

.steute

Safety switches / Position switches / Command devices



SAFE SWITCHGEAR FOR DEMANDING AND CRITICAL APPLICATIONS

// Control technology / Catalogue



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STEUTE SCHALTGERÄTE IN LÖHNE
SAFE SWITCHGEAR FOR DEMANDING AND CRITICAL APPLICATIONS

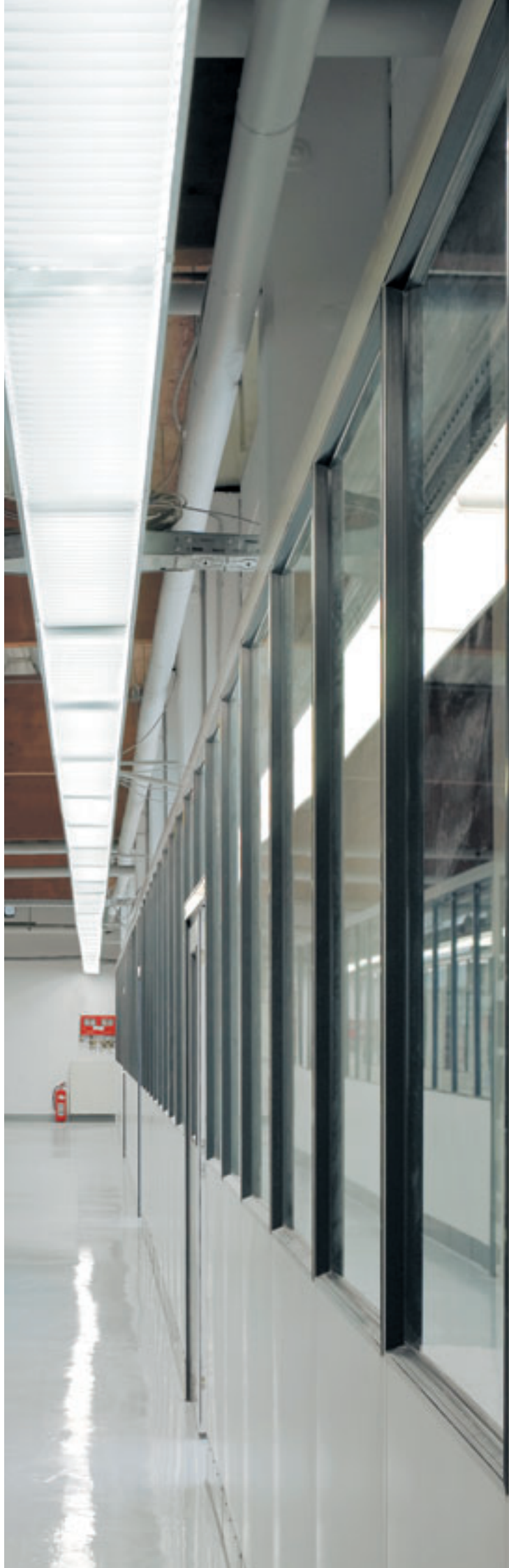




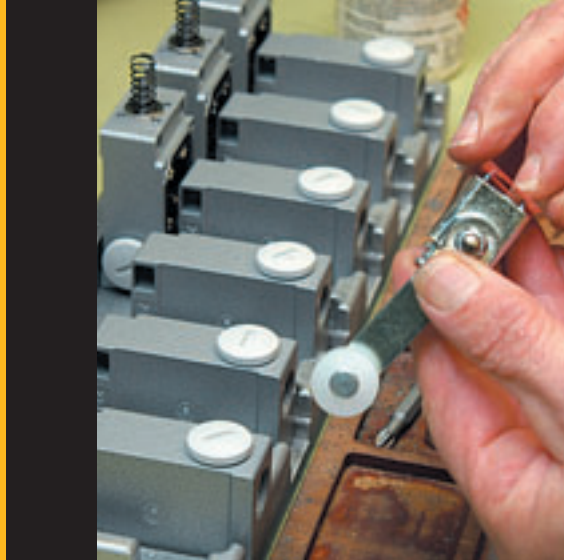
Löhne in Westphalia, Germany. Embedded between the »Wiehengebirge« and the »Teutoburger Wald«. This is the location of steute Schaltgeräte GmbH & Co. KG. Here switchgear is designed and produced for explosion protection, medical technology and control technology. Historians know our region as the area where the Battle of Varus took place in the year 9 AD. About 1700 years later the Treaty of Westphalia marked the end of the 30 Years' War. Gourmets love Westphalian sausage, walkers the beautiful landscape. Briefly: it's a good place to live. It's also a good place to work.

The industrial culture of Westphalia is mostly characterised by SME companies; the region is also the home of many hidden champions and world-market leaders, specialist machine and systems manufacturers, as well as electronic and connecting technology.

This means we have many important suppliers, customers and partners practically »on our doorstep«. And even so, our employees travel a great deal all over the world. This is because renowned companies in all industrial markets use switchgear by steute when the focus is on high quality and availability. And when they appreciate cooperating with suppliers who can adapt flexibly to their requests.



STEUTE SWITCHGEAR MEETS THE HIGHEST QUALITY REQUIREMENTS



Today, the company offers a homogenous product range, drawing on its wide know-how and characterised by a high degree of technological synergy.

180 employees attentively develop and manufacture electrical and electronic components for high-standard and explosive safety applications. These applications comply with established international directives, laws, standards and regulations. In this context, key significance is attributed to a close cooperation with technical certification institutions.

With its high standards and specific orientation, steute lives and breathes the following three QM systems

- DIN EN ISO 9001: 2000
- DIN EN ISO 13485: 2003
- Certificate of Quality Assurance acknowledgement in accordance with the 94/9/EG Directive (ATEX)

On the following pages, you will find an overview of our wide range of position switches, safety switches and command devices, each of which can be modified in accordance with customer-specific requirements.

Talk to us. Let us help you find what you are looking for.
The steute team.





Safety switches with
separate actuator

Thermoplastic enclosure

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// [Series ES 95 AZ](#)

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Metal enclosure

// [Series ST 61](#)

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01-08-0084

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 Control Category 3 or 4 to EN 954-1.

Design and operating principle

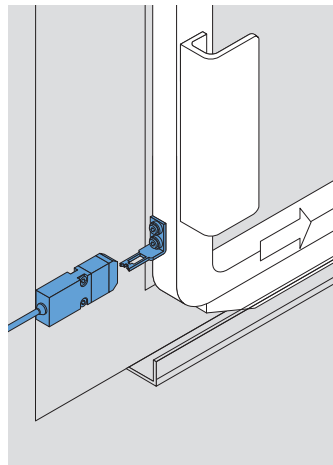
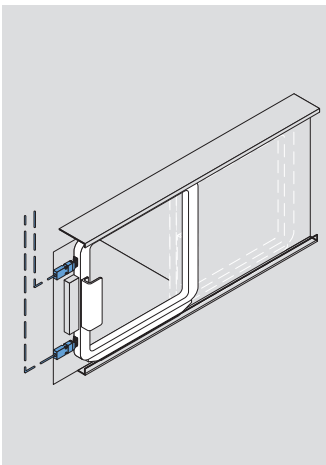
On the safety switches with a separate actuator, the switching element is not physically connected to the actuator, but functionally brought together or separated by switching. When the guard device is opened, the actuator is separated from the base unit. In this process, NC contacts are positively opened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

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

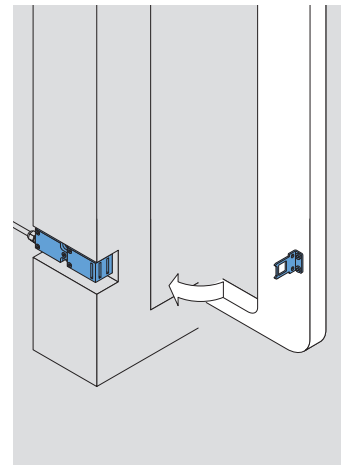
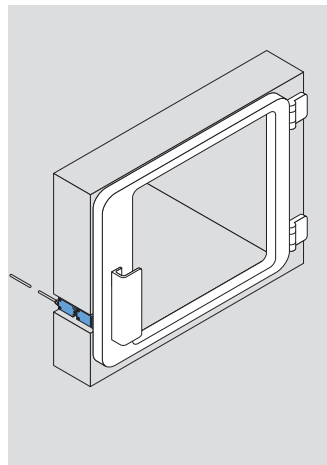
All safety switches shown in this chapter bear the CE mark according to the Machinery Directive 98/37/EC.

Application

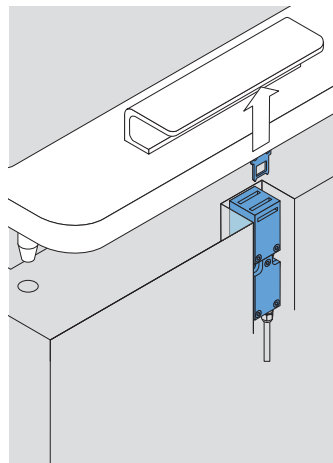
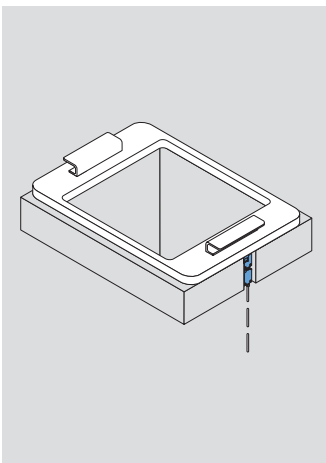
on sliding guards



on hinged guards



on removable guards




Safety switches with separate actuator

// Series ST 14

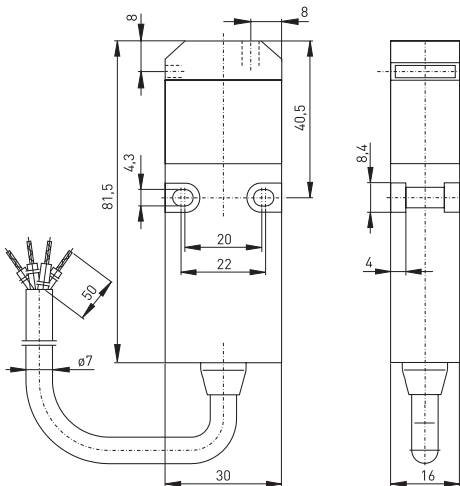
Features/Options

- Thermoplastic enclosure
- Double insulated
- 3 contacts
- Slow action \ominus , change-over contact with double break
- Slow action with overlapping contacts available
- Version with cable on left-hand side available
- With pre-wired cable, cable length 1 meter
- Ex-version available
- With gold-plated contacts available on request
- Available with connector M12 x 1, 4-pole


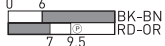

Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	stainless steel 1. 4301
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact \ominus
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Termination	cable
	4 x AWG20, 6 x AWG20, UL 2464
Cable section	4 x 0.56 mm ²
U_{imp}	4 kV
U_i	250 V
I_{the}	6 A
I_e/U_e	6 A/250 VAC; 4 A/24 VDC; 0.25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Positive break travel	8 mm
Ambient temperature	-20 °C ... +80 °C
Mechanical life	> 1 million operations
Approvals	

// ST 14



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ST 14 1Ö/1S 
1 NC / 1 NO contact with overlapping	ST 14 UE 
2 NC contacts	ST 14 2Ö 

Ordering details

ST 14 1Ö/1S-s-1m	
	Cable length 1 m, (2 m, 5 m, 10 m)
	Cable on side
	Contact type 1NC/1NO, (2Ö, 2Ö/1S, UE)
	Series
	Safety door switch

Safety switches with separate actuator

// Series ST 14, actuators

Features/Options

ST 14-B1

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

ST 14-B3

- Especially fit for hinged guards
- Actuating radius on hinged guards
a = 50 mm
- Axial misalignment x = 14 mm

Features/Options

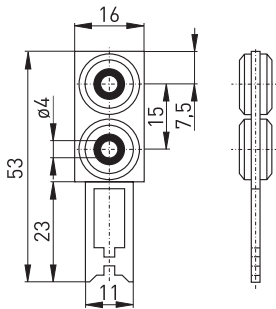
ST 14-B5

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

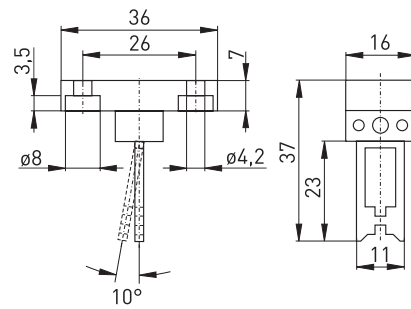
Note

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

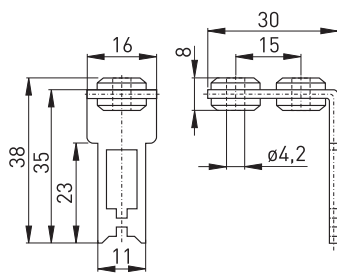
// Straight actuator ST 14-B1



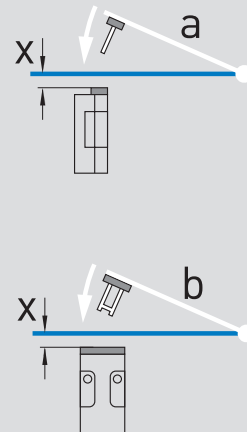
// Flexible actuator ST 14-B3



// Angled actuator ST 14-B5



// Actuating radius



- 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


Safety switches with separate actuator

// Series ES 95 AZ

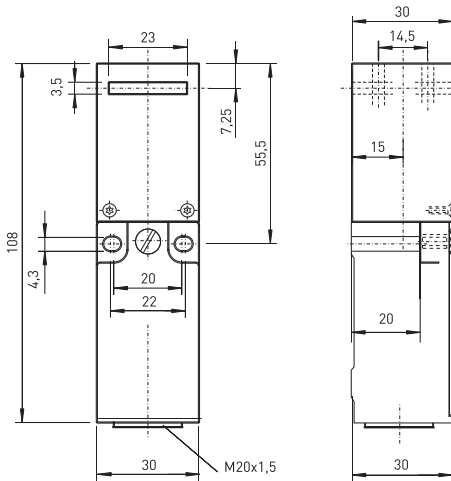
Features/Options

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

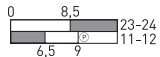
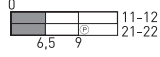
Technical data

Standards	IEC/EN 60947-5-1; EN 1088
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	stainless steel 1. 4301
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Termination	M3 screw terminals
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
U_{imp}	4 kV
U_i	250 V
I_{the}	6 A
I_e/U_e	6 A/400 VAC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Positive break travel	9 mm
Ambient temperature	-20 °C ... +80 °C
Mechanical life	> 1 million operations
Approvals	

// ES 95 AZ

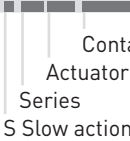


Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 95 AZ 10/1S
	
2 NC contacts	ES 95 AZ 20
	

Ordering details

ES 95 AZ 10/1S



Safety switches with separate actuator

// Series ES 95 AZ, actuators

Features/Options

95 AZ-B1

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

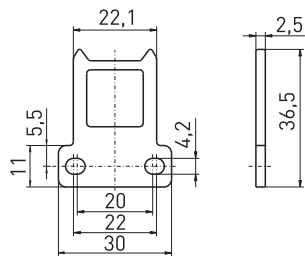
95 AZ-B5

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

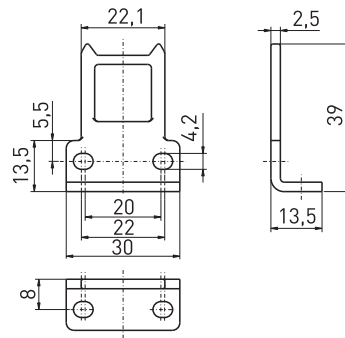
Note

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

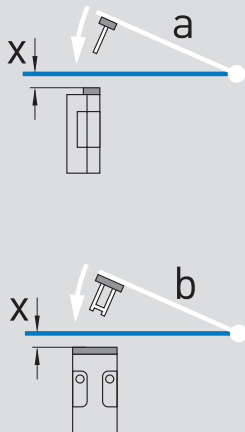
// Straight actuator 95 AZ-B1



// Angled actuator 95 AZ-B5



// Actuating radius



- 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

Safety switches with separate actuator

// Series ST 61

Features/Options

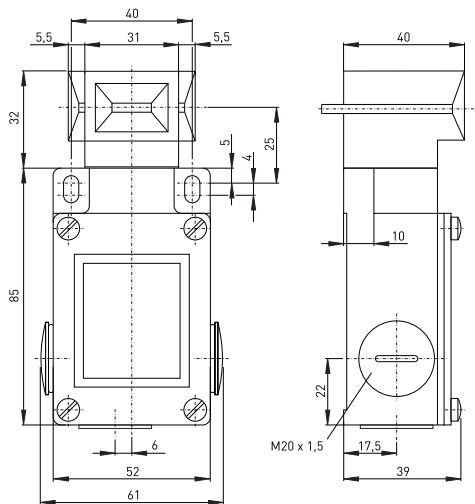
- Metal enclosure
- Double insulated
- Slow action \ominus , change-over contact with double break
- 3 cable entries M20 x 1.5
- Wiring compartment
- Ex-version available
- With gold-plated contacts available on request
- Long life
- High level of contact reliability with low voltages and currents

// ST 61



Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Enclosure	aluminium die cast, paint finish
Actuator	stainless steel 1. 4301
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact \ominus
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Termination	plug-in connector
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	3 x M20 x 1.5
U_{imp}	6 kV
I_e/U_e	ES 61: 16 A/400 VAC ES 61 2NC: 6 A/400 VAC
Max. fuse rating	ES 61: 16 A gL/gG D-fuse ES 61 2NC: 6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Utilisation category	AC-15
Max. fuse rating	ES 61: 16 A gL/gG D-fuse ES 61 2NC: 6 A gL/gG D-fuse
Positive break travel	10 mm
Ambient temperature	-20 °C ... +80 °C
Mechanical life	> 1 million operations



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ST 61 1Ö/1S
2 NC contacts	ST 61 2Ö

Ordering details

ST 61 1Ö/1S
 Contact type 1NC/1NO, (2Ö)
 Series
 Safety door switch

Safety switches with separate actuator

// Series ST 61, actuators

Features/Options

ST 61-B1

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

Features/Options

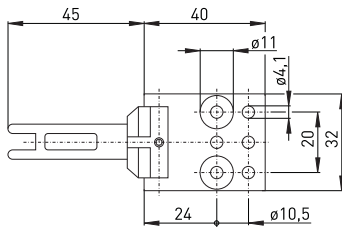
ST 61-B5

- 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

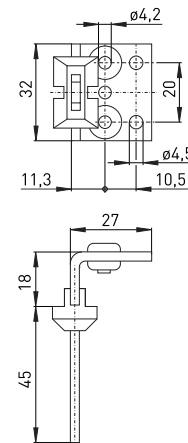
Note

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

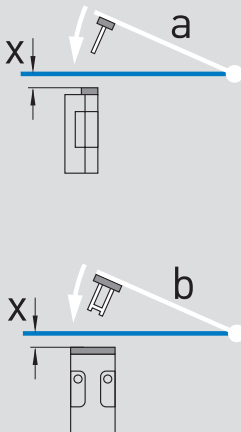
// Straight actuator ST 61-B1



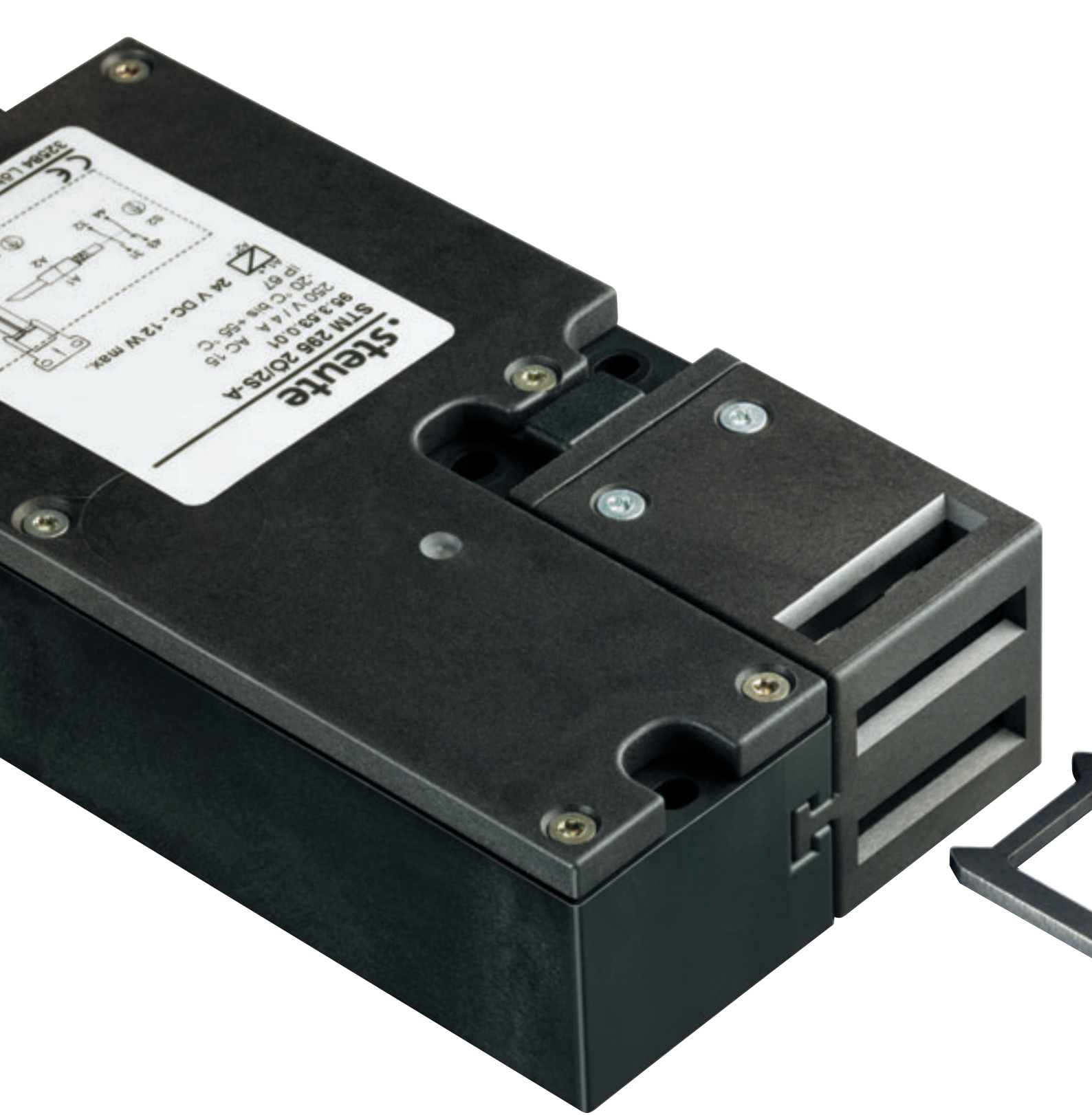
// Angled actuator ST 61-B5



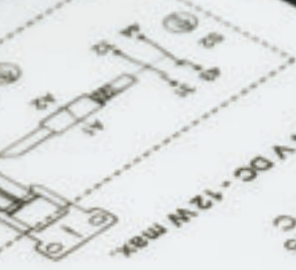
// Actuating radius



- 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



32584 L01
CE



Steute
STM 286 20/25-A
853.03.001
250 V / 4 A AC 15
20 °C bis +55 °C
24 V DC - 12 W max

Solenoid interlocks

Thermoplastic enclosure
// Series STM 295
from page 22





Solenoid interlocks

Range of application

The solenoid and pneumatic 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 and pneumatic 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 Control Category 3 or 4 to EN 954-1, subject to suitable circuit arrangements.

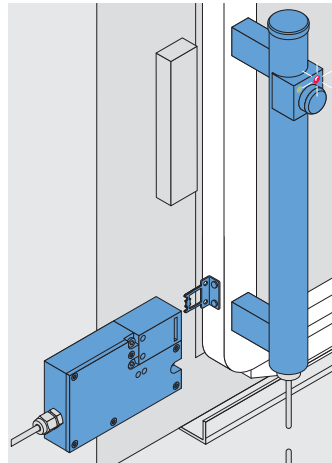
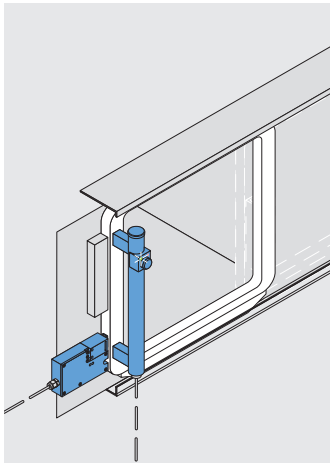
Design and operating principle

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.

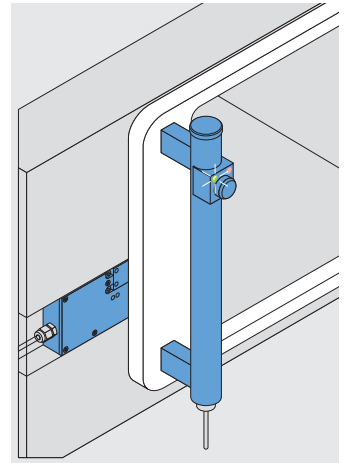
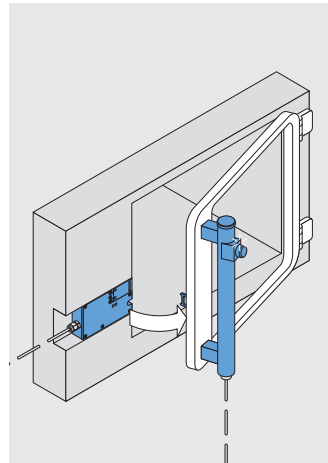
The solenoid interlocks shown in this chapter bear the CE mark according to the Machinery Directive 98/37/EC.

Application

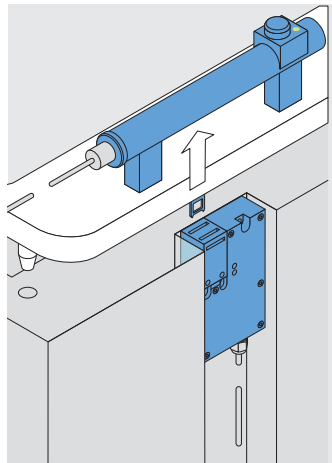
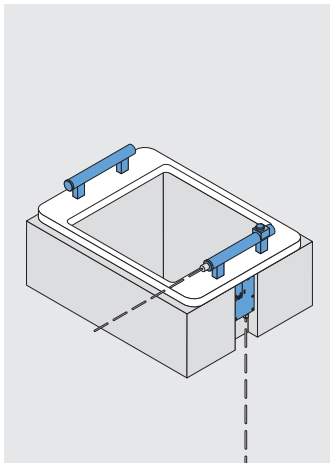
on sliding guards



on hinged guards



on removable guards



Solenoid interlocks

// Series STM 295

Features/Options

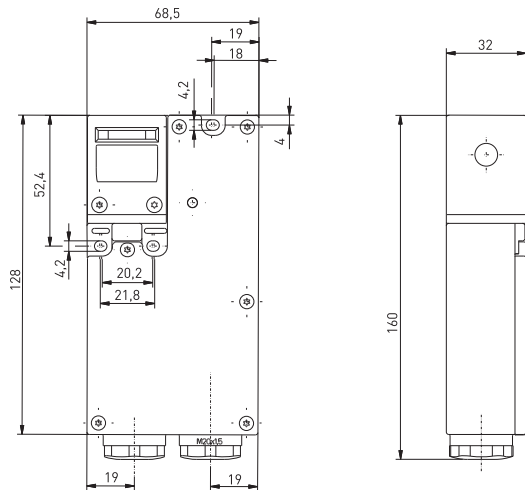
- Thermoplastic enclosure
- Double insulated □
- Two switch inserts in one enclosure
- Spring-to-lock or power-to-lock principle
- Holding force 1000 N
- Wiring compartment

// STM 295



Technical data

Standards	IEC/EN 60947-5-1; EN 1088
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	stainless steel 1.4301
Switch insert	ES 95
Protection class	IP 67 according to EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	2 NC and 2 NO contacts with positive break, galvanically separated contact bridges
Termination	M3 screw clamps
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
Cable entries	2 x M20 x 1.5 for cable section 5 ... 9 mm
Cable length	-
U_{imp}	4 kV
U_i	250 V
I_{the}	4 A
I_e/U_e	4 A/250 VAC; 0.25 A/230 VDC
Utilisation category	AC-15; DC-13
Max. fuse rating	6 A gL/gG D-fuse
U_s	24 VDC
Magnet	100 % ED
Unlocking	100 % ED
Power consumption	max. 47 VA
Ambient temperature	-20 °C ... +55 °C
Mechanical life	> 1 million operations
Holding force F	max. 1000 N
Approvals	-



Contact variants: switch travel/contacts

	Spring-to-lock principle	Power-to-lock principle
2 NC/2 NO contact	<p>STM 295 2Ö/2S-R</p>	<p>STM 295 2Ö/2S-A</p>

Ordering details

STM 295 2Ö/2S-R

R Spring-to-lock principle, [A Power-to-lock principle]
 Contact type 2 NC/2 NO contact
 Series
 Solenoid interlock

Solenoid interlocks

// Series STM 295, actuators

Features/Options

STM 295-B1

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

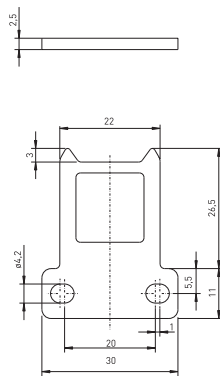
STM 295-B5

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

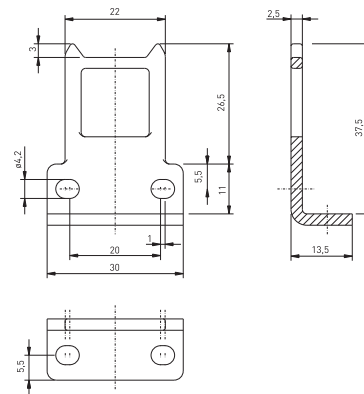
Note

The actuators are not included with the switches.

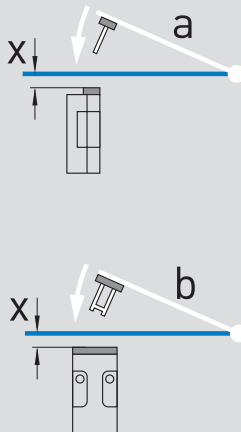
// Straight actuator STM 295-B1



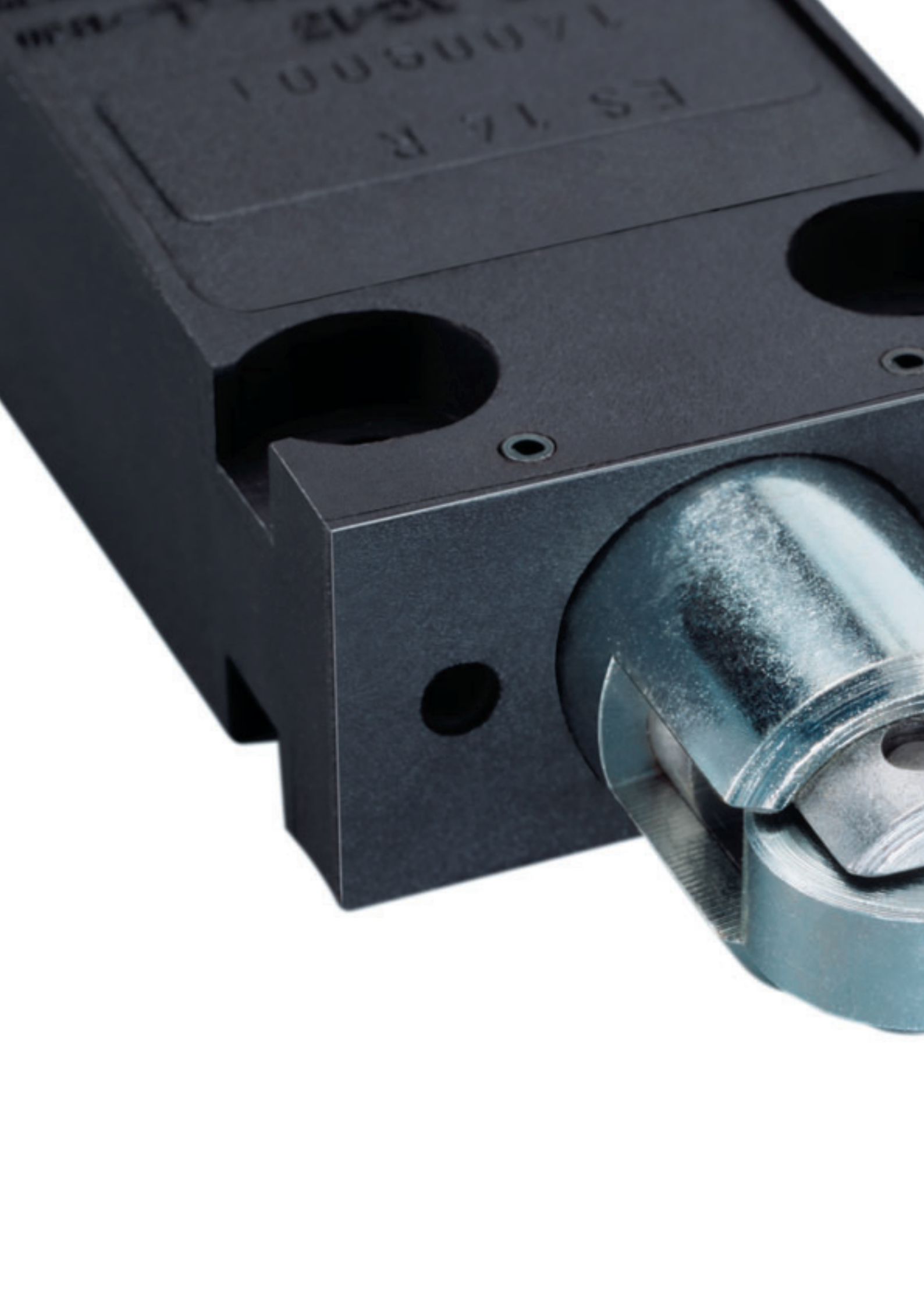
// Angled actuator STM 295-B5



// Actuating radius



- 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





Position switches with safety function

Thermoplastic enclosure

// Series ES 13

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// Series ES 14

from page 40

// Series ES/EM 95

from page 48

Metal enclosure

// Series ES 51

from page 56

// Series ES 41

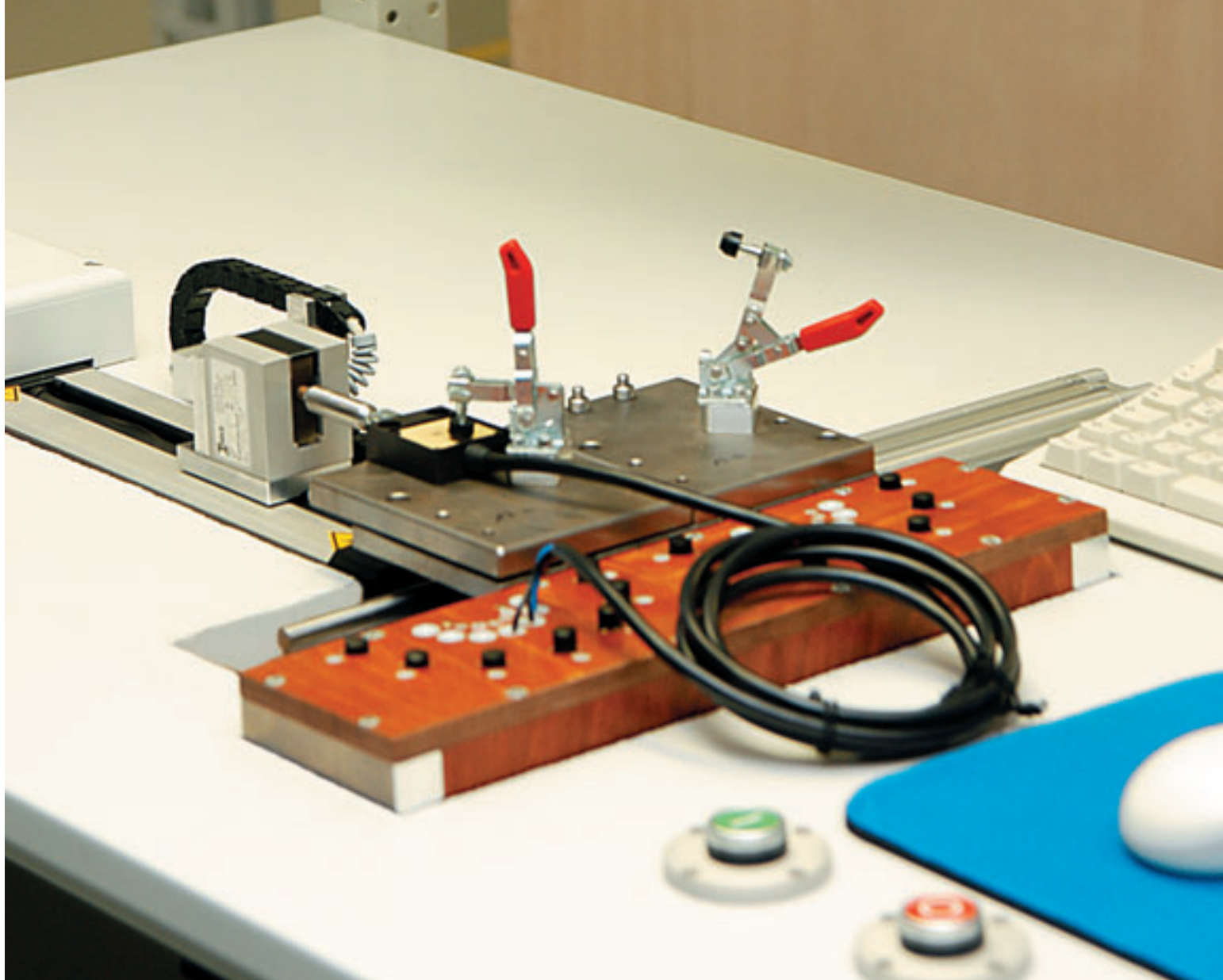
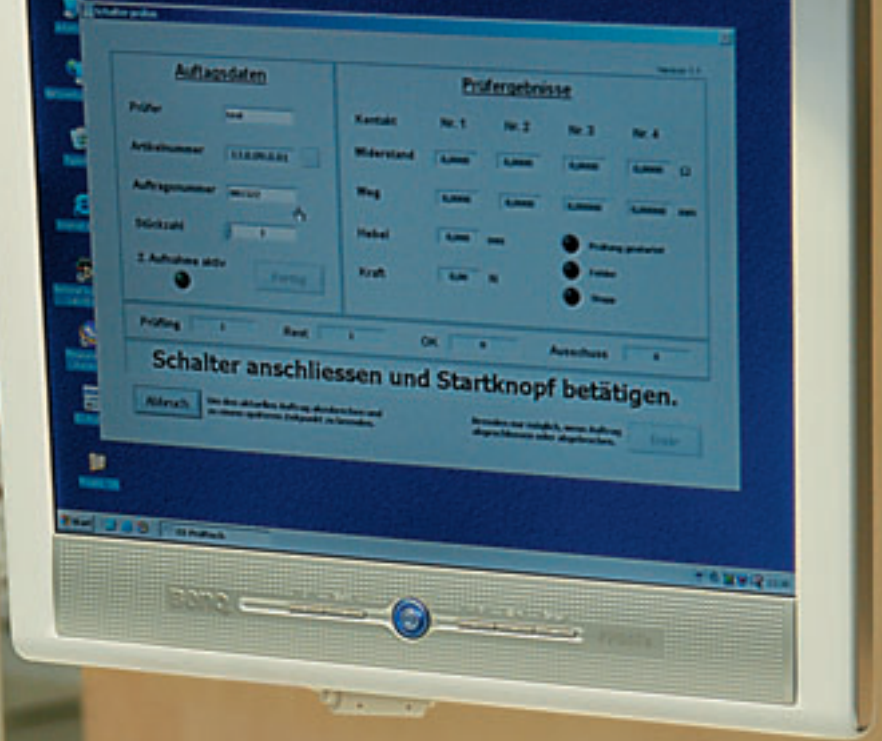
from page 66

// Series ES 411

from page 66

// Series ES 61

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Position switches with 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 Control Category 3 or 4 to EN 954-1.

