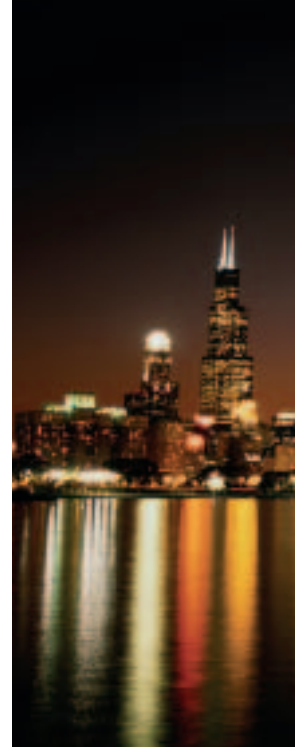


# Product Overview for Machinery



*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, Eaton Corporation plc (NYSE: ETN) is a global diversified power management company. We help customers worldwide manage the power they need for buildings, aircraft, trucks, cars, machinery and businesses. And we do it in a way that consumes fewer resources. Eaton has approximately 100,000 employees around the world and sells products to customers in more than 150 countries. Today more than half of Eaton's revenues are generated outside the U.S. In 2011, Eaton celebrated its 100th year, achieving record sales and profits, and this positive momentum has continued into 2012.

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.



## 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

The Electrical Sector is a leader in electrical products, systems and services for power quality, distribution and control, industrial automation, power transmission, lighting and wiring. The electrical segment provides technology-driven solutions that serve the critical needs of the industrial, utility, commercial, residential, information technology markets 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.



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 six consecutive years (2007, 2008, 2009, 2010, 2011 and 2012).



An Eaton Green Solution

Learn more about Eaton Green Solutions at [www.eaton.com/greensolutions](http://www.eaton.com/greensolutions)

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

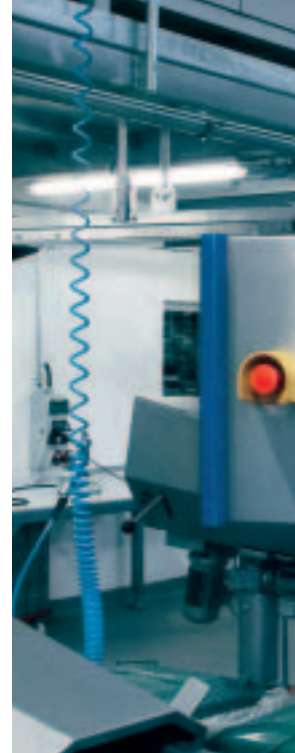
## Automotive

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.





# 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

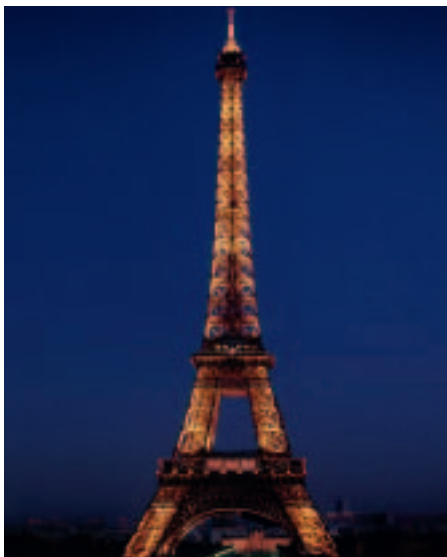
Buildings, Information Technology, Industrial & Machinery, Energy & Utilities  
We provide reliable, efficient and safe power management.

## 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.

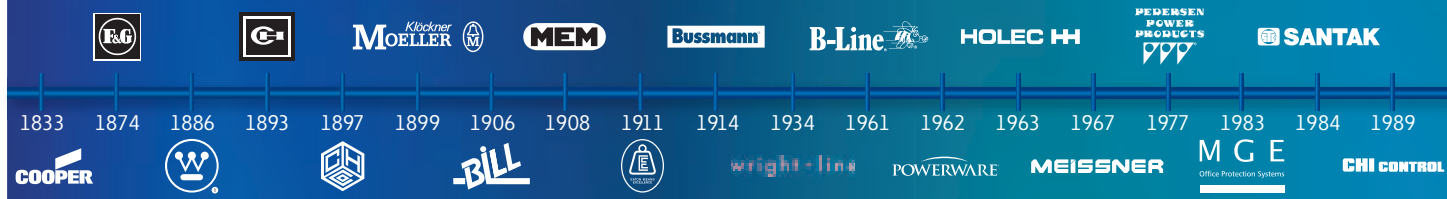
Moeller® series products from Eaton are the customers' first choice in markets adhering to IEC standards for innovative switchgear and pilot devices, controller, drive and HMI systems, as well as sophisticated visualization and communication solutions.



# EAT•N

Powering Business Worldwide

## The power of fusion.



# EAT•N

Powering Business Worldwide

There's a certain energy at Eaton. It's the power of uniting some of the world's most respected names to build a brand you can trust to meet your every power management need.

Eaton is dedicated to ensuring that reliable, efficient and safe power is available when it's needed most. Building on over 100 years of experience in electrical power management, the experts at Eaton deliver customized, integrated solutions to solve your most critical challenges. To learn more visit [www.eaton.eu/electrical](http://www.eaton.eu/electrical).

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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.



## Command and Signalling

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

xCommand

## 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

xSystem

## 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
- DS7 soft starters and PowerXL variable frequency drives
- Hydraulic energy for the machine

xStart

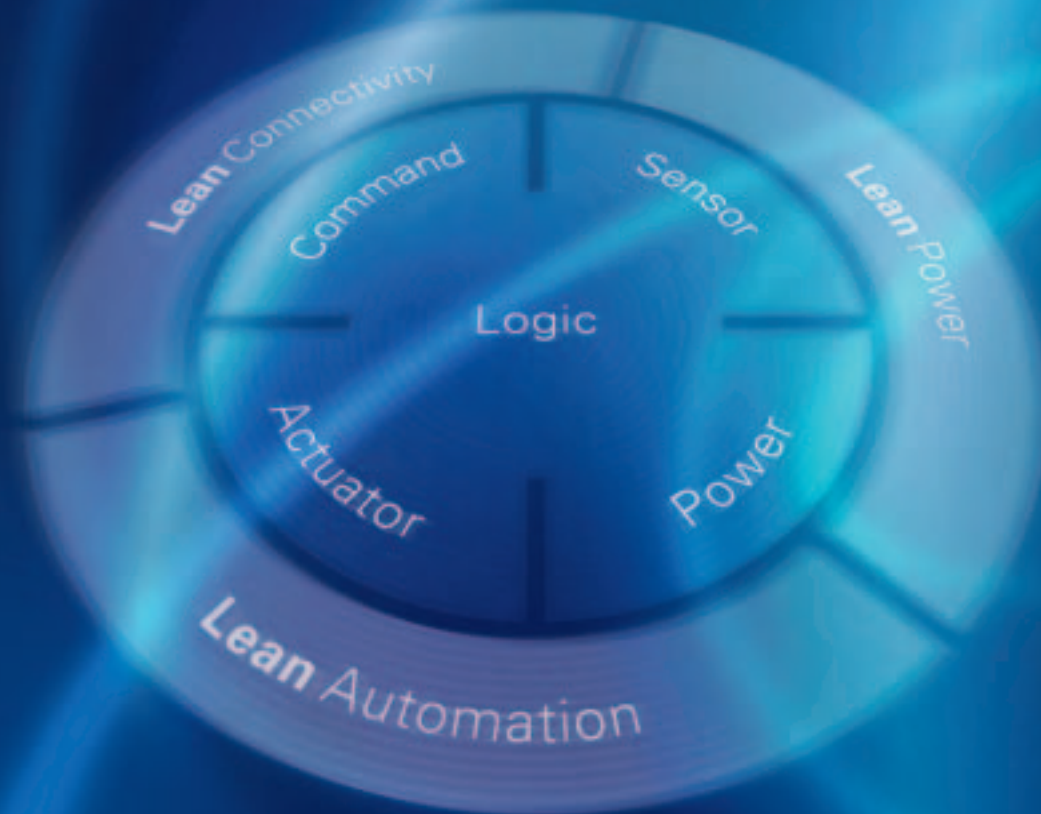
## Power Management

- 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

xEnergy



## Lean Solution Powered by SmartWire-DT®



SmartWire-DT® is a registered trademark of Eaton Corporation

## Lean Solution – the new approach for an efficient machine

The answer to increased dynamism within the corporate world is: Value creation. Hidden potential and reserves must be identified and utilized for the benefit of the customer. Eaton developed the “Lean Philosophy” for the purpose of dealing with this key concern. A central pillar of this philosophy is to recognize waste and to avoid it, and this, for example, includes complex processes, long paths, extended waiting times, over production, faults and wastage of materials.

Eaton has developed SmartWire-DT technology for the mechanical engineering sector to implement Lean Solutions as a holistic solution. This pioneering technology facilitates distributed intelligence from the control right down to the sensor for simple linear automation structures – **Lean** Automation, the simple combination of all devices using plug-in technology instead of complex point-to-point wiring – **Lean** Connectivity, and data transparency regarding energy consumption and current values for maintenance, diagnostics and efficient power consumption – **Lean** Power.

Lean Solution considerably improves the entire value chain – starting from planning, engineering, production and commissioning right through to trouble-free operation and maintenance of the machine.





## Lean Automation

The key innovation that SmartWire-DT provides in the automation field is decentralized intelligence. Modules for standard switchgear generate digital and analog information, thus eliminating the need for the I/O level. The new technology is being implemented in controllers and in drives at the same time. SmartWire-DT partners are also adding the technology to their components. This results in easily designed, straight automation structures requiring fewer components. The components for this solution are the Eaton PLC and control relay with SmartWire-DT master interface. The Lean Automation solution with Eaton HMI/PLC combines additional control and visualization in a single device.



## Lean Connectivity

All SmartWire-DT devices are connected to the SmartWire-DT cable using simple plug-in connectors. Complex and error-prone point-to-point wiring is no longer necessary. Testing and commissioning can be carried out quickly and safely. The savings that can be made are enormous. The effort and expense for wiring, test and commissioning can be reduced by up to 85% depending on the machine.



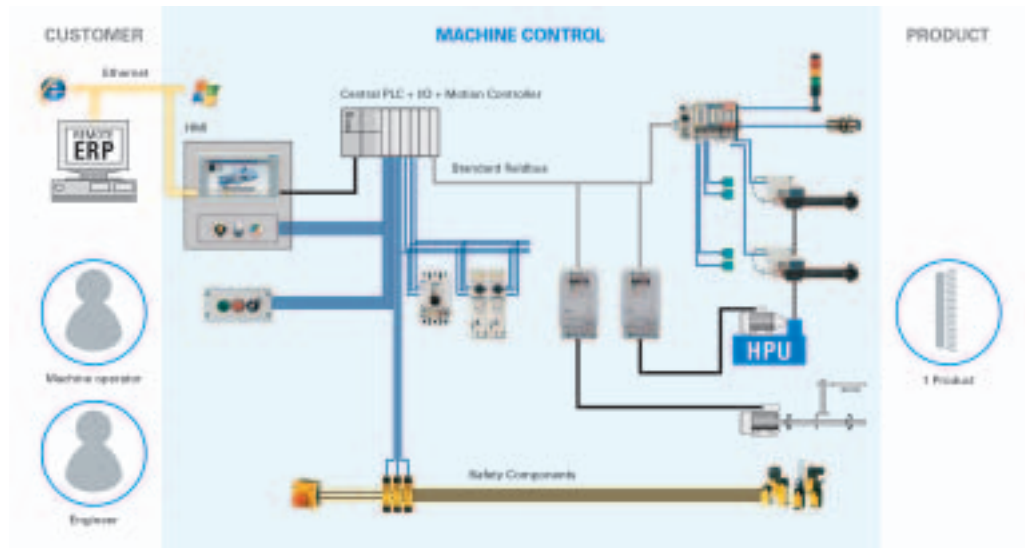
## Lean Power

A major benefit of the new technology is the data transparency from the controller to the actuator/sensor. All data related to electricity and energy consumption is made available to the entire machine and to the individual actuators. This information can be used on plants and machinery to optimize energy consumption, carry out preventative diagnostics, optimize processes and increase the availability of machinery. Switchgear that provides this comprehensive information in the motor switching and protection segment are, for example, the motor-protective circuit-breaker PKE or the circuit-breaker NZM. Thanks to the integration of SmartWire-DT in the busbar system with Cross-Link technology from Wöhner, a whole range of further devices can be integrated into these solutions.

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

Complex wiring systems connected to the central PLC become unnecessary through the use of touch displays and remote I/Os. For the first time the touch display offers a communication connection to an ERP

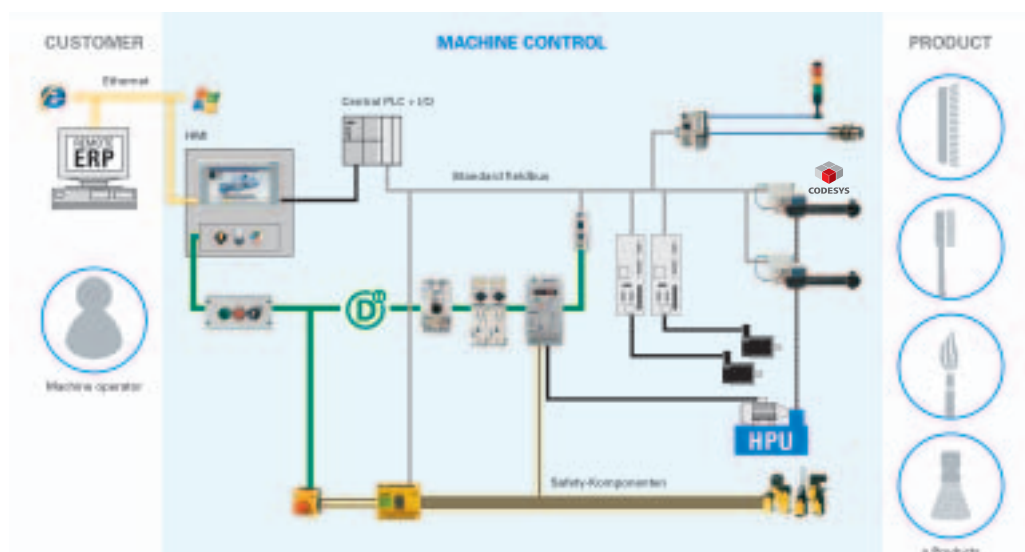
system. An onsite production manager is no longer required here and machine data can now be accessed remotely. Together with the fieldbus, remote I/Os are used to replace complex machine cabling.



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

With the introduction of SmartWire-DT the wiring for control circuit devices, motor starters and circuit-breakers is considerably reduced. SmartWire-DT incorporates the slaves into the communication

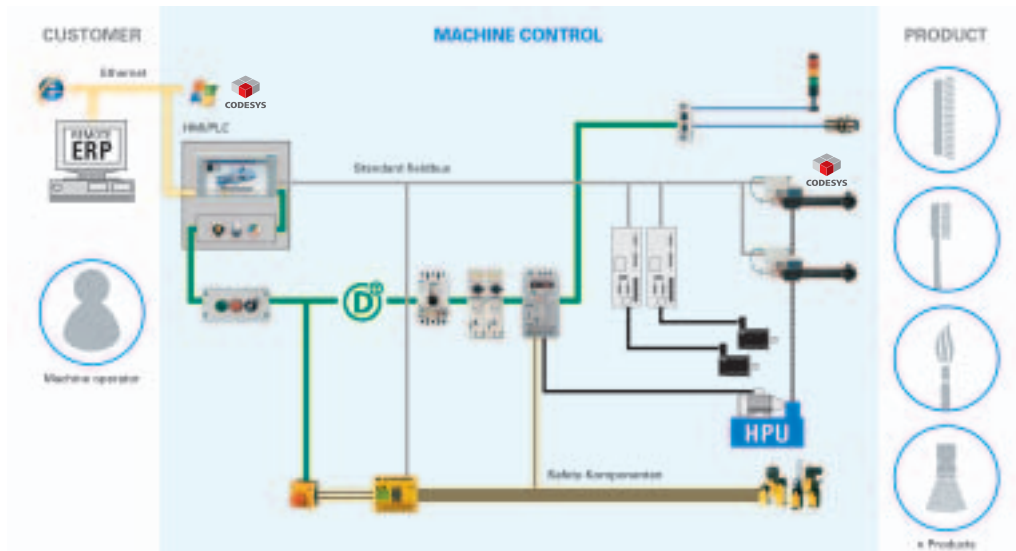
structure. The clear and simple structure also reduces the effort required for engineering, testing and commissioning. The connection of the hydraulic components to a fieldbus also reduces effort here.



## 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

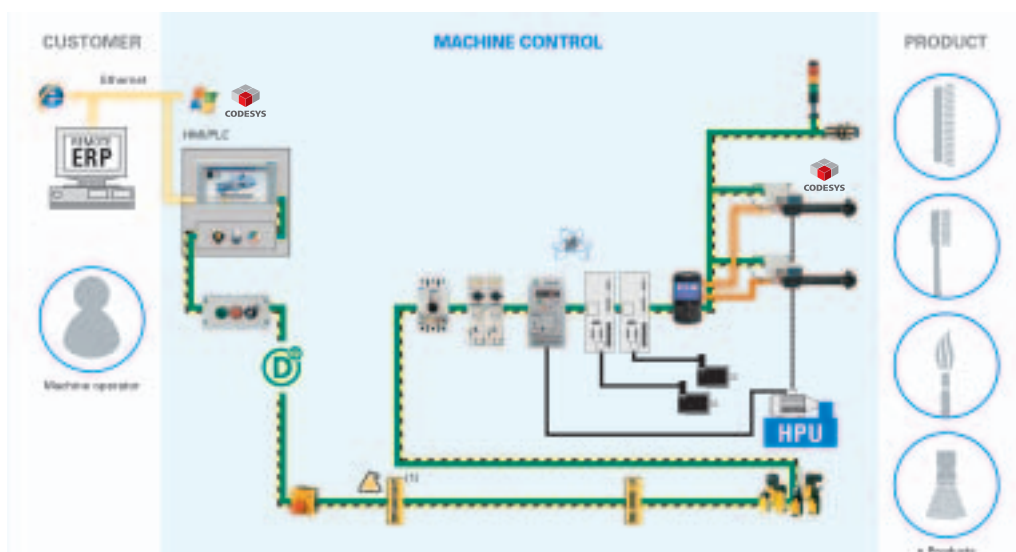
and trip indications, are transferred to the HMI/PLC via SmartWire-DT. Servo drives, variable frequency drives as well as Eaton hydraulic components are integrated via standard fieldbuses. The flexible architecture reduces both downtimes and retrofitting times.



## Lean Solution – the next step with integrated Lean Safety functionality

This innovative Lean Automation structure eliminates the need for remote I/Os and any signal wiring to sensors or actuators. Lean Connectivity brings SmartWire-DT technology directly into the devices. Functional safety is ensured through the integrated Lean Safety technology directly on the SmartWire-

DT and the safety-related switchgear. The structure consists of a SmartWire-DT coordinator and decentralized intelligent components. Starting from the coordinator such as an HMI/PLC, SmartWire-DT connects electrical switching devices as well as safety components or hydraulic and electrical drives.



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) Lean Safety: SmartWire-DT with integrated functional safety in preparation.



# Clear Benefits for the Customer

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

## Planning

- Reduced planning
- Modular, flexible, seamless concepts
- Secure
- Plausibility check of used modules

## Value addition

Improves the overall costs by:

- Using standard components
- Reducing engineering costs by up to 70 %
- Reducing the time required for wiring, testing and commissioning by up to 85 %
- A standard software platform
- Copyright protection of the achieved results

## Performance

The machine performance is also impressive:

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

## Data transparency

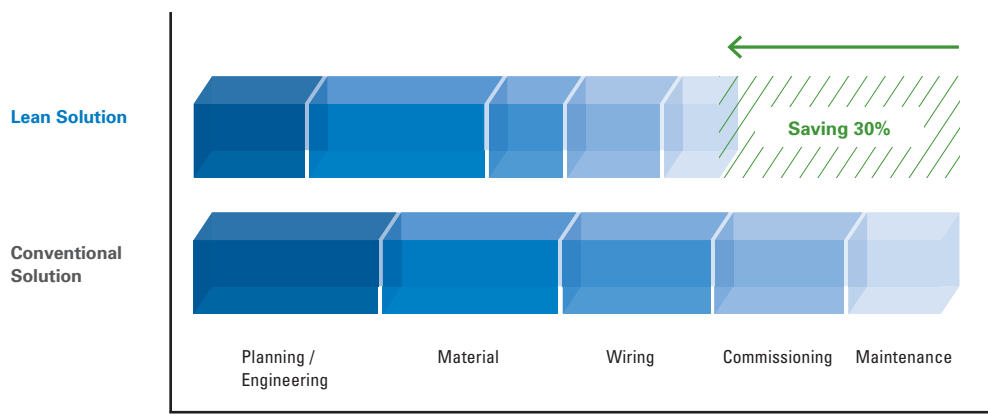
- Transparency from the controller to the sensor/actuator
- Simple diagnostics of actual values



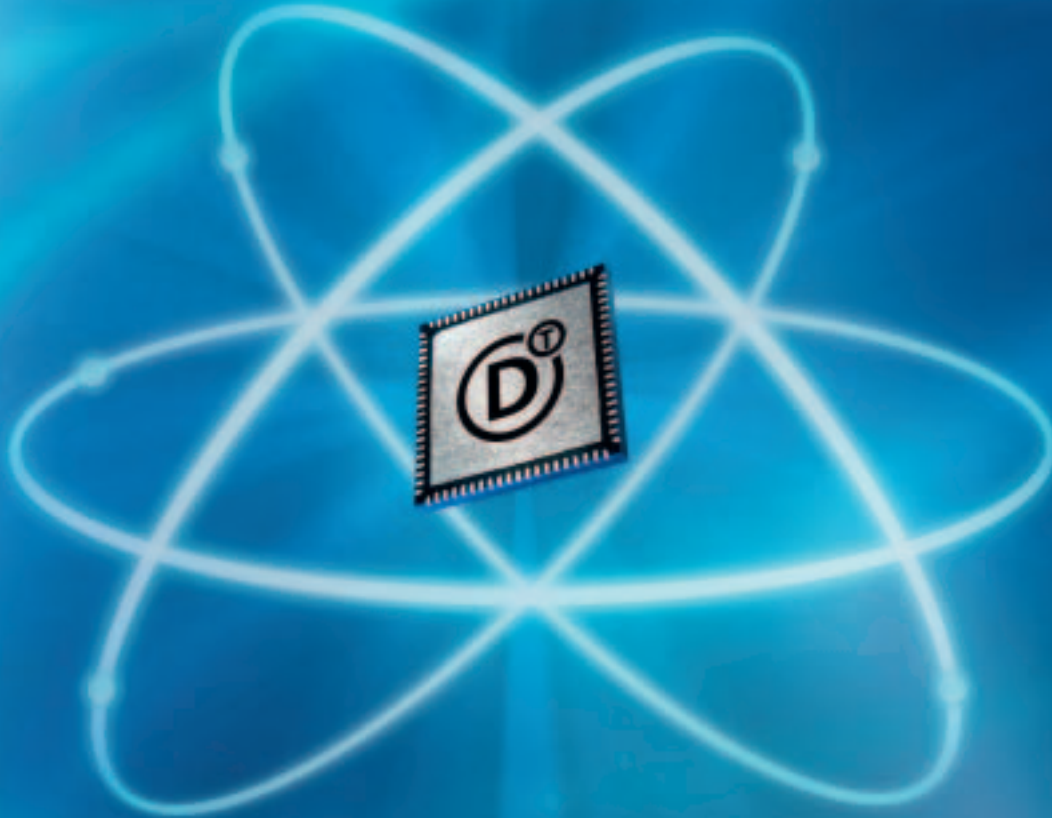
## Benefits that reduce waste

Lean Solution ensures a considerable reduction of all costs from planning and engineering, material use and wiring, right through to commissioning and subsequent maintenance. This creates the engineering freedom needed for creative and economical solutions.

### Example: Savings in every step of the life cycle



# Lean Solution Powered by SmartWire-DT® Experts



SmartWire-DT® is a registered trademark of Eaton Corporation

## Eaton SmartWire-DT® Cooperation Partners

In the implementation of the trend-setting lean technology approach, Eaton is cooperating with different SmartWire-DT partners that offer both a SmartWire-DT master and a slave interface for their products. This will optimally expand the product portfolio for SmartWire-DT and make it more attractive to customers. This will enable further impressive complete solutions to be on offer worldwide in the Lean Solution field.



Phoenix Contact with the Contactron hybrid motor starter technology and the integrated SmartWire-DT communication are one of the first cooperation partners. The complex parallel cabling of control and signal level in the switching devices is replaced by a genuine Lean Connectivity system that makes an important contribution to simplifying switch cabinet installation in the industry.



The Hilscher netX technology enables communication to all real-time Ethernet systems via a controller. As an experienced technology and development partner, Hilscher will support the integration of SmartWire-DT master connections in custom devices.



By integrating SmartWire-DT in its busbars with CrossLink technology, the cooperation partner Wöhner made it possible to integrate SmartWire-DT in many switchgear and controlgear assemblies. This solution provides new opportunities for machine and plant builders for smart energy management. In this way, valuable resources and costs can be saved.



# 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.

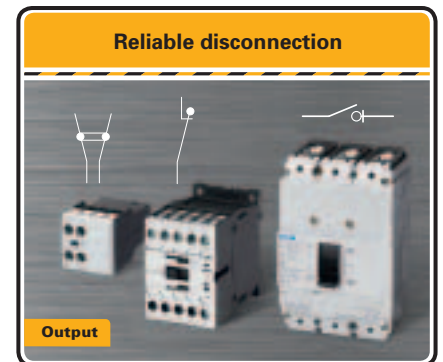
The Machinery Directive 2006/42/EC requires that machines do not pose any dangers. However, as there is no such thing as 100 % safety in engineering, the objective is to reduce these sources of danger to a tolerable level of residual risk. The overall safety of a machine defines the state which is deemed 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.

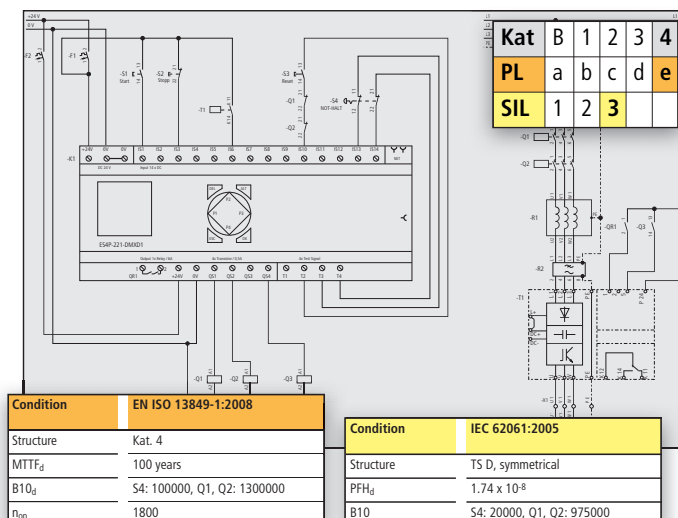


## Safety manual for machines and plants in accordance with EN ISO 13849-1 and IEC 62061

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.



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](http://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.

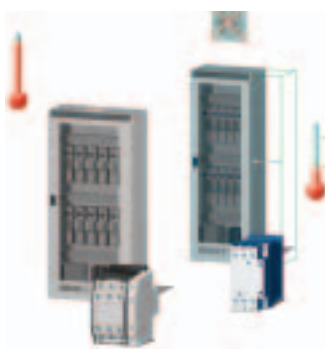
The key objective of the third step is the integration of energy-optimized components. At Eaton, energy consumption has been a central consideration in the development of components for years.



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



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.



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

## 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.

## 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 PowerXL variable frequency drives 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<sub>2</sub> 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](http://www.moeller.net/support)

## 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.





# 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.



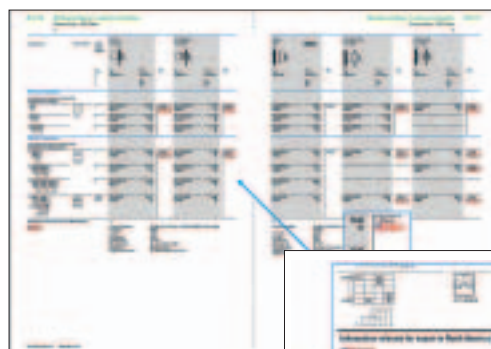
The greatest differences to the IEC world are in North America, i.e. the USA and Canada. For many newcomers to the export business, it is initially surprising to experience the very different approaches and solutions.

Special components, such as handles for main switches that can only be operated by the intentional switching of an

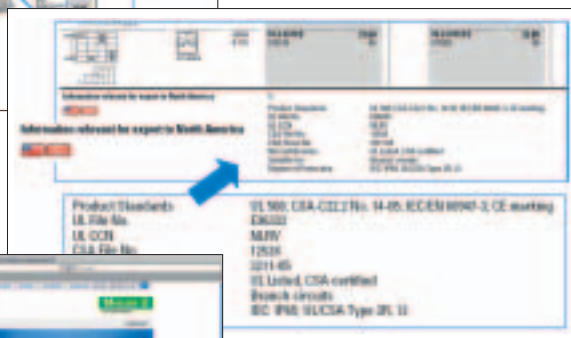


additional handle when the control panel door is opened, may sometimes be required for export to North America. Likewise, the European motor-protective circuit-breaker is only accepted with an upstream protective device or with larger air and creepage distances at the incoming terminals. Eaton is the competent partner of choice for export-related issues here.

## Qualified information is a critical key to success



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.



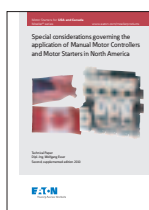
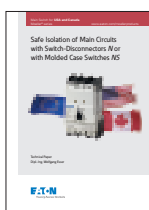
Up to 13 data items are listed here for each product, such as the suitability for use in feeders or branch circuits, the maximum operating voltage, or the North American degree of protection, such as UL / CSA Type 4X. The Main Catalogue also contains a glossary with explanations of the American terms.



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.

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 catalogs 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.

## 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 catalogs. 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 catalogs are of interest and keep up-to-date using the Update function.

## Intuitive browsing, searching and finding

Users can simply browse through the catalogs 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 catalogs. The "Eaton Catalogs" contain article numbers and type designations that are linked to the Online Catalog. 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 Online Catalog – find product details quickly and efficiently!

You can find comprehensive up-to-date product information at <http://ecat.moeller.net>

## Lookup

You can search by keywords, product names, article numbers, technical data: The search understands everything and takes you straight to the product you're looking for.

## Graphical navigation

Graphical representation of the fields of application and product groups.

## Selection aids

Tailored to the typical expert's approach, this search aid helps you quickly find the product you need.

## Data sheets

For every article the catalog can generate a technical data sheet, which you can convert to a PDF file for printing or saving with a single click.

## Parts lists

From your search results you can create a parts list that you can then send to your Eaton sales partner as a query.



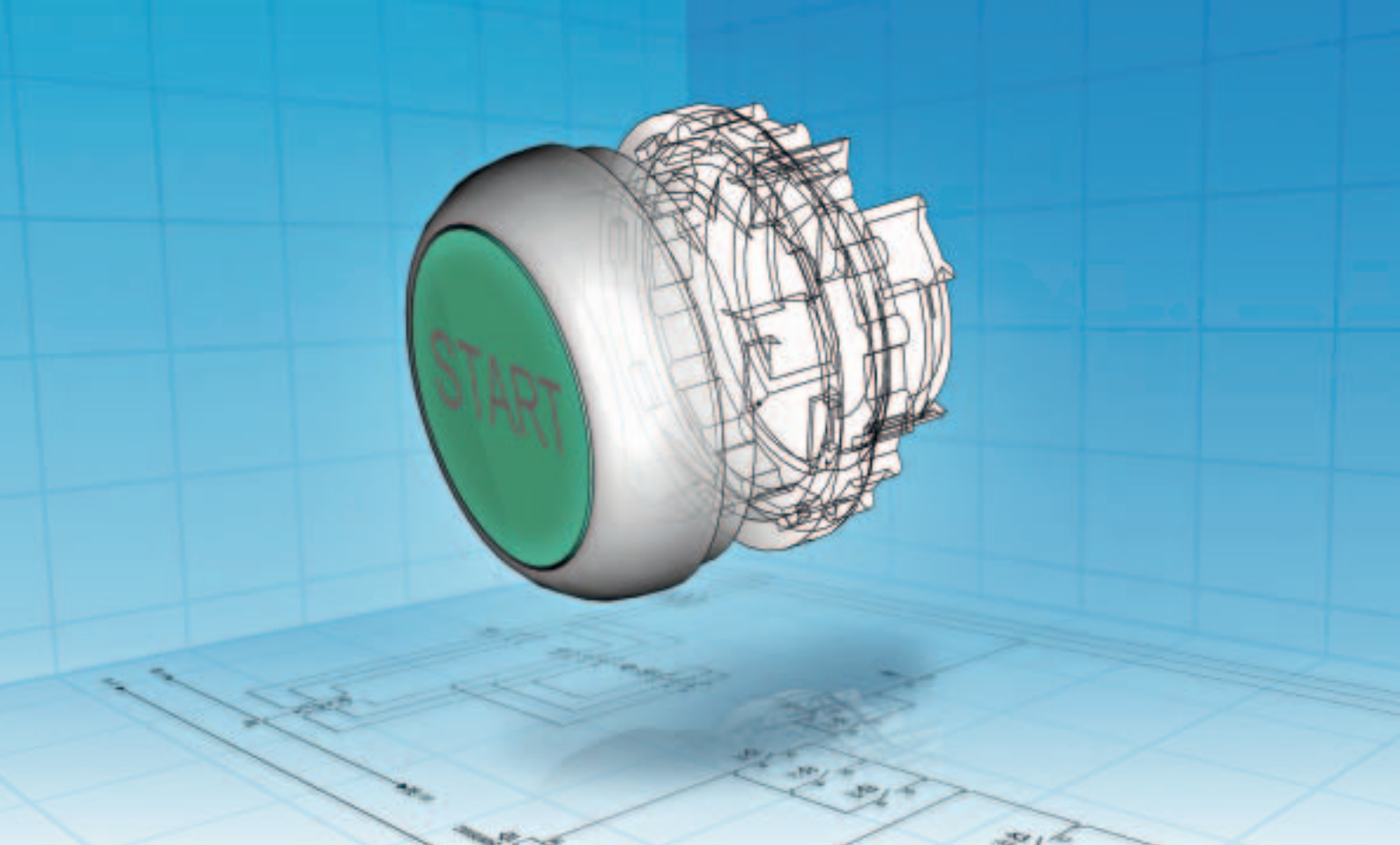
HTML data sheet; can be saved as PDF file.

A screenshot of the 'Parts list' feature in the Eaton Online Catalog. It displays a table with columns for 'Item', 'Qty', 'Photo', 'Part No.', 'Part Name', and 'Short Text'. The table contains several rows of product data, including part numbers and descriptions. Below the table, there are buttons for 'Delete product', 'Save changes', and 'Add new product'.

Parts list, e.g. for queries to Eaton Sales.

You can find comprehensive up-to-date information about Eaton's automation products and switchgear in our Online Catalog.





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



- 9,500 article data items and macros
- Convenient selection tool
- Version P8



- Models for approx. 10,000 products
- 70 different neutral & native formats

#### URL

[www.moeller.net/cad](http://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 9,500 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 10,000 products. Over 70 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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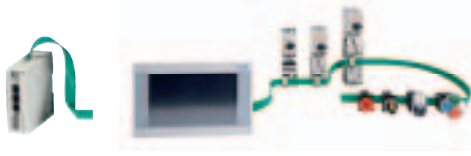
xSystem

xCommand

xStart

xEnergy





## Controls with SmartWire-DT interface

- HMI-PLC XV100
- PLC XC150
- easy800 control relay

## 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 110 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 XV102 – 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-DT interfaces
- Optimized robust plastic housing for small mounting dimensions
- CODESYS PLC/TargetVisu/WebVisu



### HMI/PLC XV112/152 – 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-DT 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



### Compact PLC XC152

- Programming via CODESYS
- Ethernet interface for communication and programming
- SmartWire-DT interface depending on the type
- Communication interface depending on the type: RS232, RS485, Profibus/MPI and CAN/easyNet

## 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

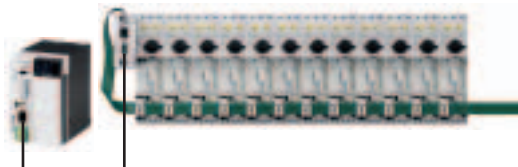
- Monochrome display with IP65 protection
- Display and enter bitmaps, bar graphs, texts and values
- Remote text display for all easyRelays
- Individual laser inscription (e.g. company name)



### 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

Any PLC

**SmartWire-DT with fieldbus interface**

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

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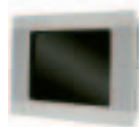
**Secure monitoring and processing with the ESR5 safety relay**

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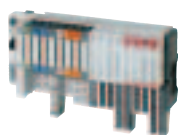
**HMI/PLC XV400/XVS400 – wide range of communication options**

- 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**

for HMI/PLC  
XI/ON  
Compact PLC  
Modular PLC

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**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 backplane bus
- Ethernet, USB, SD, CAN/easyNet interface
- Integrated web server

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**easy800 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

**Control relay easy800 with SmartWire-DT**

- easy800 with the direct connection to the communication system for switchgear SmartWire-DT
- Up to 99 devices with up to 166 inputs/outputs can be quickly interfaced and controlled via SmartWire-DT

**MFD-Titan I/O modules**

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

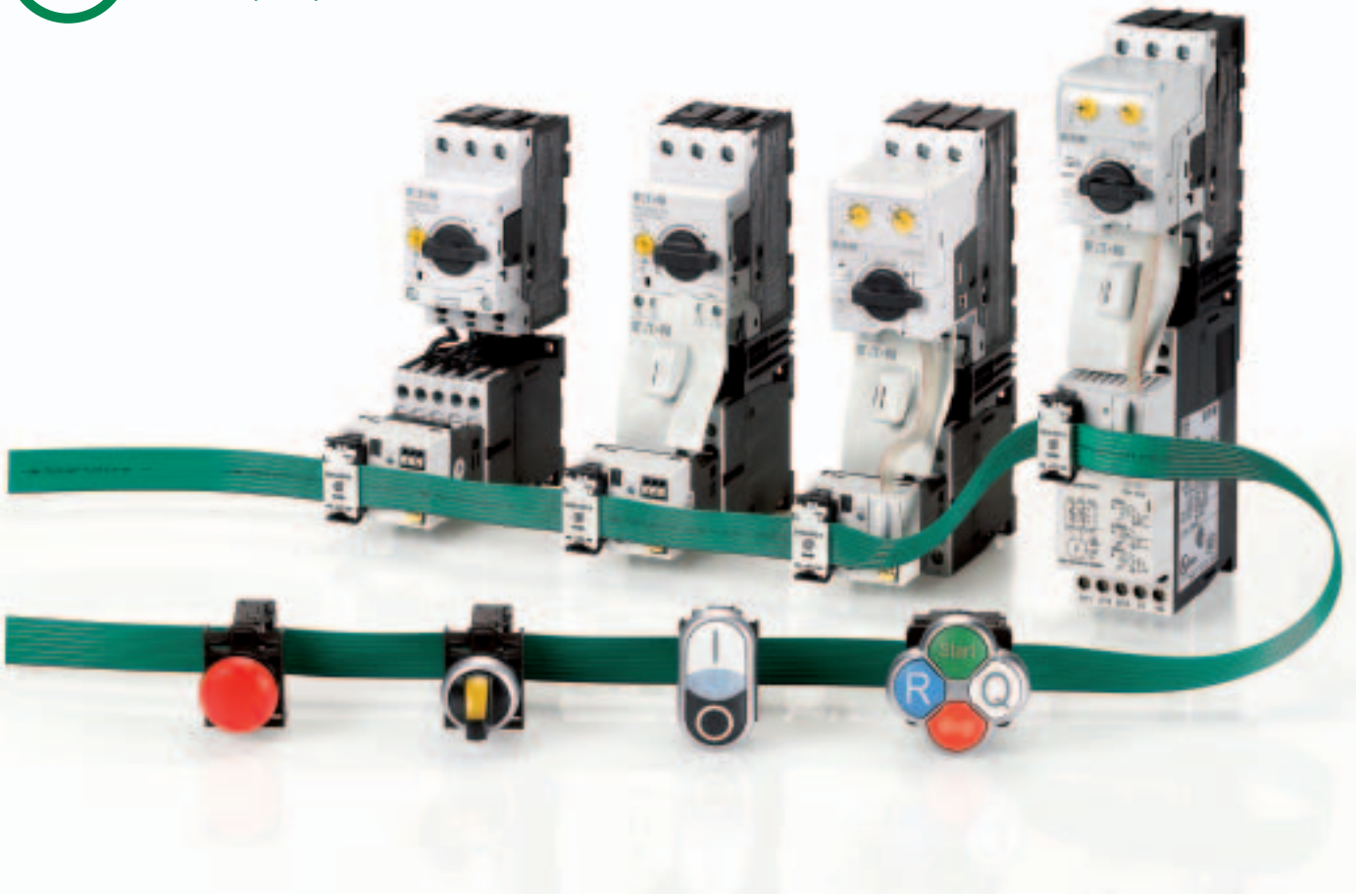
**MFD-Titan I/O modules temperature measuring**

- Pt100
- Ni1000

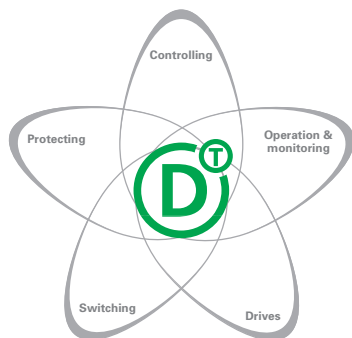
**Power supply easyPower and ELC-PS**

- Rated output voltage 24 V DC
  - Rated output currents up to 4.2 A
- Power supplies PSG**
- 1 or 3-phase devices up to 20 A
  - Output voltage range 22 - 28 V DC (PSG)

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## SmartWire-DT®. From Lean Connectivity to Lean Automation.



Lean Connectivity and Lean Automation are elements of the Lean Solution, which contain the engineering and the automation processes. Complex wiring becomes unnecessary, decentralized intelligence is created, entire device levels are eliminated, including of course the associated procurement and maintenance costs. 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.

SmartWire-DT is based on the tried-and-tested Eaton industrial switchgear and provides intelligent communication features. SmartWire-DT reduces the wiring effort and expense with many switchgear systems by up to 85% and helps along the entire value-added chain – from the design to the construction, to the commissioning up to system expansion – in the reduction of costs.



## Mit SmartWire-DT® the basis for lean Automation

Eaton offers various solutions for communication with higher-level controls. For this purpose, the user has three different interacting options of the SmartWire-DT network available for the control system. The programming system used defines the SmartWire-DT Master. Whether simple or complex control tasks, the SmartWire-DT application can be adapted to every application and thus reduces the engineering and time expenditure for wiring, test and commissioning.



### Lean Automation solutions – with CODESYS

A lean automation solution already starts with Eaton in the control level:

1. The HMI/PLC merges the most modern IT technologies with the classical PLC and HMI technologies. Control, visualization and data management tasks together with modern networking features are combined in one HMI/PLC device. The touch display controls of the XV100 series enable direct communication right down to the sensor level with the integrated SmartWire-DT interface.
2. The new compact PLC series XC152 combines a modern control architecture and comprehensive communication interfaces in a single device. In addition to Ethernet, they provide various combinations of network interfaces from Profibus-DP to CANopen. For Lean Automation solutions, the XC152 offers a feature for direct interfacing to the SmartWire-DT and thus enables communication with the switching device level using fewer components.



### SmartWire-DT® – twice as easy with easySoft

The new easy800 with SmartWire-DT combines the functions of an easy800 with the direct connection to the communication system SmartWire-DT. Instead of connecting the inputs and outputs individually to the control, they are simply connected via the SmartWire-DT line to the new EASY802-SWD and EASY806-SWD. Programming is implemented in the usual way in a ladder diagram using easySoft-Pro. The new easy800 with SmartWire-DT combines the simplicity of two systems and thus offers double the advantages in the area of control panel design.



### Open for every master with different gateways

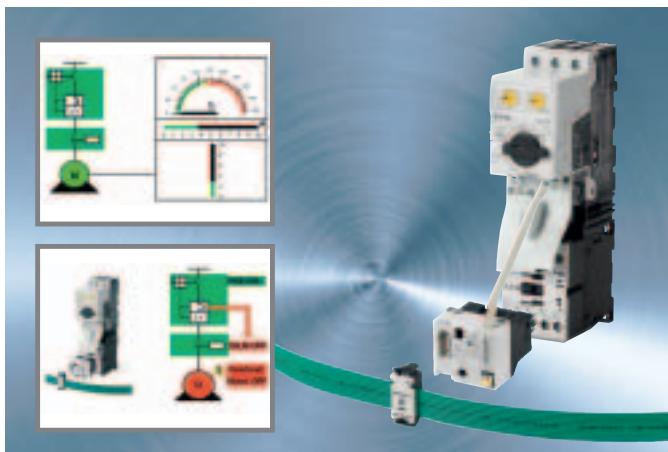
For communication with any control, Eaton offers gateways for the most differing standard fieldbus systems. Via the fieldbus interfaces for Profibus-DP, CANopen, Ethernet IP or Modbus-TCP, the SmartWire-DT can be connected to the control systems of many manufacturers.



### 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.

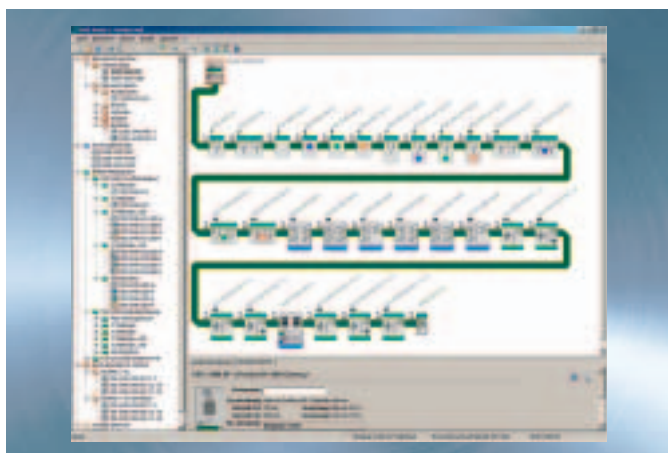


### SmartWire-DT: Intelligently logging circuit-breaker data

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.

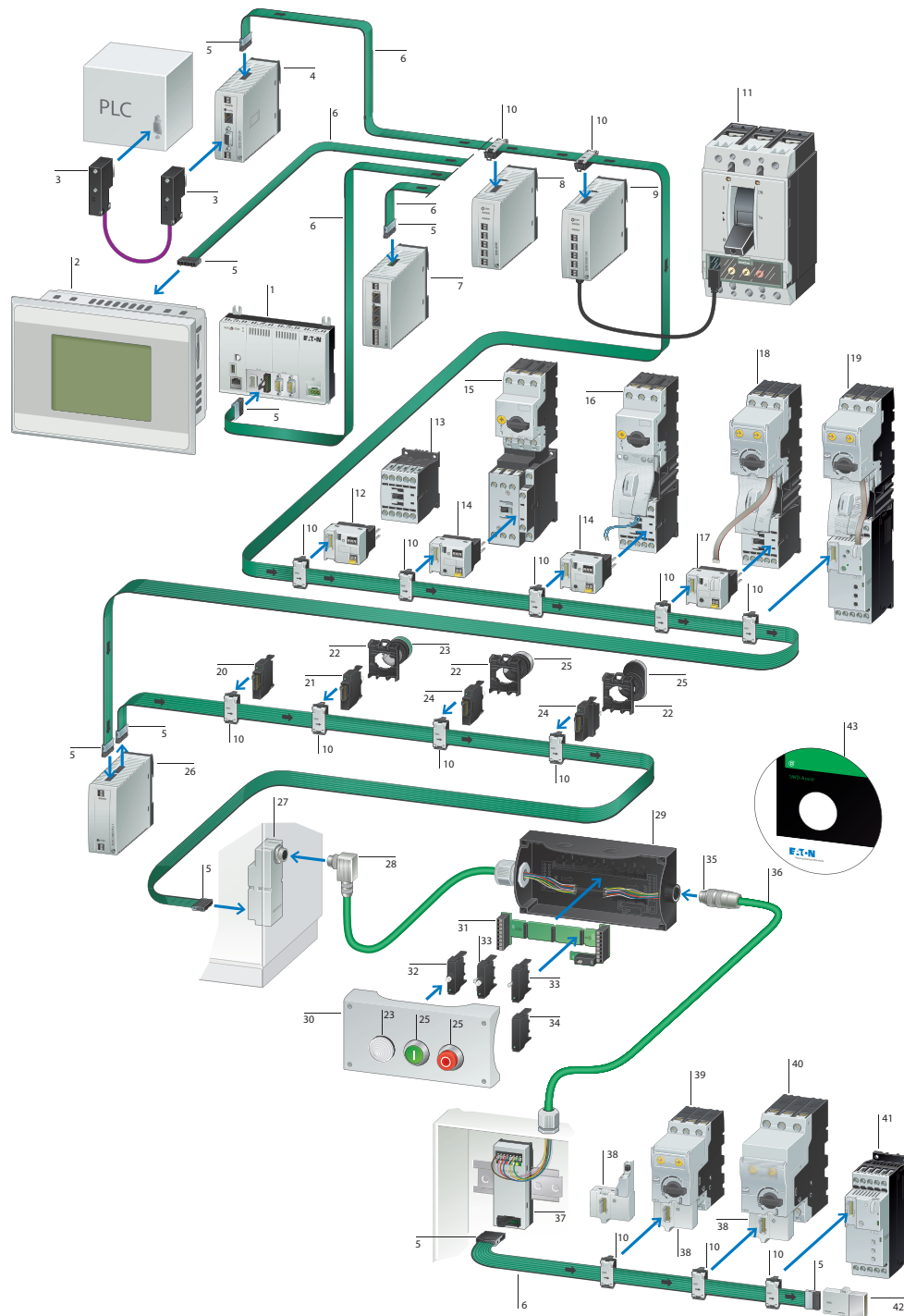
An optional remote operator can also be connected directly to the module. An energy measuring module also enables the logging of energy values and the measuring of energy consumption.





### 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.




- 1 SmartWire-DT PLC XC-152
- 2 SmartWire-DT HMI-PLC
- 3 SUB-D data plug, 9-pole
- 4 SmartWire-DT gateways
- 5 SmartWire-DT blade terminal, 8-pole
- 6 SmartWire-DT ribbon cable, 8-pole
- 7 easy800 control relay with SmartWire-DT
- 8 SmartWire-DT input/output modules
- 9 SmartWire-DT interface for NZM
- 10 SmartWire-DT device plug, 8-pole
- 11 NZM circuit-breaker
- 12 SmartWire-DT contactor module
- 13 DILM contactors
- 14 SmartWire-DT contactor module with Manual-0-Automatic switch
- 15 Motor-protective circuit-breaker
- 16 MSC motor starter
- 17 SmartWire-DT PKE module (motor starter)
- 18 Motor starter with PKE electronic motor protection
- 19 DS7 soft starter with PKE electronic motor protection
- 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 power feed module
- 27 SmartWire-DT control panel entry, ribbon to round cable
- 28 SmartWire-DT plug connector
- 29 RMQ-Titan surface mounting enclosure
- 30 RMQ-Titan surface mounting enclosure
- 31 SmartWire-DT card for function elements, base fixing
- 32 SmartWire-DT LED element for base fixing
- 33 SmartWire-DT function element for base fixing
- 34 SmartWire-DT universal slave, base fixing
- 35 SmartWire-DT plug connector
- 36 SmartWire-DT round cable, 8-pole
- 37 SmartWire-DT adapter ribbon/round cable for rail mounting
- 38 SmartWire-DT PKE module (motor-protective circuit-breaker)
- 39 PKE12, PKE32 motor-protective circuit-breaker
- 40 PKE65 motor-protective circuit-breaker
- 41 DS7 soft starter
- 42 SmartWire-DT network termination for 8-pole ribbon cable
- 43 SmartWire-DT planning and ordering tool, SWD-Assist

	Screen diagonal Inch	Resolution Pixel	built-in interfaces							Part no.	Article no.
			1 x Ethernet 100base-TX/10base-T	1 x RS485	1 x SmartWire-DT	1 x PROFIBUS/MPI	1 x USB host	1 x USB device	1 x SmartWire-DT		
Touch Panel SmartWire-DT											
HMI-PLC (PLC integrated) Resistiv-Touch mit TFT-Display, 64 k Farben Standard front with standard membrane (fully enclosed)											
Insulating enclosure and front plate											
	3.5	320 x 240 320 x 240	✓	-	-	-	-	✓	✓	XV-102-BE-35TQRC-10	153524
	5.7	640 x 480	✓	✓	✓	-	✓	-	✓	XV-102-E6-57TVRC-10	153525
	5.7	640 x 480	✓	✓	-	✓	✓	-	✓	XV-102-E8-57TVRC-10	153526
	7	800 x 480	✓	✓	✓	-	✓	✓	✓	XV-102-E6-70TWRC-10	153527
	7	800 x 480	✓	✓	-	✓	✓	✓	✓	XV-102-E8-70TWRC-10	153528
Metal enclosure and front plate											
	5.7	640 x 480	✓	✓	✓	-	✓	-	✓	XV-152-E6-57TVRC-10	166700
	5.7	640 x 480	✓	✓	-	✓	✓	-	✓	XV-152-E8-57TVRC-10	166701
	8.4		✓	✓	✓	-	✓	-	✓	XV-152-E6-84TVRC-10	166702
	8.4		✓	✓	-	✓	✓	-	✓	XV-152-E8-84TVRC-10	166703
	10.4		✓	✓	✓	-	✓	✓	✓	XV-152-E6-10TVRC-10	166704
	10.4		✓	✓	-	✓	✓	✓	✓	XV-152-E8-10TVRC-10	166705


	Built-in interfaces	Cycle time for 1 k of instructions (Bit, Byte) ms	Application/marker/retain data KByte	Part no.	Article no.
<b>SmartWire-DT compact PLC</b>					
24 V DC power supply remotely expandable Lot for memory card RUN/STOP switch and LED displays OPC Server Integrated Web server					
	RS232 SmartWire-DT	<0.04	64 MB/4 KB/32 KB	XC-152-E3-11	167850
	RS232 RS485 CAN/easyNet SmartWire-DT	<0.04	64 MB/4 KB/32 KB	XC-152-E6-11	167851
	RS232 RS485 Profibus/MPI SmartWire-DT	<0.04	64 MB/4 KB/32 KB	XC-152-E8-11	167852



**Instructions**



1) Products in preparation



	Inputs		SmartWire-DT	Outputs		Real time clock	Part no.	Article no.
	Digital	Of which can be used as outputs		Transistor	SmartWire-DT			
SmartWire-DT control relay easy800								
Combines the functionality of an easy800 with direct connection to switchgear communication system for SmartWire-DT Up to 99 SmartWire-DT modules with a total of up to 166 inputs/outputs can be connected via a SmartWire-DT lineSupply voltage 24 V DC								
	-	-	83	-	83	✓	EASY802-DC-SWD	152901
	4	2	83	2	83	✓	EASY806-DC-SWD	152902






		Baud Rates	Number of SmartWire-DT slaves	Part no.	Article no.
<b>SmartWire-DT Gateways</b>					
	For connection to PROFIBUS-DP field bus Separate diagnostics interface Separate diagnostics interface	up to 12 MBit/s	Max.58	<b>EU5C-SWD-DP</b>	116308
	For connection to CANopen® field bus Separate diagnostics interface Separate diagnostics interface	up to 1 MBit/s	Max.99	<b>EU5C-SWD-CAN</b>	116307
	For connection to the Ethernet-IP/MODBUS-TCP field bus Integrated Ethernet switch Separate diagnostics interface	10/100 MBit/s	Max.99	<b>EU5C-SWD-EIP-MODTCP</b>	153163

		Inputs Digital	of which can be used as analog	Outputs Relay	Transistor	Analog	Part no.	Article no.
<b>SmartWire-DT I/O modules</b>								
<b>Digital modules</b>								
For connection of digital I/O signals								
	Inputs with supply for sensor system.	4	-	-	-	-	<b>EU5E-SWD-4DX</b>	144060
		8	-	-	-	-	<b>EU5E-SWD-8DX</b>	116381
	The outputs are short-circuit proof.	4	-	-	4	-	<b>EU5E-SWD-4D4D</b>	116382
		4	-	2	-	-	<b>EU5E-SWD-4D2R</b>	116383
	The outputs are short-circuit proof.	-	-	-	8	-	<b>EU5E-SWD-X8D</b>	144061
<b>Analog modules</b>								
for connection of analog I/O signals								
	Inputs configurable: 0 - 10 V, 0 - 20 mA	-	4	-	-	-	<b>EU5E-SWD-4AX</b>	144062
	Inputs/outputs, configurable: 0 - 10 V, 0 - 20 mA	-	2	-	-	2	<b>EU5E-SWD-2A2A</b>	144063
	Configurable inputs: PT100, PT1000, Ni1000	-	4	-	-	-	<b>EU5E-SWD-4PT</b>	144064

		Part no.	Article no.
<b>SmartWire-DT protective modules</b>			
For connecting the contactors to SmartWire-DT Per contactor 1 module necessary.			
	Messages Switch status Contactor, status of the digital inputs 1 and 2 Commands Contactor actuation	<b>DIL-SWD-32-001</b>	118560
	Messages Contactor switching position, status of the digital inputs 1 and 2, 1-0-A switch position Commands Contactor actuation	<b>DIL-SWD-32-002</b>	118561
<b>SmartWire-DT NZM module for circuit-breaker NZM</b>			
The module implements the data connection between the NZM2/3/4 with electronic release and the SmartWire-DT.			
	The switch can also be switched remotely with a motor operator. Retentive memory for energy data (kWh) Energy data is transmitted through digital input (S0) from an external energy measuring module NZN...-XMC-S0. Two digital inputs for the switch status 2 transistor outputs for remote switching A connection cable for the circuit-breaker and two NZM auxiliary contacts (1 x NO, 1 x NC) are included as standard.  Messages Status data NZM: ON/OFF/TRIPPED Load warnings Reason for last trip Actual current value Switch type Actual settings of the rotary coding switches	<b>NZM-XSWD-704</b>	135530

	Part no.	Article no.
<b>SmartWire-DT PKE module (motor-starter combinations)</b>		
For connecting the motor-starter combination to SmartWire-DT, "expanded" 24 VDC version (MSC-DEA...) up to 15 kW.		
 <p>Surface-mounting to contactors. One module per contactor and PKE necessary. Additional SWD contactor module required for actuation of reversing starter. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Selectable overload relay function (ZMR) for switching off the contactor on overload. Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used. Connecting cable between module and trip block PKE-XTUA-... included as standard.</p> <p>Messages Switch position contactor/PKE/1-0-A switch Motor current in % Thermal motor image in % Trip indications (Overload, Short-circuit,...) Set value of overload releases Set time lag (CLASS) Part no. of trip block</p> <p>Commands Contactor actuation Activation Overload relay function (ZMR)</p>	<b>PKE-SWD-32</b>	126895
<b>SmartWire-DT PKE (motor protective circuit breaker)</b>		
For connecting the PKE motor-protective circuit-breaker with trip block to SmartWire-DT		
 <p>Fitted on PKE motor-protective circuit-breaker</p> <p>Messages Contactor state PKE Motor current in % Thermal motor image in % Trip indications (Overload, Short-circuit,...) Set value of overload releases Set time lag (CLASS) Part no. of trip block</p> <p>Commands Remote disconnection of motor-protective circuit-breaker</p>	<b>PKE-SWD-SP</b>	150614

Contacts		Colour	Front fixing Part no.	Article no.	Base fixing Part no.	Article no.
<b>SmartWire-DT RMQ connections</b>						
for combination with RMQ-Titan operating elements M22-...						
Function elements						
	1 changeover contact	without LED	<b>M22-SWD-K11</b>	115964	<b>M22-SWD-KC11</b>	115995
	2 changeover contact	without LED	<b>M22-SWD-K22</b>	115965	<b>M22-SWD-KC22</b>	115996
	1 changeover contact	○	<b>M22-SWD-K11LED-W</b>	115972	<b>M22-SWD-K11LEDC-W</b>	116003
	1 changeover contact	●	<b>M22-SWD-K11LED-B</b>	115973	<b>M22-SWD-K11LEDC-B</b>	116004
	1 changeover contact	●	<b>M22-SWD-K11LED-G</b>	115974	<b>M22-SWD-K11LEDC-G</b>	116005
	1 changeover contact	●	<b>M22-SWD-K11LED-R</b>	115975	<b>M22-SWD-K11LEDC-R</b>	116006
	2 changeover contact	○	<b>M22-SWD-K22LED-W</b>	115978	<b>M22-SWD-K22LEDC-W</b>	116009
	2 changeover contact	●	<b>M22-SWD-K22LED-B</b>	115979	<b>M22-SWD-K22LEDC-B</b>	116010
	2 changeover contact	●	<b>M22-SWD-K22LED-G</b>	115980	<b>M22-SWD-K22LEDC-G</b>	116011
	2 changeover contact	●	<b>M22-SWD-K22LED-R</b>	115981	<b>M22-SWD-K22LEDC-R</b>	116012
LED elements						
	-	○	<b>M22-SWD-LED-W</b>	115966	<b>M22-SWD-LEDC-W</b>	115997
	-	●	<b>M22-SWD-LED-B</b>	115967	<b>M22-SWD-LEDC-B</b>	115998
	-	●	<b>M22-SWD-LED-G</b>	115968	<b>M22-SWD-LEDC-G</b>	115999
	-	●	<b>M22-SWD-LED-R</b>	115969	<b>M22-SWD-LEDC-R</b>	116000

			Part no.	Article no.
<b>Power feeder modules</b>				
	Power feeder modules	For additional control voltage feeder for the motor starter and contactors	<b>EU5C-SWD-PF1-1</b>	116309
		For the formation of emergency switching off groups for motor starters and contactors for the supply of other SmartWire-DT slaves	<b>EU5C-SWD-PF2-1</b>	116380
	Flat band conductor	For additional control voltage feeder for the motor starter and contactors		
		For the formation of emergency switching off groups for motor starters and contactors		
		Length 100 m	<b>SWD4-100LF8-24</b>	116026
		Length 3 m	<b>SWD4-3LF8-24-2S</b>	116027
		Length 5 m	<b>SWD4-5LF8-24-2S</b>	116028
		Length 10 m	<b>SWD4-10LF8-24-2S</b>	116029
	External device plugs	For connecting the ribbon cable to SmartWire-DT modules	<b>SWD4-8SF2-5</b>	116022
	Blade terminal	For connecting the ribbon cable to the gateway, power feeder module, coupling, bus termination resistor	<b>SWD4-8MF2</b>	116023
	Link	For bridging open mounting locations for external device plugs Front fixing	<b>SWD4-SEL8-10</b>	116021
	Coupling	Coupling blade terminal 8-pole	<b>SWD4-8SFF2-5</b>	116024
	Network terminator	For connecting each SmartWire-DT line	<b>SWD4-RC8-10</b>	116020
	Cable adapters	for connection flat cable (plug) on round cable (terminal)	<b>SWD4-8FRF-10</b>	121377
Switch cabinet bushing for transition from SmartWire-DT ribbon cable to round cable double conductor run pluggable				
		Connection round cable via socket	<b>SWD4-SFL8-20</b>	121380
		Connection round cable via plug	<b>SWD4-SML8-20</b>	121381
	Housing bushing socket	For flush mounting in M22-I... surface mounting enclosure		
		8 pole socket	<b>SWD4-SF8-20</b>	116031
		8-pinplug connector	<b>SWD4-SM8-20</b>	116032
	Round conductor	For connecting the SmartWire-DT module outside the control panel	<b>SWD4-50LR8-24</b>	116030
		8 pole	<b>SWD4-250LR8-24</b>	144878
		HK-S0-Li2YY, 8 mm diameter		
	Plug connectors	8 pole socket	<b>SWD4-SF8-67</b>	116033
		8-pinplug connector	<b>SWD4-SM8-67</b>	116034
		8 pole socket	<b>SWD4-SF8-67W</b>	116035
		8-pinplug connector	<b>SWD4-SM8-67W</b>	116036
	Tools for plugs	Pliers for connecting external device plug and ribbon cable	<b>SWD4-CRP-1</b>	116025
		Pliers for making contacts with blade terminals and ribbon cables	<b>SWD4-CRP-2</b>	116699
		Insert for toggle lever press of external device plugs	<b>SWD4-CRPAD-1</b>	116700
		Insert for toggle lever press of blade terminal	<b>SWD4-CRPAD-2</b>	116701
	SmartWire-DT universal slave	for configured but not yet installed SmartWire-DT slaves		
		Front fixing	<b>M22-SWD-NOP</b>	147637
		Base fixing	<b>M22-SWD-NOPC</b>	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





### 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



### 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



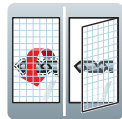
## ESR5 safety relays

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



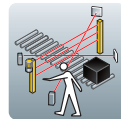
Stopping in an emergency



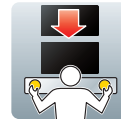
Safety gate monitoring



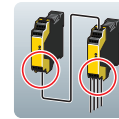
Electro-sensitive protective equipment (ESPSE)



ESPE with muting function



Two-hand control



Contact expansion



Overspeed monitoring



Zero speed monitoring

## ES4P

- Standard and safety circuit diagram
- easyNet / easyLink



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## ESR5

- Single-channel monitoring



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- Dual-channel monitoring



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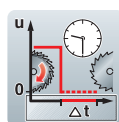
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### easySafety control relay

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



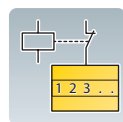
Safety timing relay



Mode selection



Enabling switch



Feedback loop

Enable/  
signalling  
contacts

Inputs/  
outputs

Display

Mounting  
width

Safety classi-  
fications

Part no.  
Article no.

