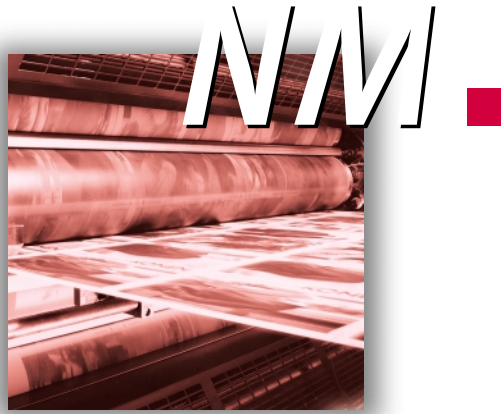


# Safety Switches



More than safety.



**EUCHNER**

# More than safety.



*Emil Euchner, the company's founder and inventor of the multiple limit switch, circa 1928.*



## **Around the world – the Swabian specialists in motion sequence control for mechanical and systems engineering.**

EUCHNER's history began in 1940 with the establishment of an engineering office by Emil Euchner. Since that time, EUCHNER has been involved in the design and development of switchgear for controlling a wide variety of motion sequences in mechanical and systems engineering. In 1953, Emil Euchner founded EUCHNER + Co., a milestone in the company's history. In 1952, he developed the first multiple limit switch – to this day a symbol of the enterprising spirit of this family-owned company.

## **Automation – Safety – ManMachine**

Today, our products range from electromechanical and electronic components to complex system solutions. With this wide range of products we can provide the necessary technologies to offer the right solution for special requirements – regardless of whether these relate to reliable and precise positioning or to components and systems for safety engineering in the automation sector.

EUCHNER products are sold through a world-wide sales network of competent partners. With our closeness to the customer and the guarantee of reliable solutions throughout the globe, we enjoy the confidence of customers all over the world.

## **Quality, reliability, precision**

Quality, reliability and precision are the hallmarks of our corporate philosophy. They represent concepts and values to which we feel totally committed. At EUCHNER, quality means that all our employees take personal responsibility for the company as a whole and, in particular, for their own field of work. This individual commitment to perfection results in products which are ideally tailored to the customers' needs and the requirements of the market. After all: our customers and their needs are the focus of all our efforts. Through efficient and effective use of resources, the promotion of personal initiative and courage in finding unusual solutions to the benefit of our customers, we ensure a high level of customer satisfaction. We familiarize ourselves with their needs, requirements and products and we learn from the experiences of our customers' own customers.

**EUCHNER – More than safety.**



Quality – made by EUCHNER

## Safety Switches NM

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## General Information

The EC Machinery Directive defines measures that reduce to a minimum the individual dangers and the accident risks associated with machines and installations that make movements which create a danger, and in the vicinity of which people may be injured. If all sources of danger cannot be eliminated by design measures, appropriate guarding measures have to be taken.

In practice, isolating guard devices are used for this purpose. These are necessary if frequent access to the hazardous zone is frequently required.

Access into hazardous zones is required to perform tasks such as loading and unloading material, troubleshooting, machine setup and cleaning work.

Safety switches of Design Type 1 and / or Design Type 2 are used to safeguard access to a hazardous zone accordingly.

The function of these switches is to monitor the moving part of the guard device and upon removal (opening) of the guard device to reliably interrupt the electrical circuit and create a safe operating status.

The new plastic-encapsulated **series NM safety switches** meet these requirements fully. With this series EUCHNER supplies safety switches that are used particularly where extremely small units are required. In addition, due to its optically highly sophisticated design, the entire product group of NM switches complies with the demand for machines with a more modern appearance.

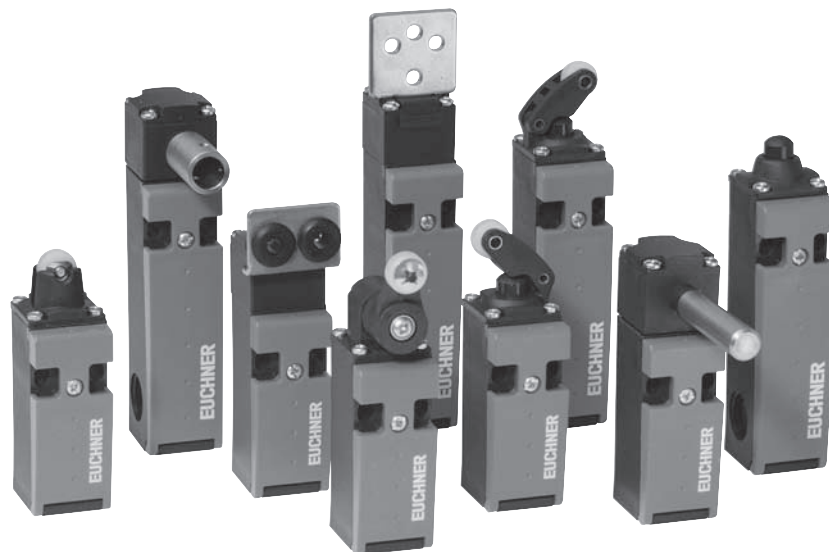
Two basic housings with up to three switch contact elements and three cable entries are available. The small housing version, with a positively driven NC contact, is used wherever a simple wiring concept is sufficient.

The larger housing version giving you two or three contact elements achieves a higher level of safety.

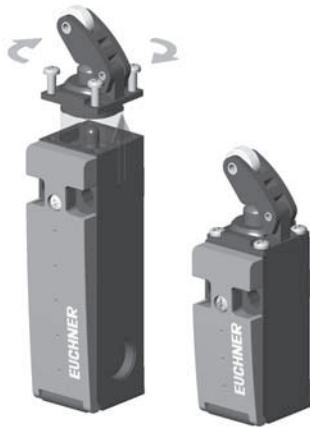
An extremely high degree of flexibility is guaranteed by the three possible cable entries (large housing version) and the ability to turn the actuator head in 90 increments. The generous connection space (Environmental Protection IP 67) for the switching elements allows easy handling.

Fixture of the cover with just one cover screw simplifies initial operation of the switch on the machine.

Besides switches with a cable entry, EUCHNER does of course also supply the series NM safety switches with M12 connectors. Due to the plug-in type connection, any wiring defects on the switch are excluded and fast installation is made possible.



In the case of **NM safety switches of Design Type 1** (see page 6), the switching element and actuator form a constructional and functional unit.



These safety switches are available with 6 different actuator heads:

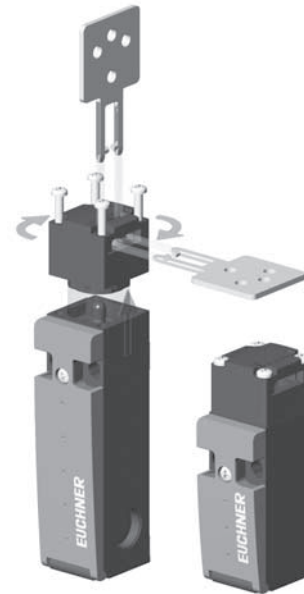
- ▶ Dome plunger
- ▶ Roller plunger
- ▶ Roller arm
- ▶ Roller lever
- ▶ Hinged actuator with solid shaft
- ▶ Hinged actuator with hollow shaft

In this way, the NM safety switches of Design Type 1 offers the designer and user a maximum degree of flexibility for a broad range of applications (for examples see page 7).

The hinged switches deserve special attention due to its solid and hollow shaft versions.

Convenient installation of the solid shaft switch (NM..AL/AK) into the existing hinge is possible by replacing the hinge pin or by adding the hollow shaft switch (NM..AG/AK) to the existing hing pin (by screwing or pinning).

In the case of **NM safety switches of Design Type 2** (see page 22), the switching element and actuator do not form a design unit, but are functionally combined or separated upon actuation.



These safety switches are used, for example, for the safeguarding of removable guards.

In the case of the switches NM..VZA, the separate, triple-coded actuators protects against tampering with protective function of the switch.

Installation of Design Type 2 safety switches is simplified with the side or top actuator entry.

Due to the compact construction of the NM..VZA switch and of the relevant actuator, they can be used on guard devices with extremely small door radii (for examples see page 23). To ensure flexibility of the actuators for imprecise door rails, EUCHNER supplies actuators with rubber bushings. High-quality, spring-mounted actuators do not have to be used.

Comprehensive accessories, e.g. door latches with integrated door handle, screwed cable glands, security screws and connecting lines, are available for all series NM safety switches (see page 26).

## EUCHNER type series NM... safety switches of Design Type 1 offer important advantages

Safety switches of Design Type 1 are switches, where the switching element and the operating element form a constructive and functional unit.

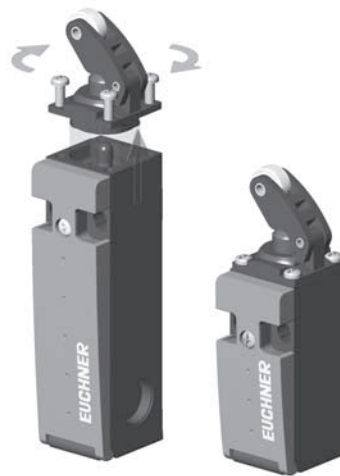
These switches are used for monitoring end positions of sliding doors and movable machine parts. For typical application examples of these switches please refer to page 7 of this catalogue.

With this new type series EUCHNER has extended its application range where small dimensions are necessary.

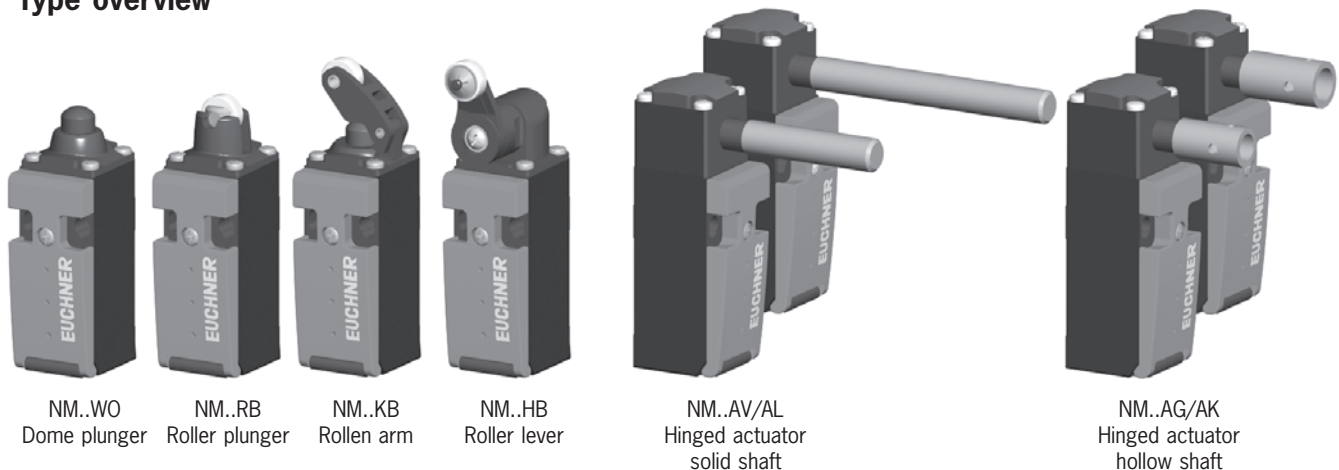
### Features

- ▶ Protective insulation by means of reinforced thermoplastic housing material
- ▶ 8 different actuation heads with same basic housing
- ▶ Compact size with maximum function
- ▶ Easy and fast changing of 4 approach directions
- ▶ 3 cable entries on side and bottom (NM11..., NM02..., NM12..., NM03...)
- ▶ Large-sized connection terminals for each contact element
- ▶ Contact elements:
  - 1 positively driven NC (NM01...)
  - 1 positively driven NC + 1 NO (NM11...)
  - 2 positively driven NC (NM02...)
  - 2 positively driven NC + 1 NO (NM12...)
  - 3 positively driven NC (NM03...)

