SCHMERSAL

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.

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.

x.000 / 10.2016 / v.A. - 101185263-EN / H / 2016-10-24 / AE-Nr. 6668

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:

EX-AZ 16-①ZV②K-③-3D

No.	Option	Description
①	03	3 NC
	12	1 NO / 2 NC
②		Ejection force
	R	Latching force 30 N
③	2254	Latching force 5 N
	1762	Front mounting
	1637	Gold-plated contacts

Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive and the Explosion Protection 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

The safety switches of the EX-AZ 16 series are suitable for sliding, hinged and removable safety guards, which need to be closed to ensure the necessary operational safety.

The components can be used in explosion-endangered areas of Zone 22 equipment category 3D. allation and maintenance requirements to the standard series EN 60079 must be met.

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.

Conditions for safe operation

Due to their specific impact energy, the components must be fitted with a protection against mechanical stresses. The specific ambient temperature range must be observed. The user must provide for a protection against the permanent influence of UV rays.

2.4 Technical data

Equipment category:	Ⓔx II 3D
Ex protection:	Ex tc IIIC T90°C Dc X
Standards:	EN 60947-5-1, EN 60079-0, EN 60079-31, BG-GS-ET-15
Coding level according to ISO 14119:	low
Enclosure:	glass-fibre reinforced thermo-plastic, self-extinguishing
Max. impact energy:	1 J
Actuating speed:	max. 1 m/s
Actuator:	stainless steel 1.4301
Protection class:	IP67
Contact material:	Silver
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 terminals
Cable section:	max. 2.5 mm² (incl. conductor ferrules)
Cable entry:	3 x M16 x 1.5
Rated impulse withstand voltage U_{imp}:	6 kV
Rated insulation voltage U_i:	500 V
Thermal test current I_{the}:	2.5 A
Utilisation category:	AC-15 / DC-13
Rated operating current/voltage I_e/U_e:	2.5 A / 230 VAC 2.5 A / 24 VDC
Max. fuse rating:	4 A gG D-fuse
Positive break travel:	8 mm
Positive break force:	each NC contact 10 N
Ambient temperature:	–20 °C … +70 °C
Mechanical life:	max. 1 million operations
Latching force:	30 N for ordering suffix R
Tightening torque:	cover screws: min. 0.6 Nm cable gland: min. 3 Nm locking screws: min. 3 Nm
Cable glands:	Ⓔx II 2GD
Cable cross-section:	min. Ø 5 mm; max. Ø 10 mm

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.

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

(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

Fitting is only authorised in a de-energised condition

The enclosure can be fixed by means of 2 mounting holes. The safety switch is double insulated. The use of an earth wire is not authorised. The component must be mechanically protected. The enclosure must not be used as an end stop. Any mounting position. The mounting position must be chosen so as to avoid the penetration of dirt in the used holes. The unused openings must be sealed by means of slot sealing plugs (AZ 15/16-1476-1 available as accessory) after fitting.

Please observe the recommendations regarding maximum impact energy, actuating speed and tightening torque in the technical data.

Mounting of the actuators: See mounting instructions actuators.

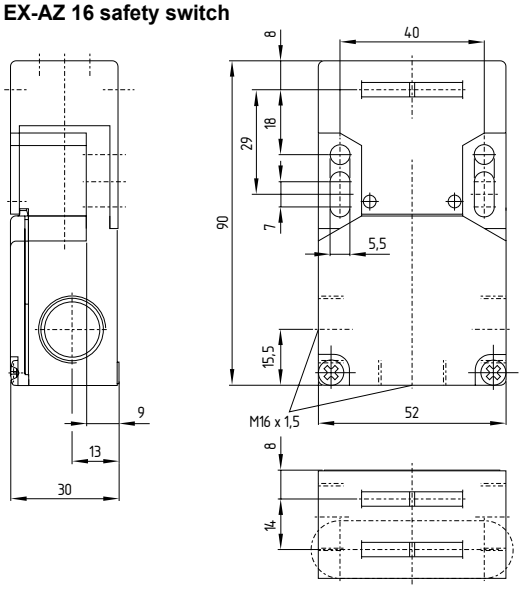
Please observe the relevant requirements of the standards ISO 12100, ISO 14119 and ISO 14120.

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.

EX-AZ 16 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.

The contact labelling can be found in the wiring compartment of the switch.

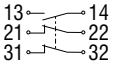
Cable glands (included in delivery) are only authorised for permanent cables. The constructor must provide for the necessary strain relief. After wiring, dust and soiling must be removed from the wiring compartment. Unused openings must be sealed with EX-certified locking screws (included in delivery).

4.2 Contact variants

Contacts are shown with safety guard closed.

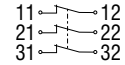
1 NO / 2 NC

EX-AZ 16-12ZV(R)K-3D



3 NC

EX-AZ 16-03ZV(R)K-3D



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:
- The installation is executed according to the instructions
- The connection is executed correctly
- The cable is correctly executed and connected
- The safety component is not damaged
- Remove particles of dust and soiling
- Check cable entry and connections in de-energised condition

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 the correct fixing of the actuator and the safety switchgear
2. Remove particles of dust and soiling
3. Check cable entry and connections in a de-energised condition

Avoid electrostaic charging. Clean with damp cloth.
Do not open the device when live.

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.
For explosion protection reasons, the component must be exchanged after max. 1 million operations.

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

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Original

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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:	EX-AZ 16 Ⓔx II 3D Ex tc IIIC T90°C Dc X
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 Explosion Protection Directive (ATEX) 2014/34/EU RoHS-Directive 2011/65/EU
Applied standards:	DIN EN 60947-5-1:2010, DIN EN ISO 14119:2014, EN 60079-0:2014, EN 60079-31:2014
Person authorized for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal
Place and date of issue:	Wuppertal, 28 September 2016

Authorised signature
Philip Schmersal
Managing Director

EX-AZ16-C-EN

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

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