SCHMERSAL

CN ƀ й 1 7

目录

1. 关于该文件

1.1 功能

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1.2 目标群：专业人员

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1.3 应用符号

信息，提示，说明：
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警告：不遵守这些警告提示可能导致人身伤害和/或机器损坏。

1.4 用途

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1.5 安全信息

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products.schmersal.com Â

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103049942-CN / C / 2024-08-02

1.6 误用警告

1.7 免责条款

2. 产品描述

2.1 订货代码

EX-AZM150SK-①R②③④-⑤-⑥-⑦-3G/D

编号	选项	描述
①		
	02 / 11	2 1 / 1
	11 / 11	1 / 1 1 / 1
	11 / 02	1 / 1 2
	02 / 02	2 2
②	（空白）	
	I	
③	（空白）	
	A	
④	（空白）	
	T	
	N	
⑤	024	U_s 24 VDC
	110	U_s 110 VAC
	230	U_s 230 VAC
⑥	（空白）	-I
	B1	B1
	B5	B5
	B6L	B6
	B6R	B6
⑦	（空白，或一个或多个数字、字符、字母等组合）	客户特殊代码，与防爆性能不相关

操动件(不包括在配货中)
AZM150-B1 直操动件
AZM150-B5 弯角操动件
AZM150-B6 可调操动件

2.2 特殊型号

2.3 目的

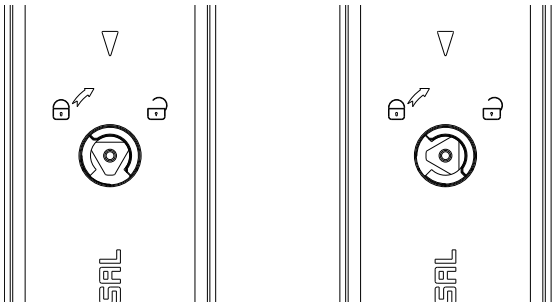
EX-AZM150

安全操作的条件

手动解锁

手动解锁

已锁定 解锁



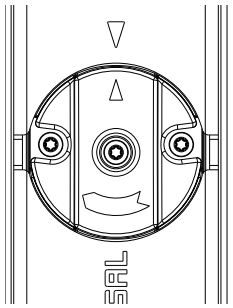
TK-M5 101100887

紧急解锁（订货后缀 -N）

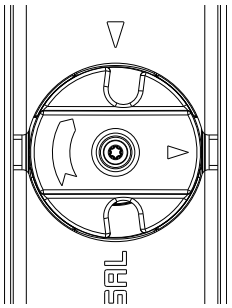
紧急出口（订货后缀-T）
（仅限在危险区域以内安装和操动）
为了激活紧急解锁，需将红色的手柄转90° 至箭头方向的终点。在这一位置上，防护门可以打开。将手柄扳转至相反方向，则可解除锁定状态。在解锁位置上，防护门受到保护，以防止意外关闭。

紧急解锁 / 紧急逃逸

已锁定



解锁



用户必须根据相关标准和所要求的安全等级评估、设计安全链。

集成了安全部件在内的完整控制系统设计必须符合相关标准。

2.4 技术参数

符合标准的指定：	Ex nR IIC T5 Gc Ex tc IIIC T80° Dc
标准：	EN 60947-5-1, EN ISO 14119 EN 60079-0, EN 60079-15, EN 60079-31 GB/T 3836.1, GB/T 3836.8, GB/T 3836.31
外壳：	玻璃纤维增强热塑塑料，自熄灭
保护罩：	不锈钢 1.4301
操动件和锁闩：	不锈钢 1.4301
触点材料：	银
手柄编码参照EN ISO 14119:	
- 标准编码版本：	低
- 独立编码版本：	高
保护类型:	IP65, IP67
绝缘防护等级：	II, ⧈
过电压类别：	II
污染等级：	2
触点类型：	电气分隔触桥，双断点转换触点Zb
开关系统:	⊖ EN 60947-5-1,缓动式,肯定断开的常闭触头
肯定断开行程（解锁）:	5 mm
强制断开力（解锁）:	每个安装的NC触点 10 N
接线端子：	螺丝连接
导线类型：	软线
最大电缆截面：	0.25 mm² ⋯ 1.5 mm² (包含导体套圈，无塑料圈)
电缆进口：	3x M20, ⟨Ex⟩ II 2 G D
- 拧紧力矩：	≥ 6.5 Nm
保持力 F_{max}：	1,950 N
保持力 F_{Zh}:	1,500 N
锁定力：	50 N
操动速度：	≤ 0.3 m/s
操动频率：	最大 1,000次/小时
机械寿命：	1,000,000 次操作
环境温度:	-25 ℃ ⋯ +55 ℃
存放温度：	- 40 ℃ ⋯ +85 ℃
相对湿度：	最大 93 %， 无冷凝，无结冰

电气参数：

应用类别：	AC-15, DC-13
- 额定工作电流/电压 I_e/U_e：	4 A / 230 VAC 4 A / 24 VDC
额定耐冲击电压 U_{imp}：	4 kV
额定绝缘电压 U_i：	300 V
热稳定电流 I_{the}：	5 A
最大保险容量：	6 A gG
要求额定短路电流：	1,000 A
额定控制电压 U_s：	24 VDC 110 VAC 230 VAC

电气参数 - 磁力控制：

负载比电磁线圈：	100%
功率消耗：	最大 8.5 W
输入信号接受的测试脉冲持续时间：	≤ 5.0 ms
- 测试脉冲间隔：	≥ 50 ms

2.5 联锁功能的安全分类

标准：	EN ISO 13849-1
预期结构：	
- 基本上：	适用于Cat. 1 / PL c
- 2声道使用和 故障排除机制*：	适用于Cat. 3 / PL d 有合适的逻辑单元
B_{10D} NC触点：	2,000,000
B_{10D} NC触点在10%欧姆触点负载情况下：	1,000,000
使用寿命：	20年