Further applications for position switches with safety function are most varied positioning duties. The variety of requirements to be found in practice can be met in detail by means of a wide range of actuating elements

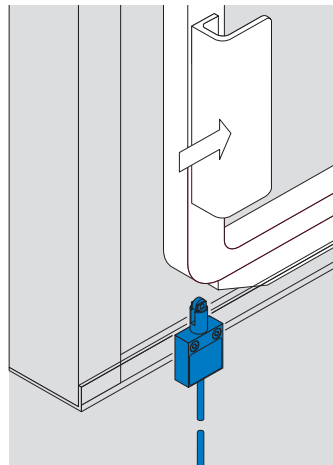
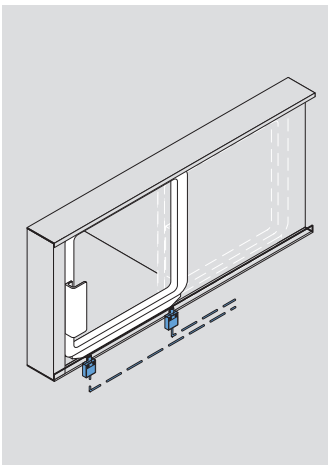
Design and operating principle

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 function 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.

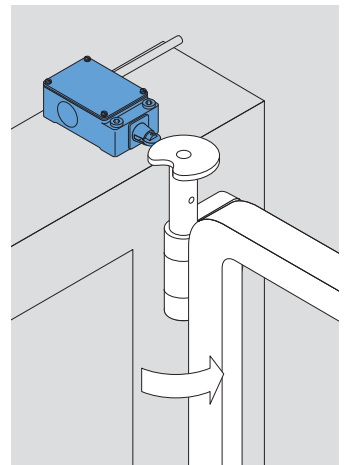
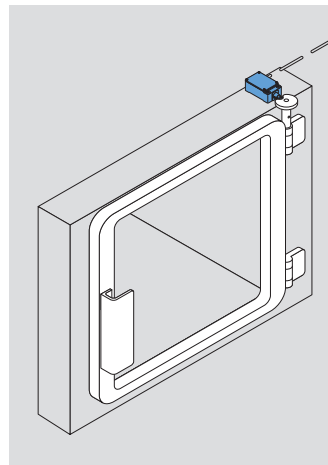
Many versions with snap or slow action are available. The position switches with a safety function can be fitted in any desired mounting position.

All position switches with safety function shown in this chapter bear the CE mark according to the Machinery Directive 98/37/EC.

Application on sliding guards

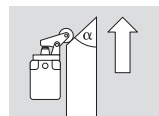


on hinged guards



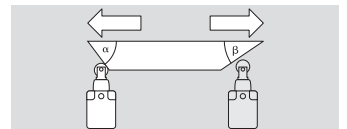
Legend

α : Actuating angle from below as shown in picture



α : Actuating angle from right of switch axis

β : Actuating angle from left of switch axis with reference to lever position as shown in picture









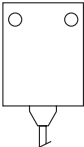
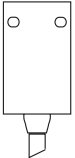

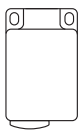
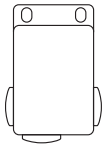
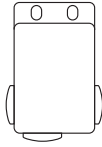
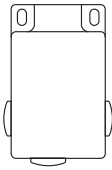


Selection table

Position switches with safety function/actuators

// Series

// Actuator

		↓	↓	↓	↺	↻	↻	↓	↔
									
ES 13, from page 30 - Thermoplastic enclosure - Cable		+ W		F	KU WKU	FKU			R WR
ES 14, from page 40 - Thermoplastic enclosure - 3 contacts - Cable		+ W		F	KU WKU	FKU	VKU		R WR
ES/EM 95, from page 48 - Thermoplastic enclosure - Wiring compartment - 1 cable entry - Design to DIN EN 50 047		W							R
ES 51, from page 56 - Metal enclosure - Wiring compartment - 1 cable entry		+ W	ST WST		KU			WK	R WR
ES 41, from page 66 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES 411, from page 66 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES 61, from page 76 - Metal enclosure - Wiring compartment - 3 cable entries		W							

+ default: plunger without watertight collar

Actuating direction → / Free movement of actuator →

	↔	↔	↔	↔	↔	↑	↔	↔
		FR		WH	WHL	WPH	D	DL
		FR	VR				D	DL
	RL			WH WHM	WHLM	WPH WPHM 4K	D	
				H WH	HL WHL	PH WPH		
				H WH	HL WHL	PH WPH		
				H WH	HL WHL	PH WPH		
				WH	WHL	WPH		

Position switches with safety function

// Series ES 13

Features/Options

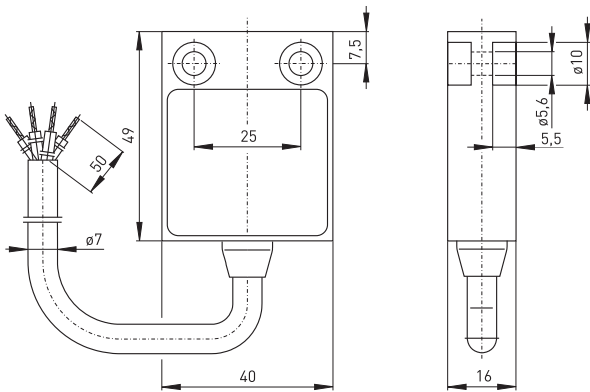
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- Slow action with overlapping contacts available
- Max. 3 contacts
- Version with 3 contacts has cable on left-hand side
- Suitable for in-line mounting
- With pre-wired cable, cable length 1 meter
- Ex-version available

// ES 13



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	change-over contact with double break with galvanically separated contact bridges
Termination	cable H05VV-F
Cable section	4 x 0.75 mm ²
U_{imp}	4 kV
U_i	250 V
I_{the}	6 A
I_e/U_e	6 A/250 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Impact resistance/Contact opening	max. 2 x 4.5 mm



Ordering details

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

- Cable length 1 m, (2 m, 5 m, 10 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 safety function

// Series ES 13

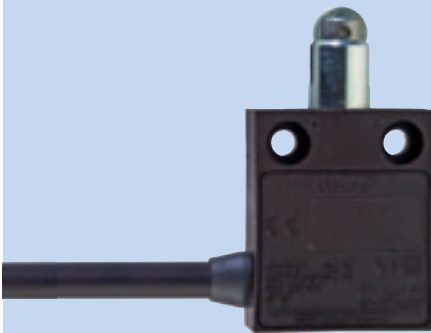
Features/Options

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

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Cable entry on side s



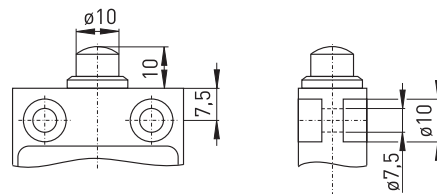
// Tapped bushing M16 x 1,5



// Connector M12 x 1, 4-pole



// Plunger



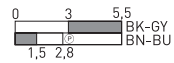
Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13

Slow action

1 NC / 1 NO contact

ES 13



Position switches with safety function

// Series ES 13, actuators

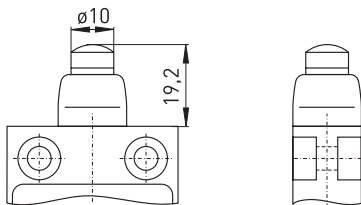
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Collar to protect against the entry of foreign bodies

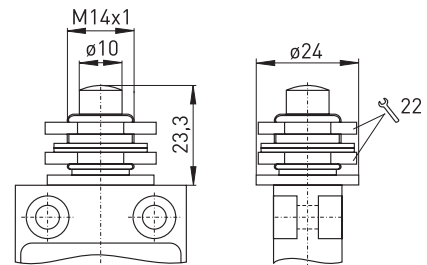
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Plunger collar W



// Plunger for front mounting F



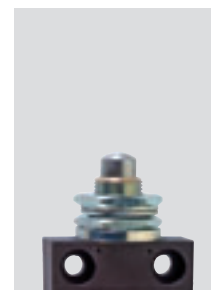
32

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 W 10/1S

	Slow action
1 NC / 1 NO contact	ES 13 F 10/1S



Features/Options

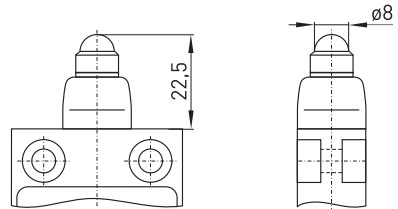
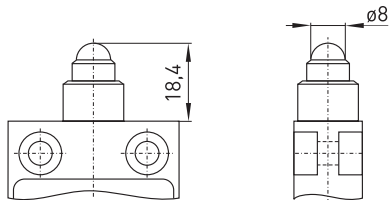
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 15°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Ball plunger KU

// Ball plunger with watertight collar WKU

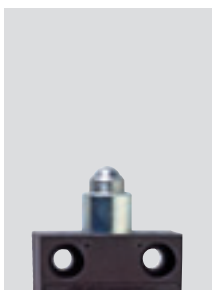


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action	
1 NC / 1 NO contact	ES 13 KU 10/1S

Slow action	
1 NC / 1 NO contact	ES 13 WKU 10/1S



Position switches with safety function

// Series ES 13, actuators

Features/Options

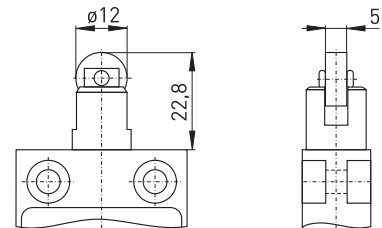
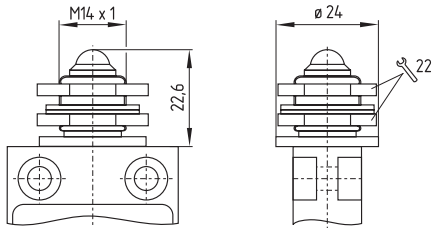
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Ball diameter: 8 mm
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90°

// Ball plunger for front mounting FKU

// Roller plunger R



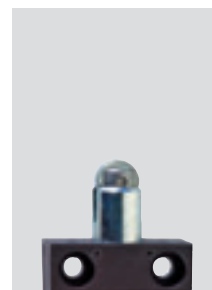
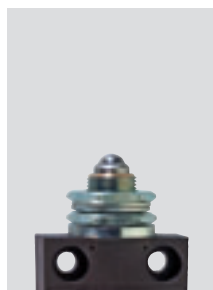
34

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 FKU 1Ö/1S

	Slow action
1 NC / 1 NO contact	ES 13 R 1Ö/1S



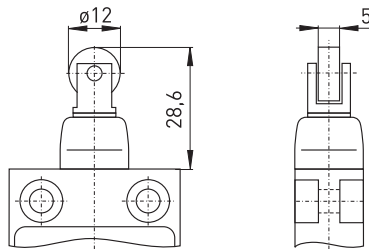
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°

// Roller plunger collar WR

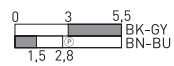


Contact variants: switch travel/contacts

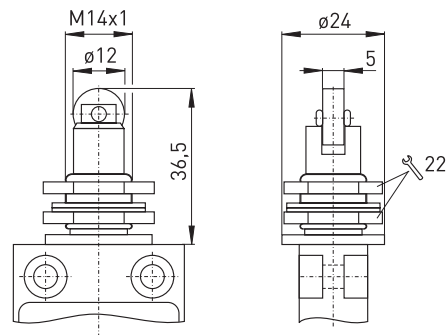
Slow action

1 NC / 1 NO contact

ES 13 WR 1Ö/1S



// Roller plunger for front mounting FR

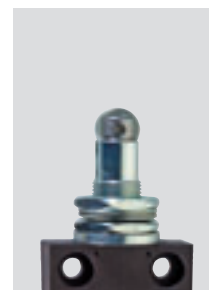
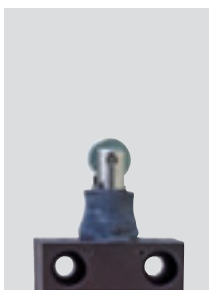
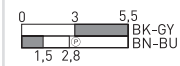


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 13 FR 1Ö/1S



Position switches with safety function

// Series ES 13, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

Note

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

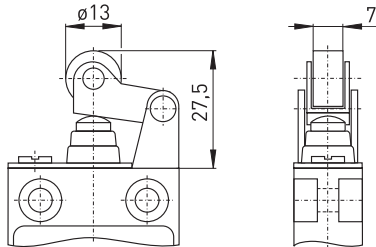
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

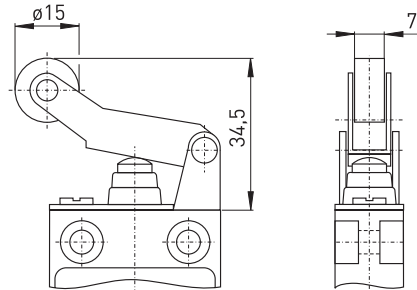
Note

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



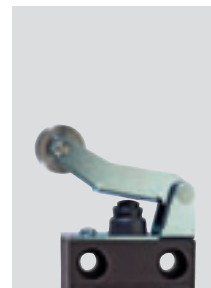
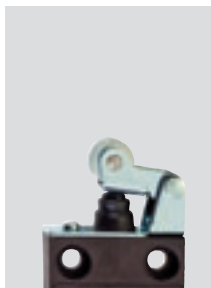
36

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 WH 10/1S

	Slow action
1 NC / 1 NO contact	ES 13 WHL 10/1S



Features/Options

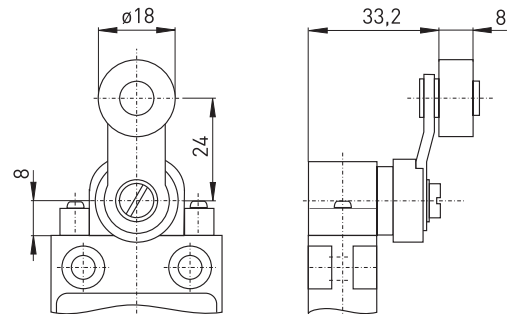
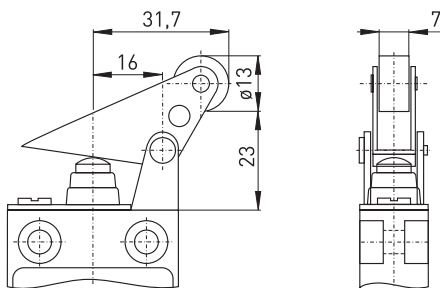
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to switch from below
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

Features/Options

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

// Parallel roller lever collar WPH

// Roller lever D

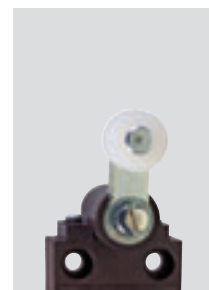


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action									
1 NC / 1 NO contact	ES 13 WPH 10/1S								
	<table border="1"> <tr> <td>0</td> <td>3,2</td> <td>5,4</td> <td>BK-GY</td> </tr> <tr> <td>1,5</td> <td>3</td> <td></td> <td>BN-BU</td> </tr> </table>	0	3,2	5,4	BK-GY	1,5	3		BN-BU
0	3,2	5,4	BK-GY						
1,5	3		BN-BU						

Slow action													
1 NC / 1 NO contact	ES 13 D 10/1S												
	<table border="1"> <tr> <td>65°</td> <td>35°</td> <td>0°</td> <td>35°</td> <td>65°</td> <td>BK-GY</td> </tr> <tr> <td>15°</td> <td>15°</td> <td></td> <td></td> <td></td> <td>BN-BU</td> </tr> </table>	65°	35°	0°	35°	65°	BK-GY	15°	15°				BN-BU
65°	35°	0°	35°	65°	BK-GY								
15°	15°				BN-BU								



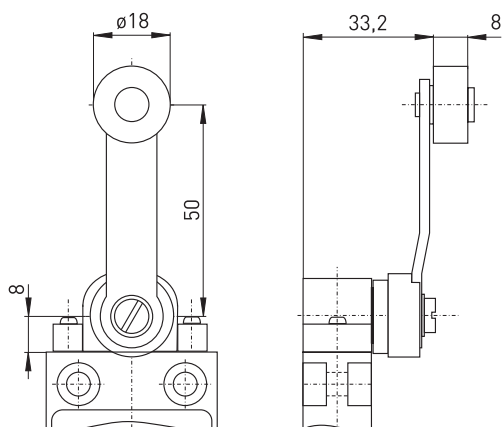
Position switches with safety function

// Series ES 13, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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 roller lever DL

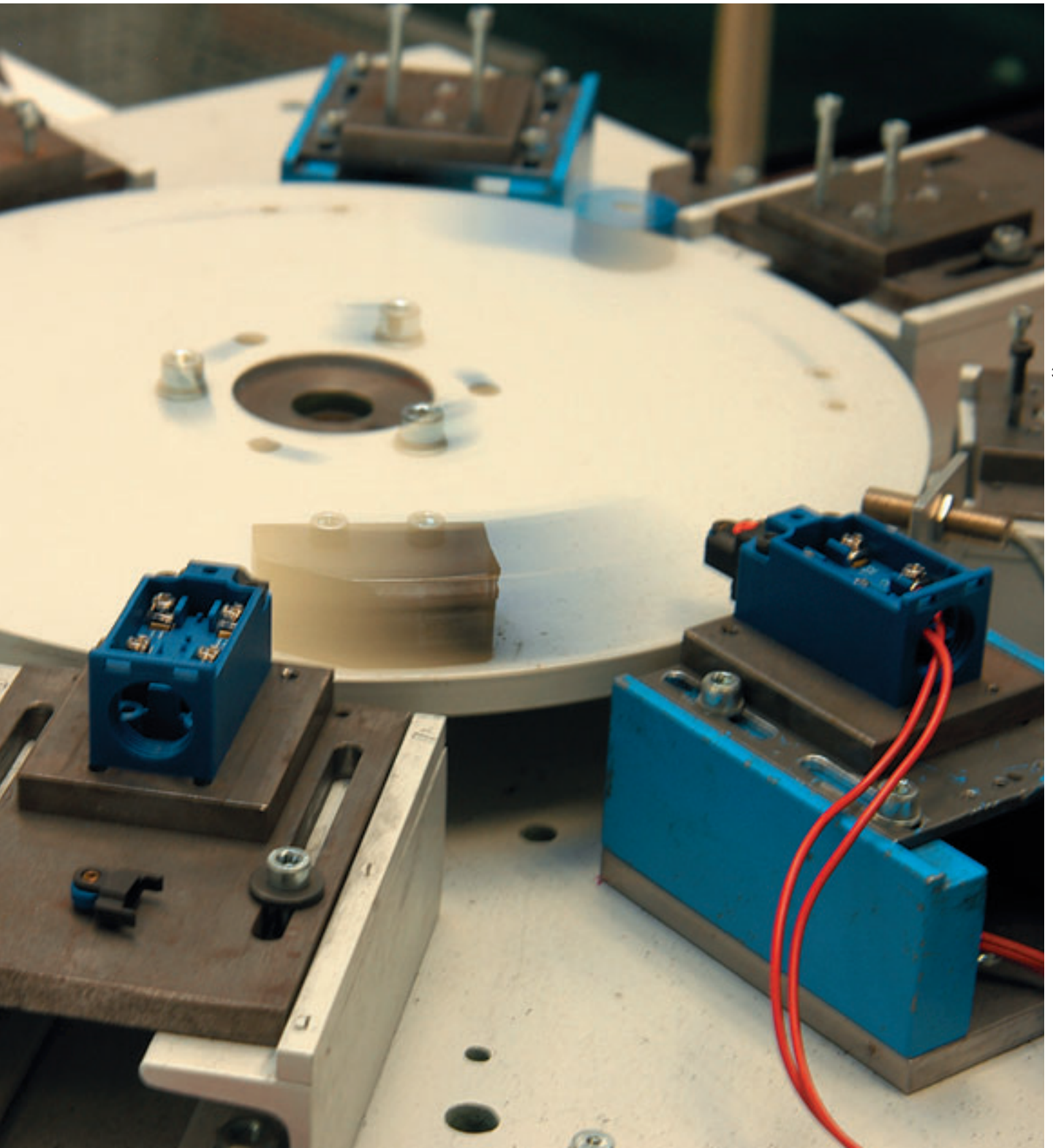


Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 DL 10/1S



QUALITY MANAGEMENT
VERIFICATION OF MECHANICAL LIFE OF POSITION SWITCHES



Position switches with safety function

// Series ES 14

Features/Options

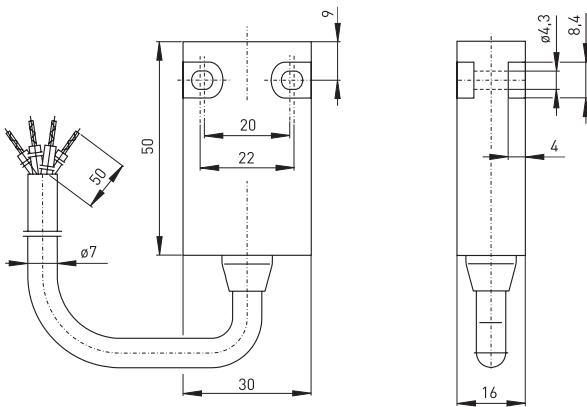
- Thermoplastic enclosure
- Double insulated
- 3 contacts
- Slow action \ominus , change-over contact or 2 NC contacts with double break
- Slow action with overlapping contacts available
- Mounting details to DIN EN 50 047
- Suitable for in-line mounting
- With pre-wired cable, cable length 1 meter
- Ex-Version available

// ES 14



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action; positive break NC contacts \ominus
Switching elements	change-over contact with double break, galvanically separated contact bridges
Termination	cable H05VV-F, AWG20
Cable section	4 x 0.75mm ² , 6 x AWG20
U_{imp}	4 kV
U_i	250 V
I_{the}	6 A
I_e/U_e	6 A/250 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Contact opening	max. 2 x 4 mm



Ordering details

ES 14 WR 10/1S-s-1m

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

Position switches with safety function

// Series ES 14, actuators

Features/Options

- Slow action version with 2 NC contacts or 2 NC and 1 NO contact available
- With gold-plated contacts available on request
- Version with UL/CSA approval available
- With latching element available on request

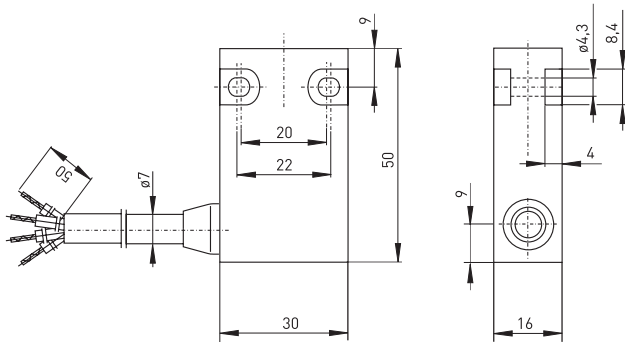
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

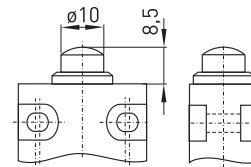
// Connector M12 x 1, 4-pole



// Cable on side



// Plunger

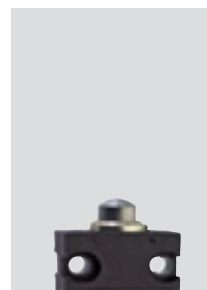
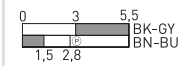


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 14 10/1S



Position switches with safety function

// Series ES 14, actuators

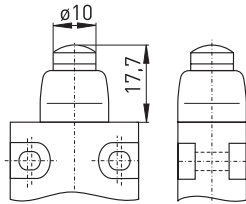
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Collar to protect against the entry of foreign bodies

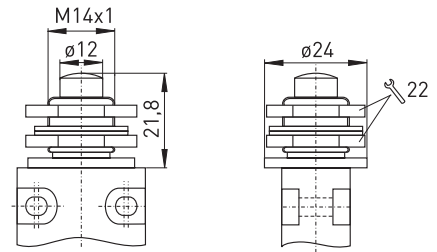
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Plunger collar W



// Plunger for front mounting F



42

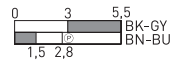
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

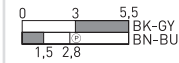
ES 14 W 10/1S



Slow action

1 NC / 1 NO contact

ES 14 F 10/1S



Features/Options

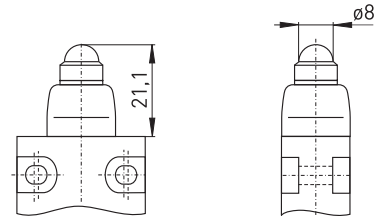
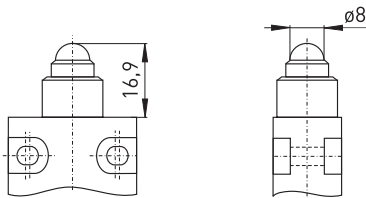
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Ball plunger KU

// Ball plunger collar WKU



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

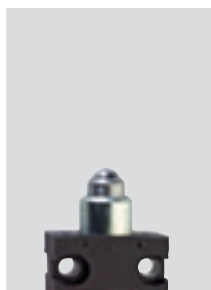
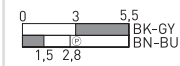
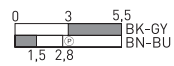
Slow action

1 NC / 1 NO contact

1 NC / 1 NO contact

ES 14 KU 10/1S

ES 14 WKU 10/1S



Position switches with safety function

// Series ES 14, actuators

Features/Options

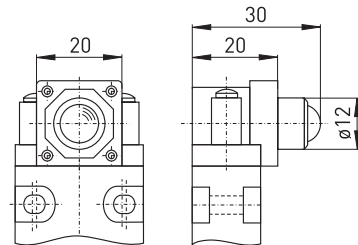
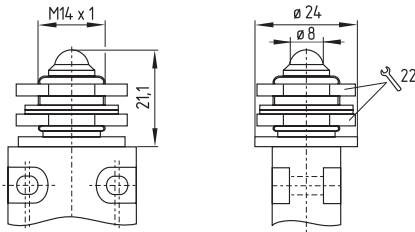
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuation from any direction
- Actuator head with captive stainless steel ball actuator

// Ball plunger for front mounting FKU

// Ball plunger at front VKU



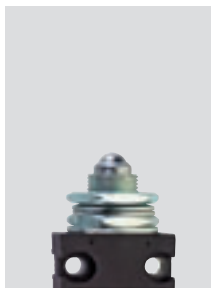
44

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 14 FKU 1Ö/1S

	Slow action
1 NC / 1 NO contact	ES 14 VKU 1Ö/1S



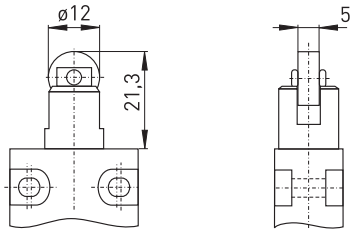
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90°

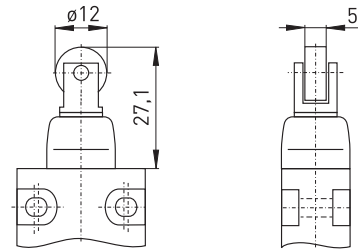
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°
- Collar to protect against the entry of foreign bodies

// Roller plunger R



// Roller plunger collar WR

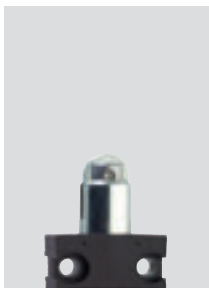


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action	
1 NC / 1 NO contact	ES 14 R 10/1S
	1,5 2,8

Slow action	
1 NC / 1 NO contact	ES 14 WR 10/1S
	1,5 2,8



Position switches with safety function

// Series ES 14, actuators

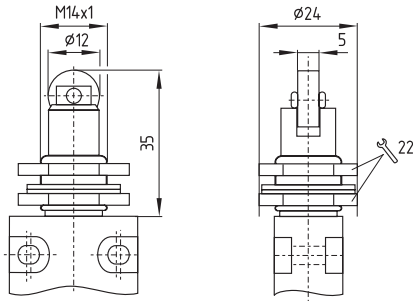
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°

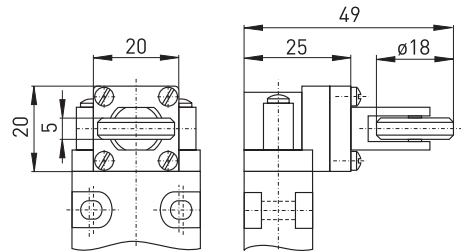
Features/Options

- Actuator can be turned 90°
- Wear-resistant thermoplastic roller

// Roller plunger for front mounting FR



// Roller plunger at front VR



46

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 14 FR 10/1S

	Slow action
1 NC / 1 NO contact	ES 14 VR 10/1S



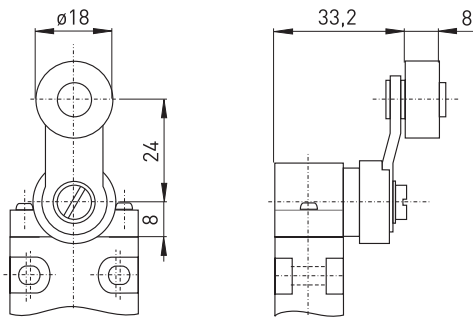
Features/Options

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

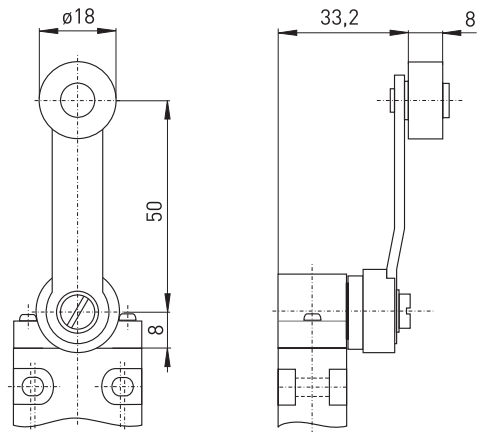
Features/Options

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

// Roller lever D



// Long roller lever DL



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action															
1 NC / 1 NO contact	ES 14 D 10/1S															
	<table border="1"> <tr> <td>70°</td> <td>22°</td> <td>0°</td> <td>22°</td> <td>70°</td> </tr> <tr> <td colspan="3">BK-GY</td> <td colspan="2">BN-BU</td> </tr> <tr> <td>7°</td> <td></td> <td>7°</td> <td></td> <td></td> </tr> </table>	70°	22°	0°	22°	70°	BK-GY			BN-BU		7°		7°		
70°	22°	0°	22°	70°												
BK-GY			BN-BU													
7°		7°														

	Slow action															
1 NC / 1 NO contact	ES 14 DL 10/1S															
	<table border="1"> <tr> <td>70°</td> <td>22°</td> <td>0°</td> <td>22°</td> <td>70°</td> </tr> <tr> <td colspan="3">BK-GY</td> <td colspan="2">BN-BU</td> </tr> <tr> <td>7°</td> <td></td> <td>7°</td> <td></td> <td></td> </tr> </table>	70°	22°	0°	22°	70°	BK-GY			BN-BU		7°		7°		
70°	22°	0°	22°	70°												
BK-GY			BN-BU													
7°		7°														



Position switches with safety function

// Series ES/EM 95

Features/Options

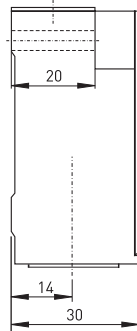
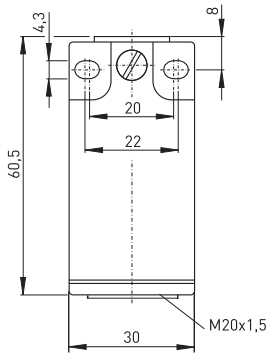
- Thermoplastic enclosure
- Transversely slotted mounting holes
- Double insulated □
- Slow action with overlapping contacts available
- Wide range of alternative actuators
- Actuator heads can be repositioned in 4 x 90° steps
- Angle of offset roller lever can be adjusted in 10° steps
- 1 cable entry M20 x 1.5
- Good resistance to oil and petroleum spirit

