Detecting Devices

Position Switches • Magnetically Operated Switches

Reference Manual · April 2009

Low-Voltage Controls and Distribution

SIEMENS

Detecting Devices

Introduction

Overview

3SE5 23., 3SF1 234 | **3SE5 24., 3SF1 244** | **3SE5 11., 3SF1 114** | **3SE5 12., 3SF1 124** | **3SE5 232, 3SF1 2.4** | **3SE5 112, 3SF1 1.4** | **3SE5 250**

	Position switches, standard				Hinge switches		Open-type
Enclosures							
Plastic	✔	✔	--	--	✔	--	✔
Metal	--	--	✔	✔	--	✔	--
Dimensions (W x H x D) in mm	31 × 68 × 33	50 × 53 × 33	40 × 78 × 38	56 × 78 × 38	31 × 68 × 33	40 × 78 × 38	30 × 48.5 × 20
Degree of protection	IP65	IP66/IP67	IP66/IP67	IP66/IP67	IP65	IP66/IP67	IP10 or IP20
Standards							
IEC 60947-5-1	Mounting and operating points acc. to EN 50047	Operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Operating points acc. to EN 50041	Mounting and operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Mounting and operating points acc. to EN 50047
Approvals	CE, UL, CSA, CCC		CE, UL, CSA, CCC		CE, UL, CSA, CCC		
Contact blocks							
2 slow-action contacts	1 NO + 1 NC		1 NO + 1 NC		--		1 NO + 1 NC
2 snap-action contacts	1 NO + 1 NC		1 NO + 1 NC		1 NO + 1 NC		1 NO + 1 NC
2 snap-action contacts, short stroke	1 NO + 1 NC		✔		✔		✔
2 snap-action contacts with 2 × 2 mm contact gap	1 NO + 1 NC		✔		✔		✔
3 slow-action contacts	1 NO + 2 NC		1 NO + 2 NC		✔		1 NO + 2 NC
3 snap-action contacts	1 NO + 2 NC		1 NO + 2 NC		1 NO + 2 NC		1 NO + 2 NC
Special features							
LED status display	✔		✔		✔		--
Increased corrosion protection	✔		✔		✔		--
Explosion protection (ATEX)	--		✔		--	✔	--
ASIsafe integrated	✔		✔		✔		--
Electrical specifications							
Insulation voltage U_i	400 V		400 V		400 V		400 V
Conventional thermal current I_{the}	6 A/10 A (3-/2-pole)		6 A/10 A (3-/2-pole)		6 A/10 A (3-/2-pole)		6 A
Terminals							
Cable entry	1 × M20 × 1.5	2 × M20 × 1.5	1 × M20 × 1.5	3 × M20 × 1.5	1 × M20 × 1.5	1 × M20 × 1.5	--
M12 connector socket 4-, 5- or 8-pole	✔	✔	✔	✔	✔	✔	--
Connector socket, 6-pole + PE	--	--	✔	✔	--	--	--
Actuators							
Rounded plungers and roller plungers	✔		✔		--		✔
Roller and angular roller levers	✔		✔		--		--
Spring rod	✔		✔		--		--
Twist levers and rod actuators	✔		✔		--		--
Fork lever	--		✔		--		--
Hinges for mounting	--		--		✔		--
Page							
Standard	13	13	16	16	8/17	8/17	40
ASIsafe	8/58	8/58	8/58	8/58	8/58	8/58	--
ATEX	--	--	8/55	8/55	--	8/55	--

✔ Available

-- Not available

**3SE5 232,
3SE5 242,
3SF1 2.4**

**3SE5 112,
3SE5 122,
3SF1 1.4**

**3SE5 322,
3SE5 312,
3SF1 3.4**

3SE6

	Position switches with separate actuator		Position switches with solenoid interlocking	Magnetically operated switches
Enclosures				
Plastic	✔	--	✔	✔
Metal	--	✔	✔	--
Dimensions (W x H x D) in mm	31 × 68 × 33, 50 × 53 × 33	40 × 78 × 38, 56 × 78 × 38	54 × 185 × 44	M30 × 44, 19 × 33 × 13, 25 × 88 × 13
Degree of protection	IP65, IP66/IP67	IP66/IP67	IP66/IP67	IP67
Standards				
IEC 60947-5-1	Mounting acc. to EN 50047	Mounting acc. to EN 50041	EN 1088, GS-ET 19	Category 3 or 4 acc. to EN ISO 13849-1 (EN 954-1)
Approvals	CE, TÜV, UL, CSA, CCC		CE, TÜV, UL, CSA, CCC	CE, UL, CSA
Contact blocks				
2 slow-action contacts	1 NO + 1 NC		--	--
2 snap-action contacts	--		--	--
3 slow-action contacts	1 NO + 2 NC		--	--
3 snap-action contacts	--		--	--
6 slow-action contacts	--		2 × (1 NO + 2 NC)	--
Reed contacts	--		--	1 NO + 1 NC, 2 NC
Special features				
LED status display	✔		✔	--
Increased corrosion protection	✔		✔	--
Explosion protection (ATEX)	✔		--	--
ASIsafe integrated	✔		✔	--
Electrical specifications				
Insulation voltage U_i	400 V		400 V	--
Conventional thermal current I_{the}	6 A		6 A	--
Terminals				
Cable entry	1 × M20 × 1.5, 2 × M20 × 1.5	1 × M20 × 1.5, 3 × M20 × 1.5	3 × M20 × 1.5	--
M12 connector socket, 4- or 5-pole	✔	✔	✔	✔
Molded cables	--	--	--	✔
AS-Interface	✔	✔	✔	✔ (through I/O module)
Actuators				
Separate actuators	✔		✔	--
Page				
Standard	45	45	51	65
ASIsafe	62	62	64	65
ATEX	--	57	--	--

✔ Available

-- Not available

General data
3SE5

Overview

Position switches in the innovative SIRIUS 3SE5 series are modern in design, compact, modular and simple to connect.

Complete units

Popular versions of the position switches in standard enclosures are available as complete units.

Position switches with plastic and metal enclosures

Modular system

The 3SE5 series features a new modular system comprising different sizes of the basic switch and an actuator which must be ordered separately. Thanks to the modular design of the switch the user can select the right solution for his application from numerous versions and install it himself in a very short time. The short delivery times of the modules enable fast replacement and thus ensure high plant availability.

Examples of selection options in the modular system

3SE2 series

The position switches of the 3SE2 series are still available, in particular those switch versions which are not yet covered by the new 3SE5 series, including the complete 3SE2 230 series with 40 mm plastic enclosure or additional switching element versions, e. g. with make-before-break, with 2 NO contacts and with 3 or 4 contacts.

Design

Enclosure sizes

The 3SE5 switches are available in five different enclosure sizes:

- Open-type position switch IP20 or IP10
- Plastic enclosures according to EN 50047 (31 mm wide), 1 cable entry
- Plastic enclosures (50 mm wide), 2 cable entries
- Metal enclosures according to EN 50041 (40 mm wide), 1 cable entry
- Metal enclosures (56 mm wide), 3 cable entries

The following items are available in addition from the 3SE2 series:

- Plastic enclosure according to EN 50041, 40 mm wide
- Metal enclosures with 3 or 4 contacts, 56 mm wide

Enclosure versions

Various basic switches can be selected for the enclosures:

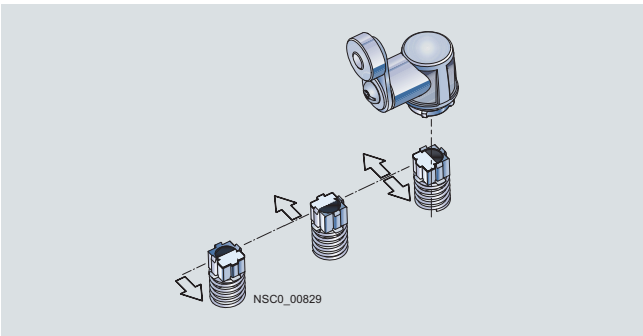
- With switching elements with two or three contacts (screw terminals) designed as slow-action or snap-action contacts
- Optional LED status display
- With mounted four or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- With increased corrosion protection
- Metal enclosures for explosion protection (ATEX) (see page 57)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 58)

Actuator variants

The following actuator variants are available:

- Rounded plungers
- Roller plungers
- Roller lever
- Angular roller lever
- Spring rod
- Twist levers and rod actuators
- Fork lever

The actuator rollers are available with various materials and diameters.



Twist actuators for twist levers and rod actuators, with setting of switching to right, left or right/left (standard for all twist actuators except fork levers)

Optional LED indicators

LED indicators available for all enclosure sizes

The enclosure versions can be supplied with an LED signaling indicator (1 × green + 1 × yellow). This is the first time that optical status monitoring is also available for small standard enclosures according to EN 50047. The LED signaling indicators are available in all common voltages (24 V DC and 230 V AC).

Additional contacts

Exchangeable two and three-pole switching blocks for all enclosure sizes

The new three-pole switching block (2 NC, 1 NO) in snap-action and slow-action is regularly available for all enclosure forms. It offers more switching through redundant shutdowns (2 NC contacts) with simultaneous signaling (1 NO contact). The same installation space is required as for a two-pole switching block.

Contact reliability

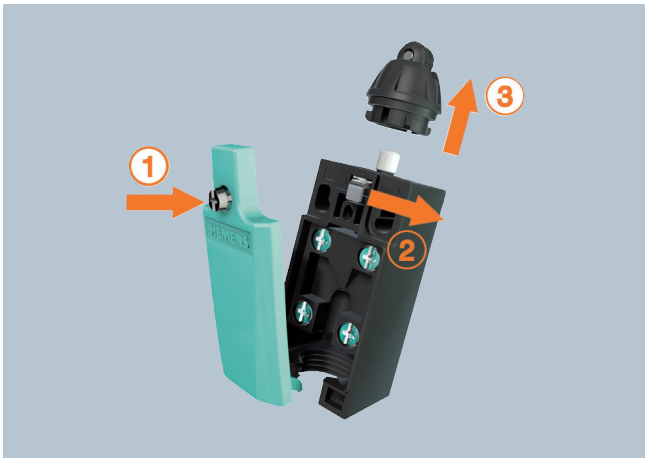
The new switching blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e. g. 1 mA at 5 V DC.

Positive opening ➔

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

Mounting

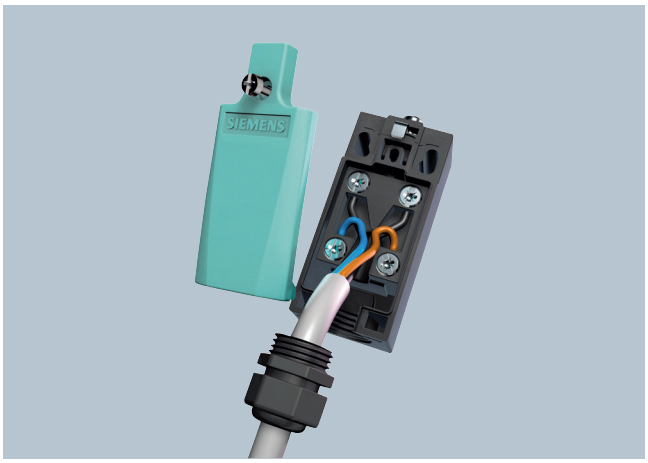
Easy plug-in method – for fast replacement of the actuator head



(1) Open cover
(2) Actuate locking lever
(3) Replace the head (turnable by 16 x 22.5°)
(4) Lock and close the cover

Fast connection method

For plastic enclosure with a width of 31 mm



These position switches can be wired quickly and easily as an added customer benefit. The connecting cable is first connected to the terminals of the contact block and then guided through a slit into the cable gland opening. The time saved through this new connection method is approx. 20 to 25 %.

Online configurator

The online configurator helps you not only to select and order the right switch but also to create complete product documentation.

- Product data sheets
- Dimensional drawings
- Operating travel diagrams
- CAD data in 2D and 3D model images
- Ordering data
- Product photos

http://www.siemens.com/lowvoltage/configurators

General data
3SE2, 3SE3

Overview

With the SIRIUS standard position switches, mechanical positions of moved machine parts are converted into electrical signals. Through their modular and uniform design and large number of variants, the devices can meet practically all requirements in industry.

Scope of supply

The 3SE2 position switches are supplied as standard as complete units. Available in addition are basic switches without an operating mechanism which are used preferably for types of operating mechanisms not found in the standard range.

Switch versions which have been replaced by the new 3SE5 devices are no longer in the standard range.

Design

Enclosure sizes

The 3SE2 switches are available in different enclosure sizes:

- Plastic enclosures according to EN 50047 (31 mm wide), 1 cable entry
- Plastic enclosures according to EN 50041 (40 mm wide), 1 cable entry
- Plastic enclosures (50 mm wide), 2 cable entries
- Metal enclosures according to EN 50041 (40 mm wide), 1 cable entry
- Metal enclosures (56 mm wide), 3 cable entries

The following items are available in addition in the 3SE3 series:

- IP20 open-type position switches
- Compact position switches with metal enclosure and molded cable

Enclosure versions

Various basic switches can be selected for the 3SE2 series:

- Standard enclosures (plastic or metal) with two slow-action or snap-action contacts (screw terminals)
- Metal enclosures with three slow-action contacts
- Metal enclosures with four slow-action or snap-action contacts

Actuator variants

The following actuator variants are available:

- Rounded plungers
- Roller plungers
- Roller lever
- Angular roller lever
- Spring rod
- Twist levers and rod actuators
- Fork lever

Design

Enclosure

The 3SE2 position switches are in either a narrow or wide enclosure made of fiber-glass strengthened, flame-retardant plastic or cast aluminum.

The position switches in a narrow enclosure comply with the standards in terms of their enclosure and actuator as well as their fixing dimensions and operating points:

- EN 50047 for rounded plunger, roller plunger, roller lever and twist lever actuators
  - 3SE2 200 series with plastic enclosure
- EN 50041 for rounded plunger, roller plunger, twist lever and rod actuators
  - 3SE2 230 series with plastic enclosure
  - 3SE2 120 series with metal enclosure

The narrow enclosures have one and the wide enclosures have two or three cable entries, suitable for looping through cables. The cable entry has a metric thread M20 × 1.5 for cable glands with 6 mm long threads (see Accessories).

To secure position switches with a safety function against changes in their position, keyed techniques must be employed on installation, such as:

- Fixing by means of round holes
- For longitudinal holes, guide pins and stops must also be used.

Actuators

All actuators can be retro-fitted or exchanged for another version. They can also be repositioned every 90° so that the switches can be operated from any of the four sides.

Important: The position switches must not be used as an end stop.

Standard, rounded and roller plungers

- Operation in direction of the plunger axis or in case of roller plunger with bar at right angles to the plunger axis.
- Rounded and roller plungers have an additional overtravel and hence a large operating distance.
- The roller plunger is recommended for lateral actuation and relatively long overtravel.

Roller and angular roller levers

- For a high starting speed of v_{max} = 2.5 m/s
- For actuators made of finely ground steel in the form of cams, straight-edges or cam disks
- Very long mechanical endurance

Spring rod

- Can be used for undefined actuations and changing starting conditions
- Starting from any direction

Twist levers and rod actuators

- For a high starting speed of v_{max} = 3 m/s
- Variety of starting options
- Insensitive to oil, dirt, grinding dust, ice and coarse-grained material
- With the twist lever the maximum approach angle is always equal to the maximum trailing angle.
- The rod actuator must be used when no actuation with approach and trailing angle is possible.

Fork lever

- Switchable in two directions
- For reciprocating movements
- Latched actuator

Rounded plungers with short-stroke contact block

- Exact switching response
- Operating travel and hysteresis greatly reduced
- Optimized wear characteristics
- Suitable for the monitoring of doors and access flaps up to Category 4 according to ISO 13849-1 (EN 954-1)

Rounded and roller plungers with central fixing

- Fast mounting with M18 × 1 thread
- Easy adjustment
- Same mounting type as the proximity switch BERO

Contacts

The position switches with plastic enclosures are available with 2 contacts; the position switches with metal enclosures are available with 2, 3 or 4 contacts. The contacts can be snap-action contacts, slow-action contacts or slow-action make-before-break contacts. The contacts are designed for a thermal current of 10 A.

Contact reliability

The movable contacts are double-break contacts. This ensures an extremely high contact stability, even when the devices are switching low voltages and currents, e. g. 5 V DC/1 mA.

As the moving double-break contacts are electrically isolated from each other, the position switches can also switch, without any reservations, circuits up to 380 V with different potentials.

The operating point of the snap-action contacts is independent of the contact erosion.

The contact chamber is covered to prevent ingress of foreign bodies.

