	additional protection for pushbuttons	**M22-T-D** 216395	–
	additional protection for double actuator pushbuttons	**M22-T-DD** 216396	–
Protective diaphragm, silicone			
	additional protection for key switches	**M22-XWS** 231275	–
Telescopic clip			
	for three contact/LED elements with base fixing, Including centring adapter	**M22-TC** 216398	–
Top-hat rail adapter			
	Top-hat rail to IEC/EN 60715 for front mounting	**M22-IVS** 216400	–
Bulkhead interface, USB socket 2.0 A/A with connection cable Front mounting prefabricated cable with permanently connected USB 2.0 Type A plug IP65 with closed cover IP20 with plug connected		**Bezel: silver**	**Bezel: black**
	Cable length 60 cm	**M22-USB-SA** 107412	**M22S-USB-SA** 147535
	Cable length 150 cm	**M22-USB-SA-150** 147543	**M22S-USB-SA-150** 147545
Bulkhead interface, RJ45 socket IP65 with closed cover IP20 with plug connected			
	Front mounting RJ45, 8/8	**M22-RJ45-SA** 107413	**M22S-RJ45-SA** 147537

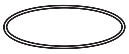


1	continuous light
2	Flashing light
3	Strobe light
4	Caps
5	Acoustic device
6	Base module
7	Spacer, 90° wall mounting
8	Gasket

	Description	Color	**Part no.** Article no.	**Part no.** Article no.
Base modules, IP54				
	with cover, screw terminals	⬛	**SL-B** 205311	
Continuous light modules, IP54				
	without light elements, filament lamps	⬜	**SL-L-W** 205312	–
		🟥	**SL-L-R** 205313	–
		🟩	**SL-L-G** 205314	–
		🟨	**SL-L-Y** 205315	–
		🟦	**SL-L-B** 205316	–

SL signal towers

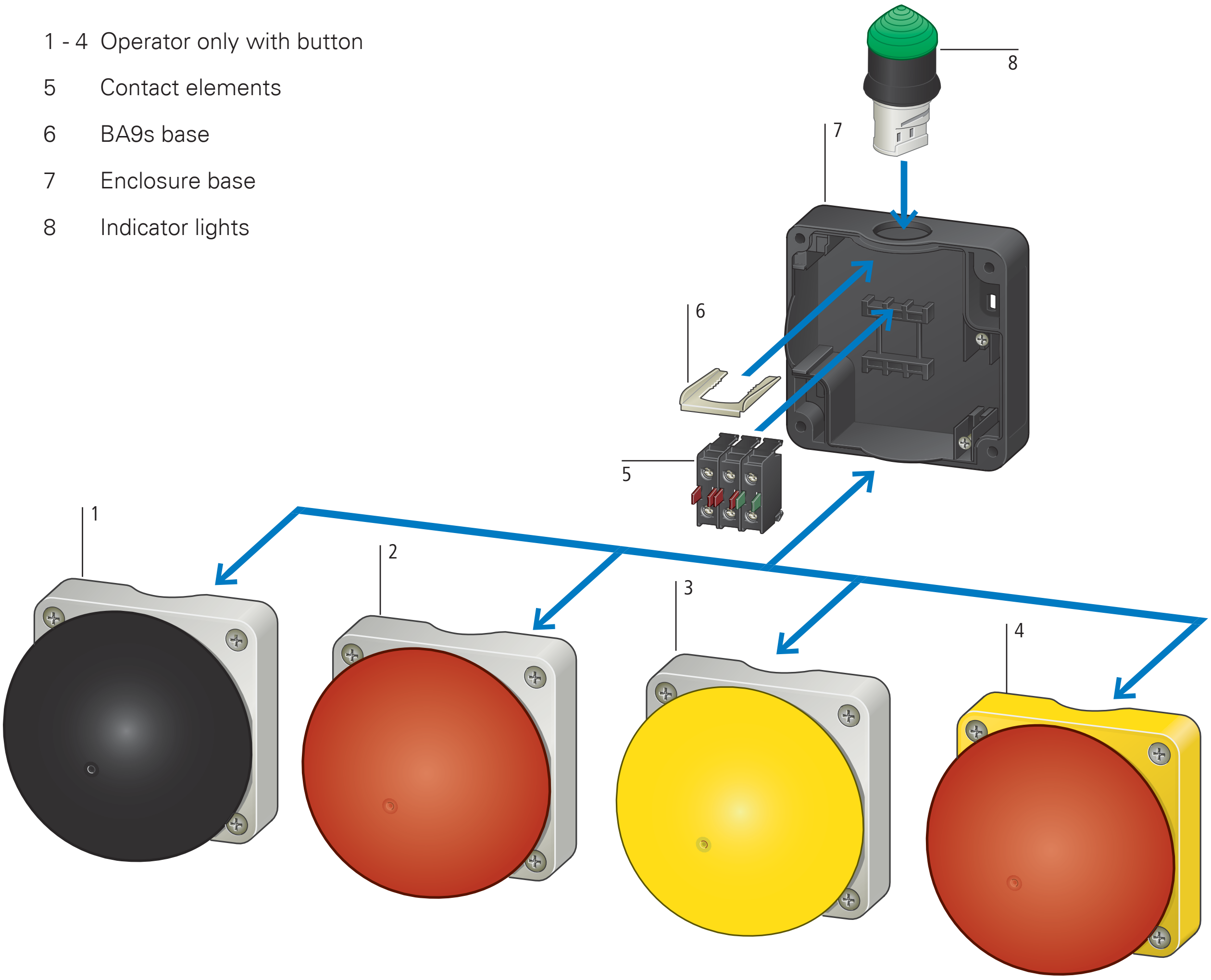
Modules, Accessories

	Description	Color	**Part no.** Article no.	**Part no.** Article no.
Flashing light module, IP54			**24 V AC/DC**	**230 V AC**
	Without light elements	⬜	**SL-BL24-W** 205317	**SL-BL230-W** 205327
		🟥	**SL-BL24-R** 205318	**SL-BL230-R** 205328
		🟨	**SL-BL24-Y** 205320	**SL-BL230-G** 205329
		🟩	**SL-BL24-G** 205319	**SL-BL230-Y** 205330
		🟦	**SL-BL24-B** 205321	**SL-BL230-B** 205331
Acoustic modules, IP20				
	Continuous tone 12 - 36 V AC/DC	📢	**SL-A24** 205341	–
	110 - 230 V AC/DC	📢	**SL-A110-230** 205342	–
	Pulse tone 12 - 36 V AC/DC	📢	**SL-AP24** 205343	–
	110 - 230 V AC/DC	📢	**SL-AP110-230** 205344	–
Strobe light module, IP54 with flash tube				
	230 V AC	⚡	**SL-FL230-W** 205338	–
		🟥⚡	**SL-FL230-R** 205339	–
		🟨⚡	**SL-FL230-Y** 205340	–
Stand with spacer				
	100 mm, insulated material	⬛	**SL-F100** 205345	–
	100 mm, metal	▨	**SL-F100M** 265359	–
	250 mm, insulated material	⬛	**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	–
Filament lamp BA 15d, 5 - 7 W				
	24 V	–	**SL-L24** 205348	–
	110 - 130 V	–	**SL-L130** 205349	–
	230 V	–	**SL-L230** 205350	–
Multiple LED BA 15d			**18 - 30 V AC/DC**	**110 - 230 V AC**
	–	○	**SL-LED-W** 215278	**SL-LED230-W** 285532
	–	🔴	**SL-LED-R** 215279	**SL-LED230-R** 285533
	–	🟢	**SL-LED-G** 215280	**SL-LED230-G** 285534
	–	🟡	**SL-LED-Y** 215281	**SL-LED230-Y** 285535
	–	🔵	**SL-LED-B** 215282	**SL-LED230-B** 285536
Gasket set				
	For increasing the degree of protection to IP65 (Not for the acoustic device) for 3 modules ≙ 4 units	–	**SL-IP65** 215277	–

FAK foot and palm switches

System overview, ordering

1 - 4	Operator only with button
5	Contact elements
6	BA9s base
7	Enclosure base
8	Indicator lights



	Function	Color			Equipping with contacts: ⊖ = Positive opening safety function according to IEC/EN 60947-5-1		**Part no.** Article no.
		Lower section	Cover	Button	N/O = normally open contact	N/C = normally closed contact	
Foot and palm switches IP67, IP69K							
	momentary	⚫	⚪	⚫	1 N/O	1 N/C	**FAK-S/KC11/I** 229749
		⚫	⚪	🔴	1 N/O	1 N/C	**FAK-R/KC11/I** 229746
	maintained	⚫	🟡	🔴	–	1 N/C	**FAK-R/V/KC01/IY** 229747
		⚫	🟡	🔴	1 N/O	1 N/C	**FAK-R/V/KC11/IY** 229748
		⚫	🟡	🔴	–	2 N/C	**FAK-R/V/KC02/IY** 256790

Movements Safely Under Control with Mechanical, Optical, Capacitive and Inductive Sensors

Wherever exact positioning is required, safety/position switches from Eaton with positively opening contacts are used. They are equipped with Cage Clamp and screw terminals and are available with metal and insulated enclosures. Easy to fit and flexible operating heads are a further feature. Safety-door switches and safety position switches protect persons and processes. They are used to ensure that protective doors are safely locked and ensure a safe shutdown. Many sensors enable an inductive, capacitive and optical object recognition. They are available as AC and DC variants. The different rectangular and cylindrical designs are ideally suited to the different areas of application. A particular highlight are the programmable and perfectly application adaptable iProx Sensors for switching distances up to 100 mm.

Quicklink Online catalogue to
www.eaton.com/moellerproducts

MBC009

More than a mechanical switch LSE-Titan

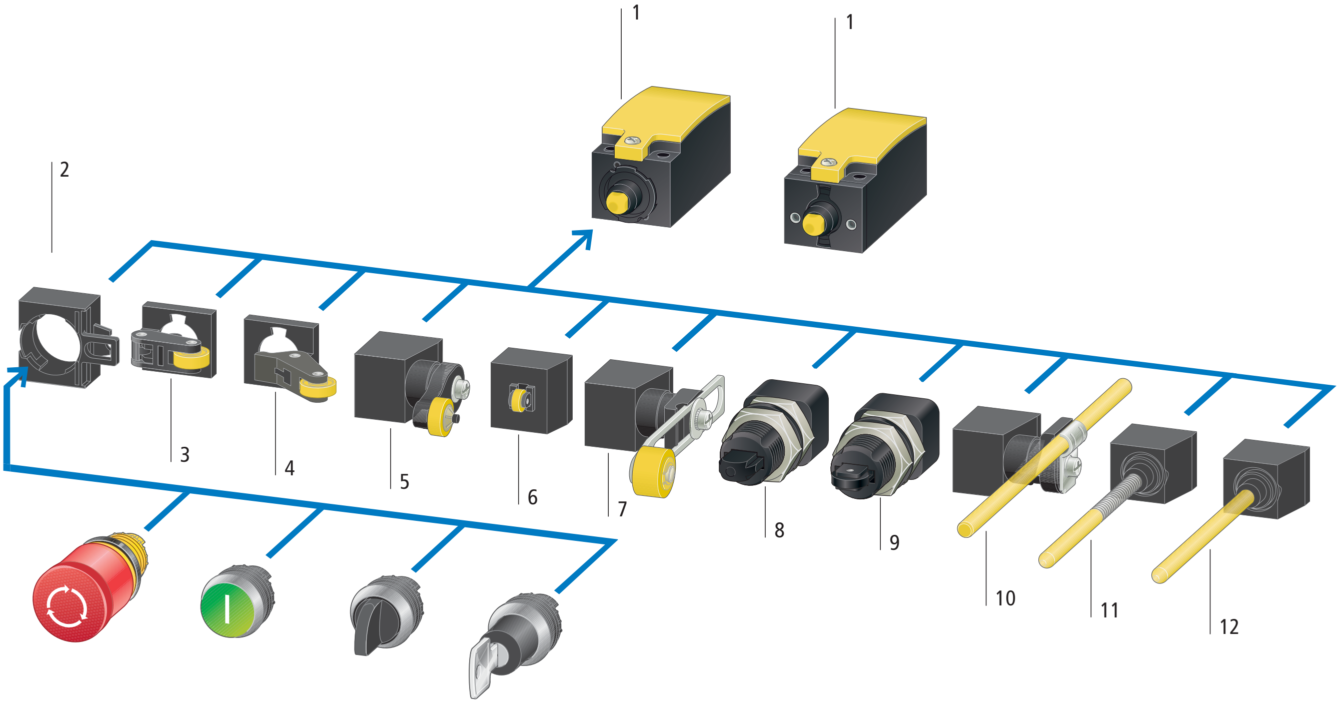
- Variable, adjustable switching point
- Precisely defined and reproducible
- Quick and bounce-free PNP switching outputs facilitate high operating frequency
- Analog voltage or current output for precise position control
- Certified by the TÜV Rheinland

iProx – the programmable inductive proximity switch solves almost every application problem

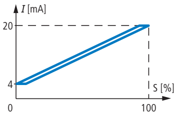
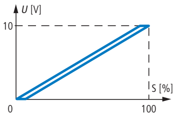
- Adjustable switching distance and operating ranges (band detection)
- Switch-on and switch-off delay
- Speed monitoring (overspeed or underspeed) without additional PLC
- Teach function for difficult detection tasks
- Simple masking and background suppression
- EMC noise immunity adaptable to the environment

Photoelectric sensors – The eyes for every environment

- Opposed mode, refracted-light and diffused mode light barriers and more
- Perfect Prox technology for the best background suppression
- Visible sensing beams for easy adjustment
- Outstanding enclosure construction and sealing
- Solutions for high pressure and steam cleaning as well as other challenging environments



1	Basic device LS, LSM
2	Fixing adapters
3	Roller lever
4	Angled roller lever
5	Rotary lever
6	Roller plunger
7	Adjustable roller lever
8	Rounded plunger, centre fixing
9	Roller plunger, centre fixing
10	Actuating rod
11	Spring-rod actuator
12	Actuating rod

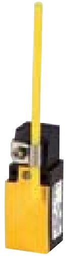
	Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact	N/C = normally closed contact	Contact sequence	housing	**Cage Clamp**[1] **Part no.** Article no.	**Screw terminal** **Part no.** Article no.
Basic device, expandable						
Analog electronic position switches IP66, IP67						
no safety function Visual status display Q1 = analog output Q2 = Diagnostics output				Insulated material		**LSE-AI** 269461
				Insulated material		**LSE-AU** 274096
IP66, IP67 operating point electronically adjustable						
Visible status display, comparable with positive opening function partly short-circuit proof, restart after reset						
	1 N/O	1 N/C		Insulated material		**LSE-11** 266121
	–	2 N/C		Insulated material		**LSE-02** 266122
Rounded plunger, IP66, IP67						
	–	2 N/C		Insulated material	**LS-02** 266107	**LS-S02** 106729
	–	2 N/C		Metal	**LSM-02** 266142	–
	1 N/O	1 N/C		Insulated material	**LS-11** 266109	**LS-S11** 106783
	1 N/O	1 N/C		Metal	**LSM-11** 266144	–
with quick-break switch	1 N/O	1 N/C		Insulated material	**LS-11S** 266105	**LS-S11S** 106798
	1 N/O	1 N/C		Metal	**LSM-11S** 266140	–
Rounded plunger, IP66, IP67 (without positive opening)						
	2 N/O	–		Insulated material	**LS-20** 266120	**LS-S20** 106808
	2 N/O	–		Metal	**LSM-20** 266155	–

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

Position switches

Safety position switches LS-Titan

	Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact	N/C = normally closed contact	housing		Cage Clamp[1] **Part no.**	Article no.	**Screw terminal** **Part no.**	Article no.
Complete devices [2]								
Roller plungers, IP66, IP67								
	1 N/O	1 N/C	Insulated material	–	**LS-11/P**	266112	**LS-S11/P**	106788
	1 N/O	1 N/C	Metal	–	**LSM-11/P**	266147	–	–
	1 N/O	1 N/C	Insulated material	with quick-break switch	**LS-11S/P**	266118	**LS-S11S/P**	106801
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/P**	266153	–	–
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 N/C	Insulated material	with quick-break switch	**LS-11S/S**	266104	**LS-S11S/S**	106805
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/S**	266139	–	–
Roller lever IP66, IP67								
long 	–	2 N/C	Insulated material	–	**LS-02/L**	266108	**LS-S02/L**	106781
	–	2 N/C	Metal	–	**LSM-02/L**	266143	–	–
	1 N/O	1 N/C	Insulated material	–	**LS-11/L**	266110	**LS-S11/L**	106785
	1 N/O	1 N/C	Metal	–	**LSM-11/L**	266145	–	–
	1 N/O	1 N/C	Insulated material	with quick-break switch	**LS-11S/L**	266116	**LS-S11S/L**	106800
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/L**	266151	–	–
short	1 N/O	1 N/C	Insulated material	–	**LS-11/LS**	290173	**LS-S11/LS**	106787
	1 N/O	1 N/C	Insulated material	–	**LS-11D/LS**	290174	**LS-S11D/LS**	106794
Large	1 N/O	1 N/C	Insulated material	–	**LS-11/LB**	290175	**LS-S11/LB**	106786
Rotary lever, IP66, IP67								
	1 N/O	1 N/C	Insulated material	–	**LS-11/RL**	266111	**LS-S11/RL**	106789
	1 N/O	1 N/C	Metal	–	**LSM-11/RL**	266146	–	–
	1 N/O	1 N/C	Insulated material	with quick-break switch	**LS-11S/RL**	266117	**LS-S11S/RL**	106802
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/RL**	266152	–	–
Adjustable roller levers, IP66, IP67								
	1 N/O	1 N/C	Insulated material	–	**LS-11/RLA**	266113	**LS-S11/RLA**	106790
	1 N/O	1 N/C	Metal	–	**LSM-11/RLA**	266148	–	–
	1 N/O	1 N/C	Insulated material	with quick-break switch	**LS-11S/RLA**	266119	**LS-S11S/RLA**	106803
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/RLA**	266154	–	–
IP66, IP67 actuating rod								
	1 N/O	1 N/C	Insulated material	with quick-break switch	**LS-11S/RR**	266106	**LS-S11S/RR**	106804
	1 N/O	1 N/C	Metal	with quick-break switch	**LSM-11S/RR**	266141	–	–

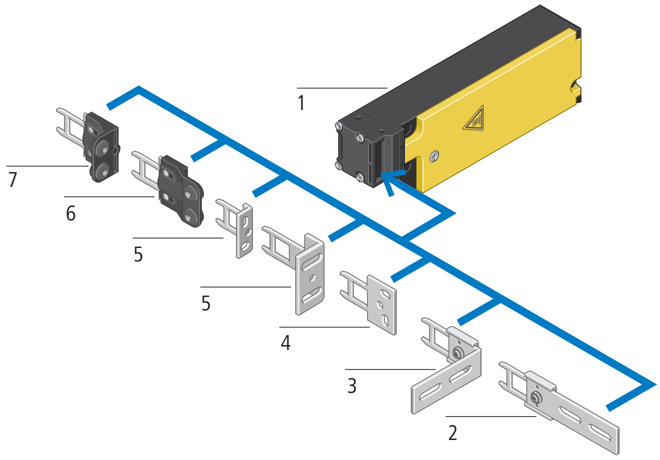
Notes

[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 starting direction.

		Insulated material **Part no.** Article no.	**Metal** **Part no.** Article no.	**Notes**
Rounded plunger, centre fixing				
	For installation in M18 × 1 enclosure wall or mounting plate bore	**LS-XZS** 114024		The operating head can be rotated at 90° intervals to adapt to the specified starting direction.
Roller plunger, centre fixing				
	For installation in M18 × 1 enclosure wall or mounting plate bore	**LS-XZRS** 114025		
Roller plunger				
	–	**LS-XP** 266125	**LSM-XP** 266158	
Roller lever				
	Large	**LS-XLB** 290178		
	short	**LS-XLS** 290177		
	long	**LS-XL** 266123	**LSM-XL** 266156	
Angled roller lever				
	–	**LS-XLA** 266124	**LSM-XLA** 266157	
Rotary lever				
	–	**LS-XRL** 266126	**LSM-XRL** 266159	
Adjustable roller lever				
	D = 18 mm	**LS-XRLA** 266127	**LSM-XRLA** 266160	
	D = 30 mm	**LS-XRLA30** 266128		
	D = 40 mm (rubber)	**LS-XRLA40R** 266130		
	D = 40 mm	**LS-XRLA40** 266129		
Actuating rod				
	Plastic rod	**LS-XRR** 266131	**LSM-XRR** 266161	
	Metal rod	**LS-XRRM** 266132	**LSM-XRRM** 266162	
Spring-rod actuator				
	Not to be used as a safety position switch. Use only in conjunction with snap-action contact.	**LS-XS** 266133	**LSM-XS** 266163	
Actuating rod				
	–	**LS-XOR** 290190		

LS-…ZBZ

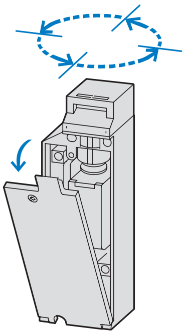


1	Basic device
2	Flat flexible actuator
3	Angled flexible actuator
4	Flat actuator
5	Angled actuator
6	Flat compensating actuator
7	Angled compensating actuator

Order actuators separately
→ HPL0200-2010

Basic devices with spring-powered interlock (closed-circuit principle) IP65

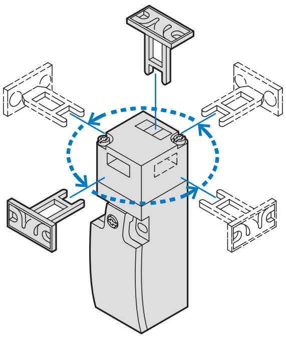
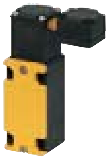
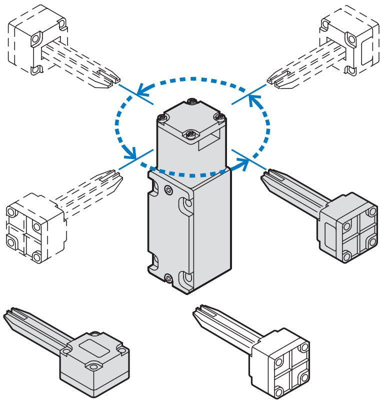
- With interlock monitoring and auxiliary release mechanism
- Monitoring of door position: continuous

	Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact	N/C = normally closed contact	Rated control voltage for magnetic system U_s V	**Part no.** Article no.	**Notes**
	1 N/O	1 N/C	24 V DC	**LS-S11-24DFT-ZBZ/X** 106829	The operating head can be rotated manually in 90° steps to suit the specified level of actuation. 
	–	2 N/C	24 V DC	**LS-S02-24DFT-ZBZ/X** 106823	
	1 N/O	1 N/C	120 V 50/60Hz	**LS-S11-120AFT-ZBZ/X** 106825	
	–	2 N/C	120 V 50/60Hz	**LS-S02-120AFT-ZBZ/X** 106778	
	1 N/O	1 N/C	230 V 50/60Hz	**LS-S11-230AFT-ZBZ/X** 106827	
	–	2 N/C	230 V 50/60Hz	**LS-S02-230AFT-ZBZ/X** 106821	

Basic devices with magnet-powered interlock (open-circuit principle) IP65

- With interlock monitoring
- Monitoring of door position: continuous

	N/O	N/C	V	Part no. Article no.	Notes
	1 N/O	1 N/C	24 V DC	**LS-S11-24DMT-ZBZ/X** 106830	
	–	2 N/C	24 V DC	**LS-S02-24DMT-ZBZ/X** 106824	
	1 N/O	1 N/C	120 V 50/60Hz	**LS-S11-120AMT-ZBZ/X** 106826	
	–	2 N/C	120 V 50/60Hz	**LS-S02-120AMT-ZBZ/X** 106820	
	1 N/O	1 N/C	230 V 50/60Hz	**LS-S11-230AMT-ZBZ/X** 106828	
	–	2 N/C	230 V 50/60Hz	**LS-S02-230AMT-ZBZ/X** 106822	

	Contact configuration ⊖ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact	N/C = normally closed contact	Approval mark	Connection Type	**Part no.** Article no.	**Notes**
Hasp-operated safety switch LSR-.../TKG, IP65						
	–	2 N/C	BG-PrüfZert	Screw terminal	**LSR-S02-1-I/TKG** 106848	
	1 N/O	1 N/C		Screw terminal	**LSR-S11-1-I/TKG** 106847	
Hinge-operated switch LSR-.../TS, IP65						
	–	2 N/C	BG-PrüfZert	Screw terminal	**LSR-S02-1-I/TS** 106852	
	1 N/O	1 N/C		Screw terminal	**LSR-S11-1-I/TS** 106851	
Safety position switch LS-...-ZB, IP65						
	–	2 N/C	BG-PrüfZert	Cage Clamp	**LS-02-ZB** 106817	 Actuator included as standard.
	–	2 N/C		Screw terminal	**LS-S02-ZB** 106874	
	1 N/O	1 N/C		Cage Clamp	**LS-11-ZB** 106819	
	1 N/O	1 N/C		Screw terminal	**LS-S11-ZB** 106876	
	1 N/O	1 N/C		Cage Clamp	**LS-11S-ZB** 106870	
	1 N/O	1 N/C		Screw terminal	**LS-S11S-ZB** 106877	
Safety position switch LS4.../ZB, IP65						
	1 N/O	1 N/C	BG-PRÜFZERT GS geprüfte Sicherheit	Screw terminal	**LS4/S11-1/I/ZB** 106857	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.  Actuator included as standard.
	1 N/O	1 N/C		Screw terminal	**LS4/S11-1/IA/ZB** 106858	
	1 N/O	2 N/C	–	Screw terminal	**LS4/S12-7/IB/ZB** 106859	

E57 Global series

- LED for output status
- Rated operating voltage 10 - 30 V DC
- Switching type PNP
- Plug-in connection M12 x 1, 3-conductor

	Rated switching distance S_n mm	Type of mounting	Contact configuration N/O = normally open contact N/C = normally closed contact	Material	**Part no.**	Article no.
M8 x 1	1	Flush	1 N/O	Stainless steel	**E57-08GS01-GDB**	135862
	2	Non-flush			**E57-08GU02-GDB**	135866
	3	Flush			**E57-08GE03-GDB**	135854
	6	Non-flush			**E57-08GE06-GDB**	135858
M12 x 1	2	Flush	1 N/O	Metal	**E57-12GS02-GDB**	135886
	4	Non-flush			**E57-12GU04-GDB**	135895
	5	Flush			**E57-12GE05-GDB**	135870
	10	Non-flush			**E57-12GE10-GDB**	135878
M18 x 1	5	Flush	1 N/O	Metal	**E57-18GS05-GDB**	135932
	8	Flush			**E57-18GE08-GDB**	135915
	8	Non-flush			**E57-18GU08-GDB**	135940
	18	Non-flush			**E57-18GE18-GDB**	135924
M30 x 1.5	10	Flush	1 N/O	Metal	**E57-30GS10-GDB**	135978
	15	Flush			**E57-30GE15-GDB**	135960
	15	Non-flush			**E57-30GU15-GDB**	135986
	29	Non-flush			**E57-30GE29-GDB**	135968

Miniature series E57

- LED for output status
- Rated operating voltage 10 - 30 V DC
- Switching type PNP
- 2 m connection cable, 3-conductor

	Rated switching distance S_n mm	Type of mounting	Contact configuration	Material	**Part no.**	Article no.
4 mm ∅	0.8	Flush	1 N/O	Stainless steel	**E57EAL4T111SP**	136239
M5 x 1	0.8	Flush	1 N/O	Stainless steel	**E57EAL5T111SP**	136241
6.5 mm ∅	1	Flush	1 N/O	Stainless steel	**E57EAL6T111SP**	136245
	2	Non-flush	1 N/O	Stainless steel	**E57EAL6T111EP**	136244

iProx series

- Rated operating voltage 6 - 48 V DC
- Switching type NPN/PNP
- Plug-in connection M12 x 1, 3-conductor

	Rated switching distance S_n mm	Type of mounting	Contact configuration	Material	**Part no.**	Article no.
M12 x 1	4	Flush	1 N/O	Stainless steel	**E59-M12A105D01-D1**	136207
M18 x 1	8	Flush	1 N/O	Stainless steel	**E59-M18A108D01-D1**	136215
	18	Non-flush	1 N/O	Stainless steel	**E59-M18C116D01-D1**	136219
M30 x 1.5	15	Flush	1 N/O	Stainless steel	**E59-M30A115D01-D1**	136223
Programming cable RS232		–	–	–	**E59RP1**	136229
Programming software CD		–	–	–	**E59SW1**	136230

E52 Serie (inductive)

- 2 LED for current and output status
- Adjustable Sensing Head for Top- and Side-Sensing
- Rated operating voltage 6 - 48 V DC
- Automatic configuration NPN, PNP
- M12 plug connectors
- 4 conductor

	Design (outer dimensions)	Rated switching distance S_n mm	Type of mounting	Contact configuration N/C = Normally closed contact N/O = Normally open contact	Material	**Part no.** Article no.
	40 x 40 x 40 Rectangular housing	15	Flush	1 N/C/1 N/O	Zinc/Insulated material	**E52Q-DL15SAD01** 135804
		15	Non-flush	1 N/C/1 N/O		**E52Q-DL15UAD01** 135805
		20	Flush	1 N/C/1 N/O		**E52Q-DL20SAD01** 135806
		20	Non-flush	1 N/C/1 N/O		**E52Q-DL20UAD01** 135807
		25	Non-flush	1 N/C/1 N/O		**E52Q-DL25UAD01** 135808
		30	Non-flush	1 N/C/1 N/O		**E52Q-DL30UAD01** 135809
		35	Non-flush	1 N/C/1 N/O		**E52Q-DL35UAD01** 135810
		40	Non-flush	1 N/C/1 N/O		**E52Q-DL40UAD01** 135811

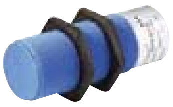
E56 Serie (inductive)

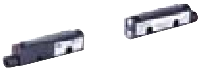
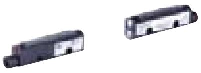
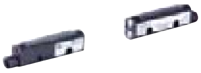
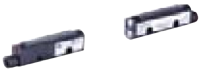
- 2 LED for current and output status
- Rated operating voltage 6 - 48 V DC
- Automatic configuration NPN, PNP
- Plug connectors
- 4 conductor

	Design (outer dimensions)	Rated switching distance S_n mm	Type of mounting	Contact configuration	Material	**Part no.** Article no.
	79 x 79 x 39	40	Flush	1 N/C/1 N/O	Insulated material	**E56ADL40SAD01** 136234
	79 x 79 x 39	50	Non-flush	1 N/C/1 N/O		**E56ADL40UAD01** 136235
	109 x 110 x 41	70	Non-flush	1 N/C/1 N/O		**E56BDL70UAD01** 136236
	171.5 x 171.5 x 67.4	100	Non-flush	1 N/C/1 N/O		**E56CDL100UAD01** 136237

E53 Serie (capacitive)

- Output signal LED
- Rated operating voltage 10 - 30 V DC
- Switching type PNP
- Plug-in connection M12
- 3 conductor

	Design (outer dimensions)	Rated switching distance S_n mm	Type of mounting	Contact configuration	Material	**Part no.** Article no.
M18 x 1 	–	8	Flush	1 N/O	Insulated material	**E53KAL18T111SD** 134768
	–	8	Flush	1 N/C		**E53KBL18T111SD** 134802
	–	15	Non-flush	1 N/O		**E53KAL18T111ED** 134767
	–	15	Non-flush	1 N/C		**E53KBL18T111ED** 134801
M30 x 1.5 	–	20	Flush	1 N/O	Insulated material	**E53KAL30T111SD** 134780
	–	20	Flush	1 N/C		**E53KBL30T111SD** 134814
	–	25	Non-flush	1 N/O		**E53KAL30T111ED** 134779
	–	25	Non-flush	1 N/C		**E53KBL30T111ED** 134813
34 ∅ 	–	25	Flush	1 N/O	Insulated material	**E53KAL34T111SD** 134790
	–	25	Flush	1 N/C		**E53KBL34T111SD** 134824
	–	35	Non-flush	1 N/O		**E53KAL34T111ED** 134789
	–	35	Non-flush	1 N/C		**E53KBL34T111ED** 134823

	Rated switching distance S_n mm	Type of light	**Part no.** Article no.
Comet series • selector switch bright/dark switching • M18 x 1, • Plug-in connection M12 x 1 • Insulated material			
3 conductor • Rated operating voltage 20 - 264 V AC, 15 - 30 V DC • Switching type NPN			
One-way light barrier (detector), flat 	24000	visible red	**12102AQD03** 135576
One-way light barrier (source), flat 	24000	visible red	**11102AQD03** 135564
Reflex sensor, flat • for combination with reflector 	7600	visible red	**14102AQD03** 135656
Reflex sensor, flat 	50	visible red	**13104AQD03** 1) 135604
	200	Infra-red	**13106AQD03** 135620
	225		**13103AQD03** 1) 135596
	610		**13100AQD03** 135580
4 conductor • Rated operating voltage 10 - 30 V DC • Switching type NPN, PNP			
One-way light barrier (detector), flat 	24000	visible red	**12102AQD07** 135577
One-way light barrier (source), flat 	24000	visible red	**11102AQD07** 135565
Reflex sensor, flat • for combination with reflector 	7600	visible red	**14102AQD07** 135657
Reflex sensor, flat 	50	visible red	**13104AQD07** 1) 135605
	200	Infra-red	**13106AQD07** 135621
	225		**13103AQD07** 1) 135597
	610		**13100AQD07** 135581

Notes

1) with background suppression (Perfect Prox)

E58-Serie

- Tempered glass lens cover protects against abrasion
- Bright 360° function display
- Rated operating voltage 10 - 30 V DC
- Switching type NPN, PNP
- Plug-in connection M12 x 1
- 4 conductor
- Stainless steel

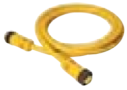
	Design (outer dimensions)	Rated switching distance S_n mm	Type of light	Switching principle	**Part no.**	Article no.
Reflected-light beam, with background suppression (Perfect Prox)						
	M18 x 1	50	visible red	dark switching	**E58-18DP50-HDP**	135671
		50		light switching	**E58-18DP50-HLP**	135673
		100		dark switching	**E58-18DP100-HDP**	135665
		100		light switching	**E58-18DP100-HLP**	135667
	M30 x 1.5	280		dark switching	**E58-30DPS280-HDP**	135681
		280		light switching	**E58-30DPS280-HLP**	135683
Reflex sensor for combination with reflector						
	M30 x 1.5	18000	visible red	dark switching	**E58-30RS18-HDP**	135689
	M30 x 1.5	18000		light switching	**E58-30RS18-HLP**	135691
One-way light barrier (detector)						
	M30 x 1.5	250000	–	dark switching	**E58-30TD250-HDP**	135693
	M30 x 1.5	250000	–	light switching	**E58-30TD250-HLP**	135695
One-way light barrier (source), forward viewing						
	M30 x 1.5	250000	visible red	–	**E58-30TS250-HAP**	135697

E65-SM-Series

- Bright indicators for power, output, and TargetLock™
- Rated operating voltage 10 - 30 V DC
- M18 x 1
- Switching type NPN, PNP
- Plug-in connection M12 x 1
- 4 conductor
- Insulated material

	Design (outer dimensions)	Rated switching distance S_n mm	Type of light	Switching principle	**Part no.**	Article no.
Reflected-light beam with background suppression (Perfect Prox)						
	–	100	–	dark switching	**E65-SMPP100-HDD**	135711
	–	100	–	light switching	**E65-SMPP100-HLD**	135713
One-way light barrier (detector) for combination with transmitter						
	–	15000	–	dark switching	**E65-SMTD15-HDD**	135731
	–	15000	–	light switching	**E65-SMTD15-HLD**	135733
One-way light barrier (transmitter) for combination with detector						
	–	15000	–	–	**E65-SMTS15-HAD**	135735

Connecting cables, DC, 4 pole

	Design, input end	Design output end	Length mm	**Part no.**	Article no.
	Coupling, flat	Cable end open	2000	**CSDS4A4CY2202**	136292
			5000	**CSDS4A4CY2205**	136294
			10000	**CSDS4A4CY2210**	136296
	Coupling, flat	Plug, straight	1500	**CSDS4A4CY2201.5-D**	136316
			3000	**CSDS4A4CY2203-D**	136293
			5000	**CSDS4A4CY2205-D**	136295
	Coupling, flat	Plug, angled	1500	**CSDR4A4CY2201.5-D**	136313
			3000	**CSDR4A4CY2203-D**	136315
			5000	**CSDR4A4CY2205-D**	136283
	Coupling, angled	Cable end open	2000	**CSDR4A4CY2202**	136279
			5000	**CSDR4A4CY2205**	136282
			10000	**CSDR4A4CY2210**	136284

Timing Relay DILET, ETR, Measuring Relay and Monitoring Relay EMR

The range of electronic timing relay incorporates three different construction designs, which are adapted for differing application fields. All timing relays are mounted on DIN top-hat rails. The measuring and monitoring relay EMR4 range is approved for worldwide use. Most of the relays feature multi-voltage coils.