// ES/EM 95



Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Class	DIN EN 50 047
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	⊖ IEC 60947-5-1 slow or snap action, positive break NC contacts
Termination	plug-in connector
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	M 20 x 1.5
U_{imp}	4 kV
U_i	400 V
I_{the}	6 A
Utilisation category	AC-15; DC-13
I_e/U_e	6 A/400 VAC; 0.25 A/230 VDC
Max. fuse rating	6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	1800/h
Ambient temperature	- 20 °C ... + 80 °C
Contact opening	2 x 3.5 mm
Approvals	Ⓢ US



Ordering details

ES 95 WH 1Ö/1S-V-LL

- █ Longitudinal slotted holes
- █ Locking
- █ 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 safety function

// Series ES 95/EM 95, actuators

Features/Options

- Mechanical locking: release by means of push button
- Mechanical locking V only possible with slow action
- With gold-plated contacts available on request

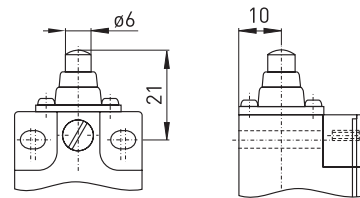
Features/Options

- Actuator type B to DIN EN 50 047
- Actuator with watertight collar

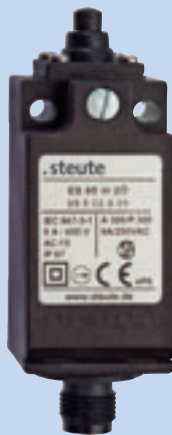
// Mechanical locking



// Plunger W



// Connector M12 x 1, 4-pole



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 W 10/1S 	ES 95 W 10/1S
1 NC / 1 NO contact with overlapping		ES 95 W UE
2 NC contacts		ES 95 W 20



Position switches with safety function

// Series ES/EM 95, actuators

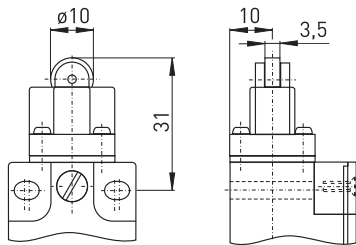
Features/Options

- Actuator type C to DIN EN 50 047
- Wear-resistant thermoplastic roller
- Metal roller available on request
- Actuator heads can be repositioned in 4 x 90° steps

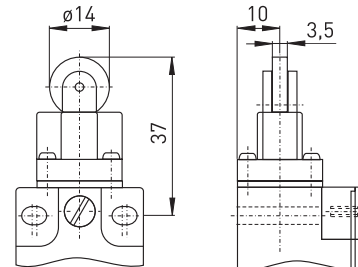
Features/Options

- Wear-resistant thermoplastic roller
- Metal roller available on request
- Actuator heads can be repositioned in 4 x 90° steps

// Roller plunger R



// Long roller plunger RL



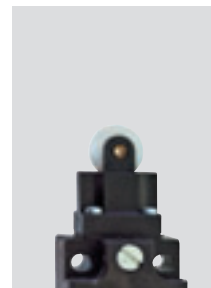
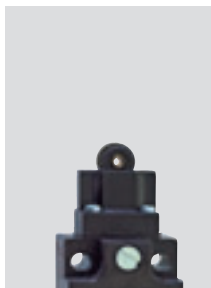
50

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 R 10/1S 	ES 95 R 10/1S
1 NC / 1 NO contact with overlapping		ES 95 R UE
2 NC contacts		ES 95 R 20

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 RL 10/1S 	ES 95 RL 10/1S
1 NC / 1 NO contact with overlapping		ES 95 RL UE
2 NC contacts		ES 95 RL 20



Features/Options

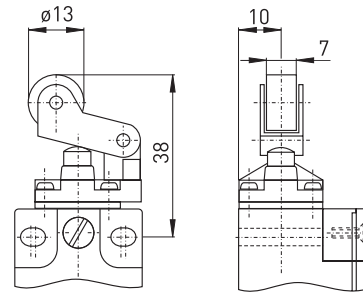
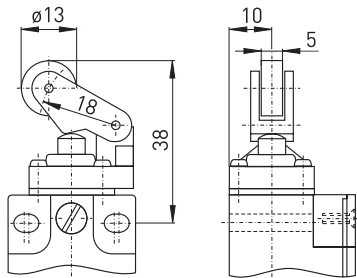
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Actuator type E to DIN EN 50 047
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

// Roller lever WH

// Metal roller lever WHM

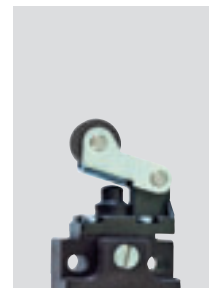


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WH 10/1S 	ES 95 WH 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WH UE
2 NC contacts		ES 95 WH 20

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WHM 10/1S 	ES 95 WHM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WHM UE
2 NC contacts		ES 95 WHM 20



Position switches with safety function

// Series ES/EM 95, actuators

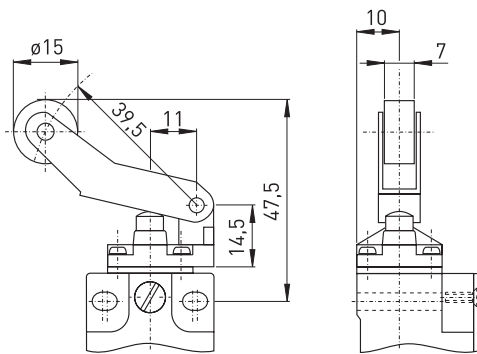
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

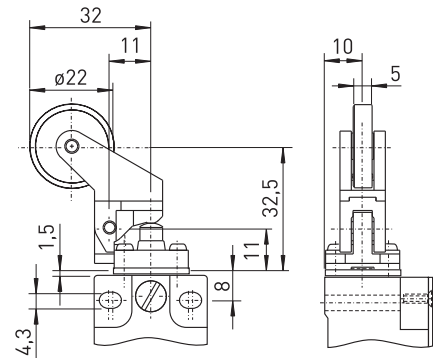
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

// Long metal roller lever WHLM



// Plastic roller lever 4K



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Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WHLM 10/1S 	ES 95 WHLM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WHLM UE
2 NC contacts		ES 95 WHLM 20

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 4K 10/1S 	ES 95 4K 10/1S
1 NC / 1 NO contact with overlapping		ES 95 4K UE
2 NC contacts		ES 95 4K 20



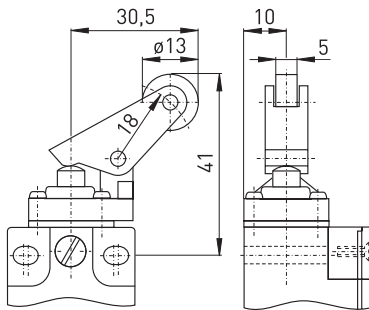
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Actuation parallel to axis of switch from below
- Metal roller available on request

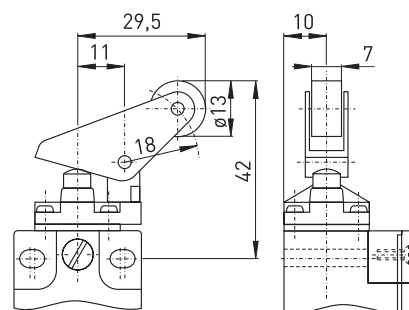
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Actuation parallel to axis of switch from below
- Metal roller available on request

// Parallel roller lever WPH



// Parallel metal roller lever WPHM

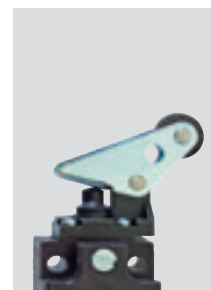


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WPH 10/1S 	ES 95 WPH 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WPH UE
2 NC contacts		ES 95 WPH 2Ö

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WPHM 10/1S 	ES 95 WPHM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WPHM UE
2 NC contacts		ES 95 WPHM 2Ö



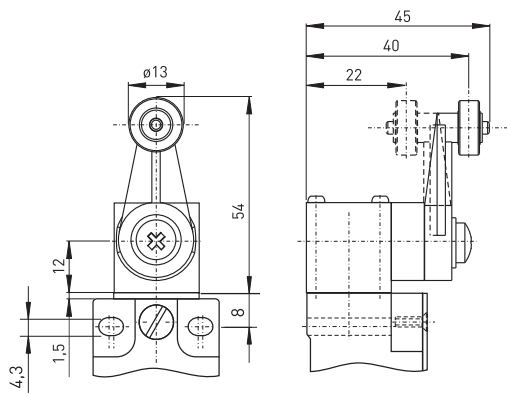
Position switches with safety function

// Series ES/EM 95, actuators

Features/Options

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

// Roller lever D



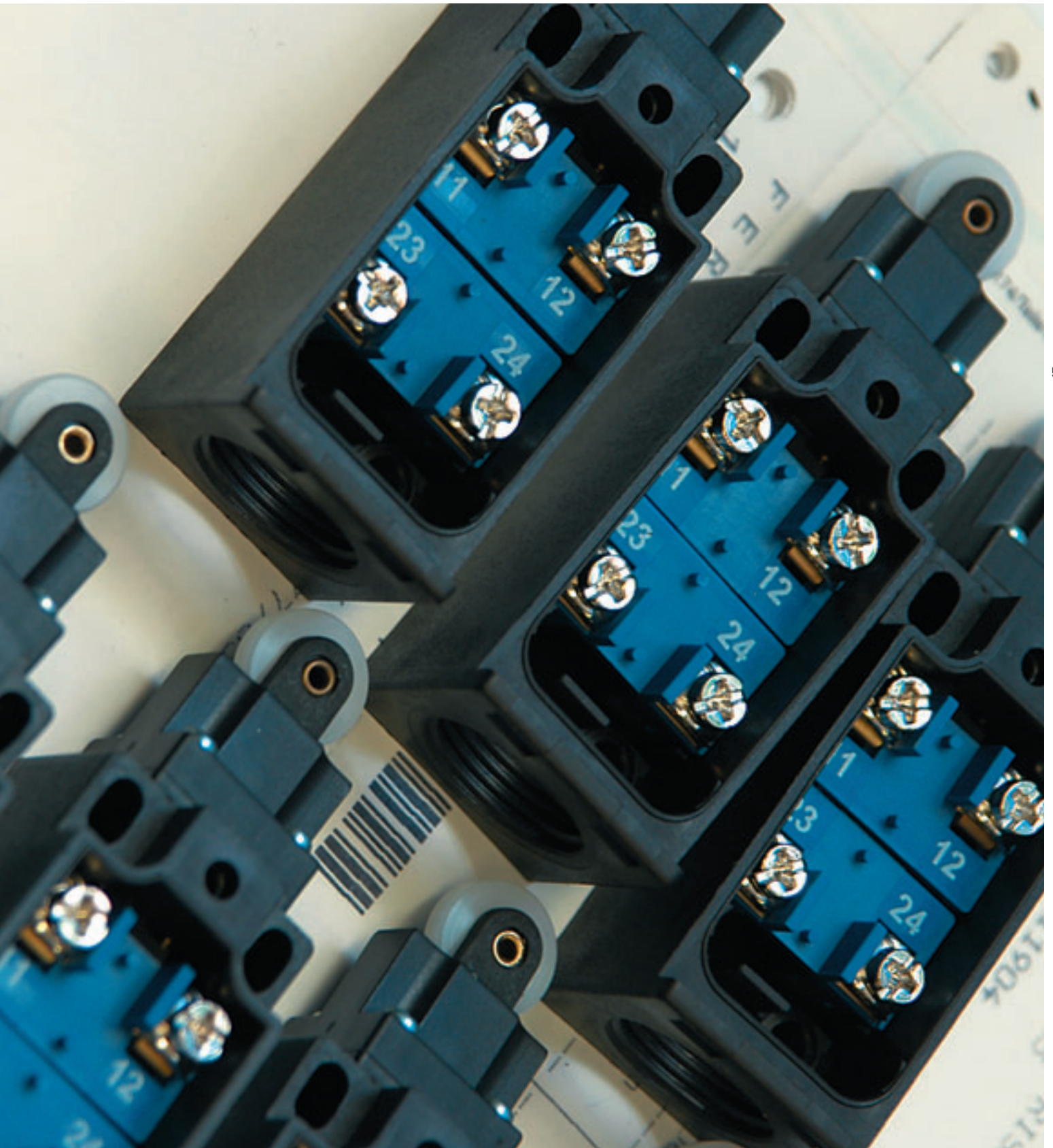
54

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 D 10/1S 	ES 95 D 10/1S
1 NC / 1 NO contact with overlapping		ES 95 D UE
2 NC contacts		ES 95 D 20



PRODUCTION PROCESS ASSEMBLY
POSITION SWITCHES WITH SAFETY FUNCTION AFTER FINAL CONTROL



Position switches with 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

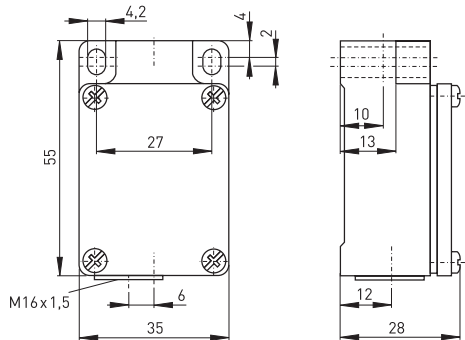
When used as a safety switch, secure the enclosure against slipping with appropriate means, e.g. pinning.

// ES 51



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	\ominus IEC 60947-5-1 slow action, positive break NC contacts
Termination	plug-in connector M3
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
Cable entry	M 16 x 1.5
U _{imp}	4 kV
U _i	400 V
I _{the}	4 A
Utilisation category	AC-15
I _e /U _e	4 A / 400 VAC
Max. fuse rating	4 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points	± 0.1 mm



Ordering details

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 safety function

// Series ES 51, actuators

Features/Options

- With gold-plated contacts available on request

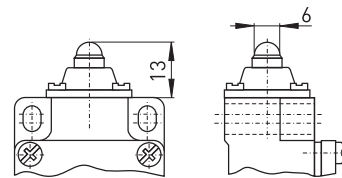
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Connector M12 x 1, 5-pole

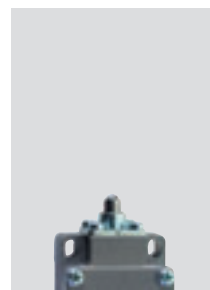


// Plunger



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 10/1S



Position switches with safety function

// Series ES 51, actuators

Features/Options

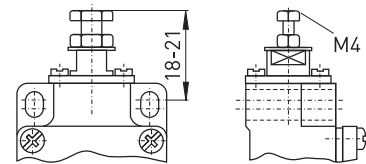
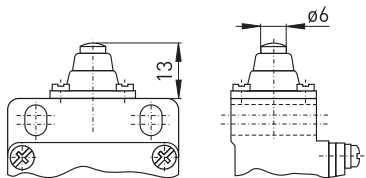
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

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

// Plunger collar W

// Adjustable plunger ST



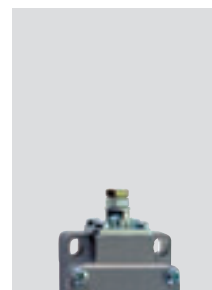
58

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 W 10/1S

	Slow action
1 NC / 1 NO contact	ES 51 ST 10/1S



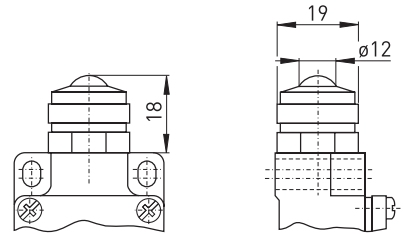
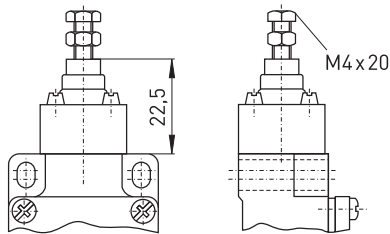
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Projection of plunger adjustable for fine setting of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Adjustable plunger with collar WST **// Ball plunger KU**

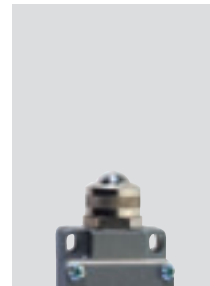
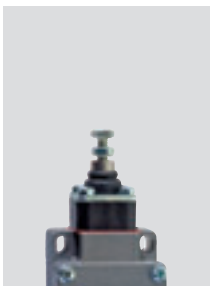


Contact variants: switch travel/contacts

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

Contact variants: switch travel/contacts

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



Position switches with safety function

// Series ES 51, actuators

Features/Options

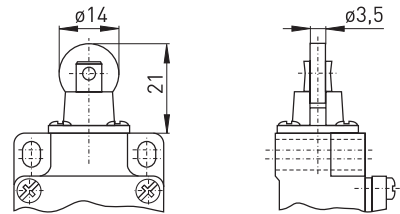
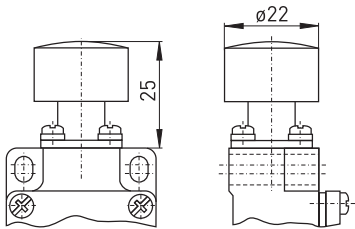
- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator heads can be repositioned by 4 x 90°

// Cover WK

// Roller plunger R



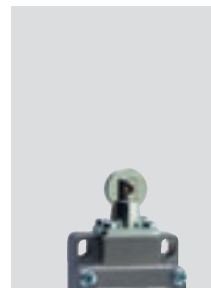
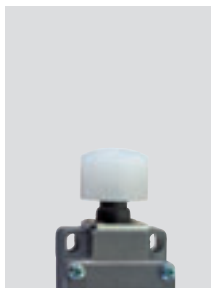
60

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

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

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



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator heads can be repositioned by 4 x 90°
- Collar to protect against the entry of foreign bodies

Features/Options

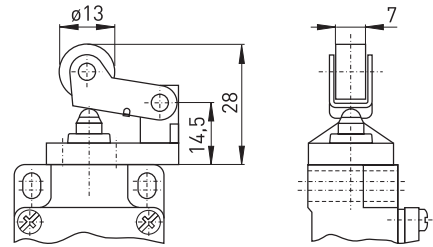
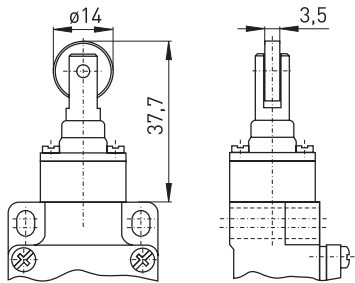
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Plastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

Note

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

// Roller plunger WR

// Lever H

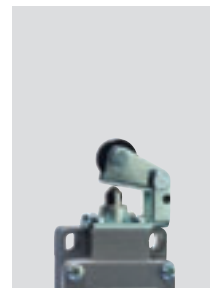


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

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

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



Position switches with safety function

// Series ES 51, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

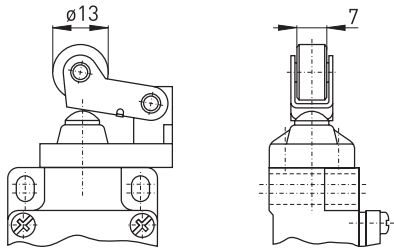
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

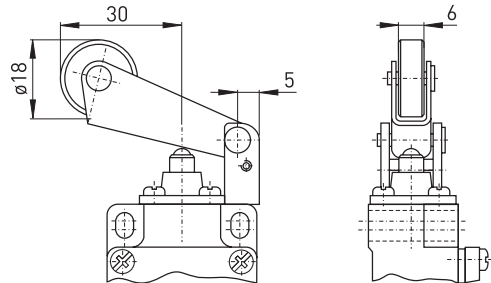
Note

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

// Offset roller lever collar WH



// Long roller lever HL



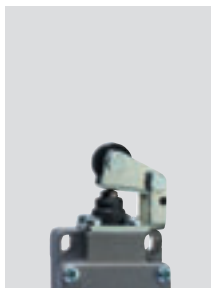
62

Contact variants: switch travel/contacts

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

Contact variants: switch travel/contacts

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



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

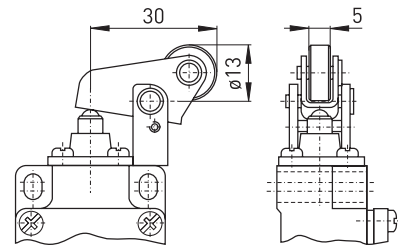
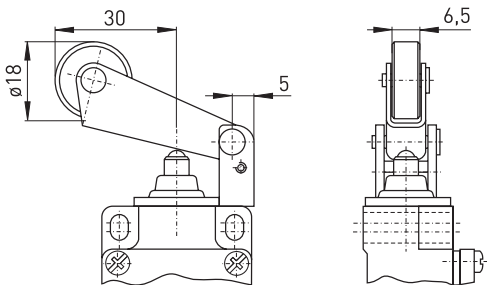
Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

// Long roller lever collar WHL

// Parallel offset 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

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



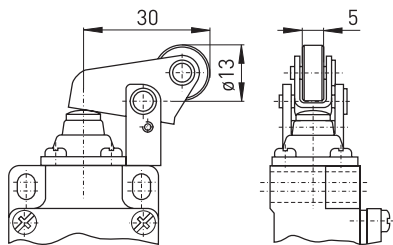
Position switches with safety function

// Series ES 51, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

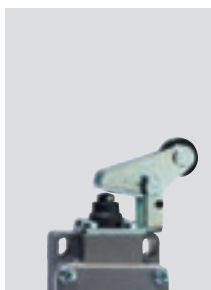
// Parallel roller lever collar WPH



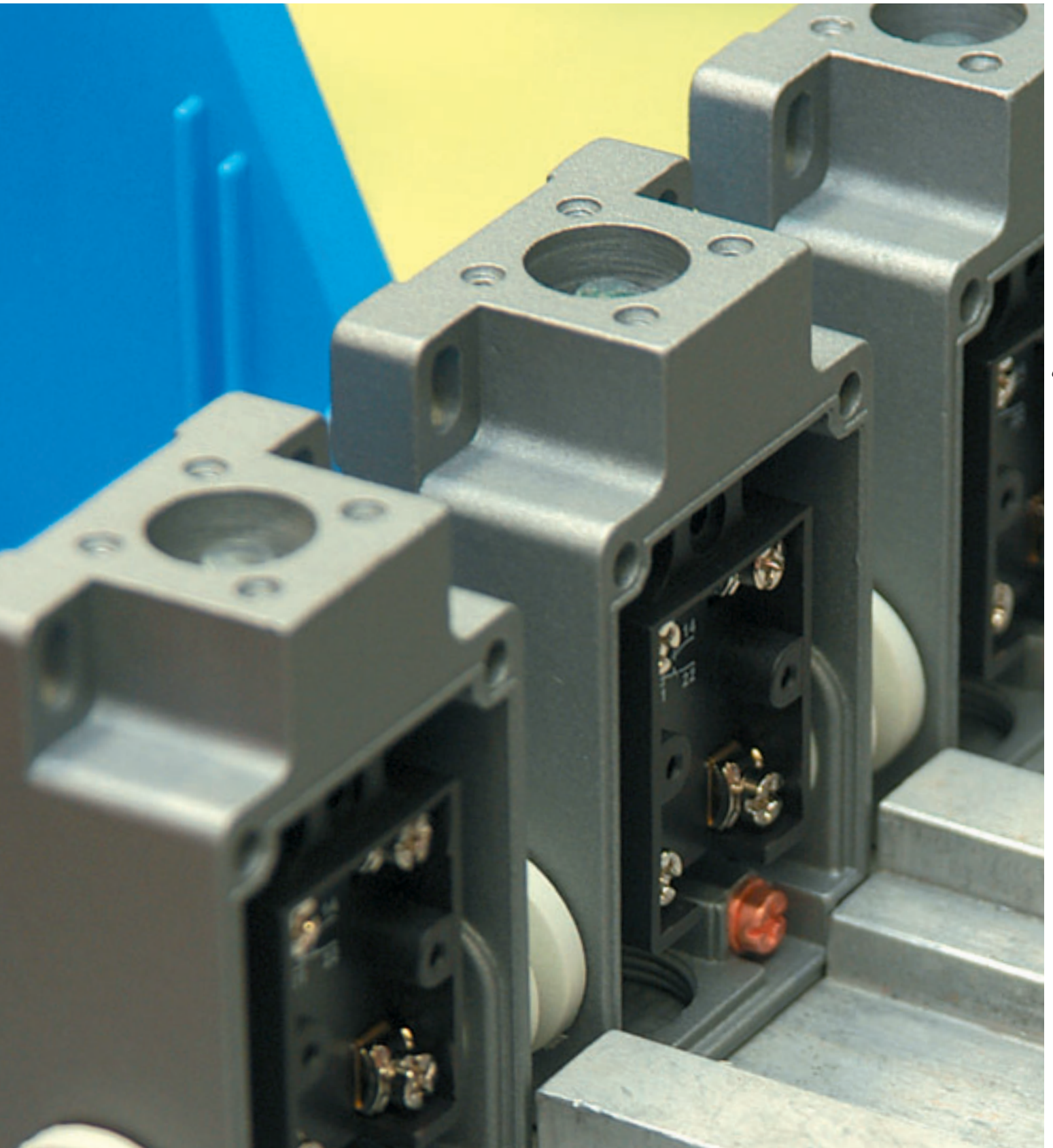
64

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 WPH 10/1S



PRODUCTION PROCESS ASSEMBLY
ASSEMBLY OF ACTUATING UNIT IN POSITION SWITCHES



Position switches with safety function // Series ES 41 and ES 411

Features/Options

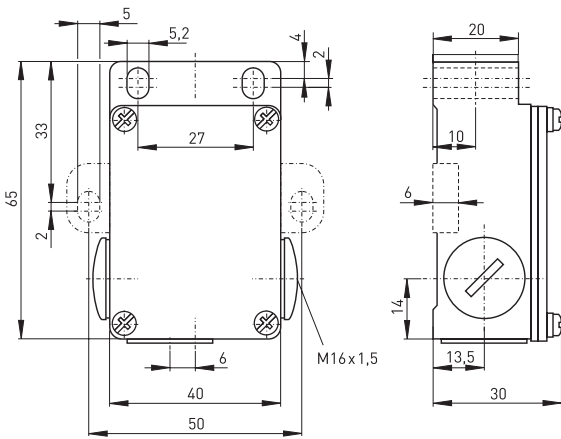
- Metal enclosure
- Slow action \ominus , change-over contact or 2 NC contacts with double break
- Slow action with overlapping contacts available
- ES 411: 25 mm mounting hole centres, depth 34 mm
- 3 cable entries M16 x 1.5
- Available with mechanical locking
- For temperatures up to 180°C available on request

// ES 41



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	slow action, positive break NC contacts \ominus IEC 60947-5-1
Termination	plug-in connector M3,5
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	3 x M 16 x 1.5
U _{imp}	4 kV
U _i	400 V
I _{the}	6 A
Utilisation category	AC-15
I _e /U _e	6 A/400 VAC
Max. fuse rating	6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points:	± 0.1 mm



Ordering details

ES 41 WH 10/1S-V

- Locking
- Contact type 1NC/1NO, (Z0, UE)
- Actuator H (R, WPH, HL, etc. ...)
- Watertight collar
- Series 41 or 411
- S Slow action

Position switches with safety function

// Series ES 41 und ES 411, actuators

Features/Options

- Mechanical locking: release by means of push button
- Mechanical locking V only possible for slow action
- With gold-plated contacts available on request

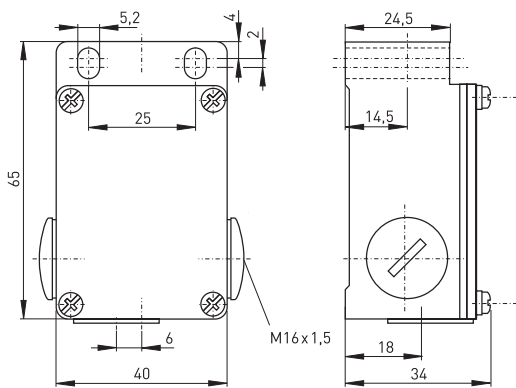
Note

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

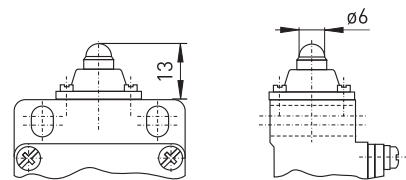
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// ES 411



// Plunger



// Mechanical locking



// Connector M12 x 1, 5-pole



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 41 10/15 ES 411 10/15
1 NC / 1 NO contact with overlapping	ES 41 UE ES 411 UE
2 NC contacts	ES 41 20 ES 411 20

Position switches with safety function // Series ES 41 and ES 411, actuators

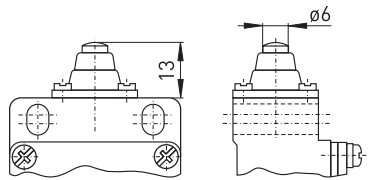
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

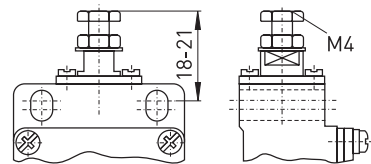
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Length of plunger adjustable by means of M4 setting screw
- For fine setting of switching point

// Plunger collar W



// Adjustable plunger ST



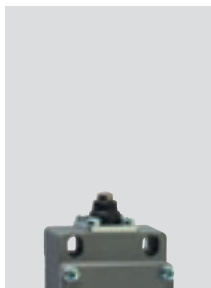
68

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 W 1Ö/1S ES 411 W 1Ö/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 W UE ES 411 W UE</p>
2 NC contacts	<p>ES 41 W 2Ö ES 411 W 2Ö</p>

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 ST 1Ö/1S ES 411 ST 1Ö/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 ST UE ES 411 ST UE</p>
2 NC contacts	<p>ES 41 ST 2Ö ES 411 ST 2Ö</p>



Features/Options

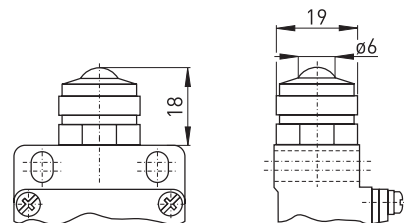
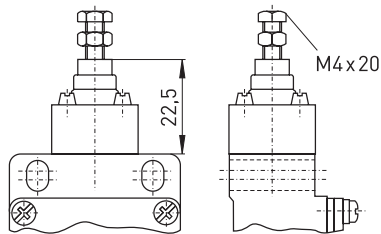
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Length of plunger adjustable by means of M4 setting screw
- For fine setting of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Adjustable plunger WST

// Ball plunger KU



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 WST 10/1S ES 411 WST 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 WST UE ES 411 WST UE</p>
2 NC contacts	<p>ES 41 WST 2Ö ES 411 WST 2Ö</p>

	Slow action
1 NC / 1 NO contact	<p>ES 41 KU 10/1S ES 411 KU 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 KU UE ES 411 KU UE</p>
2 NC contacts	<p>ES 41 KU 2Ö ES 411 KU 2Ö</p>



Position switches with safety function

// Series ES 41 and ES 411, actuators

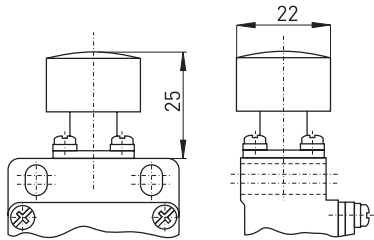
Features/Options

- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Collar to protect against the entry of foreign bodies

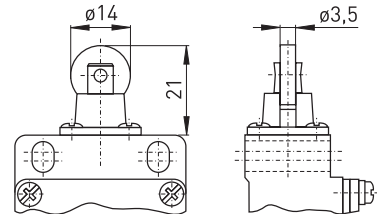
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be turned 90°

// Cover WK



// Roller plunger R



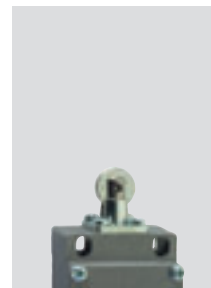
70

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 WK 10/1S ES 411 WK 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 WK UE ES 411 WK UE</p>
2 NC contacts	<p>ES 41 WK 20 ES 411 WK 20</p>

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 R 10/1S ES 411 R 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 R UE ES 411 R UE</p>
2 NC contacts	<p>ES 41 R 20 ES 411 R 20</p>



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Wear-resistant thermoplastic roller
- Actuator can be turned 90°
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Features/Options

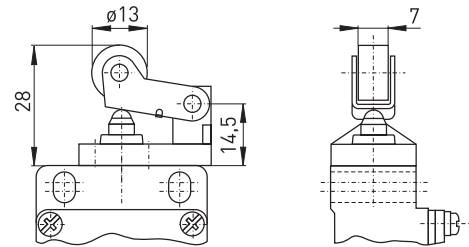
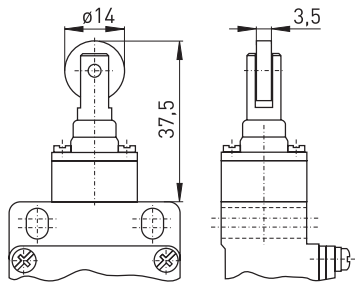
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

Note

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

// Roller plunger WR

// Lever H



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 41 WR 1Ö/1S ES 411 WR 1Ö/1S
1 NC / 1 NO contact with overlapping	ES 41 WR UE ES 411 WR UE
2 NC contacts	ES 41 WR 2Ö ES 411 WR 2Ö

	Slow action
1 NC / 1 NO contact	ES 41 H 1Ö/1S ES 411 H 1Ö/1S
1 NC / 1 NO contact with overlapping	ES 41 H UE ES 411 H UE
2 NC contacts	ES 41 H 2Ö ES 411 H 2Ö



Position switches with safety function

// Series ES 41 and ES 411, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

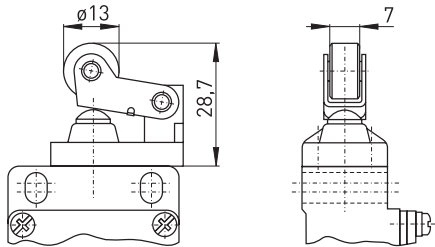
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

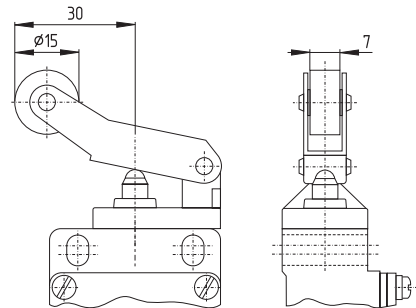
Note

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

// Offset roller lever collar WH



// Long roller lever HL



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Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 WH 10/1S ES 411 WH 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 WH UE ES 411 WH UE</p>
2 NC contacts	<p>ES 41 WH 20 ES 411 WH 20</p>

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 HL 10/1S ES 411 HL 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 HL UE ES 411 HL UE</p>
2 NC contacts	<p>ES 41 HL 20 ES 411 HL 20</p>



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

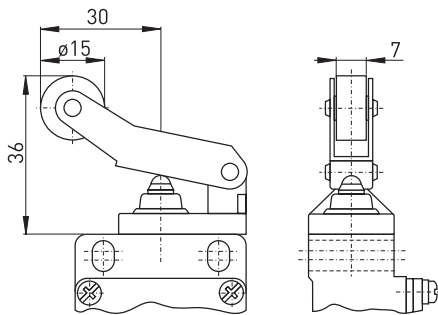
Note

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

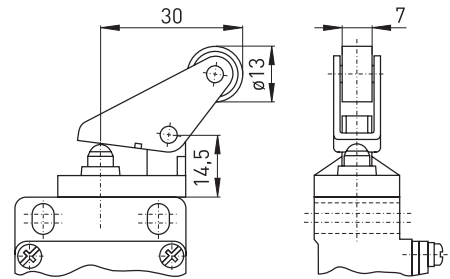
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

// Long roller lever collar WHL



// Parallel roller lever PH



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 41 WHL 10/1S ES 411 WHL 10/1S
1 NC / 1 NO contact with overlapping	ES 41 WHL UE ES 411 WHL UE
2 NC contacts	ES 41 WHL 20 ES 411 WHL 20

