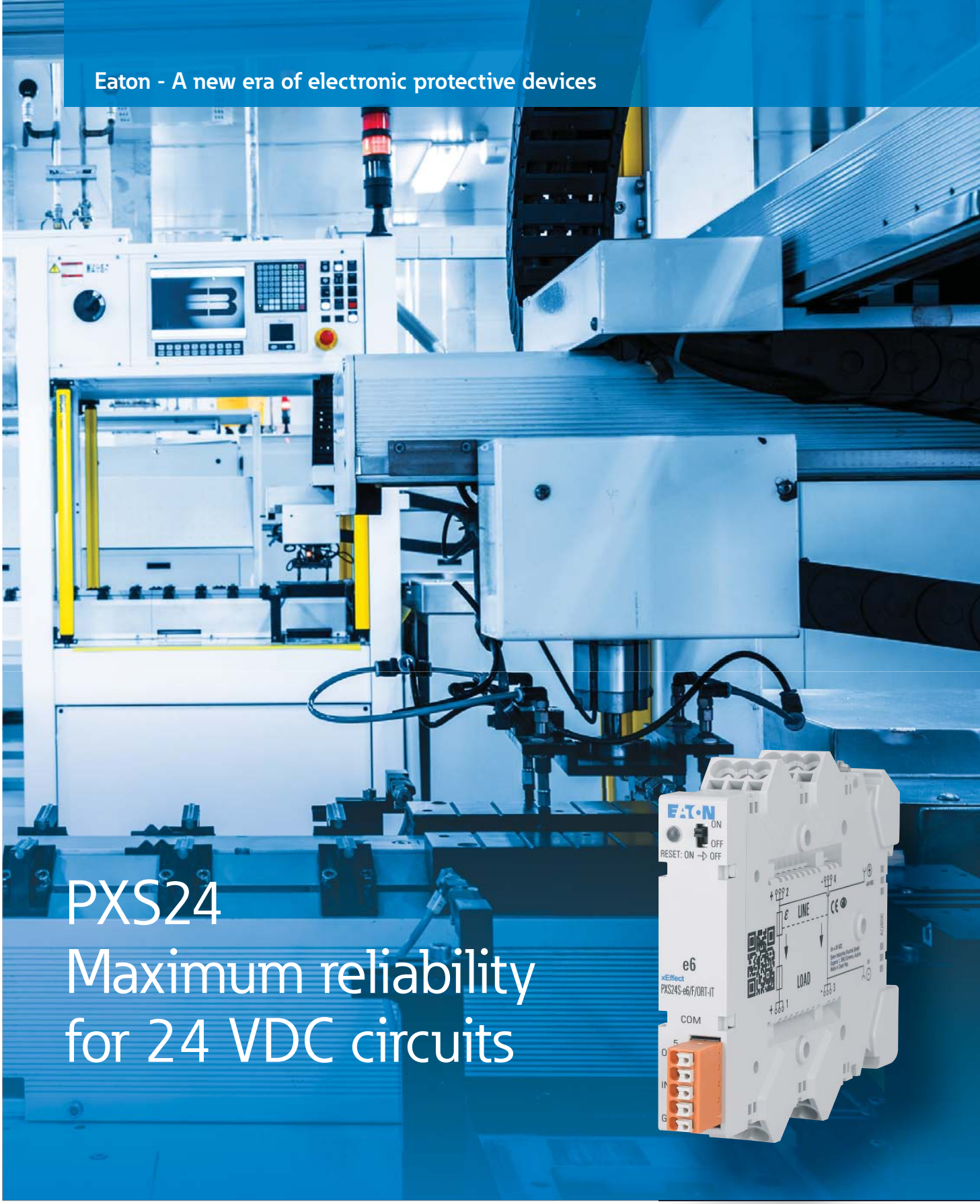
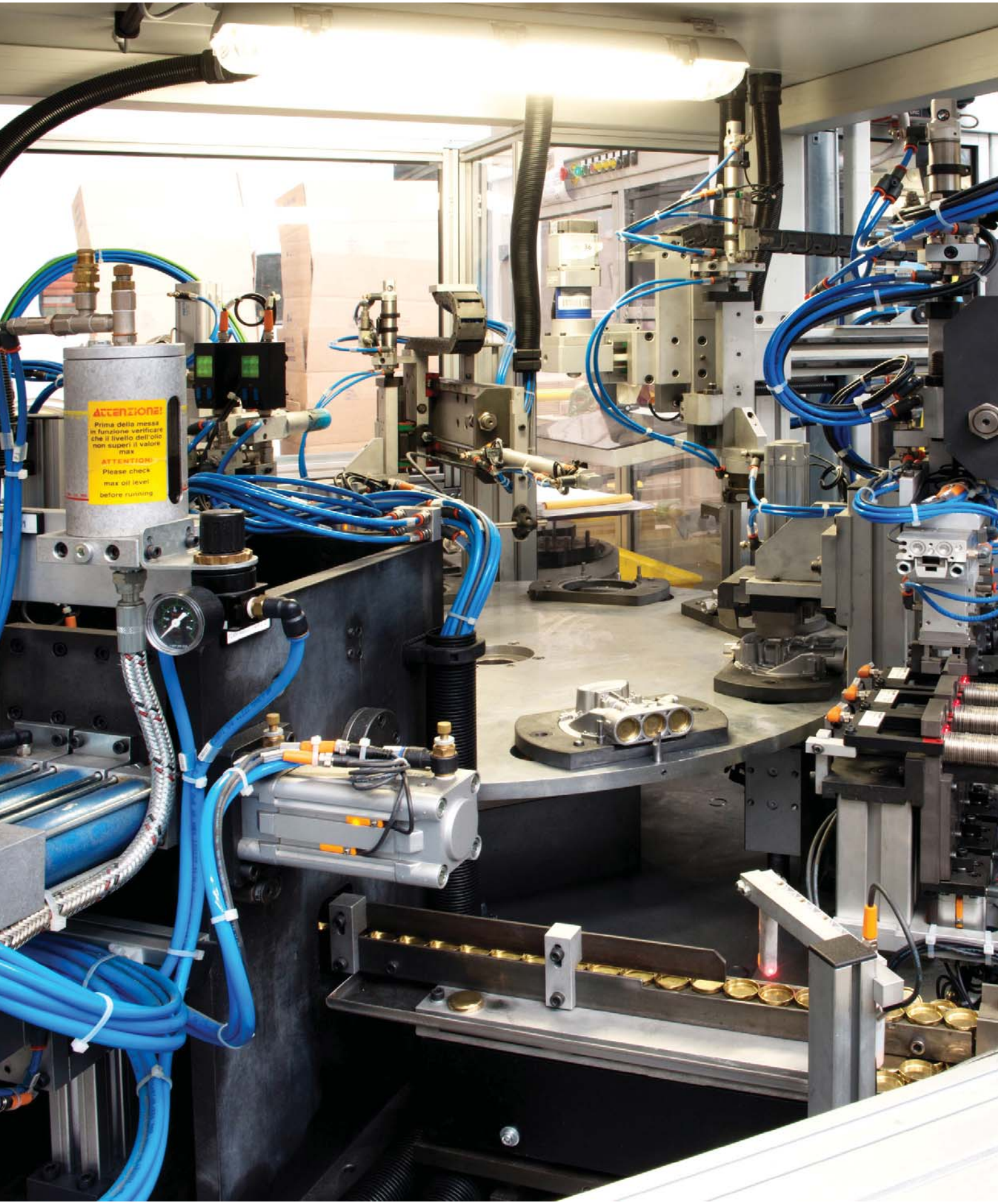
Eaton - A new era of electronic protective devices



