

GENERAL PRODUCT INTRODUCTION

K.A. Schmersal GmbH & Co. KG



SCHMERSAL
THE DNA OF SAFETY

OVERVIEW OF THE PRODUCT RANGES

SAFETY ENGINEERING



Safety switches



Solenoid interlocks



Safety sensors



Pull-wire emergency stop switches



Control panels



Safety light barriers, light grids and light curtains



Two-hand control panels



Safety-related tactile sensor



Safe signal processing

AUTOMATION TECHNOLOGY



Command and signalling devices



Maintained joystick switches



Inductive proximity switches



Position switches



Slack-wire switch



Micro switches



Assembly housing

EXPLOSION PROTECTION



Explosion protection

SAFETY TECHNOLOGY



SAFETY SWITCHES



SAFETY SWITCHES



Safety switch with separate actuator

- Monitoring of doors and flaps
- Also for removable guards
- Safety due to positive opening contacts
- Electromechanical operating principle



SAFETY SWITCHES

PRODUCT OVERVIEW (EXCERPT)



AZ16

- Proven technology
- 4 actuator openings
- Variant with individually coded actuator



AZ17

- Small design
- 2 contacts
- Variant with individually coded actuator



AZ201

- Door handle actuator for intuitive operation
- For 40 mm profiles
- Tamper protection through RFID technology



AZ415

- Robust design
- Metal housing
- Adjustable ball detent up to 400 N
- Up to 6 contacts



SAFETY SWITCHES

APPLICATION EXAMPLES



SOLENOID INTERLOCKS



SOLENOID INTERLOCKS



Solenoid interlock with separate actuator

- Actuator is held in the guard locking position by a locking pin
- A door can only be opened after it has been enabled
- The guard locking function is safely monitored
- Personal and process protection
- Different operating principles
 - Electromechanical
 - Electronic
 - bi-stable
 - electromagnetic



SOLENOID INTERLOCKS

PRODUCT OVERVIEW OF ELECTRONIC SOLENOID INTERLOCKS



AZM40

- Compact, flat design
- Bistable guard locking principle
- 180° angle flexibility of the actuator
- Holding force 2,000 N



AZM201

- Door handle actuator for intuitive operation
- For 40 mm profiles
- Tamper protection through RFID technology
- Holding force 2,000 N



AZM300

- 3 operating directions
- Hygienic design
- Tamper protection through RFID technology
- Holding force 1,150 N



AZM400

- Bistable guard locking principle
- Two-channel input signal of the guard locking function
- Unlocking against lateral force up to 300 N
- Holding force 10,000 N



MZM100

- Electromagnetic operating principle
- For personal protection tasks
- Automatic latching
- Holding force 750 N



SOLENOID INTERLOCKS

PRODUCT OVERVIEW OF ELECTROMECHANICAL SOLENOID INTERLOCKS



AZM150

- 8 approach levels thanks to rotating head
- For 40 mm profiles
- Individually coded variants
- Holding force 1,500 N



AZM161

- Fail-safe guard locking
- Auxiliary/escape release or emergency release
- Individually coded variants
- Holding force 2,000 N



AZM170

- Compact design
- Fail-safe guard locking
- Individually coded variants
- Holding force 1,000 N



AZM415

- Robust design
- Metal housing
- Adjustable ball detent up to 400 N
- Holding force 3,500 N



SOLENOID INTERLOCKS APPLICATION EXAMPLES



SOLENOID INTERLOCKS

APPLICATION EXAMPLE - AZM40 VARIABLE MOUNTING OPTIONS

AZM 40
Variable installation option



SOLENOID INTERLOCKS

APPLICATION EXAMPLE – AZM300 VARIABLE MOUNTING OPTIONS

AZM 300
Variable installation option



SAFETY SENSORS



SAFETY SENSORS



Non-contact and wear-free

- Position monitoring of laterally displaceable, rotatable or removable guards
- Insensitive to lateral displacement and contamination
- Integral cross-short, wire-breakage and external voltage monitoring of the safety cables up to the control cabinet
- High repeat accuracy of the switching points
- Different operating principles:
 - RFID (radio-frequency identification)
 - CSS (inductive pulse-echo method)
 - Magnetic



