



**EN** Operating instructions. . . . .pages 1 to 4  
Original

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**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](http://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 17-①Z②K-③-④-⑤

| No. | Option               | Description   |
|-----|----------------------|---|
| ①   | 11<br>02             | 1 NO / 1 NC<br>2 NC   |
| ②   | R                    | Latching force max. 5 N<br>Latching force 30 N  |
| ③   | 2243<br>2243-1<br>ST | M16 cable gland<br>Frontside cable output<br>Rearside cable output<br>M12 x 1 connector |
| ④   | 1637                 | Gold-plated contacts  |
| ⑤   | 5M<br>6M             | Cable length 5 m<br>Cable length 6 m  |



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 switchgears are classified according to ISO 14119 as type 2 switching 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:   | IEC 60947-5-1; BG-GS-ET-15   |
| Enclosure:   | glass-fibre reinforced thermo-plastic, self-extinguishing stainless steel 1.4301           |
| Actuator:  |  |
| Coding level according to ISO 14119:                             | low  |
| 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 <sup>2</sup> , flexible  |
| Rated impulse withstand voltage U <sub>imp</sub> :               | 4 kV   |
| Rated insulation voltage U <sub>i</sub> :                        | 250 V  |
| Thermal test current I <sub>me</sub> :                           | 10 A   |
| Utilisation category:  | AC-15  |
| Rated operating current/voltage I <sub>e</sub> /U <sub>e</sub> : | 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:  | 30 N for ordering suffix R   |

### 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 <sub>10g</sub> NC contact:                           | 2,000,000   |
| B <sub>10g</sub> 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<sub>op</sub>, d<sub>op</sub> and t<sub>cycle</sub> 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 actuators:** See mounting instructions actuators.



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

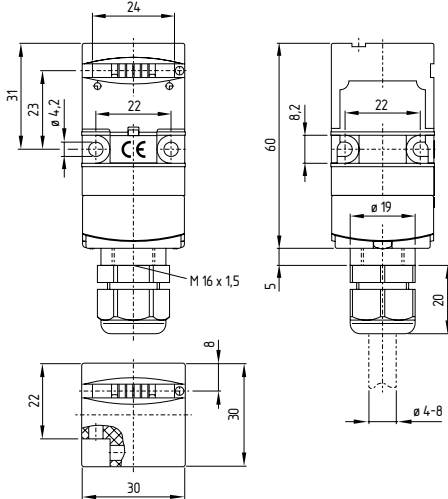


The safety component and the actuator must be permanently fitted to the safety guards and protected against displacement by suitable measures (tamperproof screws, gluing, drilling, pinning).

### 3.2 Dimensions

All measurements in mm.

#### AZ 17 safety switch



## 4. Electrical connection

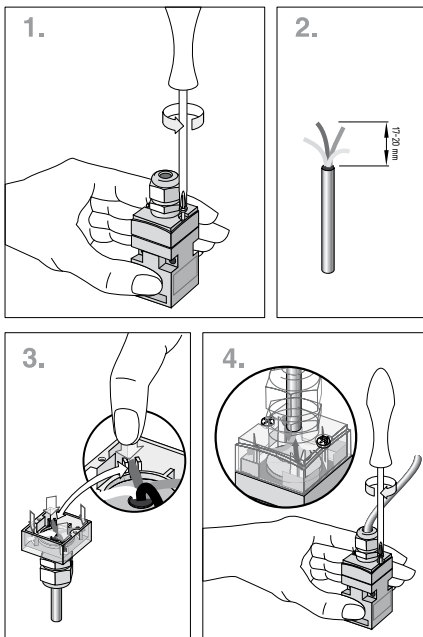
### 4.1 General information for electrical connection



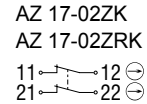
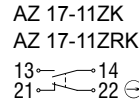
The electrical connection may only be carried out by authorised personnel in a de-energised condition.

#### Cut clamp terminals

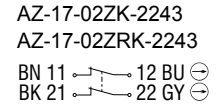
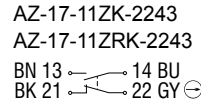
The IDC method of termination (cut clamp technology) enables connecting flexible wires with cable section 0.75...1 mm<sup>2</sup> without using conductor ferrules. To this effect, strip the wire for 17...20 mm and insert it into the cable gland, close the cable gland, push the conductors in the groove 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.



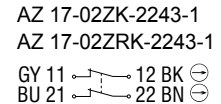
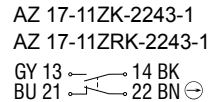
### 4.2 Contact variants



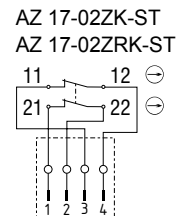
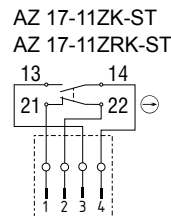
with cable, frontside



with cable, rearside



with connector, A-coding



## 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


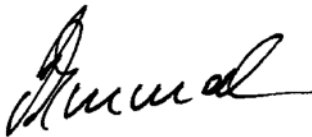
### 6.1 Disassembly

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

|  |   |  |
|--|---|--|
| <b>EU Declaration of conformity</b>  |   |  |
| Original   | K.A. Schmersal GmbH & Co. KG<br>Möddinghofe 30<br>42279 Wuppertal<br>Germany<br>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. |   |  |
| <b>Name of the component:</b>  | AZ 17   |  |
| <b>Type:</b>   | See ordering code   |  |
| <b>Description of the component:</b>   | Positive break position switch with separate actuator for safety functions                                  |  |
| <b>Relevant Directives:</b>  | Machinery Directive<br>RoHS-Directive   | 2006/42/EC<br>2011/65/EU   |
| <b>Applied standards:</b>  | DIN EN 60947-5-1:2010,<br>DIN EN ISO 14119:2014   |  |
| <b>Person authorized for the compilation of the technical documentation:</b>   | Oliver Wacker<br>Möddinghofe 30<br>42279 Wuppertal  |  |
| <b>Place and date of issue:</b>  | Wuppertal, March 14, 2016   |  |
|  |                         |  |
|  | Authorised signature<br><b>Philip Schmersal</b><br>Managing Director  |  |

AZ 17-D-EN



The currently valid declaration of conformity can be downloaded from the internet at [www.schmersal.net](http://www.schmersal.net).



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