PXS24
Maximum reliability for 24 VDC circuits

EATON
Powering Business Worldwide


ATTENZIONE!
Prima della messa
in funzione verificare
che il livello dell'olio
non superi il valore
max
ATTENTION!
Please check
max oil level
before running

Maximum safety

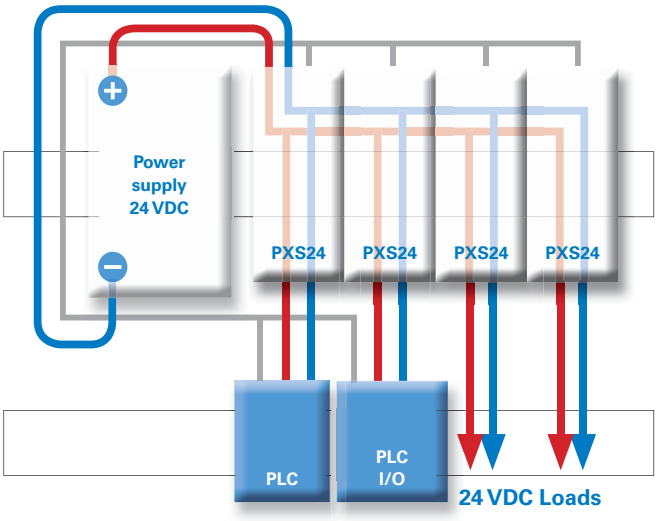
With electronic overload protection

**The rise of electronic current monitoring is unstoppable.
Eaton is at the forefront of developing electronic solutions that offer maximum protection as well as a multitude of practical advantages.**

While electromechanical solutions provided sufficient protection in applications with traditional power supplies, this is no longer the case for electronic power supplies. They are short-circuit-proof, but in the event of a fault they reduce the output voltage to such low levels that the remaining energy is too weak to trigger conventional circuit breakers.

Electronic protection modules thus provide much greater safety: They are able to detect overloads quickly and then switch off only the faulty machine parts from the power supply. The machine remains controllable and can be shut down in a controlled way, for example.

The PXS24 not only ensures the highest possible system availability, but it also saves time, space and installation costs.



PXS24 highlights:

- **Modular system**
- **Direct connection of up to 3 loads**
- **Channel-specific controlling, switching and signalling**
- **Subsequent control - simple linking of channels**
- **Simple and quick installation with push-in terminals and busbars**

A modular and scalable system

Saving space and costs

With the PXS24, you save costs and need less space for your installation. There is no need to buy four or even eight channel modules. You can also easily expand the number of channels later. This will pay off, for example, if a channel is missing during the installation, or if additional channels are needed at a later point.

Should you wish to reserve capacity for later upgrades and pre-install the busbar system ahead of time, you have the option to choose blank modules that can later be replaced quickly with electronic ones.

Everything under control & integration into the control system

Individual and group-fault messages

In practice, sum-fault indication are often not enough. The professional monitoring and visualization of systems requires the ability to process individual status signals for each channel.

These outputs can be connected to a PLC as individual or group indication, as desired.

The PXS24 is also equipped with a remote reset function. In addition, the digital inputs allow functional switching of loads, which can reduce the number of coupling relays.

Prevent negative impacts

By consecutively shutting down other machine parts in the event of a fault.

If a fault occurs in one part of a system, the impact should be minimized by shutting down relevant other, non-affected parts. Take the example of a cement mixer: If the main motor fails, the conveyor belt should immediately be stopped to avoid clogging – and thus a complicated manual cleaning of the plant.

The PXS24 recognizes this problem and controls the required processing via its fault output. If desired, the fault output of the PXS24 can also be directly linked to another PXS24, without the need for additional configuration in the PLC. The PXS24 will then switch off the "secondary" PXS24 within a few milliseconds.

Includes potential-distribution terminals

Up to 3 loads per channel

It is rare that a circuit breaker is connected to only one load; usually, 2 or 3 loads are connected. Until now, this required that the output of the circuit breaker be always connected to a separate terminal block. This set-up is error-prone and unduly cumbersome. The PXS24 has three integrated +24 VDC and GND-terminals each. This eliminates the need for complicated, fault-prone wiring.