SAFETY SENSORS

PRODUCT OVERVIEW SAFETY SENSORS WITH RFID TECHNOLOGY



RSS16

- Individually coded actuators
- Same design as AZ16
- With and without magnetic detent



RSS36

- Misaligned actuation possible
- Actuator offset monitoring
- With and without magnetic detent



RSS260

- Particularly small design
- Frontal and lateral actuation possible
- Up to 31 sensors can be connected in series



SAFETY SENSORS

PRODUCT OVERVIEW SAFETY SENSORS WITH PULSE-ECHO TECHNOLOGY



CSS34

- Misaligned actuation possible
- Intelligent diagnosis
- Up to 31 sensors can be connected in series



CSS30

- Metal housing
- High repeat accuracy of the switching points
- Integrated cross-circuit, wire breakage, external voltage monitoring



CSS180

- Misaligned actuation possible
- Early warning when operating near the limit of the sensor's hysteresis range
- Self-monitoring series-wiring of 16 sensors



CSS300

- Safety sensor can also be installed behind V4A covers
- Max. Sensor chain length 200 m
- Up to 31 sensors can be connected in series



SAFETY SENSORS

PRODUCT OVERVIEW SAFETY SENSORS WITH MAGNETIC OPERATING PRINCIPLE



BNS16

- Concealed mounting possible
- Coded reed contact
- Insensitive to soiling



BNS33

- Insensitive to transverse misalignment
- No mechanical wear
- Insensitive to soiling



BNS40S

- Suitable for food industry
- Stainless steel enclosure
- Variant with LED design



BNS180

- Compact design
- Large switching distance



PULL-WIRE EMERGENCY STOP SWITCHES



PULL-WIRE EMERGENCY STOP SWITCHES



ZQ700

- Wire length up to 10 m
- Thermoplastic enclosure
- One-side operation
- Also as pull-wire switch
- Wire pull and breakage detection



ZQ900

- Wire length up to 75 m
- Metal enclosure
- One-side operation
- Release push button
- Wire pull and breakage detection



RS655

- Wire length up to 2 x 100 m
- Metal enclosure
- Two-side mode of operation
- Wire pull and breakage detection



RS656

- Wire length up to 2 x 100 m
- Thermoplastic enclosure
- Two-side mode of operation
- Wire pull and breakage detection



CONTROL PANELS



CONTROL PANELS



BDF100-NH

- EMERGENCY STOP function with and without protective collar



BDF100

- Large product portfolio of operating and lighting elements



BDF200-NH

- With EMERGENCY STOP and 3 operating elements
- Large product portfolio of operating and lighting elements



BDF200

- With 4 operating elements
- Large product portfolio of operating and lighting elements



SAFETY LIGHT BARRIERS, LIGHT GRIDS AND LIGHT CURTAINS



SAFETY LIGHT BARRIERS, LIGHT GRIDS AND LIGHT CURTAINS



The invisible protection

- Optoelectronic safety devices
- Depending on resolution - personal, hand and finger protection
- User-friendly parameter setting, no tools required
- Integrated set-up tool



SAFETY LIGHT BARRIERS, LIGHT GRIDS AND LIGHT CURTAINS

PRODUCT OVERVIEW (EXCERPT)



SLB440

- 1 beam
- Compact design with integrated evaluation
- High range up to 75 m
- Version with heating for applications down to -30 °C



SLG440

- Up to 4 beams
- Resolution up to 300 mm
- Reliable safety concept for interference sources
- Process safety with highest availability



SLC440

- Up to 192 beams
- Resolution up to 14 mm
- Reliable safety concept for interference sources
- Process safety with highest availability



SCL440 IP69

- Protection class IP69
- Robust protective enclosure
- Cleaning resistant
- Suitable for food



