



EN Operating instructions pages 1 bis 4
Original

Content

1 About this document

1.1 Function 1

1.2 Target group: authorised qualified personnel. 1

1.3 Explanation of the symbols used 1

1.4 Appropriate use 1

1.5 General safety instructions 1

1.6 Warning about misuse 1

1.7 Exclusion of liability 2

2 Product description

2.1 Ordering code 2

2.2 Special versions. 2

2.3 Purpose 2

2.4 Technical data 2

2.5 Safety classification 2

3 Mounting

3.1 General mounting instructions 3

3.2 Choosing the actuating planes. 3

3.3 Dimensions 3

3.4 Accessories 4

4 Electrical connection

4.1 General information for electrical connection. 4

4.2 Contact options 4

5 Set-up and maintenance

5.1 Functional testing. 4

5.2 Maintenance 4

6 Disassembly and disposal

6.1 Disassembly. 4

6.2 Disposal 4

7 Declaration of conformity

1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used



Information, hint, note:

This symbol indicates useful additional information.



Caution: Failure to comply with this warning notice could lead to failures or malfunctions.

Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The Schmersal range of products is not intended for private consumers.

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: products.schmersal.com.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse



In case of improper use or manipulation of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden, the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

AZ①-②③④⑤-⑥

No.	Option	Description
①	215	Metal enclosure, Design to EN 50047
	216	Thermoplastic enclosure, Design to EN 50047
	315	Metal enclosure, Design to EN 50041
	316	Thermoplastic enclosure, Design to EN 50041
②	T	Slow action
	Z	Snap action
③	11	1 NO contacts / 1 NC contacts
	02	2 NC
	12	1 NO contacts / 2 NC contacts
	03	3 NC contacts (only for slow action T)
④	R	Latching force 12 N
	R	Latching force 30 N
⑤		Silver
	A1	Gold-plated contacts 0.3 µm
⑥		screw terminal
	ST	Connector plug M12, 4 or 8 pin
Actuator		- for sliding safety guards:
AZ21X/31X-B1		Straight actuator with rubber mounting
AZ21X/31X-B5		Angled actuator with rubber mounting
		- for hinged safety guards:
AZ21X/31X-B6		Flexible actuator with through-holes



Only if the information described in this operating instructions manual are followed correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

2.2 Special versions

For special versions, which are not listed in the ordering code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Purpose

The safety switches are suitable for sliding, hinged or removable safety guards, which need to be closed in order to ensure the necessary operational safety.

The safety switches are used for applications, in which the hazardous situation is terminated without delay when the safety guard is opened.



The safety switchgears are classified according to EN ISO 14119 as type 2 interlocking devices.



The user must evaluate and design the safety chain in accordance with the relevant standards and the required safety level.



The entire concept of the control system, in which the safety component is integrated, must be validated to the relevant standards.

2.4 Technical data

Standards:	EN 60947-5-1, EN ISO 13849-1
Enclosure:	
- AZ215/AZ315:	zinc die-cast, paint finish
- AZ216/AZ316:	glass-fibre reinforced thermoplastic
Coding level according to EN ISO 14119:	low
Degree of protection:	IP66, IP67
Tightening torque:	
- Fixing screws AZ215/AZ315:	2 Nm
- Fixing screws AZ216/AZ316:	1.2 Nm
- Cover screw AZ215/AZ315 (PZ2):	2.6 Nm
- Contact screws:	0.6 Nm ... 0.8 Nm
Contact material:	Silver
- Ordering suffix A1:	Gold-plated contacts 0.3 µm
Contact type:	change-over with double break Zb, or 3 NC contacts, galvanically separated contact bridges
Switching system:	⊖ EN 60947-5-1, slow action, NC contact with positive break
Connection:	Screw terminal or connector plug M12, 4- or 8-pin
Max. cable section:	0.34 ... 1.5 mm ² (incl. conductor ferrules)
Cable entry:	M20 x 1.5
Utilisation category AC-15, DC-13 I _e /U _e :	3 A / 240 VAC, 3 A / 24 VDC
- M12 connector, 4-pin:	3 A / 50 VAC, 3 A / 24 VDC
- M12 connector, 8-pin:	2 A / 30 VAC, 2 A / 24 VDC
Rated impulse withstand voltage U _{imp} :	4 kV
- M12 connector, 4-pole/8-pole:	0.8 kV
Rated insulation voltage U _i :	
- Screw connection, 2 contacts or 3 contacts:	250 VAC or 300 VAC
- M12 connector, 4-pole/8-pole:	50 VAC or 24 VDC
Thermal test current I _{th} :	
- Screw connection, 2 contacts or 3 contacts:	10 A or 5 A
- M12 connector, 4-pole or 8-pole:	4 A or 2 A
Required short-circuit current:	400 A
Max. fuse rating:	6 A gG D-fuse
Positive break travel:	5 mm
Positive break force:	10 N for each NC contact
Ambient temperature:	-30 °C ... +80 °C
Actuating speed:	max. 0.2 m/s
Actuating frequency:	max. 1200/h
Mechanical life:	>1 million operations