Both supply cables start at the same device: the PXS24
This not only removes the need for (often very large) loops, but also increases electromagnetic compatibility (EMC).

Practical to use

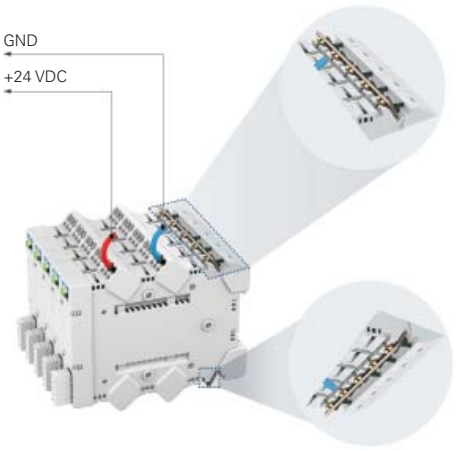
Thanks to its intelligent set-up, the PXS24 saves time and reduces sources of error:

Reliable protection
Capacitive loads are often a challenge for electronic protection modules but not for the PXS24. It ensures controlled, reliable and protected supply up to 20,000µF. For drives, there is practically no (inductive) limit.

Robust design
The design of the PXS24 pays homage to the robust and well experienced design of electromechanical circuit breakers. This ensures easy handling and the robustness required in industrial applications.

Push-in terminals
All cable connections are implemented as push-in terminals. The terminal capacity is 2.5 mm² for flexible wires with end sleeves, or up to 4 mm² for solid wires. The only time you will need a screw driver is to open the lock when removing the connections.

The push-in technology ensures that the terminals are safe, even when exposed to the vibrations that commonly occur in industrial applications.



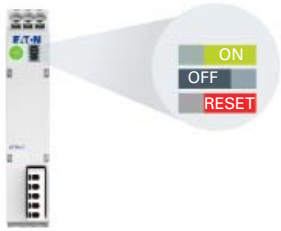
5 modules in side view:
1 channels is supplied via the internal feed in terminals ,the other channels are supplied via the busbars.

The busbar system
At its back, each PXS24 has a busbar element that shares its supply side with other devices. Busbars are available in different sizes (up to 1 m) and can be cut to any desired length. They are simply pushed into the connectors, without the need for any tools.

To reduce costs further, you can order all PXS24 models either with or without integrated feed-in terminals. To combine 10 PXS24 units, for example, only one unit with input terminals is required, as the supply of the other modules is done via the busbars.

2x control output
2x control input
1x GND

The in- and outputs are PLC-compatible
Both the control inputs as well as the control outputs conform to IEC-EN 61131-2. This ensures:
– that the communication with the PLC runs smoothly
– that the input is robust enough to respond to a sensors
– that the input can control functions that previously required a separate PLC-output.
The PXS24 makes it possible, among other things, to switch directly to another PXS24 in the case of a fault.



The local sliding switch
The local sliding switch turns the PXS24 on and off and also resets the device.