*如果故障排除的通道力学是被授权的。

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

（根据应用参数h_{op}、d_{op}和t_{cycle}以及负载变化，技术参数可能有所不同。）

如果串联多个安全部件，依据EN ISO 13849-1中规定的性能等级将会降低，因为在特定情况下，错误检查会受到限制。

2.6 锁定功能的安全分类

如果设备用作人身安全联锁，则需要对防护门锁定功能进行安全分类。

在对联锁功能进行分类时，必须区分联锁功能（锁定功能）的监控和解锁功能的控制

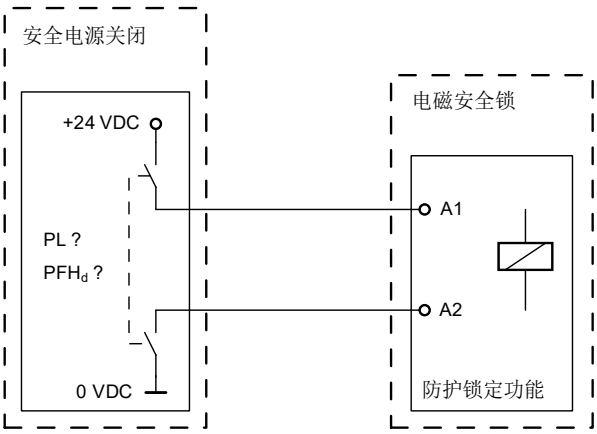
在对联锁功能进行分类时，必须区分联锁功能（锁定功能）的监控和解锁功能的控制

解锁功能的分类仅对于带受监测防护门锁定功能的设备及通电解锁的版本有效（见订购代码）。

可以通过安全断开外部电源来排除防护锁定功能的故障。

在这种情况下，防护锁定功能对解锁功能的失效概率没有影响。

解锁功能的安全等级，完全由安全的关闭外部电源决定。



必须遵守布线的故障排除。

如果操作安全分析表明，不能使用静态电流版本的电磁安全锁，则可作为一个例外情况，使用通电上锁的锁，前提是必须采取附加安全措施，确保相应的安全水平。

3. 组装

3.1 通用安装说明

请遵守EN ISO 12100、EN ISO 14119和EN ISO 14120标准中的有关规定。

有4个M5安装孔用于固定外壳 电磁安全锁有双绝缘。不允许使用接地线。严禁将电磁安全锁用作限位挡块。安装位置任意。但是选择的安装位置必须是防止污垢侵入的开口。未用操动件开口必须用防尘堵头密封。

关于标准编码操动件AZM150-B1，AZM150-B5和AZM150-B6安装的详细信息可参照操动件说明书

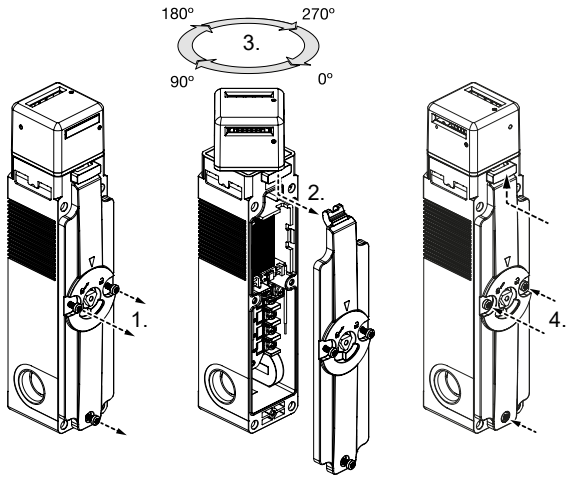
操动件的插入要求，其轴向偏移量为±1，高度偏移量为±1。
操动件必须能轻易地插入操动头中。对于无法确保这种情况的门，必须安装门扣以防止损坏设备。

当室温> 40 ℃时，必须保护线圈锁定以防止接触易燃材料或无意的个人接触。

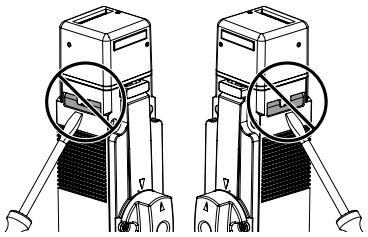
只允许在断电的情况下进行安装。

该设备始终设计为安装在设备框架上，以确保电气连续性。

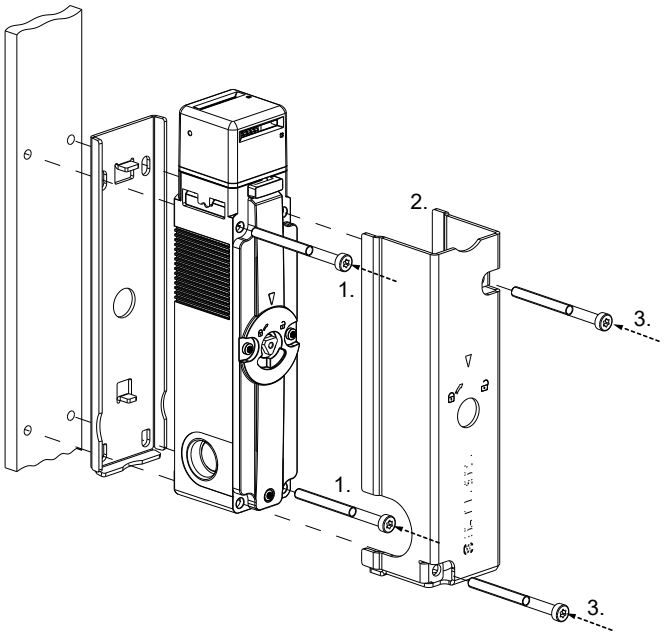
操作面选择
驱动补偿可实现8级驱动
1. 拧下盖板螺钉
2. 取下盖板
3. 转动操动头到所需位置
4. 安装盖板并固定，拧紧盖板螺钉(力矩 0.5 Nm)



不要撬出侧面的金属插片。拉出金属插片会损坏装置。

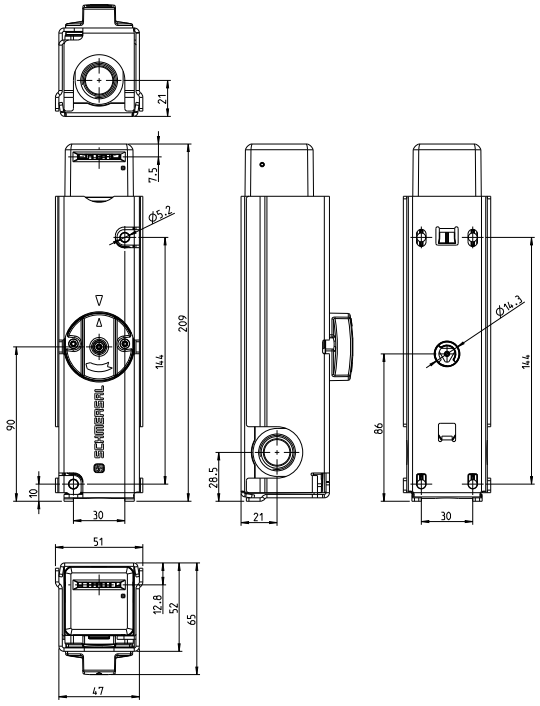


安装保护罩
1. 对齐底板和开关，拧紧左上角和右下角的两个M5安装螺钉(力矩 1.0 Nm)。
2. 装上保护罩。
3. 拧紧其余的右上角和左下角的两个M5安装螺钉(扭矩 1.0 Nm)。