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 41 PH 10/1S ES 411 PH 10/1S
1 NC / 1 NO contact with overlapping	ES 41 PH UE ES 411 PH UE
2 NC contacts	ES 41 PH 20 ES 411 PH 20



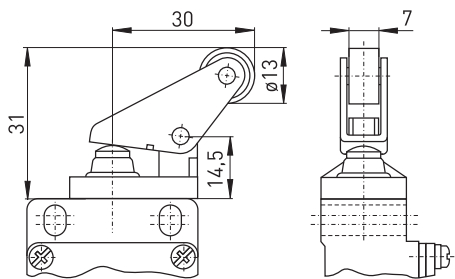
Position switches with safety function

// Series ES 41 and ES 411, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

// Parallel roller lever collar WPH



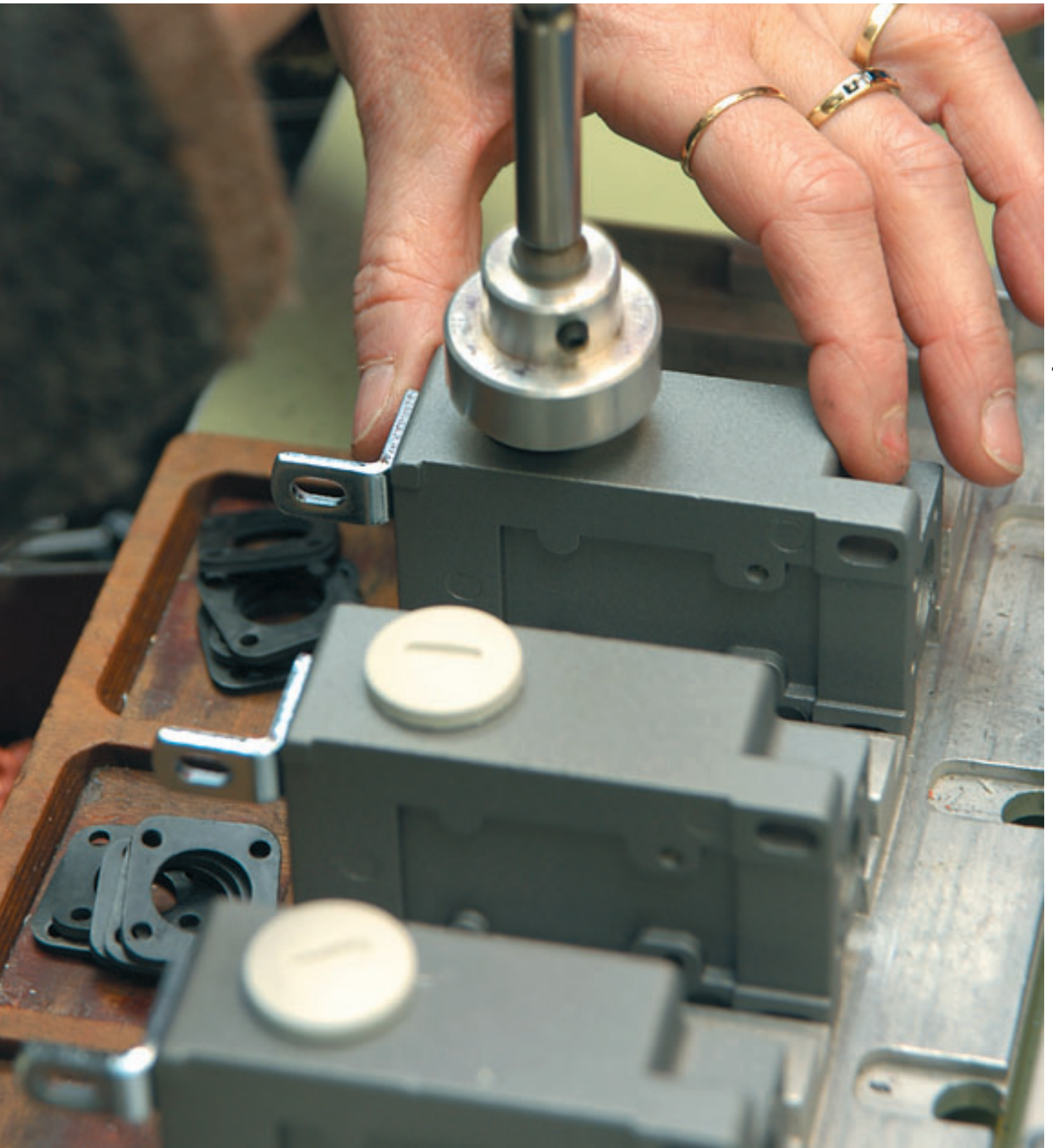
74

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 41 WPH 10/1S ES 411 WPH 10/1S</p>
1 NC / 1 NO contact with overlapping	<p>ES 41 WPH UE ES 411 WPH UE</p>
2 NC contacts	<p>ES 41 WPH 20 ES 411 WPH 20</p>



PRODUCTION PROCESS ASSEMBLY
ASSEMBLY OF BLIND CAPS IN POSITION SWITCHES



Position switches with safety function // Series ES 61

Features/Options

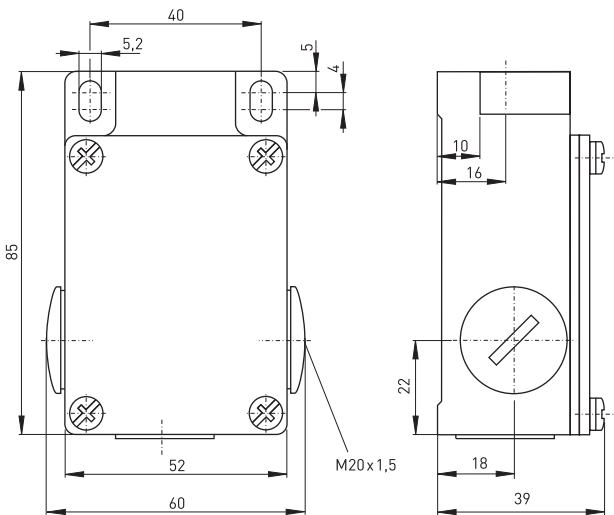
- Metal enclosure
- Slow action \ominus , change-over contact or 2 NC contacts with double break
- Available with overlapping contacts
- 3 cable entries M20 x 1.5
- Actuator heads can be repositioned by 4 x 90°
- Ex-version available

// ES 61



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	slow action, positive break NC contacts \ominus IEC 60947-5-1
Termination	plug-in connector
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	3 x M 20 x 1.5
U _{imp}	6 kV
U _i	400 V
I _{the}	6 A
Utilisation category	AC-15
Ie/Ue	16 A/400 VAC ES 61 2NC: 6 A/400 VAC
Max. fuse rating	16 A gL/gG D-fuse ES 61 2NC: 6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points:	± 0.1 mm



Ordering details

ES 61 WH 10/1S

- █ Contact type 1NC/1NO, (2Ö, UE)
- █ Actuator H (WPH, W, WHL, etc. ...)
- █ Watertight collar
- █ Series
- █ S Slow action

Position switches with safety function

// Series ES 61, actuators

Features/Options

- With gold-plated contacts available on request

Note

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

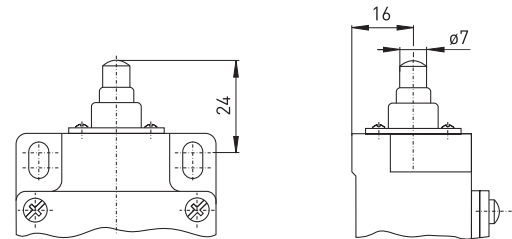
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 15°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Connector M12 x 1, 5-pole



// Plunger W



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 61 W 10/1S
1 NC / 1 NO contact with overlapping	ES 61 W UE
2 NC contacts	ES 61 W 20



Position switches with safety function

// Series ES 61, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

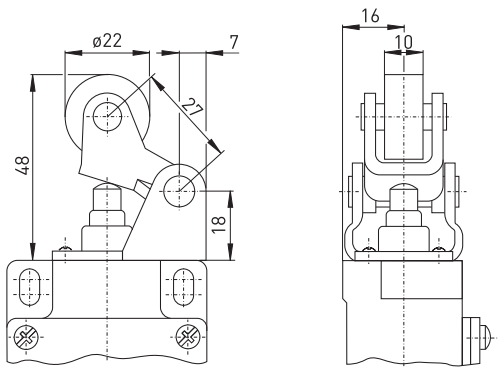
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

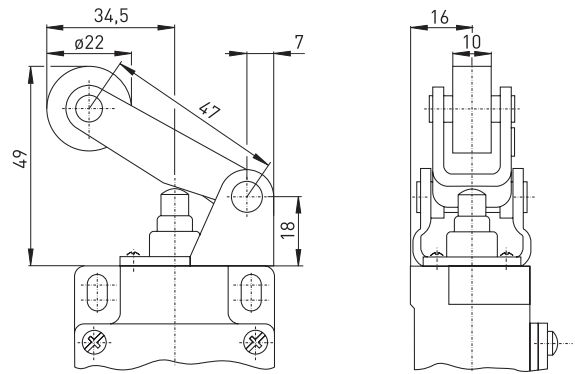
Note

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

// Roller lever WH



// Long roller lever WHL



78

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 61 WH 10/1S
1 NC / 1 NO contact with overlapping	ES 61 WH UE
2 NC contacts	ES 61 WH 2Ö

Contact variants: switch travel/contacts

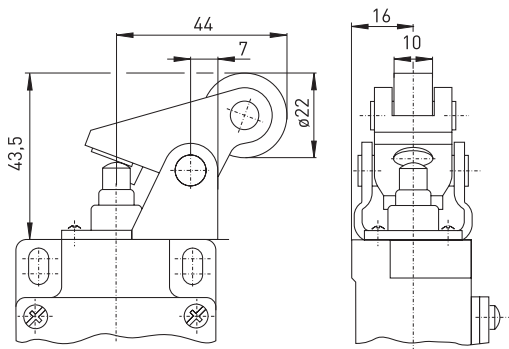
	Slow action
1 NC / 1 NO contact	ES 61 WHL 10/1S
1 NC / 1 NO contact with overlapping	ES 61 WHL UE
2 NC contacts	ES 61 WHL 2Ö



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

// Parallel roller lever WPH



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 61 WPH 1Ö/1S</p>
2 NC contacts	<p>ES 61 WPH 2Ö</p>







Safety switches
for hinged guard doors

Thermoplastic enclosure

// Series ES 95 T.C

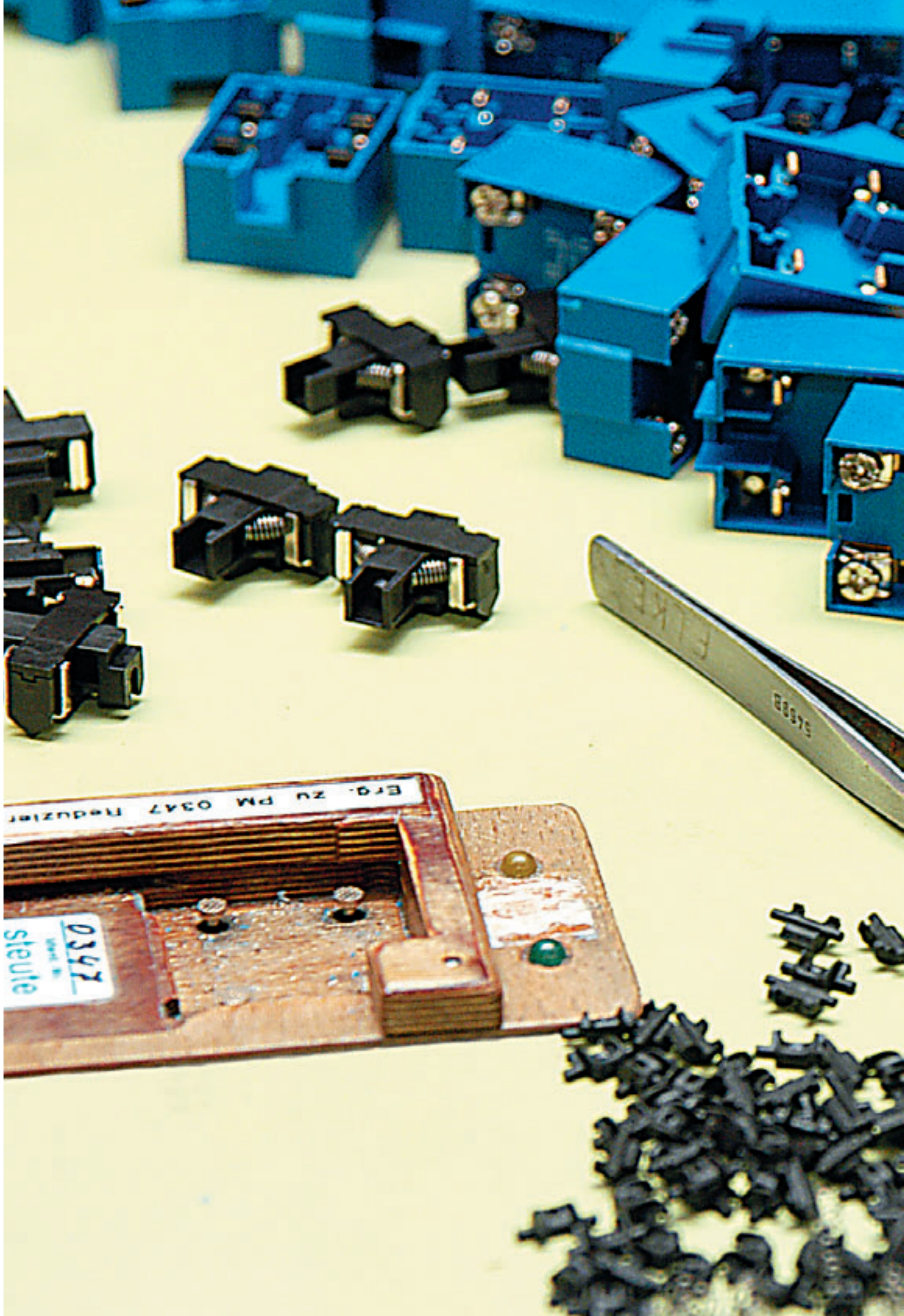
from page 84

// Series ES 13 SB

from page 85

// Series ES 95 SB

from page 86



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.

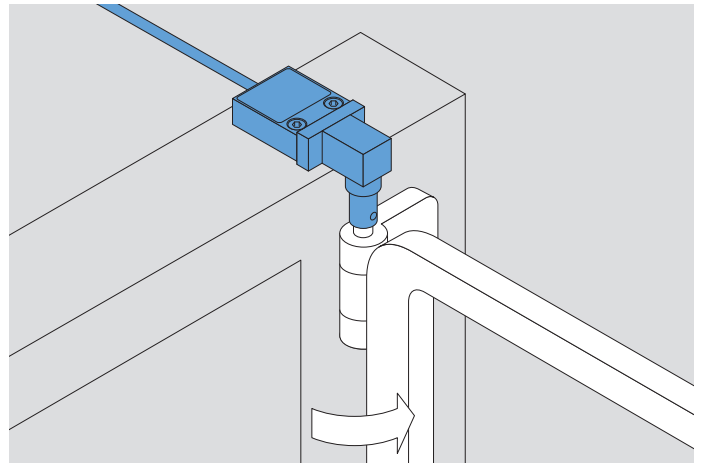
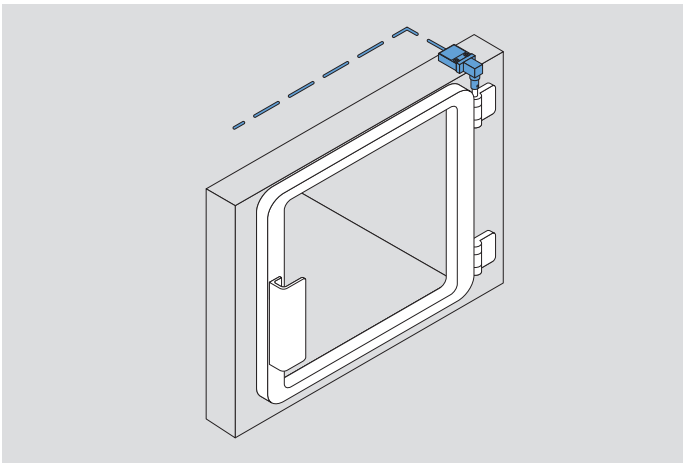
Design and operating principle

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 98/37/EC.

Application

ES 13 SB on hinged safety guard



Safety switches for hinged guard doors

// Series ES 95 T.C

Features/Options

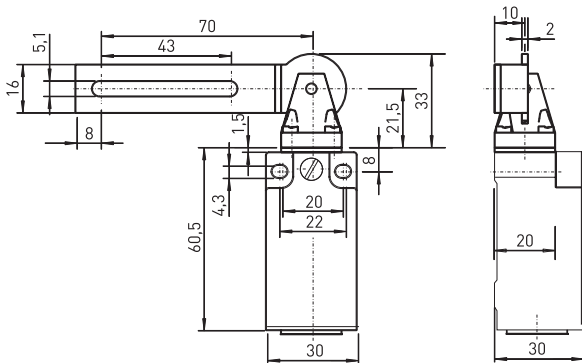
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- Cable entry M20 x 1.5
- Wiring compartment
- Ex-version available
- With gold-plated contacts available on request
- Mounting details to EN 50 047
- Transversery slotted mounting holes
- Actuator heads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

// ES 95 T.C



Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	stainless steel 1. 4301
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contacts ⊖
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Termination	M3 screw terminals
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
U_{imp}	4 kV
U_i	400 V
I_{the}	6 A
I_e/U_e	6 A/400 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +80 °C
Mechanical life	> 1 million operations
Approvals	Ⓢ US



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 95 T5C 10/1S

Ordering details

ES 95 T5C 10/1S

- Contact type 1NC/1NO, (20, UE)
- Actuator T5C
- Series
- S Slow action

Safety switches for hinged guard doors

// Series ES 95 SB

Features/Options

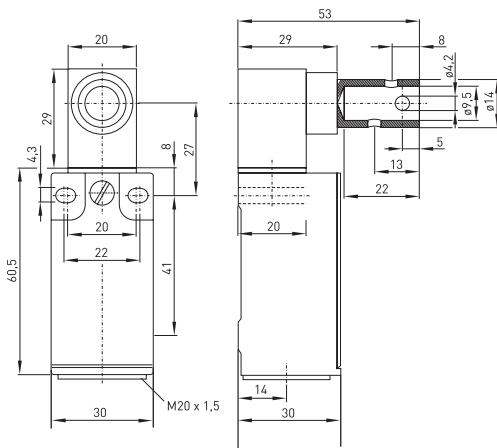
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact with double break
- Cable entry M20 x 1.5
- Wiring compartment
- Ex-version available
- With gold-plated contacts available on request
- Mounting details to EN 50 047
- Transversery slotted mounting holes
- Actuator heads can be repositioned in 4 x 90° steps
- Shaft bore ø 10 mm available

// ES 95 SB



Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	stainless steel 1. 4301
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contacts ⊖
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Termination	M3 screw terminals
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
U_{imp}	4 kV
U_i	400 V
I_{the}	6 A
I_e/U_e	6 A/400 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +80 °C
Mechanical life	> 1 million operations
Approvals	Ⓢ US



Contact variants: switch travel/contacts

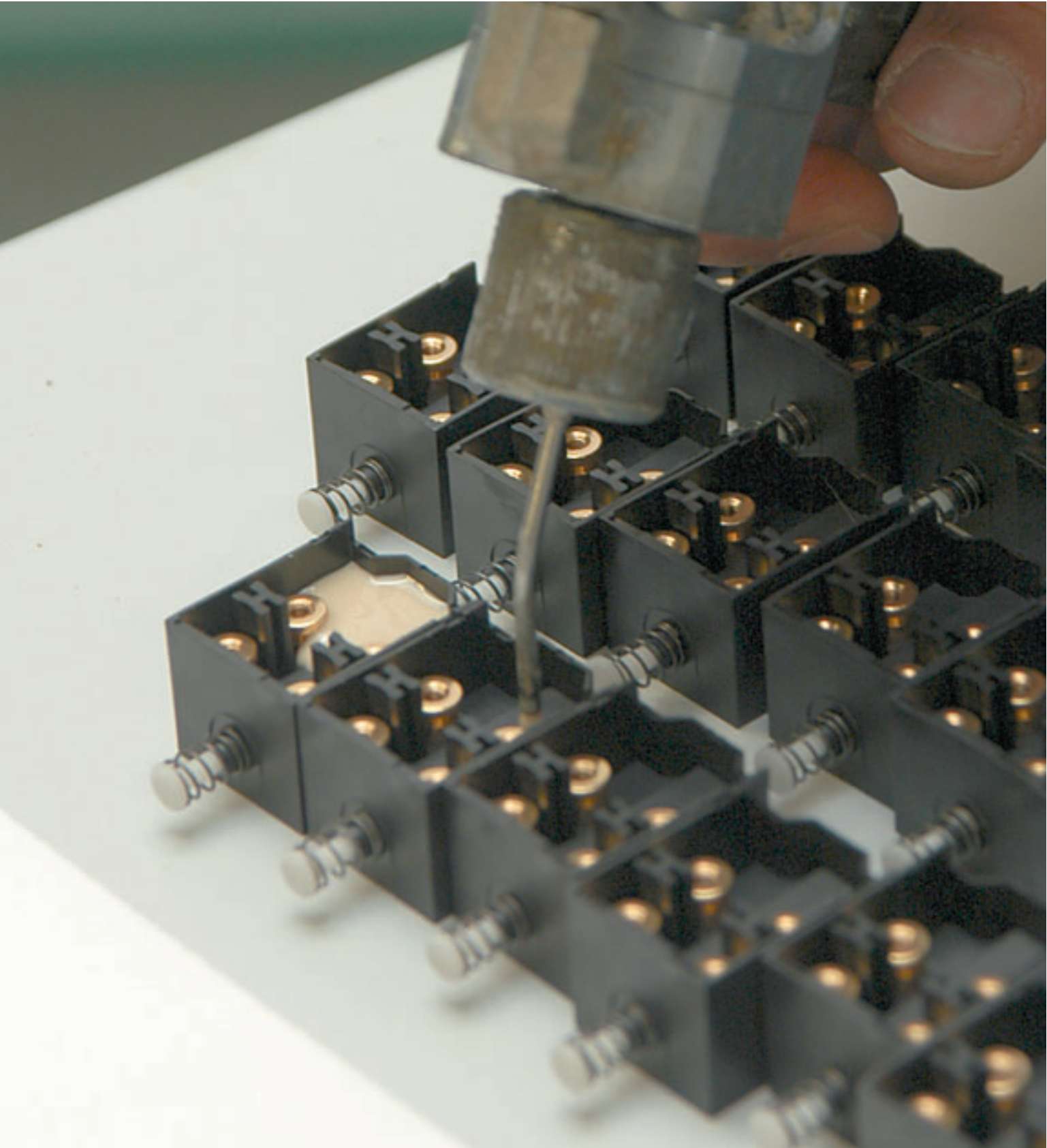
	Slow action
1 NC / 1 NO contact	ES 95 SB 10/1S 180° 16°0°16° 180° 23-24 11-12 20°10°10°20°
2 NC contacts	ES 95 SB 20 180° 20°0°20° 180° 11-12 21-22 10° 10°
1 NC / 1 NO contact with overlapping	ES 95 SB UE 180° 11°0°11° 180° 23-24 15-16 27°17°17°27°

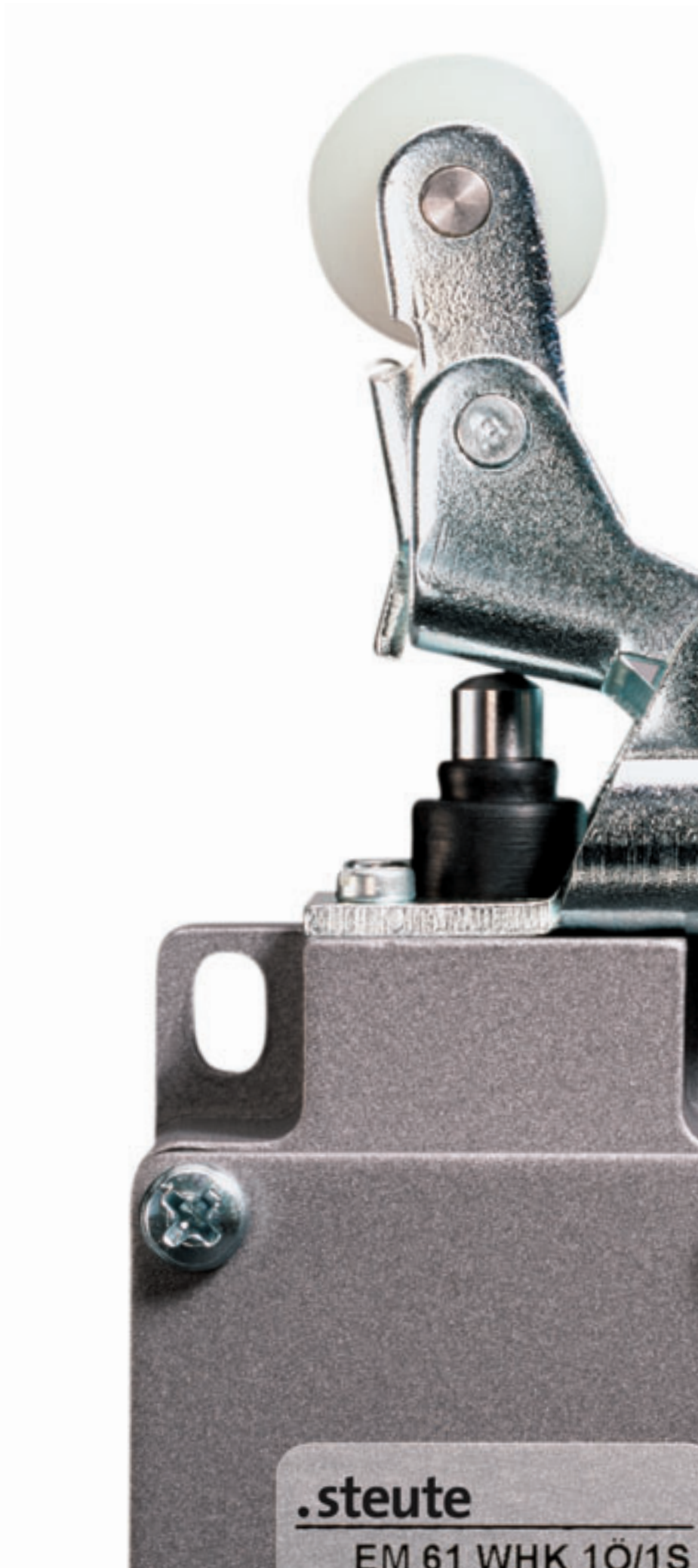
Ordering details

ES 95 SB 10/1S

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

PRODUCTION PROCESS ASSEMBLY
MOULDING OF SWITCH INSERTS FOR POSITION SWITCHES





.steute

EM 61 WHK 1Ö/1S



Position switches

Thermoplastic enclosure

// Series ES 13

from page 94

// Series ES/EM 14

from page 106

// Series ES/EM 95

from page 116

Metal enclosure

// Series E 12

from page 126

// Series ES 51

from page 138

// Series ES/EM 41

from page 150

// Series ES/EM 411

from page 150

// Series ES/EM 61

from page 164



Position switches

Range of application

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

Many of the position switches fulfil the requirements of the IEC 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.

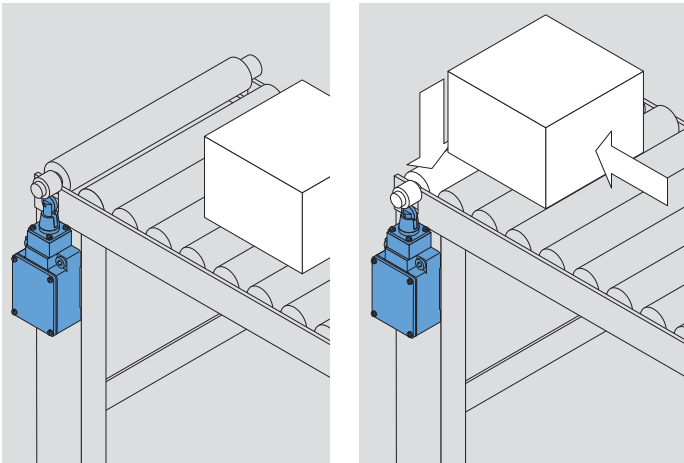
Some position switches fulfil the requirements for standardised switches to DIN EN 50 047. The position switches are available with snap and slow action and can be supplied with a metal roller on request. A large variety of actuators complete the program.

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

All position switches shown in this chapter bear the CE mark according to the low Voltage Directive 73/23/EC.

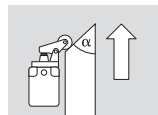
Application

Position monitoring on a conveyor belt

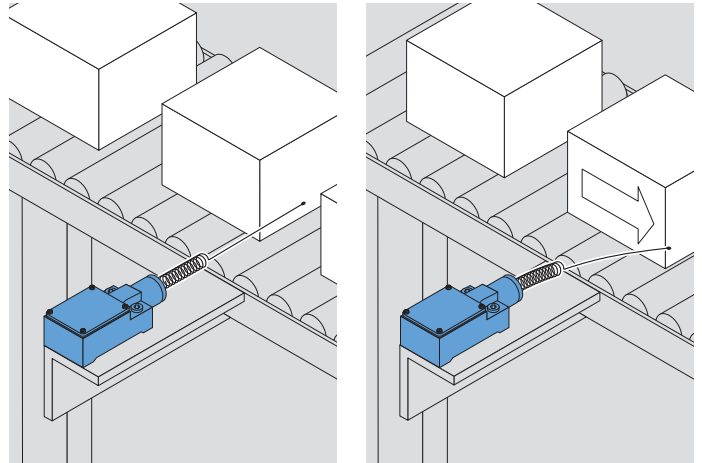


Legend

α : Actuating angle from bottom of switch axis as shown in picture

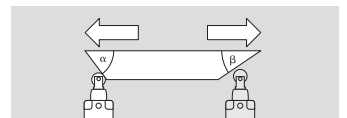


As a piece counter



α : Actuating angle from right of switch axis

β : Actuating angle from left of switch axis as shown in picture









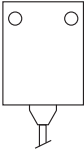


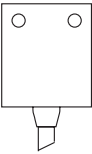

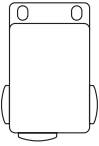
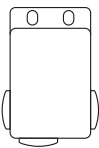
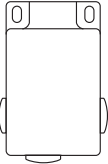


Selection table

Position switches

// Series

// Actuator

		↓	↓	↓	↺	↺	↺	↓	↔
									
ES 13, from page 88 - Thermoplastic enclosure - Cable		+ W		F	KU WKU	FKU			R WR
ES/EM 14, from page 106 - Thermoplastic enclosure - 3 contacts - Cable		+ W		F	KU WKU	FKU	VKU		R WR
ES/EM 95, from page 116 - Thermoplastic enclosure - Wiring compartment - 1 cable entry - Type to DIN EN 50 047		W							R
E 12, from page 126 - Metal enclosure - Cable		+ W		F	KU WKU	FKU			R WR
ES 51, from page 138 - Metal enclosure - Wiring compartment - 1 cable entry		+ W	ST WST		KU			WK	R WR
ES/EM 41, from page 150 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES/EM 411, from page 150 - Metal enclosure - Wiring compartment - 3 cable entries		+ W	ST WST		KU			WK	R WR
ES/EM 61, from page 164 - Metal enclosure - Wiring compartment - 3 cable entries		W							

+ Default: plunger without watertight collar

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	WHL	WPH	WHK	D		DS	DF	DD	TL			TK		
	FR		WH	WHL	WPH	WHK	D	DL	DS		DD	TL	TF		TK		
			H	HL	PH	HK	D	DL	DS	DF	DD						
			H	HL	PH	HK	D	DL	DS	DF	DD	TL	TF	TFL	TK		
			H	HL	PH	HK	D	DL	DS	DF	DD	TL	TF	TFL	TK		
			WH	WHL	WPH	WHK	D	DL	DS			TL	TF	TFL	TK		

Position switches

// Series ES 13

Features/Options

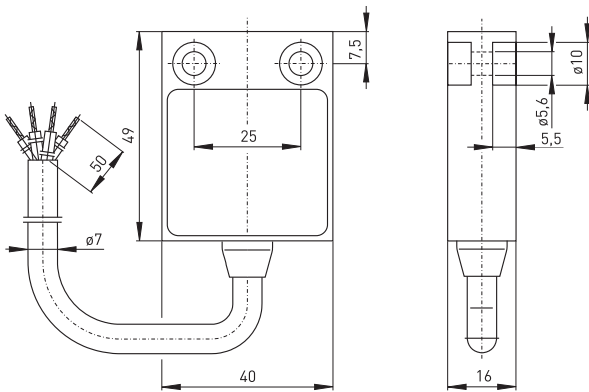
- Thermoplastic enclosure
- Double insulated
- Slow action \ominus , change-over contact with double break
- Slow action with overlapping contacts available
- Max. 3 contacts
- Version with 3 contacts has cable on left-hand side
- Suitable for in-line mounting
- With pre-wired cable, cable length 1 meter
- Ex-version available

// ES 13



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contact \ominus
Switching elements	change-over contact with double break with galvanically separated contact bridges
Termination	cable H05VV-F
Cable section	4 x 0.75 mm ²
U_{imp}	4 kV
U_i	250 V
I_{the}	6 A
I_e/U_e	6 A/250 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Impact resistance/Contact opening	max. 2 x 4.5 mm



Ordering details

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

- Cable length 1 m, (2 m, 5 m, 10 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

// Series ES 13

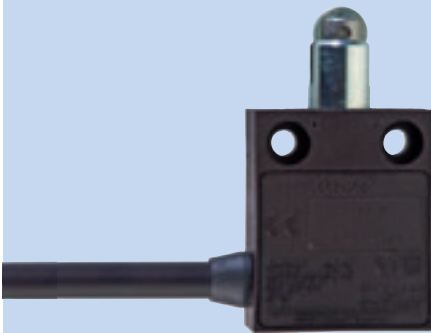
Features/Options

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

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Cable on side



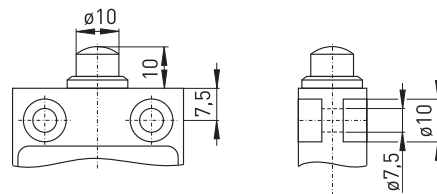
// Cable entry M16 x 1.5



// Connector M12 x 1, 4-pole



// Plunger



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 10/1S

Position switches

// Series ES 13, actuators

Features/Options

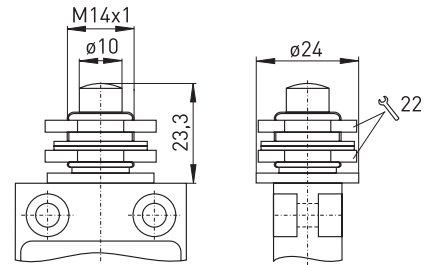
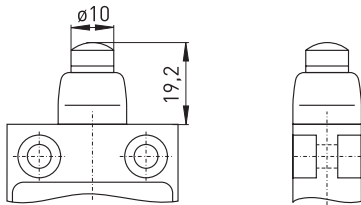
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Plunger collar W

// Plunger for front mounting F



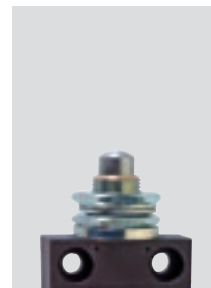
96

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 W 10/1S

	Slow action
1 NC / 1 NO contact	ES 13 F 10/1S



Features/Options

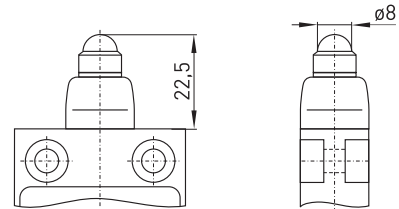
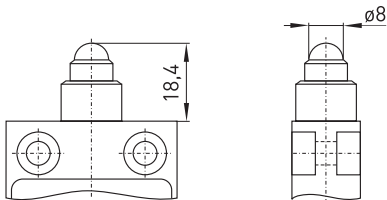
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 15°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Ball plunger KU