They cover a wide range of applications:

- Current monitors for universal use
- Phase monitors for monitoring damage protection for individual system sections
- Phase sequence relays monitoring the rotating field
- Unbalance relays for reliable phase loss detection
- Multifunctional three-phase monitors for space-saving monitoring of a rotating field
- Level monitoring relays for monitoring fill levels
- Earth leakage monitors for enhanced operational safety.

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MBC020

Timing Relay DILET and ETR – Precision and Economic Switching

- Large choice of setting ranges
- Many timing functions for every requirement
- Remote setting via potentiometer
- Flexible connection using wide voltage range power supply
- Additional signal input even for different control voltage levels

Multi-functional three-phase monitor – compact rotary field monitoring

- Monitoring of phase sequence, phase loss, phase unbalance, overvoltage and undervoltage to protect the motor
- With optional neutral conductor monitoring
- Thresholds for overvoltage and undervoltage can be adjusted or fixed
- 2 changeover contacts for higher flexibility

Earth-leakage monitor and level relay EMR – the right solution for every application

- Enhanced safety by monitoring for earth-leakage using an earth-leakage monitor
- Fault correction without long standstill times
- Test button facilitates simple function testing
- Simple level monitoring and/or dry running protection
- Enhanced safety via open circuit principle

Electronic relays

DILET, ETR timing relay

		Time range	**24 - 240 V AC, 50/60 Hz** **24 - 240 V DC** **Part no.** Article no.	**400 V AC, 50/60 Hz** **Part no.** Article no.
DILET timing relays				
	On-delayed	1.5 - 30 s	**DILET11-30-A** 048878	**DILET11-30-W** 048904
	On-delayed	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	**DILET11-M-A** 048886	**DILET11-M-W** 048891
	multi-functional with remote potentiometer	0.05 - 1s 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	**DILET70-A** 048893	**DILET70-W** 048899
ETR4 electronic timing relays, 22.5 mm wide				
	Star-delta switching	3 - 60 s	**ETR4-51-A** 031884	**ETR4-51-W** 031885
	On-delayed	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
	multi-functional		**ETR4-69-A** 031891	**ETR4-69-W** 031887
	multi-functional with connection for potentiometer, and 2 changeover contacts can be converted to 2 timed contacts or 1 non-delayed contact and 1 timed contact		**ETR4-70-A** 031888	
ETR2 electronic timing relays, 17.5 mm wide			**12 - 240 V AC, 50/60 Hz** **12-240 V DC**	**24 - 240 V AC, 50/60 Hz** **24-48 V DC**
	On-delayed 1 changeover contact	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	–	**ETR2-11** 262684
	Off-delayed 1 changeover contact		–	**ETR2-12** 262686
	Fleeting contact on energization 1 changeover contact		–	**ETR2-21** 262687
	Flashing, pulse initiating 1 changeover contact		–	**ETR2-42** 262688
	Flashing, 2 speeds (ON/OFF times variable) 1 changeover contact		–	**ETR2-44** 262730
	Multifunction relay 1 changeover contact		–	**ETR2-69** 262689
	On-delayed 2 Changeover contact		–	**ETR2-11-D** 119426
	Off-delayed 2 Changeover contact		–	**ETR2-12-D** 119427
	multi-functional 2 Changeover contact		**ETR2-69-D** 119428	–

EMR4-I… current monitoring relays, single-phase

		Current measurement range I~/I= A	Supply voltage	**Part no.** Article no.
	• 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
		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
		0.3 - 1.5 A 1 - 5 A 3 - 15 A	220 - 240 V AC, 50/60 Hz	**EMR4-I15-1-B** 106944

EMR4-F… phase sequence relay

		Monitoring voltage per phase U_N V AC	Supply voltage	**Part no.** Article no.
	• Monitors three-phase systems for phase sequence and phase failure (< 0.6 x U_e) • Supply voltage = voltage being monitored	200 - 500 V AC, 50/60 Hz	200 - 500 V AC, 50/60 Hz	**EMR4-F500-2** 221784

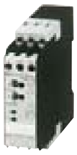
EMR5-A... phase imbalance monitoring relays

		Threshold value	Supply voltage	**Part no.** Article no.
	Power supply from the measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Imbalance • Imbalance threshold values adjustable • Response 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
			300 - 500 V AC, 50/60 Hz	**EMR5-A400-1** 134222

		Monitoring voltage per phase	Threshold value[1]	Supply voltage	Width mm	**Part no.** Article no.
Phase monitoring relay EMR5-(A)W...						
multi-functional						
	Power supply from the measuring circuit Three-phase monitoring • Phase sequence • Phase failure • Overvoltage • Undervoltage • Imbalance • Neutral cable break (not EMR5-AWN170/280...) • Threshold values for overvoltage/ undervoltage and imbalance adjustable • On-delay/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
		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
		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
		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
On- and Off-delayed						
	Power supply from the measuring circuit Three-phase monitoring of phase parameters • Phase sequence • Phase failure • Overvoltage • Undervoltage • Threshold values for overvoltage/ undervoltage adjustable (only EMR5-W300/500...). • Threshold values for imbalance adjustable (only EMR5-W300/500...) • ON-delay/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
		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
		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

		Response sensitivity	Supply voltage	Width mm	**Part no.** Article no.
EMR4-N… liquid level monitoring relays					
	• Monitors the level of conductive liquids • Monitors the ratio of mixtures of conductive liquids • Selectable: protection against running dry or overflowing	5 kΩ - 100 kΩ	220 - 240 V AC, 50/60 Hz	22.5	**EMR4-N100-1-B** 221789
	• Monitors the level of conductive liquids • Monitors the ratio of mixtures of conductive liquids • Selectable on-delay or off-delay between between 0.5 - 10 s	250 Ω - 500 kΩ	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	45	**EMR4-N500-2-A** 221791
		250 Ω - 500 kΩ	220 - 240 V AC, 50/60 Hz	45	**EMR4-N500-2-B** 221790
Liquid level monitoring relays EMR5N...					
	• Monitors the level of conductive liquids • Monitoring the conductivity of conductive liquids (mixing ratio)	5 kΩ - 100 kΩ	220 - 240 V AC, 50/60 Hz	22.5	**EMR5-N80-1-B** 134232
EMR4-R... insulation monitoring relays					
	• Monitors the insulation resistance between non-earthed AC supply systems and the protective conductor/earth • Insulation monitoring in 1-phase 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	45	**EMR4-RAC-1-A** 221793
	• Monitors the insulation resistance in non-earthed DC supply systems • Selector switch for open- or closed-circuit principle • Test and reset via local test button or remote test operation • Status display via LEDs	10 - 110 kΩ	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	45	**EMR4-RDC-1-A** 221792

Motors Switching and Protecting

Contactors DIL M and overload relays Z
- Overload protection

Page 128 ff.

Motor starter MSC-D
- Overload protection
- Short-circuit protection

Page 146 ff., 154 ff.

Motor starter MSC-DE
- Electronic wide-range overload protection with heavy duty starting
- Short-circuit protection

Page 146 ff., 154 ff.

Circuit-breaker NZM and contactor DIL M
- Overload protection
- Short-circuit protection

Page 182 ff.

Networked Motors Switching and Protection

Contactor DIL M with SmartWire-DT and electronic motor-protective relay ZEB
- Distributed control of the contactor
- Switching state read back

Page 28 ff., 128 ff.

Motor starter MSC-D with SmartWire-DT
- Distributed control of the contactor
- Read back of the contactor switch state and PKZ

Page 28 ff., 146 ff., 154 ff.

Motor starter MSC-DE with SmartWire-DT
- Distributed control of the contactor
- Read back
  - – Contactor switch state and PKE
  - – Motor current
  - – Settings
  - – Motor thermal image
  - – Trip indication, overload/ short circuit/phase loss

Page 28 ff., 146 ff., 154 ff.

Circuit-breaker NZM with SmartWire-DT and contactor DIL M
- Contactor PLC control
- Read back
  - – Circuit-breaker switching state
  - – Motor current
  - – Load warnings
  - – Settings
  - – Trip cause

Page 28 ff., 182 ff.

Soft Motor Start and Drives

Motor-protective circuit-breakers PKZ and soft starter DS 7
- Overload protection
- Short-circuit protection
- Soft start

Page 146 ff., 164 ff.

Circuit-breaker NZM and soft starter DM 4
- Overload protection
- Short-circuit protection
- Soft start

Page 182 ff.,
DM 4 see Industry Main Catalogue

Frequency inverter M-Max
- Overload protection
- Short-circuit protection
- Speed control

Page 168 ff.

Frequency inverter H-Max
- Overload protection
- Short-circuit protection
- Speed control
- HVAC functions

See Industry Main Catalogue

Networking Motors Soft Motor Start and Drives

Motor starter MSC-DE with SmartWire-DT and soft starter DS 7
- Electronic wide-range overload protection
- Short-circuit protection
- Soft start
- Read back status information

Page 28 ff., 146 ff., 164 ff.

Soft starter DM 4
- Overload protection
- Short-circuit protection
- Soft start
- Read back and setting via fieldbus

See Industry Main Catalogue

Frequency inverter M-Max
- Overload protection
- Short-circuit protection
- Read back and setting via fieldbus

Page 168 ff.

Frequency inverter H-Max
- Overload protection
- Short-circuit protection
- Speed control
- HVAC functions
- Read back and setting via fieldbus

See Industry Main Catalogue

Contactors DIL up to a High-Performance 2600 A, Efficiently and Flexibly Combinable

The contactor series covers the entire performance range from mini-contactor relay with 7 A up to a vacuum contactor at 2600 A. The combination with electronic overload relays or bimetal relays provides motor starters for the most varied of applications. All circuit-breakers fulfil the demands for world-wide use and are compliant to UL/CSA, CCC and shipping classifications. The motor protection systems are also ATEX certified. The contactors are becoming more efficient, particularly due to the new Eco types for 15.5, 38, 72 and 170 A, as well as through the many innovations with the motor starters, for example, such as SmartWire-DT.
An even higher level of operational safety is now guaranteed, for example, by the auxiliary contacts for electronic signals, which can reliably switch even the smallest signals such as feedback to the PLC.

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Contactors DIL

MBC010

Overload relay

MBC011

Mini Contactor Relays DIL E

The range of mini contactor relays has been extended by three performance ranges. The new DIL EM12 allows motors up to 5.5 kW to be controlled reliably.

- Compact dimensions for small installation spaces
- Extension of the small contactor relay range up to 5.5 kW

Contactor DIL M up to 170 A

The contactor series up to 170 A stands out with its compact dimensions. Contactors with DC and AC operation now have identical geometries.

- An identical range of accessories available for AC and DC operated devices simplifies engineering requirements

All contactor with DC actuation from DIL M17 or higher feature an electronically controlled drive unit.

- Significantly less heat dissipation due to reduced sealing consumption
- Smaller control transformers because of lower pick-up consumption
- Direct actuation from the PLC without coupling contactors up to 38 A

New electronic overload relay ZEB

The new electronic overload relay can be fitted directly to the contactors DIL M. They cover a current range up to 100 A.

- Adjustable Class setting for protection at heavy duty start
- Manual or automatic reset can be selected to enable universal application
- GF devices provide enhanced protection with earth faults.

Speedier wiring using spring-loaded terminals

Eaton provides proven quality with spring-loaded terminals. The main current paths on PKZM 0 and motor contactors up to 15.5 A all use spring-loaded terminals.

- Speedy wiring
- Highly reliable even with machines that vibrate excessively.

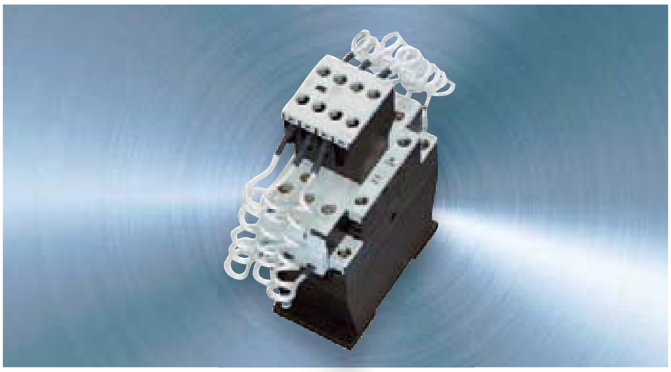
Simple, fast and reliable wiring

- The universally used standard components are combined for tool-less plug connection technology. On contactors up to 15.5 A, the DIL M12-XSL or DIL M12-XRL are fitted into the connectors rapidly and with optimum space savings without the need for tools.
- Front coil connections enable quick and reliable wiring operations.
- The plug-in motor outgoer reduces terminal strip requirement in the control panel and enables fast commissioning.
- Double box terminals on all contactors DILM up to 170 A guarantee reliable wiring even with different conductor cross-sections.

4-pole contactors

The new 4-pole contactors from Eaton are optimized for AC-1 switched loads.
They are the specialists for applications, where the mains power is switched off or over, heating systems are switched and 4-pole loads are switched.

- Four compact contactors cover the performance range up to 200 A.
- Identical accessories for 3 and 4-pole contactors guarantee efficient engineering.



Contactors for reactive current compensation systems

The contactors for capacitor DILK have been developed on the basis of the DILM contactors. The installation and connection as well as the handling are identical with the standard contactors. These contactors feature series resistors in addition to special, weld-free contact material. The capacitors are precharged via a special early-make auxiliary switch, and only then do the main contacts close and conduct continuous current.

Contactor relays DIL A

The auxiliary contactor DIL A perfectly complements the new motor contactors DIL M.

- Auxiliary contacts specially designed for the contactor relays ensure safe identification.

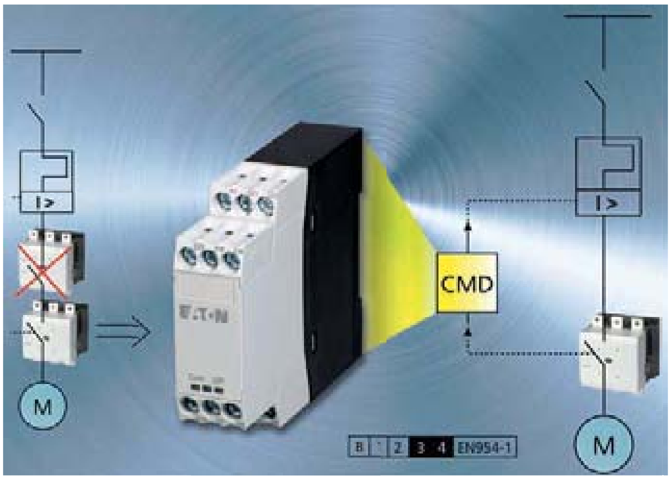
Safety technology

Safety technology is constantly increasing in significance. Contactors for a safe standstill are used here.

- Reliable feedback of the switching state of the contactor using mirror contacts.
- Long enabling circuits with low magnitude signals are switched reliably by the new electronic-enabled auxiliary switches. The integrated microswitches safely switch through the lowest signals.

Thermistor overload relay EMT6

Remarkable functional versatility in the smallest possible space. The EMT 6 thermistor overload relay protects machines against overtemperatures during severe starting duty, braking duty, undervoltage and overvoltage and high switching frequency. The temperature is monitored by means of a thermistor, directly on the motor winding. Another field of application for the EMT 6 is the monitoring of temperatures in bearings, gearboxes, oils and coolants. Three types with differing functions are available: EMT6, EMT6-DB, EMT6-DBK. The EMT 6-DBK is the most versatile with functions such as automatic or manual operation, recognition of short circuits in the sensor circuit and zero-voltage safety.



Contactor monitoring device CMD

The CMD (Contactor Monitoring Device) monitors the main contacts of a contactor for welding. For this purpose, it compares the contactor control voltage with the state of the main contacts, which are indicated reliably by a mirror contact (IEC EN 60947-4-1 Ann. F). If the contactor coil is de-energized and the contactor does not drop out, the CMD trips the backup circuit-breaker, motor-protective circuit-breaker or switch-disconnector via an undervoltage release.

Large contactors up to 2600 A

All contactors DIL M and DIL H from 185 A to 2200 A are available with electronically-controlled drives. This provides outstanding benefits for your application:
- Flexible actuation
- Considerably lower control panel temperatures due to reduced sealing power
- Considerably greater control voltage tolerance than required by the standard, ensuring greater reliability with voltage deviations
- Integrated suppressor
- Auxiliary contact contacts: 2 NO, 2 NC
- In the premium version, four wide-range devices cover the entire voltage range.

Contactors DIL M from 580 A and DIL H from 1400 A are vacuum contactors with significant benefits in comparison to air circuit-breakers:
- The electrical service life is significantly longer than on air circuit-breakers.
- A higher packing density and cleaner distribution compartment are possible, since there are no open arcs and therefore no escaping gases.

Motor protective relay ZEV

The innovative motor protective relay ZEV is designed to protect motors up to 820 A against phase failure, overload and current imbalance. An earth fault is detected quickly by the external core balance transformers. The integrated thermistor connection enables the relay to be upgraded to provide a full motor protective system. With eight preselectable tripping classes, you can even control the most difficult starting conditions for motors with long starting times.

Overview of Motor Protection up to 2600 A

Electronic and electrical overload relays, thermistor protective relays

Contactor

TYPE DIL	EEM	EM	EM12	M7	M9	M12	M15	M17	M25	M32	M38	M40	M50	M65	M72
Rated operational power AC-3 400V	3	4	5.5	3	4	5.5	7.5	7.5	11	15	18.5	18.5	22	30	37
Rated operational current AC-3 400V	6.6	9	12	7	9	12	15.5	18	25	32	38	40	50	65	72
Rated operational power AC-1 40°C	22	22	22	22	22	22	22	40	45	45	45	60	80	98	98

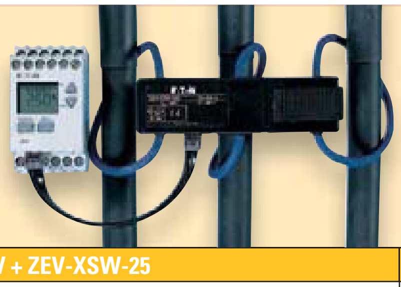
Bimetal relays

TYPE	ZE	ZB12	ZB32	ZB65
Overload release setting range	0.1 - 12A	0.1 - 16A	0.1 - 38A	6 - 75A

Electronic overload relays

TYPE	ZEB12	ZEB32	ZEB65
Overload release setting range	0.33 - 20A	0.33 - 45A	9 - 100A

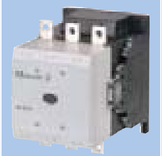
Motor protective relay



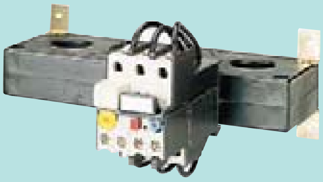
TYPE	ZEV + ZEV-XSW-25	ZEV + ZEV-XSW-65	
Overload release setting range	1 - 25A	3 - 65A	

Thermistor overload relay

TYPE	EMT6, EMT6-K, EMT6-DB, …

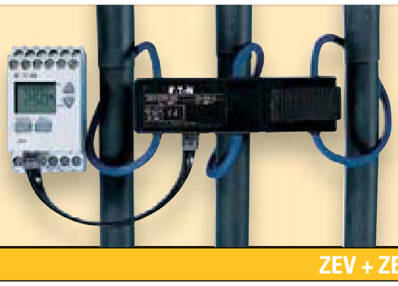


M80	M95	M115	M150	M170	M185A	M225A	M250	M300A	M400	M500	M570	M580	M650	M750	M820	M1000
37	45	55	75	90	90	110	132	160	200	250	315	315	355	400	450	560
80	95	115	150	170	185	225	250	300	400	500	570	580	650	750	820	1000
110	130	160	190	225	337	356	400	430	612	857	920	980	1041	1102	1225	1225



ZB150	Z5-../FF225A	Z5-../FF250	ZW7
35 - 175A	50 - 250A	50 - 300A	42 - 630A

ZEB150
20 - 100A



ZEV + ZEV-XSW-145	ZEV + ZEV-XSW-820
10 - 145A	40 - 820A

… EMT6KDB, EMT6-DBK

Mini contactor relays, contactor relays

Contactors, mini contactor relays, auxiliary contact modules

DILEM contactors

AC operation

max. operating power three-phase motors 50 - 60 Hz AC-3 380 V 400 V P kW	conventional thermal current $I_{th} = I_e$ AC-1 at 50 °C open $I_{th} = I_e$ A	Contact configuration Auxiliary contact N/O = normally open contact NO$_e$: NO early-make N/C = normally closed contact NC$_l$=NC late-break				**Part no.**	Article no.
3	20	1 N/O	–	–	–	**DILEEM-10(230V50HZ)**	051608
3	20	–	–	1 N/C	–	**DILEEM-01(230V50HZ)**	051633
4	20	1 N/O	–	–	–	**DILEM-10(230V50HZ)**	051786
4	20	–	–	1 N/C	–	**DILEM-01(230V50HZ)**	051795
5.5	20	1 N/O	–	–	–	**DILEM12-10(230V50HZ)**	127075
5.5	20	–	–	1 N/C	–	**DILEM12-01(230V50HZ)**	127091

DC operation

P kW	$I_{th} = I_e$ A					**Part no.**	Article no.
3	20	1 N/O	–	–	–	**DILEEM-10-G(24VDC)**	051643
3	20	–	–	1 N/C	–	**DILEEM-01-G(24VDC)**	051650
4	20	1 N/O	–	–	–	**DILEM-10-G(24VDC)**	010213
4	20	–	–	1 N/C	–	**DILEM-01-G(24VDC)**	010343
5.5	20	1 N/O	–	–	–	**DILEM12-10-G(24VDC)**	127132
5.5	20	–	–	1 N/C	–	**DILEM12-01-G(24VDC)**	127137

DILER mini contactor relays

AC operation

P kW	$I_{th} = I_e$ A					**Part no.**	Article no.
–	–	4 N/O	–	–	–	**DILER-40(230V50HZ)**	051759
–	–	3 N/O	–	1 N/C	–	**DILER-31(230V50HZ)**	051768
–	–	2 N/O	–	2 N/C	–	**DILER-22(230V50HZ)**	051777

DC operation

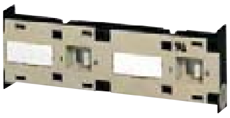
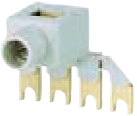
P kW	$I_{th} = I_e$ A					**Part no.**	Article no.
–	–	4 N/O	–	–	–	**DILER-40-G(24VDC)**	010223
–	–	3 N/O	–	1 N/C	–	**DILER-31-G(24VDC)**	010157
–	–	2 N/O	–	2 N/C	–	**DILER-22-G(24VDC)**	010042

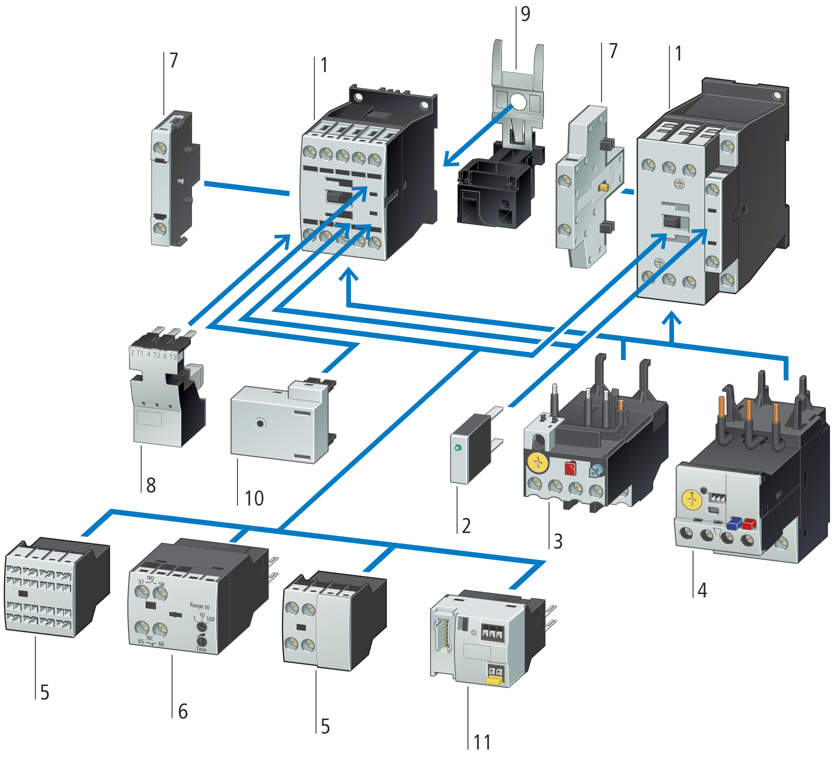
Auxiliary contact modules

P kW	$I_{th} = I_e$ A					**Part no.**	Article no.
–	–	–	–	2 N/C	–	**02DILEM**	010064
–	–	1 N/O	–	1 N/C	–	**11DILEM**	010080
–	–	2 N/O	–	2 N/C	–	**22DILEM**	010112
–	–	–	–	2 N/C	–	**02DILE**	010240
–	–	1 N/O	–	1 N/C	–	**11DILE**	010224
–	–	2 N/O	–	–	–	**20DILE**	010208
–	–	–	1 N/O$_E$	–	1 N/C$_L$	**11DDILE**	049824
–	–	–	–	4 B	–	**04DILE**	010256
–	–	1 N/O	–	3 N/C	–	**13DILE**	002397
–	–	2 N/O	–	2 N/C	–	**22DILE**	010288
–	–	3 N/O	–	1 N/C	–	**31DILE**	048912
–	–	4 N/O	–	–	–	**40DILE**	010304
–	–	1 N/O	1 N/O$_E$	1 N/C	1 N/C$_L$	**22DDILE**	049823

Mini contactor relays, contactor relays

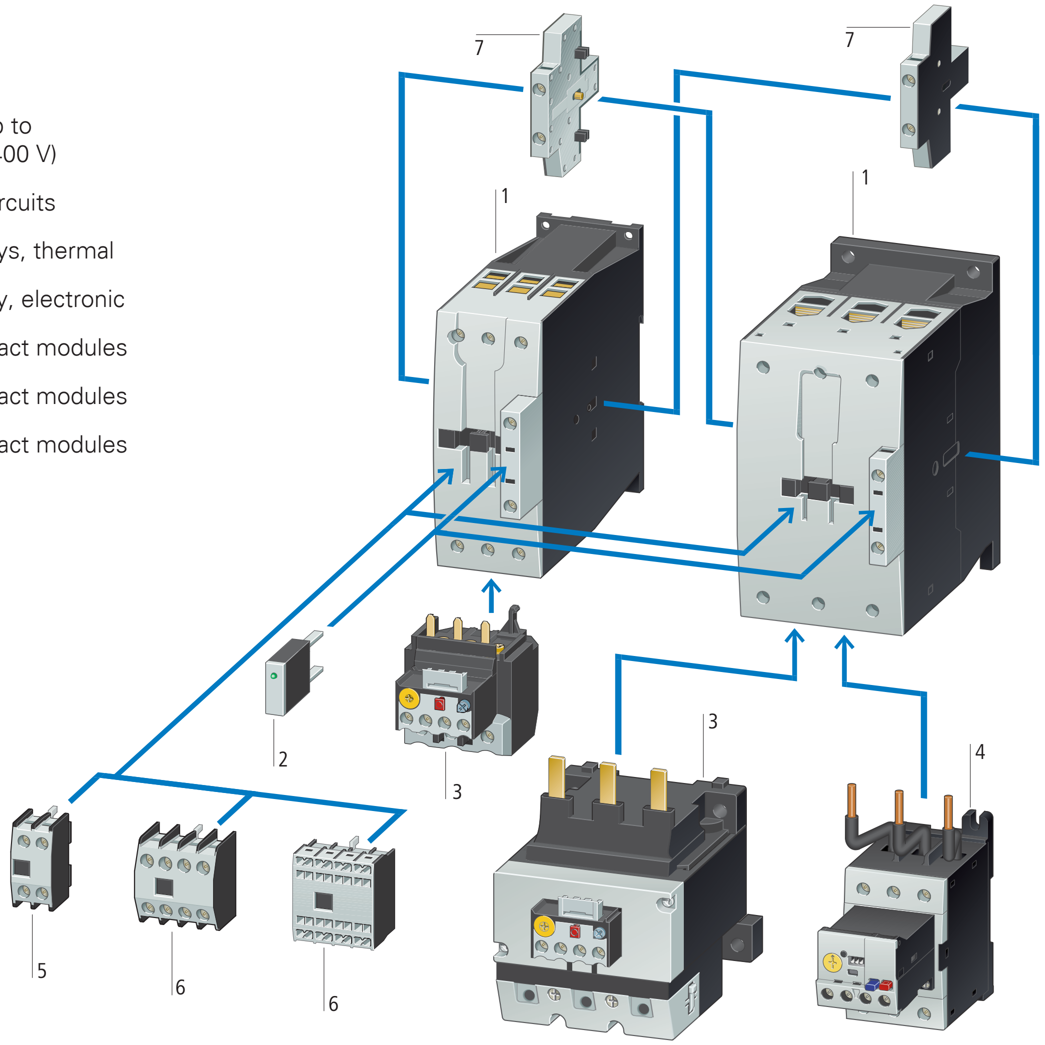
Accessories DILE, contactor relay DILA

	For use with	Contact configuration N/O = normally open contact N/C = normally closed contact		**Part no.**	Article no.
suppressor circuits					
Varistor suppressor 	DILE...	–	–	**VGDILE250**	010336
RC suppressor 	DILE...	–	–	**RCDILE250**	046320
Mechanical interlock 	DILE...	–	–	**MVDILE**	010113
Paralleling link consisting of two 4 pole paralleling links 	DILEEM DILEM12 DILEM	–	–	**P1DILEM**	019095
Basic devices DILA with interlocked opposing contacts					
AC operation 	–	4 N/O	–	**DILA-40(230V50HZ)**	276329
	–	3 N/O	1 N/C	**DILA-31(230V50HZ)**	276364
	–	2 N/O	2 N/C	**DILA-22(230V50HZ)**	276399
	–	4 N/O	–	**DILAC-40(230V50HZ)**	276441
	–	3 N/O	1 N/C	**DILAC-31(230V50HZ)**	276473
	–	2 N/O	2 N/C	**DILAC-22(230V50HZ)**	276505
DC operation 	–	4 N/O	–	**DILA-40(24VDC)**	276344
	–	3 N/O	1 N/C	**DILA-31(24VDC)**	276379
	–	2 N/O	2 N/C	**DILA-22(24VDC)**	276414
	–	4 N/O	–	**DILAC-40(24VDC)**	276456
	–	3 N/O	1 N/C	**DILAC-31(24VDC)**	276488
	–	2 N/O	2 N/C	**DILAC-22(24VDC)**	276520



