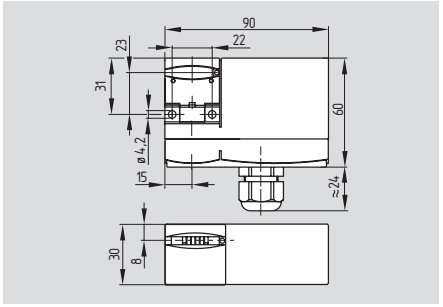
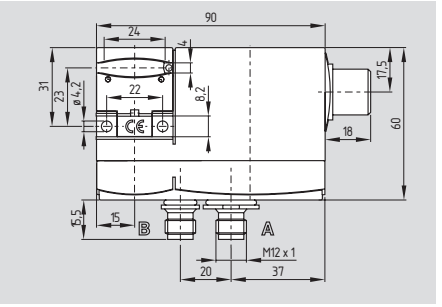
Solenoid interlocks

AZM 170 cut clamps



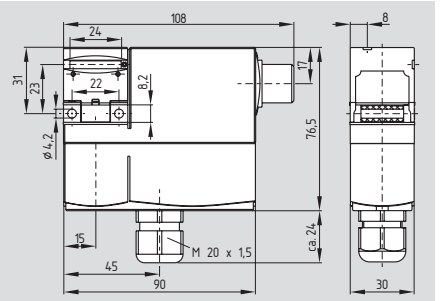
- **Cut clamps**
- Interlock with protection against incorrect locking
- Thermoplastic enclosure
- Compact design
- Manual release
- Long life
- Double insulated ⧈
- High holding force 1,000 N
- Power to unlock/power to lock principle
- 1 cable entry M20 cord grip

AZM 170 with connector



- **Connector**
- Interlock with protection against incorrect locking
- Thermoplastic enclosure
- Compact design
- Manual release
- Long life
- Double insulated ⧈
- High holding force 1,000 N
- Power to unlock/power to lock principle

AZM 170 screw terminals



- **Screw terminals**
- Interlock with protection against incorrect locking
- Thermoplastic enclosure
- Compact design
- Manual release
- Long life
- Double insulated ⧈
- High holding force 1,000 N
- Power to unlock/power to lock principle
- 1 cable entry M20 cord grip

Approvals

cULus CE

Ordering details

AZM 170①-②Z③K④-⑤-⑥⑦

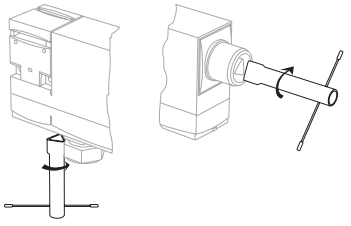
No.	Option	Description
①		Cut clamp
	SK	Screw terminals
②	11	1NO/1NC
	02	2NC
③		Latching force 5 N
	R	Latching force 30 N
④		Power to unlock
	A	Power to lock
⑤		Cable gland
	ST	Connector M12
	ST-2431	Connector M12, with individual solenoid monitoring

Ordering details

AZM 170①-②Z③K④-⑤-⑥⑦

No.	Option	Description
⑥		Manual release
	2197	Manual release from side (standard for connector and power to unlock principle)
	1637	Gold-plated contacts
⑦	24VAC/DC	Us 24 VAC/DC
	110VAC	Us 110 VAC
	230VAC	Us 230 VAC

Note



Manual release (left)
- Included on standard version
- For manual release using M5 triangular key, **Manual release from side (right)**
- Additional manual release on side, ordering suffix -2197
- Only available for power to unlock principle