// Ball plunger collar WKU

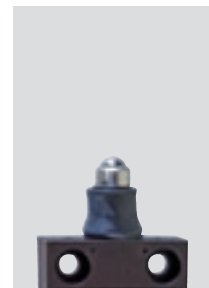
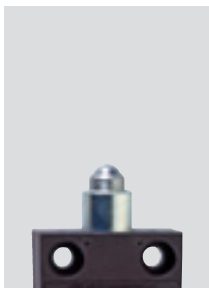


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action	
1 NC / 1 NO contact	ES 13 KU 10/1S

Slow action	
1 NC / 1 NO contact	ES 13 WKU 10/1S



Position switches

// Series ES 13, actuators

Features/Options

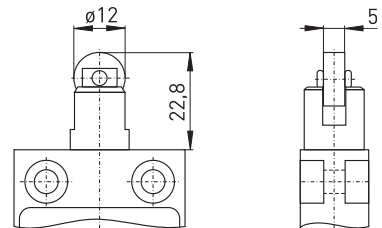
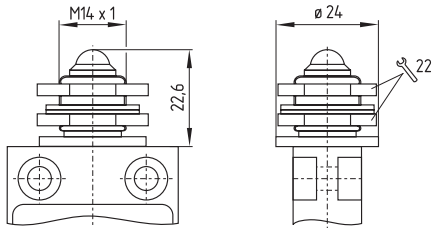
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Ball diameter 8 mm
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90°

// Ball plunger for front mounting FKU

// Roller plunger R



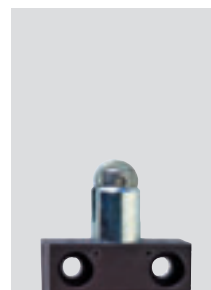
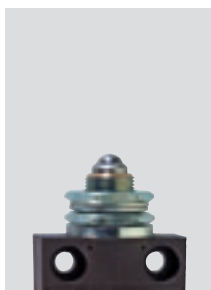
98

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 FKU 10/1S

	Slow action
1 NC / 1 NO contact	ES 13 R 10/1S



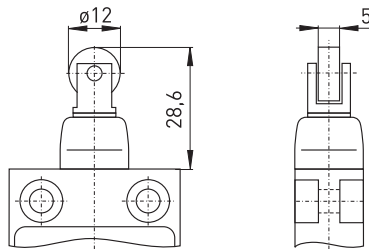
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°

// Roller plunger collar WR

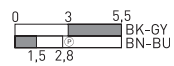


Contact variants: switch travel/contacts

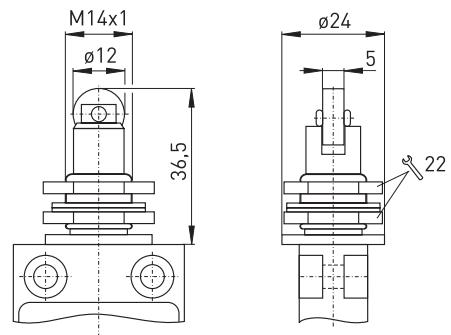
Slow action

1 NC / 1 NO contact

ES 13 WR 1Ö/1S



// Roller plunger for front mounting FR

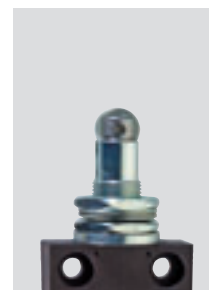
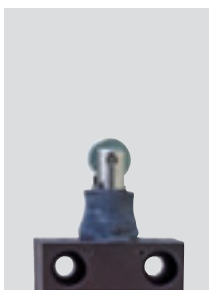
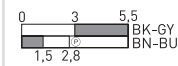


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 13 FR 1Ö/1S



Position switches

// Series ES 13, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

Note

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

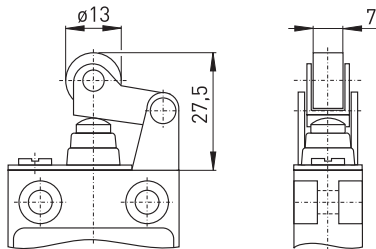
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

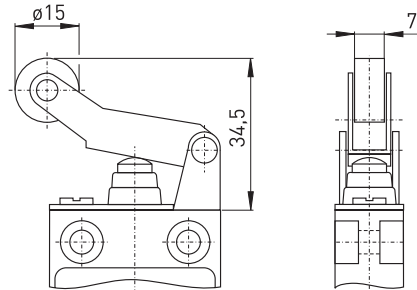
Note

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



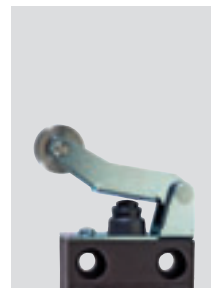
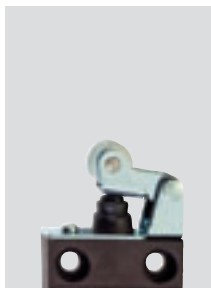
100

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 WH 10/1S

	Slow action
1 NC / 1 NO contact	ES 13 WHL 10/1S



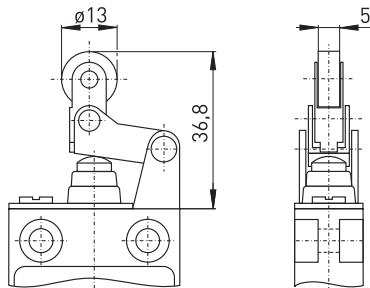
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

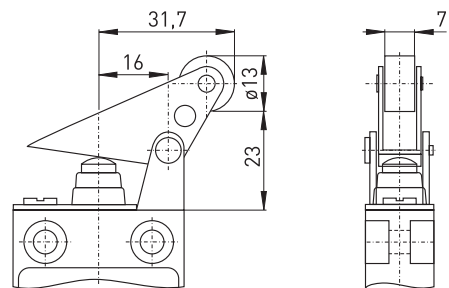
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

// Rocking roller lever collar WHK



// Parallel roller lever collar WPH



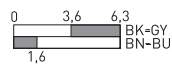
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

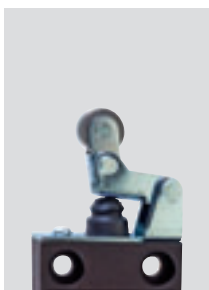
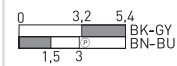
ES 13 WHK 1Ö/1S



Slow action

1 NC / 1 NO contact

ES 13 WPH 1Ö/1S



Position switches

// Series ES 13, actuators

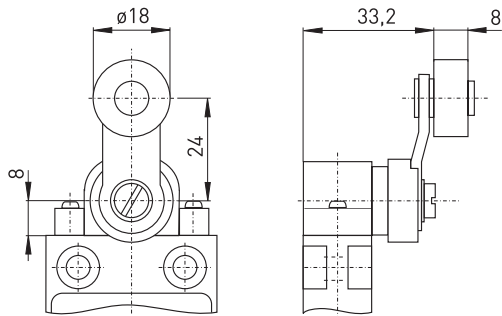
Features/Options

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

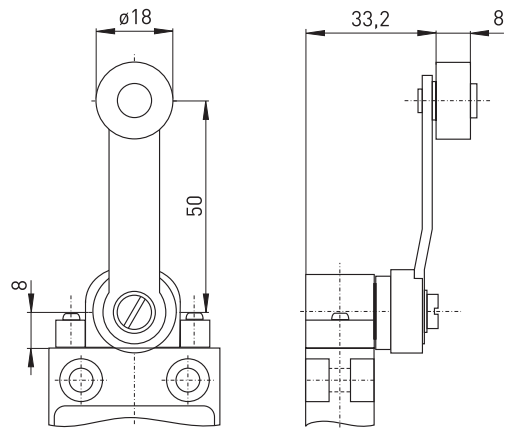
Features/Options

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

// Roller lever D



// Long roller lever DL



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Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 D 10/1S
	 GK-GY BN-BU

	Slow action
1 NC / 1 NO contact	ES 13 DL 10/1S
	 GK-GY BN-BU



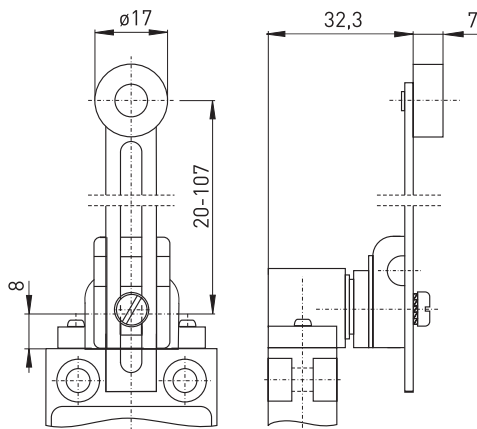
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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

- Wear-resistant thermoplastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

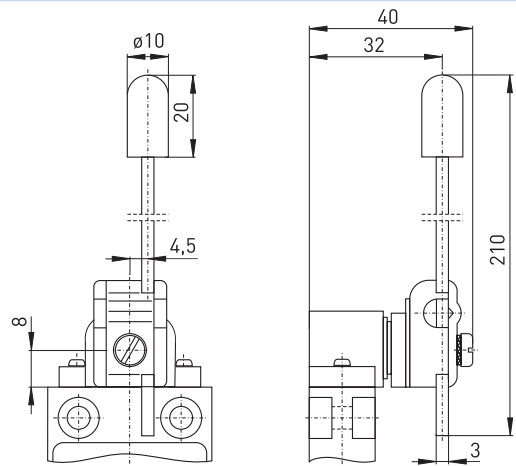
// Adjustable-length roller lever DS



Contact variants: switch travel/contacts

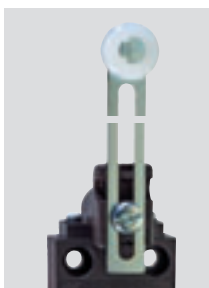
	Slow action
1 NC / 1 NO contact	ES 13 DS 10/1S
	BK-GY BN-BU

// Wire roller lever DD



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 13 DD 10/1S
	BK-GY BN-BU



Position switches

// Series ES 13, actuators

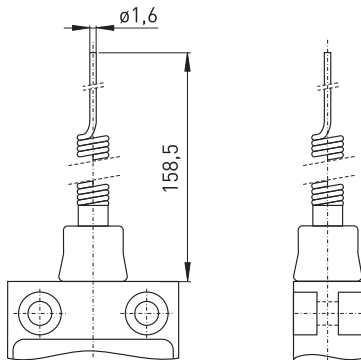
Features/Options

- 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°

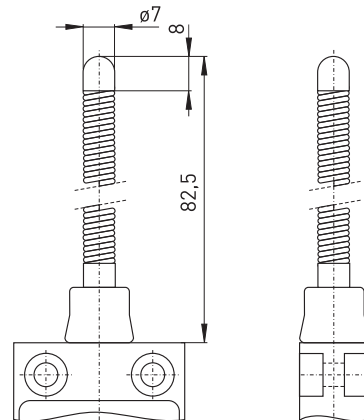
Features/Options

- 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 rounded steel tip TF



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Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action	
1 NC / 1 NO contact	ES 13 TL 10/1S
	BK-GY BN-BU

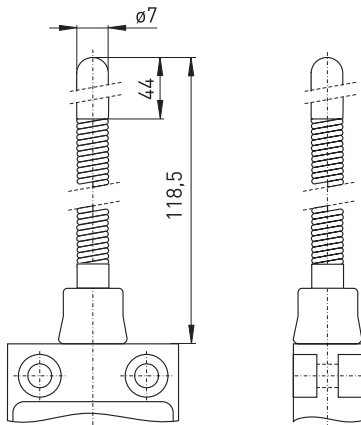
Slow action	
1 NC / 1 NO contact	ES 13 TF 10/1S
	BK-GY BN-BU



Features/Options

- Wear-resistant plastic rod
- 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 rod TK

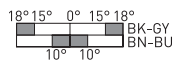


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 13 TK 10/1S



Position switches

// Series ES/EM 14

Features/Options

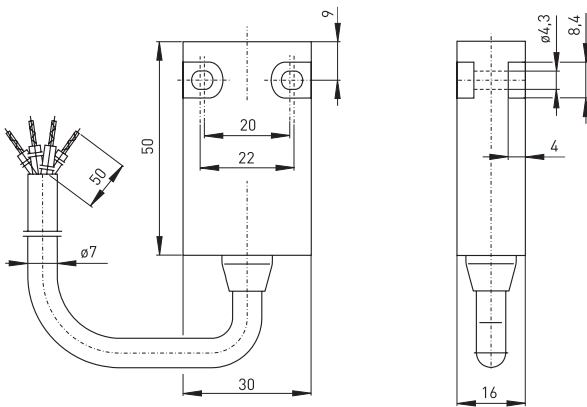
- Thermoplastic enclosure
- Double insulated □
- Slow action ⊖, change-over contact or 2 NC contacts with double break
- Snap action, change-over contact with single break
- Overlapping contacts available
- Mounting details to DIN EN 50 047
- Suitable for in-line mounting
- With pre-wired cable, cable length 1 meter
- Ex-Version available

// ES/EM 14



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching system	slow or snap action; slow action positive break NC contacts ⊖
Switching elements	ES 14: change-over contact with double break, galvanically separated contact bridges EM 14: change-over contact with single break
Termination	cable H05VV-F, AWG20
Cable section	ES 14: 4 x 0.75mm ² , 6 x AWG20 EM 14: 3 x 0.75 mm ²
U _{imp}	4 kV
U _i	250 V
I _{the}	ES 14: 6 A EM 14: 5 A
I _e /U _e	ES 14: 6 A/250 VAC; 0.25 A/230 VDC EM 14: 5 A/250 VAC; 0.16 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	ES 14: 6 A gL/gG D-fuse EM 14: 5 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Contact opening	max. 2 x 4 mm



Ordering details

ES 14 WR 10/1S-s-1m

- Cable length 1 m, (2 m, 5 m, 10 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

// Series ES/EM 14, actuators

Features/Options

- Snap action, change-over contact with double break available, e.g. EM 14 R 1NC/1NO
- Slow action with 2 NC contacts or 2 NC and 1 NO contact available
- With gold-plated contacts available on request
- Version with UL/CSA approval available
- With latching element available on request

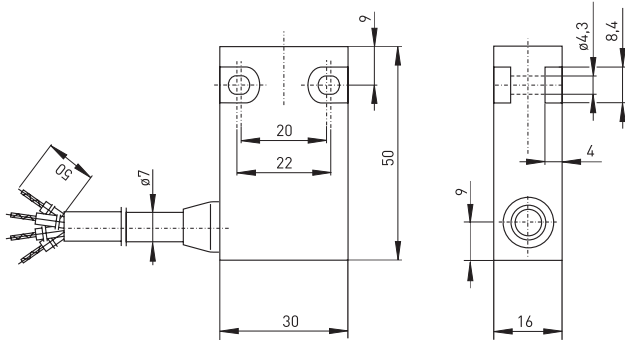
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

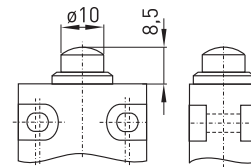
// Connector M12 x 1, 4-pole



// Cable on side



// Plunger



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 GY-BK GY-BN	ES 14 BK-GY BN-BU

Position switches

// Series ES/EM 14, actuators

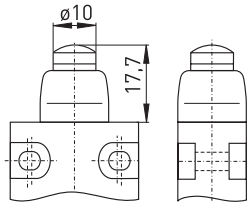
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Collar to protect against the entry of foreign bodies

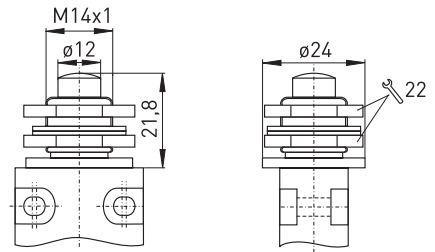
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

// Plunger with watertight collar W



// Plunger for front mounting F

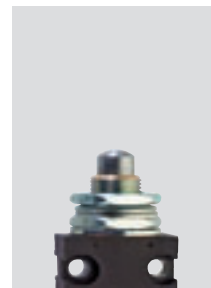


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 W GY-BK GY-BN	ES 14 W BK-GY BN-BU

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 F GY-BK GY-BN	ES 14 F BK-GY BN-BU



Features/Options

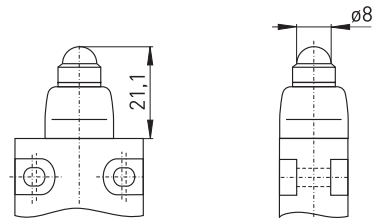
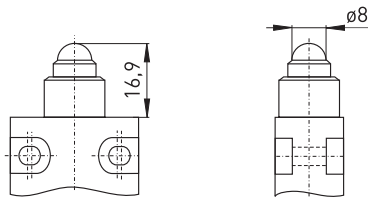
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Ball plunger KU

// Ball plunger collar WKU



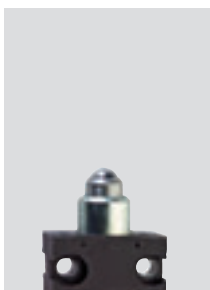
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 KU 	ES 14 KU

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 WKU 	ES 14 WKU

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Position switches

// Series ES/EM 14, actuators

Features/Options

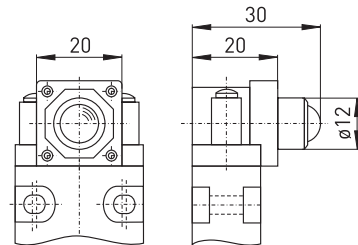
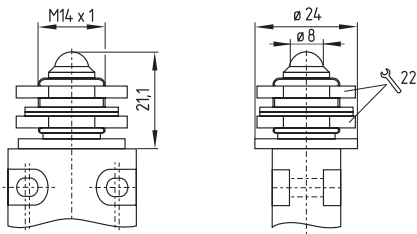
- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

Features/Options

- Actuation from any direction
- Actuator head with captive stainless steel ball actuator

// Ball plunger for front mounting FKU

// Ball plunger at front VKU



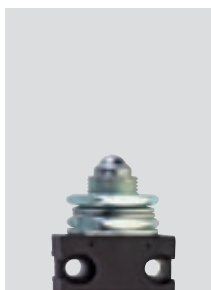
110

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 FKU 	ES 14 FKU

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 VKU 	ES 14 VKU



Features/Options

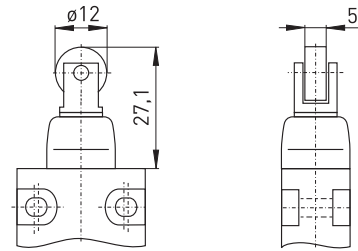
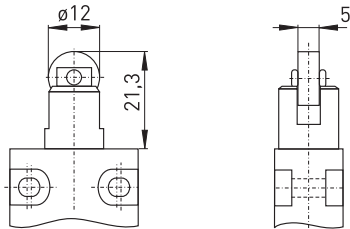
- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be delivered repositioned by 90°

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be delivered repositioned by 90°
- Collar to protect against the entry of foreign bodies

// Roller plunger R

// Roller plunger collar WR

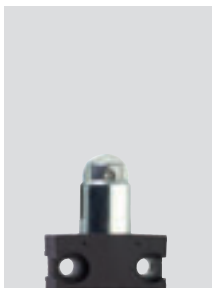


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 R 	ES 14 R

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 WR 	ES 14 WR



Position switches

// Series ES/EM 14, actuators

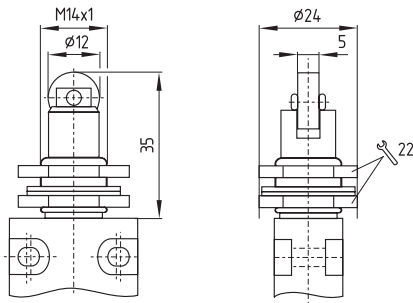
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be delivered repositioned by 90°

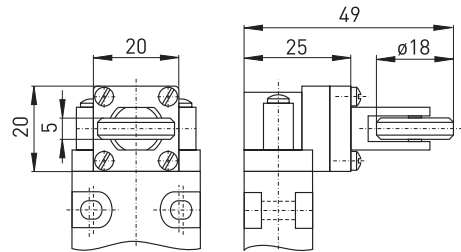
Features/Options

- Actuator can be transposed by 90°
- Wear-resistant thermoplastic roller

// Roller plunger for front mounting FR



// Roller plunger at front VR



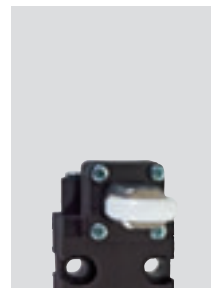
112

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 FR 	ES 14 FR

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 VR 	ES 14 VR



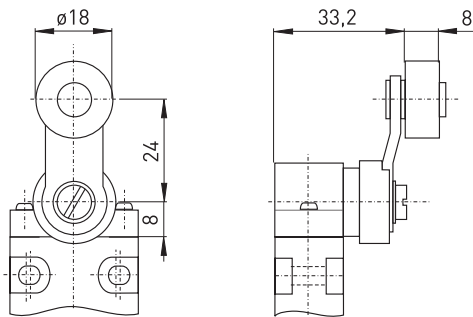
Features/Options

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

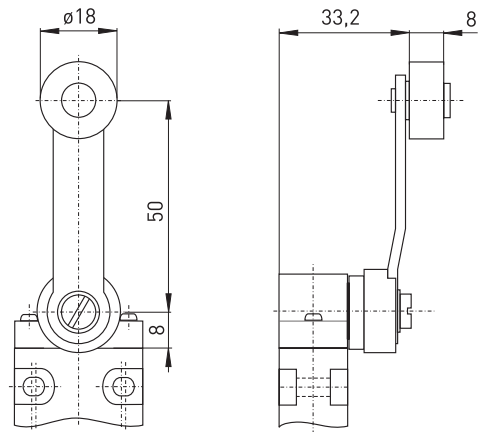
Features/Options

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

// Roller lever D



// Long roller lever DL



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 D GY-BK GY-BN	ES 14 D BK-GY BN-BU

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 DL GY-BK GY-BN	ES 14 DL BK-GY BN-BU



Position switches

// Series ES/EM 14, actuators

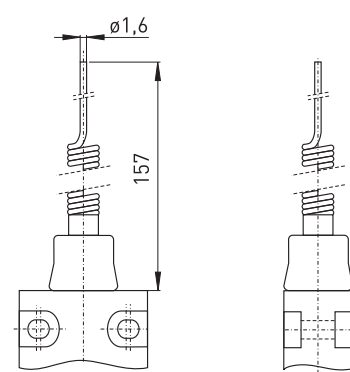
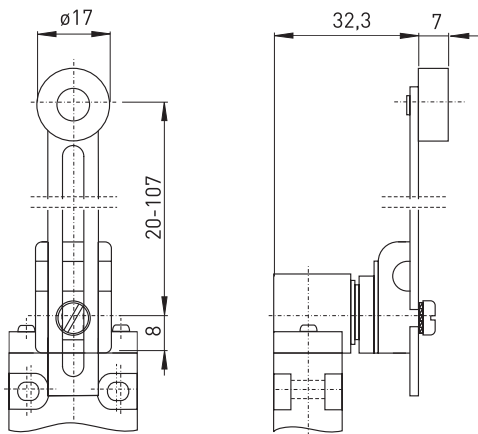
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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

- 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-length roller lever DS // Long spring rod TL



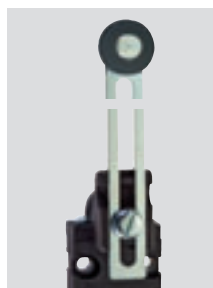
114

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 DS 	ES 14 DS

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 TL 	ES 14 TL



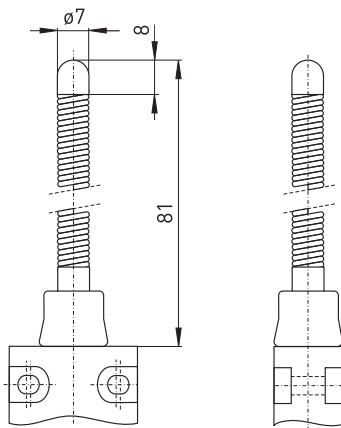
Features/Options

- 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°

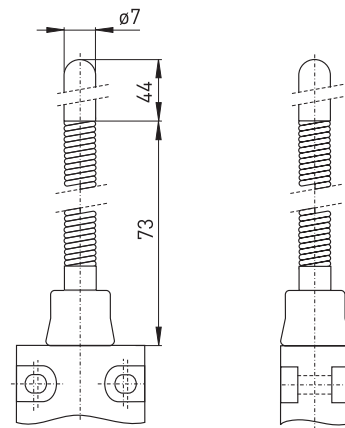
Features/Options

- Wear-resistant plastic rod
- 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 rounded steel tip TF



// Spring rod with plastic rod TK



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 TF GY-BK GY-BN	ES 14 TF BK-GY BN-BU

	Snap action	Slow action
1 NC / 1 NO contact	EM 14 TK GY-BK GY-BN	ES 14 TK BK-GY BN-BU



Position switches

// Series ES/EM 95

Features/Options

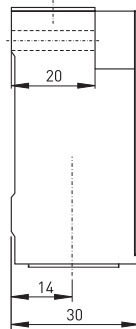
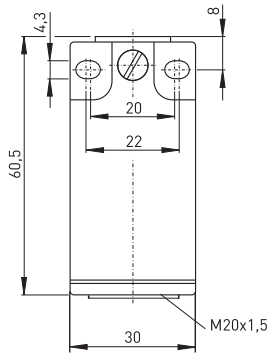
- Thermoplastic enclosure
- Transversary slotted mounting holes
- Double insulated
- Snap action with constant contact pressure up to switching point
- Slow action with overlapping contacts available
- Wide range of alternative actuators
- Actuator heads can be repositioned by 4 x 90°
- Angle of offset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

// ES/EM 95



Technical data

Standards	IEC/EN 60947-5-1; EN 1088; BG-GS-ET-15
Class	DIN EN 50 047
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	⊖ IEC 60947-5-1 slow or snap action, positive break NC contacts
Termination	plug-in connector
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	M 20 x 1.5
U _{imp}	4 kV
U _i	400 V
I _{the}	6 A
Utilisation category	AC-15; DC-13
I _e /U _e	6 A/400 VAC; 0.25 A/230 VDC
Max. fuse rating	6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	1800/h
Ambient temperature	- 20 °C ... + 80 °C
Contact opening	2 x 3.5 mm
Approvals	US



Ordering details

ES 95 WH 10/1S-V-LL

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

Position switches

// Series ES/EM 95, actuators

Features/Options

- Mechanical locking: release by means of push button
- Mechanical locking V only possible for slow action
- With gold-plated contacts available on request

Features/Options

- Actuator type B to DIN EN 50 047
- Actuator with watertight collar

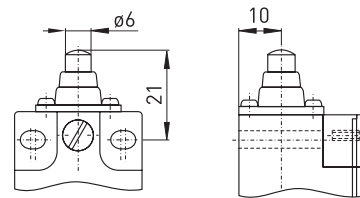
// Mechanical locking



// Connector M12 x 1, 4-pole



// Plunger W



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 W 10/1S 	ES 95 W 10/1S
1 NC / 1 NO contact with overlapping		ES 95 W UE
2 NC contacts		ES 95 W 2Ö
2 NO contacts		ES 95 W 2S



Position switches

// Series ES/EM 95, actuators

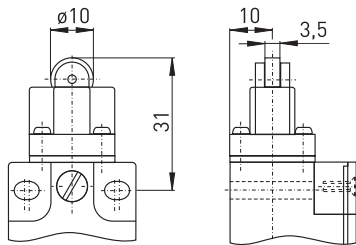
Features/Options

- Actuator type C to DIN EN 50 047
- Wear-resistant thermoplastic roller
- Metal roller available on request
- Actuator heads can be repositioned in 4 x 90° steps

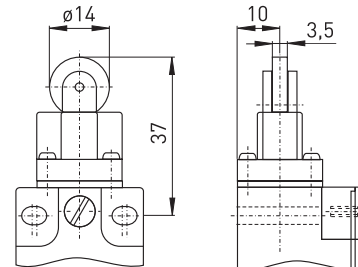
Features/Options

- Wear-resistant thermoplastic roller
- Metal roller available on request
- Actuator heads can be repositioned in 4 x 90° steps

// Roller plunger R



// Long roller plunger RL



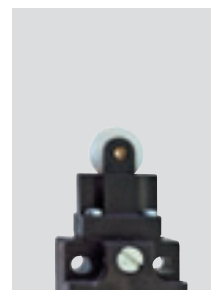
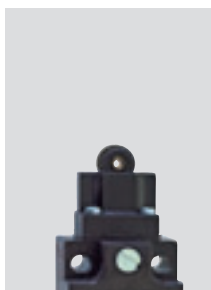
118

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 R 10/1S 	ES 95 R 10/1S
1 NC / 1 NO contact with overlapping		ES 95 R UE
2 NC contacts		ES 95 R 2Ö
2 NO contacts		ES 95 R 2S

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 RL 10/1S 	ES 95 RL 10/1S
1 NC / 1 NO contact with overlapping		ES 95 RL UE
2 NC contacts		ES 95 RL 2Ö
2 NO contacts		ES 95 RL 2S



Features/Options

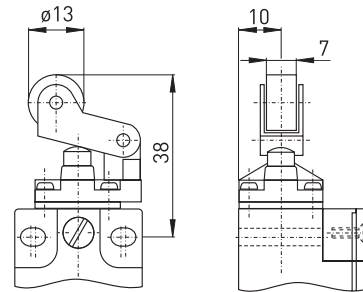
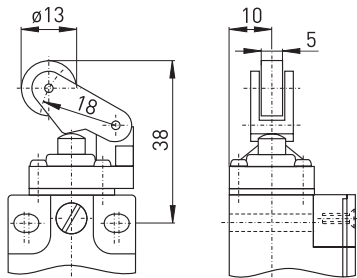
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Actuator type E to DIN EN 50 047
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

// Roller lever WHM

// Metal roller lever WHM

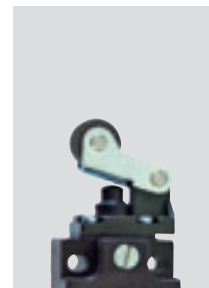
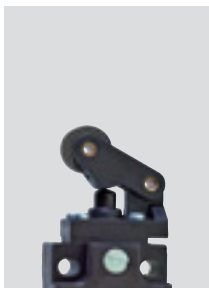


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WH 10/1S 	ES 95 WH 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WH UE
2 NC contacts		ES 95 WH 20
2 NO contacts		ES 95 WH 2S

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WHM 10/1S 	ES 95 WHM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WHM UE
2 NC contacts		ES 95 WHM 20
2 NO contacts		ES 95 WHM 2S



Position switches

// Series ES/EM 95, actuators

Features/Options

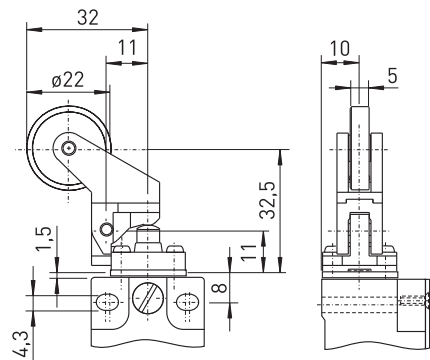
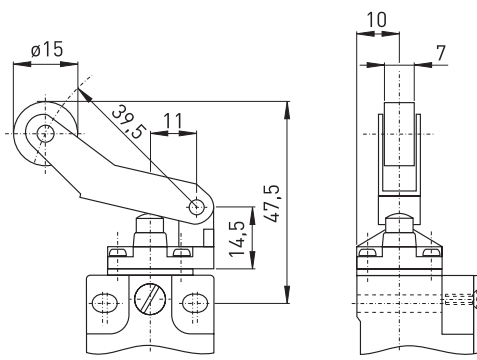
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

// Long metal roller lever WHLM

// Plastic roller lever 4K



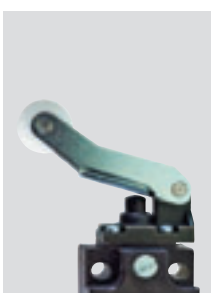
120

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WHLM 10/1S 	ES 95 WHLM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WHLM UE
2 NC contacts		ES 95 WHLM 20
2 NO contacts		ES 95 WHLM 2S

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 4K 10/1S 	ES 95 4K 10/1S
1 NC / 1 NO contact with overlapping		ES 95 4K UE
2 NC contacts		ES 95 4K 20
2 NO contacts		ES 95 4K 2S



Features/Options

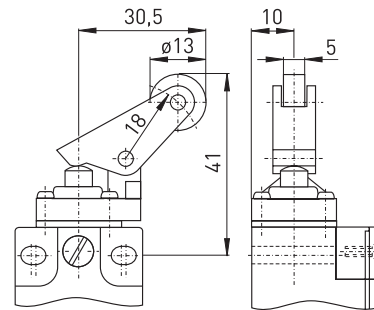
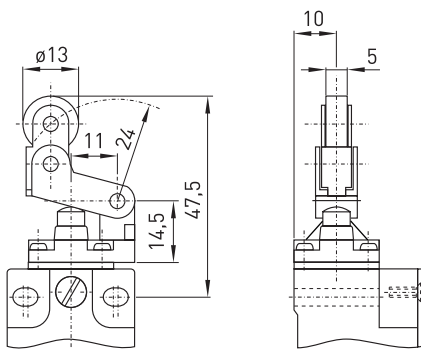
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Metal roller available on request

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Actuation parallel to axis of switch from below
- Metal roller available on request

// Rocking roller WHKM

// Parallel roller lever WPH



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WHKM 10/1S 	ES 95 WHKM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WHKM UE
2 NC contacts		ES 95 WHKM 2Ö
2 NO contacts		ES 95 WHKM 2S

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WPH 10/1S 	ES 95 WPH 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WPH UE
2 NC contacts		ES 95 WPH 2Ö
2 NO contacts		ES 95 WPH 2S



Position switches

// Series ES/EM 95, actuators

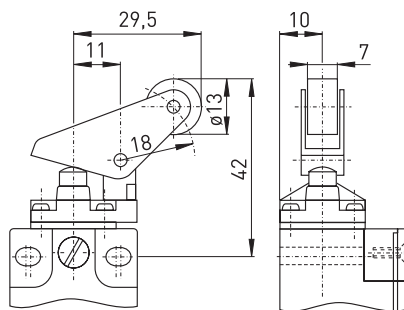
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuator with watertight collar
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Actuation parallel to axis of switch from below
- Metal roller available on request

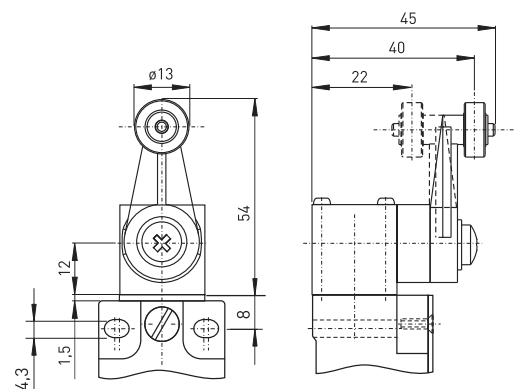
Features/Options

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

// Parallel metal roller lever WPHM



// Roller lever D

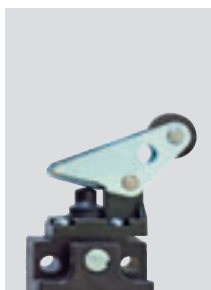


Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 WPHM 10/1S 	ES 95 WPHM 10/1S
1 NC / 1 NO contact with overlapping		ES 95 WPHM UE
2 NC contacts		ES 95 WPHM 20
2 NO contacts		ES 95 WPHM 2S

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 D 10/1S 	ES 95 D 10/1S
1 NC / 1 NO contact with overlapping		ES 95 D UE
2 NC contacts		ES 95 D 20
2 NO contacts		ES 95 D 2S