1 Contactors up to 90 kW(AC-3/400 V)
2 suppressor circuits
3 Overload relays, thermal
4 Overload relay, electronic
5 Auxiliary contact modules
6 Electronic timer module
7 Auxiliary contact modules
8 Motor feeder plug
9 PE module contact plate
10 Motor suppressor module
11 SmartWire-DT protective module

1 Contactors up to 90 kW(AC-3/400 V)
2 suppressor circuits
3 Overload relays, thermal
4 Overload relay, electronic
5 Auxiliary contact modules
6 Auxiliary contact modules
7 Auxiliary contact modules



	Max. motor rating for three-phase motors, 50 - 60 Hz AC-3	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	**AC operation** **Part no.**	Article no.	**DC operation** **Part no.**	Article no.
	380 V 400 V	open				
	P	$I_{th} = I_e$				
	kW	A				
Basic device Screw terminals						
	3	20	**DILM7-10(230V50HZ)**	276550	**DILM7-10(24VDC)**	276565
	3	20	**DILM7-01(230V50HZ)**	276585	**DILM7-01(24VDC)**	276600
	4	20	**DILM9-10(230V50HZ)**	276690	**DILM9-10(24VDC)**	276705
	4	20	**DILM9-01(230V50HZ)**	276725	**DILM9-01(24VDC)**	276740
	5.5	20	**DILM12-10(230V50HZ)**	276830	**DILM12-10(24VDC)**	276845
	5.5	20	**DILM12-01(230V50HZ)**	276865	**DILM12-01(24VDC)**	276880
	7.5	20	**DILM15-10(230V50HZ)**	290058	**DILM15-10(24VDC)**	290073
	7.5	20	**DILM15-01(230V50HZ)**	290093	**DILM15-01(24VDC)**	290108
	7.5	35	**DILM17-10(230V50HZ)**	277004	**DILM17-10(RDC24)**	277018
	7.5	35	**DILM17-01(230V50HZ)**	277036	**DILM17-01(RDC24)**	277050
	11	40	**DILM25-10(230V50HZ)**	277132	**DILM25-10(RDC24)**	277146
	11	40	**DILM25-01(230V50HZ)**	277164	**DILM25-01(RDC24)**	277178
	15	40	**DILM32-10(230V50HZ)**	277260	**DILM32-10(RDC24)**	277274
	15	40	**DILM32-01(230V50HZ)**	277292	**DILM32-01(RDC24)**	277306
	18.5	40	**DILM38-10(230V50HZ)**	112428	**DILM38-10(RDC24)**	112442
	18.5	40	**DILM38-01(230V50HZ)**	112456	**DILM38-01(RDC24)**	112470
	18.5	50	**DILM40(230V50HZ)**	277766	**DILM40(RDC24)**	277780
	22	65	**DILM50(230V50HZ)**	277830	**DILM50(RDC24)**	277844
	30	80	**DILM65(230V50HZ**	277894	**DILM65(RDC24)**	277908
	37	80	**DILM72(230V50HZ)**	107670	**DILM72(RDC24)**	107671
	37	90	**DILM80(230V50HZ)**	239402	**DILM80(RDC24)**	239416
	45	110	**DILM95(230V50HZ)**	239480	**DILM95(RDC24)**	239510
	55	130	**DILM115(RAC240)**	239548	**DILM115(RDC24)**	239555
	75	160	**DILM150(RAC240)**	239588	**DILM150(RDC24)**	239591
	90	185	**DILM170(RAC240)**	107013	**DILM170(RDC24)**	107016

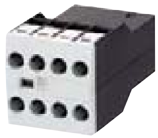
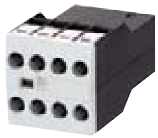
			AC operation		DC operation	
	Max. motor rating for three-phase motors 50 - 60 Hz AC-3 380 V 400 V P kW	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C open $I_{th} = I_e$ A	**Part no.**	Article no.	**Part no.**	Article no.
Basic device Spring-cage terminals						
	3	20	**DILMC7-10(230V50HZ)**	277389	**DILMC7-10(24VDC)**	277404
	3	20	**DILMC7-01(230V50HZ)**	277421	**DILMC7-01(24VDC)**	277436
	4	20	**DILMC9-10(230V50HZ)**	277453	**DILMC9-10(24VDC)**	277468
	4	20	**DILMC9-01(230V50HZ)**	277485	**DILMC9-01(24VDC)**	277500
	5.5	20	**DILMC12-10(230V50HZ)**	277517	**DILMC12-10(24VDC)**	277532
	5.5	20	**DILMC12-01(230V50HZ)**	277549	**DILMC12-01(24VDC)**	277564
	7.5	20	**DILMC15-10(230V50HZ)**	293911	**DILMC15-10(24VDC)**	293926
	7.5	20	**DILMC15-01(230V50HZ)**	293946	**DILMC15-01(24VDC)**	293961
Spring-cage terminals on auxiliary and control circuit terminals						
	7.5	35	**DILMC17-10(230V50HZ)**	277581	**DILMC17-10(RDC24)**	277595
	7.5	35	**DILMC17-01(230V50HZ**	277611	**DILMC17-01(RDC24)**	277625
	11	40	**DILMC25-10(230V50HZ)**	277641	**DILMC25-10(RDC24)**	277655
	11	40	**DILMC25-01(230V50HZ)**	277671	**DILMC25-01(RDC24)**	277685
	15	40	**DILMC32-10(230V50HZ)**	277701	**DILMC32-10(RDC24)**	277715
	15	40	**DILMC32-01(230V50HZ)**	277731	**DILMC32-01(RDC24)**	277745
	18.5	50	**DILMC40(230V50HZ)**	277965	**DILMC40(RDC24)**	277979
	22	65	**DILMC50(230V50HZ)**	277995	**DILMC50(RDC24)**	278009
	30	80	**DILMC65(230V50HZ)**	278025	**DILMC65(RDC24)**	278039
	37	90	**DILMC80(230V50HZ)**	239618	**DILMC80(RDC24)**	239652
	45	110	**DILMC95(230V50HZ)**	239685	**DILMC95(RDC24)**	239715
	55	130	**DILMC115(RAC240)**	239736	**DILMC115(RDC24)**	239741
	75	160	**DILMC150(RAC240)**	239751	**DILMC150(RDC24)**	239765

	Max. motor rating for three-phase motors 50 - 60 Hz AC-3	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	AC operation		DC operation	
	380 V 400 V P kW	open $I_{th} = I_e$ A	**Part no.**	Article no.	**Part no.**	Article no.
Complete device DILM						
	3	20	**DILM7-32(230V50HZ)**	276655	**DILM7-32(24VDC)**	276670
	4	20	**DILM9-32(230V50HZ)**	276795	**DILM9-32(24VDC)**	276810
	5.5	20	**DILM12-32(230V50HZ)**	276935	**DILM12-32(24VDC)**	276950
	7.5	35	**DILM17-32(230V50HZ)**	277100	**DILM17-32(RDC24)**	277114
	11	40	**DILM25-32(230V50HZ)**	277228	**DILM25-32(RDC24)**	277242
	15	40	**DILM32-32(230V50HZ)**	277356	**DILM32-32(RDC24)**	277370
	18.5	50	**DILM40-22(230V50HZ)**	277798	**DILM40-22(RDC24)**	277812
	22	65	**DILM50-22(230V50HZ)**	277862	**DILM50-22(RDC24)**	277876
	30	80	**DILM65-22(230V50HZ)**	277926	**DILM65-22(RDC24)**	277940
	37	90	**DILM80-22(230V50HZ)**	239449	**DILM80-22(RDC24)**	239463
	45	110	**DILM95-22(230V50HZ)**	239527	**DILM95-22(RDC24)**	239541
	55	130	**DILM115-22(RAC240)**	239578	**DILM115-22(RDC24)**	239581
	75	160	**DILM150-22(RAC240)**	239598	**DILM150-22(RDC24)**	239601
Comfort devices DILM						
	90	275	**DILM185A/22(RAC240)**	139537	–	–
	110	285	**DILM225A/22(RAC240)**	139547	–	–
Standard devices DILM						
	132	330	**DILM250-S/22(220-240V50/60HZ)**	274190	–	–
	160	350	**DILM300A-S/22(220-240V50/60HZ)**	139559	–	–
	200	500	**DILM400-S/22(220-240V50/60HZ)**	274196	–	–
	250	700	**DILM500-S/22(220-240V50/60HZ)**	274199	–	–
	315	750	**DILM570-S/22(220-240V50/60HZ)**	110744	–	–

Auxiliary contact modules

with interlocked opposing contacts, except ...XHI(C)V

Top mounting auxiliary contacts

	Contact configuration N/O = normally open contact NO$_e$: NO early-make N/C = normally closed contact NC$_l$=NC late-break		For use with	**Part no.**	Article no.
	1 N/O	1 N/C	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…	**DILM32-XHI11**	277376
	–	2 N/C		**DILM32-XHI02**	277375
	2 N/O	2 N/C		**DILM32-XHI22**	277377
	3 N/O	1 N/C		**DILM32-XHI31**	106112
	1 N/O	1 N/C		**DILM32-XHIC11**	277751
	–	2 N/C		**DILM32-XHIC02**	277750
	2 N/O	2 N/C		**DILM32-XHIC22**	277752
	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…	**DILA-XHI20**	276422
	1 N/O	1 N/C		**DILA-XHI11**	276421
	–	2 N/C		**DILA-XHI02**	276420
	1 N/O$_E$	1 N/C$_L$		**DILA-XHIV11**	276423
	4 N/O	–		**DILA-XHI40**	276428
	3 N/O	1 N/C		**DILA-XHI31**	276427
	2 N/O	2 N/C		**DILA-XHI22**	276426
	1 N/O	3 N/C		**DILA-XHI13**	276425
	–	4 B		**DILA-XHI04**	276424
	1 N/O 1 N/O$_E$	1 N/C 1 N/C$_L$		**DILA-XHIV22**	276429

	Contact configuration N/O = normally open contact NO$_e$: NO early-make N/C = normally closed contact NC$_l$=NC late-break		For use with	**Part no.**	Article no.

Auxiliary contact modules

with interlocked opposing contacts, except ...XHI(C)V

Top mounting auxiliary contacts

	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…	**DILA-XHIC20**	276528
	1 N/O	1 N/C		**DILA-XHIC11**	276527
	–	2 N/C		**DILA-XHIC02**	276526
	1 N/O$_E$	1 N/C$_L$		**DILA-XHICV11**	276529
	2 N/O	2 N/C		**DILA-XHIR22**	139580
	1 N/O	1 N/C		**DILA-XHIR11**	110140
	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 N/C		**DILA-XHIC31**	276533
	2 N/O	2 N/C		**DILA-XHIC22**	276532
	1 N/O	3 N/C		**DILA-XHIC13**	276531
	–	4 B		**DILA-XHIC04**	276530
	1 N/O 1 N/O$_E$	1 N/C 1 N/C$_L$		**DILA-XHICV22**	276535

Auxiliary contact modules

with interlocked opposing contacts

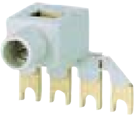
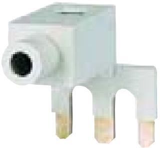
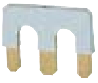
Top mounting auxiliary contacts

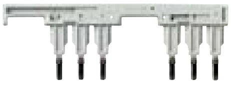
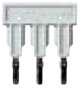
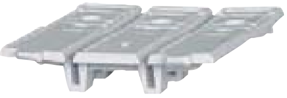
	2 N/O	–	DILM40… DILM50… DILM65… DILM72… DILM80… DILM95… DILM115… DILM150… DILM170…	**DILM150-XHI20**	277945
	1 N/O	1 N/C		**DILM150-XHI11**	277946
	1 N/O	1 N/C		**DILM150-XHIA11**	283463
	–	2 N/C		**DILM150-XHI02**	277947
	4 N/O	–		**DILM150-XHI40**	277948
	3 N/O	1 N/C		**DILM150-XHI31**	277949
	2 N/O	2 N/C		**DILM150-XHI22**	277950
	2 N/O	2 N/C		**DILM150-XHIA22**	283464
	1 N/O	3 N/C		**DILM150-XHI13**	277951
	–	4 B		**DILM150-XHI04**	277952
	1 N/O 1 N/O$_E$	1 N/C 1 N/C$_L$		**DILM150-XHIV22**	277953

Side-mounting auxiliary contacts

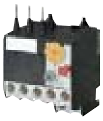
	1 N/O	–	DILM(C)7… DILM(C)9… DILM(C)12… DILM(C)15… DILA(C)…	**DILA-XHI10-S**	115948
	–	1 N/C		**DILA-XHI01-S**	115949
	1 N/O	–		**DILA-XHIC10-S**	115950
	–	1 N/C		**DILA-XHIC01-S**	115951
	1 N/O	1 N/C	DILM17… DILM25… DILM32… DILM38…	**DILM32-XHI11-S**	101371
	1 N/O	1 N/C	DILM40 - DILM225A	**DILM1000-XHI11-SI**	278425
	1 N/O$_E$	1 N/C$_L$		**DILM1000-XHIV11-SI**	278426
	1 N/O	1 N/C		**DILM1000-XHI11-SA**	278427

	For use with	**Part no.** Article no.
Suppressor circuits		
RC suppressors		
	DILM7 - DILM15 DILA	**DILM12-XSPR240** 281200
	DILM17 - DILM32	**DILM32-XSPR240** 281203
	DILM40 - DILM95	**DILM95-XSPR240** 281206
Varistor suppressors		
	DILM7 - DILM15 DILA	**DILM12-XSPV240** 281210
	DILM17 - DILM32	**DILM32-XSPV240** 281214
	DILM40 - DILM95	**DILM95-XSPV240** 281218
Varistor suppressors with integated LED		
	DILM7 - DILM15 DILA	**DILM12-XSPVL240** 281221
	DILM17 - DILM32	**DILM32-XSPVL240** 281223
	DILM40 - DILM95	**DILM95-XSPVL240** 281225
Free-wheel diode suppressor		
	DILM7 - DILM15 DILA	**DILM12-XSPD** 101672

	For use with	**Part no.** Article no.
Mechanical interlocks		
	DILM7 - DILM15 DILA	**DILM12-XMV** 281196
	DILM17 - DILM38	**DILM32-XMV** 281197
	DILM40 - DILM72	**DILM65-XMV** 281198
	DILM80 - DILM170	**DILM150-XMV** 240081
	DILM185A, DILM225A, DILM250, DILM300A, DILM400, DILM500, DILM570	**DILM500-XMV** 208289
Paralleling links for main contacts consisting of 2 paralleling links		
	DILM7 - DILM15	**DILM12-XP1** 281193
	DILM17 - DILM32	**DILM32-XP1** 281194
	DILM40 - DILM72	**DILM65-XP1** 281195
	DILM80 - DILM170	**DILM150-XP1** 284769
	DILM185A	**DILM185-XP1** 208292
Star-point bridges		
	DILM7 - DILM15	**DILM12-XS1** 281190
	DILM17 - DILM32	**DILM32-XS1** 281191
	DILM40 - DILM72	**DILM65-XS1** 281192
	DILM80 - DILM170	**DILM150-XS1** 284768
	DILM185A - DILM400	**DILM400-XS1** 208291
	DILM500	**DILM500-XS1** 208290

	For use with	**Part no.** Article no.
Star-delta wiring kit including star-point bridge Main current wiring for star-delta combination 	DILM7/9/12/15 mains contactor DILM7/9/12/15 delta contactor DILM7/9/12/15 star contactor	**DILM12-XSL** 283130
	DILM17/25/32 mains contactor DILM17/25/32 delta contactor DILM17/25/32 star contactor	**DILM32-XSL** 283131
Reversing wiring kits Main current wiring for reversing combinations 	DILM7, DILM9, DILM12	**DILM12-XRL** 283108
	DILM17, DILM25, DILM32	**DILM32-XRL** 283109
IP2X shrouding set 	DILM17, DILM25, DILM32, DILM38	**DILM32-XIP2X** 118855
	DILM40, DILM50, DILM65, DILM72	**DILM65-XIP2X** 106491
	DILM80, DILM95, DILM115, DILM150, DILM170, ZB150	**DILM150-XIP2X** 106492
Wiring set motor feeder plug		
PE module contact plate 	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	**DILM12-XMCE** 121764
Motor feeder plug with PE module and contact plate 	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	**DILM12-XMCP/E** 121769
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)-…-M12… MSC-D(E)-…-M15…	**DILM12-XMCP/T** 121770

Overload relay ZE, ZB



Setting range of overload releases I_r A	For use with DILEM		DILM7 – DILM15		DILM17 – DILM38		DILM40 – DILM72		DILM80 – DILM170	
	Part no.	Article no.	**Part no.**	Article no.	**Part no.**	Article no.	**Part no.**	Article no.	**Part no.**	Article no.
0.1 – 0.16	**ZE-0.16**	014263	**ZB12-0,16**	278431	**ZB32-0,16**	278442	–	–	–	–
0.16 – 0.24	**ZE-0.24**	014285	**ZB12-0,24**	278432	**ZB32-0,24**	278443	–	–	–	–
0.24 – 0.4	**ZE-0.4**	014300	**ZB12-0,4**	278433	**ZB32-0,4**	278444	–	–	–	–
0.4 – 0.6	**ZE-0.6**	014333	**ZB12-0,6**	278434	**ZB32-0,6**	278445	–	–	–	–
0.6 – 1	**ZE-1.0**	014376	**ZB12-1**	278435	**ZB32-1**	278446	–	–	–	–
1 – 1.6	**ZE-1.6**	014432	**ZB12-1,6**	278436	**ZB32-1,6**	278447	–	–	–	–
1.6 – 2.4	**ZE-2.4**	014479	**ZB12-2,4**	278437	**ZB32-2,4**	278448	–	–	–	–
2.4 – 4	**ZE-4**	014518	**ZB12-4**	278438	**ZB32-4**	278449	–	–	–	–
4 – 6	**ZE-6**	014565	**ZB12-6**	278439	**ZB32-6**	278450	–	–	–	–
6 – 9	**ZE-9**	014708	–	–	–	–	–	–	–	–
6 – 10	–	–	**ZB12-10**	278440	**ZB32-10**	278451	**ZB65-10**	278455	–	–
9 – 12	**ZE-12**	014752	**ZB12-12**	278441	–	–	–	–	–	–
10 – 16	–	–	–	–	–	–	**ZB65-16**	278456	–	–
12 – 16	–	–	**ZB12-16**	290168	–	–	–	–	–	–
16 – 24	–	–	–	–	**ZB32-24**	278453	**ZB65-24**	278457	–	–
24 – 32	–	–	–	–	**ZB32-32**	278454	–	–	–	–
24 – 40	–	–	–	–	–	–	**ZB65-40**	278458	–	–
32 – 38	–	–	–	–	**ZB32-38**	112474	–	–	–	–
35 – 50	–	–	–	–	–	–	–	–	**ZB150-50**	278462
40 – 57	–	–	–	–	–	–	**ZB65-57**	278459	–	–
50 – 65	–	–	–	–	–	–	**ZB65-65**	278460	–	–
50 – 70	–	–	–	–	–	–	–	–	**ZB150-70**	278463
65 – 75	–	–	–	–	–	–	**ZB65-75**	108792	–	–
70 – 100	–	–	–	–	–	–	–	–	**ZB150-100**	278464
95 – 125	–	–	–	–	–	–	–	–	**ZB150-125**	278465
120 – 150	–	–	–	–	–	–	–	–	**ZB150-150**	278466
145 – 175	–	–	–	–	–	–	–	–	**ZB150-175**	107316

Overload relays

Overload relay, thermistor overload relay for machine protection

Overload relay Z5

Function	Setting range overload releases I_r A	For use with	**Part no.**	Article no.
–	50 – 70	DILM185A DILM225A	**Z5-70/FF225A**	139572
–	70 – 100		**Z5-100/FF225A**	139573
–	95 – 125		**Z5-125/FF225A**	139574
–	120 – 160		**Z5-160/FF225A**	139575
–	160 – 220		**Z5-220/FF225A**	139576
–	200 – 250		**Z5-250/FF225A**	139577
–	50 – 70	DILM250	**Z5-70/FF250**	210070
–	70 – 100		**Z5-100/FF250**	210071
–	95 – 125		**Z5-125/FF250**	210072
–	120 – 160		**Z5-160/FF250**	210073
–	160 – 220		**Z5-220/FF250**	210074
–	200 – 250		**Z5-250/FF250**	210075
	250 – 300	DILM300A	**Z5-300/FF250**	139578

EMT6 thermistor overload relay for machine protection

Function	Setting range overload releases I_r A	For use with	**Part no.**	Article no.
without reclosing lockout Mains and fault LED display	–	–	**EMT6**	066166
	–	–	**EMT6(230V)**	066400
without reclosing lockout Mains and fault LED display Trip with short-circuit in the sensor cable	–	–	**EMT6-K**	269470
selector switch with/without reclosing lockout For manual or remote resetting Test button Mains and fault LED display	–	–	**EMT6-DB**	066167
	–	–	**EMT6-DB(230V)**	066401
selector switch with/without reclosing lockout For manual or remote resetting Test button Mains and fault LED display Trip with short-circuit in the sensor cable	–	–	**EMT6-KDB**	269471
Multifunction device Selector switch with/without reclosing lockout Trip with short-circuit in the sensor cable Zero-voltage safe For manual or remote resetting Test button Short-circuit recognition and zero-voltage safety can be deactivated Mains and fault LED display	–	–	**EMT6-DBK**	066168

Electronic overload relays ZEB

Earth fault detection	Setting range overload releases I_r A	For use with DILM7 – DILM15		DILM17 – DILM38		DILM40 – DILM72		DILM80 – DILM150	
		Part no.	Article no.	**Part no.**	Article no.	**Part no.**	Article no.	**Part no.**	Article no.
without	0.33 – 1.65	**ZEB12-1.65**	136480	**ZEB32-1.65**	136486	–	–	–	–
without	1 – 5	**ZEB12-5**	136481	**ZEB32-5**	136487	–	–	–	–
without	4 – 20	**ZEB12-20**	136482	**ZEB32-20**	136488	–	–	–	–
without	9 – 45	–	–	**ZEB32-45**	136489	**ZEB65-45**	136502	–	–
without	20 – 100	–	–	–	–	**ZEB65-100**	136504	**ZEB150-100**	136506
with	0.33 – 1.65	**ZEB12-1.65-GF**	136483	**ZEB32-1,65-GF**	136490	–	–	–	–
with	1 – 5	**ZEB12-5-GF**	136484	**ZEB32-5-GF**	136491	–	–	–	–
with	4 – 20	**ZEB12-20-GF**	136485	**ZEB32-20-GF**	136492	–	–	–	–
with	9 – 45	–	–	**ZEB32-45-GF**	136493	**ZEB65-45-GF**	136503	–	–
with	20 – 100	–	–	–	–	**ZEB65-100-GF**	136505	**ZEB150-100-GF**	136507

Motor-Protective Circuit-Breakers PKZ and PKE Flexible Solutions: Simple, Intelligent, Pluggable, Versatile

ATEX

Motor-protective circuit-breakers PKZ have been manufactured by Eaton since 1932. Our ideas and developments have decisively influenced the trends in the protection of motors since then. The results are progressive concepts and marketable product innovations that again and again assume the role of international trendsetting, pioneering products, e.g. such as the motor-protective circuit-breaker PKE. Standstill times of machines and installation should be as short as possible. The fuseless motor-protective circuit-breakers PKZ combine short-circuit protection and overload protection in a single device. This enables a short recovery time. PKZM0, PKZM01, PKZM4 and PKE feature the same range of accessories. They can be easily combined with contactors DILM and soft starters DS7. Switching technology can be this easy.

Quicklink Online catalogue at
www.eaton.com/moellerproducts

MBC012

Perfect for actuation by pressing or hitting

The motor-protective circuit-breaker PKZM01 for motors up to 25 A is ideal for small machines and other applications, which primarily prefer the use of push or impact operation. In addition to the auxiliary contacts from the PKZM0 range, there are also special enclosures in IP65 and IP40 degree of protection, also with an EMERGENCY STOP button. The short-circuit breaking capacity is 50kA.

Common accessories – tool-less installation

Only two motor-protective circuit-breakers are required to cover the range from 0.1 to 63 A. And this with only 20 different types. The motor-protective circuit-breakers are matched to the contactor series DIL and can be easily combined to motor starters.

All possibilities in the range

Motor-protective circuit-breaker PKM0 does not feature an overload protection function. These switches are used for protection of resistive loads where overload currents can not occur. Eaton offers additional transformer-protective circuit-breakers, where the response values of the short-circuit trip are even higher than with the motor-protective circuit-breakers, to master even higher peak inrush currents of idling motors without causing a trip.

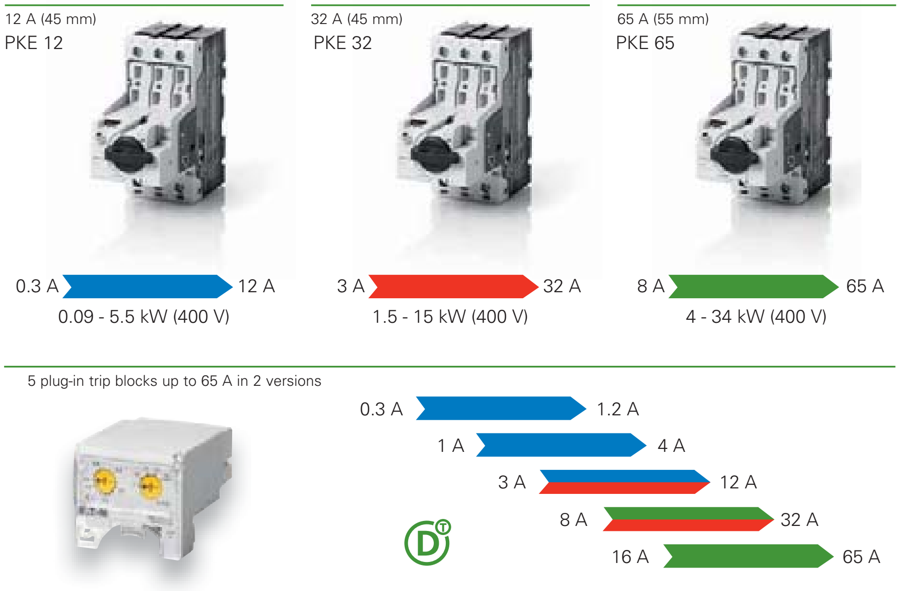
Modular design. Highest level of flexibility. Highest level of performance

Motor-protective circuit-breaker PKE with electronic overload protection offers here an interesting alternative to the bimetal solution and complements the intelligent PKZ series. The motor-protective circuit-breaker PKE provides the highest level of flexibility featuring a compact and modular design with plug-in control unit for motor currents up to 65 A.

Information at your fingertips thanks to SmartWire-DT

Motor starter combinations with PKZ and PKE enable integration into the automation environment via SmartWire-DT. The actual flow of current in the PKE can also be detected via the modular COM circuits. The data can be transferred directly into the control and is available across the system.

3 basic units + 5 trip blocks = current range up to 65 A



Modular with a wide setting range

The functional safety and the service life of a motor depends mainly on the motor protection. Motor-protective circuit-breaker PKE with electronic overload protection offers here an interesting alternative to the bimetal solution and complements the intelligent PKZ series from Eaton. The motor-protective circuit-breaker PKE provides the highest level of flexibility featuring a compact and modular design with plug-in control unit for motor currents up to 65 A. The large current setting ranges decisively reduce the number of variants and minimise the engineering work and costs accordingly.

PKZ and PKE in system xStart

The motor-protective circuit-breakers PKZ and PKE feature versatile, approved accessories available from the xStart range for safe and rational control panel construction. With most applications, an auxiliary switch is required with varying contact assignment for interlock or for signalling purposes. The motor starter design with two separate contact systems including visible isolating gaps enables a unique assignment of the protective devices PKZ or PKE and switching device DIL, whereby switchgear devices can be exchanged individually. A universal accessory series from the system xStart facilitates economy in logistical terms and reduces engineering costs.

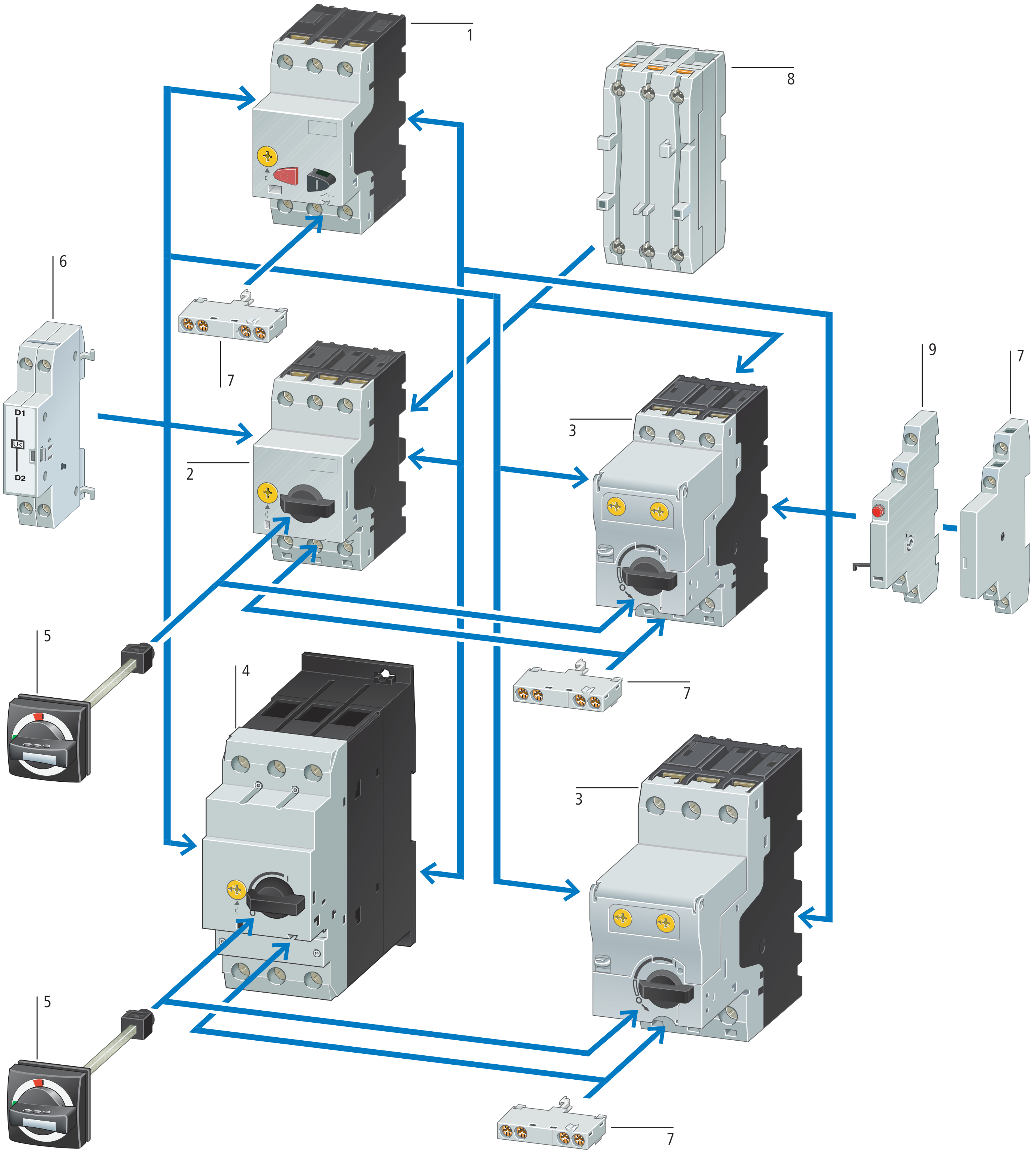
Always well informed
- Current values
- Diagnostics data
- Status messages
- Overload relay function

Information at your fingertips thanks to SmartWire-DT

Motor starter combinations with PKZ and PKE enable integration into the automation environment via SmartWire-DT. The most varying array of signalling functions can be transferred with the PKZ using the modular COM circuits. The motor-protective circuit-breaker PKE also utilizes diagnostics, status and overload messages and detects the current flow. The data can be transferred directly into the control and is available across the system. The data transparency created enhances the efficiency and the operational reliability of the drives in the operation environment of the motor-protective circuit-breaker.