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



# XV HMI/PLC: Systematic Visualization and Control



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.

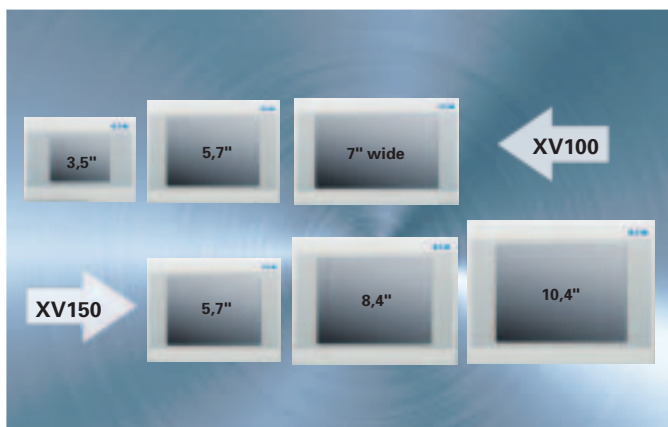




### XV100 and XV150 with SmartWire-DT master

High performance display PLC as cost-efficient system solution.

- With 3.5", 5.7" 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
- Web server



### XV100, XV150

Outstanding functionality and performance in the compact class.

- With 3.5", 5.7" 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
- Web server



### XV400

Additional functions make the XV400 a universal solution.

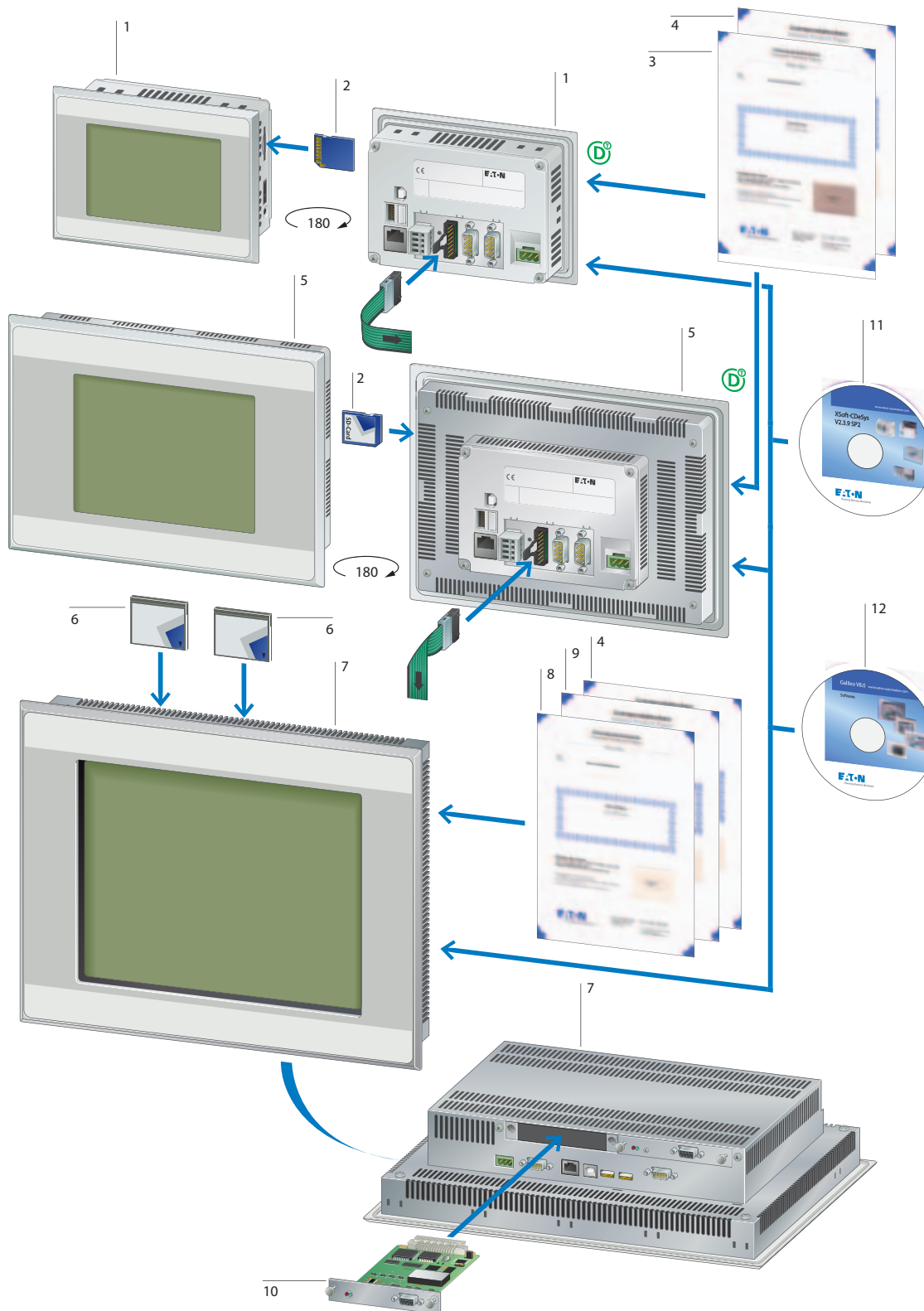
- 5.7", 8.4", 10.4", 12.1" and 15" TFT with high-end aluminum or stainless steel front and metal housing
- Infra-red or resistive touch
- Optional multiprotocol board (> 100 protocols)
- Profibus/MPI or CAN/easyNet and RS485 /RS232
- Universal type for HMI and HMI/PLC with license system
- Special approvals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



### Software

Flexibility through market standards.

- Visualization is implemented either via the intuitive design tool Galileo or the CODESYS TargetVisu
- CODESYS PLC with integrated I/Oassistant
- CODESYS WebVisu
- Windows CE








- |   |  |    |  |
|---|--|----|--|
| 1 | XV-102 HMI/PLC, resistive touch 3.5", 5.7" and 7"-widescreen                       | 7  | XV(S)-400, HMI/PLC, Infra-red or resistive touch 5.7", 8.4", 10.4", 12.1", 15"     |
| 2 | SD memory card   | 8  | XV license certificate: Increased device functionality by assigning license points |
| 3 | XV license certificate: Increased device functionality by assigning license points | 9  | OS upgrade license   |
| 4 | Product license certificate for communication expansion of the on-board interface  | 10 | Communication module   |
| 5 | XV-152 HMI/PLC, resistiv touch 5.7", 8.4 and 10.4"                                 | 11 | XSoft-CODESYS  |
| 6 | CompactFlash memory card   | 12 | Galileo  |



### 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.

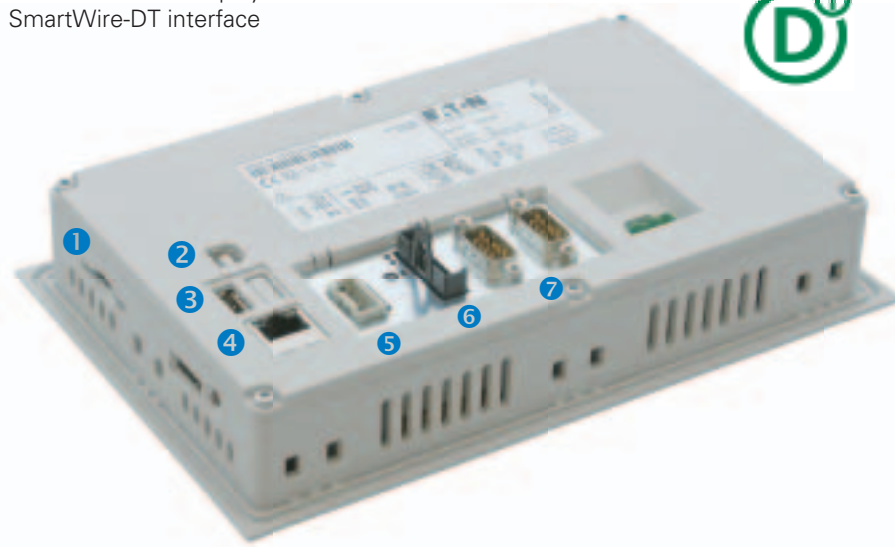
- Display sizes 3.5", 5.7" and 7" widescreen
- Small mounting depth
- Ethernet interface onboard
- USB device
- Communication interfaces depending on type: RS232, RS485, Profibus/MPI and CAN/easyNet
- SmartWire-DT interface depending on type
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64 MB
- 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.	
<b>XV100 3.5"</b>									
<ul style="list-style-type: none"> <li>• Ethernet interface</li> <li>• Approval UL508, cUL</li> </ul>		<ul style="list-style-type: none"> <li>• Mounting dimensions 123 x 87 mm</li> <li>• Resolution 320 x 240</li> </ul>							
	No	32 gray-scales	-	-	-	-	<b>XV-102-A0-35MQR-10</b> 141759		
			-	-	•	-	<b>XV-102-A2-35MQR-10</b> 141820		
			•	-	-	-	<b>XV-102-A3-35MQR-10</b> 141821		
			-	•	-	-	<b>XV-102-A4-35MQR-10</b> 141822		
			•	-	-	•	<b>XV-102-A5-35MQR-10</b> 141823		
	Can be retrofitted	64 k colors	-	-	-	-	<b>XV-102-B0-35TQR-10</b> 140007		
			-	-	•	-	<b>XV-102-B2-35TQR-10</b> 140008		
			•	-	-	-	<b>XV-102-B3-35TQR-10</b> 140009		
			-	•	-	-	<b>XV-102-B4-35TQR-10</b> 140010		
			•	-	-	•	<b>XV-102-B5-35TQR-10</b> 140011		
	Inte-grated	32 gray-scales	-	-	-	-	<b>XV-102-B0-35MQR-10- PLC</b> 140012		
			•	-	-	-	<b>XV-102-B3-35MQR-10- PLC</b> 140013		
			-	•	-	-	<b>XV-102-B4-35MQR-10- PLC</b> 140014		
			•	-	-	•	<b>XV-102-B5-35MQR-10- PLC</b> 140015		
			-	•	-	•	<b>XV-102-B6-35MQR-10- PLC</b> 140016		
	Inte-grated	64 k colors	-	-	-	-	<b>XV-102-B8-35MQR-10- PLC</b> 140017		
			-	-	-	-	<b>XV-102-B0-35TQR-10- PLC</b> 140018	<b>XV-102-BE-35TQRC-10</b> 153524	
			•	-	-	-	<b>XV-102-B3-35TQR-10- PLC</b> 140019		
			-	•	-	-	<b>XV-102-B4-35TQR-10- PLC</b> 140020		
			•	-	-	•	<b>XV-102-B5-35TQR-10- PLC</b> 140021		
			-	•	-	•	<b>XV-102-B6-35TQR-10- PLC</b> 140022		
			-	•	•	-	<b>XV-102-B8-35TQR-10- PLC</b> 140023		






# XV100

HMI/PLC with touch display

XV100 with a 7" display and SmartWire-DT interface



- ① SD memory card
- ② USB device
- ③ USB host
- ④ Ethernet
- ⑤ POW and AUX 24 V power supplies
- ⑥ SmartWire-DT interface
- ⑦ Onboard interfaces, depending on type

	PLC function	Color	RS232	RS485	Profibus/MPI	CAN/easyNet	Part no. Article no.	Part no. Article no.	
<b>XV100 5.7"</b>									
<ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Approval UL508, cUL</li> </ul>			<ul style="list-style-type: none"> <li>Mounting dimensions 157 x 117 mm</li> <li>Resolution 640 x 480</li> </ul>						
	Can be retrofitted	64 k	●	-	-	-	<b>XV-102-D0-57TVR-10</b> 142530		
			●	●	-	-	<b>XV-102-D4-57TVR-10</b> 150620		
			●	●	-	●	<b>XV-102-D6-57TVR-10</b> 142531		
			●	●	●	-	<b>XV-102-D8-57TVR-10</b> 142532		
	Inte-grated	64 k	● / -	●	-	●	<b>XV-102-D6-57TVRC-10</b> 142533	<b>XV-102-E6-57TVRC-10</b> 153525	
			● / -	●	●	-	<b>XV-102-D8-57TVRC-10</b> 142534	<b>XV-102-E8-57TVRC-10</b> 153526	
Variant without front frame from rear mounting 	Inte-grated	64 k	●	●	-	●	<b>XV-112-D6-57TVRC-00</b> 153469		
<b>XV100 7" widescreen</b>									
<ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Approval UL508, cUL</li> </ul>			<ul style="list-style-type: none"> <li>Mounting dimensions 197 x 122 mm</li> <li>Resolution 800 x 480</li> </ul>						
	Can be retrofitted	64 k	●	-	-	-	<b>XV-102-D0-70TWR-10</b> 142535		
			●	●	-	-	<b>XV-102-D4-70TWR-10</b> 150621		
			●	●	-	●	<b>XV-102-D6-70TWR-10</b> 142536		
			●	●	●	-	<b>XV-102-D8-70TWR-10</b> 142537		
	Inte-grated	64 k	● / -	●	-	●	<b>XV-102-D6-70TWRC-10</b> 142538	<b>XV-102-E6-70TWRC-10</b> 153527	
			● / -	●	●	-	<b>XV-102-D8-70TWRC-10</b> 142539	<b>XV-102-E8-70TWRC-10</b> 153528	
Variant without front frame from rear mounting 	Inte-grated	64 k	●	-	-	2 x	<b>XV-112-DB-70TWRC-00</b> 153470		








### 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.

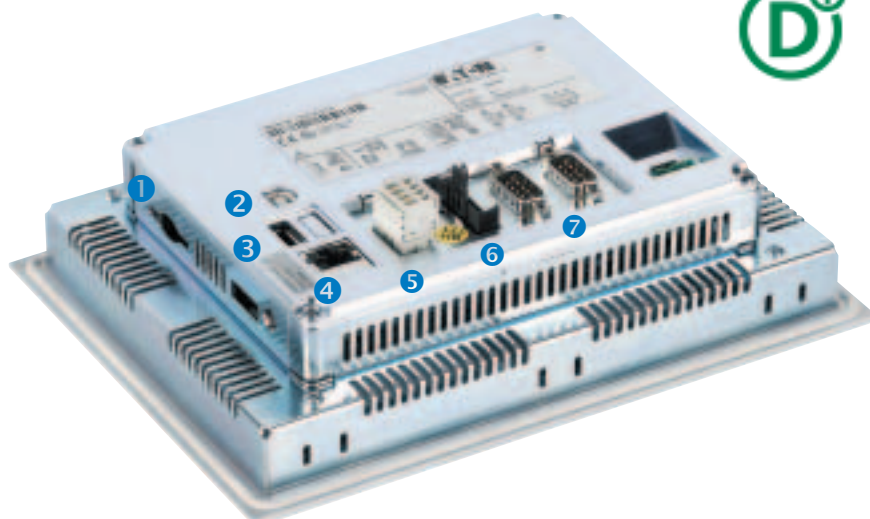
- Display sizes 5,7", 8,4" and 10,4"
- Small mounting depth
- Ethernet and RS232 interface onboard
- USB host
- Communication interface depending on type: RS232, RS485, Profibus/MPI and CAN/easyNet
- SmartWire-DT interface depending on type
- Processor: RISC CPU, 32-bit, 400 MHz
- OS, program and data memory: 64 MB
- 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.	
<b>XV150 5.7"</b> <ul style="list-style-type: none"><li>• Ethernet interface</li><li>• USB host</li><li>• Approval UL508, cUL</li><li>• Mounting dimensions 198 x 142 mm</li><li>• Resolution 640 x 480</li></ul>									
	Can be retrofitted	64 k colors	●	-	-	-	<b>XV-152-D0-57TVR-10</b> 150525		
			●	●	-	-	<b>XV-152-D4-57TVR-10</b> 150526		
			●	●	-	●	<b>XV-152-D6-57TVR-10</b> 150527		
			●	●	●	-	<b>XV-152-D8-57TVR-10</b> 150528		
	Inte-grated	64 k colors	● / -	●	-	●	<b>XV-152-D6-57TVRC-10</b> 150529	<b>XV-152-E6-57TVRC-10</b> 166700	
			● / -	●	●	-	<b>XV-152-D8-57TVRC-10</b> 150600	<b>XV-152-E8-57TVRC-10</b> 166701	
<b>XV150 8.4"</b> <ul style="list-style-type: none"><li>• Ethernet interface</li><li>• USB host</li><li>• Approval UL508, cUL</li><li>• Mounting dimensions 261 x 194 mm</li><li>• Resolution 640 x 480</li></ul>									
	Can be retrofitted	64 k colors	●	-	-	-	<b>XV-152-D0-84TVR-10</b> 150601		
			●	●	-	-	<b>XV-152-D4-84TVR-10</b> 150602		
			●	●	-	●	<b>XV-152-D6-84TVR-10</b> 150603		
			●	●	●	-	<b>XV-152-D8-84TVR-10</b> 150604		
	Inte-grated	64 k colors	● / -	●	-	●	<b>XV-152-D6-84TVRC-10</b> 150605	<b>XV-152-E6-84TVRC-10</b> 166702	
			● / -	●	●	-	<b>XV-152-D8-84TVRC-10</b> 150606	<b>XV-152-E8-84TVRC-10</b> 166703	



# XV150

HMI/PLC with Touchdisplay

XV150 with SmartWire-DT interface



- ① SD memory card
- ② USB device
- ③ USB Host
- ④ Ethernet
- ⑤ POW and AUX  
24-V power supplies
- ⑥ SmartWire-DT interface
- ⑦ On-board interfaces,  
depending on part no.





	PLC Function	Color	RS232	RS485	Profibus/ MPI	CAN/ easyNet	part no. Article no.	part no. Article no.	
<b>XV150 10.4"</b> <ul style="list-style-type: none"><li>Ethernet interface</li><li>USB Host</li><li>UL508, cUL approvals</li><li>Fitting dimensions 329 x 238 mm</li><li>Resolution 640 x 480</li></ul>									
	Extend- able	64 k Colors	✓	-	-	-	<b>XV-152-D0-10TVR-10</b> 150607		
			✓	✓	-	-	<b>XV-152-D4-10TVR-10</b> 150608		
			✓	✓	-	✓	<b>XV-152-D6-10TVR-10</b> 150609		
			✓	✓	✓	-	<b>XV-152-D8-10TVR-10</b> 150610		
	Inte- grated	64 k Colors	✓ / -	✓	-	✓	<b>XV-152-D6-10TVRC-10</b> 150611	<b>XV-152-E6-10TVRC-10</b> 166704	
		✓ / -	✓	✓	-	<b>XV-152-D8-10TVRC-10</b> 150612	<b>XV-152-E8-10TVRC-10</b> 166705		



### XV400

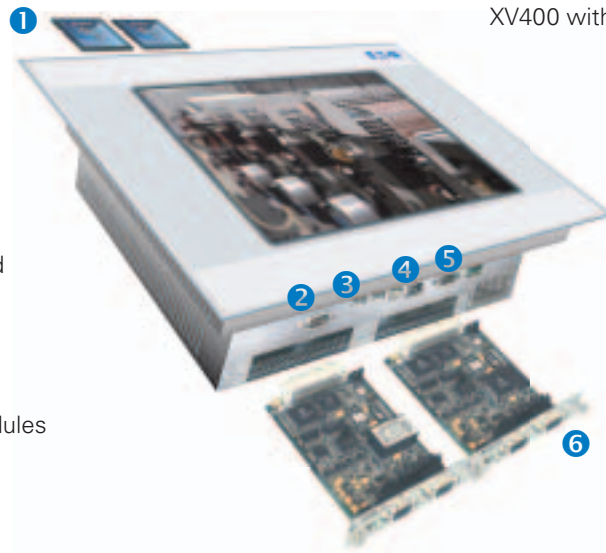
With one or two communication modules, the devices of the XV400 series offer a wide range of communication options. The robust infra-red touch technology enables use even in the harshest environments.

- 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: 64 MB
- 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.
<b>XV400 5.7"</b>						
<ul style="list-style-type: none"> <li>• Ethernet and USB host interface</li> <li>• Adjustable 256 or 65,536 colors</li> <li>• Approval UL, cUL</li> <li>• Mounting dimensions 198 x 142 mm</li> <li>• Resolution 320 x 240</li> </ul>						
	Can be retrofitted	Resistive / Standard	1 x	•	•	<b>XV-450-57TQB-1-10</b> 139899
	Can be retrofitted	Infra-red / Standard	1 x	•	•	<b>XV-460-57TQB-1-10</b> 139897
	Can be retrofitted	Infra-red / Stainless steel	1 x	•	•	<b>XV-460-57TQB-1-50</b> 139898
<b>XV400 8.4"</b>						
<ul style="list-style-type: none"> <li>• Ethernet and USB host interface</li> <li>• Adjustable 256 or 65,536 colors</li> <li>• Approval UL, cUL</li> <li>• Mounting dimensions 261 x 194 mm</li> <li>• Resolution 640 x 480</li> </ul>						
	Can be retrofitted	Infra-red / Standard	1 x	•	•	<b>XV-460-84TVB-1-10</b> 139900

# XV400

HMI/PLC with touch display





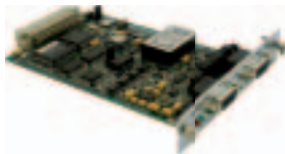
XV400 with 10.4" display

- ① 2 x CompactFlash memory card
- ② CAN/easyNet interface
- ③ 2 x USB host, 1 x USB device
- ④ Ethernet interface
- ⑤ RS232 interface
- ⑥ 2 x slot for communication modules

	PLC function	Touch / Front	Optional communication modules	RS232	CAN/ easyNet	Part no. Article no.
<b>XV400 10.4"</b> <ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Adjustable 256 or 65'536 colors</li> <li>Approval UL, cUL</li> </ul>						
<ul style="list-style-type: none"> <li>Mounting dimensions 329 x 238 mm</li> <li>Resolution 640 x 480</li> </ul>						
	Can be retrofitted	Resistive / Standard	2 x	•	•	<b>XV-430-10TVB-1-10</b> 139902
	Can be retrofitted	Infra-red / Standard	2 x	•	•	<b>XV-440-10TVB-1-10</b> 139904
	Can be retrofitted	Infra-red / Stainless steel	2 x	•	•	<b>XV-440-10TVB-1-50</b> 139908
<b>XV400 12.1"</b> <ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Adjustable 256 or 65'536 colors</li> <li>Approval UL, cUL</li> </ul>						
<ul style="list-style-type: none"> <li>Mounting dimensions 344 x 262 mm</li> <li>Resolution 800 x 600</li> </ul>						
	Can be retrofitted	Resistive / Standard	2 x	•	•	<b>XV-430-12TSB-1-10</b> 139909
	Can be retrofitted	Infra-red / Standard	2 x	•	•	<b>XV-440-12TSB-1-10</b> 139911
	Can be retrofitted	Infra-red / Stainless steel	2 x	•	•	<b>XV-440-12TSB-1-50</b> 139915



	PLC function	Touch / Front	Optional communication modules	RS232	CAN/ easyNet	Part no. Article no.
<b>XV400 15"</b> <ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Adjustable 256 or 65,536 colors</li> <li>Approval UL, cUL</li> <li>Mounting dimensions 410 x 315 mm</li> <li>Resolution 1024 x 768</li> </ul>						
	Can be retrofitted	Infra-red / Standard	2 x	●	●	<b>XV-460-15TXB-1-10</b> 139916
	Can be retrofitted	Infra-red / Stainless steel	2 x	●	●	<b>XV-460-15TXB-1-50</b> 139918

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

# XVS400






HMI/PLC with touch display



## 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: 64 MB
- 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.
<b>XVS400 5.7"</b> <ul style="list-style-type: none"> <li>• Ethernet and USB host interface</li> <li>• Adjustable 256 or 65'536 colors</li> <li>• Approval UL, cUL</li> </ul>						
<ul style="list-style-type: none"> <li>• Mounting dimensions 198 x 142 mm</li> <li>• Resolution 320 x 240</li> </ul>						
	Can be retrofitted	Resistive / Standard	-	•	•	<b>XVS-450-57MPI-1-10</b> 139969
	Can be retrofitted	Infra-red / Standard	-	•	•	<b>XVS-460-57MPI-1-10</b> 139970
<b>XVS400 8.4"</b> <ul style="list-style-type: none"> <li>• Ethernet and USB host interface</li> <li>• Adjustable 256 or 65'536 colors</li> <li>• Approval UL, cUL</li> </ul>						
<ul style="list-style-type: none"> <li>• Mounting dimensions 261 x 194 mm</li> <li>• Resolution 640 x 480</li> </ul>						
	Can be retrofitted	Infra-red / Standard	-	•	•	<b>XVS-460-84MPI-1-10</b> 139971
<b>XVS400 10.4"</b> <ul style="list-style-type: none"> <li>• Ethernet and USB host interface</li> <li>• Adjustable 256 or 65'536 colors</li> <li>• Approval UL, cUL</li> </ul>						
<ul style="list-style-type: none"> <li>• Mounting dimensions 329 x 238 mm</li> <li>• Resolution 640 x 480</li> </ul>						
	Can be retrofitted	Resistive / Standard	-	•	•	<b>XVS-430-10MPI-1-10</b> 139972
	Can be retrofitted	Infra-red / Standard	-	•	•	<b>XVS-440-10MPI-1-10</b> 139973

XVS400 with 12.1" display



- ① 2 x CompactFlash memory card
- ② RS232 interface
- ③ Ethernet interface
- ④ 2 x USB host, 1 x USB device
- ⑤ Profibus/MPI interface

	PLC function	Touch / Front	Optional communication modules	RS232	Profibus/ MPI	Part no. Article no.
<b>XVS400 12.1"</b> <ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Adjustable 256 or 65,536 colors</li> <li>Approval UL, cUL</li> <li>Mounting dimensions 344 x 262 mm</li> <li>Resolution 800 x 600</li> </ul>						
	Can be retrofitted	Resistive / Standard	-	●	●	<b>XVS-430-12MPI-1-10</b> 139974
	Can be retrofitted	Infra-red / Standard	-	●	●	<b>XVS-440-12MPI-1-10</b> 139975
<b>XVS400 15"</b> <ul style="list-style-type: none"> <li>Ethernet and USB host interface</li> <li>Adjustable 256 or 65,536 colors</li> <li>Approval UL, cUL</li> <li>Mounting dimensions 410 x 315 mm</li> <li>Resolution 1024 x 768</li> </ul>						
	Can be retrofitted	Infra-red / Standard	-	●	●	<b>XVS-460-15MPI-1-10</b> 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 1.5 m
- Ethernet, USB host and RS232 interface onboard
- Processor: Xscale PXA 270, 416MHz
- OS, program and data memory: 64 MB
- 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.
<b>XVM400 6.5"</b> <ul style="list-style-type: none"> <li>• Ethernet, USB host and RS232 interface</li> <li>• 65,536 colors</li> <li>• Approval UL, cUL</li> <li>• Diameter 250 mm</li> <li>• Resolution 680 x 480</li> </ul>						
	No	•	-	•	-	<b>XVM-430-65TVB-1-11</b> 139996
	No	•	•	•	•	<b>XVM-450-65TVB-1-11</b> 139998
	No	•	•	-	•	<b>XVM-410-65TVB-1-11</b> 139997

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








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: 56 KB / 384 KB
- External memory: 1 x CompactFlash card

	Inputs / outputs onboard	RS232	CAN/ easyNet	Part no. Article no.
XVC100	<ul style="list-style-type: none"><li>• Text display with 8 x 20 characters</li><li>• Membrane keyboard</li><li>• Approval UL, cUL</li><li>• Dimensions 212 x 156 x 60 mm</li></ul>			
	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



- ① 1 x CompactFlash memory card
- ② Plug, accessible from rear








## XP700 Industrial PC

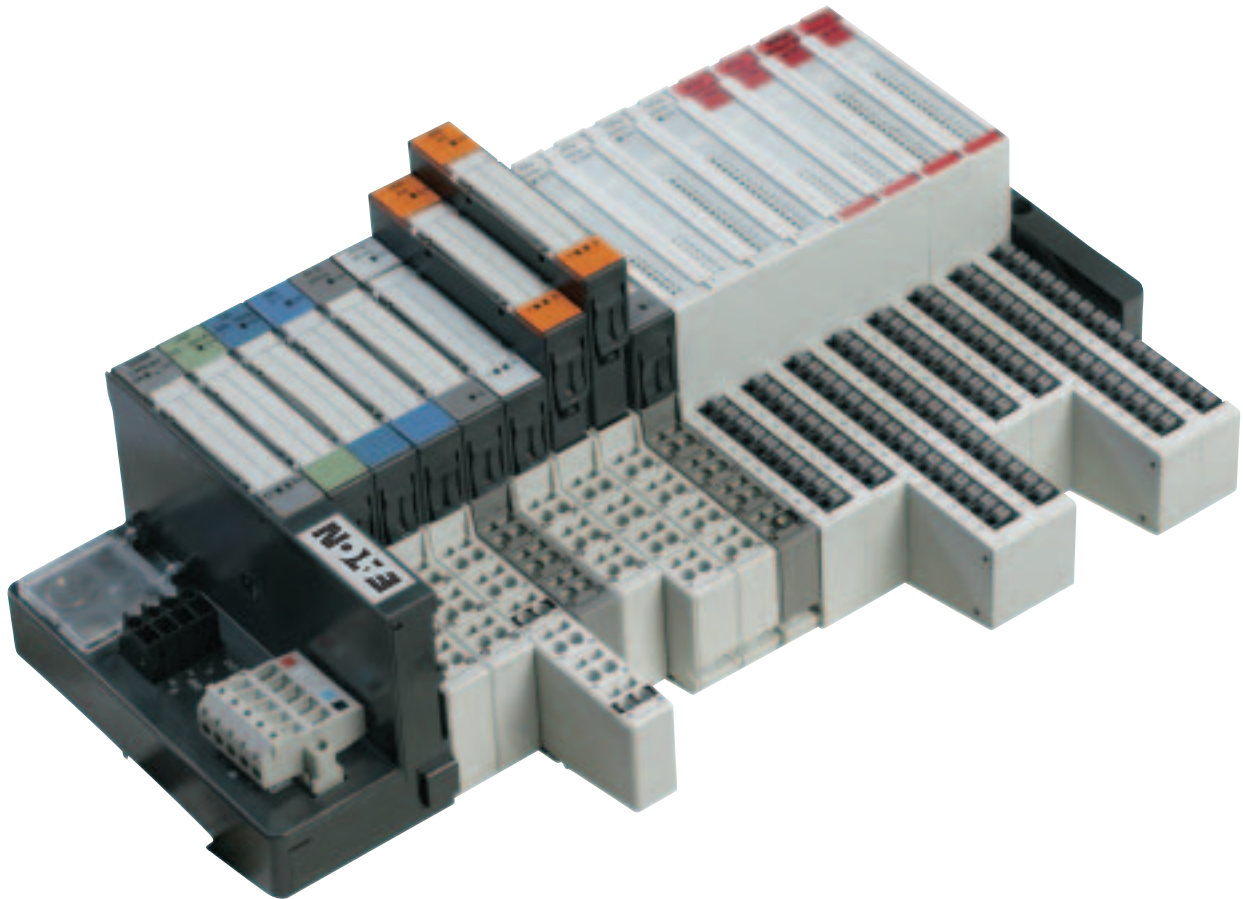
The XP700 industrial PC series is suitable for installation in the front of a switch cabinet and also as a box PC for mounting inside the switch cabinet. The robust design, combined with the uniquely rugged infra-red touch technology in safety glass, makes it suitable for use even in the harshest industrial 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 1 GHz 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.



- 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.
<b>XP700 8.4"</b>						
<ul style="list-style-type: none"> <li>• Infra-red TFT-LCD color display</li> <li>• Approval UL, cUL</li> </ul>						
	SVGA 800 x 800	Pentium 1 GHz	1024 MB	VGA	-	<b>XP-702-C0-84TSI-10</b> 140024
	SVGA 800 x 800	Pentium 1.8 GHz	2048 MB	VGA	●	<b>XP-702-D0-84TSI-10</b> 140029
<b>XP700 10.4"</b>						
<ul style="list-style-type: none"> <li>• Infra-red TFT-LCD color display</li> <li>• Approval UL, cUL</li> </ul>						
	SVGA 800 x 600	Pentium 1 GHz	1024 MB	VGA	-	<b>XP-702-C0-10TSI-10</b> 140025
	SVGA 800 x 600	Pentium 1.8 GHz	2048 MB	VGA	●	<b>XP-702-D0-10TSI-10</b> 140030
<b>XP700 12.1"</b>						
<ul style="list-style-type: none"> <li>• Infra-red TFT-LCD color display</li> <li>• Approval UL, cUL</li> </ul>						
	XGA 1024 x 768	Pentium 1 GHz	1024 MB	VGA	-	<b>XP-702-C0-12TXI-10</b> 140026
	XGA 1024 x 768	Pentium 1.8 GHz	2048 MB	VGA	●	<b>XP-702-D0-12TXI-10</b> 140031
<b>XP700 15"</b>						
<ul style="list-style-type: none"> <li>• Infra-red TFT-LCD color display</li> <li>• Approval UL, cUL</li> </ul>						
	XGA 1024 x 768	Pentium 1 GHz	1024 MB	VGA	-	<b>XP-702-C0-15TXI-10</b> 140027
	XGA 1024 x 768	Pentium 1.8 GHz	2048 MB	VGA	●	<b>XP-702-D0-15TXI-10</b> 140032
<b>XP700 Box</b>						
<ul style="list-style-type: none"> <li>• 2 x Ethernet interface</li> <li>• Approval UL, cUL</li> <li>• Dimensions 262 x 194 mm</li> </ul>						
	-	Pentium 1 GHz	1024 MB	VGA / DVI	-	<b>XP-702-Ca0-BOX-00</b> 140028
	-	Pentium 1.8 GHz	2048 MB	VGA / DVI	●	<b>XP-702-D0-BOX-00</b> 140033



# XI/ON – The Modular I/O System



**CODESYS**

**CANopen**

*DeviceNet™*

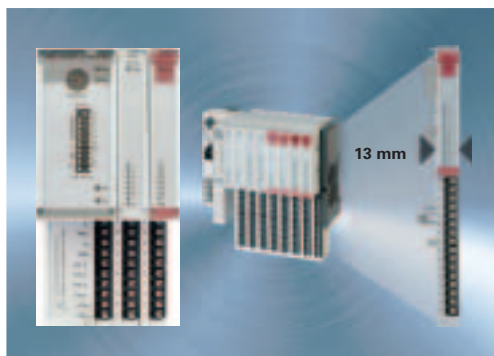
**Ethernet**



Whether for controlling movements, measuring temperature or speed, or logging currents and voltages! 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.

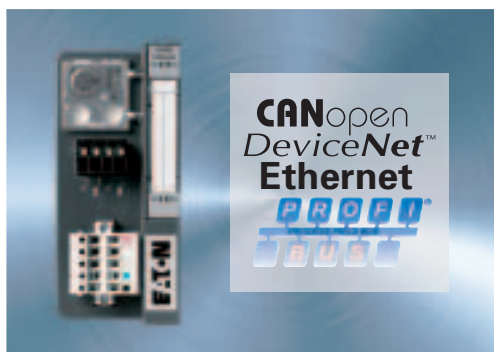




### XI/ON ECO gateways and ECO modules

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.

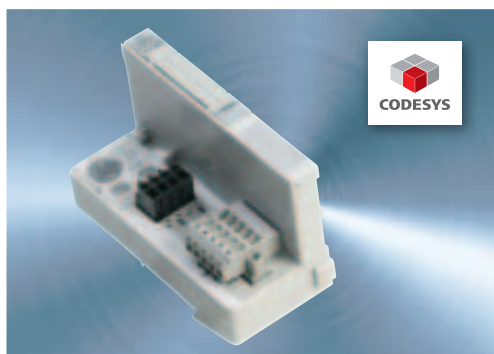
- ECO gateways with integrated bus terminating resistors
- Full compatibility with the standard XI/ON system
- No base module required
- High channel density (up to 16 DI/DO on 13 mm width)
- "Push-In" spring-loaded terminals
- Multi-functional slices
- Diagnostics interface



### XI/ON standard gateways and standard modules

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

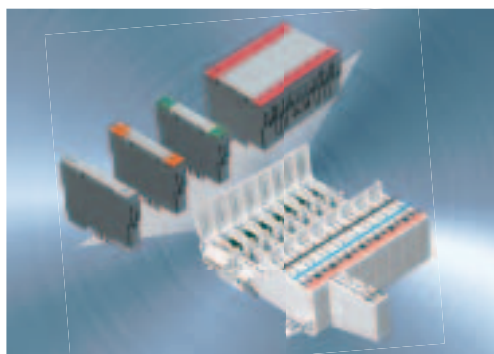
- The use of pluggable I/O modules is independent of the fieldbus used
- Wiring is implemented on the base module, fixed wiring
- Fast module exchange (hot swapping)
- Generation of diagnostics information to higher-level controller
- Up to 74 slice modules can be connected per gateway
- Mechanical coding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



### Programmable CANopen gateway

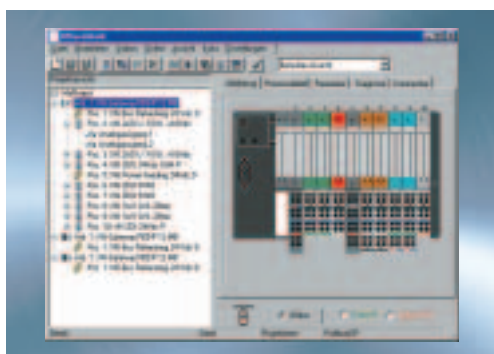
The programmable CANopen gateway brings the power of the PLC directly to the fieldbus terminal. The device is ideal for handling decentralized automation tasks and thus for relieving the load of a higher-level PLC.

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.

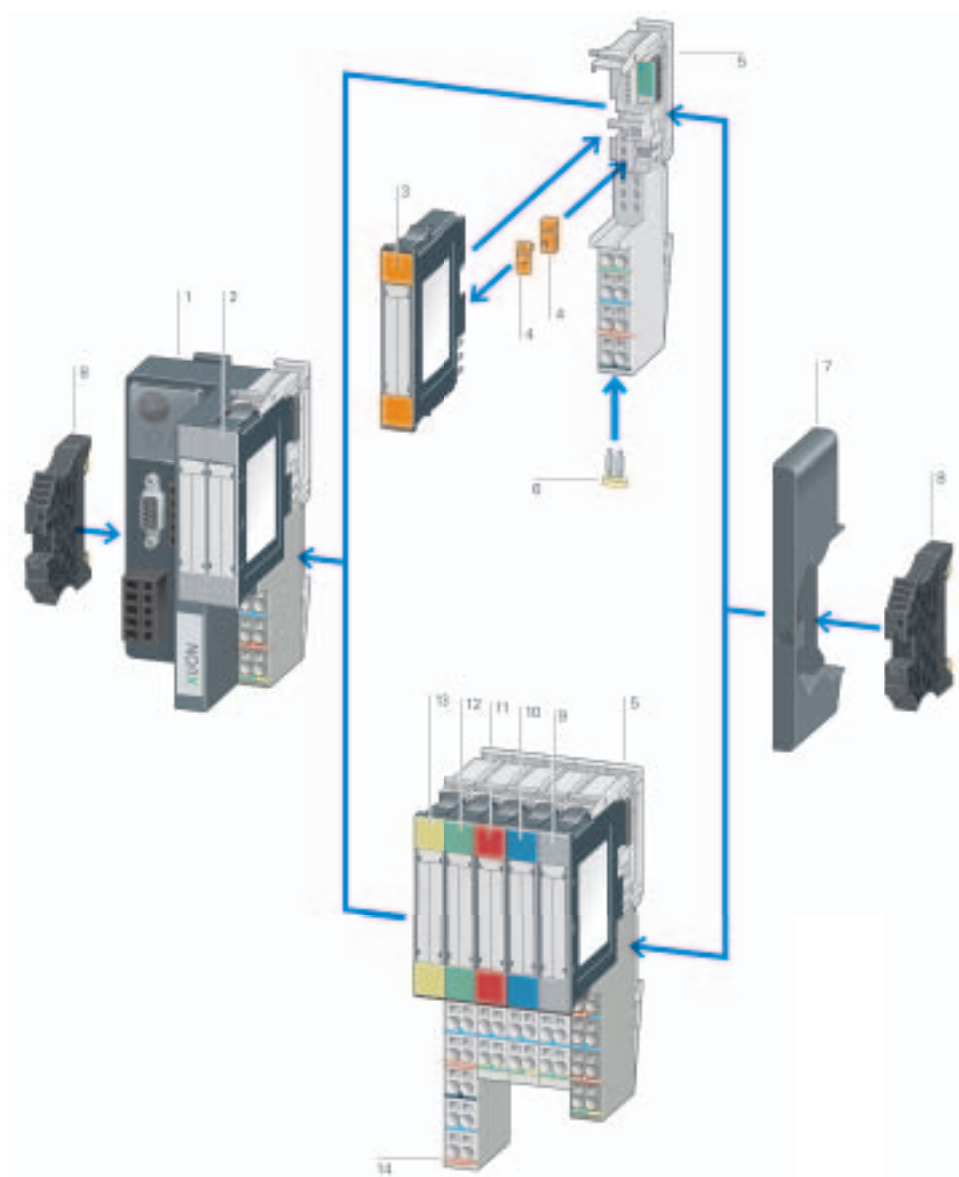


### I/Oassistant – the universal configuration and diagnostics tool

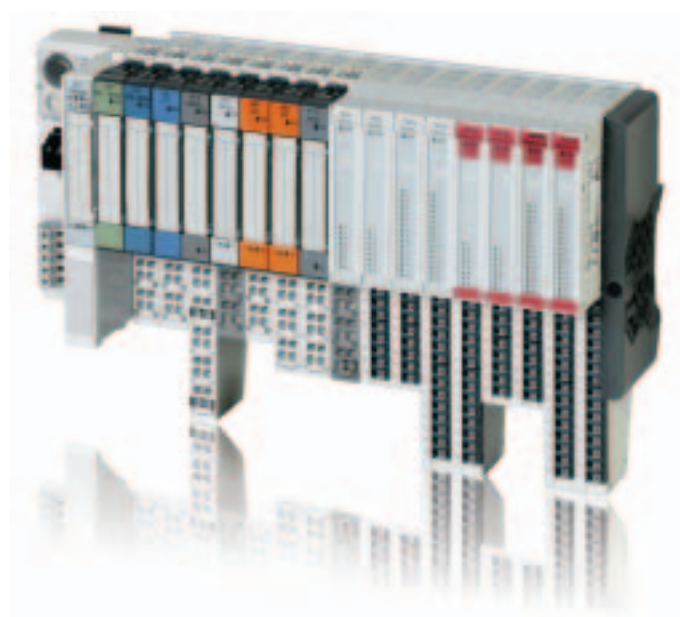
The I/Oassistant provides you with a universal tool that offers interactive support with the entire planning and implementation of your XI/ON installation. The I/Oassistant is integrated in XSOFT-CODESYS-2.

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.





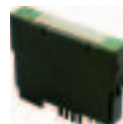
- High level of modularity
- Fieldbuses: CANopen®, Profibus-DP, DeviceNet and Ethernet
- Bus-independent, pluggable modules
- Low wiring requirement
- Precise diagnostics
- Space and cost saving with ECO modules
- Programmable CANopen® gateway
- Standard and ECO modules can be mixed

	Fieldbus / Protocol	Data transfer rate	Connections, fieldbus	Addressing	Part no. Article no.	
<b>XI/ON ECO gateways</b> <ul style="list-style-type: none"><li>• Push-in spring-loaded terminals</li><li>• System power supply 24 V DC/5 V DC</li><li>• Ripple &lt; 5 % (to EN 61131-2)</li><li>• Approvals UL508, cUL</li></ul>						
	Profibus DP / Profibus DPV0, Profibus DPV1	9.6 - 12,000 Kbit/s	Push-in spring-loaded terminals	Via DIP switch	<b>XNE-GWBR-PBDP</b> 140045	
	CANopen / CANopen	20, 50, 125, 250, 500, 800, 1,000 Kbit/s	Push-in spring-loaded terminals	Via DIP switch	<b>XNE-GWBR-CANOPEN</b> 140044	
	Ethernet / Ethernet IP	10,000, 100,000 Kbit/s	2x RJ45 socket	Via DIP switch, BootP, DHCP or PGM	<b>XNE-GWBR-2ETH-IP</b> 140047	
	Ethernet / Modbus TCP	10,000, 100,000 Kbit/s	RJ45 Ethernet switch	Via DIP switch, BootP, DHCP or PGM	<b>XNE-GWBR-2ETH-MB</b> 152279	
	Channels	Rated voltage via power supply terminal	Input delay trise / tfall	Input voltage high signal	Part no. Article no.	
<b>XI/ON ECO digital input modules</b> <ul style="list-style-type: none"><li>• Base module integrated</li><li>• Approvals UL508, cUL</li></ul>						
	8	24 V DC	< 100 / < 200 µs	11 V - U <sub>L</sub>	<b>XNE-8DI-24VDC-P</b> 140035	
	16	24 V DC	< 150 / < 300 µs	11 V - U <sub>L</sub>	<b>XNE-16DI-24VDC-P</b> 140040	
	Channels	Rated voltage via power supply terminal	Switching frequency with resistive load in Hz	Utilization factor g in %	Part no. Article no.	
<b>XI/ON ECO digital output modules</b> <ul style="list-style-type: none"><li>• Base module integrated</li><li>• Resistive, inductive and lamp load connectable</li><li>• Approvals UL508, cUL</li></ul>						
	8	24 V DC	<100	100	<b>XNE-8DO-24VDC-0.5A-P</b> 140036	
	16	24 V DC	<100	50 %, max. 4 A	<b>XNE-16DO-24VDC-0.5A-P</b> 140039	
	Channels	Measured variables	Measuring ranges	Value representation	Limit frequency in Hz	Part no. Article no.
<b>XI/ON ECO analog input modules</b> <ul style="list-style-type: none"><li>• Base module integrated</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Approvals UL508, cUL</li></ul>						
	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	<b>XNE-8AI-U/I-4PT/Ni</b> 140037
	Channels	Measured variables	Output variables	Value representation	Part no. Article no.	
<b>XI/ON ECO analog output modules</b> <ul style="list-style-type: none"><li>• Base module integrated</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Approvals UL508, cUL</li></ul>						
	4	Voltage, current	-10 - 10 V DC / 0 - 10 V DC 0 – 20 mA 4 – 20 mA	Standard, 16-bit/12-bit (flush-left)	<b>XNE-4AO-U/I*</b> 140034	



\* Approval UL508, cUL applied for

	Chan- nels	Operating modes	Pulse duration	PWM module	Resolution	Part no. Article no.
XI/ON ECO technology module: Counter module						
<ul style="list-style-type: none"><li>• Base module integrated</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple</li><li>• Approvals UL508, cUL</li></ul>	2	Continuous, once only and periodic counting	32-bit / max. 120 s	●	32-bit	XNE-2CNT-2PWM 140038
						
	Fieldbus / Protocol	Data transfer rate	Connections, fieldbus	Addressing	Part no. Article no.	
XI/ON standard gateways with integrated power supply module						
<ul style="list-style-type: none"><li>• Spring-loaded terminal/screw terminal</li><li>• System power supply 24 V DC/5 V DC</li><li>• Ripple &lt; 5 % (to EN 61131-2)</li><li>• Approvals UL508, cUL</li></ul>						
	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/O assistant	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	
	Operating and field voltage	System power supply	Rated current consumption from Modbus	Max. system supply current	Part no. Article no.	
XI/ON standard power supply module						
<ul style="list-style-type: none"><li>• Number of diagnostics bits: 4</li><li>• Ripple &lt; 5 % (to EN 61131-2)</li><li>• Approvals UL508, cUL</li></ul>						
	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	
	Channels	Rated voltage via power supply terminal	Input delay trise / tfall	Input voltage high signal	Part no. Article no.	
XI/ON standard digital input modules						
<ul style="list-style-type: none"><li>• Base module required</li><li>• Approvals UL508, cUL</li></ul>						
	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	



	Channels	Rated voltage via power supply terminal	Switching frequency with resistive load in Hz	Utilization factor g in %	Part no. Article no.	
XI/ON standard digital output modules						
	2	24 V DC	< 5000 (R <sub>L0</sub> < 1 kΩ)	100	XN-2DO-24VDC-0.5A-P 140053	
	2	24 V DC	< 100 (R <sub>L0</sub> < 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 <sub>L0</sub> < 1 kΩ)	100	XN-2DO-24VDC-2A-P 140055	
	4	24 V DC	< 1000 (R <sub>L0</sub> < 1 kΩ)	100	XN-4DO-24VDC-0.5A-P 140148	
	16	24 V DC	< 100 (R <sub>L0</sub> < 1 kΩ)	100	XN-16DO-24VDC-0.5A-P 140141	
	32	24 V DC	< 100 (R <sub>L0</sub> < 1 kΩ)	See total module current	XN-32DO-24VDC-0.5A-P 140161	
	Channels	Measured variables	Measuring range	Value representation	Limit frequency in Hz	Part no. Article no.
XI/ON standard analog input modules						
	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
	Chan-nels	Connectable sensors	Measuring ranges °C	Value representation	Part no.	Part no. Article no.
XI/ON standard temperature modules						
	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
	Channels	Measured variables	Output variables	Value representation	Part no. Article no.	
XI/ON standard analog output modules						
	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


	Channels	Contact type	Rated load voltage	Max. continuous current per channel/230 VAC resistive load	Part no. Article no.	
<b>XI/ON standard relay modules</b> <ul style="list-style-type: none"><li>• Base module required</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Resistive, inductive and lamp load connectable</li><li>• Approvals UL508, cUL</li></ul>						
	2	NC contact	230 V AC, 30 V DC	5 A	<b>XN-2DO-R-NC</b> 140061	
	2	NO contacts	230 V AC, 30 V DC	5 A	<b>XN-2DO-R-NO</b> 140062	
	2	Changeover contacts	230 V AC, 30 V DC	5 A	<b>XN-2DO-R-CO</b> 140054	
	Chan-nels	Operating modes	Pulse duration	PWM module	Resolution	Part no. Article no.
<b>XI/ON standard technology module: Counter module</b> <ul style="list-style-type: none"><li>• Base module required</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Signal evaluation A, B: Pulse and direction, rotary encoder single/double/quadruple</li><li>• Approvals UL508, cUL</li></ul>						
	1	Continuous, once only and periodic counting	8-bit / max. 0.51 s		32-bit	<b>XN-1CNT-24VDC</b> 140069

### Maximum system configuration

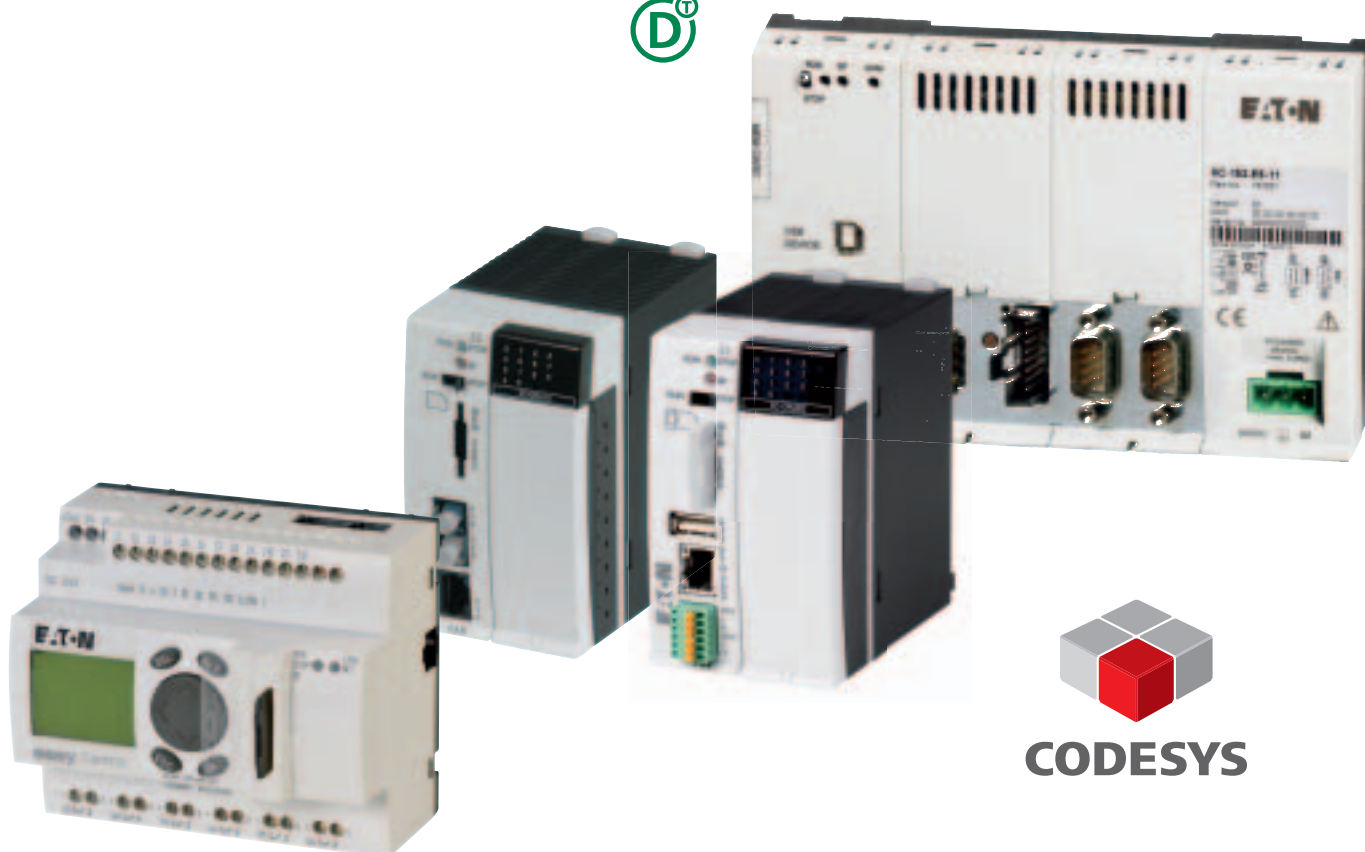
Module	XNE-GWBR-PBDP		XNE-GWBR-CANOPEN		XNE-GWBR-2ETH-IP		XNE-GWBR-2ETH-MP	
	Channels	Module	Channels	Module	Channels	Module	Channels	Module
XN-4DI-24VDC-P	136	34	244	61	288	72	288	72
XN-4DI-24VDC-N	136	34	244	61	288	72	288	72
XN-16DI-24VDC-P	128	8	128	8	128	8	128	8
XN-32DI-24VDC-P	256	8	256	8	256	8	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.

