



**EN** Operating instructions. . . . .pages 1 to 8  
Original

## Content

<b>1 About this document</b>	
1.1 Function . . . . .	1
1.2 Target group: authorised qualified personnel. . . . .	1
1.3 Explanation of the symbols used . . . . .	1
1.4 Appropriate use . . . . .	1
1.5 General safety instructions . . . . .	1
1.6 Warning about misuse . . . . .	1
1.7 Exclusion of liability . . . . .	2
<b>2 Product description</b>	
2.1 Ordering code . . . . .	2
2.2 Special versions. . . . .	3
2.3 Purpose . . . . .	3
2.4 Operating principle of the checking device . . . . .	4
2.5 AV15, AV20, AV25 with checking device . . . . .	4
2.6 AV18, AV21, AV28 without checking device. . . . .	4
2.7 Technical data . . . . .	4
<b>3 Mounting</b>	
3.1 General mounting instructions . . . . .	5
3.2 Models with checking device . . . . .	5
3.3 Possible installation positions . . . . .	5
3.4 Locking pin chambers - various variants . . . . .	6
3.5 Dimensions . . . . .	6
<b>4 Electrical connection</b>	
4.1 General information for electrical connection. . . . .	7
4.2 Pin assignment . . . . .	7
<b>5 Set-up and maintenance</b>	
5.1 Functional testing. . . . .	7
5.2 Maintenance . . . . .	7
<b>6 Disassembly and disposal</b>	
6.1 Disassembly. . . . .	7
6.2 Disposal . . . . .	7
<b>7 Appendix</b>	
7.1 EU declaration of conformity . . . . .	8
7.2 Declaration of installation. . . . .	8

## 1. About this document

### 1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

### 1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

### 1.3 Explanation of the symbols used



#### Information, hint, note:

This symbol is used for identifying useful additional information.



**Caution:** Failure to comply with this warning notice could lead to failures or malfunctions.

**Warning:** Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

### 1.4 Appropriate use

The 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](https://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.

### 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.

### 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.



Opening the middle cover of the AV20/21 invalidates the guarantee.

## 2. Product description

### 2.1 Ordering code

These operating instructions apply to the following types (standard versions in black bold font, special versions in grey):

#### AV15①②③④⑤⑥⑦-⑧

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
②		Pull strap
	H	Lever version H65
	H92	Lever version H92
	H105	Lever version H105
	B	Bearing block B
	B2	Bearing block B2
③		1 NC contact
	K	1 NC contact / 1 NO contact
④		Protection class IP20
	IP41	Protection class IP41
⑤		Without cable gland
	E1	M20 cable gland - metal (single-wire entry)
	E2	M20 cable gland, plastic – polyamide
	E4	M20 cable gland, plastic – polyamide fibreglass reinforced
⑥	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
⑦	U	Interlock bevel bottom
	D	cover-side
	R	right
	L	left
⑧	GB215	Additional frontal mounting holes M8
	xxxxx	Special version

#### AV18①②③④⑤⑥⑦-⑧

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
②		Pull strap
	H	Lever version H65
	H92	Lever version H92
	H105	Lever version H105
	B	Bearing block B
	B2	Bearing block B2
③		1 NC contact
	K	1 NC contact / 1 NO contact
④		Protection class IP20
	IP41	Protection class IP41
⑤		Without cable gland
	E1	M20 cable gland – metal (single-wire entry)
	E2	M20 cable gland, plastic – polyamide
	E4	M20 cable gland, plastic – polyamide fibreglass reinforced
⑥	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
	Z11.5	Z-dimension 11.5 mm
	Z20	20 mm
	Z25	25 mm
⑦	U	Interlock bevel bottom
	D	cover-side
	R	right
	L	left
⑧	GB215	Additional frontal mounting holes M8
	xxxxx	Special version

#### AV20①②③④⑤-⑥

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
	FL	Flange, left-hand model
	FR	Flange, right-hand model
②		Pull strap
	H	Lever version H65
	H92	Lever version H92
	H105	Lever version H105
	B	Bearing block B
	B2	Bearing block B2
③		Without cable gland
	E1	M20 cable gland – metal (single-wire entry)
	E2	M20 cable gland, plastic – polyamide
	E4	M20 cable gland, plastic – polyamide fibreglass reinforced
④	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
⑤	U	Interlock bevel bottom
	D	cover-side
	R	right
	L	left
⑥	GB215	Additional frontal mounting holes M8
	xxxxx	Special version

