

SAFETY

This month's highlight:
Schmersal safety
installation systems

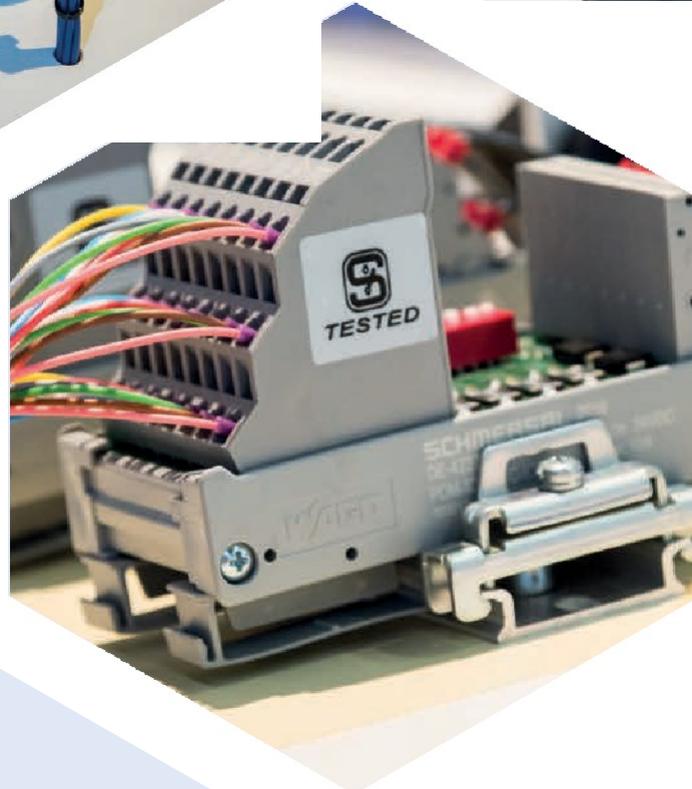
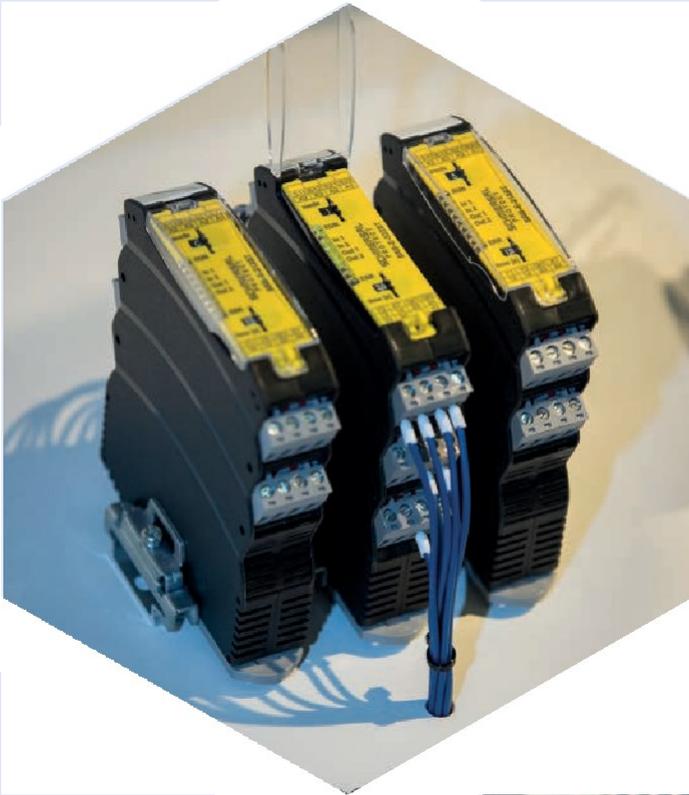


Fig. 1: The Schmersal safety installation systems were developed for protecting more complex machine systems



MACHINE AND PLANT SAFETY

Easy installation of safety systems

To secure complex machines and systems

New installation systems for safety switchgear are now available especially for securing complex machines and systems. They not only make installation easier, but also increase flexibility and improve the opportunities for troubleshooting in the spirit of preventative maintenance.

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Flexible components and systems are at the very top of the wish-list of design engineers in machine and plant construction. More and more often, machines are being expanded over the course of their service life. They are adjusted to changing circumstances, moved to other locations, or integrated into automated overall systems.