Connection

- Metric thread M20 × 1.5 for mounting glands, connector sockets or adapters
- Expansion range with mounted connector socket
- With AS-Interface F adapter for direct connection to ASIsafe; usable up to Category 2 according to ISO 13849-1 (EN 954-1).
- With AS-Interface F adapter for direct connection to ASIsafe; with additional M12 connector socket for connection of the second position switch, usable up to Category 4 according to ISO 13849-1 (EN 954-1).

Function

Positive opening ➔

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

In order to ensure this positive opening, the position switches must be actuated in such a way that the nominal values for the positive opening are substantially exceeded.

General data

Technical specifications

Type		3SE5 1.., 3SE5 2..	
General data			
Standards		IEC 60947-5-1, EN 60947-5-1	
Rated insulation voltage U_i	V	400	
Degree of pollution acc. to EN 60664-1		Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	400 AC; over 300 V AC only for equal potential	
Conventional thermal current I_{th}	A	10	6
Rated operational current I_e		2 contacts	3 contacts
• With alternating current 50 / 60 Hz		I_e/AC-15	I_e/AC-15
- At 24 V	A	6	6
- At 120 V	A	6	3
- At 240 V	A	3	1.5
• For direct current		I_e/DC-13	I_e/DC-13
- At 24 V	A	3	3
- At 125 V	A	0.55	0.55
- At 250 V	A	0.27	0.27
Short-circuit protection[1]			
• With DIAZED fuse links, operational class gG	A	6	
• With miniature circuit breaker, Char. C	A	1	
Mechanical endurance			
• Basic switches		15 ×10^6 operating cycles	
• With spring rod, 3SE5 ...-..R..		10 ×10^6 operating cycles	
• With fork lever 3SE5 1..-..T..		1 ×10^6 operating cycles	
Electrical endurance			
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		10 ×10^6 operating cycles	
• For AC-15 utilization category		0.1 ×10^6 operating cycles when interrupting I_e/AC-15 = 3 or 1.5 A at 240 V	
• For DC-13 utilization category		With DC current the endurance of the switching element depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.	
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6000 operating cycles/h	
Switching accuracy For repeated switching, measured at the plunger of the contact block	mm	0.05	
Operating point with snap-action contacts		Independent of contact erosion, constant throughout the endurance of the switch	
Rated data acc. to , , **and** .			
• Rated voltage	V	300	
• Uninterrupted current	A	6	
• Switching capacity		Heavy duty, A 300/B 300/Q 300	

Type		3SE5 23.	3SE5 24.	3SE5 11.	3SE5 12.	3SE5 25.
Enclosures						
Enclosures						
• Material		Ultramid A3X2G7		Zinc diecasting GD Zn Al4 Cu1		--
• Width	mm	31	50	40	56	30
• Dimensions acc. to EN		EN 50047	--	EN 50041	--	--
Degree of protection acc. to EN 60529		IP65	IP66/IP67[2]			2 contacts: IP20, 3 contacts: IP10
Ambient temperature						
• During operation	°C	–25 ... +85				–25 ... +85
• In operation, switch with LEDs	°C	–25 ... +70				--
• Storage, transport	°C	–40 ... +90				–40 ... +90
Mounting position		Any				
Connection						
Cable entry		1 × (M20 × 1.5)	2 × (M20 × 1.5)	1 × (M20 × 1.5)	3 × (M20 × 1.5)	--
Conductor cross-sections[3]						
• Solid	mm²	2 × (0.5 ... 1.5)				
• Finely stranded with end sleeve	mm²	2 × (0.5 ... 1.5)				
Tightening torque, contact block	Nm	0.8 ... 1.0				
Protective conductor connection inside enclosure		--		M3.5		--

1) Without any welds according to EN 60947-5-1.

2) For twist actuators with spring rod and rod actuators: IP65/IP67.

3) For the maximum number of connectable conductors for the respective contact block see operating instructions. Download from: http://www.siemens.com/automation/service&support

Type		3SE2 1, 3SE2 2, 3SE2 3, 3SE2 4, 3SE3 0		Exception: 3SE2 230-8..00	
General data					
Standards		IEC 60947-5-1, EN 60947-5-1			
Rated insulation voltage U_i	V	500			
Degree of pollution acc. to EN 60664-1		Class 3			
Rated operational voltage U_e	V	500 AC; over 380 V AC only for equal potential		500 AC; over 300 V AC only for equal potential	
Conventional thermal current I_{th}	A	10			
Rated operational current I_e					
• With alternating current 50 / 60 Hz		I_e /AC-12	I_e/AC-15		
- At 24 V	A	10	10		
- At 125 V	A	10	10		
- At 230 V	A	10	6		
- At 400 V	A	10	4		
- At 500 V	A	10	3		
• For direct current		I_e/DC-12	I_e /DC-13	I_e/DC-12	I_e /DC-13
- At 24 V	A	10	10	10	10
- At 48 V	A	6	4	6	4
- At 110 V	A	4	1	4	1
- At 220 V	A	1	0.4	1	0.27
- At 440 V	A	0.5	0.2	0.5	0.1
Short-circuit protection[1], DIAZED fuse links					
• Operational class gG	A	6		6	
• Characteristic quick	A	10		--	
Mechanical endurance		30 ×10^6 operating cycles		15 ×10^6 operating cycles	
Electrical endurance					
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		10 ×10^6 operating cycles			
• For AC-15 utilization category		0.5 ×10^6 operating cycles when interrupting I_e / AC-15 at 230 V			
• For DC-13 utilization category		With DC current the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.			
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6000 operating cycles/h		1800 operating cycles/h	
Switching accuracy For repeated switching, measured at the plunger of the contact block	mm	0.05			
Operating point with snap-action contacts		Independent of contact erosion, constant throughout the endurance of the switch			
, and rated data					
• Rated voltage	V	600		600	
• Uninterrupted current	A	10		10	
• Switching capacity		Heavy duty, A 600/Q 600		Heavy duty, A 300/Q 600	

Type		3SE2 200	3SE2 230	3SE2 210	3SE2 120	3SE2 100, 3SE2 303, 3SE2 404	3SE3 0
Enclosures							
Enclosures							
• Type acc. to EN		EN 50047	EN 50041	–	EN 50041	--	--
• Width	mm	31	40	50	40	56	--
• Material		Fiber-glass strengthened thermoplast			Aluminum (GD - AlSi 12)		--
Degree of protection acc. to EN 60529		IP67	IP66	IP67			IP20
Ambient temperature							
• During operation		–30 ... +85 °C					
Mounting position		Any					
Connection							
Cable entry		1 × (M20 × 1.5)		2 × (M20 × 1.5)	1 × (M20 × 1.5)	3 × (M20 × 1.5)	--
Conductor cross-sections							
• Solid	mm^2	2 × 2.5					
• Finely stranded with end sleeve	mm^2	2 × 1.5					
Protective conductor connection Inside enclosure		--			M3.5		--

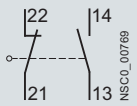
1) Without any welds according to EN 60947-5-1.

General data

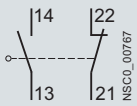
Schematics

3SE5 basic switches, enclosure widths 31 mm, 40 mm, 50 mm, 56 mm and open-type design, 30 mm

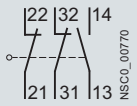
Slow-action contacts 1 NO + 1 NC
3SE5 ...-.B..., -.R...



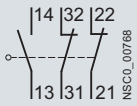
Snap-action contacts 1 NO + 1 NC
3SE5 ...-.C..., -.F..., -.G..., -.H..., -.N...



Slow-action contacts 1 NO + 2 NC
3SE5 ...-.K..., -.Q...



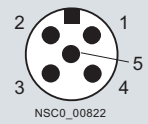
Snap-action contacts 1 NO + 2 NC
3SE5 ...-.L...



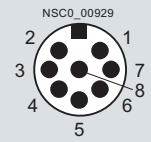
3SE5 connector assignment

M12 connector socket, 4-pole
3SY3 127

M12 connector socket, 5-pole
3SY3 128



M12 connector socket, 8-pole
3SY3 134



Connector sockets, 6-pole + PE
3SY3 131

Order No.	Connector sockets	Contacts	LEDs	Pin assignment								
	Type	Version	Version	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	PE
M12 connector sockets (4-, 5- or 8-pole)												
3SE5..4-.....-1AC4	3SY3 127	1 NO + 1 NC	--	21	22	13	14	--	--	--	--	--
3SE5..4-.....-1AC5	3SY3 128	1 NO + 1 NC	--	21	22	13	14	PE	--	--	--	--
3SE5..4-.....-1AE0	3SY3 127	2 NC	--	21	22	31	32	--	--	--	--	--
3SE5..4-.....-1AE1	3SY3 128	2 NC	--	21	22	31	32	PE	--	--	--	--
3SE5..4-.....-1AF3	3SY3 128	1 NO + 1 NC	2 LEDs	21	22	13/ LED gn	14/ LED ye	Ground LED	--	--	--	--
3SE5..4-.....-1AD4	3SY3 135	1 NO + 2 NC	2 LEDs	21	22	13/ LED gn	14/ LED ye	31	32	Ground LED	PE	--
Connector sockets, 6-pole + PE												
3SE5..5-.....-1AD0	3SY3 131	1 NO + 1 NC	--	21	22	13	14	--	--	--	--	✔
3SE5..5-.....-1AD1	3SY3 131	1 NO + 2 NC	--	21	22	13	14	31	32	--	--	✔
3SE5..5-.....-1AD2	3SY3 131	1 NO + 2 NC	2 LEDs	21	22	31	32	13/ LED gn	Ground LED	--	--	✔
3SE5..5-.....-1AF2	3SY3 131	1 NO + 1 NC	2 LEDs	21	22	13/ LED gn	14/ LED ye	--	Ground LED	--	--	✔

gn = Green
ye = Yellow
✔ = Connected

Configuration

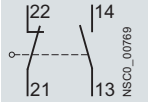
Actuation and operating travel (angle) for enclosure width 31 mm and 50 mm

Operation by bar (standard)

- ⊙ Operating point acc. to EN 50047 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{max} Max. actuating speed
- Contact closed
- Contact open

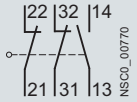
Slow-action contacts

1 NO + 1 NC



Ident. No. **11**

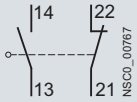
1 NO + 2 NC



Ident. No. **12**

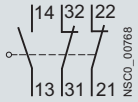
Snap-action contacts

1 NO + 1 NC



Ident. No. **11**

1 NO + 2 NC



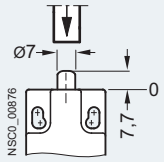
Ident. No. **12**

Rounded plungers, type B

Actuation along plunger axis

Actuation along plunger axis

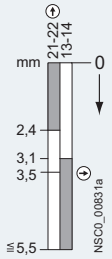
3SE5 2..-..C05



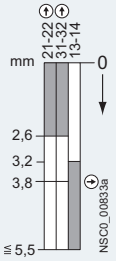
v_{max} = 1 m/s

Minimum force required in direction of operation: 18 N

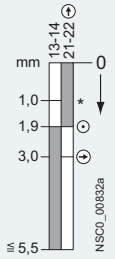
-.BC05



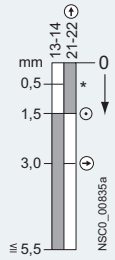
-.KC05



-.CC05, -.HC05

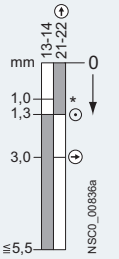


-.FC05



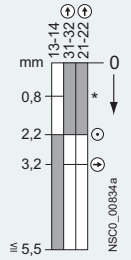
Short stroke

-.GC05



Switching interval 2 × 2 mm

-.LC05

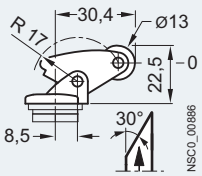


Angular roller levers

Actuation along plunger axis

Actuation along plunger axis

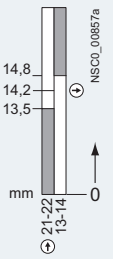
3SE5 2..-..F1.



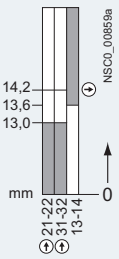
v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

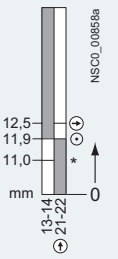
-.BF10



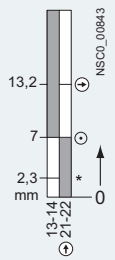
-.KF10



-.HF10

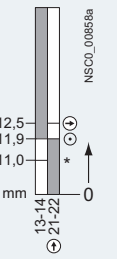


-.FC05 + head[1)]



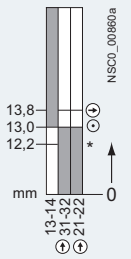
Short stroke

-.GC05 + head[1)]



Switching interval 2 × 2 mm

-.LF10



Operation by bar (standard)

- ⊙ Operating point acc. to EN 50047 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{max} Max. actuating speed

Slow-action contacts

- Contact closed
- Contact open

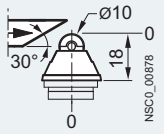
Snap-action contacts

- Contact closed
- Contact open

Roller plungers

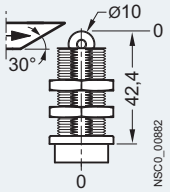
3SE5 2..-..D03, -..D04

Form C



3SE5 2..-..D10, -..D11

Central fixing

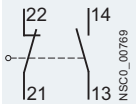


v_{max} = 1 m/s

Minimum force required in direction of operation: 18 N

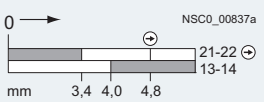
Lateral actuation

1 NO + 1 NC



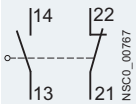
Ident. No. **11**

3SE5 2..-.BD03



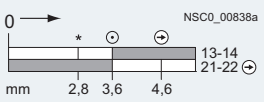
Lateral actuation

1 NO + 1 NC

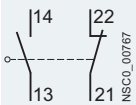


Ident. No. **11**

3SE5 2..-.HD03, -.HD10

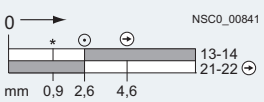


1 NO + 1 NC



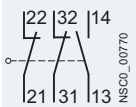
Ident. No. **11**

3SE5 2..-.FC05 + head[1)]



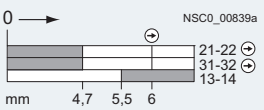
Short stroke

1 NO + 2 NC

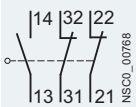


Ident. No. **12**

3SE5 2..-.KD03, -.KD10

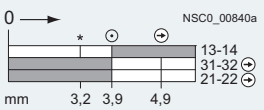


1 NO + 2 NC



Ident. No. **12**

3SE5 2..-.LD03



1) The basic switch and actuator headactuator head must be ordered separately.

3SE5, plastic and metal enclosures

Operation by bar (standard)

- ⊙ Operating point acc. to EN 50047 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{max} Max. actuating speed

Slow-action contacts

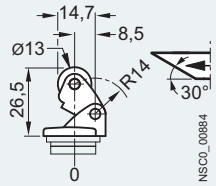
- Contact closed
- Contact open

Snap-action contacts

- Contact closed
- Contact open

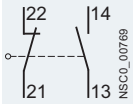
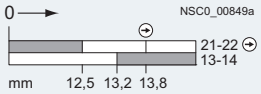
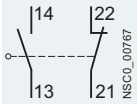
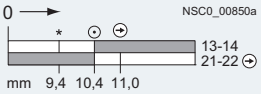
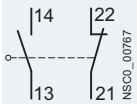
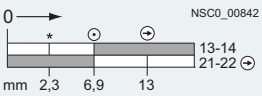
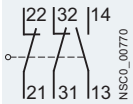
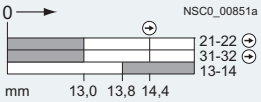
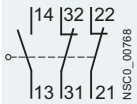
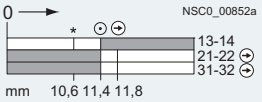
Roller levers, type E

3SE5 2..-..E1.