Motor-Protective Circuit-Breakers

System Overview



1 Motor-protective circuit-breakers PKZM01

2 Motor-protective circuit-breakers PKZM0

3 Motor-protective circuit-breakers with wide-range overload protection PKE

4 Motor-protective circuit-breakers PKZM4

5 Door coupling handle IP65

6 Voltage release

7 Standard auxiliary contact

8 Current limiter

9 Trip-indicating auxiliary contact

Motor-protective circuit-breakers

Basic devices

Moeller® series

Motor-protective circuit-breaker PKZM01, type of coordination "1" and "2"

Setting range Overload protector I_r A	Screw terminals **Part no.**	Screw terminals Article no.	Screw terminals on feed side, spring-cage terminals on secondary side **Part no.**	Screw terminals on feed side, spring-cage terminals on secondary side Article no.	Spring-cage terminals **Part no.**	Spring-cage terminals Article no.
0.1…0.16	**PKZM01-0,16**	278475	–	–	–	–
0.16…0.25	**PKZM01-0,25**	278476	–	–	–	–
0.25…0.4	**PKZM01-0,4**	278477	–	–	–	–
0.4…0.63	**PKZM01-0,63**	278478	–	–	–	–
0.63…1	**PKZM01-1**	278479	–	–	–	–
1…1.6	**PKZM01-1,6**	278480	–	–	–	–
1.6…2.5	**PKZM01-2,5**	278481	–	–	–	–
2.5…4	**PKZM01-4**	278482	–	–	–	–
4…6.3	**PKZM01-6,3**	278483	–	–	–	–
6.3…10	**PKZM01-10**	278484	–	–	–	–
8…12	**PKZM01-12**	278485	–	–	–	–
10…16	**PKZM01-16**	283390	–	–	–	–
16…20	**PKZM01-20**	283383	–	–	–	–
20…25	**PKZM01-25**	288893	–	–	–	–

Motor-protective circuit-breaker PKZM0, type of coordination "1" and "2"

Setting range Overload protector I_r A	Screw terminals **Part no.**	Screw terminals Article no.	Screw terminals on feed side, spring-cage terminals on secondary side **Part no.**	Screw terminals on feed side, spring-cage terminals on secondary side Article no.	Spring-cage terminals **Part no.**	Spring-cage terminals Article no.
0.1…0.16	**PKZM0-0,16**	072730	**PKZM0-0,16-SC**	229828	**PKZM0-0,16-C**	229669
0.16…0.25	**PKZM0-0.25**	072731	**PKZM0-0,25-SC**	229829	**PKZM0-0,25-C**	229670
0.25…0.4	**PKZM0-0,4**	072732	**PKZM0-0,4-SC**	229830	**PKZM0-0,4-C**	229671
0.4…0.63	**PKZM0-0,63**	072733	**PKZM0-0,63-SC**	229831	**PKZM0-0,63-C**	229672
0.63…1	**PKZM0-1**	072734	**PKZM0-1-SC**	229832	**PKZM0-1-C**	229673
1…1.6	**PKZM0-1,6**	072735	**PKZM0-1,6-SC**	229833	**PKZM0-1,6-C**	229674
1.6…2.5	**PKZM0-2,5**	072736	**PKZM0-2,5-SC**	229834	**PKZM0-2,5-C**	229675
2.5…4	**PKZM0-4**	072737	**PKZM0-4-SC**	229835	**PKZM0-4-C**	229676
4…6.3	**PKZM0-6,3**	072738	**PKZM0-6,3-SC**	229836	**PKZM0-6,3-C**	229677
6.3…10	**PKZM0-10**	072739	**PKZM0-10-SC**	229837	**PKZM0-10-C**	229678
8…12	**PKZM0-12**	278486	**PKZM0-12-SC**	278487	**PKZM0-12-C**	278488
10…16	**PKZM0-16**	046938	**PKZM0-16-SC**	229838	**PKZM0-16-C**	229679
16…20	**PKZM0-20**	046988	–	–	–	–
20…25	**PKZM0-25**	046989	–	–	–	–
25…32	**PKZM0-32**	278489	–	–	–	–

Motor-protective circuit-breaker PKZM4, type of coordination "1" and "2"

Setting range Overload protector I_r A	Screw terminals **Part no.**	Screw terminals Article no.	Screw terminals on feed side, spring-cage terminals on secondary side **Part no.**	Screw terminals on feed side, spring-cage terminals on secondary side Article no.	Spring-cage terminals **Part no.**	Spring-cage terminals Article no.
10…16	**PKZM4-16**	222350	–	–	–	–
16…25	**PKZM4-25**	222352	–	–	–	–
25…32	**PKZM4-32**	222353	–	–	–	–
32…40	**PKZM4-40**	222354	–	–	–	–
40…50	**PKZM4-50**	222355	–	–	–	–
50…58	**PKZM4-58**	222394	–	–	–	–
55…65	**PKZM4-63**	222413	–	–	–	–

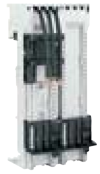
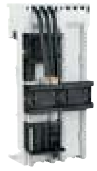
Transformer-protective circuit-breaker

Setting range Overload protector I_r A	Screw terminals **Part no.**	Screw terminals Article no.	Screw terminals on feed side, spring-cage terminals on secondary side **Part no.**	Screw terminals on feed side, spring-cage terminals on secondary side Article no.	Spring-cage terminals **Part no.**	Spring-cage terminals Article no.
0.1…0.16	**PKZM0-0,16-T**	088907	–	–	–	–
0.16…0.25	**PKZM0-0,25-T**	088908	–	–	–	–
0.25…0.4	**PKZM0-0,4-T**	088909	–	–	–	–
0.4…0.63	**PKZM0-0,63-T**	088910	–	–	–	–
0.63…1	**PKZM0-1-T**	088911	–	–	–	–
1…1.6	**PKZM0-1,6-T**	088912	–	–	–	–
1.6…2.5	**PKZM0-2,5-T**	088913	–	–	–	–
2.5…4	**PKZM0-4-T**	088914	–	–	–	–
4…6.3	**PKZM0-6,3-T**	088915	–	–	–	–
6.3…10	**PKZM0-10-T**	088916	–	–	–	–
8…12	**PKZM0-12-T**	278492	–	–	–	–
10…16	**PKZM0-16-T**	088917	–	–	–	–
16…20	**PKZM0-20-T**	088918	–	–	–	–
20…25	**PKZM0-25-T**	278493	–	–	–	–

Motor-protective circuit-breakers

Basic devices, busbar adapters

	Setting range Overload protector I_r A	**Basic device** **Part no.** Article no.	**Trip block Standard** **Part no.** Article no.	**Trip block Expanded** **Part no.** Article no.	**Motor-protective circuit-breakers Standard Complete device** **Part no.** Article no.
Motor-protective circuit-breakers PKE, type of coordination "1" and "2"					
	0.3...1.2 A	**PKE12** 121721	**PKE-XTU-1.2** 121723	**PKE-XTUA-1.2** 121727	**PKE12/XTU-1.2** 121731
	1...4 A	**PKE12** 121721	**PKE-XTU-4** 121724	**PKE-XTUA-4** 121728	**PKE12/XTU-4** 121732
	3...12 A	**PKE12** 121721	**PKE-XTU-12** 121725	**PKE-XTUA-12** 121729	**PKE12/XTU-12** 121733
	8...32 A	**PKE32** 121722	**PKE-XTU-32** 121726	**PKE-XTUA-32** 121730	**PKE32/XTU-32** 121734
	16...65 A	**PKE65** 138258	**PKE-XTU-65** 138259	**PKE-XTUA-65** 138260	**PKE65/XTU-65** 138516

	Rated operational current	For use with	**Part no.** Article no.
Busbar adapters for PKZ and PKE			
	25 A	PKZM0, PKE + DILM7…DILM15, MSC-D-…-M7, MSC-D-…-M9, MSC-D-…-M12 MSC-D-…-M15	**BBA0-25** 101451
	25 A	PKZM0, PKE + 2 x DILM7-01…DILM12-01, MSC-R-…-M7, MSC-R-…-M9, MSC-R-…-M12	**BBA0R-25** 101453
	32 A	PKZM0, PKE + DILM17…DILM32, MSC-D-…-M17, MSC-D-…-M25, MSC-D-…-M32	**BBA0-32** 101452
	32 A	PKZM0, PKE + 2 x DILM17-01…DILM32-01, MSC-R-…-M17, MSC-R-…-M25, MSC-R-…-M32	**BBA0R-32** 101454
	63 A	PKZM4 + DILM17…DILM65	**BBA4L-63** 101459

Motor-protective circuit-breakers

Auxiliary contact, three-phase commoning link

	Contact configuration		For use with	**Part no.**	Article no.
	N/O = normally open contact	N/C = normally closed contact			
Standard auxiliary contact					
	1 N/O	1 N/C	PKZM01 PKZM0 PKZM4 PKZM0-T PKM0 PKE	**NHI11-PKZ0**	072896
	1 N/O	1 N/C		**NHI11-PKZ0-C**	229680
	1 N/O	2 N/C		**NHI12-PKZ0**	072895
	2 N/O	1 N/C		**NHI21-PKZ0**	072894
	1 N/O	1 N/C		**NHI-E-11-PKZ0**	082882
	1 N/O	–		**NHI-E-10-PKZ0**	082884
	1 N/O	–		**NHI-E-10-PKZ0-C**	229681
	–	1 N/C		**NHI-E-01-PKZ0-C**	229682
Trip-indicating auxiliary contacts					
	2 x 1 N/O	–	PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE	**AGM2-10-PKZ0**	072898
	–	2 x 1 NC		**AGM2-01-PKZ0**	072899
Lockable rotary handle					
			PKZM0, PKZM4 and PKE as a main switch in compliance with EN 60204.	**AK-PKZ0**	030851
Three-phase commoning link, incoming unit via terminals 1, 3, 5					
PKZM0-... or PKE without laterally attached auxiliary contacts or voltage releases					
				B3.0/2-PKZ0	063961
				B3.0/3-PKZ0	232289
				B3.0/4-PKZ0	063960
				B3.0/5-PKZ0	232290
Attached on the right, for motor-protective circuit-breakers, with an auxiliary contact or trip-indicating auxiliary contact					
				B3.1/2-PKZ0	044945
				B3.1/3-PKZ0	044946
				B3.1/4-PKZ0	044947
				B3.1/5-PKZ0	044948
PKZM0-... or PKE: Attached with an auxiliary contact and a trip-indicating auxiliary contact on the right or attached on the left with a voltage release					
				B3.2/2-PKZ0	063963
				B3.2/4-PKZ0	063959

	For use with	**Part no.** Article no.
Wiring set		
DOL starter 	PKZM0, PKE + DILM7…DILM15 DS7-34…SX0…	**PKZM0-XDM12** 283149
	PKZM0, PKE + DILM17…DILM32	**PKZM0-XDM32** 283153
	PKZM4 + DILM40…DILM65	**PKZM4-XDM65** 101053
Reversing starter 	PKZM0, PKE + DILM7-01…DILM12-01	**PKZM0-XRM12** 283185
	PKZM0, PKE + DILM17…DILM32	**PKZM0-XRM32** 283189
Electric contact module	PKZM0, PKE + DILM17… DILM32 DS7-34…SX0…	**PKZM0-XM32DE** 239349
	PKZM4 + DILM40…DILM65	**PKZM4-XM65DE** 101056
Motor feeder plug		
PE module contact plate 	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	**DILM12-XMCE** 121764
Motor feeder plug with PE module and contact plate 	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	**DILM12-XMCP/E** 121769
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)-…-M12… MSC-D(E)-…-M15…	**DILM12-XMCP/T** 121770

Motor Starter System xStart
Fast and Flexible Assembly and Connection

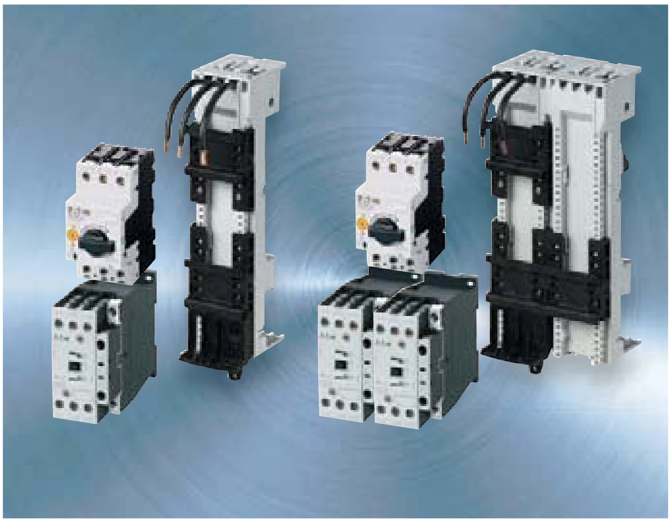
Eaton offers a comprehensive offer for starting the motor with the motor start system xStart: From protective to soft starting devices and motor protection using bimetal relays, to motor-protective circuit-breakers with electronic wide-range overload protection. All of these standard components can be easily combined using simple mechanical and electronic connectors. Three-phase commoning links and motor feeder plugs offer comfortable assistance for motor current wiring. SmartWire-DT also replaces the control current wiring and integrates comprehensive communication options into the system.

Quicklink Online catalogue at
www.eaton.com/moellerproducts

MBC013

Just a short step to a starter combination

On xStart switchgear up to 15.5 A, plug-in main and auxiliary current connections replace the classical wiring. With the standard individual components PKZM0 / PKE and the wiring set for direct-on-line starters or reversing starters for contactors or soft start devices with screw terminals, DOL starters, soft starters or reversing starters can be created in seconds.
The wiring kits include the complete main current wiring between the motor-protective circuit-breaker and contactor DIL up 15.5 A or the soft starter DS7. The electrical interlock and the reversing links are included in addition to the main current connection with the reversing starter set PKZM0-XRM12.



Flexible energy distribution

Whether it's a motor starter, soft starter or just motor-protective circuit-breakers, with the product-specific BBA busbar adapters from Eaton, a flexible energy supply/distribution can be quickly and easily established. The users have the specific adapters for the motor-protective circuit-breakers, such as the PKZM0, PKE and PKZM4 with rated currents of 0.1 to 63 A, as well as other universal adapters up to 80 A. Their standard-compliant dimensions fit on all 60 mm busbar systems from leading manufacturers. They are approved for both the European and North American markets with their UL/ CSA approvals. The new busbar adapters support installation of starter combinations, which have been assembled using tool-less plug connection technology from the motor starter range. They are available as individual units or complete motor starters.
→ Complete solutions save time and money

The wiring classic

Eaton offers the optimum wiring links for every motor-protective circuit-breaker type such as the PKZM0, PKZM4 or PKE. Optionally, several motor-protective circuit-breakers are available on cut-to-fit three-phase commoning links for parallel power feed. Matched to the corresponding application, whether it is a side-mounted auxiliary contact or undervoltage or shunt release.

The multifunctional interface

Unbeatable time-saving applications such as reversing starters or star-delta combinations can be implemented with the integrated tool-less plug connection interface of the contactors DILM(C) up to 15.5 A. The plug-on accessories or the wiring sets for the tool-less plug connections also offer the opportunity for motor interference suppression, the adaptation of customized contactor controls using solder pin adapters or the external motor cables with the PE connection of the contactor.

The new connection philosophy from Eaton for connection of the motor

With the DILM12-XMCP/E motor connector system or the DILM12-XMCE PE module, Eaton Moeller is pioneering a new connection philosophy for efficient wiring in the control panel. The connection of the motor feeder cable, L1-L3 and the PE connection directly on contactor not only saves on incomer terminal blocks and the corresponding amount of mounting rail installation in the switching cabinet, but also on additional steps such as the cable connections and testing of incomer terminal blocks to the contactors.

Connection technology in the control panel

Manufacturers of machines and systems strive to achieve a balance between the maximum level of functionality and cost optimization. SmartWire-DT is a communication system for industrial switchgear based on the concept of continued development in the control panel and peripherals: from control through to protection and switching, and extending to driving, operation and monitoring.

Motor-starter combinations with PKE, all information accessible

Motor-starter combinations with the electronic wide-range overload protection offer enhanced security with the independent and separate contact systems between the switching and protective devices. The starters can be integrated into the communication system SmartWire-DT by a plug-in module. The feedback of the important electrical information such as required for control enhances the system availability.

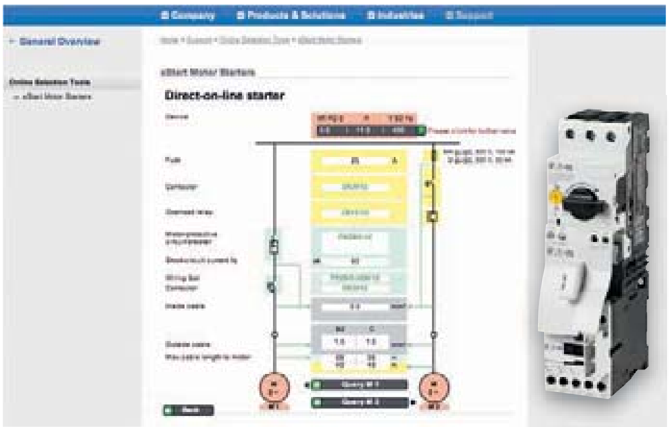
Important for machine export to North America! New National Electrical Code (NEC 2011) for the USA.

The UL 508 Type E – Manual Self-Protected Combination Motor Controllers – used in great numbers in the USA, and for even longer in Canada, must be equipped with a padlockable knob. The levers can be exchanged with padlockable types on the motor-protective circuit-breakers from Eaton.

Lean solutions
Direct-on-line starters/Reversing starters made of standard components

Direct-on-line starters made of standard components are available in four narrow sizes. Contactors and circuit-breakers feature the same compact width. No precious millimeter of control panel space is wasted. The convenient MSC motor starters using tool-less plug connection technology are available up to 15 A and require only a top-hat rail for mounting. The mechanical connector ensures a secure hold, and the electrical connector provides optimum reliability and safety. Complete mounting connectors are offered for DOL and reversing starters from 16 up to 32 A. This prevents fitting errors and cuts down on wiring time.

→ Contactors and circuit-breakers up to 170 A feature the same compact width and result in a lean motor starter, which can be installed in the control panel saving precious space.



Easy to select combinations

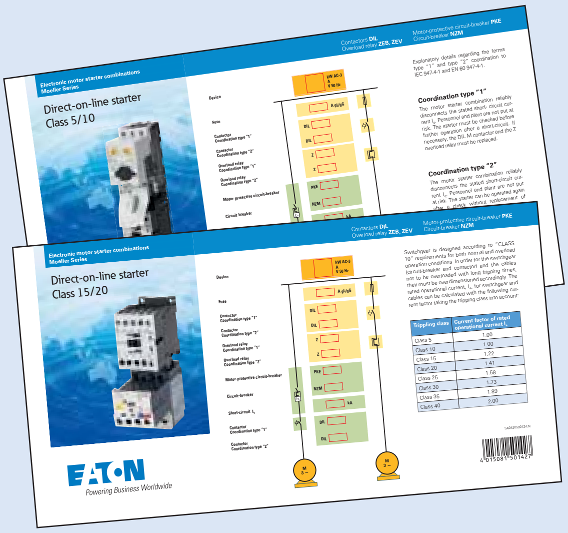
Eaton provides a PC-based electronic selection program for motor starters in addition to the comprehensive selection page in the Eaton main catalogue. This program considers various operating voltages, short-circuit ratings and co-ordination types, as well as fuseless and fused combinations. This small program is available from Eaton free of charge on the Internet. Eaton has provided the practically minded with a carton selection slider for a number of years.

→ Selection tool for motor starter combinations Online
www.moeller.net/select

Quick configuration of tested motor starter combinations

Different applications place different demands on the short-circuit rating of the motor starter. This is expressed by coordination type "1" or coordination type "2".

Both co-ordination types safely master a short-circuit. Coordination type "2" offers starter the highest level of operational continuity: They can be switched back on immediately as soon as the cause of the short-circuit has been remedied.
→ Tested fuseless motor outgoer combinations for motors up to 1000 A provide the highest level of system availability.

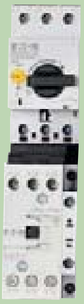
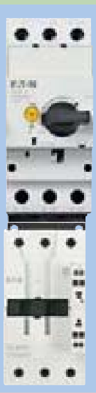


Conditions for compliance to coordination type

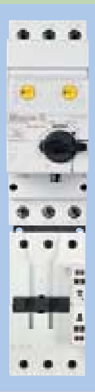
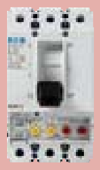
Coordination type "1":
- Safe shutdown of the specified short-circuit current I_q
- No risk to persons or installations in the event of a short-circuit
- The switch does not need to be suitable for continued operation without repair or component replacement
- Damage to the switch or individual components is admissible

Coordination type "2":
- Safe shutdown of the specified short-circuit current I_q
- No risk to persons or installations in the event of a short-circuit
- Switch is suitable for continued operation
- No damage to the switch, with the exception of welding on the contactor contacts, if they can be easily separated and are not deformed to a great degree

Motor-starter combinations

	Motor data			**Motor-protective circuit-breaker**	**Contactor** coordination type “1”	**Contactor** coordination type “2”
	AC-3 380V 400V 415V P	Rated operational current 400V I_e	Rated short-circuit current 380-415V I_q			
	kW	A	kA			
PKZM0 ...+DIL M7 to DIL M15	0.06	0.21	150	PKZM0-0,25	DILM7-...	DILM7-...
	0.09	0.31	150	PKZM0-0,4	DILM7-...	DILM7-...
	0.12	0.41	150	PKZM0-0,63	DILM7-...	DILM7-...
	0.18	0.6	150	PKZM0-0,63	DILM7-...	DILM7-...
	0.25	0.8	150	PKZM0-1	DILM7-...	DILM7-...
	0.37	1.1	150	PKZM0-1,6	DILM7-...	DILM7-...
	0.55	1.5	150	PKZM0-1,6	DILM7-...	DILM7-...
PKZM0 ...+DIL M17 to DIL M32 	0.75	1.9	150	PKZM0-2,5	DILM7-...	DILM7-...
	1.1	2.6	150	PKZM0-4	DILM7-...	DILM7-...
	1.5	3.6	150	PKZM0-4	DILM7-...	DILM7-...
	2.2	5	150	PKZM0-6,3	DILM7-...	DILM7-...
	3	6.6	150	PKZM0-10	DILM7-...	DILM17-...
	4	8.5	150	PKZM0-10	DILM9-...	DILM17-...
	5.5	11.3	50	PKZM0-12	DILM12-...	DILM17-...
PKZM4 ...+DIL M17 to DIL M65 	7.5	15.2	50	PKZM0-16	DILM15-...	DILM17-...
	11	21.7	50	PKZM0-25	DILM25-...	DILM25-...
	15	29.3	50	PKZM0-32	DILM32-...	DILM32-...
	18.5	36	50	PKZM4-40	DILM38-...	DILM40
	22	41	50	PKZM4-50	DILM50	DILM50
	30	55	50	PKZM4-58	DILM65	DILM65
	34	63	50	PKZM4-63	DILM65	DILM65
NZM...+DIL M72 to DIL M500	37	68	50	NZMN1-M80	DILM72	DILM80
	45	81	50	NZMN1-M100	DILM95	DILM95
	55	99	50	NZMN1-M100	DILM115	DILM115
	75	134	50	NZMN2-M160	DILM150	DILM150
	90	161	50	NZMN2-M200	DILM185A	DILM185A
	110	196	50	NZMN2-M200	DILM225A	DILM225A
	132	231	50	NZMN3-ME350	DILM250	DILM250
	160	279	50	NZMN3-ME350	DILM300A	DILM300A
	200	349	50	NZMN3-ME350	DILM400	DILM400
	250	437	50	NZMN3-ME450	DILM500	DILM500

Motor-starter combinations with Electronic Overload Release

	Motor data AC-3 380V 400V 415V P kW	Rated operational current 400V I_e A	Rated short-circuit current 380-415V I_q kA	**Motor-protective circuit-breaker**	**Contactor** coordination type “1”	**Contactor** coordination type “2”
PKE ...+DIL M7 to DIL M12 	0.06	0.21	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.09	0.31	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.12	0.41	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.18	0.6	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.25	0.8	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.37	1.1	100	PKE12/XTU-1,2	DILM7-...	DILM17-...
	0.55	1.5	100	PKE12/XTU-4	DILM7-...	DILM17-...
PKE ...+DIL M17 to DIL M32 	0.75	1.9	100	PKE12/XTU-4	DILM7-...	DILM17-...
	1.1	2.6	100	PKE12/XTU-4	DILM7-...	DILM17-...
	1.5	3.6	100	PKE12/XTU-4	DILM7-...	DILM17-...
	2.2	5	100	PKE12/XTU-12	DILM7-...	DILM17-...
	3	6.6	100	PKE12/XTU-12	DILM7-...	DILM17-...
	4	8.5	100	PKE12/XTU-12	DILM9-...	DILM17-...
	5.5	11.3	100	PKE12/XTU-12	DILM12-...	DILM17-...
PKE 65 ...+DIL M40 to DIL M65 	7.5	15.2	100	PKE32/XTU-32	DILM17-...	DILM17-...
	11	21.7	100	PKE32/XTU-32	DILM25-...	DILM25-...
	15	29.3	100	PKE32/XTU-32	DILM32-...	DILM32-...
	18.5	36	65	PKE65/XTUW-65	DILM40	DILM40
	22	41	65	PKE65/XTUW-65	DILM50	DILM50
	30	55	65	PKE65/XTUW-65	DILM65	DILM65
	34	63	65	PKE65/XTUW-65	DILM65	DILM65
NZM...ME...+DIL M80 to DIL M500  	37	68	100	NZMH2-ME90	DILM80	DILM80
	45	81	100	NZMH2-ME90	DILM95	DILM95
	55	99	100	NZMH2-ME140	DILM115	DILM115
	75	134	100	NZMH2-ME140	DILM150	DILM150
	90	161	100	NZMH2-ME220	DILM185A	DILM185A
	110	196	100	NZMH2-ME220	DILM225A	DILM225A
	132	231	100	NZMH3-ME350	DILM250	DILM250
	160	279	100	NZMH3-ME350	DILM300A	DILM300A
	200	349	100	NZMH3-ME350	DILM400	DILM400
	250	437	100	NZMH3-ME450	DILM500	DILM500

Motor-starter combinations

DOL starters, reversing starters

	Motor data Rated short-circuit current 380 - 415 V Type of coordination "1" I_q kA	 380 - 415 V Type of coordination "2" I_q kA	**Setting range** Overload trip I_r A	**Motor starter** **Actuating voltage 230 V 50 Hz** **Part no.**	 Article no.	**Motor starter** **Actuating voltage 24 V DC** **Part no.**	 Article no.
Complete devices MSC-D							
	150	50	0.16 - 0.25	**MSC-D-0.25-M7(230V50HZ)**	281925	**MSC-D-0.25-M7(24VDC)**	283154
	150	50	0.25 - 0.4	**MSC-D-0.4-M7(230V50HZ)**	281926	**MSC-D-0.4-M7(24VDC)**	283155
	150	50	0.4 - 0.63	**MSC-D-0.63-M7(230V50HZ)**	281927	**MSC-D-0.63-M7(24VDC)**	283156
	150	50	0.63 - 1	**MSC-D-1-M7(230V50HZ)**	281929	**MSC-D-1-M7(24VDC)**	283158
	150	50	1 - 1.6	**MSC-D-1.6-M7(230V50HZ)**	283140	**MSC-D-1.6-M7(24VDC)**	283159
	150	50	1.6 - 2.5	**MSC-D-2.5-M7(230V50HZ)**	283142	**MSC-D-2.5-M7(24VDC)**	283161
	150	50	2.5 - 4	**MSC-D-4-M7(230V50HZ)**	283143	**MSC-D-4-M7(24VDC)**	283162
	150	50	4 - 6.3	**MSC-D-6.3-M7(230V50HZ)**	283145	**MSC-D-6.3-M7(24VDC)**	283164
	150	–	6.3 - 10	**MSC-D-10-M7(230V50HZ)**	283146	**MSC-D-10-M7(24VDC)**	283165
	150	–	6.3 - 10	**MSC-D-10-M9(230V50HZ)**	283147	**MSC-D-10-M9(24VDC)**	283166
	50	–	8 - 12	**MSC-D-12-M12(230V50HZ)**	283148	**MSC-D-12-M12(24VDC)**	283167
	50	–	10 - 16	**MSC-D-16-M15(230V50HZ)**	100414	**MSC-D-16-M15(24VDC)**	100415
	50	50	6.3 - 10	**MSC-D-10-M17(230V50HZ)**	101045	**MSC-D-10-M17(24VDC)**	101047
	50	50	8 - 12	**MSC-D-12-M17(230V50HZ)**	101046	**MSC-D-12-M17(24VDC)**	101048
	50	50	10 - 16	**MSC-D-16-M17(230V50HZ)**	283150	**MSC-D-16-M17(24VDC)**	283168
	50	50	20 - 25	**MSC-D-25-M25(230V50HZ)**	283151	**MSC-D-25-M25(24VDC)**	283169
	50	50	25 - 32	**MSC-D-32-M32(230V50HZ)**	283152	**MSC-D-32-M32(24VDC)**	283170
Complete devices MSC-R							
	150	50	0.16 - 0.25	**MSC-R-0.25-M7(230V50HZ)**	283171	**MSC-R-0.25-M7(24VDC)**	283190
	150	50	0.25 - 0.4	**MSC-R-0.4-M7(230V50HZ)**	283172	**MSC-R-0.4-M7(24VDC)**	283191
	150	50	0.4 - 0.63	**MSC-R-0.63-M7(230V50HZ)**	283173	**MSC-R-0.63-M7(24VDC)**	283192
	150	50	0.63 - 1	**MSC-R-1-M7(230V50HZ)**	283175	**MSC-R-1-M7(24VDC)**	283194
	150	50	1 - 1.6	**MSC-R-1.6-M7(230V50HZ)**	283176	**MSC-R-1.6-M7(24VDC)**	283195
	150	50	1.6 - 2.5	**MSC-R-2.5-M7(230V50HZ)**	283178	**MSC-R-2.5-M7(24VDC)**	283197
	150	50	2.5 - 4	**MSC-R-4-M7(230V50HZ)**	283179	**MSC-R-4-M7(24VDC)**	283198
	150	50	4 - 6.3	**MSC-R-6.3-M7(230V50HZ)**	283181	**MSC-R-6.3-M7(24VDC)**	283200
	150	–	6.3 - 10	**MSC-R-10-M7(230V50HZ)**	283182	**MSC-R-10-M7(24VDC)**	283201
	150	–	6.3 - 10	**MSC-R-10-M9(230V50HZ)**	283183	**MSC-R-10-M9(24VDC)**	283202
	50	–	8 - 12	**MSC-R-12-M12(230V50HZ)**	283184	**MSC-R-12-M12(24VDC)**	283203
	50	50	6.3 - 10	**MSC-R-10-M17(230V50HZ)**	101049	**MSC-R-10-M17(24VDC)**	101051
	50	50	8 - 12	**MSC-R-12-M17(230V50HZ)**	101050	**MSC-R-12-M17(24VDC)**	101052
	50	50	10 - 16	**MSC-R-16-M17(230V50HZ)**	283186	**MSC-R-16-M17(24VDC)**	283204
	50	50	20 - 25	**MSC-R-25-M25(230V50HZ)**	283187	**MSC-R-25-M25(24VDC)**	283205
	50	50	25 - 32	**MSC-R-32-M32(230V50HZ)**	283188	**MSC-R-32-M32(24VDC)**	283206

