

Packaging industry

Food and beverages



Safety systems for the food-processing industry

The basis: customer orientation from the start

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. In some industries, special and additional requirements are applicable. As a customer-focussed company, who intensively deals with the wishes of the manufacturers and users of machines, Schmersal has taken up these challenges from the start. As a result, specific products and solutions were developed for many industries and for some of them, a complete portfolio has been developed.

Various requirements

Harvesting, washing, drying, filleting, heating, shredding, mixing, filling, packing: the foodstuff production process has many process steps, which are generally taken over by machine automation. During these processes, the Machinery Safety directives and standards have to be observed. In addition to that, the foodstuff industry also has other fields of activity, which must be taken into account when selecting safety switchgear or command devices for the man-machine interface.



Hygiene

Hygiene is a key issue in the food-processing industry. Four hygienic zones can be distinguished, for which strictly defined constructive details of the "hygienic design" are applicable:

- Dry zone (non-contact area; protection against soiling required)
- Splashing zone (foodstuff can splash; the operators touch the foodstuff and the machines; risk of contamination or cross-contamination)
- Wet zone (high risk of bacterial contaminations; low-pressure cleaning with chemicals or hot cleaning)
- Aggressive zone (even higher risk of contamination; frequent hot steam cleaning or high-pressure cleaning with aggressive detergents)

The Hygienic Design also influences the choice of safety switchgear. For example: the food-processing industry was the first branch which used safety sensors instead of the conventional electromechanical safety switches. These non-contact operating safety switchgears can be smoothly cleaned due to the smooth surfaces of the sensor and the actuator and therefore provide for concealed mounting.

Humidity, moisture and detergents

Stringent hygienic standards are applicable to those components or periphery of food-processing machinery, which are in contact with the product; as a result, the safety switchgear and actuating elements must meet the highest requirements as their protection class is regarded. Many series therefore are IP69K. These switchgears must be able to withstand a water jet of at least 80 bar with a temperature of 80°C.

Temperature resistance

In frozen storage or in case of shock freezing - to name two examples - automated processes take place at temperatures below the freezing point. Even more frequent are the processes, for which high temperatures are inevitable, e.g. evaporation, homogenisation, drying, condensation, distillation. Switchgear, which are used for these processes, must be accordingly high- and low-temperature resistant.



Branch-specific certifications

The specific characteristics to be featured by machinery and plants destined to the food-processing industry are laid down in different regulations, which also concern the individual machinery and plant components and which are in part very demanding. This includes, amongst others, the following norms and certification to the following standards:

- EN 1672-1 and EN 1672-2
- Ecolab
- EHEDG
- FDA

Switchgear from Schmersal is approved and certified in accordance with this regulation depending on the requirements.

Long lifetime and availability

In food production, machinery and plants often operate with short cycles and in a three-shift operation in interlinked plants. The expected availability is accordingly high. Schmersal switchgear meet these requirements. They stand the test in various applications, even under unfavorable ambient conditions.

Explosion protection

Organic dusts can present an explosive danger if the dust/air ratio falls within explosive limits. Therefore, the regulations of the dust explosion directive must be observed e.g. when filling/bottling and storing powdered food products and their primary products (flour, baking mixtures, pudding powder, coffee and cocoa powder). The Schmersal Group offers a comprehensive range of switchgear for automation and machine safety, which is approved and certified to the ATEX and IECEx Directives.

Services

Machine safety is a complex theme. The Schmersal Group offers its customers comprehensive support for the implementation of standards and guidelines in high-productive machinery and plants. Included in the service portfolio are for example: seminars and the individual consultancy of the design engineers and safety engineers in more than 20 nations by certified Safety Consultants.

Branch-related knowledge on call

The Schmersal Group aims at establishing good contacts and exchanging experiences with food-processing machinery builders, so that new safety solutions are developed and the individual consultancy is provided with the highest level of practice-orientation. To that effect, Schmersal is, amongst others, member of the "Packaging Excellence Centre" (PEC) in Waiblingen. This Centre of Competence for packaging and automation technology reuniting many companies manufacturing machinery and plants for the food packaging industry.



