

## Automation

Safety, position switches, command devices



// SYSTEMATIC CONTROL SWITCHGEAR

Catalogue





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# // SAFE SWITCHGEAR FOR DEMANDING AND CRITICAL APPLICATIONS

## Wireless



## Automation



## Extreme



## Meditec



»Safe switchgear for demanding and critical applications«. True to this motto, steute has been providing its customers with innovative, practical and durable switchgear solutions – for over 50 years.

When our customers are successful, so are we. Because we always focus on our customers, our company has grown steadily and sustainably over the last decades. Steute is committed to continuing this growth – in close cooperation with our customers.

We are situated in East Westphalia, a key region for machine building and electrical goods manufacturing. It is home to qualified specialists committed to developing and manufacturing innovative products. It is also the location of renowned universities, research and educational institutions to which we maintain healthy contacts.

Markets are no longer restricted by national borders. This is why our products are developed and tested for extreme conditions all over the world. We take care to ensure that our products are always certified according to the latest international standards. In every industrial or emerging nation in the world, steute has access to qualified specialists who can guarantee competent support and a quick service.

As a medium-sized company we are able to react with speed to customer wishes and market trends. We are continually developing innovative products and using new technologies as we consistently open up new fields of application for our switchgear.

steute is currently active in four different business fields, producing switchgear, sensors and control units for use in industry and in medical equipment:

### Wireless

Cable free switchgear and sensors for use in machinery and process plants. These industrial-strength wireless switches communicate with higher level control systems via reliable radio transmission. »Energy harvesting« can play a major role in these products.

### Automation

Standard and customised switchgear for machinery and process plants. Tried and tested electromechanical and non-contact technologies for classical applications in industrial automation and process control – always with a view to the latest global requirements.

### Extreme

Switchgear and sensors for use in extreme environments or under extreme conditions. Certified products for use in hazardous areas worldwide (e. g. ATEX, IECEx, GOST).

### Meditec

A comprehensive range of standard and customised foot and hand controls for medical devices, meeting the highest ergonomic and availability requirements. Produced in accordance with the certified EN ISO 13485 quality management system for medical products.

The following information provides an overview of our standard range of switchgear for complex and demanding applications. We will be happy to provide you with any additional information you require. If you cannot find the solution for your application: just get in touch. We have already helped numerous customers by developing »tailor-made« switchgear for their individual needs.

**Marc Stanesby**  
Managing Director  
steute Schaltgeräte GmbH & Co. KG





## Solenoid interlocks

Thermoplastic enclosure  
// [Series STM 295](#)  
from page 10



# Solenoid interlocks

## Range of application

The solenoid interlocks ensure that sliding, hinged and removable guarding devices, such as grids, hoods or doors, cannot be opened until dangerous conditions (e.g. run-on movements) have been terminated. This takes place in co-ordination with the control system of a machine. Fail-safe standstill monitors or delay timers monitor run-on movements or time sequences. These solenoid interlocks are also used for cases in which the opening of a guarding device represents a non-permissible intrusion in a production process.

In combination with the SRM range safety relay module, the solenoid interlocks achieve SIL 3 according to EN 62061 and PL e according to EN ISO 13849-1.

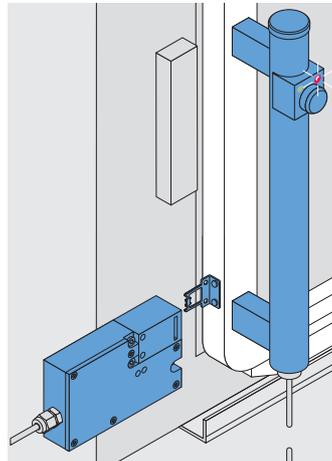
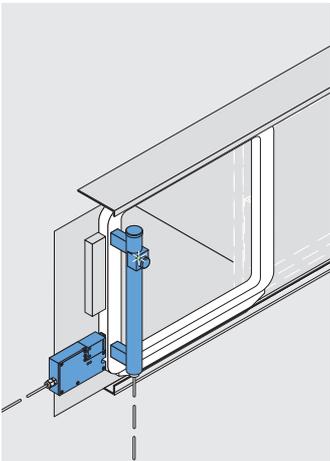
## Design and operating principle

On the solenoid interlocks, the switching element with interlock is not physically connected to the actuator but functionally united or separated on switching. When the guard device is opened in the uninterlocked condition, the actuator is separated from the base unit. In the process, NC contacts are positively opened and NO contacts closed. The machine control circuit is only activated when the actuator has been inserted into the interlock and is interlocked. The solenoid interlocks operate on the principle of »actuated without power supply«, whereby the actuator is held in the interlock by spring pressure. When power is supplied to the solenoid, the interlock is released. The guarding device can then be opened. The solenoid interlocks with the power-to-lock principle work in the opposite way.

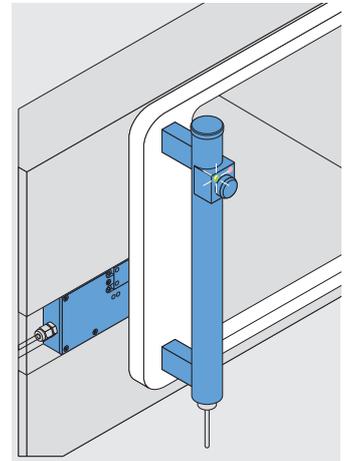
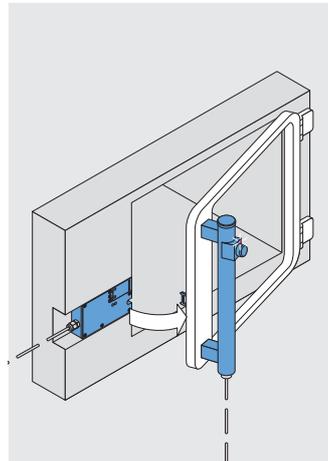
The solenoid interlocks shown in this chapter bear the CE mark according to the Machinery Directive 2006/42/EC.

## Application

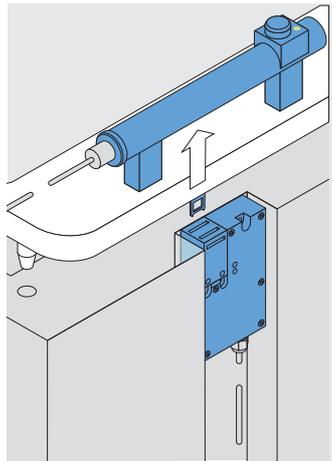
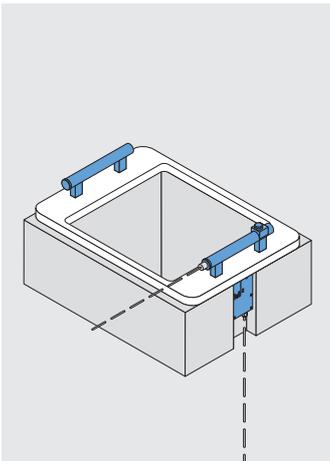
### on sliding guards



### on hinged guards



### on removable guards



# Solenoid interlocks // Series STM 295

## Features/Options

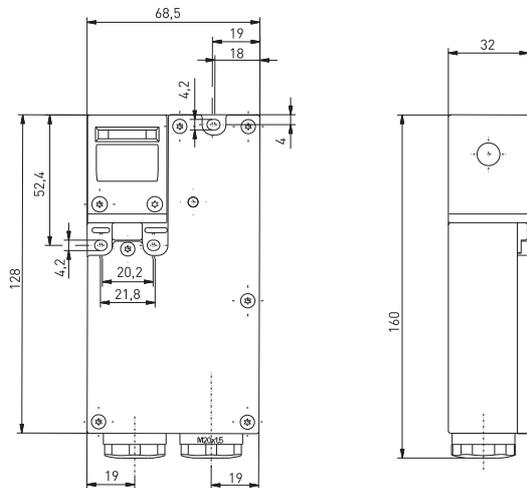
- Thermoplastic enclosure
- Double insulated □
- Two switch inserts in one enclosure
- Spring-to-lock or power-to-lock principle
- Holding force 1000 N
- Wiring compartment

## // STM 295



## Technical data

<b>Standards</b>	EN ISO 13849-1; EN 60947-5-1; EN 1088
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Actuator</b>	stainless steel 1.4301
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts ⊖
<b>Switching elements</b>	2 NC / 2 NO contacts with positive break, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entries</b>	2 x M20 x 1.5 for cable diameter 5 ... 9 mm
<b>B<sub>10d</sub> (10 % load)</b>	1 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	4 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	4 A/250 VAC; 0.25 A/230 VDC
<b>Utilisation category</b>	AC-15; DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>U<sub>s</sub></b>	24 VDC
<b>Magnet</b>	100 % ED
<b>Unlocking</b>	100 % ED
<b>Power consumption</b>	max. 47 W (0.25 s)
<b>Ambient temperature</b>	-20 °C ... +55 °C
<b>Mechanical life</b>	> 500 000 operations
<b>Holding force F</b>	max. 1000 N
<b>Approvals</b>	

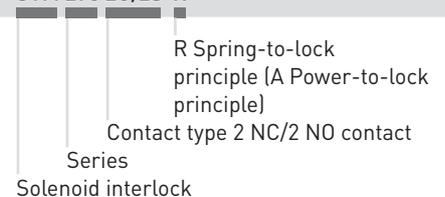


## Contact variants: switch travel/contacts

	Spring-to-lock principle	Power-to-lock principle
2 NC/2 NO contacts Material Number	STM 295 2Ö/2S-R 1183004	STM 295 2Ö/2S-A 1183003

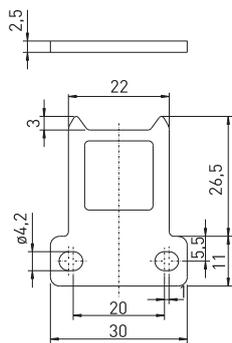
## Type code

STM 295 2Ö/2S-R



Solenoid interlocks  
 // Series STM 295, actuators

// Straight actuator STM 295-B1



Features/Options

- Actuating radius on hinged guards  
 $a = 350$  mm and  $b = 700$  mm
- Axial misalignment  $x = 11$  mm

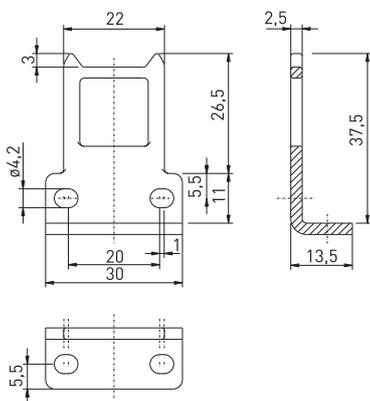
Note

The actuators are not included with the switches.

Actuator  
 STM 295-B1

Material Number  
 1183481

// Angled actuator STM 295-B5



Features/Options

- Especially suitable for hinged guards
- Actuating radius on hinged guards  
 $a = 350$  mm and  $b = 700$  mm
- Axial misalignment  $x = 13.5$  mm

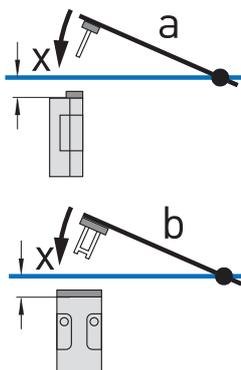
Note

The actuators are not included with the switches.

Actuator  
 STM 295-B5

Material Number  
 1183470

// Actuating radii



Features/Options

- The axis of the hinge should be  $x$  mm above the top edge of the safety switch and in the same plane
- $a$  Actuating radius to the plane of the actuator
- $b$  Actuating radius in line with the plane of the actuator
- $x$  Axial misalignment referring to the surface of the enclosure and not to the inserted actuator!

Note

Inserted position of actuator = 0 in switch travel diagram  
 The actuators are not included with the switches.





Safety switches with  
separate actuator

Thermoplastic enclosure

// Series ST 14

from page 16

// Series ES 95 AZ

from page 20

Metal enclosure

// Series ST 98

from page 22

// Series ST 61

from page 26

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# Safety switches with separate actuator

## Range of application

Safety switches with a separate actuator are suitable for sliding, hinged and particularly removable safety guards, which need to be closed to ensure the necessary operational safety. They are also suitable for mounting on profile sections and retrofitting on existing equipment. In combination with an appropriate safety control module, all safety switches shown in this chapter achieve SIL 3 according to EN 62061 and PL e according to EN ISO 13849-1.

## Design and operating principle

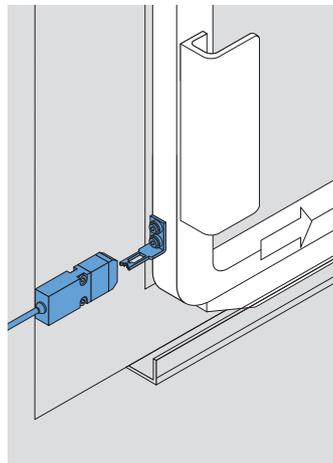
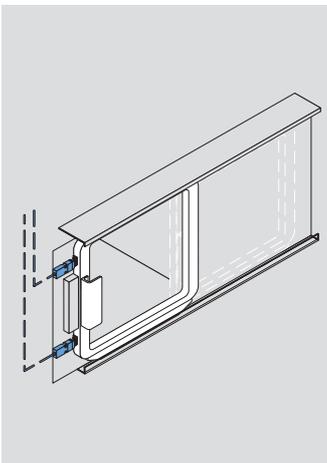
On the safety switches with a separate actuator, the switching element is not physically connected to the actuator, but functionally brought together or separated by switching. When the guard device is opened, the actuator is separated from the base unit. In this process, NC contacts are positively opened and NO contacts closed. A wide range of coded actuators is available, also suitable for small radii.

The degree of protection of all the safety switches is IP 65/67. The safety switches can be fitted in any desired mounting position.

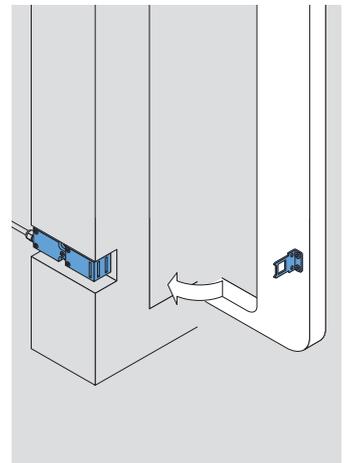
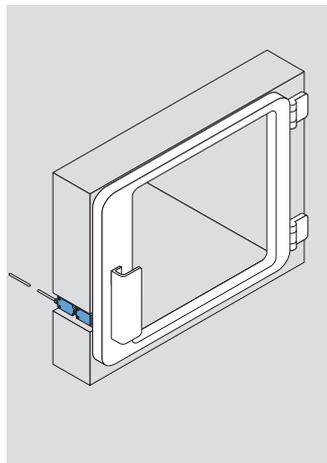
All safety switches shown in this chapter bear the CE mark according to the Machinery Directive 2006/42/EC.

## Application

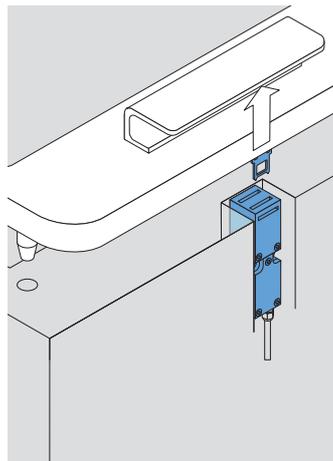
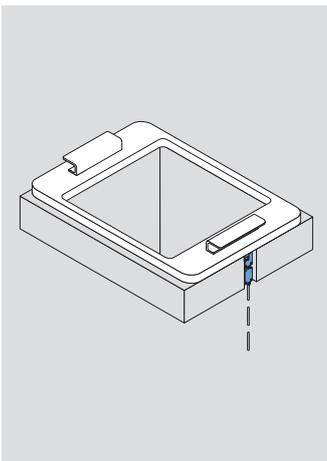
### on sliding guards



### on hinged guards



### on removable guards



# Safety switches with separate actuator

## // Series ST 14

### Features/Options

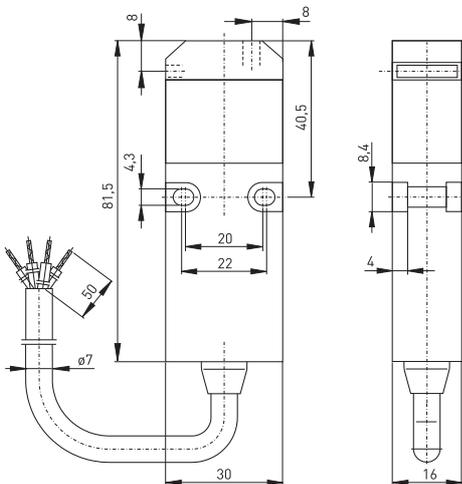
- Thermoplastic enclosure
- Double insulated
- Slow action  $\ominus$ , change-over contact with double break
- Slow action with overlapping contacts available
- Version with cable entry on side available on request
- With pre-wired cable
- Ex version available (only with 2 contacts)
- With gold-plated contacts available on request
- Available on request with connector M12 x 1, 4-pole (2 contacts) or 6-pole (3 contacts)

### Technical data

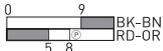
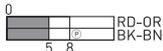
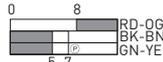
<b>Standards</b>	EN ISO 13849-1; EN 60947-5-1; BG-GS-ET-15; EN 1088
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0 stainless steel 1. 4301
<b>Actuator</b>	stainless steel 1. 4301
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts $\ominus$
<b>Switching elements</b>	change-over contact with double break Zb, 2 NC or 2 NC/1 NO contacts, galvanically separated contact bridges
<b>Connection</b>	cable 4 x AWG 20 UL 2464 (2 contacts) or 6 x AWG 20, UL 2464 (3 contacts)
<b>Cable cross-section</b>	4 x 0.56 mm <sup>2</sup> , 6 x 0.56 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/250 VAC; 4 A/24 VDC; 0.25 A/230 VDC; 3 contacts: 3 A/250 VAC; 2 A/24 VDC; 0,125 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Positive break travel</b>	8 mm
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	

3 contacts: 

// ST 14

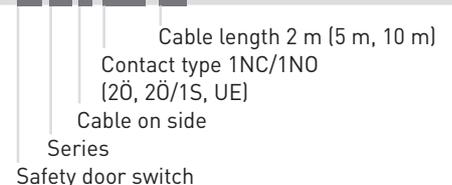


### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ST 14 1Ö/1S-2m</b> 	1045455
2 NC contacts	<b>ST 14 2Ö-2m</b> 	1053987
2 NC/1 NO contacts	<b>ST 14 2Ö/1S-2m</b> 	1188892

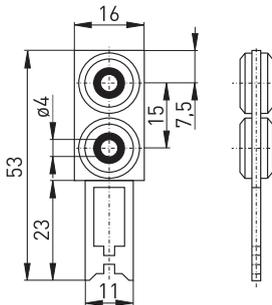
### Type code

**ST 14-S 1Ö/1S-2m**



Safety switches with separate actuator  
 // Series ST 14, actuators

// Straight actuator ST 14-B1



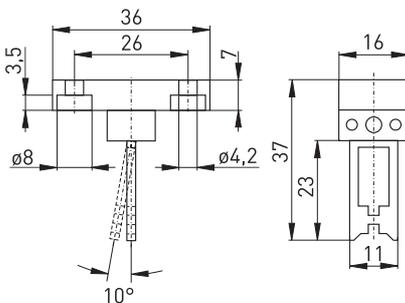
Features/Options

- Rubber mounting damps vibrations on guard devices
- Actuating radius on hinged guards a min. 900 mm and b min. 1500 mm with x = 30 mm axial misalignment
- Actuating radius on hinged guards a min. 250 mm and b min. 600 mm with x = 0 mm axial misalignment

Actuator  
 ST 14-B1

Material Number  
 1040840

// Flexible actuator ST 14-B3



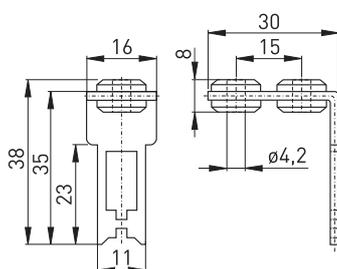
Features/Options

- Especially fit for hinged guards
- Actuating radius on hinged guards a min. 90 mm with x = 14 mm axial misalignment
- Actuating radius on hinged guards a min. 50 mm with x = 0 mm axial misalignment

Actuator  
 ST 14-B3

Material Number  
 1040842

// Angled actuator ST 14-B5



Features/Options

- Rubber mounting damps vibrations on guard devices
- Suitable for hinged guards
- Actuating radius on hinged guards a min. 500 mm and b min. 1000 mm with x = 15 mm axial misalignment
- Actuating radius on hinged guards a min. 250 mm and b min. 600 mm with x = 0 mm axial misalignment

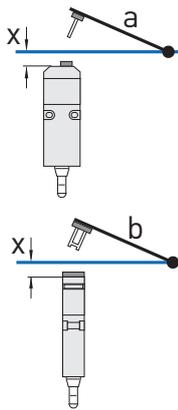
Actuator  
 ST 14-B5

Material Number  
 1040841

## Safety switches with separate actuator

### // Series ST 14, actuators

#### // Actuating radii



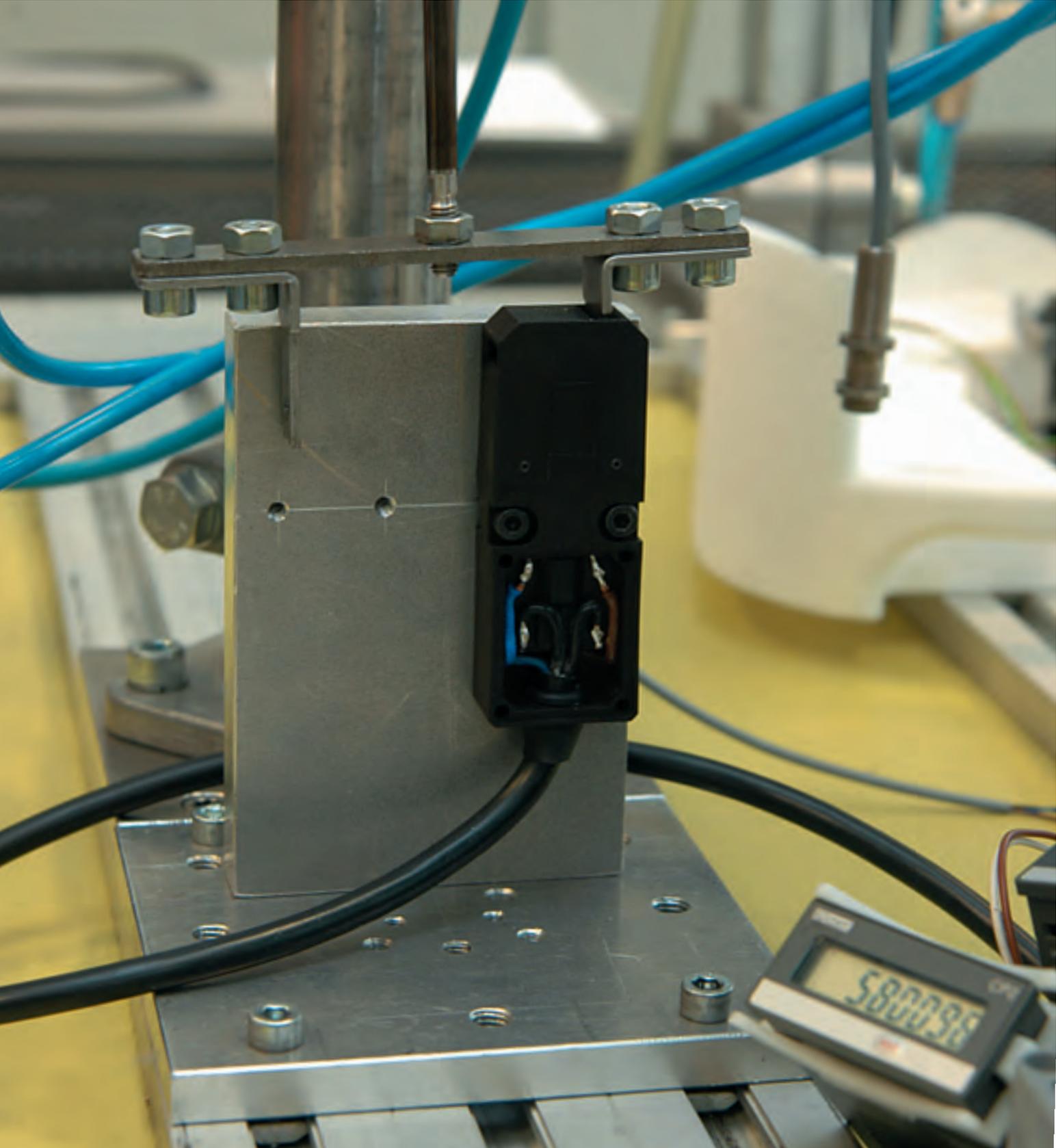
#### Features/Options

- The axis of the hinge should be  $x$  mm above the top edge of the safety switch and in the same plane
- $a$  Actuating radius to the plane of the actuator
- $b$  Actuating radius in line with the plane of the actuator
- $x$  Axial misalignment referring to the surface of the enclosure and not to the inserted actuator!

#### Note

Inserted position of actuator = 0 in switch travel diagram  
The actuators are not included with the switches.

PRODUCTION PROCESS QUALITY MANAGEMENT  
LIFE TEST OF ACTUATOR MECHANISM OF ST 14



# Safety switches with separate actuator

## // Series ES 95 AZ

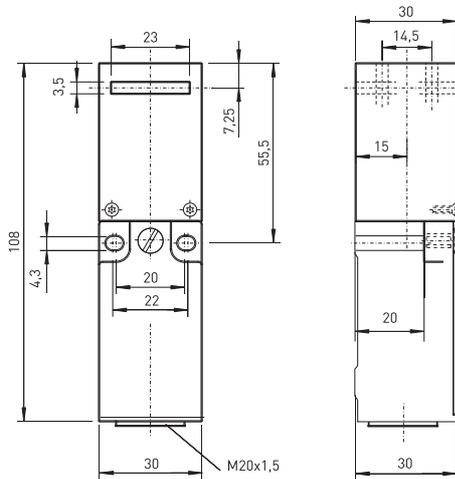
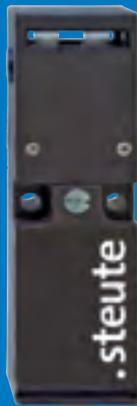
### Features/Options

- Thermoplastic enclosure
- Double insulated □
- Mounting details to EN 50 047
- Slow action ⊖, change-over contact with double break
- Wiring compartment
- Actuator can be repositioned in factory by 4 x 90°
- Available on request with connector M12 x 1, 4-pole
- Ex version available
- Gold-plated contact possible on request
- Horizontally slotted mounting holes

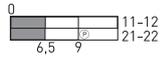
### Technical data

<b>Standards</b>	EN ISO 13849-1; EN 60947-5-1; EN 1088
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Actuator</b>	stainless steel 1. 4301
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts ⊖
<b>Switching elements</b>	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	1 x M20 x 1,5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/400 VAC; 0.25 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Positive break travel</b>	9 mm
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	

## // ES 95 AZ



### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 95 AZ 1Ö/1S 	1177756
2 NC contacts	ES 95 AZ 2Ö 	1178649

### Type code

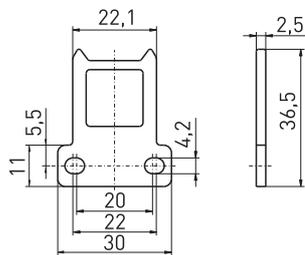
ES 95 AZ 1Ö/1S


  
 Contact type 1NC/1NO (2Ö)  
 Actuator AZ  
 Series  
 S Slow action

# Safety switches with separate actuator

## // Series ES 95 AZ, actuators

### // Straight actuator 95 AZ-B1



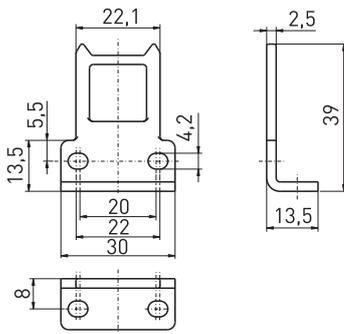
#### Features/Options

- Actuating radius on hinged guards  
a = 350 mm and b = 700 mm
- x = 11 mm

Actuator  
AZ 95-B1

Material Number  
1178645

### // Angled actuator 95 AZ-B5



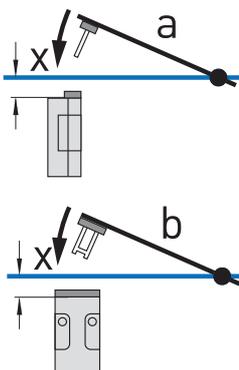
#### Features/Options

- Especially fit for hinged guards
- Actuating radius on hinged guards  
a = 350 mm and b = 700 mm
- x = 13.5 mm

Actuator  
AZ 95-B5

Material Number  
1178646

### // Actuating radii



#### Features/Options

- The axis of the hinge should be x mm above the top edge of the safety switch and in the same plane
- a Actuating radius to the plane of the actuator
- b Actuating radius in line with the plane of the actuator
- x Axial misalignment referring to the surface of the enclosure and not to the inserted actuator!

#### Note

Inserted position of actuator = 0 in switch travel diagram  
The actuators are not included with the switches.