	Motor data		Setting range	Motor starter Actuating voltage 230 V 50 Hz		Motor starter Actuating voltage 24 V DC	
	Rated short-circuit current		Overload trip	**Part no.**	Article no.	**Part no.**	Article no.
	380 - 415 V Type of coordination “1” I_q kA	380 - 415 V Type of coordination “2” I_q kA	I_r I_r A				
Complete devices MSC-US							
	100	–	0.3 - 1.2	**MSC-DE-1.2-M7(230V50HZ)**	121735	**MSC-DE-1.2-M7(24VDC)**	121736
	100	–	1 - 4	**MSC-DE-4-M7(230V50HZ)**	121737	**MSC-DE-4-M7(24VDC)**	121738
	100	–	3 - 12	**MSC-DE-12-M7(230V50HZ)**	121739	**MSC-DE-12-M7(24VDC)**	121740
	100	–	3 - 12	**MSC-DE-12-M9(230V50HZ)**	121741	**MSC-DE-12-M9(24VDC)**	121742
	100	–	3 - 12	**MSC-DE-12-M12(230V50HZ)**	121743	**MSC-DE-12-M12(24VDC)**	121744
	100	100	3 - 12	**MSC-DE-12-M17(230V50HZ)**	121745	**MSC-DE-12-M17(24VDC)**	121746
	100	100	8 - 32	**MSC-DE-32-M17(230V50HZ)**	121747	**MSC-DE-32-M17(24VDC)**	121748
	100	100	8 - 32	**MSC-DE-32-M25(230V50HZ)**	121749	**MSC-DE-32-M25(24VDC)**	121750
	100	100	8 - 32	**MSC-DE-32-M32(230V50HZ)**	121751	**MSC-DE-32-M32(24VDC)**	121752
Complete devices MSD-DEA							
	100	–	0.3 - 1.2	–	–	**MSC-DEA-1.2-M7(24VDC)**	121753
	100	–	1 - 4	–	–	**MSC-DEA-4-M7(24VDC)**	121754
	100	–	3 - 12	–	–	**MSC-DEA-12-M7(24VDC)**	121755
	100	–	3 - 12	–	–	**MSC-DEA-12-M9(24VDC)**	121756
	100	–	3 - 12	–	–	**MSC-DEA-12-M12(24VDC)**	121757
	100	100	3 - 12	–	–	**MSC-DEA-12-M17(24VDC)**	121758
	100	100	8 - 32	–	–	**MSC-DEA-32-M17(24VDC)**	121759
	100	100	8 - 32	–	–	**MSC-DEA-32-M25(24VDC)**	121760
	100	100	8 - 32	–	–	**MSC-DEA-32-M32(24VDC)**	121761

	Motor data Rated short-circuit current 380 - 415 V Type of coordination "1" I_q kA	 380 - 415 V Type of coordination "2" I_q kA	Setting range Overload trip I_r A	Motor starter actuating voltage 230 V 50 Hz Part no.	 Article no.	Motor starter Actuating voltage 24 V DC Part no.	 Article no.
Complete devices PKZ and DIL on BBA							
	100	50	0.16 - 0.25	**MSC-D-0.25-M7(230V50HZ)/BBA**	102737	**MSC-D-0.25-M7(24VDC)/BBA**	102964
	100	50	0.25 - 0.4	**MSC-D-0.4-M7(230V50HZ)/BBA**	102738	**MSC-D-0.4-M7(24VDC)/BBA**	102965
	100	50	0.4 - 0.63	**MSC-D-0.63-M7(230V50HZ)/BBA**	102739	**MSC-D-0.63-M7(24VDC)/BBA**	102966
	100	50	0.63 - 1	**MSC-D-1-M7(230V50HZ)/BBA**	102950	**MSC-D-1-M7(24VDC)/BBA**	102967
	100	50	1 - 1.6	**MSC-D-1.6-M7(230V50HZ)/BBA**	102951	**MSC-D-1.6-M7(24VDC)/BBA**	102968
	100	50	1.6 - 2.5	**MSC-D-2.5-M7(230V50HZ)/BBA**	102952	**MSC-D-2.5-M7(24VDC)/BBA**	102969
	100	50	2.5 - 4	**MSC-D-4-M7(230V50HZ)/BBA**	102953	**MSC-D-4-M7(24VDC)/BBA**	102970
	100	50	4 - 6.3	**MSC-D-6.3-M7(230V50HZ)/BBA**	102954	**MSC-D-6.3-M7(24VDC)/BBA**	102971
	100	–	6.3 - 10	**MSC-D-10-M7(230V50HZ)/BBA**	102955	**MSC-D-10-M7(24VDC)/BBA**	102972
	100	–	6.3 - 10	**MSC-D-10-M9(230V50HZ)/BBA**	102956	**MSC-D-10-M9(24VDC)/BBA**	102973
	100	–	8 - 12	**MSC-D-12-M12(230V50HZ)/BBA**	102957	**MSC-D-12-M12(24VDC)/BBA**	102974
	50	–	10 - 16	**MSC-D-16-M15(230V50HZ)/BBA**	102958	**MSC-D-16-M15(24VDC)/BBA**	102975
	100	50	6.3 - 10	**MSC-D-10-M17(230V50HZ)/BBA**	102959	**MSC-D-10-M17(24VDC)/BBA**	102976
	100	50	8 - 12	**MSC-D-12-M17(230V50HZ)/BBA**	102960	**MSC-D-12-M17(24VDC)/BBA**	102977
	50	50	10 - 16	**MSC-D-16-M17(230V50HZ)/BBA**	102961	**MSC-D-16-M17(24VDC)/BBA**	102978
	50	50	20 - 25	**MSC-D-25-M25(230V50HZ)/BBA**	102962	**MSC-D-25-M25(24VDC)/BBA**	102979
	50	50	25 - 32	**MSC-D-32-M32(230V50HZ)/BBA**	102963	**MSC-D-32-M32(24VDC)/BBA**	102980

Motor-starter combinations

Reversing starter on busbar adapter

	Motor data Rated short-circuit current 380 - 415 V Type of coordination “1” I_q kA	 380 - 415 V Type of coordination “2” I_q kA	**Setting range** Overload trip I_r A	**Motor starter actuating voltage 230 V 50 Hz** **Part no.**	Article no.	**Motor starter Actuating voltage 24 V DC** **Part no.**	Article no.
PKZ and DILM complete devices on BBA for reversing starters							
	100	50	0.16 - 0.25	**MSC-R-0.25-M7(230V50HZ)/BBA**	102981	**MSC-R-0.25-M7(24VDC)/BBA**	102997
	100	50	0.25 - 0.4	**MSC-R-0.4-M7(230V50HZ)/BBA**	102982	**MSC-R-0.4-M7(24VDC)/BBA**	102998
	100	50	0.4 - 0.63	**MSC-R-0.63-M7(230V50HZ)/BBA**	102983	**MSC-R-0.63-M7(24VDC)/BBA**	102999
	100	50	0.63 - 1	**MSC-R-1-M7(230V50HZ)/BBA**	102984	**MSC-R-1-M7(24VDC)/BBA**	103000
	100	50	1 - 1.6	**MSC-R-1.6-M7(230V50HZ)/BBA**	102985	**MSC-R-1.6-M7(24VDC)/BBA**	103001
	100	50	1.6 - 2.5	**MSC-R-2.5-M7(230V50HZ)/BBA**	102986	**MSC-R-2.5-M7(24VDC)/BBA**	103002
	100	50	2.5 - 4	**MSC-R-4-M7(230V50HZ)/BBA**	102987	**MSC-R-4-M7(24VDC)/BBA**	103003
	100	50	4 - 6.3	**MSC-R-6.3-M7(230V50HZ)/BBA**	102988	**MSC-R-6.3-M7(24VDC)/BBA**	103004
	100	–	6.3 - 10	**MSC-R-10-M7(230V50HZ)/BBA**	102989	**MSC-R-10-M7(24VDC)/BBA**	103005
	100	–	6.3 - 10	**MSC-R-10-M9(230V50HZ)/BBA**	102990	**MSC-R-10-M9(24VDC)/BBA**	103006
	100	–	8 - 12	**MSC-R-12-M12(230V50HZ)/BBA**	102991	**MSC-R-12-M12(24VDC)/BBA**	103007
	100	50	6.3 - 10	**MSC-R-10-M17(230V50HZ)/BBA**	102992	**MSC-R-10-M17(24VDC)/BBA**	103008
	100	50	8 - 12	**MSC-R-12-M17(230V50HZ)/BBA**	102993	**MSC-R-12-M17(24VDC)/BBA**	103009
	50	50	10 - 16	**MSC-R-16-M17(230V50HZ)/BBA**	102994	**MSC-R-16-M17(24VDC)/BBA**	103010
	50	50	20 - 25	**MSC-R-25-M25(230V50HZ)/BBA**	102995	**MSC-R-25-M25(24VDC)/BBA**	103011
	50	50	25 - 32	**MSC-R-32-M32(230V50HZ)/BBA**	102996	**MSC-R-32-M32(24VDC)/BBA**	103012

Soft Starter DS7 of System xStart – Soft at the Start, High on Torque

The soft starter has become increasingly established as an alternative to the star-delta starter. The soft starters of the DS7 series will be extended in summer to include devices up to 200 A. Then the complete spectrum from 4 to 200 A will be available with a common range of control and functionality, which will completely supersede the previous DS4 and DS6 series. The voltage range extends from 200 to 480 V mains voltage, and versions with 24 V AC/DC and 110-230V AC are available for control.

Designed for normal applications such as pumps, fans and small conveyors, the compact DS7 is ideal. The DS7 will soon be available with a SmartWire-DT connection to simplify wiring and enhance functionality as an automation solution.

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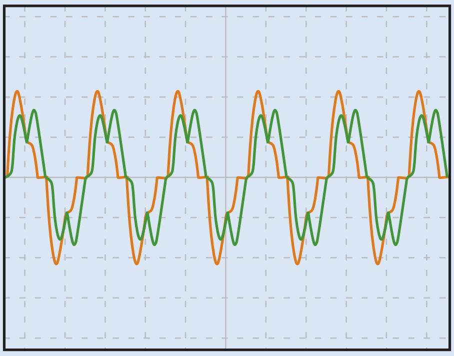
MBC014

Application examples

- Three-phase inductive loads
- Noiseless and soft motor start in transport and conveying systems
- Soft starting of pumps reduces the load on the entire installation (water impact)
- Solid-state switching of pumps in the extreme environments of chemical plants and filling stations
- Smooth start that reduces wear on V-belts in fan drives.

Current characteristic in the uncontrolled phase



Conventional methods:

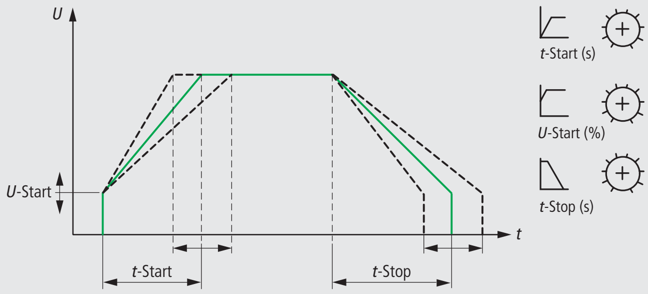
🟧 Symmetrical control with high level of DC components

New process from Eaton:

🟩 Asymmetric control without DC components

Asymmetric control: It does not get any softer

The special starting method (asymmetrical trigger control) for the soft starter function prevents DC components that normally occur with a two-phase controlled starter (Eaton patent). They suppress the formation of an elliptical rotating field, which leads to an irregular acceleration of the motor and unnecessarily extends acceleration times. The smooth starting behaviour of the DS7 is thus similar to that of a three-phase soft starter.



Soft starter DS7 offers you the opportunity to adapt the drive optimally to the application. You can set the start and stop functions and the start voltage with just three potentiometers.

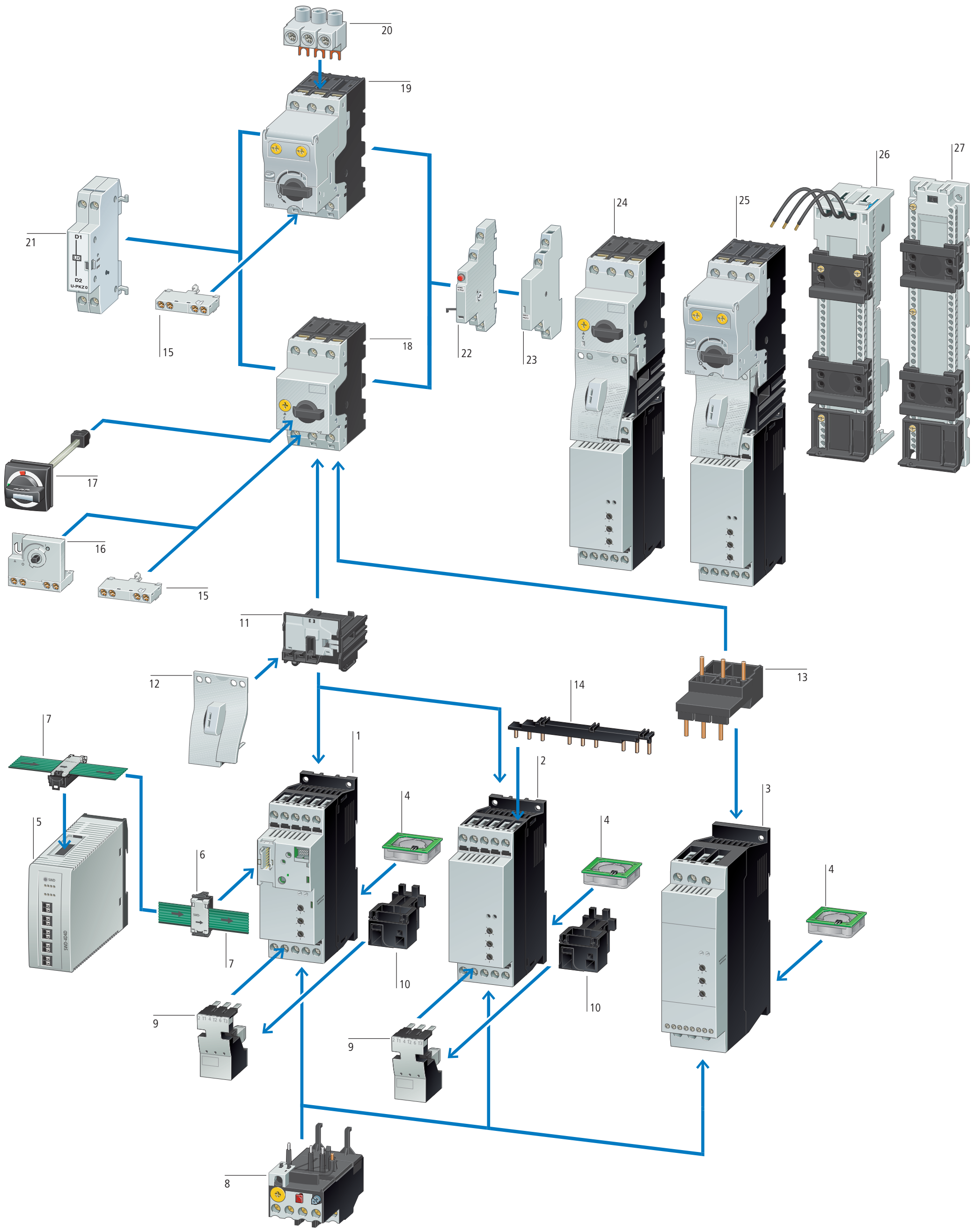
Soft start: the modern alternative to star-delta starters

Electronic soft starter fulfil the customer demand for an impact free rise in torque and a determined reduction in current during the start phase. You control the power supply of the three-phase motor in the start phase so that the motor matches the load behaviour of the load machine. The mechanical equipment is accelerated with the minimum of stress as a result. The operating behaviour and the work processes are influenced positively which means that negative influences are avoided. The product standard for the area of soft starters is the IEC / EN 60 947-4-2.

Full integration of fans prevents limitations

The built-in fan removes any limitations when connecting accessories. Even with a built-in fan, the overload relay can be attached directly to the DS7. Accordingly, the handling does not need to be reconsidered irrespective of whether standard applications of applications requiring additional cooling are necessary, e.g. with increased starting frequency or higher ambient temperatures. The xStart system concept is retained.

System overview



1	DS7 soft starters with SmartWire-DT	14	Three-phase commoning link
2	DS7 soft starters in construction size 1 for assigned motor current up to 12 A	15	Standard auxiliary contacts
3	DS7 soft starters in construction size 2 for assigned motor current up to 32 A	16	Early-make auxiliary contacts
4	Device fan (DS7-FAN-32)	17	Door coupling handle
5	SmartWire-DT gateway	18	PKZM0 motor-protective circuit-breakers
6	SmartWire-DT external device plug	19	PKE motor-protective circuit-breakers
7	SmartWire-DT flat band conductor	20	Extension terminal
8	Overload relays	21	Current limiter
9	Motor plugs in tool-less plug connection	22	Trip-indicating auxiliary contacts
10	Base for motor plugs	23	Standard auxiliary contact
11.12	PKZM0-XDM wiring set in tool-less plug connection	24	Motor-starter combination with PKZ
13	PKZM0-XDM wiring set	25	Motor-starter combination with PKE
		26	Busbar adapters
		27	Top-hat rail adapter

	Rated operational current (AC-53) I_e (IEC) A	assigned motor rating at 400 V P kW	assigned motor rating at 480 V P HP	**Part no.**	Article no.
DS7 soft starters for three-phase loads **$U_c = U_s$ = 24 V AC/DC**					
	4	1.5	2	**DS7-340SX004N0-N**	134847
	7	3	5	**DS7-340SX007N0-N**	134849
	9	4	5	**DS7-340SX009N0-N**	134910
	12	5.5	10	**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
DS7 soft starters for three-phase loads **$U_c = U_s$ = 110/230 V AC**					
	4	1.5	2	**DS7-342SX004N0-N**	134925
	7	3	5	**DS7-342SX007N0-N**	134927
	9	4	5	**DS7-342SX009N0-N**	134928
	12	5.5	10	**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
	41	22	30	**DS7-342SX041N0-N**	134934
	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

Accessories

Device fans		Can be used for soft starters	**Part no.**	Article no.
	For increasing the load cycle (i.e. 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

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Frequency Inverter M-Max™ Universal for Mechanical Engineering

The M-Max series frequency inverters allow drives to be adapted easily to customer requirements. With a compact design for assigned motor ratings from 0.25 kW to 7.5 kW, M-Max can offer maximum flexibility. M-Max also demonstrates how a high level of functionality can be implemented in a simple and user-friendly design. The small and compact book format design also allows a space saving installation. M-Max is provided with an integrated RFI filter (EMC) and a flexible interface for solving important machine building requirements, for example, the optimization of production and manufacturing processes. It reliably ensures the required motion sequences of the drive motor and thus contributes to operational safety.

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MBC015

M-Max – the “energy optimizer“

M-Max frequency inverters provide an economical solution for several processes in pumping applications. The integrated PI controller and extensive motor-protective functions ensure a high level of operational reliability and allow significant energy savings in the connected process. The lacquered control boards also allow use in highly humid and aggressive environments, such as in a sewage treatment plant. The optional MMX-IP21-FS... accessory enables the degree of protection of the M-Max to be increased to IP21.

M-Max – for “dynamic precision“

The compact design of the M-Max saves valuable mounting space in machine building, since the RFI filter and the brake chopper are already integrated. Shielded control and motor cable can also be connected with EMC compliance directly to the frequency inverter. The maximum permissible ambient temperature of +50 °C during operation with continuous current and with full overload withstand capability also meets machine building requirements.

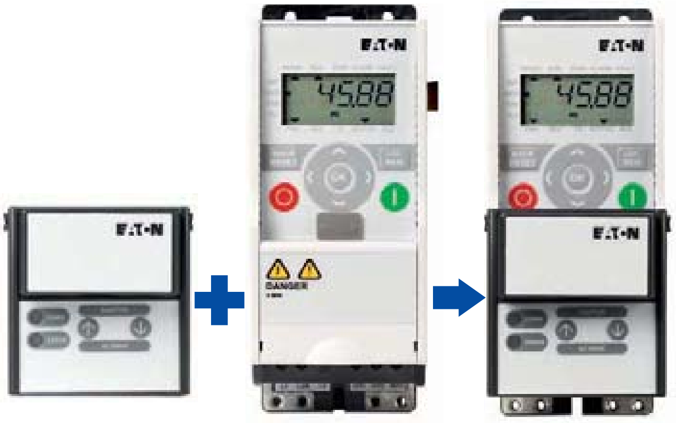
M-Max – the fieldbus flexibility

The frequency inverters of the M-Max series can be integrated into different fieldbus systems with the plug-in modules inserted into the side of the device.

The following fieldbus modules are available:

• CANopen	(XMX-NET-CO-A)
• Profibus DP	(XMX-NET-PD-A)
• DeviceNet	(XMX-NET-DN-A)

The attachment of the modules to the frequency inverter is undertaken with a special mounting frame (MMX-NET-XA).

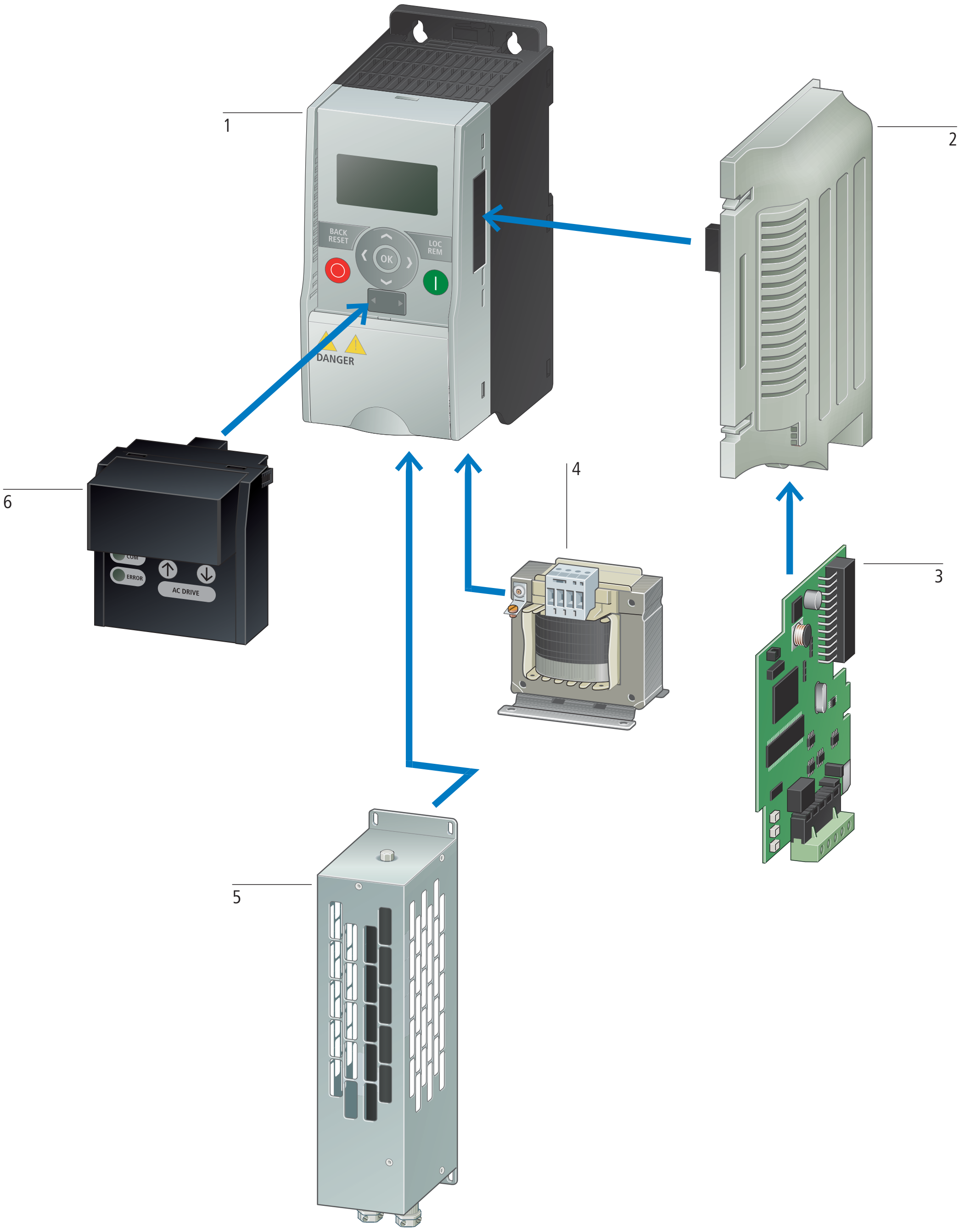


MMX-COM-PC – the “In-Line communicator”

The MMX-COM-PC communication module that can be plugged onto the front provides the following without a mains voltage on the frequency inverter (internal battery):

- Upload and download of all parameters,
- Direct link to a PC via USB interface (parameter assignment),
- Copying of parameters for series machines or when exchanging devices.

This communication module considerably increases data security and reduces the time required for commissioning and maintenance.


1
2
3
4
5
6
BACK RESET
OK
LOC REM
DANGER
COM
ERROR
AC DRIVE

Basic device

1	Frequency inverters

System accessories

2	Mounting frame for fieldbus connection
3	Communication module (in the variants CANopen, PROFIBUS-DP, DeviceNet)
6	PC interface card

Accessories

4	Main chokes/motor reactors
5	Braking resistance

	Assigned motor rating (50/60 Hz)[1] P kW	Rated operational current device[2] I_e A	Rated operational current motor I_e A	**Part no.** with internal radio interference suppression filters	Article no.	**Part no.** without internal radio interference suppression filter	Article no.
Rated operating voltage 1 AC 230 V							
	0.25	1.7	1.4	**MMX12AA1D7F0-0**	121363	**MMX12AA1D7N0-0**	122660
	0.37	2.4	2	**MMX12AA2D4F0-0**	121364	**MMX12AA2D4N0-0**	122661
	0.55	2.8	2.7	**MMX12AA2D8F0-0**	121365	**MMX12AA2D8N0-0**	122662
	0.75	3.7	3.2	**MMX12AA3D7F0-0**	121366	**MMX12AA3D7N0-0**	122663
	1.1	4.8	4.6	**MMX12AA4D8F0-0**	121367	**MMX12AA4D8N0-0**	122664
	1.5	7	6.3	**MMX12AA7D0F0-0**	121368	**MMX12AA7D0N0-0**	122665
	2.2	9.6	8.7	**MMX12AA9D6F0-0**	121369	**MMX12AA9D6N0-0**	122666
Rated operating voltage 3 AC 400 V							
	0.37	1.3	1.1	**MMX34AA1D3F0-0**	121397	**MMX34AA1D3N0-0**	122674
	0.55	1.9	1.5	**MMX34AA1D9F0-0**	121398	**MMX34AA1D9N0-0**	122675
	0.75	2.4	1.9	**MMX34AA2D4F0-0**	121399	**MMX34AA2D4N0-0**	122676
	1.1	3.3	2.6	**MMX34AA3D3F0-0**	121400	**MMX34AA3D3N0-0**	122677
	1.5	4.3	3.6	**MMX34AA4D3F0-0**	121401	**MMX34AA4D3N0-0**	122678
	2.2	5.6	5	**MMX34AA5D6F0-0**	121402	**MMX34AA5D6N0-0**	122679
	3	7.6	6.6	**MMX34AA7D6F0-0**	121403	**MMX34AA7D6N0-0**	122680
	4	9	8.5	**MMX34AA9D0F0-0**	121404	**MMX34AA9D0N0-0**	122681
	5.5	12	11.3	**MMX34AA012F0-0**	121405	**MMX34AA012N0-0**	122682
	7.5	14	15.2	**MMX34AA014F0-0**	122684	**MMX34AA014N0-0**	122683

Notes

[1] Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz).

[2] The frequency inverter's rated operational current applies for an operating frequency of 6 kHz and ambient air temperature of +50 °C.

	Input current I_{LN} A	Can be used for frequency inverters	**Part no.**	Article no.
Radio interference suppression filters Mounting next or downstream the frequency inverter				
Radio interference suppression filter, single-phase	9	MMX12AA1D7… MMX12AA2D4… MMX12AA2D8… MMX12AA3D7…	**MMX-LZ1-009**	138231
	15	MMX12AA4D8… MMX12AA7D0…	**MMX-LZ1-015**	138232
	17	MMX12AA9D6…	**MMX-LZ1-017**	138233
Radio interference suppression filter, three-phase	6	MMX32AA1D7… MMX32AA2D4… MMX32AA2D8… MMX32AA3D7… MMX34AA1D3… MMX34AA1D9… MMX34AA2D4… MMX34AA3D3…	**MMX-LZ3-006**	138234
	9	MMX32AA4D8… MMX32AA7D0… MMX34AA4D3… MMX34AA5D6…	**MMX-LZ3-009**	138235
	22	MMX32AA9D6… MMX34AA7D6… MMX34AA9D0… MMX34AA012… MMX34AA014…	**MMX-LZ3-022**	138236
PC connection	for MMX…			
	PC connection (RS422/RS485, Sub D) for MMX... frequency inverters • With 3 m long connection cable and interface converter • Data transfer with PC software (copy function with non-volatile memory) between frequency inverters of the MMX... series		**MMX-COM-PC**	121406

Hydraulic Solutions for Productive and Economic Machines

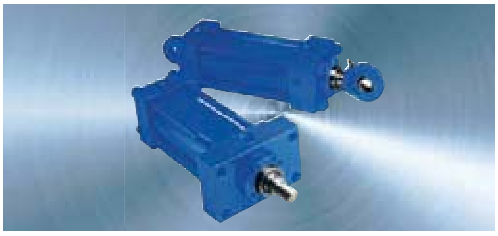
In a world of increasing pressure for "better, faster, cheaper," manufacturers face more significant challenges than ever before. Whether making automobiles, clothing, computer chips, plastic bottles, or anything in between, you need every cell in your fine-tuned operation working at its optimal state. When Eaton is on the inside, you can experience the assurance of tireless production.

Produce at peak efficiency with the superior precision and repeatability of Eaton products. Eaton hydraulic components provide the precise control and consistent operation required for virtually every step in your manufacturing operation. With Eaton, we'll help you redefine the meaning of productivity.

Whether your primary business is mass production or mass customisation, you can count on superior precision and repeatability for increased uptime, year after year.

Manifold/Valve Assembly

Providing a comprehensive line of valves coupled with industrial manifolds capable of providing unique customer solutions to increase machine production.



Custom Cylinders

Custom designed cylinders featuring highly specialized sealing systems provide the ultimate performance in high velocity applications.

Pumps and Motors

The Hydrokraft range of open and closed circuit pumps and motors for industrial applications have a continuous pressure rating of 350 bar, displacements up to 750cc/rev and a wide range of control options.

Open Circuit Piston Pumps

Eaton delivers longer life and reliable operation for punch presses and metal forming applications with medium duty PMV pumps featuring robust bearing designs.

Proportional Valves

Eaton’s Industrial Proportional Valves offer precise control every time in plastic injection moulding and endless other manufacturing applications.

Connections

WALFORM establishes the positive connection between the tube and the fitting body and greatly reduces the tightening travel as well as tightening force.

Screw-in Valves

Eaton Screw in Cartridge valves from the Vickers and Integrated Hydraulics ranges include, direct acting, proportional and solenoid control for flow, pressure and direction plus a wide range of logic elements.

Hydraulic Hoses

Eaton offers a wide variety of hose constructions that are ideally suited to a vast array of applications. Our hoses are designed to meet the most demanding applications providing maximum durability and long-lasting performance.