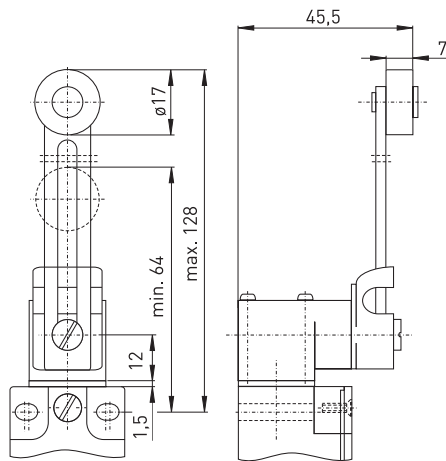
Features/Options

- Lever angle adjustable in 10° steps
- Length of roller lever adjustable
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Metal roller available on request

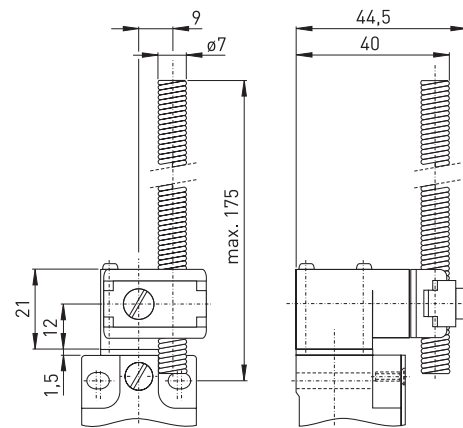
Features/Options

- Lever angle adjustable in 10° steps
- Actuator heads can be repositioned in 4 x 90° steps

// Adjustable-length roller lever DS



// Spring lever DF



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 DS 1Ö/1S 	ES 95 DS 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 95 DS UE
2 NC contacts		ES 95 DS 2Ö
2 NO contacts		ES 95 DS 2S

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 DF 1Ö/1S 	ES 95 DF 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 95 DF UE
2 NC contacts		ES 95 DF 2Ö
2 NO contacts		ES 95 DF 2S



Position switches

// Series ES/EM 95, actuators

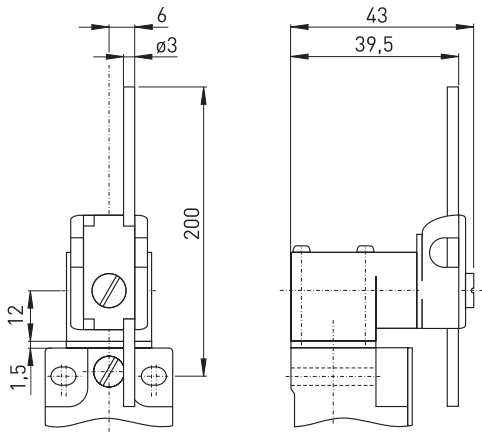
Features/Options

- Lever angle adjustable in 10° steps
- Actuator heads can be repositioned in 4 x 90° steps

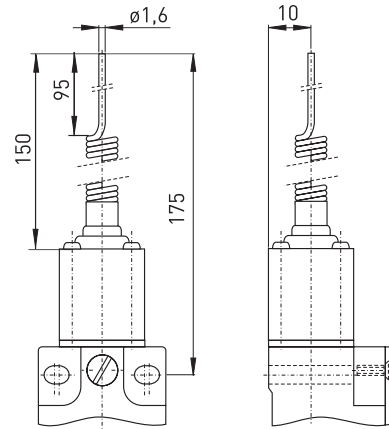
Features/Options

- Spring rod can be actuated from any direction

// Wire lever DD



// Long spring rod TL



124

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 95 DD 10/1S 	ES 95 DD 10/1S
1 NC / 1 NO contact with overlapping		ES 95 DD UE
2 NC contacts		ES 95 DD 2Ö
2 NO contacts		ES 95 DD 2S

Contact variants: switch travel/contacts

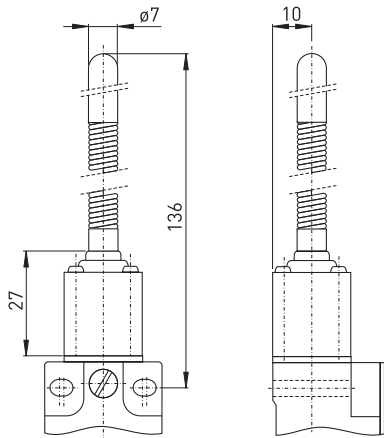
	Snap action	Slow action
1 NC / 1 NO contact	EM 95 TL 10/1S 	ES 95 TL 10/1S
2 NC contacts		ES 95 TL 2Ö



Features/Options

- Wear-resistant plastic rod
- Spring rod can be actuated from any direction

// Spring rod with plastic rod TK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	<p>EM 95 TK 1Ö/1S</p>	<p>ES 95 TK 1Ö/1S</p>
2 NC contacts		<p>ES 95 TK 2Ö</p>



Position switches

// Series E 12

Features/Options

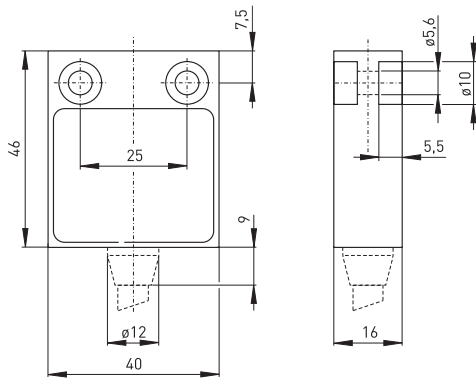
- Metal enclosure
- Snap action, change-over contact with single break
- Suitable for in-line mounting
- With pre-wired cable, cable length 1 meter
- Ex-Version available

// E 12



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	GD-AL alloy
Protection class	IP 67 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with single break
Switching system	snap action
Termination	cable H05VV-F
Cable section	4 x 0.75 mm ²
U _{imp}	4 kV
U _i	250 V
I _{the}	5 A
Utilisation category	AC-15; DC-13
Ie/Ue	5 A/250 VAC; 0.16 A/230 VDC
Max. fuse rating	5 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	1800/h
Ambient temperature	-20 °C ... + 75 °C



Ordering details

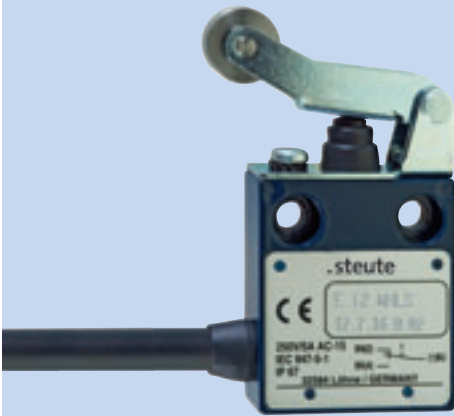
E 12 WKU-s-B-1m

- Cable length 1 m, (2 m, 5 m, 10 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
- Available with hard-coated enclosure for use in aggressive conditions

// Cable on side

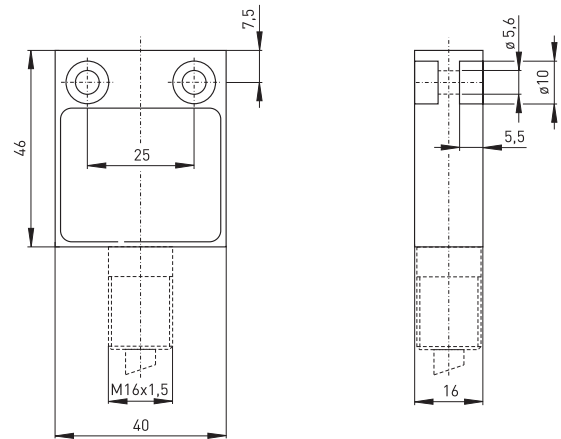
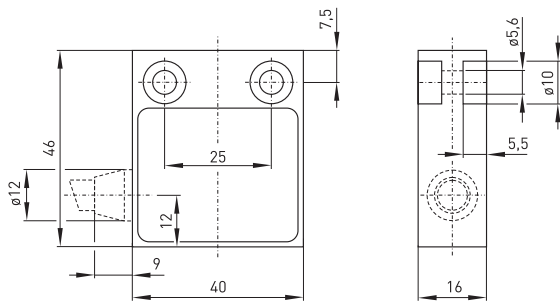


// Cable on side

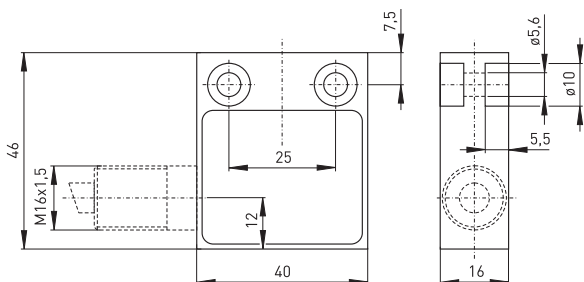
// Cable entry M16 x 1.5



// Cable entry M16 x 1.5



// Cable entry on side M16 x 1.5



// Connector M12 x 1, 4-pole



Position switches

// Series E 12, actuators

Features/Options

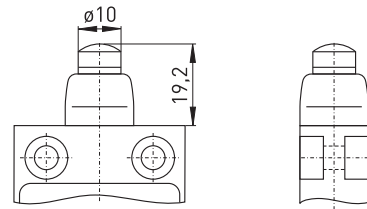
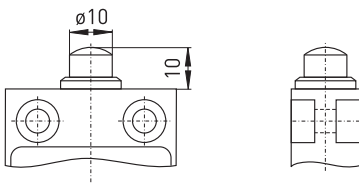
- Actuating speed 0.5 m/s with an actuating angle of 0°

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Collar to protect against the entry of foreign bodies

// Plunger

// Plunger with watertight collar W



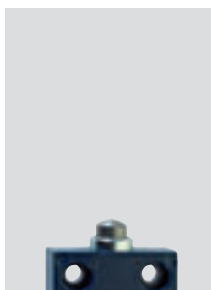
128

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12

Snap action	
1 change-over contact	E 12 W



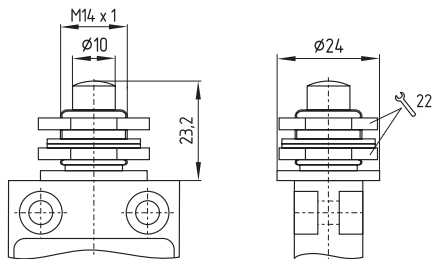
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°

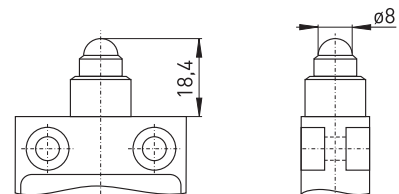
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- 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

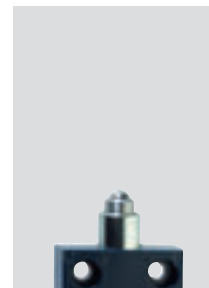
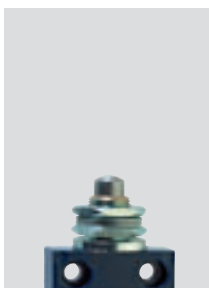
Snap action

1 change-over contact

1 change-over contact

E 12 F

E 12 KU



Position switches

// Series E 12, actuators

Features/Options

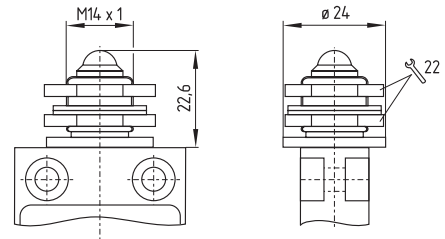
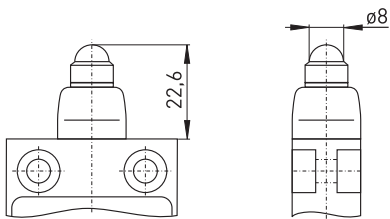
- Actuating speed 0.5 m/s with an actuating angle of 15°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Ball diameter 8 mm
- Exact repeatability of switching point

// Ball plunger collar WKU

// Ball plunger for front mounting FKU



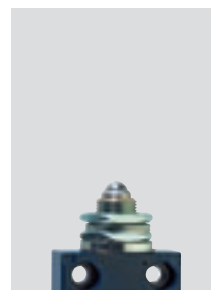
130

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 WKU
	0 1.5 5.5 GY-BK GY-BN

Snap action	
1 change-over contact	E 12 FKU
	0 1.5 5.5 GY-BK GY-BN



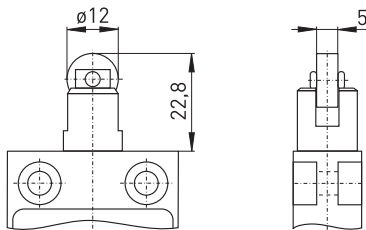
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be repositioned by 90°

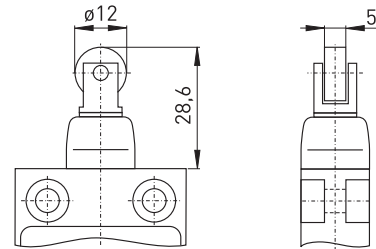
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°
- Collar to protect against the entry of foreign bodies

// Roller plunger R



// Roller plunger collar WR



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action

1 change-over contact

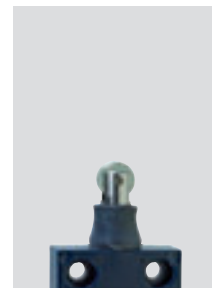
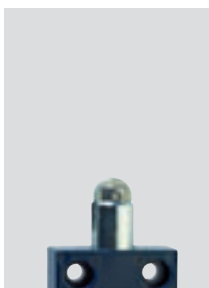
E 12 R



Snap action

1 change-over contact

E 12 WR



Position switches

// Series E 12, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator can be repositioned by 90°

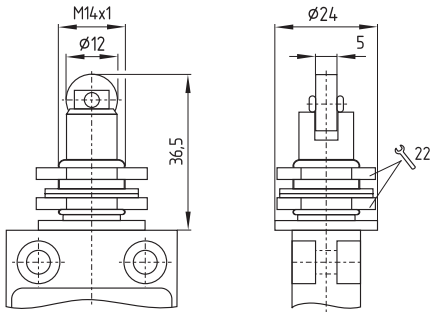
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

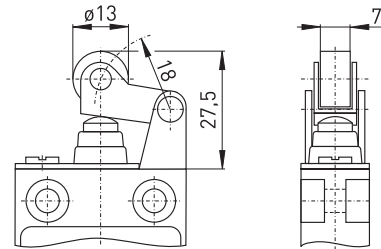
Note

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

// Roller plunger for front mounting FR



// Offset roller lever collar WH



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action

1 change-over contact

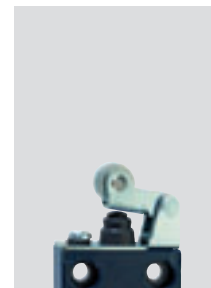
E 12 FR



Snap action

1 change-over contact

E 12 WH



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

Note

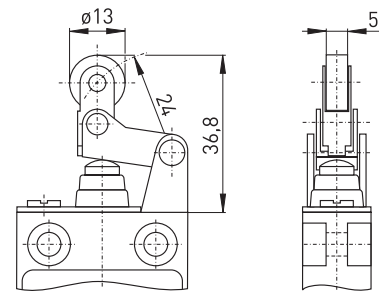
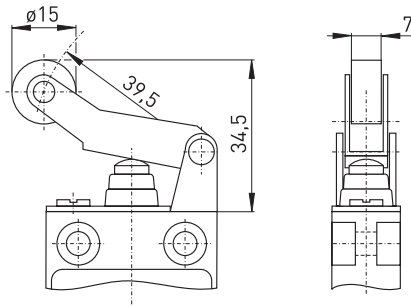
Actuation from the left should be avoided since this reduces the mechanical life of the position switch.

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

// Long roller lever collar WHL

// Rocking roller lever collar WHK

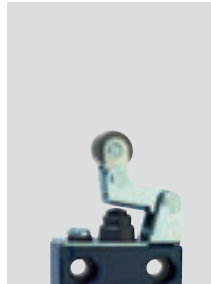
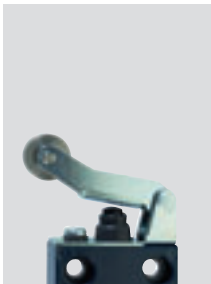


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action
1 change-over contact	E 12 WHL 0 4,1 12,8 GY-BK GY-BN

	Snap action
1 change-over contact	E 12 WHK 0 2 6,8 GY-BK GY-BN



Position switches

// Series E 12, actuators

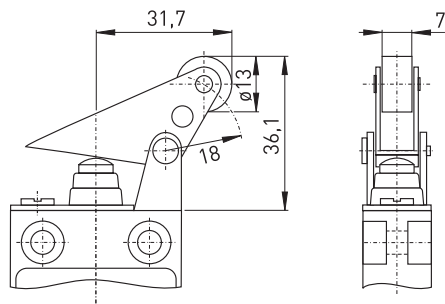
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Metal roller
- Actuator can be repositioned by 180°
- Collar to protect against the entry of foreign bodies
- With plastic roller available on request

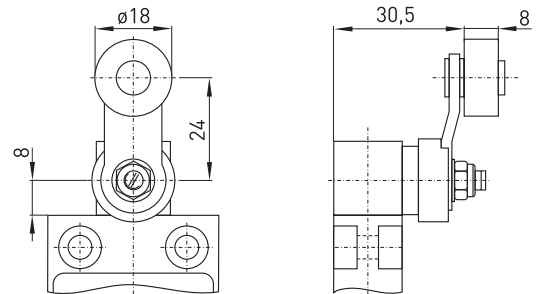
Features/Options

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

// Parallel roller lever collar WPH



// Roller lever D



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action

1 change-over contact

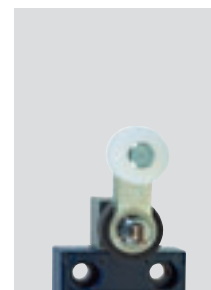
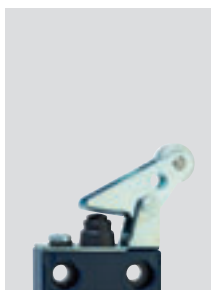
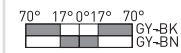
E 12 WPH



Snap action

1 change-over contact

E 12 D



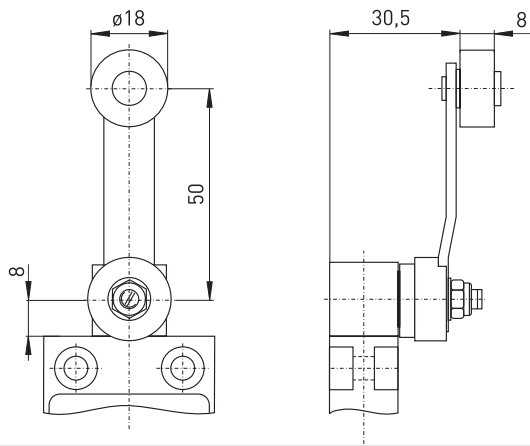
Features/Options

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

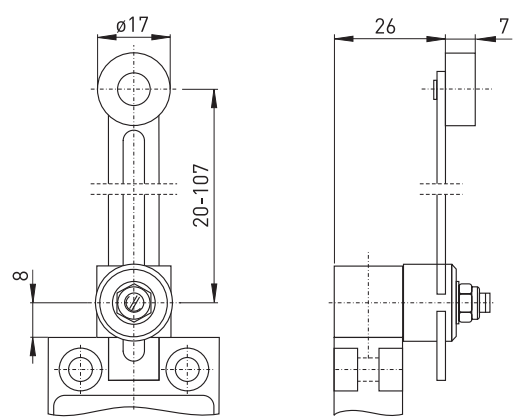
// Long roller lever DL



Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 DL
	70° 17° 0° 17° 70°
	GY-BK GY-BN

// Adjustable-length roller lever DS



Contact variants: switch travel/contacts

Snap action	
1 change-over contact	E 12 DS
	70° 17° 0° 17° 70°
	GY-BK GY-BN



Position switches

// Series E 12, actuators

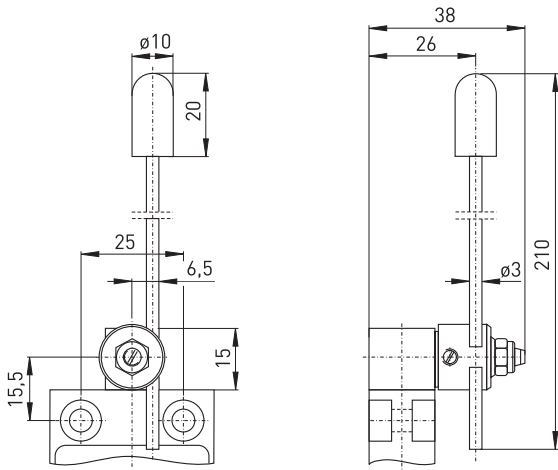
Features/Options

- Wear-resistant thermoplastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

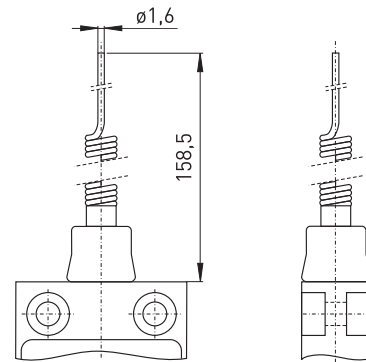
Features/Options

- 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°

// Wire lever DD



// Long spring rod TL



136

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action
1 change-over contact	E 12 DD

	Snap action
1 change-over contact	E 12 TL



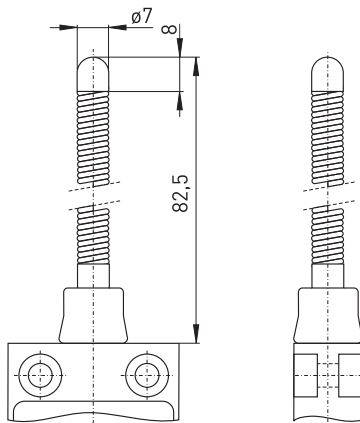
Features/Options

- 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°

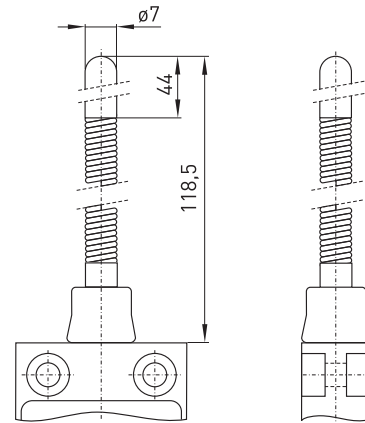
Features/Options

- Wear-resistant plastic rod
- 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 rounded steel tip TF



// Spring rod with plastic rod TK



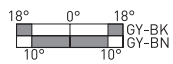
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Snap action

1 change-over contact

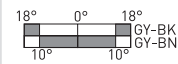
E 12 TF



Snap action

1 change-over contact

E 12 TK



Position switches

// Series ES 51

Features/Options

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

Note

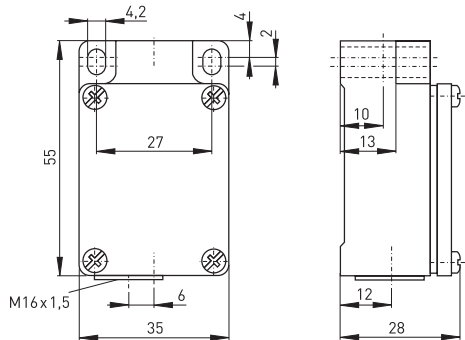
When used as safety switch, secure the enclosure against slipping with appropriate means, e.g. pinning.

// ES 51



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	\ominus IEC 60947-5-1 slow action, positive break NC contacts
Termination	plug-in connector M3
Cable section	max. 1.5 mm ² (incl. conductor ferrules)
Cable entry	M 16 x 1.5
U _{imp}	4 kV
U _i	400 V
I _{the}	4 A
Utilisation category	AC-15
I _e /U _e	4 A / 400 VAC
Max. fuse rating	4 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points	± 0.1 mm



Ordering details

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

// Series ES 51, actuators

Features/Options

- With gold-plated contacts available on request

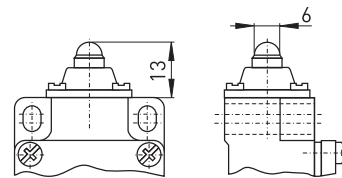
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Connector M12 x 1, 5-pole

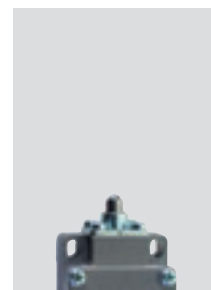


// Plunger



Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 10/1S



Position switches

// Series ES 51, actuators

Features/Options

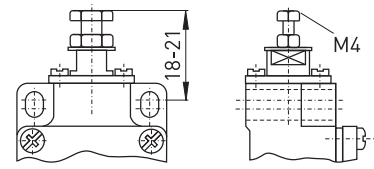
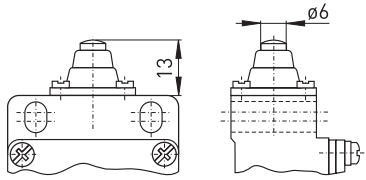
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

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

// Plunger collar W

// Adjustable plunger ST



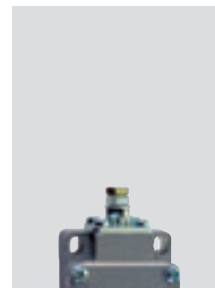
140

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 W 10/1S

	Slow action
1 NC / 1 NO contact	ES 51 ST 10/1S



Features/Options

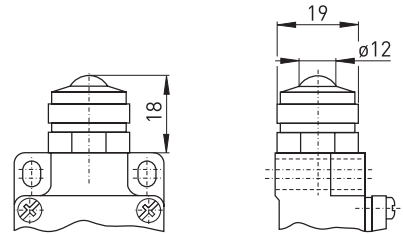
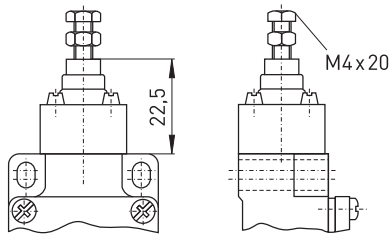
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Projection of plunger adjustable for fine setting of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Adjustable plunger collar WST

// Ball plunger KU

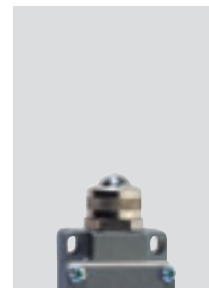
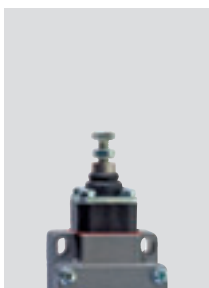


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

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

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



Position switches

// Series ES 51, actuators

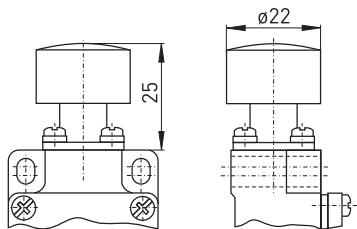
Features/Options

- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Collar to protect against the entry of foreign bodies

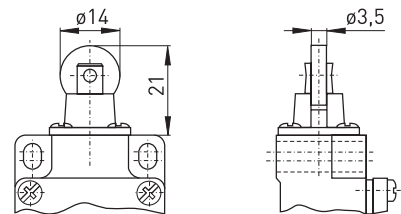
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator heads can be repositioned by 4 x 90°

// Cover WK



// Roller plunger R

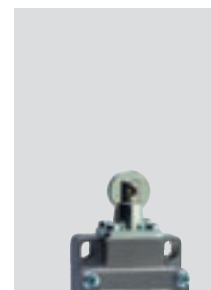
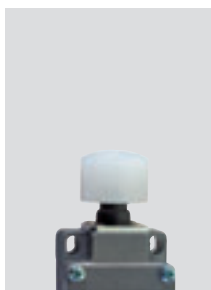


Contact variants: switch travel/contacts

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

Contact variants: switch travel/contacts

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



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Metal roller
- Actuator heads can be repositioned by 4 x 90°
- Collar to protect against the entry of foreign bodies

Features/Options

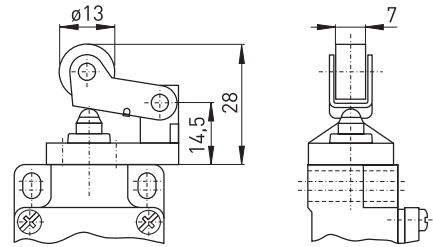
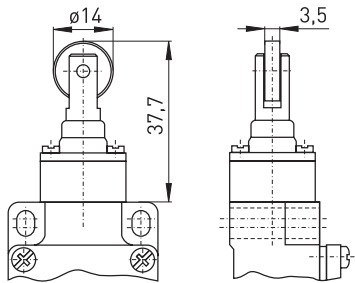
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Plastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

Note

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

// Roller plunger WR

// Lever H

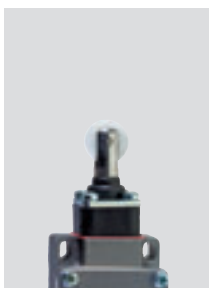


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

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

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



Position switches

// Series ES 51, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

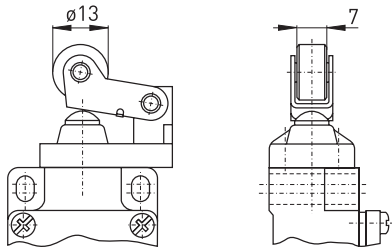
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

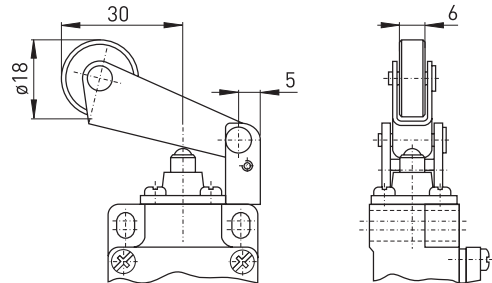
Note

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

// Offset roller lever collar WH



// Long roller lever HL



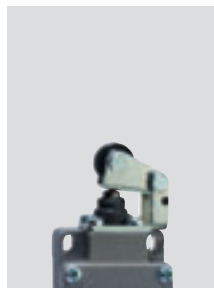
144

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

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

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



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

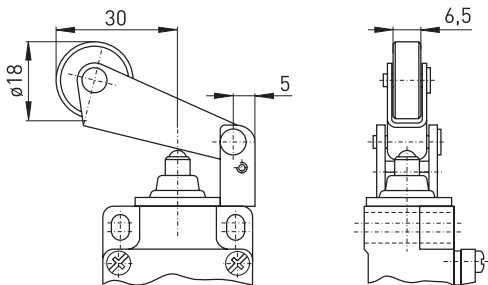
Note

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

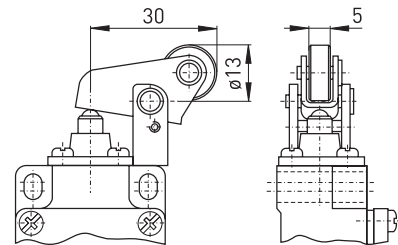
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

// Long roller lever collar WHL



// Parallel roller lever PH

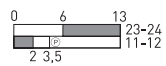


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 51 WHL 10/1S

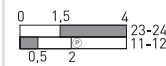


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 51 PH 10/1S



Position switches

// Series ES 51, actuators

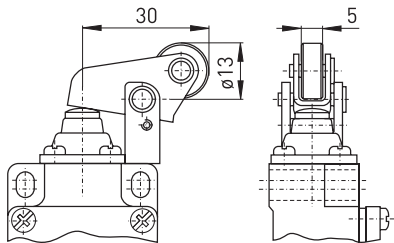
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

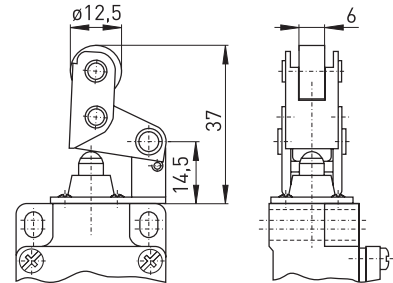
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

// Parallel roller lever collar WPH



// Rocking roller HK



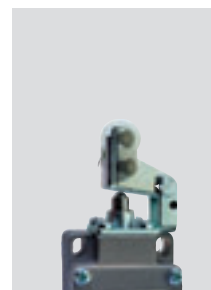
146

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 WPH 10/1S

	Slow action
1 NC / 1 NO contact	ES 51 HK 10/1S



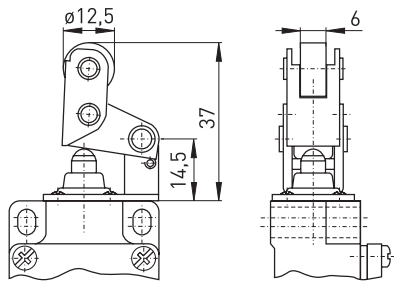
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

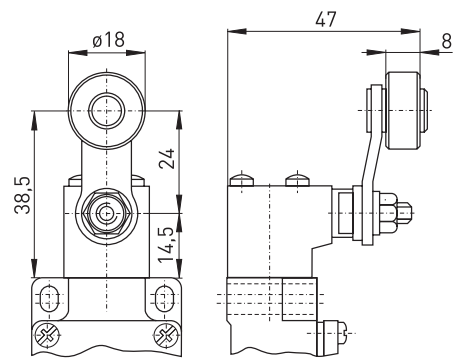
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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 roller collar WHK



// Roller lever D

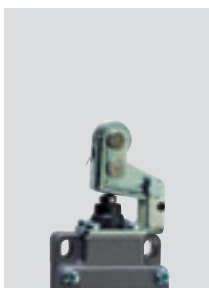


Contact variants: switch travel/contacts

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

Contact variants: switch travel/contacts

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



Position switches

// Series ES 51, actuators

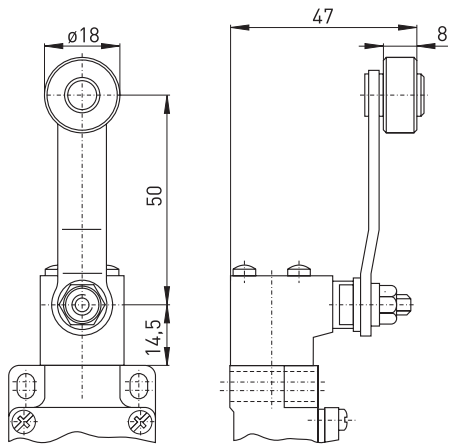
Features/Options

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

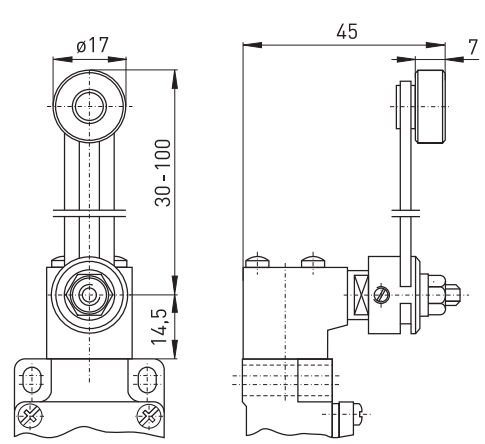
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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 roller lever DL



// Adjustable-length roller lever DS



148

Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 51 DL 10/1S

	Slow action
1 NC / 1 NO contact	ES 51 DS 10/1S



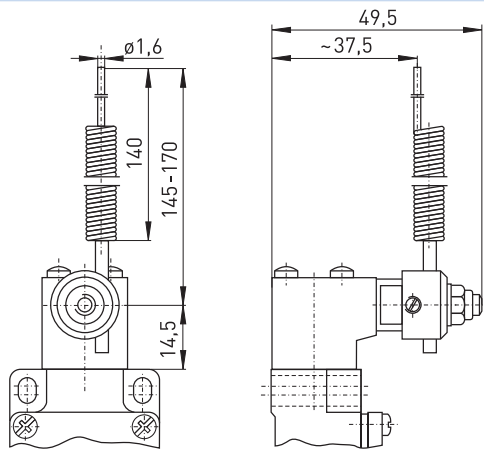
Features/Options

- Spring rod can be actuated from any direction
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