Solenoid interlocks

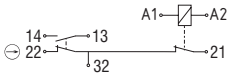
Technical data

Standards:	IEC/EN 60947-5-1, EN ISO 13849-1, BG-GS-ET-19
Enclosure:	glass fiber reinforced thermoplastic, self-extinguishing
Actuator and locking bolt:	stainless steel 1.4301
Protection class:	IP67 to EN 60529
Contact material:	silver
Contact type:	change-over contact with double break, type Zb or 2 NC contacts, with galvanically separated contact bridges
Switching principle:	⊖ IEC 60947-5-1 slow action, NC contacts with positive break
Cable type:	flexible with insulated conductor ferrules
Cable section:	
- cut clamp terminals:	0.75 … 1.0 mm²
- screw terminals:	0.25 … 1.5 mm²
U_{imp}:	4 kV
U_i:	250 V
I_{the}:	6 A
Utilization category:	AC-15, DC-13
I_e/U_e:	4 A / 230 VAC 4 A / 24 VDC
Max. fuse rating:	6 A gG D-fuse
Positive break travel:	11 mm
Positive break force:	8.5 N for each NC contact fitted
Magnet:	100% ED
Us:	24 VAC/DC 110 VAC, 50/60 Hz 230 VAC, 50/60 Hz
Power consumption:	max. 10 W
Ambient temperature:	−25 °C … +60 °C
Mechanical life:	> 1 million operations
F_{max}:	1,000 N
Latching force:	30 N for ordering suffix R
Actuating speed:	max. 2 m/s
Classification:	
Standards:	EN ISO 13849-1
B_{10d} (NC):	2,000,000
Mission time:	20 years

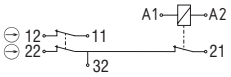
$$MTTF_d = \frac{B_{10d}}{0{,}1 \times n_{op}} \qquad n_{op} = \frac{d_{op} \times h_{op} \times 3600\ s/h}{t_{cycle}}$$

Contact variants

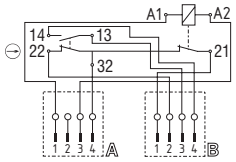
Power to unlock
1 NO / 1 NC



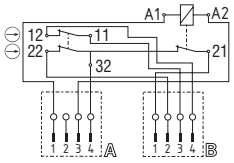
2 NC



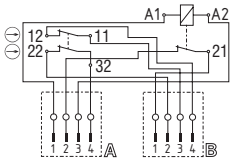
Connector
1 NO / 1 NC



2 NC

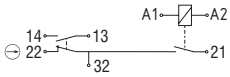


2 NC
with individual solenoid monitoring
(Ordering suffix -ST-2431)

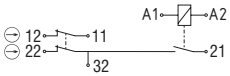


Contact variants

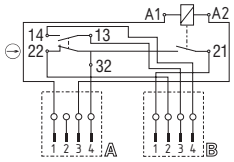
Power to lock
1 NO / 1 NC



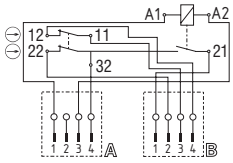
2 NC



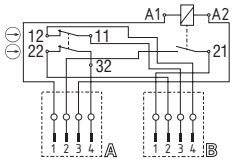
Connector
1 NO / 1 NC



2 NC



2 NC
with individual solenoid monitoring
(Ordering suffix -ST-2431)



Note

The contact 21-32 is actuated when A1-A2 is energized or de-energized.

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

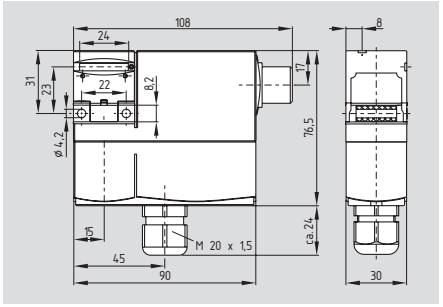
Circuit diagrams show de-energized condition with actuator inserted.

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

Note

Actuators and connector plugs must be ordered separately. (refer to page 1-34)

AZM 170SK-../..



- **Screw terminals**
- Interlock with protection against incorrect locking.
- Thermoplastic enclosure
- Compact design
- Manual release from side
- Long life
- Double-insulated ⧈
- High holding force 1,000 N
- With latching force 30 N or 5 N
- Power to unlock / power to lock principle
- 1 cable entry M20 cord grip
- EX version available