Safe Switching and Disconnecting

Rotary switch T flush
- Main switch
- Maintenance / manual override switch
- Reversing / Star-delta switch
- Powers up to 132 kW
- Non-standard switches possible

Page 176

Switch-disconnector P surface mounting
- IP 65
- Main switch
- Maintenance / manual override switch
- Reversing / Star-delta switch
- Powers up to 110 kW

Page 177

Switch-disconnector P, N
- Four switches up to 1600 A
- 3 and 4-pole
- Diverse installation and actuation options

Page 186

Switch disconnectors IN
- Disconnectors up to 6300 A

See Industry Main Catalogue

Line and System Protection

Miniature circuit-breaker FAZ
- Only 80 mm in height
- Installation / extension without removal from the rail
- Switching capacity up to 15 kA

Page 196

Digital RCCB
- Preventative information
- Warning before trip
- Integrated auxiliary switch
- Display with error current trip

Page 195

Circuit-breakers NZM and IZM
- Four NZM switches up to 1600 A
- 3 and 4-pole
- Very versatile installation and actuation
- Motor, system and generator protection
- IZM air circuit-breakers up to 6300 A

Page 182
IZM see Industry Main Catalogue

Circuit-breakers NZM + RCCB
- Up to 250 A
- Pulse current sensitive
- Rated fault current $I_{\Delta n}$=0.03A

See Industry Main Catalogue

Recording Energy Consumption and Communication

Circuit-breakers NZM Energy measuring module XMC

- Simple installation
- Measured value display on location
- Data transfer via fieldbus

Pages 183 and 193

Circuit-breaker NZM with Data Management Interface

- Warnings on load state
- Phase current displays
- Trip cause indication
- On-location and remote display

Page 193

Circuit-breaker with SmartWire-DT

- Warnings
- Remote operator control
- Data from metering modules

Page 183

Assuring Power Quality

Single-phase UPS

- Power from 500 VA to 20 kVA
- Compact protection from mains power problems
- Diverse communication options
- Up to 3 kVA Plug & Play
- Batteries are hot swappable

Page 202

Three-phase UPS

- Power from 8 kVA to 4,400 kVA
- High efficiency
- Diverse communication options
- Paralleling capability using HotSync technology
- Battery life management with the Eaton ABM technology

Page 203

Software + Accessories

- Free-of-charge shutdown and management software
- Ordered shutdown – even for VMware systems
- Management of large numbers of UPS’s
- Intelligent energy distribution

Page 203

Safe Switching, Isolating and Control with Rotary Switch T and Switch Disconnector P

The high-performance, robust and compact T rotary switches and P switch-disconnectors are used in industry, trade and building engineering applications. The degree of protection IP65 with the switch mounts and the switch front enables use in harsh environments. Ten basic switch types in four different construction types, in a whole range of standard switches and across a wide performance range are available. Customised circuits can also be implemented in addition to the standard configurations. The possibilities are almost unlimited. A comprehensive accessory range complements the switch range and rounds off the range of applications. All contacts feature double breaking contacts.

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MBC016

Rotary switch T

The rotary switch T represents a very flexible, compact and robust modular system. The TM, T0, T3, T5B, T5, T6, T8 rating sizes are available in four different construction types. The rating of the T switch ranges from 6.5 kW to 132 kW with AC23A at 400/415 V, 50-60 Hz. The rated uninterrupted current I_u is between 10 A and 315 A. The rotary switch T has a widely varied range of application uses. Customized circuits on request.

Switch-disconnector P

The switch-disconnectors P1 up to 32 A, P3 up to 100 A, P5 up to 315 A are very compact and robust. The manual operator acts directly on the contacts. The contacts are positively opened on de-energization. In addition to their use as switch disconnectors with and without the Emergency-Stop function, switch-disconnectors P can be used as On-Off switches as well as maintenance, manual override or safety switches.

RPS-E EVOLUTION

Main switch with Emergency-Stop function[1]

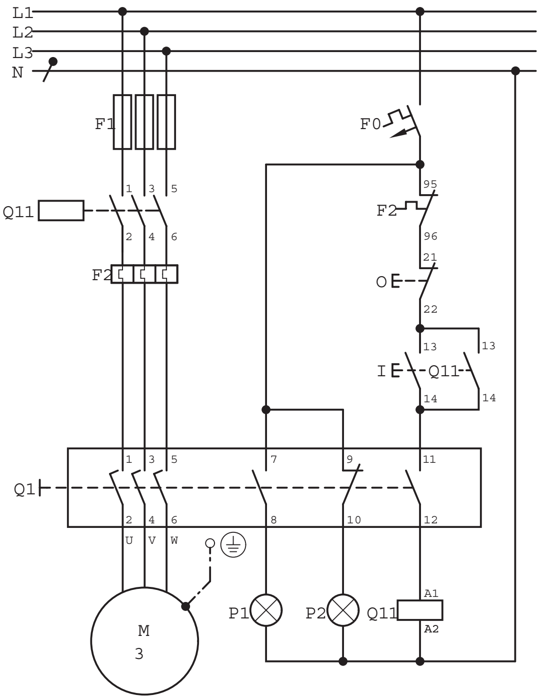
Process and processing machines require a power disconnecting device conform to EN 60204-1. Furthermore, standstill in an emergency must also be assured. As shown in the above textile processing machine, both of these functions are assumed by a switch-disconnector P3. Standstill in an emergency requires:

- priority function and operation in all operating modes
- the power supply, which is connected to the machine states which produce the danger, must switch off as quickly as possible.

[1] The EMERGENCY-STOP devices from Eaton can also be used as EMERGENCY-OFF devices.

Safety switch with load shedding and signalling

The safety switches P and T are functionally designed as maintenance and manual override switches. Safe isolation of a load from the mains is the primary function. The switch can be loaded with rated uninterrupted current I_u due to the load shedding circuit. The switch switches without a load! The additional signaling contacts can be used for indicating the switch position. The respective processing and use in the application program of the system enhances safety.

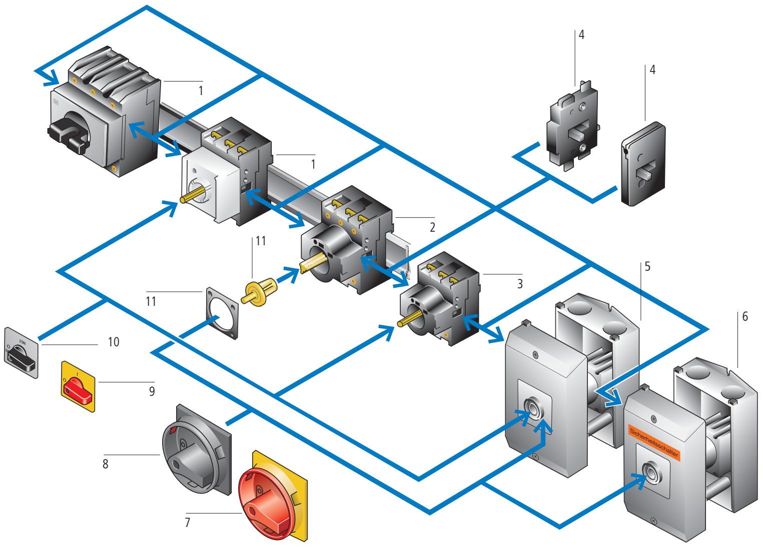


P1 = On
P2 = Off
Q11 = Load shedding

Cam switches, switch-disconnectors

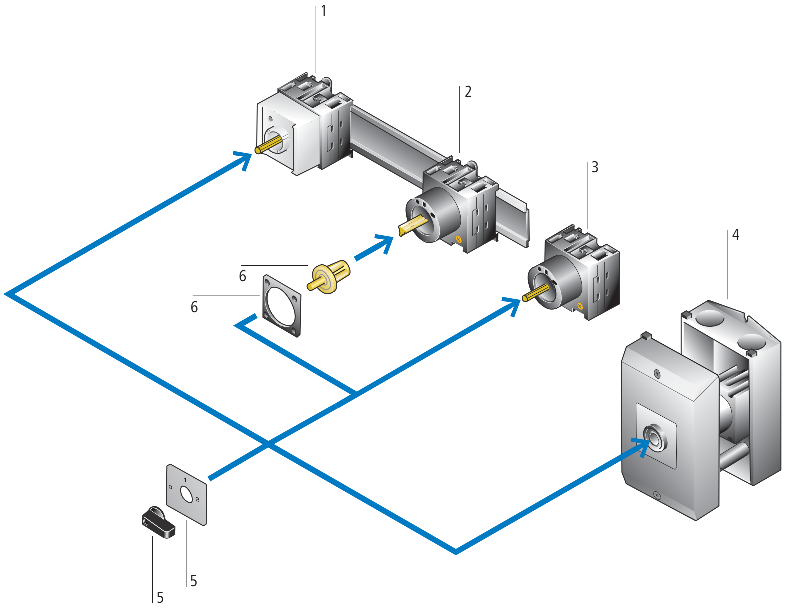
System overview

P1, P3 switch-disconnectors



1 Service distribution board mounting
2 Rear mounting
3 Flush mounting
4 Neutral conductors, auxiliary contacts
5 Assembly
6 Safety switches
7 Main switches (kit) for use as emergency switching off device
8 Main switch (kit)
9 Thumb-grip, for use as emergency switching off device
10 Thumb-grip
11 Coupling drive

T0, T3, T5B, T5 cam switches

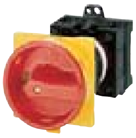


1 Service distribution board mounting
2 Rear mounting
3 Flush mounting
4 Assembly
5 Thumb-grip
6 Coupling drive

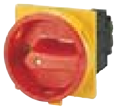
Ratings				**Switch type**							
				T0	**T3**	**T5B**	**T5**	**P1**		**P3**	
Rated operational power	**AC-23**	**380-440 V**	**KW**	6.5	13	22	30	13	15	30	50
Motor load switch	AC-3	380-440 V	KW	4	12	22	30	7.5	13	30	40
Rated uninterrupted current I_u			**A**	20	32	63	100	25	32	63	100

Surface mounting

Rear mounting



Flush mounting



Main switches, IP65

with lockable rotary handle

Pole	Rated uninter-rupted current I_u A	Surface mounting Part no.	Article no.	Rear mounting Part no.	Article no.	Flush mounting Part no.	Article no.
1	20	**T0-1-8200/I1/SVB**	207145				
	32	**T3-1-8200/I2/SVB**	207200				
	63	**T5B-1-8200/I4/SVB**	207240				
	100	**T5-1-8200/I5/SVB**	207275				
2	20	**T0-1-102/I1/SVB**	207143	**T0-1-102/V/SVB**	095824	**T0-1-102/EA/SVB**	091078
	32	**T3-1-102/I2/SVB**	207198	**T3-1-102/V/SVB**	019120	**T3-1-102/EA/SVB**	014374
	63	**T5B-1-102/I4/SVB**	207238	**T5B-1-102/V/SVB**	094463	**T5B-1-102/EA/SVB**	094469
	100	**T5-1-102/I5/SVB**	207273	**T5-1-102/V/SVB**	098806	**T5-1-102/EA/SVB**	098808
3	20	**T0-2-1/I1/SVB**	207147	**T0-2-1/V/SVB**	043619	**T0-2-1/EA/SVB**	038873
	25	**P1-25/I2/SVB**	207293	**P1-25/V/SVB**	055335	**P1-25/EA/SVB**	041097
	32	**P1-32/I2/SVB**	207314	**P1-32/V/SVB**	095676	**P1-32/EA/SVB**	081438
	63	**P3-63/I4/padlock facility**	207343	**P3-63/V/SVB**	048218	**P3-63/EA/SVB**	031607
	100	**P3-100/I5/SVB**	207373	**P3-100/V/SVB**	088558	**P3-100/EA/SVB**	074320
6	20	**T0-3-8342/I1/SVB**	207159				
	32	**T3-3-8342/I2/SVB**	207208				
	63	**T5B-3-8342/I4/SVB**	207242				
	100	**T5-3-8342/I5/SVB**	207279				

Accessories

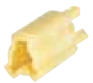
Neutral conductor

Description	Part no.	Article no.
for P1 switch-disconnectors, flush mounting	**N-P1E**	000651
for P1 switch-disconnectors, rear mounting	**N-P1Z**	000652
for P3 switch-disconnectors, flush mounting	**N-P3E**	062432
for P3 switch-disconnectors, rear mounting	**N-P3Z**	064805

Auxiliary contacts, 1 N/O / 1 N/C

Description	Part no.	Article no.
for P1/P3 switch-disconnectors, flush mounting	**HI11-P1/P3E**	061813
for P1/P3 switch-disconnectors, rear mounting	**HI11-P1/P3Z**	062031

Shaft extensions



Description	Part no.	Article no.
for T0/T3/P1 switch-disconnectors	**ZAV-T0**	027044
for T5/T5B/P3 switch-disconnectors	**ZAV-P3**	029417

Interlock extensions

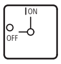
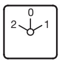
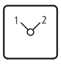
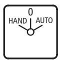
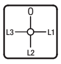
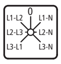
Description	Part no.	Article no.
for T0/T3/P1 switch-disconnectors	**ZVV-T0**	022298
for T5/T5B/P3 switch-disconnectors	**ZVV-P3**	024671

Add-on front plate, plug-in type
inscribed with "Main switches – open in 0 position only"

Description	Part no.	Article no.
for T0/T3/P1 switch-disconnectors	**ZFS61/62-T0**	030170
for T5/T5B/P3 switch-disconnectors	**ZFS61/62-P3**	065739

Cam switches

Control switches

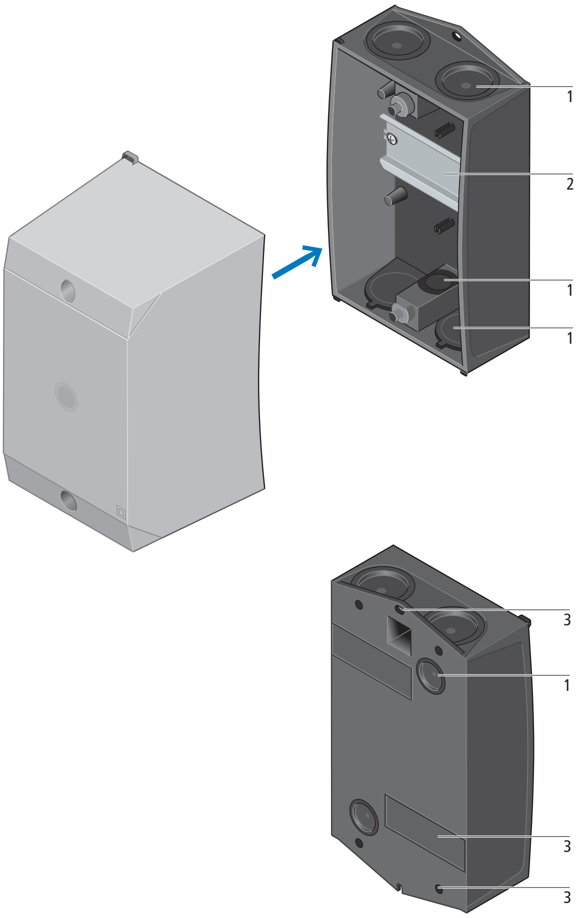
		Flush mounting Front IP65	**Centre mounting** Front IP65	**Surface mounting** IP65	**Distribution board - assembly** Front IP30	**Rear mounting** Front IP65
Front plate	Pole	**Part no.** Article no.	**Part no.** Article no.	**Part no.** Article no.	**Part no.** Article no.	**Part no.** Article no.
On-Off switch						
 **FS 908**	1	**T0-1-8200/E** 067352	**T0-1-8200/EZ** 069725	**T0-1-8200/I1** 207074	**T0-1-8200/IVS** 074471	**T0-1-8200/Z** 076844
	2	**T0-1-102/E** 088709	**T0-1-102/EZ** 091082	**T0-1-102/I1** 207061	**T0-1-102/IVS** 015147	**T0-1-102/Z** 095828
	3	**T0-2-1/E** 024639	**T0-2-1/EZ** 027012	**T0-2-1/I1** 207081	**T0-2-1/IVS** 031758	**T0-2-1/Z** 036504
Changeover switches						
 FS 621	1	**T0-1-8210/E** 012742	**T0-1-8210/EZ** 048337	**T0-1-8210/I1** 207076	**T0-1-8210/IVS** 074440	**T0-1-8210/Z** 019862
	2	**T0-2-8211/E** 022234	**T0-2-8211/EZ** 053083	**T0-2-8211/I1** 207102	**T0-2-8211/IVS** 076813	**T0-2-8211/Z** 029354
	3	**T0-3-8212/E** 029353	**T0-3-8212/EZ** 057829	**T0-3-8212/I1** 207123	**T0-3-8212/IVS** 079186	**T0-3-8212/Z** 036473
Changeover switches without 0 position						
 FS 943	1	**T0-1-8220/E** 031728	**T0-1-8220/EZ** 095799	**T0-1-8220/I1** 207078	**T0-1-8220/IVS** 055459	**T0-1-8220/Z** 086312
	2	**T0-2-8221/E** 038847	**T0-2-8221/EZ** 010372	**T0-2-8221/I1** 207104	**T0-2-8221/IVS** 057832	**T0-2-8221/Z** 074450
	3	**T0-3-8222/E** 048339	**T0-3-8222/EZ** 015118	**T0-3-8222/I1** 207124	**T0-3-8222/IVS** 060205	**T0-3-8222/Z** 088686
Hand/Auto switches						
 F 085	1	**T0-1-15431/E** 019872	**T0-1-15431/EZ** 022245	**T0-1-15431/I1** 207070	**T0-1-15431/IVS** 026991	**T0-1-15431/Z** 029364
	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
Ammeter selector switch						
 FS 9440	3	**T0-3-8048/E** 034116	**T0-3-8048/EZ** 036489		**T0-3-8048/IVS** 041235	**T0-3-8048/Z** 043608
Voltmeter selector switch						
 FS 1410759	3	**T0-3-8007/E** 095813	**T0-3-8007/EZ** 098186	**T0-3-8007/I1** 207120	**T0-3-8007/IVS** 012759	**T0-3-8007/Z** 015132

Notes

In addition to the two models T0 with I_u = 20 A listed here, the following models are available:
T3 (32 A), T5B (63 A), T5 (100 A)

Small enclosures

Basic enclosures



1 Metric cable entries push-through membrane or hard knockouts

2 Mounting systems for basic enclosures
mounting rail or mounting plate

3 Mounting
Horizontal and vertical slot apertures for wall mounting
Captive cover screws
Rubber feet to compensate for uneven walls
for CI-K1 and CI-K2

	Width mm	Height mm	Depth mm	Metric cable entry mm	Part no.	Article no.
CI-K, IP65 basic enclosures						
With mounting rail to IEC/EN 60715						
	80	120	95	with push-through cable entry diaphragm	**CI-K1-95-TS**	206881
	100	160	100		**CI-K2-100-TS**	206882
	–	–	145		**CI-K2-145-TS**	206883
	80	120	95	with hard metric cable entry knockout	**CI-K1H-95-TS**	105853
	100	160	100		**CI-K2H-100-TS**	229304
	100	160	145		**CI-K2H-145-TS**	229305
	120	200	125		**CI-K3-125-TS**	206884
	120	200	160		**CI-K3-160-TS**	206885
	160	240	125		**CI-K4-125-TS**	206886
	160	240	160		**CI-K4-160-TS**	206890
	200	280	125		**CI-K5-125-TS**	206891
	200	280	160		**CI-K5-160-TS**	206892
With adapter plate for mini contactor relays and overload relays						
	100	160	145	with push-through cable entry diaphragm	**CI-K2-145-AD**	207632
	100	160	145	with hard metric cable entry knockout	**CI-K2H-145-AD**	229308
With mounting plate						
	100	160	100	with push-through cable entry diaphragm	**CI-K2-100-M**	206893
	100	160	145	with push-through cable entry diaphragm	**CI-K2-145-M**	206894
	100	160	100	with hard metric cable entry knockout	**CI-K2H-100-M**	229306
	100	160	145		**CI-K2H-145-M**	229307
	120	200	125		**CI-K3-125-M**	206895
	120	200	160		**CI-K3-160-M**	206896
	160	240	125		**CI-K4-125-M**	206897
	160	240	160		**CI-K4-160-M**	206898
	200	280	125		**CI-K5-125-M**	206899
	200	280	160		**CI-K5-160-M**	206900

More Than Just a Main Switch Diagnostics and Energy Data from Networked Circuit-Breakers

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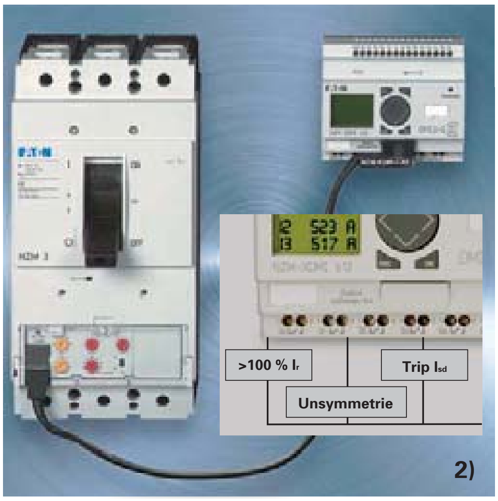
MBC017

Circuit-breakers NZM and switch-disconnectors P from Eaton are used as the main switch in many machines. Circuit-breakers NZM guarantee additional reliable short-circuit and overload protection.

They also offer much more. Warnings and diagnostics data as well as energy consumption data are communicated via the energy consumption values. Warnings about critical current values enable the implementation of measures to counter overloads; diagnostics data provide information about the cause of faults and delivers trend diagrams for the detection of peak loads.

Energy conservation is vital in the world of today. The circuit-breakers NZM record and communicate power and energy data together with the metering and communication modules. Particularly beneficial is the compact solution with integrated current transformers and voltage tap-offs. Suitable from 85 A to 630 A.

In addition to data recording with the metering and communication modules, the compact switch NZM offers 3 further communication options to further process this data. A PC software, used mainly for diagnostic purposes and 2 fieldbus interfaces with different available functions.



2)

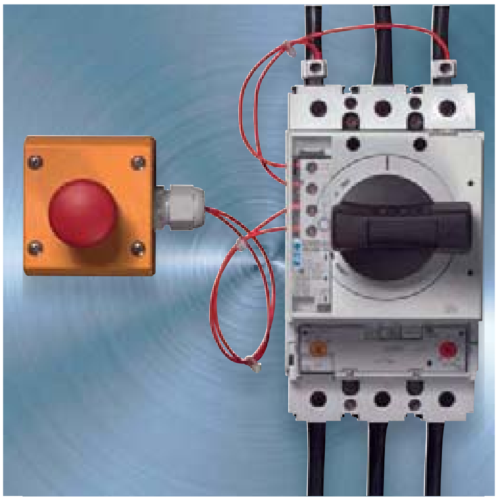
1)

3)

1)
The PC software "XPC Soft" can view the past history and the last trip cause can be reviewed.

2)
The DMI (Data Management Interface) provides comfortable access to the circuit-breaker. The functions include on-site operation via display, software switch parameterization and Profibus-DP communication.

3)
With the SmartWire Interface it is possible to efficiently access a group of switches via an open fieldbus. Particularly interesting is the operation in conjunction with other SmartWire components such as the motor starter PKE.

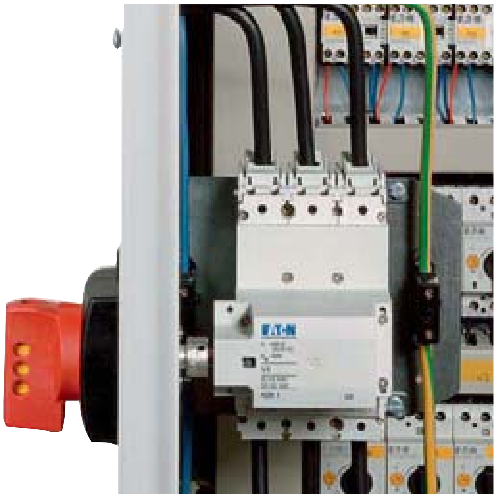


Main switch application

The main switch application with an emergency-stop function up to 1600 A conform to IEC/EN 60204-1, VDE 0113 Part 1 can be easily and cost-effectively implemented with the new Eaton products. The voltage is switched off on all current conducting circuits when the switch is switched off using the undervoltage release with two integrated early-make auxiliary contacts.

Rear operator

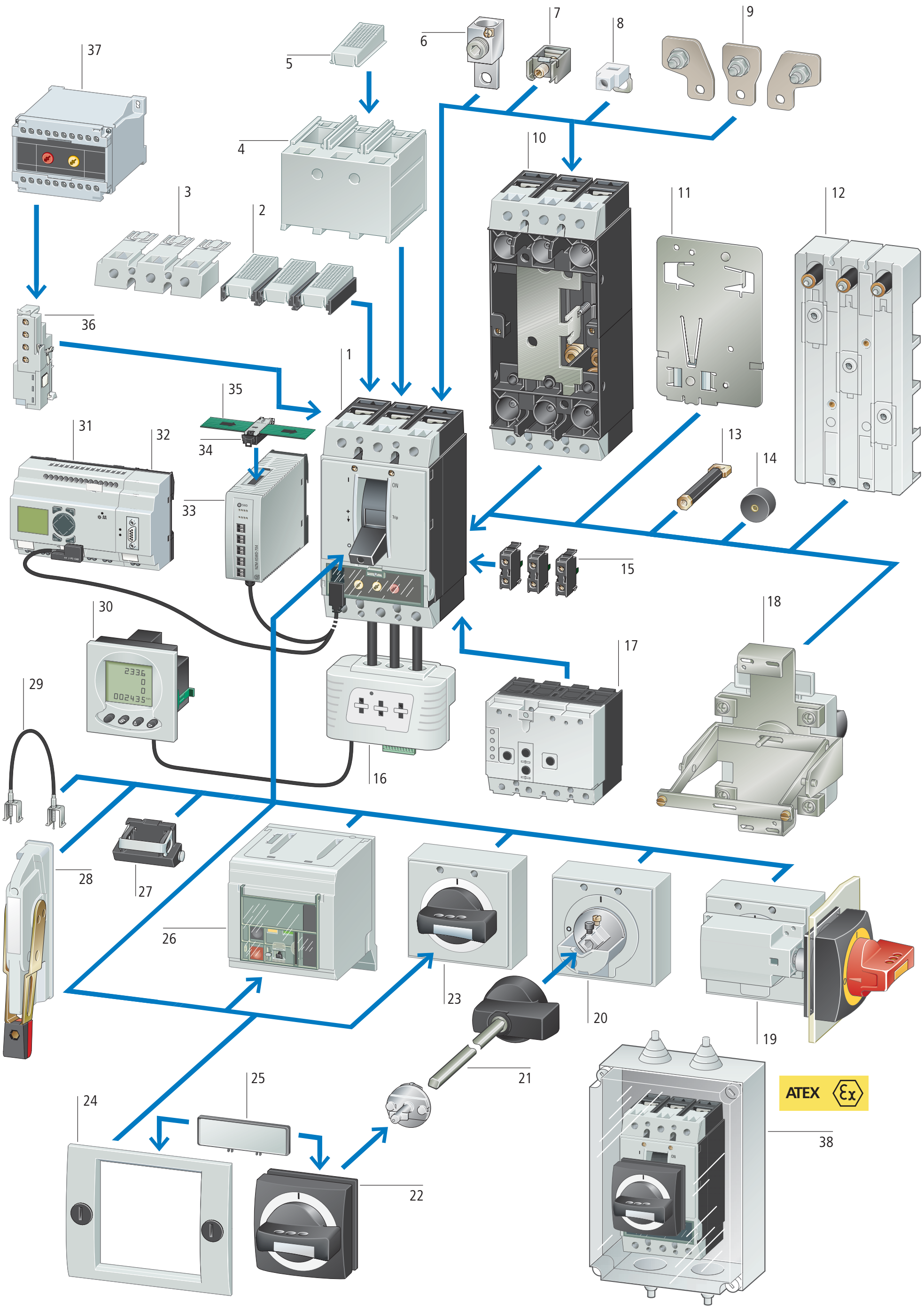
If a power disconnecting device with door coupling rotary handle is to be used in a confined space: up to 300 A rated current can be quickly mounted using the compact mechanical features and comfortably operated using the solid rotary handle. All switch variants from the NZM1 and NZM2 range – regardless of if they are circuit-breakers or switch-disconnectors – can be combined with a rear operator.



Side operator

Up to 1600 A, the side wall operator enables the switch to be operated from the right or left hand side as desired. Optional fitting of our mounting bracket results in optimum use of space in the control panel. The mounting plate can thus be used for other machine control elements.

NZM circuit-breakers, switch-disconnectors



1 Switch-disconnector; circuit-breaker; circuit-breaker for North America; Moulded case switches for North America

2 IP2X protection against contact with a finger

3 Terminal cover, knockout

4 Terminal cover

5 IP2X protection against contact with a finger

6 Tunnel terminal

7 Box terminals

8 Control circuit terminal

9 Connection width extension

10 Plug-in and withdrawable unit

11 Adapter plate

12 Busbar adapters

13 Connection on rear

14 Spacers

15 Standard auxiliary contact (HIV), trip-indicating auxiliary switch (HIA), voltage release

16 Measuring and communication module

17 Residual-current protection device

18 Rear drive

19 Main switch rotary handle for side panel mounting

20, 22 Door coupling rotary handle

21 Extension shaft

23 Rotary handle

24 Insulating surrounds

25 External warning plate/ marking plate

26 Remote operator

27 Toggle lever locking device

28 Side operator handle

29 Mechanical interlock

30 Display

31 Data management interface (DMI module)

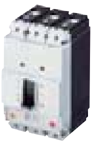
32 PROFIBUS-DP interface

33-35 NZM communication module for SmartWire-DT

36 Early-make auxiliary contacts

37 Delay unit for undervoltage releases

38 Insulated enclosures

	Rated operational current = rated uninterrupted current	Setting range			Switching capacity 400/415 V 50/60 Hz		Switching capacity 400/415 V 50/60 Hz	
		Overload trip	Short-circuit releases		**Part no.**	Article no.	**Part no.**	Article no.
		Overload trip	Non-delayed	Delayed				
	$I_n = I_u$	I_r	$I_i = I_n$ x …	$I_{sd} = I_r$ x …				
	A	A						
System and cable protection, thermomagnetic releases								
Fixed mounting with box terminal					**Basic switching capacity 25 kA**		**Normal switching capacity 50 kA**	
	20	15-20	350 A fixed	–	**NZMB1-A20**	280987	**NZMN1-A20**	281231
	25	20-25	350 A fixed	–	**NZMB1-A25**	280988	**NZMN1-A25**	281232
	32	25-32	350 A fixed	–	**NZMB1-A32**	280989	**NZMN1-A32**	281233
	40	32-40	8 - 10	–	**NZMB1-A40**	259075	**NZMN1-A40**	259081
	50	40-50	6 - 10	–	**NZMB1-A50**	259076	**NZMN1-A50**	259082
	63	50-63	6 - 10	–	**NZMB1-A63**	259077	**NZMN1-A63**	259083
	80	63-80	6 - 10	–	**NZMB1-A80**	259078	**NZMN1-A80**	259084
	100	80-100	6 - 10	–	**NZMB1-A100**	259079	**NZMN1-A100**	259085
	125	100-125	6 - 10	–	**NZMB1-A125**	259080	**NZMN1-A125**	259086
	160	125-160	1280 A fixed	–	**NZMB1-A160**	281230	**NZMN1-A160**	281234
Fixed mounting with screw connection								
	160	125-160	6 - 10	–	**NZMB2-A160**	259088	**NZMN2-A160**	259092
	200	160-200	6 - 10	–	**NZMB2-A200**	259089	**NZMN2-A200**	259093
	250	200-250	6 - 10	–	**NZMB2-A250**	259090	**NZMN2-A250**	259094
	300	240-300	6 - 10	–	**NZMB2-A300**	107518	**NZMN2-A300**	107580
	320	250-320	6 - 10	–			**NZMN3-A320**	109669
	400	320-400	6 - 10	–			**NZMN3-A400**	109670
	500	400-500	6 - 10	–			**NZMN3-A500**	109671
Systems protection and cable protection, selectivity and generator protection, electronic releases								
Fixed mounting with screw connection					**Normal switching capacity 50 kA**		**High switching capacity 150 kA**	
	100	50-100	1200 A fixed	2 - 10	**NZMN2-VE100**	259122	**NZMH2-VE100**	259125
	160	80-160	1920 A fixed	2 - 10	**NZMN2-VE160**	259123	**NZMH2-VE160**	259126
	250	125-250	3000 A fixed	2 - 10	**NZMN2-VE250**	259124	**NZMH2-VE250**	259127
	250	125-250	2 - 11	2 - 10	**NZMN3-VE250**	259131	**NZMH3-VE250**	259134
	400	200-400	2 - 11	2 - 10	**NZMN3-VE400**	259132	**NZMH3-VE400**	259135
	630	315-630	2 - 8	1.5 - 7	**NZMN3-VE630**	259133	**NZMH3-VE630**	259136

NZM circuit-breakers, switch-disconnectors

Circuit-breaker, switch-disconnector, 3-pole

Rated operational current = rated uninterrupted current $I_n = I_u$ A	Setting range: Overload Releases I_r A	Setting range: Short-circuit releases Non-delayed $I_i = I_n$ x …	Rated operating power AC-3 50/60 Hz 400 V P kW	Rated operational current AC-3 50/60 Hz 400 V I_e A	Switching capacity 400/415 V 50/60 Hz **Part no.**	Article no.	Switching capacity 400/415 V 50/60 Hz **Part no.**	Article no.