### AV21<sup>①②③④⑤⑥</sup>

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
②		Pull strap
	H	Lever version H65
	H92	Lever version H92
	H105	Lever version H105
	B	Bearing block B
	B2	Bearing block B2
③		Without cable gland
	E1	M20 cable gland – metal (single-wire entry)
	E2	M20 cable gland, plastic – polyamide
	E4	M20 cable gland, plastic – polyamide fibreglass reinforced
④	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
	Z11.5	Z-dimension 11.5 mm
	Z20	20 mm
	Z25	25 mm
⑤	U	Interlock bevel bottom
	D	cover-side
	R	right
	L	left
⑥	GB215	Additional frontal mounting holes M8
	xxxxx	Special version

### AV25<sup>①②③④⑤⑥⑦</sup>

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
	L/R	Combined left-hand/right-hand model for two-leaf shaft hinged guards
②		1 NC contact
	K	1 NC contact / 1 NO contact
③		Protection class IP20
	IP41	Protection class IP41
④		Without cable gland
	E1	M20 cable gland – metal (single-wire entry)
	E2	M20 cable gland, plastic – polyamide
	E4	M20 cable gland, plastic – polyamide fibreglass reinforced
⑤	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
⑥	U	Interlock bevel bottom
	D	cover-side
	L/R	left/right
⑦	GB215	Additional frontal mounting holes M8
	xxxxx	Special version

### AV28<sup>①②③④⑤⑥⑦</sup>

No.	Option	Description
①	L	Left-hand model
	R	Right-hand model
	L/R	Combined left-hand/right-hand model for two-leaf shaft hinged guards
②		1 NC contact
	K	1 NC contact / 1 NO contact
③		Protection class IP20
	IP41	Protection class IP41
④		Without cable gland
	E1	M20 cable gland - metal (single-wire entry)
	E2	M20 cable gland, plastic - polyamide
	E4	M20 cable gland, plastic - polyamide fibreglass reinforced
⑤	X11.5	Dimension X 11.5 mm
	X20	20 mm
	X30	30 mm
	X40	40 mm
	X45	45 mm
	X15	15 mm
	X25	25 mm
	X35	35 mm
	Z11.5	Z-dimension 11.5 mm
	Z20	20 mm
	Z25	25 mm
⑥	U	Interlock bevel bottom
	D	cover-side
	L/R	left/right
⑦	GB215	Additional frontal mounting holes M8
	xxxxx	Special version



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Lift 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 construction and operation of the following locking devices for lift shaft doors comply with the requirements of the Lift Directive, as well as the Safety Regulations for the Construction and Installation of Passenger Lifts, Goods Lifts and Service Lifts.

### Door locking devices

AV15	for single-leaf shaft doors
AV20	
AV25	for two-leaf shaft doors
AV18	
AV21	component of a locking device for shaft doors
AV28	

Provided that it is installed in compliance with the regulations, the safety locking device will keep the shaft door shut and locked, according to the control command. When the shaft door is intentionally open, the locking devices AV15, 20 and 25 prevent any unnoticed lowering of the locking pins which would, as a result, cause the locking contacts to close whilst the shaft door is open. In the case of the AV18, 21 and 28 models, this feature is achieved by virtue of the construction of the locking devices.

### 2.4 Operating principle of the checking device

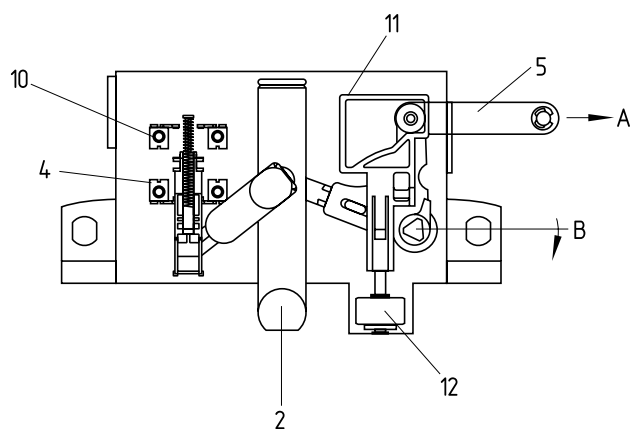
Should the locking cam be engaged before the shaft door is closed, the checking device mechanism will operate. The unlocking magnet (12) sticks to the magnet plate, thus mechanically preventing the movement of the locking pin. The locking and auxiliary contacts remain open. When the shaft door is closed, the unlocking magnet (12) and the door magnet (17) are positioned in such a way that their identical poles are facing one-another, thus repelling each other. The locking pin (2) is released and penetrates the shaft door (16). The locking contact (10) is closed and the auxiliary contact (4) is open.