Type	Transfer channels	Bit transfer rate	Cable length	Part no. Article no.	
XI/ON standard technology module: Interfaces					
<ul style="list-style-type: none"><li>• Base module required</li><li>• Rated voltage via power supply terminal: 24 V DC</li><li>• Approvals UL508, cUL</li></ul>					
	RS232	RxD, TxD, RTS, CTS	Max. 115,200 bit/s (adjustable)	Max. 15 m	<b>XN-1RS232</b> 140151
	RS485/RS422	RxD, TxD	Max. 115,200 bit/s (adjustable)	Max. 30 m	<b>XN-1RS485/422</b> 140152
	SSI	CL, D	Max. 1 MHz (adjustable)	Max. 30 m	<b>XN-1SSI</b> 140153

XN-GWBR-PBDP		XN-GWBR-DPV1		XN-GWBR-CANOPEN		XN-GWBR-DNET		XN-GWBR-MODBUS-TCP		XN-PLC-CANOPEN		Module
Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	Channels	Modules	
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



## 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. The compact PLCs XC152 facilitate cost-effective solutions of automation tasks using their computing power, the SmartWire-DT interface as well as a whole range of further interfaces. 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.





### 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



### XC152 – Compact PLC

The compact PLCs combine PLC performance with a range of communication interfaces.

- OS: Windows CE 5
- Processor: RISC CPU, 32 bit, 400 MHz
- Ethernet interface
- USB device
- Communication interface depending on the type: RS232, RS485, Profibus/MPI and CANopen
- SmartWire-DT interface depending on the type
- Program, data and retain variable memory: 64MB
- External memory: 1 x SD card



### 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



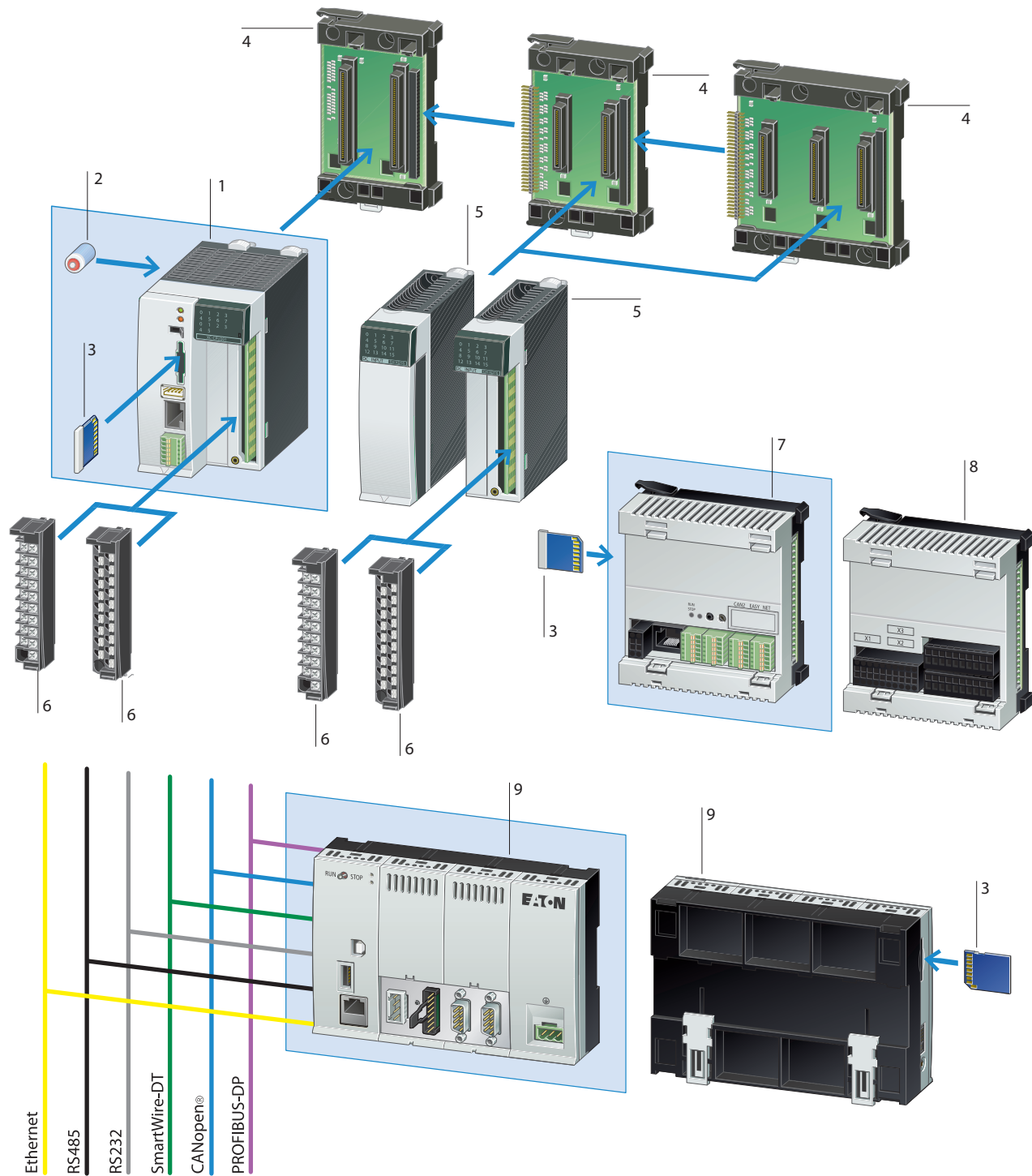
### XC200 modular PLCs

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 / Compact PLCs

## System Overview






- |   |                                      |   |  |
|---|--------------------------------------|---|--|
| 1 | Modular PLCs XC100/XC200             | 7 | XC121 expandable compact PLC<br>(→ Main Catalog, page 14/38) |
| 2 | Battery (not rechargeable)           | 8 | Input/output expansion for XC121                             |
| 3 | Memory card                          | 9 | XC 152 compact PLCs  |
| 4 | Module rack                          |   |  |
| 5 | XI/OC I/O and communications modules |   |  |
| 6 | XI/OC terminal block                 |   |  |






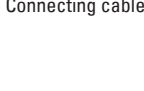



	Digital input count	Quantity of outputs	Built-in interfaces									Cycle time for 1 k of instructions (Bit, Byte)	Memory Application/ marker/ retain data	Integrated Web server	Part no. Article no.
			CANopen®	CANopen® (LWL)	RS232	Ethernet	easyNet	RS485	Profibus/MPI	CAN/easyNet	SmartWire-DT	ms	KByte		
Modular PLCs															
24 V DC power supply can be locally expanded with 15 XI/OC modules and remotely extendable Lot for memory card RUN/STOP switch and LED displays UL/CSA approval The following accessory equipment is required: terminal clamps, module rack, battery															
Modular PLC XC-CPU101															
	Digital: 8; of which usable as interrupt: 4	Transistor: 6	✓	-	✓	-	-	-	-	-	-	<0.5	64 KB/4 KB/4 KB	no	XC-CPU101-C64K-8DI-6DO 262152
			✓	-	✓	-	-	-	-	-	<0.5	128 KB/8 KB/8 KB	no	XC-CPU101-C128K-8DI-6DO 262146	
			✓	-	✓	-	-	-	-	-	<0.5	256 KB/8 KB/8 KB	no	XC-CPU101-C256K-8DI-6DO 274399	
			-	✓	✓	-	-	-	-	-	<0.5	128 KB/8 KB/8 KB	no	XC-CPU101-FC128K-8DI-6DO 289169	
Modular PLC XC-CPU201															
	Digital: 8; of which usable as interrupt: 6	Transistor: 6	✓	-	✓	✓	✓	-	-	-	-	<0.15	256 KB/16 KB/32 KB	no	XC-CPU201-EC256K-8DI-6DO 262155
			✓	-	✓	✓	✓	-	-	-	<0.15	2 MB/16 KB/32 KB	no	XC-CPU201-EC512K-8DI-6DO 262157	
			✓	-	✓	✓	✓	-	-	-	<0.15	256 KB/16 KB/32 KB	yes	XC-CPU201-EC256K-8DI-6DO-XV 262156	
			✓	-	✓	✓	✓	-	-	-	<0.15	2 MB/16 KB/32 KB	yes	XC-CPU201-EC512K-8DI-6DO-XV 262158	
Modular PLC XC-CPU202															
	Digital: 8; of which usable as interrupt: 6	Transistor: 6	✓	-	✓	✓	✓	-	-	-	-	<0.03	4 MB/16 KB/32 KB	yes	XC-CPU202-EC4M-8DI-6DO-XV 134238
XC compact PLCs															
			Built-in interfaces												
			CANopen®	CANopen® (LWL)	RS232	Ethernet	easyNet	RS485	Profibus/MPI	CAN/easyNet	SmartWire-DT				
24 V DC power supply remotely expandable Lot for memory card RUN/STOP switch and LED displays OPC Server UL/CSA approval plug in spring-cage terminals															
XC152 Compact PLC															
	-	-	-	-	✓	✓	-	✓	✓	-	-	<0.04	64 MB/4 KB/32 KB	yes	XC-152-D8-11 <sup>1)</sup> 167849
	-	-	-	-	✓	✓	-	-	-	-	✓	<0.04	64 MB/4 KB/32 KB	yes	XC-152-E3-11 <sup>1)</sup> 167850
	-	-	✓	-	-	✓	✓	✓	-	-	✓	<0.04	64 MB/4 KB/32 KB	yes	XC-152-E6-11 <sup>1)</sup> 167851
	-	-	-	-	-	✓	-	✓	✓	-	✓	<0.04	64 MB/4 KB/32 KB	yes	XC-152-E8-11 <sup>1)</sup> 167852
	-	-	✓	-	✓	✓	✓	✓	-	-	-	<0.04	64 MB/4 KB/32 KB	yes	XC-152-D6-11 <sup>1)</sup> 167855

## Instructions

<sup>1)</sup> Products in preparation

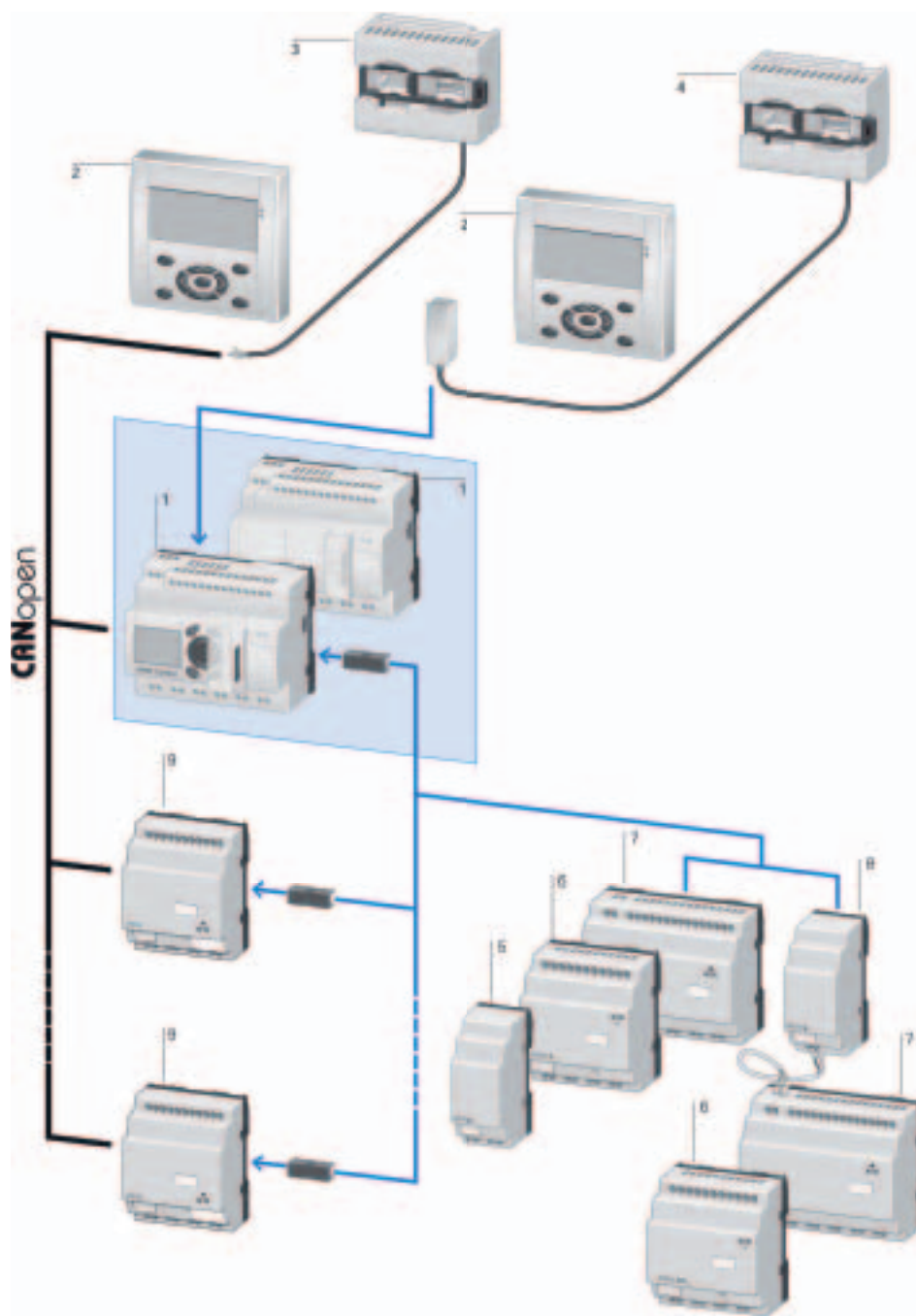
Description		part no. Article no.
<b>XI/OC</b> <ul style="list-style-type: none"> <li>• Compact I/O system for connection to XC100/200 Modular PLCs</li> <li>• XC100/200 expandable with up to 15 XI/OC modules</li> <li>• Optionally, screw terminals or spring-cage terminals for digital/analog modules</li> <li>• UL/CSA approvals</li> </ul>		
Digital modules 	8 inputs, 24 V DC	<b>XIOC-8DI</b> 257891
	16 inputs, 24 V DC	<b>XIOC-16DI</b> 257892
	32 inputs, 24 V DC	<b>XIOC-32DI</b> 267411
	8 outputs, 24 V DC, 0.3 A	<b>XIOC-8DO</b> 257894
	12 relay outputs	<b>XIOC-12DO-R</b> 257897
	16 outputs, 24 V DC, 0.3 A	<b>XIOC-16DO</b> 257896
	16 outputs, 24 V DC, 0.8 A, short-circuit proof	<b>XIOC-16DO-S</b> 257895
	16 connections, 4 inputs, 12 freely parameterizable as inputs/outputs, 24 V DC outputs 0.5 A	<b>XIOC--16DX</b> 262322
	32 outputs, 24 V DC, 0.2 A	<b>XIOC-32DO</b> 267413
Analog modules 	Inputs 8 Inputs 4 - 20 mA	<b>XIOC-8AI-I2</b> 262549
	Inputs 8 voltage input 8 - 10 V	<b>XIOC-8AI-U1</b> 257899
	Inputs 8 voltage inputs, ±10 V	<b>XIOC-8AI-U2</b> 257900
	Inputs 4 inputs for temperature monitoring, Pt100/1000	<b>XIOC-4T-PT</b> 257901
	Inputs 4 inputs for thermocouples Type K, J, L, B, N, E, R, S, T	<b>XIOC-4AI-T</b> 289933
	Outputs 2 outputs ± 10 V	<b>XIOC-2AO-U2</b> 257904
	Outputs 2 Outputs 0 - 10 V, 2 Outputs 4 - 20 mA	<b>XIOC-2AO-U1-2AO-I2</b> 257902
	Outputs 4 Outputs 0 - 10 V	<b>XIOC-4AO-U1</b> 257903
	Combination modules, 2 inputs and 1 output, 0 - 10 V 1 ms conversion time	<b>XIOC-2AI-1AO-U1</b> 262409
	Combination modules, 2 inputs and 1 output, 0 - 10 V, 0 - 20 mA 1 ms conversion time, individual changeover	<b>XIOC-2AI-1AO-U1-L1</b> 281545
	Combination modules, 4 inputs and 2 outputs, 0 - 10 V 1 ms conversion time	<b>XIOC-4AI-2AO-U1</b> 262405
	Combination modules, 4 inputs and 2 outputs, 0 - 10 V, 0 - 20 mA 1 ms conversion time, individual changeover	<b>XIOC-4AI-2AO-U1-I1</b> 281544
	1 input up to 100 kHz, 24 V DC, 5 V DC, 2 digital transistor outputs, opto-isolated, 24 V DC 30 pole plug required for counter module	<b>XIOC-1CNT-100KHZ</b> 257906
	2 inputs up to 100 kHz, (24 V DC or 5 V diff), 4 digital transistor outputs, opto-coupled, 24 V DC 30 pole plug required for counter module	<b>XIOC-2CNT-100KHZ</b> 257907
	2 incremental encoders up to 400 kHz, 5 V DC, 2 analog outputs, ±10 V	<b>XIOC-2CNT-2AO-INC</b> 262417
Communication modules 	PROFIBUS-DP master module	<b>XIOC-NET-DP-M</b> 257908
	PROFIBUS DP slave module	<b>XIOC-NET-DP-S</b> 286419
	Suconet K master module	<b>XIOC-NET-SK-M</b> 289982
	Serial interface RS232C, RS485, RS422 Operating modes: transparent mode, MODBUS master/slave, SUCOM-A, Suconet-K slave	<b>XIOC-SER</b> 267191
	Serial interface RS232C, RS485, RS422 Operating modes: transparent mode, MODBUS master/slave, SUCOM-A, DNP3 protocol	<b>XIOC-TC1</b> 135265



	Description	part no. Article no.
<b>Accessories</b>		
Terminals One 18 pole terminal plug is required for each digital and analog module. 	18 pole terminal connector with spring-cage terminals for digital or analog I/O	<b>XIOC-TERM-18T</b> 258104
	18-pin terminal connector with screw terminals for digital or analog I/O	<b>XIOC-TERM-18S</b> 258102
	30 pole plug for counter module, with 4 m cable XIOC-1CNT-100KHZ XIOC-2CNT-100KHZ	<b>XIOC-TERM30-CNT4</b> 262248
	40 pole plug for digital module, with 4 m cable XIOC-32DI XIOC-32DO	<b>XIOC-TERM32</b> 267414
Module rack 	Basic backplane for mounting XC100/200 on top-hat rail, expandable Width: 2 slots for controller	<b>XIOC-BP-XC</b> 260792
	Expansion rack for mounting XI/OC modules on top-hat rail, expandable Width: 2 slots for XI/OC modules	<b>XIOC-BP-2</b> 260794
	Basic backplane for mounting XC100/200 on top-hat rail, expandable Width: 3 slots for controller and one XI/OC module	<b>XIOC-BP-XC1</b> 260793
	Expansion rack for mounting XI/OC modules on top-hat rail, expandable Width: 3 slots for XI/OC modules	<b>XIOC-BP-3</b> 260795
	Expansion rack for mounting XI/OC modules on top-hat rail, expandable Width: 3 slots for XI/OC modules Note: Module rack for expansion with up to 15 modules, must be plugged into the 6th slot	<b>XIOC-BP-EXT</b> 274291
Memory card for storing programs, data, recipes for XC100, XC121, XC200 	SD memory card with at least 512 MB	<b>XT-MEM-MM512M</b> 138257
	SD memory card with at least 256 MB	<b>XT-MEM-MM32M</b> 262731
Battery (not rechargeable) 	For back-up of real-time clock and retentive data	<b>XT-CPU-BAT1</b> 256209
Programming cable 	2 m SUB-D, 9 pole, serial	<b>XT-SUB-D/RJ45</b> 262186
	2 m Ethernet cross	<b>XT-CAT5-X-2</b> 256487
	5 m Ethernet cross	<b>XT-CAT5-X-5</b> 256488
	Programming cable for XC, EC4P, EU5C through USB interface	<b>EU4A-RJ45-USB-CAB1</b> 115735
Connecting cable 	0.3 m Connection cable from XC200 to interface switch	<b>EASY-NT-30</b> 256283
	0.8 m Connection cable from XC200 to interface switch	<b>EASY-NT-80</b> 256284
	1.5 m Connection cable from XC200 to interface switch	<b>EASY-NT-150</b> 256285
CAN cable to ISO 11898 Recommendation: Lapp Kabel UNITRONIC-Bus LD, 2 x 2 x 0.2 mm" Impedance: 100 - 120 Ω, effective capacitance: 800 Hz, max. 60 nF/km		
Empty module 	Empty module to cover free XI/OC slots	<b>XIOC-NOP</b> 288894
Interface switch 	Interface adapter to split the combined RS-232/Ethernet interface of the XC200 into RJ45 sockets Connection cable EASY-NT-30/80/150 usable for connection to XC200.	<b>XT-RJ45-ETH-RS232</b> 289170
Filters 	Interference suppression for the external 24 VDC supply of the XC100/200 Max. current consumption: 2.2 A	<b>XT-FIL-1</b> 285316
	Power supply interference suppression of I/O modules of XC100/200 Max. current consumption: 12 A	<b>XT-FIL-2</b> 118980

# Compact PLCs

## 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				
<b>EC4P</b> <ul style="list-style-type: none"> <li>CANopen/easyNet interface</li> <li>UL/CSA approvals</li> <li>Approvals for shipboard use DNV, GL, ABS, BV, LR</li> </ul> 	12	4	-	8	-	-	●	<b>EC4P-221-MTXD1</b> 106391
	12	4	-	8	-	-	-	<b>EC4P-221-MTXX1</b> 106392
	12	4	6	-	-	-	●	<b>EC4P-221-MRXD1</b> 106393
	12	4	6	-	-	-	-	<b>EC4P-221-MRXX1</b> 106394
	12	4	-	8	1	-	●	<b>EC4P-221-MTAD1</b> 106395
	12	4	-	8	1	-	-	<b>EC4P-221-MTAX1</b> 106396
	12	4	6	-	1	-	●	<b>EC4P-221-MRAD1</b> 106397
	12	4	6	-	1	-	-	<b>EC4P-221-MRAX1</b> 106398
	12	4	-	8	-	●	●	<b>EC4P-222-MTXD1</b> 106399
	12	4	-	8	-	●	-	<b>EC4P-222-MTXX1</b> 106400
	12	4	6	-	-	●	●	<b>EC4P-222-MRXD1</b> 106401
	12	4	6	-	-	●	-	<b>EC4P-222-MRXX1</b> 106402
	12	4	-	8	1	●	●	<b>EC4P-222-MTAD1</b> 106403
	12	4	-	8	1	●	-	<b>EC4P-222-MTAX1</b> 106404
	12	4	6	-	1	●	●	<b>EC4P-222-MRAD1</b> 106405
	12	4	6	-	1	●	-	<b>EC4P-222-MRAX1</b> 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	<b>EASY618-AC-RE</b> 212314
		12	-	8	24 V DC	<b>EASY620-DC-TE</b> 212313
		12	6	-	24 V DC	<b>EASY618-DC-RE</b> 232112
		-	2	-	24 V DC	<b>EASY202-RE</b> 232186
		6	4	-	24 V DC	<b>EASY410-DC-RE</b> 114293
		6	-	4	24 V DC	<b>EASY410-DC-TE</b> 114294
		For the remote connection of a digital I/O expansion up to 30 m away				<b>EASY200-EASY</b> 212315
	Can be used via CANopen for: XC100/200, EC4P, XV	6	4	-	24 V DC	<b>EC4E-221-6D4R1</b> 114296
		6	-	4	24 V DC	<b>EC4E-221-6D4T1</b> 114297

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

Description	Part no. Article no.
<b>Remote text display</b>	
<ul style="list-style-type: none"> <li>• Display / operator unit</li> <li>• Monochrome display 132 x 64 pixels with switchable backlight</li> <li>• IP65, removable Titan front frame</li> </ul>	
 With keypad, with Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	<b>MFD-80-B</b> 265251
 With keypad, without Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	<b>MFD-80-B-X</b> 284905



Description		Power supply	Part no. Article no.
<b>Power supply/communication modules</b>			
IP20, combinable with MFD-80-.. display/operator unit			
	Without connection cable	24 V DC	<b>MFD-CP4</b> 280888
	Without connection cable	100 - 240 V AC	<b>MFD-AC-CP4</b> 286822
Description			Part no. Article no.
<b>CANopen communication module</b>			
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		<b>MFD-CP4-C0</b> 115736
<b>Programming cables</b>			
	SUB-D, 9-pole, serial, 2 m		<b>EU4A-RJ45-CAB1</b> 106726
	For EU5C, XC and EC4P via USB interface		<b>EU4A-RJ45-USB-CAB1</b> 115735
	2 m Ethernet cross		<b>XT-CAT5-X-2</b> 256487
	5 m Ethernet cross		<b>XT-CAT5-X-2</b> 256488
<b>Modem cable</b>			
	Configurable modem, printer and programming cable, possible transfer rates 56 KBaud, 9-pole SUB-D connector (plug + socket for connection by user)		<b>EASY800-M0-CAB</b> 286079
<b>Connection cables</b>			
	For connecting the EC4P (RJ45) to MFD-CP4-C0 or EC4E (terminal block)		<b>EU4A-RJ45-CAB2</b> 115387
<b>Memory cards</b>			
	Adapter with at least 128 MByte memory card		<b>EU4A-MEM-CARD1</b> 106409
	Adapter with at least 128 MByte memory card and battery for backing up the clock		<b>EU4A-MEM-CARD2</b> 144724



# 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.



### 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

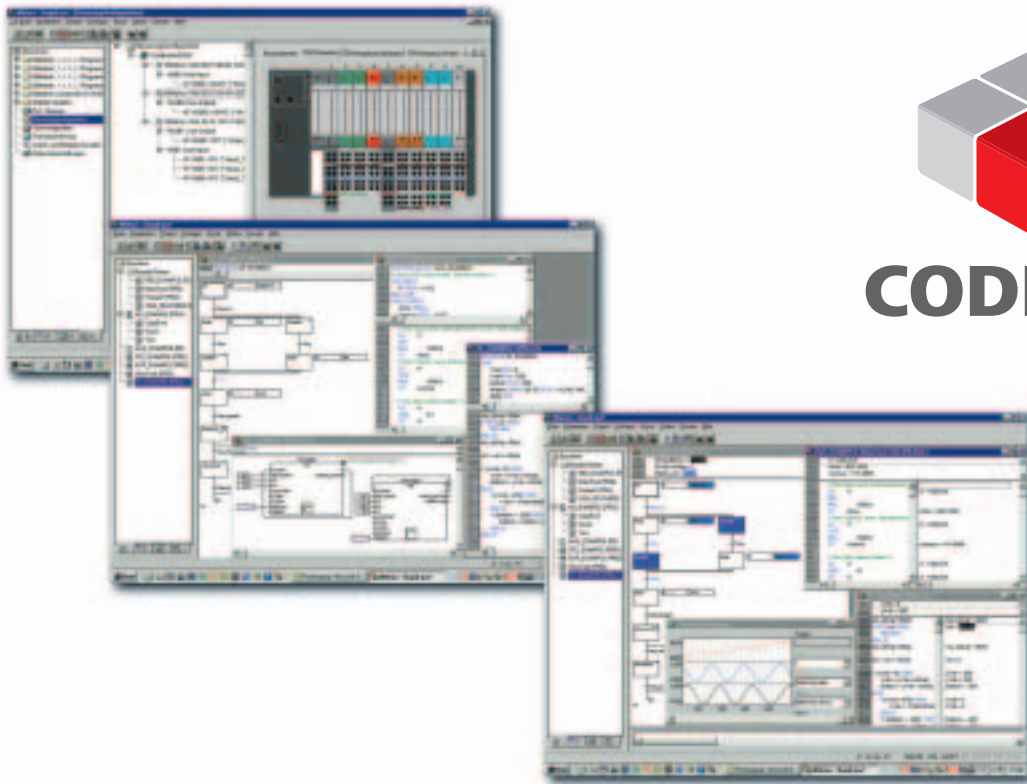
Seamless project design of all graphical panels, including PC control station

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	
 <b>Galileo development software</b> MS-Windows™-based, intelligent and intuitive visualization tool <b>GalileoOpen license for PC</b> For continuous unrestricted operation of the GALILEO runtime system on a standard PC.	<b>SW-GALILEO</b> 140379 <b>LIC-GALILEO-OPEN-PC</b> 140385



# XSoft-CODESYS-2 – PLC Programming to International Standards

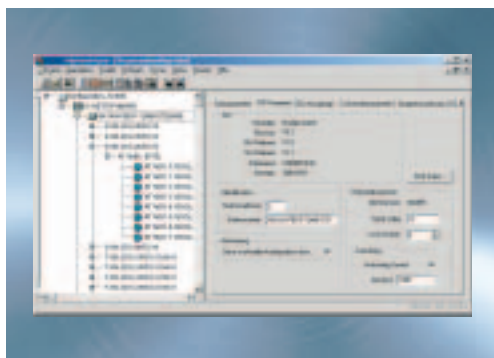
All Eaton Automation controllers are programmed with XSoft-CODESYS-2. XSoft-CODESYS-2 is based on the CODESYS standard of 3S. Matured technical features, simple handling and the widespread use of this software in the automation components of different manufacturers make it a guarantee for success.

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.



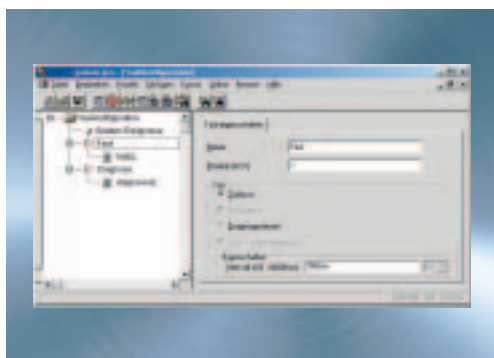


### Fieldbus configurator included

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.

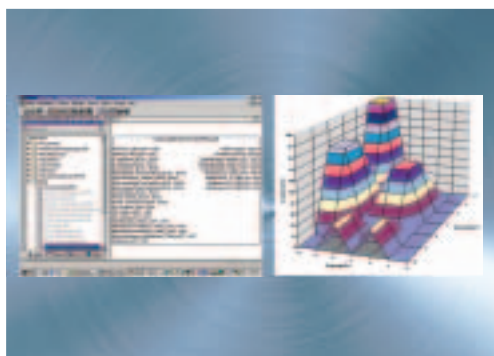


### Web visualization (only XV100, XV150, XVS400, XV400 and XC200):

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

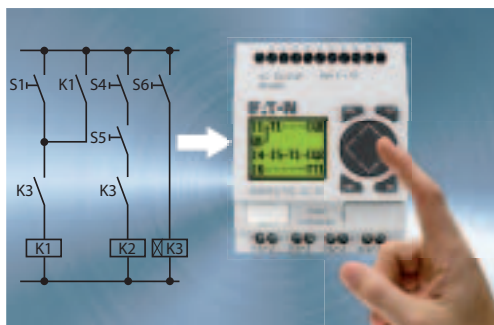
The I/Oassistant integrated in XSoft-CODESYS-2 provides you with the tailor-made project design tool for XI/ON directly inside XSoft-CODESYS-2. Without leaving XSoft-CODESYS-2, you can utilize the full functionality of the I/Oassistant for planning and implementing your remote CAN XI/ON station interactively. 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.
<b>XSoft-CODESYS-2</b>		
Programming to IEC 61131-1, supports XV, XC, XN, EC4P		
	Single user license	<b>SW-XSOFT-CODESYS-2-S</b> 142582
	Multi-user license	<b>SW-XSOFT-CODESYS-2-M</b> 142583



## 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.



### easy500

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

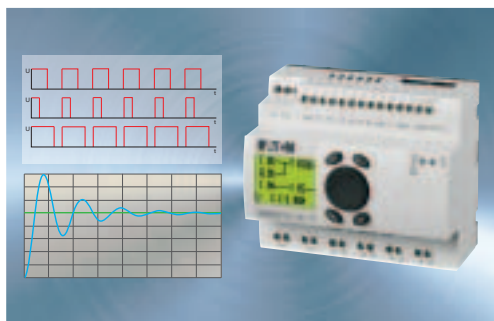
- 1:1 electronic circuit diagram entry
- Circuit diagram entry directly on the device possible
- 128 rungs with 3 contacts each and 1 coil in series
- Functions such as multi-function timing relays, impulse relays, counters, analog value comparators, week and year time switches, value entry, value display...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



### easy800 with SmartWire-DT

Combines the functions of an easy800 with the direct connection to the communication system for switchgear SmartWire-DT (SW-DT):

- Exchange of data as well as power supply for the SmartWire-DT devices and contactors via the communication system SmartWire-DT
- Up to 99 SmartWire-DT devices in total with up to 166 inputs/outputs can be connected
- easyNet as well as 4 additional fast inputs, 2 of which can be used as fast outputs
- Serial interface for programming or for connection of a remote text display or touch panel or for connection to the Ethernet



### Remote text display

For display and operation in the control panel door, on the machine or on the operator panel up to 5 m from the basis unit:

- Display of text and values as well as entry of values
- For use with all easyRelay, easySafety and easyControl
- Consisting of display/operator unit MFD-80(-B), power supply/communication module MFD-AC-CP4 as well as connection cable MFD-CP4-...CAB5 or EU4A-RJ45-CAB2
- Also suitable for harsh environments with high degree of protection IP65

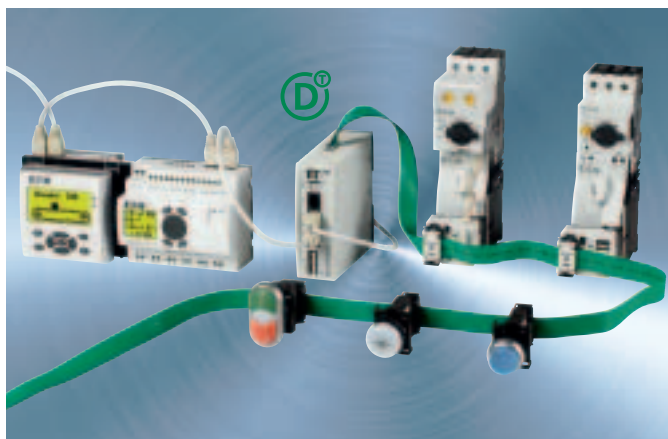


### MFD-Titan

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)





## SmartWire-DT

SmartWire-DT is a high-performance system that can be used to quickly and easily connect switchgear such as contactors, motor-protective circuit-breakers, control circuit devices as well as digital and analog input/output modules. On the new easy800 with integrated SmartWire-DT master, up to 99 SmartWire-DT devices in total with up to 166 inputs/outputs can be connected via the SmartWire-DT line. All required supply voltages, including those for the bus devices as well as 24 V DC for the contactors are provided directly with the flat 8-pole SmartWire-DT bus line. This saves wiring effort and troubleshooting and saves time and costs.



## EASY802-DC-SWD

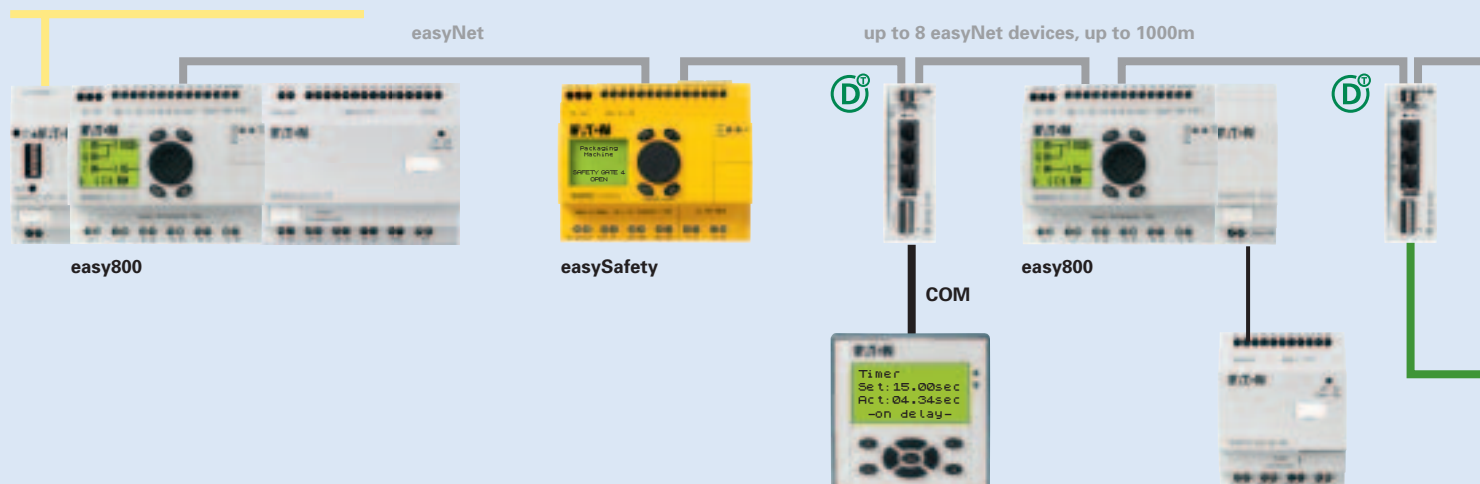
EASY802-DC-SWD features a POW power supply for supplying power to the device as well as the SmartWire-DT devices. A second AUX power supply provides the connected contactors with 24 V DC. The configuration of the SmartWire-DT devices is undertaken at a touch of the provided Configuration button. LEDs provide feedback concerning the states on the device and the SmartWire-DT line. The serial interface serves for programming as well as for connection of a remote text display, touch panel or for connection to the Ethernet.



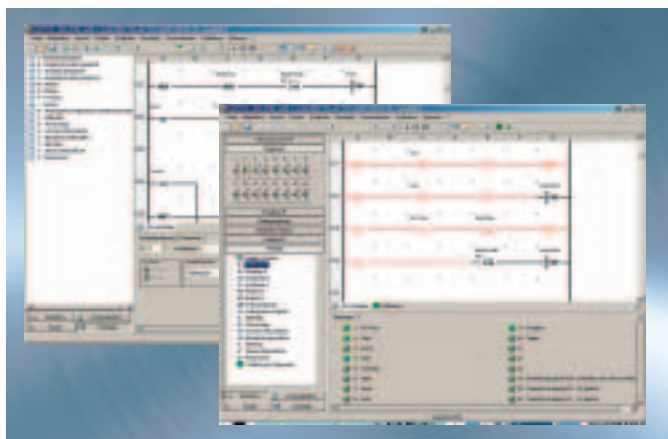
## EASY806-DC-SWD

In addition to the functionality of the EASY802-DC-SWD, the EASY806-DC-SWD also features 4 fast inputs (5 KHz). 2 of the 4 inputs can also be configured as fast outputs (5 KHz) (transistor 24 V DC, 0.1 A). In addition to the additional inputs/outputs on EASY806-DC-SWD, there is a connection option to the easyNet. In this way, up to 1360 inputs/outputs can be connected.

## Ethernet







### easySoft-Basic

The programming software easySoft-Basic is used for programming **easy500/700**. "Drag & Drop" functions enable quick and comfortable entry of the circuit diagram. Programming is implemented in Ladder Diagram. Furthermore, the software offers the opportunity for simulation, on-line communication and documentation.



### easySoft-Pro

With easySoft-Pro, **easy500/700/800, the multi function display MFD-Titan, as well as easy800 with SmartWire-DT** can be programmed. In addition to the functions of the easySoft-Basic, a screen editor for creation of the MFD Titan screens is available with the easySoft-Pro. The integration of the SmartWire-DT line into the program occurred with the inclusion of the SmartWire-DT configurator. The easySoft-Pro CD contains a free OPC server, which enables the standardized inclusion of higher-level control systems (OPC clients). Just like easySoft-Basic, easySoft-Pro can be installed in 13 languages.



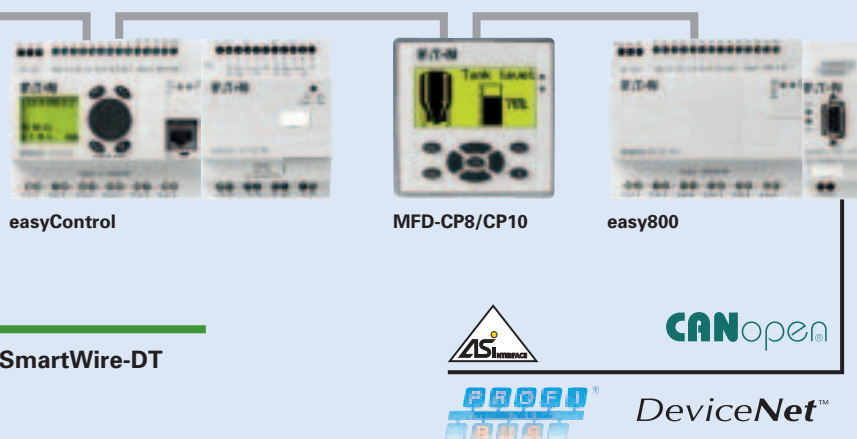
### Bluetooth adapter

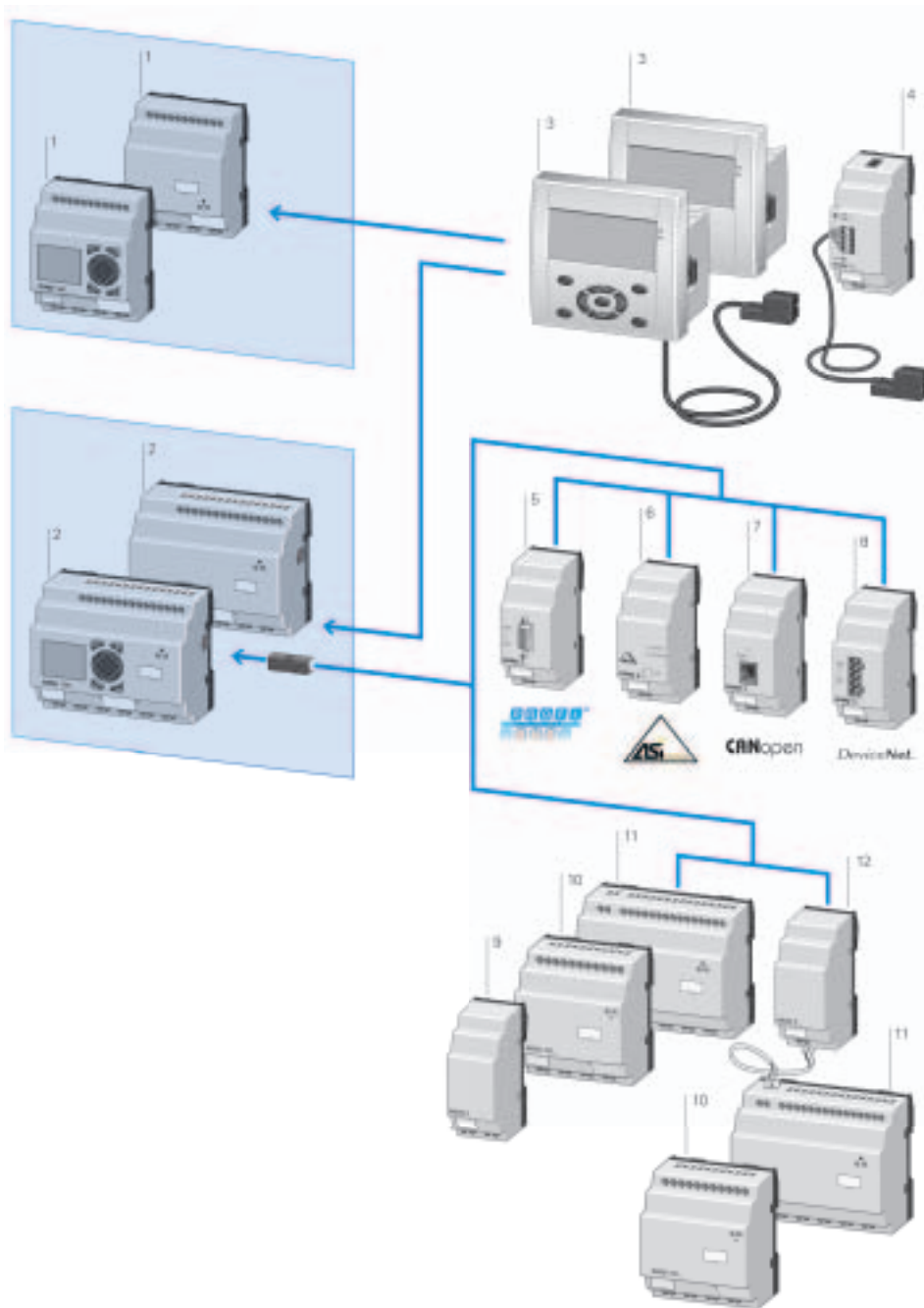
Our Bluetooth adapter makes it possible to conveniently commission and service machines and other equipment remotely.

- Simple communication with easy800, MFD-Titan or easyControl from outside loud and/or dangerous areas
- Remotely test, commission, and service applications, transfer them to PLCs, or diagnose faults
- Prevent unauthorized remote access to PLCs with a unique 8-digit PIN
- A range of up to ten meters in industrial environments
- Simple recognition of bluetooth adapter in Windows 7
- Small, compact design in practical pocket-size format

### Communication and data exchange

In addition to the communication via easyNet, it is possible to exchange data with higher-level automation systems. Bus modules for connection to the AS-i, PROFIBUS-DP, CANopen and DeviceNet are available for this purpose. With the EASY209-SE, a connection possibility is available from easyRelay and MFD-Titan to the Ethernet. This facilitates remote access and programming via easySoft, as well as OPC functionality.







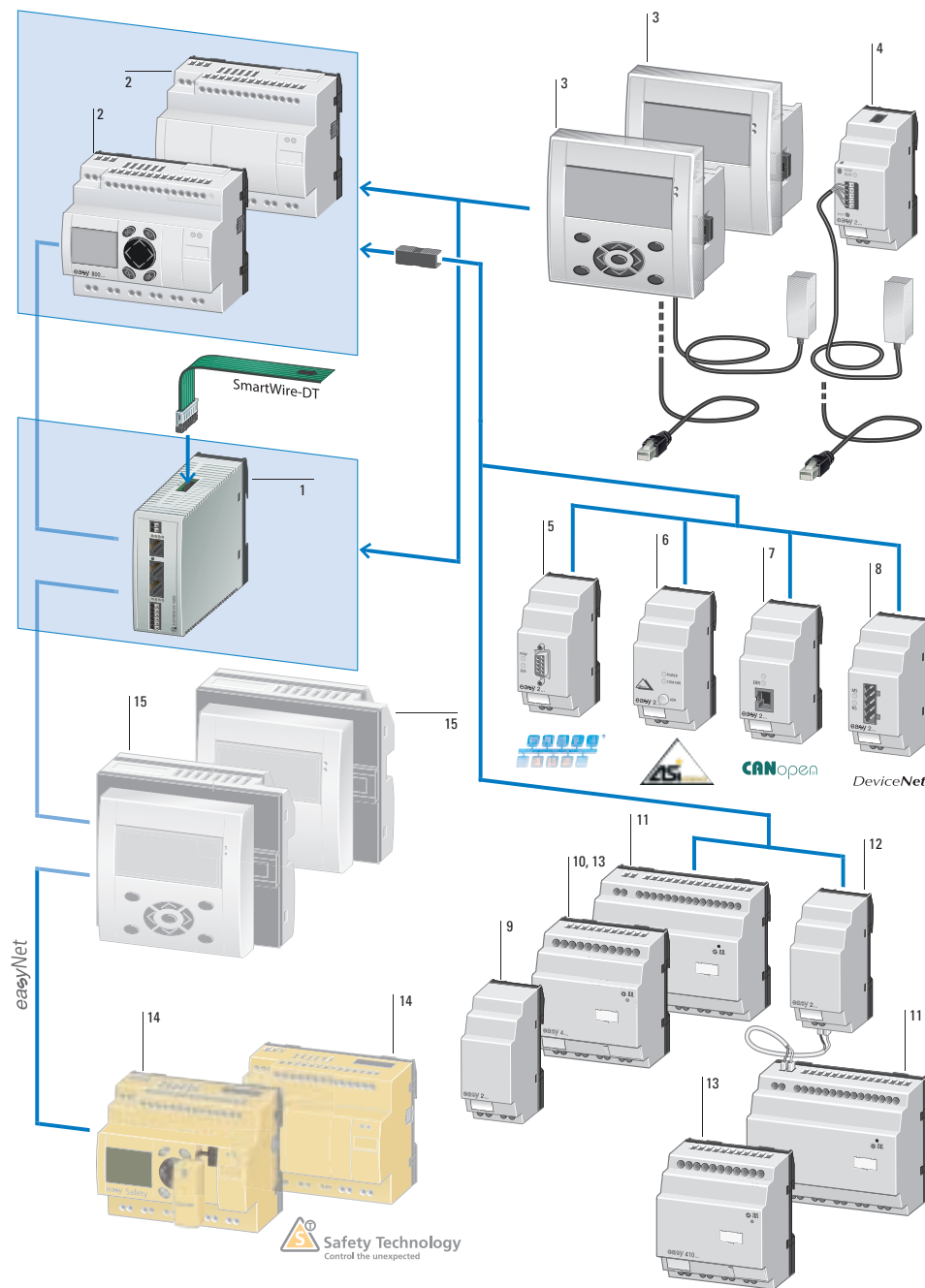


1. easy500 control relay
2. easy700 control relay
3. Removable text display: MFD-80(-B) display/operator unit, + power supply/communication module incl. MFD-(AC)-CP4-500 connection cable
4. EASY209-SE Ethernet gateway + MFD-CP4-500-CAB5 connection cable
5. EASY204-DP Profibus-DP bus module
6. ASi EASY205-ASI 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 – 99 h 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	Part no. 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								
easy 500/700 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
easy 500/700 programming cables								
	SUB-D, 9-pole, serial, 2 m							EASY-PC-CAB 202409
	USB, 2 m							EASY-USB-CAB 107926










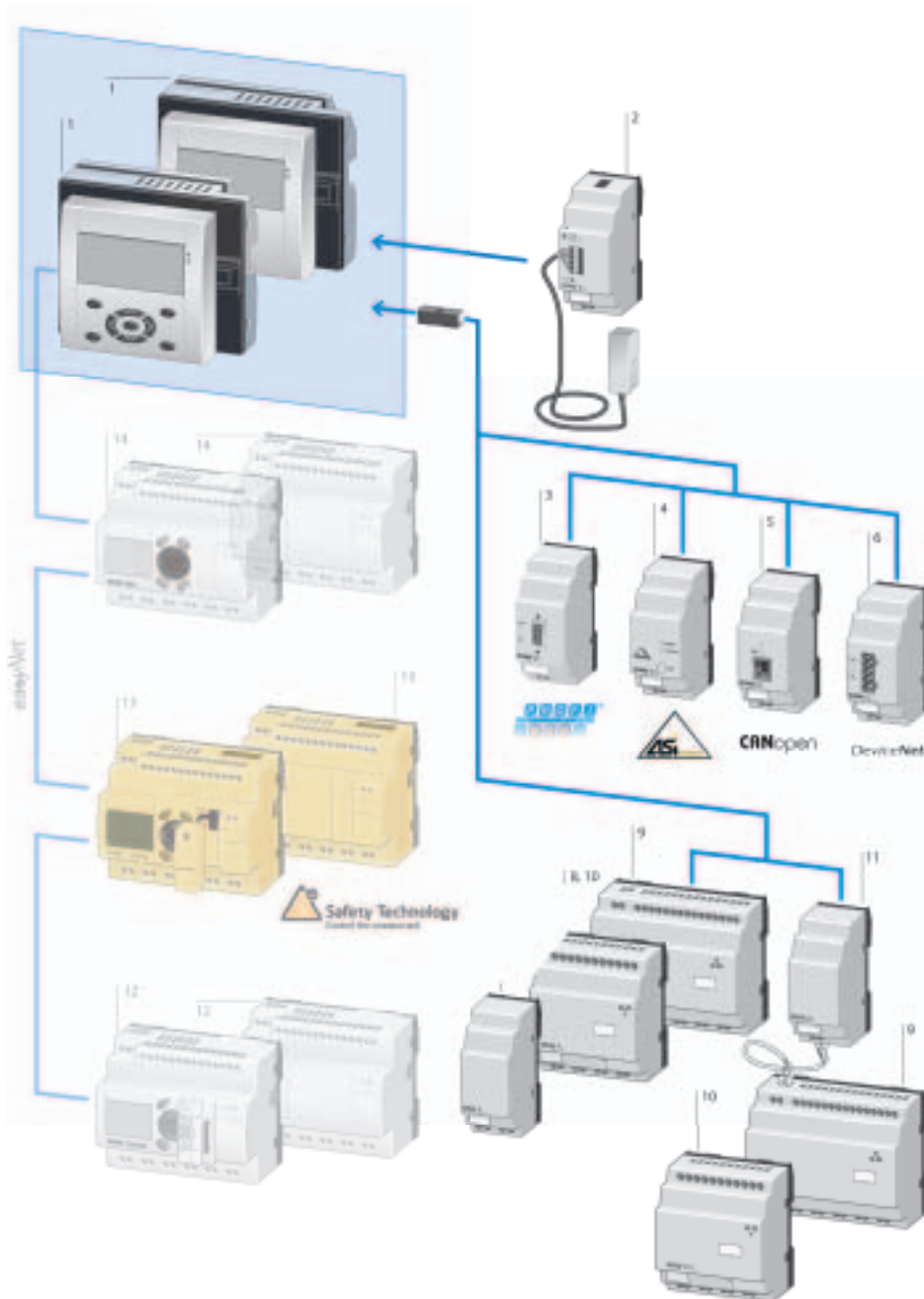
1. easy800 control relay with SmartWire-DT
2. Removable text display: MFD-80-(B) display/operator unit + power supply/communication module incl. MFD-(AC)-CP4-800 connection cable
3. EASY209-SE Ethernet gateway + MFD-CP4-800-CAB5 connection cable
4. EASY204-DP Profibus-DP bus module
5. ASi EASY205-ASI 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<sup>31</sup>, 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<sup>32</sup> 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		Additional features		Supply voltage	Part no. Article no.	
	Digital	of which can be used as analog	Relay 10 A (UL)	Transistor	Analog	Real time clock	Display & keypad		
<b>easy800</b>									
Expandable: Digital inputs/outputs, bus systems AS-Interface, PROFIBUS-DP, CANopen®, DeviceNet Bus system easyNet on board Customized laser inscription or delivery with user program possible with EASY-COMBINATION-* product (article No. 257823)									
	12	4	6	-	-	✓	✓	24 V DC	<b>EASY819-DC-RC</b> 256269
	12	4	6	-	-	✓	-	24 V DC	<b>EASY819-DC-RCX</b> 256270
	12	4	6	-	1	✓	✓	24 V DC	<b>EASY820-DC-RC</b> 256271
	12	4	6	-	1	✓	-	24 V DC	<b>EASY820-DC-RCX</b> 256272
	12	4	-	8	-	✓	✓	24 V DC	<b>EASY821-DC-TC</b> 256273
	12	4	-	8	-	✓	-	24 V DC	<b>EASY821-DC-TCX</b> 256274
	12	4	-	8	1	✓	✓	24 V DC	<b>EASY822-DC-TC</b> 256275
	12	4	-	8	1	✓	-	24 V DC	<b>EASY822-DC-TCX</b> 256276
	12	-	6	-	-	✓	✓	100 - 240 V AC	<b>EASY819-AC-RC</b> 256267
12	-	6	-	-	✓	-	100 - 240 V AC	<b>EASY819-AC-RCX</b> 256268	
	Inputs		Outputs		Additional features		Supply voltage	Part no. Article no.	
	Digital	Of which can be used as outputs	Smart-Wire-DT	Transistor	Smart-Wire-DT	Real time clock	Display & keypad		
<b>easy800 with SmartWire-DT</b>									
Combines the functionality of an easy800 with direct connection to switchgear communication system for SmartWire-DT Up to 99 SmartWire-DT modules with a total of up to 166 inputs/outputs can be connected via a SmartWire-DT line									
	-	-	83	-	83	✓	-	24 V DC	<b>EASY802-DC-SWD</b> 152901
	4	2	83	2	83	✓	-	24 V DC	<b>EASY806-DC-SWD</b> 152902
Software								Part no. Article no.	
<b>Programming and visualisation software</b>									
	13 installation languages Operating systems: Windows 2000 SP4, Windows XP SP3, Windows Vista (32-bit), Windows 7 (32-bit + 64 Bit)								<b>EASY-SOFT-PRO</b> 266040
	Function					Description	Length m	Part no. Article no.	
<b>Programming cable</b>									
	For downloading the user program from PC to device					SUB-D, 9 pole, serial	2	<b>EASY800-PC-CAB</b> 256277	
		For downloading the user program from PC to device					USB	2	<b>EASY800-USB-CAB</b> 106408
		For upload of user program or configuration from PC to device					SUB-D, 9 pole, serial	2	<b>EU4A-RJ45-CAB1</b> 106726
		For upload of user program or configuration from PC to device					USB	2	<b>EU4A-RJ45-USB-CAB1</b> 115735




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<sup>31</sup>, 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<sup>32</sup> 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

Description		Part no. Article no.
<b>Display / operator unit</b>		
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	<b>MFD-80-B</b> 265251
	with keypad, without Eaton logotype NEMA 4x in conjunction with MFD-XM-80 protective diaphragm	<b>MFD-80-B-X</b> 284905
	without keypad, with Eaton logotype NEMA 4x	<b>MFD-80</b> 265250
	without keypad, without Eaton logotype NEMA 4x	<b>MFD-80-X</b> 284904

Supply voltage	Description	Part no. Article no.
<b>Power supply/CPU modules</b>		
Combinable with MFD-80... display/operator unit and 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		
	100 - 240 V AC	Program and screen memory
	100 - 240 V AC	Program and screen memory, with easyNet
	24 V DC	Program and screen memory
	24 V DC	Program and screen memory, with easyNet
	24 V DC	Double program and screen memory
	24 V DC	Double program and screen memory, with easyNet
	24 V DC	Double program and screen memory, with easyNet
		<b>MFD-AC-CP8-ME</b> 274091
		<b>MFD-AC-CP8-NT</b> 274092
		<b>MFD-CP8-ME</b> 267164
		<b>MFD-CP8-NT</b> 265253
		<b>MFD-CP10-ME</b> 133801
		<b>MFD-CP10-NT</b> 133800

	Power supply	Can be use for	Inputs			Outputs			Temperature ranges	Part no. Article no.
			Digital	Of which usable as analog	Pt100	Relay 10 A (UL)	Transistor	analog		
I/O modules										
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	4	-	-	-	<b>MFD-R16</b> 265254
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	-	4	-	-	<b>MFD-T16</b> 265255
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	4	-	1	-	<b>MFD-RA17</b> 265364
	24 V DC	MFD-CP8... MFD-CP10...	12	4	-	-	4	1	-	<b>MFD-TA17</b> 265256
	100-240 V DC	MFD-AC-CP8...	12	-	-	4	-	-	-	<b>MFD-AC-R16</b> 274093
I/O modules with temperature measuring										
	24 V DC	MFD-CP8... from device version 08, MFD-CP10	6	2	2	-	4	-	-40...+90°C 0...+250°C 0...+400°C	<b>MFD-TP12-PT-A</b> 106042
			6	2	2	-	4	-	-200...+200°C 0...+850°C	<b>MFD-TP12-PT-B</b> 106043
			6	2	-	-	4	-	-40...+90°C 0...+250°C	<b>MFD-TP12-NI-A</b> 106044
			6	2	2	-	4	1	-40...+90°C 0...+250°C 0...+400°C	<b>MFD-TAP13-PT-A</b> 106045
			6	2	2	-	4	1	-200...+200°C 0...+850°C	<b>MFD-TAP13-PT-B</b> 106046
			6	2	-	-	4	1	-40...+90°C 0...+250°C	<b>MFD-TAP13-NI-A</b> 106047





Note: For programming software and programming cable see easy800



## 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.



	Input voltage range	Rated output voltage	Setting range of output voltage	Rated output power	Rated output current	Part no. Article no.
<b>Power supply units, 1-phase</b>						
<ul style="list-style-type: none"> <li>Rated input voltage: 100 - 240 V AC</li> </ul>						
	85 - 264 V AC	24 V DC / 12 V DC	-	8 W	0.35 A / 20 mA	<b>EASY200-POW</b> 229424
	85 - 264 V AC	24 V DC	-	30 W	1.25 A	<b>EASY400-POW</b> 212319
	85 - 264 V AC	24 V DC	-	60 W	2.5 A	<b>EASY500-POW</b> 110941
	85 - 264 V AC	24 V DC	-	100 W	4.2 A	<b>EASY600-POW</b> 262399
	85 - 264 V AC	24 V DC	-	24 W	1 A	<b>ELC-PS01</b> 135239
	85 - 264 V AC	24 V DC	-	48 W	2 A	<b>ELC-PS02</b> 135240
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	60 W	2.5 A	<b>PSG60E</b> 131673
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	120 W	5 A	<b>PSG120E</b> 131318
	85 - 264 V AC (120 - 375 V DC)	24 V DC	22 - 28 V DC	240 W	10 A	<b>PSG240E</b> 131670
	(120 - 375 V DC)	24 V DC	22 - 28 V DC	480 W	20 A	<b>PSG480E</b> 135227
<b>Power supply units, 3-phase</b>						
<ul style="list-style-type: none"> <li>Rated input voltage: 3 x 400 - 500 V AC</li> </ul>						
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	60 W	2.5 A	<b>PSG60F</b> 135226
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	120 W	5 A	<b>PSG120F</b> 131319
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	240 W	10 A	<b>PSG240F</b> 131671
	320 - 575 V AC (450 - 800 V DC)	24 V DC	22 - 28 V DC	480 W	20 A	<b>PSG480F</b> 131672

## Push-button



**flush,  
titanium ring**  
IP67, IP69K –  
spring-return /  
stay-put



**extended,  
titanium ring**  
IP67, IP69K –  
spring-return /  
stay-put

## Mushroom actuator



IP67, IP69K –  
spring-return /  
stay-put

## Double actuator



IP66  
extended / flush

## 4 position push-button

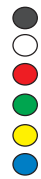


IP66  
– opposing buttons  
not mechanically  
interlocked  
– opposing buttons  
mechanically  
interlocked

## Indicator lights



**flush**  
IP67, IP69K



**extended**  
IP67, IP69K



## Illuminated push-button actuators

**flush,  
titanium ring**  
IP67, IP69K  
spring-return /  
stay-put



**extended,  
titanium ring**  
IP67, IP69K  
spring-return /  
stay-put



## Thumb-grip selector switch



IP66  
spring-return /  
stay-put



## Illuminated thumb-grip selector switch



IP66  
spring-return /  
stay-put



## Key-operated actuator



IP66  
spring-return /  
stay-put  
2 / 3 positions



## Selector switch



IP66  
spring-return /  
stay-put  
2 / 3 / 4 positions

## Joystick



IP66  
spring-return /  
stay-put  
2 and 4 positions  
horizontal and vertical

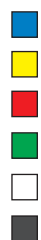
# Control Circuit Devices RMQ 16

See Industry Main Catalogue

## Push-button actuators



IP65  
spring-return /  
stay-put  
18 x 18 mm and  
25 x 25 mm



## Illuminated actuators



IP65  
flush / extended  
18 x 18 mm and  
25 x 25 mm



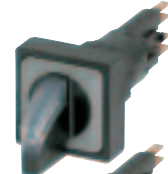
## Illuminated push-button actuators



IP65  
spring-return /  
stay-put  
18 x 18 mm and  
25 x 25 mm



## Selector switch actuators



IP65  
spring-return /  
stay-put  
2 / 3 positions  
18 x 18 mm and  
25 x 25 mm



## Key-operated actuators



IP65  
spring-return /  
stay-put  
2 / 3 positions  
18 x 18 mm and  
25 x 25 mm



## EMERGENCY-STOP/OFF actuators



**Mushroom actuator, 38 mm**  
IP66, IP69K  
illuminated,  
non-illuminated,  
pull or turn to reset



**Palm switch 45 and 60 mm**  
IP66, IP69K  
pull or 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



IP66

## 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

## Complete unit



## Continuous light / flashing module



without bulbs



## Acoustic module



IP20  
continuous and pulsed sound

## Base module



IP54  
black with cover

## Stand with spacer



Stand with spacer, fixing bracket 90° for wall mounting

## FAK switch

Page 109

## EMERGENCY-STOP/OFF buttons



IP65, 25 x 25 mm  
illuminated / not-illuminated

## Contact blocks



NO / NC

## Emergency-Stop labels



in four languages / blank

## Screw adapter



for NO / NC and lamp sockets

## Foot and palm switch



IP67, IP67K

## Emergency-Stop button



IP67, IP67K  
tamper proof

## Mechanical Position Detection

Page 110 ff.