COMMAND DEVICES



COMMAND DEVICES



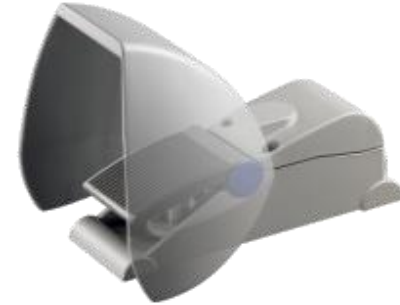
Two-hand control panels

- Operating panel suitable for at least 8 additional command devices and indicator lights
- Ergonomic operation due to support of the wrist



Enabling device

- 3 levels Off-On-Off
- Contacts do not close upon reset level 3 → 1
- With and without additional pushbutton



Foot switch

- 1 to 3 pedal versions
- With and without protective shield
- Low pedal actuation height



SAFETY-RELATED TACTILE SENSORS



SAFETY-RELATED TACTILE SENSORS



**Tactile monitoring systems stop
the dangerous movement on contact**

- Safety edges
- Safety mats
- Safety bumpers



SAFETY-RELATED TACTILE SENSORS



Safety edges

- Protection against crushing and shearing points
- At safety doors, lifting tables, lifting platforms or industrial gates
- Deformation of the rubber profile weakens or interrupts the IR signal between transmitter and receiver units



Safety mats

- Area protection in the vicinity of machines and plants
- Individual sizes and shapes possible
- Robust design (overrun with forklift)



Safety bumpers

- Protection of crushing and shearing points
- On automatically closing doors and gates and for safeguarding the travel directions of driverless transport systems

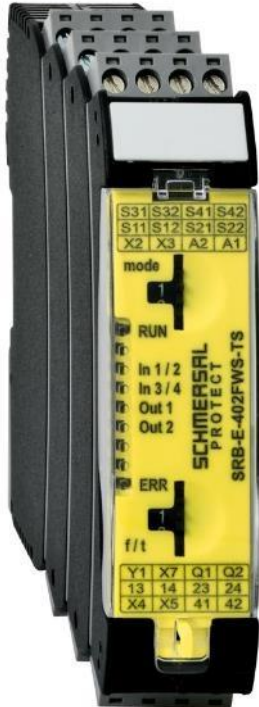


SAFE SIGNAL PROCESSING



SAFE SIGNAL PROCESSING

SAFETY-MONITORING MODULES AND PROGRAMMABLE SAFETY CONTROLLERS



Safe processing

- From multifunctional safety-monitoring modules to programmable safety controllers
- Monitoring of safety functions such as
 - Emergency stop
 - Safety gates
 - Light barriers or light grids
 - Two-hand control panels or safety mats
- Standstill monitors and time relays



SAFE SIGNAL PROCESSING

PRODUCT OVERVIEW (EXCERPT)



SRB-E-301ST

- Safety-monitor module
- STOP 0 function
- Edge monitoring / Auto-Start
- 3 safety contacts
- 1 auxiliary contact



SRB-E-402FWS-TS

- Safety-monitor module
- Safety standstill monitor, safety time relay
- Detects standstill using 1 or 2 impulse sensors



PROTECT SELECT

- Compact safety controller
- Up to six two-channel safety switching devices can be connected
- Individual customer programs possible