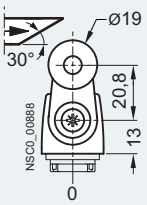
v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

Slow-action contacts		Snap-action contacts	
	Lateral actuation		Lateral actuation
1 NO + 1 NC	**3SE5 2..-.BE10**	**1 NO + 1 NC**	**3SE5 2..-.HE10**
			
Ident. No. **11**		Ident. No. **11**	
		1 NO + 1 NC	**3SE5 2..-.FC05 + head[2)]**
			
		Ident. No. **11**	Short stroke
1 NO + 2 NC	**3SE5 2..-.KE10**	**1 NO + 2 NC**	**3SE5 2..-.LE10**
			
Ident. No. **12**		Ident. No. **12**	

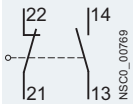
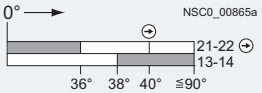
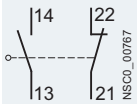
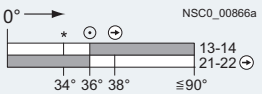
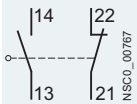
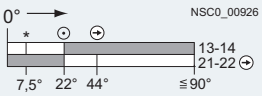
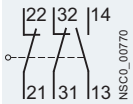
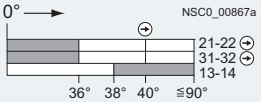
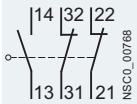
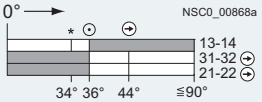
Twist levers[1)], type A

3SE5 2..-..K2.



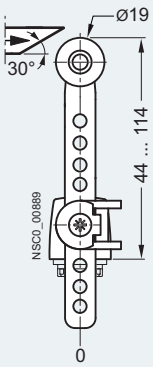
v_{max} = 1.5 m/s

Minimum torque in direction of operation: 0.25 Nm

Slow-action contacts		Snap-action contacts	
	Deflection in direction of rotation		Deflection in direction of rotation
1 NO + 1 NC	**3SE5 2..-.BK21**	**1 NO + 1 NC**	**3SE5 2..-.HK21**
			
Ident. No. **11**		Ident. No. **11**	
		1 NO + 1 NC	**3SE5 2..-.FC05 + head[2)]**
			
		Ident. No. **11**	Short stroke
1 NO + 2 NC	**3SE5 2..-.KK21**	**1 NO + 2 NC**	**3SE5 2..-.LK21**
			
Ident. No. **12**		Ident. No. **12**	

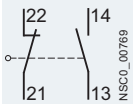
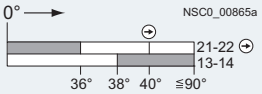
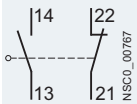
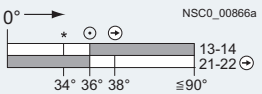
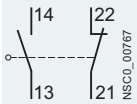
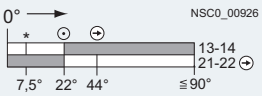
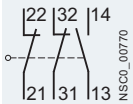
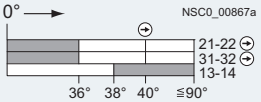
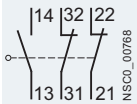
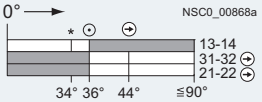
Twist levers[1)], adjustable length

3SE5 2..-..K6.



v_{max} = 1.5 m/s

Minimum torque in direction of operation: 0.25 Nm

Slow-action contacts		Snap-action contacts	
	Deflection in direction of rotation		Deflection in direction of rotation
1 NO + 1 NC	**3SE5 2..-.BC05 + head[2)]**	**1 NO + 1 NC**	**3SE5 2..-.HK60**
			
Ident. No. **11**		Ident. No. **11**	
		1 NO + 1 NC	**3SE5 2..-.FC05 + head[2)]**
			
		Ident. No. **11**	Short stroke
1 NO + 2 NC	**3SE5 2..-.KC05 + head[2)]**	**1 NO + 2 NC**	**3SE5 2..-.LC05 + head[2)]**
			
Ident. No. **12**		Ident. No. **12**	

1) Adjustment of the lever in increments of 10°, maximum deflection 90°.

2) The basic switch and actuator head must be ordered separately.

Operation by bar (standard)

- ⊙ Operating point acc. to EN 50041/47 (snap-action)
- * Operating point on return (snap-action)
- ⊖ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{max} Max. actuating speed

Slow-action contacts

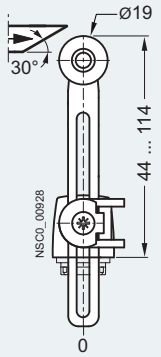
- Contact closed
- Contact open

Snap-action contacts

- Contact closed
- Contact open

Twist levers[1], adjustable length

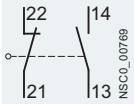
3SE5 2..-..K5.

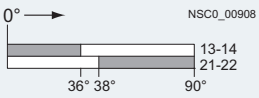


$x v_{max}$ = 1.5 m/s
Minimum torque
in direction of operation: 0.25 Nm

Deflection in direction of rotation

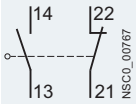
1 NO + 1 NC — **3SE5 2..-.BK50**

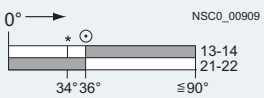




Ident. No. **11**

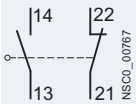
1 NO + 1 NC — **3SE5 2..-.HK50**

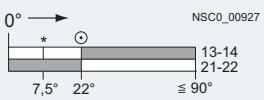




Ident. No. **11**

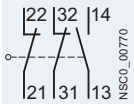
1 NO + 1 NC — **3SE5 2..-.FC05 + head[2]**

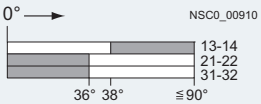




Ident. No. **11** — Short stroke

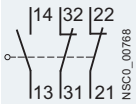
1 NO + 2 NC — **3SE5 2..-.KC05 + head[2]**

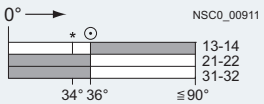




Ident. No. **12**

1 NO + 2 NC — **3SE5 2..-.LK50**

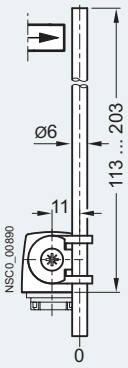




Ident. No. **12**

Rod actuators[1], type D

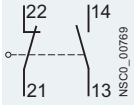
3SE5 2..-..K8.

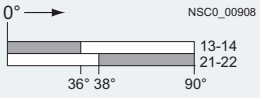


v_{max} = 1.5 m/s
Minimum torque
in direction of operation: 0.25 Nm

Deflection in direction of rotation

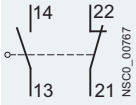
1 NO + 1 NC — **3SE5 2..-.BC05 + head[2]**

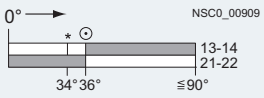




Ident. No. **11**

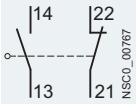
1 NO + 1 NC — **3SE5 2..-.HK80, -.HK82**

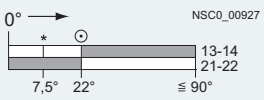




Ident. No. **11**

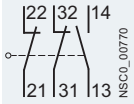
1 NO + 1 NC — **3SE5 2..-.FC05 + head[2]**

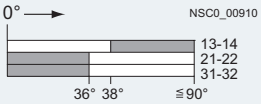




Ident. No. **11** — Short stroke

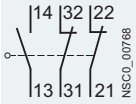
1 NO + 2 NC — **3SE5 2..-.KC05 + head[2]**

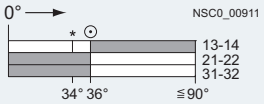




Ident. No. **12**

1 NO + 2 NC — **3SE5 2..-.LC05 + head[2]**

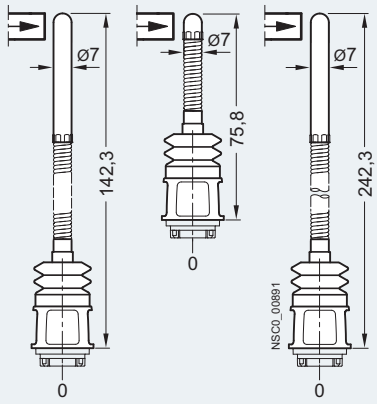




Ident. No. **12**

Spring rods

3SE5 2..-..R0.

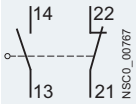


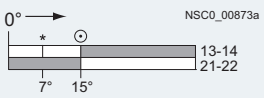
v_{max} = 1 m/s
Minimum force required
in direction of operation: 9 N

The spring rods can be used only with snap-action contacts.

Deflection of spring rod

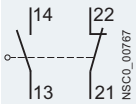
1 NO + 1 NC — **3SE5 2..-.HR01**





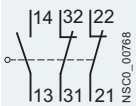
Ident. No. **11**

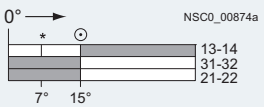
1 NO + 1 NC — **3SE5 2..-.FC05 + head[2]**



Ident. No. **11** — Short stroke

1 NO + 2 NC — **3SE5 2..-.LC05 + head[2]**





Ident. No. **12**

1) Adjustment of the lever in increments of 10°, maximum deflection 90°.

2) The basic switch and actuator head must be ordered separately.

3SE5, plastic and metal enclosures

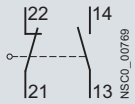
Actuation and operating travel (angle) for enclosure width 40 mm and 56 mm

Operation by bar (standard)

⊙ Operating point acc. to EN 50041 (snap-action)
* Operating point on return (snap-action)
⊕ Positive opening acc. to EN 60947-5-1
→ Direction of operation
v_{max} Max. actuating speed
Contact closed
Contact open

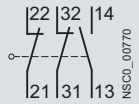
Slow-action contacts

1 NO + 1 NC



Ident. No. **11**

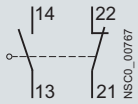
1 NO + 2 NC



Ident. No. **12**

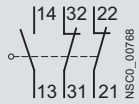
Snap-action contacts

1 NO + 1 NC



Ident. No. **11**

1 NO + 2 NC

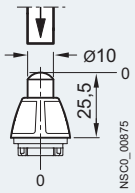


Ident. No. **12**

Rounded plungers, type B

Actuation along plunger axis

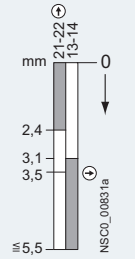
3SE5 1..-..C02



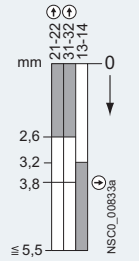
v_{max} = 1.5 m/s

Minimum force required in direction of operation: 18 N

3SE5 1..-.BC02

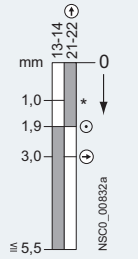


3SE5 1..-.KC02

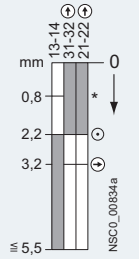


Actuation along plunger axis

3SE5 1..-.CC02



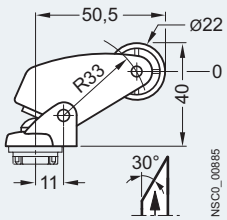
3SE5 1..-.LC02



Angular roller levers

Actuation along plunger axis

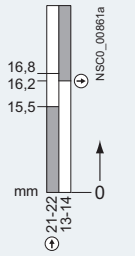
3SE5 112-..F0.



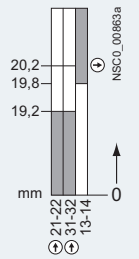
v_{max} = 2.5 m/s

Minimum force required in direction of operation: 9 N

3SE5 1..-.BF01

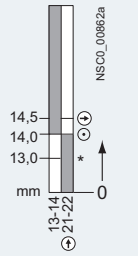


3SE5 1..-.KA00 + head[1]

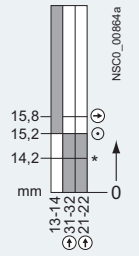


Actuation along plunger axis

3SE5 1..-.CF01



3SE5 1..-.LF01



Operation by bar (standard)

⊙ Operating point acc. to EN 50041 (snap-action)
* Operating point on return (snap-action)
⊕ Positive opening acc. to EN 60947-5-1
→ Direction of operation
v_{max} Max. actuating speed

Slow-action contacts

Contact closed
Contact open

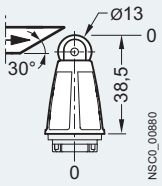
Snap-action contacts

Contact closed
Contact open

Roller plungers, type C

Lateral actuation

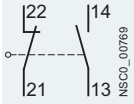
3SE5 1..-..D02



v_{max} = 1 m/s

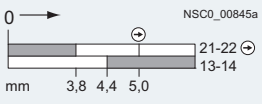
Minimum force required in direction of operation: 18 N

1 NO + 1 NC

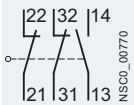


Ident. No. **11**

3SE5 1..-.BD02

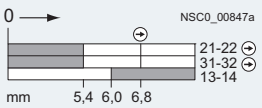


1 NO + 2 NC



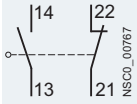
Ident. No. **12**

3SE5 1..-.KD02



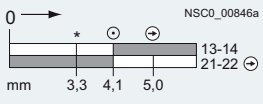
Lateral actuation

1 NO + 1 NC

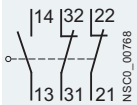


Ident. No. **11**

3SE5 1..-.CD02

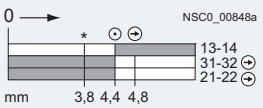


1 NO + 2 NC



Ident. No. **12**

3SE5 1..-.LD02



1) The basic switch and actuator head must be ordered separately.

Operation by bar (standard)

- ⊙ Operating point acc. to EN 50041 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{max} Max. actuating speed

Slow-action contacts

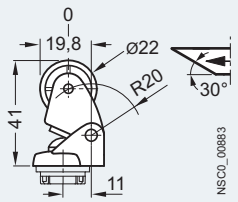
- Contact closed
- Contact open

Snap-action contacts

- Contact closed
- Contact open

Roller levers

3SE5 1..-..E0.

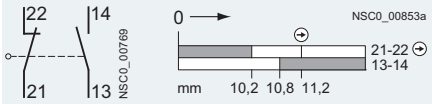


v_{max} = 2.5 m/s

Minimum force required in direction of operation: 9 N

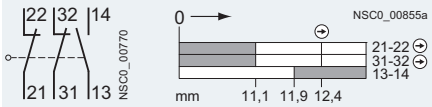
Lateral actuation

1 NO + 1 NC — **3SE5 1..-.BE01**



Ident. No. **11**

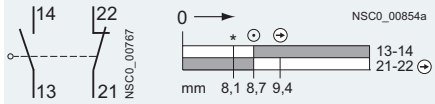
1 NO + 2 NC — **3SE5 1..-.KE01**



Ident. No. **12**

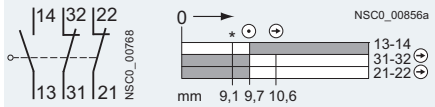
Lateral actuation

1 NO + 1 NC — **3SE5 1..-.CE01**



Ident. No. **11**

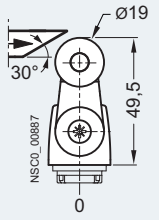
1 NO + 2 NC — **3SE5 1..-.LE01**



Ident. No. **12**

Twist levers[1], type A

3SE5 1..-..H0.

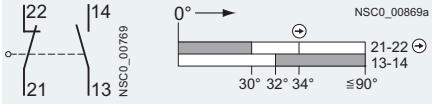


v_{max} = 1.5 m/s

Minimum torque in direction of operation: 0.25 Nm

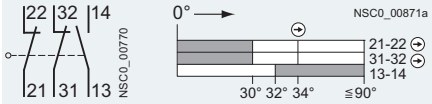
Deflection in direction of rotation

1 NO + 1 NC — **3SE5 1..-.BH01**



Ident. No. **11**

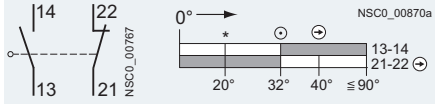
1 NO + 2 NC — **3SE5 1..-.KH01**



Ident. No. **12**

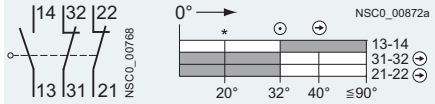
Deflection in direction of rotation

1 NO + 1 NC — **3SE5 1..-.CH01**



Ident. No. **11**

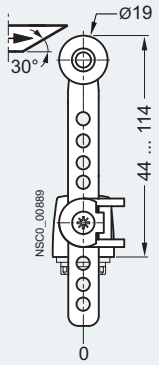
1 NO + 2 NC — **3SE5 1..-.LH01**



Ident. No. **12**

Twist levers[1], adjustable length

3SE5 1..-..H6.

