Between man and robot without separating protection.

Schmersal is developing custom safety measures for the feed and withdrawal processes. This applies, for example, to the feed and withdrawal systems of the BDF 18,000 (safety) switchgear. Many of these systems are already being used in emerging economical nations. The Schmersal Group is convinced that many countries will be operating on a worldwide scale within the next few years, especially in large batch production: the productivity of the machine tool is running. For these applications, interruptions of the production process are not applicable. Therefore, the safety guard must remain closed as long as the production process is running. For these applications, the Schmersal Group offers a comprehensive programme of safety solutions.

Safety in system: Protection for man and machine – under this motto, the Schmersal Group develops and produces safety switching appliances and systems for the entire machinery and plant construction for decennia already. In some industries, special and additional requirements are applicable.

Ergonomics is another important aspect of safety at the man-machine interface. After all, in several areas of machinery and plant construction, the machine will be operated by different operators, who are working in the walkable safety environment. The Schmersal Group is tackling and will continue to tackle in the future.

Table of contents
- Command and signalling devices
- Safety bus systems
- Command devices with safety function
- Machine tools
- Packaging
- Elevators and escalators
- Application advice
- Machine safety

The Schmersal Group offers its customers comprehensive safety solutions in close cooperation with our customers, thus contributing to a safer world. Over 1,400 employees in more than 50 countries around the world are developing safety technology solutions.

The machine tool builder must become aware of the safety requirements and guidelines in high-productive processes. The Schmersal Group is constantly working on the development of new devices and systems for every imaginable application and requirement of the different industries. New safety concepts require new solutions. The Schmersal Group is developing and implementing these solutions for the entire machinery and plant construction, in accordance with the latest technical developments, in accordance with the latest technical developments.

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The Schmersal Group
185 years operating safety service.

www.schmersal.com
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Safety at the man-machine interface

configured. R series, complete operating panels can be conventional profile systems. By means of series, which can be directly installed onto for instance the operating panels of the BDF elements enabling an intuitive operation runsvation

Transparency during operation and obser-

Signal evaluation: the choice is up to the user

module increases the safety of the mainte-

developed with a larger actuator. Another ant of the AZM 200 solenoid interlock has been with safety guards with overlap, a special vari-

18,000 (safety) switchgear. Many of these signals.

PSC safety controller, whose modular structure versions as PROTECT-OEM. The PROTECT-
is simply activated by drag-and-drop. This in which the desired preconfigured programme

enterprises can rely on Schmersal for fast and usually are operating on a worldwide scale - players. This is inevitable, as their customers
collaboration with you.

Do you have special requirements with regard
to machinery safety? Do not hesitate to contact safety engineers by certified Safety Consult-

individual consultancy for machine builders and amongst other things, seminars in the Wup-
machine tools. The service portfolio includes,

Schmersal Group offers its customers com-

International presence

do not only embrace machinery manufacturers, but generally all types of enterprises engaged in machine manufacturing. To this end, Schmersal is present in more than 20 countries. Schmersal has a wide range of products and solutions that are suitable for many industries, from large to small. Schmersal is a major player in the international market and is committed to providing innovative and high-quality solutions for all types of machinery.
Safety at the man-machine interface

Safety by design. Schmersal is developing safety-related systems for decades in close collaboration with individual customers or upon request of the machine builder. For this purpose, a comprehensive range of products, from safety switches to safety monitoring and processing, has been developed. It is not only the function of safety components and systems that can be considered, but also the user-friendliness and ease of operation. Machines in the metalworking industry, e.g. turning, milling, and grinding, are increasingly complex with growing productivity requirements. The Schmersal Group develops powerful safety systems for the machine tool industry. This provides safety to your industry!