PROTECT PSC1

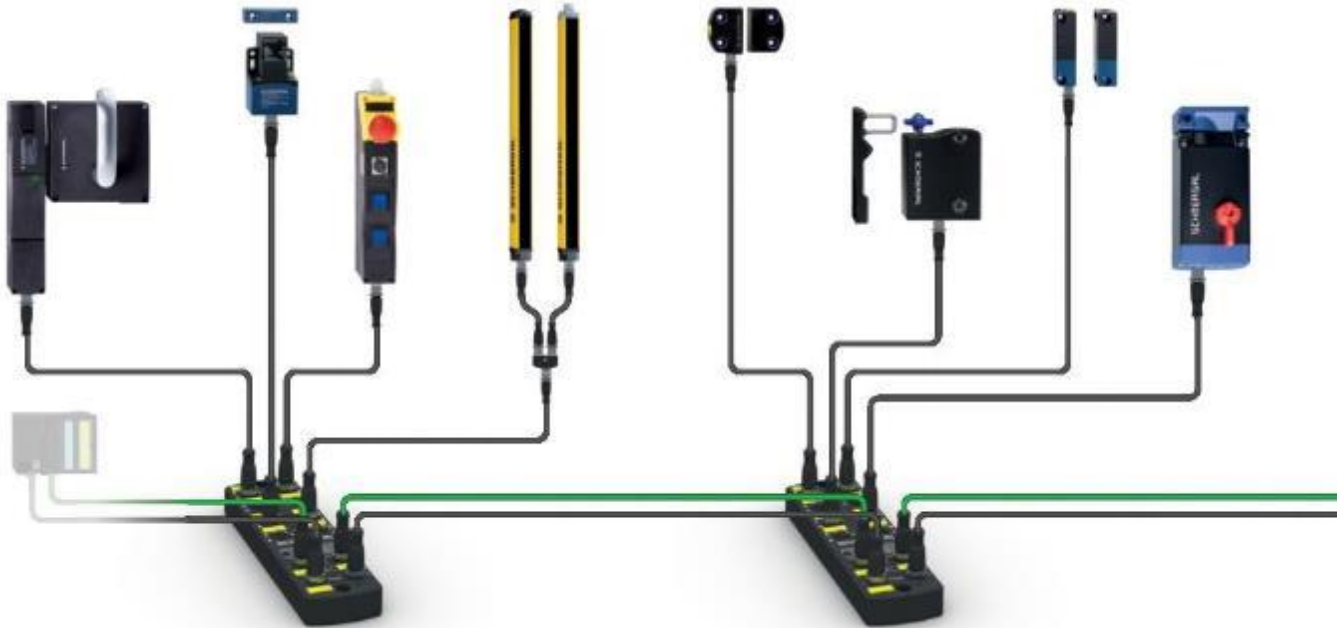
- Programmable safety controller
- For modern production systems and single machines with complex design
- Modularly expandable



SYSTEM SOLUTIONS



SYSTEM SOLUTIONS



System solutions for functional safety

- Individually adaptable
- Easy and fail-safe to install
- Minimize the wiring effort



SYSTEM SOLUTIONS



Safety Fieldbox

- Connection of up to 8 safety switching devices
- Safe communication via PROFINET/PROFIsafe
- Simple and fail-safe installation



AS-Interface Safety at Work

- Wide range of safety switchgear with integrated AS-Interface Safety at Work interface
- Safe transmission mechanism
- Simple and fail-safe installation



Serial diagnostics

- Extensive status and diagnostic data
- SD gateway with industrial fieldbus protocols
- Simple and fail-safe installation



AUTOMATION TECHNOLOGY



COMMAND AND SIGNALLING DEVICES



COMMAND AND SIGNALLING DEVICES

N-PROGRAM FOR THE FOOD INDUSTRY




EMERGENCY STOP command devices

- Food, hygienic and outdoor applications
- Pull release by integrated snap-action mechanism or separate spring element
- IP69K, -25 °C ... +80 °C
- Mounting diameter 22.3 mm




Illuminated signals

- With flat or high glass
- For LED bulbs or with integrated LED
- IP69K, -25 °C ... +80 °C
- 




Pushbuttons

- Food, hygienic and outdoor applications
- Material ABS, chrome plated
- IP69K, -25 °C ... +80 °C
- 



Illuminated pushbuttons

- Food, hygienic and outdoor applications
- Material ABS, chrome plated
- IP69K, -25 °C ... +80 °C
- 




COMMAND AND SIGNALLING DEVICES

N-PROGRAM FOR THE FOOD INDUSTRY



Pushbuttons / mushroom buttons

- Impact switches with and without latching
- Food, hygienic and outdoor applications
- Mounting diameter 22.3 mm
- 



