Smart Power Supply
S8AS2

Smart Power Supply Circuit Consolidation to simplify field operation

An advanced power supply system that integrates the power source, protective devices, and connection interfaces is setting a new standard in the industry

In the manufacturing industries centered on the automotive sector, more production lines are becoming automated, electrified, and computerized, leading to an increase in devices and wires connected to control panels. This surely increases the workload of design teams and field operators. OMRON has updated S8AS, an integrated Power Supply that combines a DC power supply important to control panels with electronic circuit protector (CP) and terminal block functions. This all-in-one Power Supply will improve the efficiency of control panel-related electrical work from design to maintenance, helping solve problems in the field.

Power supply
High efficiency

+

Protector
Improved tripping performance

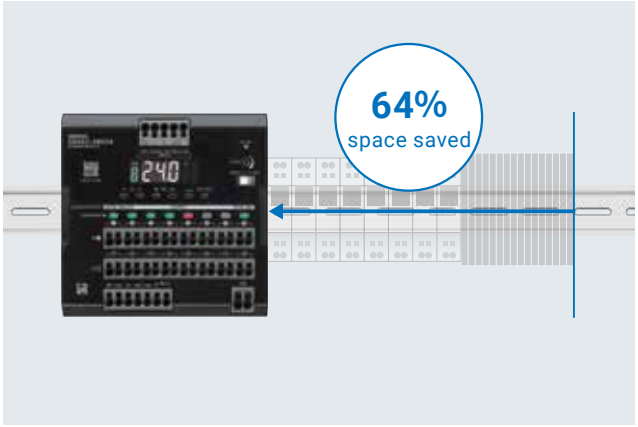
+

Connection
Various connection terminals

As a single integrated unit, the system reduces field work associated with facility setup and control panels

Design

High efficiency and low heat generation enable significant space savings

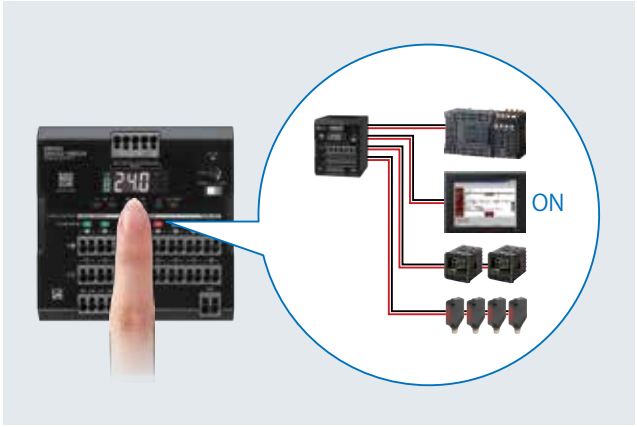


Manufacturing

Shortened wiring work without wiring between devices and by adopting the push-in connection

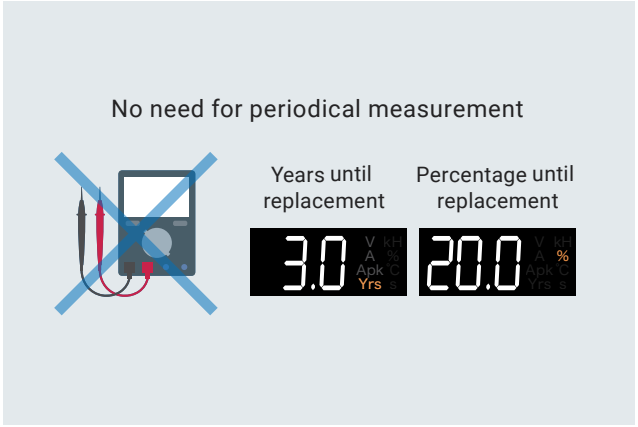
Commissioning

Quick operation check of power supply circuits via display panel



Maintenance

Easy maintenance: Power supply lifespan is easily monitored



Reinforced protection for the electrical section

Stabilized power supply circuits

Environmental impact reduction

Reduced GHG emissions from control panels

Maximizes control panel space and reduces wiring time

Struggling with optimizing device placement in a limited space and handling complex wiring

Sophisticated facilities and devices often require more power supplies and circuits, making the layout design more complex. They need a larger power capacity, more circuit protectors (CPs), and more terminal blocks, requiring more time to optimally place them in a limited space. This increases the work related to device installation and connection, putting additional pressure on assembly operators.