### 2.5 AV15, AV20, AV25 with checking device

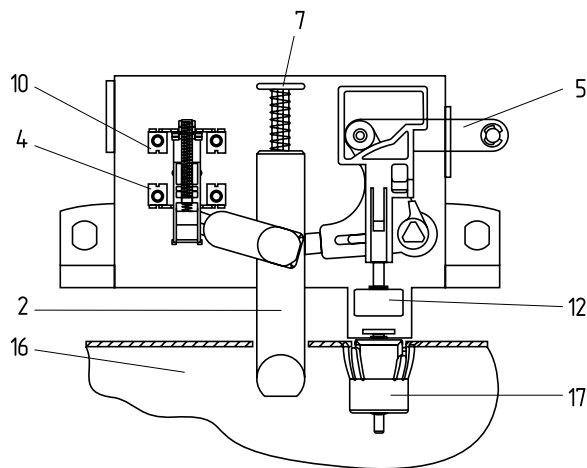
When the shaft door is open and the locking cam fallen, the locking pin (2) is retracted due to either tension in direction A on the traction link (5) or to the roller arm swinging in direction B.



Depiction of the position of the contacts using the AV20 door locking devices as an example. Interchanged position of the locking bolt contact and auxiliary contact on AV15 and AV25 (see also section 4.2).



With the locking cam engaged, the roller arm and/or the traction link (5) are released and the locking pin (2) penetrates the shaft door (16).



#### Key

- 2 Locking pin
- 4 Auxiliary contact
- 5 Pull strap
- 7 Spring
- 10 Locking bolt contact
- 11 Locking element
- 12 Offset roller lever
- 16 Shaft door
- 17 Fail-safe locking system

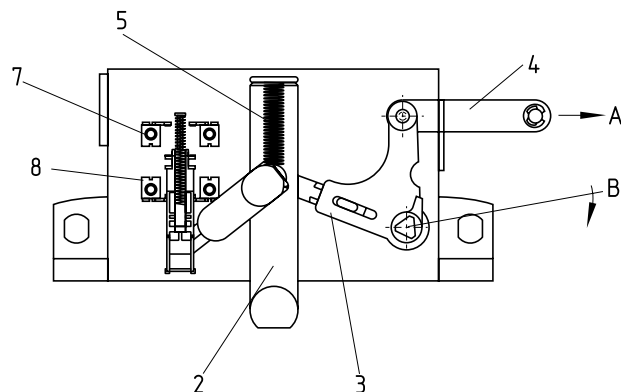
### 2.6 AV18, AV21, AV28 without checking device

When the shaft door is open and the locking cam fallen, the locking pin (2) is retracted due to either tension in direction A on the traction link (4) or to the roller arm swinging in direction B. The locking contact (7) is open and the auxiliary contact (8) is closed.

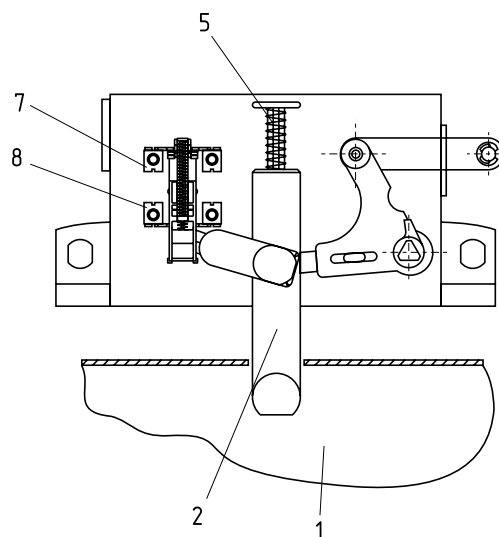


Depiction of the position of the contacts using the AV21 door locking devices as an example.