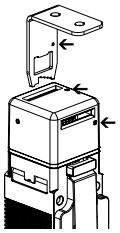
3.2 尺寸

测量值均以mm为单位
安装保护罩



3.3 安装独立编码操动件

电磁安全锁插入开口处标志和操动件上的标志必须是相对的。



在出厂条件下，独立编码的安全开关AZM150- ...I的操动件已被插入上部的操动件入口中。

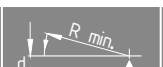
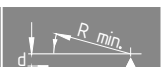
交货时，操动件处于插入状态。对于通电开锁开关，操动件必须通过手动解锁的方式来释放。如果三角钥匙转动90度，锁紧螺栓会被拉到解锁位置。只有在将三角钥匙转回初始位置后方可恢复正常的锁定功能。

操动件必须永久固定在安全防护门上，通过合适的措施防止移位（防破坏螺栓、胶接、螺栓头钻孔等）。

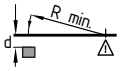
固定安装时，如需铆接或焊接，必须注意操动件的插入深度不可改变。有多种不同的操动件可供选择。

操动件B1和B5适用于滑动和可移动的安全监控。对于铰链防护装置推荐选用AZM150-B6L或者AZM150-B6R操动件。

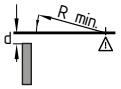
对于在旋转式防护门上安装操动件时应注意旋转轴应位于安全开关上表面的上部平面内，这样操动件可以插入至安全开关内部。（见附表）

操动半径					
		R_{min} [mm]	d [mm]	R_{min} [mm]	d [mm]
	AZM150-B6L	250	18.5	250	23
	AZM 150-B6R	250	18.5	250	23
	AZM150-B1				
	AZM150-B5				

注：



操动件半径
前面操动件旋转形式

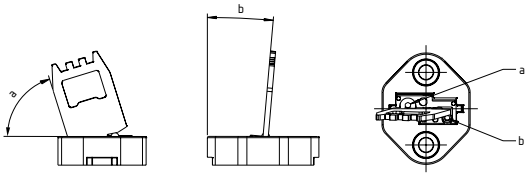


操动件半径
后面操动件旋转形式

铰链的旋转轴必须处于高出安全开关上表面d mm 处的平面内。基本条件已经将防护门旋转半径调节至最小半径R_{min}，此时对应操动件偏移角度最大。

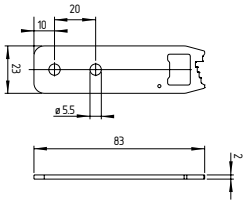
调节螺钉

AZM150-B6L或者AZM150-B6R操动件在工厂设置为最小半径。为增加半径，可通过A/F 2mm的六角扳手调节a+b两个螺钉。

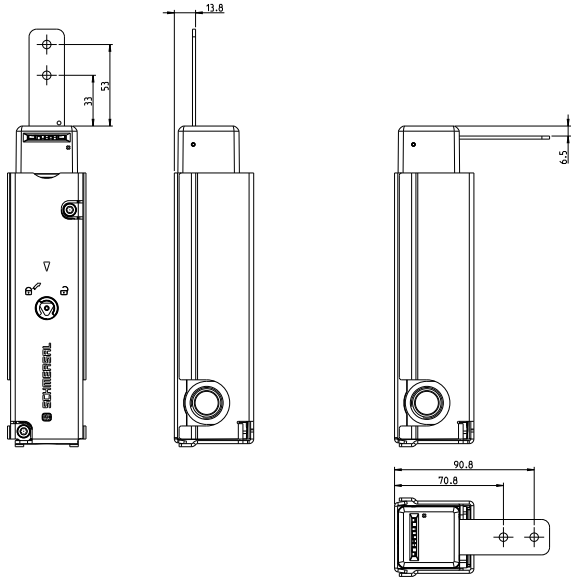


操动件螺钉强度为5.6.

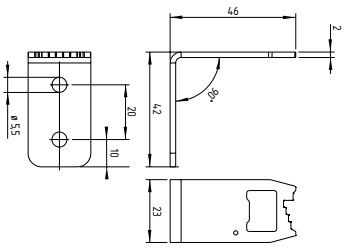
操动件AZM150-B1



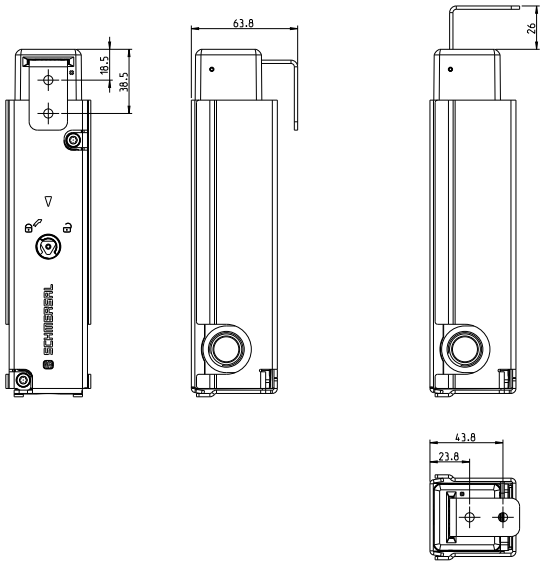
操动件安装位置
(所有尺寸 ± 0.3 mm)



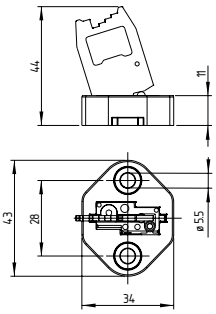
操动件AZM150-B5



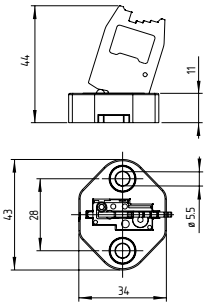
操动件安装位置
(所有尺寸 ± 0.3 mm)



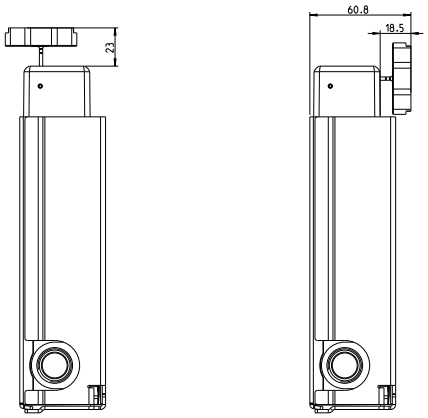
操动件AZM150-B6L



操动件 AZM150-B6R



操动件安装位置
(所有尺寸 ± 0.3 mm)