### Fast changing of the approach direction!



### Type overview



NM..WO  
Dome plunger

NM..RB  
Roller plunger

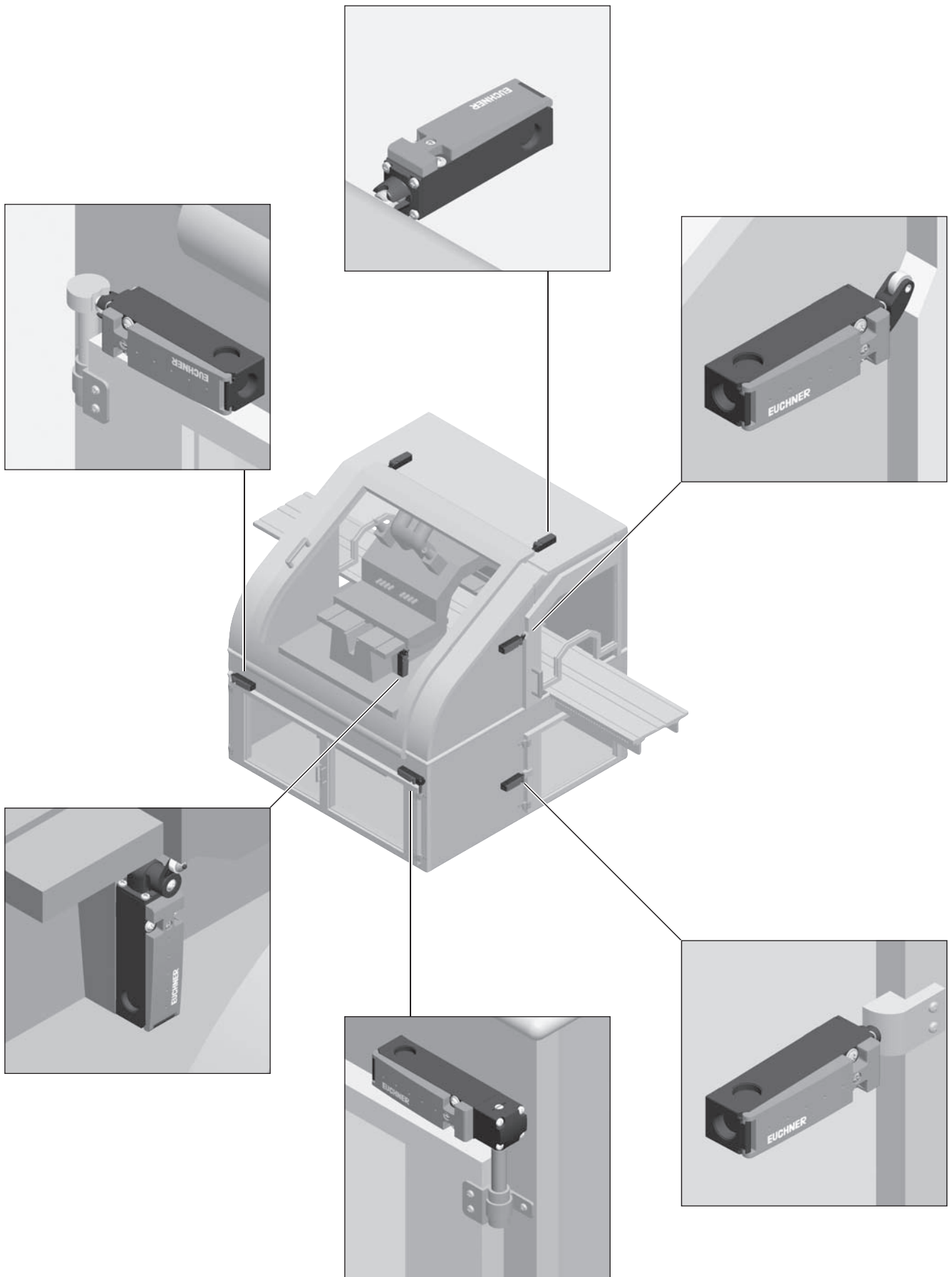
NM..KB  
Rollen arm

NM..HB  
Roller lever

NM..AV/AL  
Hinged actuator  
solid shaft

NM..AG/AK  
Hinged actuator  
hollow shaft

## Applications for Safety Switches Design Type 1











## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	30 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Dome plunger					
Plunger material	Plastic					
Actuation force	15					N
Approach speed max.	60					m/min
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-5-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg

## Ordering table

Design	Article	Contact elements	Plunger form	Approach direction	Cable entry	Order No.
<b>short</b> 	NM01WOK-M	1 positively driven NC	WO	K	M	084 495
	NM11WOK-MC2069	1 positively driven NC + 1 NO				095 375
	NM02WOK-MC2069	2 positively driven NC				095 374
<b>long</b> 	NM11WOK-M	1 positively driven NC + 1 NO	WO	K	M	084 496
	NM02WOK-M	2 positively driven NC				084 497
	NM12WOK-M	2 positively driven NC + 1 NO				084 498
	NM03WOK-M	3 positively driven NC				084 499

**Ordering example:** NM, switching element **ES 12**, actuator head **WO**, approach direction **K**, cable entry M16x1.5 **M**

**NM12WOK-M**

**Order No. 084 498**

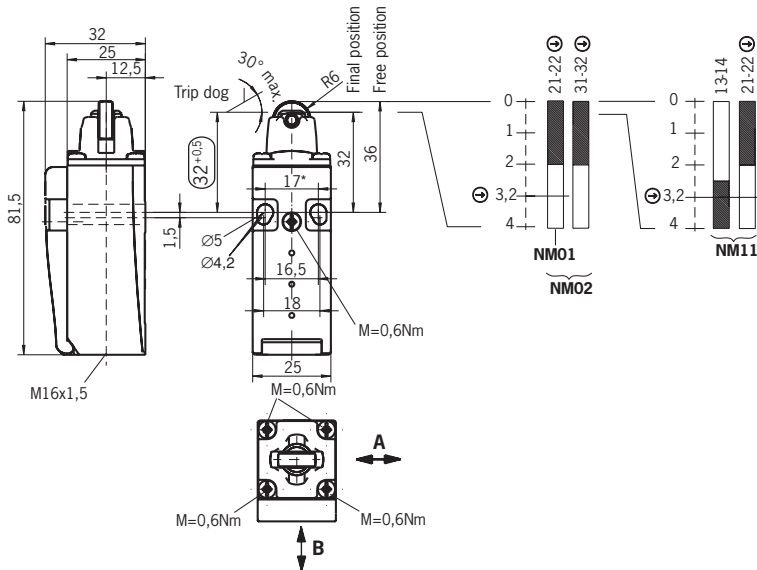
## Type series NM..RB...

- ▶ Roller plunger
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



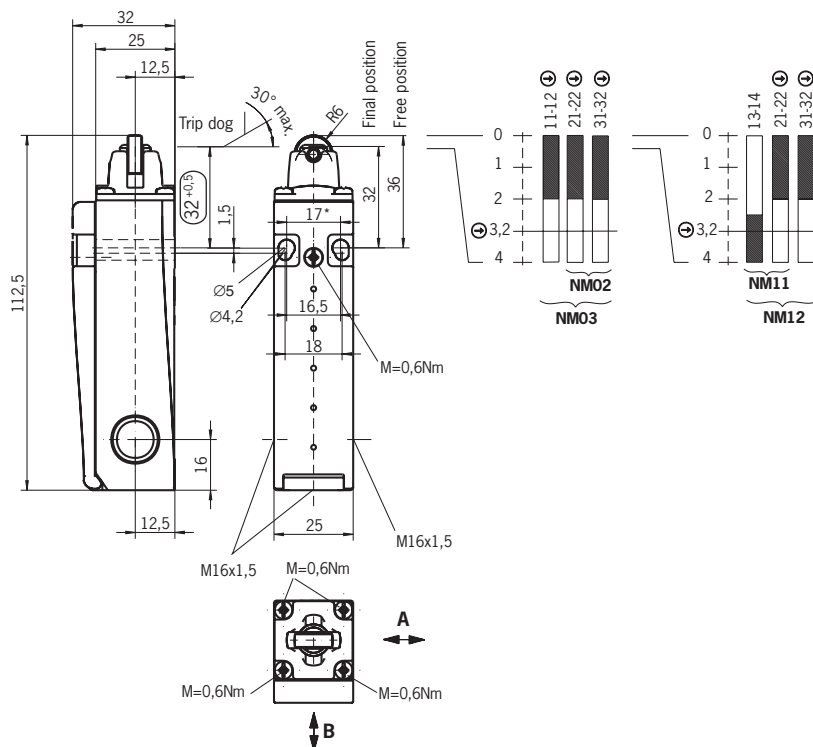
### Dimension drawing

NM01RB... / NM11RB...C2069 / NM02RB...C2069



### Dimension drawing

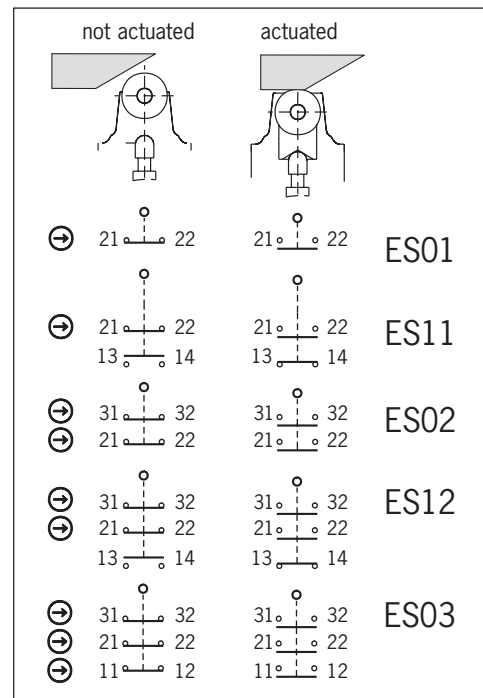
NM11RB... / NM02RB... / NM12RB... / NM03RB...



### Switching elements

(dependent action contact elements)

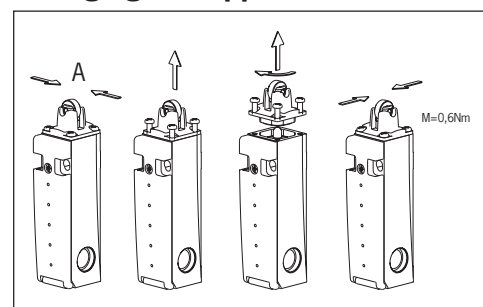
- ES 01 1 positively driven NC contact
- ES 11 1 positively driven NC contact + 1 NO
- ES 02 2 positively driven NC contact
- ES 12 2 positively driven NC contact + 1 NO
- ES 03 3 positively driven NC contact



### Installation notes

The trip dog distance as shown in the dimension diagram must be observed in order to obtain the isolating distance. Actuating elements such as trip dogs must be attached with a positive connection in accordance with EN 1088, e.g. riveted, welded or otherwise secured to prevent detachment.

### Changing the approach direction





⚠ The complete safety switch must be replaced in the event of faults.

## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	30 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Roller plunger					
Roller material	Plastic					
Actuation force	15					N
Approach speed max.	60					m/min
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-5-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg

## Ordering table

Design	Article	Contact elements	Plunger form	Approach direction	Cable entry	Order No.
 short	NM01RBA-M	1 positively driven NC	RB	A	M	084 515
	NM11RBA-MC2069	1 positively driven NC + 1 NO				095 373
	NM02RBA-MC2069	2 positively driven NC				095 372
 long	NM11RBA-M	1 positively driven NC + 1 NO	RB	A	M	084 516
	NM02RBA-M	2 positively driven NC				084 517
	NM12RBA-M	2 positively driven NC + 1 NO				084 518
	NM03RBA-M	3 positively driven NC				084 519

**Ordering example:** NM, switching element **ES 12**, actuator head **RB**, approach direction **A**, cable entry M16x1.5 **M**

**NM12RBA-M**

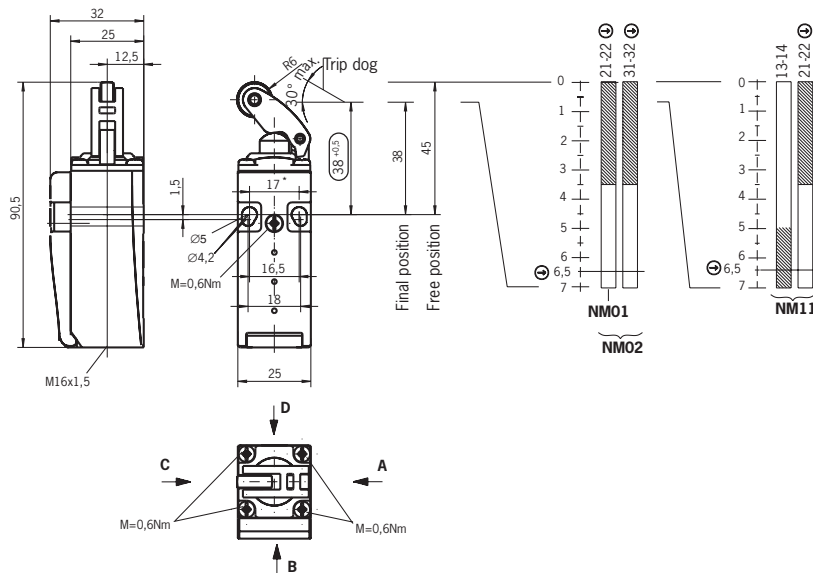
**Order No. 084 518**

## Type series NM..KB...

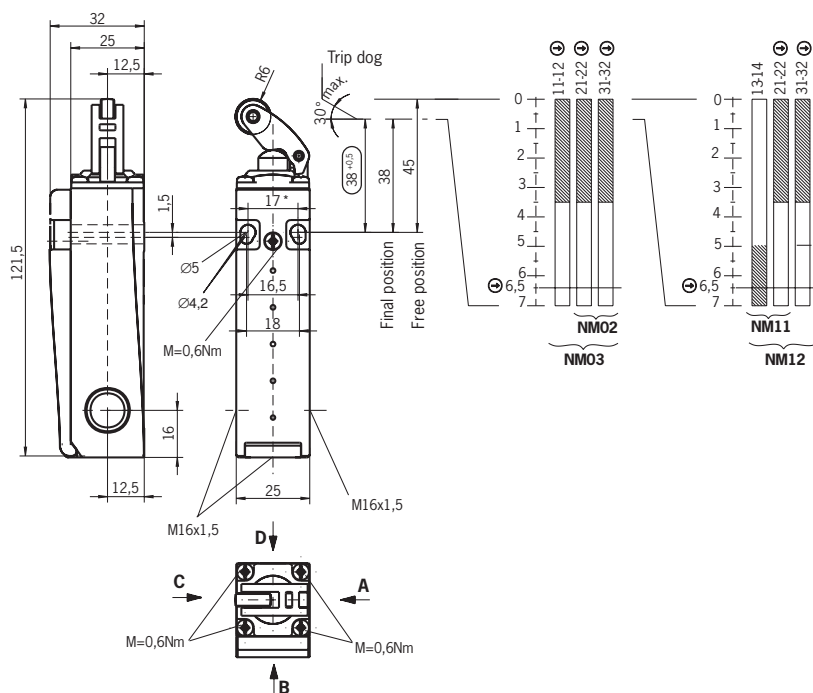
- ▶ Roller arm
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



## Dimension drawing NM01KB... / NM11KB...C2069 / NM02KB...C2069



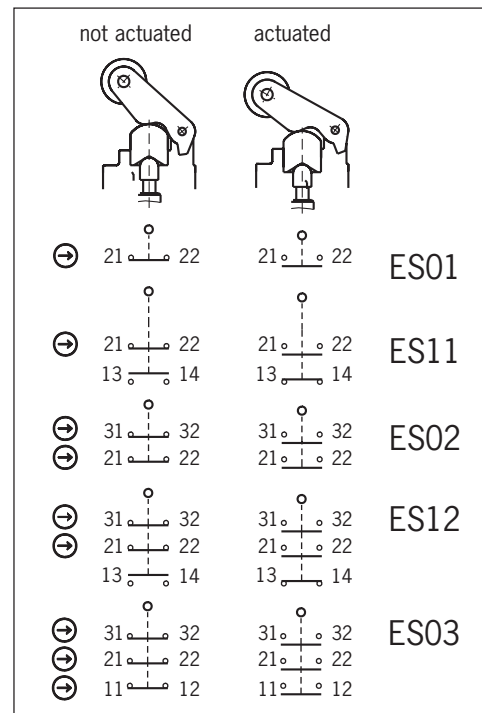
## Dimension drawing NM11KB... / NM02KB... / NM12KB... / NM03KB...



## Switching elements

(dependent action contact elements)

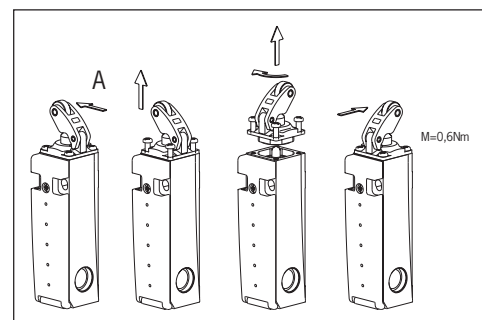
- ES 01** 1 positively driven NC contact
- ES 11** 1 positively driven NC contact + 1 NO
- ES 02** 2 positively driven NC contact
- ES 12** 2 positively driven NC contact + 1 NO
- ES 03** 3 positively driven NC contact



## Installation notes

The trip dog distance as shown in the dimension diagram must be observed in order to obtain the isolating distance. Actuating elements such as trip dogs must be attached with a positive connection in accordance with EN 1088, e.g. riveted, welded or otherwise secured to prevent detachment.

## Changing the approach direction





**⚠** The complete safety switch must be replaced in the event of faults.

## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	20 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Roller arm					
Roller material	Plastic					
Actuation force	15					N
Approach speed max.	60					m/min
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-5-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg

## Ordering table

Design	Article	Contact elements	Plunger form	Approach direction	Cable entry	Order No.
 short	NM01KBA-M	1 positively driven NC	KB	A	M	084 522
	NM11KBA-MC2069	1 positively driven NC + 1 NO				095 371
	NM02KBA-MC2069	2 positively driven NC				095 370
 long	NM11KBA-M	1 positively driven NC + 1 NO	KB	A	M	084 523
	NM02KBA-M	2 positively driven NC				084 524
	NM12KBA-M	2 positively driven NC + 1 NO				084 525
	NM03KBA-M	3 positively driven NC				084 526

**Ordering example:** NM, switching element **ES 12**, actuator head **KB**, approach direction **A**, cable entry M16x1.5 **M**

**NM12KBA-M**

**Order No. 084 525**

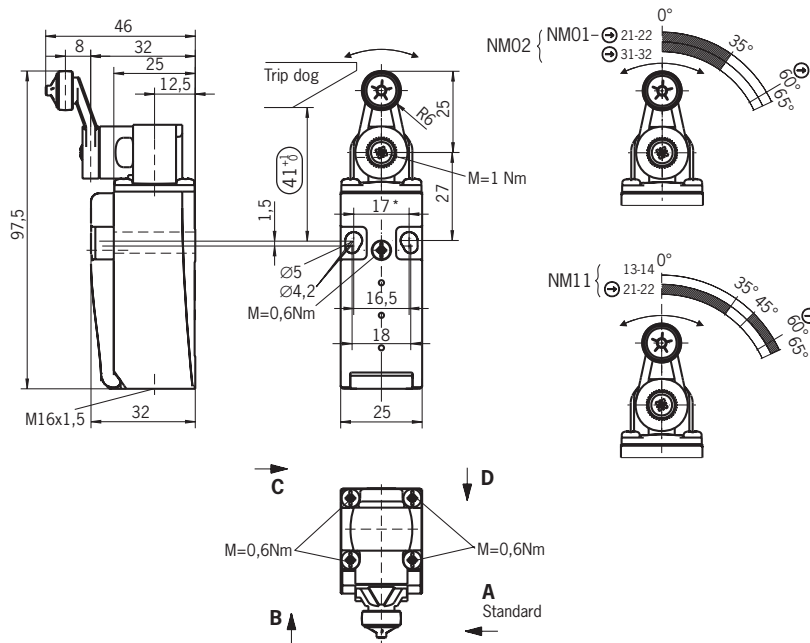
## Type series NM..HB...

- ▶ Roller lever
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



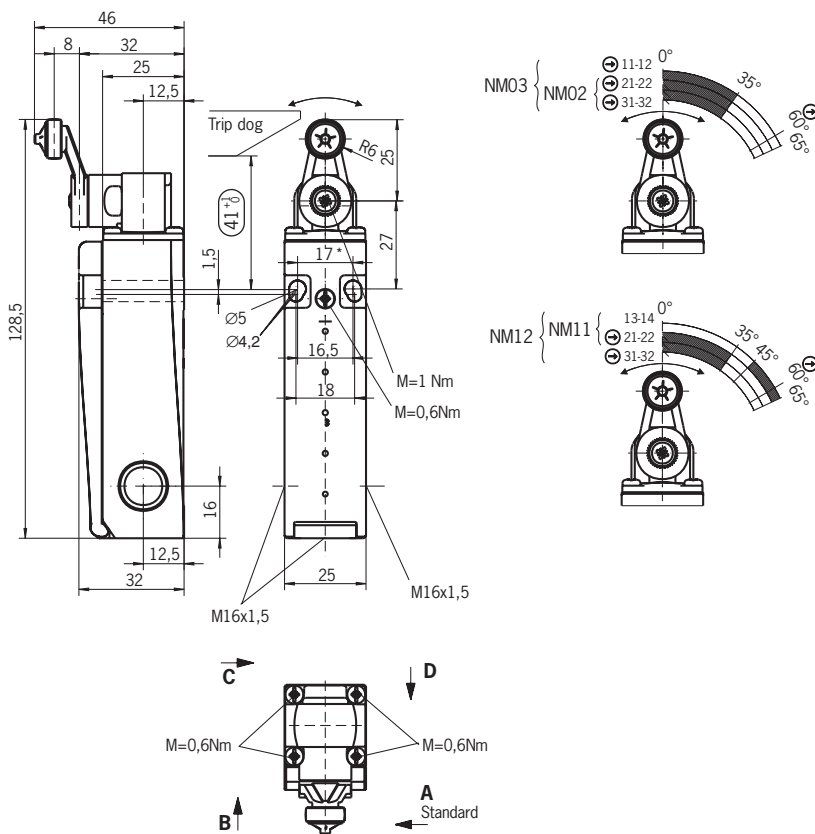
### Dimension drawing

NM01HB... / NM11HB...C2069 / NM02HB...C2069



### Dimension drawing

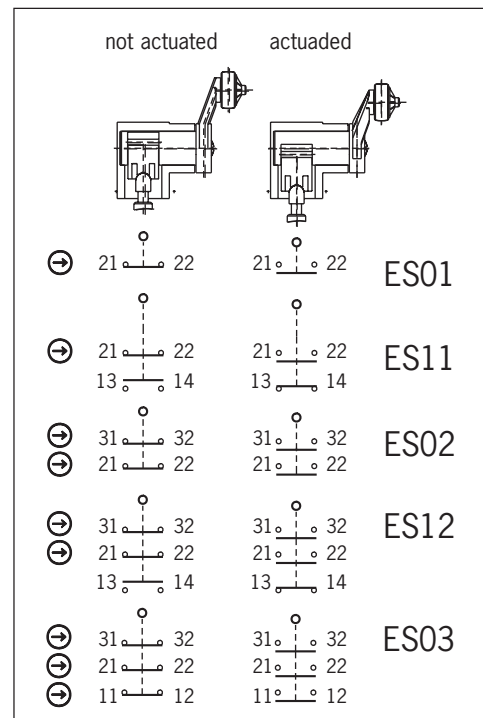
NM11HB... / NM02HB... / NM12HB... / NM03HB...