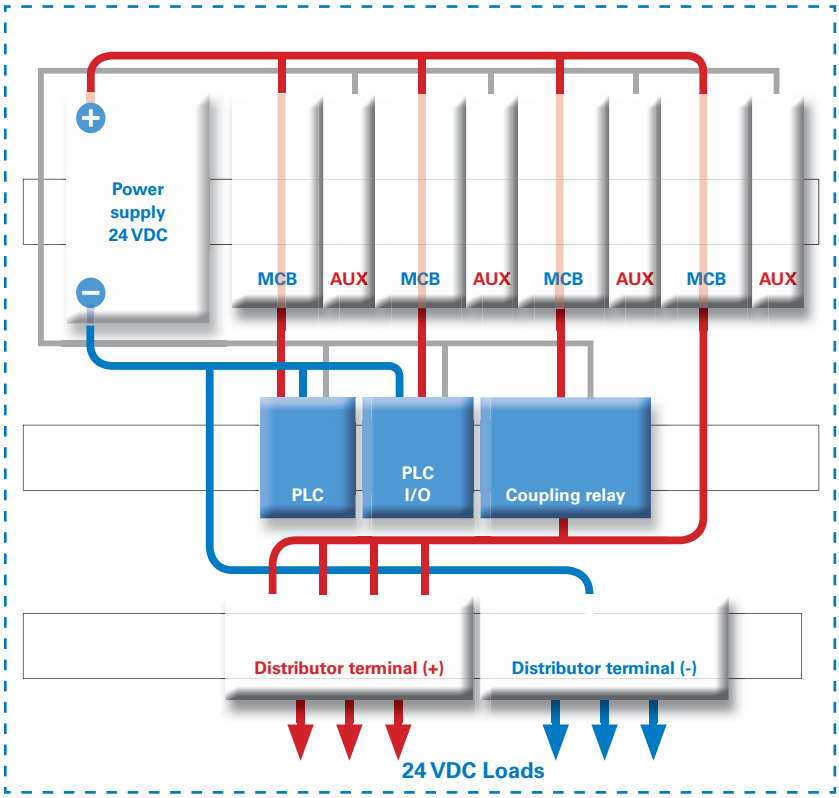
For safety reasons an “off” will always takes precedence. So only when the local sliding switch is in the “on” position it can be controlled from a PLC or another remot control unit.

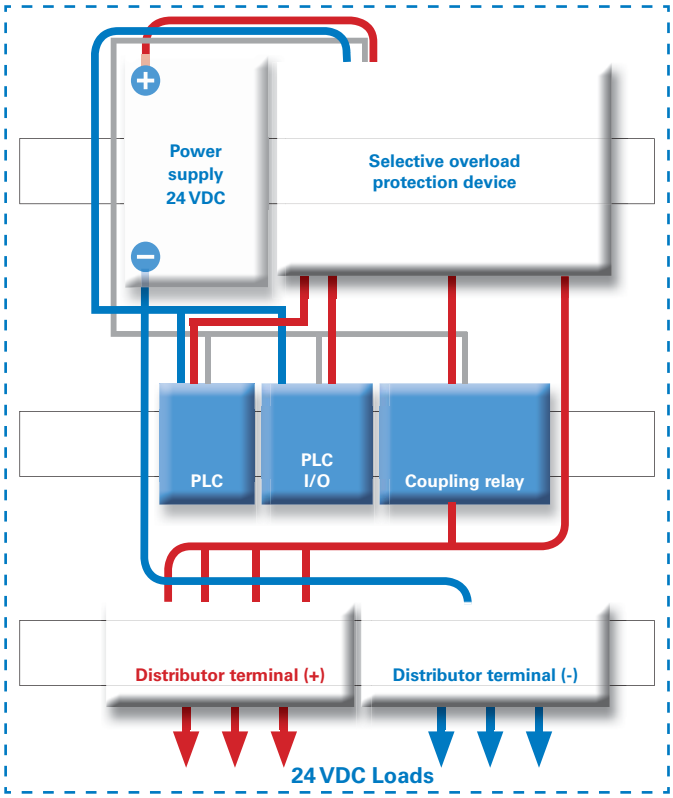
Global use
All versions of the PXS24 have UL approval. This means that there are no difficulties with installing the PXS24 in machines for use in North America.

Installation concept

The PXS24 installation concept allows that up to 3 loads will be directly connected to the output side. This helps to reduce the number of potential-distributor terminals, which helps to reduce the size of the control cabinet.