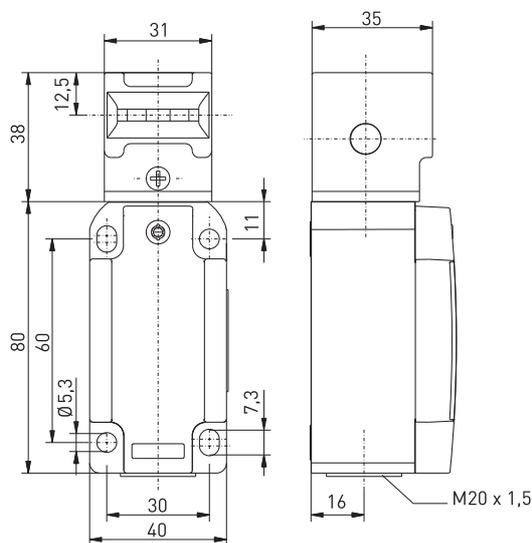
# Safety switches with separate actuator

## // Series ST 98

### Features/Options

- Metal enclosure
- Mounting details to EN 50 041
- Slow action  $\ominus$ , change-over contact with double break
- Wiring compartment
- Actuator can be repositioned in factory by 4 x 90°
- Ex version available

// ST 98



### Technical data

<b>Standards</b>	EN ISO 13849-1; EN 60947-5-1; EN 1088
<b>Enclosure</b>	zinc die-cast, enamel finish
<b>Actuator</b>	stainless steel 1. 4301
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts $\ominus$
<b>Switching elements</b>	change-over, 2 NC, 2 NC/1 NO or 1 NC/2 NO contacts with double break Zb, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	2 contacts: max. 2.5 mm <sup>2</sup> , 3 contacts: max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	1 x M20 x 1,5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	2 contacts: 6 A, 3 contacts: 1.5 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	2 contacts: 6 A/250 VAC; 0.25 A/230 VDC 3 contacts: 1.5 A/230 VAC; 0.27 A/250 VDC
<b>Utilisation category</b>	AC-15; DC-13
<b>Max. fuse rating</b>	2 contacts: 6 A gG/gN fuse 3 contacts: 1.5 A gG/gN fuse
<b>Positive break travel</b>	8.3 mm
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations

### Contact variants: switch travel/contacts

	Slow action	Material Number
2 NC / 1 NO contact	<b>ST 98-12</b> 	1224002
1 NC / 1 NO contact	<b>ST 98-11</b> 	on request
2 NC contacts	<b>ST 98-02</b> 	on request

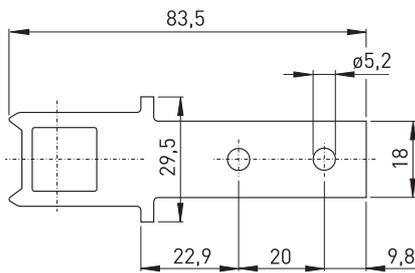
### Type code

**ST 98 -11**

Contact type 1 NC/1 NO contact  
[-02, -12, -21]  
Series  
Actuator ST

Safety switches with separate actuator  
 // Series ST 98, actuators

// Straight actuator AZ 335/355-B1



Features/Options

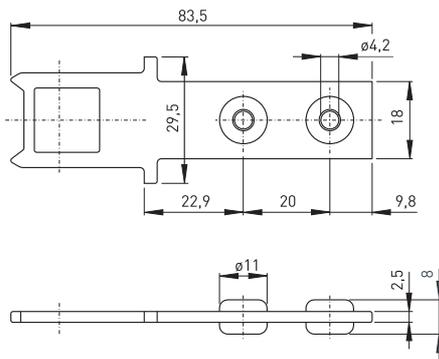
- Actuating radius on hinged guards  
 $a = 900 \text{ mm}$  and  $b = 700 \text{ mm}$
- $x = 52.7 \text{ mm}$

Actuator  
 AZ 335/355-B1

Material Number  
 1170536

23

// Straight actuator AZ 335/355-B1-2245



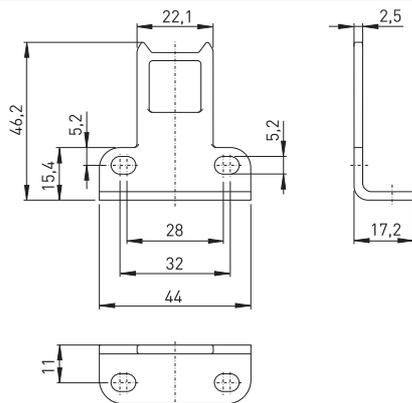
Features/Options

- Rubber mounting damps vibrations on guard devices
- Actuating radius on hinged guards  
 $a = 900 \text{ mm}$  and  $b = 700 \text{ mm}$
- $x = 52.7 \text{ mm}$

Actuator  
 AZ 335/355-B1-2245

Material Number  
 1170537

// Angled actuator AZ 335/355-B5



Features/Options

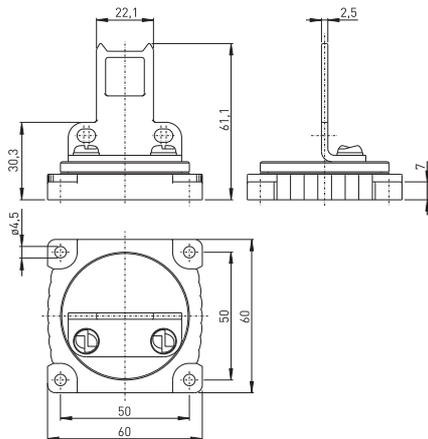
- Especially suitable for hinged guards
- Actuating radius on hinged guards  
 $a = 900 \text{ mm}$  and  $b = 700 \text{ mm}$
- $x = 15.4 \text{ mm}$

Actuator  
 AZ 335/355-B5

Material Number  
 1170538

Safety switches with separate actuator  
 // Series ST 98, actuators

// Angled actuator AZ 335/355-B5-Flex



Features/Options

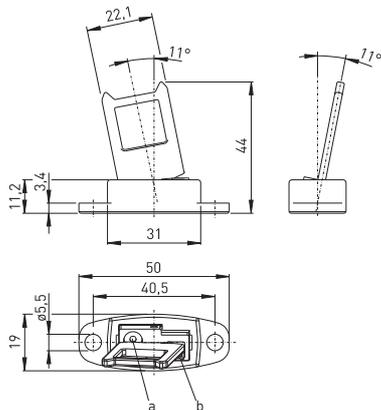
- Especially suitable for sliding and hinged guards
- Compensates play of  $\pm 5$  mm in two axes
- Actuating radius on hinged guards  
 $a = 100$  mm and  $b = 100$  mm
- $x = 30.3$  mm

Actuator  
 AZ 335/355-B5-Flex

Material Number  
 1182126

24

// Flexible actuator AZ 335/355-B6



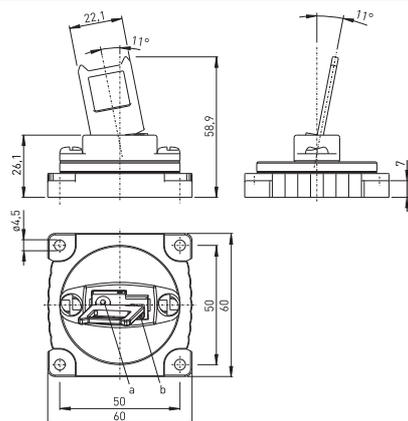
Merkmale/Optionen

- Especially suitable for hinged guards
- Actuating radius adjustable, min. 100 mm, using a hexagonal key wrench 2 mm A/F (a or b)
- Actuating radius on hinged guards  
 $a = 100$  mm and  $b = 100$  mm
- $x = 13$  mm

Actuator  
 AZ 335/355-B6

Material Number  
 1170540

// Flexible actuator AZ 335/355-B6-Flex



Features/Options

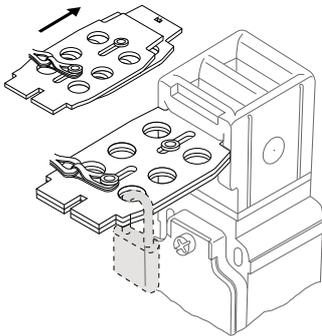
- Especially suitable for hinged guards
- Compensates play of  $\pm 5$  mm in two axes
- Actuating radius on hinged guards  $a = 100$  mm
- $x = 28$  mm

Actuator  
 AZ 335/355-B6-Flex

Material Number  
 1182698

## Safety switches with separate actuator // Series ST 98, actuators

### // Lockout tag SZ 16/335



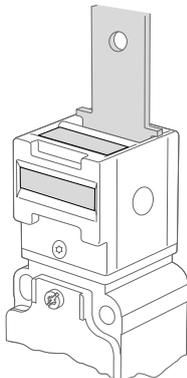
#### Features/Options

- To prevent inadvertent closing, e. g. during maintenance by preventing actuation of the switch

Actuator  
SZ 16/335

Material Number  
1170535

### // Slot sealing plug AZ 335/355-1990



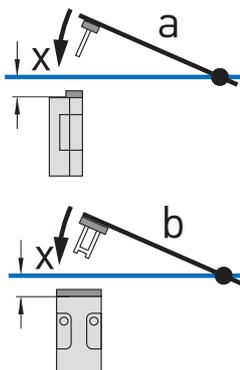
#### Features/Options

- For protection against the ingress of coarse dirt
- Quantity required: 3 per switch, ordering unit: 10 pieces

Actuator  
AZ 335/355-1990

Material Number  
1172965

### // Actuating radii



#### Features/Options

- The axis of the hinge should be  $x$  mm above the top edge of the safety switch and in the same plane
- $a$  Actuating radius to the plane of the actuator
- $b$  Actuating radius in line with the plane of the actuator
- $x$  Axial misalignment referring to the surface of the enclosure and not to the inserted actuator!

#### Note

Inserted position of actuator = 0 in switch travel diagram  
The actuators are not included with the switches.

# Safety switches with separate actuator

## // Series ST 61

### Features/Options

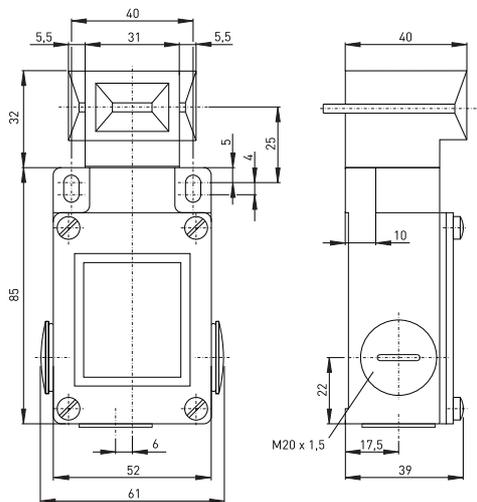
- Metal enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- 3 cable entries M20 x 1.5
- Wiring compartment
- Ex version available
- With gold-plated contacts available on request
- Long life
- High level of contact reliability with low voltages and currents

// ST 61



### Technical data

<b>Standards</b>	EN ISO 13849-1; EN 60947-5-1; EN 1088; BG-GS-ET-15
<b>Enclosure</b>	aluminium die cast, enamel finish
<b>Actuator</b>	stainless steel 1. 4301
<b>Degree of protection</b>	IP 65 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts ⊖
<b>Switching elements</b>	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 2.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	3 x M20 x 1.5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	6 kV
<b>I<sub>e</sub>/U<sub>e</sub></b>	ST 61 1Ö/1S: 16 A/400 VAC ST 61 2Ö: 6 A/400 VAC
<b>Mechanical life</b>	> 1 million operations
<b>Utilisation category</b>	AC-15
<b>Max. fuse rating</b>	ST 61 1Ö/1S: 16 A gG/gN fuse ST 61 2Ö: 6 A gG/gN fuse
<b>Positive break travel</b>	10 mm
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	



### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ST 61 1Ö/1S</b> 	<b>1047846</b>
2 NC contacts	<b>ST 61 2Ö</b> 	<b>1047979</b>

### Type code

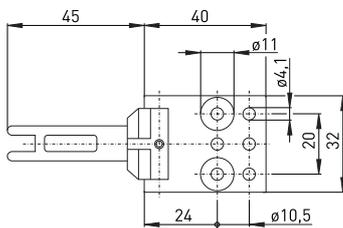
**ST 61 1Ö/1S**

Contact type 1 NC/1 NO (2Ö)  
Series  
Safety door switch

# Safety switches with separate actuator

## // Series ST 61, actuators

### // Straight actuator ST 61-B1



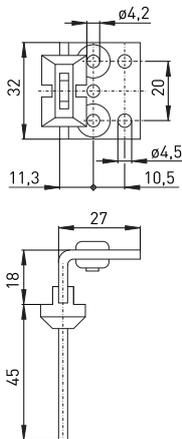
#### Features/Options

- Rubber mounting damps vibrations on guard devices
- Actuating radius on hinged guards
  - a = 140 mm and b = 1000 mm
- x = 30 mm

Actuator  
ST 61-B1

Material Number  
1032911

### // Angled actuator ST 61-B5



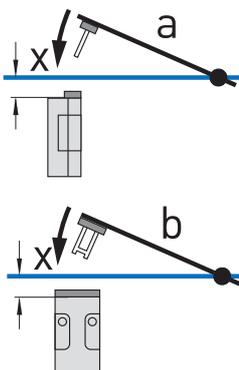
#### Features/Options

- Rubber mounting damps vibrations on guard devices
- Especially fit for hinged guards
- Actuating radius on hinged guards
  - a = 140 mm and b = 1000 mm
- x = 15 mm

Actuator  
ST 61-B5

Material Number  
1032913

### // Actuating radii



#### Features/Options

- The axis of the hinge should be x mm above the top edge of the safety switch and in the same plane
- a Actuating radius to the plane of the actuator
- b Actuating radius in line with the plane of the actuator
- x Axial misalignment referring to the surface of the enclosure and not to the inserted actuator!

#### Note

Inserted position of actuator = 0 in switch travel diagram  
The actuators are not included with the switches.





## Safety switches for hinged guard doors

### Thermoplastic enclosure

// Series ES 95 T.C

from page 32

// Series ES 13 SB

from page 33

// Series ES 95 SB

from page 34

// Series ES 98 SB

from page 35



# Safety switches for hinged guard doors

## Range of application

These safety switches are suitable for hinged safety guards, which need to be closed in order to guarantee the necessary operational safety.

The variety of requirements to be found in practice can be met by means of the wide range of safety switches for hinged guard doors.

Depending on the particular version of the switch, small doors and service flaps, as well as heavy hinged doors on machinery and plants, can be protected in such a way as to provide for easy setting up and maintenance.

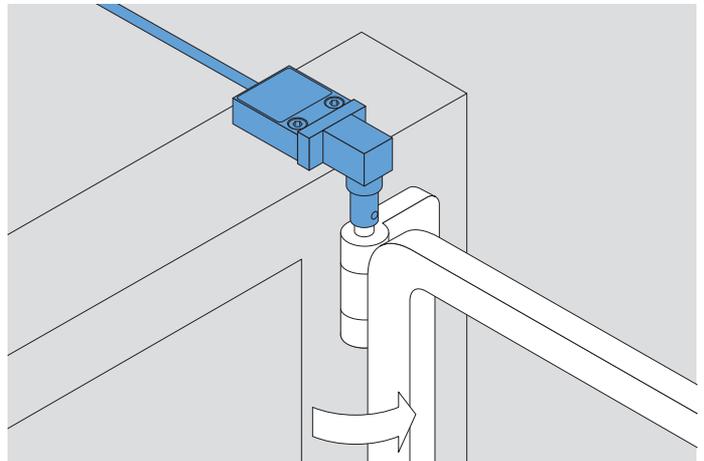
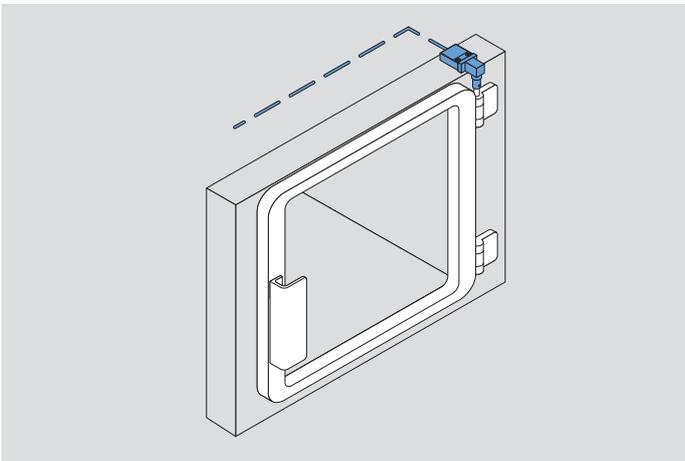
## Design and operating principle

A general advantage of the safety switches shown here is the integral cam within the safety switch. The requirements of EN 1088, such as positive linkage between cam and actuator, as well as protection against tampering, are thus fulfilled. This combination within the switch provides cost advantage for the user in avoiding the necessity of mounting a specially designed cam. These safety switches are provided with slow action.

All safety switches for hinged guard doors shown in this chapter bear the CE mark according to the Machinery Directive 2006/42/EC.

## Application

### ES 13 SB on hinged safety guard



# Safety switches for hinged guard doors

## // Series ES 95 T.C

### Features/Options

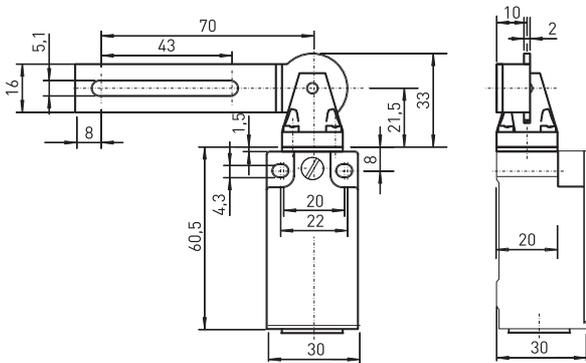
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- Cable entry M20 x 1.5
- Wiring compartment
- Ex version available
- With gold-plated contacts available on request
- Mounting details to EN 50 047
- Horizontally slotted mounting holes
- Actuator heads can be repositioned by 4 x 90°

// ES 95 T.C



### Technical data

<b>Standards</b>	EN 60947-5-1; EN 1088; BG-GS-ET-15; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts ⊖
<b>Switching elements</b>	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/400 VAC; 0,25 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	

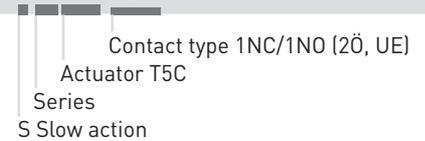


### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 95 T5C 10/1S</b> 	1179327
2 NC contacts	<b>ES 95 T5C 20</b> 	1181614
1 NC / 1 NO contact with overlapping	<b>ES 95 T5C UE</b> 	on request

### Type code

ES 95 T5C 10/1S



# Safety switches for hinged guard doors

## // Series ES 13 SB

### Features/Options

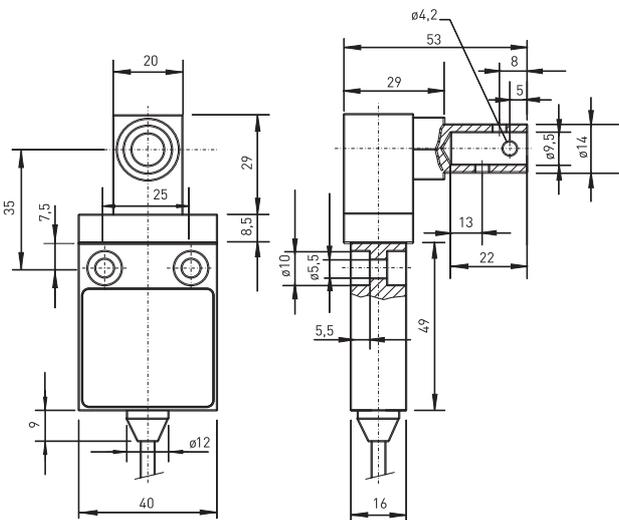
- Thermoplastic enclosure
- Double insulated
- Slow action  $\ominus$ , change-over contact with double break
- Slow action with overlapping contacts available
- Version with cable entry on side available on request
- With pre-wired cable
- Ex version available
- With gold-plated contacts available on request
- Max. 3 contacts
- Version with 3 contacts has cable entry on side

## // ES 13 SB



## Technical data

<b>Standards</b>	EN 60947-5-1; EN 1088; BG-GS-ET-15; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts $\ominus$
<b>Switching elements</b>	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	cable H05VV-F, length 2 or 5 m
<b>Cable cross-section</b>	4 x 0.75 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/250 VAC; 4 A/24 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	

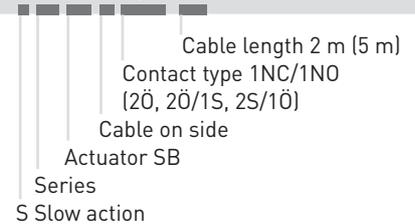


### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 13 SB 1Ö/1S-2m 	1179012
2 NC contacts	ES 13 SB 2Ö-2m 	on request

### Type code

ES 13 SB-S 1Ö/1S-2m



# Safety switches for hinged guard doors

## // Series ES 95 SB

### Features/Options

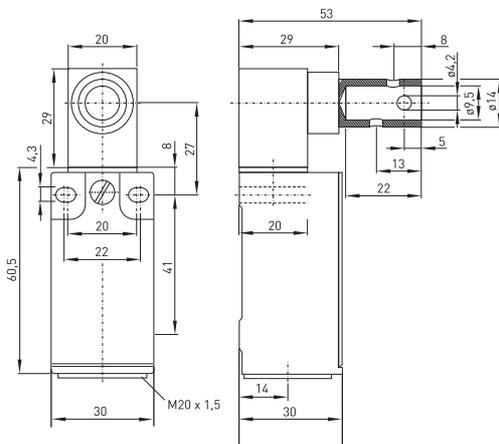
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- Cable entry M20 x 1.5
- Wiring compartment
- Ex version available
- With gold-plated contacts available on request
- Mounting details to EN 50047
- Horizontally slotted mounting holes
- Actuator can be repositioned by 4 x 90°
- Shaft bore  $\varnothing$  9.5 mm or  $\varnothing$  10 mm available

## // ES 95 SB



## Technical data

<b>Standards</b>	EN 60947-5-1; EN 1088; BG-GS-ET-15; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts ⊖
<b>Switching elements</b>	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/400 VAC; 0.25 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations
<b>Approvals</b>	



### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 95 SB 10/1S-9,5mm</b> 	1050057
2 NC contacts	<b>ES 95 SB 20-9,5mm</b> 	1050456
1 NC / 1 NO contact with overlapping	<b>ES 95 SB UE-9,5mm</b> 	1050299

### Type code

**ES 95 SB 10/1S**

Contact type 1NC/1NO (20, UE)  
 Actuator SB  
 Series  
 S Slow action

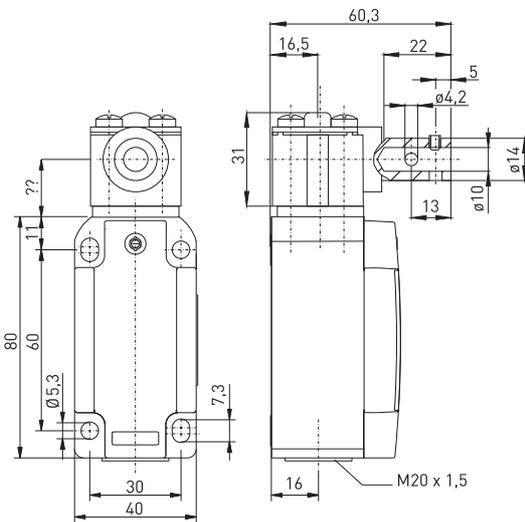
# Safety switches for hinged guard doors

## // Series ES 98 SB

### Features/Options

- Metal enclosure
- Mounting details to EN 50041
- Slow action  $\ominus$ , change-over contact with double break
- Max. 3 contacts
- Actuator can be repositioned by 4 x 90°
- Shaft bore  $\varnothing$  10 mm
- Ex version available

## // ES 98 SB



## Technical data

<b>Standards</b>	EN 60947-5-1; EN 1088; BG-GS-ET-15; EN ISO 13849-1
<b>Enclosure</b>	zinc die-cast, enamel finish
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contact $\ominus$
<b>Switching elements</b>	change-over, 2 NC, 2 NC/1 NO or 1 NC/2 NO contacts with double break Zb, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	2 contacts: max. 2.5 mm <sup>2</sup> , 3 contacts: max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	1 x M20 x 1,5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	2 contacts: 6 A, 3 contacts: 1.5 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	2 contacts: 6 A/250 VAC; 0.25 A/230 VDC 3 contacts: 1.5 A/230 VAC; 0.27 A/250 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	2 contacts: 6 A gG/gN fuse 3 contacts: 1.5 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +80 °C
<b>Mechanical life</b>	> 1 million operations

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### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 98 SB 10/1S 	on request
2 NC contacts	ES 98 SB 20 	on request

### Type code

ES 98 SB 10/1S

Contact type 1NC/1NO  
 (20, 20/1S, 2S/10)  
 Actuator SB  
 Series  
 S Slow action



to



## Position switches with/without safety function

### Thermoplastic enclosure

// Series ES 13

from page 42

// Series ES/EM 14

from page 54

// Series ES/EM 95

from page 64

### Metal enclosure

// Series E 12

from page 74

// Series ES/EM 98

from page 86

// Series ES 51

from page 92

// Series ES/EM 41

from page 104

// Series ES/EM 411

from page 104

// Series ES/EM 61

from page 118

// Series ES/EM 91

from page 126



# Position switches with/without safety function

## Range of application

The position switches with a safety function are suitable for sliding and hinged guard devices, which must be closed in order to guarantee the necessary operational safety. In combination with an appropriate safety control module, all safety switches shown in this chapter achieve SIL 3 according to EN 62061 and PL e according to EN ISO 13849-1.

Position switches are used where moving parts of machines and industrial plants have to be positioned, controlled and monitored.

The various application fields, ranging from fine mechanics to heavy-duty machinery, require different materials, electrical capacity and quality criteria regarding construction and design.

## Design and operating principle

On the position switches with a safety function, the guard device and the positive break NC contact are positively linked. With the safety guard in closed condition, the position switch with safety func-

tion is not operated. On sliding guards one switch is actuated and one switch is not actuated so that there is a change when opening and closing the guard door. Many of the position switches fulfil the requirements of the EN 60947-5-1 standard and can therefore also be used as position switches with safety function. These products are identified by the symbol  $\ominus$  for positive break. Some position switches fulfil the requirements for standardised switches to EN 50 047.

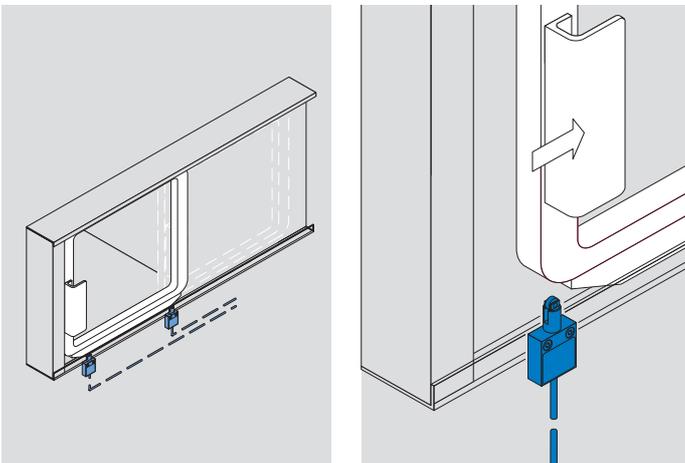
The position switches are available with snap and slow action and can be supplied with a metal roller on request. A large variety of actuators complete the program.

The devices are listed in the order of enclosure dimensions and materials, starting with the smallest and the plastic enclosures.

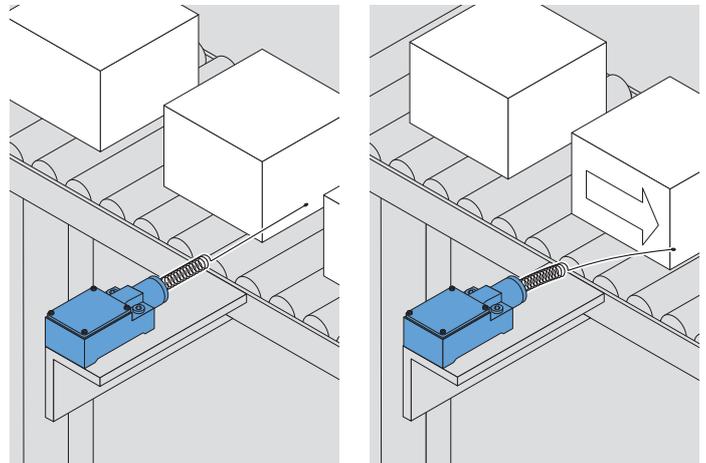
All position switches with safety function shown in this chapter bear the CE mark according to the Machinery Directive 2006/42/EC. The position switches shown in this chapter bear the CE mark according to the low Voltage Directive 06/95/EC.

## Application

### Position monitoring on a conveyor belt



### As a piece counter



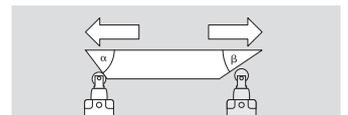
## Legend

$\alpha$ : Actuating angle from bottom of switch axis as shown in picture



$\alpha$ : Actuating angle from right of switch axis

$\beta$ : Actuating angle from left of switch axis as shown in picture



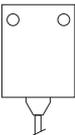
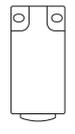
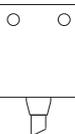
# Selection table

## Position switches with/without safety function

// Series

// Actuator

+ Default: plunger without watertight collar

		↓	↓	↓	↺	↺	↺	↓	↔
									
ES 13, from page 42 - Thermoplastic enclosure - Cable		+ W		F	KU WКУ	FKU			R WR
ES/EM 14, from page 54 - Thermoplastic enclosure - 3 contacts - Cable		+ W		F	KU WКУ	FKU	VКУ		R WR
ES/EM 95, from page 64 - Thermoplastic enclosure - Wiring compartment - 1 cable entry - Type to EN 50 047		W							R
E 12, from page 74 - Metal enclosure - Cable		+ W		F	KU WКУ	FKU			R WR
ES/EM 98, from page 86 - Metal enclosure - 3 contacts - Wiring compartment - 1 cable entry		+							R
ES 51, from page 92 - Metal enclosure - Wiring compartment - 1 cable entry		+ W	ST WST		KU			WK	R WR
ES/EM 41, from page 104 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES/EM 411, from page 104 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES/EM 61, from page 118 - Metal enclosure - Wiring compartment - 3 cable entries		W							

Actuating direction → / Free movement of actuator →

	↔	↔	↔	↔	↔	↑	↔	↔	↔	↔	↔	↔	↻	↻	↻	↻
	FR			WH	WHL	WPH	WHK	D	DL	DS		DD	TL	TF		TK
	FR	VR						D	DL	DS		DD	TL	TF		TK
RL				WH WHM	WHLM	WPH WPHM 4K	WHKM	D		DS	DF	DD	TL			TK
	FR			WH	WHL	WPH	WHK	D	DL	DS		DD	TL	TF		TK
				H		PH		D	DL	DS		DD				TK
				H WH	HL WHL	PH WPH	HK WHK	D	DL	DS	DF	DD				
				H WH	HL WHL	PH WPH	HK WHK	D	DL	DS	DF	DD	TL	TF	TFL	TK
				H WH	HL WHL	PH WPH	HK WHK	D	DL	DS	DF	DD	TL	TF	TFL	TK
				WH	WHL	WPH	WHK	D	DL	DS			TL	TF	TFL	TK

# Position switches with/without safety function

## // Series ES 13

### Features/Options

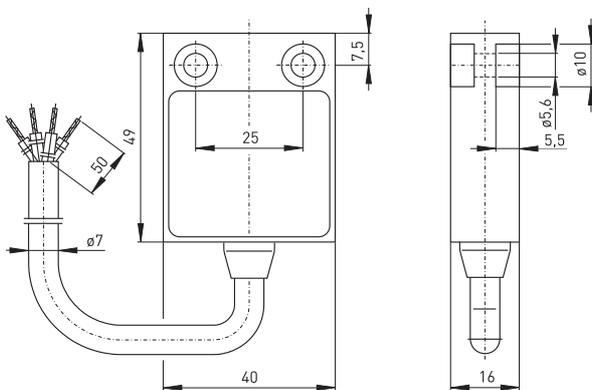
- Thermoplastic enclosure
- Double insulated
- Slow action  $\ominus$ , change-over or 2 NC/1 NO contact with double break
- Slow action with overlapping contacts available
- Version with 3 contacts has cable on left-hand side
- Suitable for in-line mounting
- With pre-wired cable, cable length 2 metres
- Ex version available

// ES 13



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts $\ominus$
<b>Switching elements</b>	change-over contact with double break, galvanically separated contact bridges
<b>Connection</b>	cable, 2 contacts: H05VV-F; 3 contacts: AWG 20
<b>Cable cross-section</b>	2 contacts: 4 x 0.75 mm <sup>2</sup> ; 3 contacts: 6 x 0.56 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/250 VAC; 0.25 A/230 VDC, 4 A/24 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Frequency of operation</b>	1800/h
<b>Repeat accuracy of switching points</b>	± 0.1 mm
<b>Contact opening</b>	2 contacts: max. 2 x 4.5 mm; 3 contacts: max. 2 x 3.5 mm
<b>Approvals</b>	 3 contacts:



### Type code

ES 13 WR 10/1S-s-B-2m

- Cable length 2 m (5 m)
- Tapped bushing M16 x 1.5
- Cable on side
- Contact type 1NC/1NO (UE, 20/1S, 10/2S)
- Actuator R (H, TK, D, etc. ...)
- Watertight collar
- Series
- S Slow action

# Position switches with/without safety function

## // Series ES 13

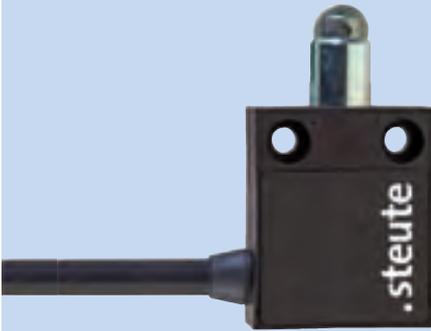
### Features/Options

- With gold-plated contacts available on request
- Pneumatic version available on request

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

### // Cable on side s



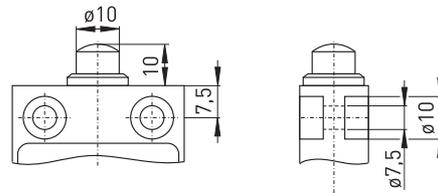
### // Cable entry M16 x 1.5



### // Connector M12 x 1, 4-pole



### // Plunger



Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 13 10/1S-2m
Material Number	1044856