### Position switches LS-Titan



### Operating heads

Roller lever



Adjustable roller lever



Actuating rod



### Analog electronic position switch



## Safe Mechanical Position Detection

Page 114 ff.

### Door flap safety switch



### Door hinge safety switch



### Safety position switch

Spring-powered or magnet-powered interlock



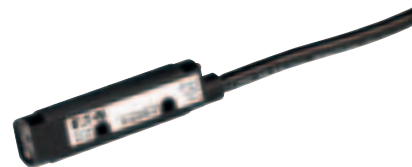
Complete unit



## Optical Product Recognition

Page 116 ff.

### Comet series photoelectric sensors / emitters



### E58 Harsh Duty



### Intelligent and compact E65-SM series



### Optional fiber-glass extension

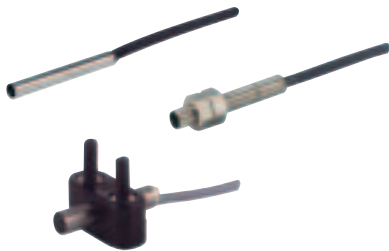




## Inductive Metal Detection

Page 116 ff.

### Miniature series



### Global series



### E52 and E56 series



### Premium Plus series



See Industry Main Catalogue

## Intelligent Sensor Adaption

Page 116

### iProx series



### ProxView software



## Checking Capacitive Fill Levels

Page 117

### 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 122 ff.

### Electronic timing relay DIL ET



### Electronic timing relay ETR 2

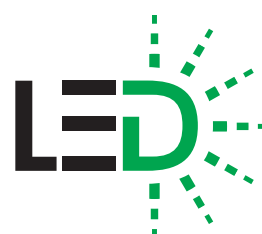


### Electronic timing relay ETR 4



### Electronic measuring and monitoring relays EMR4





## In Great Shape: The Ergonomic Control Circuit Devices RMQ-Titan<sup>®</sup>



Modern 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<sup>1)</sup> 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.

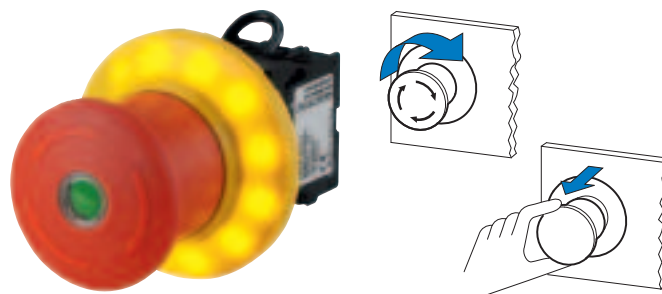
Control circuit devices RMQ-Titan are ingeniously simple to connect with SmartWire-DT.

<sup>1)</sup> 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 IP54 / IP67.



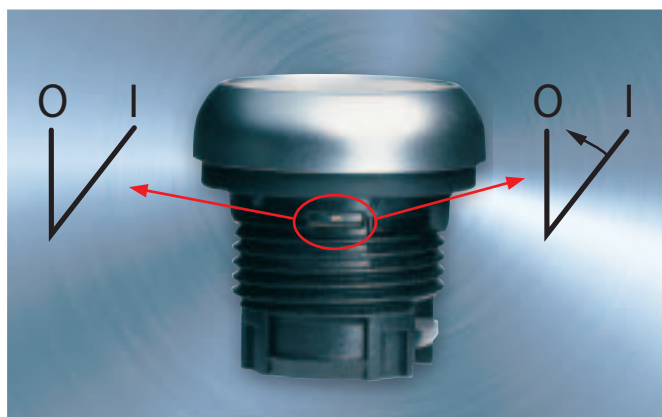
### Safe shutdown with RMO-Titan

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.



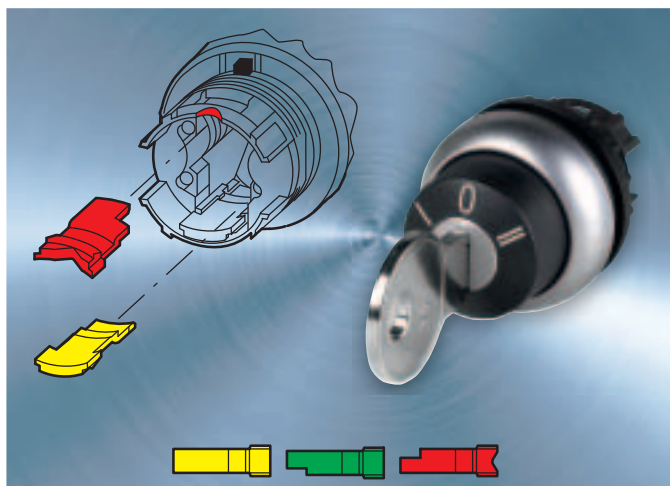
### SmartWire-DT – simply ingenious

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.



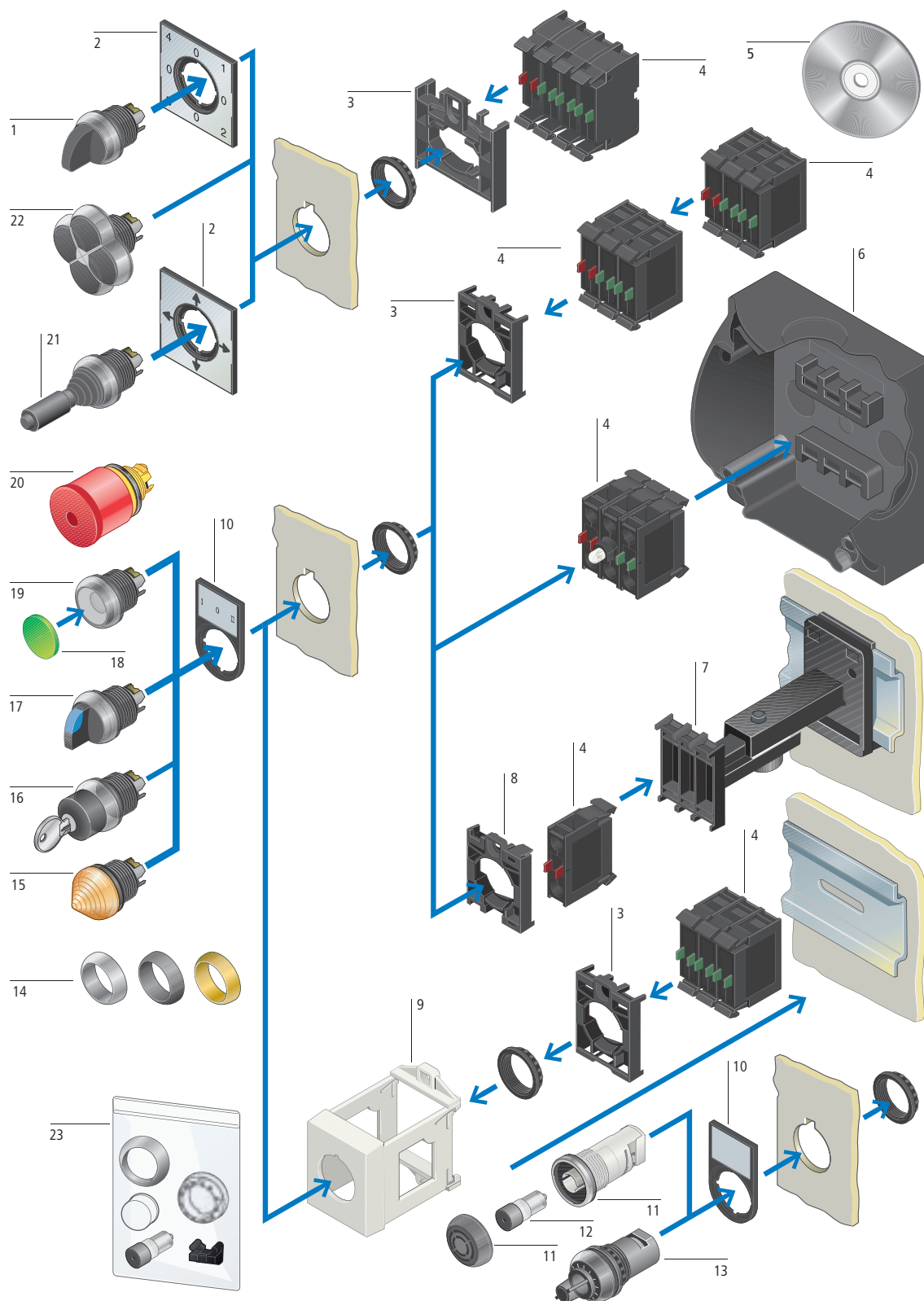
### Simple function coding

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/en/support/index.jsp](http://www.moeller.net/en/support/index.jsp) Search term: Labeleditor



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

















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
			M22-D-R-X0	216605
			M22-D-G-X1	216607
			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
			M22-DL-A	167429
 Actuator extended,	momentary		M22-DLH-W	216965
			M22-DLH-R	216967
			M22-DLH-G	216969
			M22-DLH-Y	216971
			M22-DLH-B	216973
			M22-DLH-A	167433
Double actuator pushbuttons with indicator light, IP66				
 White lens	momentary		M22-DDL-GR-X1/X0	216700
			M22-DDL-GR-GB1/GB0	216702
			M22-DDL-WS-X1/X0	216706
Mushroom actuator, IP67, IP69K				
 Mushroom actuator	momentary		M22-DP-S	216712
			M22-DP-R	216714
			M22-DP-G	216716
			M22-DP-Y	216718
			M22-DP-R-X0	216720

# RMQ-Titan pilot devices

Emergency stop pushbuttons/ Emergency switching off pushbuttons

Moeller® series

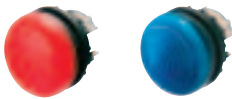






















Description/inscription		Color	Part no. Article no.	Part no. Article no.
Emergency stop pushbuttons/ Emergency switching off pushbuttons				
Mushroom-shaped, IP66 or IP67, IP69K			Diameter = 38 mm	
	Unlock by pulling without illumination		M22-PV 216876	-
	Unlock by pulling illuminated with LED element 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 pulling without illumination		M22-PV45P 152862	M22-PV60P 152864
	Unlock by pulling illuminated with LED element M22-LED...		M22-PVL45P 152860	M22-PVL60P 152861
	Unlock by pulling with mechanical switch position indication		M22-PV45P-MPI 152863	M22-PV60P-MPI 152865
	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
	Unlock by turning with mechanical switch position indication		M22-PVT45P-MPI 121463	M22-PVT60P-MPI 121465
	Unlock by turning with key without illumination		M22-PVS45P-MS1 121468	M22-PVS60P-MS1 121469
	Unlock by turning with key without illumination		M22-PVS45P-RS 121466	M22-PVS60P-RS 121467
Emergency stop/ switching off labels yellow, with black lettering				
33 x 50 mm	Emergency-stop actuator		M22-XZK1-D99 121089	-
	Emergency switching off		M22-XZK-D99 216471	-
	Blank		M22-XZK 216470	-
50 x 50 mm	Emergency-stop actuator quadrilingual: de, en, fr, it		M22-XYK11 121373	-
	Emergency switching off quadrilingual: de, en, fr, it		M22-XYK1 216484	-
	Diameter 90 mm		Emergency-stop actuator 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 actuator 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 buttons M22-PV, M22-PVL, M22-PVS		M22-PL-PV 216397	-
				

Description/inscription		Color	Part no. Article no.
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 fixing adapter M22-A4 → page 102			
With rotary head	maintained		M22-WR4 279419
With thumb-grip	maintained		M22-WRK4 279431
IP66, key-operated actuators			
	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

Moeller® series

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
			M22-L-A 164374	M22-LH-A 164375
Illuminated selector switch actuators, thumb-grip, IP66				
	Two positions		momentary	maintained
			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	
















Description		Color	Part no. Article no.
LED elements with screw terminals			
<div>Front mount</div> <div></div>	12 - 30 V AC/DC	<div></div>	M22-LED-W 216557
		<div></div>	M22-LED-R 216558
		<div></div>	M22-LED-G 216559
		<div></div>	M22-LED-B 218057
	85 - 264 V AC	<div></div>	M22-LED230-W 216563
		<div></div>	M22-LED230-R 216564
		<div></div>	M22-LED230-G 216565
		<div></div>	M22-LED230-B 218059
<div>Base fixing</div> <div></div>	12 - 30 V AC/DC	<div></div>	M22-LEDC-W 216560
		<div></div>	M22-LEDC-R 216561
		<div></div>	M22-LEDC-G 216562
		<div></div>	M22-LEDC-B 218058
	85 - 264 V AC	<div></div>	M22-LEDC230-W 216566
		<div></div>	M22-LEDC230-R 216567
		<div></div>	M22-LEDC230-G 216568
		<div></div>	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		
<div></div>	1	<div></div>	M22-IY1 216536
<div></div>	1	<div></div>	M22-I1 216535
	2		M22-I2 216537
	3		M22-I3 216538
	4		M22-I4 216539
	6 (IP66)		M22-I6 216540
Flush mounting plates IP65			
<div></div>	1	<div></div>	M22-E1 216541
	2		M22-E2 216543
	3		M22-E3 216544

# RMQ-Titan pilot devices

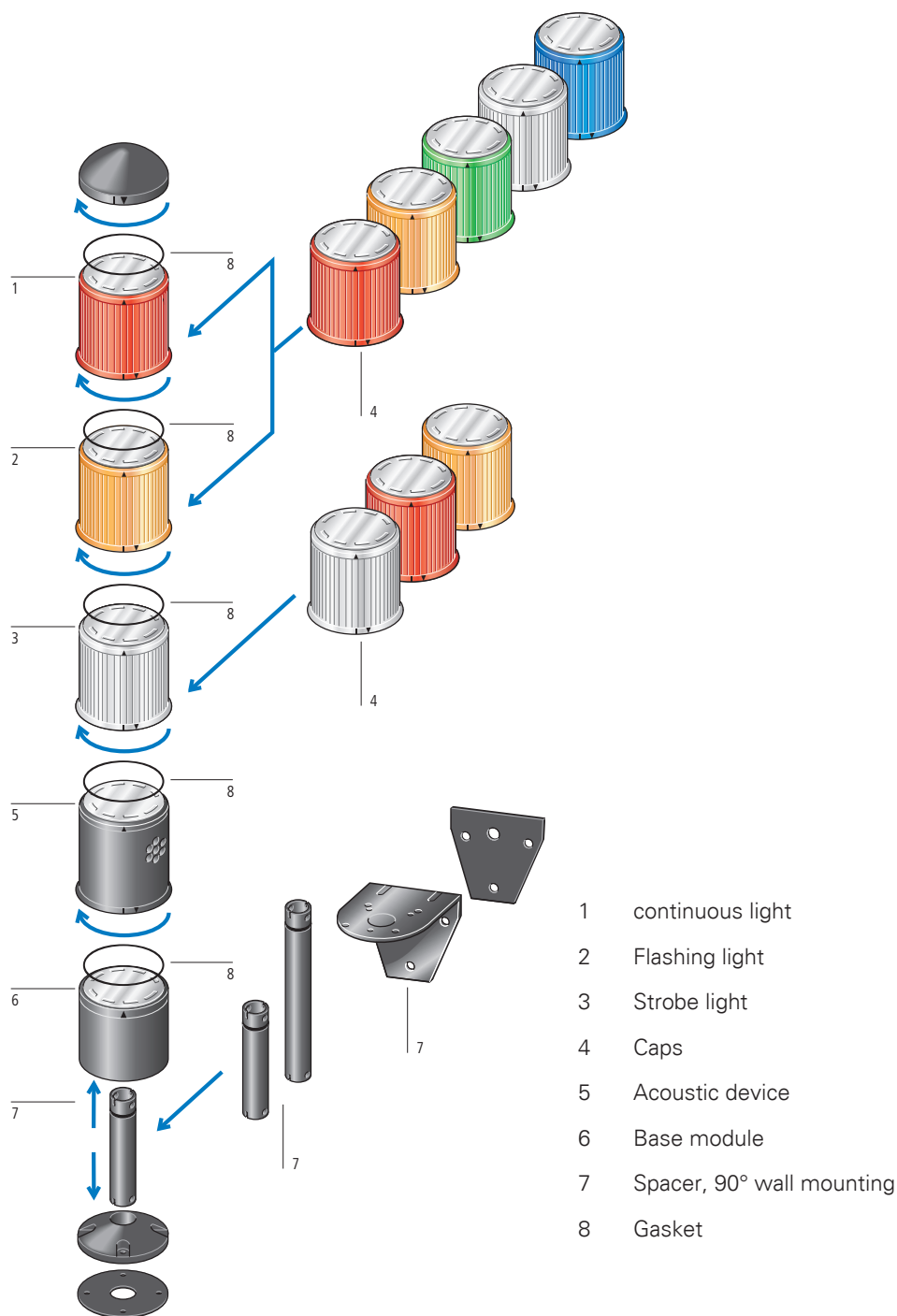
Complete devices, potentiometer, acoustic device









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	IP67, IP69K	M22-D-G-X1/KC11/I 216522
		1 N/O, 1 N/C		
2 numbers of locations	2 N/O, 2 N/C			M22-I2-M1 216529
3 numbers of locations	3 N/O, 3 N/C			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

	Description	Color	Part no.	Article no.	Part no.	Article no.
<b>Joystick, IP66</b>						
 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		
<b>Labels for joysticks</b>						
	No inscription		M22-XCK	279433		
	4 direction arrows		M22-XCK1	279434		
	2 direction arrows, can be turned through 90°		M22-XCK3	290260		
<b>4-way pushbutton, IP66</b>						
 Momentary in every position	No inscription		M22-D4-S	279411		
	4 direction arrows		M22-D4-S-X7	286336		
<b>Complete legend holders, IP66</b>						
 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		
<b>IP66, legend holders, without label mount</b>						
 round, black	for pushbuttons 30 x 50 mm		M22S-ST-X	216392		
	for double actuator pushbuttons 30 x 75 mm		M22S-STDD-X	216394		
<b>Insert labels for label mount</b>						
	Aluminium-coloured, no inscription		M22-XST	216480		
<b>Button plates for pushbutton actuators</b>						
 			<b>Design: flush</b>		<b>Design: raised</b>	
			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
			M22-XD-R-X0	218153	M22-XD-R-X0	218153
			M22-XD-G-X1	218165	M22-XDH-G-X1	218210

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













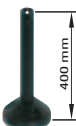















Description		Color	Part no. Article no.	Part no. Article no.
Base modules, IP54				
	with cover, screw terminals		<b>SL-B</b> 205311	
Continuous light modules, IP54				
	without light elements, filament lamps		<b>SL-L-W</b> 205312	-
			<b>SL-L-R</b> 205313	-
			<b>SL-L-G</b> 205314	-
			<b>SL-L-Y</b> 205315	-
			<b>SL-L-B</b> 205316	-

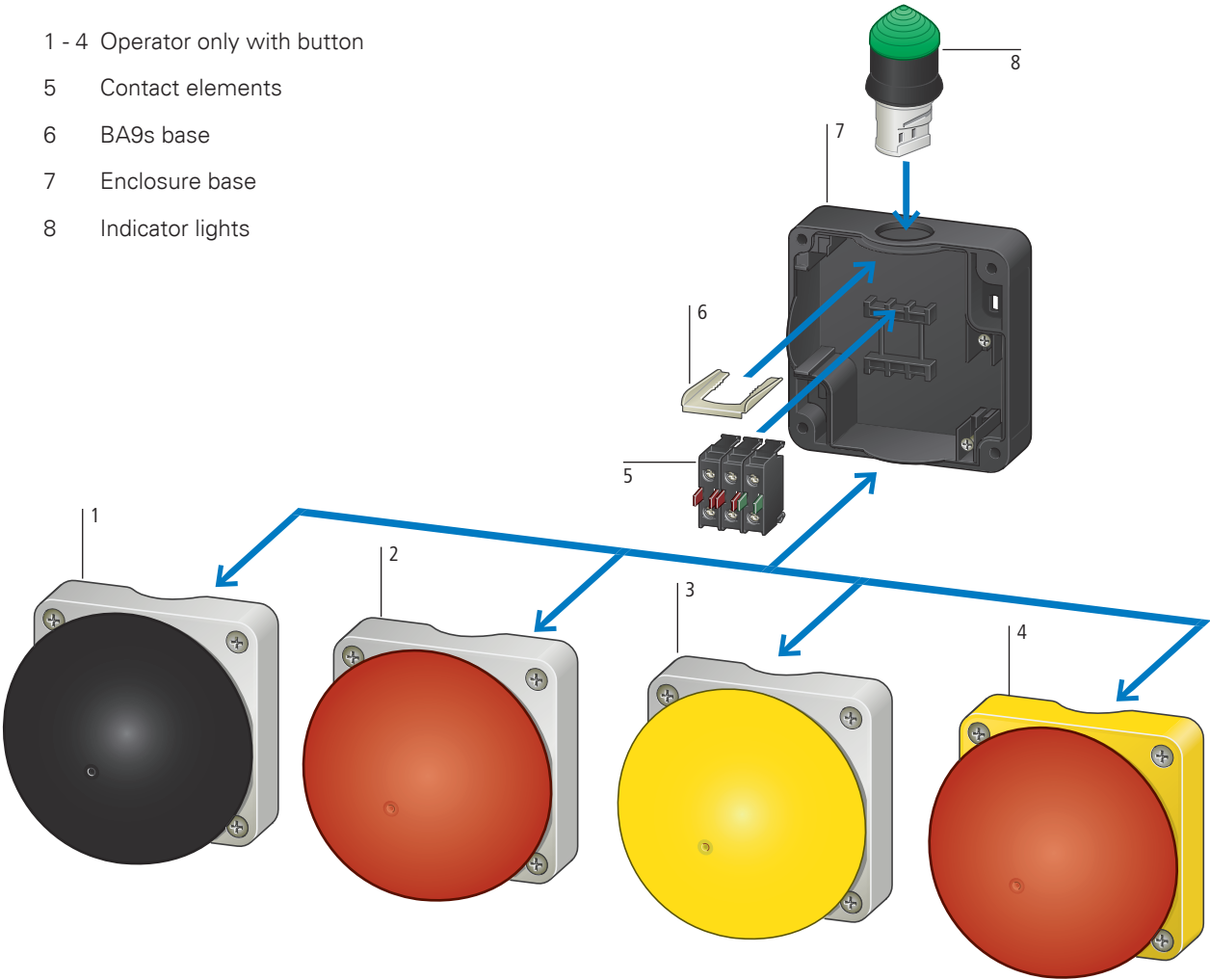


# SL signal towers


















## Modules, Accessories

	Description	Color	Part no. Article no.	Part no. Article no.
Flashing light module, IP54				
	Without light elements		<b>24 V AC/DC</b> <b>SL-BL24-W</b> 205317	<b>230 V AC</b> <b>SL-BL230-W</b> 205327
			<b>SL-BL24-R</b> 205318	<b>SL-BL230-R</b> 205328
			<b>SL-BL24-Y</b> 205320	<b>SL-BL230-G</b> 205329
			<b>SL-BL24-G</b> 205319	<b>SL-BL230-Y</b> 205330
			<b>SL-BL24-B</b> 205321	<b>SL-BL230-B</b> 205331
Acoustic modules, IP20				
	<b>Continuous tone</b> 12 - 36 V AC/DC		<b>SL-A24</b> 205341	-
	110 - 230 V AC/DC		<b>SL-A110-230</b> 205342	-
	<b>Pulse tone</b> 12 - 36 V AC/DC		<b>SL-AP24</b> 205343	-
	110 - 230 V AC/DC		<b>SL-AP110-230</b> 205344	-
Strobe light module, IP54 with flash tube				
	230 V AC		<b>SL-FL230-W</b> 205338	-
			<b>SL-FL230-R</b> 205339	-
			<b>SL-FL230-Y</b> 205340	-
Stand with spacer				
	100 mm, insulated material		<b>SL-F100</b> 205345	-
	100 mm, metal		<b>SL-F100M</b> 265359	-
	250 mm, insulated material		<b>SL-F250</b> 205346	-
	250 mm, metal		<b>SL-F250M</b> 268925	-
	400 mm, metal		<b>SL-F400</b> 215275	-
	800 mm, metal		<b>SL-F800</b> 215276	-
Fixing bracket 90°, for wall mounting				
	Metal	-	<b>SL-FW</b> 205347	-
Filament lamp BA 15d, 5 - 7 W				
	24 V	-	<b>SL-L24</b> 205348	-
	110 - 130 V	-	<b>SL-L130</b> 205349	-
	230 V	-	<b>SL-L230</b> 205350	-
Multiple LED BA 15d				
	-		<b>18 - 30 V AC/DC</b> <b>SL-LED-W</b> 215278	<b>110 - 230 V AC</b> <b>SL-LED230-W</b> 285532
	-		<b>SL-LED-R</b> 215279	<b>SL-LED230-R</b> 285533
	-		<b>SL-LED-G</b> 215280	<b>SL-LED230-G</b> 285534
	-		<b>SL-LED-Y</b> 215281	<b>SL-LED230-Y</b> 285535
	-		<b>SL-LED-B</b> 215282	<b>SL-LED230-B</b> 285536
	-			
Gasket set				
	For increasing the degree of protection to IP65 (Not for the acoustic device) for 3 modules ± 4 units	-	<b>SL-IP65</b> 215277	-

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



Command and Signalling

	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	<b>FAK-S/KC11/I</b> 229749
					1 N/O	1 N/C	<b>FAK-R/KC11/I</b> 229746
	maintained				-	1 N/C	<b>FAK-R/V/KC01/IY</b> 229747
					1 N/O	1 N/C	<b>FAK-R/V/KC11/IY</b> 229748
					-	2 N/C	<b>FAK-R/V/KC02/IY</b> 256790



# Movements Safely Under Control Detect Positions Mechanically, Optically and Inductively

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.



### 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



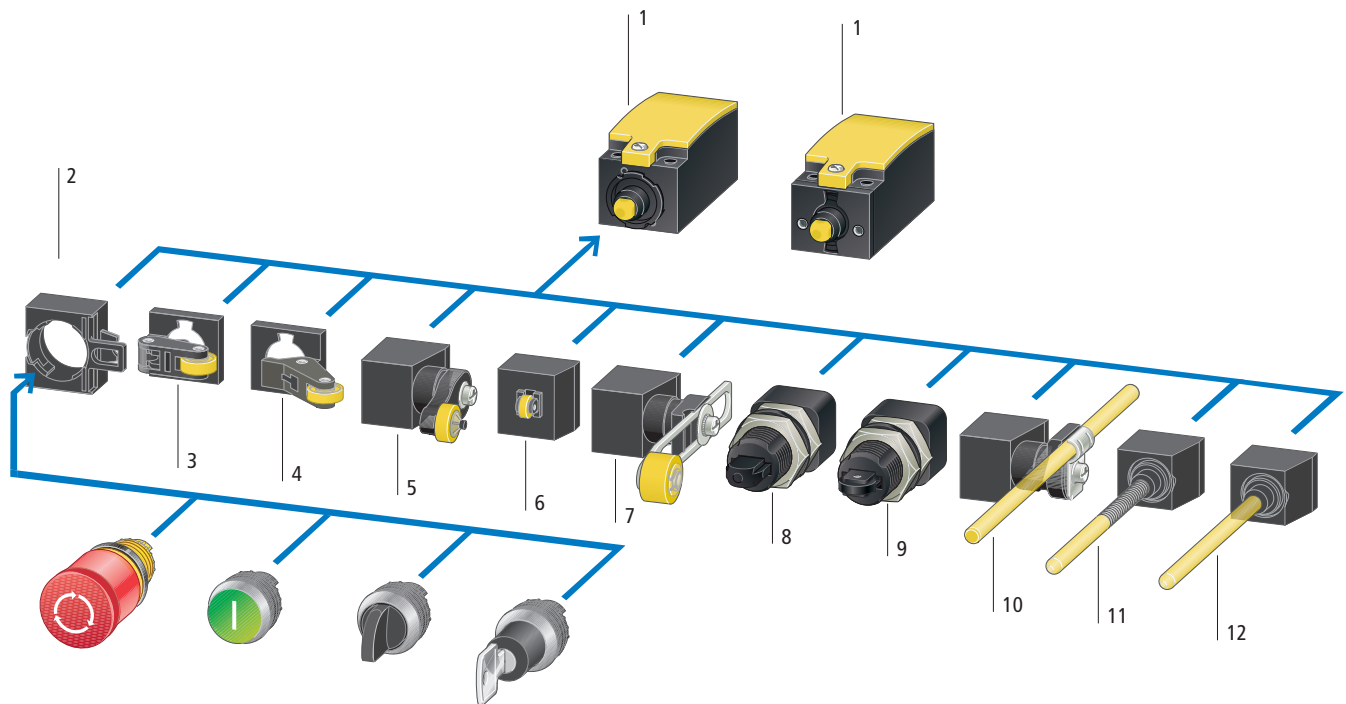
### Photoelectric sensors – The eyes for every environment

- 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

# Position switches

Safety position switches LS-Titan


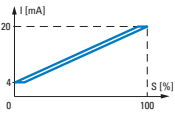
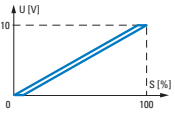




Moeller® series



- 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		Contact sequence	housing	Cage Clamp <sup>1)</sup>	Screw terminal
☞ Positive opening safety function according to IEC/EN 60947-5-1					
N/O = normally open contact	N/C = normally closed contact			Part no. Article no.	Part no. Article no.
<b>Basic device, expandable</b>					
Analog electronic position switches IP66, IP67					
no safety function Visual status display Q1 = analog output Q2 = Diagnostics output					
					
			Insulated material	<b>LSE-AI</b> 269461	
			Insulated material	<b>LSE-AU</b> 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	<b>LSE-11</b> 266121
		-	2 N/C	Insulated material	<b>LSE-02</b> 266122
Rounded plunger, IP66, IP67					
		-	2 N/C	Insulated material	<b>LS-02</b> 266107
		-	2 N/C	Metal	<b>LSM-02</b> 266142
		1 N/O	1 N/C	Insulated material	<b>LS-11</b> 266109
		1 N/O	1 N/C	Metal	<b>LSM-11</b> 266144
with quick-break switch		1 N/O	1 N/C	Insulated material	<b>LS-11S</b> 266105
		1 N/O	1 N/C	Metal	<b>LSM-11S</b> 266140
Rounded plunger, IP66, IP67 (without positive opening)					
		2 N/O	-	Insulated material	<b>LS-20</b> 266120
		2 N/O	-	Metal	<b>LSM-20</b> 266155

## Notes

<sup>1)</sup> 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

Moeller® series

		Contact configuration		housing		Cage Clamp <sup>1)</sup>		Screw terminal	
		⊕ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact    N/C = normally closed contact				Part no.	Article no.	Part no.	Article no.
Complete devices <sup>2)</sup>									
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
short	1 N/O		1 N/C ⊕	Metal	with quick-break switch	LSM-11S/L	266151	-	-
	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

<sup>1)</sup> 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

<sup>2)</sup> The operating head can be rotated at 90° intervals to adapt to the specified starting direction.

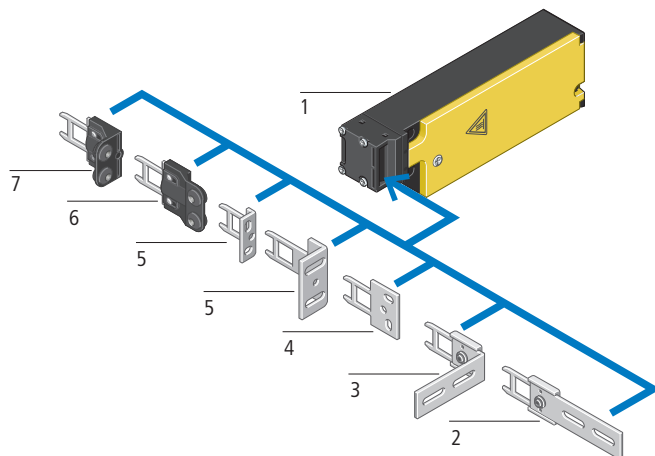
		Insulated material Part no. Article no.	Metal Part no. Article no.	Notes
<b>Rounded plunger, centre fixing</b>				
	For installation in M18 × 1 enclosure wall or mounting plate bore	<b>LS-XZS</b> 114024		The operating head can be rotated at 90° intervals to adapt to the specified starting direction.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

# Position switches

Safety position switch LS...ZBZ

Moeller® series




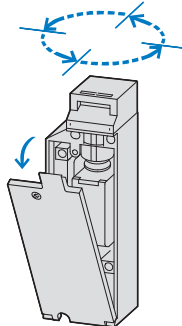
LS-...ZBZ












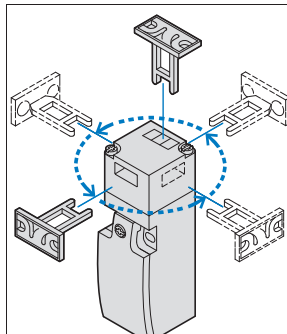


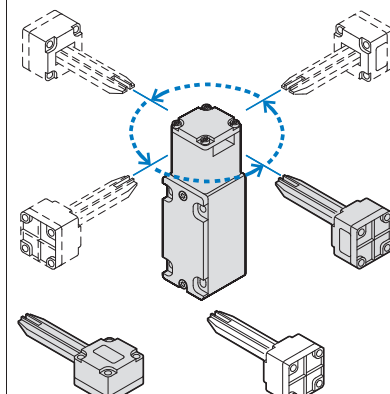
- 1 Basic device
- 2 Flat flexible actuator
- 3 Angled flexible actuator
- 4 Flat actuator
- 5 Angled actuator
- 6 Flat compensating actuator
- 7 Angled compensating actuator

Order actuators separately  
→ Catalog Industrial Switchgear 2011











Contact configuration			Rated control voltage for magnetic system U <sub>s</sub>  V	Part no. Article no.	Notes
⊕ Positive opening safety function according to IEC/EN 60947-5-1					
N/O = normally open contact	N/C = normally closed contact				

Basic devices with spring-powered interlock (closed-circuit principle) IP65					
• With interlock monitoring and auxiliary release mechanism					
• Monitoring of door position: continuous					
  	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					
  	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	Approval mark	Connection Type	Part no. Article no.	Notes	
⊕ Positive opening safety function according to IEC/EN 60947-5-1 N/O = normally open contact    N/C = normally closed contact					
Hasp-operated safety switch LSR-.../TKG, IP65					
	-	2 N/C ⊕		Screw terminal	<b>LSR-S02-1-I/TKG</b> 106848
	1 N/O	1 N/C ⊕		Screw terminal	<b>LSR-S11-1-I/TKG</b> 106847
Hinge-operated switch LSR-.../TS, IP65					
	-	2 N/C ⊕		Screw terminal	<b>LSR-S02-1-I/TS</b> 106852
	1 N/O	1 N/C ⊕		Screw terminal	<b>LSR-S11-1-I/TS</b> 106851
Safety position switch LS-...-ZB, IP65					
	-	2 N/C ⊕		Cage Clamp	<b>LS-02-ZB</b> 106817
	-	2 N/C ⊕		Screw terminal	<b>LS-S02-ZB</b> 106874
	1 N/O	1 N/C ⊕		Cage Clamp	<b>LS-11-ZB</b> 106819
	1 N/O	1 N/C ⊕		Screw terminal	<b>LS-S11-ZB</b> 106876
	1 N/O	1 N/C ⊕		Cage Clamp	<b>LS-11S-ZB</b> 106870
	1 N/O	1 N/C ⊕		Screw terminal	<b>LS-S11S-ZB</b> 106877
					
Actuator included as standard.					
Safety position switch LS4.../ZB, IP65					
	1 N/O	1 N/C ⊕		Screw terminal	<b>LS4/S11-1/I/ZB</b> 106857
	1 N/O	1 N/C ⊕		Screw terminal	<b>LS4/S11-1/IA/ZB</b> 106858
	1 N/O	2 N/C ⊕		Screw terminal	<b>LS4/S12-7/IB/ZB</b> 106859
					
Actuator included as standard.					

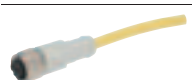





	Rated switching distance $S_n$ mm	Type of mounting	Contact configuration N/O = normally open contact N/C = normally closed contact	Material	Part no.	Article no.
<b>E57 Global series</b> <ul style="list-style-type: none"><li>• LED for output status</li><li>• Rated operating voltage 10 - 30 V DC</li><li>• Switching type PNP</li><li>• Plug-in connection M12 x 1, 3-conductor</li></ul>						
M8 x 1						
	1	Flush	1 N/O	Stainless steel	<b>E57-08GS01-GDB</b>	135862
	2	Non-flush			<b>E57-08GU02-GDB</b>	135866
	3	Flush			<b>E57-08GE03-GDB</b>	135854
	6	Non-flush			<b>E57-08GE06-GDB</b>	135858
M12 x 1						
	2	Flush	1 N/O	Metal	<b>E57-12GS02-GDB</b>	135886
	4	Non-flush			<b>E57-12GU04-GDB</b>	135895
	5	Flush			<b>E57-12GE05-GDB</b>	135870
	10	Non-flush			<b>E57-12GE10-GDB</b>	135878
M18 x 1						
	5	Flush	1 N/O	Metal	<b>E57-18GS05-GDB</b>	135932
	8	Flush			<b>E57-18GE08-GDB</b>	135915
	8	Non-flush			<b>E57-18GU08-GDB</b>	135940
	18	Non-flush			<b>E57-18GE18-GDB</b>	135924
M30 x 1.5						
	10	Flush	1 N/O	Metal	<b>E57-30GS10-GDB</b>	135978
	15	Flush			<b>E57-30GE15-GDB</b>	135960
	15	Non-flush			<b>E57-30GU15-GDB</b>	135986
	29	Non-flush			<b>E57-30GE29-GDB</b>	135968
<b>Miniature series E57</b> <ul style="list-style-type: none"><li>• LED for output status</li><li>• Rated operating voltage 10 - 30 V DC</li><li>• Switching type PNP</li><li>• 2 m connection cable, 3-conductor</li></ul>						
4 mm Ø						
	0.8	Flush	1 N/O	Stainless steel	<b>E57EAL4T111SP</b>	136239
M5 x 1						
	0.8	Flush	1 N/O	Stainless steel	<b>E57EAL5T111SP</b>	136241
6.5 mm Ø						
	1	Flush	1 N/O	Stainless steel	<b>E57EAL6T111SP</b>	136245
	2	Non-flush	1 N/O	Stainless steel	<b>E57EAL6T111EP</b>	136244
<b>iProx series</b> <ul style="list-style-type: none"><li>• Rated operating voltage 6 - 48 V DC</li><li>• Switching type NPN/PNP</li><li>• Plug-in connection M12 x 1, 3-conductor</li></ul>						
M12 x 1						
	4	Flush	1 N/O	Stainless steel	<b>E59-M12A105D01-D1</b>	136207
M18 x 1						
	8	Flush	1 N/O	Stainless steel	<b>E59-M18A108D01-D1</b>	136215
	18	Non-flush	1 N/O	Stainless steel	<b>E59-M18C116D01-D1</b>	136219
M30 x 1.5						
	15	Flush	1 N/O	Stainless steel	<b>E59-M30A115D01-D1</b>	136223
Programming cable RS232					<b>E59RP1</b>	136229
Programming software CD					<b>E59SW1</b>	136230

	Design (outer dimensions)	Rated switching distance  S <sub>n</sub> mm	Type of mounting	Contact configuration N/C = Normally closed contact N/O = Normally open contact	Material	Part no. Article no.
<b>E52 Serie (inductive)</b> <ul style="list-style-type: none"><li>• 2 LED for current and output status</li><li>• Adjustable Sensing Head for Top- and Side-Sensing</li><li>• Rated operating voltage 6 - 48 V DC</li><li>• Automatic configuration NPN, PNP</li><li>• M12 plug connectors</li><li>• 4 conductor</li></ul>						
	40 x 40 x 40 Rectangular housing	15	Flush	1 N/C/1 N/O	Zinc/Insulated material	<b>E52Q-DL15SAD01</b> 135804
		15	Non-flush	1 N/C/1 N/O		<b>E52Q-DL15UAD01</b> 135805
		20	Flush	1 N/C/1 N/O		<b>E52Q-DL20SAD01</b> 135806
		20	Non-flush	1 N/C/1 N/O		<b>E52Q-DL20UAD01</b> 135807
		25	Non-flush	1 N/C/1 N/O		<b>E52Q-DL25UAD01</b> 135808
		30	Non-flush	1 N/C/1 N/O		<b>E52Q-DL30UAD01</b> 135809
		35	Non-flush	1 N/C/1 N/O		<b>E52Q-DL35UAD01</b> 135810
		40	Non-flush	1 N/C/1 N/O		<b>E52Q-DL40UAD01</b> 135811
<b>E56 Serie (inductive)</b> <ul style="list-style-type: none"><li>• 2 LED for current and output status</li><li>• Rated operating voltage 6 - 48 V DC</li><li>• Automatic configuration NPN, PNP</li><li>• Plug connectors</li><li>• 4 conductor</li></ul>						
	79 x 79 x 39	40	Flush	1 N/C/1 N/O	Insulated material	<b>E56ADL40SAD01</b> 136234
	79 x 79 x 39	50	Non-flush	1 N/C/1 N/O		<b>E56ADL40UAD01</b> 136235
	109 x 110 x 41	70	Non-flush	1 N/C/1 N/O		<b>E56BDL70UAD01</b> 136236
	171.5 x 171.5 x 67.4	100	Non-flush	1 N/C/1 N/O		<b>E56CDL100UAD01</b> 136237
<b>E53 Serie (capacitive)</b> <ul style="list-style-type: none"><li>• Output signal LED</li><li>• Rated operating voltage 10 - 30 V DC</li><li>• Switching type PNP</li><li>• Plug-in connection M12</li><li>• 3 conductor</li></ul>						
	M18 x 1	-	Flush	1 N/O	Insulated material	<b>E53KAL18T111SD</b> 134768
	-	8	Flush	1 N/C		<b>E53KBL18T111SD</b> 134802
	-	15	Non-flush	1 N/O		<b>E53KAL18T111ED</b> 134767
	-	15	Non-flush	1 N/C		<b>E53KBL18T111ED</b> 134801
	M30 x 1.5	-	Flush	1 N/O	Insulated material	<b>E53KAL30T111SD</b> 134780
	-	20	Flush	1 N/C		<b>E53KBL30T111SD</b> 134814
	-	25	Non-flush	1 N/O		<b>E53KAL30T111ED</b> 134779
	-	25	Non-flush	1 N/C		<b>E53KBL30T111ED</b> 134813
	34 Ø	-	Flush	1 N/O	Insulated material	<b>E53KAL34T111SD</b> 134790
	-	25	Flush	1 N/C		<b>E53KBL34T111SD</b> 134824
	-	35	Non-flush	1 N/O		<b>E53KAL34T111ED</b> 134789
	-	35	Non-flush	1 N/C		<b>E53KBL34T111ED</b> 134823

	Rated switching distance $S_n$ mm	Type of light	Part no. Article no.
<b>Comet series</b>			
<ul style="list-style-type: none"> <li>selector switch bright/dark switching</li> <li>M18 x 1,</li> <li>Plug-in connection M12 x 1</li> <li>Insulated material</li> </ul>			
3 conductor			
<ul style="list-style-type: none"> <li>Rated operating voltage 20 - 264 V AC, 15 - 30 V DC</li> <li>Switching type NPN</li> </ul>			
One-way light barrier (detector), flat	24000	visible red	<b>12102AQD03</b> 135576
			
One-way light barrier (source), flat	24000	visible red	<b>11102AQD03</b> 135564
			
Reflex sensor, flat			
<ul style="list-style-type: none"> <li>for combination with reflector</li> </ul>	7600	visible red	<b>14102AQD03</b> 135656
			
Reflex sensor, flat	50	visible red	<b>13104AQD03</b> <sup>1)</sup> 135604
			
	200	Infra-red	<b>13106AQD03</b> 135620
	225		<b>13103AQD03</b> <sup>1)</sup> 135596
	610		<b>13100AQD03</b> 135580
4 conductor			
<ul style="list-style-type: none"> <li>Rated operating voltage 10 - 30 V DC</li> <li>Switching type NPN, PNP</li> </ul>			
One-way light barrier (detector), flat	24000	visible red	<b>12102AQD07</b> 135577
			
One-way light barrier (source), flat	24000	visible red	<b>11102AQD07</b> 135565
			
Reflex sensor, flat			
<ul style="list-style-type: none"> <li>for combination with reflector</li> </ul>	7600	visible red	<b>14102AQD07</b> 135657
			
Reflex sensor, flat	50	visible red	<b>13104AQD07</b> <sup>1)</sup> 135605
			
	200	Infra-red	<b>13106AQD07</b> 135621
	225		<b>13103AQD07</b> <sup>1)</sup> 135597
	610		<b>13100AQD07</b> 135581
<b>Notes</b>	<sup>1)</sup> with background suppression (Perfect Prox)		

	Design (outer dimensions)	Rated switching distance S <sub>n</sub> mm	Type of light	Switching principle	Part no.	Article no.
<b>E58-Series</b> <ul style="list-style-type: none"><li>• Tempered glass lens cover protects against abrasion</li><li>• Bright 360° function display</li><li>• Rated operating voltage 10 - 30 V DC</li><li>• Switching type NPN, PNP</li><li>• Plug-in connection M12 x 1</li><li>• 4 conductor</li><li>• Stainless steel</li></ul>						
Reflected-light beam, with background suppression (Perfect Prox)						
	M18 x 1	50	visible red	dark switching	<b>E58-18DP50-HDP</b>	135671
		50		light switching	<b>E58-18DP50-HLP</b>	135673
		100		dark switching	<b>E58-18DP100-HDP</b>	135665
		100		light switching	<b>E58-18DP100-HLP</b>	135667
	M30 x 1.5	280		dark switching	<b>E58-30DPS280-HDP</b>	135681
		280		light switching	<b>E58-30DPS280-HLP</b>	135683
Reflex sensor for combination with reflector						
	M30 x 1.5	18000	visible red	dark switching	<b>E58-30RS18-HDP</b>	135689
	M30 x 1.5	18000		light switching	<b>E58-30RS18-HLP</b>	135691
One-way light barrier (detector)						
	M30 x 1.5	250000	-	dark switching	<b>E58-30TD250-HDP</b>	135693
	M30 x 1.5	250000	-	light switching	<b>E58-30TD250-HLP</b>	135695
One-way light barrier (source), forward viewing						
	M30 x 1.5	250000	visible red	-	<b>E58-30TS250-HAP</b>	135697
<b>E65-SM-Series</b> <ul style="list-style-type: none"><li>• Bright indicators for power, output, and TargetLock™</li><li>• Rated operating voltage 10 - 30 V DC</li><li>• M18 x 1</li><li>• Switching type NPN, PNP</li><li>• Plug-in connection M12 x 1</li><li>• 4 conductor</li><li>• Insulated material</li></ul>						
Reflected-light beam with background suppression (Perfect Prox)						
	-	100	-	dark switching	<b>E65-SMPP100-HDD</b>	135711
	-	100	-	light switching	<b>E65-SMPP100-HLD</b>	135713
One-way light barrier (detector) for combination with transmitter						
	-	15000	-	dark switching	<b>E65-SMTD15-HDD</b>	135731
	-	15000	-	light switching	<b>E65-SMTD15-HLD</b>	135733
One-way light barrier (transmitter) for combination with detector						
	-	15000	-	-	<b>E65-SMTS15-HAD</b>	135735

	Design, input end	Design output end	Length mm	Part no.	Article no.
<b>Connecting cables, DC, 4 pole</b>					
	Coupling, flat	Cable end open	2000	<b>CSDS4A4CY2202</b>	136292
			5000	<b>CSDS4A4CY2205</b>	136294
			10000	<b>CSDS4A4CY2210</b>	136296
	Coupling, flat	Plug, straight	1500	<b>CSDS4A4CY2201.5-D</b>	136316
			3000	<b>CSDS4A4CY2203-D</b>	136293
			5000	<b>CSDS4A4CY2205-D</b>	136295
	Coupling, flat	Plug, angled	1500	<b>CSDR4A4CY2201.5-D</b>	136313
			3000	<b>CSDR4A4CY2203-D</b>	136315
			5000	<b>CSDR4A4CY2205-D</b>	136283
	Coupling, angled	Cable end open	2000	<b>CSDR4A4CY2202</b>	136279
			5000	<b>CSDR4A4CY2205</b>	136282
			10000	<b>CSDR4A4CY2210</b>	136284



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



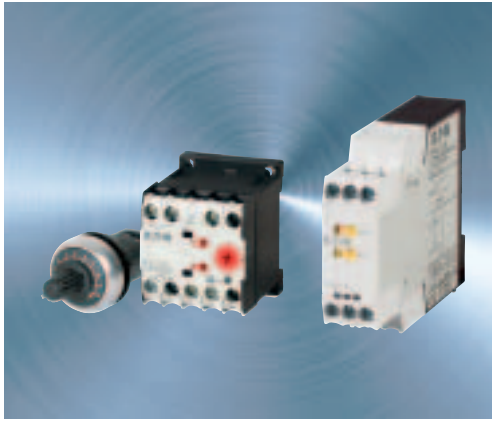
The range of electronic timing relay incorporates three different construction designs, which are adapted for differing application fields. All timing relays are mounted on DIN top-hat rails. The measuring and monitoring relay EMR4 range is approved for worldwide use. Most of the relays feature multi-voltage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



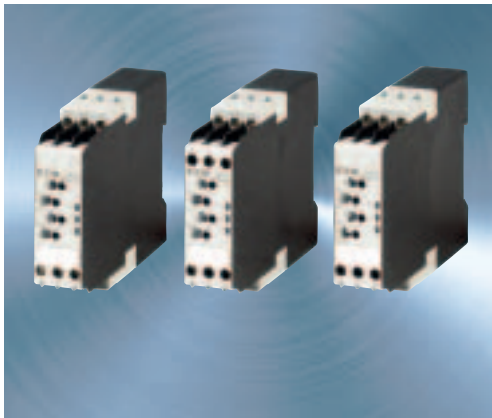
## Timing Relay DILET and ETR – Precision and Economic Switching



- 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



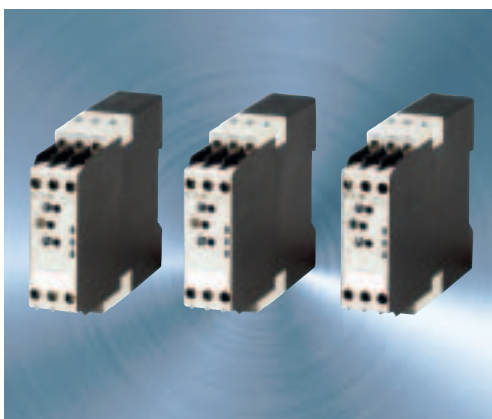
## Earth-leakage monitor and level relay EMR – the right solution for every application



- 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



## Single-phase current monitor EMR – for universal use









- Precision current monitoring in AC and DC networks
- Adjustable triggering delay for bridging transitory current peaks.
  - Status display via colored LEDs
  - Expansion of the measurement range possible via external current transformers



# Electronic relays




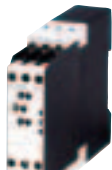
EMR Measuring and monitoring relays

		Function										Time range	Number of change-over contacts	Width mm	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.
		On-delayed	Off-delayed	Fleeting contact on energization	Fleeting contact on de-energization	Flashing, pulse initiating	Flashing, pause initiating	On- and Off-delayed	Pulse forming	Pulse generating	Star-delta switching					
<b>DILET timing relays</b>																
	-	✓	-	-	-	-	-	-	-	-	-	0.05 s - 60 h	1	45	<b>DILET11-M-A</b> 048886	<b>DILET11-M-W</b> 048891
	-	✓	-	-	-	-	-	-	-	-	-	1.5 - 30 s	1	45	<b>DILET11-30-A</b> 048878	<b>DILET11-30-W</b> 048904
	with connection for potentiometer	✓	✓	✓	✓	✓	-	✓	✓	✓	-	0.05 s - 60 h	1	45	<b>DILET70-A</b> 048893	<b>DILET70-W</b> 048899
<b>ETR4 timing relays</b>																
	Changeover contact with a changeover time of 50 ms	-	-	-	-	-	-	-	-	-	✓	3 - 60 s	1	22.5	<b>ETR4-51-A</b> 031884	<b>ETR4-51-W</b> 031885
	-	✓	-	-	-	-	-	-	-	-	-	0.05 s - 100 h	1	22.5	<b>ETR4-11-A</b> 031882	<b>ETR4-11-W</b> 031883
	-	✓	✓	✓	✓	✓	-	✓	✓	✓	-	0.05 s - 100 h	1	22.5	<b>ETR4-69-A</b> 031891	<b>ETR4-69-W</b> 031887
	with connection for potentiometer Changeover contact can be converted to 2 timed contacts or 1 non-delayed contact and 1 timed contact	✓	✓	✓	✓	✓	-	✓	✓	✓	-	0.05 s - 100 h	2	22.5	<b>ETR4-70-A</b> 031888	-
															<b>12 - 240 V AC, 50/60 Hz 12 - 240 V DC</b>	<b>24 - 240 V AC, 50/60 Hz 24 - 48 V DC</b>
<b>ETR2 timing relays</b>																
	-	✓	-	-	-	-	-	-	-	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-11</b> 262684
	-	✓	-	-	-	-	-	-	-	-	-	0.05 s - 100 h	2	17.5	-	<b>ETR2-11-D</b> 119426
	-	-	✓	-	-	-	-	-	-	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-12</b> 262686
	-	-	✓	-	-	-	-	-	-	-	-	0.05 s - 100 h	2	17.5	-	<b>ETR2-12-D</b> 119427
	-	-	-	✓	-	-	-	-	-	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-21</b> 262687
	-	-	-	-	✓	-	-	-	-	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-42</b> 262688
	Pulse and pause times independently adjustable	-	-	-	-	✓	✓	-	-	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-44</b> 262730
	-	✓	✓	✓	✓	✓	✓	-	✓	-	-	0.05 s - 100 h	1	17.5	-	<b>ETR2-69</b> 262689
	-	✓	✓	✓	✓	✓	✓	-	✓	-	-	0.05 s - 100 h	2	17.5	<b>ETR2-69-D</b> 119428	-

		Monitoring of						Monitoring voltage per phase			Adjustable threshold values			Threshold value		Supply voltage		Part no. Article no.	
		Phase sequence	Phase failure	Overvoltage	Undervoltage	Imbalance	Neutral cable break	U <sub>N</sub> V AC				Overvoltage	Undervoltage	Imbalance			V AC		
<b>Phase sequence relays</b>																			
	Power supply from the measuring circuit Phase failure detection at < 0.6 x U <sub>0</sub>	✓	✓	-	-	-	-	200 - 500 V AC, 50/60 Hz	-	-	-	-				200 - 500 V AC, 50/60 Hz		<b>EMR4-F500-2</b> 221784	
<b>Phase sequence relays</b>																			
	Power supply from the measuring circuit	✓	✓	-	-	✓	-	160 - 300 V AC, 50/60 Hz	-	-	✓	-				160 - 300 V AC, 50/60 Hz		<b>EMR5-A300-1-C</b> 134230	
	On delay: None = 0 or adjustable from 0.1 to 30 s Imbalance threshold values adjustable 2 - 25 % of mean value of phase voltages	✓	✓	-	-	✓	-	300 - 500 V AC, 50/60 Hz	-	-	✓	-				300 - 500 V AC, 50/60 Hz		<b>EMR5-A400-1</b> 134222	
<b>Phase monitoring relays</b>																			
Multi-functional Power supply from the measuring circuit On-delay/off-delay: none = 0 or adjustable between 0.1 - 30 s Imbalance threshold values adjustable 2 - 25 % of mean value of phase voltages																			
		✓	✓	✓	✓	✓	✓	90 - 170 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 120 - 170 V AC U <sub>min</sub> 90 - 130 V AC				90 - 170 V AC, 50/60 Hz		<b>EMR5-AWN170-1-E</b> 134225	
		✓	✓	✓	✓	✓	✓	160 - 300 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 220 - 300 V AC U <sub>min</sub> 160 - 230 V AC				160 - 300 V AC, 50/60 Hz		<b>EMR5-AW300-1-C</b> 134223	
		✓	✓	✓	✓	✓	✓	180 - 280 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 240 - 280 V AC U <sub>min</sub> 180 - 220 V AC				180 - 280 V AC, 50/60 Hz		<b>EMR5-AWN280-1-F</b> 134226	
	22.5mm	Automatic phase sequence correction	✓	✓	✓	✓	✓	-	180 - 280 V AC, 50/60/400 Hz	✓	✓	✓	U <sub>max</sub> 240 - 280 V AC U <sub>min</sub> 180 - 220 V AC				180 - 280 V AC, 50/60/400 Hz		<b>EMR5-AWN280-1</b> 134233
			✓	✓	✓	✓	✓	-	300 - 500 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 420 - 500 V AC U <sub>min</sub> 300 - 380 V AC				300 - 500 V AC, 50/60 Hz		<b>EMR5-AW500-1-D</b> 134224
		✓	✓	✓	✓	✓	-	300 - 500 V AC, 50/60/400 Hz	✓	✓	✓	U <sub>max</sub> 420 - 500 V AC U <sub>min</sub> 300 - 380 V AC				300 - 500 V AC, 50/60/400 Hz		<b>EMR5-AWN500-1</b> 134234	
		✓	✓	✓	✓	✓	-	350 - 580 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 480 - 580 V AC U <sub>min</sub> 350 - 460 V AC				350 - 580 V AC, 50/60 Hz		<b>EMR5-AWM580-2</b> 134235	
		✓	✓	✓	✓	✓	-	450 - 720 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 600 - 720 V AC U <sub>min</sub> 450 - 570 V AC				450 - 720 V AC, 50/60 Hz		<b>EMR5-AWM720-2</b> 134236	
	45mm	Automatic phase sequence correction	✓	✓	✓	✓	✓	-	530 - 820 V AC, 50/60 Hz	✓	✓	✓	U <sub>max</sub> 690 - 820 V AC U <sub>min</sub> 530 - 660 V AC				530 - 820 V AC, 50/60 Hz		<b>EMR5-AWM820-2</b> 134237
On- and Off-delayed																			
	Power supply from the measuring circuit	✓	✓	✓	✓	-	-	160 - 300 V AC, 50/60 Hz	✓	✓	-	U <sub>max</sub> 220 - 300 V AC U <sub>min</sub> 160 - 230 V AC				160 - 300 V AC, 50/60 Hz		<b>EMR5-W300-1-C</b> 134227	
	On-delay/off-delay: none = 0 or adjustable between 0.1 - 30 s	✓	✓	✓	✓	-	-	300 - 500 V AC, 50/60 Hz	✓	✓	-	U <sub>max</sub> 420 - 500 V AC U <sub>min</sub> 300 - 380 V AC				300 - 500 V AC, 50/60 Hz		<b>EMR5-W500-1-D</b> 134221	
		✓	✓	✓	✓	-	-	380 V AC, 50/60 Hz	-	-	-	U <sub>max</sub> 418 V AC, fixed U <sub>min</sub> 342 V AC, fixed				380 V AC, 50/60 Hz		<b>EMR5-W380-1</b> 134228	
			✓	✓	✓	✓	-	-	400 V AC, 50/60 Hz	-	-	-	U <sub>max</sub> 440 V AC, fixed U <sub>min</sub> 360 V AC, fixed				400 V AC, 50/60 Hz		<b>EMR5-W400-1</b> 134229

# Electronic relays

## EMR Measuring and monitoring relays

		Monitoring of	Adjustable pick-up time $\Omega$	Supply voltage V AC	Width mm	Part no. Article no.
<b>Level monitoring relays</b>						
	Selectable: protection against running dry or overflowing	Fill level of conductive liquids	5 k $\Omega$ - 100 k $\Omega$	220 - 240 V AC, 50/60 Hz	22.5	<b>EMR4-N100-1-B</b> 221789
	On-delay/off-delay: adjustable between 0.1 - 10 s	Fill level of conductive liquids Mixture ratio of conductive liquids	250 $\Omega$ - 500 k $\Omega$	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	45	<b>EMR4-N500-2-A</b> 221791
	On-delay/off-delay: adjustable between 0.1 - 10 s	Fill level of conductive liquids Mixture ratio of conductive liquids	250 $\Omega$ - 500 k $\Omega$	220 - 240 V AC, 50/60 Hz	45	<b>EMR4-N500-2-B</b> 221790
	-	Fill level of conductive liquids Mixture ratio of conductive liquids	5 k $\Omega$ - 100 k $\Omega$	220 - 240 V AC, 50/60 Hz	22.5	<b>EMR5-N80-1-B</b> 134232
<b>Insulation monitoring relays</b>						
	Tripping function memory Status indication via LEDs Test and reset via local test button or remote test operation	Insulation resistance in non-grounded single-phase and three-phase AC supply systems	1 - 110 k $\Omega$	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	-	<b>EMR4-RAC-1-A</b> 221793
	Status indication via LEDs Test via local test button or remote test operation Selector switch for open- or closed-circuit principle	insulation resistance in non-earthed DC supply systems	10 - 110 k $\Omega$	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	-	<b>EMR4-RDC-1-A</b> 221792
			Current measuring range $I_{\sim}/I_{=}$ A	Supply voltage V AC	Width mm	Part no. Article no.
<b>Current monitoring relays</b>						
	Switching hysteresis adjustable from 3 - 30 % On delay: None = 0 or adjustable from 0.1 to 30 s Extension of the measurement range possible with current transformers		0.1 1 A	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	22.5	<b>EMR4-I1-1-A</b> 106942
			0.3 1.5 A 1 5 A 3 15 A	24 - 240 V AC, 50/60 Hz 24 - 240 V DC	22.5	<b>EMR4-I15-1-A</b> 106943
			0.3 1.5 A 1 5 A 3 15 A	220 - 240 V AC, 50/60 Hz	22.5	<b>EMR4-I15-1-B</b> 106944





## 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 148 ff., 156 ff.



**Motor starter MSC-DE**

- Electronic wide-range overload protection with heavy duty starting
- Short-circuit protection

Page 148 ff., 156 ff.