3.4 附件

	命名/描述	订货代码
三角钥匙	TK-M5	101100887
门把手系统	DHS-150-BKBU-L	137000626
	DHS-150-BKBU-R	137000625
停工上锁标签	SZ150-1	153027887
电缆接头	M20 x 1.5	按特殊需求
防逆转螺丝	M5 x 15, 2个 (包含垫圈)	按特殊需求

4. 电气连接

4.1 电气接线指示

电气接线需在电源关闭的情况下由授权专业人员完成。

如果风险分析指出使用监控联锁，则应将其接入安全回路，并与标有⏚符号的触点连接。

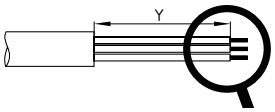
应使用带有相应防护等级的合适电缆接头。所需的插入口应使用合适的工具打开。

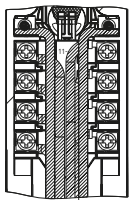
只能使用防爆电缆接头和带集成或相关密封的防爆空心塞，这些都是在相应的应用领域中被授权的。电缆接头必须按照适用的操作说明手册进行安装。电缆接头只被授权用于永久性电缆。施工单位必须提供必要的应力消除装置。未使用的电缆入口必须用防爆认证的锁紧螺钉来密封。

完成接线后，必须清洗接线盒(除去多余的电缆等)。

最大电缆截面：0.25 … 1.5 mm²
(包含导体套圈，无塑料圈)

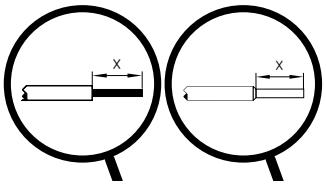
拆除电缆护套





A1	A2
1.	y = 71 mm
2.	y = 67 mm
3.	y = 57 mm
4.	y = 47 mm
	y = 37 mm

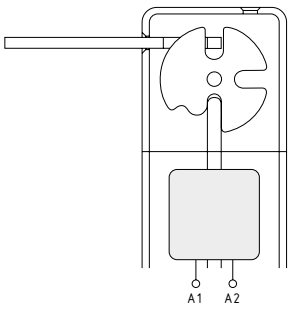
导体的固定长度x： 6 mm



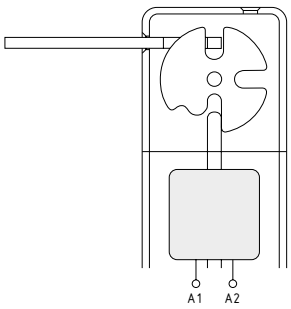
4.2 触点选项

触点在电源关闭且已插入操动件的情况如图所示。

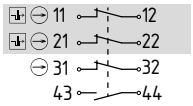
通电开锁
防护系统关闭-联锁



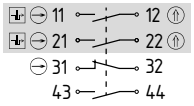
通电上锁
防护系统关闭-未联锁



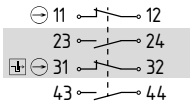
AZM150...-02/11



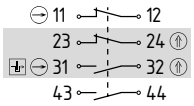
AZM150...-02/11...A



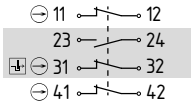
AZM150...-11/11



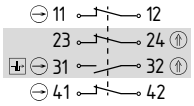
AZM150...-11/11...A



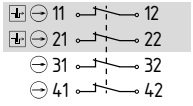
AZM150...-11/02



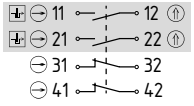
AZM150...-11/02...A



AZM150...-02/02



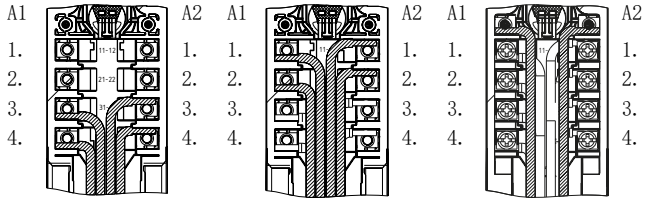
AZM150...-02/02...A



注：
- 线圈触点
- ⊖ 肯定断开常闭触点
- 根据EN ISO 14119的要求监控联锁
- ⇧ 操动

4.3 接线图示

布线时，应考虑左右端子螺丝的端子偏移量。
将电缆整齐地排在其他电缆的旁边或上面。



5. 调试与维护

安装、操作和维护必须由合格的专业人员执行。安装和维护所需的要求可在本操作手册中找到。不要将设备暴露在机械和/或热负荷或压力下，这超过了操作说明手册中规定的限度。

对于安全开关设备的安装和操作，必须遵守适用的（也包括国家）安全和事故预防规定以及公认的技术规范。

5.1 功能检查

必须测试该安全开关的安全功能。事先要检查并满足下列条件：
1. 安装电磁安全锁和操动件
2. 检查电缆进线及连接是否完好无损
3. 检查开关外壳是否损坏
4. 检查侧面盖板和后侧
   手动解锁是否在起始位置

5.2 维护

推荐按照下列内容进行常规的目测检查和功能测试：
1. 检查操动件和开关是否紧固安装
2. 去除污垢
3. 检查电缆进线和连接

必须采取相应措施以防止发生蓄意破坏或回避安全防护装置的行为，例如可使用替代操动件。

损坏或故障部件必须更换。

5.3 特殊（限制）使用条件

存在潜在静电电荷危险，仅可使用湿布擦拭产品。
带电时请勿打开设备。

由于防爆原因，壳盖密封垫部件及手动解锁旋转轴密封件必须在最多100万次操作后进行更换。

1. 产品使用环境温度范围：-25 ℃ ⋯ +55 ℃

警告 - 禁止在存在爆炸性气体的区域内打开、维护或检修设备。

该设备通常无需打开，因此无需设置测试口。

5.4 例行检查和试验

进行例行试验时，可用包括密封系统的电缆引入装置或导管引入装置对设备进行试验。

1. 在恒温条件下，低千大气压至少0.3 kPa（相对误差0 %~10 %）的内部压力变为初始值的二分之一所需时间，应不少于180秒。

2. 可以用下列试验程序之一替代：
   --在恒温条件下，低于大气压至少3.0 kPa（相对误差0 %~10 %）的内部压力变为2.7 kPa所需时间，应不少于27秒;

   --在恒温条件下，低于大气压至少0.3 kPa（相对误差0 %~10 %）的内部压力变为0.27 kPa所需时间，应不少于27秒。

注1：增加替代方法是为了采用可能降低压力的调整值，缩短进行例行试验所需时间。
注2：如果利用较小压力值有困难，可以采用10倍的较大值。

6. 拆卸与处理

6.1 拆卸

该安全开关必须在电源关闭的情况下拆卸。

6.2 处理

该开关必须按照相关的国家标准和法规进行处理。

SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 7
Original

Content

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 indicates 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 Schmersal range of products is not intended for private consumers.