### Switching elements

(dependent action contact elements)

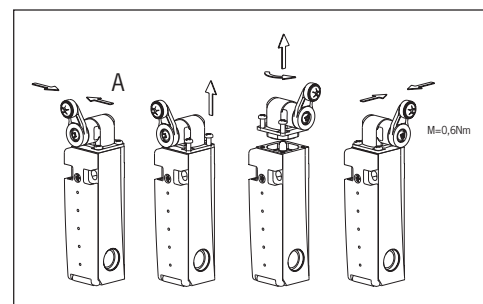
- ES 01 1 positively driven NC contact
- ES 11 1 positively driven NC contact + 1 NO
- ES 02 2 positively driven NC contact
- ES 12 2 positively driven NC contact + 1 NO
- ES 03 3 positively driven NC contact



### Installation notes

The trip dog distance as shown in the dimension diagram must be observed in order to obtain the isolating distance. Actuating elements such as trip dogs must be attached with a positive connection in accordance with EN 1088, e.g. riveted, welded or otherwise secured to prevent detachment.

### Changing the approach direction

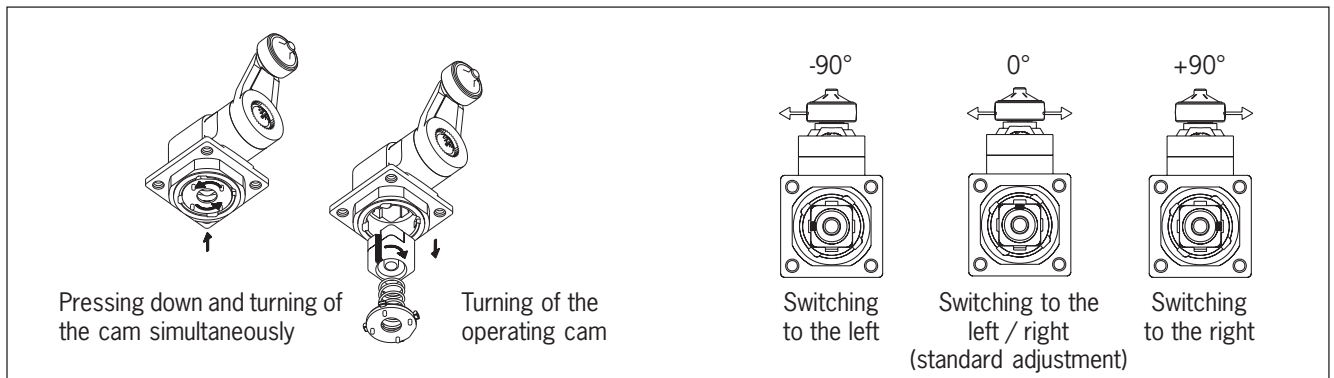


⚠ The complete safety switch must be replaced in the event of faults.

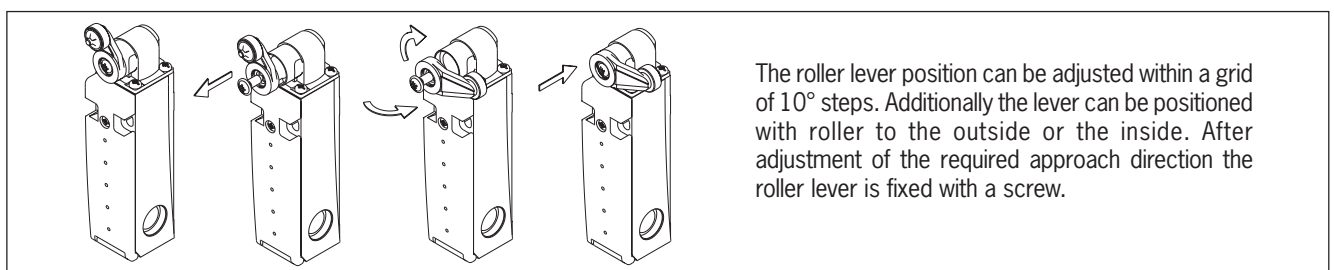
## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	20 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Roller lever					
Roller material	Plastic					
Approach speed max.	60					m/min
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-5-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg



## Conversion of the switch direction by means of turning the operating cam



## Conversion of the roller levers



## Ordering table

Design	Article	Contact elements	Plunger form	Approach direction	Cable entry	Order No.
short 	NM01HBA-M	1 positively driven NC	HB	A	M	084 527
	NM11HBA-MC2069	1 positively driven NC + 1 NO				095 369
	NM02HBA-MC2069	2 positively driven NC				095 368
long 	NM11HBA-M	1 positively driven NC + 1 NO	HB	A	M	084 528
	NM02HBA-M	2 positively driven NC				084 529
	NM12HBA-M	2 positively driven NC + 1 NO				084 530
	NM03HBA-M	3 positively driven NC				084 531

**Ordering example:** NM, switching element ES 12, actuator head HB, approach direction A, cable entry M16x1.5 M

**NM12HBA-M**

**Order No. 084 530**



## Type series NM..AV... / NM.. AL...

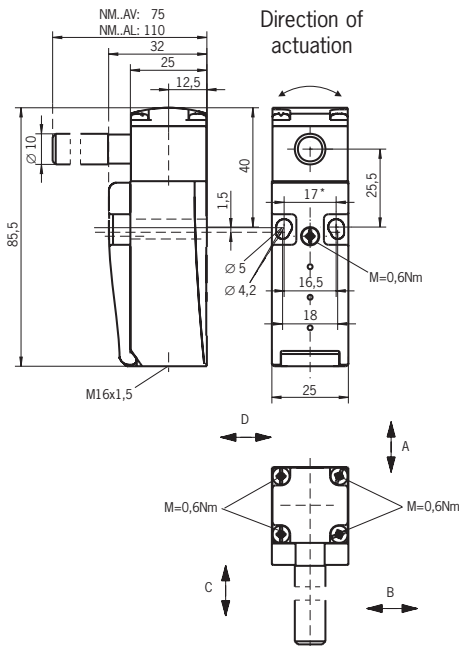
- ▶ Hinged actuator with solid shaft, shaft length 75 mm / 110 mm
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



\* Approval applied

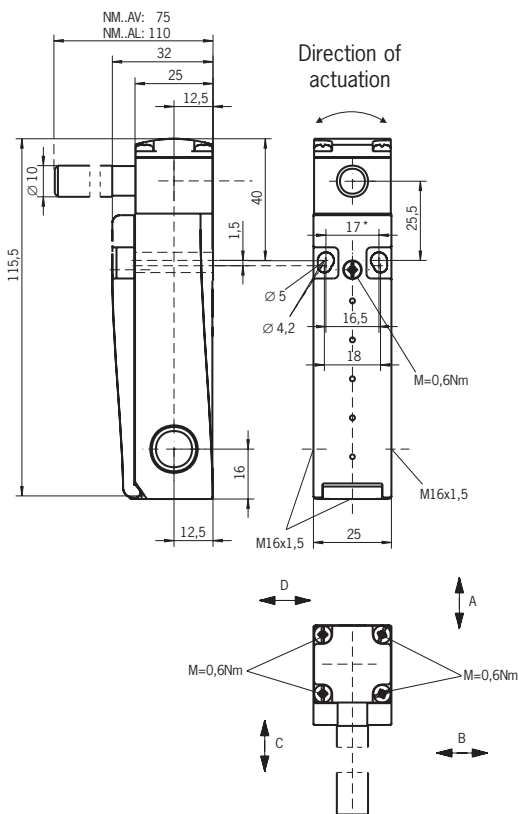
### Dimension drawing

NM01AV... / NM11AV...C2069 / NM02AV...C2069  
 NM01AL... / NM11AL...C2069 / NM02AL...C2069



### Dimension drawing

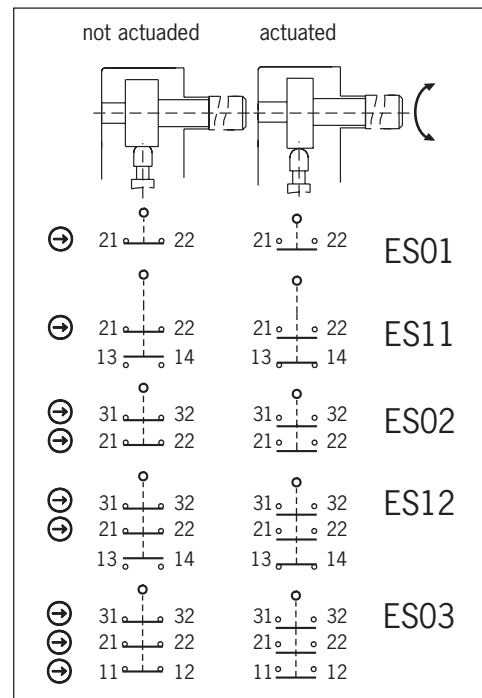
NM11..AV... / NM02..AV... / NM12..AV... / NM03..AV...  
 NM11..AL... / NM02..AL... / NM12..AL... / NM03..AL...



### Switching elements

(dependent action contact elements)

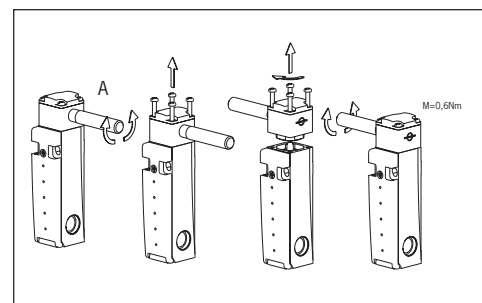
- ES 01 1 positively driven NC contact
- ES 11 1 positively driven NC contact + 1 NO
- ES 02 2 positively driven NC contact
- ES 12 2 positively driven NC contact + 1 NO
- ES 03 3 positively driven NC contact



### Installation notes

The hinged actuator must be positively connected with the door hinge according to EN 1088, e.g. by means of pins.

### Changing the approach direction

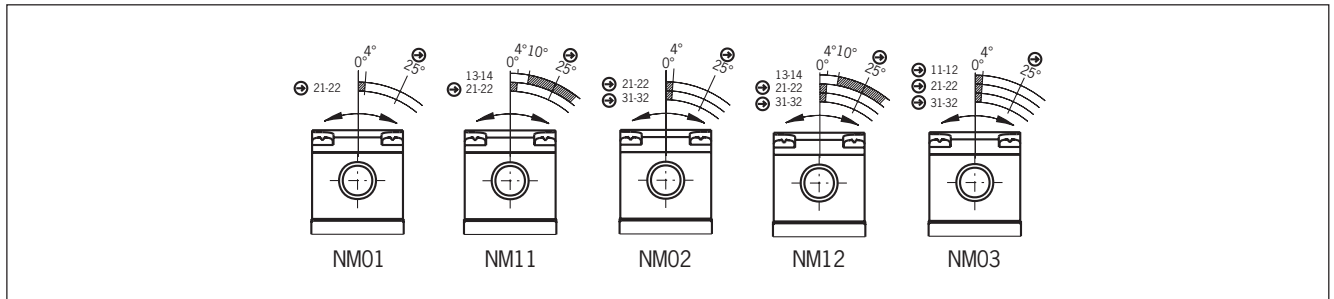


⚠ The complete safety switch must be replaced in the event of faults.