Example of conventional installation

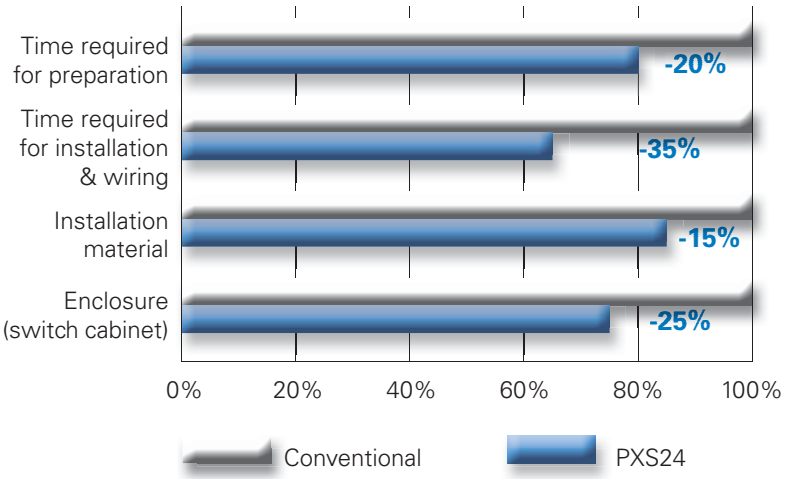


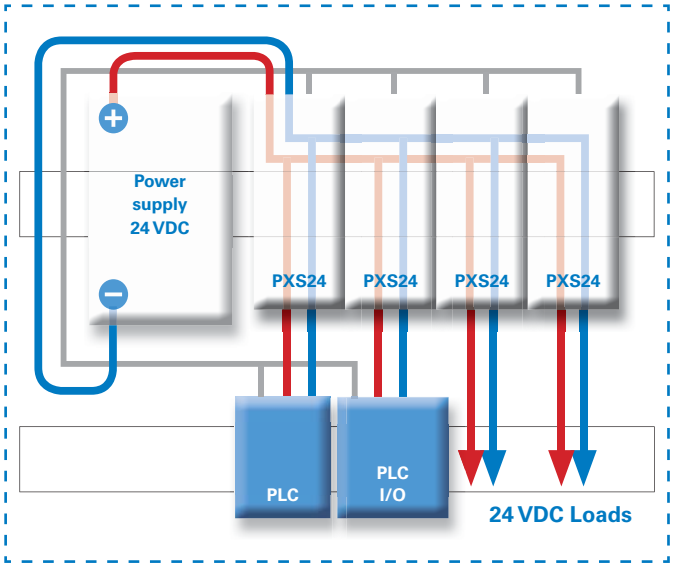


Example of PXS24 installation

In addition, features such as the push-in terminals or the busbar help to reduce installation times. Coupling relais can be reduced because operational switching will be also done by PXS24. Eaton's new PXS24 concept not only allows you to reduce installation cost and effort, but also saves space in the switch cabinet.

The cost savings potential offered by Eaton's PXS24:





Cost savings potential

Protective Devices

PXS24 - Electronic Protective Devices for 24 V DC circuits

sg05317

Description

- The highest standards of safety and reliability at 24 V DC circuits
- Direct connection of up to 3 loads
- Simple and quick installation with push-in terminals and busbars
- Active current limitation
- Sequence control - easy linking of channels
- Modular system
- Individual and collective fault messages
- ON-OFF remote reset function
- Subsequent switching of system in fault situation
- PLC compatible conform to IEC/EN 61131-2
- Local sliding switch
- UL approval

Protective Devices

PXS24 - Electronic Protective Devices for 24 V DC circuits

Rated current I_n (A)	Rated voltage U_n (V)	Type Designation	Article No.	Units per package
PXS24...F/ORT-IT				
Standard with feed-in terminals (with Communication plug)				
2	24	PXS24S-e2/F/ORT-IT	PXS24S02A001	1/42
4	24	PXS24S-e4/F/ORT-IT	PXS24S04A001	1/42
6	24	PXS24S-e6/F/ORT-IT	PXS24S06A001	1/42
8	24	PXS24S-e8/F/ORT-IT	PXS24S08A001	1/42
10	24	PXS24S-e10/F/ORT-IT	PXS24S10A001	1/42
13	24	PXS24S-e13/F/ORT-IT	PXS24S13A001	1/42
16	24	PXS24S-e16/F/ORT-IT	PXS24S16A001	1/42