2.5 Safety classification

Standards:	EN ISO 13849-1
Envisaged structure:	
- Basically:	applicable up to Cat. 1 / PL c
- With 2-channel usage and fault exclusion mechanism*:	applicable up to Cat. 3 / PL d with suitable logic unit
B _{10D} NC contact:	2,000,000
B _{10D} NO contact at 10% ohmic contact load:	1,000,000
Mission time:	20 years

* If a fault exclusion to the 1-channel mechanics is authorised.

$$MTTF_D = \frac{B_{10D}}{0,1 \times n_{op}} \quad n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

(Determined values can vary depending on the application-specific parameters h_{op}, d_{op} and t_{cycle} as well as the load.)

If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances.

3. Mounting

3.1 General mounting instructions

2 holes (M4) are provided for fixing the enclosure. The mounting dimensions are indicated on the rear of the device. The switch enclosure must not be used as an end stop. Any position is possible. The mounting position must be chosen so as to avoid the penetration of coarse dirt into the used holes.

The unused actuation opening must be covered with the slot cover provided.



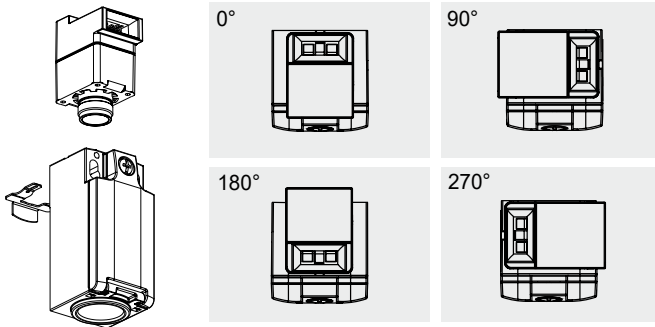
The actuator must be permanently fitted to the safety guards and protected against displacement by suitable measures (tamperproof screws, gluing, drilling of the screw heads).



Please observe the relevant requirements of the standards EN ISO 12100, EN ISO 14119 and EN ISO 14120.

3.2 Choosing the actuating planes

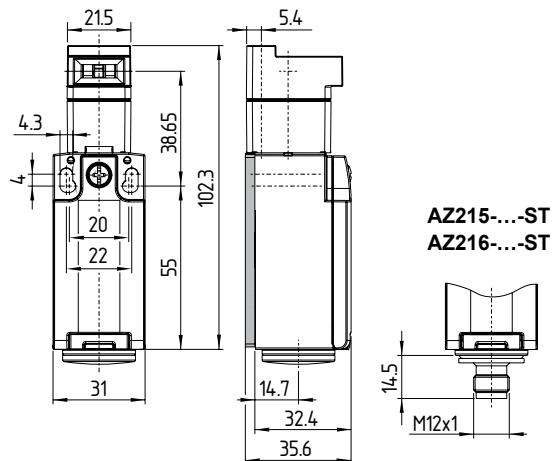
By turning the head in 4x 90° steps, 4 actuating planes are possible. To do this, pull out the latch plate on the rear, move the head into the desired position by raising slightly and turning, then press the latch plate in again.



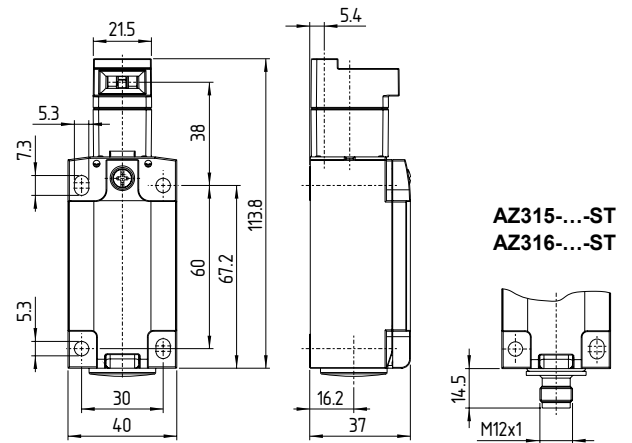
3.3 Dimensions

All measurements in mm.

AZ215 / AZ216

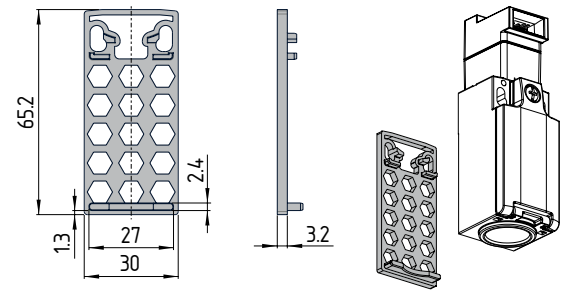


AZ315 / AZ316

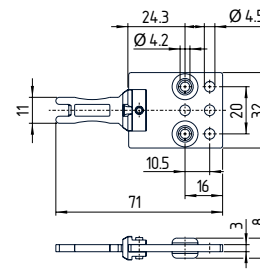


AZ215 / AZ216 with adapter plate

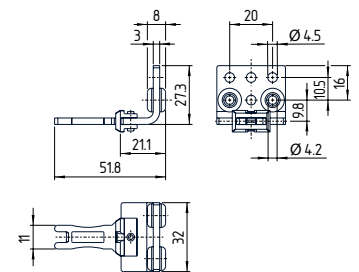
When turning the actuator head into the 0° or 180° position, the supplied adapter plate must be used.



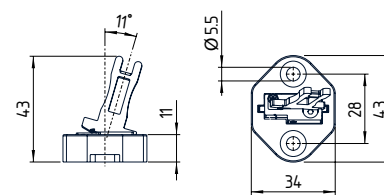
Actuator B1



Actuator B5



Actuator B6



Actuator B6 for swing doors

The axis of the hinge must be d mm above and in a parallel plane to the top surface of the safety switch. The basis setting provides a minimum radius of R_{min}.

	Actuating radii			
	R _{min} [mm]	d [mm]	R _{min} [mm]	d [mm]
AZ21X/31X-B6	150	16	150	16

3.4 Accessories

Description	Designation	Part number
Disposable screw set, M5 x 14, 2x	ACC-NRS-M5X14-FHS-2PCS	103033698

4. Electrical connection

4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition.

The contact labelling can be found in the wiring compartment of the switch. Appropriate cable glands with a suitable degree of protection are to be used.

Settle length x of the conductor: 5 ... 6 mm



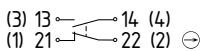
After wiring, dust and soiling must be removed from the wiring compartment.

4.2 Contact options

Pin assignment of versions with M12 connector shown in brackets.

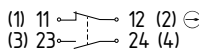
Snap action

AZ...-Z11



Slow action

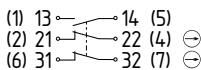
AZ...-T11



AZ...-T02



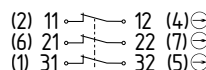
AZ...-Z12



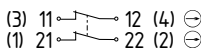
AZ...-T12



AZ...-T03



AZ...-Z02



Key

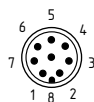
⊖ Positive break NC contact

Connector ST

4-pole



8-pole



K.A. Schmersal GmbH & Co. KG

Mödinghofe 30, 42279 Wuppertal
Germany
Telephone: +49 202 6474-0
Telefax: +49 202 6474-100
E-Mail: info@schmersal.com
Internet: www.schmersal.com

5. Set-up and maintenance

5.1 Functional testing

The safety function of the safety components must be tested. The following conditions must be previously checked and met:

1. Check the free movement of the actuating element
2. Check the integrity of the cable entry and connections
3. Check the switch enclosure for damage

5.2 Maintenance

By use in extreme conditions, we recommend routine maintenance including the following steps:

1. Check for correct installation of the actuator and the switch
2. Remove particles of dust and soiling
3. Check cable entry and connections



Adequate measures must be taken to ensure protection against tampering either to prevent tampering of the safety guard, for instance by means of replacement actuators.

Damaged or defective components must be replaced.

6. Disassembly and disposal

6.1 Disassembly

The safety switchgear must be disassembled in a de-energised condition only.

6.2 Disposal

The safety switchgear must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.



7. Declaration of conformity

We declare under our sole responsibility that the products mentioned comply with all relevant provisions of the directives and regulations listed below and conform to the following standards.

Relevant Directives:



2006/42/EC
2011/65/EU

Applied standards:

EN 60947-5-1:2017 + AC:2020



The currently valid declaration of conformity can be downloaded from the internet at products.schmersal.com.