Selector switches/buttons

- Selector switch/pushbutton with short or long toggle
- 2 or 3 switch positions
- Food, hygienic and outdoor applications



Main switches

- 16 A, 40 A or 63 A
- IP69K
- Food, hygienic and outdoor applications



Contact and light elements

- For switches, pushbuttons and indicator lights



COMMAND AND SIGNALLING DEVICES

E-PROGRAM FOR HARSH ENVIRONMENTAL CONDITIONS




EMERGENCY STOP command devices

- Metal control unit
- For applications under difficult operating conditions
- Disengagement by rotary pull release, pull release or key release




Illuminated signals

- With flat or high glass
- Indicator light for BA9s or with integrated LED
- Mounting diameter 22.3 mm
- 




Pushbuttons

- Control panel and front ring made of aluminum
- For difficult operating conditions
- Mounting diameter 22.3 mm
- 



Illuminated pushbuttons

- Vandal-proof
- Ambient temperature -25 °C ... +75 °C
- Protection class IP65
- Mounting diameter 22.3 mm
- 




COMMAND AND SIGNALLING DEVICES

E-PROGRAM FOR HARSH ENVIRONMENTAL CONDITIONS



Pushbuttons / mushroom buttons

- Pushbutton with and without detent
- Operating part and front ring made of aluminum
- Mounting diameter 22.3 mm
- 



Selector switches/buttons

- Selector switch/pushbutton with short or long toggle
- Selector switch/pushbutton with square actuator
- 2 or 3 switch positions



Selector switches/buttons

- Selector switch/pushbutton with short or long toggle
- Selector switch/pushbutton with square actuator
- 2 or 3 switch positions



Contact and light elements

- For switches, pushbuttons and indicator lights



MAINTAINED JOYSTICK SWITCHES / SPRING-RETURN



MAINTAINED JOYSTICK SWITCHES / SPRING-RETURN



RK - Maintained joystick switches / spring-return

- For harsh environmental conditions
- Mounting diameter Ø 22.3 mm
- Up to 6 mm front panel thickness



NK - Joystick switches

- Suitable for food industry
- Mounting diameter Ø 22.3 mm
- Up to 6 mm front panel thickness



INDUCTIVE PROXIMITY SWITCHES



INDUCTIVE PROXIMITY SWITCHES



Housing construction form: cylinder, thread

- Design M8, M12, M18, M30
- Electronic, switches contactless when approached
- Insensitive to vibrations



Housing construction form: cylinder, smooth

- Design Ø 6.5 mm, Ø 20 mm or Ø 40 mm
- Electronic, switches contactless when approached
- Insensitive to vibrations



Housing construction form: Block

- Design 250, 333, 384 or 385
- Electronic, switches contactless when approached
- Insensitive to vibrations



POSITION SWITCHES



POSITION SWITCHES



Modular and flexible

- Position switches with safety function
- Safe position detection of moving machine parts and monitoring of movable guards
- Modular design (selection of basic switch and actuating element)
- Large selection of actuating elements for different applications
- Actuating elements can be adjusted by 45°
- Positive-locking connection between the guard and the positive-opening NC contact
- Various contact variants



POSITION SWITCHES

PRODUCT OVERVIEW (EXCERPT)



PS116

- Thermoplastic enclosure with metal head
- Compact design
- Complete unit or modular system
- Construction form according to EN 50047



PS215 / PS216

- Metal / thermoplastic enclosure
- Quick connection technology due to 45° turned terminals
- Complete unit or modular construction kit
- Construction form according to EN 50047



PS226

- Thermoplastic enclosure
- Quick connection technology through 45° turned terminals
- 2 cable entries
- Construction form according to EN 50047