sg05317

PXS24...F/ORT				
Standard without feed-in terminals (with Communication plug)				
2	24	PXS24S-e2/F/ORT	PXS24S02A002	1/42
4	24	PXS24S-e4/F/ORT	PXS24S04A002	1/42
6	24	PXS24S-e6/F/ORT	PXS24S06A002	1/42
8	24	PXS24S-e8/F/ORT	PXS24S08A002	1/42
10	24	PXS24S-e10/F/ORT	PXS24S10A002	1/42
13	24	PXS24S-e13/F/ORT	PXS24S13A002	1/42
16	24	PXS24S-e16/F/ORT	PXS24S16A002	1/42

sg05317

PXS24E...F-IT				
Economy with feed-in terminals (without Communication plug)				
2	24	PXS24E-e2/F-IT	PXS24E02A001	1/42
4	24	PXS24E-e4/F-IT	PXS24E04A001	1/42
6	24	PXS24E-e6/F-IT	PXS24E06A001	1/42
8	24	PXS24E-e8/F-IT	PXS24E08A001	1/42
10	24	PXS24E-e10/F-IT	PXS24E10A001	1/42

sg05417

PXS24E...F				
Economy without feed-in terminals (without Communication plug)				
2	24	PXS24E-e2/F	PXS24E02A002	1/42
4	24	PXS24E-e4/F	PXS24E04A002	1/42
6	24	PXS24E-e6/F	PXS24E06A002	1/42
8	24	PXS24E-e8/F	PXS24E08A002	1/42
10	24	PXS24E-e10/F	PXS24E10A002	1/42

sg05417

Protective Devices

PXS24 - Accessories

Busbar

- Can be cut
- Max. current: 80 A (at 55 °C ambient temperature)

sg03718

Operating voltage	Length	Type Designation	Article No.	Units per package
Max. 30 V	1 m	PXS24-BB/80A/1M	PXS24BB00001	1/1
Max. 30 V	4 TE (approx. 70 mm)	PXS24-BB/80A/4TE	PXS24BB00004	1/1
Max. 30 V	8 TE (approx. 140 mm)	PXS24-BB/80A/8TE	PXS24BB00008	1/1
Max. 30 V	12 TE (approx. 210 mm)	PXS24-BB/80A/12TE	PXS24BB000012	1/1

Busbar cover

- Can be cut

sg03818

	1 m	PXS24-BBC	PXS24ACC0002	1/1

Placeholder

- Module with no electrical function

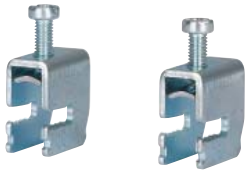
sg03918_r

		PXS24-PCH	PXS24ACC0000	1/42

Input terminals

- 2 pieces per power supply are required!
- Terminal capacity 1.5 - 16 mm² with or without end-sleeves, rigid and flexible
- Max. load current: 60 A (at 55 °C ambient temperature, only in connection with PXS24-BB…)