## Technical Data



Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	> 4 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Hinged actuator with solid shaft, outside diameter 10 mm					
Shaft length	75 (NM..AV) / 110 (NM..AL)					mm
Axle material	stainless steel					
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08		approx. 0.1			kg

## Switching diagram





## Ordering table

### Shaft length 75 mm

Design	Article	Contact elements	Actuator head	Cable entry	Order No.
short 	NM01AV-M	1 positively driven NC	AV	M	084 545
	NM11AV-MC2069	1 positively driven NC + 1 NO			095 367
	NM02AV-MC2069	2 positively driven NC			095 366
long 	NM11AV-M	1 positively driven NC + 1 NO	AV	M	084 546
	NM02AV-M	2 positively driven NC			084 547
	NM12AV-M	2 positively driven NC + 1 NO			084 548
	NM03AV-M	3 positively driven NC			084 549

### Shaft length 110 mm

Design	Article	Contact elements	Actuator head	Cable entry	Order No.
short 	NM01AL-M	1 positively driven NC	AL	M	079 117
	NM11AL-MC2069	1 positively driven NC + 1 NO			095 365
	NM02AL-MC2069	2 positively driven NC			095 364
long 	NM11AL-M	1 positively driven NC + 1 NO	AL	M	079 118
	NM02AL-M	2 positively driven NC			079 119
	NM12AL-M	2 positively driven NC + 1 NO			079 120
	NM03AL-M	3 positively driven NC			079 121

**Ordering example:** NM, switching element ES 12, actuator head AV (shaft length 75 mm), cable entry M16x1.5 M

**NM12AV-M**

**Order No. 084 548**

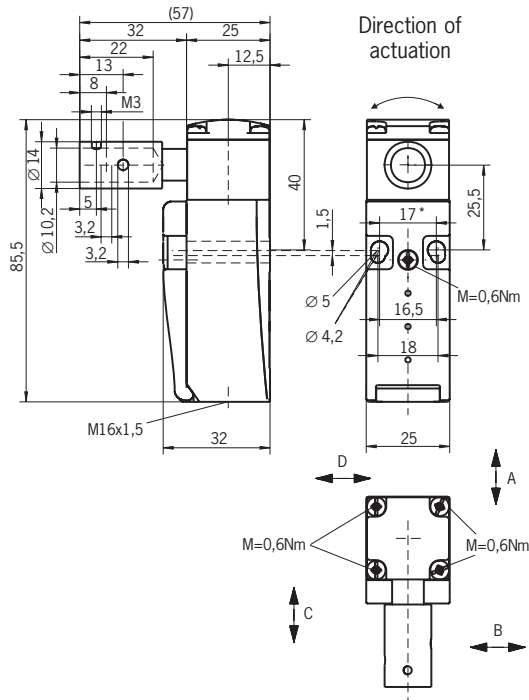
## Type series NM..AG...

- ▶ Hinged actuator with hollow shaft, inside diameter 10.2 mm
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



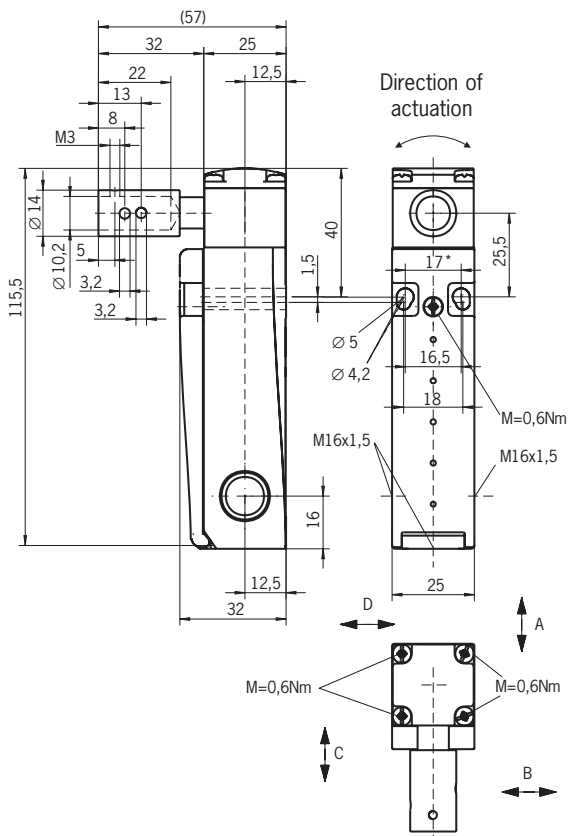
### Dimension drawing

NM01AG... / NM11AG...C2069 / NM02AG...C2069



### Dimension drawing

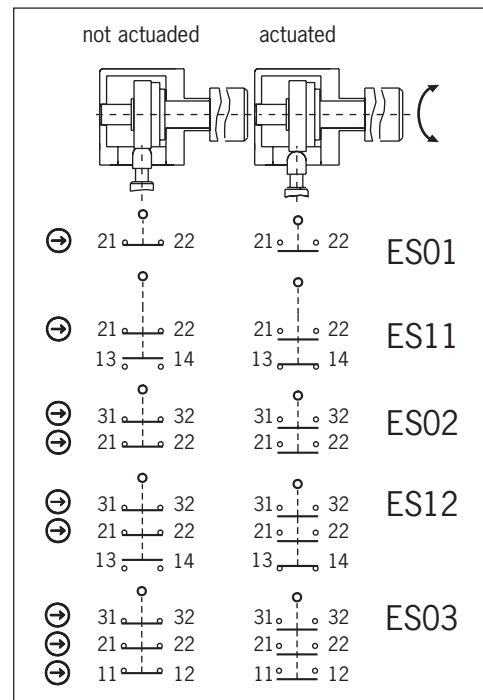
NM11AG... / NM02AG... / NM12AG... / NM03AG...



### Switching elements

(dependent action contact elements)

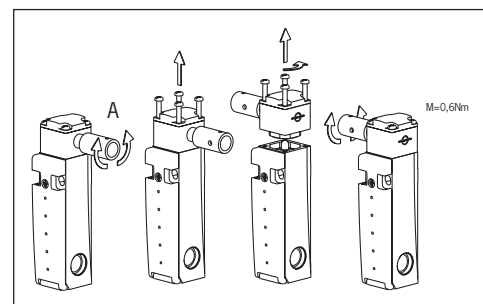
- ES 01 1 positively driven NC contact
- ES 11 1 positively driven NC contact + 1 NO
- ES 02 2 positively driven NC contact
- ES 12 2 positively driven NC contact + 1 NO
- ES 03 3 positively driven NC contact



### Installation notes

The hinged actuator must be positively connected with the door hinge according to EN 1088, e.g. by means of pins.

### Changing the approach direction

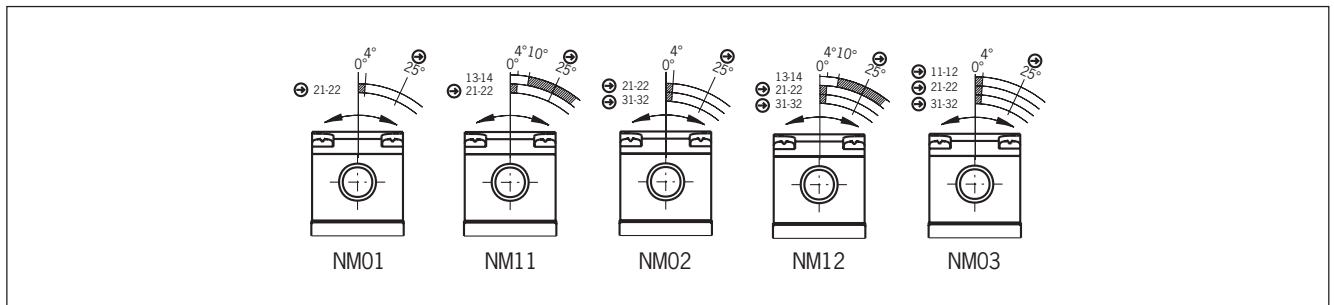


⚠ The complete safety switch must be replaced in the event of faults.



## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	> 4 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Hinged actuator with hollow shaft, inside diameter 10.2 mm					
Axle material	stainless steel					
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg

## Switching diagram



## Ordering table

Design	Article	Contact elements	Actuator head	Cable entry	Order No.
 short	NM01AG-M	1 positively driven NC	AG	M	084 553
	NM11AG-MC2069	1 positively driven NC + 1 NO			095 361
	NM02AG-MC2069	2 positively driven NC			095 360
 long	NM11AG-M	1 positively driven NC + 1 NO	AG	M	084 554
	NM02AG-M	2 positively driven NC			084 555
	NM12AG-M	2 positively driven NC + 1 NO			084 556
	NM03AG-M	3 positively driven NC			084 557

**Ordering example:** NM, switching element **ES 12**, actuator head **AG**, cable entry M16x1.5 M  
**NM12AG-M**

**Order No. 084 556**

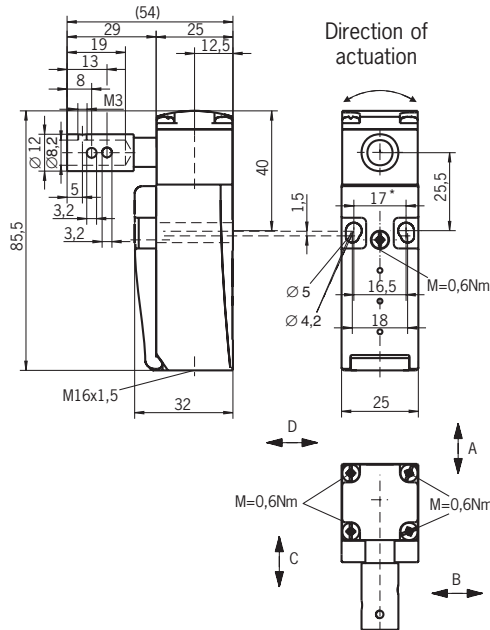
## Type series NM..AK...

