Packaging industry

Food and beverages

SCHMERSAL

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. An 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 easily cleaned due to the smooth surfaces of the sensor and the actuator and also 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 high and low temperature resistent.

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 topic. 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 ISO 14119
- 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 IP69
- High tolerance to door misalignment
- Clamping force 1,150 N, switchable latching force (25 N / 50 N)
- PL e / Cat. 4 to ISO 13849-1 / SIL 3 to 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
- With integrated AS-Interface, AS-i Power, AUX Power
- Emergency release-N for use outside the hazardous area
- Emergency-T exit for use within the hazardous area

Code number: C-96AZM3

MZM 100 – 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
- Locking force 750 N (typically) / 500 N (guaranteed), continuously monitored
- 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 201 – Solenoid interlock

- Clamping force 2000 N, latching force 30 N
- Thermoplastic enclosure
- Sensor technology permits an offset of ± 5 mm between actuator and interlock
- Non-contact, coded electronic RFID system, coding HIGH
- Self-monitoring series-wiring with up to 31 devices, max. length of the sensor chain 200 m
- Intelligent diagnosis
- PL e / Cat. 4 to ISO 13849-1 / SIL 3 to IEC 61508
- Optionally with emergency exit or emergency release
- Protection class IP67
- Optionally with integrated AS interface
- Suitable for hinged and sliding guards
- 100% drop-in replacement for predecessor model AZM200

Code number: C-24AZM2

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

RSS16 – Safety sensor

- Coding level "high" in accordance with ISO 14119 with an individual RFID code
- Three encoding options for demand-protection against manipulation
- Three directions of actuation for sliding and rotating doors
- Optionally with 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
- Optional for areas at risk of explosion
  - IECEx, ATEX
  - Category 3D and 3G
  - Ex tc (dust), Ex ec (gas)

Code number: C-52RSS1

RSS 36 – Safety sensor

- Coding level "high" in accordance with 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 ISO 13849-1
  - and SIL 3 to IEC 61508
- Protection class IP69
- With optional integrated AS interface

Code number: C-84RSS3

RSS260 – Safety sensor

- Intelligent non-contact door monitoring with a high level of protection against manipulation
- Coding level "high" in accordance with 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

Code number: C-52RSS2

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

CSS 30S – Safety sensor

- Rugged stainless steel housing 1.4404, M30
- 2 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 IP69
- Concealed mounting behind stainless steel possible
- PL e / Cat. 4 to ISO 13849-1 / SIL 3 to IEC 61508
- Extensive serial diagnostic functions

Code number: C-09CSS3

BNS 40S – Safety sensor

- Stainless steel enclosure
- With coding
- Rectangular design
- Long life, no mechanical wear
- Protection class IP69
- 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

PS116 – Position switch family

- Series PS116, PS2xx and PS3xx
- 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 / 1 NC contact
- Redundant switch-off with positive break normally-closed contacts with additional signaling contact

Code number: PS116

TESK – Hinge safety switch

- 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

Code number: C-28TESK

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BDF 200 – Universal Control Panel

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 an reset functions available
- Optional integrated AS-Interface, AS-i Power
- Optionally highly-visible indicator lamp G24 (red / green) optional
- EMERGENCY STOP suitable for applications
  - Up to PL e/category 4 in accordance with EN ISO 13849-1
  - In SIL 3 in accordance with IEC 61508
- Protection class IP65
- Dimensions: 40 mm x 244 mm x 50 mm
- Optionally with electronic EMERGENCY STOP function with OSSD
- Plug and play solution for connection to the safety fieldbox

Code number: C-62BDF2

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

SLC/SLG 440/440COM – Safety light curtains Type 4 with protective enclosure SH/PH

Code number: Protective enclosure

- High protection class IP69, 2-part O-ring seal
- Hygienic design
  – End caps, mounting and membrane made of stainless steel V4A
- Break and shock-resistant protective tube made of polycarbonate
- Connection with M12x1 4-pin or 8-pin, cable length 10 m
- Beam blanking device for fixed and moving objects
- User-friendly parameter setting, no tools required
- Process reliability with daily cleaning
- Integrated set-up tool
- Optional integrated AS-i Safety at Work interface
- Resolution 14 mm … 30 mm
- Range 0.3 m … 20 m
- Area protection with up to 4 emitters
- Suitable for applications in PL e / SIL 3