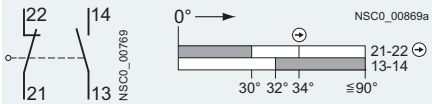


v_{max} = 1.5 m/s

Minimum torque in direction of operation: 0.25 Nm

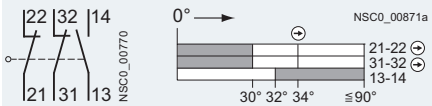
Deflection in direction of rotation

1 NO + 1 NC — **3SE5 1..-.BH60**



Ident. No. **11**

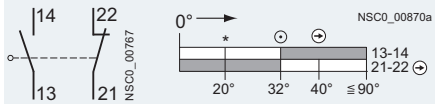
1 NO + 2 NC — **3SE5 1..-.KA00 + head[2]**



Ident. No. **12**

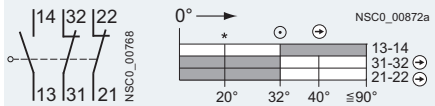
Deflection in direction of rotation

1 NO + 1 NC — **3SE5 1..-.CH60**



Ident. No. **11**

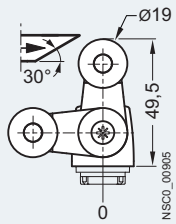
1 NO + 2 NC — **3SE5 1..-.LH60**



Ident. No. **12**

Fork levers[1]

3SE5 1..-..T1.



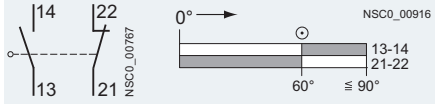
v_{max} = 1.5 m/s

Minimum torque in direction of operation: 0.25 Nm

The fork levers can be used only with snap-action contacts.

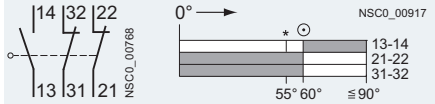
Deflection in direction of rotation

1 NO + 1 NC — **3SE5 1..-.CT11**



Ident. No. **11**

1 NO + 2 NC — **3SE5 1..-.LA00 + head[2]**



Ident. No. **12**

1) Adjustment of the lever in increments of 10°, maximum deflection 90°.

2) The basic switch and actuator head must be ordered separately.

3SE5, plastic and metal enclosures

Operation by bar (standard)

- ⊙ Operating point acc. to EN 50041/47 (snap-action)
- * Operating point on return (snap-action)
- ⊕ Positive opening acc. to EN 60947-5-1
- → Direction of operation
- v_{ma} Max. actuating speed

Slow-action contacts

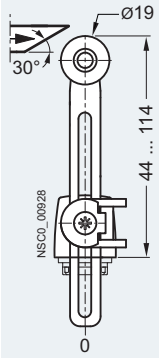
- Contact closed
- Contact open

Snap-action contacts

- Contact closed
- Contact open

Twist levers[1], adjustable length

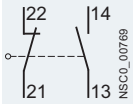
3SE5 1..-..H5.



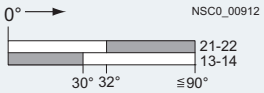
v_{max} = 1.5 m/s
Minimum torque
in direction of operation: 0.25 Nm

Deflection in direction of rotation

1 NO + 1 NC

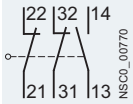


3SE5 1..-.BH50

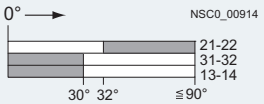


Ident. No. **11**

1 NO + 2 NC



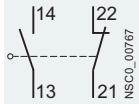
3SE5 1..-.KA00 + head[2]



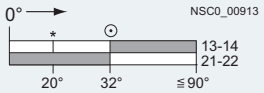
Ident. No. **12**

Deflection in direction of rotation

1 NO + 1 NC

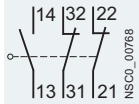


3SE5 1..-.CH50, -.CH51

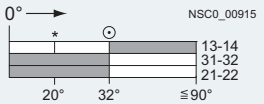


Ident. No. **11**

1 NO + 2 NC



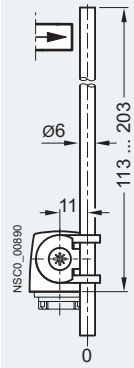
3SE5 1..-.LH50



Ident. No. **12**

Rod actuators[1], type D

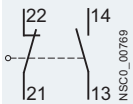
3SE5 1..-..H8.



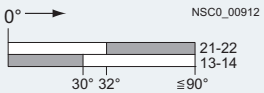
v_{max} = 1.5 m/s
Minimum torque
in direction of operation: 0.25 Nm

Deflection in direction of rotation

1 NO + 1 NC

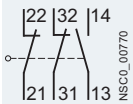


3SE5 1..-.BA00 + head[2]

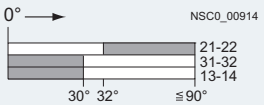


Ident. No. **11**

1 NO + 2 NC



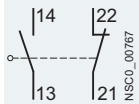
3SE5 1..-.KA00 + head[2]



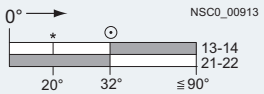
Ident. No. **12**

Deflection in direction of rotation

1 NO + 1 NC

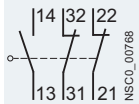


3SE5 1..-.CH80, -.CH82

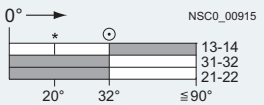


Ident. No. **11**

1 NO + 2 NC



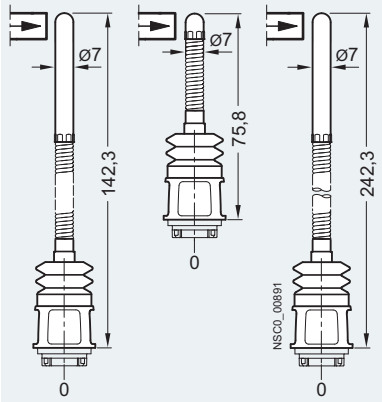
3SE5 1..-.LA00 + head[2]



Ident. No. **12**

Spring rods

3SE5 1..-..R0.

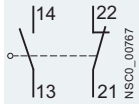


v_{max} = 1 m/s
Minimum force required
in direction of operation: 9 N

The spring rods can be used only with snap-action contacts.

Deflection of spring rod

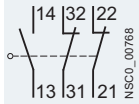
1 NO + 1 NC



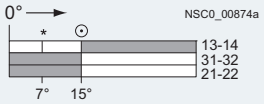
3SE5 1..-.CR01

Ident. No. **11**

1 NO + 2 NC



3SE5 1..-.LA00 + head[2])



Ident. No. **12**

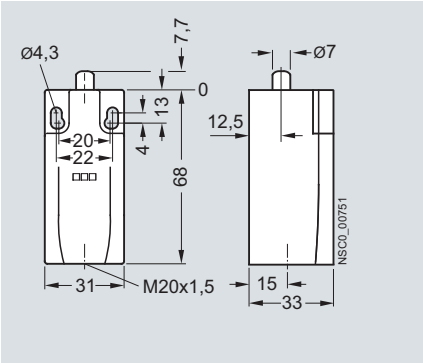
1) Adjustment of the lever in increments of 10°, maximum deflection 90°.

2) The basic switch and actuator head must be ordered separately.

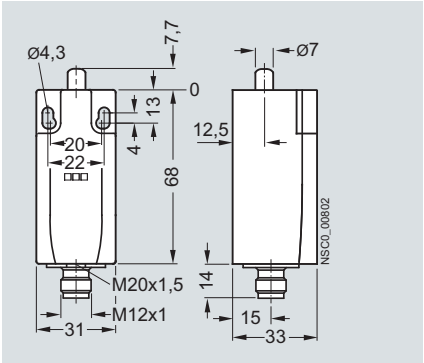
Dimensional drawings

Basic switches

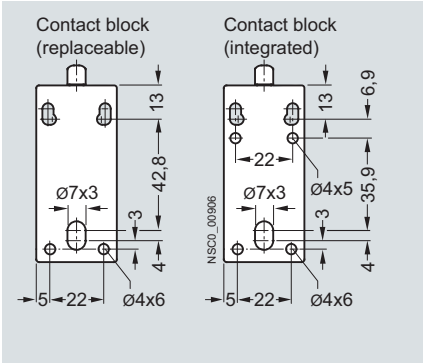
Enclosure width 31 mm, EN 50047, with M20 × 1.5 connecting thread
3SE5 232



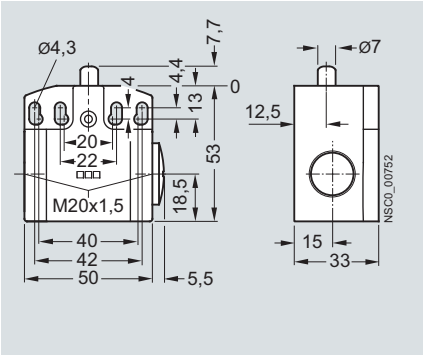
Enclosure width 31 mm, EN 50047, with M12 connector socket
3SE5 234



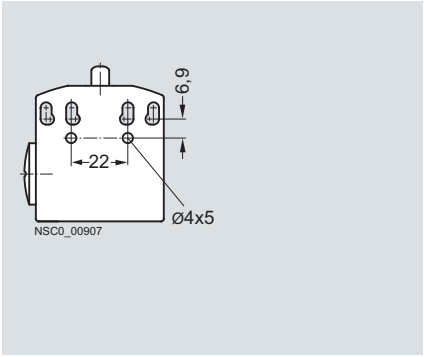
Enclosure width 31 mm, EN 50047, rear with fixing holes
3SE5 232



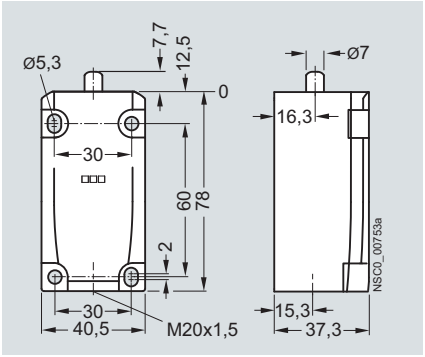
Enclosure width 50 mm, with M20 × 1.5 connecting thread
3SE5 242



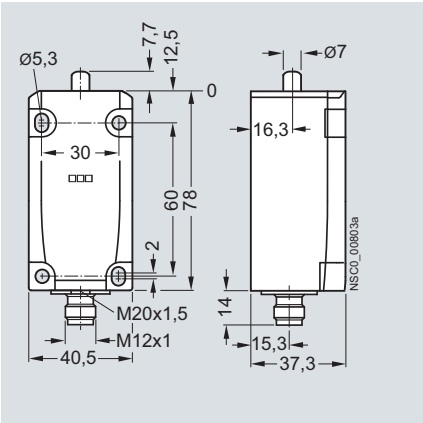
Enclosure width 50 mm, rear with fixing holes
3SE5 242



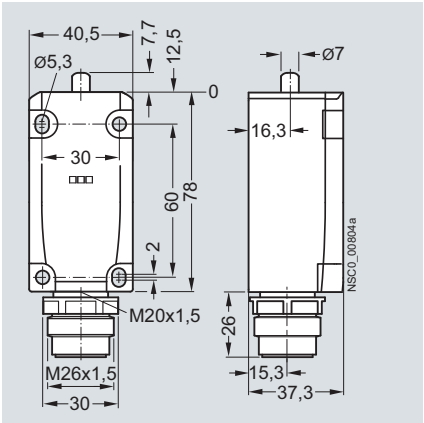
Enclosure width 40 mm, EN 50041, with M20 × 1.5 connecting thread
3SE5 112



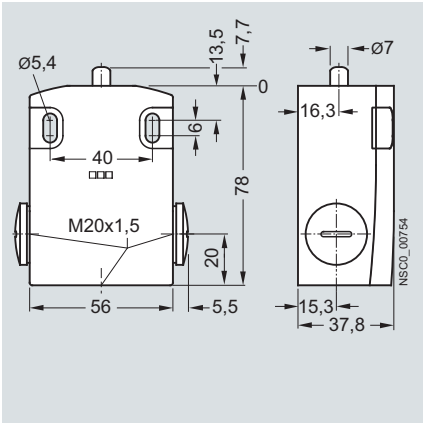
Enclosure width 40 mm, EN 50041, with M12 connector socket
3SE5 114



Enclosure width 40 mm, EN 50041, with 6-pole connector socket
3SE5 115



Enclosure width 56 mm, with M20 × 1.5 connecting thread
3SE5 122

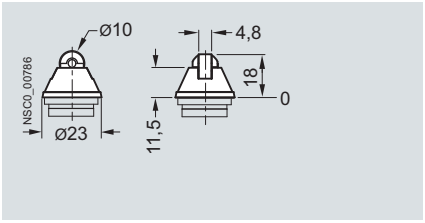


For operating mechanisms for basic switches, see pages 20 and 21.

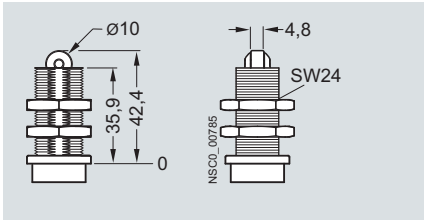
3SE5, plastic and metal enclosures

Operating mechanisms for enclosure width 31 and 50 mm

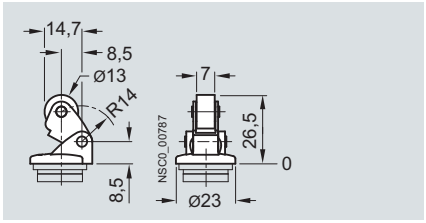
Roller plunger, type C acc. to EN 50047



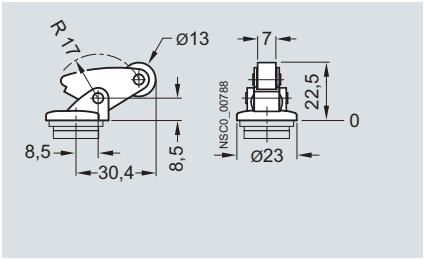
Roller plunger with central fixing



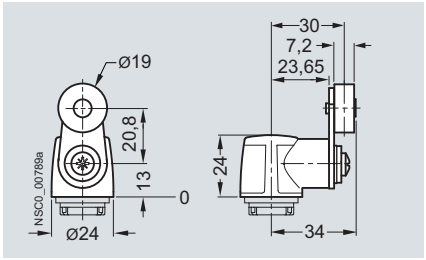
Roller lever, type E acc. to EN 50047



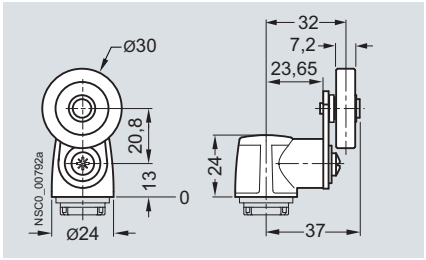
Angular roller lever



Twist lever, type A acc. to EN 50047

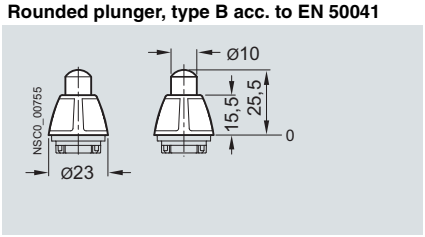


Twist lever, roller 30 mm

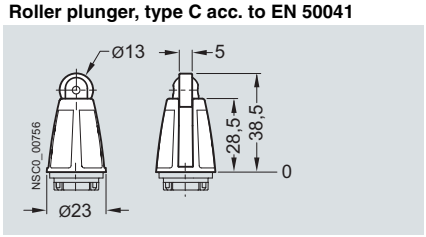


Operating mechanisms for enclosure width 40 mm and 56 mm

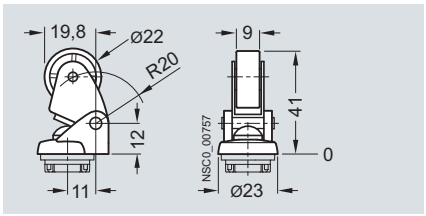
Rounded plunger, type B acc. to EN 50041