Motor protection, thermomagnetic release

- NZM...1-M...: with phase failure sensitivity, tripping class 10 A

Fixed mounting
with box terminal

$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	P kW	I_e A	**Basic switching capacity 25 kA** Part no.	Article no.	**Normal switching capacity 50 kA** Part no.	Article no.
40	32-40	8 - 14	18.5	36	**NZMB1-M40**	265710	**NZMN1-M40**	265718
50	40-50	8 - 14	22	41	**NZMB1-M50**	265711	**NZMN1-M50**	265719
63	50-63	8 - 14	30	55	**NZMB1-M63**	265712	**NZMN1-M63**	265720
80	63-80	8 - 14	37	68	**NZMB1-M80**	265713	**NZMN1-M80**	265721
100	80-100	8 - 12.5	45	81	**NZMB1-M100**	265714	**NZMN1-M100**	265722

Fixed mounting
with screw connection

$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	P kW	I_e A	Part no.	Article no.	Part no.	Article no.
125	100-125	8 - 14	55	99	**NZMB2-M125**	265715	**NZMN2-M125**	265723
160	125-160	8 - 14	75	134	**NZMB2-M160**	265716	**NZMN2-M160**	265724
200	160-200	8 - 14	110	196	**NZMB2-M200**	265717	**NZMN2-M200**	265725

Motor protection, electronic releases

with phase failure sensitivity, tripping class adjustable

Fixed mounting
with screw connection

$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	P kW	I_e A	**Normal switching capacity 50 kA** Part no.	Article no.	**High switching capacity 150 kA** Part no.	Article no.
220	110-220	2 - 14	110	196	**NZMN3-ME220**	265781	**NZMH3-ME220**	265789
350	175-350	2 - 14	200	349	**NZMN3-ME350**	265782	**NZMH3-ME350**	265790
450	225-450	2 - 12	250	437	**NZMN3-ME450**	284468	**NZMH3-ME450**	284469

Rated operational current = rated uninterrupted current $I_n = I_u$ A	Short-circuit protective device max. fuse gL-characteristic A gL	**Part no.**	Article no.

Switch-disconnectors

3 switch positions I, +, 0
Can be remotely operated with voltage release XU/XA, remote operator XR, can be equipped with trip-indicating auxiliary switch M22-K..

Fixed mounting
with box terminal

$I_n = I_u$ A	A gL	Part no.	Article no.
63	125	**N1-63**	259143
100	125	**N1-100**	259144
125	125	**N1-125**	259145
160	160	**N1-160**	281236

Fixed mounting
with screw connection

$I_n = I_u$ A	A gL	Part no.	Article no.
160	250	**N2-160**	266008
200	250	**N2-200**	266009
250	250	**N2-250**	266010
400	630	**N3-400**	266019
630	630	**N3-630**	266020

	Rated operational current = rated uninterrupted current $I_n = I_u$ A	Setting range Overload trip I_r A	Short-circuit releases Non-delayed $I_i = I_n$ x …	**Switching capacity 480 V 60 Hz** **Part no.**	Article no.	**Switching capacity 480 V 60 Hz** **Part no.**	Article no.

System and cable protection, thermomagnetic releases

Adjustable overload release I_r

	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	Part no.	Article no.	Part no.	Article no.
Fixed mounting with box terminal				**Normal switching capacity 35 kA**			
	20	15-20	350 A fixed	**NZMN1-A20-NA**	281570		
	25	20-25	350 A fixed	**NZMN1-A25-NA**	281571		
	32	25-32	350 A fixed	**NZMN1-A32-NA**	281572		
	40	32-40	8 - 10	**NZMN1-A40-NA**	274237		
	50	40-50	6 - 10	**NZMN1-A50-NA**	274239		
	63	50-63	6 - 10	**NZMN1-A63-NA**	274240		
	80	63-80	6 - 10	**NZMN1-A80-NA**	274241		
	100	80-100	6 - 10	**NZMN1-A100-NA**	274242		
	125	100-125	6 - 10	**NZMN1-A125-NA**	281573		
Fixed mounting with screw connection						**High switching capacity 150 kA**	
	20	15-20	350 A fixed	**NZMN2-A20-NA**	269217	**NZMH2-A20-NA**	269228
	25	20-25	350 A fixed	**NZMN2-A25-NA**	269218	**NZMH2-A25-NA**	269229
	32	25-32	350 A fixed	**NZMN2-A32-NA**	269219	**NZMH2-A32-NA**	269230
	40	32-40	8 - 10	**NZMN2-A40-NA**	269220	**NZMH2-A40-NA**	269231
	50	40-50	6 - 10	**NZMN2-A50-NA**	269221	**NZMH2-A50-NA**	269232
	63	50-63	6 - 10	**NZMN2-A63-NA**	269222	**NZMH2-A63-NA**	269233
	80	63-80	6 - 10	**NZMN2-A80-NA**	269223	**NZMH2-A80-NA**	269234
	100	80-100	6 - 10	**NZMN2-A100-NA**	269224	**NZMH2-A100-NA**	269235
	125	100-125	6 - 10	**NZMN2-A125-NA**	269225	**NZMH2-A125-NA**	269236
						High switching capacity 100 kA	
	160	125-160	6 - 10	**NZMN2-A160-NA**	269226	**NZMH2-A160-NA**	269237
	200	160-200	6 - 10	**NZMN2-A200-NA**	269227	**NZMH2-A200-NA**	269238
	250	200-250	6 - 10	**NZMN2-A250-NA**	271106	**NZMH2-A250-NA**	271107

Systems protection and cable protection, electronic releases

Adjustable overload release I_r
r.m.s. value measurement and “thermal memory”

	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	Part no.	Article no.	Part no.	Article no.
Fixed mounting with screw connection				**Normal switching capacity 42 kA**		**High switching capacity 100 kA**	
	250	125-250	2 - 11	**NZMN3-AE250-NA**	269299	**NZMH3-AE250-NA**	269302
	400	200-400	2 - 11	**NZMN3-AE400-NA**	269300	**NZMH3-AE400-NA**	269303
	600	300-600	2 - 8	**NZMN3-AE600-NA**	269301	**NZMH3-AE600-NA**	269304

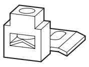
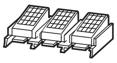
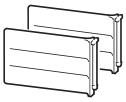
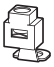
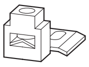
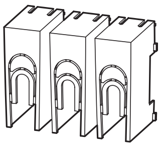
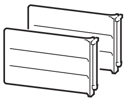
Moulded case switch for North America

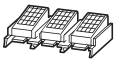
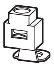
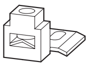
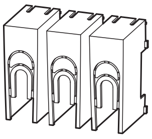
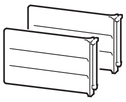
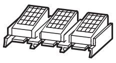
With permanently set short-circuit release (self-protection)
3 switch positions I, +, 0
Can be remotely operated with voltage release XU/XA, remote operator XR,
can be equipped with trip-indicating auxiliary switch M22-K..

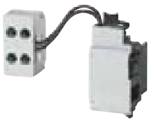
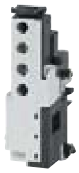
	$I_n = I_u$ A	I_r A	$I_i = I_n$ x …	Part no.	Article no.	Part no.	Article no.
Fixed mounting with box terminal				**Switching capacity 35 kA**			
	63	–	1250 fixed	**NS1-63-NA**	102681		
	100	–	1250 fixed	**NS1-100-NA**	102682		
	125	–	1250 fixed	**NS1-125-NA**	102683		
Fixed mounting with screw connection				**Switching capacity 100 kA**			
	160	–	2500 fixed	**NS2-160-NA**	102684		
	200	–	2500 fixed	**NS2-200-NA**	102685		
	250	–	2500 fixed	**NS2-250-NA**	102686		
	400	–	6600 fixed	**NS3-400-NA**	102687		
	600	–	6600 fixed	**NS3-600-NA**	102688		

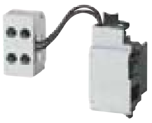
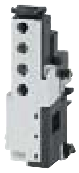
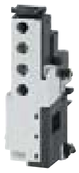
NZM circuit-breakers, switch-disconnectors

Terminal types

	For use with	Rated operational current I_n A	Terminal capacity		**Part no. suffix**	Article no. for ordering with basic device	**Part no.**	Article no. when ordered separately
			Connection	Terminal capacities mm²				
NZM1 terminal types								
Control circuit terminal								
	NZM1, N(S)1	–	Box terminal	1 x 0.75 - 2.5 2 x 0.75 - 1.5	–	–	**NZM-XSTK**	266739
Terminal cover knockout not UL/CSA approved For box terminal								
	NZM1, N1	–	–	–	–	–	**NZM1-XKSFA**	100780
Cover								
	NZM1, N(S)1	–	–	–	–	–	**NZM1-XKSA**	260021
IP2X protection against contact with a finger								
For box terminal								
	NZM1, N1	–	–	–	–	–	**NZM1-XIPK**	266744
for cover NZM1-XKSA or NZM1…(C)NA, N(S)1…NA								
	NZM1, NS1	–	–	–	–	–	**NZM1-XIPA**	266748
Phase isolators								
	NZM1, N(S)1	–	–	–	–	–	**NZM1-XKP**	119862
NZM2 terminal types								
Box terminal								
	NZM2, N(S)2 ≤ 160 A	–	Cu cable	1 x 10 - 185 2 x 4 - 70	**+NZM2-160-XKCO**	262218	**NZM2-160-XKC**	262240
					+NZM2-160-XKCU	262223	–	–
	NZM2, N(S)2 > 160 A	–			**+NZM2-250-XKCO**	262242	**NZM2-250-XKC**	262244
					+NZM2-250-XKCU	262243	–	–
Control circuit terminal								
	NZM2, N(S)2	–	Screw connection	1 x 0.75 - 2.5 2 x 0.75 - 1.5	–	–	**NZM2-XSTS**	260156
	NZM2, N(S)2	–	Box terminal		–	–	**NZM-XSTK**	266739
Cable lug-cover								
	NZM2, NS2	–	Copper cable lugs Aluminium cable lug	1 x 10-185 2 x 4-70 1 x 10-50 2 x 10-50	–	–	**NZM2-XKSAE**	119868
Phase isolators								
	NZM2, N(S)2	–	–	–	–	–	**NZM2-XKP**	119864

	For use with	Rated operational current I_n A	Terminal capacity Connection	Terminal capacities mm²	**Part no. suffix**	Article no. for ordering with basic device	**Part no.**	Article no. when ordered separately
IP2X protection against contact with a finger								
For box terminal								
	NZM2, N(S)2	–	–	–	–	–	**NZM2-XIPK**	266773
For cover NZM2-XKSA or NZM2 or NZM2…(C)NA and N(S)2…NA								
	NZM2, N(S)2	–	–	–	–	–	**NZM2-XIPA**	266777
CU-Cable lug not UL/CSA approved When using cable lugs without NZM3-XKSA cover, they must be insulated.								
	NZM2, N2	–	–	150 mm²	–	–	**KS150-NZM7**	059777
			–	120 mm²	–	–	**KS120-NZM7**	059776
			–	95 mm²	–	–	**KS95-NZM7**	059775
			–	185 mm²	–	–	**NZM2-XKS185**	260032
NZM3 terminal types								
Box terminal								
	NZM3, N(S)3	max. 500 400 UL/CSA	Cu cable Cu cable	1 x 35 - 240 2 x 16 - 120	**+NZM3-XKCO**	262246	**NZM3-XKC**	260042
					+NZM3-XKCU	262245	–	–
Control circuit terminal								
	NZM3, N(S)3	–	Screw connection	1 x 0.75 - 2.5 2 x 0.75 - 1.5	–	–	**NZM3/4-XSTS**	266797
	NZM3-4, N(S)3-4	–	Box terminal		–	–	**NZM-XSTK**	266739
Cable lug-cover								
	NZM3, N(S)3	–	–	–	–	–	**NZM3-XKSAE**	119869
Phase isolators								
	NZM3, N(S)3	–	–	–	–	–	**NZM3-XKP**	100512
IP2X protection against contact with a finger								
For box terminal								
	NZM3, N3	–	–	–	–	–	**NZM3-XIPK**	266804
for cover NZM3-XKSA or NZM3…(C)NA and N(S)3…NA								
	NZM3, N(S)3	–	–	–	–	–	**NZM3-XIPA**	266808
CU-Cable lug not UL/CSA approved When using cable lugs **without** NZM3-XKSA cover, they must be insulated.								
	NZM3, N(S)3	–	–	–	–	–	**NZM3-XKS185**	260040
		–	–	–	–	–	**NZM3-XKS240**	260041

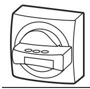
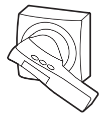
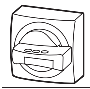
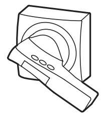
		For use with	Contact configuration: ⊖ = Safety function by positive opening according to IEC/EN 60947-5-1		**Part no.**	Article no. when ordered separately
			N/O = normally open contact	N/C = normally closed contact		
Auxiliary contact with screw connection/spring-cage terminal						
Standard auxiliary contact (HIN) Switching with the main contacts. Used for indicating and interlocking tasks						
	Single contact	NZM1, 2, 3 N(S)1, 2, 3	1 N/O	–	**M22-K10**	216376
			–	1 N/C	**M22-K01**	216378
Early-make auxiliary contacts For interlocking and load shedding circuits, as well as for early make of the undervoltage release in main switch/ emergency switching off applications						
	With terminal block on the left-hand switch side.	NZM1 N(S)1	2 N/O	–	**NZM1-XHIV**	259426
	–	NZM2, 3 N(S)2, 3	2 N/O	–	**NZM2/3-XHIV**	259430
Trip-indicating auxiliary switch (HIA) General trip indication '+', when tripped by voltage release, overload release or short-circuit release.						
	Single contact	NZM1, 2, 3 N(S)1, 2, 3	1 N/O	–	**M22-K10**	216376
			–	1 N/C	**M22-K01**	216378

		For use with	Rated control voltage U_s V	**Part no.**	Article no. when ordered separately
Undervoltage release					
Without auxiliary contacts non-delayed disconnection of NZM circuit-breaker or N switch-disconnector when the control voltage sinks below 35 – 70% U_S. For use with emergency switching off devices in conjunction with emergency switching off button.					
	With terminal block on the left-hand switch side.	NZM1, N(S)1	208 V - 240 V 50/60 Hz	**NZM1-XU208-240AC**	259442
			380 V - 440 V 50/60 Hz	**NZM1-XU380-440AC**	259444
			24 V DC	**NZM1-XU24DC**	259452
	–	NZM2, N(S)2 NZM3, N(S)3	208 V - 240 V 50/60 Hz	**NZM2/3-XU208-240AC**	259499
			380 V - 440 V 50/60 Hz	**NZM2/3-XU380-440AC**	259501
			24 V DC	**NZM2/3-XU24DC**	259509
Shunt release					
Without auxiliary contacts Switches are tripped by a voltage pulse or by the application of uninterrupted voltage.					
	With terminal block on the left-hand switch side.	NZM1, N(S)1	24 V AC/DC	**NZM1-XA24AC/DC**	259708
			208 V - 250 V AC/DC	**NZM1-XA208-250AC/DC**	259726
	–	NZM2, N(S)2 NZM3, N(S)3	24 V AC/DC	**NZM2/3-XA24AC/DC**	259754
			208 V - 250 V AC/DC	**NZM2/3-XA208-250AC/DC**	259763

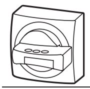
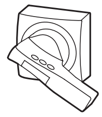
Door coupling rotary handle

Complete including rotary drive and coupling parts
An additional extension shaft is necessary with the NZM...-XT(V)D(V)(R)(-60) types.
Protection type IP66/UL/CSA type 4X, 12

Standard, black/grey

		For use with	**Part no.**	Article no. when ordered separately	**Notes**
	Lockable on the 0 position on the handle using up to 3 padlocks. With door interlock.	NZM1, N(S)1	**NZM1-XTVD**	260166	Door interlock • **Not** 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) • External warning plate/marking plate can be clipped on.
		NZM2, N(S)2	**NZM2-XTVD**	260168	
		NZM3, N(S)3	**NZM3-XTVD**	260170	
	Lockable on the handle on the switch using up to 3 padlocks. Can be locked in 0 position, with adequate modification also in I position. With door interlock. Lockable on the switch in the 0 position.	NZM1, N(S)1	**NZM1-XTVDV**	260172	
		NZM2, N(S)2	**NZM2-XTVDV**	260174	
		NZM3, N(S)3	**NZM3-XTVDV**	260176	

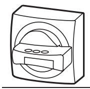
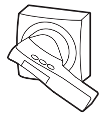
Red-yellow for emergency switching off

		For use with	**Part no.**	Article no. when ordered separately	**Notes**
	Lockable on the handle on the switch using up to 3 padlocks. Lockable in 0 position on handle. With door interlock. Lockable on the switch in the 0 position.	NZM1, N(S)1	**NZM1-XTVDVR**	260178	Door interlock • **Not** 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 • External warning plate/marking plate can be clipped on.
		NZM2, N(S)2	**NZM2-XTVDVR**	260180	
		NZM3, N(S)3	**NZM3-XTVDVR**	260182	

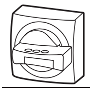
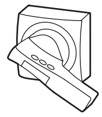
Door coupling rotary handle for North America UL/CSA

Complete including rotary drive and coupling parts
Extension shaft additionally required.
Protection type IP66/UL/CSA type 4X, 12
Divergent to normal IEC handles:
Door opening only possible with active rotation beyond the 0 position.

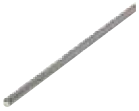
Standard, black/grey

		For use with	**Part no.**	Article no. when ordered separately	**Notes**
	Lockable in 0 position on handle. With door interlock.	NZM1, N1	**NZM1-XTVD-NA**	271445	Door interlock • **Not** defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • cannot be combined with mechanical interlock • External warning plate/marking plate can be clipped on.
		NZM2, N2	**NZM2-XTVD-NA**	271446	
		NZM3, N3	**NZM3-XTVD-NA**	271447	

Red-yellow for emergency switching off

		For use with	**Part no.**	Article no. when ordered separately	**Notes**
	Lockable on the handle on the switch using up to 3 padlocks. Lockable in 0 position on handle. With door interlock. Lockable on the switch in the 0 position.	NZM1, N(S)1	**NZM1-XTVDVR-NA**	271449	Door interlock • **Not** defeated in the locked OFF position. • Door opening with active rotation beyond the 0 position. • cannot be combined with mechanical interlock • External warning plate/marking plate can be clipped on.
		NZM2, N(S)2	**NZM2-XTVDVR-NA**	271450	
		NZM3, N(S)3	**NZM3-XTVDVR-NA**	271451	

Extension shaft

		For use with	**Part no.**	Article no. when ordered separately	**Notes**
	400 mm max. mounting depth	NZM1, N(S)1 NZM2, N(S)2	**NZM1/2-XV4**	261232	Length 290 mm, can be cut to desired length.
		NZM3, N(S)3	**NZM3/4-XV4**	261234	
	600 mm max. mounting depth	NZM1, N(S)1 NZM2, N(S)2	**NZM1/2-XV6**	260191	Length 425 mm, can be cut to desired length.
		NZM3, N(S)3	**NZM3/4-XV6**	260193	

NZM circuit-breakers, switch-disconnectors

Main switch assembly kit, remote operator

Moeller® series

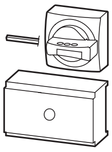
		For use with	Rated control voltage U_s V	**Part no.** Article no. when ordered separately

Main switch assembly kit for IEC, UL/CSA

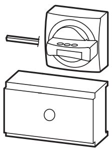
Equipment supplied:
- Door coupling rotary handle with rotary drive
- NZM...-XV4 extension shaft
- External warning plate/marking plate in German/English
- Black and yellow lightning symbol

Protection type IP66/UL/CSA type 4X, 12

With black door coupling rotary handle

		For use with	Rated control voltage U_s V	Part no. / Article no.
	Lockable on the 0 position on the handle using up to 3 padlocks, can also be modified for the I position. With door interlock.	NZM1 N(S)1		**NZM1-XHB** 266626
		NZM2 N(S)2		**NZM2-XHB** 266627
		NZM3 N(S)3		**NZM3-XHB** 266628

with red door coupling rotary handle
for use of switch as emergency switching off device to IEC/EN 60204-1, VDE 0113 part 1

		For use with	Rated control voltage U_s V	Part no. / Article no.
	Lockable on the 0 position on the handle using up to 3 padlocks. With door interlock as additional feature, locking facility on circuit-breaker in 0 position.	NZM1 N(S)1		**NZM1-XHBR** 266632
		NZM2 N(S)2		**NZM2-XHBR** 266633
		NZM3 N(S)3		**NZM3-XHBR** 266634

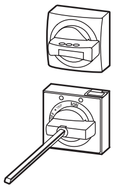
Main switch assembly kit with additional rotary handle for UL/CSA

Main switch assembly kit with additional rotary handle for switching with opened control panel door

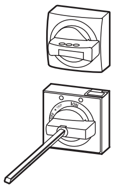
Equipment supplied:
- Door coupling rotary handle with rotary drive
- Add-on rotary handle on switch with “Deliberate Action” operation
- Extension shaft NZM…-XV6 for mounting depth 600 mm, NZM1/2-XV4 with NZM1 for mounting depth 400 mm
- External warning plate/marking plate in German/English
- Black and yellow lightning symbol

Protection type IP66/UL/CSA type 4X, 12

With black door coupling rotary handle

		For use with	Rated control voltage U_s V	Part no. / Article no.
	Lockable on the 0 position on the handle using up to 3 padlocks, can also be modified for the I position. With door interlock as additional feature, locking facility on circuit-breaker in 0 position.	NZM1 N(S)1		**NZM1-XHB-DA-NA** 125958
		NZM2 N(S)2		**NZM2-XHB-DA-NA** 116897
		NZM3 N(S)3		**NZM3-XHB-DA-NA** 119000

with red door coupling rotary handle
for use of switch as emergency switching off device

		For use with	Rated control voltage U_s V	Part no. / Article no.
	Lockable on the 0 position on the handle using up to 3 padlocks. With door interlock and lockable on the switch in the 0 position.	NZM1 N(S)1		**NZM1-XHB-DAR-NA** 125959
		NZM2 N(S)2		**NZM2-XHB-DAR-NA** 116898
		NZM3 N(S)3		**NZM3-XHB-DAR-NA** 119001

Remote operator

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, break time 110 – 170 ms

		For use with	Rated control voltage U_s V	Part no. / Article no.
	Sliding switch for "Auto" or "Manual" Max. number auxiliary contacts: - Standard auxiliary contact: 2 - Trip-indicating auxiliary switch: 1	NZM2 N(S)2	208 - 240 V 50/60 Hz	**NZM2-XRD208-240AC** 115391
			24 – 30 V DC	**NZM2-XRD24-30DC** 115393

Closing delay 60 – 100 ms, break time 300 – 3000 ms
Can be synchronized

		For use with	Rated control voltage U_s V	Part no. / Article no.
		NZM3 N(S)3	208 - 240 V 50/60 Hz	**NZM3-XR208-240AC** 259850
			24 – 30 V DC	**NZM3-XR24-30DC** 259854

	Description	**Part no.** Article no.	**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).	**NZM-XPC-KIT** 265631	Only for use in combination with circuit-breakers with **electronic** releases.
Data management interface (DMI module)			
	• Access to diagnostics and operational data. • Recording of current values, motor starter function, set parameters. • Control of the circuit-breakers with electronic trip block. • Comprehensive remote diagnostic options and remote access via field bus in combination with a fieldbus connection.	**NZM-XDMI612** 260217	Inclusive NZM-XDMI-CAB connection cable between NZM and DMI (length: 2m). Only for use in combination with circuit-breakers with **electronic** releases.
Field bus connection 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). • Remote parameter definition	**NZM-XDMI-DPV1** 270333	Connected to the DMI module and has the same contour appearance.
NZM interface module for SmartWire-DT			
	The module implements the data connection between the NZM2/3/4 with electronic release and the SmartWire-DT. • Transfer of phase currents, parameter data, status data and diagnostics data. • Transfer of circuit-breaker position (wiring of auxiliary contacts to DMI inputs).	**NZM-XSWD-704** 135530	A connection cable to the circuit-breaker is included as standard.
Energy measuring module			
	For measuring the electrical active energy. one pulse output for active energy. The pulse rate is fixed.	**NZM2-XMC-S0** 129839	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or secondary side.
		NZM3-XMC-S0 129960	
Measuring and communication module			
	For measuring current, voltage, power and energy. Two S0 pulse outputs Modbus interface (Slave) Display device NZM-XMC-DISP can be connected for local indication of the readings.	**NZM2-XMC-MB** 129961	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or secondary side.
		NZM3-XMC-MB 129962	
Digital display device			
	For door-mounting (connection to local display) For all measurement and communication modules with Modbus interface Permanent configured screens available Front cutout 92 × 92 break-out	**NZM-XMC-DISP** 129967	A connection to the measuring and communication module NZM...-XMC-MB is possible via an 4 conductor data cable (not included as standard).

15 kA

to IEC / EN 60947

Protection for All Applications – Safety up to 125 A

Industry, system builders and the trade sector worldwide place their trust in Eaton products and solutions. Tested quality, approvals and shipping register classifications vouch for the functional scope and reliability of Xpole industrial miniature circuit breakers being suitable for world markets. In conjunction with the versatile complete range of modular installation devices and accessories, the user is provided with more options for solving complex technical problems.

Eaton offers a comprehensive range of residual current devices for residual current protection of persons against electrical shock and to protect installations against fire.

Quicklink Online catalog to
www.eaton.com/moellerproducts

MBC018

When it comes to protection and switching, industry in many countries relies on Eaton products

Optimum product quality and tested reliability and safety stand for optimum protection of personnel, installations and plant. Approvals in many countries confirm that Eaton builds its products to comply with the latest national and international regulations. The high IEC/EN 60947 switching capacity of 15 kA with FAZ and 15 to 25 kA with AZ, as well as effective current limitation and selectivity provide optimum system protection and maximum availability.

Powerful range for machine and system builders

The Xpole Industrial FAZ is available with B, C and D characteristic to IEC/EN 60898. An additional special characteristic has become necessary for effective protection, due to the growing proportion of sensitive electronics. The Z characteristic with a short-circuit response current of 2 to 3 x I_n offers quick overload protection reaction for this purpose.
The K characteristic with a high short-circuit response current of 8 to 12 x I_n prevents nuisance tripping during connection of three-phase loads.
The S characteristic with a limited response current of 13 to 17 x I_n has become established in system building.

Flexibility using modular installation devices

Eaton offers a broad range of modular installation devices for the control circuit and for switching, as well as for signalling and alarms. All these devices are suitable for DIN-rail mounting and offer tangible installation and wiring benefits for industrial applications.

Digital RCCB for more operational continuity

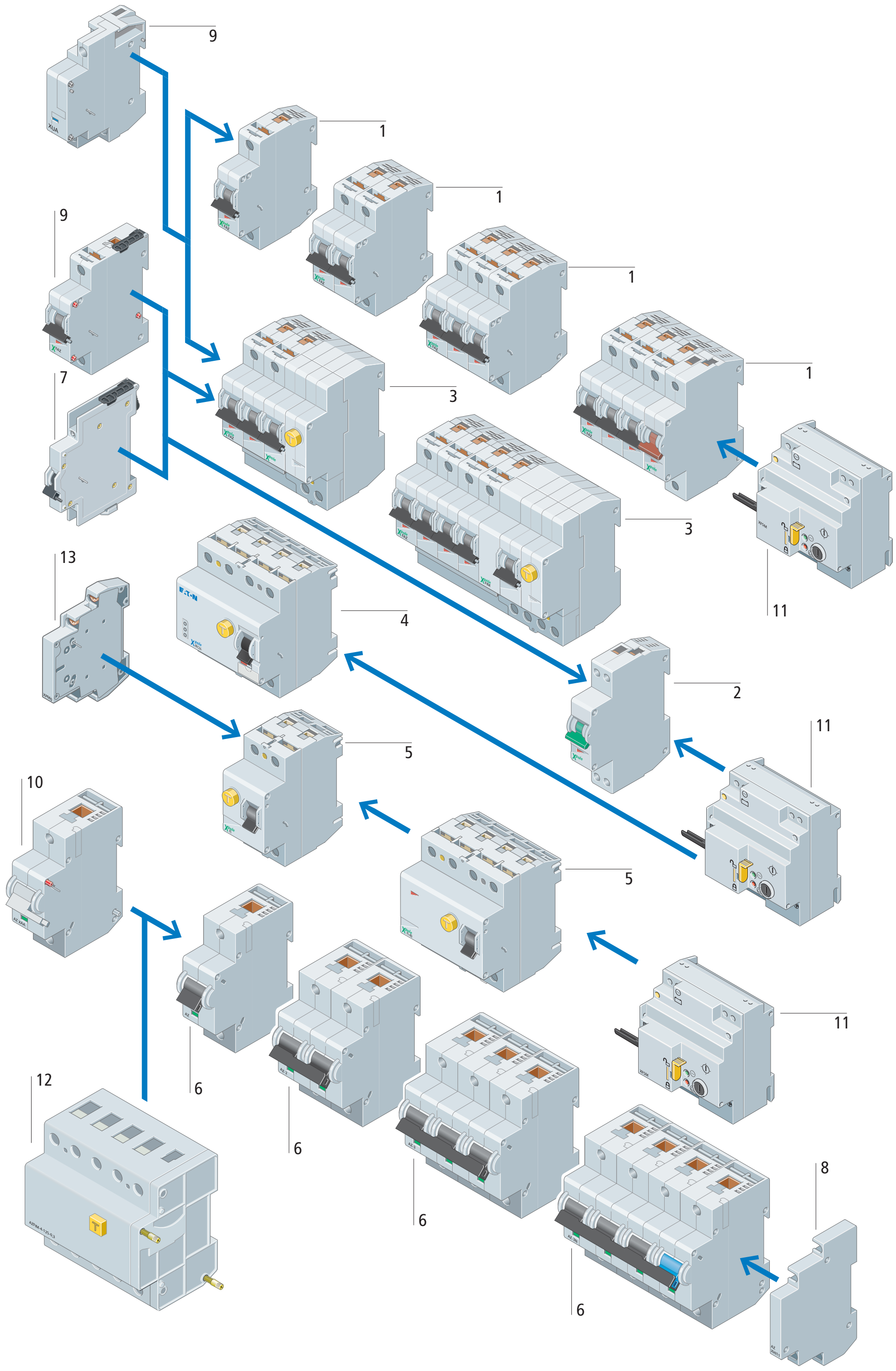
Whether for 3-pole or 4-pole standards – the new digital residual current devices from Eaton are potent multi-functional "Bodyguards", providing safety in many machines and installations. They are just as intelligent as they are vigilant – ensuring the fault currents are stopped in their tracks. The digital bodyguards immediately indicate any inconsistencies. And that with the integrated LEDs as well as remotely using floating switching contacts. This warning function allows the user to intervene and to guarantee the operational continuity. If there is really danger present, the digital RCCB will switch off precisely – faster and with greater precision than conventional analog switches.

Practical complete product range

The comprehensive range is complemented by equipment required in industrial installations, such as DIN-rail mounting Schuko sockets, ammeters and voltmeters, power consumption and operational hours meters, as well as analog and digital timers, staircase timers, light intensity switches, buzzers and bells. Eaton offers an extensive product range for the perfect installation, all from a single source.