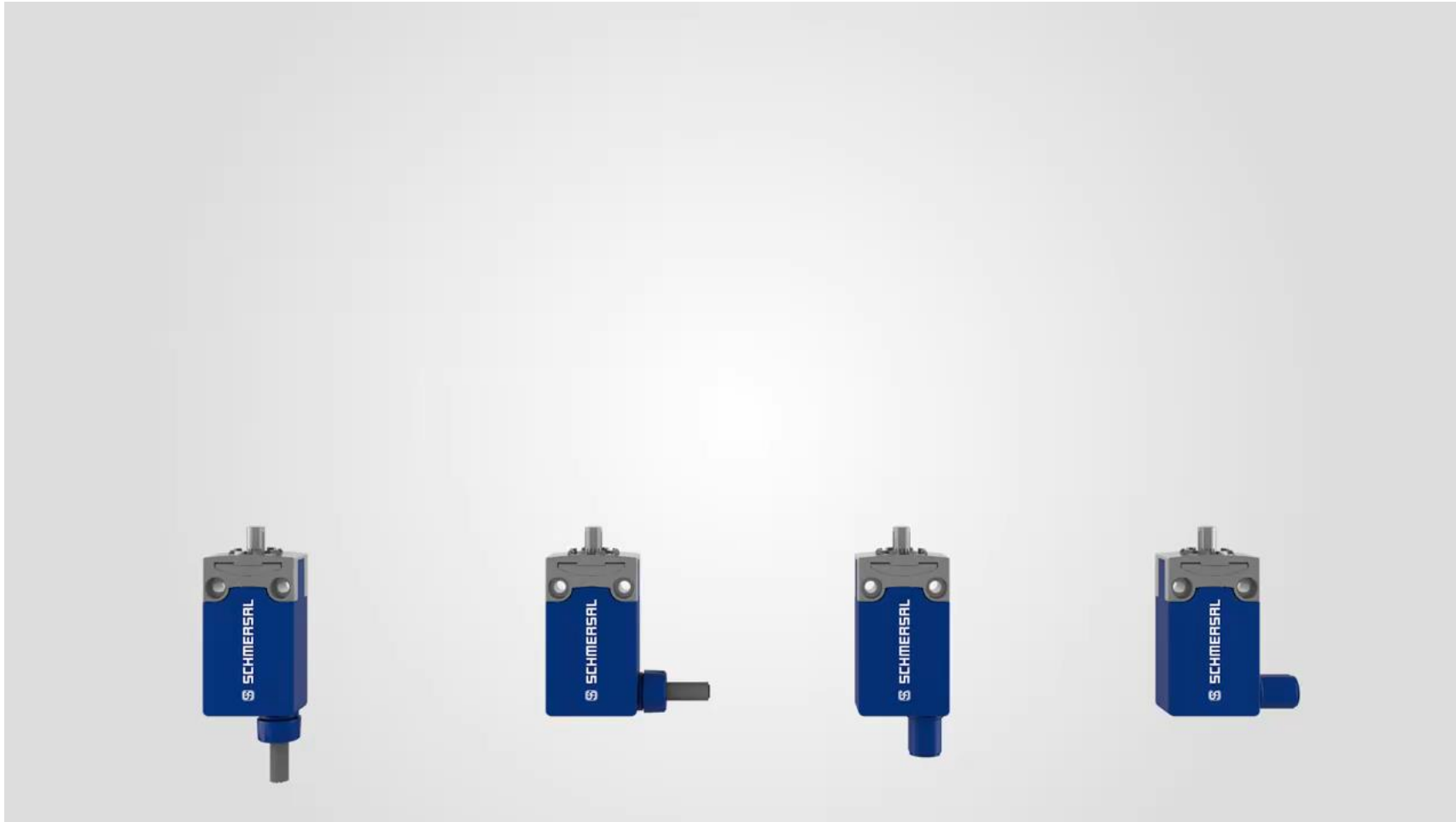
PS315 / PS316

- Metal / thermoplastic enclosure
- Quick connection technology due to 45° turned terminals
- Complete unit or modular system
- Construction form according to EN 50041



POSITION SWITCHES

APPLICATION EXAMPLES



SLACK-WIRE AND BELT ALIGNMENT SWITCHES



SLACK-WIRE AND BELT ALIGNMENT SWITCHES



SLACK-WIRE SWITCH

- Slack wire monitoring for cranes or transport equipment
- Belt break monitoring on conveyor systems
- Metal enclosure
- For heavy duty operation