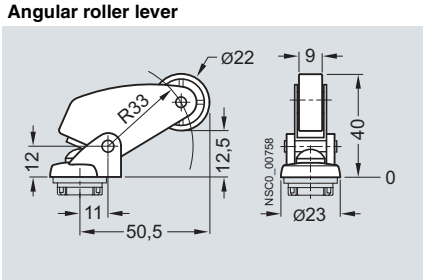
Roller plunger, type C acc. to EN 50041



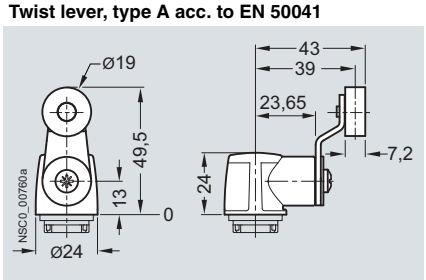
Roller lever



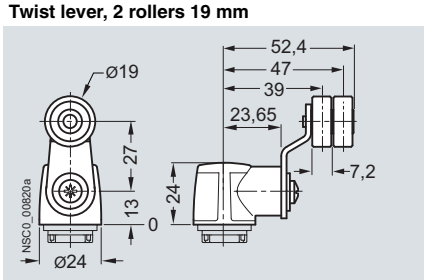
Angular roller lever



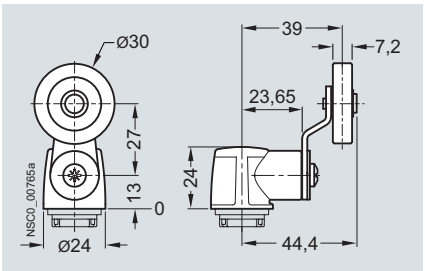
Twist lever, type A acc. to EN 50041



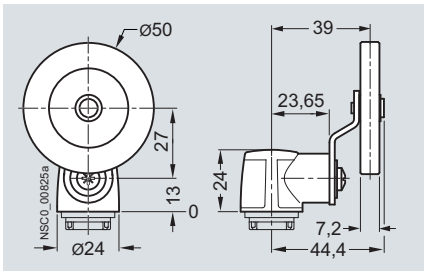
Twist lever, 2 rollers 19 mm



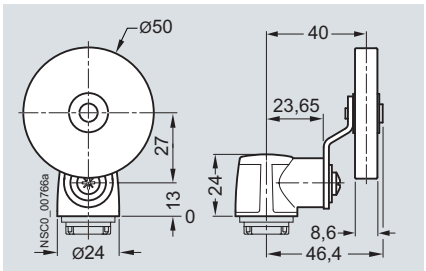
Twist lever, roller 30 mm



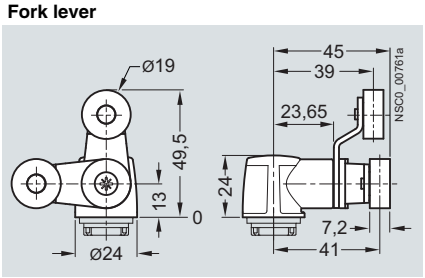
Twist lever, roller 50 mm



Twist lever, rubber roller 50 mm

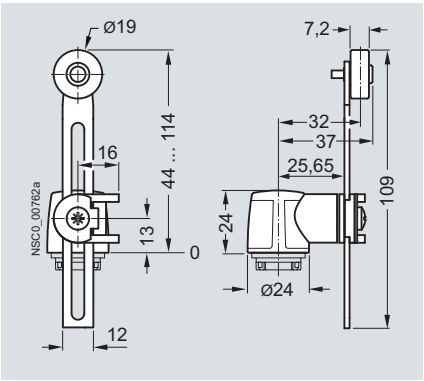


Fork lever

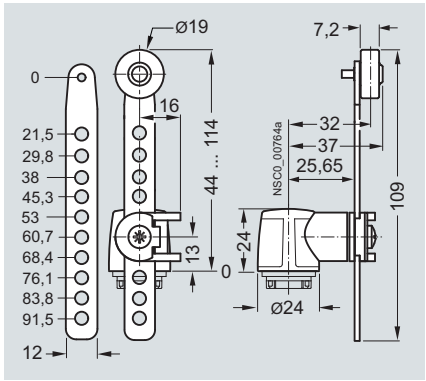


Operating mechanisms for all enclosure widths

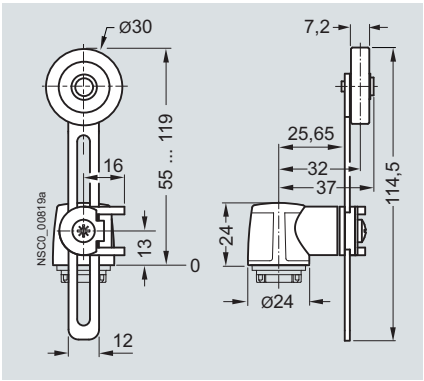
Twist lever, adjustable length, roller 19 mm



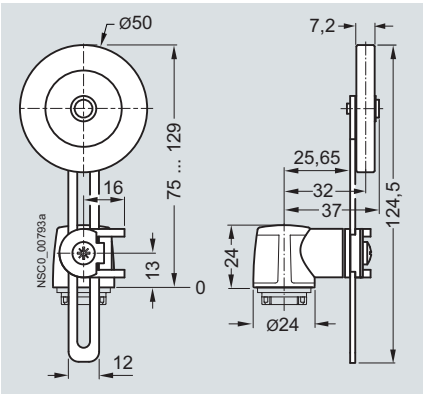
Twist lever, adjustable length, with grid hole, roller 19 mm



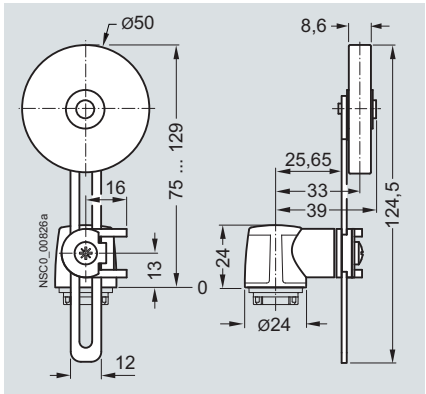
Twist lever, adjustable length, roller 30 mm



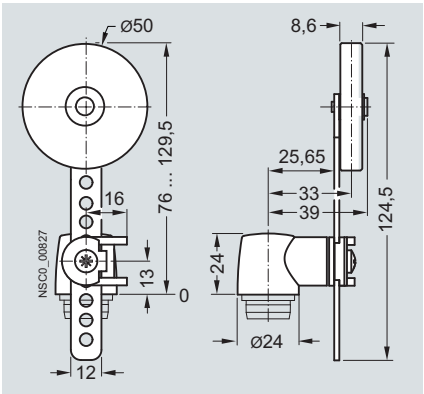
Twist lever, adjustable length, roller 50 mm



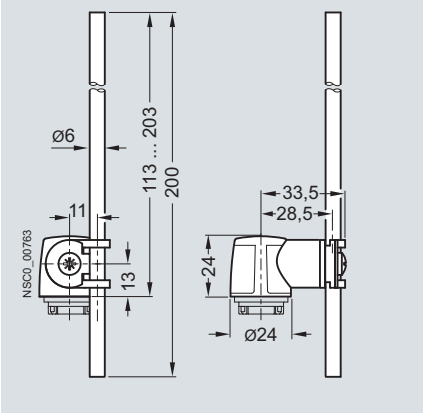
Twist lever, adjustable length, rubber roller 50 mm



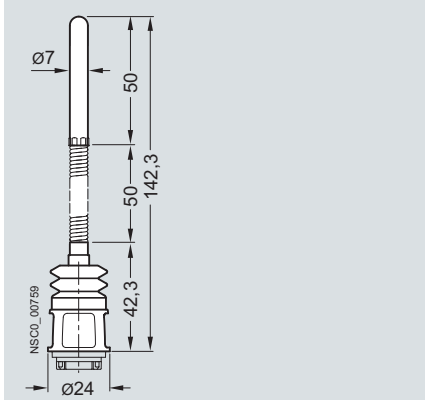
Twist lever, adjustable length, with grid hole, rubber roller 50 mm



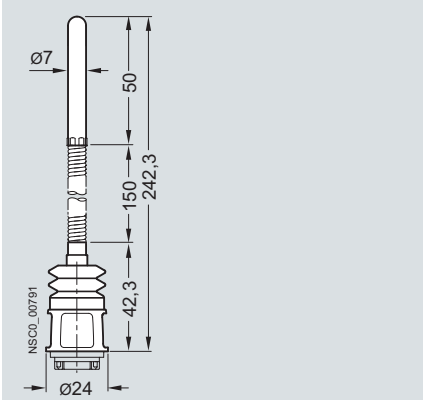
Rod actuator



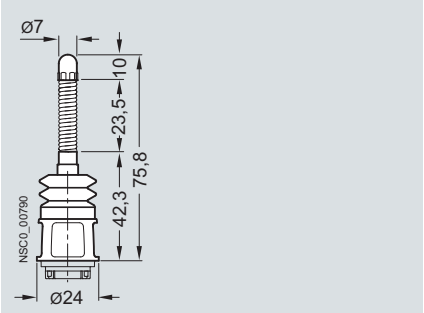
Spring rod, length 142.5 mm



Spring rod, length 242.5 mm



Spring rod, length 76 mm



3SE2, plastic enclosures
Enclosure width 31 mm and 50 mm

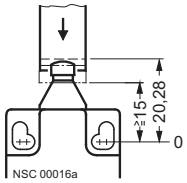
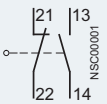
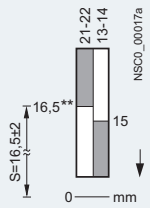
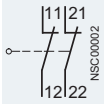
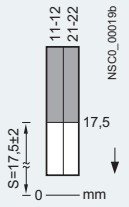
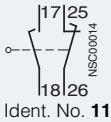
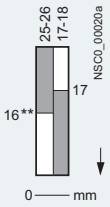
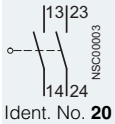
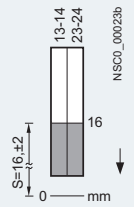
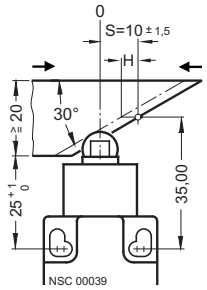
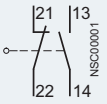
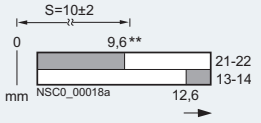
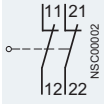
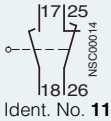
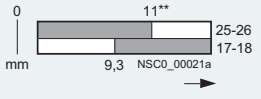
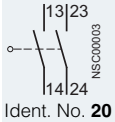
Configuration

Operation, actuating speed and travel or angle of actuators

Bars, cams, stops, etc. are used as actuators.The shape of the actuator must provide the given angles for the leading and trailing edges.

Actuating speed in the direction of the plunger axis

The actuating speed in the case of position switches with slow-action contacts is not permitted to go lower than 15 mm/s for DC and 1 mm/s for AC. Position switches with snap-action contacts should be used when the actuating speeds are lower.

Operation by bar (standard)	**Contact blocks**	**Nominal travel (measured)**	**Contact blocks**	**Nominal travel**
v_{max} Max. actuating speed S Operating travel acc. to EN 50047 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50047 S Operating travel acc. to EN 50047 Contact closed Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1		
Rounded plungers, type B		Actuation along plunger axis		Actuation along plunger axis
3SE2 200–.C, 3SE2 210–.C	*Slow-action contacts*			
	**1 NO + 1 NC**	**3SE2 2.0-0C**	**2 NC**	**3SE2 2.0-6C**
				
v_{max} = 1 m/s Minimum force required in direction of operation: 9 N	Ident. No. **11**		Ident. No. **02**	
	1 NO + 1 NC with make-before-break	**3SE2 2.0-3C**	**2 NO**	**3SE2 2.0-7C**
				
	Ident. No. **11**		Ident. No. **20**	
Roller plungers, type C		Lateral actuation		
3SE2 200–.D, 3SE2 210–.D	*Slow-action contacts*			
	**1 NO + 1 NC**	**3SE2 2.0-0D**	**2 NC**	**3SE2 2.0-6D**
				
v_{max} = 1 m/s Minimum force required in direction of operation: 9 N	Ident. No. **11**		Ident. No. **02**	
	1 NO + 1 NC with make-before-break	**3SE2 2.0-3D**	**2 NO**	**3SE2 2.0-7D**
				
	Ident. No. **11**		Ident. No. **20**	

3SE2, plastic enclosures
Enclosure width 31 mm and 50 mm

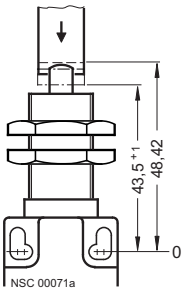
Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Contact blocks	Nominal travel
v_{max} Max. actuating speed S Operating travel acc. to EN 50047 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50047 S Operating travel acc. to EN 50047 Contact closed Contact open ** Positive opening ⊕ acc. to IEC 60947-5-1		

Rounded plungers with central fixing

Actuation along plunger axis

Actuation along plunger axis

3SE2 200–.L, 3SE2 210–.L



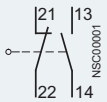
Central fixing with M18 thread

v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

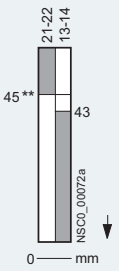
Slow-action contacts

1 NO + 1 NC

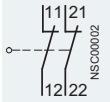


Ident. No. **11**

3SE2 2.0-0L

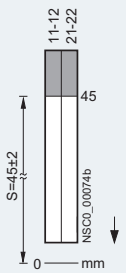


2 NC

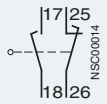


Ident. No. **02**

3SE2 2.0-6L

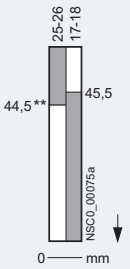


1 NO + 1 NC with make-before-break

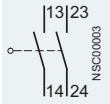


Ident. No. **11**

3SE2 2.0-3L

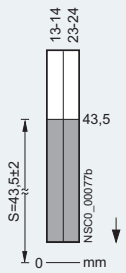


2 NO



Ident. No. **20**

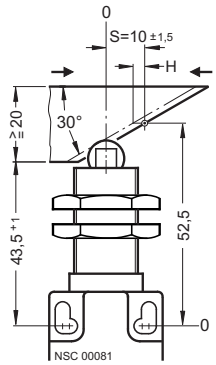
3SE2 2.0-7L



Roller plungers with central fixing

Lateral actuation

3SE2 200–.M, 3SE2 210–.M



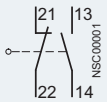
Central fixing with M18 thread

v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

Slow-action contacts

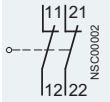
1 NO + 1 NC



Ident. No. **11**

3SE2 2.0-0M

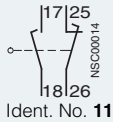
2 NC



Ident. No. **02**

3SE2 2.0-6M

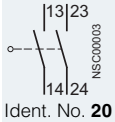
1 NO + 1 NC with make-before-break



Ident. No. **11**

3SE2 2.0-3M

2 NO



Ident. No. **20**

3SE2 2.0-7M

3SE2, plastic enclosures
Enclosure width 31 mm and 50 mm

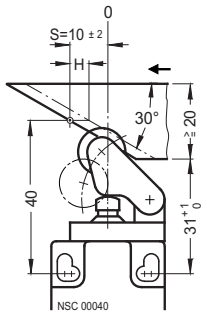
Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Contact blocks	Nominal travel
v_{max} Max. actuating speed S Operating travel acc. to EN 50047 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50047 S Operating travel acc. to EN 50047 Contact closed Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1		

Roller levers, type E

Lateral actuation

Lateral actuation

3SE2 200–.E, 3SE2 210–.E

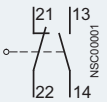


v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

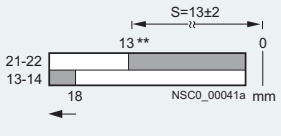
Slow-action contacts

1 NO + 1 NC

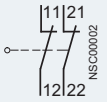


Ident. No. **11**

3SE2 2.0-0E

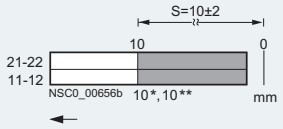


2 NC

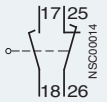


Ident. No. **02**

3SE2 2.0-6E

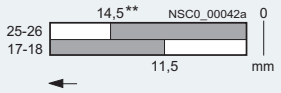


1 NO + 1 NC with make-before-break



Ident. No. **11**

3SE2 2.0-3E



2 NO

Ident. No. **20**

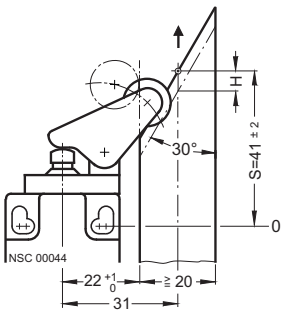
3SE2 2.0-7E

Angular roller levers

Actuation along plunger axis

Actuation along plunger axis

3SE2 200–.F, 3SE2 210–.F



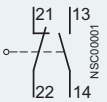
v_{max} = 1 m/s

Minimum force required in direction of operation: 9 N

The example for approach is only applicable to 3SE2 200. It is not possible in this way for 3SE2 210.