Layout design

Reduced system size with high-efficiency, low-heat-generation power circuits

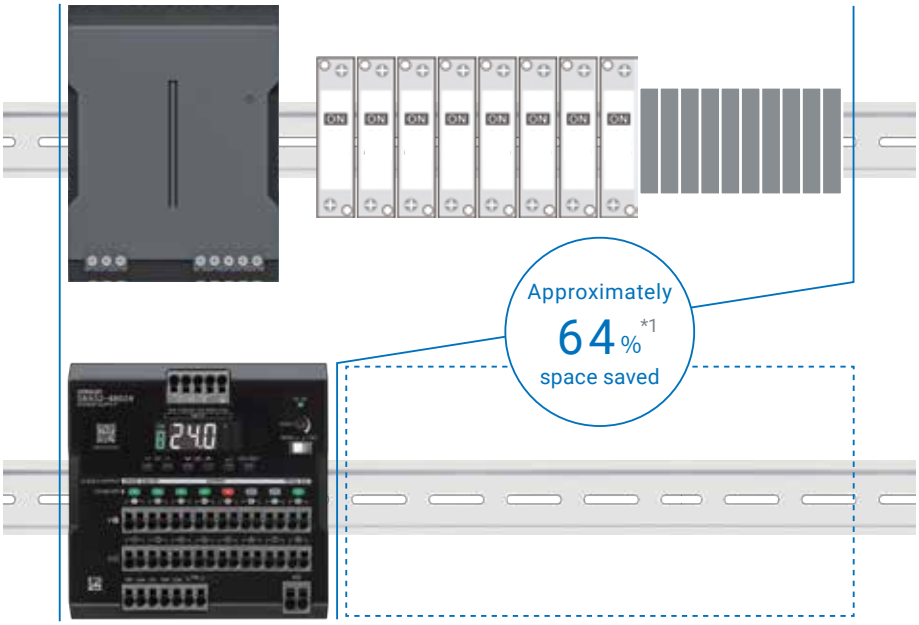
Previous

Power Supply (480 W) x 1
+ Standard mechanical CP x 8
+ Standard terminal block x 10

S8AS2

S8AS2 (480 W) x 1 only

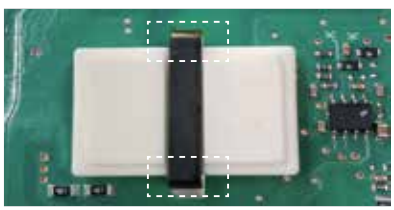
*1. CP and terminal section: 8 circuits (systems)



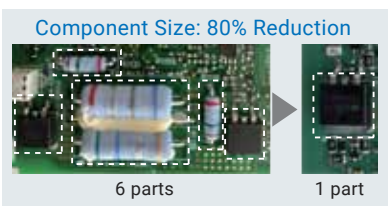
Efforts for miniaturization

- Improving the density and efficiency to optimize the power supply and electronic circuit protectors

Improved heat dissipation by adopting an advanced device (GaN)



Ceramic heat dissipation design (side-lock method that does not interfere with PCB layout)



Automatic current control adopted for the CP circuit section to realize a low heat generation design

Assembly and wiring

Consolidating devices reduces component count and speeds up installation and wiring

Installation and wiring work Approximately 1/10*1

*1. Based on our survey.

Previous Power Supply (480 W) + Mechanical CP + Terminal block

One Power Supply, eight CPs, and ten terminal blocks are installed in a control panel, and wiring is necessary on the load side and between the devices.

S8AS2 S8AS2 (480 W) only

S8AS2 is installed in a control panel, and wiring is done on the load side. No wiring is necessary between devices.

Wiring and short-circuit bars are required between devices

Integrated design eliminates the need for wiring between devices

Wiring

A Push-in Plus terminal block to shorten the wiring work

wiring work Approximately 60%*2

A Push-in Plus terminal block can greatly reduce the wiring work compared with a screwed terminal block.

1. Remove the screw.
2. Insert the terminal.
3. Fasten the screw.
4. Put a check mark.
5. Further fasten the screw.

Previous A screwed terminal block requires more steps to complete wiring.

1. Insert the terminal.

Value Design for Panel With a Push-in Plus terminal block, wiring is completed in a single step.