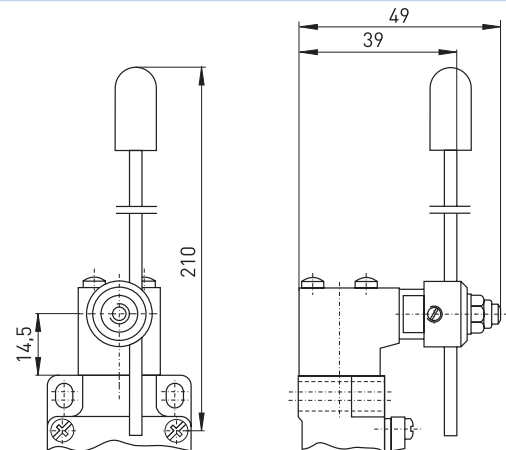
Features/Options

- Wear-resistant thermoplastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

// Spring roller lever DF



// Wire roller lever DD

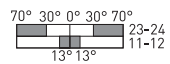


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 51 DF 10/1S

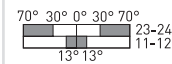


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 51 DD 10/1S



Position switches

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

Features/Options

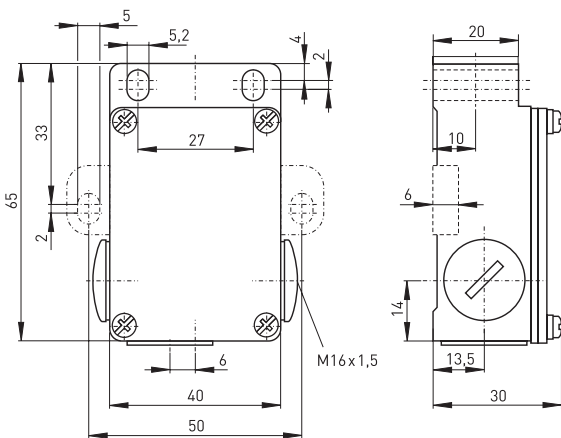
- Metal enclosure
- Slow action \ominus , change-over contact or 2 NC contacts with double break
- Snap action, change-over contact with double break
- Slow action with overlapping contacts available
- ES/EM 411: with 25 mm mounting centres, depth 34 mm
- 3 cable entries M16 x 1.5
- Available with mechanical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

// ES/EM 41



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	slow or snap action; slow action: positive break NC contacts \ominus IEC 60947-5-1
Termination	plug-in connector M3,5
Cable section	max. 2.5 mm ² (incl. conductor ferrules)
Cable entry	3 x M 16 x 1.5
U _{imp}	4 kV
U _i	400 V
I _{the}	6 A
Utilisation category	AC-15
I _e /U _e	6 A/400 VAC
Max. fuse rating	6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points:	± 0.1 mm



Ordering details

ES 41 WH 10/1S-V

- Locking
- 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

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

Features/Options

- Mechanical locking: release by means of pushbutton
- Mechanical locking V only possible for slow action
- With gold-plated contacts available on request

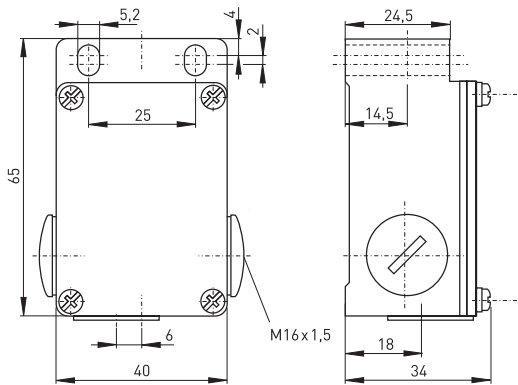
Note

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

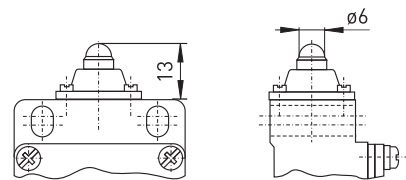
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// ES/EM 411



// Plunger



// Mechanical locking



// Connector M12 x 1, 5-pole



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 10/1S EM 411 10/1S 	ES 41 10/1S ES 411 10/1S
1 NC / 1 NO contact with overlapping		ES 41 UE ES 411 UE
2 NC contacts		ES 41 20 ES 411 20

Position switches

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

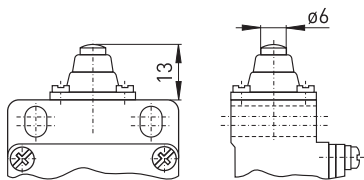
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

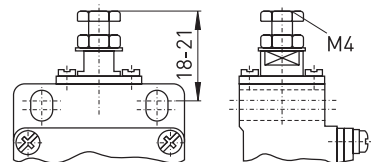
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 0°
- Length of plunger adjustable by means of M4 setting screw
- For fine setting of switching point

// Plunger collar W



// Adjustable plunger ST



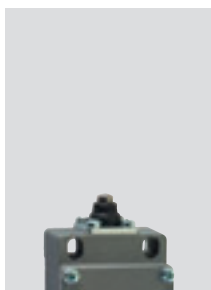
152

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 W 10/1S EM 411 W 10/1S 	ES 41 W 10/1S ES 411 W 10/1S
1 NC / 1 NO contact with overlapping		ES 41 W UE ES 411 W UE
2 NC contacts		ES 41 W 20 ES 411 W 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 ST 10/1S EM 411 ST 10/1S 	ES 41 ST 10/1S ES 411 ST 10/1S
1 NC / 1 NO contact with overlapping		ES 41 ST UE ES 411 ST UE
2 NC contacts		ES 41 ST 20 ES 411 ST 20



Features/Options

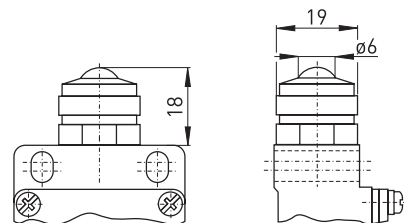
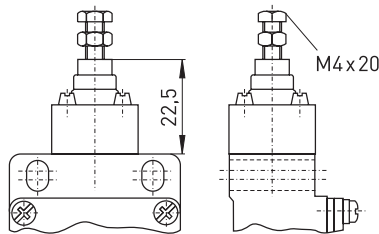
- Actuating speed 0.5 m/s with an actuating angle of 0°
- Length of plunger adjustable by means of M4 setting screw
- For fine setting of switching point
- Collar to protect against the entry of foreign bodies

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 20°
- Can be actuated in line with or from side of switch axis
- Actuator head with captive stainless steel ball actuator
- Exact repeatability of switching point

// Adjustable plunger collar WST

// Ball plunger KU

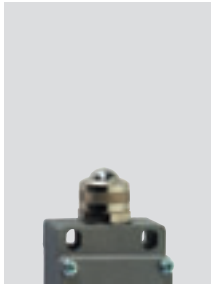


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 WST 1Ö/1S EM 411 WST 1Ö/1S 	ES 41 WST 1Ö/1S ES 411 WST 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 41 WST UE ES 411 WST UE
2 NC contacts		ES 41 WST 2Ö ES 411 WST 2Ö

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 KU 1Ö/1S EM 411 KU 1Ö/1S 	ES 41 KU 1Ö/1S ES 411 KU 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 41 KU UE ES 411 KU UE
2 NC contacts		ES 41 KU 2Ö ES 411 KU 2Ö



Position switches

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

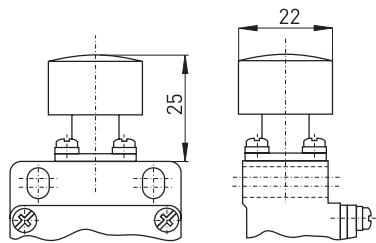
Features/Options

- Large actuating surface
- Safe switching even with imprecise actuation
- Suitable for manual operation
- Collar to protect against the entry of foreign bodies

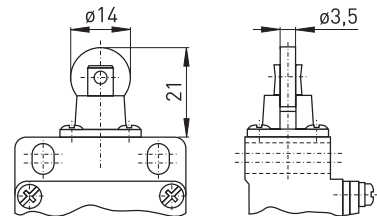
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 30°
- Metal roller
- Actuator can be turned 90°

// Cap WK



// Roller plunger R



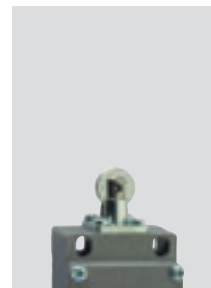
154

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 WK 10/1S EM 411 WK 10/1S	ES 41 WK 10/1S ES 411 WK 10/1S
1 NC / 1 NO contact with overlapping		ES 41 WK UE ES 411 WK UE
2 NC contacts		ES 41 WK 20 ES 411 WK 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 R 10/1S EM 411 R 10/1S	ES 41 R 10/1S ES 411 R 10/1S
1 NC / 1 NO contact with overlapping		ES 41 R UE ES 411 R UE
2 NC contacts		ES 41 R 20 ES 411 R 20



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 25°
- Wear-resistant thermoplastic roller
- Actuator can be turned 90°
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Features/Options

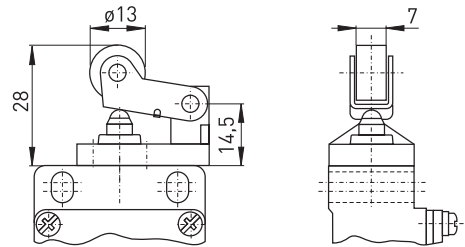
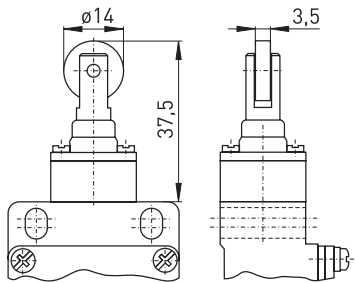
- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

Note

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

// Roller plunger WR

// Lever H

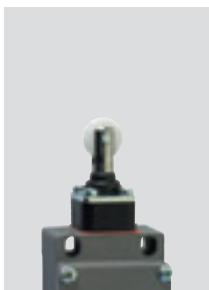


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 WR 1Ö/1S EM 411 WR 1Ö/1S 	ES 41 WR 1Ö/1S ES 411 WR 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 41 WR UE ES 411 WR UE
2 NC contacts		ES 41 WR 2Ö ES 411 WR 2Ö

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 H 1Ö/1S EM 411 H 1Ö/1S 	ES 41 H 1Ö/1S ES 411 H 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 41 H UE ES 411 H UE
2 NC contacts		ES 41 H 2Ö ES 411 H 2Ö



Position switches

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

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

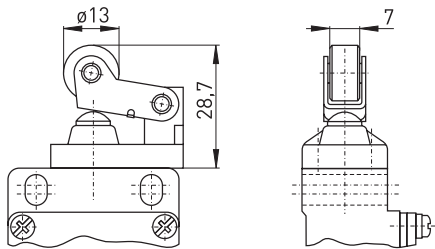
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

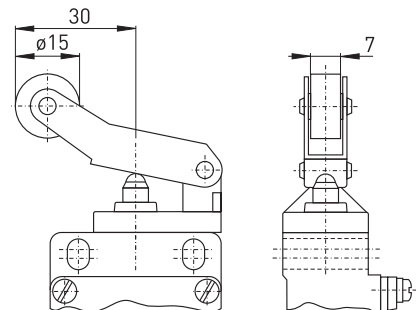
Note

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

// Offset 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	EM 41 WH 10/1S EM 411 WH 10/1S 	ES 41 WH 10/1S ES 411 WH 10/1S
1 NC / 1 NO contact with overlapping		ES 41 WH UE ES 411 WH UE
2 NC contacts		ES 41 WH 20 ES 411 WH 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 HL 10/1S EM 411 HL 10/1S 	ES 41 HL 10/1S ES 411 HL 10/1S
1 NC / 1 NO contact with overlapping		ES 41 HL UE ES 411 HL UE
2 NC contacts		ES 41 HL 20 ES 411 HL 20



Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

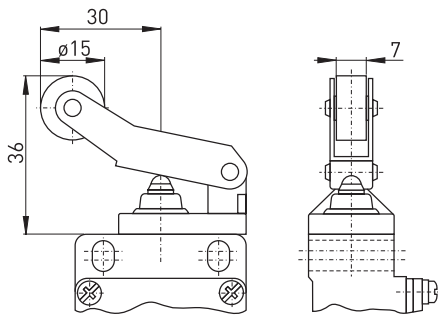
Note

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

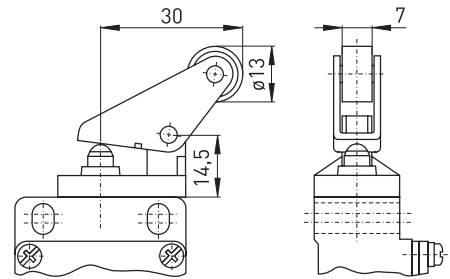
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

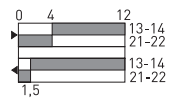
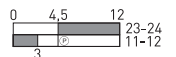
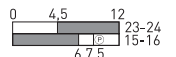
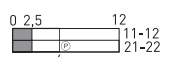
// Long roller lever collar WHL



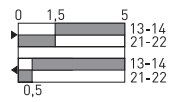
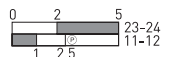
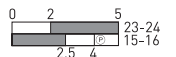
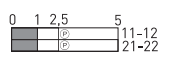
// Parallel roller lever PH



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 WHL 10/1S EM 411 WHL 10/1S 	ES 41 WHL 10/1S ES 411 WHL 10/1S 
1 NC / 1 NO contact with overlapping		ES 41 WHL UE ES 411 WHL UE 
2 NC contacts		ES 41 WHL 20 ES 411 WHL 20 

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 PH 10/1S EM 411 PH 10/1S 	ES 41 PH 10/1S ES 411 PH 10/1S 
1 NC / 1 NO contact with overlapping		ES 41 PH UE ES 411 PH UE 
2 NC contacts		ES 41 PH 20 ES 411 PH 20 



Position switches

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

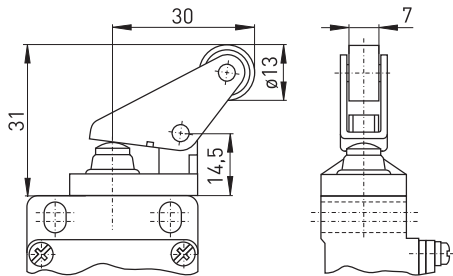
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

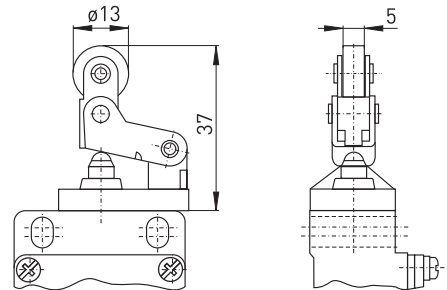
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- With metal roller available on request

// Parallel roller lever collar WPH



// Rocking roller HK



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Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 WPH 10/1S EM 411 WPH 10/1S 	ES 41 WPH 10/1S ES 411 WPH 10/1S
1 NC / 1 NO contact with overlapping		ES 41 WPH UE ES 411 WPH UE
2 NC contacts		ES 41 WPH 20 ES 411 WPH 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 HK 10/1S EM 411 HK 10/1S 	ES 411 HK 10/1S ES 411 HK 10/1S
1 NC / 1 NO contact with overlapping		ES 41 HK UE ES 411 HK UE
2 NC contacts		ES 41 HK 20 ES 411 HK 20



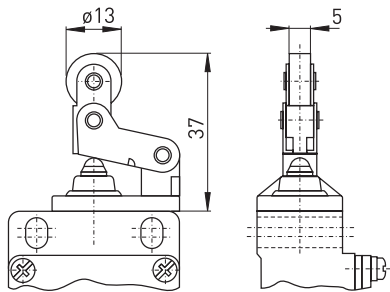
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

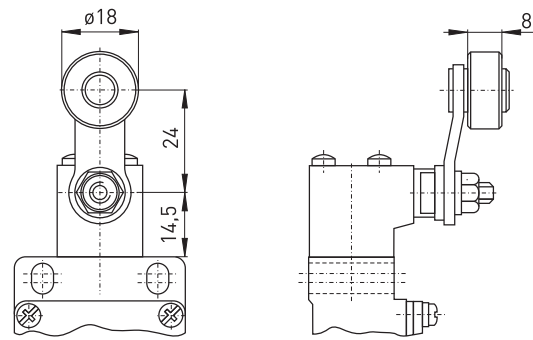
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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 roller collar WHK



// Roller lever D



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	<p>EM 41 WHK 1Ö/1S EM 411 WHK 1Ö/1S</p>	<p>ES 41 WHK 1Ö/1S ES 411 WHK 1Ö/1S</p>
1 NC / 1 NO contact with overlapping		<p>ES 41 WHK UE ES 411 WHK UE</p>
2 NC contacts		<p>ES 41 WHK 2Ö ES 411 WHK 2Ö</p>

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	<p>EM 41 D 1Ö/1S EM 411 D 1Ö/1S</p>	<p>ES 41 D 1Ö/1S ES 411 D 1Ö/1S</p>
1 NC / 1 NO contact with overlapping		<p>ES 41 D UE ES 411 D UE</p>
2 NC contacts		<p>ES 41 D 2Ö ES 411 D 2Ö</p>



Position switches

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

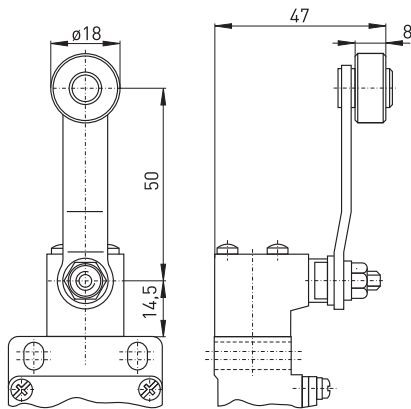
Features/Options

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

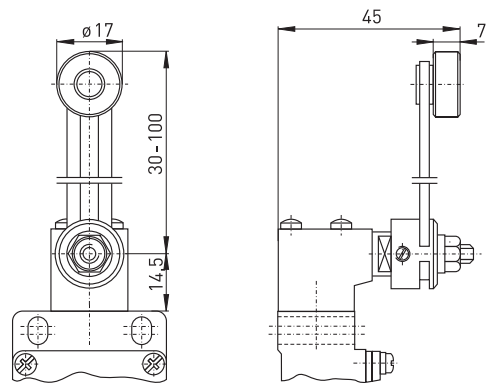
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 45°
- Wear-resistant thermoplastic 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 roller lever DL



// Adjustable-length roller lever DS



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Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 DL 10/1S EM 411 DL 10/1S 	ES 41 DL 10/1S ES 411 DL 10/1S
1 NC / 1 NO contact with overlapping		ES 41 DL UE ES 411 DL UE
2 NC contacts		ES 41 DL 20 ES 411 DL 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 DS 10/1S EM 411 DS 10/1S 	ES 41 DS 10/1S ES 411 DS 10/1S
1 NC / 1 NO contact with overlapping		ES 41 DS UE ES 411 DS UE
2 NC contacts		ES 41 DS 20 ES 411 DS 20



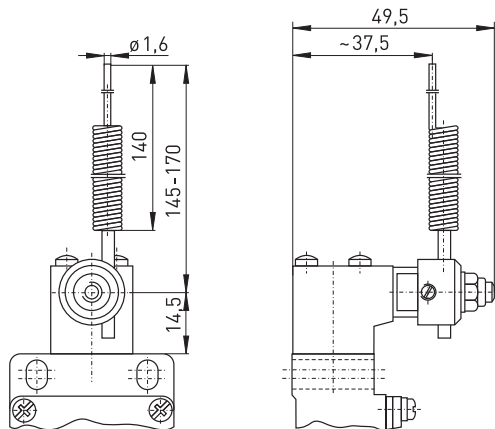
Features/Options

- Actuating speed 0.5 m/s
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

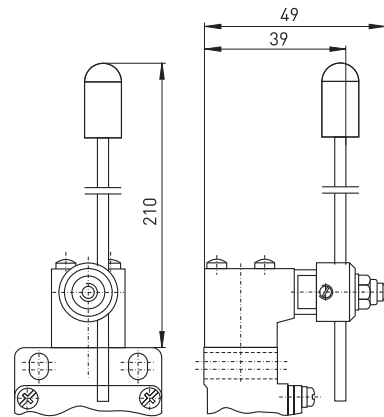
Features/Options

- Actuating speed 0.5 m/s
- Wear-resistant thermoplastic tip
- Lever can be repositioned in 10° steps clockwise or counter-clockwise
- Actuator can be repositioned by 180°

// Spring lever DF



// Wire lever DD



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	<p>EM 41 DF 10/1S EM 411 DF 10/1S</p>	<p>ES 41 DF 10/1S ES 411 DF 10/1S</p>
1 NC / 1 NO contact with overlapping		<p>ES 41 DF UE ES 411 DF UE</p>
2 NC contacts		<p>ES 41 DF 20 ES 411 DF 20</p>

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	<p>EM 41 DD 10/1S EM 411 DD 10/1S</p>	<p>ES 41 DD 10/1S ES 411 DD 10/1S</p>
1 NC / 1 NO contact with overlapping		<p>ES 41 DD UE ES 411 DD UE</p>
2 NC contacts		<p>ES 41 DD 20 ES 411 DD 20</p>



Position switches

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

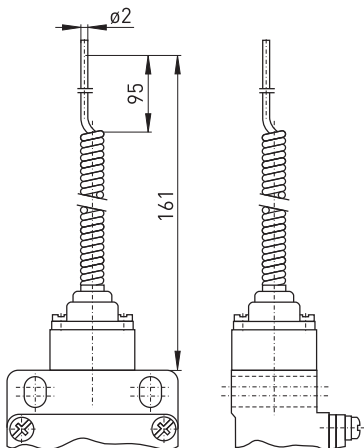
Features/Options

- 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

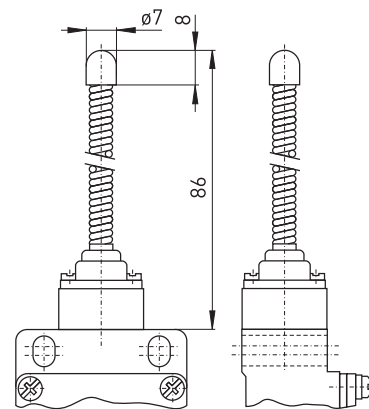
Features/Options

- 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 rounded steel tip TF



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Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 TL 10/1S EM 411 TL 10/1S 	ES 41 TL 10/1S ES 411 TL 10/1S
1 NC / 1 NO contact with overlapping		ES 41 TL UE ES 411 TL UE
2 NC contacts		ES 41 TL 20 ES 411 TL 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 TF 10/1S EM 411 TF 10/1S 	ES 41 TF 10/1S ES 411 TF 10/1S
1 NC / 1 NO contact with overlapping		ES 41 TF UE ES 411 TF UE
2 NC contacts		ES 41 TF 20 ES 411 TF 20



Features/Options

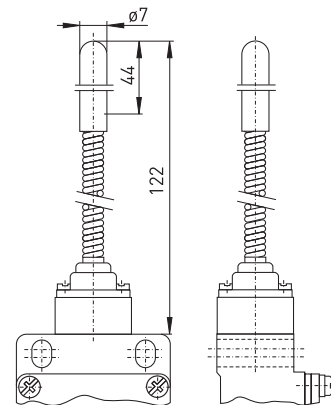
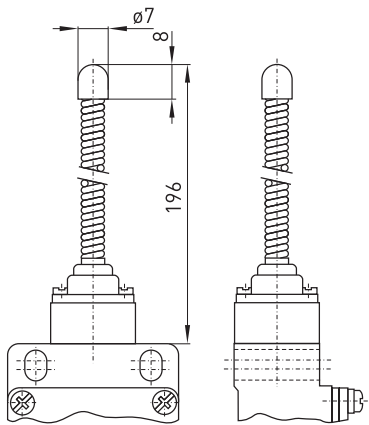
- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

Features/Options

- Wear-resistant thermoplastic 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 rounded steel tip TFL

// Spring rod with plastic rod TK



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 TFL 10/1S EM 411 TFL 10/1S 	ES 41 TFL 10/1S ES 411 TFL 10/1S
1 NC / 1 NO contact with overlapping		ES 41 TFL UE ES 411 TFL UE
2 NC contacts		ES 41 TFL 20 ES 411 TFL 20

	Snap action	Slow action
1 NC / 1 NO contact	EM 41 TK 10/1S EM 411 TK 10/1S 	ES 41 TK 10/1S ES 411 TK 10/1S
1 NC / 1 NO contact with overlapping		ES 41 TK UE ES 411 TK UE
2 NC contacts		ES 41 TK 20 ES 411 TK 20



Position switches

// Series ES/EM 61

Features/Options

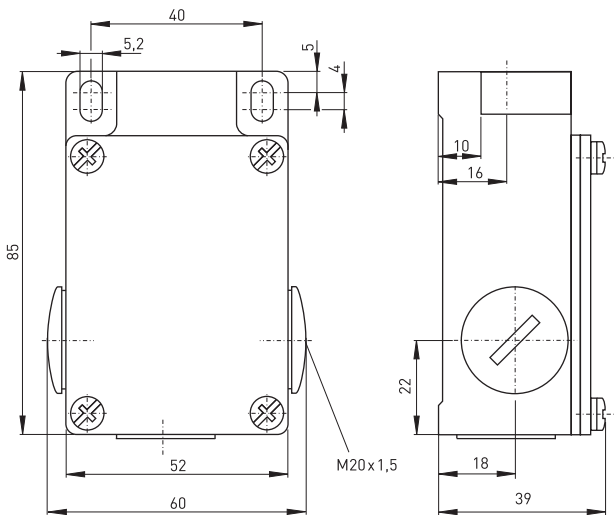
- Metal enclosure
- Slow action \ominus , change-over contact or 2 NC contacts with double break
- Snap action, change-over contact with double break
- Available with overlapping contacts
- 3 cable entries M20 x 1.5
- Actuator heads can be repositioned by 4 x 90°
- Ex-version available

// ES/EM 61



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	aluminium die cast, paint finish
Protection class	IP 65 to IEC/EN 60529
Contact material	silver
Switching elements	change-over contact with double break Zb or 2 NC contacts, galvanically separated contact bridges
Switching system	slow or snap action; slow action positive break NC contacts \ominus IEC 60947-5-1
Termination	plug-in connector
Cable section	max. 2,5 mm ² (incl. conductor ferrules)
Cable entry	3 x M 20 x 1.5
U _{imp}	6 kV
U _i	400 V
I _{the}	6 A
Utilisation category	AC-15
I _e /U _e	ES 61: 16 A/400 VAC EM 61: 6 A/400 VAC ES 61 2NC: 6 A/400 VAC
Max. fuse rating	ES 61: 16 A gL/gG D-fuse EM 61: 6 A gL/gG D-fuse ES 61 2NC: 6 A gL/gG D-fuse
Mechanical life	> 1 million operations
Switching frequency	3600/h
Ambient temperature	- 20 °C ... + 80 °C
Repeat accuracy of switching points:	± 0,1 mm



Ordering details

EM 61 WH 10/1S

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

Position switches

// Series ES/EM 61, actuators

Features/Options

- With gold-plated contacts available on request

Note

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

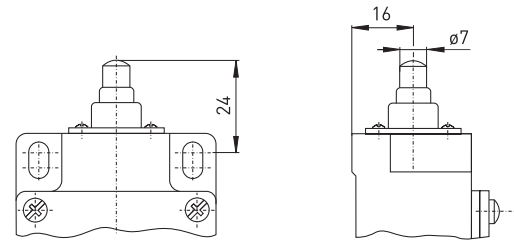
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of 15°
- Exact repeatability of switching point
- Collar to protect against the entry of foreign bodies

// Connector M12 x 1, 5-pole



// Plunger W



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 W 10/1S 	ES 61 W 10/1S
1 NC / 1 NO contact with overlapping		ES 61 W UE
2 NC contacts		ES 61 W 20



Position switches

// Series ES/EM 61, actuators

Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 25^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

Note

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

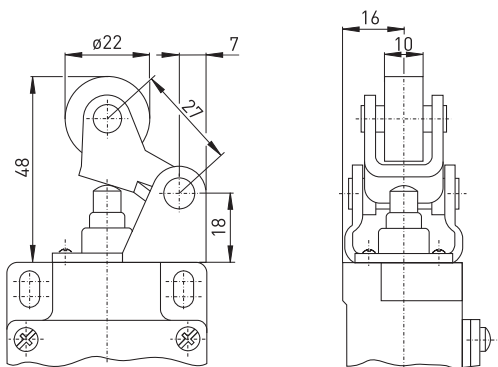
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 40^\circ$ and $\beta = 30^\circ$
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

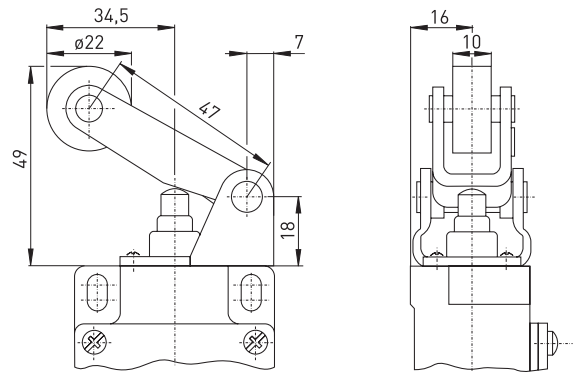
Note

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

// Lever WH



// Long roller lever WHL



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 WH 10/1S 	ES 61 WH 10/1S
1 NC / 1 NO contact with overlapping		ES 61 WH UE
2 NC contacts		ES 61 WH 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 WHL 10/1S 	ES 61 WHL 10/1S
1 NC / 1 NO contact with overlapping		ES 61 WHL UE
2 NC contacts		ES 61 WHL 20



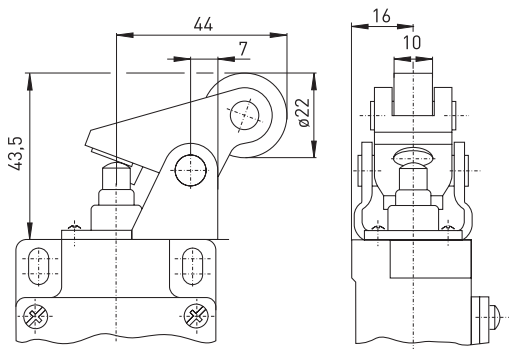
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of $\alpha = 30^\circ$
- Actuation parallel to axis of switch from below
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

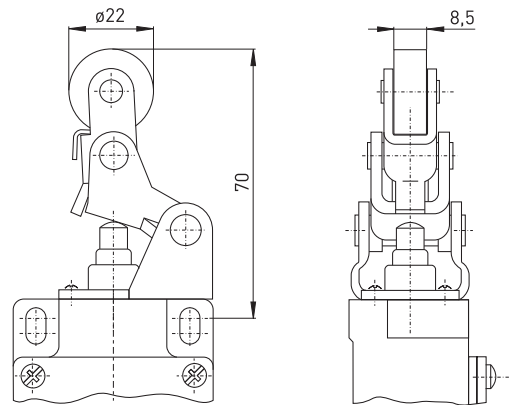
Features/Options

- Actuating speed 0.5 m/s with an actuating angle of α and $\beta = 40^\circ$
- Actuation only possible from right-hand side
- Free movement of actuator from the other side
- Wear-resistant thermoplastic roller
- Actuator heads can be repositioned in 4 x 90° steps
- Collar to protect against the entry of foreign bodies
- With metal roller available on request

// Parallel roller lever WPH



// Rocking roller WHK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 WPH 10/1S 	ES 61 WPH 10/1S
2 NC contacts		ES 61 WPH 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 WHK 10/1S 	ES 61 WHK 10/1S
1 NC / 1 NO contact with overlapping		ES 61 WHK UE
2 NC contacts		ES 61 WHK 20



Position switches

// Series ES/EM 61, actuators

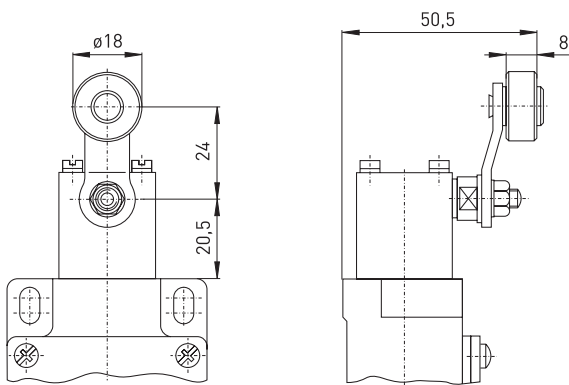
Features/Options

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

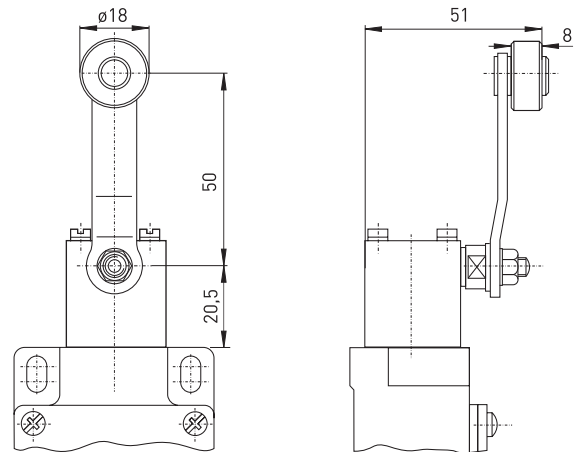
Features/Options

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

// Roller lever D



// Long roller lever DL



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 D 10/1S 	ES 61 D 10/1S
1 NC / 1 NO contact with overlapping		ES 61 D UE
2 NC contacts		ES 61 D 20

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 DL 10/1S 	ES 61 DL 10/1S
1 NC / 1 NO contact with overlapping		ES 61 DL UE
2 NC contacts		ES 61 DL 20



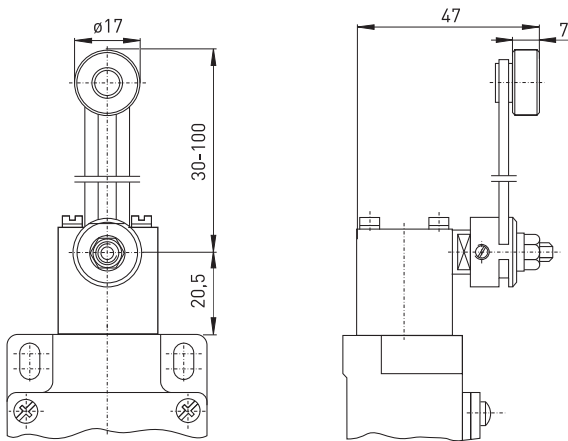
Features/Options

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

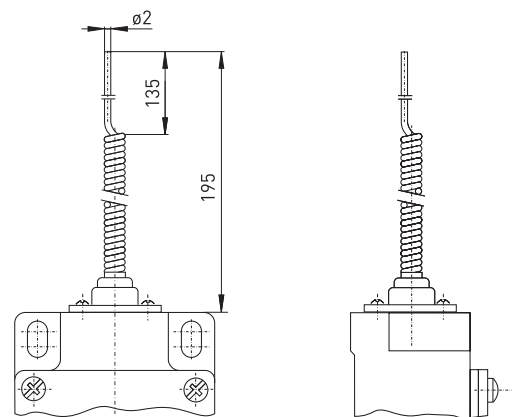
Features/Options

- 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-length roller lever DS



// Long spring rod TL



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 DS 10/1S 	ES 61 DS 10/1S
1 NC / 1 NO contact with overlapping		ES 61 DS UE
2 NC contacts		ES 61 DS 20

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 TL 10/1S 	ES 61 TL 10/1S
1 NC / 1 NO contact with overlapping		ES 61 TL UE
2 NC contacts		ES 61 TL 20