# Position switches with/without safety function

## // Series ES 13, actuators

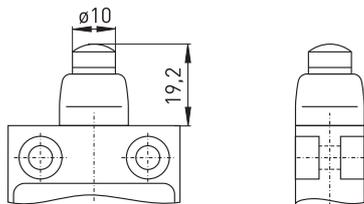
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Watertight collar for protection against penetration of dirt

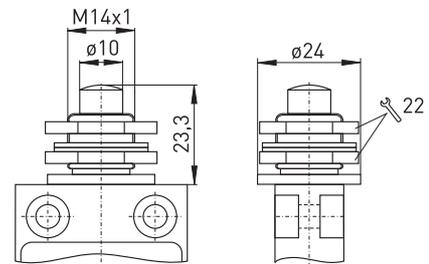
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

### // Plunger collar W



### // Plunger for front mounting F



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

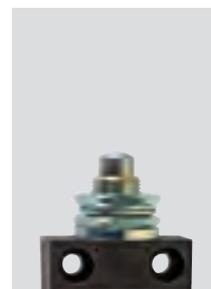
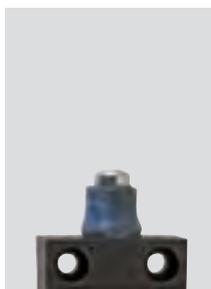
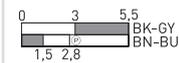
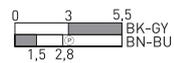
Slow action

1 NC/1 NO contact  
Material Number

ES 13 W 10/1S-2m  
1181842

1 NC/1 NO contact  
Material Number

ES 13 F 10/1S-2m  
1188773



**Features/Options**

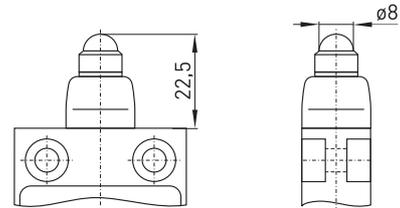
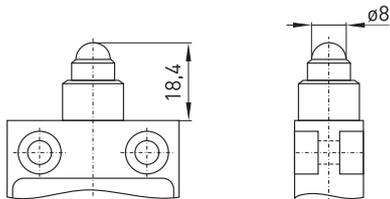
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 15°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

**// Ball plunger KU**

**// Ball plunger collar WKU**



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

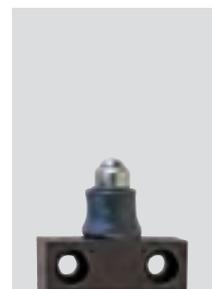
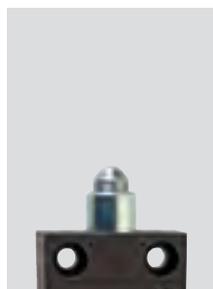
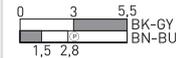
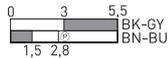
Slow action

1 NC/1 NO contact  
Material Number

ES 13 KU 1Ö/1S-2m  
1188774

1 NC/1 NO contact  
Material Number

ES 13 WKU 1Ö/1S-2m  
1188781



# Position switches with/without safety function

## // Series ES 13, actuators

### Features/Options

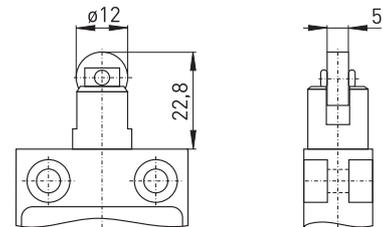
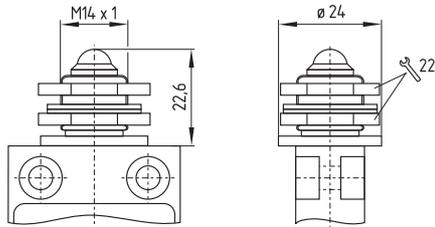
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Ball diameter 8 mm
- Exact repeatability of switching point

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90° on request

## // Ball plunger for front mounting FKU

## // Roller plunger R



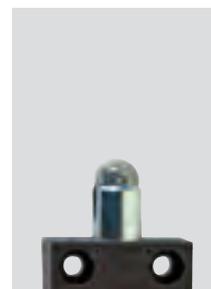
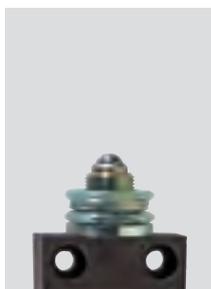
46

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact Material Number	ES 13 FKU 1Ö/1S-2m 1045242

	Slow action
1 NC/1 NO contact Material Number	ES 13 R 1Ö/1S-2m 1044991



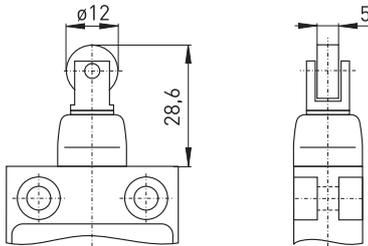
Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90° on request
- Watertight collar for protection against penetration of dirt

Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90° on request

// Roller plunger collar WR

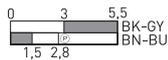


Contact variants: switch travel/contacts

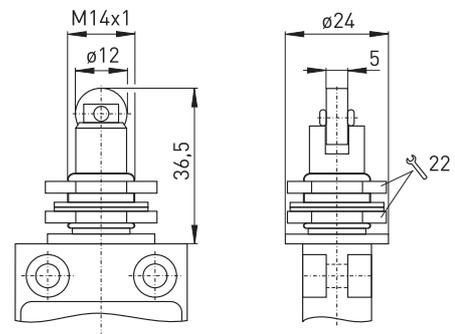
Slow action

1 NC/1 NO contact  
Material Number

ES 13 WR 1Ö/1S-2m  
1045070



// Roller plunger for front mounting FR

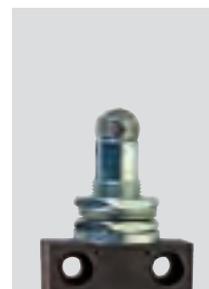
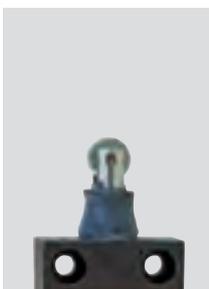
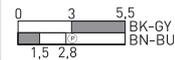


Contact variants: switch travel/contacts

Slow action

1 NC/1 NO contact  
Material Number

ES 13 FR 1Ö/1S-2m  
1045250



# Position switches with/without safety function

## // Series ES 13, actuators

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch

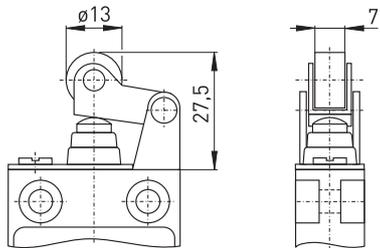
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

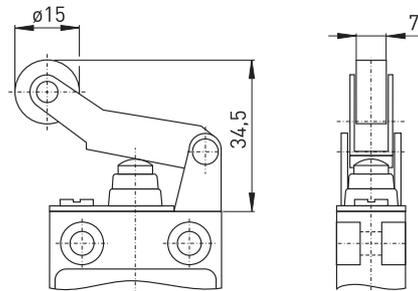
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch

## // Roller lever collar WH



## // Long roller lever collar WHL



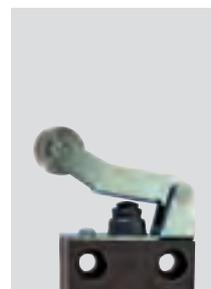
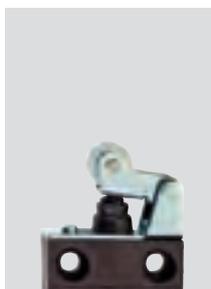
48

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact Material Number	ES 13 WH 10/1S-2m 1045106

	Slow action
1 NC/1 NO contact Material Number	ES 13 WHL 10/1S-2m 1045140



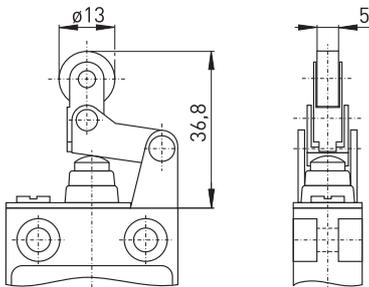
**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

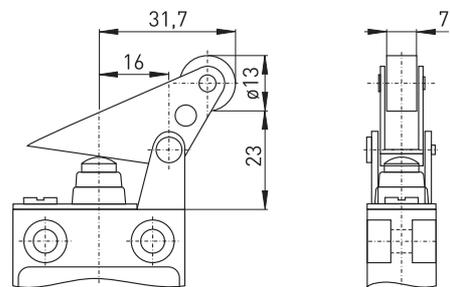
**Features/Options**

- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

// Offset roller lever collar WHK



// Parallel roller lever collar WPH

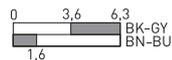


Contact variants: switch travel/contacts

**Slow action**

1 NC/1 NO contact  
Material Number

**ES 13 WHK 1Ö/1S-2m**  
**1188929**

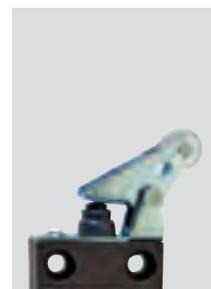
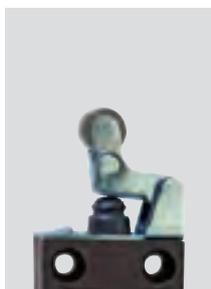


Contact variants: switch travel/contacts

**Slow action**

1 NC/1 NO contact  
Material Number

**ES 13 WPH 1Ö/1S-2m**  
**1188933**



# Position switches with/without safety function

## // Series ES 13, actuators

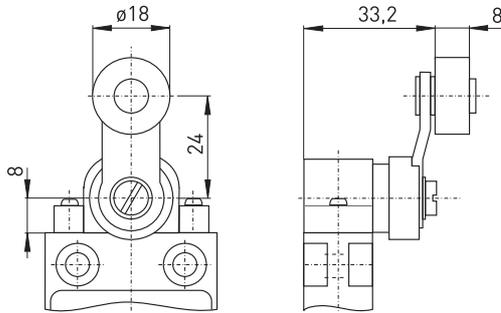
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

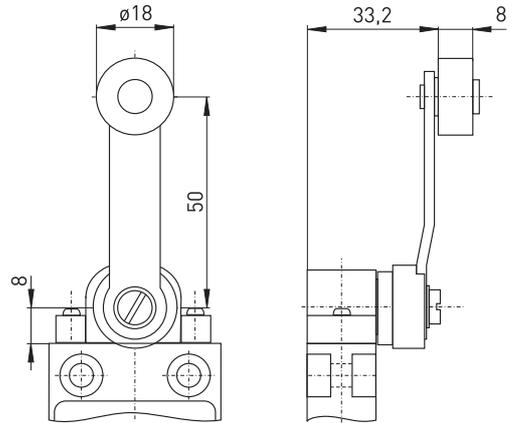
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

## // Rocking lever D



## // Long rocking lever DL



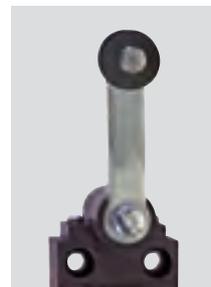
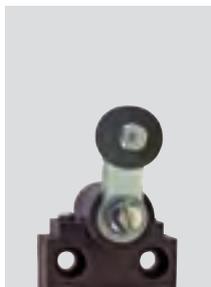
50

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact Material Number	ES 13 D 10/1S-2m 1045179

	Slow action
1 NC/1 NO contact Material Number	ES 13 DL 10/1S-2m 1188936



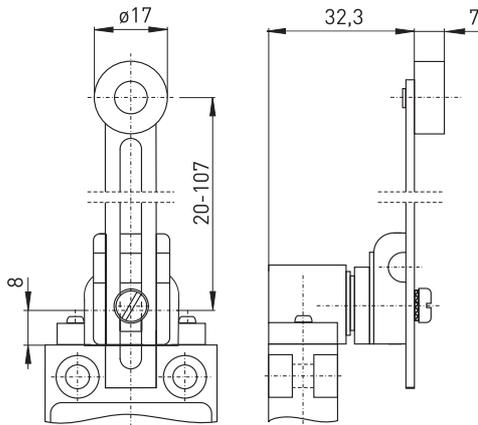
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

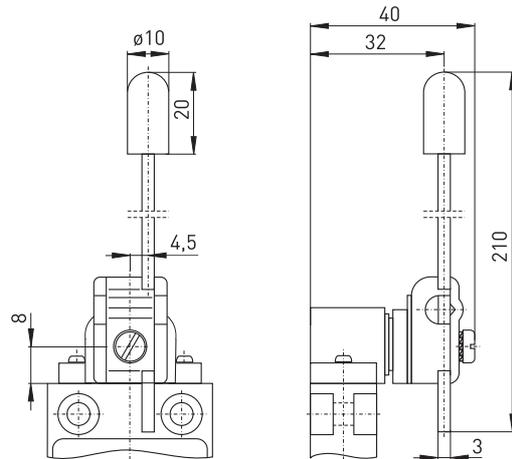
**Features/Options**

- No safety switch!
- Wear-resistant plastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

**// Adjustable rocking lever DS**



**// Rod lever DD**



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact Material Number	ES 13 DS 10/1S-2m 1188937

	Slow action
1 NC/1 NO contact Material Number	ES 13 DD 10/1S-2m 1188938



# Position switches with/without safety function

## // Series ES 13, actuators

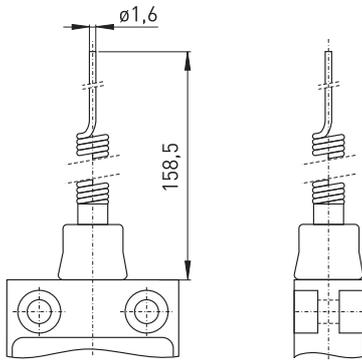
### Features/Options

- No safety switch!
- Spring rod can be actuated from any direction
- Spring rod can be shortened 30 mm in actuating area
- Exact linear actuation not necessary
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

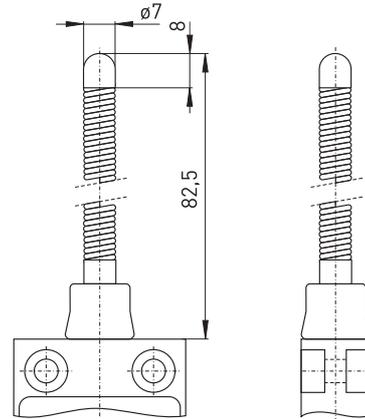
### Features/Options

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

### // Long spring rod TL



### // Spring rod with steel tip TF



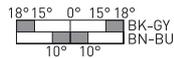
52

Contact variants: switch travel/contacts

Slow action

1 NC/1 NO contact  
Material Number

ES 13 TL 10°/1S-2m  
1189007

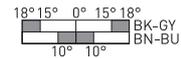


Contact variants: switch travel/contacts

Slow action

1 NC/1 NO contact  
Material Number

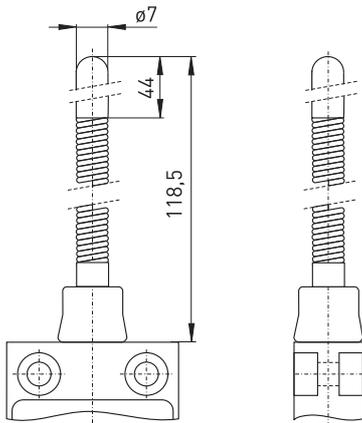
ES 13 TF 10°/1S-2m  
1189009



Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

// Spring rod with plastic tip TK

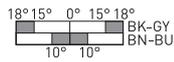


Contact variants: switch travel/contacts

Slow action

1 NC/1 NO contact  
Material Number

ES 13 TK 10/1S-2m  
1045216



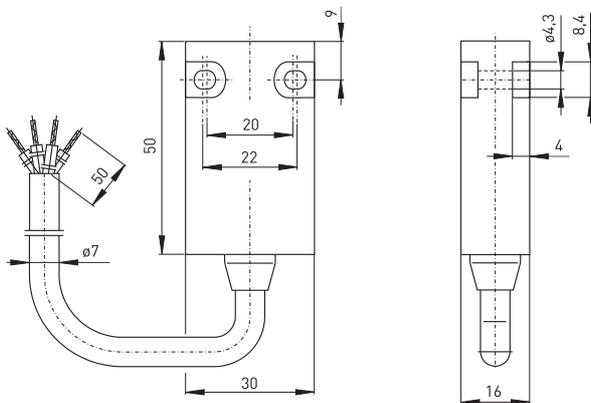
# Position switches with/without safety function

## // Series ES/EM 14

### Features/Options

- Thermoplastic enclosure
- Double insulated  $\square$
- Slow action  $\ominus$ , change-over or 2 NC contacts with double break
- Snap action, change-over contact with single break
- Overlapping contacts available
- Mounting details to EN 50 047
- Suitable for in-line mounting
- With pre-wired cable, cable length 2 meters
- Ex version available

## // ES/EM 14



## Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow or snap action; slow action positive break NC contacts $\ominus$
<b>Switching elements</b>	ES 14: change-over or 2 NC contact with double break, galvanically separated contact bridges EM 14: change-over contact with single break
<b>Connection</b>	cable PVC H05VV-F
<b>Cable cross-section</b>	ES 14, EM 14 IÖ/1S: 4 x 0.75mm <sup>2</sup> , EM 14: 3 x 0.75 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	ES 14: 6 A; EM 14: 5 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	ES 14: 6 A/250 VAC; 0.25 A/230 VDC EM 14: 5 A/250 VAC; 0.16 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	ES 14: 6 A gG/gN fuse EM 14: 5 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Frequency of operation</b>	1800/h
<b>Repeat accuracy of switching points</b>	± 0.1 mm
<b>Contact opening</b>	max. 2 x 4 mm
<b>Approvals</b>	

### Type code

ES 14 WR IÖ/1S-s-2m

- Cable length 2 m (5 m)
- Cable on side
- Contact type 1NC/1NO (UE, 2Ö, 2Ö/1S)
- Actuator R (H, TK, D, etc. ...)
- Watertight collar
- Series
- S Slow action (M Snap action)

# Position switches with/without safety function

## // Series ES/EM 14, actuators

### Features/Options

- Snap action, change-over contact with double break available, e.g. EM 14 R 1NC/1NO
- With gold-plated contacts available on request
- Version with UL/CSA approval available
- With latching element available on request

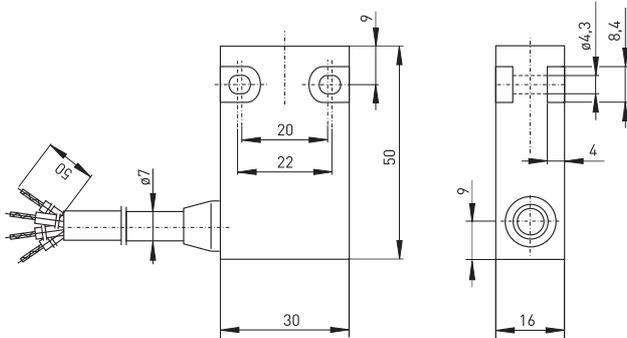
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

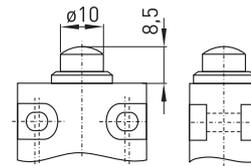
### // Connector M12 x 1, 4-pole



### // Cable on side

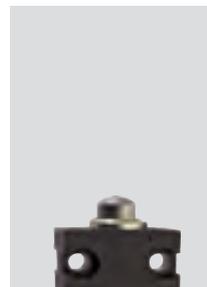


### // Plunger



### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 14 1045571	ES 14 10/1S-2m 1045298



# Position switches with/without safety function

## // Series ES/EM 14, actuators

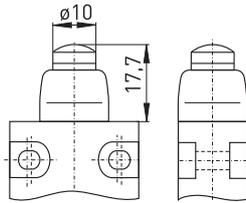
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Watertight collar for protection against penetration of dirt

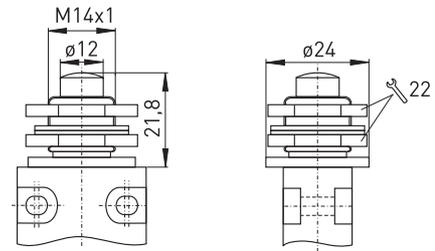
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

### // Plunger with watertight collar W



### // Plunger for front mounting F



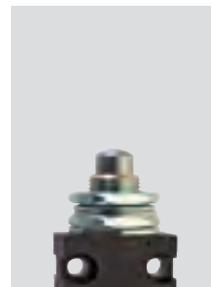
56

#### Contact variants: switch travel/contacts

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 W-2m</b> <b>1045580</b>	<b>ES 14 W 10/1S-2m</b> <b>1189058</b>

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 F-2m</b> <b>1188885</b>	<b>ES 14 F 10/1S-2m</b> <b>1045438</b>



**Features/Options**

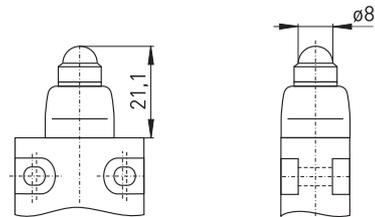
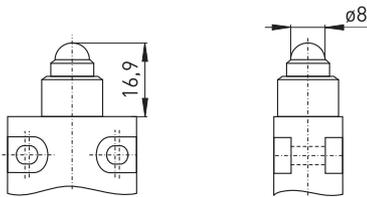
- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

**// Ball plunger KU**

**// Ball plunger collar WKU**

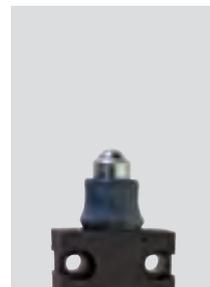
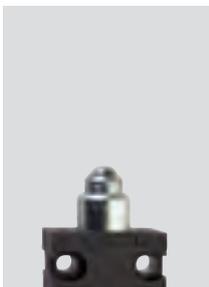


**Contact variants: switch travel/contacts**

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 KU-2m</b> <b>1188909</b>	<b>ES 14 KU 10̈/1S-2m</b> <b>1189059</b>

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 WKU-2m</b> <b>1175538</b>	<b>ES 14 WKU 10̈/1S-2m</b> <b>1180567</b>



# Position switches with/without safety function

## // Series ES/EM 14, actuators

### Features/Options

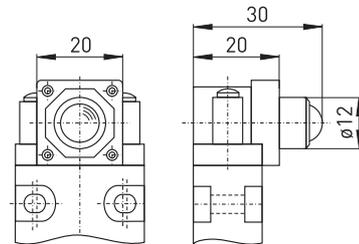
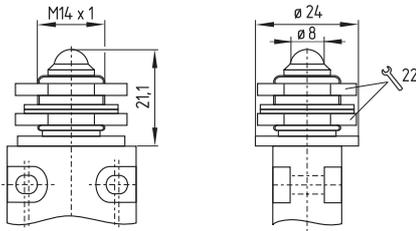
- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

### Features/Options

- Safety switch only version with slow action
- Actuation from any direction
- Actuator with captive stainless steel ball

## // Ball plunger for front mounting FKU

## // Vertical ball plunger VKU



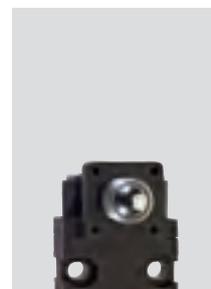
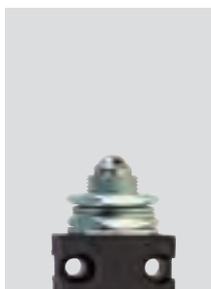
58

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 FKU-2m</b> <b>1188910</b>	<b>ES 14 FKU 1Ö/1S-2m</b> <b>1053487</b>

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 VKU-2m</b> <b>1186354</b>	<b>ES 14 VKU 1Ö/1S-2m</b> <b>1189124</b>



**Features/Options**

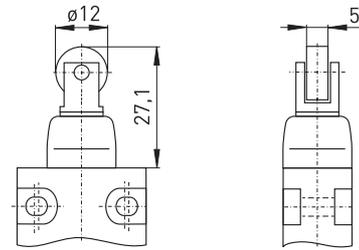
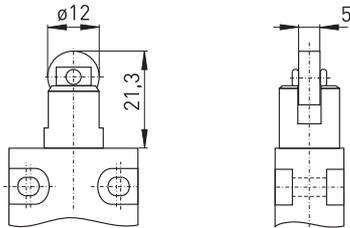
- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Metal roller
- Actuator repositioned by 90° available on request

**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator repositioned by 90° available on request
- Watertight collar for protection against penetration of dirt

// Roller plunger R

// Roller plunger collar WR

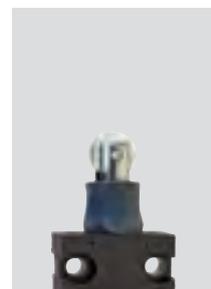
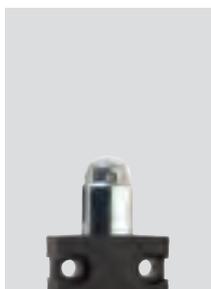


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 R-2m</b> <b>1045594</b>	<b>ES 14 R 1Ö/1S-2m</b> <b>1045362</b>

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 WR-2m</b> <b>1178413</b>	<b>ES 14 WR 1Ö/1S-2m</b> <b>1045384</b>



# Position switches with/without safety function

## // Series ES/EM 14, actuators

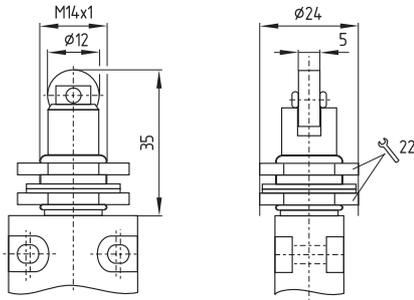
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator repositioned by 90° available on request

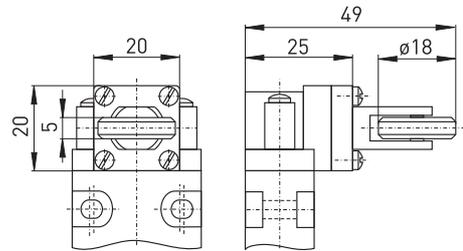
### Features/Options

- Safety switch only version with slow action
- Actuator can be transposed by 90°
- Wear-resistant plastic roller

## // Roller plunger for front mounting FR



## // Vertical roller plunger VR



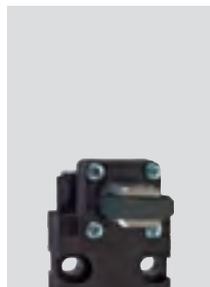
60

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 FR</b> <b>1174494</b>	<b>ES 14 FR 10/1S-2m</b> <b>1189131</b>

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 VR</b> <b>1188914</b>	<b>ES 14 VR 10/1S-2m</b> <b>1189132</b>



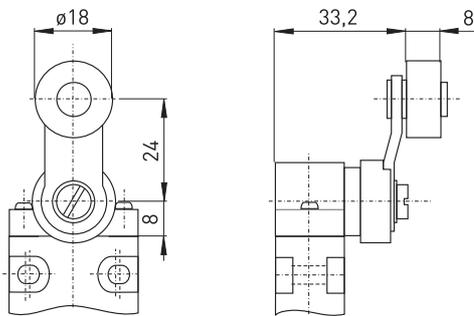
**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

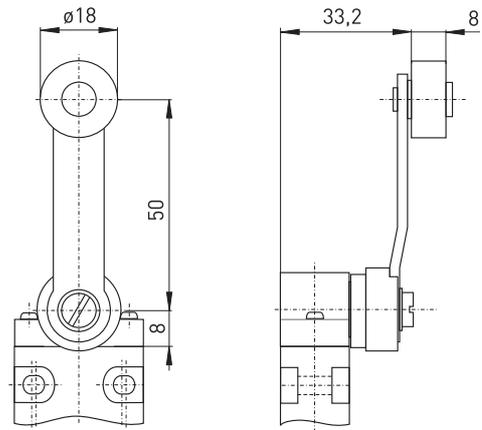
**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

**// Rocking lever D**



**// Long rocking lever DL**

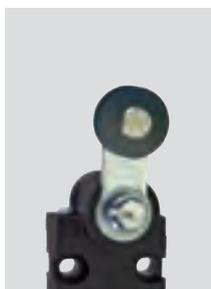


**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 D</b> <b>1045623</b>	<b>ES 14 D 10/1S-2m</b> <b>1045398</b>

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 DL</b> <b>1188924</b>	<b>ES 14 DL 10/1S-2m</b> <b>1189133</b>



# Position switches with/without safety function

## // Series ES/EM 14, actuators

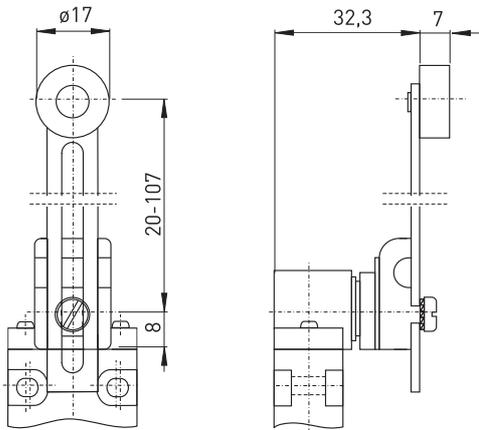
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

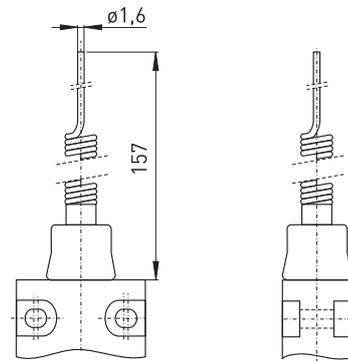
### Features/Options

- No safety switch!
- Spring rod can be actuated from any direction
- Spring rod can be shortened 30 mm in actuating area
- Exact linear actuation not necessary
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

## // Adjustable rocking lever DS



## // Long spring rod TL



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### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 DS-2m</b> <b>1188928</b>	<b>ES 14 DS 10°/1S-2m</b> <b>1189134</b>
	 GY-BK GY-BN	 BK-GY BN-BU

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 TL-2m</b> <b>1045633</b>	<b>ES 14 TL 10°/1S-2m</b> <b>1189135</b>
	 GY-BK GY-BN	 BK-GY BN-BU



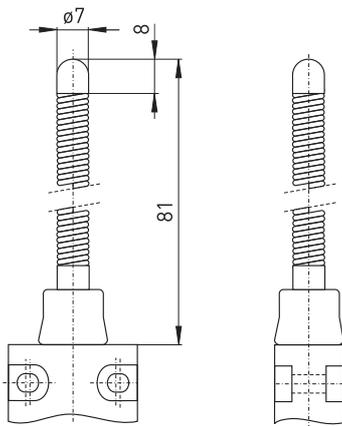
**Features/Options**

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

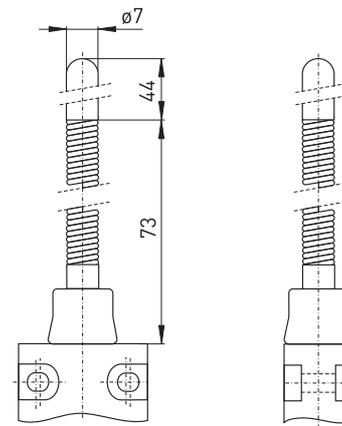
**Features/Options**

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

// Spring rod with steel tip TF



// Spring rod with plastic tip TK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 TF-2m</b> <b>1051636</b>	<b>ES 14 TF 10/1S-2m</b> <b>1045429</b>
	 GY-BK GY-BN	 BK-GY BN-BU

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 14 TK-2m</b> <b>1188932</b>	<b>ES 14 TK 10/1S-2m</b> <b>1189136</b>
	 GY-BK GY-BN	 BK-GY BN-BU



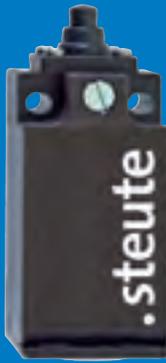
# Position switches with/without safety function