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: products.schmersal.com.

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.

103049942-EN / C / 2024-08-02

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. The relevant requirements of the standard EN 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:

EX-AZM150SK-①R②③④-⑤-⑥-⑦-3G/D

No.	Option	Description	
①		Magnet:	Actuator:
	02 / 11	2 NC	1 NO / 1 NC
	11 / 11	1 NO / 1 NC	1 NO / 1 NC
	11 / 02	1 NO / 1 NC	2 NC
	02 / 02	2 NC	2 NC
②	(blank)	Standard coded (Actuator not included in delivery)	
	I	Individually coded (incl. actuator, see ⑥)	
③	(blank)	Power to unlock	
	A	Power to lock	
④	(blank)	Manual release	
	T	Emergency Exit	
	N	Emergency release	
⑤	024	U_s 24 VDC	
	110	U_s 110 VAC	
	230	U_s 230 VAC	
⑥	(blank)	Including actuator for individually coded versions I:	
	B1	Straight actuator B1 included	
	B5	Angled actuator B5 included	
	B6L	incl. flexible actuator B6, left	
	B6R	incl. flexible actuator B6, right	
⑦	(blank, or one or more combinations of numbers, characters, letters)	Customer-specific codes, not related to explosion-proof performance	

Standard coded actuator (not included in delivery)

AZM150-B1	Straight actuator
AZM150-B5	Angled actuator
AZM150-B6	Flexible actuator

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 Purpose

The solenoid interlock 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.
The components can be used in potentially explosive atmospheres of Zone 2 and 22 equipment category 3G and 3D. The installation and maintenance requirements to the standard series EN IEC 60079 and GB/T 3836 must be met.
The EX-AZM150 solenoid interlocks with individual coding offer a higher protection against tampering and remain off when the guard system is unlocked or open.

Conditions for safe operation

Due to the 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.

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.

The safety switchgears are classified according to EN ISO 14119 as type 2 interlocking devices. Designs with individual coding are classified as highly coded.

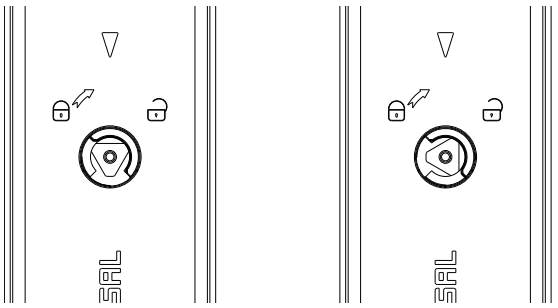
Manual release

(for set-up, maintenance, etc.)
The rear and cover-side manual release can be actuated independently of one another. Check that both are in the starting position when putting the device into operation.

The manual release is realised by turning the triangular key, so that the locking bolt is pulled into the unlocking position. 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 seals, which are included in delivery.

Manual release

Locked **Unlocked**



Triangular key TK-M5 (101100887) available as accessory.

Emergency release (ordering suffix -N)

(Fitting only from outside the hazardous area)

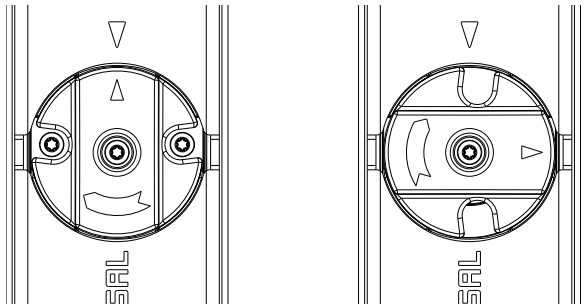
The emergency release should only be used in an emergency.
The solenoid interlock should be installed and/or protected so that an inadvertent opening of the interlock by an emergency release can be prevented.
The emergency release must be clearly labelled that it should only be used in an emergency. The label can be used that was included in the delivery.

To activate the emergency release, turn the red lever 90 in the direction of the arrow as far as it will go. In this position, the safety guard can be opened. The lever is latched and cannot be returned to its original position. To cancel the blocking condition, the central mounting screw must be loosened to such extent that the lever can be turned back into its original position. The screw must then be re-tightened.

Emergency exit (Ordering suffix -T)
(Fitting and actuation only from within the hazardous area)
To activate the emergency exit of version T, turn the red lever 90 in the direction of the arrow as far as it will go. In this position, the safety guard can be opened. The blocked position is cancelled by turning the lever in the opposite direction. In unlocked position, the safety guard is protected against unintentional closing.

Emergency release / Emergency exit

Locked **Unlocked**



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

Designation in accordance with standards:	Ex nR IIC T5 Gc Ex tc IIIC T80° Dc
Standards:	EN 60947-5-1, EN ISO 14119 EN 60079-0, EN 60079-15, EN 60079-31 GB/T 3836.1, GB/T 3836.8, GB/T 3836.31
Enclosure:	glass-fibre reinforced thermoplastic, self-extinguishing
Protective enclosure:	stainless steel 1.4301
Actuator and locking bolt:	stainless steel 1.4301
Contact material:	Silver
Coding level according to EN ISO 14119:	
- Standard coding version:	low
- Individual coding version:	high
Degree of protection:	IP65, IP67
Insulation protection class:	II, ⧈
Overvoltage category:	II
Degree of pollution:	2
Contact type:	Change-over contact with double break type Zb, with galvanically separated contact bridges
Switching system:	⊖ acc. EN 60947-5-1 slow action, NC contact with positive break
Positive break travel (unlocked):	5 mm
Positive break force (unlocked):	10 N for each NC contact fitted
Connection:	screw terminals
Cable type:	flexible
Max. cable section:	0.25 mm² … 1.5 mm² (incl. conductor ferrules without plastic collar)
Cable entry: - Tightening torque:	3x M20, ⟨Ex⟩ II 2 G D ≥ 6.5 Nm
Holding force F_{max}:	1,950 N
Holding force F_{Zh}:	1,500 N
Latching force:	50 N
Actuating speed:	≤ 0.3 m/s
Actuating frequency:	max. 1,000 operations/h
Mechanical life:	1,000,000 operations
Ambient temperature:	-25 °C … +55 °C
Storage temperature:	–40 °C … +85 °C
Relative humidity:	max. 93 %, non condensing, non icing

Electrical data:

Utilisation category:	AC-15, DC-13
- Rated operating current/voltage I_e/U_e:	4 A / 230 VAC 4 A / 24 VDC
Rated impulse withstand voltage U_{imp}:	4 kV
Rated insulation voltage U_i:	300 V
Thermal test current I_{the}:	5 A
Max. fuse rating:	6 A gG
Required rated short-circuit current:	1,000 A
Rated control voltage U_s:	24 VDC 110 VAC 230 VAC

Electrical data – Magnet control:

Magnet switch-on time:	100%
Power consumption:	max. 8.5 W
Accepted test pulse duration on input signal:	≤ 5.0 ms
- With test pulse interval of:	≥ 50 ms

2.5 Safety classification of the interlocking function

Standards:	EN 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
Mission time:	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 EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances.