- ▶ Hinged actuator with hollow shaft, inside diameter 8.2 mm
- ▶ Cable entry M16x1.5
- ▶ Switching elements with 1, 2 or 3 contacts



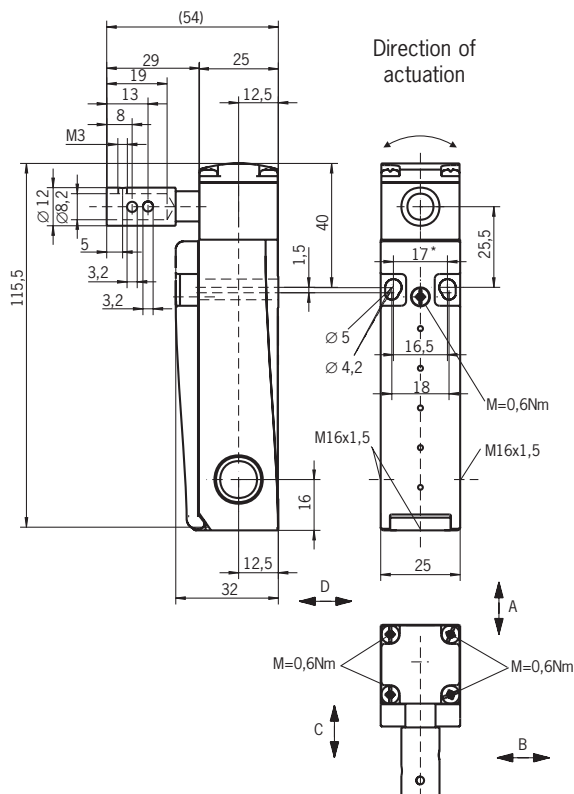
## Dimension drawing

NM01AK... / NM11AK...C2069 / NM02AK...C2069



## Dimension drawing

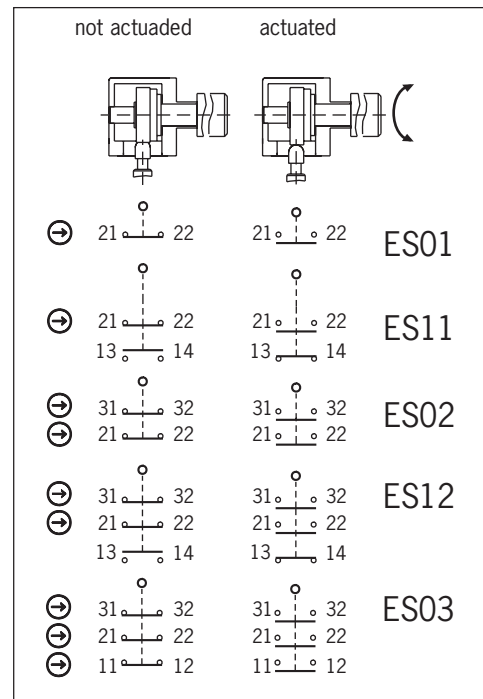
NM11AK... / NM02AK... / NM12AK... / NM03AK...



## Switching elements

(dependent action contact elements)

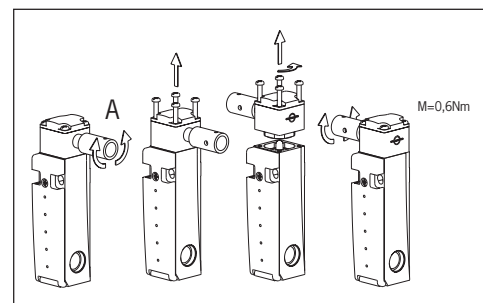
- ES 01** 1 positively driven NC contact
- ES 11** 1 positively driven NC contact + 1 NO
- ES 02** 2 positively driven NC contact
- ES 12** 2 positively driven NC contact + 1 NO
- ES 03** 3 positively driven NC contact



## Installation notes

The hinged actuator must be positively connected with the door hinge according to EN 1088, e.g. by means of pins.

## Changing the approach direction

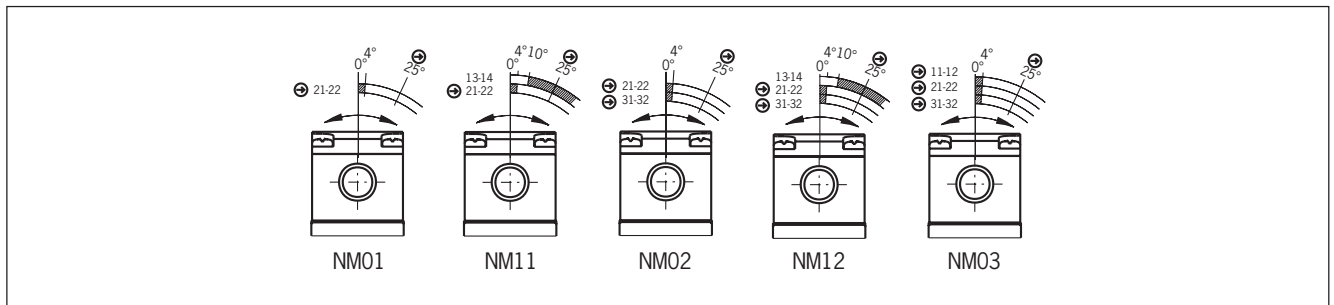


⚠ The complete safety switch must be replaced in the event of faults.



## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	> 4 x 10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Actuator	Hinged actuator with hollow shaft, inside diameter 8.2 mm					
Axle material	stainless steel					
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Pretravel up to switching point ⊖	see switching diagramm					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Utilization category to IEC 60 947-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
Connection type	Screw terminal					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg

## Switching diagram



## Ordering table

Design	Article	Contact elements	Actuator head	Cable entry	Order No.
 short	NM01AK-M	1 positively driven NC	AK	M	084 559
	NM11AK-MC2069	1 positively driven NC + 1 NO			095 363
	NM02AK-MC2069	2 positively driven NC			095 362
 long	NM11AK-M	1 positively driven NC + 1 NO	AK	M	084 560
	NM02AK-M	2 positively driven NC			084 561
	NM12AK-M	2 positively driven NC + 1 NO			084 562
	NM03AK-M	3 positively driven NC			084 563

**Ordering example:** NM, switching element **ES 12**, actuator head **AK**, cable entry M16x1.5 **M**  
**NM12AK-M**

**Order No. 084 562**

## EUCHNER type series NM safety switches of Design Type 2 offer important advantages

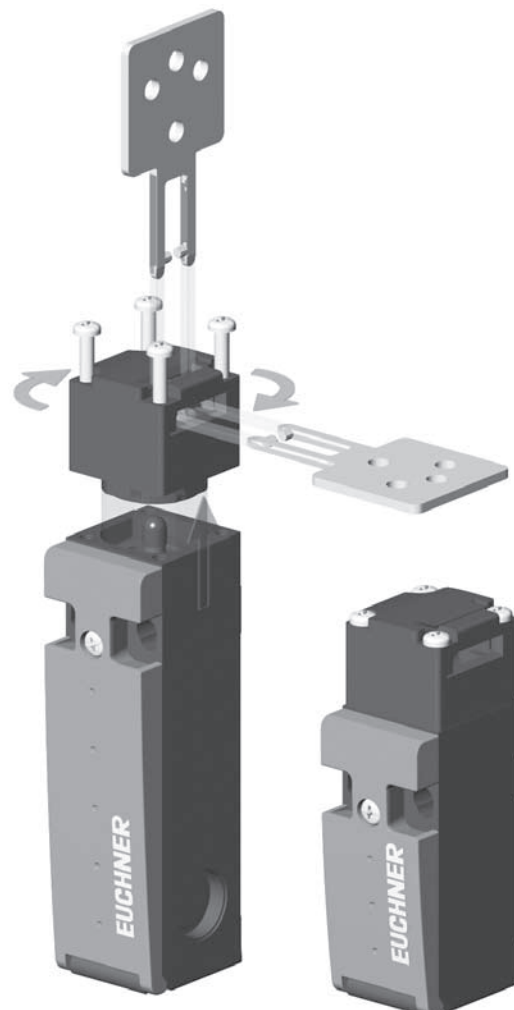
**Safety switches of Design Type 2 are switches, where the switching element and actuator do not form a design unit, but they are functionally combined or separated upon actuation.**

For typical application examples of this type range please refer to page 23 of this catalogue.  
With this new type series EUCHNER has extended its application range where small dimensions are necessary.

### Features

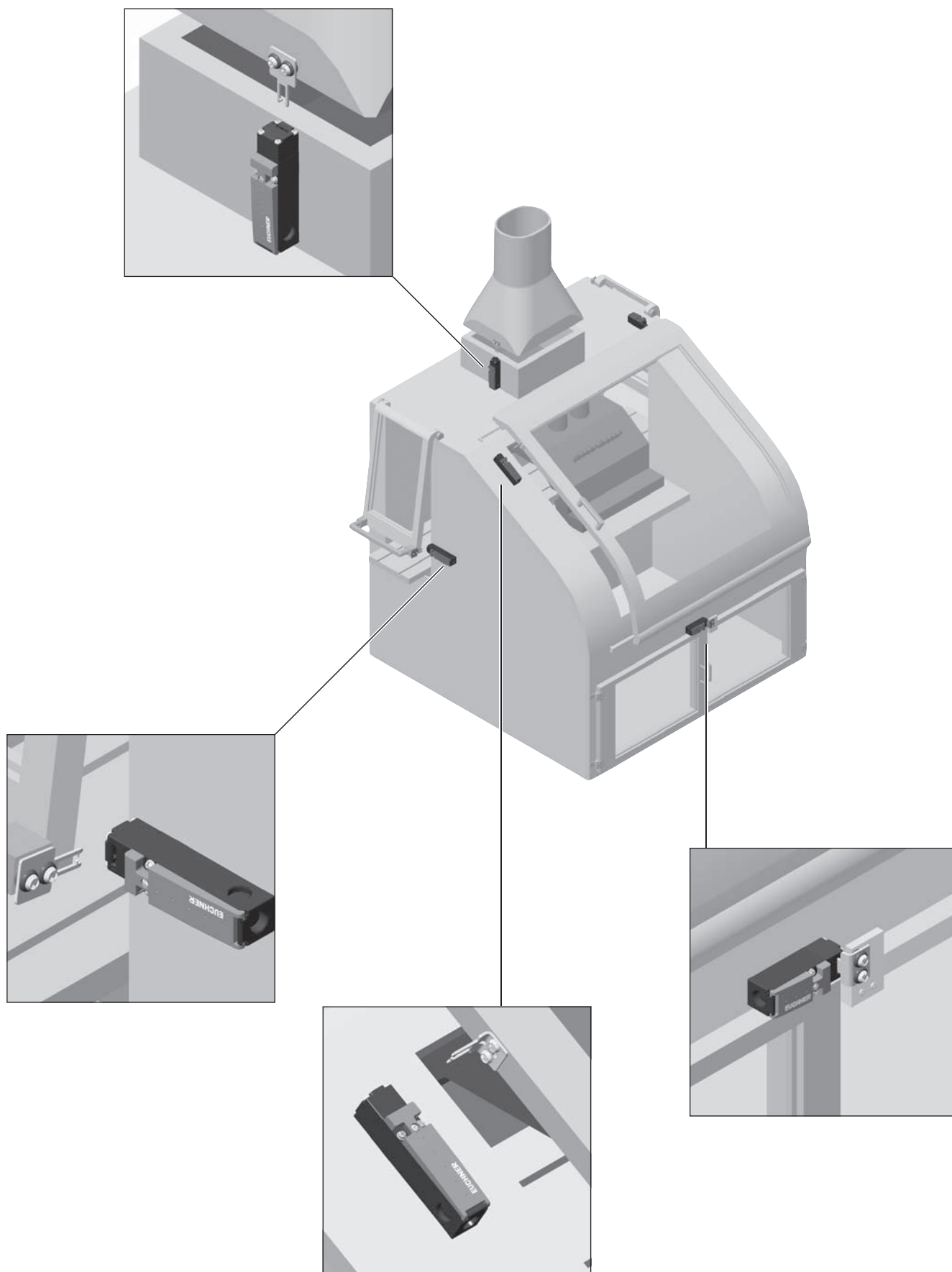
- ▶ Protective insulation by means of reinforced thermoplastic housing material
- ▶ Compact size with maximum function
- ▶ 4 lateral approach directions
- ▶ 1 approach direction from top
- ▶ Easy and fast changing of the approach direction
- ▶ Increased actuator travel of 4 mm
- ▶ Small approach radius with straight/bent actuator
- ▶ 3 cable entries on side and bottom (NM11..., NM02..., NM12..., NM03...)
- ▶ Large-sized connection terminals for each contact element
- ▶ Contact elements:
  - 1 positively driven NC (NM01...)
  - 1 positively driven NC + 1 NO (NM11...)
  - 2 positively driven NC (NM02...)
  - 2 positively driven NC + 1 NO (NM12...)
  - 3 positively driven NC (NM03...)