## // Series ES/EM 95

### Features/Options

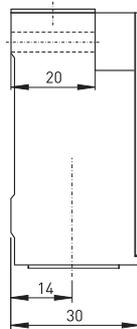
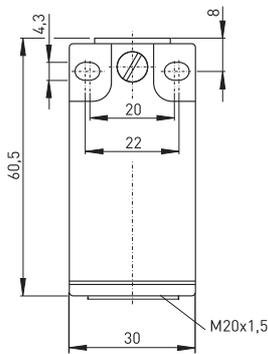
- Thermoplastic enclosure
- Horizontally slotted mounting holes
- Double insulated □
- Snap action with constant contact pressure up to switching point
- Slow action with overlapping contacts available
- Actuator can be repositioned by 4 x 90°
- Angle of offset roller lever can be adjusted in 10° steps
- 1 cable entry M20 x 1.5
- Good resistance to oil and petroleum spirit
- Ex version available

## // ES/EM 95



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Design</b>	EN 50 047
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow or snap action, positive break NC contacts ⊖
<b>Switching elements</b>	change-over, 2 NC or 2 NO contacts with double break Zb, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 2.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	M20 x 1.5
<b>B<sub>10d</sub></b> (10 % load)	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>Utilisation category</b>	AC-15; DC-13
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/400 VAC; 0,25 A/230 VDC; 4 A/24 VDC
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Mechanical life</b>	> 1 million operations
<b>Frequency of operation</b>	1800/h
<b>Ambient temperature</b>	- 20 °C ... + 80 °C
<b>Contact opening</b>	2 x 3.5 mm
<b>Approvals</b>	  



### Type code

ES 95 WH 10/1S-V-LL

- Longitudinal slotted holes
- Latching
- Contact type 1NC/1NO, (2Ö, 2S, UE)
- Actuator H (R, D, DS, etc. ...)
- Watertight collar
- Series
- S Slow action (M Snap action)

# Position switches with/without safety function

## // Series ES/EM 95, actuators

### Features/Options

- Available on request with mechanical latching V, release by means of push-button (only possible with slow action)
- With gold-plated contacts available on request

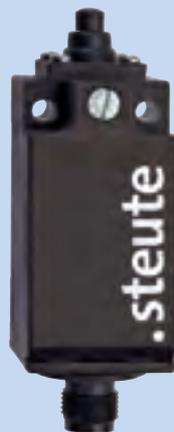
### Features/Options

- Actuator type B to EN 50 047
- Watertight collar for protection against penetration of dirt

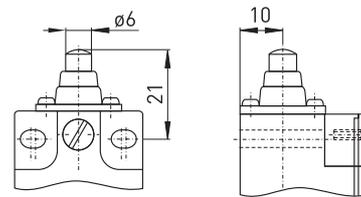
### // Mechanical latching



### // Connector M12 x 1, 4-pole

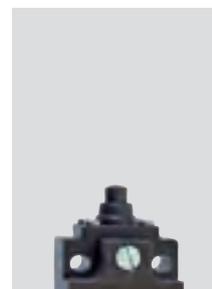


### // Plunger with collar W



### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 W 10/1S</b> <b>1050060</b>	<b>ES 95 W 10/1S</b> <b>1049911</b>
1 NO/1 NC overlapping Material Number		<b>ES 95 W UE</b> <b>1050169</b>
2 NC contacts Material Number		<b>ES 95 W 20</b> <b>1050303</b>
2 NO contacts Material Number		<b>ES 95 W 2S</b> <b>1050460</b>



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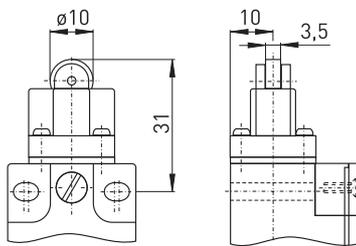
### Features/Options

- Actuator type C to EN 50 047
- Wear-resistant plastic roller
- Metal roller available on request
- Actuator can be repositioned by 4 x 90°

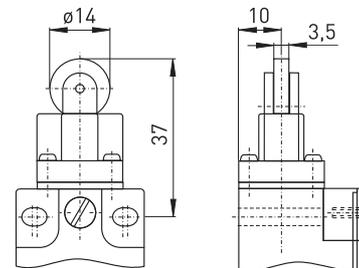
### Features/Options

- Wear-resistant plastic roller
- Metal roller available on request
- Actuator can be repositioned by 4 x 90°

### // Roller plunger R



### // Long roller plunger RL



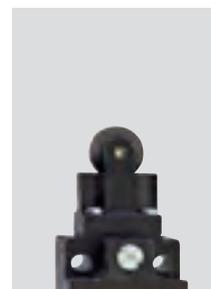
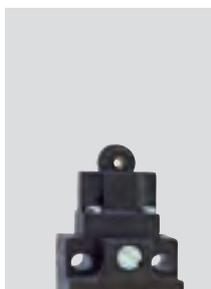
66

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 R 10/1S</b> <b>1050071</b> 	<b>ES 95 R 10/1S</b> <b>1049925</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 R UE</b> <b>1050176</b> 
2 NC contacts Material Number		<b>ES 95 R 20</b> <b>1050315</b> 
2 NO contacts Material Number		<b>ES 95 R 2S</b> <b>1050467</b> 

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 RL 10/1S</b> <b>1050077</b> 	<b>ES 95 RL 10/1S</b> <b>1049931</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 RL UE</b> <b>1050180</b> 
2 NC contacts Material Number		<b>ES 95 RL 20</b> <b>1050320</b> 
2 NO contacts Material Number		<b>ES 95 RL 2S</b> <b>1050471</b> 



**Features/Options**

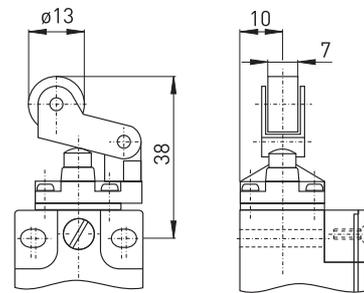
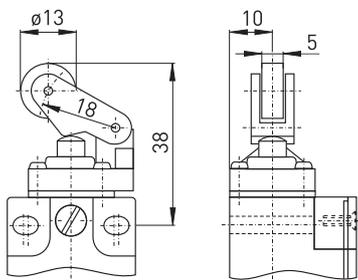
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Actuator type E to EN 50 047
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Metal roller available on request

**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Metal roller available on request

// Roller lever with collar WH

// Metal roller lever with collar WH

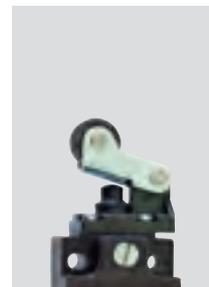
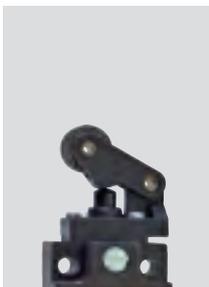


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WH 10/1S</b> <b>1050084</b> 	<b>ES 95 WH 10/1S</b> <b>1049944</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 WH UE</b> <b>1050185</b> 
2 NC contacts Material Number		<b>ES 95 WH 2Ö</b> <b>1050326</b> 
2 NO contacts Material Number		<b>ES 95 WH 2S</b> <b>1050475</b> 

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WHM 10/1S</b> <b>1050086</b> 	<b>ES 95 WHM 10/1S</b> <b>1049946</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 WHM UE</b> <b>1050187</b> 
2 NC contacts Material Number		<b>ES 95 WHM 2Ö</b> <b>1050328</b> 
2 NO contacts Material Number		<b>ES 95 WHM 2S</b> <b>1050477</b> 



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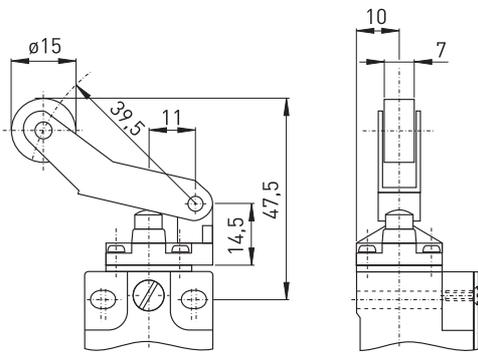
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Metal roller available on request

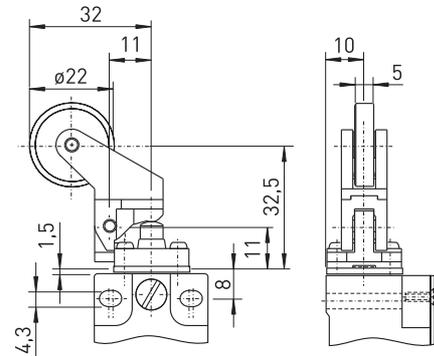
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation parallel to axis of switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Metal roller available on request

### // Long metal roller lever collar WHLM



### // Plastic roller lever with collar 4K



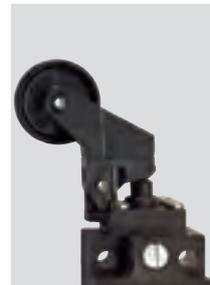
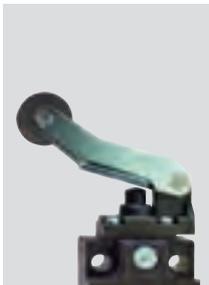
68

#### Contact variants: switch travel/contacts

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WHLM 10/1S</b> <b>1050104</b> 	<b>ES 95 WHLM 10/1S</b> <b>1049972</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 WHLM UE</b> <b>1050217</b> 
2 NC contacts Material Number		<b>ES 95 WHLM 20</b> <b>1050360</b> 
2 NO contacts Material Number		<b>ES 95 WHLM 2S</b> <b>1050507</b> 

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 4K 10/1S</b> <b>1185690</b> 	<b>ES 95 4K 10/1S</b> <b>1183312</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 4K UE</b> <b>on request</b> 
2 NC contacts Material Number		<b>ES 95 4K 20</b> <b>1183439</b> 
2 NO contacts Material Number		<b>ES 95 4K 2S</b> <b>on request</b> 



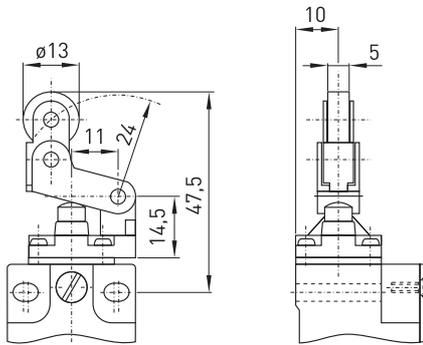
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Metal roller available on request

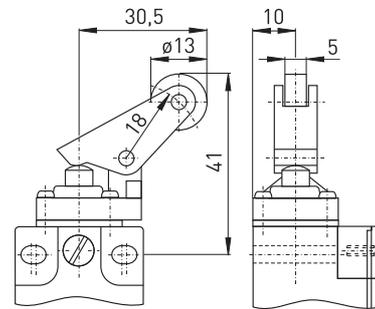
**Features/Options**

- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Actuation parallel to switch from below
- Metal roller available on request

// Offset metal roller lever collar WHKM



// Parallel roller lever with collar WPH

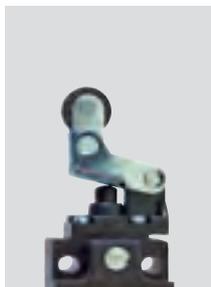


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WHKM 10/1S</b> 1050060 	<b>ES 95 WHKM 10/1S</b> 1049911 
1 NO/1 NC overlapping Material Number		<b>ES 95 WHKM UE</b> 1050233 
2 NC contacts Material Number		<b>ES 95 WHKM 20</b> 1050376 
2 NO contacts Material Number		<b>ES 95 WHKM 2S</b> 1050523 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WPH 10/1S</b> 1050120 	<b>ES 95 WPH 10/1S</b> 1049995 
1 NO/1 NC overlapping Material Number		<b>ES 95 WPH UE</b> 1050249 
2 NC contacts Material Number		<b>ES 95 WPH 20</b> 1050392 
2 NO contacts Material Number		<b>ES 95 WPH 2S</b> 1050539 



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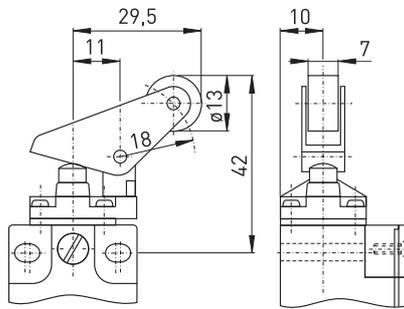
### Features/Options

- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Watertight collar for protection against penetration of dirt
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Actuation parallel to switch from below
- Metal roller available on request

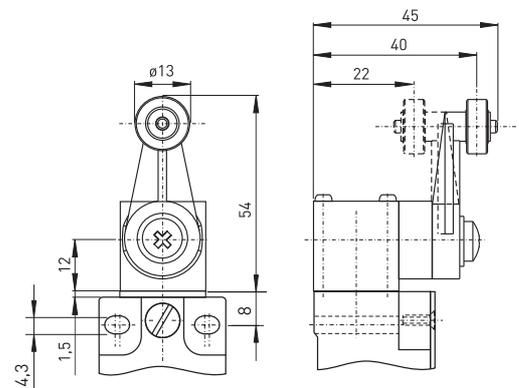
### Features/Options

- Lever angle adjustable in 10° steps
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Metal roller available on request

## // Parallel metal roller lever collar WPHM



## // Rocking lever D

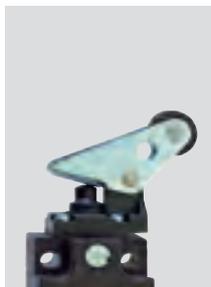


### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 WPHM 10/1S</b> <b>1050122</b> 	<b>ES 95 WPHM 10/1S</b> <b>1049997</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 WPHM UE</b> <b>1050251</b> 
2 NC contacts Material Number		<b>ES 95 WPHM 20</b> <b>1050394</b> 
2 NO contacts Material Number		<b>ES 95 WPHM 2S</b> <b>1050541</b> 

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 D 10/1S</b> <b>1050138</b> 	<b>ES 95 D 10/1S</b> <b>1050006</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 D UE</b> <b>1050281</b> 
2 NC contacts Material Number		<b>ES 95 D 20</b> <b>1050426</b> 
2 NO contacts Material Number		<b>ES 95 D 2S</b> <b>1050571</b> 



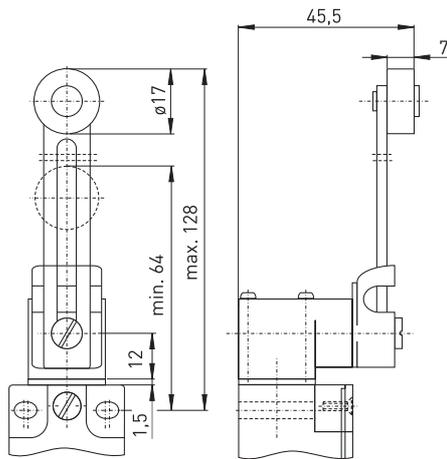
Features/Options

- No safety switch!
- Lever angle adjustable in 10° steps
- Length of roller lever adjustable
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Metal roller available on request

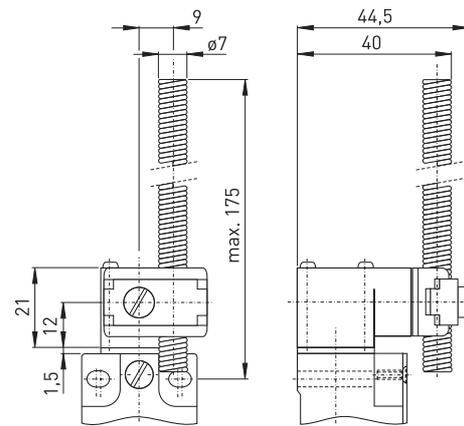
Features/Options

- No safety switch!
- Lever angle adjustable in 10° steps
- Actuator can be repositioned by 4 x 90°

// Adjustable rocking lever DS



// Spring-rod lever DF



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 DS 10/1S</b> <b>1050153</b> 	<b>ES 95 DS 10/1S</b> <b>1050035</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 DS UE</b> <b>1050295</b> 
2 NC contacts Material Number		<b>ES 95 DS 20</b> <b>1050444</b> 
2 NO contacts Material Number		<b>ES 95 DS 2S</b> <b>1050585</b> 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 DF 10/1S</b> <b>1050149</b> 	<b>ES 95 DF 10/1S</b> <b>1050031</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 DF UE</b> <b>1050291</b> 
2 NC contacts Material Number		<b>ES 95 DF 20</b> <b>1050440</b> 
2 NO contacts Material Number		<b>ES 95 DF 2S</b> <b>1050581</b> 



# Position switches with/without safety function

## // Series ES/EM 95, actuators

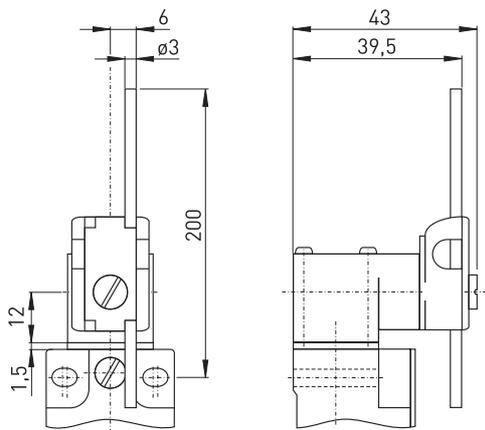
### Features/Options

- No safety switch!
- Lever angle adjustable in 10° steps
- Actuator can be repositioned by 4 x 90°

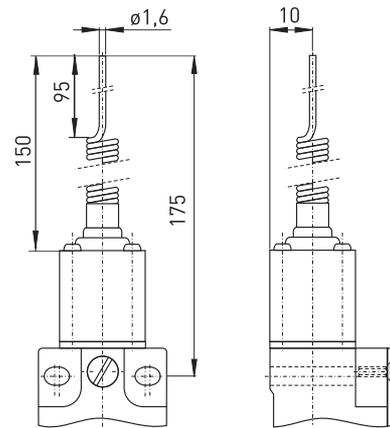
### Features/Options

- No safety switch!
- Spring rod can be actuated from any direction

### // Rod lever DD



### // Long spring rod TL



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#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 DD 10/1S</b> <b>1050146</b> 	<b>ES 95 DD 10/1S</b> <b>1050022</b> 
1 NO/1 NC overlapping Material Number		<b>ES 95 DD UE</b> <b>1050286</b> 
2 NC contacts Material Number		<b>ES 95 DD 2Ö</b> <b>1050434</b> 
2 NO contacts Material Number		<b>ES 95 DD 2S</b> <b>1050577</b> 

#### Contact variants: switch travel/contacts

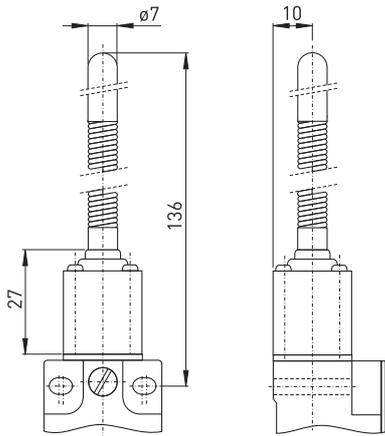
	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 95 TL 10/1S</b> <b>1050159</b> 	<b>ES 95 TL 10/1S</b> <b>1050043</b> 
2 NC contacts Material Number		<b>ES 95 TL 2Ö</b> <b>on request</b> 



Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction

// Spring rod with plastic tip TK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 95 TK 1Ö/1S 1050161	ES 95 TK 1Ö/1S 1052136
2 NC contacts Material Number		ES 95 TK 2Ö 1050448



# Position switches with/without safety function

## // Series E 12

### Features/Options

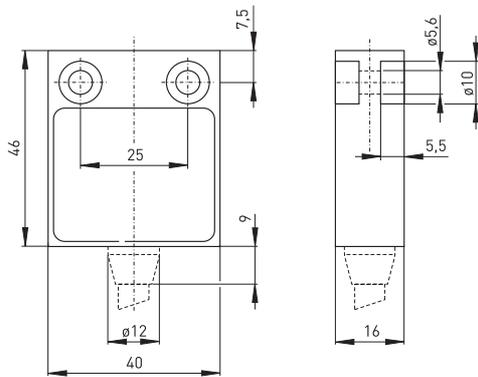
- No safety switch!
- Metal enclosure
- Snap action, change-over contact with single break
- Suitable for in-line mounting
- With pre-wired cable, cable length 2 meters
- Ex version available

## // E 12



## Technical data

Standards	EN 60947-5-1
Enclosure	aluminium die-cast, enamel finish
Degree of protection	IP 67 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with single break
Switching system	snap action
Connection	cable H05VV-F
Cable cross-section	4 x 0.75 mm <sup>2</sup>
U <sub>imp</sub>	4 kV
U <sub>i</sub>	250 V
I <sub>the</sub>	5 A
Utilisation category	AC-15; DC-13
I <sub>e</sub> /U <sub>e</sub>	5 A/250 VAC; 0.16 A/230 VDC
Max. fuse rating	5 A gG/gN fuse
Mechanical life	> 1 million operations
Frequency of operation	1800/h
Ambient temperature	-20 °C ... + 75 °C
Approvals	



### Type code

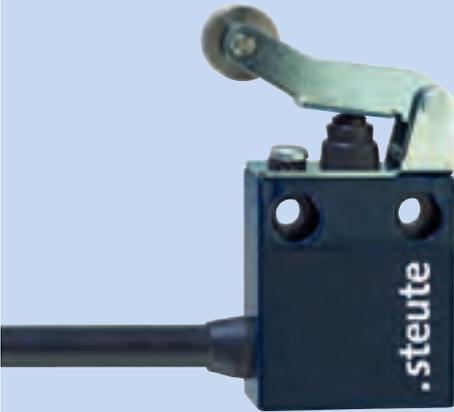
**E 12 WKU-s-B-2m**

- █ Cable length 2 m (5 m)
- █ Tapped bushing M16 x 1.5
- █ Cable on side
- █ Actuator KU (H, TK, D, etc. ...)
- █ Watertight collar
- █ Series

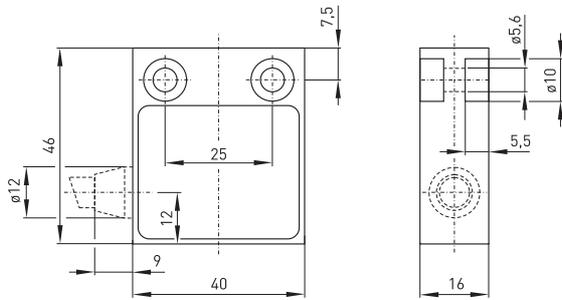
Features/Options

- With gold-plated contacts available on request

// Cable on side



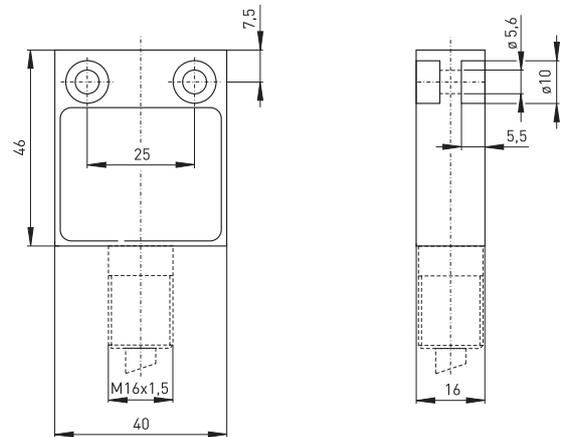
// Cable on side



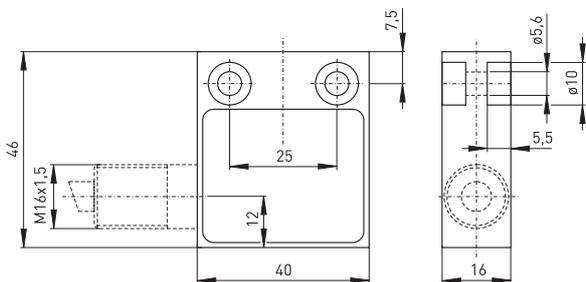
// Cable entry M16 x 1.5



// Cable entry M16 x 1.5



// Cable entry on side M16 x 1.5



// Connector M12 x 1, 4-pole



# Position switches with/without safety function

## // Series E 12, actuators

**Features/Options**

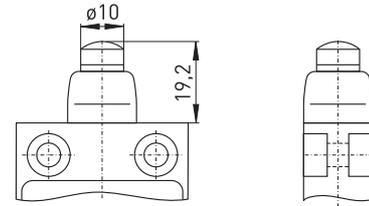
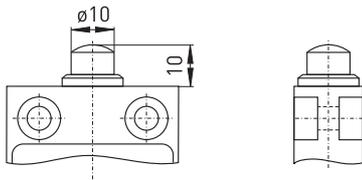
- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Watertight collar for protection against penetration of dirt

### // Plunger

### // Plunger with watertight collar W



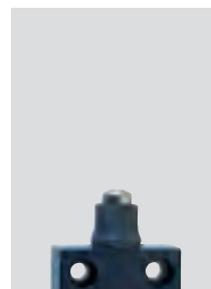
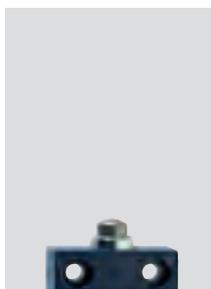
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Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action
1 change-over contact	E 12-2m
Material Number	1044194

	Snap action
1 change-over contact	E 12 W-2m
Material Number	1044242



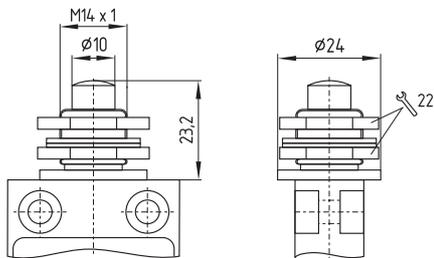
Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

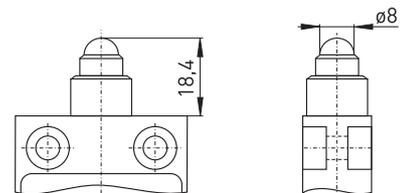
Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

// Plunger for front mounting F



// Ball plunger KU

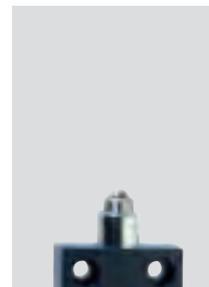
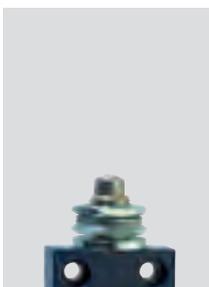


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 F-2m
Material Number	1188874
	0 1,5 5,5 GY-BK GY-BN

Snap action	
1 change-over contact	E 12 KU-2m
Material Number	1044268
	0 1,5 5,5 GY-BK GY-BN



# Position switches with/without safety function

## // Series E 12, actuators

### Features/Options

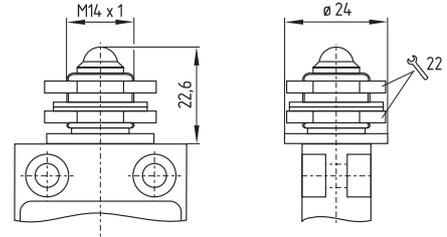
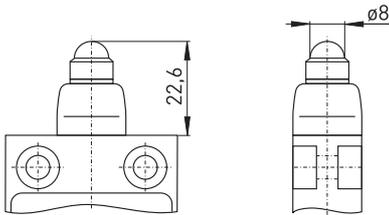
- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 15°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Ball diameter 8 mm
- Exact repeatability of switching point

### // Ball plunger collar WKU

### // Ball plunger for front mounting FKU



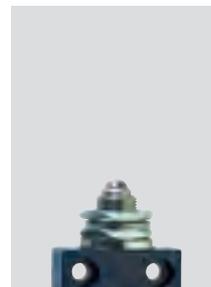
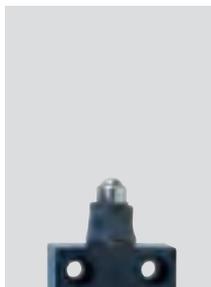
78

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action									
1 change-over contact	E 12 WKU-2m									
Material Number	1052918									
	<table border="1"> <tr> <td>0</td> <td>1.5</td> <td>5.5</td> </tr> <tr> <td></td> <td></td> <td>GY-BK</td> </tr> <tr> <td></td> <td></td> <td>GY-BN</td> </tr> </table>	0	1.5	5.5			GY-BK			GY-BN
0	1.5	5.5								
		GY-BK								
		GY-BN								

	Snap action									
1 change-over contact	E 12 FKU-2m									
Material Number	1188876									
	<table border="1"> <tr> <td>0</td> <td>1.5</td> <td>5.5</td> </tr> <tr> <td></td> <td></td> <td>GY-BK</td> </tr> <tr> <td></td> <td></td> <td>GY-BN</td> </tr> </table>	0	1.5	5.5			GY-BK			GY-BN
0	1.5	5.5								
		GY-BK								
		GY-BN								



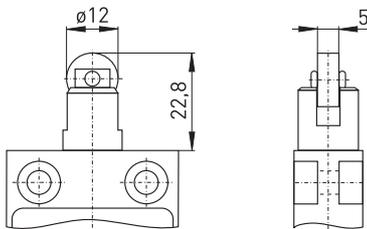
Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Metal roller
- Actuator repositioned by 90° available on request

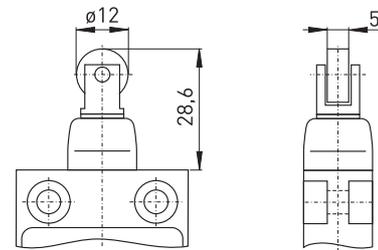
Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator repositioned by 90° available on request
- Watertight collar for protection against penetration of dirt

// Roller plunger R



// Roller plunger collar WR

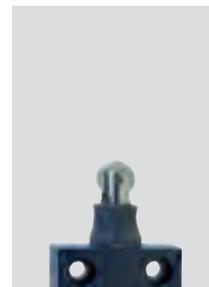
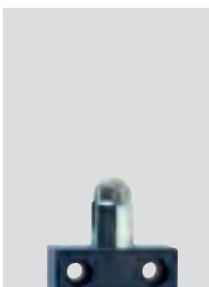


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 R-2m
Material Number	1044360
	0 1,5 5,5 GY-BK GY-BN

Snap action	
1 change-over contact	E 12 WR-2m
Material Number	1044440
	0 1,5 5,5 GY-BK GY-BN



# Position switches with/without safety function

## // Series E 12, actuators

### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator repositioned by 90° available on request

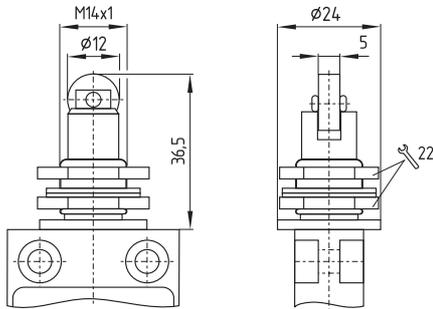
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

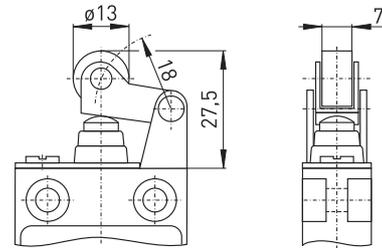
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

## // Roller plunger for front mounting FR



## // Roller lever collar WH



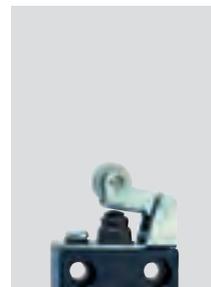
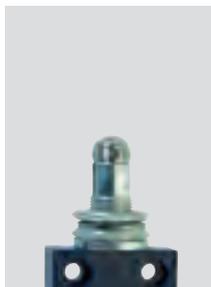
80

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Snap action
1 change-over contact	E 12 FR-2m
Material Number	1044839