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

Code number: SLC and SLG

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

SLB240/440 – Safety light barriers

GIT SICHERHEIT AWARD 2018 WINNER

Code number: SLB

- SLB240
  - Range 15 m
  - Coding adjustable without aids/PC
  - Suitable for applications to cat. 2/PL c/SIL 1
  - Protection class IP67, ambient temperature –30 C to +50 C
  - W x D x H: 28 x 33 x 72/91 mm
  - Integrated evaluation, status and diagnostic display

- SLB440-H
  - Range 75 m
  - Coding adjustable without aids/PC
  - Suitable for applications to cat. 4/PL e/SIL 3
  - Protection class IP67, ambient temperature –30 C to +50 C
  - W x D x H: 28 x 33 x 72/91 mm
  - Integrated evaluation, status and diagnostic display
  - Optional heater for low temperature ranges

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

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 ≥ 5 V / 3.2 mA.
- Mounting holes 22.3 mm, with adapter 30.5 mm
- Protection class IP67, IP69
- 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 Ø 50 mm

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

Code number: C-43NDRR

Mushroom head impact button/ Mushroom push button Ø 50 mm

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

Code number: C-75NDPP

Maintained selector switches / spring-return selector switches

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

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

Illuminated pushbutton

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

Code number: C-13NDLL

Illuminated signal

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

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

3 colour LED

- 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
- IP69

Code number: C-47NWSE

Potentiometer drive

- To accommodate standard potentiometers
- IP69

Code number: C-82NDAN

NBG Assembly housing

- Stainless steel enclosure V4A
- Protection class IP69
- Optionally available as ex-version

Code number: C-51NBG1

Mounting flange with position switch

- PS116 + PS2xx in conjunction with device heads of series N and E
- Specially for emergency stop impact buttons – Protection class IP69 in front of the front panel and IP67 behind the front panel

Code number: EFMH/SEK103

Joystick switches NK/RK

- 2 - 4 actuating directions
- NK: Food industry, hygienic
  RK: Outdoor area, plant technology
- IP67, IP69 in front of front panel
- Temperature range from –40 °C to +80 °C

Code number: NK-T

Main switch 3 pin

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

Code number: NHSNH63

Accessories: Emergency stop protective collar

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

Code number: NHS16/2

Main switch 2 / 4 pin

- 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-...

- User-friendly
  - Multi-functional evaluation switches
  - Up to 11 different freely adjustable applications
  - Connection for all standard safety switching devices up to PL e in accordance with 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

Code number: SRB-E

PROTECT SELECT

- 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 grids, safety switches, safety mats, etc.
  - 4 safe semiconductor outputs
  - 2 safe relay outputs
  - 4 optional signaling outputs
- Customer specific programs

Code number: C-09PROT

PROTECT PSC1

- Safe type-tested logic control according to Annex IV of the Machinery Directive 2006/42/EC
- Connection for all standard safety switching devices up to PL e in accordance with ISO 13849-1
- Modular expansion with up to 272 inputs / outputs
- Safe 2A double p-type semiconductor outputs, switchable to safe p- / n-switching semiconductor outputs
- Freely programmable inputs / outputs
- Safe drive monitoring according to EN 61800-5-2 (SDM – Safe Drive Monitoring) for up to 12 axes
- Universal communication module:
  - Supports standard field bus systems including the safety protocols
  - Setting and resetting of field bus protocols by software
  - Safety Remote IOs
  - Safe cross-communication
- Schmersal SD-Bus-Interface integrated

Code number: C-82PROT

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

The Schmersal Group

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 countries.

Customers of the Schmersal Group include global players from the area of mechanical engineering and plant manufacturing as well as operators of machinery. They profit from the company's extensive expertise as a provider of systems and solutions for machine safety. Furthermore, Schmersal specialises in various areas including food & beverage, packaging, machine tools, lift switchgear, heavy industry and automotive.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they design and realise complex solutions for safety around the world in close collaboration with the clients.

Safety Products

- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

Safety Systems

- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

Safety Services

- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation

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