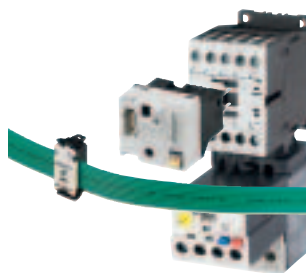


**Circuit-breaker NZM and contactor DIL M**

- Overload protection
- Short-circuit protection

Page 192 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., 130 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., 148 ff., 156 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., 148 ff., 156 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., 192 ff.

## Soft Motor Start and Drives



### Motor-protective circuit-breakers PKZ and soft starter DS 7

- Overload protection
- Short-circuit protection
- Soft start

Page 148 ff., 166 ff.



### Circuit-breaker NZM and soft starter DM 4

- Overload protection
- Short-circuit protection
- Soft start

Page 192 ff.,  
DM 4 see Industry Main Catalogue



### PowerXL DC1 variable frequency drives up to 11 kW

- Ease of use & robust
- V/f motor control
- RFI Filter optional
- Brake chopper optional

Page 170 ff.



### PowerXL DA1 variable frequency drives up to 250 kW

- Ease of use & robust
- V/f, SLV, CLV motor control
- 200 % torque @ 0 rpm
- RFI Filter and brake chopper integrated
- Master/Slave communication

Page 170 ff.

## 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., 148 ff., 166 ff.



### Soft starter DM 4

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

See Industry Main Catalogue



### PowerXL DC1 variable frequency drives up to 11 kW

- Ease of use & robust
- V/f motor control
- CANopen onboard
- Modbus RTU onboard
- SmartWire-DT optional

Page 170 ff.



### PowerXL DA1 variable frequency drives up to 250 kW

- Ease of use & robust
- V/f, SLV, CLV motor control
- 200 % torque @ 0 rpm
- RFI Filter and brake chopper integrated
- CANopen onboard
- Modbus RTU onboard
- Fieldbus modules optional
- SmartWire-DT optional

Page 170 ff.



# 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.



### 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 175 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.



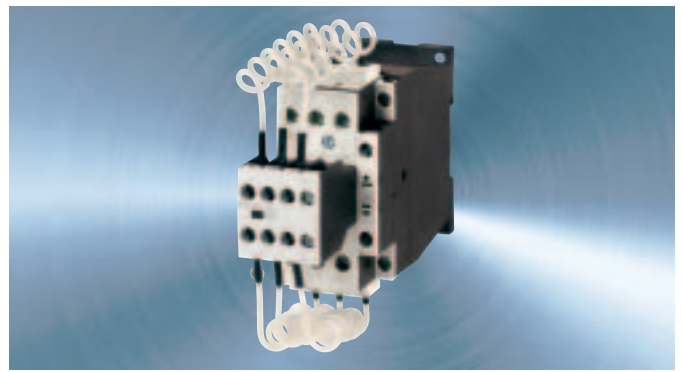


#### 4-pole contactors

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

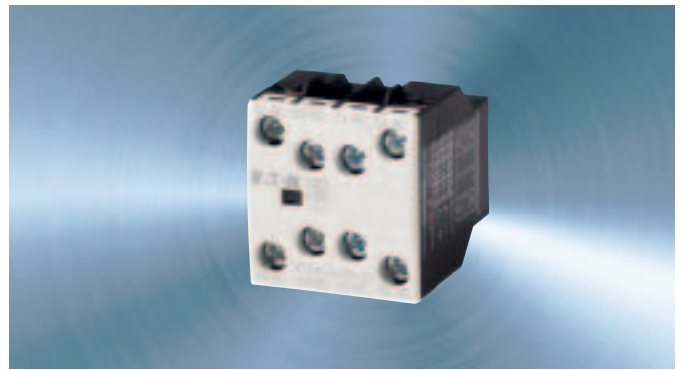
The contactors for capacitor DILK have been developed on the basis of the DILM contactors. The installation and connection as well as the handling are identical with the standard contactors. These contactors feature series resistors in addition to special, weld-free contact material. The capacitors are pre-charged 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.

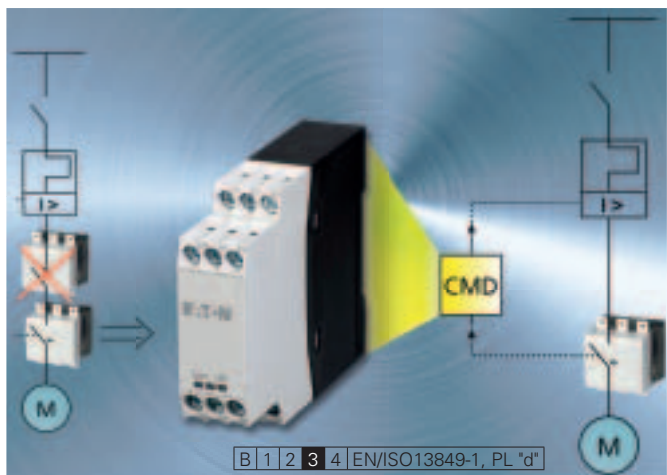
- Reliable feedback of the switching state of the contactor using mirror contacts.
- Long enabling circuits with low magnitude signals are switched reliably by the new electronic-enabled auxiliary switches. The integrated microswitches safely switch through the lowest signals.



#### 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 contactors:

- The electrical service life is significantly longer than on air contactors.
- 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 1000 A


Electronic and electrical overload relays, thermistor protective relays

Moeller® series

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



Motor protective relay				
TYPE				
Overload release setting range		ZEV + ZEV-XSW-25		ZEV + ZEV-XSW-65
		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

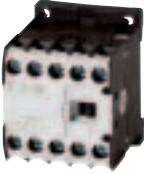
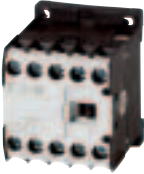
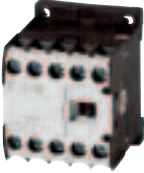
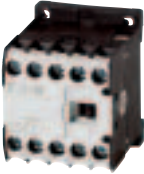

	
ZEV + ZEV-XSW-145	ZEV + ZEV-XSW-820
10 - 145A	40 - 820A



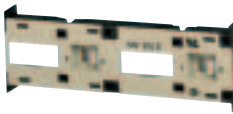
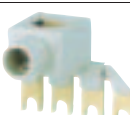





... EMT6KDB, EMT6-DBK

# Mini contactor relays, contactor relays

Contactors, mini contactor relays, auxiliary contact modules

Moeller® series

	Max. rating for three-phase motors, 50 - 60 Hz AC-3 380 V 400 V	Rated operational current AC-1 Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 40 °C $I_{th}=I_e$ A	Contacts N/O = Normally open N/O <sub>e</sub> : NO early-make N/C = Normally closed N/C <sub>i</sub> =NC late-break	Part no.	Article no.
<b>Contactors DILEEM</b>					
AC operation					
	3	22	1 N/O - - -	DILEEM-10(230V50HZ,240V60HZ)	051608
	3	22	- - 1 N/C -	DILEEM-01(230V50HZ,240V60HZ)	051633
	4	22	1 N/O - - -	DILEEM-10(230V50HZ,240V60HZ)	051786
	4	22	- - 1 N/C -	DILEEM-01(230V50HZ,240V60HZ)	051795
	5.5	22	1 N/O - - -	DILEEM12-10(230V50HZ,240V60HZ)	127075
	5.5	22	- - 1 N/C -	DILEEM12-01(230V50HZ,240V60HZ)	127091
DC operation					
	3	22	1 N/O - - -	DILEEM-10-G(24VDC)	051643
	3	22	- - 1 N/C -	DILEEM-01-G(24VDC)	051650
	4	22	1 N/O - - -	DILEEM-10-G(24VDC)	010213
	4	22	- - 1 N/C -	DILEEM-01-G(24VDC)	010343
	5.5	22	1 N/O - - -	DILEEM12-10-G(24VDC)	127132
	5.5	22	- - 1 N/C -	DILEEM12-01-G(24VDC)	127137
<b>DILER Mini-contactors</b>					
AC operation					
	-	-	4 N/O - - -	DILER-40(230V50HZ,240V60HZ)	051759
	-	-	3 N/O - 1 N/C -	DILER-31(230V50HZ,240V60HZ)	051768
	-	-	2 N/O - 2 N/C -	DILER-22(230V50HZ,240V60HZ)	051777
DC operation					
	-	-	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
<b>Auxiliary contact modules</b>					
	-	-	- - 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 <sub>E</sub> - 1 N/C <sub>L</sub>	11DDILE	049824
	-	-	- - 4 N/C -	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 <sub>E</sub> 1 N/C 1 N/C <sub>L</sub>	22DDILE	049823

	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					
Screw terminals					
	-	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
Spring-cage terminals					
	-	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					
Screw terminals					
	-	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
Spring-cage terminals					
	-	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



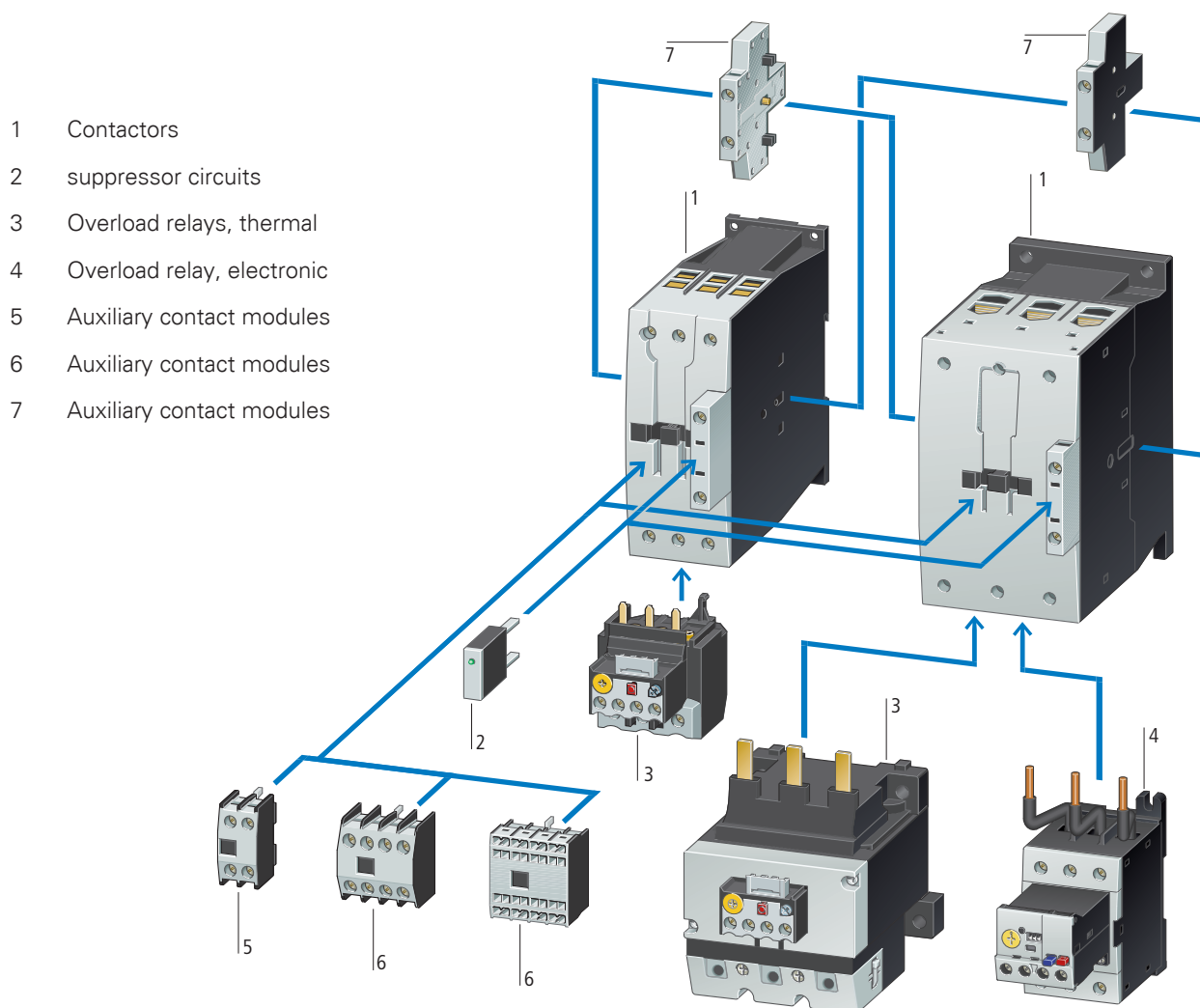
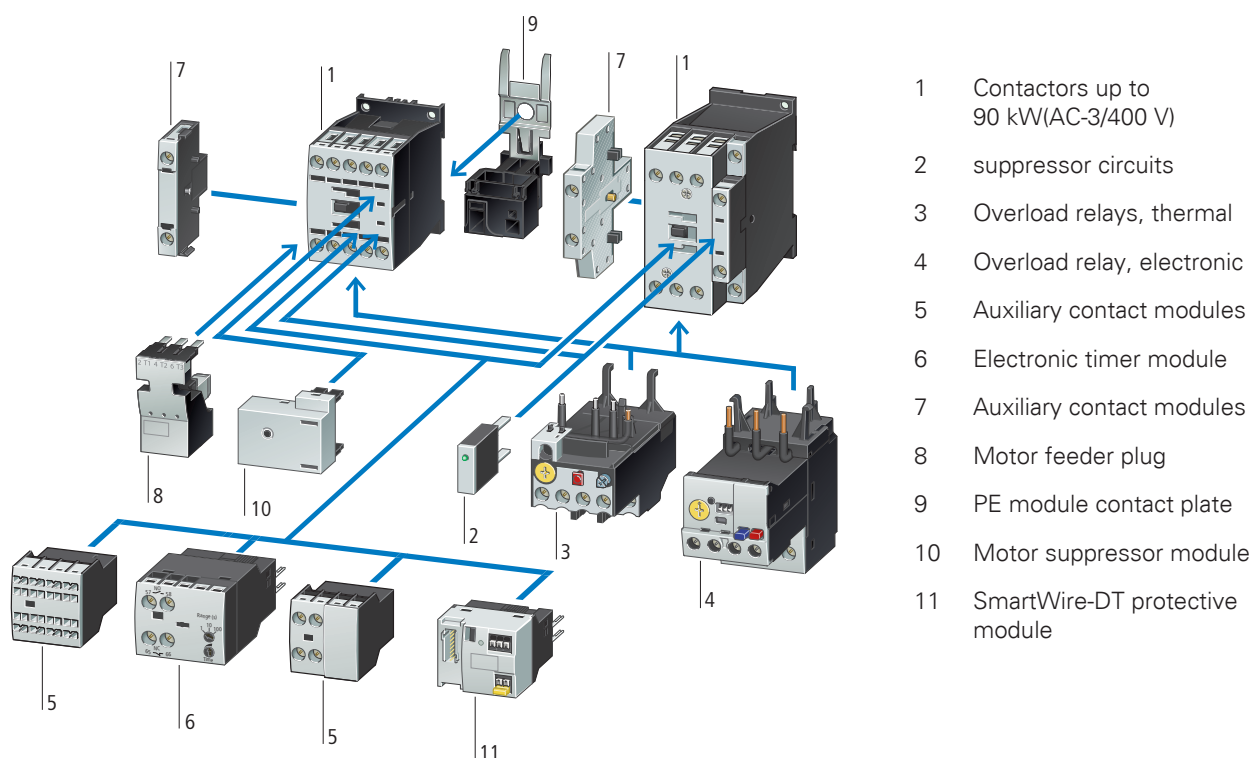



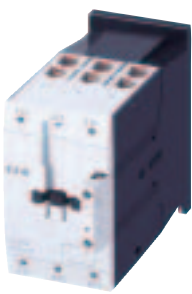


Photo	Max. rating for three-phase motors, 50 - 60 Hz	Rated operational current	AC operation		DC operation	
			Part no.	Article no.	Part no.	Article no.
	AC-3 380 V 400 V	AC-1 Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 40 °C $I_{th} = I_e$				
	P kW	A				
<b>Basic device</b>						
Screw terminals						
	3	22	DILM7-10(230V50HZ)	276550	DILM7-10(24VDC)	276565
	3	22	DILM7-01(230V50HZ)	276585	DILM7-01(24VDC)	276600
	4	22	DILM9-10(230V50HZ)	276690	DILM9-10(24VDC)	276705
	4	22	DILM9-01(230V50HZ)	276725	DILM9-01(24VDC)	276740
	5.5	22	DILM12-10(230V50HZ)	276830	DILM12-10(24VDC)	276845
	5.5	22	DILM12-01(230V50HZ)	276865	DILM12-01(24VDC)	276880
	7.5	22	DILM15-01(230V50HZ)	290093	DILM15-01(24VDC)	290108
	7.5	22	DILM15-10(230V50HZ)	290058	DILM15-10(24VDC)	290073
	7.5	40	DILM17-10(230V50HZ)	277004	DILM17-10(RDC24)	277018
	7.5	40	DILM17-01(230V50HZ)	277036	DILM17-01(RDC24)	277050
	11	45	DILM25-10(230V50HZ)	277132	DILM25-10(RDC24)	277146
	11	45	DILM25-01(230V50HZ)	277164	DILM25-01(RDC24)	277178
	15	45	DILM32-01(230V50HZ)	277292	DILM32-01(RDC24)	277306
	15	45	DILM32-10(230V50HZ)	277260	DILM32-10(RDC24)	277274
	18.5	45	DILM38-10(230V50HZ)	112428	DILM38-10(RDC24)	112442
	18.5	45	DILM38-01(230V50HZ)	112456	DILM38-01(RDC24)	112470
	18.5	60	DILM40(230V50HZ)	277766	DILM40(RDC24)	277780
	22	80	DILM50(230V50HZ)	277830	DILM50(RDC24)	277844
	30	98	DILM65(230V50HZ)	277894	DILM65(RDC24)	277908
	37	98	DILM72(230V50HZ)	107670	DILM72(RDC24)	107671
	37	110	DILM80(230V50HZ)	239402	DILM80(RDC24)	239416
	45	130	DILM95(230V50HZ)	239480	DILM95(RDC24)	239510
	55	160	DILM115(RAC240)	239548	DILM115(RDC24)	239555
	75	190	DILM150(RAC240)	239588	DILM150(RDC24)	239591
	90	225	DILM170(RAC240)	107013	DILM170(RDC24)	107016

# Contactors

Basic devices up to 170 A, spring-cage terminals

Moeller® series





Photo	Max. rating for three-phase motors, 50 - 60 Hz	Rated operational current	AC operation		DC operation	
			Part no.	Article no.	Part no.	Article no.
	AC-3 380 V 400 V	AC-1 Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 40 °C $I_{th} = I_e$				
	P kW	A				
<b>Basic device</b>						
Spring-loaded terminals						
	3	22	DILMC7-10(230V50HZ)	277389	DILMC7-10(24VDC)	277404
	3	22	DILMC7-01(230V50HZ)	277421	DILMC7-01(24VDC)	277436
	4	22	DILMC9-10(230V50HZ)	277453	DILMC9-10(24VDC)	277468
	4	22	DILMC9-01(230V50HZ)	277485	DILMC9-01(24VDC)	277500
	5.5	22	DILMC12-10(230V50HZ)	277517	DILMC12-10(24VDC)	277532
	5.5	22	DILMC12-01(230V50HZ)	277549	DILMC12-01(24VDC)	277564
	7.5	22	DILMC15-01(230V50HZ)	293946	DILMC15-01(24VDC)	293961
	7.5	22	DILMC15-10(230V50HZ)	293911	DILMC15-10(24VDC)	293926
Spring-cage terminals on auxiliary and control circuit terminals						
	7.5	40	DILMC17-10(230V50HZ)	277581	DILMC17-10(RDC24)	277595
	7.5	40	DILMC17-01(230V50HZ)	277611	DILMC17-01(RDC24)	277625
	11	45	DILMC25-10(230V50HZ)	277641	DILMC25-10(RDC24)	277655
	11	45	DILMC25-01(230V50HZ)	277671	DILMC25-01(RDC24)	277685
	15	45	DILMC32-10(230V50HZ)	277701	DILMC32-10(RDC24)	277715
	15	45	DILMC32-01(230V50HZ)	277731	DILMC32-01(RDC24)	277745
	18.5	60	DILMC40(230V50HZ)	277965	DILMC40(RDC24)	277979
	22	80	DILMC50(230V50HZ)	277995	DILMC50(RDC24)	278009
	30	98	DILMC65(230V50HZ)	278025	DILMC65(RDC24)	278039
	37	110	DILMC80(230V50HZ)	239618	DILMC80(RDC24)	239652
	45	130	DILMC95(230V50HZ)	239685	DILMC95(RDC24)	239715
	55	160	DILMC115(RAC240)	239736	DILMC115(RDC24)	239741
	75	190	DILMC150(RAC240)	239751	DILMC150(RDC24)	239765





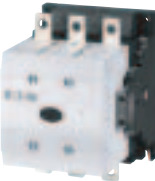




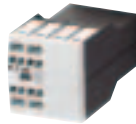
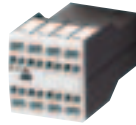




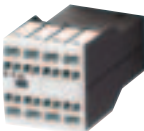










Photo	Max. rating for three-phase motors, 50 - 60 Hz	Rated operational current	AC operation		DC operation	
			Part no.	Article no.	Part no.	Article no.
	AC-3 380 V 400 V	AC-1 Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 40 °C $I_{th} = I_e$ A				
<b>DILM complete units</b>						
	3	22	DILM7-32(230V50HZ)	276655	DILM7-32(24VDC)	276670
	4	22	DILM9-32(230V50HZ)	276795	DILM9-32(24VDC)	276810
	5.5	22	DILM12-32(230V50HZ)	276935	DILM12-32(24VDC)	276950
	7.5	40	DILM17-32(230V50HZ)	277100	DILM17-32(RDC24)	277114
	11	45	DILM25-32(230V50HZ)	277228	DILM25-32(RDC24)	277242
	15	45	DILM32-32(230V50HZ)	277356	DILM32-32(RDC24)	277370
	18.5	60	DILM40-22(230V50HZ)	277798	DILM40-22(RDC24)	277812
	22	80	DILM50-22(230V50HZ)	277862	DILM50-22(RDC24)	277876
	30	98	DILM65-22(230V50HZ)	277926	DILM65-22(RDC24)	277940
	37	110	DILM80-22(230V50HZ)	239449	DILM80-22(RDC24)	239463
	45	130	DILM95-22(230V50HZ)	239527	DILM95-22(RDC24)	239541
	55	160	DILM115-22(RAC240)	239578	DILM115-22(RDC24)	239581
	75	190	DILM150-22(RAC240)	239598	DILM150-22(RDC24)	239601
<b>Comfort devices DILM</b>						
	90	337	DILM185A/22(RAC240)	139537	DILM185A/22(RDC24)	139540
	110	386	DILM225A/22(RAC240)	139547	DILM225A/22(RDC24)	139550
	132	430	DILM250/22(RA250)	208201	DILM250/22(RDC48)	208199
	160	490	DILM300A/22(RA250)	139556	DILM300A/22(RDC48)	139554
	200	612	DILM400/22(RA250)	208209	DILM400/22(RDC48)	208207
	250	800	DILM500/22(RA250)	208213	DILM500/22(RDC48)	208211
<b>Standard devices DILM</b>						
	132	430	DILM250-S/22(220-240V50/60HZ)	274190	-	-
	160	490	DILM300A-S/22(220-240V50/60HZ)	139559	-	-
	200	612	DILM400-S/22(220-240V50/60HZ)	274196	-	-
	250	800	DILM500-S/22(220-240V50/60HZ)	274199	-	-
	315	920	DILM570-S/22(220-240V50/60HZ)	110744	-	-



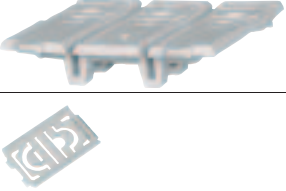
Photo	Contacts N/O = Normally open N/O <sub>e</sub> : NO early-make N/C = Normally closed N/C <sub>L</sub> =NC late-break		For use with	Part no.	Article no.	
Auxiliary contact modules						
with interlocked opposing contacts, except ...XHI(C)V						
Top mounting auxiliary contacts						
	1 N/O	1 N/C	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/NO <sub>E</sub>	1 N/C <sub>L</sub>		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 N/C		DILA-XHI04	276424	
	1 N/O 1 N/NO <sub>E</sub>	1 N/C 1 N/C <sub>L</sub>		DILA-XHIV22	276429	
	1 S (for electronic applications)	1 Ö (for electronic applications)	DILA-XHIR11	110140		
	2 S (1 S above microswitch for electronic applications)	2 N/C (1 N/C above microswitch for electronic applications)	DILA-XHIR22	139580		



Contact configuration			For use with	Part no.	Article no.
N/O = normally open contact NO <sub>E</sub> : NO early-make N/C = normally closed contact NC <sub>L</sub> =NC late-break					
<b>Auxiliary contact modules</b>					
with interlocked opposing contacts, except ...XHI(C)V					
Top mounting auxiliary contacts					
	2 NO	-	DILM(C)7...	<b>DILA-XHIC20</b>	276528
	1 N/O	1 N/C	DILM(C)9...	<b>DILA-XHIC11</b>	276527
	-	2 N/C	DILM(C)12...	<b>DILA-XHIC02</b>	276526
	1 N/O <sub>E</sub>	1 N/C <sub>L</sub>	DILM(C)15...	<b>DILA-XHICV11</b>	276529
			DILM(C)17...		
	4 N/O	-	DILM(C)7...	<b>DILA-XHIC40</b>	276534
	3 N/O	1 N/C	DILM(C)9...	<b>DILA-XHIC31</b>	276533
	2 NO	2 N/C	DILM(C)12...	<b>DILA-XHIC22</b>	276532
	1 N/O	3 N/C	DILM(C)15...	<b>DILA-XHIC13</b>	276531
	-	4 N/C	DILM(C)17...	<b>DILA-XHIC04</b>	276530
	1 N/O	1 N/C	DILM(C)25...	<b>DILA-XHICV22</b>	276535
	1 N/O <sub>E</sub>	1 N/C <sub>L</sub>	DILM(C)32...		
			DILM38...		
<b>Auxiliary contact modules</b>					
with interlocked opposing contacts, except ...XHI(C)V					
Top mounting auxiliary contacts					
	2 NO	-	DILM40...	<b>DILM150-XHI20</b>	277945
	1 N/O	1 N/C	DILM50...	<b>DILM150-XHI11</b>	277946
	1 N/O	1 N/C	DILM65...	<b>DILM150-XHIA11</b>	283463
	-	2 N/C	DILM72...	<b>DILM150-XHI02</b>	277947
	4 N/O	-	DILM80...		
	3 N/O	1 N/C	DILM95...	<b>DILM150-XHI40</b>	277948
	2 NO	2 N/C	DILM115...	<b>DILM150-XHI31</b>	277949
	2 NO	2 N/C	DILM150...	<b>DILM150-XHI22</b>	277950
	1 N/O	3 N/C	DILM170...	<b>DILM150-XHIA22</b>	283464
	-	4 N/C		<b>DILM150-XHI13</b>	277951
	1 N/O	1 N/C		<b>DILM150-XHI04</b>	277952
	1 N/O <sub>E</sub>	1 N/C <sub>L</sub>		<b>DILM150-XHIV22</b>	277953
<b>Side mounting auxiliary contact</b>					
	1 N/O	-	DILM(C)7...	<b>DILA-XHI10-S</b>	115948
	-	1 N/C	DILM(C)9...	<b>DILA-XHI01-S</b>	115949
	1 N/O	-	DILM(C)12...	<b>DILA-XHIC10-S</b>	115950
	-	1 N/C	DILM(C)15...	<b>DILA-XHIC01-S</b>	115951
	1 N/O	1 N/C	DILM(C)...	<b>DILA-XHI11-S</b>	101371
			DILM17...		
			DILM25...		
			DILM32...		
	1 N/O	1 N/C	DILM38...		
	1 N/O	1 N/C	DILM250 - DILM1600	<b>DILM820-XHI11-SI</b>	208281
	1 N/O <sub>E</sub>	1 N/C <sub>L</sub>		<b>DILM820-XHI11-SA</b>	208282
				<b>DILM820-XHI11V-SI</b>	208283
	1 N/O	1 N/C	DILM40 - DILM225A	<b>DILM1000-XHI11-SI</b>	278425
	1 N/O <sub>E</sub>	1 N/C <sub>L</sub>		<b>DILM1000-XHIV11-SI</b>	278426
	1 N/O	1 N/C		<b>DILM1000-XHI11-SA</b>	278427

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

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

	For use with	Part no. Article no.
<b>Star-delta wiring kit including star-point bridge</b>		
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	<b>DILM12-XSL</b> 283130
	DILM17/25/32 mains contactor DILM17/25/32 delta contactor DILM17/25/32 star contactor	<b>DILM32-XSL</b> 283131
	DILM40/50/65 mains contactor DILM40/50/65 delta contactor DILM40/50/65 star contactor	<b>DILM65-XSL</b> 101058
<b>Reversing wiring kit</b>		
Main current wiring for reversing combinations		
	DILM7, DILM9, DILM12	<b>DILM12-XRL</b> 283108
	DILM17, DILM25, DILM32	<b>DILM32-XRL</b> 283109
	DILM40, DILM50, DILM65	<b>DILM65-XRL</b> 101057
<b>IP2X shrouding set</b>		
	DILM17, DILM25, DILM32, DILM38	<b>DILM32-XIP2X</b> 118855
	DILM40, DILM50, DILM65, DILM72	<b>DILM65-XIP2X</b> 106491
	DILM80, DILM95, DILM115, DILM150, DILM170, ZB150	<b>DILM150-XIP2X</b> 106492
<b>Wiring set motor feeder plug</b>		
PE module contact plate	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	<b>DILM12-XMCE</b> 121764
Motor feeder plug with space unit card and contact plate	DILM(C)7, DILM(C)9, DILM(C)12, DILM(C)15	<b>DILM12-XMCP/E</b> 121769
Motor feeder plug with space unit card without contact plate	DS7-34...SX004(-012) 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...	<b>DILM12-XMCP/T</b> 121770

Setting range of  
overload releases $I_r$   
A**For use with  
DILEM****Part no.**

Article no.

**DILM7 - DILM15****Part no.**

Article no.

**DILM17 - DILM38****Part no.**

Article no.

**DILM40 - DILM72****Part no.**

Article no.

**DILM80 - DILM170****Part no.**

Article no.



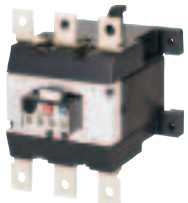


## Overload relay ZE, ZB

0.1 - 0.16	<b>ZE-0.16</b>	014263	<b>ZB12-0.16</b>	278431	<b>ZB32-0.16</b>	278442	-	-	-	-
0.16 - 0.24	<b>ZE-0.24</b>	014285	<b>ZB12-0.24</b>	278432	<b>ZB32-0.24</b>	278443	-	-	-	-
0.24 - 0.4	<b>ZE-0.4</b>	014300	<b>ZB12-0.4</b>	278433	<b>ZB32-0.4</b>	278444	-	-	-	-
0.4 - 0.6	<b>ZE-0.6</b>	014333	<b>ZB12-0.6</b>	278434	<b>ZB32-0.6</b>	278445	-	-	-	-
0.6 - 1	<b>ZE-1.0</b>	014376	<b>ZB12-1</b>	278435	<b>ZB32-1</b>	278446	-	-	-	-
1 - 1.6	<b>ZE-1.6</b>	014432	<b>ZB12-1.6</b>	278436	<b>ZB32-1.6</b>	278447	-	-	-	-
1.6 - 2.4	<b>ZE-2.4</b>	014479	<b>ZB12-2.4</b>	278437	<b>ZB32-2.4</b>	278448	-	-	-	-
2.4 - 4	<b>ZE-4</b>	014518	<b>ZB12-4</b>	278438	<b>ZB32-4</b>	278449	-	-	-	-
4 - 6	<b>ZE-6</b>	014565	<b>ZB12-6</b>	278439	<b>ZB32-6</b>	278450	-	-	-	-
6 - 9	<b>ZE-9</b>	014708	-	-	-	-	-	-	-	-
6 - 10	-	-	<b>ZB12-10</b>	278440	<b>ZB32-10</b>	278451	<b>ZB65-10</b>	278455	-	-
9 - 12	<b>ZE-12</b>	014752	<b>ZB12-12</b>	278441	-	-	-	-	-	-
10 - 16	-	-	-	-	-	-	<b>ZB65-16</b>	278456	-	-
12 - 16	-	-	<b>ZB12-16</b>	290168	-	-	-	-	-	-
16 - 24	-	-	-	-	<b>ZB32-24</b>	278453	<b>ZB65-24</b>	278457	-	-
24 - 32	-	-	-	-	<b>ZB32-32</b>	278454	-	-	-	-
24 - 40	-	-	-	-	-	-	<b>ZB65-40</b>	278458	-	-
32 - 38	-	-	-	-	<b>ZB32-38</b>	112474	-	-	-	-
35 - 50	-	-	-	-	-	-	-	-	<b>ZB150-50</b>	278462
40 - 57	-	-	-	-	-	-	<b>ZB65-57</b>	278459	-	-
50 - 65	-	-	-	-	-	-	<b>ZB65-65</b>	278460	-	-
50 - 70	-	-	-	-	-	-	-	-	<b>ZB150-70</b>	278463
65 - 75	-	-	-	-	-	-	<b>ZB65-75</b>	108792	-	-
70 - 100	-	-	-	-	-	-	-	-	<b>ZB150-100</b>	278464
95 - 125	-	-	-	-	-	-	-	-	<b>ZB150-125</b>	278465
120 - 150	-	-	-	-	-	-	-	-	<b>ZB150-150</b>	278466
145 - 175	-	-	-	-	-	-	-	-	<b>ZB150-175</b>	107316



## Overload relays

Overload relay, thermistor overload relay for machine protection

	Setting range of overload releases	For use with	Part no.	Article no.
	$I_r$ A 			
<b>Overload relay Z5</b>				
	50 - 70	DILM185A DILM225A	<b>Z5-70/FF225A</b>	139572
	70 - 100		<b>Z5-100/FF225A</b>	139573
	95 - 125		<b>Z5-125/FF225A</b>	139574
	120 - 160		<b>Z5-160/FF225A</b>	139575
	160 - 220		<b>Z5-220/FF225A</b>	139576
	200 - 250		<b>Z5-250/FF225A</b>	139577
	50 - 70	DILM250	<b>Z5-70/FF250</b>	210070
	70 - 100		<b>Z5-100/FF250</b>	210071
	95 - 125		<b>Z5-125/FF250</b>	210072
	120 - 160		<b>Z5-160/FF250</b>	210073
	160 - 220		<b>Z5-220/FF250</b>	210074
	200 - 250		<b>Z5-250/FF250</b>	210075
	250 - 300	DILM300A	<b>Z5-300/FF250</b>	139578
	Function		Part no.	Article no.
<b>EMT6 thermistor overload relay for machine protection</b>				
	Without reclosing lockout Mains and fault LED display		<b>EMT6</b>	066166
			<b>EMT6(230V)</b>	066400
	Without reclosing lockout Mains and fault LED display Trip with short-circuit in the sensor cable		<b>EMT6-K</b>	269470
	convertible with/without reclosing lockout For manual or remote resetting Test button Mains and fault LED display		<b>EMT6-DB</b>	066167
			<b>EMT6-DB(230V)</b>	066401
	convertible with/without reclosing lockout For manual or remote resetting Test button Mains and fault LED display Trip with short-circuit in the sensor cable		<b>EMT6-KDB</b>	269471
	Multifunction device convertible 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		<b>EMT6-DBK</b>	066168



Earth-fault  
protection

## Setting range

Overload releases

$I_r$

A



## Electronic overload relays ZEB

### Direct mounting

Setting range	For use with	Part no. Article no.	Part no. Article no.	Part no. Article no.	Part no. Article no.	Part no. Article no.
none	DILM7 - DILM15		DILM17 - DILM38	DILM40 - DILM72	DILM80 - DILM150	DILM185A - DILM225A
0.33 - 1.65	<b>ZEB12-1,65</b> 136480	<b>ZEB32-1,65</b> 136486	-	-	-	-
1 - 5	<b>ZEB12-5</b> 136481	<b>ZEB32-5</b> 136487	-	-	-	-
4 - 20	<b>ZEB12-20</b> 136482	<b>ZEB32-20</b> 136488	-	-	-	-
9 - 45	-	<b>ZEB32-45</b> 136489	<b>ZEB65-45</b> 136502	-	-	-
20 - 100	-	-	<b>ZEB65-100</b> 136504	<b>ZEB150-100</b> 136506	-	-
35 - 175	-	-	-	<b>ZEB150-175</b> 164303	<b>ZEB225A-175</b> 164307	-
with						
0.33 - 1.65	<b>ZEB12-1,65-GF</b> 136483	<b>ZEB32-1,65-GF</b> 136490	-	-	-	-
1 - 5	<b>ZEB12-5-GF</b> 136484	<b>ZEB32-5-GF</b> 136491	-	-	-	-
4 - 20	<b>ZEB12-20-GF</b> 136485	<b>ZEB32-20-GF</b> 136492	-	-	-	-
9 - 45	-	<b>ZEB32-45-GF</b> 136493	<b>ZEB65-45-GF</b> 136503	-	-	-
20 - 100	-	-	<b>ZEB65-100-GF</b> 136505	<b>ZEB150-100-GF</b> 136507	-	-
35 - 175	-	-	-	<b>ZEB150-175-GF</b> 164304	<b>ZEB225A-175-GF</b> 164308	-
Separate mounting						
none						
0.33 - 1.65	-	<b>ZEB32-1,65/KK</b> 136494	-	-	-	-
1 - 5	-	<b>ZEB32-5/KK</b> 136495	-	-	-	-
4 - 20	-	<b>ZEB32-20/KK</b> 136496	-	-	-	-
9 - 45	-	<b>ZEB32-45/KK</b> 136497	-	-	-	-
20 - 100	-	-	-	<b>ZEB150-100/KK</b> 136508	-	-
35 - 175	-	-	-	<b>ZEB150-175/KK</b> 164305	-	-
with						
0.33 - 1.65	-	<b>ZEB32-1,65-GF/KK</b> 136498	-	-	-	-
1 - 5	-	<b>ZEB32-5-GF/KK</b> 136499	-	-	-	-
4 - 20	-	<b>ZEB32-20-GF/KK</b> 136500	-	-	-	-
9 - 45	-	<b>ZEB32-45-GF/KK</b> 136501	-	-	-	-
20 - 100	-	-	-	<b>ZEB150-100-GF/KK</b> 136509	-	-
35 - 175	-	-	-	<b>ZEB150-175-GF/KK</b> 164306	-	-



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



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.



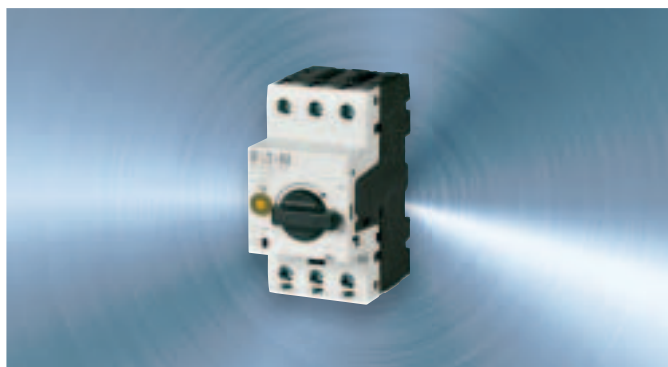
### Perfect for actuation by pressing or hitting

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

12 A (45 mm)  
PKE 12



0.3 A → 12 A  
0.09 - 5.5 kW (400 V)

32 A (45 mm)  
PKE 32



1 A → 32 A  
0.37 - 15 kW (400 V)

65 A (55 mm)  
PKE 65



8 A → 65 A  
4 - 30 kW (400 V)

5 plug-in trip blocks up to 65 A in 2 versions



0.3 A → 1.2 A  
1 A → 4 A  
3 A → 12 A  
8 A → 32 A  
16 A → 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.

### Information at your fingertips thanks to SmartWire-DT

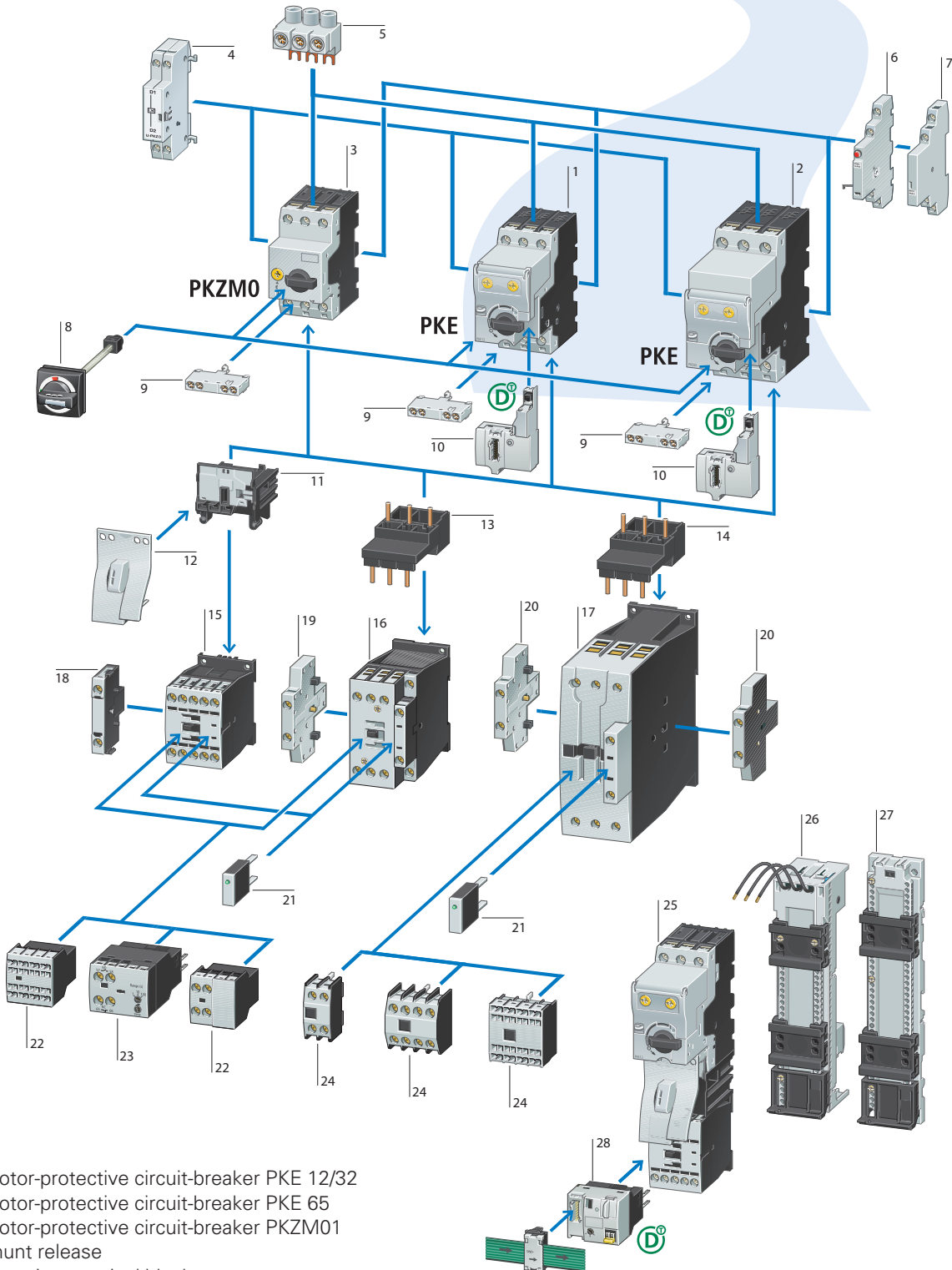
Motor starter combinations with PKZ and PKE enable integration into the automation environment via SmartWire-DT. The most varying array of signalling functions can be transferred with the PKZ using the modular COM circuits. The motor-protective circuit-breaker PKE also utilizes diagnostics, status and 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.

Always well informed

- Current values
- Diagnostics data
- Status messages
- Overload relay function












- 1 Motor-protective circuit-breaker PKE 12/32
- 2 Motor-protective circuit-breaker PKE 65
- 3 Motor-protective circuit-breaker PKZM01
- 4 Shunt release
- 5 Incoming terminal block
- 6 Trip-indicating auxiliary contact
- 7 Side mounted auxiliary contact
- 8 Door-coupling rotary handle and shaft extension
- 9 Front mounted auxiliary contact
- 10 SmartWire-DT communication interface for PKE
- 11 Mechanical plug-in connector
- 12 Combination plug-in connector
- 13 Electrical plug-in connector
- 14 Electrical plug-in connector
- 15 Contactor up to 15 A
- 16 Contactor up to 38 A
- 17 Contactor up to 65 A
- 18 Side mounted auxiliary contact

- 19 Side mounted auxiliary contact
- 20 Side mounted auxiliary contact
- 21 Suppressor
- 22 Surface mount auxiliary contact
- 23 Electronic timer
- 24 Surface mount auxiliary contact
- 25 DOL starter MSC-DEA up to 5.5 kW with PKE
- 26 Busbar adapter
- 27 Top-hat rail adapter plate
- 28 SmartWire-DT PKE module





# Motor-protective circuit-breakers






Basic devices




















Moeller® series



















Setting range Overload protector		Screw terminals		Screw terminals on feed side, spring-cage terminals on secondary side		Spring-cage terminals	
		Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
<b>Motor-protective circuit-breaker PKZM01,</b> type of coordination "1" and "2"							
	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	-	-	-	-
<b>Motor-protective circuit-breaker PKZM0,</b> type of coordination "1" and "2"							
	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	-	-	-	-
<b>Motor-protective circuit-breaker PKZM4,</b> type of coordination "1" and "2"							
	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	-	-	-	-
<b>Transformer-protective circuit-breaker</b>							
	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	-	-	-	-

				
Setting range of overload releases $I_r$ A	<b>Basic device</b>	<b>Trip block Standard</b>	<b>Trip block Expanded</b>	<b>Complete device Standard</b>
	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>
<b>Motor-protective circuit-breaker PKE, type of coordination 1 and 2</b>				
0.3 - 1.2	<b>PKE12</b> 121721	<b>PKE-XTU-1,2</b> 121723	<b>PKE-XTUA-1,2</b> 121727	<b>PKE12/XTU-1,2</b> 121731
1 - 4	<b>PKE12</b> 121721	<b>PKE-XTU-4</b> 121724	<b>PKE-XTUA-4</b> 121728	<b>PKE12/XTU-4</b> 121732
3 - 12	<b>PKE12</b> 121721	<b>PKE-XTU-12</b> 121725	<b>PKE-XTUA-12</b> 121729	<b>PKE12/XTU-12</b> 121733
8 - 32	<b>PKE32</b> 121722	<b>PKE-XTU-32</b> 121726	<b>PKE-XTUA-32</b> 121730	<b>PKE32/XTU-32</b> 121734

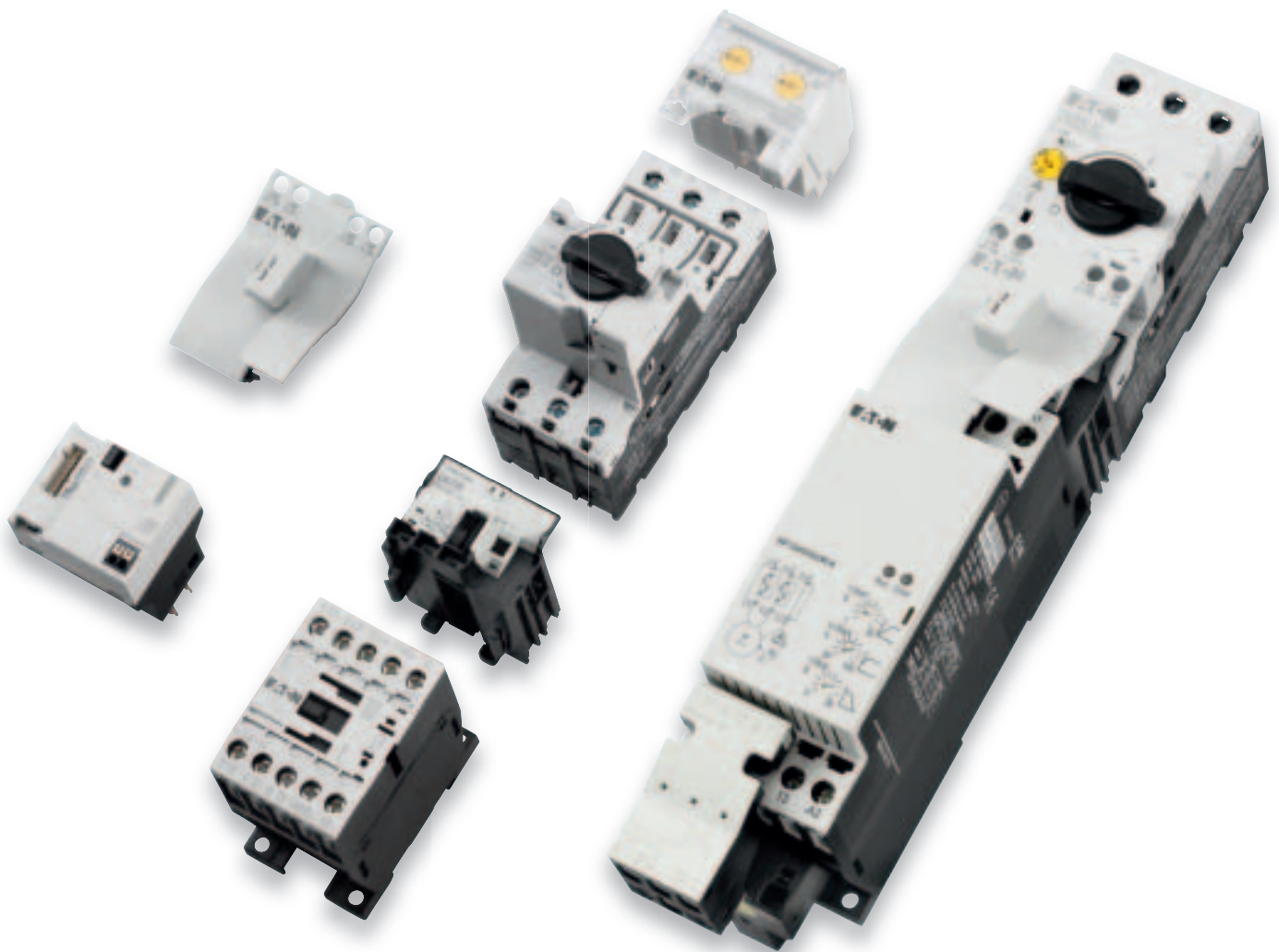
				
Setting range of overload releases $I_r$ A	<b>Basic device</b>	<b>Trip block Standard</b>	<b>Trip block Expanded</b>	<b>Complete device Standard</b>
	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>	<b>Part no.</b> <b>Article no.</b>
<b>Motor-protective circuit-breaker PKE, type of coordination 1 and 2</b>				
8 - 32	<b>PKE65</b> 138258	<b>PKE-XTUW-32</b> 138261	<b>PKE-XTUWA-32</b> 138262	<b>PKE65/XTUW-32</b> 138517
16 - 65	<b>PKE65</b> 138258	<b>PKE-XTU-65</b> 138259	<b>PKE-XTUA-65</b> 138260	<b>PKE65/XTU-65</b> 138516

	Rated operational current $I_e$ A	For use with	<b>Part no.</b> Article no.
<b>Busbar adapters for PKZ and PKE</b>			
	25	PKZM0, PKE + DILM7 PKZM0, PKE + DILM9 PKZM0, PKE + DILM12 PKZM0, PKE + DILM15 MSC-D-0,25-M7... - MSC-D-16-M15...	<b>BBA0-25</b> 101451
	25	PKZM0, PKE + 2 x DILM7-01 PKZM0, PKE + 2 x DILM9-01 PKZM0, PKE + 2 x DILM12-01 MSC-R-0,25-M7... - MSC-R-12-M12...	<b>BBA0R-25</b> 101453
	32	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	<b>BBA0-32</b> 101452
	32	PKZM0, PKE + 2 x DILM17-01 PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM32-01	<b>BBA0R-32</b> 101454
	63	PKZM4, PKE65 + DILM17 PKZM4, PKE65 + DILM25 PKZM4, PKE65 + DILM32 PKZM4, PKE65 + DILM40 PKZM4, PKE65 + DILM50 PKZM4, PKE65 + DILM65	<b>BBA4L-63</b> 101459

	Contacts N/O = Normally open	N/C = Normally closed	For use with	Part no.	Article no.	
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 N/C	AGM2-01-PKZ0		072899	
Early-make auxiliary contact						
	2 N/O	-	PKZM0 PKZM0-T PKM0 PKZM4	VHI20-PKZ0	203595	
	2 N/O	-	PKZM01	VHI20-PKZ01	278495	
Shunt release						
	-	-	PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE	A-PKZ0(230V50HZ)	073187	
	-	-		A-PKZ0(24VDC)	073200	
	-	-		U-PKZ0(230V50HZ)	073135	
	-	-		U-PKZ0(24VDC)	157862	
Rotary handle, lockable						
	-	-	for locking motor-protective circuit-breakers PKZM0, PKZM4 and PKE as a main switch in compliance with EN 60204 Can be padlocked in the "0" position with a padlock Hasp thickness: 3 – 6.35 mm	AK-PKZ0	030851	
Three-phase commoning link, incoming unit via terminals 1, 3, 5						
For PKZM0-... or PKE without side mounted auxiliary contacts or shunt 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	
for PKZM0-... or PKE: attached with an auxiliary contact and a trip-indicating auxiliary contact on the right or attached on the left with a shunt release						
	-	-	-	B3.2/2-PKZ0	063963	
	-	-	-	B3.2/4-PKZ0	063959	
Incoming terminal						
	-	-	PKZM0 PKE	BK25/3-PKZ0	032720	
	-	-	PKZM0	BK25/3-PKZ0-E	262518	
Shroud for unused terminals						
	-	-	Protection against direct contact. For covering unused terminals on three-phase commoning link B3...-PKZ0	H-B3-PKZ0	032721	

	Description	For use with	Part no. Article no.
<b>Wiring set</b>			
For DOL Starter			
	-	PKZM0, PKE + DILM7 DS7-34...SX004...	<b>PKZM0-XDM12</b> 283149
	-	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	<b>PKZM0-XDM32</b> 283153
	-	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	<b>PKZM4-XDM65</b> 101053
For reversing starters			
	-	PKZM0, PKE + DILM7-01 PKZM0, PKE + DILM9-01 PKZM0, PKE + DILM12-01	<b>PKZM0-XRM12</b> 283185
	-	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	<b>PKZM0-XRM32</b> 283189
Electric contact module			
	-	PKZM0, PKE + DILM17 DS7-34...SX016...	<b>PKZM0-XM32DE</b> 239349
	-	PKZM4 + DILM40	<b>PKZM4-XM65DE</b> 101056
<b>Motor feeder plug</b>			
	PE module contact plate	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	<b>DILM12-XMCE</b> 121764
	Motor feeder plug with space unit card and contact plate	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	<b>DILM12-XMCP/E</b> 121769
	Motor feeder plug with space unit card without contact plate	DS7-34...SX004... PKZM0/PKE + DILM(C)7 PKZM0/PKE + DILM(C)9 PKZM0/PKE + DILM(C)12 PKZM0/PKE + DILM(C)15 MSC-D(E)-...-M7... MSC-D(E)-...-M9... MSC-D(E)-...-M15...	<b>DILM12-XMCP/T</b> 121770
<b>Door coupling handles</b>			
	For use as main switch to IEC/EN 60204	PKZM0 PKZM4	<b>PKZ0-XH</b> 106132
	For use as a main switch to EN 60204 in MCC power distribution systems and with PKZM0 installed when rotated by 90°	PKZM0 PKZM4	<b>PKZ0-XH-MCC</b> 106136
	For use as main switch to IEC/EN 60204	PKE	<b>PKE-XH</b> 142416
	For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed when rotated by 90°	PKE	<b>PKE-XH-MCC</b> 142418
	For use as a main switch with Emergency-Stop function, to EN 60204	PKZM0 PKZM4	<b>PKZ0-XRH</b> 106133
	For use as a main switch with Emergency-Stop function to EN 60204 in MCC power distribution systems and with PKZM0 installed when rotated by 90°	PKZM0 PKZM4	<b>PKZ0-XRH-MCC</b> 106137
	For use as a main switch with Emergency-Stop function, to EN 60204	PKE	<b>PKE-XRH</b> 142417
	For use as a main switch with Emergency-Stop function to EN 60204 in MCC power distribution systems and with PKE installed when rotated by 90°	PKE	<b>PKE-XRH-MCC</b> 142419





# Motor Starter System xStart

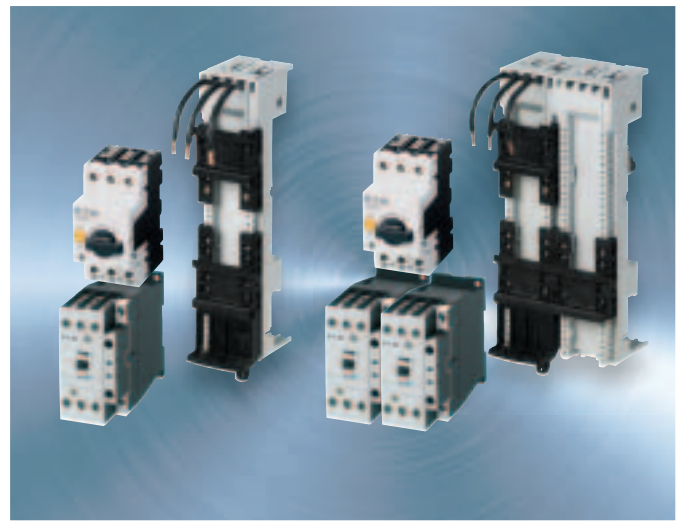
## Fast and Flexible Assembly and Connection

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.