Safety guard monitoring

AZM 300 - Solenoid interlock



- Intelligent door monitoring with a high level of protection against manipulation as per ISO14119
- Symmetrical mounting for right- and left-hinged doors
- Three actuating directions so that there is only one version for rotating and sliding guards
- Protection class IP69K
- High tolerance to door misalignment
- Clamping force 1000 N, switchable latching force (25 N / 50 N)
- PL e / Cat.4 as per EN ISO 13849-1 / SIL 3 as per IEC 61508
- Series-wiring with up to 31 devices without reduction of the safety level
- More than 30,000 different codings
- Serial diagnostic
- Power to lock or power to unlock
- Actuator or solenoid interlock monitoring
- Planned with integrated AS-Interface
- Emergency release-N for use outside the hazardous area
- Emergency-T exit for use within the hazardous area

Code number: C-96AZM3



¹⁾ under preparation

MZM 100B – Safety sensor with solenoid interlock



- Unique active principle for solenoid interlocks (for personal protection functions)
- 40 mm x 179 mm x 40 mm
- Fine-adjustment through slotted holes
- Can be used as an end stop
- Clamping force 750 N (typical) / 500 N (guaranteed)
- Variably adjustable latching
- Contact-free, coded electronic system
- Sensor technology permits an offset between actuator and interlock of ± 5 mm vertically and ± 3 mm horizontally
- Intelligent diagnosis
- Self-monitoring possible with up to 31 devices
- Power to lock
- Actuator or solenoid interlock monitoring
- Optionally with integrated AS interface
- Protection class IP67

Code number: C-91MZM1



AZM 200 – Electronic solenoid interlocks



- Clamping force 2000 N, latching force 30 N
- Thermoplastic enclosure
- Sensor technology permits an offset of ± 5 mm between actuator and interlock
- Contact-free, coded electronic system
- Self-monitoring possible with up to 31 devices max. length of the sensor chain 200 m
- Intelligent diagnosis
- PL e / Cat.4 as per EN ISO 13849-1 / SIL 3 as per IEC 61508
- Optional manual release
- Protection class IP67
- Optionally with integrated AS interface

Code number: C-24AZM2



Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

RSS 16 – Safety sensor



Code number: C-52RSS1

- Encoding level "high" according to ISO 14119 with an individual RFID code
- Three encoding options for demand-protection against manipulation
- Three directions of actuation for sliding and rotating doors
- Door stop with magnetic latching function, latching force 40 / 60 N
- Latching space and connector
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508



RSS 36 – Safety sensor



Code number: C-84RSS3

- Encoding level "high" according to ISO 14119 with an individual RFID code
- Intelligent non-contact door monitoring with a high level of protection against manipulation
- Electronic safety-sensor
- Repeated universal or individual coding
- High tolerance to horizontal and vertical misalignment with pre-indication in hysteresis area
- Optionally with integrated magnetic latching
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP69K
- With optional integrated AS interface



RSS 260 – Safety sensor



Code number: C-52RSS2

- Intelligent non-contact door monitoring with a high level of protection against manipulation
- Encoding level "high" according to ISO 14119 with an individual RFID code
- Three encoding options for demand-protection against manipulation
- Compact design and subtle, elegant design
- Easy installation without additional angles
- Universal application through different targets for typical installation situations
- Preservation of safety levels and diagnostic capability even when connected in series
- With optional integrated AS interface
- Three different actuators available



Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Safety guard monitoring

CSS 30S – Safety sensor



- Rugged stainless steel housing 1.4404, M30
- Two short-circuit proof PNP safety outputs (24 VDC, 250 mA each)
- up to 31 safety sensors can be wired in series, self-monitoring
- integrated cross-wire short and external voltage monitoring of the safety outputs
- Integrated connector M12, 8-pin
- Protection class IP69K
- Concealed mounting behind stainless steel possible
- PL e / Cat.4 as per EN ISO 13849-1 / SIL 3 as per IEC 61508
- Extensive serial diagnostic functions

Code number: C-09CSS3



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BNS 40S – Safety sensor



- Stainless steel enclosure
- with coding
- Rectangular design
- long life, no mechanical wear
- Protection class IP69K
- Insensitive to transverse misalignment
- Concealed mounting behind stainless steel possible
- Insensitive to soiling
- Connecting cable suitable for the food-processing industry
- Ex-version

Code number: C-15BNS4



RM40S – Magnetic stopper for ease of cleaning



- Door hinge with magnetic latching 25 N / 35 N / 60 N
- Housing completely enclosed in stainless steel
- Different directions of actuation
- Easy to clean and is rugged
- Rear sided thread M4 or through holes
- Ideal accessory for BNS 40S

Code number: RM40S

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

PS 116 – Position switches



Code number: PS116

- Compact metal and thermoplastic enclosure
- Connecting cable or connector plug M12, on the side / below
- Different easily replaceable actuators, adjustable in 15° steps
- Actuator element in 8 x 45° can be implemented
- Protection class IP66, IP67
- Slow action 1 NO contact / 2 NC contacts



TESK – Hinge safety switch



Code number: C-28TESK

- Freely adjustable switching angle or preset
- Large swivel angle of 270°
- Optimised for profile system
- With long hinge halves special for combining with plastic doors
- With up to 4 contacts
- Metal enclosure
- Connecting cable or connector plug M12, on the side / below



BDF 200 – Universal Control Panel



Code number: C-62BDF2

Emergency stop and 3 command and signalling devices

- Control panel with emergency stop function and 3 mounting positions for command and signalling devices
- Large range of illuminated pushbuttons, selector switches, LED indicators, key-operated switches, emergency stop buttons
- Emergency-stop, start/stop and reset functions available
- Optional integrated AS-Interface
- Optionally highly-visible indicator lamp G24 (red / green) optional
- EMERGENCY STOP suitable for applications
 - up to PL d / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP65
- Dimensions: 40 mm x 244 mm x 50 mm



Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

SLC/SLG 420/440/445 – Safety light curtains and safety light grids



Code number: SLC or SLG

- Can be adapted to any application due to the functional diversity in one version: Muting, cyclic operation, object muting, dual acknowledgment
- Parameterisation with a single button, without external aids (PC / software)
- The closed sensor profile offers an optimal protection under extreme mechanical loads.
- Set-up assistance and integrated large status and diagnostic display (end cap), resulting in reduced mounting work and reduced costs
- Due to the integrated functions, no external switchgear is required.
- High protection class IP67, IP69K
- Optional integrated AS-I Safety at Work interface
- Resolution 14 ... 30 mm
- Range 0.3 ... 20 m
- Area protection with up to 4 emitters
- Suitable for applications in PL e / SIL 3



LED-CleanSIGN signal column



Code number: C-49CLEA

- Ease of cleaning and disinfection by easy-to-clean and hygiene-compliant design
- Use of food-safe, detergent-resistant material (approval to FDA)
- EHEDG and Fraunhofer IPA approval
- Protection class IP67 and IP69K
- Complies with air cleanliness class 2 to DIN EN ISO 14644
- Maintenance-free through LED technology with long lifetime of up to 50,000 hours
- Pine Tree Clip® (fastener) enables quick and smooth assembly
- Easy assembly and wiring
- Electronic modularity of the individual stages
- Integrated buzzer



WDG 58V – Encoder



Code number: C-54WDG5

- Incremental shaft encoder
- Extremely robust execution suitable for high bearing loads up to 100N
- Stainless steel execution 1.4401 (V4A)
- EHEDG: Approved hygiene-compliant construction/design (Hygienic Design)
- Ecolab: Certificate regarding the resistance to detergents and disinfectants
- Up to 25 000 pulses
- Protection class IP67 and IP69K
- Radial shaft seal without dead zones (PTFE)
- Full connection protection at 10 ... 30 VDC
- optional: -40 °C ... +80 °C



Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Command and signalling devices

Hygiene-compliant control devices and indicator lights range N



- Special sealing measures prevent the ingress of dirt into the gaps and aids in thorough cleaning of the operating and display elements
- Suitable for low voltage $\geq 5\text{ V} / 3.2\text{ mA}$.
- Mounting holes 22.3 mm, with adapter 30.5 mm
- Protection class IP65, IP69K
- Pushbutton, short stroke button
- Mushroom button, illuminated signal, illuminated button with LEDs
- Selector switch with 2 and 3 positions and short and long knob
- Emergency-stop command device with mechanical latching function
- Lockable mounting frame for maintained selector switch
- Screw terminals, blade terminal, cage clamp terminals or PCB connection
- Potentiometer drive



Emergency stop command device $\varnothing 50\text{ mm}$



- As per IEC 60947-5-5, EN ISO 13850
- With optional protective cover V4A
- Bellows: white, black, blue

Code number: C-43NDRR

Illuminated pushbutton

Mushroom head impact button/
Emergency stop pushbutton $\varnothing 50\text{ mm}$



- Bellows: white, black, blue
- Different colours available

Code number: C-75NDPP

Illuminated signal

Maintained selector switches /
spring-return selector switches



- Optional short or long knob
- Colours: white, grey or black

Code number: C-75NWSW / C-95NWTT

3 colour LED



- High luminosity due to integrated multi-LED
- Different colours available
- Bellows: white, black, blue

Code number: C-13NDLL



- "Super-bright" LED in integrated device head
- Different colours available
- Surface or high collar

Code number: C-44NME4 / C-74NML7



- LED illumination element red, green, yellow in one device
- Colours can be controlled separately

Code number: ELDE.N-RD-GN-YE

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Command and signalling devices

NDLP30 Ø 30 mm Illuminated pushbutton



- Mushroom pushbutton with improved ergonomics
- With and without illumination
- Bellows: white, black, blue

Code number: C-73NDLP

Step selector switch



- 3 to 12 switch positions
- One NO contact per stage
- IP69K

Code number: C-47NWSE

Potentiometer drive



- To accommodate standard potentiometers
- IP69K

Code number: C-82NDAN

NBG Assembly housing



- Stainless steel enclosure V4A
- Protection class IP67, IP69K
- Optionally available as ex-version

Code number: C-51NBG1

WKT... / MKT... /WKS... / MKS...