Solutions for complex safety cases

For special safety cases, the Schmersal Group has developed the PROTECT-OEM machine safety controller. Its modular structure allows it to be adapted to many different applications. The PROTECT-OEM controller is also available in customer-specific versions as PROTECT-SELECT compact safety controller, whose modular structure is simply activated by drag-and-drop. This makes it possible to use existing programme components and easily adapt different machine safety requirements. In addition, the PSC safety controller, whose modular structure is activated by drag-and-drop, allows an intuitive operation and configuration.

Solutions for simple safety cases

Solutions for simple safety cases are represented by the SRB 100 DR safety-monitoring system. These devices are used in hazardous areas of interlinked machine tools. The service portfolio includes, amongst other things, seminars in the Wuppertal Technical College training centre as well as the application centre of the Wuppertal Technical College. The Schmersal Group offers everything for safety engineering in the technical area.

Solutions for hazardous areas

For highly hazardous areas, such as safety guards with overlap, a special variant of the AZM 200 solenoid interlock has been developed with a larger actuator. Another example: the SRB 100 DR safety-monitoring system or the SRB 100 DR safety-monitoring system with integrated ASi Safety interface. The Schmersal Group offers a comprehensive programme of safety devices and systems for the entire machinery and plant construction for decades already. In many industries, special and additional requirements are applicable. The Schmersal Group has been tackling and will continue to tackle these challenges from the start. As a result, specific products and solutions were developed for many industries, amongst which the metal working industry, e.g. turning, milling, and grinding, is a highly crucial factor in determining the productivity and competitive advantages of a machine tool. As a result, the Schmersal Group develops powerful safety systems for the machine tool industry. This provides safety to your industry!

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Safety switch with separate actuator

Application: Safety switches with separate actuators are used in the entire production application and existing equipment.

Operational safety: They can also be used for fitting on profile sections, able safety guards, which need to be closed to ensure the necessary operational safety. They can also be used for monitoring the position of hinged, sliding and especially removable safety guards such as fences, flaps or doors, from being opened before hazardous or fail-safe standstill monitors, sliding, hinged and removable safety guards in conjunction with the control part of a machine, e.g. fail-safe delay times.

The solenoid interlocks of the AZM series have been designed to prevent, below the indicated code numbers. Detailed information about the products can be found at: www.schmersal.net

AZM 190 - Code number: C-04AZM1
AZM 415 - Code number: C-23AZM4
AZM 200 - Code number: C-24AZM2

Non-contact solenoid interlocks

Optionally with individual coding

Holding force of 500 - 3500 N

Versions with connector and cable

A wide range of accessories is available

Hygiene geprüft

BG-PRÜFZERT.

AZM 190 - Code number: C-04AZM1
AZM 415 - Code number: C-23AZM4
AZM 200 - Code number: C-24AZM2

S O

CCR

Safety switch with separate actuator

Application: The use of safety switches in switchgear advantage, in case where an enhanced flexibility.

The set of safety switches in switchgear advantage, in case where an enhanced flexibility.

System overview: The use of safety switches in switchgear advantage, in case where an enhanced flexibility.

Functionality: With or without safety function or non-contact sensors.

In accordance with the application and the requirements, the position switches with and without safety function or non-contact sensors.

Safety monitoring modules and safety controllers are used for the safe evaluation of switching signals. Possible signal generators are, for example, mechanical position switches, safety switches, solenoid interlocks and indicators. In accordance with the application and the requirements, the position switches with and without safety function or non-contact sensors.

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Safety systems:

- Safety switches with separate actuators
- Hinge safety switches
- Pull-wire emergency stop switches
- Emergency stop button
- Safety mats
- Safety edges
- Actuating elements for various applications

Application

- In accordance with the application and the requirements, the position sensors are used to monitor the status of system components, such as limits, stopping points or hazardous areas. Compared to the separating safety guards, grids and safety light curtains are used to protect access to hazardous areas or points or hazardous areas.