### Just a short step to a starter combination

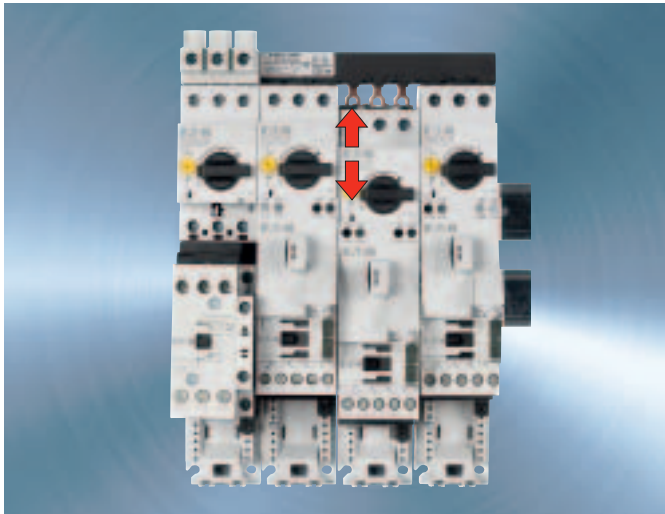
On xStart switchgear up to 15.5 A, plug-in main and auxiliary current connections replace the classical wiring. With the standard individual components PKZM0 / PKE and the wiring set for direct-on-line starters or reversing starters for contactors or soft start devices with screw terminals, DOL starters, 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 to 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

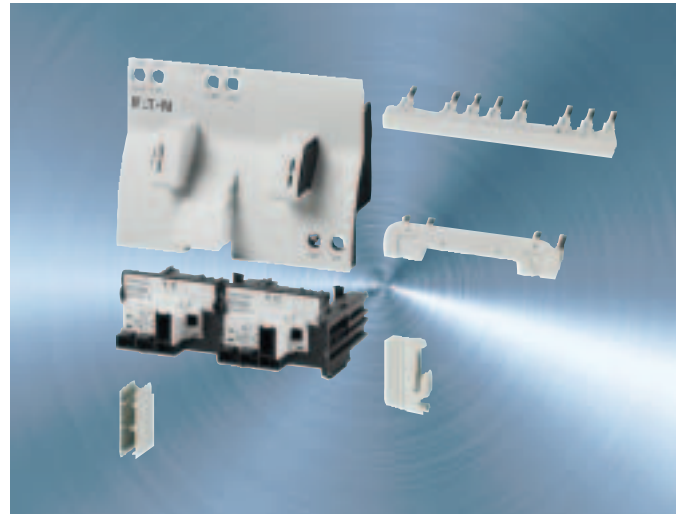
Whether it's a motor starter, soft starter or just motor-protective circuit-breakers, with the product-specific BBA busbar adapters from Eaton, a flexible energy supply/distribution can be quickly and easily established. The users have the specific adapters for the motor-protective circuit-breakers, 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

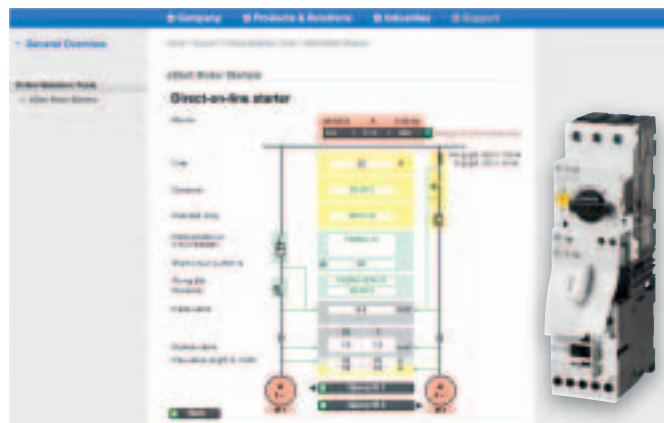
The motor-protective circuit-breaker PKE with electronic wide-range overload protection can be integrated in just a few simple steps via SmartWire-DT into the communication structure of the automation system. This facilitates a more in-depth view of the motor output circuit load and provides additional optimization potential for system availability. The respective SmartWire-DT modules facilitate the communication connection for compact PKE motor starter combinations up to 32 A motor current and the direct connection to the motor-protective circuit-breaker PKE up to 65 A motor current.



### 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

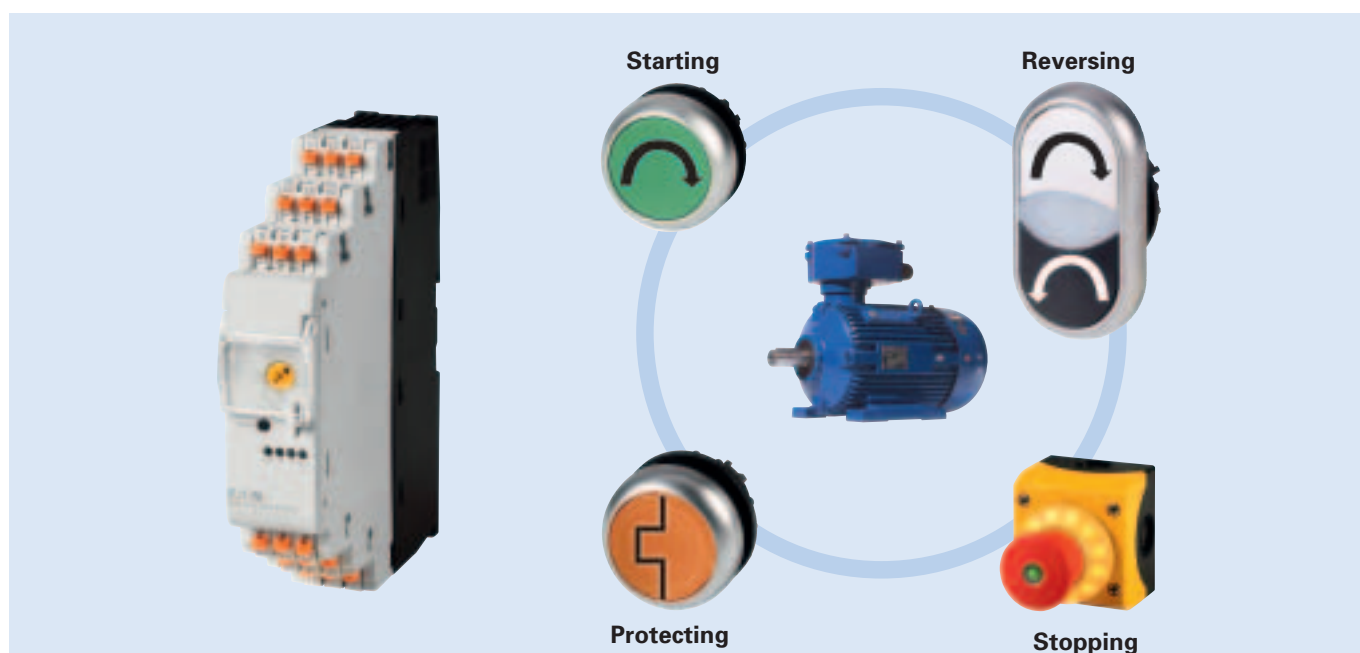
Direct-on-line starters made of standard components are available in four narrow sizes. Contactors and circuit-breakers feature the same compact width. No precious millimeter of control panel space is wasted. The convenient MSC motor starters using tool-less plug connection technology are available up 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](http://www.moeller.net/select)



### Longer life at only 30 mm

A strong partner to machine builders Eaton has a long-standing reputation as reliable provider of switchgear and protective devices for motors. A key requirement in machinery construction is the availability of compact, multifunctional switchgear that saves space in today's ever smaller control panels as well as cutting engineering and installation times.

With electronic motor starter EMS Eaton offers a multifunctional device complete with built-in motor protection in a device that measures only 30 mm in width. The electronic

motor starter offers up to four motor starter functions in a single device, which saves space in the control panel as well as time in installation and commissioning.



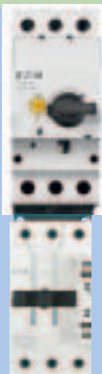

The standardized push-in technology for main and control current terminals further minimizes the time needed to install the electronic motor starter.

The electronic motor starter is used for reliably controlling and protecting motors in the performance range of 0.06 kW/400 V to 3 kW/400 V.





# Motor-starter combinations

Standard

Moeller® series

		Motor data			Motor-protective circuit-breaker	Contactors coordination type "1"	Contactors coordination type "2"
		AC-3 380V 400V 415V P	Rated operational current 400V  I <sub>e</sub>	Rated short-circuit current 380-415V  I <sub>q</sub>			
		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-...
PKZM0 ...+DIL M17 to DIL M32		0.55	1.5	150	PKZM0-1,6	DILM7-...	DILM7-...
		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-...
PKZM4 ...+DIL M17 to DIL M65		4	8.5	150	PKZM0-10	DILM9-...	DILM17-...
		5.5	11.3	50	PKZM0-12	DILM12-...	DILM17-...
		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
NZM...+DIL M72 to DIL M500		22	41	50	PKZM4-50	DILM50	DILM50
		30	55	50	PKZM4-58	DILM65	DILM65
		34	63	50	PKZM4-63	DILM65	DILM65
		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 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					
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-...
PKE ...+DIL M17 to DIL M32		0.55	1.5	100	PKE12/XTU-4	DILM7-...	DILM17-...
		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-...
PKE 65 ...+DIL M40 to DIL M65		5.5	11.3	100	PKE12/XTU-12	DILM12-...	DILM17-...
		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

Moeller® series

	Motor data		Setting range Overload trip  	Motor starter Actuating voltage 230 V 50 Hz		Motor starter Actuating voltage 24 V DC	
	Rated short-circuit current			Part no.	Article no.	Part no.	Article no.
	380 - 415 V	380 - 415 V					
	Type of coordination "1"	Type of coordination "2"					
	I <sub>q</sub> kA	I <sub>q</sub> kA					
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	$I_r$ 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-starter combinations


DOL starter on busbar adapter, electronic motor starter



Moeller® series


Motor Data		Setting range	Motor starter Actuating voltage 230 V 50 Hz	Article no.	Motor starter Actuating voltage 24 V DC	Article no.
Rated short-circuit current		Overload trip	Part no.		Part no.	
380 - 415 V	380 - 415 V					
Type of coordination "1"	Type of coordination "2"					
I <sub>q</sub> kA	I <sub>q</sub> kA	I <sub>r</sub> A				




PKZ and DILM complete devices on BBA for DOL starters							
	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
	100	-	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 Data			Setting range	Motor starter Actuating voltage 230 V 50 Hz	Article no.	Motor starter Actuating voltage 24 V DC	Article no.
Rated short-circuit current		Overload trip	Part no.	Part no.			
380 - 415 V	380 - 415 V						
Type of coordination "1"	Type of coordination "2"						
$I_q$	$I_q$	$I_r$					
kA	kA	A					

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

Functions		Max. motor rating Three-phase motors 50 –60 Hz AC-53a 380 V 400 V 415 V P kW	Setting range of overload releases	Electronic motor starter Actuating voltage 24 V DC Part no.	Article no.
					

EMS complete devices					
	DOL start, reversing start, motor protection	0.06 - 0.75	0.18 - 2.4	EMS-RO-T-2.4-24VDC	170101
	DOL start, reversing start, motor protection	0.55 - 3	1.5 - 9	EMS-RO-T-9-24VDC	170102
	DOL start, reversing start, motor protection, emergency stop	0.06 - 0.75	0.18 - 2.4	EMS-ROS-T-2.4-24VDC	170105
	DOL start, reversing start, motor protection, emergency stop	0.55 - 3	1.5 - 9	EMS-ROS-T-9-24VDC	169789





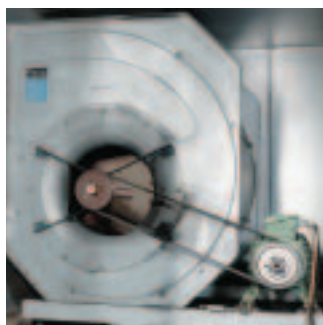
## Soft Starter DS7 of System xStart – Soft at the Start, High on Torque



The soft starter has become increasingly established as an alternative to the star-delta starter. Already a continuous spectrum for the drives up to 110 kW is on offer with the DS4 and DS6 series. This is now followed by the new DS7 series that combines the benefits of the DS4 with the xStart system.

The DS7 is a fully integral element in this system; all existing components can be used. The DS7 replaces the mechanical contactor and extends the function "Motor soft start". Motor start-up is soft but still at a higher torque than other available solutions using a patented method. Extended service intervals and reduced operating costs are welcomed side effects.

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

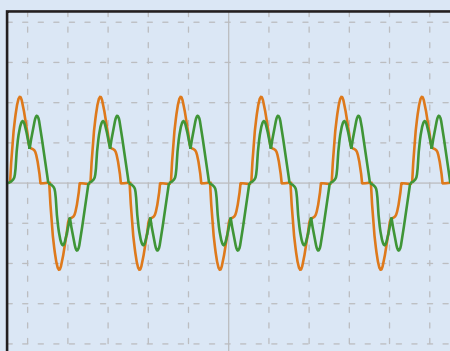


## Application examples

- 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:

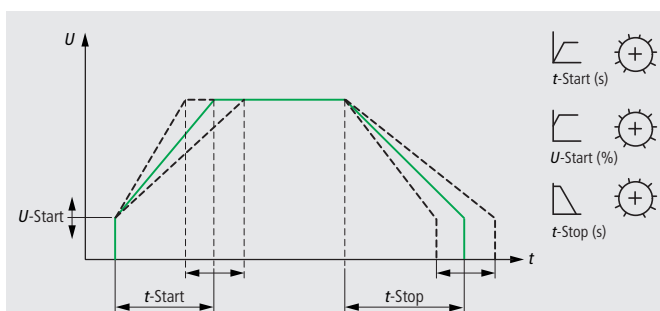
■ Symmetrical control with high level of DC components

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.

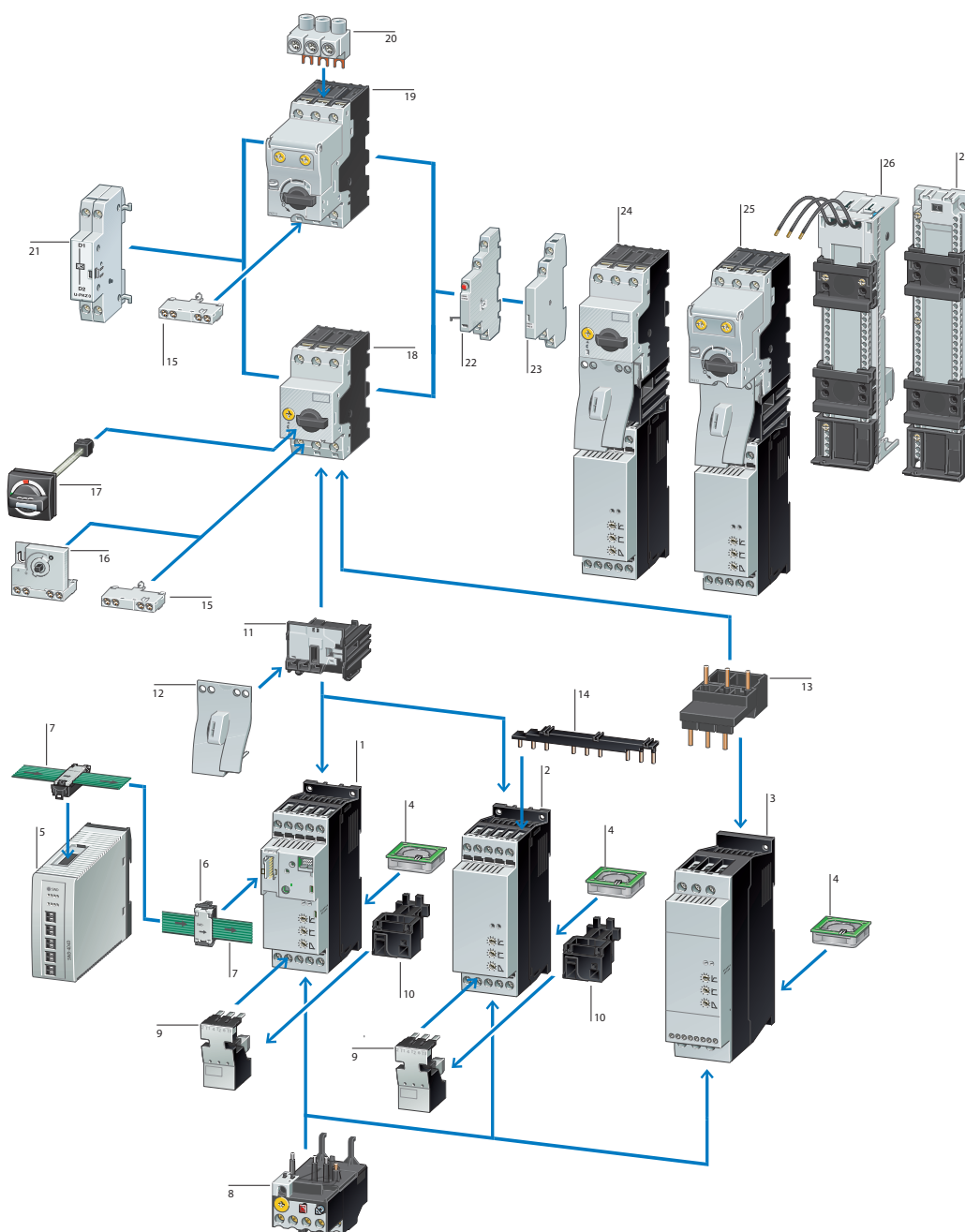
## Soft start: the modern alternative to star-delta starters

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.






- |       |  |    |   |
|-------|--|----|---|
| 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)	assigned motor rating at 400 V	assigned motor rating at 480 V	$U_c = U_s = 24 \text{ V AC/DC}$	$U_c = U_s = 110/230 \text{ V AC}$	$U_c = U_s = 24 \text{ V DC}$
	$I_e$ (IEC) A	P kW	P HP	part no. Article no.	part no. Article no.	part no. Article no.
DS7 soft starters for three-phase loads						
	4	1.5	2	DS7-340SX004N0-N 134847	DS7-342SX004N0-N 134925	DS7-34DSX004N0-D 134943
	7	3	3	DS7-340SX007N0-N 134849	DS7-342SX007N0-N 134927	DS7-34DSX007N0-D 134945
	9	4	5	DS7-340SX009N0-N 134910	DS7-342SX009N0-N 134928	DS7-34DSX009N0-D 134946
	12	5.5	10	DS7-340SX012N0-N 134911	DS7-342SX012N0-N 134929	DS7-34DSX012N0-D 134947
	16	7.5	10	DS7-340SX016N0-N 134912	DS7-342SX016N0-N 134930	DS7-34DSX016N0-D 134948
	24	11	15	DS7-340SX024N0-N 134913	DS7-342SX024N0-N 134931	DS7-34DSX024N0-D 134949
	32	15	25	DS7-340SX032N0-N 134914	DS7-342SX032N0-N 134932	DS7-34DSX032N0-D 134950
	41	22	30	DS7-340SX041N0-N 134916	DS7-342SX041N0-N 134934	DS7-34DSX041N0-D 134952
	55	30	40	DS7-340SX055N0-N 134917	DS7-342SX055N0-N 134935	DS7-34DSX055N0-D 134953
	70	37	50	DS7-340SX070N0-N 134918	DS7-342SX070N0-N 134936	DS7-34DSX070N0-D 134954
	81	45	60	DS7-340SX081N0-N 134919	DS7-342SX081N0-N 134937	DS7-34DSX081N0-D 134955
	100	55	75	DS7-340SX100N0-N 134920	DS7-342SX100N0-N 134938	DS7-34DSX100N0-D 134956
	135	75	100	DS7-340SX135N0-N 134921	DS7-342SX135N0-N 134939	DS7-34DSX135N0-D 134957
	160	90	125	DS7-340SX160N0-N 134922	DS7-342SX160N0-N 134940	DS7-34DSX160N0-D 134958
	200	110	150	DS7-340SX200N0-N 134923	DS7-342SX200N0-N 134941	DS7-34DSX200N0-D 134959

## Accessories

	Can be used for soft starters	part no.	Article no.
Device fans			
	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
	For increasing the load cycle (i.e. more starts per hour or longer-lasting starting current)	DS7-34...SX041... DS7-34...SX055... DS7-34...SX070... DS7-34...SX081... DS7-34...SX100...  DS7-34...SX135... DS7-34...SX160... DS7-34...SX200...	DS7-FAN-100 169021  DS7-FAN-200 169022





DC1

DA1

# PowerXL™ variable frequency drives

## Greater efficiency at work



Download the catalogue

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→ Customer Support

→ Catalogues

With the new PowerXL™ family of products, Eaton has launched two rugged and easy-to-use series of variable frequency drives, enabling us to continue providing the right product for simple and complex applications in the machine building and plant engineering and construction industries. These drives have been developed with a focus on efficiency at the very center of every step in a machine or plant's lifecycle: from the design stage, through configuration and installation, all the way to commissioning, operation, and maintenance.

### **DC1 – The ideal solution for conventional motors**

The DC1 is Eaton's compact variable frequency drive. Its simple mounting and installation requirements, together with its basic parameter configuration, make this drive ideal for fans, pumps, and conveyor systems. On top of this, additional parameters and functionalities can be enabled to master more demanding applications. DC1 drives are available with protection types IP 20 and IP 66 and with outputs of up to 11 kW.

### **DA1 – The all-rounder for demanding motor applications**

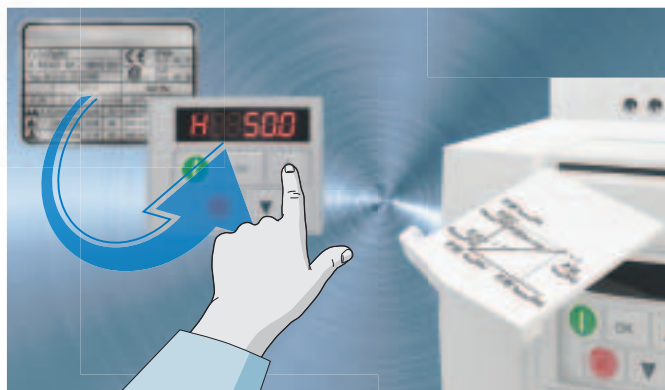
DA1 variable frequency drives are the perfect match for demanding, speed-dependent applications. A wide performance range of up to 250 kW, together with compact dimensions and a high level of functionality, are sure to leave a lasting impression, as is the fact that they are not only able to handle the wide range of uses that the DC1 can cover, but also hoisting and safety applications, among many others. These drives are available with protection types IP 20, IP 55, and IP 66, and can even be used to drive permanent-magnet motors.





### Simply use a COM stick to copy parameter configurations

Our communications stick makes it possible to quickly and easily transfer parameters from your laptop to PowerXL variable frequency drives using Bluetooth. The convenience of this feature is only matched by the stick's copy function, which can be used to transfer parameters from one variable frequency drive to another.



### Parameter configuration tasks made simple

Parameters can be conveniently configured with the drives' input keys. Also, with only 14 basic parameters, you will be able to quickly set your motor's rated values (motor voltage, current, frequency etc.) and put your applications to work right away. An info card in each device ensures that commissioning will be even easier.



### Perfect communications with SmartWire-DT

In the future, it will be possible to expand the variable frequency drives in the new DC1 and DA1 series with SmartWire-DT modules, enabling users to communicate with their variable frequency drives by relying on the corresponding PROFIdrive profile (other profiles are also available for simple applications). In addition to providing the option of configuring the parameters in your variable frequency drives, these expansion modules will also provide you with the ability to use advanced diagnostics. Finally, function blocks will make it possible to connect to Eaton PLCs and HMIs without a hitch.

### No derating at 50 °C

All DC1 and DA1 series devices with protection type IP20 are ready for use without derating even at ambient temperatures of 50 °C. They can be run with the device's rated operational current and do not have to reduce it.

The benefits:

- Smaller control panel dimensions are required
- No costs for additional ventilation

In addition, the option of installing the devices side by side ensures that the space inside your control panel will be used as efficiently as possible.

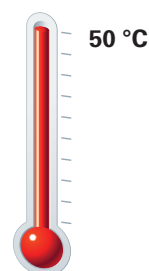
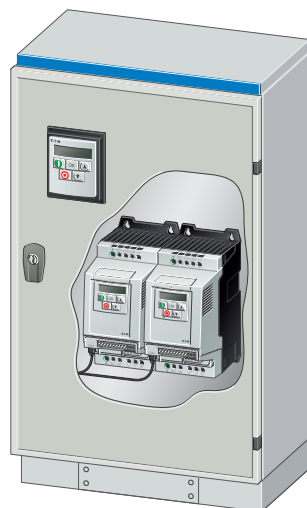
### A single operating unit for up to 63 devices

Up to 63 devices can be accessed through a keypad mounted in the control panel.



### Communicate like never before

Our new variable frequency drives also come with the latest in communication features, including a CANopen and Modbus RTU interface as standard. In addition, DA1 drives can also be connected to Ethernet-based protocols (PROFINET, Ethernet/IP, EtherCAT, Modbus TCP, BACnet/IP), the widespread PROFIBUS, and, for American markets, DeviceNet.





### Also for demanding lifting applications

The DA1 variable frequency drive's sensorless vector control (SLV) provides 200% torque at 0 rpm, making it perfect for crane applications.



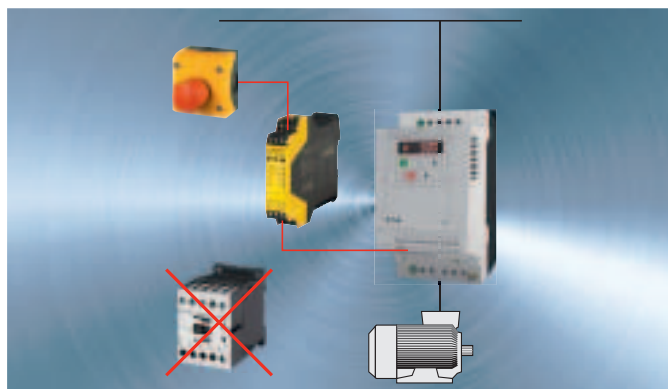
### IP66 - for when things get dusty or humid

Both series are also available with protection type IP66 (up to outputs of 7.5 kW) for applications in dusty environments and surroundings in which splash water cannot be avoided. In addition, DA1 devices can also be provided with optional PCB protection designed to protect against the damaging effects of extreme humidity.



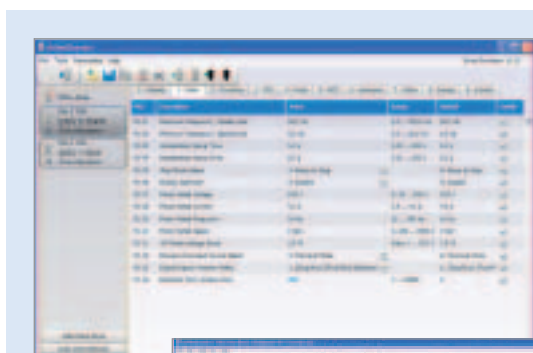
### Simple planning and engineering

Our electronic selection tools make it possible to quickly select the drive you need for your specific application, as well as the corresponding switchgear, protective elements, chokes, and filters, complete with the corresponding article numbers. [www.eaton.eu/selectiontools](http://www.eaton.eu/selectiontools)



### The built-in STO (Safe Torque Off) safety function

The Safe Torque-Off (STO) function is how the most fundamental drive-integrated safety function is implemented in the DA1, ensuring that torque will be fully removed from the motor and preventing accidental starts. This also eliminates the need for an additional mains contactor.



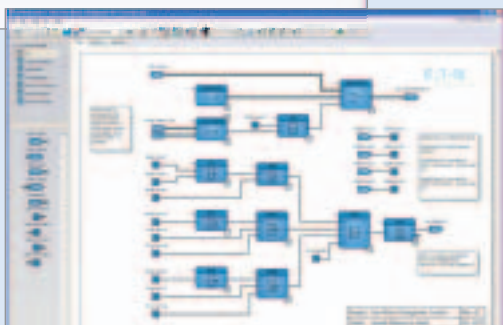
## Simplify parameter configuration and programming tasks with drivesConnect

### Configure parameters online and offline

The parameterization function has an uncluttered, easy to understand user interface. With the editor variable frequency drives can be parameterized both online and offline. In online mode monitor values can be used for diagnostics.

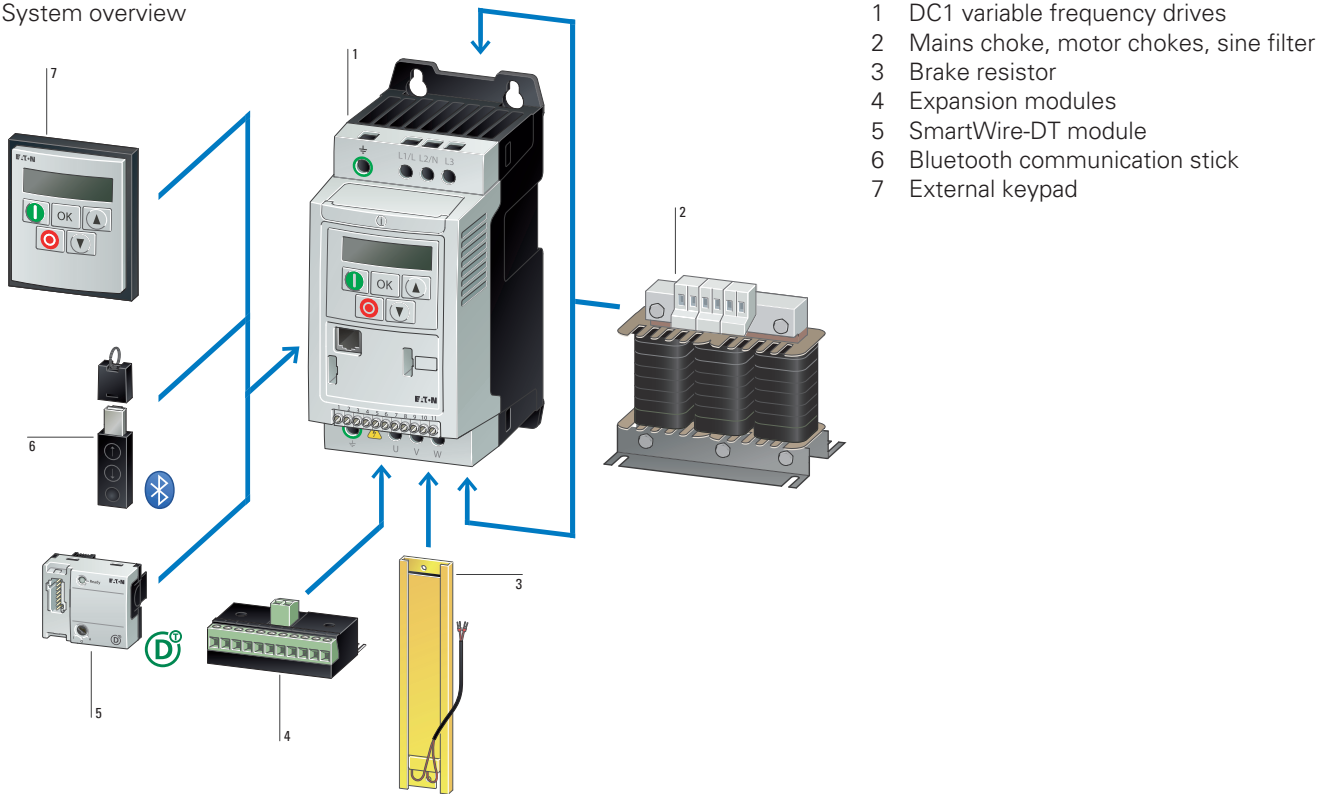
### PLC function - Simple programming

PLC programming can be used to create separate logic gates in the DA1 (including time-based dependencies, for example) and generate specific applications this way, enabling the variable frequency drive to adapt to any application. This eliminates the costs involved in the use of additional hardware.



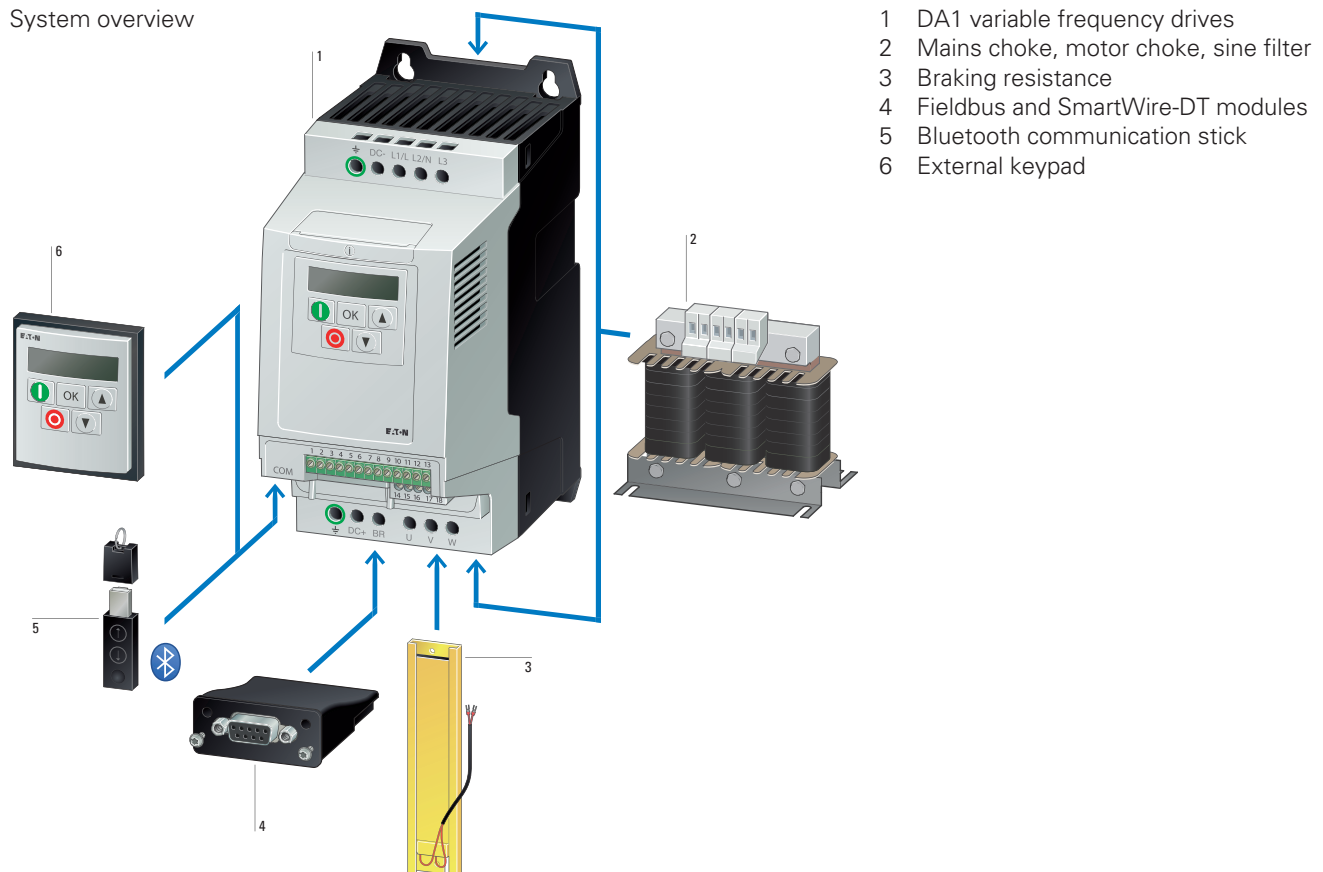
# PowerXL™ variable frequency drives DC1

System overview



# PowerXL™ variable frequency drives DA1

System overview



Size	Rated operational current <sup>1)</sup> I <sub>e</sub> A	Assigned motor rating <sup>2)</sup> P kW	Rated motor current I <sub>e</sub> A	Fitted with 7-digital display assembly Brake chopper Radio interference suppression filter	Protection type	Part no.	Article no.
<b>U<sub>e</sub> 230 V AC, 1-phase / U<sub>2</sub> 230 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 200 (-10%) - 240 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS1	2.3	0.37	2	✓ - -	IP20/NEMA 0	DC1-122D3NN-A20N	169222
FS1	2.3	0.37	2	✓ - ✓	IP20/NEMA 0	DC1-122D3FN-A20N	169240
FS1	4.3	0.75	3.2	✓ - -	IP20/NEMA 0	DC1-124D3NN-A20N	169225
FS1	4.3	0.75	3.2	✓ - ✓	IP20/NEMA 0	DC1-124D3FN-A20N	169243
FS1	7	1.5	6.3	✓ - -	IP20/NEMA 0	DC1-127D0NN-A20N	169228
FS1	7	1.5	6.3	✓ - ✓	IP20/NEMA 0	DC1-127D0FN-A20N	169246
FS2	7	1.5	6.3	✓ ✓ -	IP20/NEMA 0	DC1-127D0NB-A20N	169231
FS2	7	1.5	6.3	✓ ✓ ✓	IP20/NEMA 0	DC1-127D0FB-A20N	169249
FS2	10.5	2.2	8.7	✓ ✓ -	IP20/NEMA 0	DC1-12011NB-A20N	169234
FS2	10.5	2.2	8.7	✓ ✓ ✓	IP20/NEMA 0	DC1-12011FB-A20N	169252
FS3	15	4	14.8	✓ ✓ -	IP20/NEMA 0	DC1-12015NB-A20N	169237
<b>U<sub>e</sub> 400 V AC, 3-phase / U<sub>2</sub> 400 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 380 (-10%) - 480 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS1	2.2	0.75	1.9	✓ - -	IP20/NEMA 0	DC1-342D2NN-A20N	169453
FS1	2.2	0.75	1.9	✓ - ✓	IP20/NEMA 0	DC1-342D2FN-A20N	169475
FS1	4.1	1.5	3.6	✓ - -	IP20/NEMA 0	DC1-344D1NN-A20N	169456
FS1	4.1	1.5	3.6	✓ - ✓	IP20/NEMA 0	DC1-344D1FN-A20N	169478
FS2	4.1	1.5	3.6	✓ ✓ -	IP20/NEMA 0	DC1-344D1NB-A20N	169459
FS2	4.1	1.5	3.6	✓ ✓ ✓	IP20/NEMA 0	DC1-344D1FB-A20N	169481
FS2	5.8	2.2	5	✓ ✓ -	IP20/NEMA 0	DC1-345D8NB-A20N	169462
FS2	5.8	2.2	5	✓ ✓ ✓	IP20/NEMA 0	DC1-345D8FB-A20N	169484
FS2	9.5	4	8.5	✓ ✓ -	IP20/NEMA 0	DC1-349D5NB-A20N	169465
FS2	9.5	4	8.5	✓ ✓ ✓	IP20/NEMA 0	DC1-349D5FB-A20N	169487
FS3	14	5.5	11.3	✓ ✓ -	IP20/NEMA 0	DC1-34014NB-A20N	169468
FS3	14	5.5	11.3	✓ ✓ ✓	IP20/NEMA 0	DC1-34014FB-A20N	169490
FS3	18	7.5	15.2	✓ ✓ -	IP20/NEMA 0	DC1-34018NB-A20N	169471
FS3	18	7.5	15.2	✓ ✓ ✓	IP20/NEMA 0	DC1-34018FB-A20N	169493
FS3	24	11	21.7	✓ ✓ -	IP20/NEMA 0	DC1-34024NB-A20N	169474
FS3	24	11	21.7	✓ ✓ ✓	IP20/NEMA 0	DC1-34024FB-A20N	169496

### Notes



FS1

FS2

FS3

<sup>1)</sup> Rated operational current at an operating frequency of 4 kHz and an ambient air temperature of +50°C

<sup>2)</sup> for normal internally and externally ventilated 4 pole, three-phase asynchronous motors with 1500 rpm<sup>-1</sup> at 50 Hz or 1800 min<sup>-1</sup> at 60 Hz



Size	Rated operational current <sup>1)</sup> I <sub>e</sub> A	Assigned motor rating <sup>2)</sup> P kW	Rated motor current I <sub>e</sub> A	Fitted with Radio interference suppression filter Brake chopper 7-digital display assembly OLED display Additional PCB protection	Protection type	Part no.	Article no.
<b>U<sub>e</sub> 230 V AC, 1-phase / U<sub>2</sub> 230 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 200 (-10%) - 240 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS2	4.3	0.75	3.2	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-124D3FB-A20N	169152
FS2	4.3	0.75	3.2	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-124D3FB-A20C	169078
FS2	7	1.5	6.3	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-127D0FB-A20N	169155
FS2	7	1.5	6.3	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-127D0FB-A20C	169081
FS2	10.5	2.2	8.7	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-12011FB-A20N	169158
FS2	10.5	2.2	8.7	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-12011FB-A20C	169084
<b>U<sub>e</sub> 400 V AC, 3-phase / U<sub>2</sub> 400 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 380 (-10%) - 480 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS2	2.2	0.75	1.9	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-342D2FB-A20N	169191
FS2	2.2	0.75	1.9	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-342D2FB-A20C	169117
FS2	4.1	1.5	3.6	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-344D1FB-A20N	169194
FS2	4.1	1.5	3.6	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-344D1FB-A20C	169120
FS2	5.8	2.2	5	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-345D8FB-A20N	169197
FS2	5.8	2.2	5	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-345D8FB-A20C	169051
FS2	9.5	4	8.5	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-349D5FB-A20N	169200
FS2	9.5	4	8.5	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-349D5FB-A20C	169054
FS3	14	5.5	11.3	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-34014FB-A20N	169203
FS3	14	5.5	11.3	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-34014FB-A20C	169057
FS3	18	7.5	15.2	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-34018FB-A20N	169206
FS3	18	7.5	15.2	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-34018FB-A20C	169060
FS4	24	11	21.7	✓ ✓ - ✓ -	IP55	DA1-34024FB-B55N	169323
FS4	24	11	21.7	✓ ✓ ✓ - -	IP55	DA1-34024FB-A55N	169210
FS3	24	11	21.7	✓ ✓ ✓ - -	IP20/NEMA 0	DA1-34024FB-A20N	169209
FS4	24	11	21.7	✓ ✓ - ✓ ✓	IP55	DA1-34024FB-B55C	169390
FS3	24	11	21.7	✓ ✓ ✓ - ✓	IP20/NEMA 0	DA1-34024FB-A20C	169063
FS4	24	11	21.7	✓ ✓ ✓ - ✓	IP55	DA1-34024FB-A55C	169064
FS4	30	15	30	✓ ✓ - ✓ -	IP55	DA1-34030FB-B55N	169324
FS4	30	15	29.3	✓ ✓ ✓ - -	IP55	DA1-34030FB-A55N	169211
FS4	30	15	29.3	✓ ✓ ✓ - ✓	IP55	DA1-34030FB-A55C	169065
FS4	30	15	29.3	✓ ✓ - ✓ ✓	IP55	DA1-34030FB-B55C	169391
FS4	39	18.5	36	✓ ✓ ✓ - -	IP55	DA1-34039FB-A55N	169212
FS4	39	18.5	36	✓ ✓ - ✓ -	IP55	DA1-34039FB-B55N	169325
FS4	39	18.5	36	✓ ✓ ✓ - ✓	IP55	DA1-34039FB-A55C	169066
FS4	39	18.5	36	✓ ✓ - ✓ ✓	IP55	DA1-34039FB-B55C	169392
FS4	46	22	41	✓ ✓ - ✓ -	IP55	DA1-34046FB-B55N	169326
FS4	46	22	41	✓ ✓ ✓ - -	IP55	DA1-34046FB-A55N	169213
FS4	46	22	41	✓ ✓ ✓ - ✓	IP55	DA1-34046FB-A55C	169067
FS4	46	22	41	✓ ✓ - ✓ ✓	IP55	DA1-34046FB-B55C	169393

## Notes



FS2



FS3



FS4

<sup>1)</sup> With a switching frequency of 4 kHz and an ambient air temperature of +40°C or +50°C for IP20/NEMA 0

<sup>2)</sup> Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)



Size	Rated operational current <sup>1)</sup> I <sub>e</sub> A	Assigned motor rating <sup>2)</sup> P kW	Rated motor current I <sub>e</sub> A	Fitted with Radio interference suppression filter Brake chopper 7-digital display assembly OLED display Additional PCB protection	Protection type	Part no.	Article no.
<b>U<sub>e</sub> 400 V AC, 3-phase / U<sub>2</sub> 400 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 380 (-10%) - 480 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS5	61	30	55	✓ ✓ ✓ - -	IP55	DA1-34061FB-A55N	169214
FS5	61	30	55	✓ ✓ - ✓ -	IP55	DA1-34061FB-B55N	169327
FS5	61	30	55	✓ ✓ ✓ - ✓	IP55	DA1-34061FB-A55C	169068
FS5	61	30	55	✓ ✓ - ✓ ✓	IP55	DA1-34061FB-B55C	169394
FS5	72	37	68	✓ ✓ - ✓ -	IP55	DA1-34072FB-B55N	169328
FS5	72	37	68	✓ ✓ ✓ - -	IP55	DA1-34072FB-A55N	169215
FS5	72	37	68	✓ ✓ - ✓ ✓	IP55	DA1-34072FB-B55C	169395
FS5	72	37	68	✓ ✓ ✓ - ✓	IP55	DA1-34072FB-A55C	169069
FS6	90	45	81	✓ - - ✓ -	IP55	DA1-34090FN-B55N	169329
FS6	90	45	81	✓ - ✓ - -	IP55	DA1-34090FN-A55N	169216
FS6	90	45	81	✓ - - ✓ ✓	IP55	DA1-34090FN-B55C	169396
FS6	90	45	81	✓ ✓ - ✓ -	IP55	DA1-34090FB-B55N	169330
FS6	90	45	81	✓ ✓ ✓ - -	IP55	DA1-34090FB-A55N	169037
FS6	90	45	81	✓ - ✓ - ✓	IP55	DA1-34090FN-A55C	169070
FS6	90	45	81	✓ ✓ - ✓ ✓	IP55	DA1-34090FB-B55C	169397
FS6	90	45	81	✓ ✓ ✓ - ✓	IP55	DA1-34090FB-A55C	169071
FS6	110	55	99	✓ - - ✓ -	IP55	DA1-34110FN-B55N	169331
FS6	110	55	99	✓ - ✓ - -	IP55	DA1-34110FN-A55N	169038
FS6	110	55	99	✓ - - ✓ - ✓	IP55	DA1-34110FN-A55C	169072
FS6	110	55	99	✓ - - ✓ ✓	IP55	DA1-34110FN-B55C	169398
FS6	110	55	99	✓ ✓ ✓ - -	IP55	DA1-34110FB-A55N	169039
FS6	110	55	99	✓ ✓ - ✓ -	IP55	DA1-34110FB-B55N	169332
FS6	110	55	99	✓ ✓ ✓ - ✓	IP55	DA1-34110FB-A55C	169265
FS6	110	55	99	✓ ✓ - ✓ ✓	IP55	DA1-34110FB-B55C	169399
FS6	150	75	134	✓ - - ✓ -	IP55	DA1-34150FN-B55N	169333
FS6	150	75	134	✓ - ✓ - -	IP55	DA1-34150FN-A55N	169040
FS6	150	75	134	✓ ✓ ✓ - -	IP55	DA1-34150FB-A55N	169041
FS6	150	75	134	✓ ✓ - ✓ -	IP55	DA1-34150FB-B55N	169334
FS6	150	75	134	✓ - - ✓ ✓	IP55	DA1-34150FN-B55C	169400
FS6	150	75	134	✓ - ✓ - ✓	IP55	DA1-34150FN-A55C	169266
FS6	180	90	161	✓ ✓ ✓ - -	IP55	DA1-34180FB-A55N	169043
FS6	150	75	134	✓ ✓ ✓ - ✓	IP55	DA1-34150FB-A55C	169267
FS6	150	75	134	✓ ✓ - ✓ ✓	IP55	DA1-34150FB-B55C	169401
FS6	180	90	161	✓ - - ✓ -	IP55	DA1-34180FN-B55N	169335
FS6	180	90	161	✓ - ✓ - -	IP55	DA1-34180FN-A55N	169042
FS6	180	90	161	✓ ✓ - ✓ -	IP55	DA1-34180FB-B55N	169336
FS6	180	90	161	✓ - - ✓ ✓	IP55	DA1-34180FN-B55C	169402
FS6	180	90	161	✓ - ✓ - ✓	IP55	DA1-34180FN-A55C	169268
FS6	180	90	161	✓ ✓ ✓ - ✓	IP55	DA1-34180FB-A55C	169269
FS6	180	90	161	✓ ✓ - ✓ ✓	IP55	DA1-34180FB-B55C	169403
FS7	202	110	196	✓ - - ✓ -	IP55	DA1-34202FN-A55N	169044
FS7	202	110	196	✓ - - ✓ -	IP55	DA1-34202FN-B55N	169337
FS7	202	110	196	✓ ✓ ✓ - -	IP55	DA1-34202FB-A55N	169045
FS7	202	110	196	✓ - - ✓ ✓	IP55	DA1-34202FB-B55C	169404
FS7	202	110	196	✓ - ✓ - ✓	IP55	DA1-34202FN-A55C	169270
FS7	202	110	196	✓ ✓ - ✓ -	IP55	DA1-34202FB-B55N	169338
FS7	202	110	196	✓ ✓ ✓ - ✓	IP55	DA1-34202FB-A55C	169271
FS7	202	110	196	✓ ✓ - ✓ ✓	IP55	DA1-34202FB-B55C	169405
FS7	240	132	231	✓ - ✓ - -	IP55	DA1-34240FN-A55N	169046
FS7	240	132	231	✓ - - ✓ -	IP55	DA1-34240FN-B55N	169339
FS7	240	132	231	✓ ✓ ✓ - -	IP55	DA1-34240FB-A55N	169047
FS7	240	132	231	✓ - - ✓ ✓	IP55	DA1-34240FB-B55C	169272

Size	Rated operational current <sup>1)</sup> I <sub>e</sub> A	Assigned motor rating <sup>2)</sup> P kW	Rated motor current I <sub>e</sub> A	Fitted with Radio interference suppression filter Brake chopper 7-digital display assembly OLED display Additional PCB protection	Protection type	Part no.	Article no.
<b>U<sub>e</sub> 400 V AC, 3-phase / U<sub>2</sub> 400 V AC, 3-phase</b>							
Mains voltage IEC (50/60Hz) U <sub>LN</sub> 380 (-10%) - 480 (+10%) V Interface RS485/Modbus RTU, CANopen®							
FS7	240	132	231	✓ - - ✓ ✓	IP55	DA1-34240FN-B55C	169406
FS7	240	132	231	✓ ✓ - ✓ -	IP55	DA1-34240FB-B55N	169340
FS7	240	132	231	✓ ✓ ✓ - ✓	IP55	DA1-34240FB-A55C	169273
FS7	240	132	231	✓ ✓ - ✓ ✓	IP55	DA1-34240FB-B55C	169407
FS7	302	160	279	✓ - ✓ - -	IP55	DA1-34302FN-A55N	169048
FS7	302	160	279	✓ - - ✓ ✓	IP55	DA1-34302FN-B55C	169408
FS7	302	160	279	✓ - - ✓ -	IP55	DA1-34302FN-B55N	169341
FS7	302	160	279	✓ ✓ - ✓ -	IP55	DA1-34302FB-B55N	169342
FS7	302	160	279	✓ - ✓ - ✓	IP55	DA1-34302FN-A55C	169274
FS7	302	160	279	✓ ✓ ✓ - -	IP55	DA1-34302FB-A55N	169073
FS7	302	160	279	✓ ✓ ✓ - ✓	IP55	DA1-34302FB-A55C	169275
FS7	302	160	279	✓ ✓ - ✓ ✓	IP55	DA1-34302FB-B55C	169217
FS8	370	200	349	✓ - ✓ - -	IP40	DA1-34370FN-A40N	169074
FS8	370	200	349	✓ - - ✓ -	IP40	DA1-34370FN-B40N	169343
FS8	370	200	349	✓ - ✓ - ✓	IP40	DA1-34370FN-A40C	169276
FS8	370	200	349	✓ - - ✓ ✓	IP40	DA1-34370FN-B40C	169218
FS8	370	200	349	✓ ✓ ✓ - -	IP40	DA1-34370FB-A40N	169075
FS8	370	200	349	✓ ✓ - ✓ -	IP40	DA1-34370FB-B40N	169344
FS8	370	200	349	✓ ✓ ✓ - ✓	IP40	DA1-34370FB-A40C	169277
FS8	370	200	349	✓ ✓ - ✓ ✓	IP40	DA1-34370FB-B40C	169219
FS8	450	250	437	✓ - ✓ - -	IP40	DA1-34450FN-A40N	169076
FS8	450	250	437	✓ - - ✓ -	IP40	DA1-34450FN-B40N	169345
FS8	450	250	437	✓ ✓ - ✓ -	IP40	DA1-34450FB-B40N	169346
FS8	450	250	437	✓ ✓ ✓ - -	IP40	DA1-34450FB-A40N	169077
FS8	450	250	437	✓ - ✓ - ✓	IP40	DA1-34450FN-A40C	169278
FS8	450	250	437	✓ - - ✓ ✓	IP40	DA1-34450FN-B40C	169220
FS8	450	250	437	✓ ✓ - ✓ ✓	IP40	DA1-34450FB-B40C	169221
FS8	450	250	437	✓ ✓ ✓ - ✓	IP40	DA1-34450FB-A40C	169279

## Notes



FS5

<sup>1)</sup> With a switching frequency of 4 kHz and an ambient air temperature of +40°C or +50°C for IP20/NEMA 0

<sup>2)</sup> Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

	minimum external braking resistance $R_{min}$ $\Omega$	Continuous braking rating $P_{DB}$ W	For use with	Part no.	Article no.
<b>Braking resistances</b>					
for direct installation in variable frequency drive enclosure of frame sizes 2 and 3. Braking resistance in anodized aluminium enclosure					
	33	500	DC1, DA1	<b>DX-BR3-033</b>	169151
	100	200	DC1, DA1	<b>DX-BR3-100</b>	169150
	Description		For use with	Part no.	Article no.
<b>External keypad</b>					
	with LED display		DC1, DA1	<b>DX-KEY-LED</b>	169132
	with OLED display		DC1, DA1	<b>DX-KEY-OLED</b>	169133
<b>Bluetooth communication stick</b>					
	-		DC1, DA1	<b>DX-COM-STICK</b>	169134
<b>Licence key</b>					
	for enabling the drivesConnect program's PLC function		DA1	<b>DX-COM-SOFT</b>	169136
<b>PC connection</b>					
Connection cable with RJ45 plugs					
	Length 0.5 m		DC1, DA1	<b>DX-CBL-RJ45-0M5</b>	169137
	Length 1 m		DC1, DA1	<b>DX-CBL-RJ45-1M0</b>	169138
	Length 3 m		DC1, DA1	<b>DX-CBL-RJ45-3M0</b>	169139
<b>Bus termination resistor</b>					
	-		DC1, DA1	<b>DX-CBL-TERM</b>	169140
<b>Cable and splitter</b>					
	RJ45, 3 sockets		DC1, DA1	<b>DX-SPL-RJ45-3SL</b>	169141
	RJ45, 2 sockets/1 plug		DC1, DA1	<b>DX-SPL-RJ45-2SL1PL</b>	169142
<b>Expansion modules</b>					
	110-V-input (electrically isolated)		DC1	<b>DXC-EXT-IO110</b>	169032
	230-V-input (electrically isolated)		DC1	<b>DXC-EXT-IO230</b>	169033
	2 relay outputs		DC1	<b>DXC-EXT-2R0</b>	169031
	3 relay outputs		DA1	<b>DXA-EXT-3R0</b>	169121
	2 relay outputs 1 analog output		DC1	<b>DXC-EXT-2R01A0</b>	169030
	3 digital inputs Relay output 1		DA1	<b>DXA-EXT-3DI1R0</b>	169036
<b>Simulator</b>					
	3 digital inputs Relay output 1 1 Potentiometer		DC1	<b>DXC-EXT-LOCSIM</b>	169034
<b>Encoder</b>					
	-		DA1	<b>DXA-EXT-ENCOD</b>	169035
<b>Fieldbus modules</b>					
	Ethernet IP		DA1	<b>DX-NET-ETHERNET-2</b>	169122
	DeviceNet		DA1	<b>DX-NET-DEVICENET</b>	169123
	PROFIBUS		DA1	<b>DX-NET-PROFIBUS</b>	169124
	PROFINET		DA1	<b>DX-NET-PROFINET-2</b>	169125
	Modbus/TCP		DA1	<b>DX-NET-MOVBUSTCP-2</b>	169126
	EtherCAT		DA1	<b>DX-NET-ETHERCAT-2</b>	169127
	BACnet/IP		DA1	<b>DX-NET-BACNETIP-2</b>	169128
	SmartWire-DT		DA1 (IP20)	<b>DX-NET-SWD1</b>	169129
	SmartWire-DT		DC1/DA1 (IP55/IP66)	<b>DX-NET-SWD2</b>	169130
	SmartWire-DT		DC1 (IP20)	<b>DX-NET-SWD3</b>	169131

	Rated operational current $I_e$ A	Inductance L mH	Maximum heat dissipation $P_v$ W	Part no.	Article no.
<b>Mains choke</b>					
1-phase max. permitted mains supply voltage V AC: 260 V + 0% (50/60 Hz)					
	5.8	5.05	9	DX-LN1-006	269490
	8.6	3.41	11	DX-LN1-009	269495
	13	2.25	12	DX-LN1-013	269496
	18	1.63	17	DX-LN1-018	269497
	24	1.22	20	DX-LN1-024	269498
	32	0.92	24	DX-LN1-032	169791
3-phase max. permitted mains supply voltage V AC: 550 V + 0% (50/60 Hz)					
	3.9	7.51	17	DX-LN3-004	269500
	6	4.9	19	DX-LN3-006	269501
	10	2.94	33	DX-LN3-010	269502
	16	1.84	44	DX-LN3-016	269503
	25	1.18	57	DX-LN3-025	269504
	40	0.64	59	DX-LN3-040	269505
	50	0.37	58	DX-LN3-050	269506
	60	0.31	60	DX-LN3-060	269507
	80	0.23	86	DX-LN3-080	269508
	100	0.18	101	DX-LN3-100	269509
	120	0.15	100	DX-LN3-120	269510
	160	0.11	140	DX-LN3-160	269511
	200	0.09	154	DX-LN3-200	269512
	250	0.07	155	DX-LN3-250	269513
	300	0.06	196	DX-LN3-300	269514
	303	0.06	230	DX-LN3-303	169143
	370	0.05	290	DX-LN3-370	169144
	450	0.04	300	DX-LN3-450	169145
<b>Motor chokes</b>					
			max. heat dissipation (pulse frequency) (12 kHz)		
3-phase max. permitted mains supply voltage V AC: 750 V + 0% (50/60 Hz)					
	5	2	24	DX-LM3-005	269538
	8	4.1	54	DX-LM3-008	269539
	11	3	71	DX-LM3-011	269541
	16	1.5	78	DX-LM3-016	269542
	35	1	116	DX-LM3-035	269543
	50	0.6	168	DX-LM3-050	269544
	63	0.5	193	DX-LM3-063	269545
	80	0.5	206	DX-LM3-080	269546
	100	0.45	294	DX-LM3-100	269547
	150	0.35	424	DX-LM3-150	269548
	180	0.3	439	DX-LM3-180	269549
	220	0.2	517	DX-LM3-220	269560
	260	0.15	520	DX-LM3-260	269561
	303	0.15	-	DX-LM3-303	169146
	370	0.12	-	DX-LM3-370	169147
	450	0.1	-	DX-LM3-450	169148
<b>Sine filter</b>					
3-phase					
	4	11	50	DX-SIN3-004	271538
	10	5.1	100	DX-SIN3-010	271590
	16.5	3.07	70	DX-SIN3-016	271591
	23.5	2.5	125	DX-SIN3-023	271593
	32	2	100	DX-SIN3-032	271594
	37	1.7	100	DX-SIN3-037	271595
	48	1.2	240	DX-SIN3-048	271597
	61	1	280	DX-SIN3-061	271599
	72	0.95	300	DX-SIN3-072	271600
	90	0.8	290	DX-SIN3-090	271601
	115	0	460	DX-SIN3-115	271602
	150	0.5	530	DX-SIN3-150	271603
	180	0.4	500	DX-SIN3-180	271604
	250	0.35	550	DX-SIN3-250	271605
	440	0.14	650	DX-SIN3-440	271606
	480	0.14	1550	DX-SIN3-480	169149



# 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.

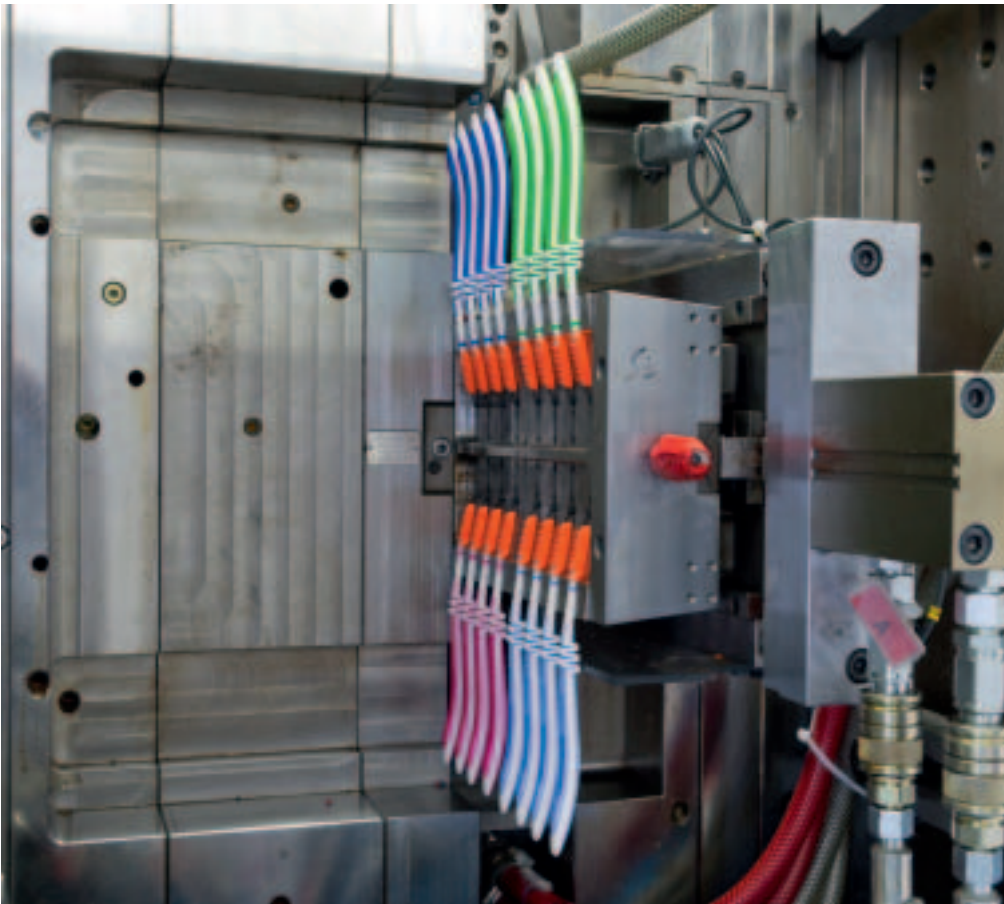
Whether your primary business is mass production or mass customisation, you can count on superior precision and repeatability for increased uptime, year after year.