Interchanged position of the locking bolt contact and auxiliary contact on AV18 and AV28 (see also section 4.2).



When the shaft door is closed and the locking cam engaged, the locking pin (2) penetrates the shaft door (1). The locking contact (7) is closed and the auxiliary contact (8) is open.



#### Key

- 1 Shaft door
- 2 Locking pin
- 3 Angle roller lever
- 4 Pull strap
- 5 Spring
- 7 Locking bolt contact
- 8 Auxiliary contact

### 2.7 Technical data

Standards:	EN 81-20, EN 81-50
Enclosure:	
- AV20/21:	glass-fibre reinforced thermoplastic, self-extinguishing,
- AV15/18, AV25/28:	light alloy die-casting
Degree of protection:	
- AV20/21:	IP54
- AV15/18, AV 25/28:	IP20
Locking pin:	brass Ø 18 mm
Contact material:	Silver

Contact type:	Change-over contact with double break, with galvanically separated contact bridges
- AV20/21:	1 NC contact / 1 NO contact
- AV15/18, AV25/28:	1 NC contact / 1 NO contact (optionally 1 NC)
Connection type:	screw terminals
Cable section:	1 ... 1.5 mm <sup>2</sup>
Rated impulse withstand voltage $U_{imp}$ :	6 kV
Rated insulation voltage $U_i$ :	
- AV20/21:	500 VAC
- AV15/18, AV25/28:	400 VAC
Thermal test current $I_{the}$ :	10 A
Utilisation category to EN 60947-5-1:	AC-15: 2 A / 230 VAC DC-13: 1 A / 24 VDC
Rated operating current/voltage $I_e/U_e$ to EN 81:	2 A / 230 VAC 2 A / 200 VDC
Max. fuse rating:	6 A (slow blow)
Emergency release:	using triangular key M5 to DIN 22417
Permanent magnet:	
- AV20, AV15, AV25:	with checking device (ceramic-oxide magnet with high coercive field strength, flux variation depending on the temperature 0.2 %/°C, which is, however, reversible.)
Ambient temperature:	- 15 °C ... + 70 °C

### 3. Mounting

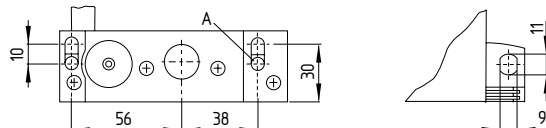
#### 3.1 General mounting instructions

Two mounting holes are provided for fixing the enclosure. The door locking devices AV20 and AV21 are double-insulated. The use of an earth wire is not authorised.

The door locking devices AV15/18/25/28 are not double-insulated, which means that a protective conductor needs to be connected.

Drill a suitable engagement hole for the locking pin in the door vane, this should be sufficiently large so that the movement of the locking pin is not impaired. Two 9 x 11 mm slotted holes are provided for the fixing of the locking device.

#### AV20 FLH.....



**Key** A adjustable M6 nut

To guarantee the effective engagement-depth of at least 7 mm at the departure of the lift car and to guarantee the positive operation of the means used to prove the position of the locking element, the following depths the locking bolt need to engage into or behind the locking part:

	AV15, AV20, AV25	AV18, AV21, AV28
While operating	≥ 16 mm (max. 21 mm)	≥ 12 mm (max. 21 mm)
In the case of open circuit of the lock contact	≥ 13 mm	≥ 8 mm



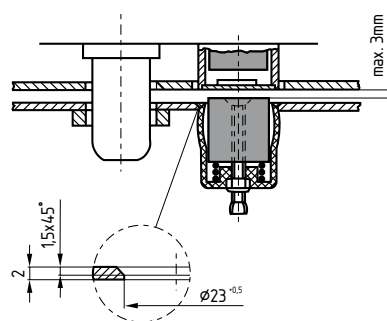
The relevant requirements of the standard EN ISO 12100 must be observed.



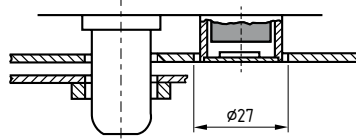
The door locking devices and, where necessary, door magnet (which protects against unintentional closure) are to be secured by suitable means (with the use of tamperproof screws, by bonding, drilling out screw heads, pin locking) on the guard system and secured to prevent them from shifting.