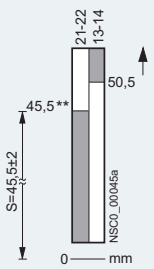
Slow-action contacts

1 NO + 1 NC

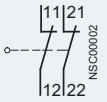


Ident. No. **11**

3SE2 2.0-0F

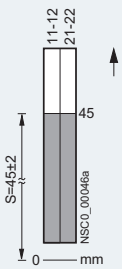


2 NC

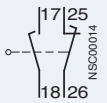


Ident. No. **02**

3SE2 2.0-6F

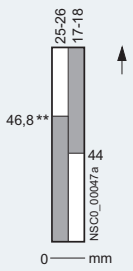


1 NO + 1 NC with make-before-break

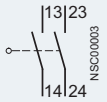


Ident. No. **11**

3SE2 2.0-3F

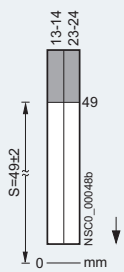


2 NO



Ident. No. **20**

3SE2 2.0-7F



3SE2, plastic enclosures
Enclosure width 31 mm and 50 mm

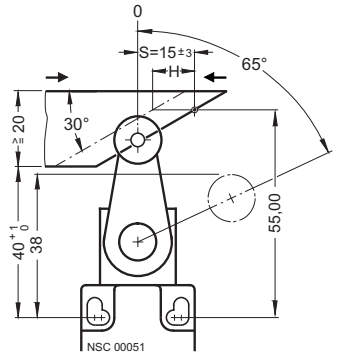
Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Contact blocks	Nominal travel
v_{max} Max. actuating speed S Operating travel acc. to EN 50047 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50047 S Operating travel acc. to EN 50047 Contact closed Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1		

Twist levers, type A

Lateral actuation

Lateral actuation

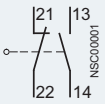
3SE2 200–.G[1]



Lever adjustable in increments of 10°
v_{max} = 1 m/s
Minimum force required in direction of operation: 18 N

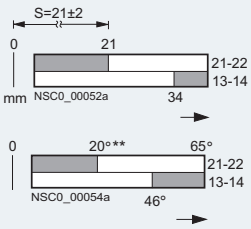
Slow-action contacts

1 NO + 1 NC

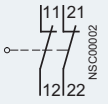


Ident. No. **11**

3SE2 2.0-0G

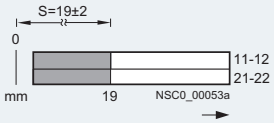


2 NC

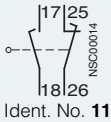


Ident. No. **02**

3SE2 2.0-6G

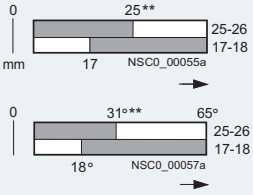


1 NO + 1 NC with make-before-break

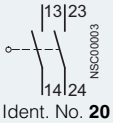


Ident. No. **11**

3SE2 2.0-3G

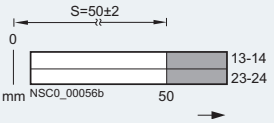


2 NO



Ident. No. **20**

3SE2 2.0-7G

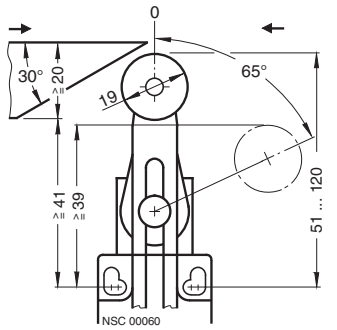


Twist levers, adjustable length

Deflection in direction of rotation

Deflection in direction of rotation

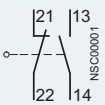
3SE2 200–.U, 3SE2 210–.U



Lever adjustable in increments of 10°
v_{max} = 1 m/s
Minimum force required in direction of operation: 18 N

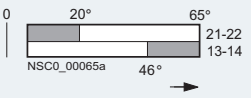
Slow-action contacts

1 NO + 1 NC

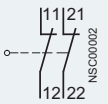


Ident. No. **11**

3SE2 2.0-0U

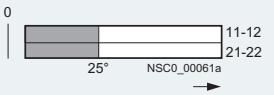


2 NC

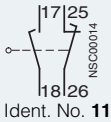


Ident. No. **02**

3SE2 2.0-6U

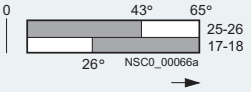


1 NO + 1 NC with make-before-break



Ident. No. **11**

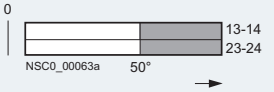
3SE2 2.0-3U



2 NO

Ident. No. **20**

3SE2 2.0-7U

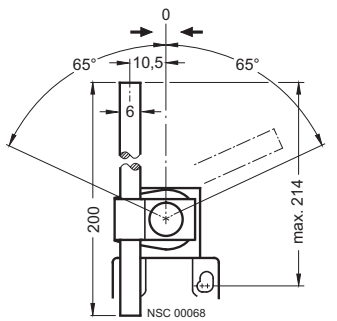


Rod actuators

Deflection in direction of rotation

Deflection in direction of rotation

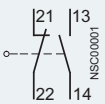
3SE2 200–.W, 3SE2 210–.W
3SE2 200–.V, 3SE2 210–.V
3SE2 200–.S, 3SE2 210–.S



Lever adjustable in increments of 10°
v_{max} = 1.5 m/s
Minimum force required in direction of operation: 18 N

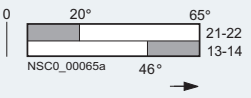
Slow-action contacts

1 NO + 1 NC

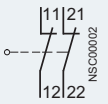


Ident. No. **11**

3SE2 2.0-0W, -0V, -0S

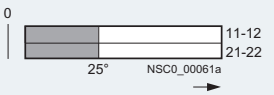


2 NC

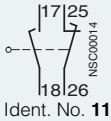


Ident. No. **02**

3SE2 2.0-6W, -0V, -0S

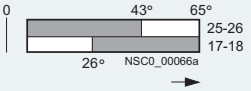


1 NO + 1 NC with make-before-break



Ident. No. **11**

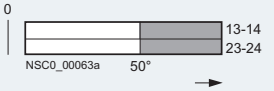
3SE2 2.0-3W, -0V, -0S



2 NO

Ident. No. **20**

3SE2 2.0-7W, -0V, -0S

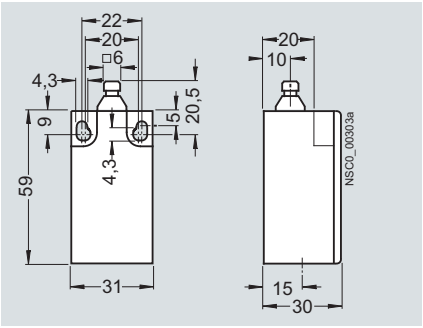


1) Not for 3SE2 200–.GA. hinge switches.

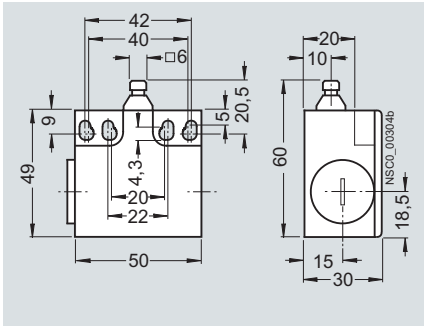
3SE2, plastic enclosures
Enclosure width 31 mm and 50 mm

Dimensional drawings

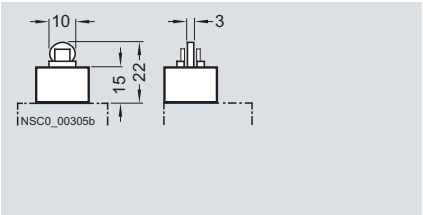
3SE2 200, narrow enclosure, with rounded plunger, type B



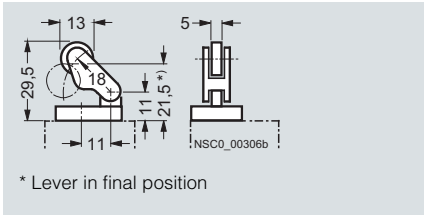
3SE2 210, wide enclosure, with rounded plunger, type B



Roller plunger, type C

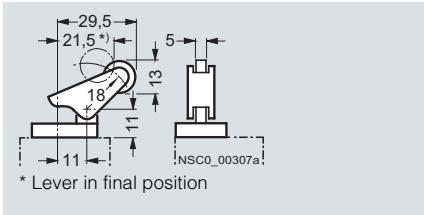


Roller lever, type E



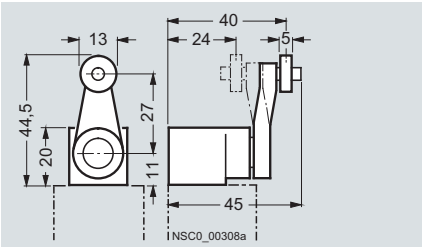
* Lever in final position

Angular roller lever

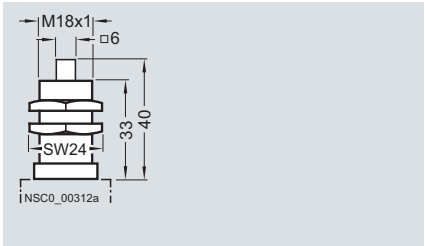


* Lever in final position

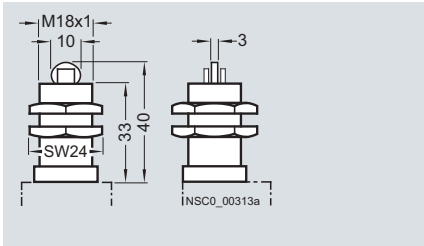
Twist lever, type A



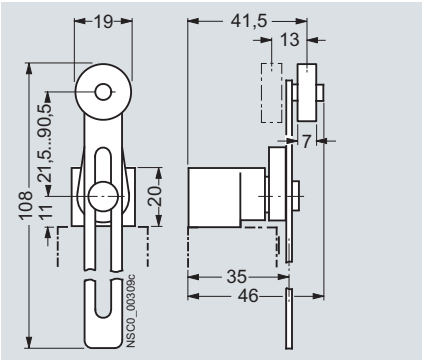
Rounded plunger, central fixing with M18 × 1 thread



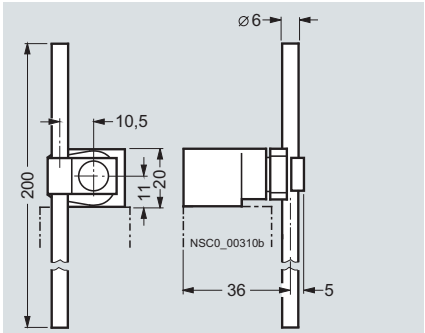
Roller plunger, central fixing with M18 × 1 thread



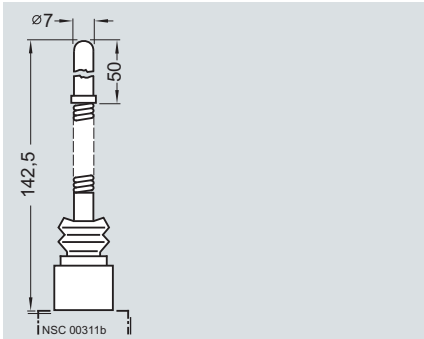
Twist lever, adjustable length



Rod actuator



Spring rod

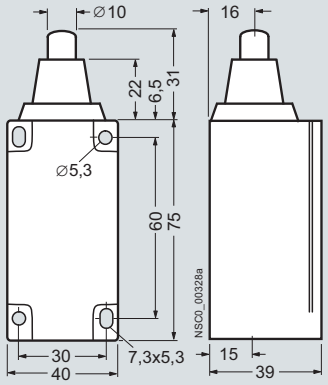


Configuration

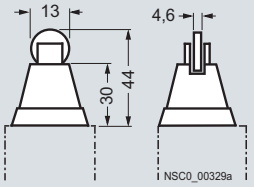
See metal enclosures, pages 28 to 31.

Dimensional drawings

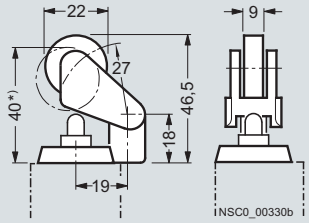
3SE2 230, enclosure acc. to EN 50041, with rounded plunger, type B



Roller plunger, type C

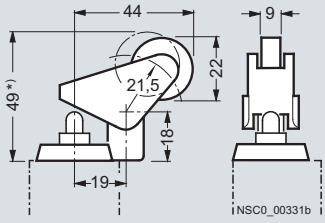


Roller lever



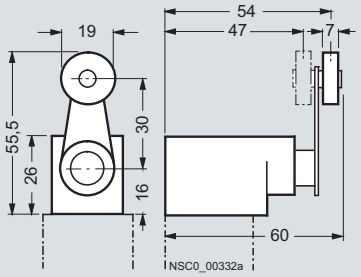
* Lever in final position

Angular roller lever

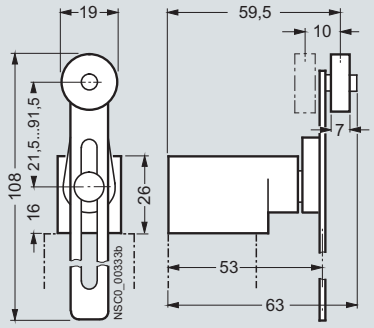


* Lever in final position

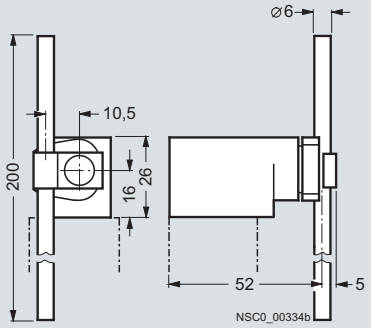
Twist lever, type A



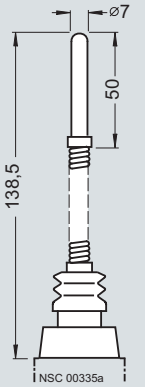
Twist lever, adjustable length



Rod actuator, type D



Spring rod



3SE2, metal enclosures
Enclosure width 40 mm and 56 mm

Configuration

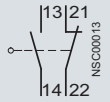
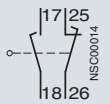
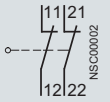
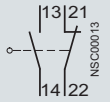
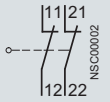
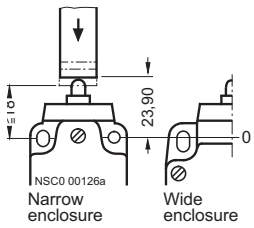
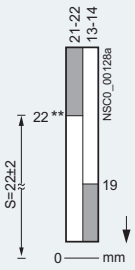
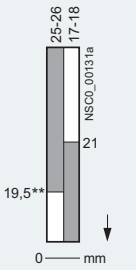
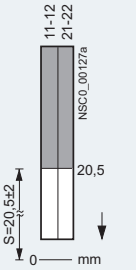
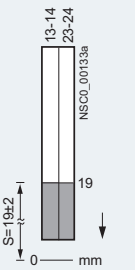
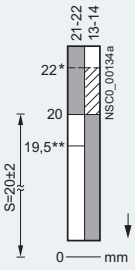
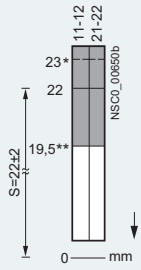
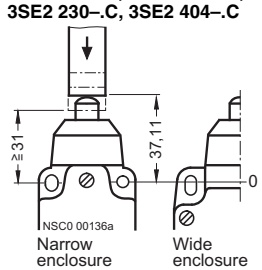
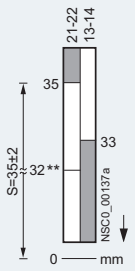
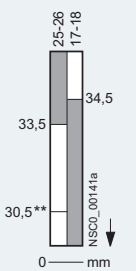
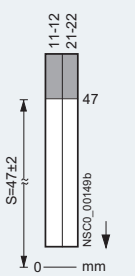
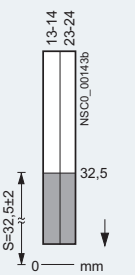
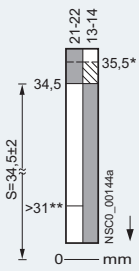
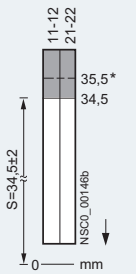
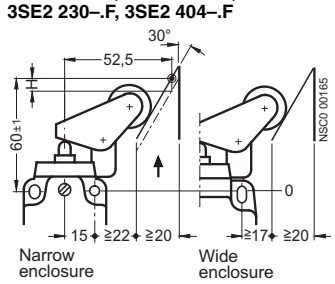
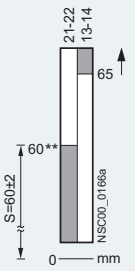
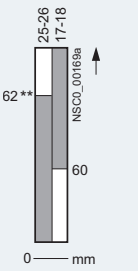
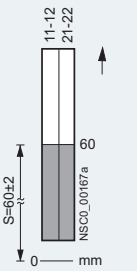
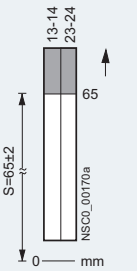
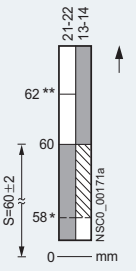
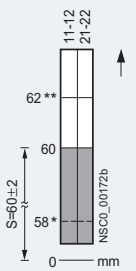
Operation, actuating speed and travel or angle of actuators

Bars, cams, stops, etc. are used as actuators.The shape of the actuator must provide the given angles for the leading and trailing edges.

Actuating speed in the direction of the plunger axis

The actuating speed in the case of position switches with slow-action contacts is not permitted to go lower than 15 mm/s for DC and 1 mm/s for AC. Position switches with snap-action contacts should be used when the actuating speeds are lower.

Position switches with 2 or 4 contacts

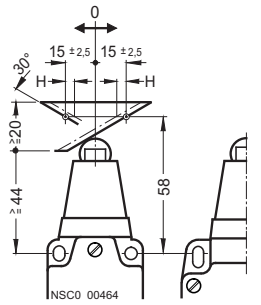
Operation by bar (standard)	**Slow-action contacts**				**Snap-action contacts**	
0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 H Travel difference * Operating point on return (snap-action) ** Positive opening acc. to EN 60947-5-1 → Direction of operation v_{max} Max. actuating speed Contact closed Contact open Return travel of the NO contact (snap action)	**1 NO + 1 NC**	**1 NO + 2 NC**	**2 NC**	**2 NO**	**1 NO + 1 NC**	**2 NC**
						
Ident. No. **11**	Ident. No. **12**	Ident. No. **02**	Ident. No. **20**	Ident. No. **11**	Ident. No. **02**
3SE3 000–0A 3SE3 010–0A	3SE3 000–3A 3SE3 010–3A	3SE3 000–6A	3SE3 000–7A	3SE3 000–1A 3SE3 010–1A	3SE3 000–8AV00 3SE3 010–8AV00
Plungers	Actuation along plunger axis				Actuation along plunger axis	
3SE2 100–.B, 3SE2 120–.B, 3SE2 404–.B	**3SE2 1.0-3B**		**3SE2 1.0-7B**			
 Narrow enclosure Wide enclosure						
v_{max} = 1.5 m/s Minimum force required in direction of operation: 12 N	With make-before-break					
Rounded plungers, type B	Actuation along plunger axis				Actuation along plunger axis	
3SE2 100–.C, 3SE2 120–.C, 3SE2 230–.C, 3SE2 404–.C	**3SE2 230-0C**	**3SE2 1.0-3C, 3SE2 230-3C**	**3SE2 230-6C**	**3SE2 1.0-7C, 3SE2 230-7C**	**3SE2 230-1C**	**3SE2 230-8C**
 Narrow enclosure Wide enclosure						
v_{max} = 1.5 m/s Minimum force required in direction of operation: 32 N	With make-before-break					
Angular roller levers	Actuation along plunger axis				Actuation along plunger axis	
3SE2 100–.F, 3SE2 120–.F, 3SE2 230–.F, 3SE2 404–.F	**3SE2 230-0F**	**3SE2 1.0-3F, 3SE2 230-3F**	**3SE2 230-6F**	**3SE2 1.0-7F, 3SE2 230-7F**	**3SE2 230-1F**	**3SE2 230-8F**
 Narrow enclosure Wide enclosure						
v_{max} = 2.5 m/s Minimum force required in direction of operation: 12N	With make-before-break					

Position switches with 2 or 4 contacts

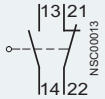
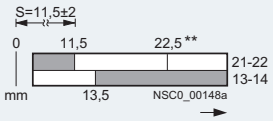
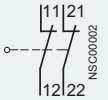
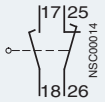
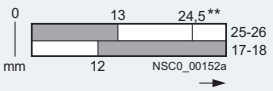
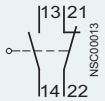
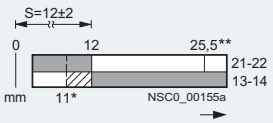
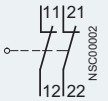
Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Contact blocks	Nominal travel
⊙ Operating point acc. to EN 50041 v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 Contact closed Contact open Return travel * Operating point on return ** Positive opening ⊖ acc. to IEC 60947-5-1		

Roller plungers, type C

3SE2 100–.D, 3SE2 120–.D, 3SE2 230–.D, 3SE2 404–.D

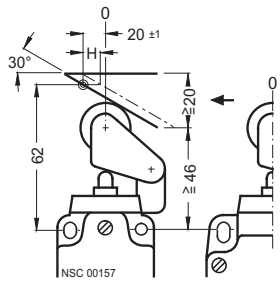


v_{max} = 1 m/s (3SE2 230–1D),
v_{max} = 0.5 m/s (3SE2 1.0–1D),
Minimum force required in direction of operation: 32 N

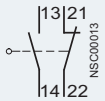
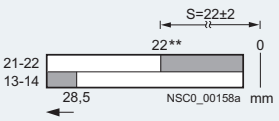
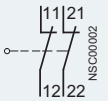
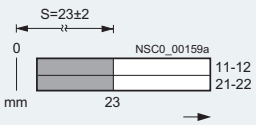
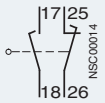
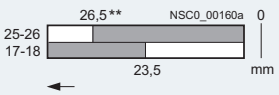
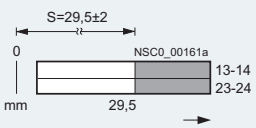
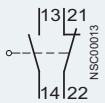
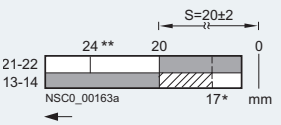
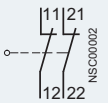
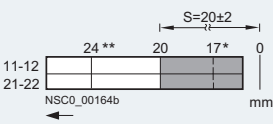
	Lateral actuation		Lateral actuation
Slow-action contacts			
1 NO + 1 NC	**3SE2 230-0D**	**2 NC**	**3SE2 230-6D**
 3SE3 000–0A, 3SE3 010–0A, Ident. No. **11**		 3SE3 000–6A, Ident. No. **02**	
1 NO + 1 NC with make-before-break	**3SE2 1.0-3D, 3SE2 230-3D**	**2 NO**	**3SE2 1.0-7D, 3SE2 230-7D**
 3SE3 000–3A, 3SE3 010–3A, Ident. No. **11**		 3SE3 000–7A, Ident. No. **20**	
Snap-action contacts			
1 NO + 1 NC	**3SE2 230-1D**	**2 NC**	**3SE2 230-8DV00**
 3SE3 000–1A, 3SE3 010–1A, Ident. No. **11**		 3SE3 000–8AV00, 3SE3 010–8AV00, Ident. No. **02**	

Roller levers

3SE2 100–.E, 3SE2 120–.E, 3SE2 230–.E, 3SE2 404–.E



v_{max} = 2.5 m/s
Minimum force required in direction of operation: 12 N

	Lateral actuation		Lateral actuation
Slow-action contacts			
1 NO + 1 NC	**3SE2 230-0E**	**2 NC**	**3SE2 230-6E**
 3SE3 000–0A, 3SE3 010–0A, Ident. No. **11**		 3SE3 000–6A, Ident. No. **02**	
1 NO + 1 NC with make-before-break	**3SE2 1.0-3E, 3SE2 230-3E**	**2 NO**	**3SE2 1.0-7E, 3SE2 230-7E**
 3SE3 000–3A, 3SE3 010–3A, Ident. No. **11**		 3SE3 000–7A, Ident. No. **20**	
Snap-action contacts			
1 NO + 1 NC	**3SE2 230-1E**	**2 NC**	**3SE2 230-8EV00**
 3SE3 000–1A, 3SE3 010–1A, Ident. No. **11**		 3SE3 000–8AV00, 3SE3 010–8AV00, Ident. No. **02**	

3SE2, metal enclosures
Enclosure width 40 mm and 56 mm

Position switches with 2 or 4 contacts

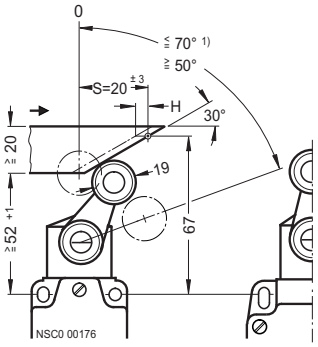
Operation by bar (standard)		Contact blocks	Nominal travel (measured)		Contact blocks	Nominal travel
⊙	Operating point acc. to EN 50041	Terminal designation acc. to EN 50013	0-line	Reference line acc. to EN 50041		
α	Approach angle		S	Operating travel acc. to EN 50041		
β	Trailing angle			Contact closed		
v_{max}	Max. actuating speed			Contact open		
0-line	Reference line acc. to EN 50041			Return travel		
S	Operating travel acc. to EN 50041		*	Operating point on return		
H	Travel difference		**	Positive opening ⊕ acc. to IEC 60947-5-1		
→	Direction of operation					

Twist levers, type A

Lateral actuation/in direction of rotation

Lateral actuation

3SE2 100–.GW, 3SE2 120–.GW, 3SE2 230–.GW, 3SE2 404–.GW



Narrow enclosure — Wide enclosure

Lever adjustable in increments of 10°

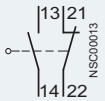
v_{max} = 3 m/s

Minimum torque in direction of operation: 25 Ncm

Contact operation either from right or left or from right and left.

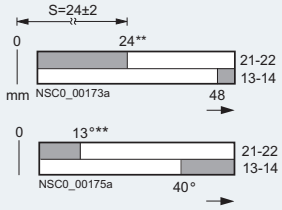
Slow-action contacts

1 NO + 1 NC

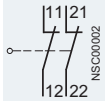


3SE3 000–0A, 3SE3 010–0A, Ident. No. **11**

3SE2 230-0GW

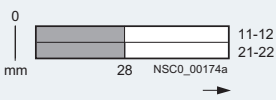


2 NC

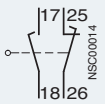


3SE3 000–6A, Ident. No. **02**

3SE2 230-6GW

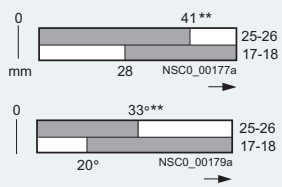


1 NO + 1 NC with make-before-break



3SE3 000–3A, 3SE3 010–3A, Ident. No. **11**

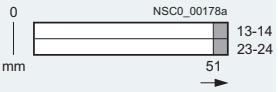
3SE2 1.0-3GW, 3SE2 230-3GW



2 NO

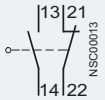
3SE3 000–7A, Ident. No. **20**

3SE2 1.0-7GW, 3SE2 230-7GW



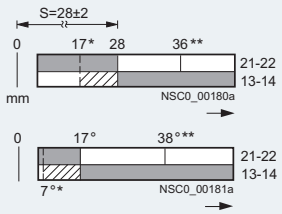
Snap-action contacts

1 NO + 1 NC

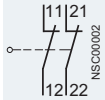


3SE3 000–1A, 3SE3 010–1A, Ident. No. **11**

3SE2 230-1GW

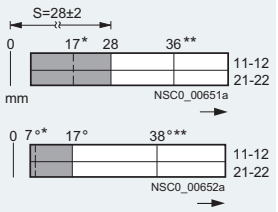


2 NC



3SE3 000–8AV00, 3SE3 010–8AV00, Ident. No. **02**

3SE2 230-8GW00

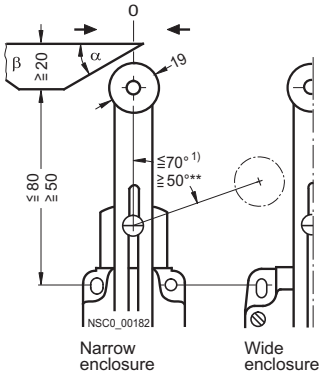


Twist levers, adjustable length

Deflection in direction of rotation

Deflection in direction of rotation

3SE2 100–.UW, 3SE2 120–.UW, 3SE2 230–.U, 3SE2 404–.UW



Narrow enclosure — Wide enclosure

Lever adjustable in increments of 10°

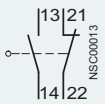
v_{max} = 1 m/s,
α_{max} = 30°, β_{max} = 30°

Minimum torque in direction of operation: 25 Ncm

Contact operation either from right or left or from right and left.

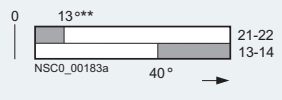
Slow-action contacts

1 NO + 1 NC

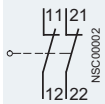


3SE3 000–0A, 3SE3 010–0A, Ident. No. **11**

3SE2 230-0U

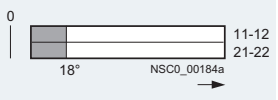


2 NC

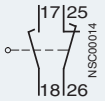


3SE3 000–6A, Ident. No. **02**

3SE2 230-6U

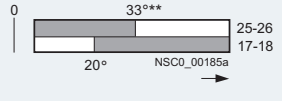


1 NO + 1 NC with make-before-break



3SE3 000–3A, 3SE3 010–3A, Ident. No. **11**

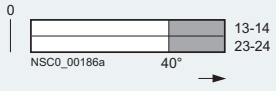
3SE2 1.0-3UW



2 NO

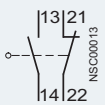
3SE3 000–7A, Ident. No. **20**

3SE2 1.0-7UW, 3SE2 230-7U



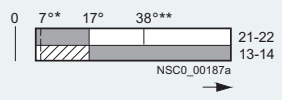
Snap-action contacts

1 NO + 1 NC

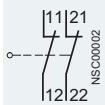


3SE3 000–1A, 3SE3 010–1A, Ident. No. **11**

3SE2 230-1U

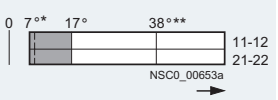


2 NC



3SE3 000–8AV00, 3SE3 010–8AV00, Ident. No. **02**

3SE2 230-8UW00



1) Max. operating angle 70°.

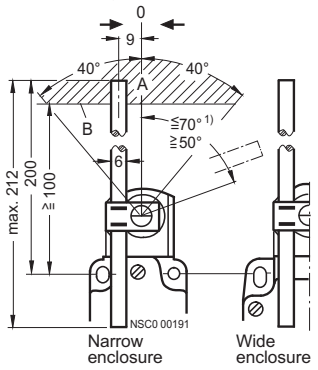
Position switches with 2 or 4 contacts

Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Contact blocks	Nominal travel
⊙ Operating point acc. to EN 50041 v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 Contact closed Contact open Return travel * Operating point on return ** Positive opening ⊕ acc. to IEC 60947-5-1		

Rod actuators

3SE2 100–.WW, 3SE2 120–.WW, 3SE2 230–.W, 3SE2 404–.WW

3SE2 100–.VW, 3SE2 120–.VW, 3SE2 230–.V, 3SE2 404–.VW



A = Operating range
B = Lower edge of actuator

Lever adjustable in increments of 10°

v_{max} = 3 m/s

Minimum torque in direction of operation: 25 Ncm

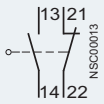
Contact operation is possible from either right or left. By twisting the plunger from the right and left.

