SCHMERSAL

EN Operating instructions..... pages 1 to 6
Translation of the original operating instructions

FR Vous trouverez la version actuelle du mode d'emploi dans votre langue nationale officielle sur l'Internet, www.schmersal.net.

ES Encontrará el manual de instrucciones actual en su idioma oficial de la UE en nuestra página de Internet www.schmersal.net.

NL U vindt de huidige versie van de gebruikshandleiding in uw officiële landstaal op het Internet, www.schmersal.net.

IT Il manuale d'istruzioni aggiornato nella vostra lingua (lingua ufficiale UE) è scaricabile in Internet all'indirizzo www.schmersal.net.

JP EU公用語で書かれた最新の取扱説明書は、インターネット(www.schmersal.net)からダウンロードできます。

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1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, set-up, and comissioning for the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version must be 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 only by trained specialist personnel, authorised by the plant operator.

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 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 damages to the machine.

1.4 Appropriate use

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailled 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.

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. The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

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

x.500 / v.A. / 07.2009 / BZ-Nr. 50122-116V900 / Teile-Nr. 1180580-EN / Ausgabe C

1.6 Warning about misuse

In case of inadequate or improper use or manipulations of the safety switchgear, personal hazards or damages to machinery or plant components cannot be excluded. The relevant requirements of the standard EN 1088 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:

AZM 170①-②Z③K④-⑤-⑥-024		
No.	**Option**	**Description**
①	SK	Screw terminals
	ST	M12 x 1 connector
②	12/11	1 NO 2 NC / 1 NO 1 NC contact
	12/02	1 NO 2 NC / 2 NC contacts
	12/00	1 NO/2 NC contacts
	11/11	1 NO 1 NC / 1 NO 1 NC contact
	11/02	1 NO 1 NC / 2 NC contacts
	02/10	2 NO/1 NC contact
	02/01	2 NC / 1 NO contact
③		Latching force 5 N
	R	Latching force 30 N
④		Power to unlock
	A	Power to lock
⑤	1637	Gold-plated contacts
⑥	2197	Manual release for power to unlock

Individual coding additionally with ordering suffix “i”.

Only if the conversions 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.

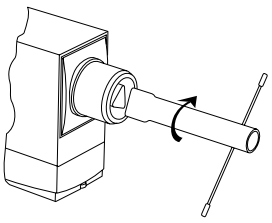
2.3 Destination and use

The solenoid interlock AZM 170 has been designed to prevent, in conjunction with the control part of a machine, movable safety guards from being opened before hazardous conditions have been eliminated.

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the safety guard can be opened immediately on failure of the power supply or upon activation of the main switch.

Manual release

A manual release is available as a mounting aid,and in the event of a power failure in case the power to unlock principle is used. If the triangular key is turned 180°, the locking bolt is pulled into the unlocking position. Please ensure that jamming by external influence on the actuator is avoided. The normal locking function is only restored after the triangular key has been returned to its original position. After being put into operation, the manual release must be secured by installing the sealing plug, which is included in delivery.



Emergency exit (optional)

Fitting and actuation only from within the hazardous area

2.4 Technical data

Standards:	IEC/EN 60947-5-1; EN ISO 13849-1; EN 1088; BG-GS-ET-19
Enclosure:	glass-fibre reinforced thermoplastic, self-extinguishing
Actuator and locking bolt:	stainless steel 1.4301
Contact material:	Silver
Protection class:	IP 67
Contact types:	change-over contact with double break, type Zb, with galvanically separated contact bridges
Switching system:	⊖ to IEC 60947-5-1; slow action, positive break NC contact
Cable entry:	M20 x 1.5
Termination:	Screw terminals or connector
Cable type:	Flexible with insulated conductor ferrules
Cable section:	min. 0.25 mm^2, max. 1.5 mm^2 (including conductor ferrules)
U_{imp}:	4 kV; connector: 0.8 kV
U_i:	250 V; connector: 60 V
I_{the}:	6 A; connector: 2 A
Utilisation category:	DC-13
I_e/U_e:	4 A / 24 VDC; connector: 2 A / 24 VDC
Max. fuse rating:	6 A gG D-fuse; connector: 2 A gG D-fuse
Positive break travel (unlocked):	11 mm
Positive break force (unlocked):	each NC contact 8.5 N
Magnet:	100% ED
U_s:	24 VDC
Magnet:	100 % ED
Power consumption:	max. 10 W
Ambient temperature:	– 25 °C … + 60 °C
Mechanical life:	> 1 million operations
F_{max}:	1000 N
Latching force:	30 N for ordering suffix R
Actuating speed:	max. 2 m/s
Actuating frequency:	max. 1000 operations / h