- The use of safety sensors is of particular advantage, in cases where e.g. run-on movements have to be stopped in the event of a failure of the drive system (fail-safe delay time). Spring-return/maintained joystick switches, pushbuttons, selectors and indicator lights

- As actuating elements for various applications, such as enabling switches, safety switches, solenoid interlocks of the AZM series have been designed to prevent, for example, the risk of injury or interfering with the material flow, hinge switches are often used on machinery, where no protection can be installed on the closing side. Safety sensors are also frequently used as sensors for monitoring the system state, having contactless, high-speed and high-resolution properties. Possible signal generators are, for example, mechanical position switches, safety switches, solenoid interlocks and optoelectronic sensors.

- The solenoid interlocks of the AZM series have been designed to prevent, e.g. run-on movements, in conjunction with the control part of a machine, e.g. fail-safe delay time. Depending on the device configuration and design, both small doors and service flaps as well as heavy hinged guards can be mounting- and maintenance-friendly secured in machinery and plant building.

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### Safety switch systems and control elements

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>C-12335</td>
<td>AZ 3350 - Code number: C-32AZ33</td>
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<tr>
<td>C-21SLC4</td>
<td>SLC 421 - Code number: C-21SLC4</td>
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<tr>
<td>C-22CSS1</td>
<td>CSS 180 - Code number: C-22CSS1</td>
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<tr>
<td>C-64TFH2</td>
<td>TFH 232 - Code number: C-64TFH2</td>
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<tr>
<td>C-57RSS3</td>
<td>RSS 36 - Code number: C-57RSS3</td>
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</tbody>
</table>

### Application

1. **Operational Safety**: They are suitable for installations in conjunction with the control part of a machine, e.g. fail-safe delay timers. They can also be used for fitting on profile sections as well as on hinges, flaps or doors.

2. **Material Handling**: Depending on the device configuration and design, both small doors and service flaps as well as heavy hinged guards can be mounted. Depending on the type of actuation of the safety switch, involving a risk of injury or interfering with the material flow, hinge switches are often used.

3. **Hygiene**: Safety switches are used in machinery and plant building. They are maintenance-friendly and have been certified for cleaning of the devices.

4. **New Developments**: New in the programme are the compact, modular control panels of the AZM series with connector and cable variants.

### Special Features

- **Holding Force**: Holding force of 500 - 3500 N
- **Life**: Long life
- **Enclosure**: Metal and thermoplastic enclosure
- **Contacts**: Up to 4 safety contacts
- **Coding**: Optionally with individual coding
- **Plastic and stainless steel enclosure
- **Insensitive to Soiling**: Inhygienic and extremely dirty conditions can occur. This is provided by the simplicity of installation and service.

### Additional Products

<table>
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<tr>
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<tr>
<td>C-32AZ33</td>
<td>AZM 415 - Code number: C-23AZM4</td>
</tr>
</tbody>
</table>

### Additional Notes

- **Applications**
  - Optoelectronic safety devices such as safety light barriers, safety light grids and safety light curtains are used to protect access to hazardous points or hazardous areas.
  - Compared to the separating safety guards, grids and safety light curtains are used where these do not interfere with the material flow.

- **Positioning and Limit Switching**
  - In accordance with the application and the requirements, the positioning or the limit switching can be realised either with mechanical position switches and switches or with non-contact sensors.

### Safety Monitoring Modules and Safety Controllers

- **Application**
  - In accordance with the application and the requirement, the position monitoring or the limit switching can be realised with mechanical position switches and switches or with non-contact sensors.

- **Hygiene Certified**: BG-PRÜFZERT.

### Additional Information

- **Maintenance**
  - Designed for easy maintenance in machinery and plant building.

- **Cleanliness**: Designed for easy cleaning in machinery and plant building.

- **Contact Elements**: Spring-return/maintained joystick switches, pushbuttons, selectors, thumb-levers, safety switches and actuating elements for various applications.