*2. Based on our measurement data for both Push-in Plus and screwed terminal blocks.

Easy on-site troubleshooting by checking the display with no measurements required

The power supply circuit inspection and measurement significantly increase work during commissioning and maintenance.

Sophisticated facilities and devices often require more components, which increases the work for monitoring and testing power supply circuits during facility commissioning, maintenance, device replacement, and regular inspections. This puts more pressure on field operators.

Commissioning

Complete confirmation of the power supply circuit operation for each system simply by checking the display of the S8AS2

Switch on and off the supply voltage of each system with the button on the front of the S8AS2. The current value appears in the front display when the supply voltage is on. Use the display of the power supply system to facilitate the field operation.

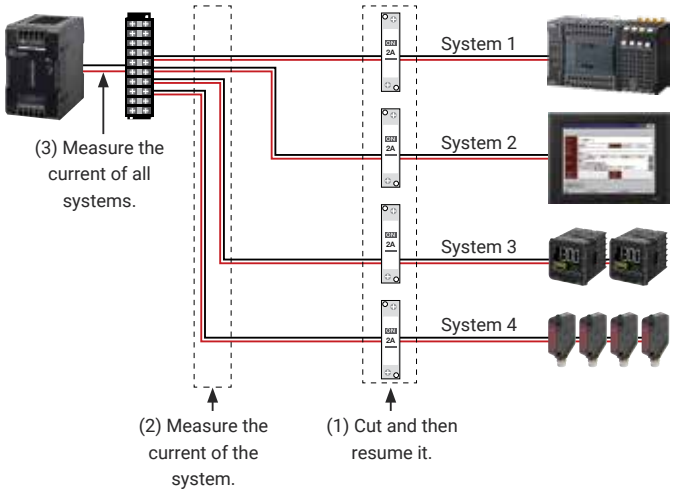
Previous

Work on CPs and wiring positions one by one.

(1) Cut the CP of the system and then resume it.

(2) Measure the current of the system with a tester.

(3) Measure the current of all systems with a tester.



S8AS2

Complete by working on S8AS2 only.

(1) With the button (C) on the front, cut the CP of the system and then resume it.

(2) With the display (A) and the button (B) on the front, check the currents of the system and all systems.

Two-color LEDs indicate the status of individual branch systems.

LED: Lit in green
... Not exceeding the rated output current

LED: Lit in red
... Output is cut and an alarm is output.

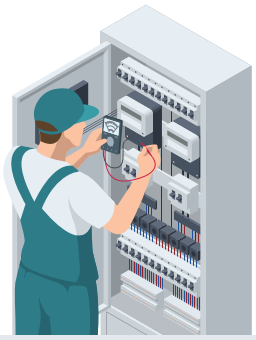
Maintenance

Monitor the power circuit status with the digital display without measurement

The digital display on the front of the S8AS2 allows easy monitoring of the voltages, currents, and maximum currents of each system and all systems.

Previous

To monitor the facility conditions, the power supply current and voltage are checked with a tester and recorded before work and before and after maintenance.



Tester

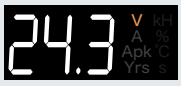
Oscilloscope

Current sensor

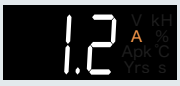
S8AS2

The voltage and current can be easily checked on the display of the S8AS2, without using a tester.

Voltage



Current



Maximum current (peak hold)

Predictable replacement timing, eliminating the need for regular inspections

By visualizing the service life, the product can be used more efficiently, minimizing waste and reducing the workload associated with regular inspections and replacements.

Previous

The power supply output voltage is regularly measured with a tester.

- Workload increases as the systems and circuits increase.
- Inspection is necessary every six months.

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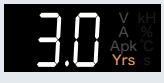
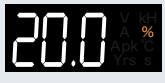
The display of the S8AS2 shows the replacement time for you to check without a tester.