BELT ALIGNMENT SWITCH

- Monitoring of straight running of conveyor belts
- Staggered signal for advance warning or shutdown of the conveyor belt
- With Dupline® interface Diagnostic function with less wiring effort



Rotating spindle limit switch

- For machine tools, crane and conveyor systems
- With snap-action switch insert



Gear-switches

- For lifting and conveying technology or rolling gates
- For limit switching or positioning of motion sequences
- Adjustable cam disks transmit the drive movement to the switching elements



MICRO SWITCHES



MICRO SWITCHES



M 610
M 630

- Soldering, plug or screw terminals
- Thermoplastic enclosure



M 687 / 680 / 682
M 6900

- Soldering, plug or universal terminals
- Thermoplastic enclosure



Z/T 232 / Z 232 / T 232
M 589

- Screw connection
- Thermoplastic enclosure



M 660-11-2-Y
M 660 / 6600
M 6610 / 6620

- Without mounting flange
- Rubber or thermoplastic enclosure



ASSEMBLY HOUSING



ASSEMBLY HOUSING PRODUCT OVERVIEW (EXCERPT)



MBGHAC

- Aluminium enclosure
- For EMERGENCY STOP with integrated protective collar
- Protective collar reduces unwanted downtimes



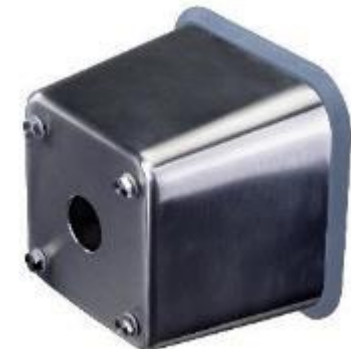
MBGAC

- Aluminium enclosure
- Proven sealing concept
- Versatile use



KG

- Housing material plastic
- Cable outlets preassembled



NBG/EBG/EX-EBG

- Stainless steel enclosure
- Specially designed for hygienic and heavy-duty applications
- Special ribbed seal encloses the housing base



EXPLOSION PROTECTION



EXPLOSION PROTECTION



Highest safety level

- Wide range of safety switchgear for hazardous areas
- ATEX- and IECEx-certified safety switchgear



EXPLOSION PROTECTION PRODUCT OVERVIEW (EXCERPT)



Safety-monitoring modules

- For example SRB200EXI
- Associated apparatus for intrinsically safe circuits (Ex i)
- Suitable for signal processing of EMERGENCY STOP command devices, interlocking devices, etc.
- Installation in Ex-Zone 2



Safety switches

- For example EX-AZ16
- Installation in Ex-Zone 22
- High contact reliability at low currents
- For intrinsically safe circuits (Ex i) up to Ex-Zones 0 and 20



Solenoid interlocks

- For example EX-AZM161
- Installation in Ex-Zone 22
- Holding force 2,000 N
- Fail-safe guard locking



Safety sensors

- For example EX-BNS40S
- Installation in Ex-Zones 2 and 22
- Suitable for food applications
- Insensitive to lateral displacement



EXPLOSION PROTECTION

PRODUCT OVERVIEW (EXCERPT)



Position switches

- For example EX-I-BS655
- With different function units
- Installation in Ex-Zones 1 and 21



Emergency pull-wire switches

- For example EX-RS655
- Wire pull and wire break function
- Wire length up to 2 x 100 m
- Installation in Ex-Zones 1 and 21



Belt misalignment and slack-wire switches

- For example EX-441
- Suitable for heavy duty operation
- Installation in Ex-Zone 21



Command and signalling devices

- For example EX-R
- Pushbuttons, illuminated pushbuttons, illuminated signals, EMERGENCY STOP buttons, selector buttons and switches
- Installation in Ex-Zone 1 and 21



REFERENCES



THANK YOU FOR YOUR ATTENTION

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Title

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SCHMERSAL
THE DNA OF SAFETY

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