- **Protection Class**: Protection class up to IP69K

- **Standards**: IEC/EN 61496-1, -2

- **Data Sheet**: Detailed information about the products can be found at [www.schmersal.net](http://www.schmersal.net) below the indicated code numbers.
Safety switch with separate actuator

- Up to 5 safety contacts
- Versions with connector and cable
- Holding force of 500 - 3500 N
- Metal and thermoplastic enclosure
- Non-contact solenoid interlocks
- Positive linkage without cam
- Suitable for standard profile systems
- Protection class up to IP69K

Solenoid interlocks

- Options with individual coding
- Metal and thermoplastic enclosure
- Protection class up to IP69K
- With integrated logic circuit for monitoring and evaluation
- With coding and paired coding
- Plastic and stainless steel enclosure
- Insensitive to soiling
- Insensitive to transverse misalignment

Hygiene-tested according to BG-PRÜFZERT.

Safety light barriers range 4 - 15 m

- IEC/EN 61496-1, -2
- Versions with connector and cable
- Two-hand control panels
- Actuating elements for various applications
- Different designs

Safety bus systems

- Compact safety controllers
- Safety-monitoring modules
- Safety-monitoring modules and safety controllers

Optoelectronic safety devices

- Command devices are optical impellers for the non-contact line transmission of signals, which, in contrast to conventional devices, require no mechanical parting, no mechanical contact, no material handling and no actuating devices.
- Emergency stops, stop switches, on-off switches
- Light curtains, light barriers, light shields, light gaskets
- Optoelectronic proximity switches, photoelectric sensors, sensors and detection lights

Application

- Non-contact detection of objects provides outstanding advantages in machinery and process technology.
- Intrinsically safe devices or impulse switches are suitable for use in explosive gas atmospheres.
- Highly sensitive, multi-channel systems can be used for the remote monitoring of areas.
- Safety mats
- Safety sensors in application-specific modules, for example, for robots, forklifts or cranes.
Safety at the man-machine interface

Wherever man and machine must collaborate, safety at the man-machine interface is a high priority. Safety is a complex theme and requires a change in thinking from the manufacturers and users of machines. Motivated by the vision of a safe working environment, the Schmersal Group’s engineers are developing powerful safety systems for the machine tool industry. This provides safety to your industry!

The Schmersal Group

For many decades, the medium-sized, family-owned Schmersal has been a leading manufacturer of safety systems and solutions. The Schmersal Group has grown from a small manufacturer of safety switches and indicators in 1925 to a global company, which produces safety products for the protection of man and machine. Today, Schmersal has over 1,400 employees in more than 50 countries around the world and is one of the world’s largest range of safety systems and solutions for the protection of man and machine.

Schmersal has been the world’s leading manufacturer of safety systems and solutions for more than 50 years. We are operating on a worldwide scale – the Schmersal Group is represented in more than 20 countries. Our products have been developed in close cooperation with our customers, thus contributing to a safer world.

Over 1,400 employees in more than 50 countries around the world are developing safety technology solutions in close cooperation with our customers, thus contributing to a safer world.

The Schmersal Group manufactures a very wide variety of mechanical and non-contact switchgear has now become the manufactured in accordance with this principle for many decennia already.

High productivity

Machine tools accomplish diverse processes in the manufacturing process. Safety in any operating mode - ranging from a compact solenoid interlock for small safety guards to a three-point interlock for very large safety guards, interrupted the production process. This explains the above-average use of solely requirements - ranging from a compact solenoid interlock for small safety guards to a three-point interlock for very large safety guards. Safety devices installed on machinery however is unfortunately standard practice in one-third of accidents on machinery and plants occurs as a result of tampering with safety devices exclusively. The Schmersal Group develops powerful safety systems for the machine tool industry.

Interruptions of the production process are outside. Under the principle of safety in any operating mode, the core target is to avoid tampering. This can be done by considering existing machine tool manufacturers to develop powerful safety systems for the machine tool industry. This provides safety to your industry!

Core target: avoid tampering

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