	Snap action
1 change-over contact	E 12 WH-2m
Material Number	1044508



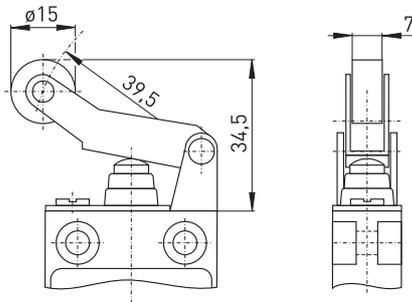
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

**Note**

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

// Long roller lever collar WHL



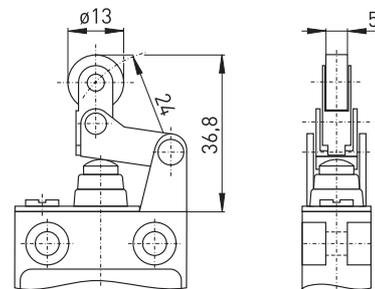
Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 WHL-2m
Material Number	1044553
	0 4.1 12.8 GY-BK GY-BN

**Features/Options**

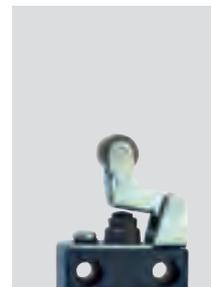
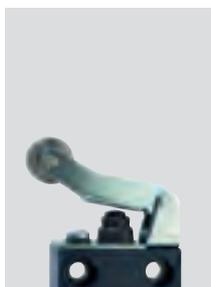
- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

// Offset roller lever collar WHK



Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 WHK-2m
Material Number	1044601
	0 2 6.8 GY-BK GY-BN



# Position switches with/without safety function

## // Series E 12, actuators

### Features/Options

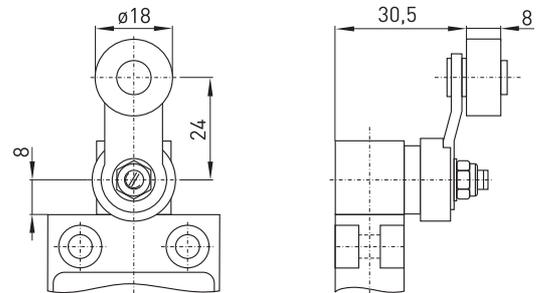
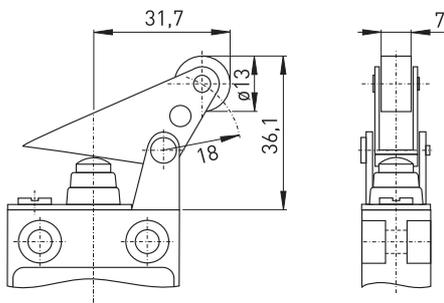
- No safety switch!
- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Metal roller
- Actuator repositioned by 180° available on request
- Watertight collar for protection against penetration of dirt
- With plastic roller available on request

### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator repositioned by 180° available on request
- With metal roller available on request

### // Parallel roller lever collar WPH

### // Rocking lever D



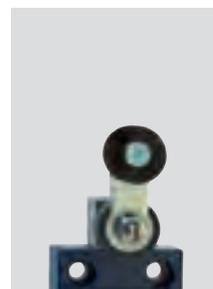
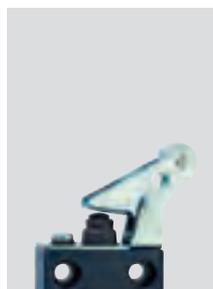
82

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action
1 change-over contact	E 12 WPH-2m
Material Number	1188878

	Snap action
1 change-over contact	E 12 D-2m
Material Number	1188881



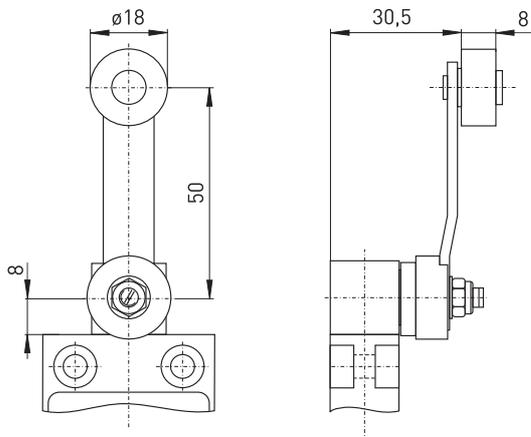
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator repositioned by 180° available on request
- With metal roller available on request

**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator repositioned by 180° available on request
- With metal roller available on request

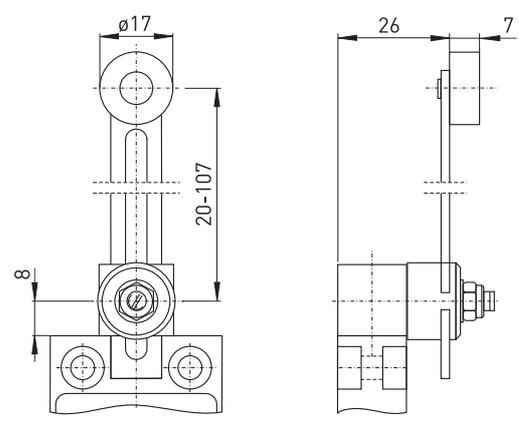
**// Long rocking lever DL**



Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 DL-2m
Material Number	1188883
	70° 17° 0° 17° 70°
	GY-BK GY-BN

**// Adjustable rocking lever DS**



Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 DS-2m
Material Number	1044675
	70° 17° 0° 17° 70°
	GY-BK GY-BN



# Position switches with/without safety function

## // Series E 12, actuators

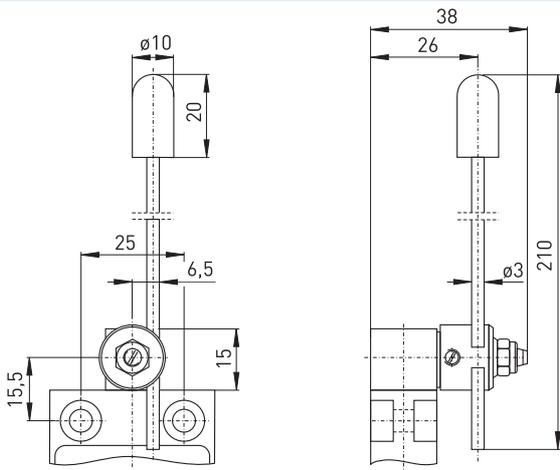
### Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator repositioned by 180° available on request

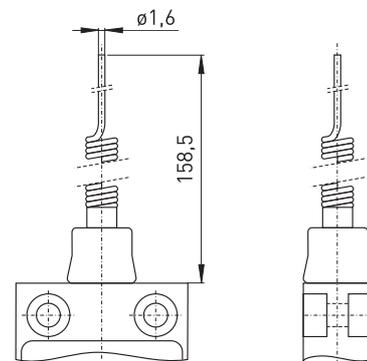
### Features/Options

- No safety switch!
- Spring rod can be actuated from any direction
- Spring rod can be shortened 30 mm in actuating area
- Exact linear actuation not necessary
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

### // Rod lever DD



### // Long spring rod TL



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action
1 change-over contact Material Number	E 12 DD-2m 1188887

	Snap action
1 change-over contact Material Number	E 12 TL-2m 1044703



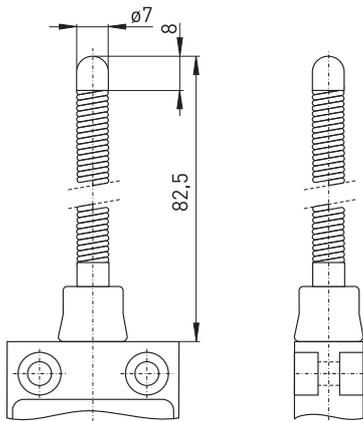
Features/Options

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

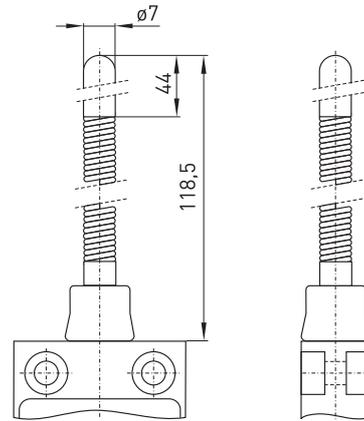
Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle of 18°

// Spring rod with steel tip TF



// Spring rod with plastic tip TK



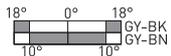
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action

1 change-over contact  
Material Number

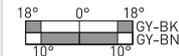
E 12 TF-2m  
1188889



Snap action

1 change-over contact  
Material Number

E 12 TK-2m  
1178560



# Position switches with/without safety function

## // Series ES/EM 98

### Features/Options

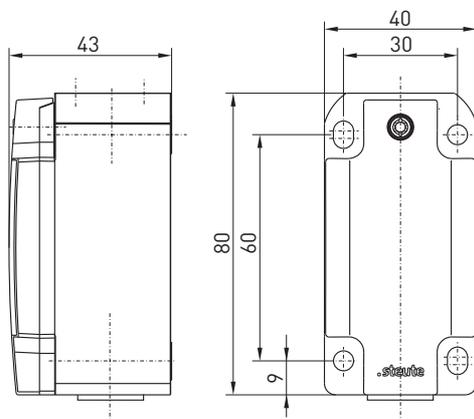
- Metal enclosure
- Design to EN 50041
- Slow action  $\ominus$ , change-over contact, 2 NC, 2 NC/1 NO or 1 NC/2 NO with double break
- Snap action, 2 NC/1 NO or 1 NC/2 NO contact with double break
- Available with overlapping contacts
- Actuator can be repositioned by 4 x 90°
- Ex version available

// ES/EM 98



### Technical data

Standards	EN 60947-5-1; EN ISO 13849-1
Design	EN 50041
Enclosure	zinc die-cast, enamel finish
Degree of protection	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow or snap action, positive break NC contacts $\ominus$
Switching elements	change-over, 2 NC, 2 NC/1 NO or 1 NC/2 NO contacts with double break Zb, galvanically separated contact bridges
Connection	screw connection terminals
Cable cross-section	2 contacts: max. 2.5 mm <sup>2</sup> , 3 contacts: max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
Cable entry	1 x M20 x 1.5
B <sub>10d</sub> (10 % load)	2 million
T <sub>M</sub>	max. 20 years
U <sub>imp</sub>	4 kV
U <sub>i</sub>	400 V
I <sub>the</sub>	2 contacts: 6 A, 3 contacts: 1.5 A
I <sub>e</sub> /U <sub>e</sub>	2 contacts: 6 A/250 VAC; 0.25 A/230 VDC 3 contacts: 1.5 A/230 VAC; 0.27 A/250 VDC
Utilisation category	AC-15; DC-13
Max. fuse rating	2 contacts: 6 A gG/gN fuse 3 contacts: 1.5 A gG/gN fuse
Mechanical life	> 1 million operations
Frequency of operation	1800/h
Ambient temperature	- 20 °C ... +80 °C



### Type code

EM 98 H-12

- Contact type 2 NC/1 NO (-11, -11U, -02, -12, -21)
- Actuator H (R, D, etc. ...)
- Series
- M Snap action (S Slow action)

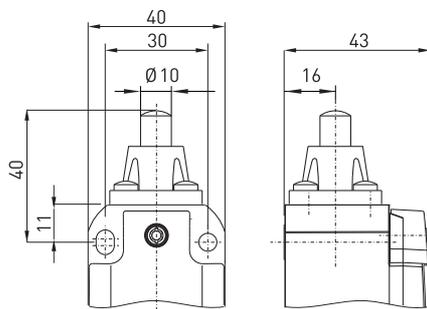
Features/Options

- Actuator type B to EN 50041
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°

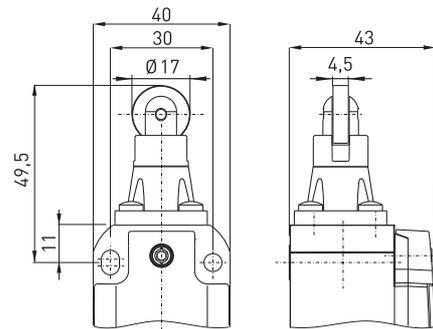
Features/Options

- Actuator type C to EN 50041
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°

// Plunger



// Roller plunger R

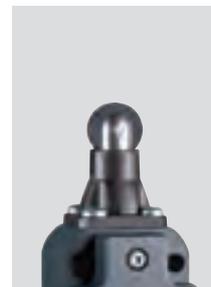
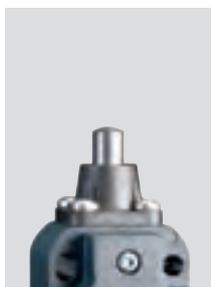


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98-11 1188439 
1 NO/1 NC overlapping Material Number		ES 98-11U on request 
2 NC contacts Material Number		ES 98-02 on request 
2 NC/1 NO contacts Material Number	EM 98-12 1190307 	ES 98-12 1190283 
1 NC/2 NO contacts Material Number	EM 98-21 1190308 	ES 98-21 1190284 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 R-11 1198445 
1 NO/1 NC overlapping Material Number		ES 98 R-11U on request 
2 NC contacts Material Number		ES 98 R-02 on request 
2 NC/1 NO contacts Material Number	EM 98 R-12 1190309 	ES 98 R-12 1190285 
1 NC/2 NO contacts Material Number	EM 98 R-21 1190310 	ES 98 R-21 1190286 



# Position switches with/without safety function

## // Series ES/EM 98, actuators

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Actuation parallel to switch from right
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°

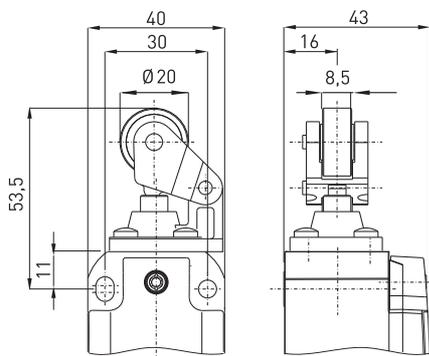
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

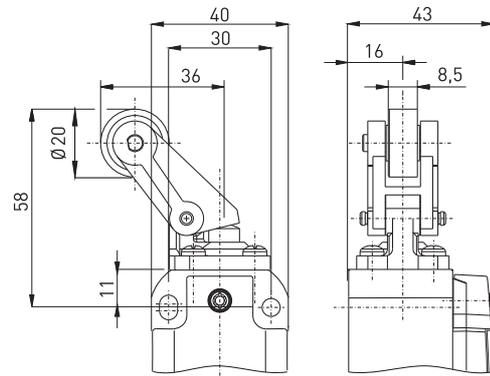
### Features/Options

- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°

## // Roller lever H



## // Parallel roller lever PH



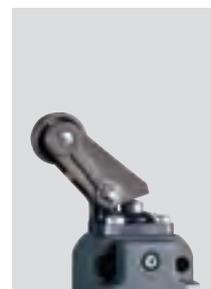
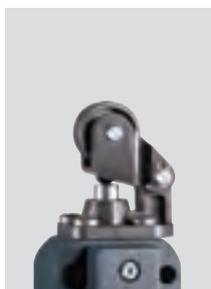
88

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number		<b>ES 98 H-11</b> <b>1190317</b> 
1 NO/1 NC overlapping Material Number		<b>ES 98 H-11U</b> <b>on request</b> 
2 NC contacts Material Number		<b>ES 98 H-02</b> <b>on request</b> 
2 NC/1 NO contacts Material Number	<b>EM 98 H-12</b> <b>1190319</b> 	<b>ES 98 H-12</b> <b>1190315</b> 
1 NC/2 NO contacts Material Number	<b>EM 98 H-21</b> <b>1190320</b> 	<b>ES 98 H-21</b> <b>1190318</b> 

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number		<b>ES 98 PH-11</b> <b>on request</b> 
1 NO/1 NC overlapping Material Number		<b>ES 98 PH-11U</b> <b>on request</b> 
2 NC contacts Material Number		<b>ES 98 PH-02</b> <b>on request</b> 
2 NC/1 NO contacts Material Number	<b>EM 98 PH-12</b> <b>on request</b>	<b>ES 98 PH-12</b> <b>on request</b>
1 NC/2 NO contacts Material Number	<b>EM 98 PH-21</b> <b>on request</b>	<b>ES 98 PH-21</b> <b>on request</b>



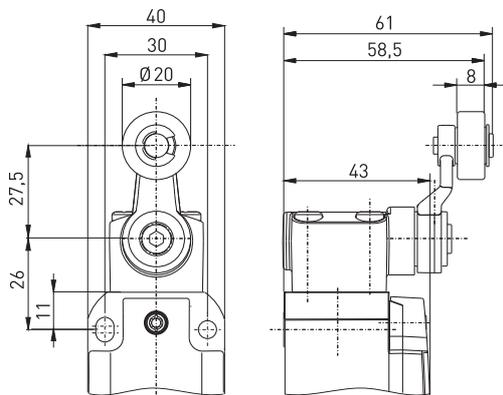
**Features/Options**

- Actuator type A to EN 50041
- Actuating speed max. 2.5 m/s with a vertical actuating angle of 30°
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°

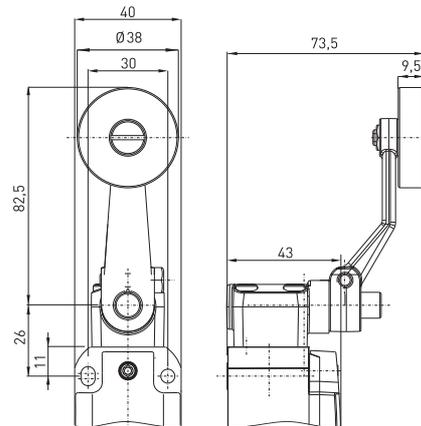
**Features/Options**

- Actuating speed max. 2.5 m/s with a vertical actuating angle of 30°
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°

**// Rocking lever D**



**// Long rocking lever DL**

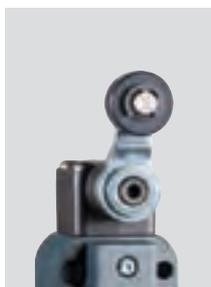


**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 D-11 1189646 85° 25°0°25° 85° 23-24 11-12 30°15°15°30°
1 NO/1 NC overlapping Material Number		ES 98 D-11U on request 85° 20°0°20° 85° 23-24 15-16 40°25°25°40°
2 NC contacts Material Number		ES 98 D-02 on request 85° 30° 0° 30° 85° 11-12 21-22 15°15°
2 NC/1 NO contacts Material Number	EM 98 D-12 1190311	ES 98 D-12 1190288
1 NC/2 NO contacts Material Number	EM 98 D-21 1190312	ES 98 D-21 1190289

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 DL-11 1189905 85° 25°0°25° 85° 23-24 11-12 30°15°15°30°
1 NO/1 NC overlapping Material Number		ES 98 DL-11U on request 85° 20°0°20° 85° 23-24 15-16 40°25°25°40°
2 NC contacts Material Number		ES 98 DL-02 on request 85° 30° 0° 30° 85° 11-12 21-22 15°15°
2 NC/1 NO contacts Material Number	EM 98 DL-12 on request	ES 98 DL-12 on request
1 NC/2 NO contacts Material Number	EM 98 DL-21 on request	ES 98 DL-21 on request



# Position switches with/without safety function

## // Series ES/EM 98, actuators

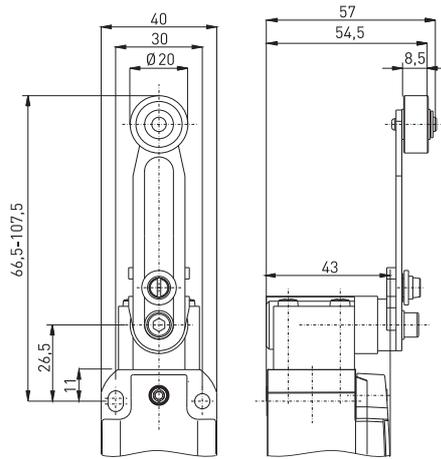
### Features/Options

- No safety switch!
- Actuating speed max. 2.5 m/s with a vertical actuating angle of 30°
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°

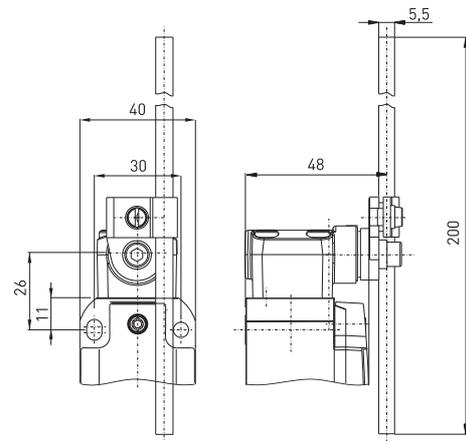
### Features/Options

- No safety switch!
- Actuating speed max. 2.5 m/s with a vertical actuating angle of 30°
- Actuator type D to EN 50041

### // Adjustable rocking lever DS



### // Rod lever DD



90

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 DS-11 1190290 
1 NO/1 NC overlapping Material Number		ES 98 DS-11U on request 
2 NC contacts Material Number		ES 98 DS-02 on request 
2 NC/1 NO contacts Material Number	EM 98 DS-12 1190313	ES 98 DS-12 1190291
1 NC/2 NO contacts Material Number	EM 98 DS-21 1190314	ES 98 DS-21 1190306

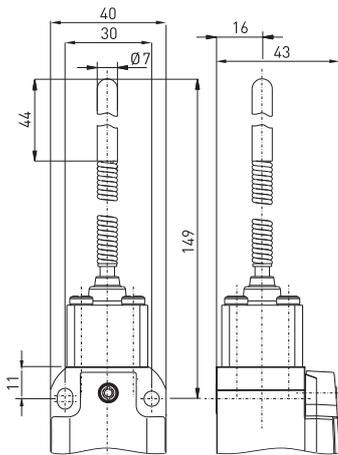
	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 DD-11 on request 
1 NO/1 NC overlapping Material Number		ES 98 DD-11U on request 
2 NC contacts Material Number		ES 98 DD-02 on request 
2 NC/1 NO contacts Material Number	EM 98 DD-12 on request	ES 98 DD-12 on request
1 NC/2 NO contacts Material Number	EM 98 DD-21 on request	ES 98 DD-21 on request



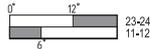
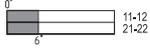
**Features/Options**

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of spring allows for deflection above the max. switching angle of 12°

**// Spring rod with plastic tip TK**



**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number		ES 98 TK-11 on request 
2 NC contacts Material Number		ES 98 TK-02 on request 
2 NC/1 NO contacts Material Number	EM 98 TK-12 1218367	ES 98 TK-12 1221172
1 NC/2 NO contacts Material Number	EM 98 TK-21 on request	ES 98 TK-21 on request



# Position switches with/without safety function

## // Series ES 51

### Features/Options

- Metal enclosure
- Slow action  $\ominus$ , change-over contact with double break
- 1 cable entry M16 x 1.5

### Note

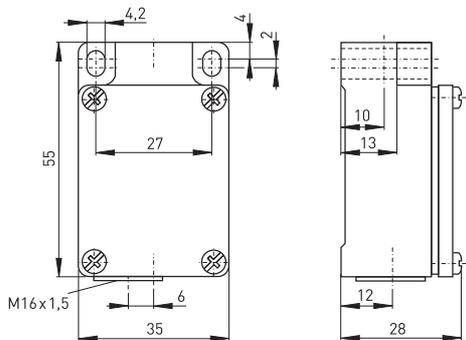
When used as safety switch, secure the enclosure against slipping with appropriate means, e.g. pinning.

// ES 51



### Technical data

Standards	EN 60947-5-1; EN ISO 13849-1
Enclosure	aluminium die-cast, enamel finish
Degree of protection	IP 65 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contacts $\ominus$
Switching elements	change-over contact with double break Zb, galvanically separated contact bridges
Connection	screw connection terminals
Cable cross-section	max. 1.5 mm <sup>2</sup> (incl. conductor ferrules)
Cable entry	1 x M16 x 1.5
B <sub>10d</sub> (10 % load)	2 million
T <sub>M</sub>	max. 20 years
U <sub>imp</sub>	4 kV
U <sub>i</sub>	400 V
I <sub>the</sub>	4 A
Utilisation category	AC-15
I <sub>e</sub> /U <sub>e</sub>	4 A / 400 VAC
Max. fuse rating	4 A gG/gN fuse
Mechanical life	> 1 million operations
Frequency of operation	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points	± 0.1 mm
Approvals	



### Type code

ES 51 WK 10/1S-ST

- Connector M12 x 1, 5-pole
- Contact type 1NC/1NO
- Actuator K (R, TK, D, etc. ...)
- Watertight collar
- Series
- S Slow action

# Position switches with/without safety function

## // Series ES 51, actuators

### Features/Options

- With gold-plated contacts available on request
- Available on request with plug-in connector M12 x 1, 5-pole

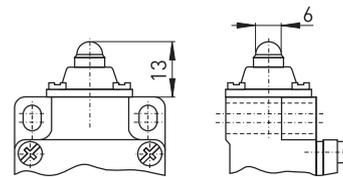
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball actuator
- Exact repeatability of switching point

### // Connector M12 x 1, 5-pole

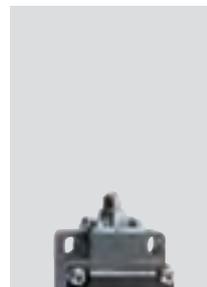


### // Plunger



Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 10/1S
Material Number	1047001



# Position switches with/without safety function

## // Series ES 51, actuators

### Features/Options

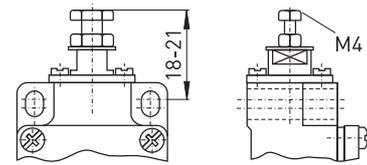
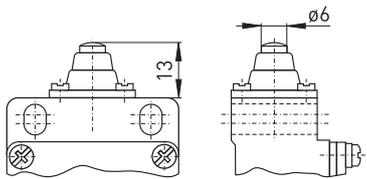
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Projection of plunger adjustable for fine setting of switching point

### // Plunger collar W

### // Adjustable plunger ST



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

Slow action

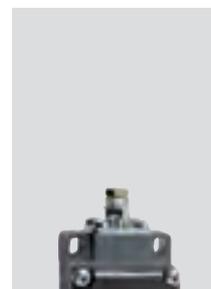
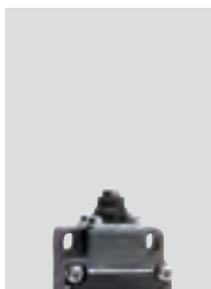
1 NC/1 NO contact  
Material Number

**ES 51 W 10/1S**  
**1047005**



1 NC/1 NO contact  
Material Number

**ES 51 ST 10/1S**  
**1047010**



**Features/Options**

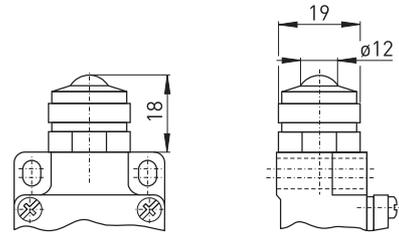
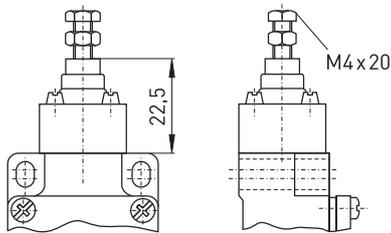
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Projection of plunger adjustable for fine setting of switching point
- Watertight collar for protection against penetration of dirt

**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

**// Adjustable plunger collar WST**

**// Ball plunger KU**

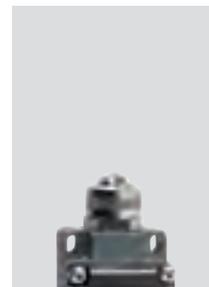
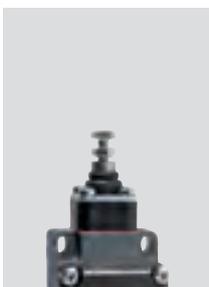


**Contact variants: switch travel/contacts**

**Contact variants: switch travel/contacts**

	Slow action
1 NC/1 NO contact	ES 51 WST 10/1S
Material Number	1047011

	Slow action
1 NC/1 NO contact	ES 51 KU 10/1S
Material Number	1047008



# Position switches with/without safety function

## // Series ES 51, actuators

### Features/Options

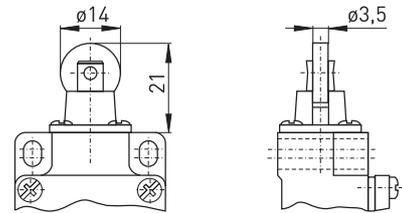
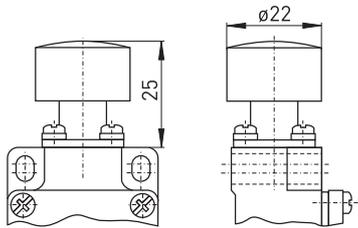
- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Watertight collar for protection against penetration of dirt

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 4 x 90°

### // Cap with collar WK

### // Roller plunger R



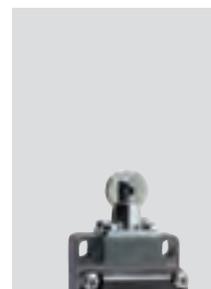
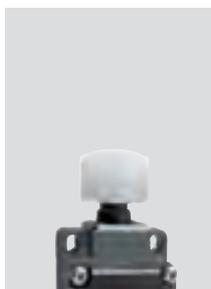
96

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 WK 10/1S
Material Number	1047012

	Slow action
1 NC/1 NO contact	ES 51 R 10/1S
Material Number	1047013



**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt

**Features/Options**

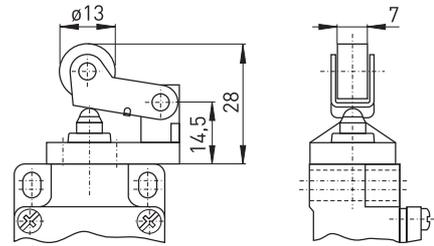
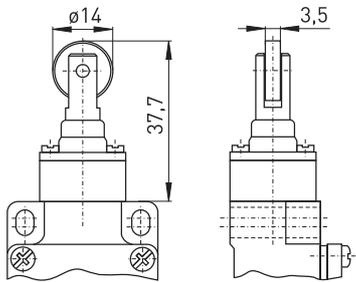
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Plastic roller
- Actuator can be repositioned by 4 x 90°
- With metal roller available on request

**Note**

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

// Roller plunger with collar WR

// Roller lever H

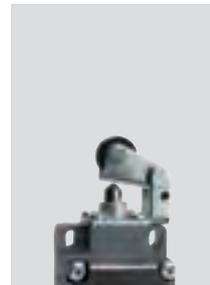
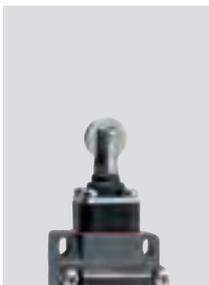


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 WR 1Ö/1S
Material Number	1047017

	Slow action
1 NC/1 NO contact	ES 51 H 1Ö/1S
Material Number	1047019



# Position switches with/without safety function

## // Series ES 51, actuators

### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

### Note

Actuation from the left should be avoided as this reduces the mechanical life of the position switch.