Position switches

// Series ES/EM 61, actuators

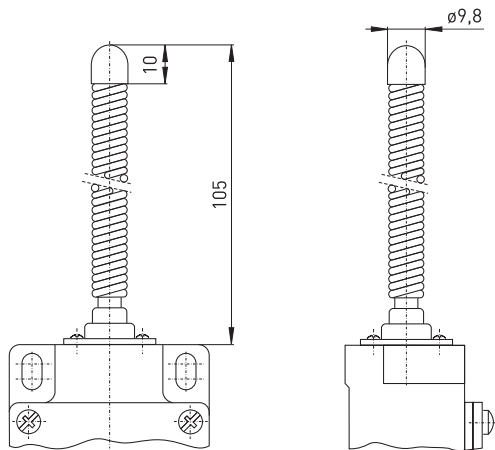
Features/Options

- With rounded steel tip
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

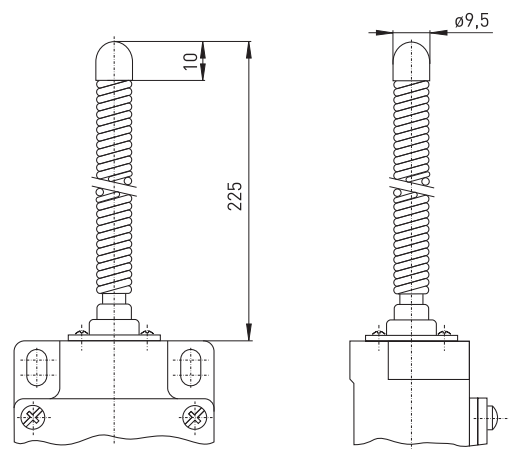
Features/Options

- 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 rounded steel tip TF



// Long spring rod with rounded steel tip TFL



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 TF 10/1S 	ES 61 TF 10/1S
1 NC / 1 NO contact with overlapping		ES 61 TF UE
2 NC contacts		ES 61 TF 2Ö

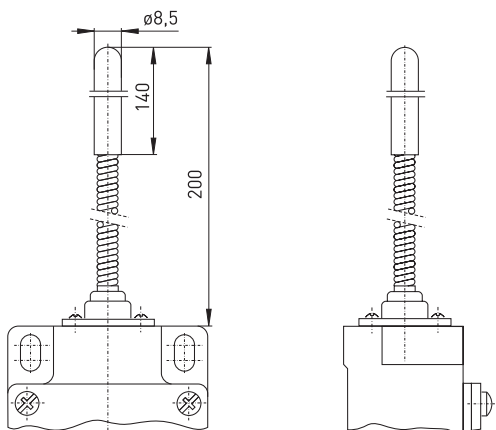
	Snap action	Slow action
1 NC / 1 NO contact	EM 61 TFL 10/1S 	ES 61 TFL 10/1S
1 NC / 1 NO contact with overlapping		ES 61 TFL UE
2 NC contacts		ES 61 TFL 2Ö



Features/Options

- Wear-resistant plastic rod
- Spring rod can be actuated from any direction
- Elasticity of the spring allows for deflection above the max. switching angle

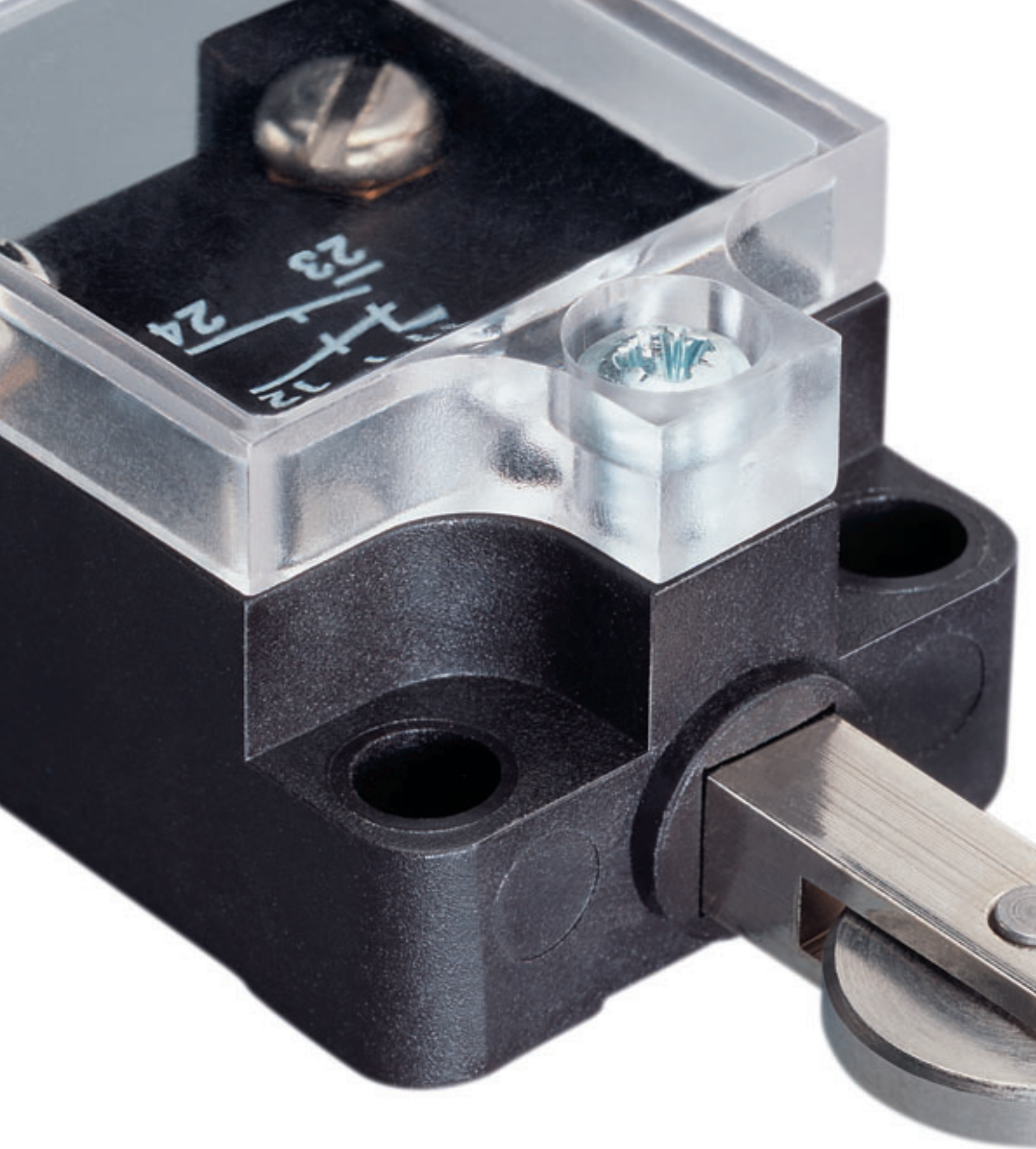
// Spring rod with plastic rod TK



Contact variants: switch travel/contacts

	Snap action	Slow action
1 NC / 1 NO contact	EM 61 TK 1Ö/1S 	ES 61 TK 1Ö/1S
1 NC / 1 NO contact with overlapping		ES 61 TK UE
2 NC contacts		ES 61 TK 2Ö





Miniature limit switches

Thermoplastic enclosure

// Series C 50

from page 176

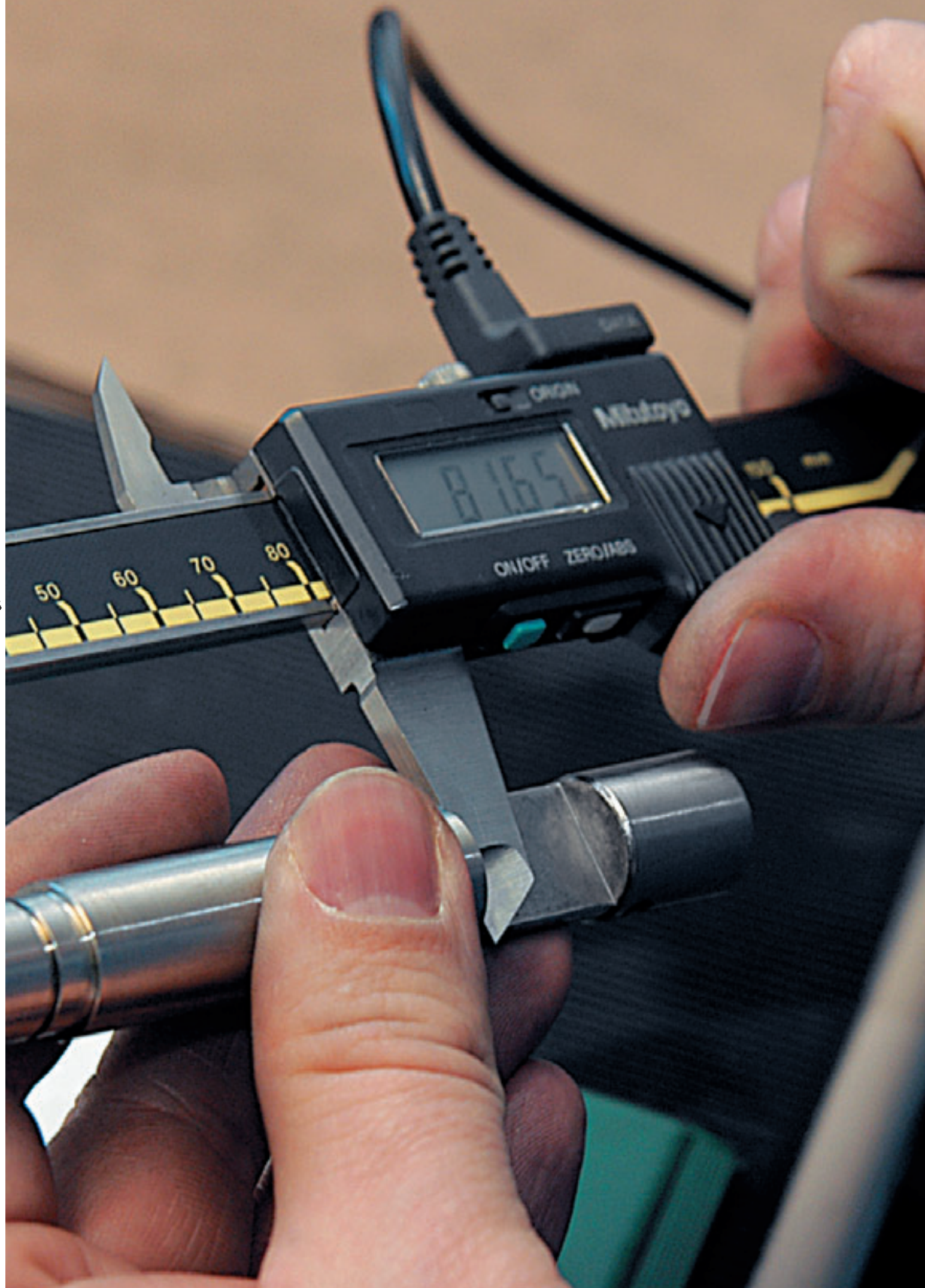
// Series C 500

from page 180

// Series ES 50

from page 184





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

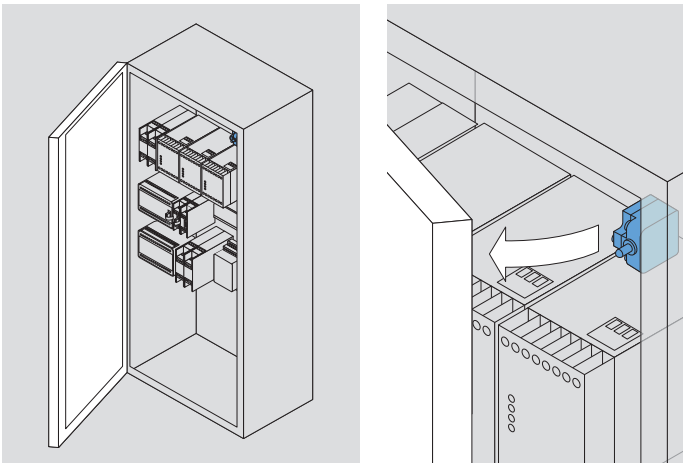
Minimum space requirement, high switching capacity and robust design are some of the many advantages of these miniature limit switches.

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

All miniature limit switches shown in this chapter bear the CE mark according to the Low Voltage Directive 73/23/EC.

Application

Position monitoring of a control cabinet door.



Miniature limit switches

// Series C 50

Features/Options

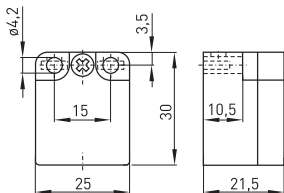
- Thermoplastic enclosure
- Change-over contact with double break, positive break NC contact ⊖
- Galvanically separated contact bridges
- Available for top mounting with 2 x M3 tapped holes

// C 50



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	plunger: brass
Protection class	IP 30 to IEC/EN 60529
Soiling level	3
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	change-over contact with double break Zb and galvanically separated contact bridges
Termination	plug-in connector
Cable section	max. 1.5 mm ²
U_{imp}	4 kV
U_i	400 V
I_{the}	4 A
I_e/U_e	4 A/400 VAC
Utilisation category	AC-15
Max. fuse rating	4 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Impact resistance/Contact opening	2 x 4 mm
Approvals	Ⓢ _{US}



Ordering details

C 50 R 10/1S

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

Series

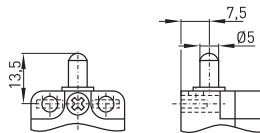
Miniature limit switches

// Series C 50, actuators

Features/Options

- Plunger with knurled-head setting screw
- Projection of plunger adjustable for fine setting of switching point

// Plunger

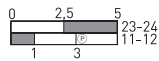


Contact variants: switch travel/contacts

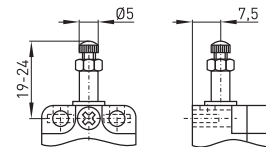
Slow action

1 NC / 1 NO contact

C 50 10/1S



// Adjustable plunger ST

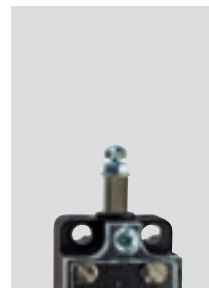
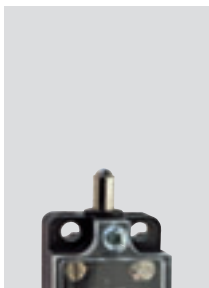
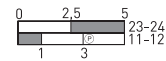


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

C 50 ST 10/1S



Miniature limit switches

// Series C 50, actuators

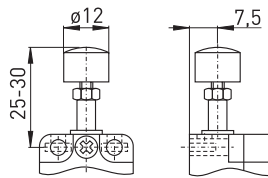
Features/Options

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

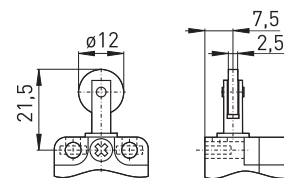
Features/Options

- Available with roller plunger turned 90°

// Adjustable plunger cap K



// Roller plunger R



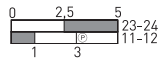
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

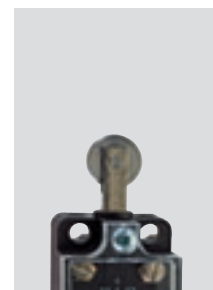
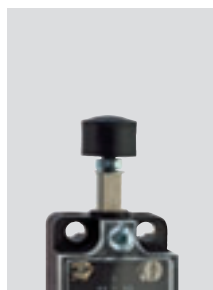
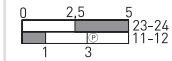
C 50 K 10/1S



Slow action

1 NC / 1 NO contact

C 50 R 10/1S



PRODUCTION PROCESS ASSEMBLY
ASSEMBLY OF MINIATURE LIMIT SWITCHES



Miniature limit switches

// Series C 500

Features/Options

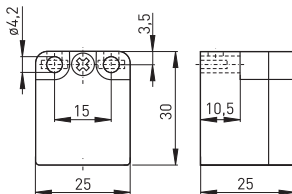
- Thermoplastic enclosure
- Change-over contact with double break, positive break NC contact ⊖
- Galvanically separated contact bridges
- Available for top mounting with 2 x M3 tapped holes

// C 500



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	plunger: brass
Protection class	IP 30 to IEC/EN 60529
Soiling level	3
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	change-over contact with double break Zb and galvanically separated contact bridges
Termination	plug-in connector
Cable section	max. 1.5 mm ²
U_{imp}	4 kV
U_i	400 V
I_{the}	4 A
I_e/U_e	4 A/400 VAC
Utilisation category	AC-15
Max. fuse rating	4 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Impact resistance/Contact opening	2 x 4 mm
Approvals	



Ordering details

C 500 R 1Ö/1S

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

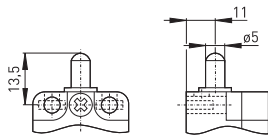
Miniature limit switches

// Series C 500, actuators

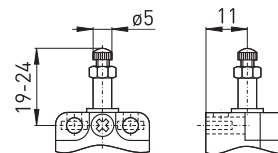
Features/Options

- Plunger with knurled-head setting screw
- Projection of plunger adjustable for fine setting of switching point

// Plunger



// Adjustable plunger ST

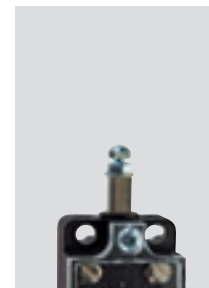
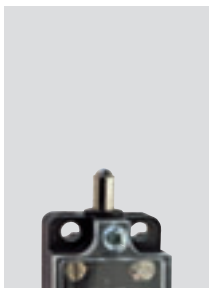


Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	C 500 10/1S

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



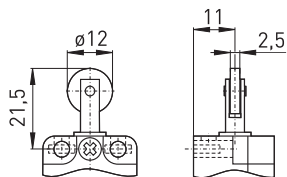
Miniature limit switches

// Series C 500, actuators

Features/Options

- Available with roller plunger turned 90°

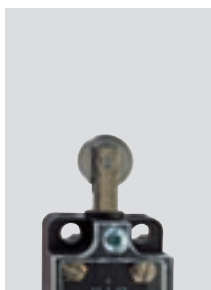
// Roller plunger R



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Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	C 500 R 10/1S



PRODUCTION PROCESS ASSEMBLY
PRODUCTION AND URGENT ORDERS

GmbH -Zentrallager-
A3

14911



50 Stck

: 26.01.06

000000

Ausfall

Datum

Name

INGSAUFTRAG

140074

Controle

41001

500 Stck

: 25.01.06

002/80708004

INGSAUFTRAG

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
SCHMERSAL-Nr.: 1145775

Benennung

Name

Datum

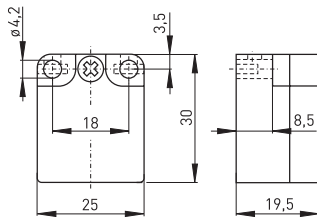
Miniature limit switches

// 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

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermoplastic, self-extinguishing UL 94-V0
Actuator	plunger: brass
Protection class	IP 30 to IEC/EN 60529
Soiling level	3
Contact material	silver
Switching system	slow action, positive break NC contact ⊖
Switching elements	change-over contact with double break Zb and galvanically separated contact bridges
Termination	plug-in connector
Cable section	max. 1.5 mm ²
U_{imp}	4 kV
U_i	400 V
I_{the}	4 A
I_e/U_e	4 A/400 VAC
Utilisation category	AC-15
Max. fuse rating	4 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Repeat accuracy of switching points	± 0.1 mm
Impact resistance/Contact opening	2 x 4 mm
Approvals	c US

Ordering details

ES 50 R 10/1S

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

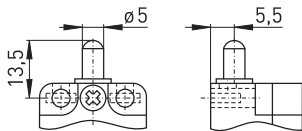
Miniature limit switches

// Series ES 50, actuators

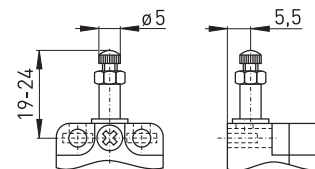
Features/Options

- Plunger with knurled-head setting screw
- Projection of plunger adjustable for fine setting of switching point

// Plunger



// Adjustable plunger ST

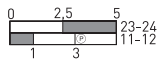


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 50 10/1S

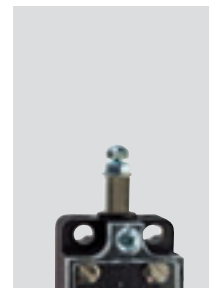
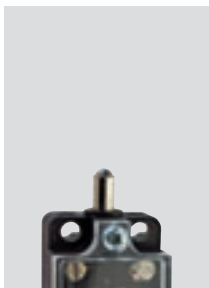
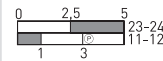


Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 50 ST 10/1S



Miniature limit switches

// Series ES 50, actuators

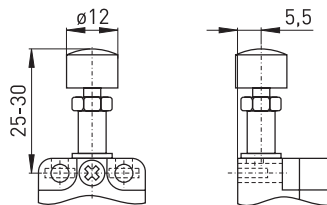
Features/Options

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

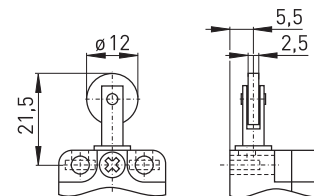
Features/Options

- Available with roller plunger turned 90°

// Adjustable plunger cap K



// Roller plunger R



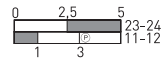
Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

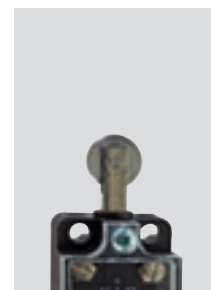
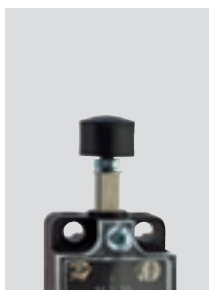
ES 50 K 10/1S



Slow action

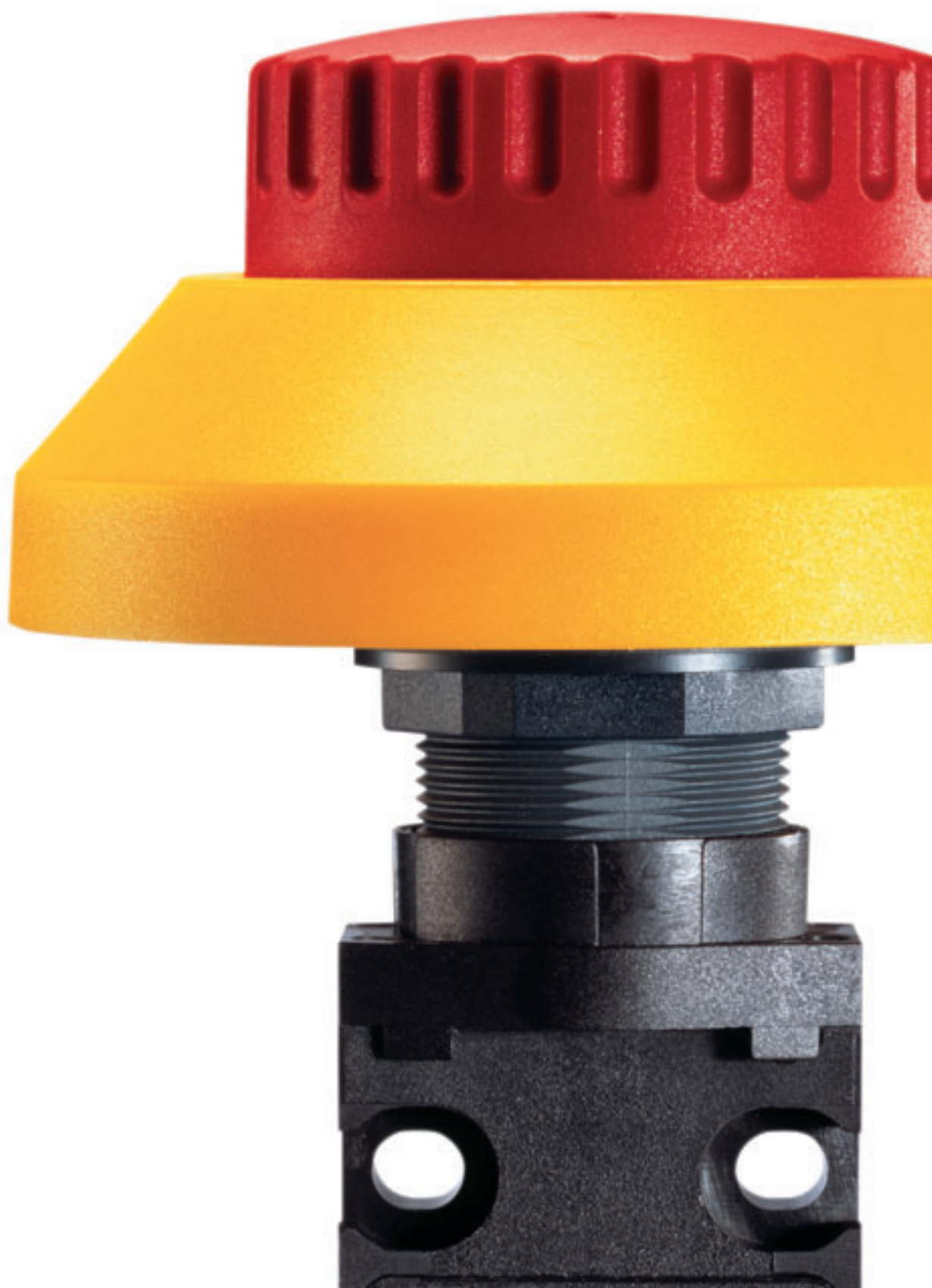
1 NC / 1 NO contact

ES 50 R 10/1S



PRODUCTION PROCESS ASSEMBLY
PREASSEMBLY FOR MINIATURE LIMIT SWITCHES





Command devices

Thermoplastic enclosure
// [Series ES 14](#)
from page 192





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.

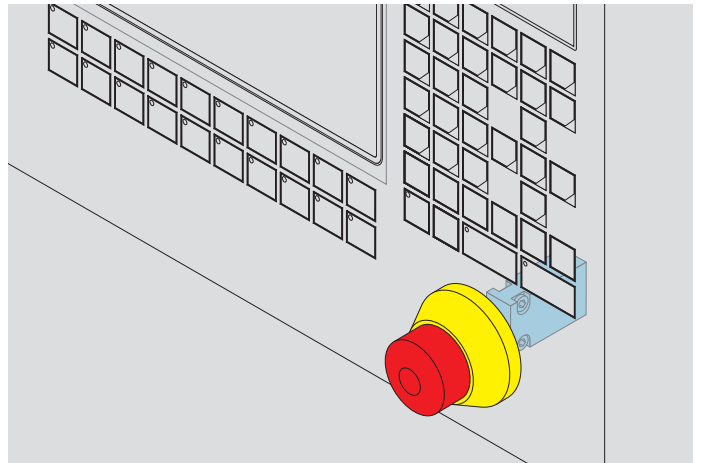
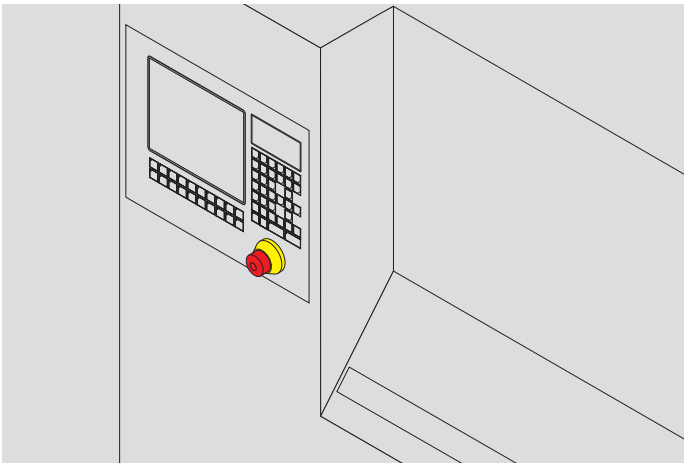
Design and operating principle

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 protection class 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 73/23/EC and the emergency-stop push-buttons according to the Machinery Directive 98/37/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
- Mounting details to DIN EN 50 047
- With pre-wired cable, cable length 1 meter
- Ex-version available

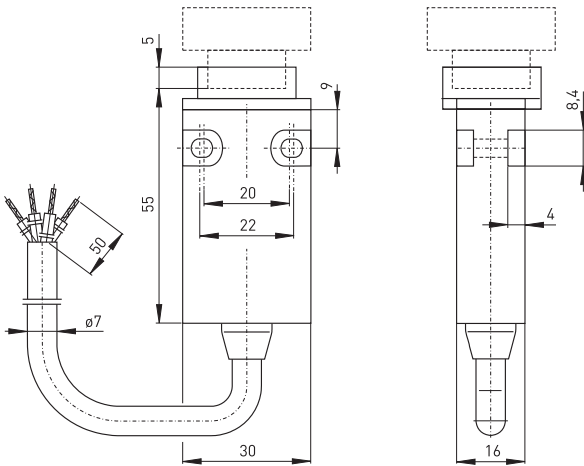
// ES 14



Technical data

Standards	IEC/EN 60947-5-1
Enclosure	glass-fibre reinforced, shock-proof thermo- plastic, self-extinguishing UL 94-V0
Protection class	IP 65/67 to IEC/EN 60529
Contact material	silver
Switching system	slow action, positive break NC contacts \ominus
Switching elements	change-over contact with double break, galvanically separated contact bridges
Termination	cable H05VV-F
Cable section	4 x 0.75 mm ²
U _{imp}	4 kV
U _i	250 V
I _{the}	6 A
I _e /U _e	6 A/250 VAC; 0,25 A/230 VDC
Utilisation category	AC-15, DC-13
Max. fuse rating	6 A gL/gG D-fuse
Ambient temperature	-20 °C ... +75 °C
Mechanical life	> 1 million operations
Switching frequency	1800/h
Contact opening	2 x 4 mm

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Ordering details

ES 14 RUV 1Ö/1S-s-1m

- Cable length 1 m,
(2 m, 5 m, 10 m)
- Cable on side
- Contact type 1NC/1NO (2Ö)
- Actuator RUV (RT, RSSA, RW, etc. ...)
- Series
- S Slow action

Command devices

// Series ES 14, actuators

Features/Options

- Slow action with 2 NC contacts available
- With gold-plated contacts available on request

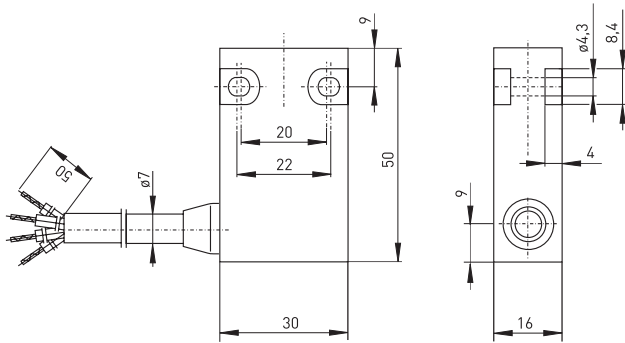
Features/Options

- With pre-wired cable, cable length 1 meter
- Protection class IP 65

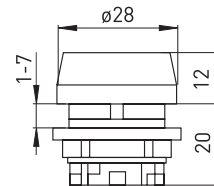
// Connector M12 x 1, 4-pole



// Cable on side



// Push button RT



Contact variants: switch travel/contacts

Slow action

1 NC / 1 NO contact

ES 14 RT



Command devices

// Series ES 14, actuators

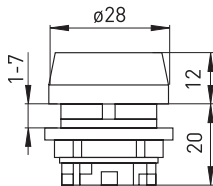
Features/Options

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

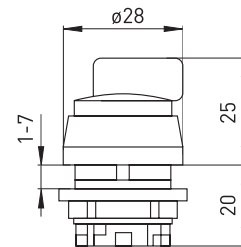
Features/Options

- Selector with rest positions
- Available in 3 different versions
- Protection class 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

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	<p>ES 14 RTM</p>
	<p>2 switching positions Switching angle 90° 0 - I or I - II</p>
	<p>3 switching positions Switching angle - 45° + 45° I - 0 - II</p>
	<p>Control switch actuated selector Left-hand side switching, right-hand side stroke Switching angle - 45° + 45° I - 0 ← II</p>

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



Features/Options

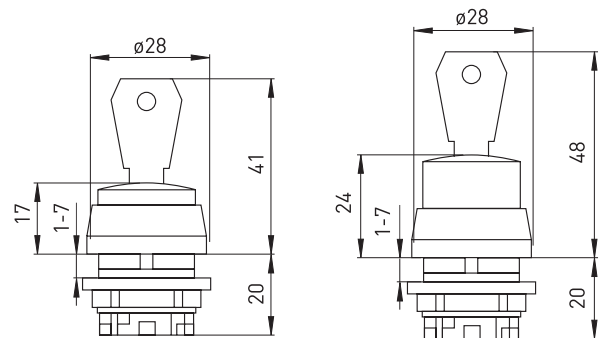
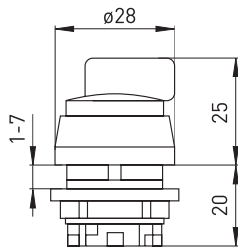
- RST with spring return
- Available in 2 different versions
- Protection class IP 65
- With pre-wired cable, cable length 1 meter

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
- Protection class 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
1 NC / 1 NO contact	<p>ES 14 RST ...</p>
Switching angle 90° with return to left position, 0 ← I	<p>ES 14 RSTA 0 ← I</p>
Switching angle - 45° + 45° with return to central position I → 0 ← II	<p>ES 14 RSTB I → 0 ← II</p>

	Slow action	2 switching positions	3 switching positions
1 NC / 1 NO contact	<p>ES 14 RSSA ...</p>		
Key switch		EEx 14 RSSA 14	EEx 14 RSSA 12
		EEx 14 RSSA 15	EEx 14 RSSA 13
		EEx 14 RSSA 17	EEx 14 RSSA 23
		EEx 14 RSSA 18	EEx 14 RSSA 24
		EEx 14 RSSA 27	

Legend

- Switching position
- Spring return
- Position for key removal



Command devices

// Series ES 14, actuators

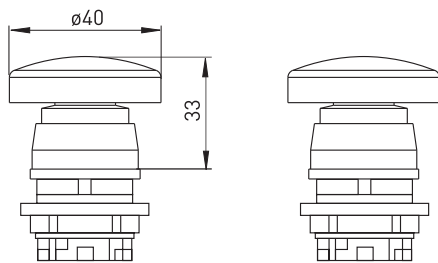
Features/Options

- Thermoplastic actuator
- Protection class IP 65
- With pre-wired cable, cable length 1 meter

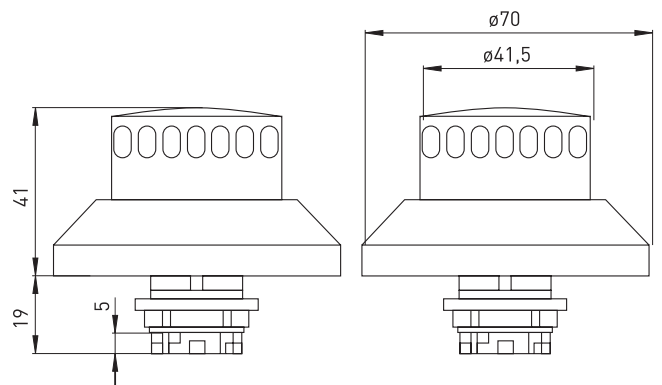
Features/Options

- Thermoplastic actuator
- To EN 418
- 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
- Protection class IP 65
- With pre-wired cable, cable length 1 meter

// Push button RS SW



// Emergency stop push button RUV



Contact variants: switch travel/contacts

Contact variants: switch travel/contacts

	Slow action
1 NC / 1 NO contact	ES 14 RS SW BK → GY BU → BN
2 NC contacts	ES 14 RS SW 2Ö BK → GY BU → BN

	Slow action
1 NC / 1 NO contact	ES 14 RUV BK → GY BU → BN
2 NC contacts	ES 14 RUV 2Ö BK → GY BU → BN









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



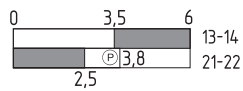
STEUTE SWITCHGEAR HAVE PROVED SUITABLE AND RELIABLE FOR MANY YEARS,
EVEN IN THE COMPLEX FIELD OF CONTROL TECHNOLOGY





LEGEND

Y	A/F
	Positive break NC contact
	Positive break travel/angle
	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

Beside safety switches, position switches and command devices, steute designs and manufactures for industrial applications of control technology various designs of control devices, e. g. foot, position switches, emergency pull-wire, door-handle switches and safety switchgear with radio

technology. In addition, switchgear for explosion protection that are applied where flammable atmospheres can occur – Ex position, pull-wire, safety switches and solenoid interlocks, as well as magnetic sensors. Furthermore steute boasts a wide program of control devices for complex and

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