#### 3.2 Models with checking device

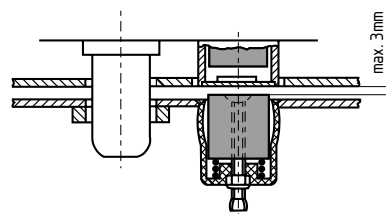
A suitably drilled hole of max. 23 mm diameter is required for the fixing of the door magnet.



The drilled hole for the magnet protection tube must be sufficiently large (min. 27 mm).



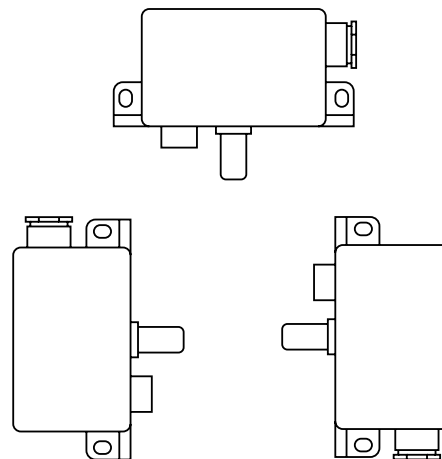
The distance between the centres of the door magnet and the counter-magnet must be no greater than 2 mm. The adjustable distance between the door magnet and the counter magnet must be no greater than 3 mm.



#### The with checking device

- works on a magnetic principle. Therefore, there should be no excessive iron in the vicinity.
- has a high resistance to galling, therefore, do not oil!

#### 3.3 Possible installation positions



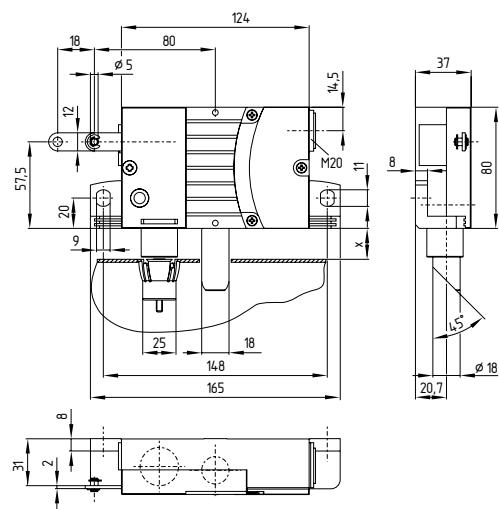


- Before adjusting the roller arm, gently loosen the locking screw: do not force!
- The distance between the door magnet and the counter magnet is adjustable (max. 3 mm).
- If the door falls by > 6 mm the locking device is to be re-adjusted!
- Triangular release M5 for quick adjustment on rear of housing.



All measurements in mm.

Left-hand model with traction link  
(right-hand model is mirror image)



Technical drawing of the 1000 Series Laser Cutter showing front and side views with dimensions.

**Front View Dimensions:**

- Overall height: 95
- Distance from base to top of main body: 89
- Distance from base to top of laser head: 37
- Base diameter:  $\varnothing 18$

**Side View Dimensions:**

- Overall width: 55
- Distance from front face to rear face: 11
- Distance from front face to laser head: 25
- Distance from front face to rear face (total): 12
- Base diameter:  $\varnothing 24$
- Base width: 20.7
- Rear face diameter:  $\varnothing 36$

Technical drawing of the 123 series hydraulic cylinder, showing front and side views with dimensions.

**Front View (Left):**

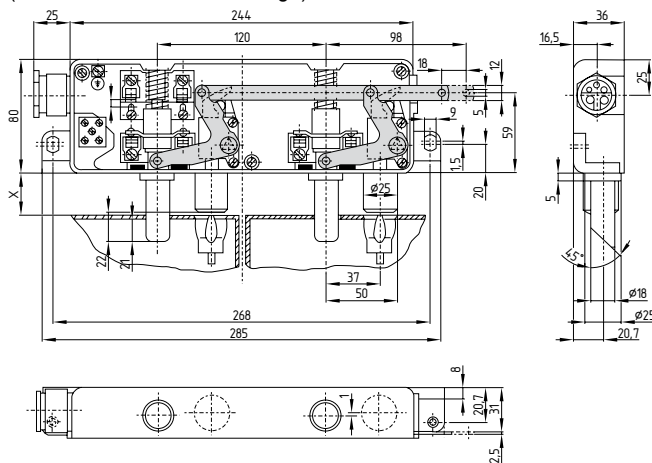
- Overall width: 165
- Mounting bracket width: 95
- Cylinder body width: 123
- Mounting bracket height: 75

**Side View (Right):**

- Overall height: 83



Right-hand model with auxiliary contact and cable gland E1  
(left-hand model is mirror image)



The AV25 is shown above, AV28 has the same dimensions, however without checking device

### 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.

Appropriate cable glands with a suitable degree of protection are to be used.