### Fast changing of the approach direction!





## Applications for Safety Switches Design Type 2

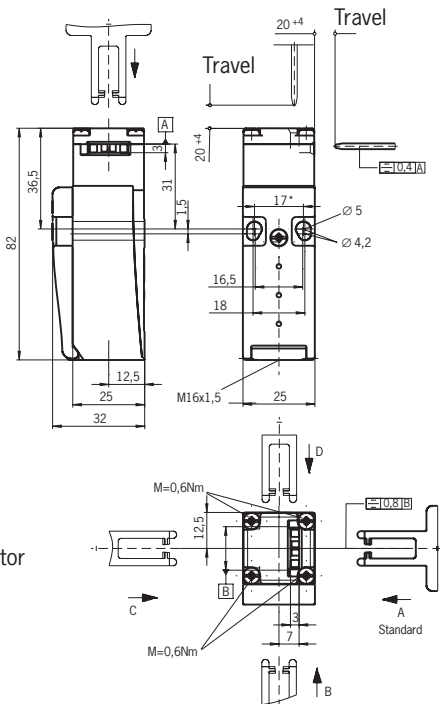


## Type series NM..VZ.

- ▶ Cable entry M16x1.5 or Plug connector M12 (connecting cable see page 28)
- ▶ Switching element with 1, 2 or 3 contacts

### Dimension drawing

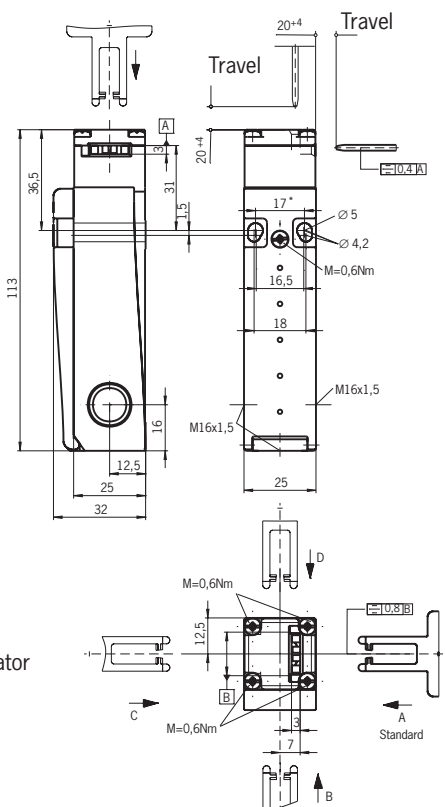
NM01VZ... / NM11VZ...C2069 / NM02VZ...C2069



Please order actuator separately. (See page 26/27)

### Dimension drawing

NM11VZ... / NM02VZ... / NM12VZ... / NM03VZ...



Please order actuator separately. (See page 26/27)

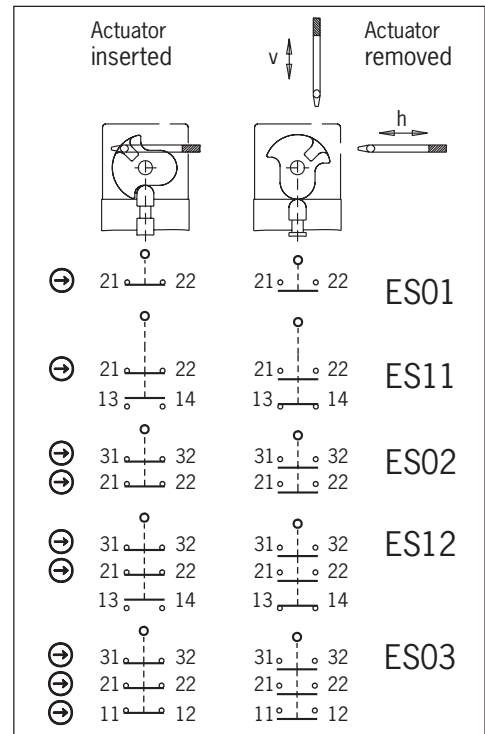


\* Approval applied for cable entry types M16x1.5

### Switching elements

(dependent action contact elements)

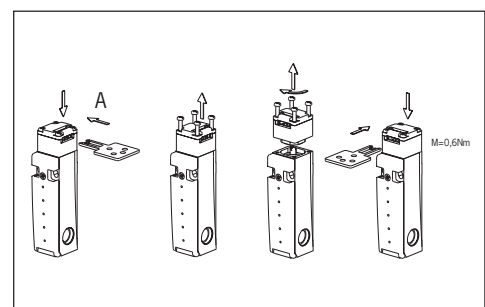
- ES 01 1 positively driven NC contact
- ES 11 1 positively driven NC contact + 1 NO
- ES 02 2 positively driven NC contact
- ES 12 2 positively driven NC contact + 1 NO
- ES 03 3 positively driven NC contact



### Installation notes

The safety switch and actuator must be assembled for installation purposes. The actuator must be positively attached to the mounting surface, e.g. by using safety screws or by welding, riveting, pinning. The safety switch must not be used as an end stop.

### Changing the approach direction

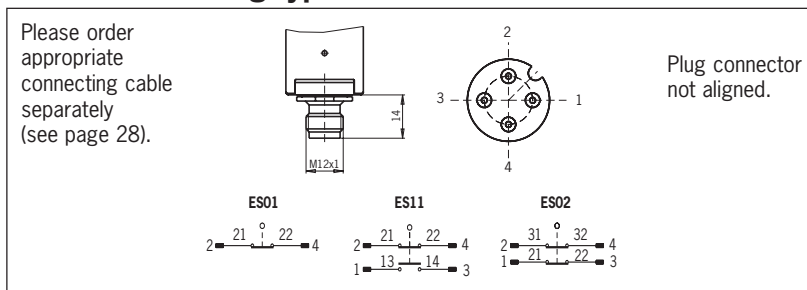


⚠ The complete safety switch must be replaced in the event of faults.

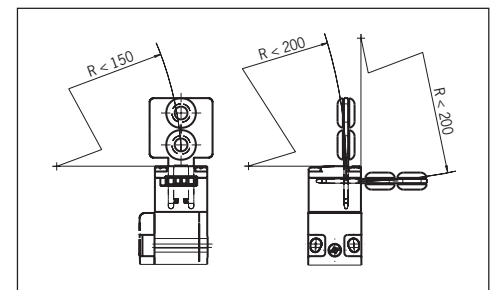
## Technical Data

Parameter	Value					Unit
Housing material	Reinforced thermoplastic					
Environmental protection to IEC 529	IP 67					
Mounting position	optional					
Mechanical service life	10 <sup>6</sup> switching cycles					
Ambient temperature	- 20 to + 80					°C
Approach speed max.	20					m/min
Switching element	ES 01	ES 11	ES 02	ES 12	ES 03	
Contact elements	1 NC ⊖	1 NC ⊖ + 1 NO	2 NC ⊖	2 NC ⊖ + 1 NO	3 NC ⊖	
Switching principle	Dependent action contact element					
Rated insulation voltage U <sub>i</sub>	250					V <sub>≅</sub>
Rated impulse withstand voltage U <sub>imp</sub>	2.5					kV
Switching voltage min.	12					V
Switching current min. at 24 V	1					mA
Contact material	Silver alloy, gold flashed					
<b>Connection type NM...-M</b>	Screw terminal					
Cable entry	1 x M16x1.5	3 x M16x1.5				
Utilization category to IEC 60 947-5-1	AC-15 4 A 230 V / DC-13 4 A 24 V					
Wire cross section	0.34 - 1.5					mm <sup>2</sup>
<b>Connection type NM...-SM4</b>	plug connector M12		-	-		
Utilization category to IEC 60 947-5-1	AC-15 4A 230 V / DC-13 4A 24 V		-	-		
Betätigungskraft	approx. 6					N
Retaining force	approx. 10					N
Short circuit protection (control circuit fuse)	4					A gG
Weight	approx. 0.08	approx. 0.1				kg
<b>Insertion depth</b>						
Necessary minimum travel	20					mm
Permissible overtravel	4					mm

## Dimension drawing type NM..VZ.-SM4



## Minimum door radius



## Ordering table

### Cable entry M16x1.5

Design	Article	Contact elements	Actuator head	Approach direction	Cable entry	Order No.
<b>short</b> 	NM01VZA-M	1 positively driven NC	VZ	A	M	084 451
	NM11VZA-MC2069	1 positively driven NC + 1 NO				094 471
	NM02VZA-MC2069	2 positively driven NC				094 470
<b>long</b> 	NM11VZA-M	1 positively driven NC + 1 NO	VZ	A	M	084 452
	NM02VZA-M	2 positively driven NC				084 453
	NM12VZA-M	2 positively driven NC + 1 NO				084 454
	NM03VZA-M	3 positively driven NC				084 455

### Plug connector M12

Design	Article	Contact elements	Actuator head	Anfahrriichtung	Connector	Order No.
<b>short</b>	NM01VZA-SM4	1 positively driven NC	VZ	A	SM4	on request
<b>long</b>	NM11VZA-SM4	1 positively driven NC + 1 NO	VZ	A	SM4	085 626
	NM02VZA-SM4	2 positively driven NC				084 564
	NM12VZA-SM4	2 positively driven NC + 1 NO				-
	NM03VZA-SM4	3 positively driven NC				-

**Ordering example:** NM, switching element ES 12, actuator head VZ, approach direction A, cable entry M16x1.5 M

**NM12VZA-M**

**Order No. 084 454**

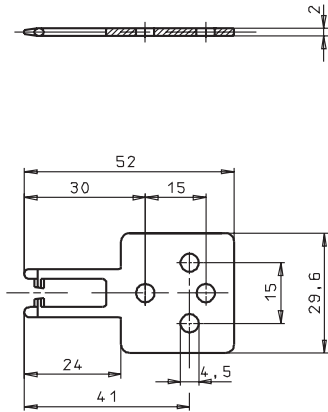
## Accessories

### Actuators

#### Straight actuator

(2 safety screws M4x14 included)

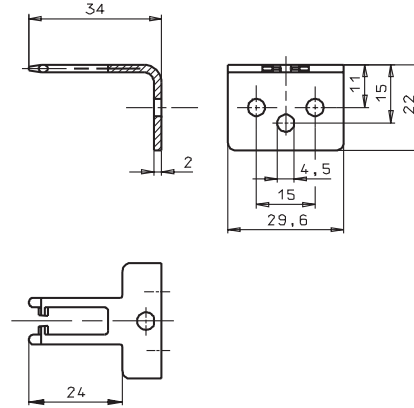
Article	Order No.
Actuator-M-G	074 076



#### Bent actuator

(2 safety screws M4x14 included)

Article	Order No.
Actuator-M-W	074 077

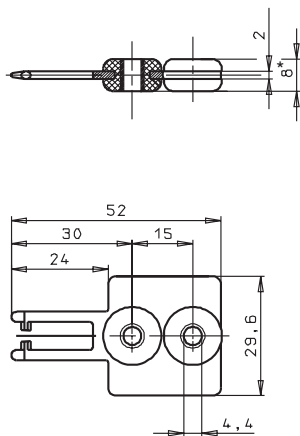


### Actuators with rubber bush

#### Straight actuator, rubber bush in longitudinal direction

(2 safety screws M4x14 included)

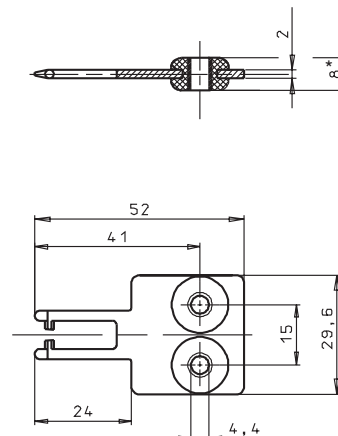
Article	Order No.
Actuator-M-GT	074 078



#### Straight actuator, rubber bush in cross direction

(2 safety screws M4x14 included)