## Perfect interaction of electrical and hydraulic technology

Lean Solution ultimately brings together the world of hydraulics and the world of electrical engineering in automation. A fully integrated electro-hydraulic system is a complete solution for your machine. Automation components such as HMI/PLCs communicate perfectly via CANopen with intelligent Eaton hydraulic valves. The brain of the system is implemented by the HMI/PLC which combines control, visualization and data management tasks with state-of-the-art networking features in a single device. Via a CANopen fieldbus, the HMI/PLC communicates with drives, I/Os and now with the new KBS valves as well, thus providing full control of machine axis movement. The HMI/PLC can also communicate on SmartWire-DT with pushbutton actuators, indicator lights, and switchgear right up to the sensors, thus providing an efficient solution for connectivity. Eaton's fully integrated electro-hydraulic system enhances in every respect the machine productivity and performance and simultaneously reduces the wiring, test and commissioning requirement.





## What are your requirements?

Irrespective of whether you supply original parts for machine components or are an end customer, Eaton is aware of the most critical energy management requirements in the machine-building sector. We are aware of your requirement to reduce the time to market due to the increasingly shorter time-spans between the market launch of new models. We also know that the operating costs must be reduced ensuring that you remain a valuable and preferred supplier. Just as we know that you place great emphasis on efficiency, reliability and sustainability. And this is why we can develop the best solutions together with you, employing products complying to global standards and thus assuring world-wide availability.



### Open-Circuit Piston Pumps

Featuring robust bearing designs, Eaton medium-duty PVM pumps deliver longer life and reliable operation for CNC machining tools in metal-cutting applications. The pressure/flow-compensated pumps provide dependable component and system operation without costly breakdowns and maintenance. Special design techniques reduce both structure- and fluid-born noise and yield extended pump life.



### Eaton AxisPro™ Proportional Valve

Eaton AxisPro proportional valves provide integrated programmable control capabilities in sophisticated electro-hydraulic axis control applications. These valves contain both programmable onboard electronics and integral spool Linear Voltage Differential Transformer (LVDT) sensors to provide precise, accurate, responsive axis control capabilities. Their modular design delivers four levels of control ranging from an entry level valve that is quick and easy to configure, right through to a valve that can be customized by uploading application code created by Eaton's Pro-FX Control software.



### 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.





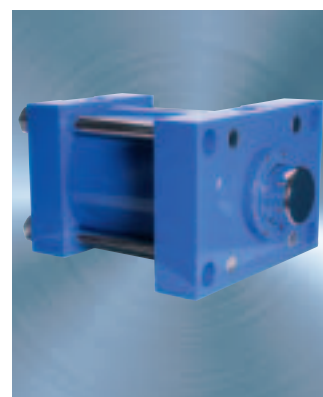
### Proportional Directional Valves

Eaton's specially designed injection P/Q valves (D05, D07, D08, and D10) provide precise control of injection velocity, smooth transition from velocity to pressure control, and back pressure control that is highly repeatable to produce parts with tight dimensional accuracy and high quality. The valves are pre-wired with ruggedly constructed onboard electronics. Factory-set adjustments, including gain, spool dead-band compensation, and offset, ensure high valve-to-valve reproducibility.



### LifeSense™ Hose

Eaton is an industry leader in developing new hydraulic hose solutions. Our hydraulic hose products are suitable for nearly any application, pressure level, and fluid type. With Eaton's new LifeSense™ condition-based hydraulic hose monitoring system, hydraulic hose failures will no longer be a major concern. LifeSense hose monitors the health of hydraulic hose assemblies, detects events that have been shown to be symptomatic of the hose beginning to fail, and notifies the user prior to failure with enough time to replace the hose before it fails.



### Tie Rod Cylinders

Eaton's Vickers and Hydro-Line G, N, I, and L Series cylinders include a broad range of NFPA and ISO hydraulic, pneumatic, and electro-hydraulic styles focused on industrial markets. This comprehensive line features a proven design coupled with the Eaton SureSeal™ system for improved performance and better serviceability. Virtually unlimited options are available.



### Rotary switch T flush

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

Page 186 ff.



### Switch-disconnector P surface mounting

- IP65
- Main switch
- Maintenance / manual override switch
- Reversing / Star-delta switch
- Powers up to 110 kW

Page 187 ff.



### Switch-disconnector P, N

- Four switches up to 1600 A
- 3 and 4-pole
- Diverse installation and actuation options

Page 196



### Switch disconnectors IN

- Disconnectors up to 6300 A

See Industry  
Main Catalogue



### Miniature circuit-breaker FAZ

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

Page 204 ff.



### Digital RCCB

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

Page 206 ff.



### 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

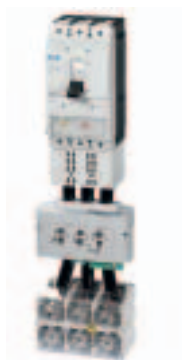
Page 192  
IZM see Industry  
Main Catalogue



### Circuit-breakers NZM + RCCB

- Up to 250 A
- Pulse current sensitive/ AC/DC sensitive
- Rated fault current  $I_{\Delta n}=0.03\text{ A}\dots3.0\text{ A}$

See Industry  
Main Catalogue



### Circuit-breakers NZM Energy measuring module XMC

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

Pages 192 and 203



### Circuit-breaker NZM with Data Management Interface

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

Page 193 and 203



### Circuit-breaker with SmartWire-DT

- Warnings
- Remote operator control
- Data from metering modules

Page 193



### 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 220



### 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 221

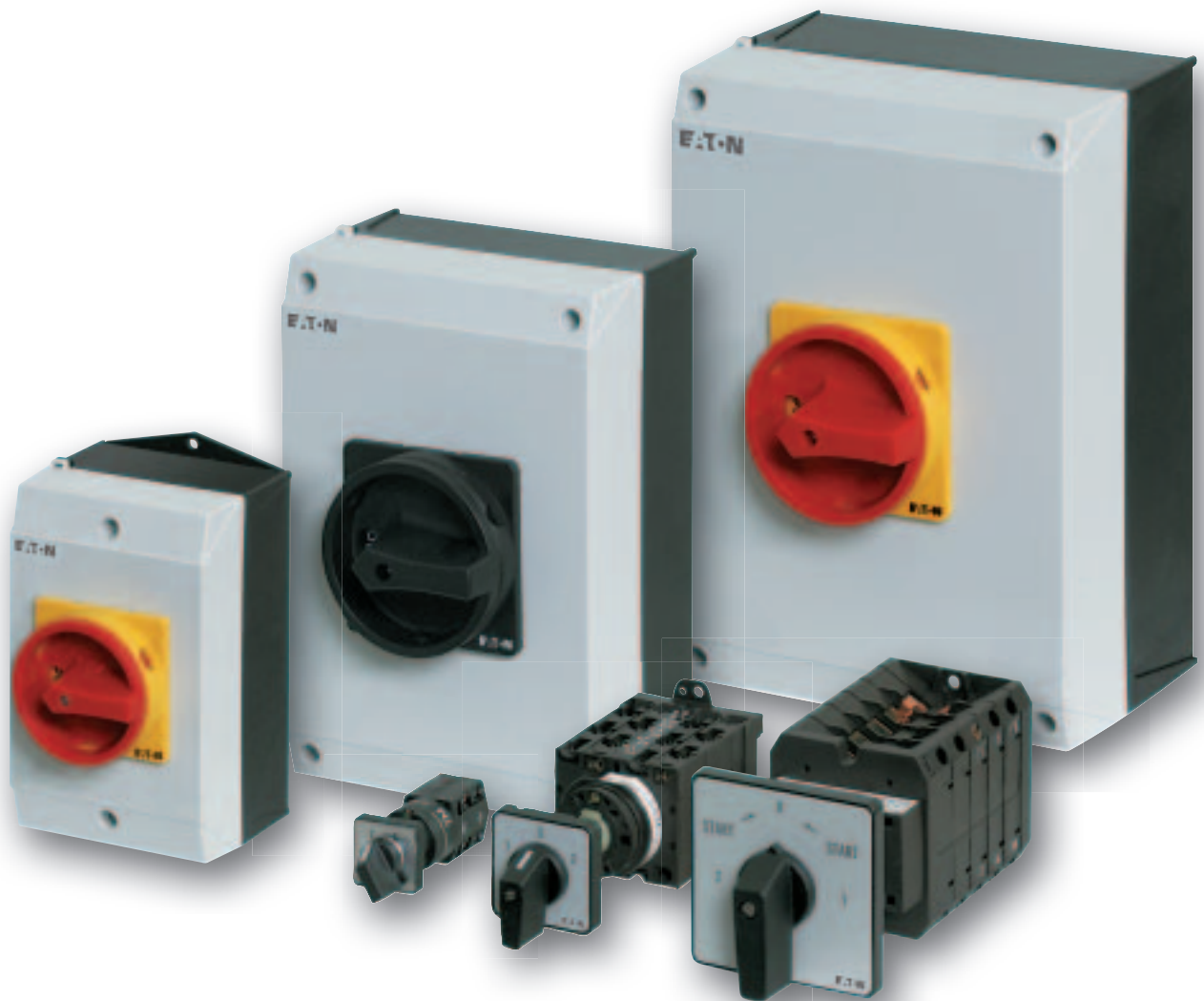


### Software + Accessories

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

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# Safe Switching, Isolating and Control with Rotary Switch T and Switch Disconnecter 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.



### 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 AC 23 A 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.



### Main switch with Emergency-Stop function<sup>1)</sup>

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:

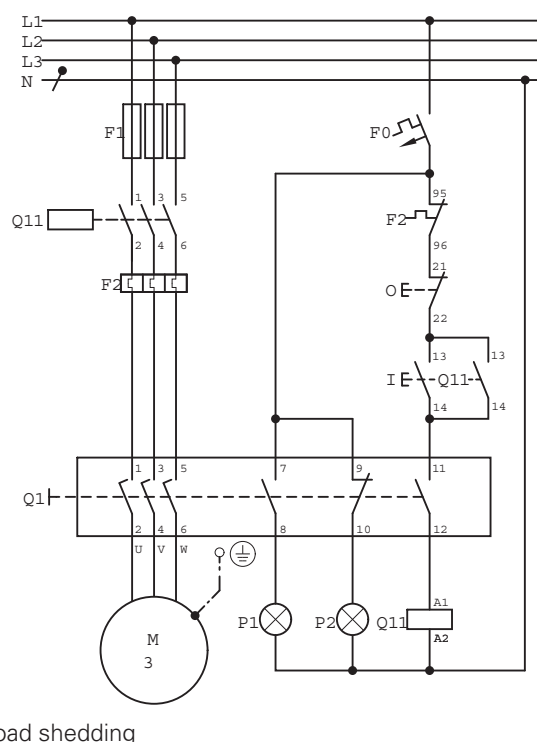
- priority function and operation in all operating modes
- the power supply, which is connected to the machine states which produce the danger, must switch off as quickly as possible.

<sup>1)</sup> 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 signalling contacts can be used for indicating the switch position. The respective processing and use in the application program of the system enhances safety.

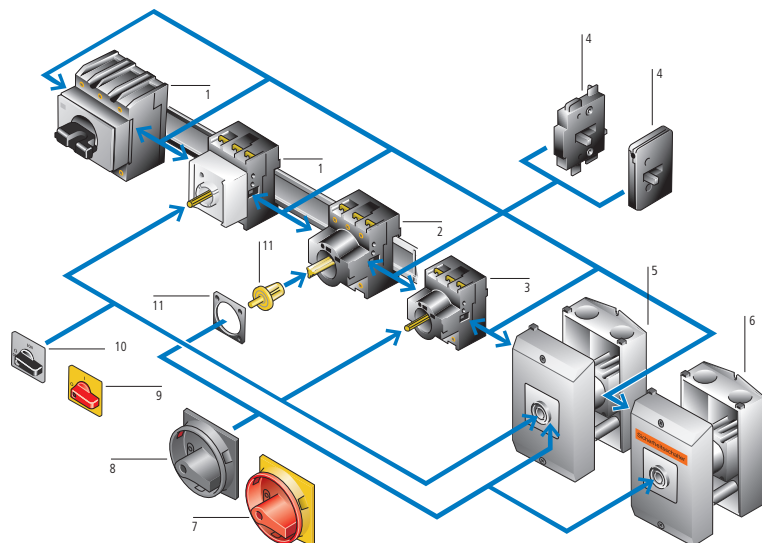


# Cam switches, switch-disconnectors

## System overview

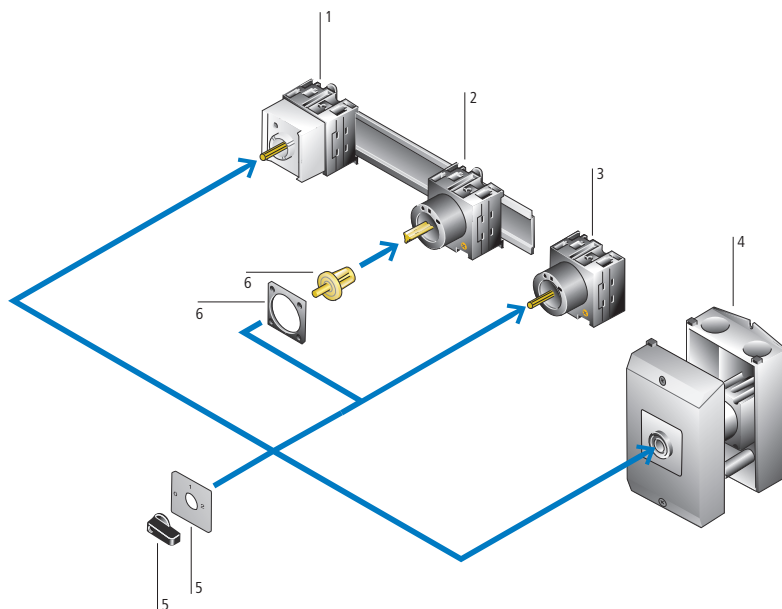
Moeller® series

### 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

		<b>Surface mounting</b>		<b>Rear mounting</b>		<b>Flush mounting</b>	
							
Pole	Rated uninterrupted current $I_u$ A	Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
<b>Main switches, IP65</b> with lockable rotary handle							
1	20	<b>T0-1-8200/I1/SVB</b>	207145				
	32	<b>T3-1-8200/I2/SVB</b>	207200				
	63	<b>T5B-1-8200/I4/SVB</b>	207240				
	100	<b>T5-1-8200/I5/SVB</b>	207275				
2	20	<b>T0-1-102/I1/SVB</b>	207143	<b>T0-1-102/V/SVB</b>	095824	<b>T0-1-102/EA/SVB</b>	091078
	32	<b>T3-1-102/I2/SVB</b>	207198	<b>T3-1-102/V/SVB</b>	019120	<b>T3-1-102/EA/SVB</b>	014374
	63	<b>T5B-1-102/I4/SVB</b>	207238	<b>T5B-1-102/V/SVB</b>	094463	<b>T5B-1-102/EA/SVB</b>	094469
	100	<b>T5-1-102/I5/SVB</b>	207273	<b>T5-1-102/V/SVB</b>	098806	<b>T5-1-102/EA/SVB</b>	098808
3	20	<b>T0-2-1/I1/SVB</b>	207147	<b>T0-2-1/V/SVB</b>	043619	<b>T0-2-1/EA/SVB</b>	038873
	25	<b>P1-25/I2/SVB</b>	207293	<b>P1-25/V/SVB</b>	055335	<b>P1-25/EA/SVB</b>	041097
	32	<b>P1-32/I2/SVB</b>	207314	<b>P1-32/V/SVB</b>	095676	<b>P1-32/EA/SVB</b>	081438
	63	<b>P3-63/I4/padlock facility</b>	207343	<b>P3-63/V/SVB</b>	048218	<b>P3-63/EA/SVB</b>	031607
	100	<b>P3-100/I5/SVB</b>	207373	<b>P3-100/V/SVB</b>	088558	<b>P3-100/EA/SVB</b>	074320
6	20	<b>T0-3-8342/I1/SVB</b>	207159				
	32	<b>T3-3-8342/I2/SVB</b>	207208				
	63	<b>T5B-3-8342/I4/SVB</b>	207242				
	100	<b>T5-3-8342/I5/SVB</b>	207279				

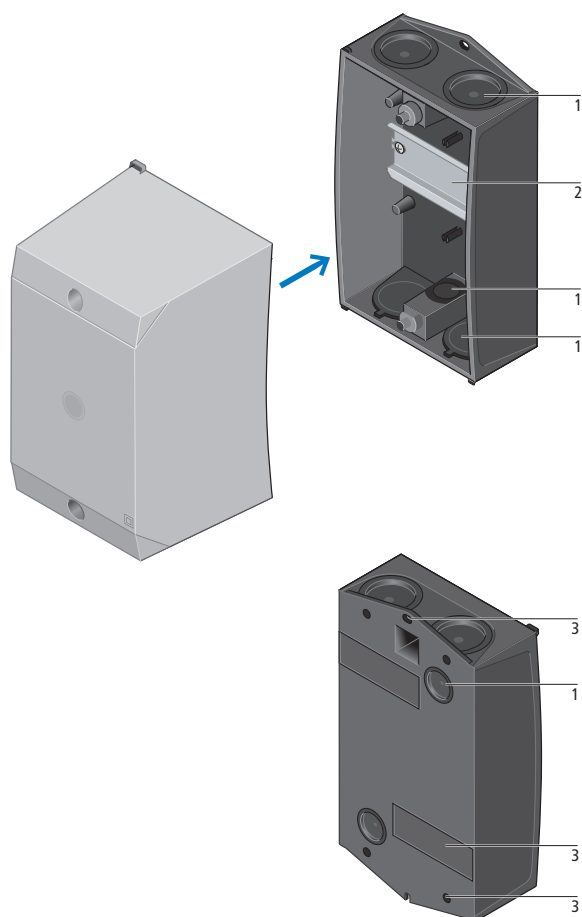
Description		Part no.	Article no.
<b>Accessories</b>			
Neutral conductor 	for P1 switch-disconnectors, flush mounting	N-P1E	000651
	for P1 switch-disconnectors, rear mounting	N-P1Z	000652
	for P3 switch-disconnectors, flush mounting	N-P3E	062432
	for P3 switch-disconnectors, rear mounting	N-P3Z	064805
Auxiliary contacts, 1 N/O / 1 N/C 	for P1/P3 switch-disconnectors, flush mounting	HI11-P1/P3E	061813
	for P1/P3 switch-disconnectors, rear mounting	HI11-P1/P3Z	062031
Shaft extensions 	for T0/T3/P1 switch-disconnectors	ZAV-T0	027044
	for T5/T5B/P3 switch-disconnectors	ZAV-P3	029417
Interlock extensions 	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" 	for T0/T3/P1 switch-disconnectors	ZFS61/62-T0	030170
	for T5/T5B/P3 switch-disconnectors	ZFS61/62-P3	065739

		Flush mounting	Centre mounting	Surface mounting	Distribution board - assembly	Rear mounting
		Front IP65	Front IP65	IP65	Front IP30	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.
<b>On-Off switch</b>						
 FS 908	1	<b>T0-1-8200/E</b> 067352	<b>T0-1-8200/EZ</b> 069725	<b>T0-1-8200/I1</b> 207074	<b>T0-1-8200/IVS</b> 074471	<b>T0-1-8200/Z</b> 076844
	2	<b>T0-1-102/E</b> 088709	<b>T0-1-102/EZ</b> 091082	<b>T0-1-102/I1</b> 207061	<b>T0-1-102/IVS</b> 015147	<b>T0-1-102/Z</b> 095828
	3	<b>T0-2-1/E</b> 024639	<b>T0-2-1/EZ</b> 027012	<b>T0-2-1/I1</b> 207081	<b>T0-2-1/IVS</b> 031758	<b>T0-2-1/Z</b> 036504
<b>Changeover switches</b>						
 FS 621	1	<b>T0-1-8210/E</b> 012742	<b>T0-1-8210/EZ</b> 048337	<b>T0-1-8210/I1</b> 207076	<b>T0-1-8210/IVS</b> 074440	<b>T0-1-8210/Z</b> 019862
	2	<b>T0-2-8211/E</b> 022234	<b>T0-2-8211/EZ</b> 053083	<b>T0-2-8211/I1</b> 207102	<b>T0-2-8211/IVS</b> 076813	<b>T0-2-8211/Z</b> 029354
	3	<b>T0-3-8212/E</b> 029353	<b>T0-3-8212/EZ</b> 057829	<b>T0-3-8212/I1</b> 207123	<b>T0-3-8212/IVS</b> 079186	<b>T0-3-8212/Z</b> 036473
<b>Changeover switches without 0 position</b>						
 FS 943	1	<b>T0-1-8220/E</b> 031728	<b>T0-1-8220/EZ</b> 095799	<b>T0-1-8220/I1</b> 207078	<b>T0-1-8220/IVS</b> 055459	<b>T0-1-8220/Z</b> 086312
	2	<b>T0-2-8221/E</b> 038847	<b>T0-2-8221/EZ</b> 010372	<b>T0-2-8221/I1</b> 207104	<b>T0-2-8221/IVS</b> 057832	<b>T0-2-8221/Z</b> 074450
	3	<b>T0-3-8222/E</b> 048339	<b>T0-3-8222/EZ</b> 015118	<b>T0-3-8222/I1</b> 207124	<b>T0-3-8222/IVS</b> 060205	<b>T0-3-8222/Z</b> 088686
<b>Hand/Auto switches</b>						
 F 085	1	<b>T0-1-15431/E</b> 019872	<b>T0-1-15431/EZ</b> 022245	<b>T0-1-15431/I1</b> 207070	<b>T0-1-15431/IVS</b> 026991	<b>T0-1-15431/Z</b> 029364
	2	<b>T0-2-15432/E</b> 034110	<b>T0-2-15432/EZ</b> 036483	<b>T0-2-15432/I1</b> 207091	<b>T0-2-15432/IVS</b> 041229	<b>T0-2-15432/Z</b> 043602
	3	<b>T0-3-15433/E</b> 048348	<b>T0-3-15433/EZ</b> 050721	<b>T0-3-15433/I1</b> 207115	<b>T0-3-15433/IVS</b> 055467	<b>T0-3-15433/Z</b> 057840
<b>Ammeter selector switch</b>						
 FS 9440	3	<b>T0-3-8048/E</b> 034116	<b>T0-3-8048/EZ</b> 036489		<b>T0-3-8048/IVS</b> 041235	<b>T0-3-8048/Z</b> 043608
<b>Voltmeter selector switch</b>						
 FS 1410759	3	<b>T0-3-8007/E</b> 095813	<b>T0-3-8007/EZ</b> 098186	<b>T0-3-8007/I1</b> 207120	<b>T0-3-8007/IVS</b> 012759	<b>T0-3-8007/Z</b> 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)



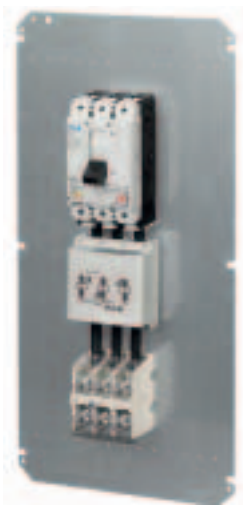


- 1 Metric cable entries push-through membrane or hard knockouts
- 2 Mounting systems for basic enclosures  
mounting rail or mounting plate
- 3 Mounting  
Horizontal and vertical slot apertures for wall mounting  
Captive cover screws  
Rubber feet to compensate for uneven walls  
for CI-K1 and CI-K2

	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

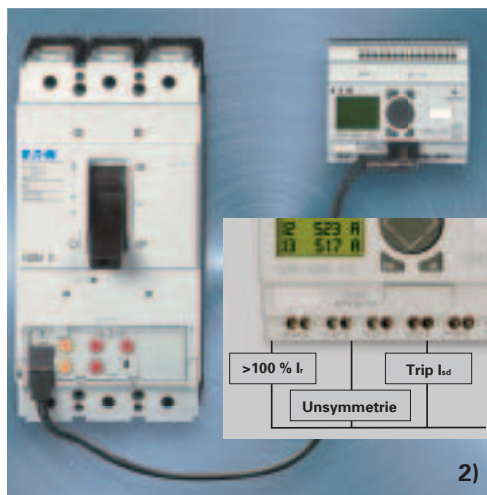


Circuit-breakers NZM and switch-disconnectors P from Eaton are used as the main switch in many machines. Circuit-breakers NZM guarantee additional reliable short-circuit and overload protection.

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.

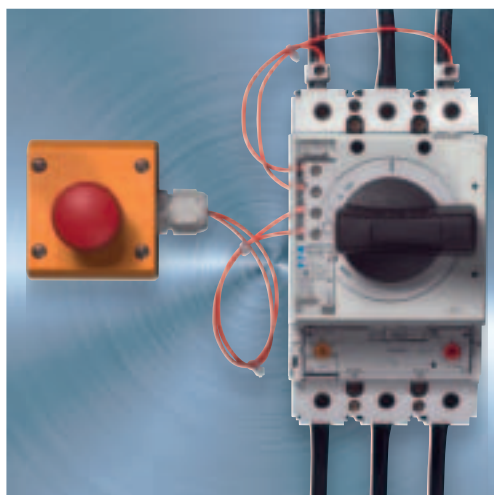
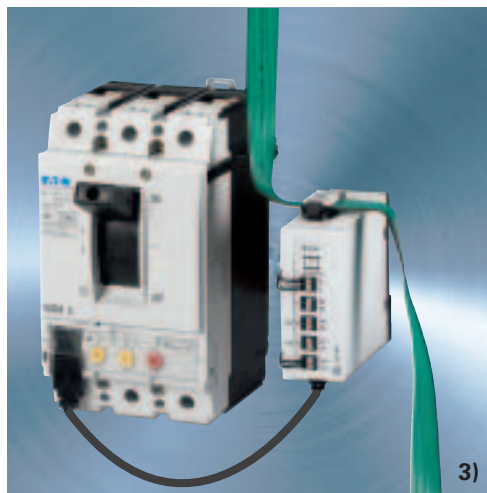
In addition to data recording with the metering and communication modules, the compact switch NZM offers 3 further communication options to further process this data. A PC software, used mainly for diagnostic purposes and 2 fieldbus interfaces with different available functions.



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

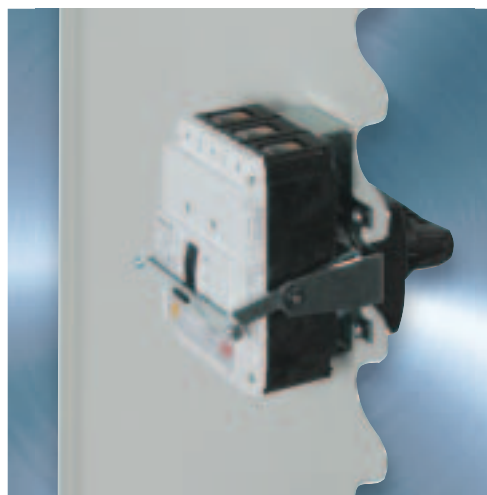
**2)**  
The DMI (Data Management Interface) provides comfortable access to the circuit-breaker. The functions include on-site operation via display, software switch parameterization and Profibus-DP communication.

**3)**  
With the SmartWire-DT 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-DT components such as the motor starter PKE.



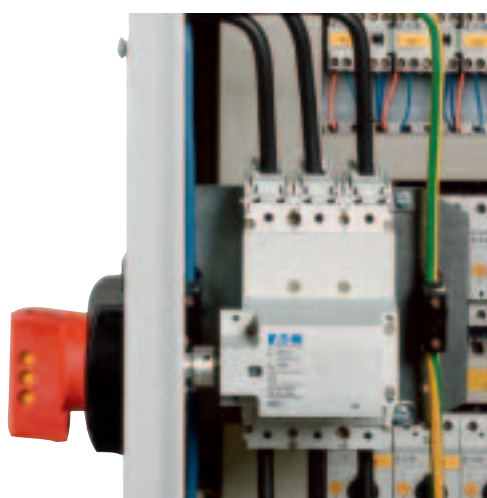
### Main switch application

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.



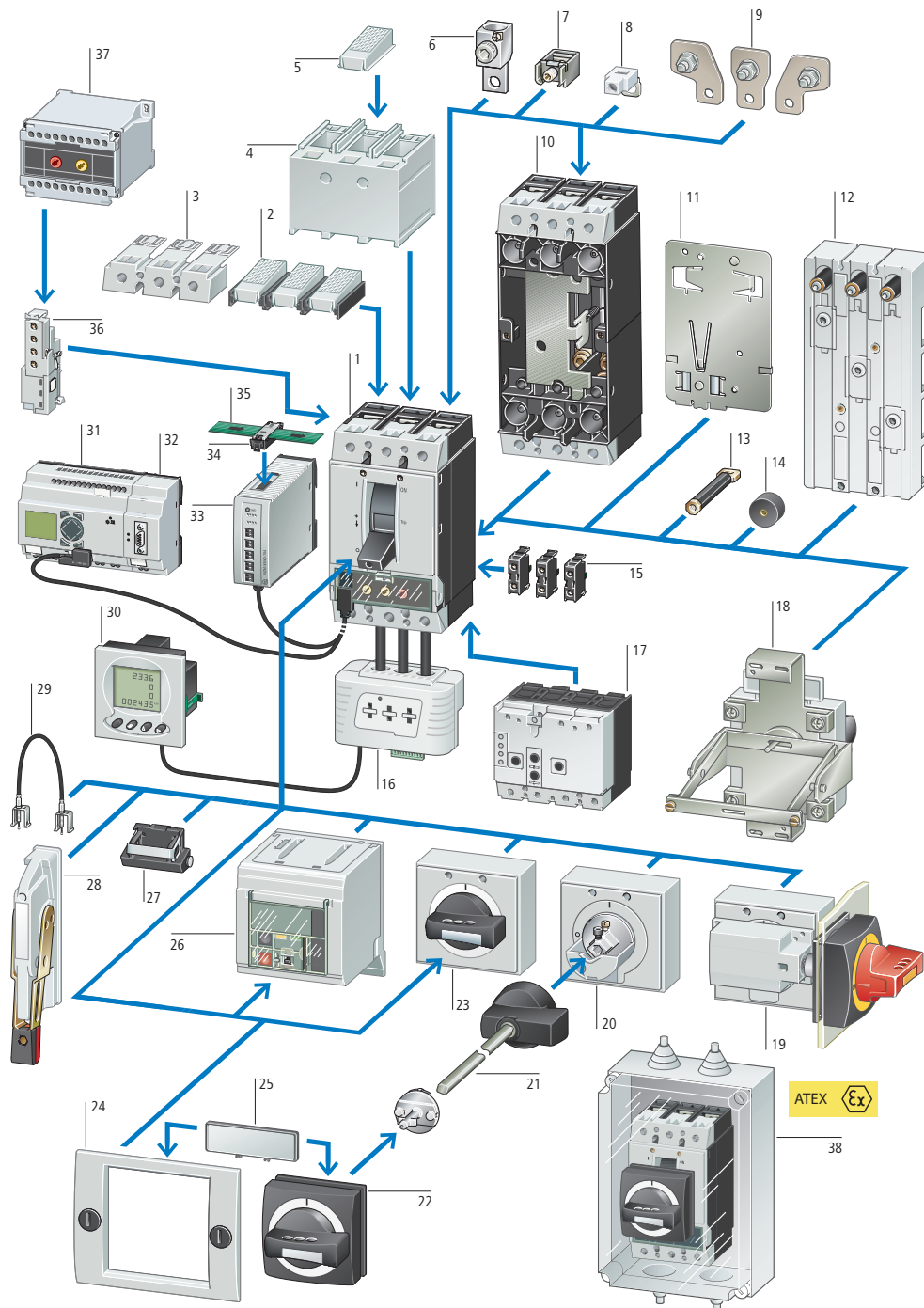
### Rear operator

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.



- |  |   |  |   |
|--|---|--|---|
| 1 Switch-disconnector; circuit-breaker; circuit-breaker for North America; Moulded case switches for North America | 9 Connection width extension  | 18 Rear drive  | 29 Mechanical interlock                       |
| 2 IP2X protection against contact with a finger  | 10 Plug-in and withdrawable unit  | 19 Main switch rotary handle for side panel mounting | 30 Display                                    |
| 3 Terminal cover, knockout   | 11 Adapter plate  | 20, 22 Door coupling rotary handle                   | 31 Data management interface (DMI module)     |
| 4 Terminal cover   | 12 Busbar adapters  | 21 Extension shaft                                   | 32 PROFIBUS-DP interface                      |
| 5 IP2X protection against contact with a finger  | 13 Connection on rear   | 23 Rotary handle                                     | 33- NZM communication module for SmartWire-DT |
| 6 Tunnel terminal  | 14 Spacers  | 24 Insulating surrounds                              | 36 Early-make auxiliary contacts              |
| 7 Box terminals  | 15 Standard auxiliary contact (HIV), trip-indicating auxiliary switch (HIA) | 25 External warning plate/ marking plate             | 37 Delay unit for undervoltage releases       |
| 8 Control circuit terminal   | 16 Measuring and communication module                                       | 26 Remote operator                                   | 38 Insulated enclosures                       |
|  | 17 Residual-current protection device                                       | 27 Toggle lever locking device                       |   |
|  |   | 28 Side operator handle                              |   |






					Switching capacity 400/415 V 50/60 Hz		Switching capacity 400/415 V 50/60 Hz	
Rated operational current = rated uninterrupted current $I_n = I_u$ A		Setting range			Part no.	Article no.	Part no.	Article no.
		Overload trip	Short-circuit releases					
		Overload trip	Non-delayed	Delayed				
		$I_r$ A	$I_i = I_n \times \dots$	$I_{sd} = I_r \times \dots$				
System and cable protection, thermomagnetic releases								
<b>Fixed mounting</b> with box terminal					<b>Basic switching capacity 25 kA</b>		<b>Normal switching capacity 50 kA</b>	
	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
<b>Fixed mounting</b> 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								
<b>Fixed mounting</b> with screw connection					<b>Normal switching capacity 50 kA</b>		<b>High switching capacity 150 kA</b>	
	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








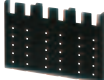



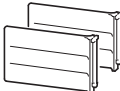




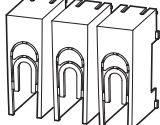
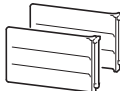
# NZM circuit-breakers, switch-disconnectors







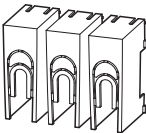
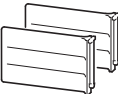



Circuit-breaker, switch-disconnector, 3-pole





Moeller® series





						Switching capacity 400/415 V 50/60 Hz		Switching capacity 400/415 V 50/60 Hz	
Rated operational current = rated uninterrupted current		Setting range		Rated operating power AC-3 50/60 Hz	Rated operational current AC-3 50/60 Hz	Part no.	Article no.	Part no.	Article no.
$I_n = I_u$		Overload Releases	Short-circuit releases Non-delayed	400 V P kW	400 V $I_e$ A				
A		A	$I_i = I_n \times \dots$						
<b>Motor protection, thermomagnetic release</b>									
• NZM...1-M...: with phase failure sensitivity, tripping class 10 A									
<b>Fixed mounting</b> with box terminal						<b>Basic switching capacity 25 kA</b>		<b>Normal switching capacity 50 kA</b>	
	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
<b>Fixed mounting</b> with screw connection									
	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
<b>Motor protection, electronic releases</b>									
with phase failure sensitivity, tripping class adjustable									
<b>Fixed mounting</b> with screw connection						<b>Normal switching capacity 50 kA</b>		<b>High switching capacity 150 kA</b>	
	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	Setting range		Switching capacity 480 V 60 Hz		Switching capacity 480 V 60 Hz	
				Part no.	Article no.	Part no.	Article no.
	$I_n = I_u$ A	Overload trip $I_r$ A	Short-circuit releases Non-delayed $I_i = I_n \times \dots$				
<b>System and cable protection, thermomagnetic releases</b> Adjustable overload release $I_r$							
<b>Fixed mounting</b> with box terminal				<b>Normal switching capacity</b> 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		
<b>Fixed mounting</b> with screw connection						<b>High switching capacity</b> 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
						<b>High switching capacity</b> 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
<b>Systems protection and cable protection, electronic releases</b> Adjustable overload release $I_r$ , r.m.s. value measurement and "thermal memory"							
<b>Fixed mounting</b> with screw connection				<b>Normal switching capacity</b> 42 kA		<b>High switching capacity</b> 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
<b>Moulded case switch for North America</b> With permanently set short-circuit release (self-protection) <b>3 switch positions I, +, 0</b> Can be remotely operated with voltage release XU/XA, remote operator XR, can be equipped with trip-indicating auxiliary switch M22-K..							
<b>Fixed mounting</b> with box terminal				<b>Switching capacity</b> 35 kA			
	63	-	1250 fixed	NS1-63-NA	102681		
	100	-	1250 fixed	NS1-100-NA	102682		
	125	-	1250 fixed	NS1-125-NA	102683		
<b>Fixed mounting</b> with screw connection				<b>Switching capacity</b> 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		









	For use with	Terminal capacity Connection	Terminal capacities mm <sup>2</sup>	Part no. suffix	Article no. for ordering with basic device	Part no.	Article no. when ordered separately
<b>NZM1 terminal types</b>							
Control circuit terminal							
	NZM1, N(S)1	Box terminal	1 x 0.75 - 2.5 2 x 0.75 - 1.5	-	-	<b>NZM-XSTK</b>	266739
Multi tunnel terminal							
	NZM1, N(S)1 ≤ 160 A	Cu cable	6 x 2.5 - 16	-	-	<b>NZM1-XKAM</b>	144112
Terminal cover knockout not UL/CSA approved For box terminal							
	NZM1, N1	-	-	-	-	<b>NZM1-XKSFA</b>	100780
Cover							
	NZM1, N(S)1	-	-	-	-	<b>NZM1-XKSA</b>	260021
IP2X protection against contact with finger							
For box terminal							
	NZM1, N1	-	-	-	-	<b>NZM1-XIPK</b>	266744
for cover NZM1-XKSA or NZM1...(C)NA, N(S)1...NA							
	NZM1, NS1	-	-	-	-	<b>NZM1-XIPA</b>	266748
Phase isolators							
	NZM1, N(S)1	-	-	-	-	<b>NZM1-XKP</b>	119862
<b>NZM2 terminal type</b>							
Box terminal							
	NZM2, N(S)2 ≤ 160 A	Cu cable	1 x 10 - 185 2 x 4 - 70	<b>+NZM2-160-XKCO</b>	262218	<b>NZM2-160-XKC</b>	262240
	NZM2, N(S)2 > 160 A			<b>+NZM2-160-XKCU</b>	262223	-	-
				<b>+NZM2-250-XKCO</b>	262242	<b>NZM2-250-XKC</b>	262244
				<b>+NZM2-250-XKCU</b>	262243	-	-
Multi tunnel terminal							
	NZM2, N(S)2 ≤ 250 A	Cu cable	6 x 2.5 - 35	-	-	<b>NZM2-XKAM</b>	144113
Control circuit terminal							
	NZM2, N(S)2	Screw connection	1 x 0.75 - 2.5 2 x 0.75 - 1.5	-	-	<b>NZM2-XSTS</b>	260156
	NZM2, N(S)2	Box terminal		-	-	<b>NZM-XSTK</b>	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	-	-	<b>NZM2-XKSAE</b>	119868
Phase isolators							
	NZM2, N(S)2	-	-	-	-	<b>NZM2-XKP</b>	119864

For use with		Terminal capacity		Part no. suffix	Article no. for ordering with basic device	Part no.	Article no. when ordered separately
		Connection	Terminal capacities mm²				
IP2X protection against contact with finger							
For box terminal							
	NZM2, N(S)2	-	-	-	-	NZM2-XIPK	266773
For cover NZM2-XKSA 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 terminals							
Box terminal							
	NZM3, N(S)3	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 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 <b>without</b> 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 N/O = normally open contact N/C = normally closed contact		Part no.	Article no. when ordered separately
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 -	- 1 N/C	M22-K10 M22-K01	216376 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 -	- 1 N/C	M22-K10 M22-K01	216376 216378

For use with		Rated control voltage U <sub>s</sub> 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 <sub>s</sub> . 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 380 V - 440 V 50/60 Hz 24 V DC	NZM1-XU208-240AC NZM1-XU380-440AC NZM1-XU24DC	259442 259444 259452
	-	NZM2, N(S)2 NZM3, N(S)3	208 V - 240 V 50/60 Hz 380 V - 440 V 50/60 Hz 24 V DC	NZM2/3-XU208-240AC NZM2/3-XU380-440AC NZM2/3-XU24DC	259499 259501 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 208 V - 250 V AC/DC	NZM1-XA24AC/DC NZM1-XA208-250AC/DC	259708 259726
	-	NZM2, N(S)2 NZM3, N(S)3	24 V AC/DC 208 V - 250 V AC/DC	NZM2/3-XA24AC/DC NZM2/3-XA208-250AC/DC	259754 259763

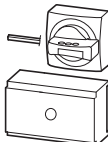













	For use with	Part no.	Article no. when ordered separately	Notes	
<b>Door coupling rotary handle</b> Complete including rotary drive and coupling parts An additional extension shaft is necessary with the NZM...-XT(V)D(V)(R)(-60) types. Protection type IP66/UL/CSA type 4X, 12					
Standard, black/grey					
	Lockable on the 0 position on the handle using up to 3 padlocks. With door interlock.	NZM1, N(S)1	<b>NZM1-XTVD</b> 260166	<b>Door interlock</b> <ul style="list-style-type: none"><li>• <b>Not</b> defeated in the locked OFF and ON positions</li><li>• Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position.</li><li>• Door can be opened in OFF NZM...-XTVD(V)</li><li>• External warning plate/markings plate can be clipped on.</li></ul>	
		NZM2, N(S)2	<b>NZM2-XTVD</b> 260168		
		NZM3, N(S)3	<b>NZM3-XTVD</b> 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	<b>NZM1-XTVDV</b> 260172		
		NZM2, N(S)2	<b>NZM2-XTVDV</b> 260174		
		NZM3, N(S)3	<b>NZM3-XTVDV</b> 260176		
Red-yellow for emergency switching off					
	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	<b>NZM1-XTVDVR</b> 260178	<b>Door interlock</b> <ul style="list-style-type: none"><li>• <b>Not</b> defeated in the locked OFF position.</li><li>• Can be modified such that it can be defeated from the outside using a screwdriver, when it is in the unlocked ON position.</li><li>• Door can be opened in OFF NZM...-XTVDVR</li><li>• External warning plate/markings plate can be clipped on.</li></ul>	
		NZM2, N(S)2	<b>NZM2-XTVDVR</b> 260180		
		NZM3, N(S)3	<b>NZM3-XTVDVR</b> 260182		
<b>Door coupling rotary handle for North America UL/CSA</b> 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					
	Lockable in 0 position on handle. With door interlock.	NZM1, N1	<b>NZM1-XTVD-NA</b> 271445		<b>Door interlock</b> <ul style="list-style-type: none"><li>• <b>Not</b> defeated in the locked OFF position.</li><li>• Door opening with active rotation beyond the 0 position.</li><li>• cannot be combined with mechanical interlock</li><li>• External warning plate/markings plate can be clipped on.</li></ul>
		NZM2, N2	<b>NZM2-XTVD-NA</b> 271446		
		NZM3, N3	<b>NZM3-XTVD-NA</b> 271447		
					
Red-yellow for emergency switching off					
	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	<b>NZM1-XTVDVR-NA</b> 271449	<b>Door interlock</b> <ul style="list-style-type: none"><li>• <b>Not</b> defeated in the locked OFF position.</li><li>• Door opening with active rotation beyond the 0 position.</li><li>• cannot be combined with mechanical interlock</li><li>• External warning plate/markings plate can be clipped on.</li></ul>	
		NZM2, N(S)2	<b>NZM2-XTVDVR-NA</b> 271450		
		NZM3, N(S)3	<b>NZM3-XTVDVR-NA</b> 271451		
					
<b>Extension shaft</b>					
	400 mm max. mounting depth	NZM1, N(S)1	<b>NZM1/2-XV4</b> 261232	Length 290 mm, can be cut to desired length.	
		NZM2, N(S)2			
		NZM3, N(S)3	<b>NZM3/4-XV4</b> 261234		
	600 mm max. mounting depth	NZM1, N(S)1	<b>NZM1/2-XV6</b> 260191	Length 425 mm, can be cut to desired length.	
		NZM2, N(S)2			
		NZM3, N(S)3	<b>NZM3/4-XV6</b> 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
<b>Main switch assembly kit for IEC, UL/CSA</b> Equipment supplied: <ul style="list-style-type: none"><li>• Door coupling rotary handle with rotary drive</li><li>• NZM...-XV4 extension shaft</li><li>• External warning plate/markings plate in German/English</li><li>• Black and yellow lightning symbol</li></ul> Protection type IP66/UL/CSA type 4X, 12			
With black door coupling rotary handle			
	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	<b>NZM1-XHB</b> 266626
		NZM2 N(S)2	<b>NZM2-XHB</b> 266627
		NZM3 N(S)3	<b>NZM3-XHB</b> 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			
	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	<b>NZM1-XHBR</b> 266632
		NZM2 N(S)2	<b>NZM2-XHBR</b> 266633
		NZM3 N(S)3	<b>NZM3-XHBR</b> 266634
<b>Main switch assembly kit with additional rotary handle for UL/CSA</b> Main switch assembly kit with additional rotary handle for switching with opened control panel door Equipment supplied: <ul style="list-style-type: none"><li>• Door coupling rotary handle with rotary drive</li><li>• Add-on rotary handle on switch with "Deliberate Action" operation</li><li>• Extension shaft NZM...-XV6 for mounting depth 600 mm, NZM1/2-XV4 with NZM1 for mounting depth 400 mm</li><li>• External warning plate/markings plate in German/English</li><li>• Black and yellow lightning symbol</li></ul> Protection type IP66/UL/CSA type 4X, 12			
With black door coupling rotary handle			
	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	<b>NZM1-XHB-DA-NA</b> 125958
		NZM2 N(S)2	<b>NZM2-XHB-DA-NA</b> 116897
		NZM3 N(S)3	<b>NZM3-XHB-DA-NA</b> 119000
with red door coupling rotary handle for use of switch as emergency switching off device			
	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	<b>NZM1-XHB-DAR-NA</b> 125959
		NZM2 N(S)2	<b>NZM2-XHB-DAR-NA</b> 116898
		NZM3 N(S)3	<b>NZM3-XHB-DAR-NA</b> 119001
<b>Remote operator</b> 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			
	Sliding switch for "Auto" or "Manual" Max. number auxiliary contacts: <ul style="list-style-type: none"><li>- Standard auxiliary contact: 2</li><li>- Trip-indicating auxiliary switch: 1</li></ul>	NZM2 N(S)2	208 - 240 V 50/60 Hz <b>NZM2-XRD208-240AC</b> 115391
			24 – 30 V DC <b>NZM2-XRD24-30DC</b> 115393
Closing delay 60 – 100 ms, break time 300 – 3000 ms Can be synchronized			
		NZM3 N(S)3	208 - 240 V 50/60 Hz <b>NZM3-XR208-240AC</b> 259850
			24 – 30 V DC <b>NZM3-XR24-30DC</b> 259854

Description	Part no. Article no.	Notes
<b>Diagnostics and configuration software for NZM and DMI (local)</b>		
PC software for direct connection to all NZM circuit-breakers with electronic releases (IEC and UL/CSA devices).	<b>NZM-XPC-KIT</b> 265631	Only for use in combination with circuit-breakers with <b>electronic</b> releases.
<b>Data management interface (DMI module)</b>		
 <ul style="list-style-type: none"> <li>Access to diagnostics and operational data.</li> <li>Recording of current values, motor starter function, set parameters.</li> <li>Control of the circuit-breakers with electronic trip block.</li> <li>Comprehensive remote diagnostic options and remote access via field bus in combination with a fieldbus connection.</li> </ul>	<b>NZM-XDMI612</b> 260217	Inclusive NZM-XDMI-CAB connection cable between NZM and DMI (length: 2 m). Only for use in combination with circuit-breakers with <b>electronic</b> releases.
<b>Field bus connection for DMI</b>		
 <ul style="list-style-type: none"> <li>Connection to the DMI module</li> <li>Transfer of phase currents, parameter data, status data and diagnostics data.</li> <li>Transfer of circuit-breaker position (wiring of auxiliary contacts to DMI inputs).</li> <li>Remote parameter definition</li> </ul>	<b>NZM-XDMI-DPV1</b> 270333	Connected to the DMI module and has the same contour appearance.
<b>NZM interface module for SmartWire-DT</b>		
 <ul style="list-style-type: none"> <li>The module implements the data connection between the NZM2/3/4 with electronic release and the SmartWire-DT.</li> <li>Transfer of phase currents, parameter data, status data and diagnostics data.</li> <li>Transfer of circuit-breaker position (wiring of auxiliary contacts to DMI inputs).</li> </ul>	<b>NZM-XSWD-704</b> 135530	A connection cable to the circuit-breaker is included as standard.
<b>Energy measuring module</b>		
 <ul style="list-style-type: none"> <li>For measuring the electrical active energy.</li> <li>one pulse output for active energy. The pulse rate is fixed.</li> </ul>	<b>NZM2-XMC-S0</b> 129839 <b>NZM3-XMC-S0</b> 129960	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or secondary side.
<b>Measuring and communication module</b>		
 <ul style="list-style-type: none"> <li>For measuring current, voltage, power and energy.</li> <li>Two SO pulse outputs</li> <li>Modbus interface (Slave)</li> <li>Display device NZM-XMC-DISP can be connected for local indication of the readings.</li> </ul>	<b>NZM2-XMC-MB-250</b> 156641 <b>NZM2-XMC-MB</b> 129961 <b>NZM3-XMC-MB</b> 129962	When mounting, observe the minimum clearances to circuit-breaker NZM. The module can be fitted on the input or secondary side.
<b>Digital display device</b>		
 <ul style="list-style-type: none"> <li>For door-mounting (connection to local display)</li> <li>For all measurement and communication modules with Modbus interface</li> <li>Permanent configured screens available</li> <li>Front cutout 92 x 92 break-out</li> </ul>	<b>NZM-XMC-DISP</b> 129967	A connection to the measuring and communication module NZM...XMC-MB is possible via an 4 conductor data cable (not included as standard).

				High switching capacity, 150 kA; 415 V 50/60 Hz	
Amount of poles	Rated current = rated uninterrupted current  $I_u$ (A)	Setting range		Part no.	Article no.
		Overload trip $I_r$ (A)	Short-circuit releases $I_i$ (A)		
				Screw connection	
Circuit-breakers with earth-fault release, 3-pole for apparatus with power electronics, such as power inverters and frequency inverters					
<div></div>					
AC/DC sensitive according to core-balance principle in range of 0 – 100 kHz residual-current frequency. Not UL/CSA approved. Rated operating voltage 400 V 50/60 Hz, rated fault current $I_{\Delta n}$ = 0.03 A Turnkey combination of current-limiting circuit-breaker and residual current device.					
	3-pole	125	100 - 125	750...1250	NZMH2-A125-FIA30 129710
		160	125 - 160	960...1600	NZMH2-A160-FIA30 112627
		200	160 - 200	1200...2000	NZMH2-A200-FIA30 112628
		250	200 - 250	1500...2500	NZMH2-A250-FIA30 112629



up to 25 kA  
to IEC / EN 60947-2

## Protection for All Applications – Safety up to 125 A



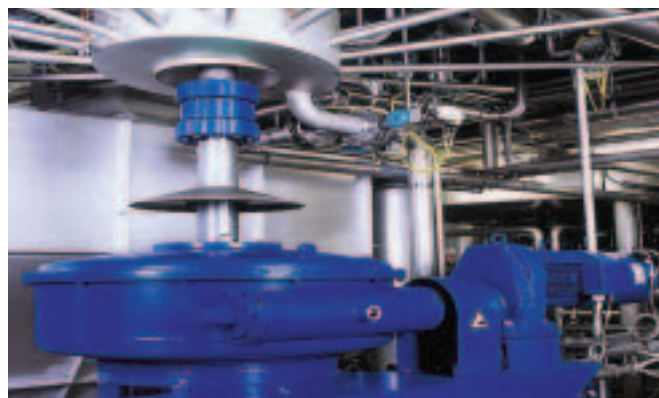
Industry, system builders and the trade sector worldwide place their trust in Eaton products and solutions. Tested quality, approvals and shipping register classifications vouch for the functional scope and reliability of xEffect industrial miniature circuit breakers being suitable for world markets. 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.