2.6 Safety classification of the interlock function

If the device is used as an interlock for personal safety, a safety classification of the guard locking function is required.

When classifying the interlock function, a distinction must be made between monitoring of the interlock function (locking function) and controlling the unlocking function.

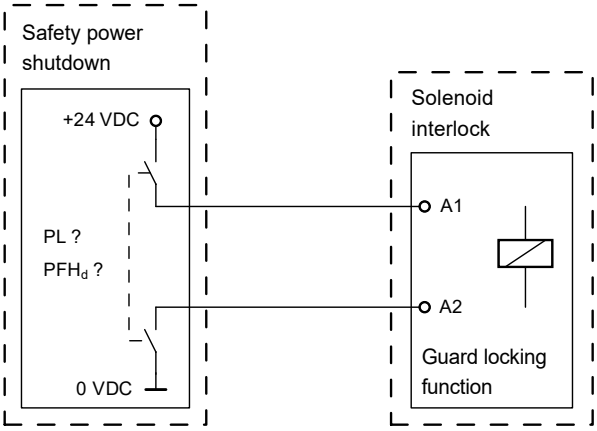
The following safety classification of the unlocking function is based on the application of the principle of safety energy disconnection for the solenoid supply.

The classification of the unlocking function is only valid for devices with monitored guard locking function and in the power to unlock version (see ordering code).

A fault exclusion for the guard locking function can be assumed by an external safety energy disconnection.

In this case, the guard locking function does not have an effect on the failure probability of the unlock function.

The safety level of the unlock function is determined exclusively by the external safety power shutdown.



Fault exclusion with regard to wiring routing must be observed.

If for a certain application the power to unlock version of a solenoid interlock cannot be used, for this exception an interlock with power to lock can be used if additional safety measure need to be realised that have an equivalent safety level.

3. Assembly

3.1 General mounting instructions

Please observe the remarks of the standards EN ISO 12100, EN ISO 14119 and EN ISO 14120.

4 M5 holes are provided for mounting the enclosure. The solenoid interlock is double insulated. The use of an earth wire is not authorised. The solenoid interlock 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. Unused actuator openings must be sealed with slot sealing plugs.

Detailed information on actuators with standard coding (not included in delivery) AZM150-B1, AZM150-B5 and AZM150-B6 and their mounting can be found in the actuator operating instructions.

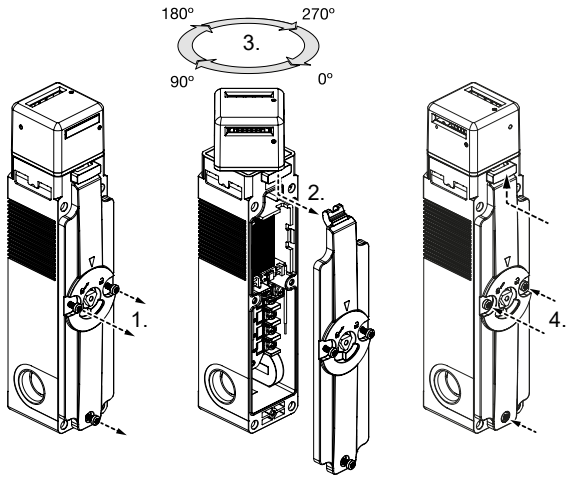
The insertion funnel on the head of the interlock allows insertion of a flexible actuator with an axial offset of ≤ ±1 and a height offset of ≤ ±1. The actuator must be inserted into the actuator head easily. For doors that do not ensure this is possible, a door catch must be installed to prevent damage to the device.

When used in ambient temperatures > 40°C, the solenoid interlock must be protected against contact with inflammable materials or inadvertent personal contact.

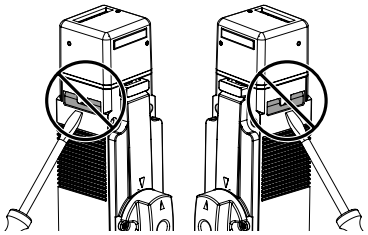
Fitting is only authorized in a de-energised condition.

The equipment is always intended to be mounted on the frame of the equipment in a way where electrical continuity is maintained.

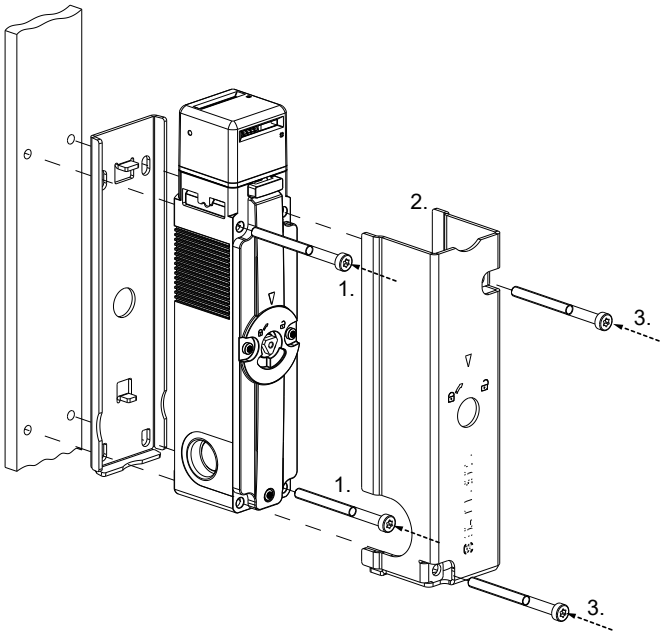
Choosing the actuating planes
Offsetting the actuating head enables actuation of 8 levels.
1. Cover screws must be loosened
2. Remove cover
3. Turn actuating head to desired position
4. Fit the cover and engage, tighten the cover screws (torque 0.5 Nm)



Do not lever out the side tabs. Levering out the tabs will damage the device.



