# 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 highand 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 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.





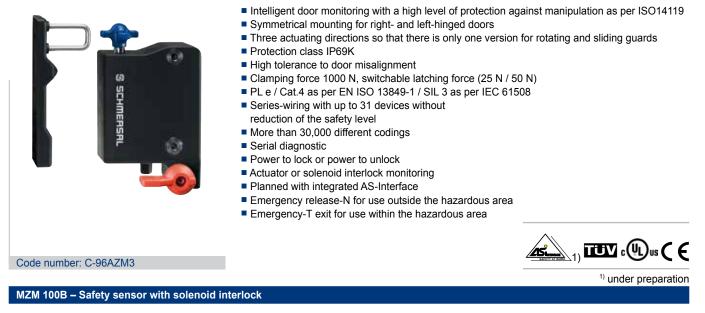






# Safety guard monitoring

### AZM 300 - Solenoid interlock



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



S SCHMERSAL

## RSS 16 – Safety sensor





IMERSAL



- 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

- and SIL 3 to IEC 61508

- up to PL e / category 4 to EN ISO 13849-1





# Code number: C-52RSS1 RSS 36 – Safety sensor

	<ul> <li>Encoding level "high" according to ISO 14119 with an individual RFID code</li> <li>Intelligent non-contact door monitoring with a high level of protection against manipulation</li> <li>Electronic safety-sensor</li> <li>Repeated universal or individual coding</li> <li>High tolerance to horizontal and vertical misalignment with pre-indication in hysteresis area</li> <li>Optionally with integrated magnetic latching</li> <li>Suitable for applications <ul> <li>up to PL e / category 4 to EN ISO 13849-1</li> <li>and SIL 3 to IEC 61508</li> </ul> </li> <li>Protection class IP69K</li> <li>With optional integrated AS interface</li> </ul>
Code number: C-84RSS3	

RSS 260 – Safety sensor

Code number: C-52RSS2



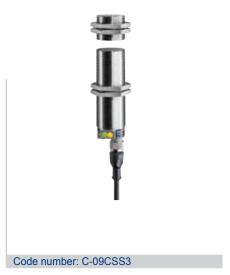
Intelligent non-contact door monitoring with a high level of protection against manipulation

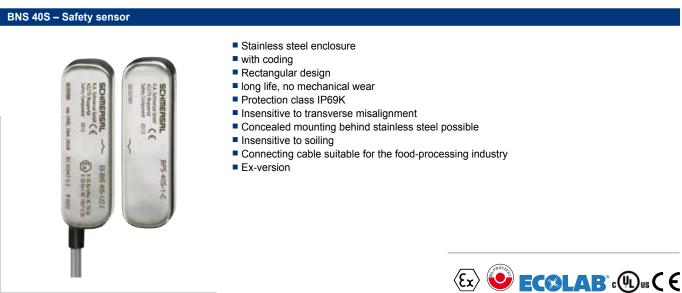
- Encoding level "high" according to ISO 14119 with an individual RFID code
- Three encoding options for demand-protection against manipulation
- Compact design and subtle, elegant design
- Easy installation without additional angles
- Universal application through different targets for typical installation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



# Safety guard monitoring

### CSS 30S – Safety sensor





Rugged stainless steel housing 1.4404, M30

Concealed mounting behind stainless steel possible
 PL e / Cat.4 as per EN ISO 13849-1 / SIL 3 as per IEC 61508

Integrated connector M12, 8-pinProtection class IP69K

Extensive serial diagnostic functions

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

**SCHMERSAL** 

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

# PS 116 – Position switches

- 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

	<ul> <li>Freely adjustable switching angle or preset</li> <li>Large swivel angle of 270°</li> <li>Optimised for profile system</li> <li>With long hinge halves special for combining with plastic doors</li> <li>With up to 4 contacts</li> <li>Metal enclosure</li> <li>Connecting cable or connector plug M12, on the side / below</li> </ul>
Code number: C-28TESK	

### BDF 200 – Universal Control Panel



#### Emergency stop and 3 command and signalling devices

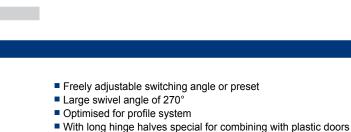
- Control panel with emergency stop function and 3 mounting positions for command and signalling devices
- Large range of illuminated pushbuttons, selector switches, LED indicators, key-operated switches, emergency stop buttons
- Emergency-stop, start/stop an reset functions available
- Optional integrated AS-Interface
- 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



Code number: C-62BDF2

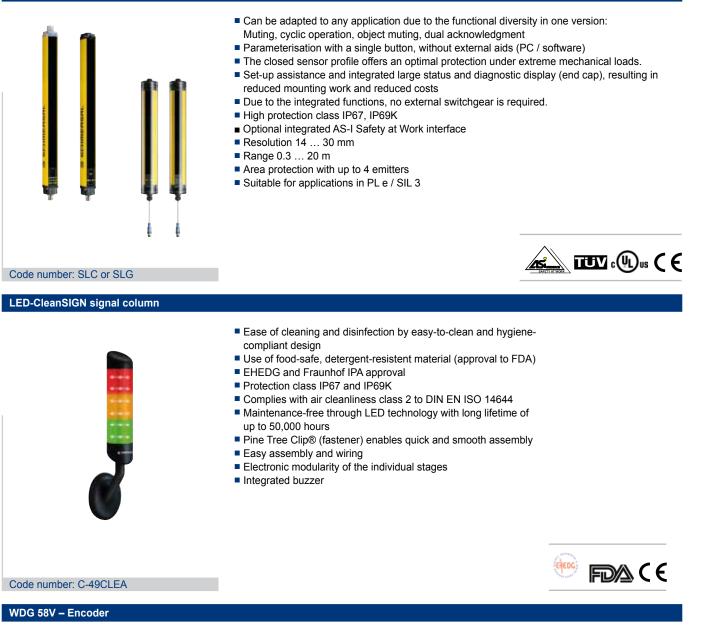






# Security/Automation

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





- 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



**SCHMERSAL** 

Code number: C-54WDG5

# 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 ≥ 5 V / 3.2 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 Ø 50 mm

Mushroom head impact button/ Emergency stop pushbutton Ø 50 mm Maintained selector switches / spring-return selector switches



Illuminated pushbutton



Bellows: white, black, blueDifferent colours available

#### Code number: C-75NDPP

### Illuminated signal



- Optional short or long knob
   Colourse white stress on block
- Colours: white, grey or black

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

3 colour LED



# Command and signalling devices

NDLP30 Ø 30 mm Illuminated pushbutton

Step selector switch

Potentiometer drive



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

Code number: C-73NDLP

**NBG Assembly housing** 



- 3 to 12 switch positions
  One NO contact per stage
  IP69K
- IP09K

Code number: C-47NWSE

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



- To accommodate standard potentiometers
- . IP69K

Code number: C-82NDAN

### Mounting flange with position switch



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

Code number: C-51NBG1

#### Main switch 3 pin



- 2 4 actuating directionsVarious contact functions
- Solvent-and chemical resistant

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

### Main switch 2 / 4 pin



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

Code number: EFMH/SEK103

Accessories: Emergency stop protective collar





# Safe signal processing

# Safety monitoring PROTECT SRB-E-...



- 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



# 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 curtains, safety switches, safety mat, etc.
- 4 safe semiconductor outputs
- 2 safe rely 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 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







# **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 word-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



- Elevators and Escalators
- Packaging
- Food

Industries

- Automotive
- Machine tools
- Heavy industry



# Application support

- CE conformity assessment
- Risk assessment
- Upgrading / Retrofit

Services

- 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.

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