Years until replacement



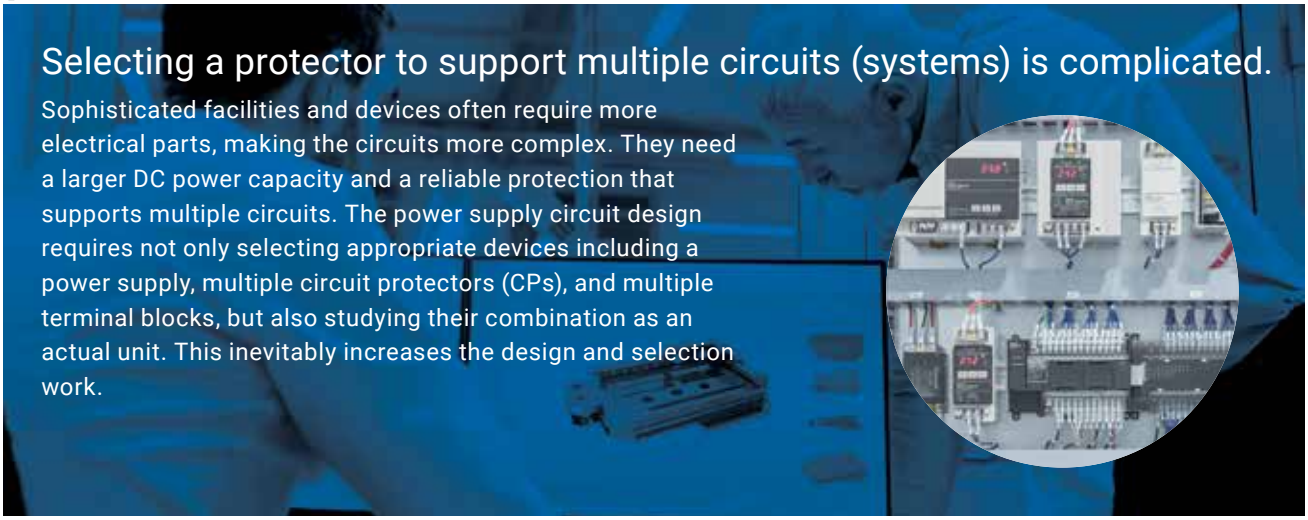
Percentage until replacement



- Simply press the button even if systems and circuits increase.
- Check when the replacement time approaches.

Reinforced protection for the electrical section

Simplified selection and stabilization of power circuits



Selecting a protector to support multiple circuits (systems) is complicated.

Sophisticated facilities and devices often require more electrical parts, making the circuits more complex. They need a larger DC power capacity and a reliable protection that supports multiple circuits. The power supply circuit design requires not only selecting appropriate devices including a power supply, multiple circuit protectors (CPs), and multiple terminal blocks, but also studying their combination as an actual unit. This inevitably increases the design and selection work.

Selecting power supply circuits

Consolidating power supply circuits for simplified device selection

A Power Supply, electronic CPs, and terminal blocks have been integrated into one unit, eliminating the need to prepare multiple devices and evaluate their combination.

Previous

	STEP1 Examining selection criteria	STEP 2 Checking the actual unit operation	STEP 3 Selecting three models
Result	Current of all power circuits Cutoff current of each circuit (system)	Checking the operation on an actual unit to select a power supply and circuit protectors	Selecting terminal blocks according to the device connection configuration
Description	The currents of each circuit (system) and all circuits are estimated to decide the cutoff current of each system.	The candidate devices undergo a load short-circuit failure simulation and an operation check at power-on, and may be changed if necessary.	The device connection configuration is detailed to estimate the number of terminals and the currents required.

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	STEP1 Selecting an S8AS2 model	STEP2 / STEP3
Result	Current of all power circuits	
Description	The currents of each circuit (system) and all circuits are estimated to confirm that the maximum cutoff current of each circuit does not exceed 3.8 A.	

Selection is completed in STEP 1 only.
(The same as when selecting a power supply only)

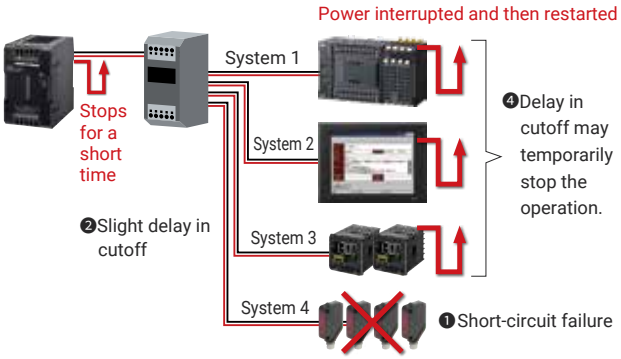
Stabilized power circuits by electronic circuit protectors with excellent cutoff performance

Electronic circuit protectors with excellent tripping performance can stabilize circuits at power-on or in case of a device error.