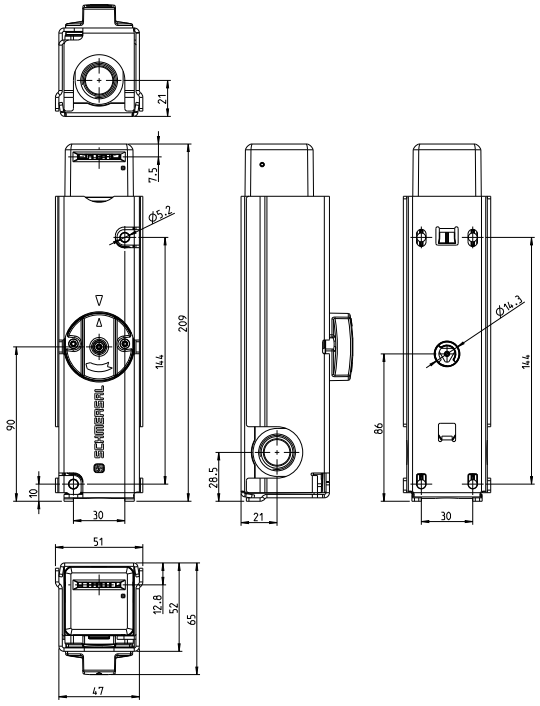
Mounting protective enclosure
1. Align the base plate and the switch, and tighten two M5 mounting screws (with torque 1.0 Nm) in the upper left and lower right corners.
2. Put on the protective cover.
3. Tighten the other two M5 mounting screws (with torque 1.0 Nm) in the upper right and lower left corners.



3.2 Dimensions

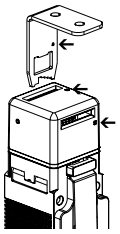
All measurements in mm.

Fitting of protective enclosure



3.3 Mounting of individually coded actuators

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



In the as-delivery condition, the actuator of the individually coded safety switch AZM150 -... I is inserted in the upper actuator inlet.

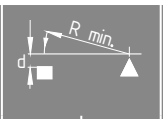
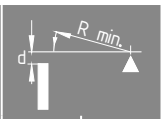
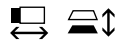
On delivery, the actuator is in inserted condition. For power-to-unlock components, the actuator must be released by means of the manual release. If the triangular key is turned 90°, the locking bolt is pulled into the unlocking position. The normal locking function is only restored after the triangular key has been returned to its original position.

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

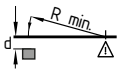
Please observe that, when fixing the switch e.g. by means of rivetting or welding, the insertion depth of the actuator is not modified. There are different actuator types available.

The actuators AZM150-B1 and AZM150-B5 are suitable for sliding and removable safety guards. For hinged guards, the AZM150-B6L or AZM150-B6R actuator.

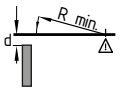
When the switch is fitted on a hinged safety guard, please ensure that the point of rotation is located within the range of the upper surface of the safety switch, in which the actuator hook is inserted (refer to table).

Actuating radii					
		R_{min} [mm]	d [mm]	R_{min} [mm]	d [mm]
	**AZM150-B6L**	250	18.5	250	23
	AZM150-B6R	250	18.5	250	23
	**AZM150-B1**				
	AZM150-B5				

Key



Actuator radii, when the actuator is pivoted in from the front

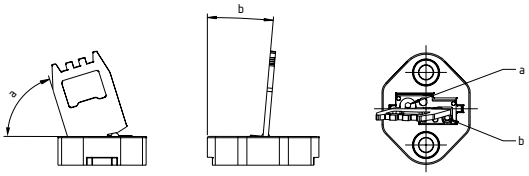


Actuator radii, when the actuator is pivoted in from above

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 R_{min}.

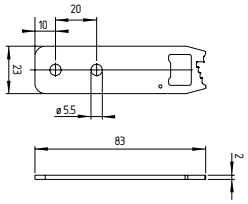
Setting screw

The AZM150-B6L or AZM150-B6R actuator is 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 mm.

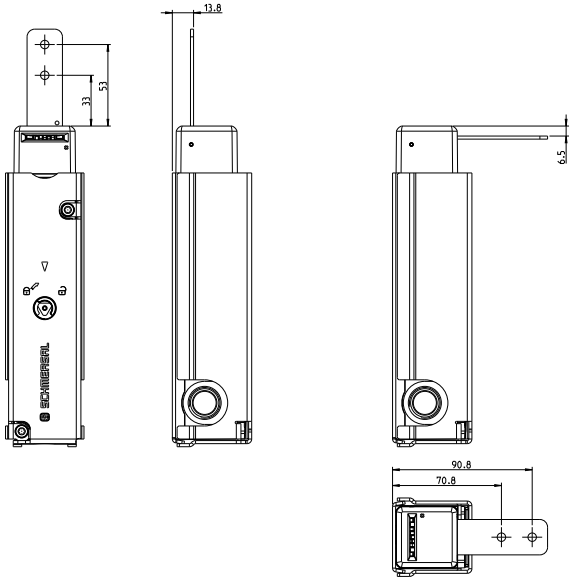


Strength of the actuator screws 5.6.

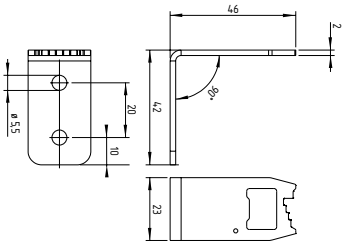
Actuator AZM150-B1



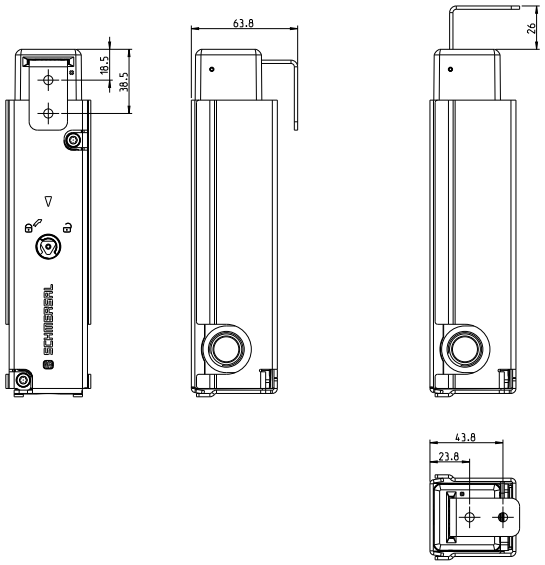
Installation position with actuator inserted
(all measurements ± 0.3 mm)



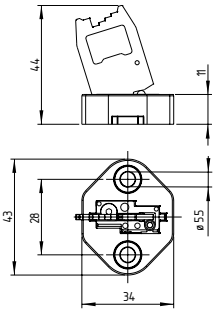
Actuator AZM150-B5



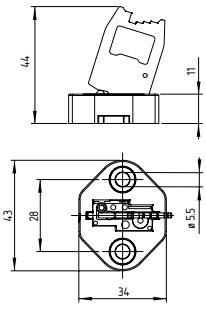
Installation position with actuator inserted
(all measurements ± 0.3 mm)