- 2 - 4 actuating directions
- Various contact functions
- Solvent- and chemical resistant

Code number: C-18WKT / C-47WKS

Mounting flange with position switch



- Position switch with 1 to 2 safety contacts
- Protection class IP67 behind the front panel

Code number: EFMH/SEK103

Main switch 3 pin



- Versions 40A and 63A
- With red or black toggle
- Quadratic V4A mounting plate

Code number: NHSNH63

Main switch 2 / 4 pin



- Versions 16A
- With red or black toggle
- V4A mounting plate 70 x 80 mm, Ø100

Code number: NHS16/2

Accessories: Emergency stop protective collar



- Bracket material 1 4550, stainless steel plate V4A powder-coated

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Safe signal processing

Safety monitoring PROTECT SRB-E...



Code number: SRB-E

- User friendly
 - Multi-functional evaluation switches
 - Up to 11 different freely adjustable applications
 - Connection for all standard safety switching devices up to PL e as per EN ISO 13849-1
 - Wear-free switching via safe semiconductor outputs
 - Very short on-demand response times 10 ms
 - Easy adjustment via rotary switch
 - Intelligent diagnostic and status messages via LED displays
 - Pluggable connection technology
- Powerful versions
 - Up to 5 safety outputs (relay technology / semiconductor technology)
 - Input extension for monitoring 4 safety relays (up to PL e)
 - Relay module can be cascaded via the safety inputs
 - Two safety functions each with 2 safety outputs
 - Powerful p-type safe semiconductor outputs up to 5.5 A



PROTECT SELECT



Code number: C-09PROT

- User friendly
 - Simple and flexible parameterisation
 - Multilingual menu navigation via colour display
 - Error and status messages in plain text
- Compact
 - Replaces up to 8 safety relays up to PL e / SIL 3
 - Compact safety technology in the 52 mm housing
 - 18 safe inputs for redundant query of all common safety sensors such as emergency stop, light curtains, safety switches, safety mat, etc.
 - 4 safe semiconductor outputs
 - 2 safe relay outputs
 - 4 optional signaling outputs
- Customer specific programs



PROTECT PSC1



Code number: C-82PROT

- Safe type-tested logic control according to Annex IV of the Machinery Directive 2006/42/EC
- Connection for all standard safety relays up to PL e as per EN ISO 13849-1
- Modular expansion with up to 272 inputs / outputs
- Secure 2A double p-type semiconductor outputs, switchable to secure p- / n-switching semiconductor outputs
- Freely programmable inputs / outputs
- Safe axis monitoring according to EN 61800-5-2 (SDM - Safe Drive Monitoring) for up to 12 axes
- Universal communication module:
 - Supports the standard field bus systems including the safety protocols
 - Setting and resetting the field bus protocols by software
 - Activation of the safety protocols is done via Safety Protocol Card
 - Safety Remote IO's
 - Safe cross-communication
- Schmersal SD-Bus-Interface integrated



Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers



The Schmersal Group

The privately-owned Schmersal Group has been developing and manufacturing products to enhance the safety at work for decades. The company was founded in 1945 and is represented by seven manufacturing sites on three continents and with its own companies and sales partners in more than 60 nations. In the demanding field of machine safety, the Schmersal Group is one of the international market and competence leaders. Based on a comprehensive product range, the company's approximately 2000 employees develop and design complete solutions for the safety of man and machine.

Customers of the Schmersal Group include „global players“ from mechanical engineering and plant manufacturing and machine users. They benefit from the comprehensive know-how of the company when it comes to the standard-compliant integration of safety technology in the production processes. Furthermore, Schmersal has special sector expertise in the application fields that demand high quality and special characteristics from safety switching systems. These include food production, the packaging industry, machine tool construction, lift engineering, heavy industry and the automotive industry.

Against the backdrop of increasing numbers of standards and directives, tec.nicum offers a comprehensive range of safety services as part of the Schmersal Group services division: Certified functional safety engineers advise customers on selecting suitable safety equipment, CE compliance assessments and risk assessment, on a world-wide basis.

Product ranges



Safe switching and monitoring

- Guard door monitoring (Safety switches)
- Command devices with safety function
- Tactile safety devices
- Optoelectronic safety devices

Safe signal processing

- Safety relay components
- Safety controllers
- Safety bus systems

Automation

- Position detection
- Command and signalling devices

Industries



- Elevators and Escalators
- Packaging
- Food
- Automotive
- Machine tools
- Heavy industry

Services



- Application support
- CE conformity assessment
- Risk assessment
- Upgrading / Retrofit
- Technical planning and implementation
- Training courses

Competences



- Machine safety
- Automation
- Explosion protection
- Hygienic design

www.schmersal.com



Precautions have been taken to assure accuracy of the information in this catalogue. Typographic or pictorial errors that are brought to our attention will be corrected in subsequent issues.