2.5 Safety classification

Standards:	EN ISO 13849-1
B_{10d} (NC contact):	2,000,000

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

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

3 Mounting

3.1 General mounting instructions

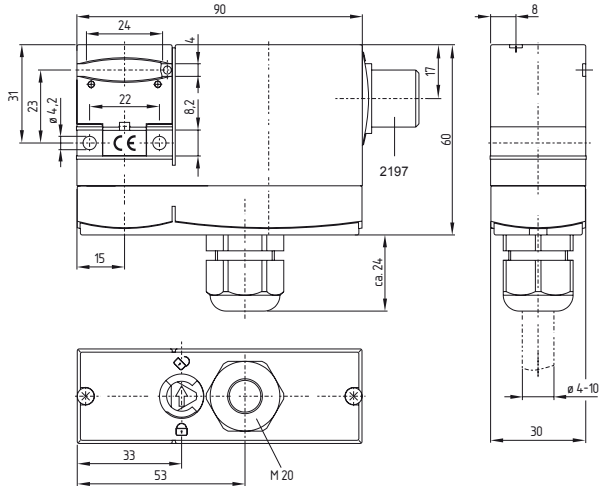
Two mounting holes are provided for fixing the enclosure. The solenoid interlock has double insulation. The use of a protective ground connector therefore is not authorised. The solenoid interlock must not be used as an end stop. Any mounting position,that the ingression of dirt and soiling in the used opening must be avoided. The unused opening must be sealed by means of slot sealing plugs. Tightening force for the Torx T10 cover screws 0.7 ... 1 Nm.

Please observe the remarks of the standards EN ISO 12100, EN 953 and EN 1088.

3.2 Dimensions

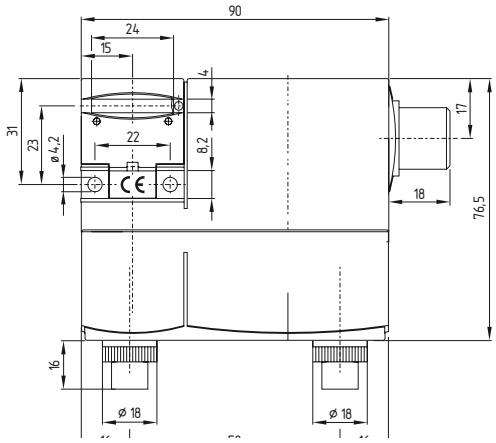
All measurements in mm.

AZM 170SK with screw terminals and cable entry



Legend: manual release from side, ordering suffix -2197

AZM 170ST with connectors



Mounting of the actuator

See actuator mounting instructions.

4 Electrical connection

4.1 General information for the electrical connection

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

At least one magnetic contact with positive break ⊖ must be integrated in the safety circuit.

For the cable entry, suitable cable glands with an appropriate degree of protection must be used. The thin walls of the mounting holes are removed when the cable gland is screwed in.

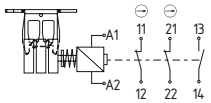
4.2 Contact variants

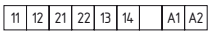
Contacts shown in de-energised condition and with the actuator inserted.

AZM 170SK with screw terminals and cable entry

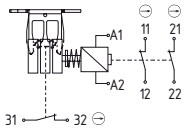
Power to unlock

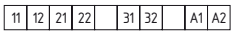
1 NO/2 NC contacts (Ordering suffix - 12/00)



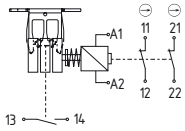


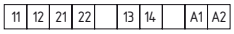
2 NC / 1 NO contact (Ordering suffix - 02/01)



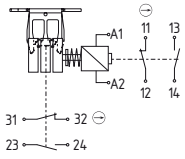


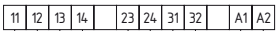
2 NO/1 NC contact (Ordering suffix - 02/10)





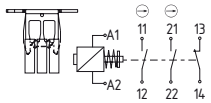
1 NO 1 NC / 1 NO 1 NC contact (Ordering suffix - 11/11)

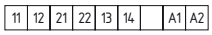




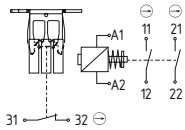
Power to lock

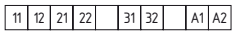
1 NO/2 NC contacts (Ordering suffix - 12/00)



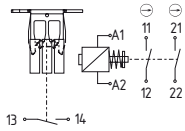


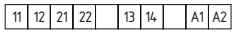
2 NC / 1 NO contact (Ordering suffix - 02/01)



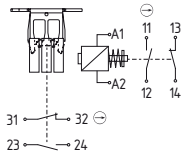


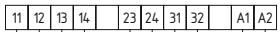
2 NO/1 NC contact (Ordering suffix - 02/10)



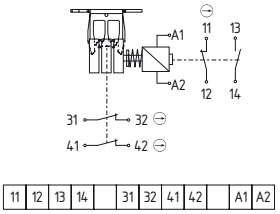


1 NO 1 NC / 1 NO 1 NC contact (Ordering suffix - 11/11)

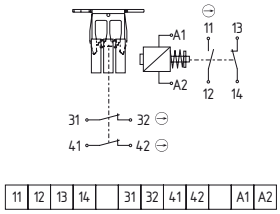




1 NO 1 NC / 2 NC contacts (Ordering suffix - 11/02)



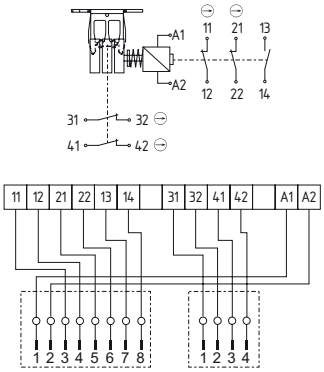
1 NO 1 NC / 2 NC contacts (Ordering suffix - 11/02)



AZM 170ST with connectors

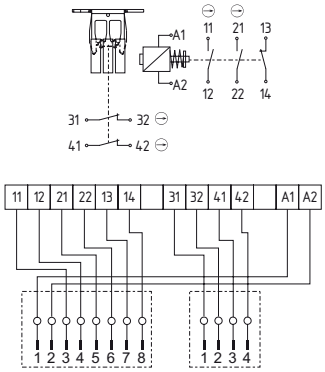
Power to unlock

1 NO 2 NC / 2 NC contacts (Ordering suffix - 12/02)

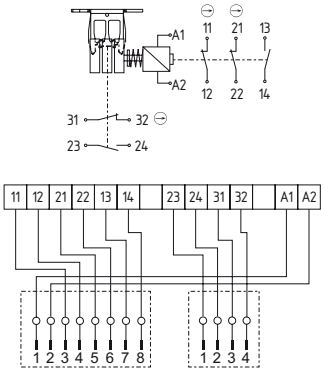


Power to lock

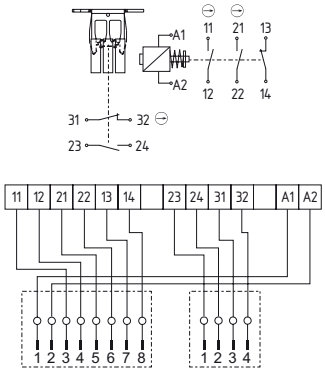
1 NO 2 NC / 2 NC contacts (Ordering suffix - 12/02)



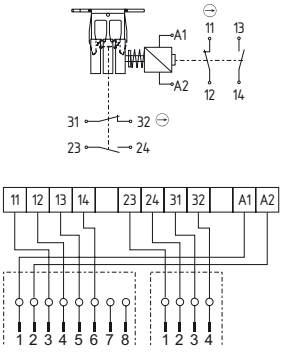
1 NO 2 NC / 1 NO 1 NC contact (Ordering suffix - 12/11)



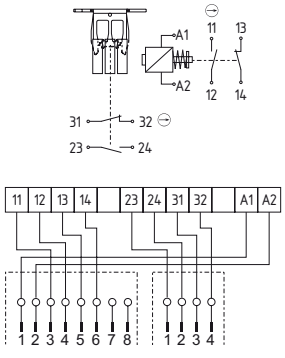
1 NO 2 NC / 1 NO 1 NC contact (Ordering suffix - 12/11)



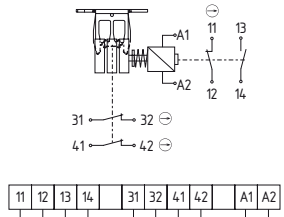
1 NO 1 NC / 1 NO 1 NC contact (Ordering suffix - 11/11)



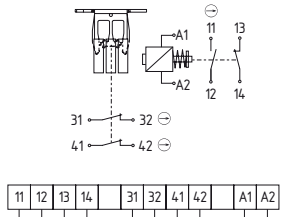
1 NO 1 NC / 1 NO 1 NC contact (Ordering suffix - 11/11)



1 NO 1 NC / 2 NC contacts (Ordering suffix - 11/02)

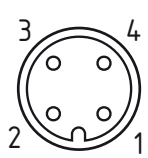


1 NO 1 NC / 2 NC contacts (Ordering suffix - 11/02)



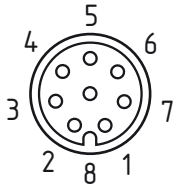
4.3 Wire colour code for the connector

M12, 4-pole



PIN 1: BN
PIN 2: WH
PIN 3: BU
PIN 4: BK

M12, 8-pole



PIN 1: WH
PIN 2: BN
PIN 3: GN
PIN 4: YW
PIN 5: GY
PIN 6: PK
PIN 7: BU
PIN 8: RD

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. Fitting of the solenoid interlock and the actuator
2. Check the integrity of the cable entry and connections
3. Check the switch enclosure for damage.

5.2 Maintenance

A regular visual inspection and functional test, including the following steps, is recommended:
1. Check for tight installation of the actuator and the switch
2. Remove particles of dust and soiling
3 Check cable entry and connections

Damaged or defective components must be replaced.

6 Disassembly and disposal

6.1 Disassembly

The safety sensor 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 Appendix

7.1 EC Declaration of conformity

SCHMERSAL

EC Declaration of conformity

Translation of the original declaration of conformity
valid as of December 29, 2009

K.A. Schmersal GmbH
Industrielle Sicherheitsschaltsysteme
Möddinghofe 30 ▪ 42279 Wuppertal
Germany
Internet: www.schmersal.com

We hereby certify that the hereafter described safety components both in its basic design and construction conforms to the applicable European Directives

Name of the safety component/type:	AZM 170/AZM 170i
Description of the safety component:	Interlocking device with electromagnetic interlock for safety functions
Harmonised EC-Directives:	2006/42/EC EC-Machinery Directive 2004/108/ EC EMC-Directive
Person authorized for the compilation of the technical documentation:	Ulrich Loss Möddinghofe 30 42279 Wuppertal
Place and date of issue:	Wuppertal, November 26, 2009

Authorised signature
Heinz Schmersal
Managing Director

AZM 170-C-EN

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

CE

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