#### Settle length x of the conductor:

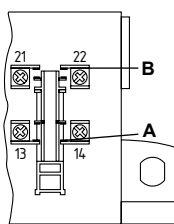
- AV20/21: 6 mm
- AV15/18, AV25/28: 6.5 mm



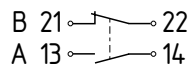
#### 4.2 Pin assignment

In the actuated and locked condition, the locking bolt contact B is closed, the auxiliary contact A is open.

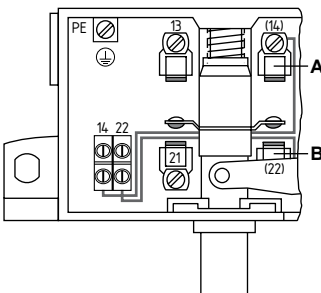
AV20/21



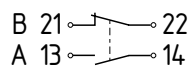
1 NC contact /  
1 NO contact



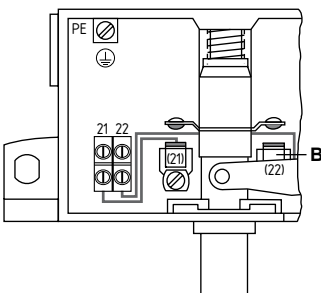
AV15/18, AV25/28



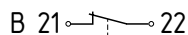
1 NC contact /  
1 NO contact



AV15/18, AV25/28 (without auxiliary contact)



1 NC contact



#### Key

- A Auxiliary contact
- B Locking bolt contact

**K.A. Schmersal GmbH & Co. KG**  
 Möddinghofe 30, 42279 Wuppertal  
 Germany  
 Phone: +49 202 6474-0  
 Telefax: +49 202 6474-100  
 E-Mail: [info@schmersal.com](mailto:info@schmersal.com)  
 Internet: [www.schmersal.com](http://www.schmersal.com)

### 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



Adequate measures must be taken to ensure protection against tampering either to prevent tampering of the safety guard, for instance by means of replacement actuators.

**Damaged or defective components must be replaced.**

### 6. Disassembly and disposal

#### 6.1 Disassembly

The safety switchgear must be disassembled in a de-energised condition only.

#### 6.2 Disposal

The safety switchgear must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.



7. Appendix

7.1 EU declaration of conformity

EU Declaration of conformity



Original

K.A. Schmersal GmbH & Co. KG  
Möddinghofe 30  
42279 Wuppertal  
Germany  
Internet: www.schmersal.com

We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.

Name of the component:

AV15, AV18, AV20, AV21, AV25, AV28

Type:

See ordering code

Year of construction:

See identification plate

Description of the component:

Door locking devices

Relevant Directives:

Low Voltage Directive2014/35/EU

Lift Directive2014/33/EU

RoHS-Directive2011/65/EU

Applied standards:

EN 81-20:2020  
EN 81-50:2020

Notified body for Type Examination:

TÜV SÜD Industrie Service GmbH  
Westendstr. 199  
80686 München  
Germany  
ID no: 0036

EU-Type Examination Certificate:

EU-DL 059 (AV15), EU-DL 076 (AV18),  
EU-DL 528 (AV20), EU-DL 529 (AV21),  
EU-DL 060 (AV25), EU-DL 075 (AV28)

Place and date of issue:

Wuppertal, July 4, 2025



Authorised signature  
**Philip Schmersal**  
Managing Director

AV15-28-F-EN



The currently valid declaration of conformity and prototype test certificate can be downloaded from the internet at [products.schmersal.com](https://products.schmersal.com).



7.2 Declaration of installation

The above described devise is installed in elevator:

Serial no.:

Year of construction:

Installation firm:

Stamp and signature: