



EN Operating instructions.pages 1 to 6
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 Destination and use 2

2.4 Technical data 2

2.5 Safety classification 2

3 Mounting

3.1 General mounting instructions 2

3.2 Dimensions 3

4 Electrical connection

4.1 General information for electrical connection. 4

4.2 Contact variants. 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 EU 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 is used for identifying 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 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: www.schmersal.net.

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 when safety switchgear is used. The relevant requirements of the standard ISO 14119 must be observed.

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:

AZ 17-①Z②I-③-④

| No. | Option | Description |
|-----|--------|---|
| ① | 11 | 1 NO / 1 NC |
| | 02 | 2 NC |
| ② | R | Latching force max. 5 N Latching force 30 N |
| ③ | ST | M16 cable gland |
| ④ | B1 | M12 x 1 connector |
| | B5 | Straight actuator B1 included |
| | B6L | Angled actuator B5 included |
| | B6R | Flexible actuator for left-hand side door hinge B6L included |
| | B6R | Flexible actuator for right-hand side door hinge B6L included |



Only if the information described in this operating instructions manual are realised 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 order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Destination and use

Safety switches with separate actuators AZ 17 are suitable for moveable safety guards, which need to be closed to ensure the necessary operational security.

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

When the safety guard is opened, the NC contacts are positively opened and the NO contacts are closed.



The safety switchgear units are classified as type 2 interlocking devices in accordance with ISO 14119 and are rated as highly coded.



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: | IEC 60947-5-1; BG-GS-ET-15 |
| Enclosure: | glass-fibre reinforced thermo-plastic, self-extinguishing stainless steel 1.4301 |
| Actuator: | stainless steel 1.4301 |
| Coding level according to ISO 14119: | high |
| Protection class: | IP67 to IEC 60529 |
| Contact material: | Silver |
| Contact type: | change-over with double break Zb, or 2 NC contacts, galvanically separated contact bridges |
| Switching system: | ⊖ acc. IEC 60947-5-1 slow action, NC contact with positive break |
| Connection: | cut clamp terminals or connector M12, 4-pole |
| Cable section: | 0.75...1.0 mm ² , flexible |
| Rated impulse withstand voltage U _{imp} : | 4 kV |
| Rated insulation voltage U _i : | 250 V |
| Thermal test current I _{the} : | 10 A |
| Utilisation category: | AC-15 |
| Rated operating current/voltage I _e /U _e : | 4 A / 230 VAC |
| Required short-circuit current: | 1000 A |
| Max. fuse rating: | 6 A gG D-fuse |
| Positive break travel: | 11 mm |
| Positive break force: | each NC contact 17 N |
| Ambient temperature: | -30 °C ... +80 °C |
| Mechanical life: | > 1 million operations |
| Actuating speed: | max. 2 m/s |
| Actuating frequency: | max. 2000 operations/h |
| Latching force: | 5 N |
| - Ordering suffix R: | 30 N |

2.5 Safety classification

| | |
|--|---|
| Standards: | 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 |
| Service life: | 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 ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances.

3. Mounting

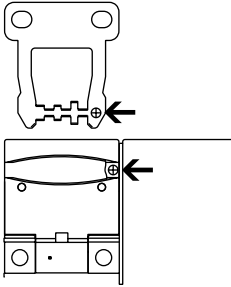
3.1 General mounting instructions

The mounting position however must be chosen so that the ingress of dirt and soiling in the used opening is avoided. Use the supplied base plate for the fixing. The tightening torque of the fixing screws must not exceed 150 Ncm. The enclosure must not be used as an end stop. Any mounting position. The mounting position however must be chosen so that the ingress of dirt and soiling in the used opening is avoided. The unused opening must be sealed by means of slot sealing plugs.

Mounting of the actuator



The marks on the used actuator opening of the solenoid interlock and on the actuator must be opposite.

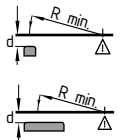


Please observe that, when fixing the switch e.g. by means of rivetting or welding, the insertion depth of the actuator is not modified. Different actuator forms are available. The actuators B1 and B5 are preferably used for sliding and removable safety guards. For hinged guards, the B6R and B6L actuators.

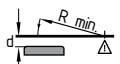
When the switch is fitted on a hinged safety guard, please ensure that the point of rotation is located within the range of the upper surface of the safety switch, in which the actuator hook is inserted (refer to table).

| Actuating radii | | | | | |
|-----------------|-----|----------------|--------|----------------|--------|
| | | R_{min} [mm] | d [mm] | R_{min} [mm] | d [mm] |
| | B6L | 50 | 11 | 50 | 11 |
| | B6R | 50 | 11 | 50 | 11 |
| | B1 | - | - | - | - |
| | B5 | - | - | - | - |

Key



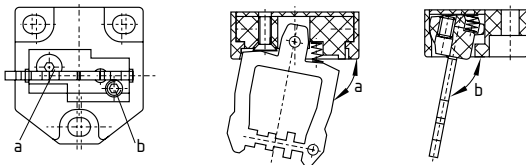
Actuating radius over the small edge of the actuator



Actuating radius over the wide edge of the actuator

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 Rmin.

Actuator B6L / B6R



The B6L or B6R actuators are set to the smallest radius in factory. To increase the radius, the setting screws a + b must be turned by means of a hexagonal key A/F 2.5 mm.



Please observe the remarks of the standards ISO 12100, EN 953 and ISO 14119.