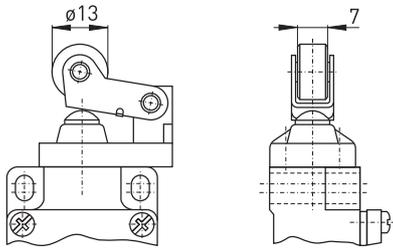
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- With metal roller available on request

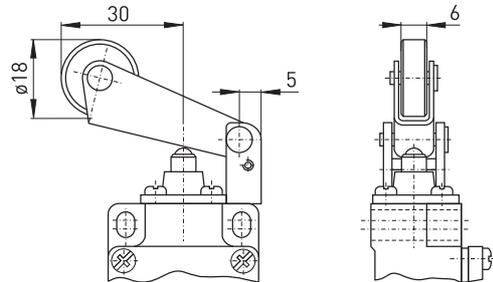
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

## // Roller lever collar WH



## // Long roller lever HL



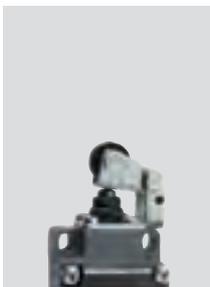
98

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 WH 10/1S
Material Number	1047022

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 HL 10/1S
Material Number	1047027



**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

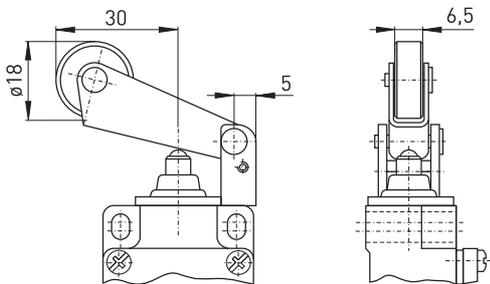
**Note**

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

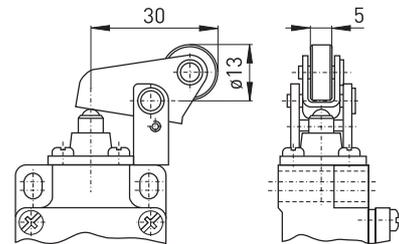
**Features/Options**

- Actuating speed max. 0.5 m/s with an actuating angle of  $30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- With metal roller available on request

// Long roller lever collar WHL



// Parallel roller lever PH



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 WHL 10/1S
Material Number	1047029

	Slow action
1 NC/1 NO contact	ES 51 PH 10/1S
Material Number	1047034



# Position switches with/without safety function

## // Series ES 51, actuators

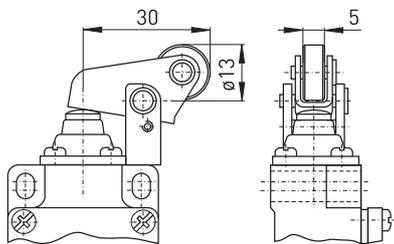
### Features/Options

- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

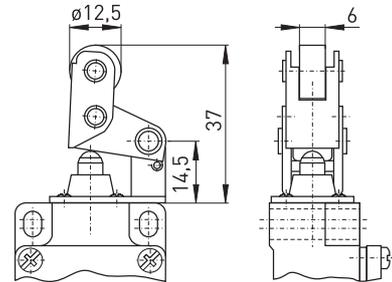
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- With metal roller available on request

### // Parallel roller lever collar WPH



### // Offset roller lever HK

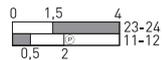


Contact variants: switch travel/contacts

#### Slow action

1 NC/1 NO contact  
Material Number

ES 51 WPH 10/1S  
1047035

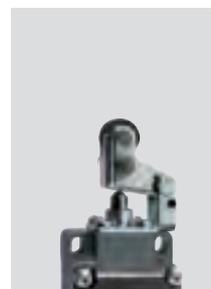
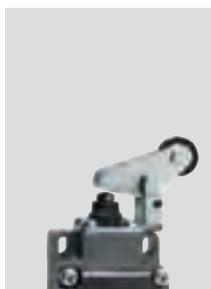
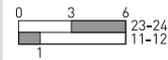


Contact variants: switch travel/contacts

#### Slow action

1 NC/1 NO contact  
Material Number

ES 51 HK 10/1S  
1047032



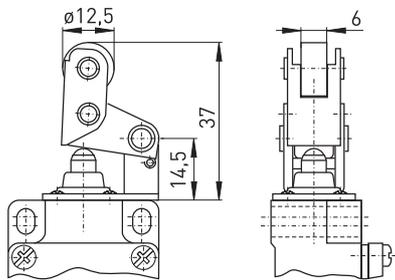
**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

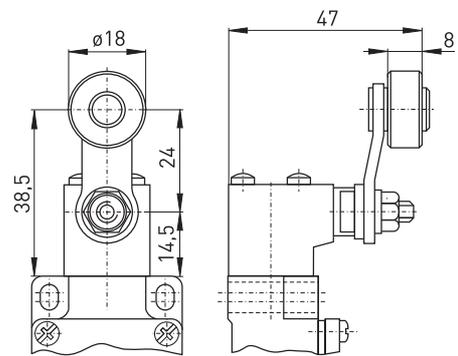
**Features/Options**

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

// Offset roller lever collar WHK



// Rocking lever D

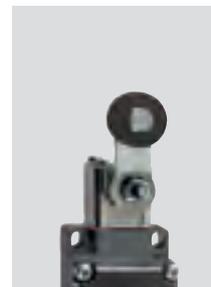
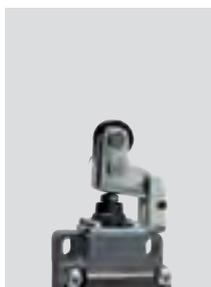


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact	ES 51 WHK 1Ö/1S
Material Number	1047033

	Slow action
1 NC/1 NO contact	ES 51 D 1Ö/1S
Material Number	1047036



# Position switches with/without safety function

## // Series ES 51, actuators

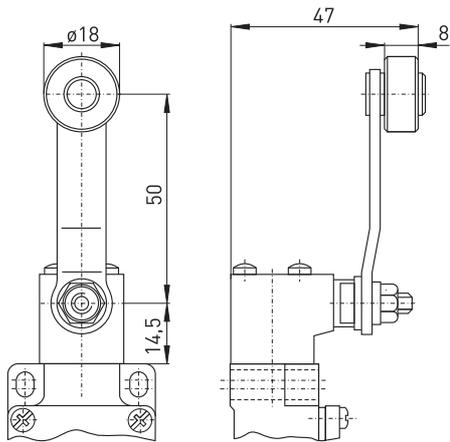
### Features/Options

- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

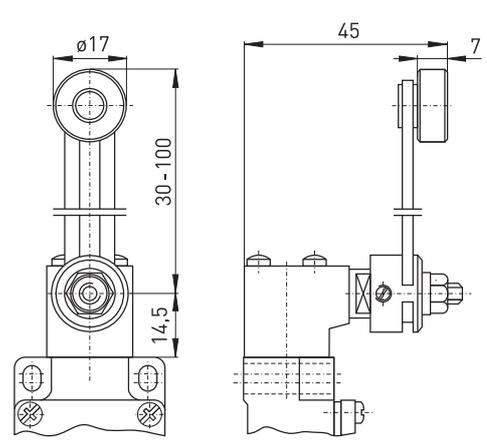
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

### // Long rocking lever DL



### // Adjustable rocking lever DS



102

### Contact variants: switch travel/contacts

### Contact variants: switch travel/contacts

	Slow action
1 NC/1 NO contact Material Number	<b>ES 51 DL 10/1S</b> <b>1047039</b>

	Slow action
1 NC/1 NO contact Material Number	<b>ES 51 DS 10/1S</b> <b>1047042</b>



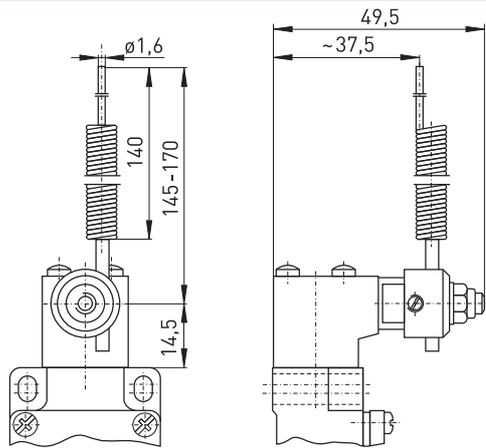
Features/Options

- No safety switch!
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

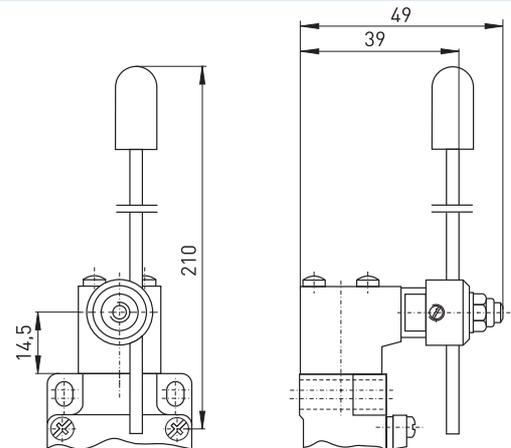
Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

// Spring-rod lever DF



// Rod lever DD



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

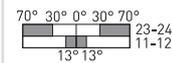
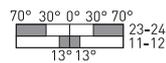
Slow action

1 NC/1 NO contact  
Material Number

ES 51 DF 10/1S  
1047041

1 NC/1 NO contact  
Materialnummer

ES 51 DD 10/1S  
1047040



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411

### Features/Options

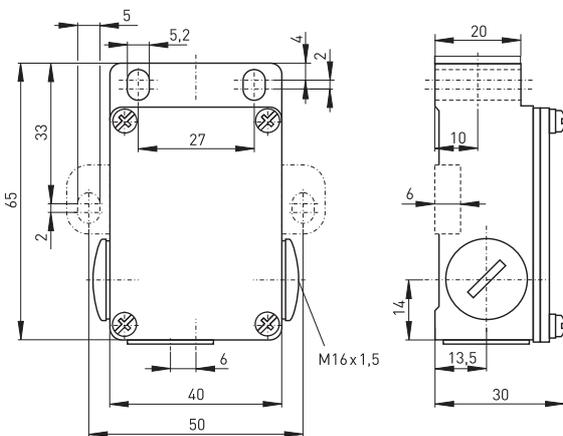
- Metal enclosure
- Slow action  $\ominus$ , change-over contact or 2 NC contacts with double break
- Snap action, change-over contact with double break
- Slow action with overlapping contacts available
- ES/EM 411: with 25 mm mounting centres, depth 34 mm
- 3 cable entries M16 x 1.5
- Slow action version for high temperatures up to 180°C available on request

### // ES/EM 41



### Technical data

Standards	EN 60947-5-1; EN ISO 13849-1
Enclosure	aluminium die-cast, enamel finish
Degree of protection	IP 65 to IEC/EN 60529
Contact material	silver
Switching system	slow or snap action; slow action: positive break NC contacts $\ominus$ change-over contact with double break Za or 2 NC contacts
Switching elements	change-over contact with double break Za or 2 NC contacts
Connection	screw connection terminals
Cable cross-section	max. 2.5 mm <sup>2</sup> (incl. conductor ferrules)
Cable entry	3 x M16 x 1.5
B <sub>10d</sub> (10 % load)	2 million
T <sub>M</sub>	max. 20 years
U <sub>imp</sub>	4 kV
U <sub>i</sub>	400 V
I <sub>the</sub>	6 A
Utilisation category	AC-15
I <sub>e</sub> /U <sub>e</sub>	6 A/400 VAC
Max. fuse rating	6 A gG/gN fuse
Mechanical life	> 1 million operations
Frequency of operation	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points	± 0.1 mm
Approvals	 



### Type code

ES 41 WH 10/1S-V

- Latching
- Contact type 1NC/1NO, (20, UE)
- Actuator H (R, TK, D, etc. ...)
- Watertight collar
- Series 41 or 411
- S Slow action (M Snap action)

# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

### Features/Options

- Available on request with mechanical latching V, release by means of push-button (only possible with slow action)
- Available on request with plug-in connector M12 x 1, 5-pole
- With gold-plated contacts available on request

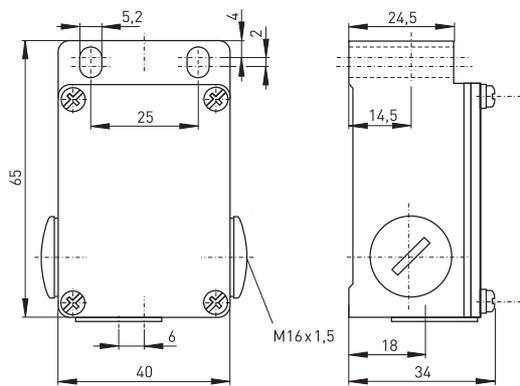
### Note

When used as safety switch, secure the enclosure against slipping with appropriate means, e.g. pinning.

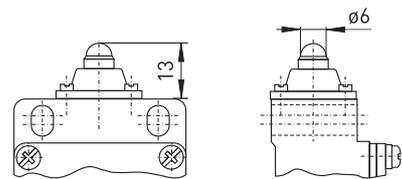
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball actuator
- Exact repeatability of switching point

## // ES/EM 411



## // Plunger



## // Mechanical latching



## // Connector M12 x 1, 5-pole



### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 10/1S 1046364	ES 41 10/1S 1046253
Material Number	EM 411 10/1S 1046676	ES 411 10/1S 1046639
1 NO/1 NC overlapping Material Number		ES 41 UE 1046494
Material Number		ES 411 UE 1046733
2 NC contacts Material Number		ES 41 20 1046518
Material Number		ES 411 20 1046754

# Position switches with/without safety function

## // Series ES/EM 41 und ES/EM 411, actuators

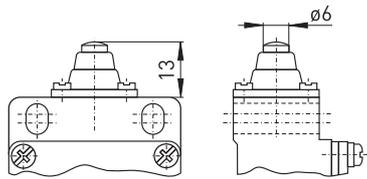
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

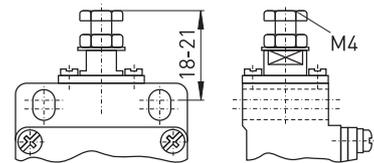
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Length of metal plunger adjustable by means of M4 screw for fine adjustment of switching travel

### // Plunger collar W



### // Adjustable plunger ST



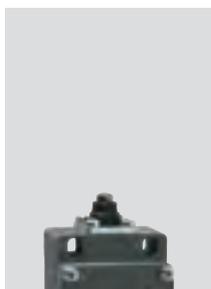
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#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 W 10/1S</b> <b>1046376</b>	<b>ES 41 W 10/1S</b> <b>1046267</b>
Material Number	<b>EM 411 W 10/1S</b> <b>1046677</b>	<b>ES 411 W 10/1S</b> <b>1046640</b>
1 NO/1 NC overlapping Material Number		<b>ES 41 W UE</b> <b>1046495</b>
Material Number		<b>ES 411 W UE</b> <b>1046734</b>
2 NC contacts Material Number		<b>ES 41 W 20</b> <b>1046520</b>
Material Number		<b>ES 411 W 20</b> <b>1046755</b>

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 ST 10/1S</b> <b>1046380</b>	<b>ES 41 ST 10/1S</b> <b>1046278</b>
Material Number	<b>EM 411 ST 10/1S</b> <b>1046681</b>	<b>ES 411 ST 10/1S</b> <b>1046642</b>
1 NO/1 NC overlapping Material Number		<b>ES 41 ST UE</b> <b>1046497</b>
Material Number		<b>ES 411 ST UE</b> <b>1046736</b>
2 NC contacts Material Number		<b>ES 41 ST 20</b> <b>1046522</b>
Material Number		<b>ES 411 ST 20</b> <b>1046757</b>



**Features/Options**

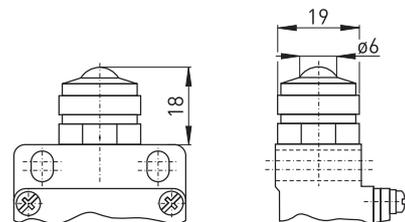
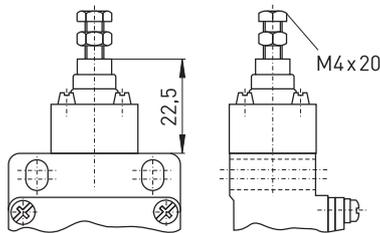
- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 0°
- Length of metal plunger adjustable by means of M4 screw for fine adjustment of switching travel
- Watertight collar for protection against penetration of dirt

**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 20°
- Vertical actuation or actuation from side possible
- Actuator with captive stainless steel ball
- Exact repeatability of switching point

**// Adjustable plunger collar WST**

**// Ball plunger KU**



**Contact variants: switch travel/contacts**

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 WST 1Ö/1S</b> 1046382	<b>ES 41 WST 1Ö/1S</b> 1046282
Material Number	<b>EM 411 WST 1Ö/1S</b> 1046683	<b>ES 411 WST 1Ö/1S</b> 1046644
1 NO/1 NC overlapping Material Number		<b>ES 41 WST UE</b> 1046498
Material Number		<b>ES 411 WST UE</b> 1046737
2 NC contacts Material Number		<b>ES 41 WST 2Ö</b> 1046523
Material Number		<b>ES 411 WST 2Ö</b> 1046758

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 KU 1Ö/1S</b> 1046379	<b>ES 41 KU 1Ö/1S</b> 1046277
Material Number	<b>EM 411 KU 1Ö/1S</b> 1046680	<b>ES 411 KU 1Ö/1S</b> 1046641
1 NO/1 NC overlapping Material Number		<b>ES 41 KU UE</b> 1046496
Material Number		<b>ES 411 KU UE</b> 1046735
2 NC contacts Material Number		<b>ES 41 KU 2Ö</b> 1046521
Material Number		<b>ES 411 KU 2Ö</b> 1046756



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

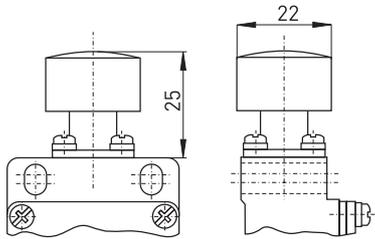
### Features/Options

- Safety switch only version with slow action
- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Watertight collar for protection against penetration of dirt

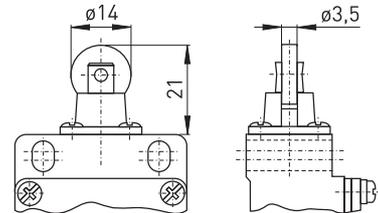
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90°

### // Cap with collar WK



### // Roller plunger R



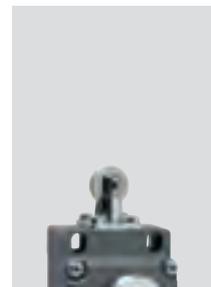
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#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 WK 10/1S</b> 1046383	<b>ES 41 WK 10/1S</b> 1046283
Material Number	<b>EM 411 WK 10/1S</b> 1046684	<b>ES 411 WK 10/1S</b> 1046645
1 NO/1 NC overlapping Material Number		<b>ES 41 WK UE</b> 1046499
Material Number		<b>ES 411 WK UE</b> 1046738
2 NC contacts Material Number		<b>ES 41 WK 20</b> 1046524
Material Number		<b>ES 411 WK 20</b> 1046759

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 R 10/1S</b> 1046384	<b>ES 41 R 10/1S</b> 1046284
Material Number	<b>EM 411 R 10/1S</b> 1046685	<b>ES 411 R 10/1S</b> 1046646
1 NO/1 NC overlapping Material Number		<b>ES 41 R UE</b> 1046500
Material Number		<b>ES 411 R UE</b> 1046739
2 NC contacts Material Number		<b>ES 41 R 20</b> 1046525
Material Number		<b>ES 411 R 20</b> 1046760



### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 25°
- Wear-resistant plastic roller
- Actuator can be repositioned by 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

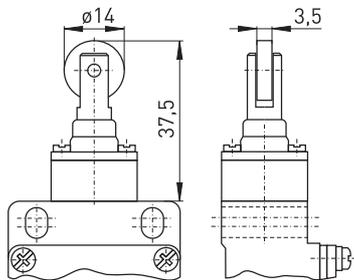
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- With metal roller available on request

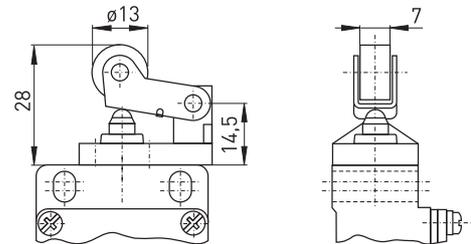
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

## // Roller plunger with collar WR



## // Roller lever H

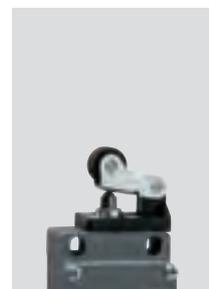
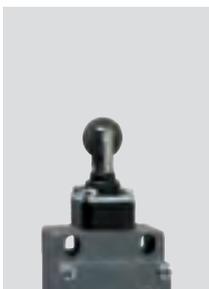


### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 WR 10/1S 1046390	ES 41 WR 10/1S 1046296
Material Number	EM 411 WR 10/1S 1046688	ES 411 WR 10/1S 1046650
1 NO/1 NC overlapping Material Number		ES 41 WR UE 1046501
Material Number		ES 411 WR UE 1046740
2 NC contacts Material Number		ES 41 WR 20 1046527
Material Number		ES 411 WR 20 1046761

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 H 10/1S 1046392	ES 41 H 10/1S 1046298
Material Number	EM 411 H 10/1S 1046690	ES 411 H 10/1S 1046651
1 NO/1 NC overlapping Material Number		ES 41 H UE 1046502
Material Number		ES 411 H UE 1046741
2 NC contacts Material Number		ES 41 H 20 1046528
Material Number		ES 411 H 20 1046762



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

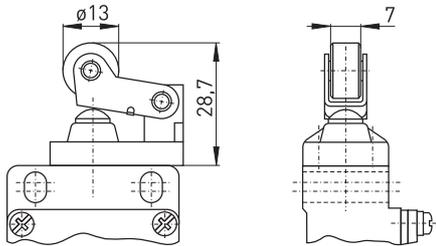
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- With metal roller available on request

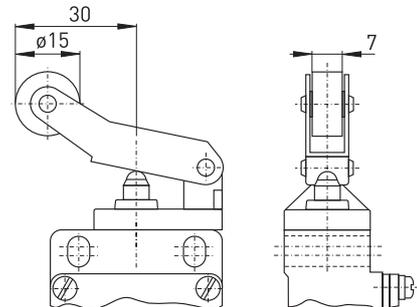
### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

### // Roller lever collar WH



### // Long roller lever HL



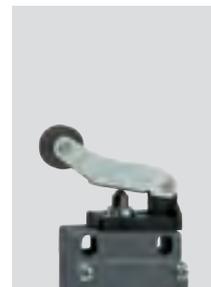
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### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 WH 10/1S 1046408	ES 41 WH 10/1S 1046305
Material Number	EM 411 WH 10/1S 1046697	ES 411 WH 10/1S 1046654
1 NO/1 NC overlapping Material Number		ES 41 WH UE 1046504
Material Number		ES 411 WH UE 1046742
2 NC contacts Material Number		ES 41 WH 20 1046529
Material Number		ES 411 WH 20 1046763

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 HL 10/1S 1046417	ES 41 HL 10/1S 1046316
Material Number	EM 411 HL 10/1S 1046700	ES 411 HL 10/1S 1046656
1 NO/1 NC overlapping Material Number		ES 41 HL UE 1046505
Material Number		ES 411 HL UE 1046743
2 NC contacts Material Number		ES 41 HL 20 1046531
Material Number		ES 411 HL 20 1046764



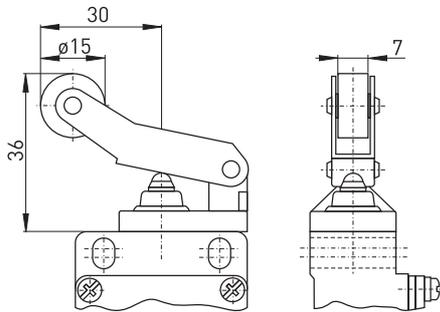
**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

**Note**

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

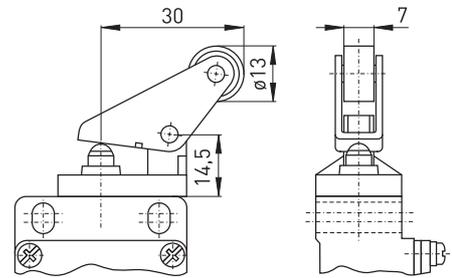
// Long roller lever collar WHL



**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with an actuating angle of  $30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- With metal roller available on request

// Parallel roller lever PH



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 WHL 10/1S 1046421	ES 41 WHL 10/1S 1046318
Material Number	EM 411 WHL 10/1S 1046702	ES 411 WHL 10/1S 1046657
1 NO/1 NC overlapping Material Number		ES 41 WHL UE 1046506
Material Number		ES 411 WHL UE 1046744
2 NC contacts Material Number		ES 41 WHL 20 1046532
Material Number		ES 411 WHL 20 1046765

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 PH 10/1S 1046431	ES 41 PH 10/1S 1046324
Material Number	EM 411 PH 10/1S 1046706	ES 411 PH 10/1S 1046661
1 NO/1 NC overlapping Material Number		ES 41 PH UE 1046509
Material Number		ES 411 PH UE 1046747
2 NC contacts Material Number		ES 41 PH 20 1046538
Material Number		ES 411 PH 20 1046768



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

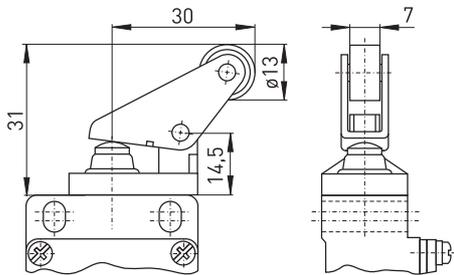
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

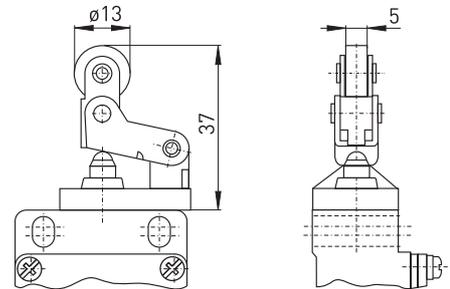
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- With metal roller available on request

### // Parallel roller lever collar WPH



### // Offset roller lever HK



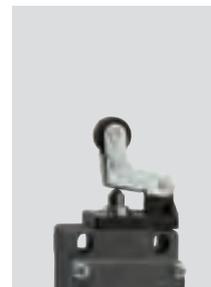
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#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 WPH 10/1S</b> 1046434	<b>ES 41 WPH 10/1S</b> 1046325
Material Number	<b>EM 411 WPH 10/1S</b> 1046711	<b>ES 411 WPH 10/1S</b> 1046662
1 NO/1 NC overlapping Material Number		<b>ES 41 WPH UE</b> 1046510
Material Number		<b>ES 411 WPH UE</b> 1046748
2 NC contacts Material Number		<b>ES 41 WPH 20</b> 1046539
Material Number		<b>ES 411 WPH 20</b> 1046769

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 41 HK 10/1S</b> 1046426	<b>ES 411 HK 10/1S</b> 1046321
Material Number	<b>EM 411 HK 10/1S</b> 1046703	<b>ES 411 HK 10/1S</b> 1046659
1 NO/1 NC overlapping Material Number		<b>ES 41 HK UE</b> 1046507
Material Number		<b>ES 411 HK UE</b> 1046745
2 NC contacts Material Number		<b>ES 41 HK 20</b> 1046533
Material Number		<b>ES 411 HK 20</b> 1046766



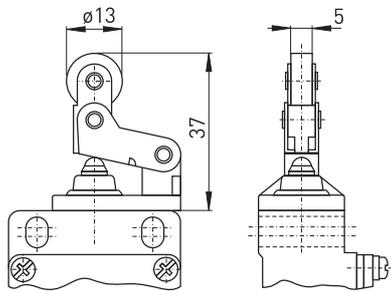
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 40°
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

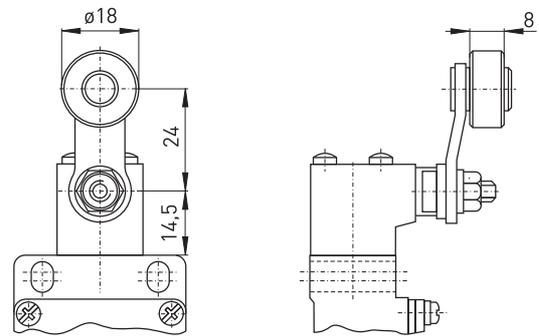
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

## // Offset roller lever collar WHK



## // Rocking lever D

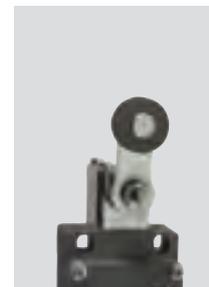
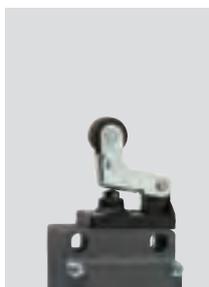


### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 WHK 1Ö/1S 1046427	ES 41 WHK 1Ö/1S 1046323
Material Number	EM 411 WHK 1Ö/1S 1046705	ES 411 WHK 1Ö/1S 1046660
1 NO/1 NC overlapping Material Number		ES 41 WHK UE 1046508
Material Number		ES 411 WHK UE 1046746
2 NC contacts Material Number		ES 41 WHK 2Ö 1046534
Material Number		ES 411 WHK 2Ö 1046767

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 D 1Ö/1S 1046438	ES 41 D 1Ö/1S 1046327
Material Number	EM 411 D 1Ö/1S 1046712	ES 411 D 1Ö/1S 1046664
1 NO/1 NC overlapping Material Number		ES 41 D UE 1046511
Material Number		ES 411 D UE 1046749
2 NC contacts Material Number		ES 41 D 2Ö 1046540
Material Number		ES 411 D 2Ö 1046770



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

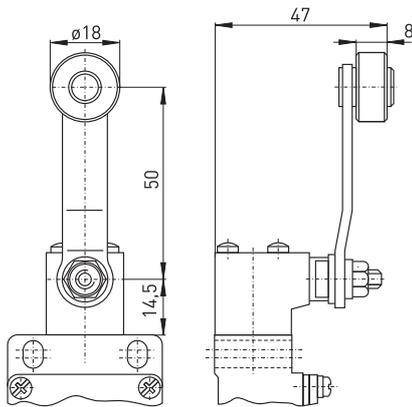
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

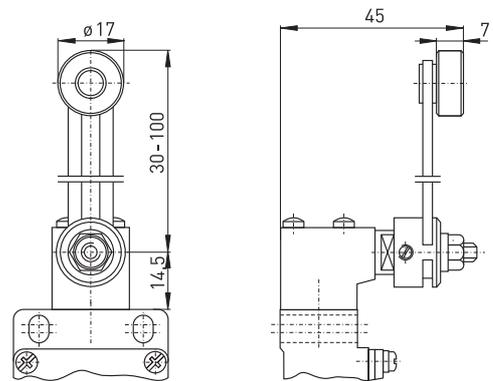
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

### // Long rocking lever DL



### // Adjustable rocking lever DS



114

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 DL 10/1S 1046448	ES 41 DL 10/1S 1046336
Material Number	EM 411 DL 10/1S 1046715	ES 411 DL 10/1S 1046666
1 NO/1 NC overlapping Material Number		ES 41 DL UE 1046513
Material Number		ES 411 DL UE 1046750
2 NC contacts Material Number		ES 41 DL 20 1046543
Material Number		ES 411 DL 20 1046771

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 DS 10/1S 1046463	ES 41 DS 10/1S 1046345
Material Number	EM 411 DS 10/1S 1046720	ES 411 DS 10/1S 1046671
1 NO/1 NC overlapping Material Number		ES 41 DS UE 1046516
Material Number		ES 411 DS UE 1046753
2 NC contacts Material Number		ES 41 DS 20 1046546
Material Number		ES 411 DS 20 1046774



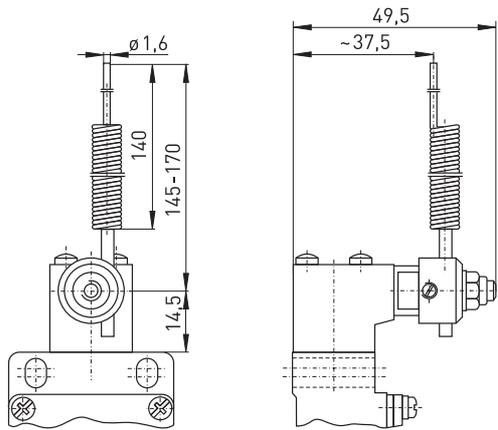
**Features/Options**

- No safety switch!
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

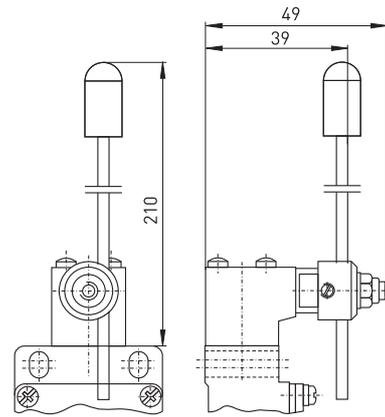
**Features/Options**

- No safety switch!
- Wear-resistant plastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