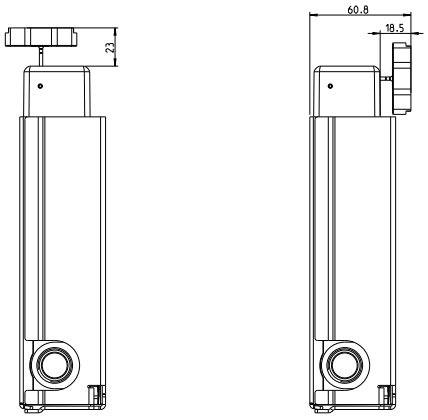
Actuator AZM150-B6L



Actuator AZM150-B6R



Installation position with actuator inserted
(all measurements ± 0.3 mm)



3.4 Accessories

	Designation / description	Ordering code
Triangular key	TK-M5	101100887
Door handle system	DHS-150-BKBU-L DHS-150-BKBU-R	137000626 137000625
Lockout tag	SZ150-1	153027887
Cable gland	M20 x 1,5	on request
Tamperproof screws	M5 x 15, 2 (incl. washers)	on request

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.

If the risk analysis indicates the use of a monitored interlock they are to be connected in the safety circuit with the contacts indicated with the symbol ⊣↓.

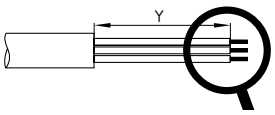
Appropriate cable glands with a suitable degree of protection are to be used. The desired insertion opening should be opened with a suitable tool.

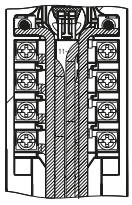
Only use Ex cable glands and Ex blanking plugs with integrated or associated seals which are authorised for the corresponding field of application. The cable glands must be fitted in accordance with the applicable operating instructions manual. Cable glands are only authorised for permanent cables. The constructor must provide for the necessary strain relief. Unused cable entries must be sealed by means of Ex approved locking screws.

After wiring, the wiring compartment must be cleaned (i.e. remove excess cables etc.).

Max. cable section: 0.25 … 1.5 mm²
(incl. conductor ferrules without plastic collar)

Removing the cable sheathing

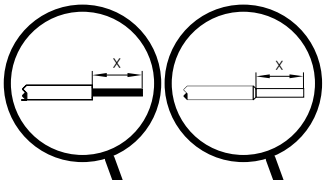




A1	A2
1.	1. y = 67 mm
2.	2. y = 57 mm
3.	3. y = 47 mm
4.	4. y = 37 mm

A2 y = 71 mm

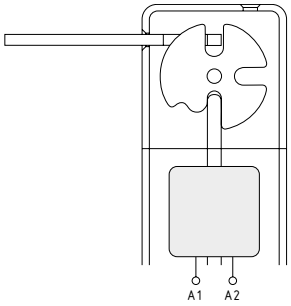
Settle length x of the conductor: 6 mm



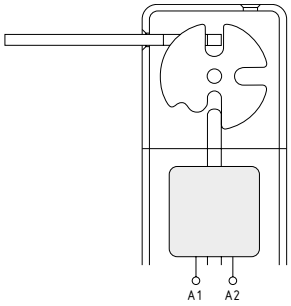
4.2 Contact Options

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

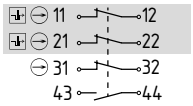
Power to unlock
Guard system closed
and interlocked



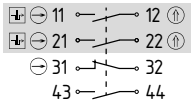
Power to lock
Guard system closed
and not interlocked



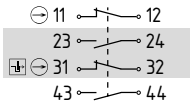
AZM150...-02/11



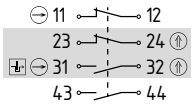
AZM150...-02/11...A



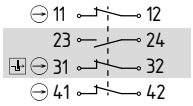
AZM150...-11/11



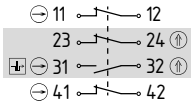
AZM150...-11/11...A



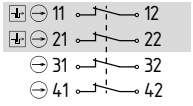
AZM150...-11/02



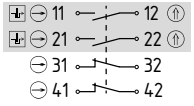
AZM150...-11/02...A



AZM150...-02/02



AZM150...-02/02...A

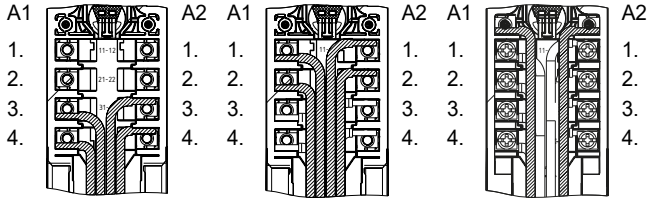


Key

- Magnetic contact
- ⊖ Positive break NC contact
- Monitoring the interlock according to EN ISO 14119
- ⇧ Actuated

4.3 Wiring examples

When routing the cables, account for an offset of the terminals at the left and right terminal screws.
Route the cables neatly next to or above the other cables.



5. Set-up and maintenance

The installation, operation and maintenance must be executed by qualified professionals. The requirements to be met for the installation and the maintenance can be found in this operating instructions manual. Do not expose the device to mechanical and/or thermal loads or stressed, which exceed the limits specified in the operating instructions manual.
For the set-up and the operation of the safety switchgear, the applicable (also national) safety and accident prevention regulations as well as the generally acknowledged codes of practice of technology must be observed.

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
4. Check that both the cover-side and rear manual releases are in the starting position

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

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.

5.3 Special (restricted) conditions of use

Potential electrostatic charge hazard, wipe the product with a damp cloth only.Do not open the device when it is charged.

For explosion-proof reasons, gasket components and seals of manual release shaft must be replaced after a maximum of one million operations.

1. Ambient temperature: -25 °C … +55 °C

Warning - Do not open, maintain or service in an area when an explosive atmosphere is present.

The equipment is normally not open, so no test port is necessary.

5.4 Routine verifications and tests

The equipment may be tested using the cable glands or conduit entry devices that include the sealing system for the routine test.

1. Under constant temperature conditions, the time interval required for an internal pressure of 0.3 kPa (0~+10 %) below atmospheric to change to half the initial value shall be not less than 180 s.

2. Alternatively one of the following test procedures may be used.
--Under constant temperature conditions, the time interval required for an internal pressure of 3.0 kPa (0~+10%) below atmospheric to change to at most 2.7 kPa below atmospheric shall be not less than 27 s.
--Unde constant temperature conditions, the time interval required for an internal pressure of 0.3 kPa (0~+10%) below atmospheric to change to at most 0,27 kPa below atmospheric shall be not less than 27 s.

NOTE1: The alternatives are added to shorten the time needed for the routine tests using adjusted figures for the possible pressure reduction.
NOTE2: If using the low value of pressure creates difficulties, the alternative 10 times higher figures may be used.

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.