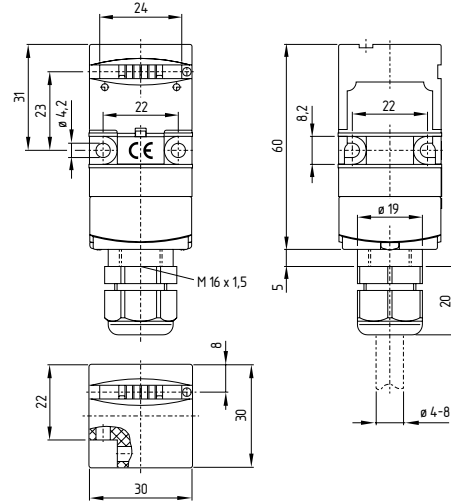


The safety component and the actuator must be permanently fitted to the safety guards and protected against displacement by suitable measures (tamperproof screws, gluing, drilling, pinning).

3.2 Dimensions

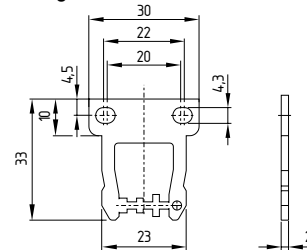
All measurements in mm.

AZ 17 safety switch

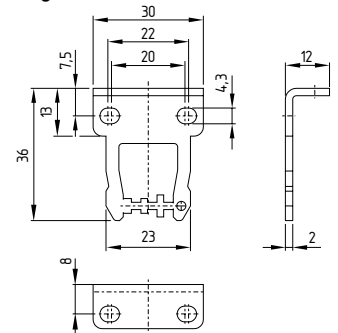


Actuator

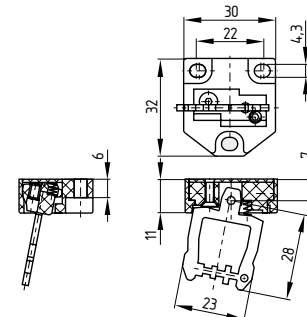
Straight actuator B1



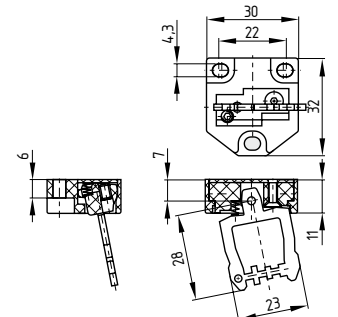
Angled actuator B5



Flexible actuator B6L



Flexible actuator B6R



4. Electrical connection

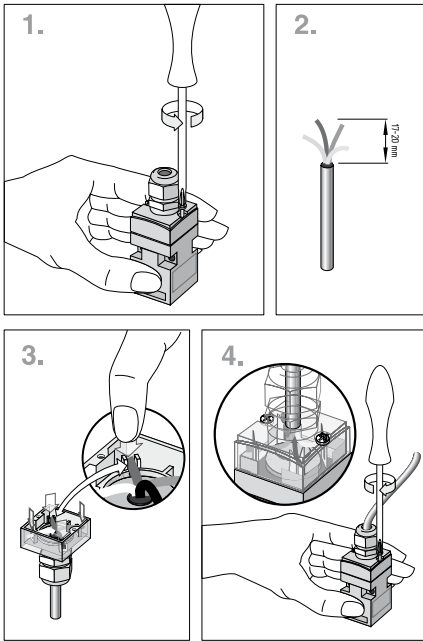
4.1 General information for electrical connection



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

Cut clamp terminals

The IDC method of termination (cut clamp technology) enables connecting flexible wires with cable section 0.75...1 mm² without using conductor ferrules. To this effect, strip the wire for 17...20 mm and insert it into the cable gland, close the cable gland, push the conductors in the groove of the cover (refer to wiring example) and screw the cover back. Alternatingly tighten the cover screws uniformly. Tightening force for the Torx T10 cover screws 0.7 ... 1 Nm.

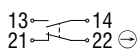


4.2 Contact variants

Contacts are shown with safety guard closed.

AZ 17-11ZK

AZ 17-11ZRK



AZ 17-02ZK

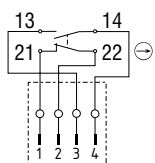
AZ 17-02ZRK



with connector, A-coding

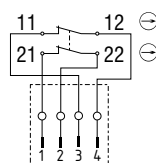
AZ 17-11ZK-ST

AZ 17-11ZRK-ST



AZ 17-02ZK-ST

AZ 17-02ZRK-ST



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 for correct installation of the actuator and the switch
2. Check the integrity of the cable entry and connections
3. Check the switch enclosure for damage

5.2 Maintenance

In case of correct installation in accordance with the instructions described above, the component requires little maintenance. For 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. EU Declaration of conformity

EU Declaration of conformity



Original
K.A. Schmersal GmbH & Co. KG
Möddinghofe 30
42279 Wuppertal
Germany
Internet: www.schmersal.com

We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.

Name of the component: AZ 17 I

Type: See ordering code

Description of the component: Positive break position switch with separate actuator for safety functions

Relevant Directives: Machinery Directive 2006/42/EC
RoHS-Directive 2011/65/EU

Applied standards: DIN EN 60947-5-1:2010,
DIN EN ISO 14119:2014

Person authorized for the compilation of the technical documentation: Oliver Wacker
Möddinghofe 30
42279 Wuppertal

Place and date of issue: Wuppertal, March 14, 2016

Authorised signature
Philip Schmersal
Managing Director

AZ17I-B-EN



The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.



K.A. Schmersal GmbH & Co. KG
Möddinghofe 30, D - 42279 Wuppertal
Postfach 24 02 63, D - 42232 Wuppertal

Phone: +49 - (0)2 02 - 64 74 - 0
Telefax: +49 - (0)2 02 - 64 74 - 1 00
E-Mail: info@schmersal.com
Internet: <http://www.schmersal.com>