**// Spring-rod lever DF**



**// Rod lever DD**



**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 DF 10/1S 1046460	ES 41 DF 10/1S 1046344
Material Number	EM 411 DF 10/1S 1046718	ES 411 DF 10/1S 1046670
1 NO/1 NC overlapping Material Number		ES 41 DF UE 1046515
Material Number		ES 411 DF UE 1046752
2 NC contacts Material Number		ES 41 DF 20 1046545
Material Number		ES 411 DF 20 1046773

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 DD 10/1S 1046454	ES 41 DD 10/1S 1046343
Material Number	EM 411 DD 10/1S 1046717	ES 411 DD 10/1S 1046668
1 NO/1 NC overlapping Material Number		ES 41 DD UE 1046514
Material Number		ES 411 DD UE 1046751
2 NC contacts Material Number		ES 41 DD 20 1046544
Material Number		ES 411 DD 20 1046772



# Position switches with/without safety function

## // Series ES/EM 41 and ES/EM 411, actuators

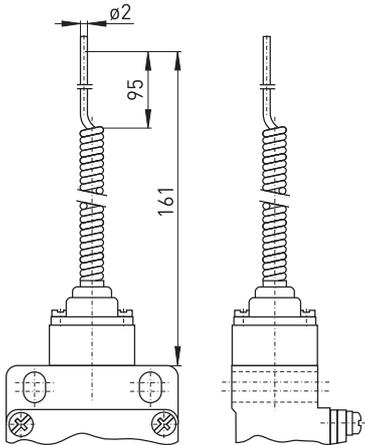
### Features/Options

- No safety switch!
- Spring rod can be actuated from any direction
- Spring rod can be shortened 30 mm in actuating area
- Exact linear actuation not necessary
- Elasticity of the spring allows for deflection above the max. switching angle

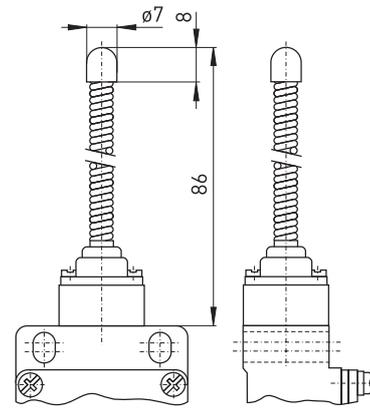
### Features/Options

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

### // Long spring rod TL



### // Spring rod with steel tip TF



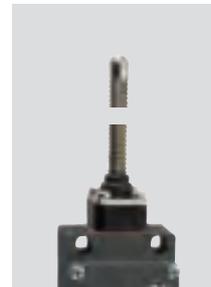
116

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Materialnummer	EM 41 TL 10/1S 1046468	ES 41 TL 10/1S
Material Number	EM 411 TL 10/1S 1046722	ES 411 TL 10/1S
2 NC contacts Material Number		ES 41 TL 20
Material Number		ES 411 TL 20

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 TF 10/1S 1046471	ES 41 TF 10/1S 1159563
Material Number	EM 411 TF 10/1S 1046723	ES 411 TF 10/1S 1046672
2 NC contacts Material Number		ES 41 TF 20 1182124
Material Number		ES 411 TF 20 1169189



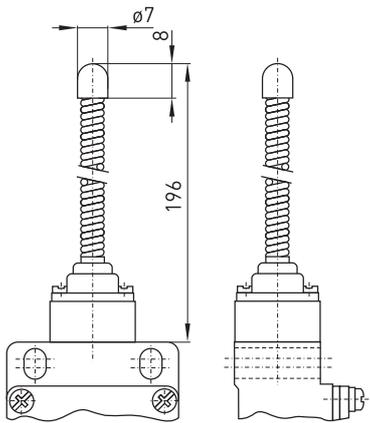
**Features/Options**

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

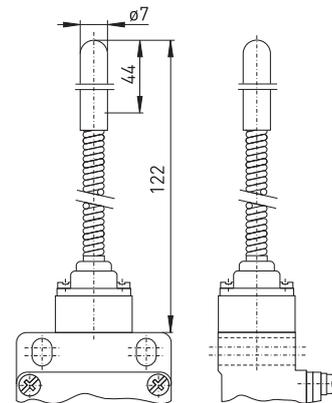
**Features/Options**

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

**// Long spring rod with steel tip TFL**



**// Spring rod with plastic tip TK**



**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 TFL 1Ö/1S 1046481	ES 41 TFL 1Ö/1S 1167396
Material Number	EM 411 TFL 1Ö/1S 1046728	ES 411 TFL 1Ö/1S
2 NC contacts Material Number		ES 41 TFL 2Ö 1053803
Material Number		ES 411 TFL 2Ö

**Contact variants: switch travel/contacts**

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 41 TK 1Ö/1S 1046477	ES 41 TK 1Ö/1S
Material Number	EM 411 TK 1Ö/1S 1046724	ES 411 TK 1Ö/1S 1046674
2 NC contacts Material Number		ES 41 TK 2Ö 1046547
Material Number		ES 411 TK 2Ö



# Position switches with/without safety function

## // Series ES/EM 61

### Features/Options

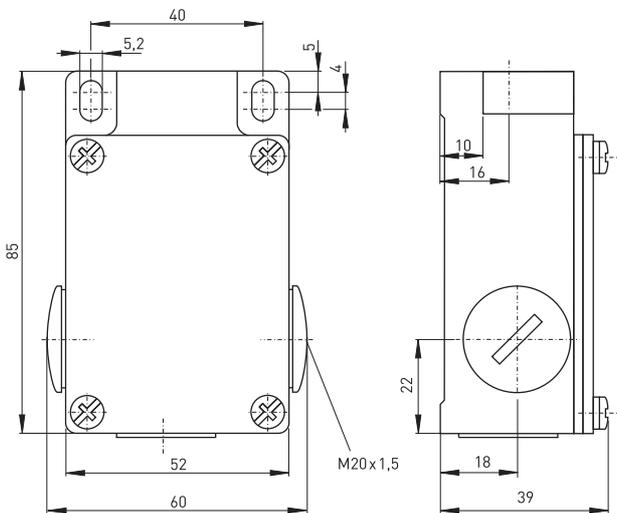
- Metal enclosure
- Slow action  $\ominus$ , change-over contact or 2 NC contacts with double break
- Snap action, change-over contact with double break
- Available with overlapping contacts
- 3 cable entries M20 x 1.5
- Actuator can be repositioned by 4 x 90°
- Ex version available

## // ES/EM 61



## Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	aluminium die-cast, enamel finish
<b>Degree of protection</b>	IP 65 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow or snap action; slow action positive break NC contacts $\ominus$ change-over contact or 2 NC contacts with double break Zb, galvanically separated contact bridges
<b>Switching elements</b>	
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 2.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	3 x M20 x 1.5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	6 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>Utilisation category</b>	AC-15
<b>I<sub>e</sub>/U<sub>e</sub></b>	ES 61: 16 A/400 VAC ES 61 2Ö: 6 A/400 VAC EM 61: 6 A/400 VAC
<b>Max. fuse rating</b>	ES 61: 16 A gG/gN fuse ES 61 2Ö: 6 A gG/gN fuse EM 61: 6 A gG/gN fuse
<b>Mechanical life</b>	> 1 million operations
<b>Frequency of operation</b>	3600/h
<b>Ambient temperature</b>	- 20 °C ... + 80 °C
<b>Repeat accuracy of switching points</b>	± 0,1 mm
<b>Approvals</b>	 



### Type code

EM 61 WH 1Ö/1S

- Contact type 1NC/1NO, (2Ö, UE)
- Actuator H (R, HK, D, etc. ...)
- Watertight collar
- Series
- M Snap action (S Slow action)

# Position switches with/without safety function

## // Series ES/EM 61, actuators

### Features/Options

- With gold-plated contacts available on request
- Available on request with plug-in connector M12 x 1, 5-pole

### Note

When used as safety switch, secure the enclosure against slipping with appropriate means, e.g. pinning.

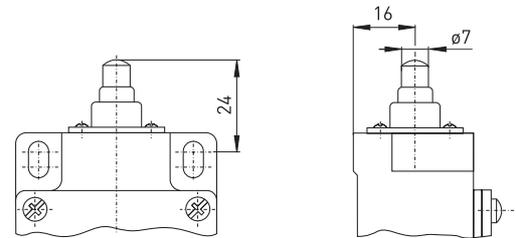
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 15°
- Exact repeatability of switching point
- Watertight collar for protection against penetration of dirt

### // Connector M12 x 1, 5-pole



### // Plunger with collar W



### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 W 10/1S</b> <b>1047870</b> 	<b>ES 61 W 10/1S</b> <b>1047803</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 W UE</b> <b>1047914</b> 
2 NC contacts Material Number		<b>ES 61 W 20</b> <b>1047966</b> 



# Position switches with/without safety function

## // Series ES/EM 61, actuators

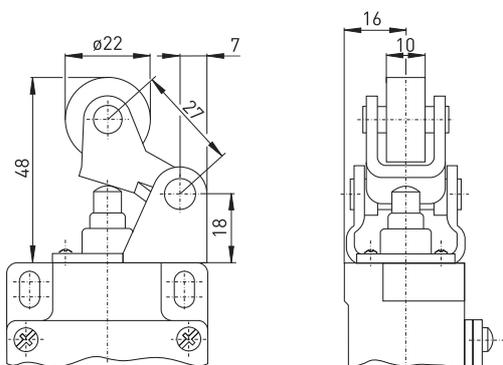
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 25^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

## // Roller lever with collar WH



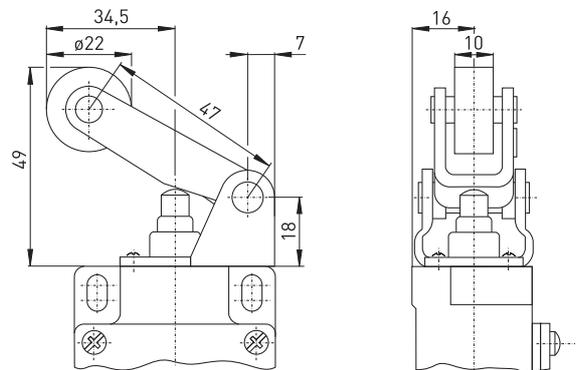
### Features/Options

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha = 40^\circ$  and  $\beta = 30^\circ$
- Wear-resistant plastic roller
- Actuator can be repositioned by  $4 \times 90^\circ$
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

### Note

Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

## // Long roller lever collar WHL



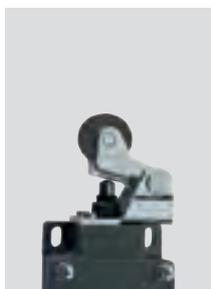
120

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 WH 10/1S</b> <b>1047876</b> 	<b>ES 61 WH 10/1S</b> <b>1047807</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 WH UE</b> <b>1047916</b> 
2 NC contacts Material Number		<b>ES 61 WH 20</b> <b>1047969</b> 

### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 WHL 10/1S</b> <b>1047884</b> 	<b>ES 61 WHL 10/1S</b> <b>1047811</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 WHL UE</b> <b>1047918</b> 
2 NC contacts Material Number		<b>ES 61 WHL 20</b> <b>1047971</b> 



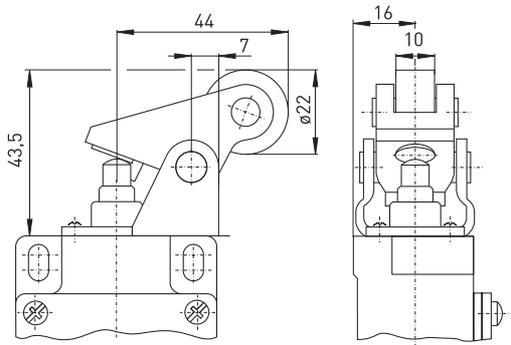
**Features/Options**

- Safety switch only version with slow action
- Actuating speed max. 0.5 m/s with an actuating angle of 30°
- Actuation parallel to switch from below
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

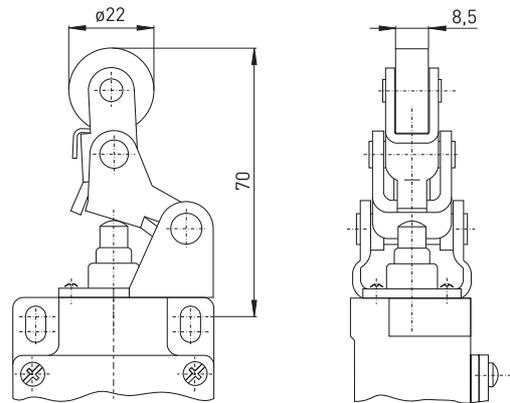
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of  $\alpha$  and  $\beta = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from left-hand side
- Wear-resistant plastic roller
- Actuator can be repositioned by 4 x 90°
- Watertight collar for protection against penetration of dirt
- With metal roller available on request

// Parallel roller lever collar WPH



// Offset roller lever collar WHK

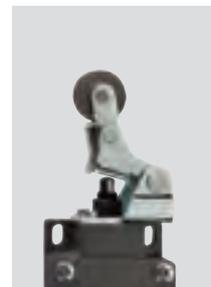


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 WPH 10/1S</b> <b>1047889</b> 	<b>ES 61 WPH 10/1S</b> <b>1047818</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 WPH UE</b> <b>1047922</b>
2 NC contacts Material Number		<b>ES 61 WPH 20</b> <b>1047975</b> 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 WHK 10/1S</b> <b>1047886</b> 	<b>ES 61 WHK 10/1S</b> <b>1047816</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 WHK UE</b> <b>1047920</b> 
2 NC contacts Material Number		<b>ES 61 WHK 20</b> <b>1047973</b> 



# Position switches with/without safety function

## // Series ES/EM 61, actuators

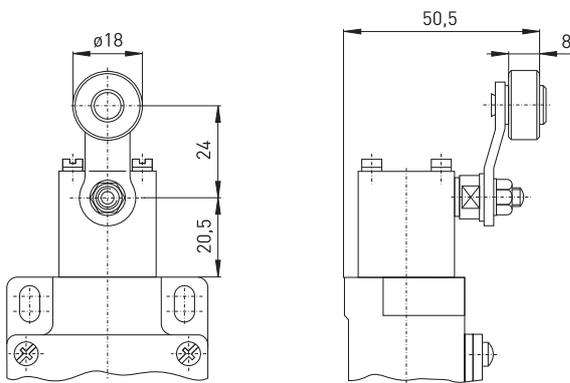
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

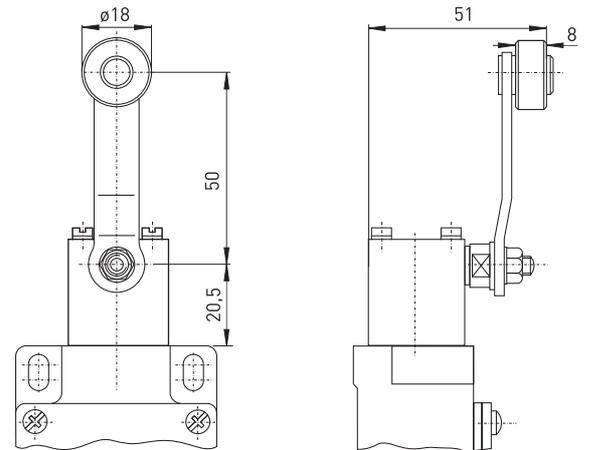
### Features/Options

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

### // Rocking lever D



### // Long rocking lever DL



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 D 10/1S</b> <b>1047891</b> 	<b>ES 61 D 10/1S</b> <b>1047819</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 D UE</b> <b>1047923</b> 
2 NC contacts Material Number		<b>ES 61 D 20</b> <b>1163751</b> 

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 DL 10/1S</b> <b>1047895</b> 	<b>ES 61 DL 10/1S</b> <b>1047820</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 DL UE</b> <b>1047924</b> 
2 NC contacts Material Number		<b>ES 61 DL 20</b> <b>1182267</b> 



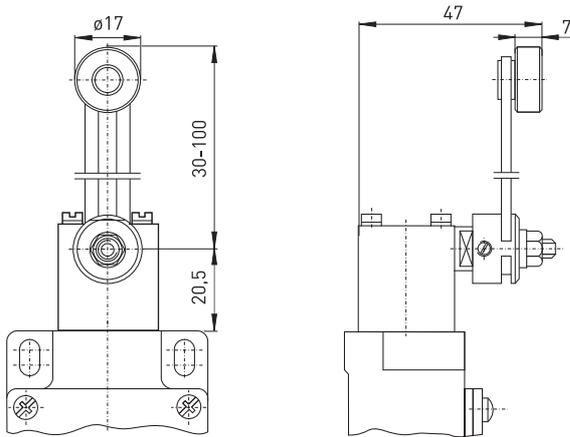
**Features/Options**

- No safety switch!
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Wear-resistant plastic roller
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°
- With metal roller available on request

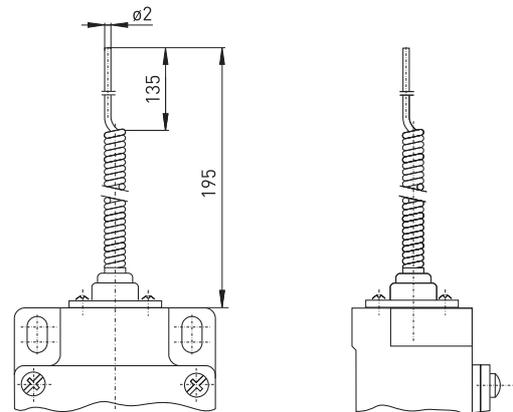
**Features/Options**

- No safety switch!
- Spring rod can be actuated from any direction
- Spring rod can be shortened 30 mm in actuating area
- Exact linear actuation not necessary
- Elasticity of the spring allows for deflection above the max. switching angle

**// Adjustable rocking lever DS**



**// Long spring rod TL**



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 61 DS 10/1S 1047898 	ES 61 DS 10/1S 1047823 
1 NO/1 NC overlapping Material Number		ES 61 DS UE 1047927 
2 NC contacts Material Number		ES 61 DS 20 1181846 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	EM 61 TL 10/1S 1047900 	ES 61 TL 10/1S 1165952 
1 NO/1 NC overlapping Material Number		ES 61 TL UE 1052152 
2 NC contacts Material Number		ES 61 TL 20 on request 



# Position switches with/without safety function

## // Series ES/EM 61, actuators

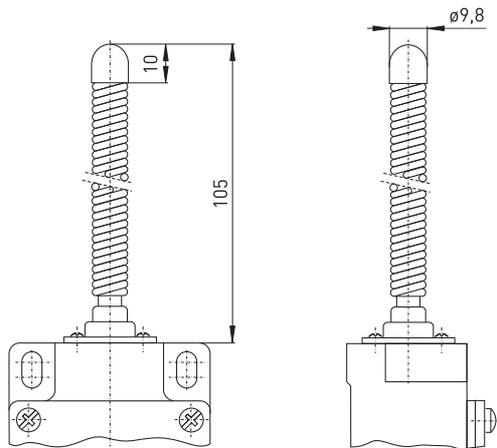
### Features/Options

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

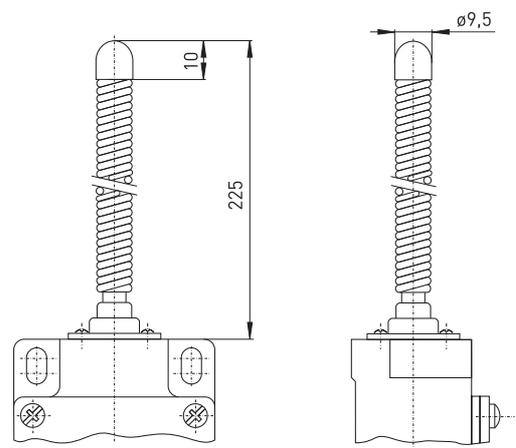
### Features/Options

- No safety switch!
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

### // Spring rod with steel tip TF



### // Long spring rod with steel tip TFL



#### Contact variants: switch travel/contacts

#### Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 TF 10/1S</b> 1047902 	<b>ES 61 TF 10/1S</b> 1181105 
1 NO/1 NC overlapping Material Number		<b>ES 61 TF UE</b> on request 
2 NC contacts Material Number		<b>ES 61 TF 20</b> 1175986 

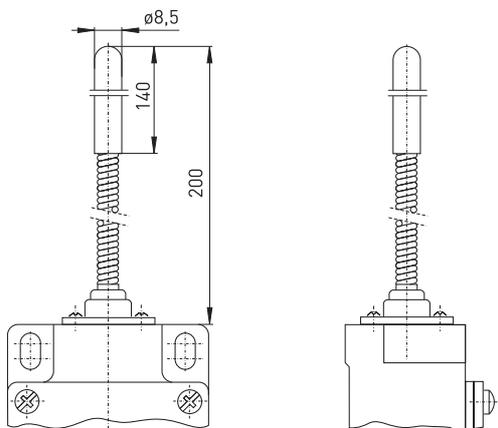
	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 TFL 10/1S</b> 1047908 	<b>ES 61 TFL 10/1S</b> 1165960 
1 NO/1 NC overlapping Material Number		<b>ES 61 TFL UE</b> on request 
2 NC contacts Material Number		<b>ES 61 TFL 20</b> 1160807 



Features/Options

- No safety switch!
- Wear-resistant plastic tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

// Spring rod with plastic tip TK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC/1 NO contact Material Number	<b>EM 61 TK 1Ö/1S</b> <b>1047903</b> 	<b>ES 61 TK 1Ö/1S</b> <b>on request</b> 
1 NO/1 NC overlapping Material Number		<b>ES 61 TK UE</b> <b>on request</b> 
2 NC contacts Material Number		<b>ES 61 TK 2Ö</b> <b>on request</b> 



# Position switches with/without safety function

## // Series ES/EM 91

### Features/Options

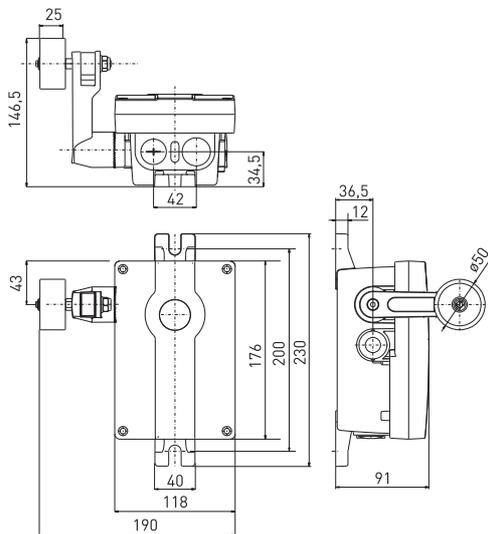
- Thermoplastic enclosure
- Slow or snap action  $\ominus$ , max. 6 contacts
- 2 cable entries M25 x 1.5
- Versions with rated operating current  $I_e$  up to 16 A available on request
- Ex version available

### // ES/EM 91 DL



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, UV resistant to EN ISO 4892
<b>Degree of protection</b>	IP 66/67 to IEC/EN 60529
<b>Switch insert</b>	ES 232 or EM 232
<b>Contact material</b>	silver
<b>Switching system</b>	slow or snap action, positive break NC contacts $\ominus$
<b>Switching elements</b>	2 NC/2NO, 4 NC/2 NO or 3 NC/3 NO contacts with double break Zb, galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 2.5 mm <sup>2</sup> (incl. conductor ferrules)
<b>Cable entry</b>	2 x M25 x 1.5
<b>B<sub>10d</sub> (10 % load)</b>	2 million
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	6 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	6 A
<b>Utilisation category</b>	AC-15
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/400 VAC
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Mechanical life</b>	> 1 million operations
<b>Ambient temperature</b>	-40 °C ... +85 °C



### Type code

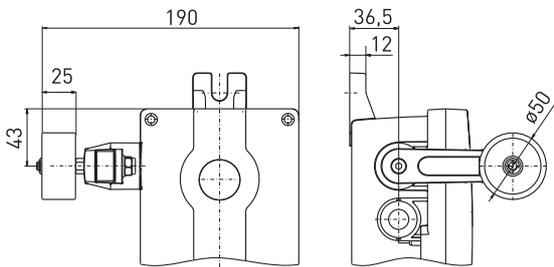
EM 91 DL-2Ö/2S

Contact type 2NC/2NO (4Ö/2S, 3Ö/3S)  
 Actuator DL  
 Series 91  
 M Snap action (S Slow action)

**Features/Options**

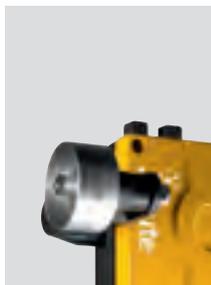
- Actuating speed max. 0.5 m/s with a vertical actuating angle of 45°
- Metal roller
- Lever can be repositioned in 6° steps clockwise or counter-clockwise

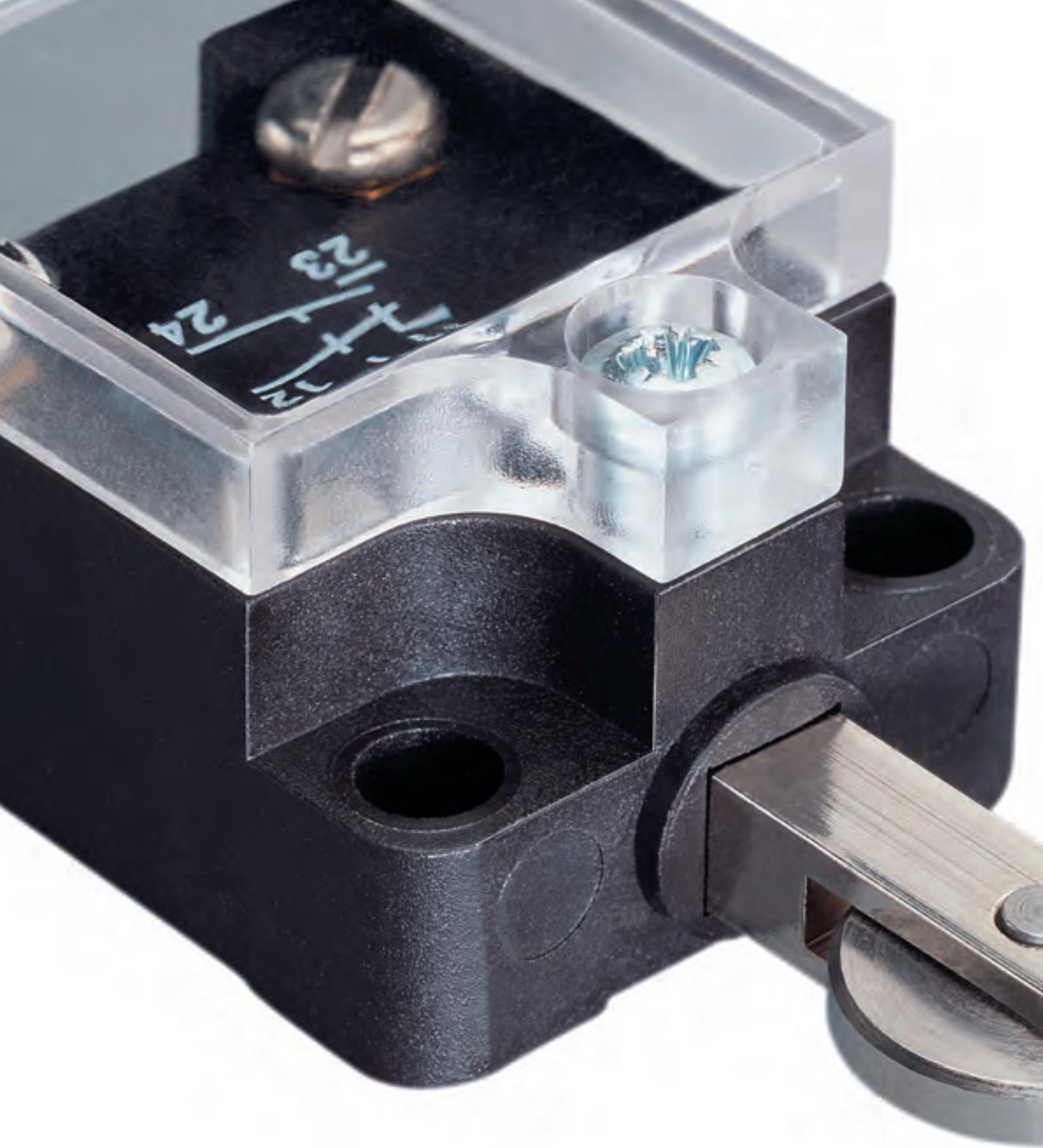
// Long rocking lever DL



Contact variants: switch travel/contacts

	Snap action	Slow action
2 NC/2 NO contact Material Number	<b>EM 91 DL 2Ö/2S</b> <b>1211724</b> 	<b>ES 91 DL 2Ö/2S</b> <b>1242734</b> 
4 NC/2 NO contact Material Number	<b>EM 91 DL 1Ö/1S</b> <b>1242732</b> 	<b>ES 91 DL 1Ö/1S</b> <b>1215301</b> 
3 NC/3 NO contacts Material Number	<b>EM 91 DL 3Ö/3S</b> <b>1215105</b> 	<b>ES 91 DL 3Ö/3S</b> <b>1213694</b> 





## Miniature limit switches

### Thermoplastic enclosure

// [Series C 50](#)

from page 132

// [Series C 500](#)

from page 136

// [Series ES 50](#)

from page 140





# Miniature limit switches

## Range of application

Miniature limit switches are used, for example, in control, regulation, precision engineering and on appliances, as well as motor vehicles.

## Design and operating principle

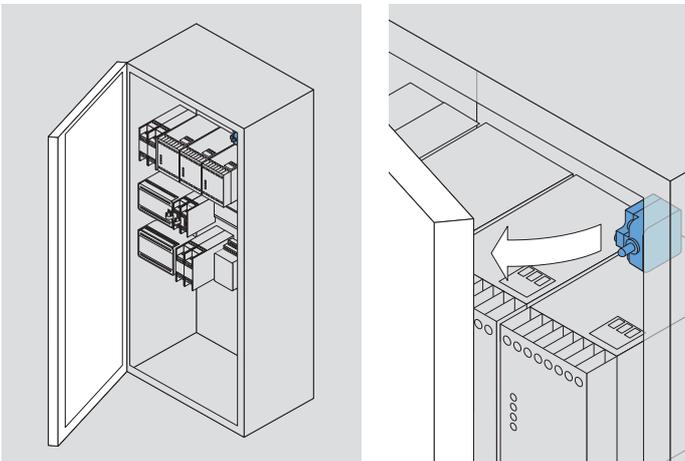
Minimum space requirement, high switching capacity and robust design are some of the many advantages of these miniature limit switches.

The miniature limit switches are available with slow action and are equipped with positive break NC contacts. A large variety of actuators are available. The miniature limit switches all have IP 30 degree of protection.

All miniature limit switches shown in this chapter bear the CE mark according to the Low Voltage Directive 06/95/EC.

## Application

Position monitoring of a control cabinet door.