### 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 60947-2 switching capacity of 15 kA with FAZ and 15 to 25 kA with AZ and FAZT, as well as effective current limitation and selectivity provide optimum system protection and maximum availability.



### Powerful range for machine and system builders

The xEffect Industrial FAZ is available with B, C and D characteristic to IEC/EN 60898-1. 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  $3 \times I_n$  offers quick overload protection reaction for this purpose. The K characteristic with a high short-circuit response current of  $8$  to  $12 \times I_n$  prevents nuisance tripping during connection of three-phase loads.

The S characteristic with a limited response current of  $13$  to  $17 \times I_n$  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 signaling and alarms. All these devices are suitable for DIN-rail mounting and offer tangible installation and wiring benefits for industrial applications.



### Lightning and surge protection

The lightning and surge protective device SPB-12/280 is a combined lightning and surge arrester (arrester class B+C) in just one space unit. The world's first complies with required lightning surge currents of protection classes III and IV of the IEC 62305 and thus achieves the required minimum lightning surge current of 12.5 kA per protected circuit specified in standard IEC 60364-5-53. The transient voltage surge suppression is achieved with a nominal impulse discharge current of 25 kA that greatly exceeds the minimum requirement of 5 kA per protected circuit.



### 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.





## Digital residual-current protection designed to keep your equipment running

Whether using three-pole or four-pole standards, Eaton's new digital residual current devices are powerful multifunctional „bodyguards“ designed to ensure safety in distributed environments and work with a wide variety of machines and systems. They are as intelligent as they are vigilant, and will prevent even the smallest fault current from passing. Moreover, these digital guardians will immediately indicate any inconsistencies. This advance warning function is designed to enable operators to intervene and ensure that operations keep running smoothly. If there really is any danger, the digital residual current device will trip with utmost precision – much more accurately, in fact, than conventional analog circuit-breakers. This high-precision tripping behavior keeps accidental tripping to a minimum and will improve the continuity of your operations.



## Light and sound warnings

Digital circuit-breakers use a potential-free switching contact to communicate with their surroundings. This means that it will not be necessary to run all the way to the distribution board to figure out what the system's status is, as an automatic advance warning can be issued when  $I_{\Delta} > 0,3 \times I_{\Delta n}$ , for example. These warning signals can be implemented in any number of ways, going from simply lighting up external lamps and/or activating buzzers to using an Xcomfort connection, including receiving SMS messages on a cell phone – in short, anything is possible.

## Continuous electrical system monitoring

An LED traffic light indicator on the device makes it possible to immediately determine the system's status locally.

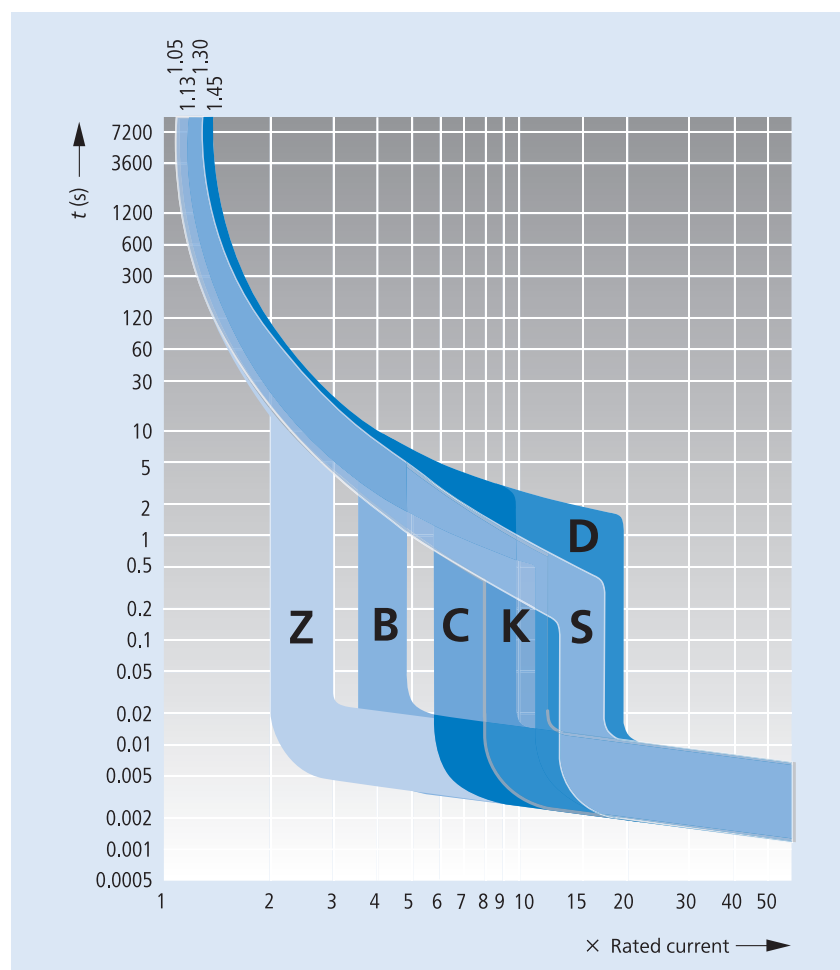
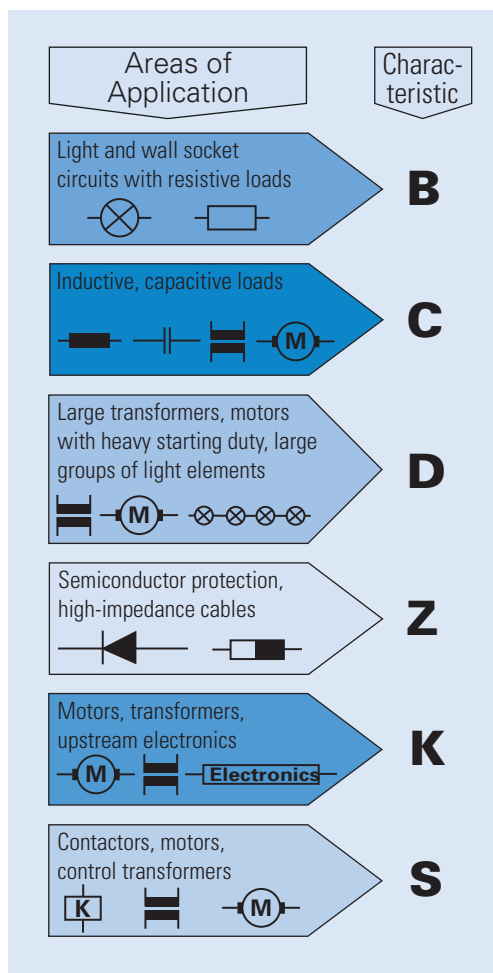
- Green = Normal range
- Yellow = The leakage current or fault current is 30–50% of  $I_{\Delta n}$
- Red = The leakage current or fault current is > 50% of  $I_{\Delta n}$ .

The device will trip very closely to the 100% value.



## Combine convenience with efficiency and safety

The device's test button only has to be pressed once a year. In addition, an integrated overload functionality makes it possible to eliminate the need for a thermal back-up fuse for the residual current device, while an integrated short time delay (type G) ensures that it will not trip in response to short transient overvoltages (e.g., caused by a lightning strike). The upper and lower ring tongue/spring clamp double terminals provide added convenience, matched by the added safety provided by the accessories for the device. Both the integrated red/green position indicator and the white/blue tripped current indicator provide all the necessary information right on the unit. Finally, a wide range of accessories, such as the Z-HK, can be retrofitted, and the fact that the device can be sealed provides even greater levels of safety.



Tripping characteristics of the xEffect Industrial FAZ miniature circuit-breaker

The versatile, individual tripping characteristics offer cable protection, individual device protection and protection in the control circuit.

The high levels of rated switching capacity from 10 to 25 kA, as well as effective current limitation and selectivity ensure optimum system protection and availability.

The B characteristic is utilised in the protection of light and wall socket circuits.

The C characteristic is utilised wherever operational current peaks and other surges occur that must not lead to tripping.

For large transformers, motors with heavy starting duty or extensive groups of light elements, the D characteristic is the correct solution.

The characteristics are available on single- and multi-pole component versions in all the ratings up to 63 A.

### Enhanced cable protection at high operational continuity

The K characteristic trips out at short circuits of 8 to 12 times rated current and is utilised wherever operational current peaks and other current surges can occur, but must not cause tripping.

Thus it lies in the upper reach of the C and in the lower reach of the D characteristic. This allows motors, capacitors, welding transformers and electronically controlled upstream devices to be connected in the optimum way. The K characteristic from Eaton offers enhanced cable protection due to its narrower bimetal tripping range for overload protection.

### Safety for control circuits

The control circuit protective switch with S characteristic is designed for the protection of control circuits with high inrush currents. At  $13$  to  $17 \times I_n$ , the magnitude of the short-circuit current here lies in a limited band of the D characteristic above the starting peak of the typical control transformer. Thus, unintentional tripping is prevented by the S characteristic device, which is tested to IEC/EN60947-2. Compliant with this Standard, the control circuit protective switch only permits an overload of between 5 and 30%.

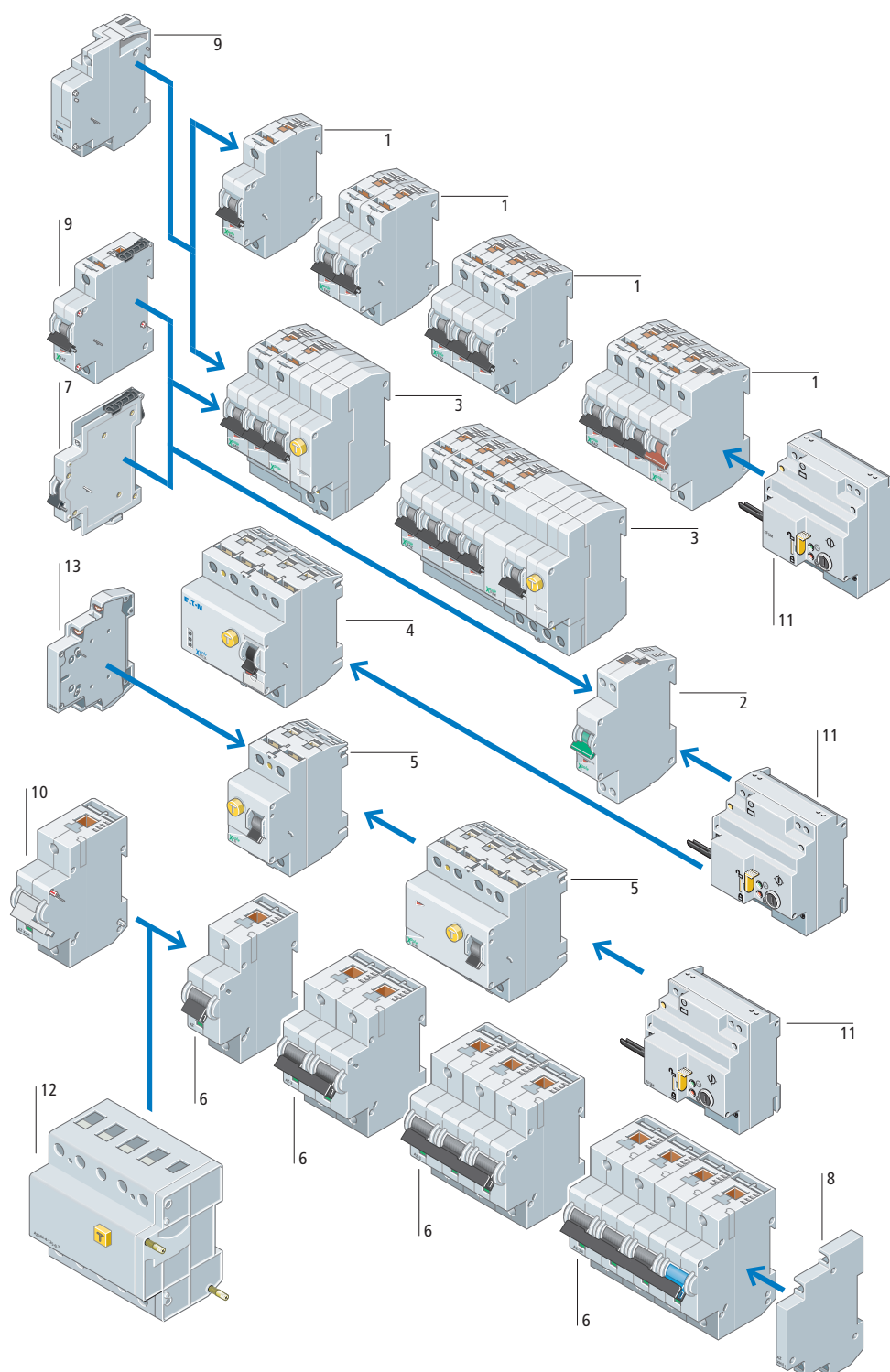
### Rapid-response protection for electronics

Electronic components and devices can be destroyed by even small current surges. The protective switches xEffect Industrial FAZ with Z characteristic trip out instantly even at surges of 2 to 3 times rated current. This property also renders these protective circuit-breakers suitable for the protection of high-impedance cables.

# Miniature circuit-breaker, residual current device

System overview

Moeller® series



- |   |  |    |   |
|---|--|----|---|
| 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                                  |

Also available as  
1N-, 3N- and 4-pole  
versions.



Rated current $I_n$ A	Switching capacity (IEC/EN 60947-2) kA	1 pole		2 pole		3 pole	
		Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
<b>FAZ miniature circuit-breakers</b>							
Characteristic B Instantaneous release response current 3 - 5 x $I_n$ Switching capacity 15 kA (IEC/EN 60947-2)							
1	15	FAZ-B1/1	278520	FAZ-B1/2	278719	FAZ-B1/3	278832
1.5	15	FAZ-B1,5/1	278521	FAZ-B1,5/2	278720	FAZ-B1,5/3	278833
1.6	15	FAZ-B1,6/1	278522	FAZ-B1,6/2	278721	FAZ-B1,6/3	278834
2	15	FAZ-B2/1	278523	FAZ-B2/2	278722	FAZ-B2/3	278835
2.5	15	FAZ-B2,5/1	278524	FAZ-B2,5/2	278723	FAZ-B2,5/3	278836
3	15	FAZ-B3/1	278525	FAZ-B3/2	278724	FAZ-B3/3	278837
3.5	15	FAZ-B3,5/1	278526	FAZ-B3,5/2	278725	FAZ-B3,5/3	278838
4	15	FAZ-B4/1	278527	FAZ-B4/2	278726	FAZ-B4/3	278839
5	15	FAZ-B5/1	278528	FAZ-B5/2	278727	FAZ-B5/3	278840
6	15	FAZ-B6/1	278529	FAZ-B6/2	278728	FAZ-B6/3	278841
8	15	FAZ-B8/1	278530	FAZ-B8/2	278729	FAZ-B8/3	278842
10	15	FAZ-B10/1	278531	FAZ-B10/2	278730	FAZ-B10/3	278843
12	15	FAZ-B12/1	278532	FAZ-B12/2	278731	FAZ-B12/3	278844
13	15	FAZ-B13/1	278533	FAZ-B13/2	278732	FAZ-B13/3	278845
15	15	FAZ-B15/1	278534	FAZ-B15/2	278733	FAZ-B15/3	278846
16	15	FAZ-B16/1	278535	FAZ-B16/2	278734	FAZ-B16/3	278847
20	15	FAZ-B20/1	278536	FAZ-B20/2	278735	FAZ-B20/3	278848
25	15	FAZ-B25/1	278537	FAZ-B25/2	278736	FAZ-B25/3	278849
32	15	FAZ-B32/1	278538	FAZ-B32/2	278737	FAZ-B32/3	278850
40	15	FAZ-B40/1	278539	FAZ-B40/2	278738	FAZ-B40/3	278851
50	15	FAZ-B50/1	278540	FAZ-B50/2	278739	FAZ-B50/3	278852
63	15	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)							
0.16	15	FAZ-C0,16/1	278542	FAZ-C0,16/2	278741	FAZ-C0,16/3	278854
0.25	15	FAZ-C0,25/1	278543	FAZ-C0,25/2	278742	FAZ-C0,25/3	278855
0.5	15	FAZ-C0,5/1	278544	FAZ-C0,5/2	278743	FAZ-C0,5/3	278856
0.75	15	FAZ-C0,75/1	278545	FAZ-C0,75/2	278744	FAZ-C0,75/3	278857
1	15	FAZ-C1/1	278546	FAZ-C1/2	278745	FAZ-C1/3	278858
1.5	15	FAZ-C1,5/1	278547	FAZ-C1,5/2	278746	FAZ-C1,5/3	278859
1.6	15	FAZ-C1,6/1	278548	FAZ-C1,6/2	278747	FAZ-C1,6/3	278860
2	15	FAZ-C2/1	278549	FAZ-C2/2	278748	FAZ-C2/3	278861
2.5	15	FAZ-C2,5/1	278550	FAZ-C2,5/2	278749	FAZ-C2,5/3	278862
3	15	FAZ-C3/1	278551	FAZ-C3/2	278750	FAZ-C3/3	278863
3.5	15	FAZ-C3,5/1	278552	FAZ-C3,5/2	278751	FAZ-C3,5/3	278864
4	15	FAZ-C4/1	278553	FAZ-C4/2	278752	FAZ-C4/3	278865
5	15	FAZ-C5/1	278554	FAZ-C5/2	278753	FAZ-C5/3	278866
6	15	FAZ-C6/1	278555	FAZ-C6/2	278754	FAZ-C6/3	278867
8	15	FAZ-C8/1	278556	FAZ-C8/2	278755	FAZ-C8/3	278868
10	15	FAZ-C10/1	278557	FAZ-C10/2	278756	FAZ-C10/3	278869
12	15	FAZ-C12/1	278558	FAZ-C12/2	278757	FAZ-C12/3	278870
13	15	FAZ-C13/1	278559	FAZ-C13/2	278758	FAZ-C13/3	278871
15	15	FAZ-C15/1	278560	FAZ-C15/2	278759	FAZ-C15/3	278872
16	15	FAZ-C16/1	278561	FAZ-C16/2	278760	FAZ-C16/3	278873
20	15	FAZ-C20/1	278562	FAZ-C20/2	278761	FAZ-C20/3	278874
25	15	FAZ-C25/1	278563	FAZ-C25/2	278762	FAZ-C25/3	278875
32	15	FAZ-C32/1	278564	FAZ-C32/2	278763	FAZ-C32/3	278876
40	15	FAZ-C40/1	278565	FAZ-C40/2	278764	FAZ-C40/3	278877

Also available as  
1N-, 3N- and 4-pole  
versions.















Rated current		Switching capacity (IEC/EN 60947-2)		1 pole		2 pole		3 pole	
$I_n$				Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
A		kA							
50		15		FAZ-C50/1	278566	FAZ-C50/2	278765	FAZ-C50/3	278878
63		15		FAZ-C63/1	278567	FAZ-C63/2	278766	FAZ-C63/3	278879
<b>FAZ miniature circuit-breakers</b>									
Characteristic D		Instantaneous release response current							
		10 - 20 x $I_n$							
0.5		15		FAZ-D0,5/1	278568	FAZ-D0,5/2	278767	FAZ-D0,5/3	278880
1		15		FAZ-D1/1	278569	FAZ-D1/2	278768	FAZ-D1/3	278881
1.5		15		FAZ-D1,5/1	278570	FAZ-D1,5/2	278769	FAZ-D1,5/3	278882
1.6		15		FAZ-D1,6/1	278571	FAZ-D1,6/2	278770	FAZ-D1,6/3	278883
2		15		FAZ-D2/1	278572	FAZ-D2/2	278771	FAZ-D2/3	278884
2.5		15		FAZ-D2,5/1	278573	FAZ-D2,5/2	278772	FAZ-D2,5/3	278885
3		15		FAZ-D3/1	278574	FAZ-D3/2	278773	FAZ-D3/3	278886
3.5		15		FAZ-D3,5/1	278575	FAZ-D3,5/2	278774	FAZ-D3,5/3	278887
4		15		FAZ-D4/1	278576	FAZ-D4/2	278775	FAZ-D4/3	278888
5		15		FAZ-D5/1	278577	FAZ-D5/2	278776	FAZ-D5/3	278889
6		15		FAZ-D6/1	278578	FAZ-D6/2	278777	FAZ-D6/3	278890
8		15		FAZ-D8/1	278579	FAZ-D8/2	278778	FAZ-D8/3	278891
10		15		FAZ-D10/1	278580	FAZ-D10/2	278779	FAZ-D10/3	278892
12		15		FAZ-D12/1	278581	FAZ-D12/2	278780	FAZ-D12/3	278893
13		15		FAZ-D13/1	278582	FAZ-D13/2	278781	FAZ-D13/3	278894
15		15		FAZ-D15/1	278583	FAZ-D15/2	278782	FAZ-D15/3	278895
16		15		FAZ-D16/1	278584	FAZ-D16/2	278783	FAZ-D16/3	278896
20		15		FAZ-D20/1	278585	FAZ-D20/2	278784	FAZ-D20/3	278897
25		15		FAZ-D25/1	278586	FAZ-D25/2	278785	FAZ-D25/3	278898
32		15		FAZ-D32/1	278587	FAZ-D32/2	278786	FAZ-D32/3	278899
40		15		FAZ-D40/1	278588	FAZ-D40/2	278787	FAZ-D40/3	278900
50		10		FAZ-D50/1	115370	FAZ-D50/2	115372	FAZ-D50/3	115374
63		10		FAZ-D63/1	115371	FAZ-D63/2	115373	FAZ-D63/3	115375
Characteristic K		Instantaneous release response current							
		8 - 12 x $I_n$							
		Switching capacity 15 kA (IEC/EN 60947-2)							
0.5		15		FAZ-K0,5/1	278589	FAZ-K0,5/2	278788	FAZ-K0,5/3	278901
1		15		FAZ-K1/1	278590	FAZ-K1/2	278789	FAZ-K1/3	278902
1.6		15		FAZ-K1,6/1	278591	FAZ-K1,6/2	278790	FAZ-K1,6/3	278903
2		15		FAZ-K2/1	278592	FAZ-K2/2	278791	FAZ-K2/3	278904
3		15		FAZ-K3/1	278593	FAZ-K3/2	278792	FAZ-K3/3	278905
4		15		FAZ-K4/1	278594	FAZ-K4/2	278793	FAZ-K4/3	278906
6		15		FAZ-K6/1	278595	FAZ-K6/2	278794	FAZ-K6/3	278907
8		15		FAZ-K8/1	278596	FAZ-K8/2	278795	FAZ-K8/3	278908
10		15		FAZ-K10/1	278597	FAZ-K10/2	278796	FAZ-K10/3	278909
13		15		FAZ-K13/1	278598	FAZ-K13/2	278797	FAZ-K13/3	278910
16		15		FAZ-K16/1	278599	FAZ-K16/2	278798	FAZ-K16/3	278911
20		15		FAZ-K20/1	278600	FAZ-K20/2	278799	FAZ-K20/3	278912
25		15		FAZ-K25/1	278601	FAZ-K25/2	278800	FAZ-K25/3	278913
32		15		FAZ-K32/1	278602	FAZ-K32/2	278801	FAZ-K32/3	278914
40		15		FAZ-K40/1	278603	FAZ-K40/2	278802	FAZ-K40/3	278915
50		15		FAZ-K50/1	278604	FAZ-K50/2	278803	FAZ-K50/3	278916
63		15		FAZ-K63/1	278605	FAZ-K63/2	278804	FAZ-K63/3	278917



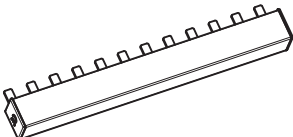


Rated current $I_n$ A	Switching capacity (IEC/EN 60947-2) kA	1 pole		2 pole		3 pole	
		Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
<b>FAZ miniature circuit-breakers</b>							
Characteristic N/O Instantaneous release response current 13 - 17 x $I_n$ Switching Capacity 10 kA (IEC/EN 60947-2)							
1	10	FAZ-S1/1	278606	FAZ-S1/2	278805	-	-
2	10	FAZ-S2/1	278607	FAZ-S2/2	278806	-	-
3	10	FAZ-S3/1	278608	FAZ-S3/2	278807	-	-
4	10	FAZ-S4/1	278609	FAZ-S4/2	278808	-	-
6	10	FAZ-S6/1	278610	FAZ-S6/2	278809	-	-
10	10	FAZ-S10/1	278611	FAZ-S10/2	278810	-	-
16	10	FAZ-S16/1	278612	FAZ-S16/2	278811	-	-
20	10	FAZ-S20/1	278613	FAZ-S20/2	278812	-	-
25	10	FAZ-S25/1	278614	FAZ-S25/2	278813	-	-
32	10	FAZ-S32/1	278615	FAZ-S32/2	278814	-	-
40	10	FAZ-S40/1	278616	FAZ-S40/2	278815	-	-
Characteristic Z Instantaneous release response current 2 - 3 x $I_n$ Switching capacity 15 kA (IEC/EN 60947-2) Also available as 4-pole version.							
0.5	15	FAZ-Z0,5/1	278617	FAZ-Z0,5/2	278816	FAZ-Z0,5/3	278918
1	15	FAZ-Z1/1	278618	FAZ-Z1/2	278817	FAZ-Z1/3	278919
1.6	15	FAZ-Z1,6/1	278619	FAZ-Z1,6/2	278818	FAZ-Z1,6/3	278920
2	15	FAZ-Z2/1	278620	FAZ-Z2/2	278819	FAZ-Z2/3	278921
3	15	FAZ-Z3/1	278621	FAZ-Z3/2	278820	FAZ-Z3/3	278922
4	15	FAZ-Z4/1	278622	FAZ-Z4/2	278821	FAZ-Z4/3	278923
6	15	FAZ-Z6/1	278623	FAZ-Z6/2	278822	FAZ-Z6/3	278924
8	15	FAZ-Z8/1	278624	FAZ-Z8/2	278823	FAZ-Z8/3	278925
10	15	FAZ-Z10/1	278625	FAZ-Z10/2	278824	FAZ-Z10/3	278926
16	15	FAZ-Z16/1	278626	FAZ-Z16/2	278825	FAZ-Z16/3	278927
20	15	FAZ-Z20/1	278627	FAZ-Z20/2	278826	FAZ-Z20/3	278928
25	15	FAZ-Z25/1	278628	FAZ-Z25/2	278827	FAZ-Z25/3	278929
32	15	FAZ-Z32/1	278629	FAZ-Z32/2	278828	FAZ-Z32/3	278930
40	15	FAZ-Z40/1	278630	FAZ-Z40/2	278829	FAZ-Z40/3	278931
50	15	FAZ-Z50/1	278631	FAZ-Z50/2	278830	FAZ-Z50/3	278932
63	15	FAZ-Z63/1	278632	FAZ-Z63/2	278831	FAZ-Z63/3	278933
<b>Miniature circuit-breakers for DC application</b>							
Characteristic C Instantaneous release response current 5 - 10 x $I_n$ Switching capacity 10 kA (IEC/EN 60947-2) (L/R = 4 ms) Rated operating voltage 250 V DC per pole							
2	10	FAZ-C2/1-DC	279122	FAZ-C2/2-DC	279134	-	-
3	10	FAZ-C3/1-DC	279123	FAZ-C3/2-DC	279135	-	-
4	10	FAZ-C4/1-DC	279124	FAZ-C4/2-DC	279136	-	-
6	10	FAZ-C6/1-DC	279125	FAZ-C6/2-DC	279137	-	-
10	10	FAZ-C10/1-DC	279126	FAZ-C10/2-DC	279138	-	-
13	10	FAZ-C13/1-DC	279127	FAZ-C13/2-DC	279139	-	-
16	10	FAZ-C16/1-DC	279128	FAZ-C16/2-DC	279140	-	-
20	10	FAZ-C20/1-DC	279129	FAZ-C20/2-DC	279141	-	-
25	10	FAZ-C25/1-DC	279130	FAZ-C25/2-DC	279142	-	-
32	10	FAZ-C32/1-DC	279131	FAZ-C32/2-DC	279143	-	-
40	10	FAZ-C40/1-DC	279132	FAZ-C40/2-DC	279144	-	-
50	10	FAZ-C50/1-DC	279133	FAZ-C50/2-DC	279145	-	-

		Contacts Number	Contact sequence	Space units 1 SU = 18 mm SU	Part no.	Article no.
<b>Auxiliary contacts and voltage releases</b>						
Auxiliary contacts for FAZ, AZ, PKNM						
	Up to 63 A	1 N/O/1 N/C		0.5	<b>FAZ-XHIN11</b>	286054
Trip-indicating auxiliary contact/auxiliary contact for FAZ, PKNM <sup>1)</sup>						
	Up to 63 A	2 C/O		0.5	<b>FAZ-XAM002</b>	262414
Shunt releases for FAZ, PKNM, AZ						
	Up to 63 A	-		1	<b>FAZ-XAA-C-12-110VAC</b>	278518
	Up to 63 A	-		1	<b>FAZ-XAA-C-110-415VAC</b>	278519
Undervoltage releases for FAZ						
	-	-		1	<b>FAZ-XUA(115VAC)</b>	212049
	-	-		1	<b>FAZ-XUA(230VAC)</b>	212051
	-	-		1	<b>FAZ-XUA(400VAC)</b>	212053
MCB lock for FAZ/FIP						
	-	-	-	-	<b>IS/SPE-1TE</b>	101911

### Instructions

<sup>1)</sup> The device is supplied with the groove in the yellow selector button in the horizontal: Changeover contact 4.11 – 4.12/4.14 switches when tripped manually or electrically. Turning the yellow selector button by 90° results in contact 4.11 – 4.12/4.14 responding only to electrical tripping: the contact 4.11 – 4.12/4.14 remains closed when tripped by hand.

	Phases Number	Cross-section mm <sup>2</sup>	Part no.	Article no.
<b>Accessories FAZ-...</b>				
Busbars BB-UL				
	1	25	<b>BB-UL-18/1P-1M/57</b>	121981
	2	25	<b>BB-UL-18/2P-2M/56</b>	121982
	3	25	<b>BB-UL-18/3P-3M/57</b>	121983
	1	25	<b>BB-UL-25/1P-1M/57</b>	121989
	2	25	<b>BB-UL-25/2P-2M/56</b>	121990
	3	25	<b>BB-UL-25/3P-3M/57</b>	121991

Also available as  
1N-, 3N- and 4-pole  
versions.



Rated current  I <sub>n</sub> A	Switching capacity (IEC/EN 60947-2)  kA	1 pole		2 pole		3 pole	
		Part no.	Article no.	Part no.	Article no.	Part no.	Article no.
FAZT miniature circuit-breakers							
Characteristic B							
1	25	FAZT-B1/1	240770	FAZT-B1/2	240820	FAZT-B1/3	240874
2	25	FAZT-B2/1	240771	FAZT-B2/2	240821	FAZT-B2/3	240875
3	25	FAZT-B3/1	240772	FAZT-B3/2	240822	FAZT-B3/3	240876
4	25	FAZT-B4/1	240777	FAZT-B4/2	240823	FAZT-B4/3	240877
6	25	FAZT-B6/1	240782	FAZT-B6/2	240824	FAZT-B6/3	240878
10	25	FAZT-B10/1	240787	FAZT-B10/2	240825	FAZT-B10/3	240879
12	25	FAZT-B12/1	240792	FAZT-B12/2	240826	FAZT-B12/3	240880
13	25	FAZT-B13/1	240793	FAZT-B13/2	240827	FAZT-B13/3	240881
15	25	FAZT-B15/1	240794	FAZT-B15/2	240828	FAZT-B15/3	240882
16	25	FAZT-B16/1	240795	FAZT-B16/2	240829	FAZT-B16/3	240883
20	25	FAZT-B20/1	240796	FAZT-B20/2	240830	FAZT-B20/3	240884
25	25	FAZT-B25/1	240797	FAZT-B25/2	240831	FAZT-B25/3	240885
32	20	FAZT-B32/1	141907	FAZT-B32/2	142485	FAZT-B32/3	142493
40	20	FAZT-B40/1	141908	FAZT-B40/2	142486	FAZT-B40/3	142494
Characteristic C							
1	25	FAZT-C1/1	240798	FAZT-C1/2	240832	FAZT-C1/3	240886
2	25	FAZT-C2/1	240799	FAZT-C2/2	240833	FAZT-C2/3	240887
3	25	FAZT-C3/1	240800	FAZT-C3/2	240838	FAZT-C3/3	240888
4	25	FAZT-C4/1	240801	FAZT-C4/2	240843	FAZT-C4/3	240889
6	25	FAZT-C6/1	240802	FAZT-C6/2	240850	FAZT-C6/3	240890
10	25	FAZT-C10/1	240803	FAZT-C10/2	240855	FAZT-C10/3	240891
12	25	FAZT-C12/1	240804	FAZT-C12/2	240858	FAZT-C12/3	240892
13	25	FAZT-C13/1	240805	FAZT-C13/2	240859	FAZT-C13/3	240893
15	25	FAZT-C15/1	240806	FAZT-C15/2	240860	FAZT-C15/3	240894
16	25	FAZT-C16/1	240807	FAZT-C16/2	240861	FAZT-C16/3	240895
20	25	FAZT-C20/1	240808	FAZT-C20/2	240862	FAZT-C20/3	240896
25	25	FAZT-C25/1	240809	FAZT-C25/2	240863	FAZT-C25/3	240897
32	20	FAZT-C32/1	141909	FAZT-C32/2	142487	FAZT-C32/3	142495
40	20	FAZT-C40/1	142480	FAZT-C40/2	142488	FAZT-C40/3	142496
Characteristic D							
1	25	FAZT-D1/1	240810	FAZT-D1/2	240864	FAZT-D1/3	240898
2	25	FAZT-D2/1	240811	FAZT-D2/2	240865	FAZT-D2/3	240899
3	25	FAZT-D3/1	240812	FAZT-D3/2	240866	FAZT-D3/3	240900
4	25	FAZT-D4/1	240813	FAZT-D4/2	240867	FAZT-D4/3	240901
6	25	FAZT-D6/1	240814	FAZT-D6/2	240868	FAZT-D6/3	240902
10	25	FAZT-D10/1	240815	FAZT-D10/2	240869	FAZT-D10/3	240903
12	25	FAZT-D12/1	240816	FAZT-D12/2	240870	FAZT-D12/3	240904
13	25	FAZT-D13/1	240817	FAZT-D13/2	240871	FAZT-D13/3	240905
15	20	FAZT-D15/1	240818	FAZT-D15/2	240872	FAZT-D15/3	240910
16	20	FAZT-D16/1	240819	FAZT-D16/2	240873	FAZT-D16/3	240915
20	20	FAZT-D20/1	142481	FAZT-D20/2	142489	FAZT-D20/3	142497
25	15	FAZT-D25/1	142482	FAZT-D25/2	142490	FAZT-D25/3	142498
32	15	FAZT-D32/1	142483	FAZT-D32/2	142491	FAZT-D32/3	142499
40	15	FAZT-D40/1	142484	FAZT-D40/2	142492	FAZT-D40/3	142500


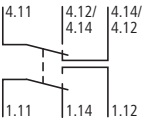



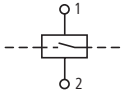






Rated current $I_n$ A	Interrupting Capacity (SCCR) kA	1 pole Part no.	Article no.	2 pole Part no.	Article no.	3 pole Part no.	Article no.
<b>Miniature circuit-breakers for North America</b>							
Characteristic B Switching capacity 15 kA IEC							
1	10	FAZ-B1/1-NA	132414	FAZ-B1/2-NA	132693	FAZ-B1/3-NA	132712
1.5	10	FAZ-B1,5/1-NA	132415	FAZ-B1,5/2-NA	132694	FAZ-B1,5/3-NA	132713
2	10	FAZ-B2/1-NA	132416	FAZ-B2/2-NA	132695	FAZ-B2/3-NA	132714
3	10	FAZ-B3/1-NA	132417	FAZ-B3/2-NA	132696	FAZ-B3/3-NA	132715
4	10	FAZ-B4/1-NA	132418	FAZ-B4/2-NA	132697	FAZ-B4/3-NA	132716
5	10	FAZ-B5/1-NA	132419	FAZ-B5/2-NA	132698	FAZ-B5/3-NA	132717
6	10	FAZ-B6/1-NA	132680	FAZ-B6/2-NA	132699	FAZ-B6/3-NA	132718
7	10	FAZ-B7/1-NA	132681	FAZ-B7/2-NA	132700	FAZ-B7/3-NA	132719
8	10	FAZ-B8/1-NA	132682	FAZ-B8/2-NA	132701	FAZ-B8/3-NA	132720
10	10	FAZ-B10/1-NA	132683	FAZ-B10/2-NA	132702	FAZ-B10/3-NA	132721
13	10	FAZ-B13/1-NA	132684	FAZ-B13/2-NA	132703	FAZ-B13/3-NA	132722
15	14	FAZ-B15/1-NA	132685	FAZ-B15/2-NA	132704	FAZ-B15/3-NA	132723
16	14	FAZ-B16/1-NA	132686	FAZ-B16/2-NA	132705	FAZ-B16/3-NA	132724
20	14	FAZ-B20/1-NA	132687	FAZ-B20/2-NA	132706	FAZ-B20/3-NA	132725
25	14	FAZ-B25/1-NA	132688	FAZ-B25/2-NA	132707	FAZ-B25/3-NA	132726
30	10	FAZ-B30/1-NA	132689	FAZ-B30/2-NA	132708	FAZ-B30/3-NA	132727
32	10	FAZ-B32/1-NA	132690	FAZ-B32/2-NA	132709	FAZ-B32/3-NA	132728
35	10	FAZ-B35/1-NA	132691	FAZ-B35/2-NA	132710	FAZ-B35/3-NA	132729
40	10	FAZ-B40/1-NA	132692	FAZ-B40/2-NA	132711	FAZ-B40/3-NA	132730
Characteristic C Switching capacity 15 kA IEC							
0.5	10	FAZ-C0,5/1-NA	102077	FAZ-C0,5/2-NA	102157	FAZ-C0,5/3-NA	102237
1	10	FAZ-C1/1-NA	102078	FAZ-C1/2-NA	102158	FAZ-C1/3-NA	102238
1.5	10	FAZ-C1,5/1-NA	102079	FAZ-C1,5/2-NA	102159	FAZ-C1,5/3-NA	102239
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
5	10	FAZ-C5/1-NA	102083	FAZ-C5/2-NA	102163	FAZ-C5/3-NA	102243
6	10	FAZ-C6/1-NA	102084	FAZ-C6/2-NA	102164	FAZ-C6/3-NA	102244
7	10	FAZ-C7/1-NA	102085	FAZ-C7/2-NA	102165	FAZ-C7/3-NA	102245
8	10	FAZ-C8/1-NA	102086	FAZ-C8/2-NA	102166	FAZ-C8/3-NA	102246
10	10	FAZ-C10/1-NA	102087	FAZ-C10/2-NA	102167	FAZ-C10/3-NA	102247
13	10	FAZ-C13/1-NA	102088	FAZ-C13/2-NA	102168	FAZ-C13/3-NA	102248
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
20	14	FAZ-C20/1-NA	102091	FAZ-C20/2-NA	102171	FAZ-C20/3-NA	102251
25	14	FAZ-C25/1-NA	102092	FAZ-C25/2-NA	102172	FAZ-C25/3-NA	102252
30	10	FAZ-C30/1-NA	102093	FAZ-C30/2-NA	102173	FAZ-C30/3-NA	102253
32	10	FAZ-C32/1-NA	102094	FAZ-C32/2-NA	102174	FAZ-C32/3-NA	102254
35	10	FAZ-C35/1-NA	102095	FAZ-C35/2-NA	102175	FAZ-C35/3-NA	102255
40	10	FAZ-C40/1-NA	102096	FAZ-C40/2-NA	102176	FAZ-C40/3-NA	102256




Rated current $I_n$ A	Interrupting Capacity (SCCR) kA	1 pole Part no.	Article no.	2 pole Part no.	Article no.	3 pole Part no.	Article no.
<b>Miniature circuit-breakers for North America</b>							
Characteristic D Switching capacity 15 kA IEC							
0.5	10	FAZ-D0,5/1-NA	102097	FAZ-D0,5/2-NA	102177	FAZ-D0,5/3-NA	102257
1	10	FAZ-D1/1-NA	102098	FAZ-D1/2-NA	102178	FAZ-D1/3-NA	102258
1.5	10	FAZ-D1,5/1-NA	102099	FAZ-D1,5/2-NA	102179	FAZ-D1,5/3-NA	102259
2	10	FAZ-D2/1-NA	102100	FAZ-D2/2-NA	102180	FAZ-D2/3-NA	102260
3	10	FAZ-D3/1-NA	102101	FAZ-D3/2-NA	102181	FAZ-D3/3-NA	102261
4	10	FAZ-D4/1-NA	102102	FAZ-D4/2-NA	102182	FAZ-D4/3-NA	102262
5	10	FAZ-D5/1-NA	102103	FAZ-D5/2-NA	102183	FAZ-D5/3-NA	102263
6	10	FAZ-D6/1-NA	102104	FAZ-D6/2-NA	102184	FAZ-D6/3-NA	102264
7	10	FAZ-D7/1-NA	102105	FAZ-D7/2-NA	102185	FAZ-D7/3-NA	102265
8	10	FAZ-D8/1-NA	102106	FAZ-D8/2-NA	102186	FAZ-D8/3-NA	102266
10	10	FAZ-D10/1-NA	102107	FAZ-D10/2-NA	102187	FAZ-D10/3-NA	102267
13	10	FAZ-D13/1-NA	102108	FAZ-D13/2-NA	102188	FAZ-D13/3-NA	102268
15	14	FAZ-D15/1-NA	102109	FAZ-D15/2-NA	102189	FAZ-D15/3-NA	102269
16	14	FAZ-D16/1-NA	102110	FAZ-D16/2-NA	102190	FAZ-D16/3-NA	102270
20	14	FAZ-D20/1-NA	102111	FAZ-D20/2-NA	102191	FAZ-D20/3-NA	102271
25	14	FAZ-D25/1-NA	102112	FAZ-D25/2-NA	102192	FAZ-D25/3-NA	102272
30	10	FAZ-D30/1-NA	102113	FAZ-D30/2-NA	102193	FAZ-D30/3-NA	102273
32	10	FAZ-D32/1-NA	102114	FAZ-D32/2-NA	102194	FAZ-D32/3-NA	102274
35	10	FAZ-D35/1-NA	102115	FAZ-D35/2-NA	102195	FAZ-D35/3-NA	102275
40	10	FAZ-D40/1-NA	102116	FAZ-D40/2-NA	102196	FAZ-D40/3-NA	102276
<b>Miniature circuit-breaker for North America for DC applications</b>							
Characteristic C Switching capacity 10 kA IEC Bemessungsspannung 125 V DC je Pol UL 489							
2	10	FAZ-C2/1-NA-DC	113752	FAZ-C2/2-NA-DC	137239	-	-
3	10	FAZ-C3/1-NA-DC	113753	FAZ-C3/2-NA-DC	137250	-	-
4	10	FAZ-C4/1-NA-DC	113754	FAZ-C4/2-NA-DC	137251	-	-
5	10	FAZ-C5/1-NA-DC	113755	FAZ-C5/2-NA-DC	137252	-	-
6	10	FAZ-C6/1-NA-DC	113756	FAZ-C6/2-NA-DC	120638	-	-
7	10	FAZ-C7/1-NA-DC	113757	FAZ-C7/2-NA-DC	120639	-	-
8	10	FAZ-C8/1-NA-DC	113758	FAZ-C8/2-NA-DC	120640	-	-
10	10	FAZ-C10/1-NA-DC	113759	FAZ-C10/2-NA-DC	120641	-	-
13	10	FAZ-C13/1-NA-DC	113760	FAZ-C13/2-NA-DC	120642	-	-
15	10	FAZ-C15/1-NA-DC	113761	FAZ-C15/2-NA-DC	120643	-	-
16	10	FAZ-C16/1-NA-DC	113762	FAZ-C16/2-NA-DC	120644	-	-
20	10	FAZ-C20/1-NA-DC	113763	FAZ-C20/2-NA-DC	120645	-	-
25	10	FAZ-C25/1-NA-DC	113764	FAZ-C25/2-NA-DC	120646	-	-
30	10	FAZ-C30/1-NA-DC	113765	FAZ-C30/2-NA-DC	120647	-	-
32	10	FAZ-C32/1-NA-DC	113766	FAZ-C32/2-NA-DC	120648	-	-
35	10	FAZ-C35/1-NA-DC	113767	FAZ-C35/2-NA-DC	120649	-	-
40	10	FAZ-C40/1-NA-DC	113768	FAZ-C40/2-NA-DC	120650	-	-



	Contacts CO = changeover N/O = Normally open N/C = Normally closed	Contact sequence	Space units 1 SU = 18 mm	Part no.	Article no.
<b>Accessories for FAZ-NA, FAZ-RT</b>					
Tripping signal contact The function of the two changeover contacts can be changed from auxiliary contact to "trip indication contact".					
	2 C/O		0.5	<b>Z-NHK</b>	248434
Auxiliary contact Suitable for FAZ-NA > 480Y/277 V AC					
	1 N/O 1 N/C		0.5	<b>Z-IHK-NA</b>	113895
Shunt release Additional mounting of standard auxiliary contacts possible Position indicator red/green					
	-		1	<b>FAZ-XAA-NA110-415VAC</b>	102036
	-		1	<b>FAZ-XAA-NA12-110VAC</b>	102037
MCB lock for FAZ/FIP					
	-	-	-	<b>IS/SPE-1TE</b>	101911

	Phases Number	Devices Number	Part no.	Article no.
<b>Accessories for FAZ-NA, FAZ-RT</b>				
Busbars (pin), UL 489 • 16 mm <sup>2</sup> • Rated operational current 80 A • Do not shorten				
	1	6	<b>Z-SV/UL-16/1P-1TE/6</b>	104892
	1	12	<b>Z-SV/UL-16/1P-1TE/12</b>	104893
	1	18	<b>Z-SV/UL-16/1P-1TE/18</b>	104894
	2	6	<b>Z-SV/UL-16/2P-2TE/6</b>	104895
	2	12	<b>Z-SV/UL-16/2P-2TE/12</b>	104896
	2	18	<b>Z-SV/UL-16/2P-2TE/18</b>	104897
	3	6	<b>Z-SV/UL-16/3P-3TE/6</b>	104898
	3	12	<b>Z-SV/UL-16/3P-3TE/12</b>	104899
	3	18	<b>Z-SV/UL-16/3P-3TE/18</b>	104900
Extension terminals • 2,5 - 35 mm <sup>2</sup> , AWG 14-2 • UL 489				
	-	-	<b>Z-EK/35/UL</b>	104901
Busbar cover for 3 pins UL 489				
	-	-	<b>ZV-BS-UL</b>	104904

	Rated current $I_n$ A	Part no.	Article no.
<b>Residual current devices dRCM, digital</b>			
<ul style="list-style-type: none"> <li>• Contact position display red-green</li> <li>• trip indication white/blue</li> <li>• 4 pole</li> </ul>			
	Surge-proof 3 kA, pulse-current sensitive, type G/A		
	Rated fault current $I_{\Delta N} = 30 \text{ mA}$	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 $I_{\Delta N} = 300 \text{ mA}$	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, part no. R		
	Rated fault current $I_{\Delta N} = 30 \text{ mA}$	63	dRCM-63/4/003-R+ 120842
	Selective and surge-proof typ. 5 kA, pulse-current sensitive, Type S/A		
	Rated fault current $I_{\Delta N} = 300 \text{ mA}$	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 $I_{\Delta N} = 300 \text{ mA}$	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 $I_{\Delta N} = 30 \text{ mA}$	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 500 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

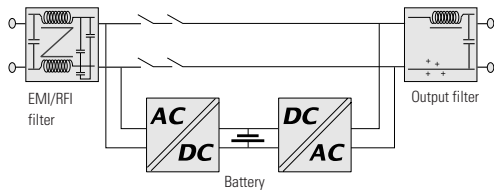
Further information at:  
[www.eaton.com/powerquality](http://www.eaton.com/powerquality)

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 of its customers.

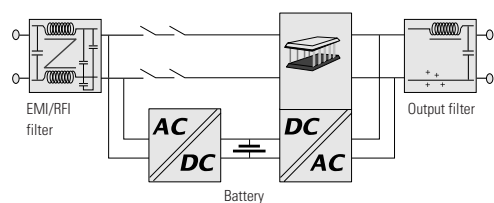
# Power Protection for Different Needs

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.



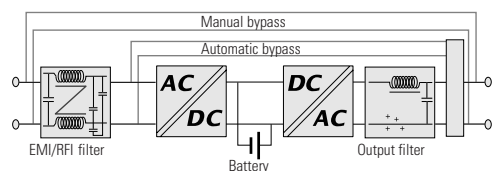
## Passive standby topology (off-line)

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.



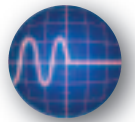
## Line interactive topology

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.

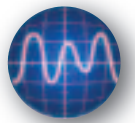


## Double conversion topology (on-line)

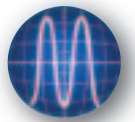
is a basis for UPSs designed for continuous power protection of critical equipment against power related problems: Power failure, power sag, power surge, undervoltage, overvoltage, switching transient, line noise, frequency variation and harmonic distortion. It ensures a consistent quality of power supply 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.



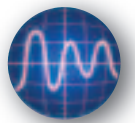
1. Power failure



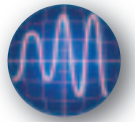
2. Power sag



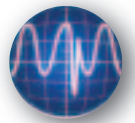
3. Power surge



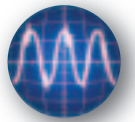
4. Undervoltage



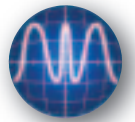
5. Overvoltage



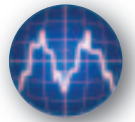
6. Switching transients



7. Line noise



8. Frequency variation



9. Harmonic distortion

# Single phase UPS



## 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 with EcoControl (up to 30% energy savings)



## Eaton 3S

Standby topology (off-line) 550/700 VA

- 6 Schuko or 8 IEC output sockets
- Line protection for telephone
- USB port included
- Replaceable batteries
- Compact unit fits on or under the desk or can be mounted on a wall



## 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 cards



## 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 EcoControl (up to 25% energy savings)
- Power management software
- Replaceable batteries



## 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
- Serial and USB ports as well as a slot for optional management cards



## 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 cards



## Eaton EX RT 1:1, Eaton EX RT 3:1

On-line double conversion topology  
7 and 11 kVA, single phase in and out 5/7 and 11 kVA, three phase in, single phase out

- Online double conversion topology with internal and maintenance bypass
- Rack/Tower convertible (6U)
- Multilingual LCD display
- Hot swappable battery and power modules
- Extended runtime solutions with EXB cabinets, up to 8 hours with CLA supercharger
- Serial port and slot for optional Management Cards (Web/SNMP, Contacts, ModBus)



## 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



## Eaton 9355 3:3

On-line double conversion topology 8-40 kVA

- 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



## Eaton 9390 3:3

On-line double conversion topology 40-160 kVA

- 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)
- ECT allows full capacity test without need for load bank
- Up to six 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



## 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



An Eaton Green Solution



## Eaton 9395 3:3

On-line double conversion topology 225-1100 kVA

- 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)
- ECT allows full capacity test without need for load bank
- 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 ESS



An Eaton Green Solution

## Software & Accessories

### ePDU –

### Intelligent Power® Distribution

Eatons Standard range of ePDU's include

#### Managed ePDUs

- **monitoring:** kWh, V, W and A 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:** kWh, V, W and A 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:** kWh, V, W and A 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 Current 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 Power Management Software

### Intelligent Power® Manager

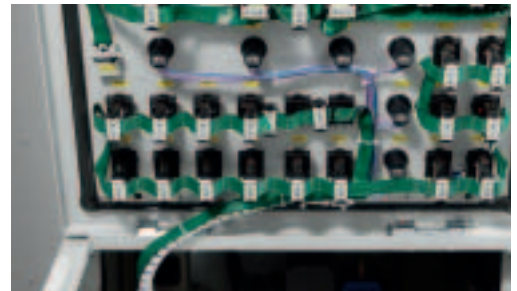
- Facilitates easy management of UPS systems and ePDUs over the network through intuitive, web-based user interface
- Easy to install and operate
- Alarms administrators through email
- Integration in VMware vCenter and Microsoft Hyper-V MSCVMM

### Intelligent Power Protector

- Controlled and managed shutdown of a computer or server by a UPS
- Automatically saves current work and data

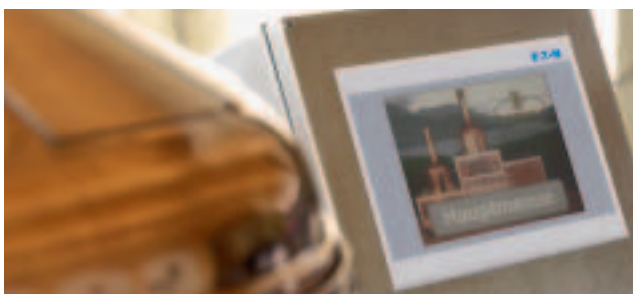


# Machine building



## 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."



## 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 Salvermster, 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 AG, Switzerland

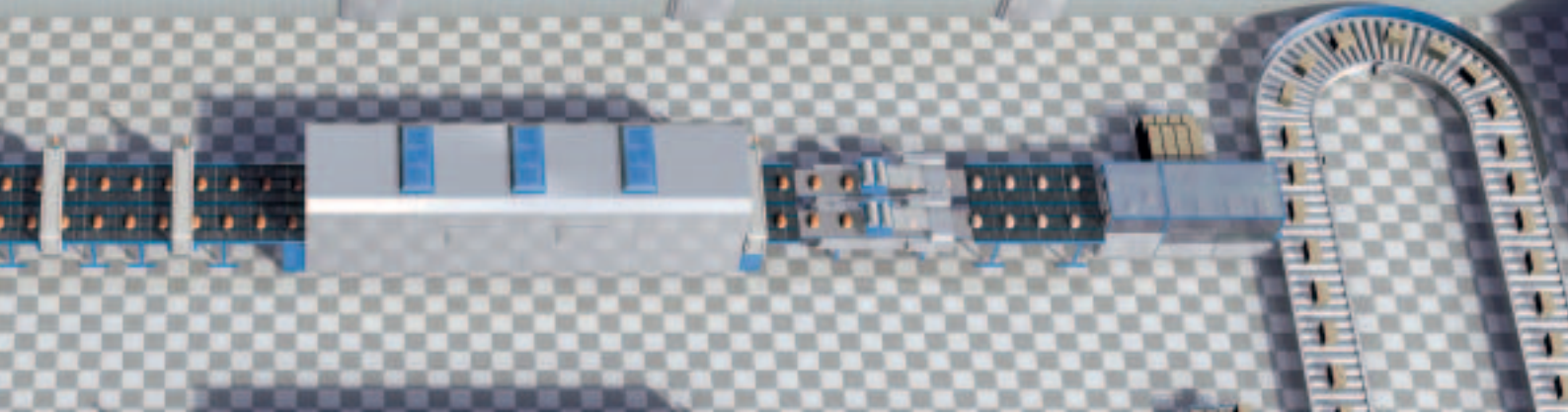
Toggenburger AG is active in the field of gravel and concrete, renaturation/earthworks and environmental technology as well as in lifting and transportation. Around 350 inputs, 169 outputs (350 analog) and remote maintenance and diagnostics functions had to be incorporated in a new control concept for 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



### 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."

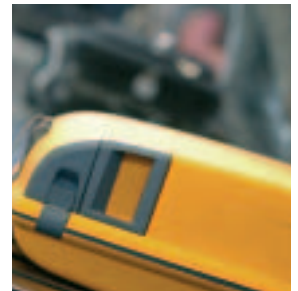


### Gillenkirch Packaging Systems GmbH

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

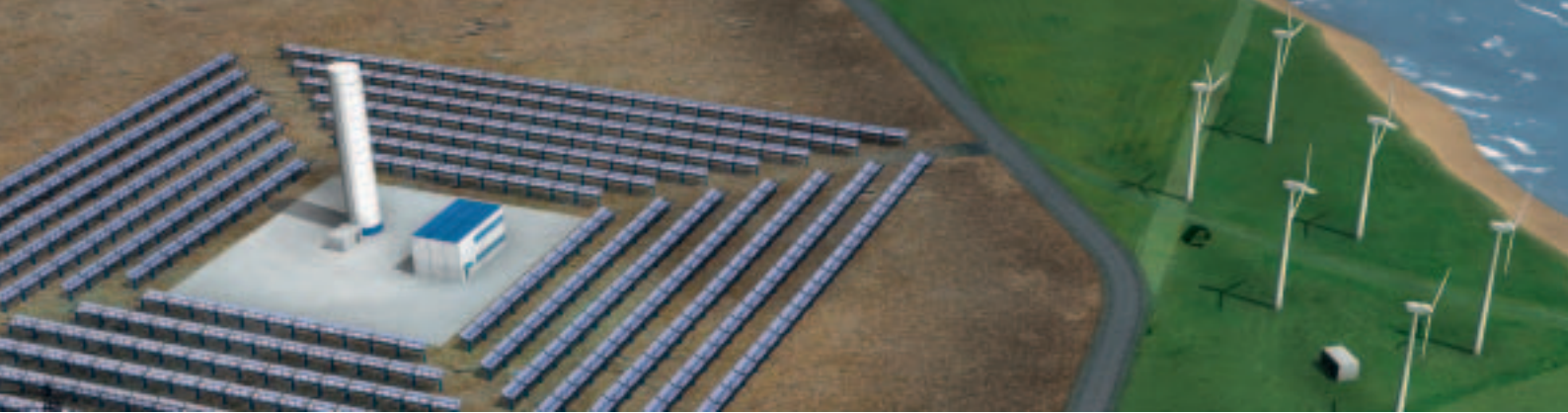
Today state-of-the-art conveying systems are being installed in airports and distribution centers as modular and decentralized systems. Suppliers of baggage handling systems and airport operators have discovered the benefits of Eaton's Rapid Link decentralized drive system, since they enable energy savings 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.



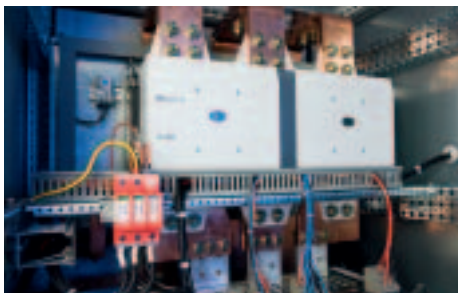
## Wahl GmbH + Co. KG, Hannover Airport

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."

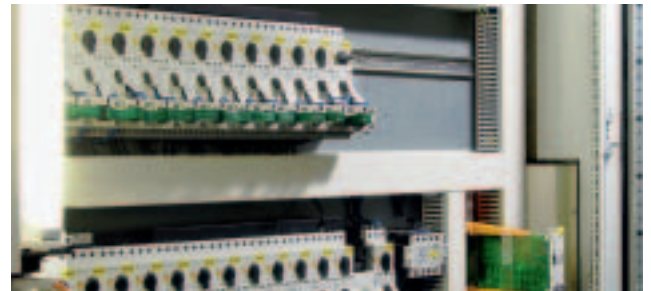


## Sputnik Engineering AG

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 is dedicated to ensuring that reliable, efficient and safe power is available when it's needed most. With unparalleled knowledge of electrical power management across industries, experts at Eaton deliver customized, integrated solutions to solve our customers' most critical challenges.

Our focus is on delivering the right solution for the application. But, decision makers demand more than just innovative products. They turn to Eaton for an unwavering commitment to personal support that makes customer success a top priority. For more information, **visit [www.eaton.com/electrical](http://www.eaton.com/electrical)**.

**To contact an Eaton salesperson or local distributor/agent, please visit [www.eaton.eu/electrical/customersupport](http://www.eaton.eu/electrical/customersupport)**

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