Miniature circuit-breaker, residual current device

System overview



1	FAZ miniature circuit-breakers	7	FAZ auxiliary contacts
1	FAZT miniature circuit-breakers	8	AZ auxiliary contacts
2	FAZ-PN miniature circuit-breaker	9	FAZ voltage releases
3	Residual-current protective modules for fitting to FAZ	10	AZ voltage releases
4	dRCM digital residual-current devices	11	Remote switching module
5	Residual-current devices	12	Residual-current protective modules for fitting to AZ
6	AZ miniature circuit-breakers	13	FI auxiliary contact

Rated operational current I_n A	1 pole Part no.	Article no.	2 pole Part no.	Article no.	3 pole Part no.	Article no.
FAZ miniature circuit-breakers Characteristic B Instantaneous release response current 3 - 5 x I_n Switching Capacity 15 kA (IEC/EN 60947-2)						
4 (10 kA, IEC/EN 60898-1)	**FAZ-B4/1-HS**	279274	**FAZ-B4/2-HS**	279275	–	–
5	**FAZ-B5/1**	278528	–	–	–	–
6	**FAZ-B6/1**	278529	**FAZ-B6/2**	278728	**FAZ-B6/3**	278841
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
13	**FAZ-B13/1**	278533	**FAZ-B13/2**	278732	**FAZ-B13/3**	278845
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	**FAZ-C0.5/2**	278743	**FAZ-C0.5/3**	278856
1	**FAZ-C1/1**	278546	**FAZ-C1/2**	278745	**FAZ-C1/3**	278858
1.6	**FAZ-C1,6/1**	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
Characteristic D Instantaneous release response current 10 - 20 x I_n Switching Capacity 15 kA (IEC/EN 60947-2)						
6	**FAZ-D6/1**	278578	**FAZ-D6/2**	278777	**FAZ-D6/3**	278890
10	**FAZ-D10/1**	278580	**FAZ-D10/2**	278779	**FAZ-D10/3**	278892
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
Characteristic K Instantaneous release response current 8 - 12 x I_n Switching Capacity 15 kA (IEC/EN 60947-2)						
1	**FAZ-K1/1**	278590	**FAZ-K1/2**	278789	**FAZ-K1/3**	278902
1.6	**FAZ-K1,6/1**	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
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

Circuit-breaker

FAZ, FAZT, FAZ-DC miniature circuit-breakers

Moeller® series

Rated operational current I_n A	**1 pole** **Part no.**	Article no.	**2 pole** **Part no.**	Article no.	**3 pole** **Part no.**	Article no.
Characteristic K Instantaneous release response current 8 - 12 x I_n Switching Capacity 15 kA (IEC/EN 60947-2)						
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
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
Characteristic N/O Instantaneous release response current 13 - 17 x I_n Switching capacity 10 kA (IEC/EN 60947-2)						
1	**FAZ-S1/1**	278606	**FAZ-S1/2**	278805	–	–
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	–	–
Characteristic Z Instantaneous release response current 2 - 3 x I_n Switching capacity 10 kA (IEC/EN 60947-2)						
1	**FAZ-Z1/1**	278618	**FAZ-Z1/2**	278817	**FAZ-Z1/3**	278919
2	**FAZ-Z2/1**	278620	**FAZ-Z2/2**	278819	**FAZ-Z2/3**	278921
3	**FAZ-Z3/1**	278621	**FAZ-Z3/2**	278820	**FAZ-Z3/3**	278922
4	**FAZ-Z4/1**	278622	**FAZ-Z4/2**	278821	**FAZ-Z4/3**	278923
6	**FAZ-Z6/1**	278623	**FAZ-Z6/2**	278822	**FAZ-Z6/3**	278924
10	**FAZ-Z10/1**	278625	**FAZ-Z10/2**	278824	**FAZ-Z10/3**	278926
16	**FAZ-Z16/1**	278626	**FAZ-Z16/2**	278825	**FAZ-Z16/3**	278927
20	**FAZ-Z20/1**	278627	**FAZ-Z20/2**	278826	**FAZ-Z20/3**	278928
FAZT miniature circuit-breakers						
Characteristic B Switching capacity up to 25 kA (IEC/EN 60947-2), 60 V DC						
1	**FAZT-B1/1**	240770	**FAZT-B1/2**	240820	**FAZT-B1/3**	240874
2	**FAZT-B2/1**	240771	**FAZT-B2/2**	240821	**FAZT-B2/3**	240875
4	**FAZT-B4/1**	240777	**FAZT-B4/2**	240823	**FAZT-B4/3**	240877
10	**FAZT-B10/1**	240787	**FAZT-B10/2**	240825	**FAZT-B10/3**	240879
16	**FAZT-B16/1**	240795	**FAZT-B16/2**	240829	**FAZT-B16/3**	240883
25	**FAZT-B25/1**	240797	**FAZT-B25/2**	240831	**FAZT-B25/3**	240885
Characteristic C Switching capacity up to 25 kA (IEC/EN 60947-2), 60 V DC						
2	**FAZT-C2/1**	240799	**FAZT-C2/2**	240833	**FAZT-C2/3**	240887
4	**FAZT-C4/1**	240801	**FAZT-C4/2**	240843	**FAZT-C4/3**	240889
16	**FAZT-C16/1**	240807	**FAZT-C16/2**	240861	**FAZT-C16/3**	240895
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 up to 250 V DC per pole						
2	**FAZ-C2/1-DC**	279122	**FAZ-C2/2-DC**	279134	–	–
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	–	–
16	**FAZ-C16/1-DC**	279128	**FAZ-C16/2-DC**	279140	–	–
20	**FAZ-C20/1-DC**	279129	**FAZ-C20/2-DC**	279141	–	–

Rated operational current I_n A	Interrupting Capacity (SCCR) kA	1 pole Part no.	1 pole Article no.	2 pole Part no.	2 pole Article no.	3 pole Part no.	3 pole Article no.
Miniature circuit-breaker FAZ-NA • Characteristic B, AC • Switching capacity 15 kA (IEC/EN 60947-2)							
6	10	**FAZ-B6/1-NA**	132680	**FAZ-B6/2-NA**	132699	**FAZ-B6/3-NA**	132718
16	14	**FAZ-B16/1-NA**	132686	**FAZ-B16/2-NA**	132705	**FAZ-B16/3-NA**	132724
32	10	**FAZ-B32/1-NA**	132690	**FAZ-B32/2-NA**	132709	**FAZ-B32/3-NA**	132728
• Characteristic C, AC • Switching capacity 15 kA (IEC/EN 60947-2)							
2	10	**FAZ-C2/1-NA**	102080	**FAZ-C2/2-NA**	102160	**FAZ-C2/3-NA**	102240
3	10	**FAZ-C3/1-NA**	102081	**FAZ-C3/2-NA**	102161	**FAZ-C3/3-NA**	102241
4	10	**FAZ-C4/1-NA**	102082	**FAZ-C4/2-NA**	102162	**FAZ-C4/3-NA**	102242
6	10	**FAZ-C6/1-NA**	102084	**FAZ-C6/2-NA**	102164	**FAZ-C6/3-NA**	102244
10	10	**FAZ-C10/1-NA**	102087	**FAZ-C10/2-NA**	102167	**FAZ-C10/3-NA**	102247
15	14	**FAZ-C15/1-NA**	102089	**FAZ-C15/2-NA**	102169	**FAZ-C15/3-NA**	102249
16	14	**FAZ-C16/1-NA**	102090	**FAZ-C16/2-NA**	102170	**FAZ-C16/3-NA**	102250
40	10	**FAZ-C40/1-NA**	102096	**FAZ-C40/2-NA**	102176	**FAZ-C40/3-NA**	102256
• Characteristic C, DC • Switching capacity 15 kA (IEC/EN 60947-2)							
6	10	**FAZ-C6/1-NA-DC**	113756	**FAZ-C6/2-NA-DC**	120638	–	
13	10	**FAZ-C13/1-NA-DC**	113760	**FAZ-C13/2-NA-DC**	120642	–	
16	10	**FAZ-C16/1-NA-DC**	113762	**FAZ-C16/2-NA-DC**	120644	–	
25	10	**FAZ-C25/1-NA-DC**	113764	**FAZ-C25/2-NA-DC**	120646	–	
40	10	**FAZ-C40/1-NA-DC**	113768	**FAZ-C40/2-NA-DC**	120650	–	

Circuit-breaker

Auxiliary contacts

	For use with		Contacts Number	Space units 1 PE = 18 mm Space unit	Cross-section mm^2	**Part no.**	Article no.
Auxiliary contacts and voltage releases							
Auxiliary contacts for FAZ							
	FAZ...	Up to 63 A	1 N/O / 1 NC	0.5	–	**FAZ-XHIN11**	286054
	FAZ...	Up to 63 A	1 W	0.5	–	**FAZ-XHINW1**	286055
Trip-indicating auxiliary contacts/auxiliary contacts for FAZ							
	FAZ...	Up to 63 A	2 C/O	0.5	–	**FAZ-XAM002**	262414
Shunt release for FAZ							
	FAZ...	Up to 63 A	–	1	–	**FAZ-XAA-C-110-415VAC**	278519
Undervoltage releases for FAZ							
	FAZ...	–	–	1	–	**FAZ-XUA(230VAC)**	212051
Extension terminal							
	4.3 Nm, touch-proof busbar connection to miniature circuit-breaker				25	**FAZ-XK25**	212116
	M5: 3.0 Nm, M8: 4.3 Nm touch-proof connection to FAZ-XIS... busbar				35	**FAZ-XK35**	212119

Residual-current devices dRCM, digital

- 4 pole
- Contact position display red-green
- Trip indication white/blue

		Rated operational current I_n A	**Part no.**	Article no.
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
		40	**dRCM-40/4/003-G/A+**	120836
		63	**dRCM-63/4/003-G/A+**	120838
		80	**dRCM-80/4/003-G/A+**	120840
	Rated fault current $I_{\Delta N}$ = 300 mA	25	**dRCM-25/4/03-G/A+**	120835
		40	**dRCM-40/4/03-G/A+**	120837
		63	**dRCM-63/4/03-G/A+**	120839
		80	**dRCM-80/4/03-G/A+**	120841
Surge-proof 3 kA, X-ray applications, Type R				
	Rated fault current $I_{\Delta N}$ = 30 mA	63	**dRCM-63/4/003-R+**	120842
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
		63	**dRCM-63/4/03-S/A+**	120844
		80	**dRCM-80/4/03-S/A+**	120845
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
		63	**dRCM-63/4/03-U+**	120847
		80	**dRCM-80/4/03-U+**	120848
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
		63	**dRCM-63/4/003-U+**	120846

Eaton UPS Systems – Reliable Protection for Machines and System Engineering

Eaton product and service range

- AC UPS from 350 VA up to 4400 kVA
- DC systems of all sizes
- A broad portfolio of rack-based power distribution units (ePDU™)
- Rack environment monitoring
- Software and connectivity products for power management and remote control
- Technical support and maintenance
- Complete power quality solutions

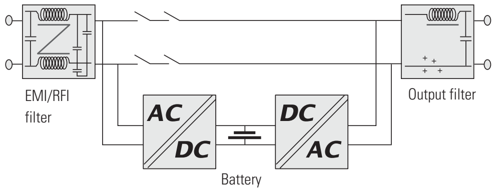
Further information at:
www.eaton.com/powerquality

Eaton Power Quality Division, a part of the Electrical Sector, has more than 45 years of experience in designing and producing innovative power quality products. The result is an expansive portfolio of products, which help to protect our customer's business processes, critical applications and systems from all power problems and failures.

Since the first patent awarded in 1962, Eaton Power Quality has played a decisive role in the development of voltage protection systems. The objective of the leading technology innovator is to continuously develop new solutions to meet the growing demands if it's customers.

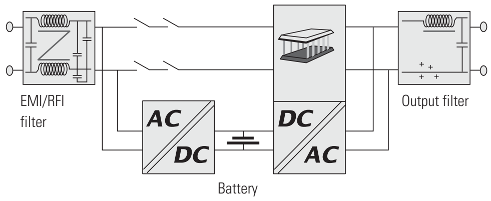
Power Protection for Different Needs

The most common power problems include power failure, power sag, power surge, undervoltage, overvoltage, switching transient, line noise, frequency variation and harmonic distortion. Based on three UPS topologies, Eaton offers a wide range of UPS solutions to provide an appropriate level of power protection against different power problems and failures.



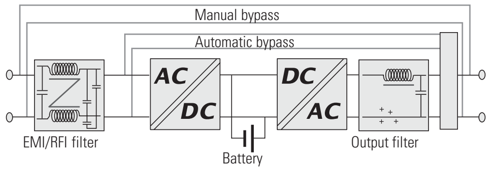
Passive standby topology (off-line)

is the most frequently used UPS topology for protecting PCs against power failure, power sag and power surge. In normal mode, the UPS supplies power to the application directly from the mains, filtered but without active conversion. The battery is charged from the mains. In the event of a power cut or fluctuation, the UPS delivers stable power from the battery. The advantages of this topology are low cost and adequacy for office environments.



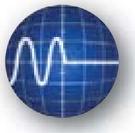
Line interactive topology

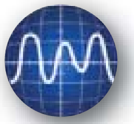
is used for protecting enterprise networks and IT applications against power failure, power sag, power surge, undervoltage and overvoltage. In normal mode, the device is controlled by a UPS microprocessor that monitors the quality of the supply and reacts to fluctuations. A voltage compensation circuit is enabled to boost or reduce the supply voltage to compensate for the fluctuations. The main advantage of this topology is that it enables compensation of under and overvoltage without using the batteries.

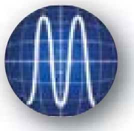


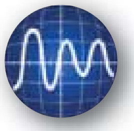
Double conversion topology (on-line)

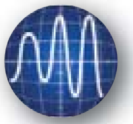
is a basis for UPSs designed for continuous power protection of critical equipment against power related problems: Power failure, power sag, power surge, undervoltage, overvoltage, switching transient, line noise, frequency variation and harmonic distortion. It ensures a consistent quality of power supply regardless of disturbances in the incoming mains. The output voltage is entirely regenerated by a sequence of AC to DC conversion followed by DC to AC conversion in order to create power supply without any electrical interference.
Double conversion UPSs can be used with any type of equipment as there are no transients when changing over to battery power.

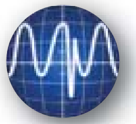

1. Power failure

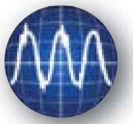

2. Power sag

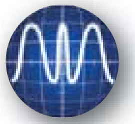

3. Power surge

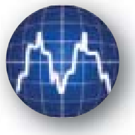

4. Undervoltage


5. Overvoltage


6. Switching transients


7. Line noise


8. Frequency variation


9. Harmonic distortion

Single-Phase UPS Systems

Eaton Protection Station

Standby topology (off-line) 500/650/800 VA
- 6 (500) or 8 (650,800) Schuko sockets
- Line protection for telephone
- USB port included
- Power management software
- Replaceable batteries
- 650/800 in Eco mode (master-slave function)

Eaton 5PX

Line interactive topology 1500/2200/3000 VA
- Sine wave output voltage
- Graphical LCD display
- Energy measurement per output group
- Programmable output groups
- Hot-swappable battery capability
- Output power factor 0.9
- Serial and USB ports as well as a slot for optional management boards

Eaton 9130

On-line double conversion topology 700 to 6000 VA
- On-line double conversion topology with internal bypass
- Output power factor 0.9
- Longer battery life with ABM® battery management technology
- Graphical LCD display
- Load segments
- Hot-swappable battery capability
- Long battery life
- Serial and USB ports as well as a slot for optional management boards

Eaton 9140

On-line double conversion topology 7500/10000 VA
- On-line double conversion topology with internal bypass
- Up to 10 kVA power in just 6U of rack space
- Longer battery life with ABM® battery management technology
- Intuitive LCD display
- Hot-swappable battery and power module capability
- Long battery life
- Serial and USB ports as well as a slot for optional management boards

Eaton 3S

Standby topology (off-line) 550/700 VA
- 6 Schuko or 8 IEC output sockets
- Line protection for telephone
- USB port included
- Power management software
- Replaceable batteries
- Compact unit fits on or under the desk or can be mounted on a wall

Eaton Ellipse Eco

Standby topology (off-line) 500/650/800/1200/1600 VA
- With 4 or 8 Schuko / IEC output sockets
- Line protection for telephone
- USB version with Eco mode (master-slave function)
- Power management software
- Replaceable batteries

Eaton 5130

Line interactive topology 1250/1750/2500/3000 VA
- Automatic voltage regulation (AVR) with sinewave output voltage
- 2-in-1 format (rack or tower)
- Output power factor 0.9
- Load segments
- Hot-swappable battery capability
- Long battery life
- Serial and USB ports as well as a slot for optional management boards

Eaton 9135

On-line double conversion topology 5000/6000 VA
- On-line double conversion topology with internal bypass
- Deployment versatility with rack/tower format (3U)
- Output power factor 0.9
- Multilingual LCD display
- Load segments
- Hot-swappable battery and power module capability
- Long battery life
- Serial and USB ports as well as a slot for optional management boards

Eaton 9155 1:1, Eaton 9155 3:1

On-line double conversion topology 8-15 kVA (1:1), 8-30 kVA (3:1)
- Optimized for protection of modern IT equipment (output power factor 0.9)
- IGBT rectifier with PFC
- Up to four UPSs can be paralleled to increase availability or add capacity (Hot-Sync®)
- ABM® technology prolongs battery service life by up to 50 percent
- Compact and easy to install

Three-phase UPS's

Eaton 9355 3:3

On-line double conversion topology 8-40 VA

- Optimized for protection of modern IT equipment (output power factor 0.9)
- IGBT rectifier with PFC
- Up to four UPSs can be paralleled to increase availability or add capacity (HotSync®)
- ABM® technology prolongs battery service life by up to 50 percent
- Compact and easy to install

An Eaton Green Solution

Eaton BladeUPS™ 3:3

On-line double conversion topology, and Energy Saver technology 12-60 kVA/kW (output power factor 1)

- Optimized for data center environments
- Up to 60kVA/60kW plus 12kVA/12kW redundancy incl. bypass in a standard 42U rack
- Up to 98.6 % efficiency reduces operating and cooling costs
- Expandable and accommodates continuous changes in data centres through its scalable architecture
- Hot swappable components ensure uptime
- ABM® technology prolongs battery service life by up to 50 percent

Eaton 9390 3:3

On-line double conversion topology 40-160 VA

- Optimized for protection of modern IT equipment (output power factor 0.9)
- IGBT rectifier with PFC
- Very high level of efficiency, even at low loads (up to 99 percent with ESS)
- Load test without load (ECT)
- Up to eight UPSs can be paralleled (HotSync®)
- ABM® technology prolongs battery service life by up to 50 percent
- Front access provides easy availability for service and save valuable space

An Eaton Green Solution

Eaton 9395 3:3

On-line double conversion topology 225-1100 VA

- The highest performance Ups currently available on the market
- IGBT rectifier with PFC
- Very high level of efficiency, even at low loads (up to 99 percent with ESS)
- Load test without load (ECT)
- Optimized for protection of modern IT equipment (output power factor 0.9)
- Up to five UPSs can be paralleled to increase availability or add more capacity (HotSync®)
- ABM® technology prolongs battery service life by up to 50 percent
- Front access provides easy availability for service and save valuable space
- New energy saving technology "Energy Advantage Architecture – EAA" using VMMS and ES

Software & Accessories

ePDU – Intelligent Power® Distribution

Eatons Standard range of ePDU's include

Managed ePDUs

- **monitoring:** V, W, A and kWh for individual outlet, outlet group and full ePDU. Temperature and humidity via optional sensors.
- **switching:** individual outlet or group, sequencing and cycling with delays
- **control:** via Ethernet and advanced LCD screen on the unit

Advanced Monitored ePDUs – detailed information for efficient operations

- **monitoring:** V, W, A and kWh for individual outlet, outlet group and full ePDU. Temperature and humidity via optional sensors.
- **control:** monitor and control key properties and alerts remotely over Ethernet or via advanced LCD screen on the unit

Switched ePDUs – remote shut-down and restart of equipment

- **monitoring:** V, W, A and kWh for total load. Temperature and humidity via optional sensors.
- **switching:** individual outlets, on, off, cycling and sequencing
- **control:** monitor and switch over Ethernet, monitor locally via advanced LCD screen on the unit

Monitored ePDUs – accurate Currant readings for accurate load balancing

- **monitoring:** Amps for branch circuit and full ePDU
- **control:** monitor locally and remotely, and control key properties and alerts over Ethernet

Basic ePDUs – Designed for cost effective, rugged and reliable power distribution

Custom series

If you require something special, then we can offer custom Eaton ePDUs tailored to your needs.

Eaton management software

UPS management software for monitoring and shutdown of systems

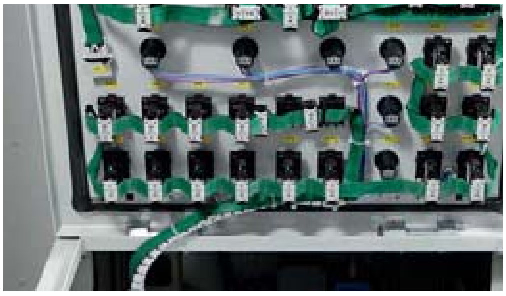
Intelligent Power® Manager

- Facilitates easy management of several UPS systems and ePDUs
- Easy to use and operate
- Intuitive, web-based user interface enables access to the entire network
- Integration in VMware vCenter and Microsoft Hyper-VMSCVMM

Intelligent Power Protector

- Controlled and managed shutdown of a computer or server by a UPS
- Allows you to save current work and data

Machine building



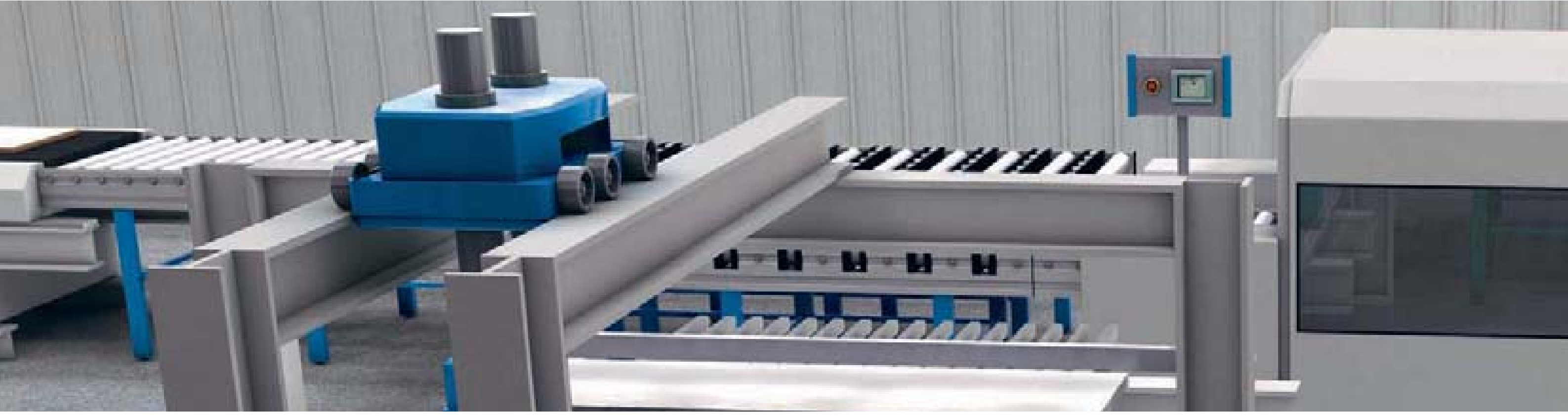
mts Perforator GmbH

The tunnelling machine specialist Perforator GmbH is located in Valluhn near Hamburg and uses Eaton's SmartWire-DT to control its mts tunnelling machines. Importance was also placed on safety and warranty issues, as well as the availability of spare parts. The SmartWire technology, not only reduces design engineering, installation and wiring costs, but also offers an effective protection against manipulation. Norbert Simdon, from electronic Support at mts Perforator, had this to say: “The use of SmartWire-DT in the control station clearly reduces engineering and wiring costs. However, the integrated manipulation protection is even more important for guaranteeing our tunnelling machines.”

Hauptmenue

ProDesign GmbH

ProDesign GmbH is a company that designs and develops (special) machines, as well as complete production systems, particularly in the food and medical technology sectors. Dipl. Ing. (FH) Markus Salvermoster, general manager of the ProDesign GmbH engineering consultants in Tuttlingen, summarizes as follows: “We wanted a controller for our Pico brewing systems that offered simple and clear operation, visualization and control in equal measure. After all, our customers are beer enthusiasts and not control engineers. Furthermore, we wanted highly reliable components to ensure long-term satisfaction for our customers. All Eaton components, whether they are XV panels with XSoft-CoDeSys or easy800, meet these requirements – at attractive prices. Eaton employees gave us expert support with our projects, including the first test systems. Eaton products have now been successfully used in series production with flying colors.”



Machine building

Toggenburger
Toggenb

Toggenburger AG, Switzerland

Toggenburger AG is active in the field of gravel and concrete, renaturation/earthworks and environmental technology as well as in lifting and transportation. Around 350 inputs, 169 outputs (350 analog) and remote maintenance and diagnostics functions had to be incorporated in a new control concept for a new excavated soil washing plant. The entire communication had to be implemented via Ethernet. Three XC200 modular PLCs, two XV440 HMI-PLCs, five XION gateways (Modbus-TCP) and an ES4P-221-DMXD1 easySafety control relay were used. Daniel Stutz, deputy plant manager at Toggenburger AG, had this to say: “We are very satisfied with the entire solution. Commissioning was completed without any problems and communication between all operating devices functioned directly at the start. The cause of any malfunctions that develop can be identified quickly thanks to the clear and uniform visualization. We can call up all process data, the batch number or the individual operating hours from any location.”

CDM Engineering / OMP Prealpina Italy

CDM Engineering/ OMP Prealpina is a company that develops and produces extruders with screw diameters of 30 - 250 mm. Eaton's switchgear and control devices are used in all CDM machines. The Eaton XC100/200 PLC with a CANopen network controls the entire extruder plant. The infra-red touch display offers the operator intuitive operation and also simple parameter entry when required. The equipment also includes different pushbutton actuators of the RMQ-Titan series such as emergency-stop buttons or actuators for selecting the operating mode of the machine during different process steps. In addition to this are Eaton circuit-breakers and motor-protective circuit-breakers for AC and DC motors. The entire control wiring between the PLC and switchgear is replaced with SmartWire-DT.

Food / packaging

.1+E0
A3 Speed 200 S
CM/HHS 600-160
2/356215/09

Meurer Verpackungssysteme GmbH Co. KG

Meurer has been producing high quality and flexible final packaging systems for more than 40 years. Its machines are used worldwide for a wide range of products and sectors. Meurer exports around 70 percent of its products, of which 5 to 10 percent are exported to North America. In order to ensure that its machines can be exported to North America, Meurer uses the services of Eaton as a competent and reliable partner. Dipl.-Ing. Guido Grewe, team leader for electrical engineering at Meurer, had this to say: "Our strategy aims to inspire our customers with tailor-made solutions. As this applies to customers worldwide we supply turnkey final packaging machines, so to speak, that are ready to use. The approval obstacles vary all over the world. Particularly when exporting to North America, we have relied for several years on the extensive expertise of Eaton."

Gillenkirch Packaging Systems GmbH

Oscar Manteca, partner at Gillenkirch had this to say: "We set high standards in quality, reliability and service for all system sections. Innovations such as SmartWire-DT help us to continuously further develop our product range and keep it in line with the latest state of the art. As we were able to impressively reduce the installation times, it was even possible to supply the system described here before the agreed date. The integrated current measuring of all loads enables the direct signalling of different load states on the process control system. The system operator carries out any optimization online and thus avoids production downtimes. We are very satisfied with Eaton's new SmartWire-DT solution."

Airport / logistics

Airport operators rely on Rapid Link 4.0

Today state-of-the-art conveying systems are being installed in airports and distribution centers as modular and decentralized systems. Suppliers of baggage handling systems and airport operators have discovered the benefits of Eaton's Rapid Link decentralized drive system, since they enable energy savings of more than 20% on baggage handling systems. Added to this is the fact that Eaton is a partner with a global presence, offering compliance with all worldwide standards and extensive solution expertise. Thanks to the Rapid Link 4.0 housing concept, the motor starters and frequency inverters up to 2.2 kW have the same fixing dimensions. Motor starters allow up to 3000 operations an hour. Frequency inverters can now be switched from V/f mode to speed control as required. The external fan unit with IP65 protection is standard for the 2.2 kW frame size and increases the temperature range to 55°C without derating.

STOP
AIR BERLIN

Wahl GmbH + Co. KG, Hannover Airport

Olaf Maaß, project manager at Wahl responsible for the automation project at Hannover airport, summarizes as follows: “I would have been glad to implement the project using EIB technology”. However, it soon became obvious that the solution with Eaton's easy control relays is considerably more economical and efficient. easy control relays are also extremely reliable and easy to program. Added to this is the good technical support provided by Eaton, which always responds competently and quickly.” Torsten Menge, who works for the electrical engineering services at Hannover Airport and is responsible for the planning and consulting for new buildings and conversions, added the following: “For me the name Eaton has been synonymous with outstanding product quality for many years.”

Renewable energies

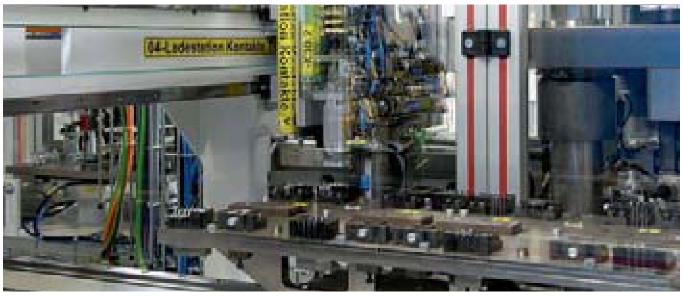
Woodward SEG

Woodward SEG from Kempen on the Lower Rhine has been a constant presence on the market for frequency inverters for wind turbine generators (WTGs) for over ten years. The speed range of wind turbine generators is more often in the lower range than in the rated range. This means that circuit-breakers have to be switched on and off very frequently. A bypass to the Eaton main switch, consisting of a compact circuit-breaker and vacuum contactor takes over the grid connection in the partial load range and thus reduces maintenance costs such as well as downtimes of the WTG. Team leader Eric Hartmann, Woodward-SEG: “We are very happy with Eaton's technical support. The understanding of a system for wind power technology can only be achieved on the basis of continuous cooperation. In my opinion, our strengths are in the search for common and well-founded solutions.”

Sputnik Engineering AG

With SolarMax, the company offers a broad product range from string inverters for private homes to central inverters for solar power stations. Eaton's xStart contactors are used for switching the AC voltage to the central inverter of the SolarMax S series. “Sputnik Engineering AG inverters represent the proverbial Swiss quality. We have therefore chosen suppliers that meet our high standards” managing director Christoph von Bergen explains. “The failure of a photovoltaic installation can involve considerable costs. We prevent this by using tried and tested components that are perfectly suited to this sector. Eaton not only offers high quality components but also excellent technical consulting locally.”

Automotive industry



Söhner Gruppe

The automotive industry is a key business sector for the Söhner Group. Several special plastic hybrid parts are manufactured on complex production systems – from motor management, ABS braking systems, air conditioning to fuel preparation, right through to emission or energy management. “Product cycles are becoming increasingly shorter, especially in the automotive industry. This requires us to be able to adapt our production and testing equipment quickly. The simple and modular switch cabinet design made possible with SmartWire-DT is an ideal solution, since we save costs and can respond flexibly to customer requirements,” Martin Klein from the electrical engineering department at Söhner explains. “The excellent cooperation between our electrical wholesaler Otto Klenk, Heilbronn, and the Eaton branch were decisive factors in choosing SmartWire technology for this project.”

Nimak GmbH

Its innovative capacity, together with an outstanding reputation in design and quality, ensured Nimak a prominent position internationally in the market sectors for welding machines and systems. Manual and robot welding tongs are offered as well as systems for arc welding. Nimak developed new servo driven welding tongs for the body shell construction line of a well-known German automotive manufacturer. This required a powerful and flexible control system for the welding tongs which would be networked with the robot and welding control system. Eaton's XC200 modular PLC with integrated Ethernet and CANopen interfaces was used. A special Interbus interface was integrated in the control system via the flexible Eaton I/O technology concept. The hardware, the XSoft-CoDeSys programming system and the support from Eaton enabled Nimak to meet the requirements of end customers totally and on schedule.

Eaton's Electrical Sector is a global leader in power distribution, power quality, control and automation, and monitoring products. When combined with Eaton's full-scale engineering services, these products provide customer-driven PowerChain™ solutions to serve the power system needs of the data center, industrial, institutional, public sector, utility, commercial, residential, IT, mission critical, alternative energy and OEM markets worldwide.

PowerChain solutions help enterprises achieve sustainable and competitive advantages through proactive management of the power system as a strategic, integrated asset throughout its life cycle, resulting in enhanced safety, greater reliability and energy efficiency. For more information, visit www.eaton.com/electrical.

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