Machine safety: Flexibility and transparency are desired

That aside, simple assembly of the machine is increasingly desired, and not just for the mechanical components, but also and particularly for the electrotechnical systems. Qualified personnel are required, and there is

lots of potential for errors. Efficient, error-free installation of the electrotechnical components is even more important.

Thirdly, the users of a machine would like to be able to use the most comprehensive diagnostic information in order to detect irregularities in line with "predictive maintenance". The information should also improve the ability to react quickly in the event of faults and outages and therefore to retain the productivity of the machine or system.

These trends also affect machine safety. In terms of diagnostics information, they are very much applicable. Since the safety systems trigger a shut-off of the machine or a stoppage of the hazardous movement

in the event of irregularities (which is precisely their job, after all), the impact on availability is particularly great.

Answer to current trends: The installation systems

Taking these trends into consideration, the Schmersal Group has developed not only a new range, but an entirely new design of components for machine safety: the Schmersal Safety Installation Systems. They are suitable for securing complex machine plants (Fig. 1) or, to put it more accurately, for the quick, simple cabling of safety switchgear in series.



Fig. 2: The PDM passive distributor module is particularly suitable for food and packaging machines.

The basic principle of the installation systems is that the machine constructor does not connect the safety switchgear to the relevant safety controller or the associated safety relay module, but with a separate unit which can be installed in the control cabinet or in the field. There, the signals are bundled together and forwarded to the evaluation unit or to the safety control unit.

Simple connection in series – in the field or in the control cabinet

Therefore, in principle, the installation systems function like a safety-oriented bus system, with the difference being that no special bus protocol is used. The safety switchgear is simply connected in series. This considerably reduces the wiring required.

One particular advantage is in the fact that different electronic safety switchgear systems, such as safety sensors and interlocks, can be combined and incorporated in the respective application. This is practical, as with larger systems, different machine areas often need to be secured using different safety switches. At the same time, the new system offers cost-optimised options for applications exclusively using electronic safety switchgear.

Individual diagnostics are possible

The safety installation systems also allow individual diagnosis of the safety switchgear connected. This means the operator can clearly identify which switch in the series has triggered a signal. This allows any faults occurring to be repaired more quickly, and machine downtimes can be avoided. This also allows the safety installation systems to contribute toward increased machine availability.

Passive modules for control cabinet installation and for in the field



Fig. 3: The PFB passive fieldbox is a plug & play solution in a robust IP67 design.

There are two different installation systems available for applications with exclusively electronic safety switchgear, with a passive distributor module (PDM) and with a passive fieldbox (PFB). They allow mixed series connection of up to four different electronic safety switchgear units for each module. Multiple modules can be connected together to form larger systems. The PDM passive distributor module (Fig. 2) was developed for DIN rail mounting; in other words, for installation in terminal boxes and in control cabinets. It is compact in design, easy to install and also suitable for application with strict hygiene requirements, such as food and packaging machines. The PFB passive fieldbox (Fig. 3) is a plug and play solution in a robust IP67 design for decentralised use in a range of applications.

Relatively large safety systems can easily be wired using the PDM and PFB modules because wire diameters of up to 1.5 mm² can be connected. The unique selling point of the two solutions is the individual securing of the safety switchgear devices with circuit breakers with self-returning fuses.

Active versions for safety switches and sensors

There is a third and active variant of safety switches and safety sensors: For safe series connection of electromechanical safety switches with contact outputs or safety sensor with electronic OSSD outputs, a safety input expansion to the SRB-E range takes on the active electronic signal evaluation (Fig. 4). This solution also achieves a safety level of Cat. 4 / PL e / SIL 3 for the series connection of contacts.

With optional SD interface

The passive installation systems include a version with a “Serial Diagnosis” (SD) interface for the serial transfer of non-secure



Fig. 4: The active SRB-E input expansions for mechanical safety circuit devices

data. Safety sensors and interlocks connected in series, which are fitted with an SD interface, then transmit comprehensive diagnostic data to a control system via the SD gateway and a fieldbus. For the MZM100-SD contactless magnetic solenoid interlock, this could be, for example diagnostics data or error messages such as “Error or cross-circuit on a safety output”, “Operating voltage too low” or “Actuator faulty”. This enables quick problem solving. Extended diagnostics functions will, in future, enable preventive maintenance and the avoidance of machine downtime. ☐

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