# Miniature limit switches

## // Series C 50

### Features/Options

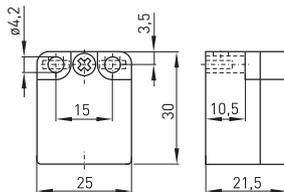
- Thermoplastic enclosure
- Change-over contact with double break, positive break NC contact ⊖
- Galvanically separated contact bridges
- Available for top mounting with 2 x M3 tapped holes

// C 50



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 18349-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Actuator</b>	plunger: brass
<b>Degree of protection</b>	IP 30 to IEC/EN 60529
<b>Degree of pollution</b>	3
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contact ⊖
<b>Switching elements</b>	change-over contact with double break Zb and galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % Load)</b>	70.000
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	4 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	4 A/400 VAC
<b>Utilisation category</b>	AC-15
<b>Max. fuse rating</b>	4 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Switching frequency</b>	1800/h
<b>Repeat accuracy of switching points</b>	± 0.1 mm
<b>Contact opening</b>	2 x 4 mm
<b>Approvals</b>	



Type code

**C 50 R 10/1S**

Series  
Contact type 1NC/1NO  
Actuator R (ST, K,)

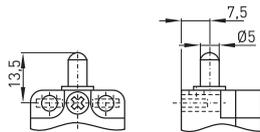
# Miniature limit switches

## // Series C 50, actuators

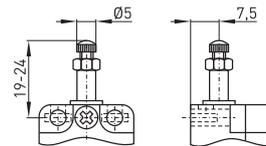
### Features/Options

- Plunger with knurled-head setting screw
- Length of metal plunger adjustable for fine adjustment of switching travel

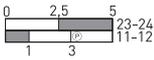
### // Plunger



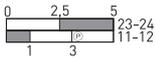
### // Adjustable plunger ST



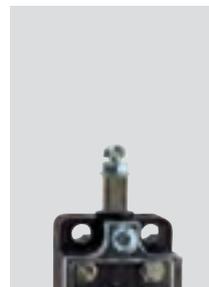
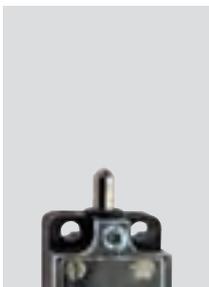
#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 50 1Ö/1S 	1046955

#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 50 ST 1Ö/1S 	1046958

133



# Miniature limit switches

## // Series C 50, actuators

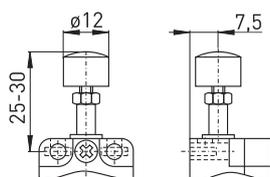
### Features/Options

- Adjustable thermoplastic cap
- Large actuating surface
- Safe switching even with imprecise actuation

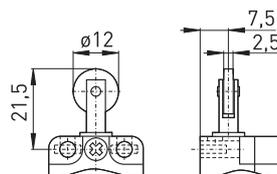
### Features/Options

- Available on request with roller plunger turned 90°

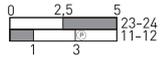
### // Cap K



### // Roller plunger R

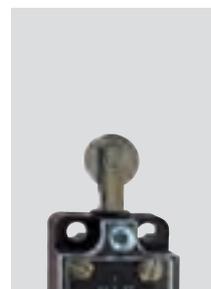
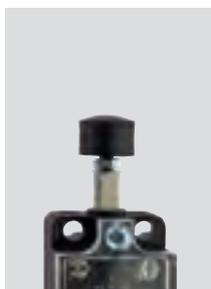


#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 50 K 10/1S 	1046960

#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 50 R 10/1S 	1046962



PRODUCTION PROCESS ASSEMBLY  
ASSEMBLY OF MINIATURE LIMIT SWITCHES



# Miniature limit switches

## // Series C 500

### Features/Options

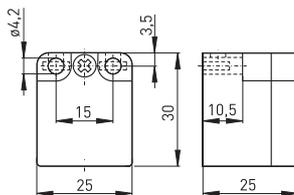
- Thermoplastic enclosure
- Change-over contact with double break, positive break NC contact ⊖
- Galvanically separated contact bridges
- Available for top mounting with 2 x M3 tapped holes

// C 500



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Actuator</b>	plunger: brass
<b>Degree of protection</b>	IP 30 to IEC/EN 60529
<b>Degree of pollution</b>	3
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contact ⊖
<b>Switching elements</b>	change-over contact with double break Zb and galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % Load)</b>	70.000
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	4 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	4 A/400 VAC
<b>Utilisation category</b>	AC-15
<b>Max. fuse rating</b>	4 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Switching frequency</b>	1800/h
<b>Repeat accuracy of switching points</b>	± 0.1 mm
<b>Contact opening</b>	2 x 4 mm
<b>Approvals</b>	



Type code

**C 500 R 1Ö/1S**

Series | Contact type 1NC/1NO  
Actuator R (ST)

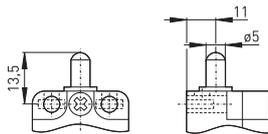
# Miniature limit switches

## // Series C 500, actuators

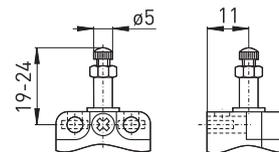
### Features/Options

- Plunger with knurled-head setting screw
- Length of metal plunger adjustable for fine adjustment of switching travel

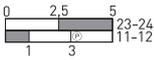
### // Plunger



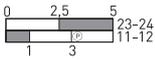
### // Adjustable plunger ST



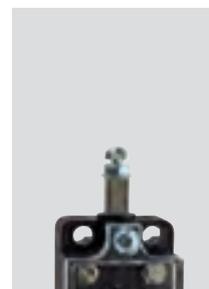
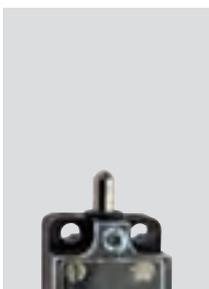
#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 500 10/1S 	1046930

#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	C 500 ST 10/1S 	1046931

137



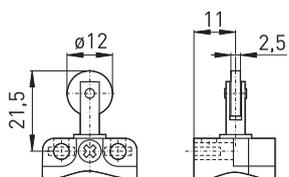
# Miniature limit switches

## // Series C 500, actuators

### Features/Options

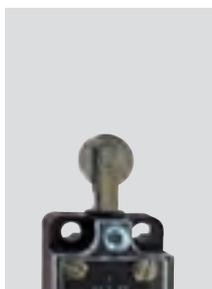
- Available on request with roller plunger turned 90°

### // Roller plunger R



### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>C 500 R 10/15</b> 	1046932



PRODUCTION PROCESS ASSEMBLY  
PRODUCTION AND URGENT ORDERS

GmbH -Zentrallager-  
A3

14911



50 Stck

: 26.01.06

000000

Ausfall

Datum

Name

NG SAUFTRAG

140074

Controle

41001

500 Stck

: 25.01.06

002/80708004

NG SAUFTRAG

139783

GmbH  
A3

**EILT**

50 Stck

41915

M16x1,5 hinten, Noryldeckel

: 25.01.06

002/80809003

Ausfall

Datum

Name

PRO/ENGINEER

Maßstab 2:1  
Werkstoff

Type  
EM 41 WH 10/15

Benennung

Name

Datum

# Miniature limit switches

## // Series ES 50

### Features/Options

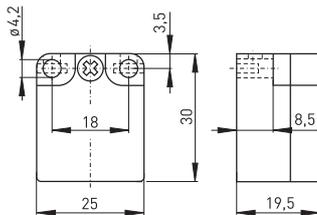
- Thermoplastic enclosure
- Change-over contact with double break, positive break NC contact ⊖
- Galvanically separated contact bridges
- Available for top mounting with 2 x M3 tapped holes

// ES 50



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Actuator</b>	plunger: brass
<b>Degree of protection</b>	IP 30 to IEC/EN 60529
<b>Degree of pollution</b>	3
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contact ⊖
<b>Switching elements</b>	change-over contact with double break Zb and galvanically separated contact bridges
<b>Connection</b>	screw connection terminals
<b>Cable cross-section</b>	max. 1.5 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % Load)</b>	70.000
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	400 V
<b>I<sub>the</sub></b>	4 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	4 A/400 VAC
<b>Utilisation category</b>	AC-15
<b>Max. fuse rating</b>	4 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	> 1 million operations
<b>Switching frequency</b>	1800/h
<b>Repeat accuracy of switching points</b>	± 0.1 mm
<b>Contact opening</b>	2 x 4 mm
<b>Approvals</b>	US PCG



Type code

ES 50 R 10/1S

Contact type 1NC/1NO
   
 Actuator R (ST, K,)
   
 Series
   
 S Slow action

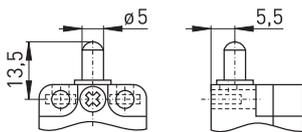
# Miniature limit switches

## // Series ES 50, actuators

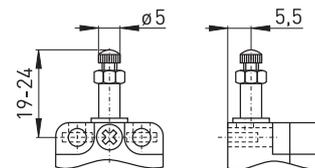
### Features/Options

- Plunger with knurled-head setting screw
- Length of metal plunger adjustable for fine adjustment of switching travel

### // Plunger



### // Adjustable plunger ST



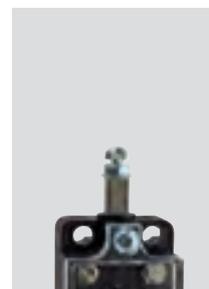
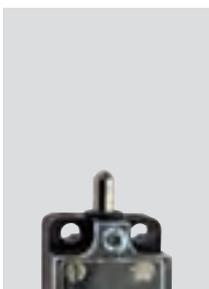
#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 50 10/1S	1046984

#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 50 ST 10/1S	1046989

141



# Miniature limit switches

## // Series ES 50, actuators

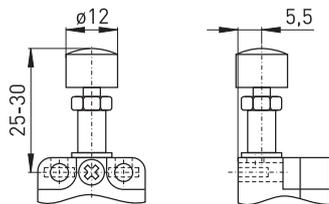
### Features/Options

- Adjustable thermoplastic cap
- Large actuating surface
- Safe switching even with imprecise actuation

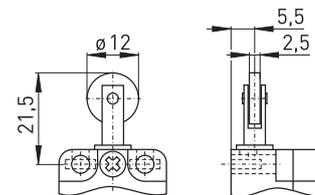
### Features/Options

- Available on request with roller plunger turned 90°

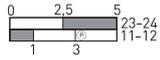
### // Cap K



### // Roller plunger R

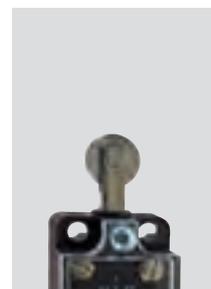
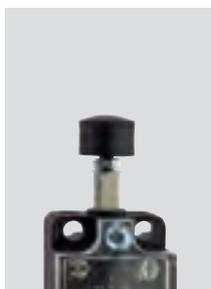


#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 50 K 10/1S 	1046991

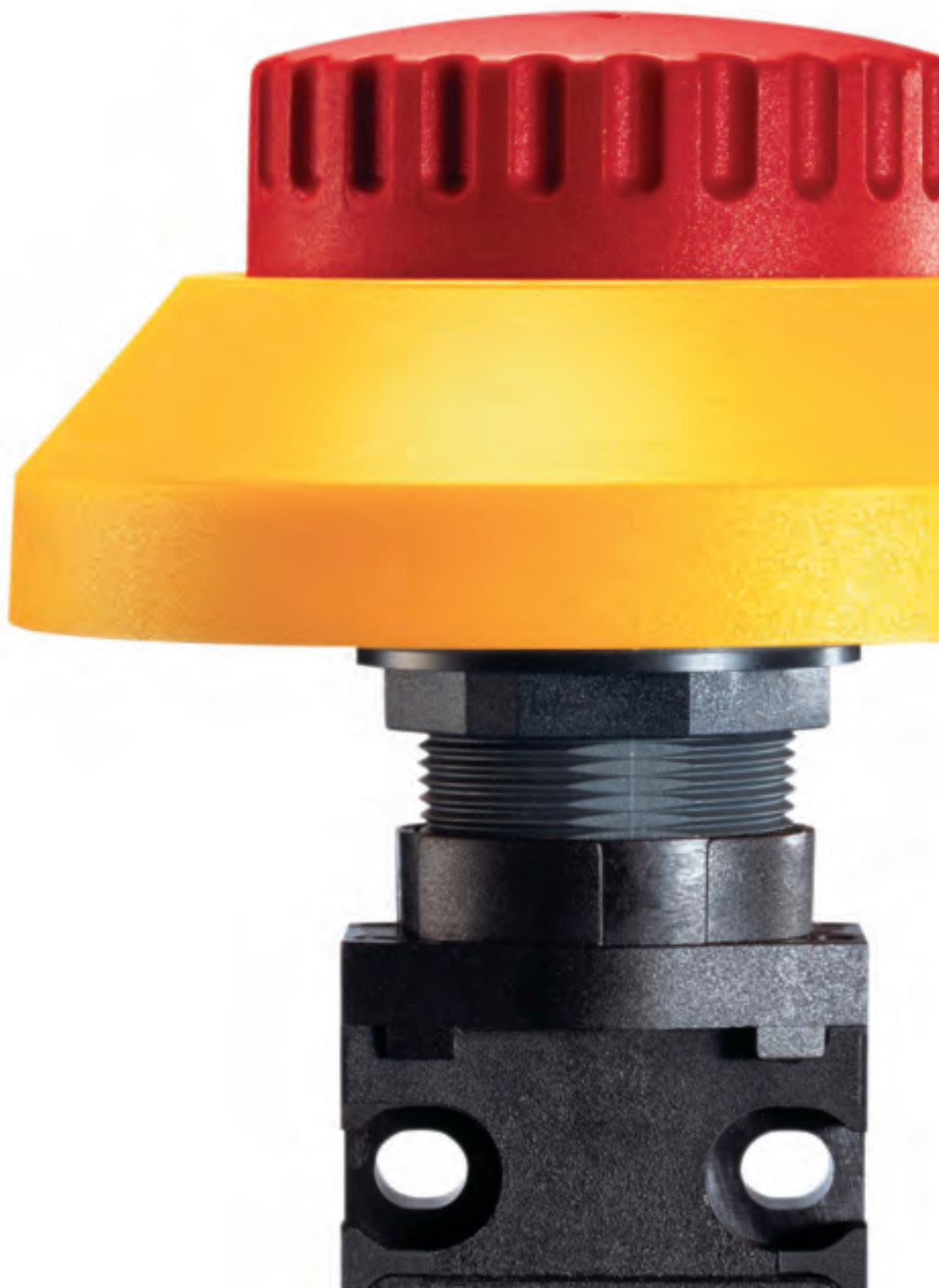
#### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 50 R 10/1S 	1046992



PRODUCTION PROCESS ASSEMBLY  
PREASSEMBLY FOR MINIATURE LIMIT SWITCHES

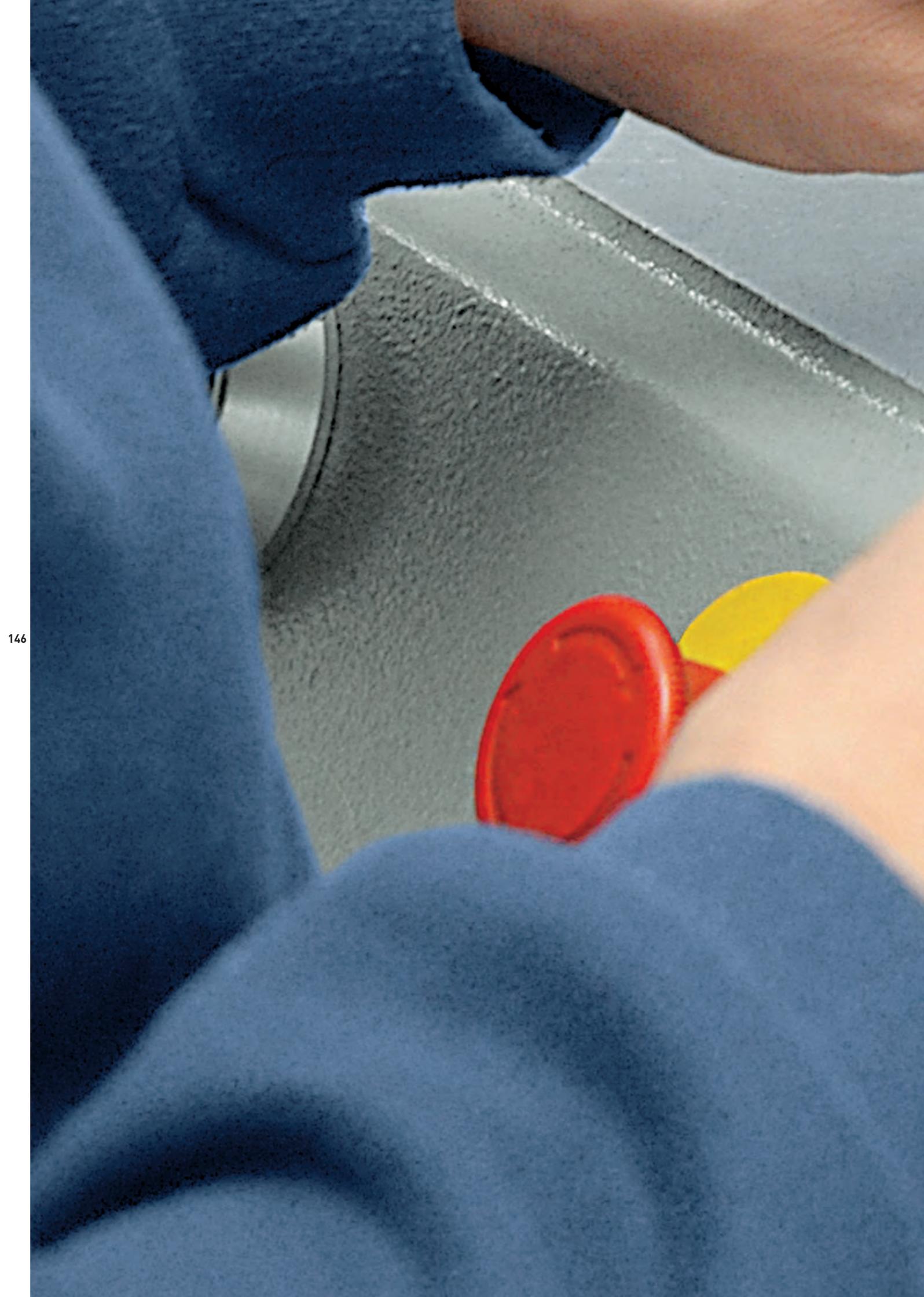




## Command devices

Thermoplastic enclosure  
// [Series ES 14](#)  
from page 148





# Command devices

## Range of application

Command devices are mounted in switchboards, control panels, two-hand control panels and in the lift industry. On manual actuation, the devices start or terminate operating sequences and functional processes.

There are versions as push-buttons, semi-rotary, key-operated and emergency-stop switches. The emergency-stop devices are wired in the safety circuit of machinery or plants. They fulfil the requirements of EN 60204-1.

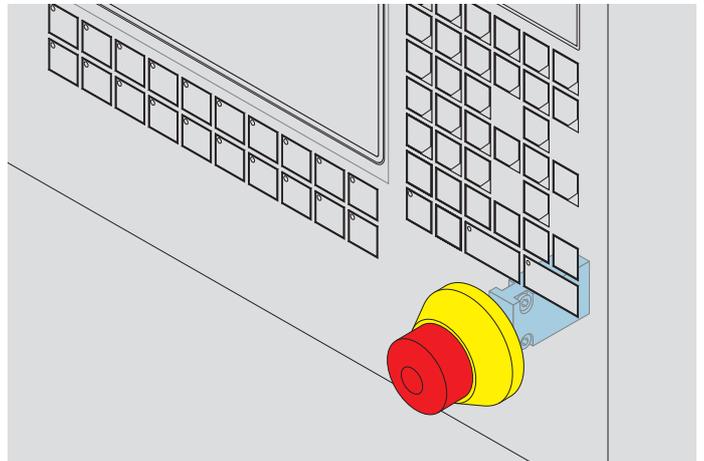
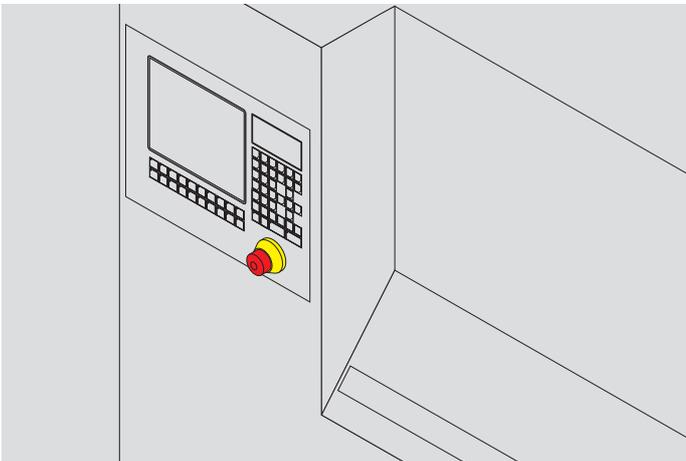
## Design and operating principle

The command devices are fit for  $\varnothing 22.5$  mm mounting holes and suitable for spacings of 30 mm between centres. All command devices provide degree of protection IP 65/67 and are double insulated for class II.

The actuator is connected to the ES14 switch by a bayonet fastener. Available switching elements with slow action are: emergency-stop push-buttons, push-buttons with and without diaphragm, selectors, control switches and key-operated switches.

All command devices shown in this chapter bear the CE mark according to the Low Voltage Directive 06/95/EC and the emergency-stop push-buttons according to the Machinery Directive 2006/42/EC.

## Application



# Command devices

## // Series ES 14

### Features/Options

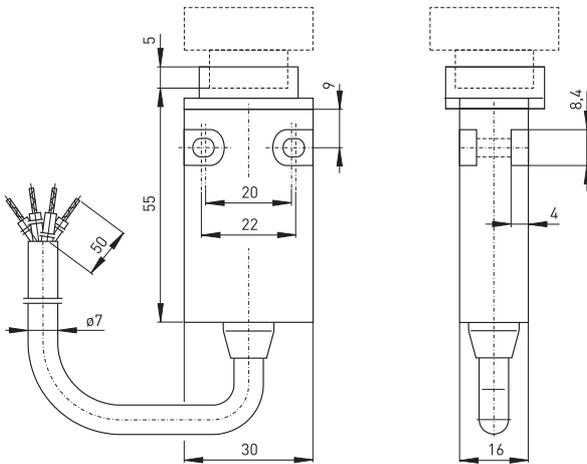
- Thermoplastic enclosure
- Double insulated
- Slow action  $\ominus$ , change-over contact or 2 NC contacts with double break
- Overlapping contacts available
- Mounting hole diameter 22.5 mm
- With pre-wired cable, cable length 1 meter
- Ex version available

// ES 14



### Technical data

<b>Standards</b>	EN 60947-5-1; EN ISO 13849-1
<b>Enclosure</b>	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
<b>Degree of protection</b>	IP 65/67 to IEC/EN 60529
<b>Contact material</b>	silver
<b>Switching system</b>	slow action, positive break NC contacts $\ominus$
<b>Switching elements</b>	change-over contact with double break or 2 NC contacts, galvanically separated contact bridges
<b>Connection</b>	cable H05VV-F
<b>Cable cross-section</b>	4 x 0.75 mm <sup>2</sup>
<b>B<sub>10d</sub> (10 % load)</b>	60 000
<b>T<sub>M</sub></b>	max. 20 years
<b>U<sub>imp</sub></b>	4 kV
<b>U<sub>i</sub></b>	250 V
<b>I<sub>the</sub></b>	6 A
<b>I<sub>e</sub>/U<sub>e</sub></b>	6 A/250 VAC; 0.25 A/230 VDC
<b>Utilisation category</b>	AC-15, DC-13
<b>Max. fuse rating</b>	6 A gG/gN fuse
<b>Ambient temperature</b>	-20 °C ... +75 °C
<b>Mechanical life</b>	>30 000 operations
<b>Frequency of operation</b>	1800/h
<b>Contact opening</b>	2 x 4 mm
<b>Approvals</b>	 



### Type code

ES 14 RUV-S 10/IS-1m

- Cable length 1 m
- Contact type 1NC/1NO (2Ö)
- Cable on side
- Actuator RUV (RT, RSSA, RW, etc. ...)
- Series
- S Slow action

# Command devices

## // Series ES 14, actuators

### Features/Options

- With gold-plated contacts available on request

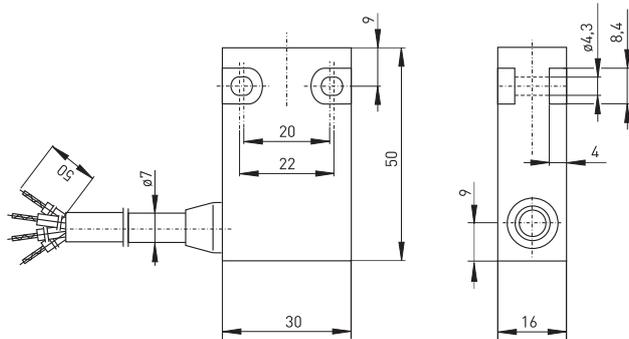
### Features/Options

- With pre-wired cable, cable length 1 meter
- Degree of protection IP 65

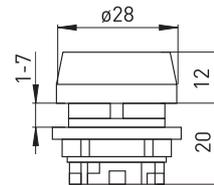
// Connector M12 x 1, 4-pole



// Cable on side

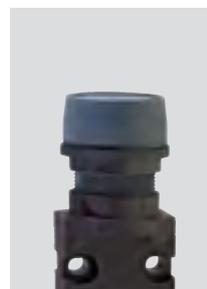


// Push-button RT



Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	ES 14 RT 	1051617



# Command devices

## // Series ES 14, actuators

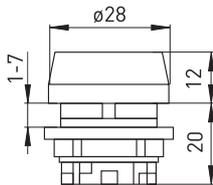
### Features/Options

- Diaphragm of transparent silicon material
- IP 67 for actuators with diaphragm
- With pre-wired cable, cable length 1 meter

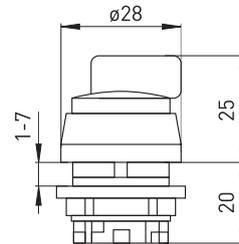
### Features/Options

- Selector with rest positions
- Available in 3 different versions
- Degree of protection IP 65
- With pre-wired cable, cable length 1 meter

## // Push-button with diaphragm RTM



## // Selector RW



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### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 14 RTM</b> 	1052982

### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 14 RW ...</b> 	
2 switching positions Switching angle 90° 0 - I or I - II	<b>ES 14 RWA 0 - I</b> <b>ES 14 RWA I - II</b> 	1178655 1178656 
3 switching positions Switching angle - 45° + 45° I - 0 - II	<b>ES 14 RWB I - 0 - II</b> 	1178657 
Control switch actuated selector Left-hand side switching, right-hand side stroke Switching angle - 45° + 45° I - 0 ← II	<b>ES 14 RWC I - 0 ← II</b> 	on request 



**Features/Options**

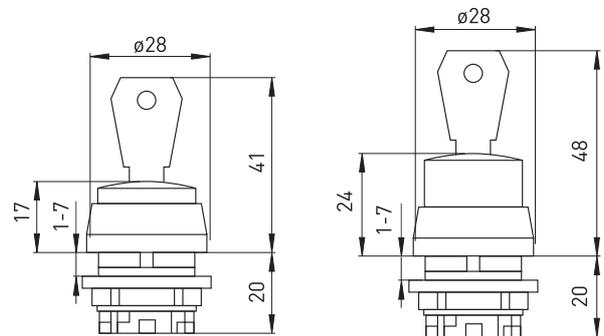
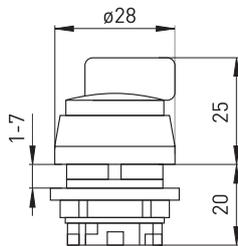
- RST with spring return
- Available in 2 different versions
- Degree of protection IP 65
- With pre-wired cable, cable length 1 meter

**Features/Options**

- RSSA key switch with safety cylinder lock (locks against turning)
- Normal version always has same key number
- Available in 9 different versions
- Up to 20 lock combinations available on request
- Degree of protection IP 65
- With pre-wired cable, cable length 1 meter

**// Control switch RST**

**// Key switch RSSA**



**Contact variants: switch travel/contacts**

**Contact variants: switch travel/contacts**

	Slow action	Material Number
1 NC / 1 NO contact	ES 14 RST ... BK — GY BU — BN	
Switching angle 90° with return to left position, 0 ← I	ES 14 RSTA 0 ← I 0 — I — BK-GY BN-BU	on request
Switching angle - 45° + 45° with return to central position I → 0 ← II	ES 14 RSTB I → 0 ← II I — 0 — II — BK-GY BN-BU	1184714

	Slow action	2 switching positions	3 switching positions
1 NC / 1 NO contact	ES 14 RSSA ... 0 — BK-GY BN-BU		
Key switch	ES 14 RSSA 14 Material Number	1045513	ES 14 RSSA 12 on request
Material Number	ES 14 RSSA 15 1045514		ES 14 RSSA 13 1178658
Material Number	ES 14 RSSA 17 on request		ES 14 RSSA 23 on request
Material Number	ES 14 RSSA 18 on request		ES 14 RSSA 24 on request
Material Number	ES 14 RSSA 27 on request		

**Legend**

- I — Switching position
- ↔ — Spring return
- — Position for key removal



# Command devices

## // Series ES 14, actuators

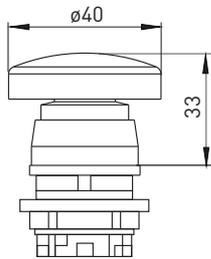
### Features/Options

- Thermoplastic actuator
- Degree of protection IP 65
- With pre-wired cable, cable length 1 meter

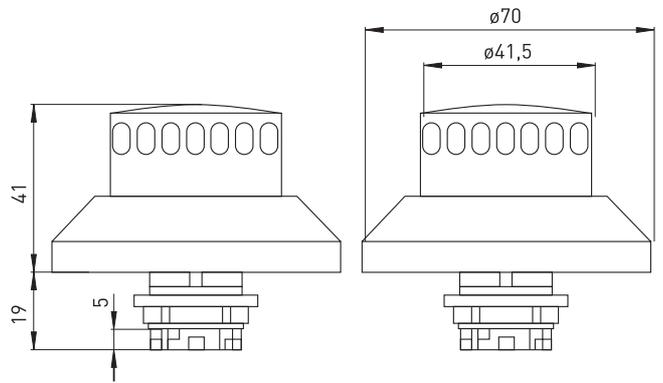
### Features/Options

- Thermoplastic actuator
- To EN 13850
- 1 NC contact and 1 NO contact, double break, type Zb
- Projection from front of panel 41 mm
- With collar to prevent blocking
- Reset by turning clockwise
- With pressure-point to protect against unintentional actuation
- Degree of protection IP 65
- With pre-wired cable, cable length 1 meter

## // Push-button RS SW



## // Emergency-stop push-button RUV



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### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 14 RS SW</b> BK $\rightarrow$ GY BU $\rightarrow$ BN	1179171
2 NC contacts	<b>ES 14 RS SW 2Ö</b> BK $\rightarrow$ GY BU $\rightarrow$ BN	on request

### Contact variants: switch travel/contacts

	Slow action	Material Number
1 NC / 1 NO contact	<b>ES 14 RUV</b> BK $\rightarrow$ GY BU $\rightarrow$ BN	1045525
2 NC contacts	<b>ES 14 RUV 2Ö</b> BK $\rightarrow$ GY BU $\rightarrow$ BN	1053257



SWITCHGEAR FROM STEUTE ENSURES SAFETY AT WORK, AS WELL AS  
HIGH PRODUCTIVITY

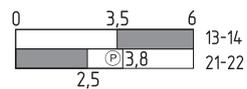




# LEGEND

	A/F
	Double insulated
	Positive break NC contact
	Positive break travel/angle
	Actuated
	Not actuated
	CSA/UL approval, Canada
	TÜV approved
	Trade association type-tested
	Directive-compliance, see Declaration of Conformity
$I_e$	Rated operating current
$I_{the}$	Thermal test current
$U_e$	Rated operating voltage
$U_i$	Rated insulation voltage
$U_{imp}$	Rated impulse withstand voltage

## Explanation of the switch travel diagrams



	Contact opened
	Contact closed

X1-X2	NC contacts
X3-X4	NO contacts
X5-X6	Contact overlapping

## Color codes to DIN IEC 757

BK	black
BN	brown
BU	blue
GN	green
GY	grey
OG	orange
PK	pink
RD	red
TQ	turquoise
VI	violet
WH	white
YE	yellow

### Image sources

Fotostudion Udo Kowalski, Wuppertal

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