Standard electronic CP

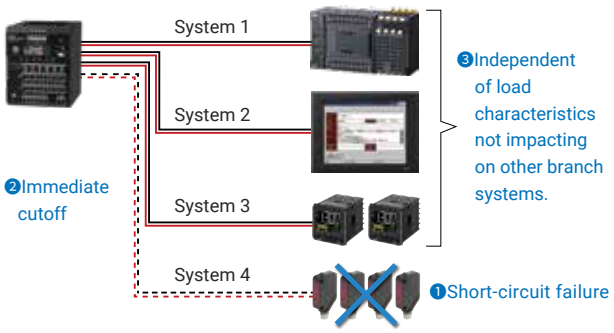
Careful examination is necessary to decide an appropriate combination based on the power supply and load characteristics. Otherwise, a slight delay may occur in the cutoff operation and cause a voltage drop in other systems, potentially resulting in operational failure.

❸ Overcurrent protection activated for a short time



S8AS2's electronic CP

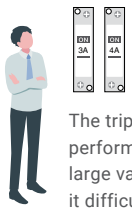
The electronic CP integrated into S8AS2 can ideally control the cutoff operation using our proprietary technology that enables it to adapt to the power supply characteristics. It can provide a reliable cutoff for a wide range of load characteristics.



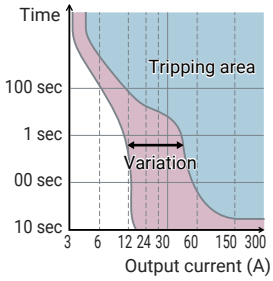
Why an electronic circuit protector?

Mechanical CP

A mechanical CP has a fixed tripping current specific to the model. It shows large variations in tripping performance between units, making it difficult to select an appropriate CP.



The tripping performance shows large variations, making it difficult to select 3 A or 4 A current type.

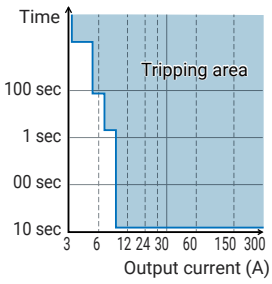


Electronic CP

An electronic CP has a variable tripping current with high tripping accuracy, allowing you to select, evaluate, and inspect the CP in a shorter time.

Rated output current
— 3 A

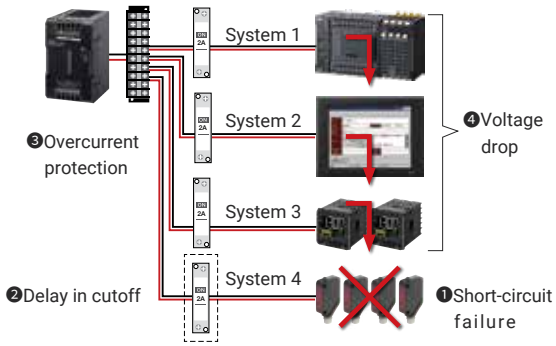
The tripping performance of the DC electronic CP ensures a tripping as designed.



*Rated output current set to 3 A

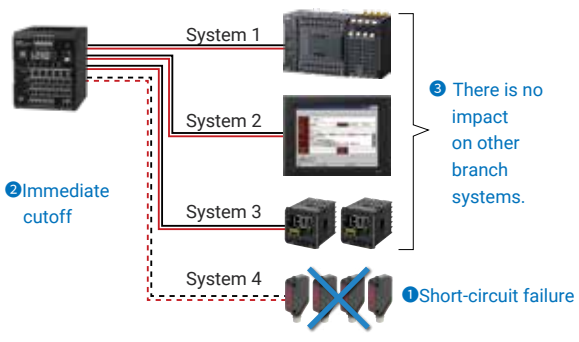
Mechanical CP

In case of an error, the power supply's protection is activated before the mechanical CP's cutoff, causing all systems to stop.



Electronic CP

The error system is identified and immediately cut off, allowing recovery in a shorter time.



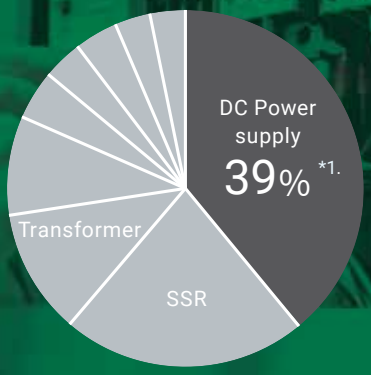
Environmental impact reduction

Reducing GHG emissions of control panels

Power Issues in control panel

Many devices in control panel consume their own energy, which is then lost as heat. Among them, DC power supplies are one of the most powerful devices.

Power Consumption in Control Panel



*1. Percentage of power consumption based on the conceptual control panel designed by OMRON, according to OMRON investigation in May 2023.

Reduces power loss by using a highly efficient power supply

CO_2 is one of the greenhouse gas (GHG). Using a more efficient DC Power Supply reduces the power consumed within control panel and consequently reduces CO_2 emissions.

Previous OMRON'S 240 W model

87% typ /230 VAC

CO_2 emission volume **93 kg**[*2] **reduced**

Efficiency **8% improvement** (87%→95%)

S8AS2 S8AS2 240 W

95% typ /230 VAC
(power supply section only: 96% typ /230 VAC)

Power consumption approx. **65%** reduction

Our conventional Power Supply S8AS 480 W

88% typ /230 VAC

CO_2 emission volume **162 kg**[*3] **reduced**

Efficiency **7% improvement** (88%→95%)

S8AS2 480 W

95% typ /230 VAC
(power supply section only: 96% typ /230 VAC)

Power consumption approx. **61%** reduction

*2. Estimated on 8h/day x 365 days, 240 W output power, 1 Wh=0.4591 g (the in-house conversion rate from electricity to CO2 emission).
*3. Estimated on 8h/day x 365 days, 480 W output power, 1 Wh=0.4591 g (the in-house conversion rate from electricity to CO2 emission).

For building green control panels

Natural disasters caused by global warming and climate change have become global social issue, that drives over 150 countries and regions worldwide to take action toward decarbonization.Our goal is to reduce greenhouse gas (GHG) emissions toward by half through new ways of building control panels, that key figure of the manufacturing site.

Green

Creating green control panels

Reducing GHG emission of control panels to achieve carbon neutrality

This Value Design also integrate environment consideration concept that enable earth and user-friendly control panel building.

Panel

Further Evolution for Panels

Realize compact & highly reliable control panels

Unified size and side-by-side mounting help delivering more compact control panels with additional functionality.OMRON Push-In Plus technology for easy wire insertion and firm wire holding ability.

Process

Innovation for design, building Process

Realize greatly reduces design/manufacturing work

eCAD library provided for all models greatly reduces design work. Push-In Plus technology requires only a single step, greatly reducing wiring work.

People

Simple & Easy People

Provide reliable and comfortable manufacturing for all people who deal with control panels

OMRON's Push-In Plus technology is as easy as inserting to an earphone jack. This reduces the load on worker fingers.

Value Design for Panel

Integrating green perspectives into Value Design

Value Design for Panel (Value Design) is the common concept shared across OMRON's in-panel product specifications to deliver new value to your control panels.This Value Design also integrate environment consideration concept that enable earth and user-friendly control panel building.

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Controllers & I/O
• Machine Automation Controllers (MAC) • Motion Controllers
• Programmable Logic Controllers (PLC) • Temperature Controllers • Remote I/O

Operator Interfaces
• Human Machine Interface (HMI)

Motion & Drives
• Machine Automation Controllers (MAC) • Motion Controllers • Servo Systems
• Frequency Inverters

Vision, Measurement & Identification
• Vision Sensors & Systems • Measurement Sensors • Auto Identification Systems

Sensing
• Photoelectric Sensors • Fiber-Optic Sensors • Proximity Sensors
• Rotary Encoders • Ultrasonic Sensors

Safety
• Safety Light Curtains • Safety Laser Scanners • Programmable Safety Systems
• Safety Mats and Edges • Safety Door Switches • Emergency Stop Devices
• Safety Switches & Operator Controls • Safety Monitoring/Force-guided Relays

Control Components
• Power Supplies • Timers • Counters • Programmable Relays
• Digital Panel Meters • Monitoring Products

Switches & Relays
• Limit Switches • Pushbutton Switches • Electromechanical Relays
• Solid State Relays

Software
• Programming & Configuration • Runtime

Note: Specifications are subject to change.