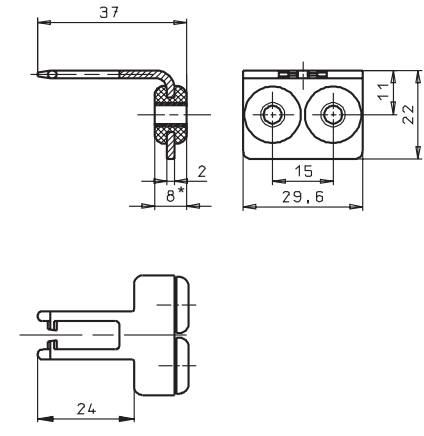
Article	Order No.
Actuator-M-GQ	074 079



#### Bent actuator, rubber bush

(2 safety screws M4x14 included)

Article	Order No.
Actuator-M-WT	074 080

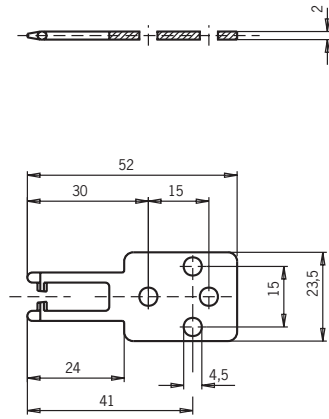


\* Dimension 8 is related to the fitted condition

## Slim actuator

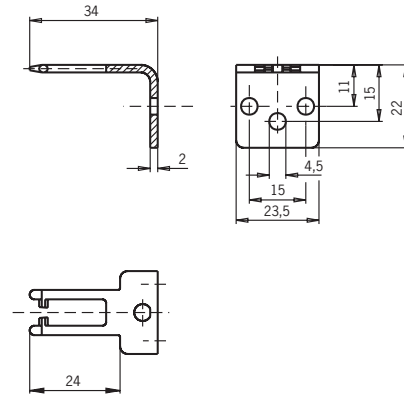
**Straight actuator, slim**  
(2 safety screws M4x14 included)

Article	Order No.
Actuator-M-GS	074 128



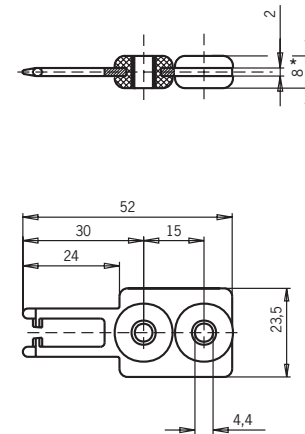
**Bent actuator, slim**  
(2 safety screws M4x14 included)

Article	Order No.
Actuator-M-WS	074 129



**Straight actuator, slim with rubber bush**  
(2 safety screws M4x14 included)

Article	Order No.
Actuator-M-GTS	074 130



\* Dimension 8 is related to the fitted condition

## Safety screws

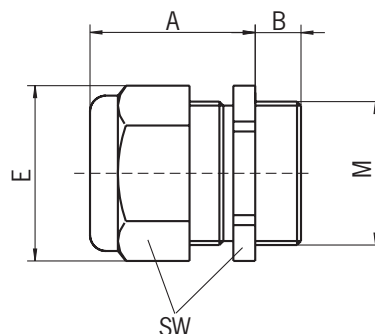
Type of screw	Application	Packing unit	Article	Order No.
M4x14	for all types NM..VZ actuators	100 pcs.	M4x14/V100	074 063
PL3x26	head screws of type series NM...VZ, NM...AV, NM...AL, NM...AG und NM...AK	100 pcs.	PL3x26/V100	085 576
PL3x8	head screws of type series NM...HB, NM...RB, NM...WO und NM...KB	100 pcs.	PL3x8/V100	085 577

## Cable glands (plastic)

In the following table, please find the dimensions of the cable gland and the cable diameter that can be used with EUCHNER safety switches range NM.

M	Outer diameter of cable D	A	B	E	SW	Article	Order No.
16X1,5	5-10	max. 28	8	22	20	EKPM16/05	084 572

Dimensions in mm

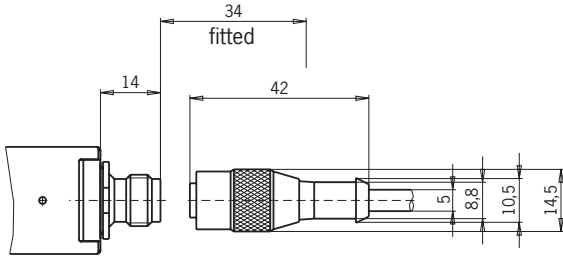


## Connecting cable for Safety Switches type NM..VZ.-SM4

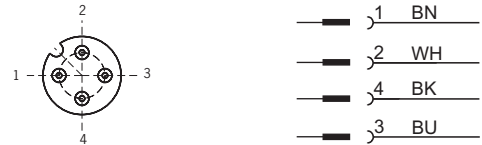
Round connectors with screw plug and molded PUR cable, Type series SGLF

Number of poles: 4

### Dimension drawing



### Connection pattern



### Technical Data

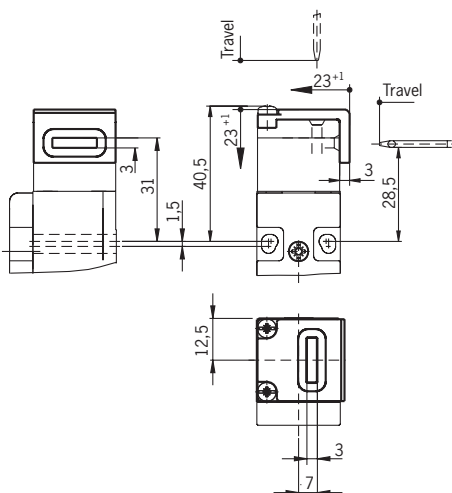
Parameter	Value	Unit
Number of poles	4	
Environmental protection acc. to IEC 529/EN60529	IP 67, in connected and secured state	
Ambient temperature	- 25 to + 90	°C
Contact material	CuZn, nickel-plated, 0.3 µm gold-plated	
Type of connection	PUR lead, molded	
Connection cross-section	4 x 0.25	mm <sup>2</sup>
Volume resistance	≤ 5	mΩ
Rated voltage	250	V
Rated current	4	A
Mass	0.2	kg

### Ordering table

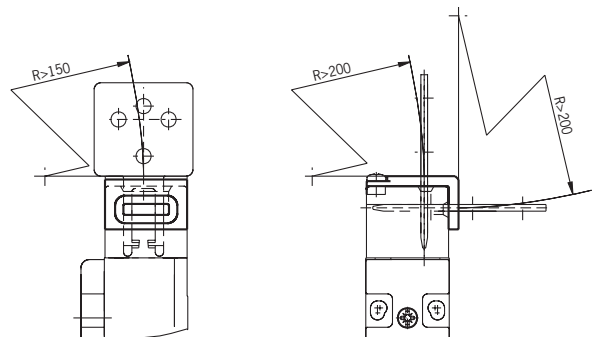
Version	Article	Order No.
Straight plug, lead 2 m PUR	SGLF4-2000P	035 612
Straight plug, lead 5 m PUR	SGLF4-5000P	035 613

## Insertion funnel for Safety Switches NM..VZ...

By using the insertion funnel, due to the large opening also inaccurately positioned actuators are inserted reliably into the switch head and therefore the safety switch is protected against mechanical effects.



### Minimum door radius with insertion funnel



### Ordering table

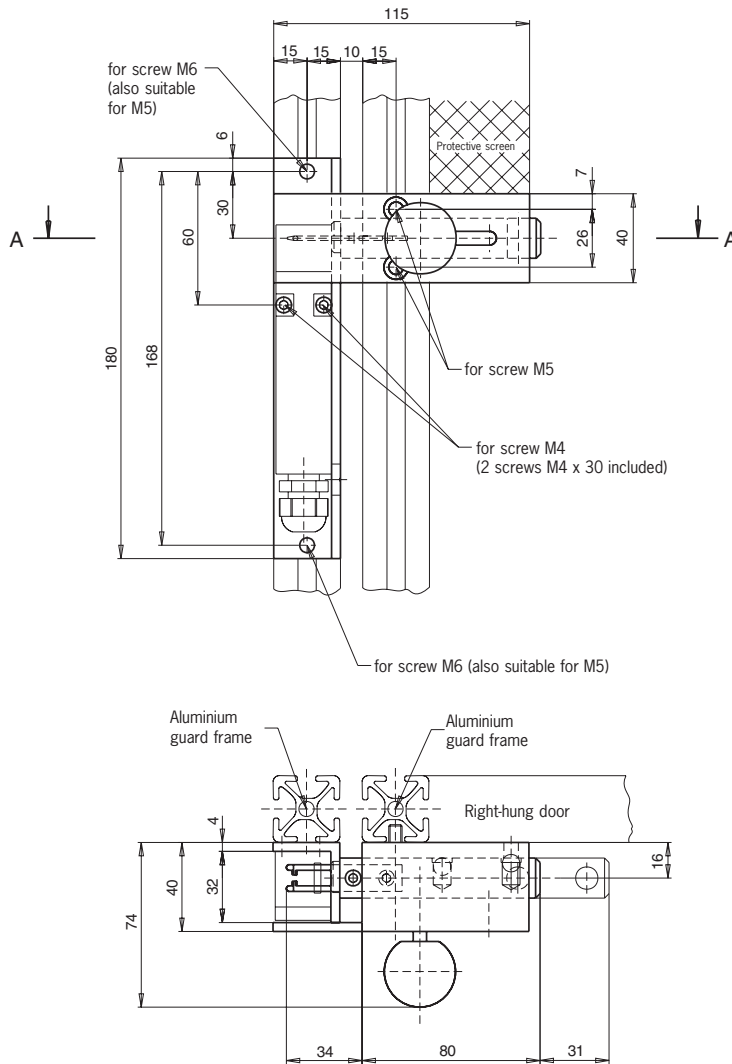
Article	Order No.
Insertion funnel-M (2 mounting screws included)	083 565

## Bolt NM

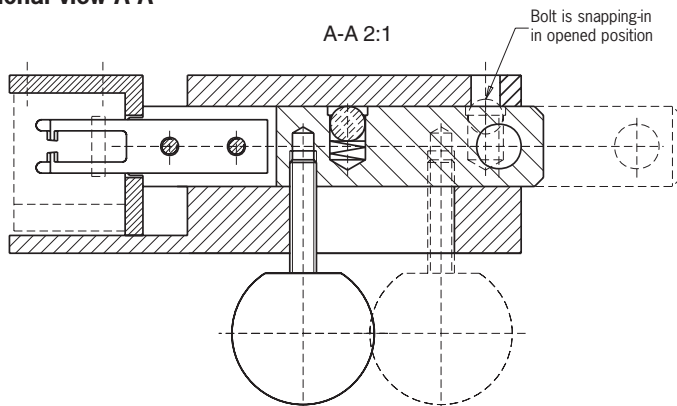
► For NM..VZA Safety Switches

### Dimension drawing

**Bolt NM for right-hung or left-hung door**  
(diagram shows right-hung door)



### Sectional view A-A



### Characteristics

- Easy screw mounting to both aluminium profiles and machine guards
- Distinctive yellow colour for easy recognition
- Symmetrical design for right-hung or left-hung doors
- No additional door handle necessary
- Bolt with snap-in mechanism in opened position
- Extended hole at the bolt permits fixing of padlocks

### Notes

- Switch bracket and actuator included
- Please order safety switch separately

### Ordering table

Article	Order No.
<b>Bolt NM</b> for right-hung and left-hung doors, switch bracket and actuator included	077 233
<b>Switch Bracket NM</b> single part	077 245



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