Approvals

* under preparation

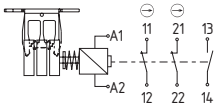
Technical data

Standards:	IEC/EN 60947-5-1 EN ISO 13849-1 BG-GS-ET-19
Enclosure:	glass fiber reinforced thermoplastic, self-extinguishing
Actuator and locking bolt:	stainless steel 1.4301
Protection class:	IP67 to EN 60529
Contact material:	silver
Contact type:	change-over contact with double break, type Zb with galvanically separated contact bridges
Switching principle:	⊖ IEC 60947-5-1 slow action, NC contacts with positive break
Cable gland:	M20
Connection:	screw terminals
Cable type:	flexible with insulated conductor ferrules
Cable section:	min. 0.25 mm² max. 1.5 mm² (incl. conductor ferrules)
U_{imp}:	4 kV
U_i:	250 V
I_{the}:	6 A
Utilization category:	DC-13
I_e/U_e:	4 A / 24 VDC
Max. fuse rating:	6 A gG D-fuse
Positive break travel:	11 mm
Positive break force:	8.5 N for each NC contact fitted
Magnet:	100% ED
U_s:	24 VDC
Power consumption:	max. 10 W
Ambient temperature:	−25 °C … +60 °C
Mechanical life:	> 1 million operations
F_{max}:	1,000 N
Latching force:	30 N for ordering suffix R
Actuating speed:	max. 2 m/s
Classification:	
Standards:	EN ISO 13849-1
B_{10d} (NC):	2,000,000
Mission time:	20 years

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

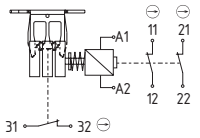
Contact variants

Power to unlock
1 NO 2 NC
(Ordering suffix -12/00)



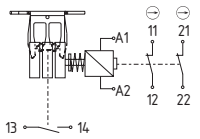
11	12	21	22	13	14		A1	A2

2 NC / 1 NC
(Ordering suffix -02/01)



11	12	21	22		31	32		A1	A2

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



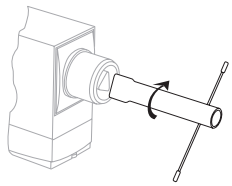
11	12	21	22		13	14		A1	A2

Ordering details

AZM 170SK-①Z②K③-④-⑤-024

No.	Option	Description
①	12/00	1NO 2NC / –
	11/11	1NO 1NC / 1NO 1NC
	11/02	1NO 1NC / 2NC
	02/01	2NC / 1NC
	02/10	2NC / 1NO
②		Latching force 5 N
	R	Latching force 30 N
③		Power to unlock
	A	Power to lock
④	1637	Gold-plated contacts
⑤	2197	Manual release for power to unlock principle

Note



Manual release from side
- For manual release using M5 triangular key, available as accessory
- Manual release available for power to unlock principle
- Ordering suffix -2197

Note

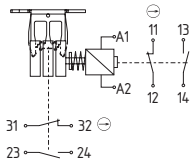
Circuit diagrams show de-energized condition with actuator inserted.

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

Solenoid interlocks

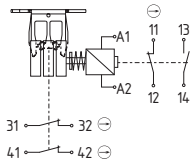
Contact variants

Power to unlock
1 NO 1 NC / 1 NO 1 NC
(Ordering suffix -11/11)



11	12	13	14		23	24	31	32		A1	A2

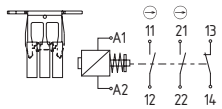
1 NO 1 NC / 2 NC
(Ordering suffix -11/02)



11	12	13	14		31	32	41	42		A1	A2

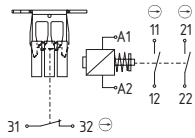
Contact variants

Power to lock
1 NO 2 NC
(Ordering suffix -12/00)



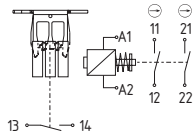
11	12	21	22	13	14		A1	A2

2 NC / 1 NC
(Ordering suffix -02/01)



11	12	21	22		31	32		A1	A2

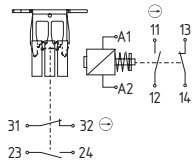
2 NC / 1 NO
(Ordering suffix -02/10)



11	12	21	22		13	14		A1	A2

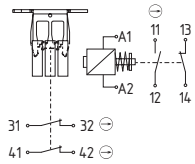
Contact variants

Power to lock
1 NO 1 NC / 1 NO 1 NC
(Ordering suffix -11/11)



11	12	13	14		23	24	31	32		A1	A2

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



11	12	13	14		31	32	41	42		A1	A2

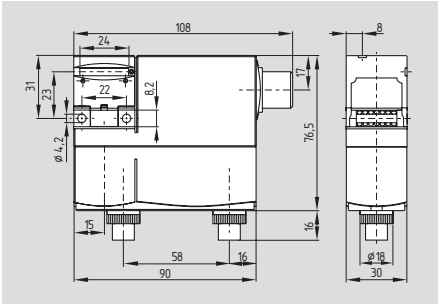
Note

Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

Note

Actuators must be ordered separately.
(refer to page 1-34)

AZM 170ST-../..



- **Plug-in connector**
- Interlock with protection against incorrect locking.
- Thermoplastic enclosure
- Compact design
- Manual release from side
- Long life
- Double-insulated ⧈
- High holding force 1,000 N
- With latching force 30 N or 5 N
- Power to unlock / power to lock principle
- Plug-in connector can be rotated
- Plug-in connectors required: 4- and 8-poles
- EX version available

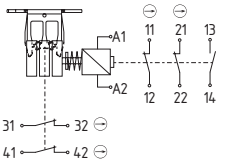
Technical data

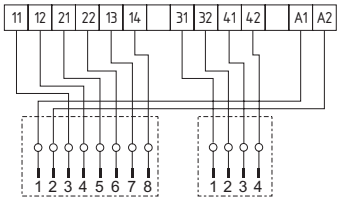
Standards:	IEC/EN 60947-5-1 EN ISO 13849-1 BG-GS-ET-19
Enclosure:	glass fiber reinforced thermoplastic, self-extinguishing
Actuator and locking bolt:	stainless steel 1.4301
Protection class:	IP67 to EN 60529
Contact material:	silver
Contact type:	change-over contact with double break, type Zb with galvanically separated contact bridges
Switching principle:	⊖ IEC 60947-5-1 slow action, NC contacts with positive break
Connection:	connector
U_{imp}:	0.8 kV
U_i:	60 V
I_{the}:	2 A
Utilization category:	DC-13
I_e/U_e:	2 A / 24 VDC
Max. fuse rating:	2 A gG D-fuse
Positive break travel:	11 mm
Positive break force:	8.5 N for each NC contact fitted
Magnet:	100% ED
U_s:	24 VDC
Power consumption:	max. 10 W
Ambient temperature:	−25 °C … +60 °C
Mechanical life:	> 1 million operations
F_{max}:	1,000 N
Latching force:	30 N for ordering suffix R
Actuating speed:	max. 2 m/s
Classification:	
Standards:	EN ISO 13849-1
B_{10d} (NC):	2,000,000
Mission time:	20 years

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

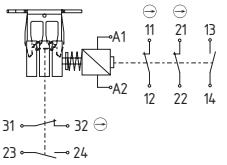
Contact variants

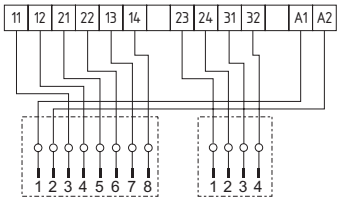
Power to unlock
1 NO 2 NC / 2 NC
(Ordering suffix -12/02)





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





Approvals

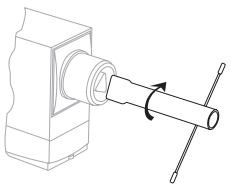
* under preparation

Ordering details

AZM 170ST-①Z②K③-④-⑤-024

No.	Option	Description
①	12/11	1NO 2NC / 1NO 1NC
	12/02	1NO 2NC / 2NC
	11/11	1NO 1NC / 1NO 1NC
	11/02	1NO 1NC / 2NC
②		Latching force 5 N
	R	Latching force 30 N
③		Power to unlock
	A	Power to lock
④	1637	Gold-plated contacts
⑤	2197	Manual release for power to unlock principle

Note



Manual release from side
- For manual release using M5 triangular key, available as accessory
- Manual release available for power to unlock principle
- Ordering suffix -2197

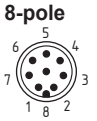
Note

Connector M12

4-pole

PIN 1: brown BN
PIN 2: white WH
PIN 3: blue BU
PIN 4: black BK

8-pole

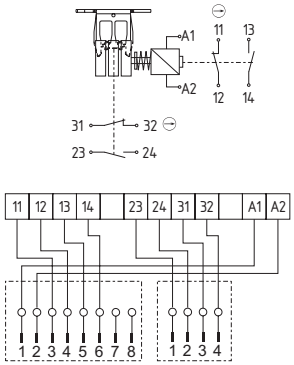


PIN 1: white WH
PIN 2: brown BN
PIN 3: green GN
PIN 4: yellow YW
PIN 5: grey GY
PIN 6: pink PK
PIN 7: blue BU
PIN 8: red RD

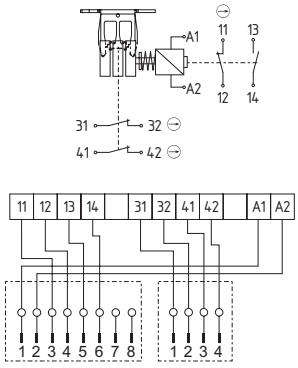
Solenoid interlocks

Contact variants

Power to unlock
1 NO 1 NC / 1 NO 1 NC
(Ordering suffix -11/11)

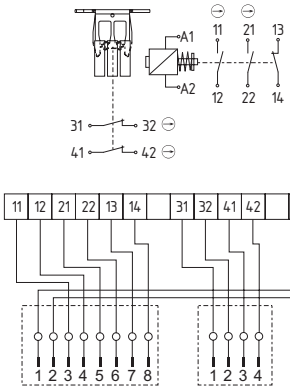


1 NO 1 NC / 2 NC
(Ordering suffix -11/02)

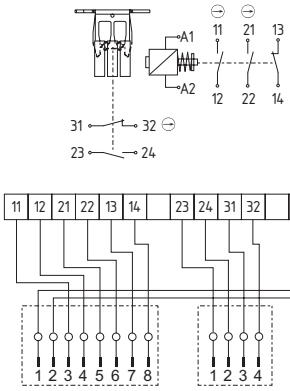


Contact variants

Power to lock
1 NO 2 NC / 2 NC
(Ordering suffix -12/02)

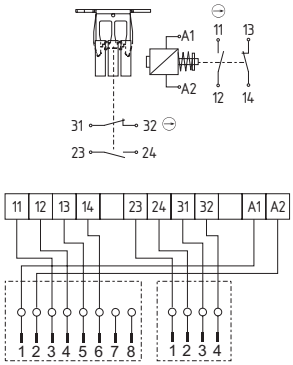


1 NO 2 NC / 1 NO 1 NC
(Ordering suffix -12/11)

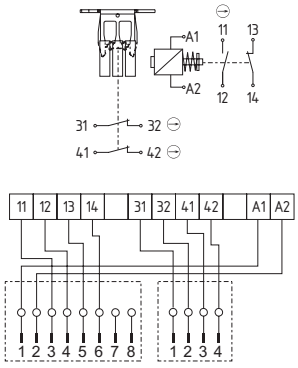


Contact variants

Power to lock
1 NO 1 NC / 1 NO 1 NC
(Ordering suffix -11/11)



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



Note

Circuit diagrams show de-energized condition with actuator inserted.

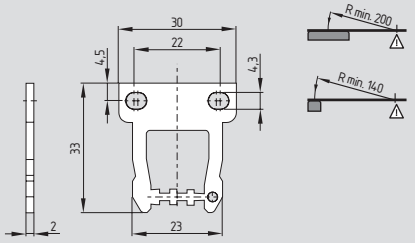
At least one magnetic contact with positive break ⊖ must be integrated in the safety circuit.

Actuators and connector plugs must be ordered separately. (refer to page 1-34)

Note

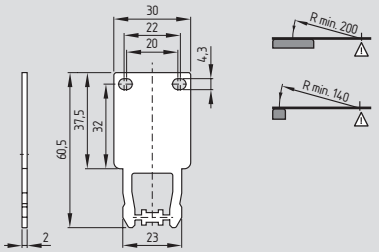
Interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the accident risk, since the guarding device can immediately be opened on failure of the electrical power supply or when the main switch is opened.

System components



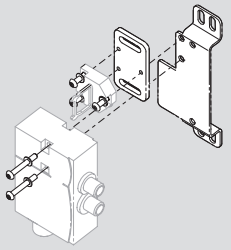
Straight actuator AZ 17/170-B1

System components

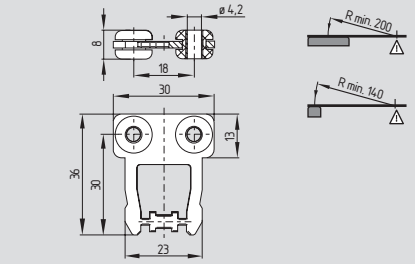


Long straight actuator AZ 17/170-B11

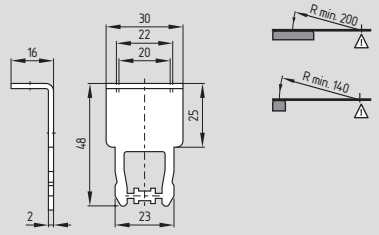
System components



Mounting set MS AZM 170

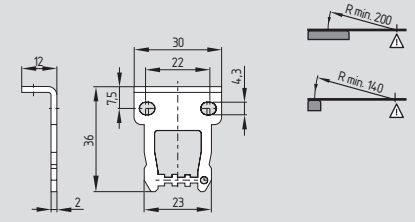


AZ 17/170-B1-2245 with rubber mounting

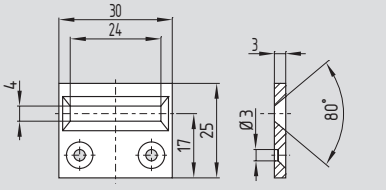


Long angled actuator AZ 17/170-B15

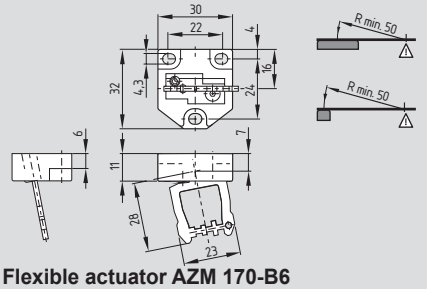
Connector plug



Angled actuator AZ 17/170-B5



Centering guide AZM 170-B



Flexible actuator AZM 170-B6

Ordering details

Straight actuator	**AZ 17/170-B1**
with rubber mounting	**AZ 17/170-B1-2245**
Angled actuator	**AZ 17/170-B5**
Flexible actuator	**AZ 17/170-B6**

Ordering details

Long straight actuator	**AZ 17/170-B11**
Long angled actuator	**AZ 17/170-B15**
Centering guide	**AZM 170-B**

Centering device

Mounting outside	**TFA-020**
Mounting inside	**TFI-020**

(Product information see page 1-52)

Ordering details

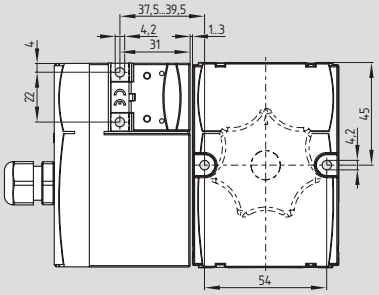
Mounting sets	**MS AZM 170 P**
	MS AZM 170 R/P
Connector plug M12	
without cable, 4-poles:	**101209950**
with 5m cable, 4-poles:	**101208523**
with 5m cable, 8-poles:	**101209964**
Without cable, 4-poles, B-code	**101209976**
With 5m cable, 4-poles, B-code	**101209938**

Tamperproof screws with unidirectional slots (without drawing)

M4 x 8	**101147463**

(Quantity 2 pcs)

Actuator AZM 170-B25



- Door-handle actuator for solenoid interlocks AZM 170-…ZRK (latching)
- Ergonomic operation
- No supplementary door-handle required
- No protruding actuator
- Simple mounting
- Several door-handles available
- Possibility to mount the own handles using a default square screw (8 mm)
- Mounting plate for fitting to standard profiles optionally available

Approvals

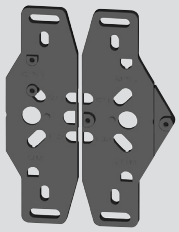
CE

Ordering details

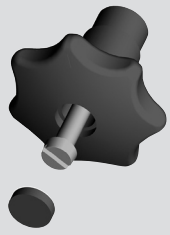
AZM 170-B25-①-②

No.	Option	Description
①	L	Door hinge left
	R	Door hinge right (View directed towards the inside of the hazardous area)
②	G0	Actuator without handle
	G1	Star grip
	G2	T-grip

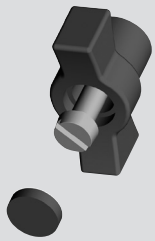
System components



Mounting plate



Star grip



T-grip

Ordering details

Mounting plate	**MP AZ 17/170-B25**
Star grip	**G1**
T-grip	**G2**

Note

The safety switch or solenoid interlock is not included in delivery and must be ordered separately.

Please note that you need a device with latching (R).

The technical data of the AZM 170-…ZRK solenoid interlock can be found in the main catalog page 1-28 or in the online catalog at www.usa.schmersal.net