sg05917



		PXS24-IT	PXS24ACC0001	1/1

Protective Devices

PXS24 - Technical Data

Technical Data

Mark		CE
Certification		UL508 + UL2367 (Section 10 and 12)
Product Standard		Applicable sections of: EN60947-1, EN60947-5-1, EN61009-1, EN61131-2 and EN61000-4-2 Details see In-House Standard WN-PXS24
Electrical		
Operating voltage	U_B	24 DC (16….30 V DC)
Rated current	I_N	Fix; 2, 4, 6, 8, 10, 13, 16 A
Overload and short circuit current protection		Typ. 1.3 x I_N, with active current-limiting up to 1.25 x I_N
Trip characteristic		see time / current table
Capacitive Loads		up to 20,000 µF
Inductive Loads		$I_N \leq 6$ A … $\tau_{max} \leq 60$ ms 6 A < $I_N \leq 10$ A … $\tau_{max} \leq 12$ ms 10 A < $I_N \leq 16$ A … $\tau_{max} \leq 7.5$ ms
Service life when used as a relay		see Time / Current Table
Mechanical		
Number of Channels		1
Width		17.5 (1MU)
Height		92.5 mm
Depth		119.2 mm
Type of terminals		Push-In terminals
Line terminals (optional)		3x LINE (+) and 3x GND (-)
Load terminals		3x LOAD (+) and 3x GND (-)
Terminal capacity Input/Output terminals		2.5 mm² (flexible with wire end sleeve) 4 mm² (rigid)
Terminal capacity Communication plug		1 mm² (flexible with wire end sleeve) 1.5 mm² (rigid)
Communication plug		2x control output (internal linked) 2x control input (internal linked) 1x GND
Busbar		LINE (+) and GND (-); max. 80 A in various length up to 1 m
Montage		Snapping on DIN rail TH35 (EN 60715)
Status LED		Bi-colour; Green = OK; Red = tripped; OFF = channel not in use
Sliding switch		ON/OFF/Reset
Control output		Triped; about Communication plug (according to IEC 61131-2), Class: 0.1 A; Typ1/Typ2 and Typ3 Digital Inputs Max. 30 PXS24V Other indication devices up to 0.2 A @ 24 V (EATON RMQ series,…)
Control input		ON/OFF/Reset; about Communication plug (according to IEC 61131-2) Type1/Type3; Max. 30 PXS24
Sequencer		About Communication plug
Text field		17.5 x 6 mm
Degree of protection		IP20
Operation temperature		-30 °C to +55 °C
Storage Temperature		-40 °C to +100 °C

Protective Devices

PXS24 - Technical Data

Time / Current Table

Rated current I_N [A]	Shut-off time [ms]	Active current limiting	Service life when used as a relay t_{on} = 0.05 s / t_{off} = 10 s
2	470	1.25 x I_N	> 10,000,000
4	280	1.25 x I_N	> 10,000,000
6	170	1.25 x I_N	> 10,000,000
8	110	1.25 x I_N	400,000
10	90	1.25 x I_N	10,000
13	80	1.25 x I_N	no usage as relay - only protection
16	70	1.25 x I_N	no usage as relay - only protection

Overview of the PXS24 features

Feature	Economy	Standard
Rated current (fixed, 2, 4, 6, 8, 10, 13, 16 A)	**0-10 A**	**0-16 A**
Active current limiting	**x**	**x**
Modular system	**x**	**x**
3 load connections (+/-)	**x**	**x**
Push-in terminals	**x**	**x**
Busbar (+/-)	**x**	**x**
Local status LED	**x**	**x**
Local switch (on/off/reset)	**x**	**x**
Sequencer		**x**
Digital control outputs (on/off/reset)		**x**
Digital control inputs (on/off/reset)		**x**

Note for UL applications: The PXS solid state overcurrent protector has been tested in accordance to UL 508 and CSA 22.2 No. 14 for DC general use. Temperature, overload and endurance, dielectric and breakdown of component tests were conducted. Calibration and overloaded operation tests were conducted in accordance with UL 2367.

Eaton is a power management company with 2017 sales of $20.4 billion. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is dedicated to improving the quality of life and the environment through the use of power management technologies and services. Eaton has approximately 96,000 employees and sells products to customers in more than 175 countries.

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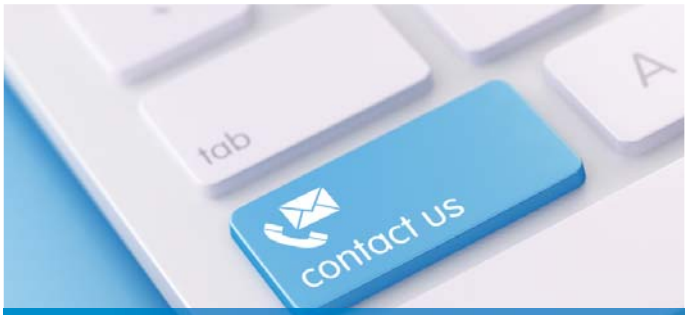

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