Deflection in direction of rotation

Deflection in direction of rotation

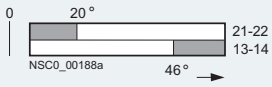
Slow-action contacts

1 NO + 1 NC

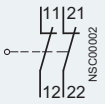


3SE3 000–0A,
3SE3 010–0A,
Ident. No. **11**

3SE2 230-0V, -0W

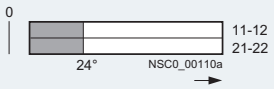


2 NC

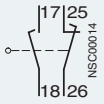


3SE3 000–6A,
Ident. No. **02**

3SE2 230-6V, -6W

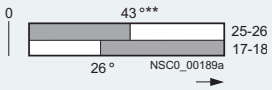


1 NO + 1 NC with make-before-break

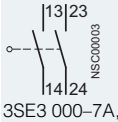


3SE3 000–3A,
3SE3 010–3A,
Ident. No. **11**

3SE2 1.0-3WW

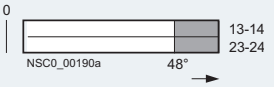


2 NO



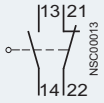
3SE3 000–7A,
Ident. No. **20**

3SE2 1.0-7WW, 3SE2 230-7V, -7W



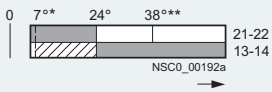
Snap-action contact

1 NO + 1 NC

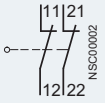


3SE3 000–1A,
3SE3 010–1A,
Ident. No. **11**

3SE2 230-1V, -1W

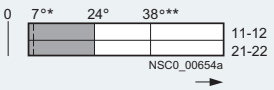


2 NC



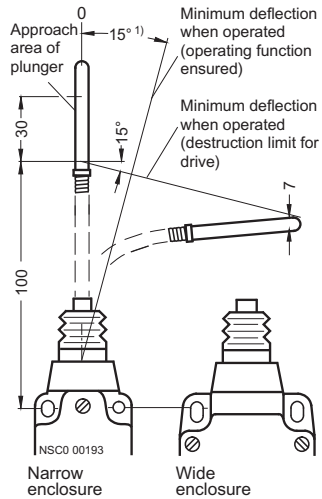
3SE3 000–8AV00,
3SE3 010–8AV00,
Ident. No. **02**

3SE2 230-8VW00, -8WW00



Spring rods

3SE2 230–.R



v_{max} = 1 m/s, approachable from all sides

Minimum force required in direction of operation: 12 N

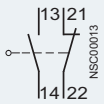
With lateral deflection at the tip: 2.5 N

Deflection of spring rod

Deflection of spring rod

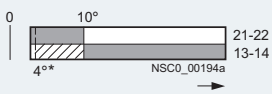
Snap-action contacts

1 NO + 1 NC

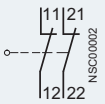


3SE3 000–1A,
3SE3 010–1A,
Ident. No. **11**

3SE2 230–1R

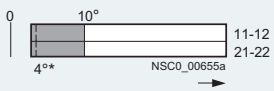


2 NC



3SE3 000–8AV00,
3SE3 010–8AV00,
Ident. No. **02**

3SE2 230–8RV00



1) Max. operating angle 70°.

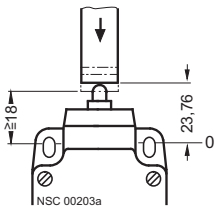
3SE2, metal enclosures
Enclosure width 40 mm and 56 mm

Position switches with 3 contacts

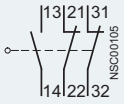
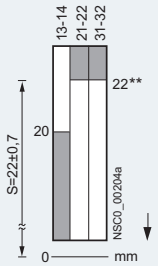
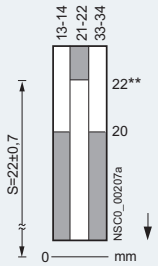
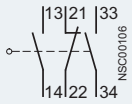
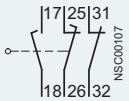
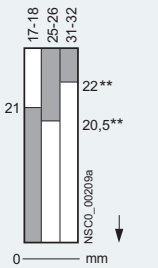
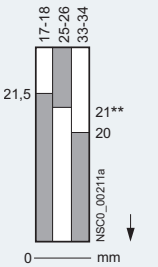
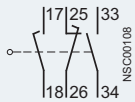
Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Minimum force required in direction of operation
v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 Contact closed Contact open * Operating point on return ** Positive opening ⊖ acc. to IEC 60947-5-1	

Plungers — *Slow-action contacts* — Actuation along plunger axis

3SE2 303–.B

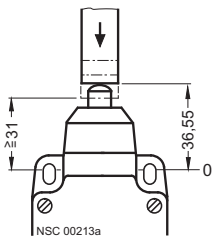


v_{max} = 1.5 m/s

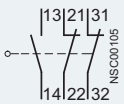
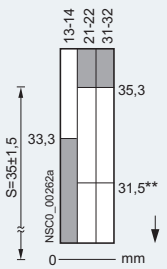
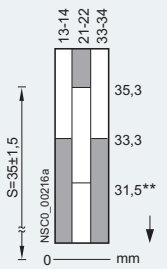
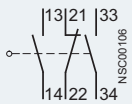
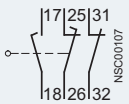
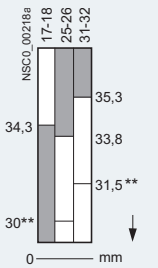
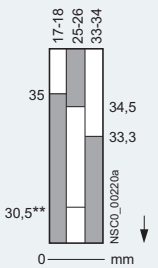
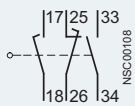
Contact blocks	3SE2 303–0B	3SE2 303–1B	Minimum force
1 NO + 2 NC  Ident. No. **12**			16 N
2 NO + 1 NC  Ident. No. **21**			18 N
1 NO + 2 NC with make-before-break  Ident. No. **12**	**3SE2 303–2B** 	**3SE2 303–3B** 	16 N
2 NO + 1 NC with make-before-break  Ident. No. **21**			18 N

Rounded plungers — *Slow-action contacts* — Actuation along plunger axis

3SE2 303–.C



v_{max} = 1.5 m/s

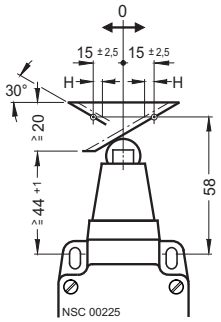
Contact blocks	3SE2 303-0C	3SE2 303–1C	Minimum force
1 NO + 2 NC  Ident. No. **12**			35 N
2 NO + 1 NC  Ident. No. **21**			37 N
1 NO + 2 NC with make-before-break  Ident. No. **12**	**3SE2 303–2C** 	**3SE2 303–3C** 	35 N
2 NO + 1 NC with make-before-break  Ident. No. **21**			37 N

Position switches with 3 contacts

Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Minimum force required in direction of operation
v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 Contact closed Contact open * Operating point on return ** Positive opening ⊖ acc. to IEC 60947-5-1	

Roller plungers

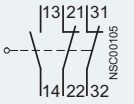
3SE2 303–.D



v_{max} = 1 m/s

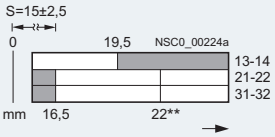
Slow-action contacts — Lateral actuation

1 NO + 2 NC



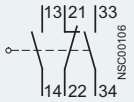
Ident. No. **12**

3SE2 303–0D



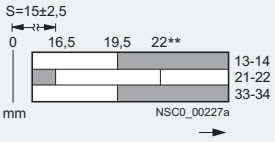
35 N

2 NO + 1 NC



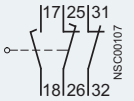
Ident. No. **21**

3SE2 303–1D



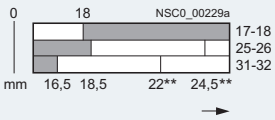
37 N

1 NO + 2 NC
with make-before-break



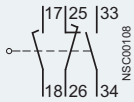
Ident. No. **12**

3SE2 303–2D



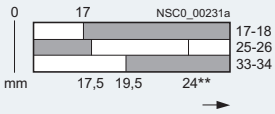
35 N

2 NO + 1 NC
with make-before-break



Ident. No. **21**

3SE2 303–3D



37 N

3SE2, metal enclosures
Enclosure width 40 mm and 56 mm

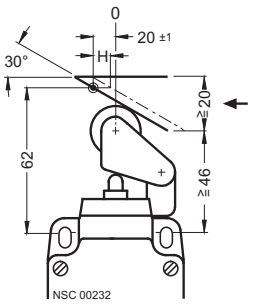
Position switches with 3 contacts

Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Minimum force required in direction of operation
v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 ■ Contact closed □ Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1	

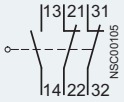
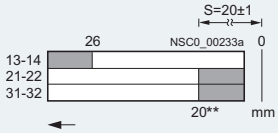
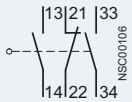
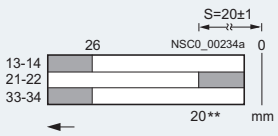
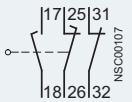
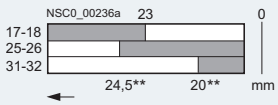
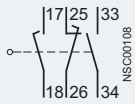
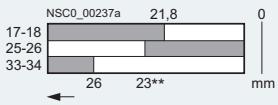
Roller levers

Slow-action contacts — Lateral actuation

3SE2 303–.E



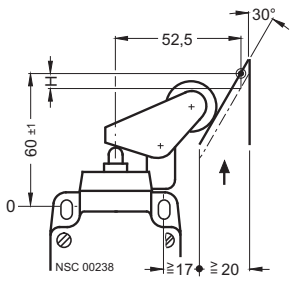
v_{max} = 1 m/s

1 NO + 2 NC  Ident. No. **12**	**3SE2 303–0E** 	15 N
2 NO + 1 NC  Ident. No. **21**	**3SE2 303–1E** 	17 N
1 NO + 2 NC **with make-before-break**  Ident. No. **12**	**3SE2 303–2E** 	15 N
2 NO + 1 NC **with make-before-break**  Ident. No. **21**	**3SE2 303–3E** 	17 N

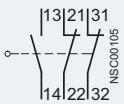
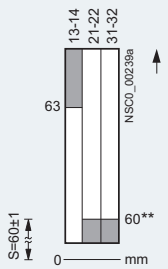
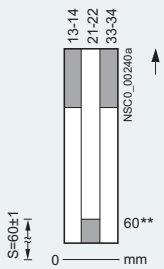
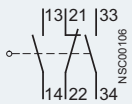
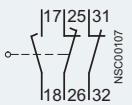
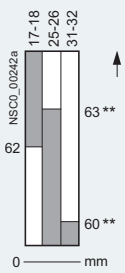
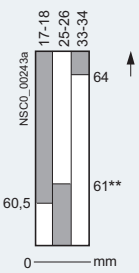
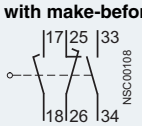
Angular roller levers

Slow-action contacts — Actuation along plunger axis

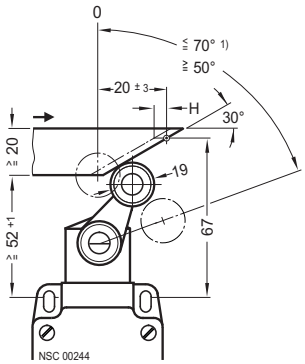
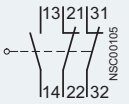
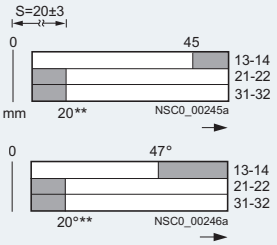
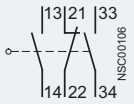
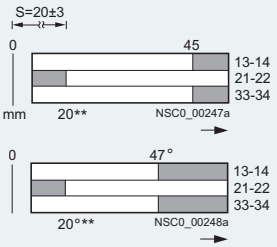
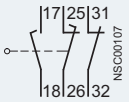
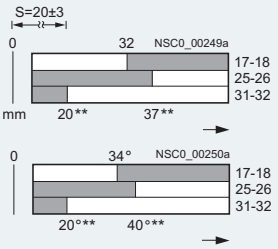
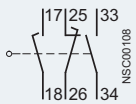
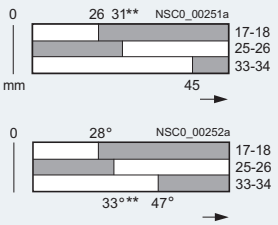
3SE2 303–.F



v_{max} = 1 m/s

1 NO + 2 NC  Ident. No. **12**	**3SE2 303–0F** 	**3SE2 303–1F** 	15 N
2 NO + 1 NC  Ident. No. **21**			17 N
1 NO + 2 NC **with make-before-break**  Ident. No. **12**	**3SE2 303–2F** 	**3SE2 303–3F** 	15 N
2 NO + 1 NC **with make-before-break**  Ident. No. **21**			17 N

Position switches with 3 contacts

Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Minimum torque in direction of rotation
v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 H Travel difference → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 Contact closed Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1	
Twist levers	*Slow-action contacts*	Lateral actuation/in direction of rotation	
3SE2 303–.GW–Z, Z = A31	**1 NO + 2 NC**	**3SE2 303–0GW**	25 Ncm
			
Lever adjustable in increments of 10° v_{max} = 3 m/s Contact operation is possible from either right or left. By twisting the plunger from the right and left.	Ident. No. **12**		
	2 NO + 1 NC	**3SE2 303–1GW**	25 Ncm
			
	Ident. No. **21**		
	1 NO + 2 NC with make-before-break	**3SE2 303–2GW**	25 Ncm
			
	Ident. No. **12**		
	2 NO + 1 NC with make-before-break	**3SE2 303–3GW**	25 Ncm
			
	Ident. No. **21**		

1) Max. operating angle 70°.
Max. deflection for adjustment purposes 90°.

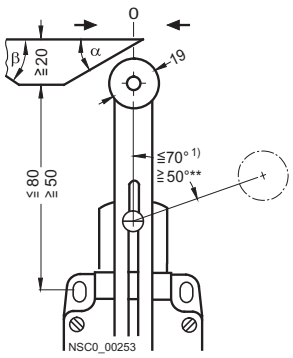
3SE2, metal enclosures
Enclosure width 40 mm and 56 mm

Position switches with 3 contacts

Operation by bar (standard)	Contact blocks	Nominal travel (measured)	Minimum torque in direction of rotation
α Approach angle β Trailing angle v_{max} Max. actuating speed 0-line Reference line acc. to EN 50041 → Direction of operation	Terminal designation acc. to EN 50013	0-line Reference line acc. to EN 50041 S Operating travel acc. to EN 50041 ■ Contact closed □ Contact open ** Positive opening ⊖ acc. to IEC 60947-5-1	

Twist levers, adjustable length

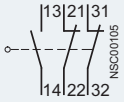
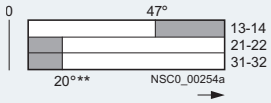
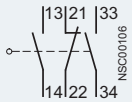
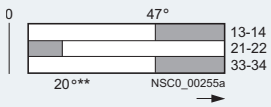
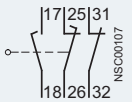
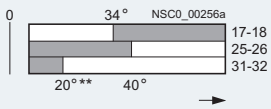
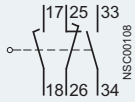
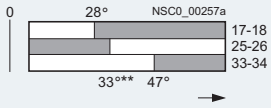
3SE2 303–.UW



Lever adjustable in increments of 10°

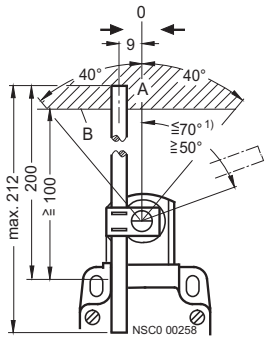
v_{max} = 3 m/s,
α_{max} = 30°,
β_{max} = 30°

Contact operation is possible from either right or left. By twisting the plunger from the right and left.

Slow-action contacts	Deflection in direction of rotation	
1 NO + 2 NC  Ident. No. **12**	**3SE2 303–0UW** 	25 Ncm
2 NO + 1 NC  Ident. No. **21**	**3SE2 303–1UW** 	25 Ncm
1 NO + 2 NC **with make-before-break**  Ident. No. **12**	**3SE2 303–2UW** 	25 Ncm
2 NO + 1 NC **with make-before-break**  Ident. No. **21**	**3SE2 303–3UW** 	25 Ncm

Rod actuators

3SE2 303–.VW, 3SE2 303–.WW

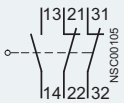
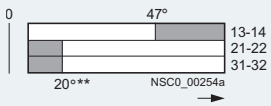
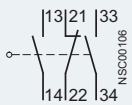
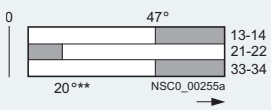
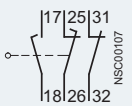
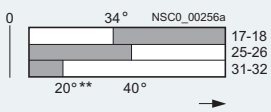
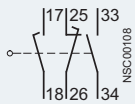
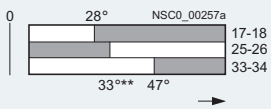


A = Operating range
B = Lower edge of actuator

Lever adjustable in increments of 10°

v_{max} = 3 m/s

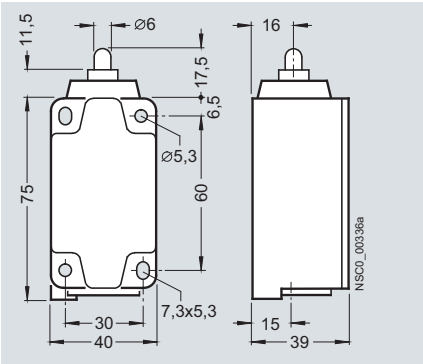
Contact operation is possible from either right or left. By twisting the plunger from the right and left.

Slow-action contacts	Deflection in direction of rotation	
1 NO + 2 NC  Ident. No. **12**	**3SE2 303–0VW, 3SE2 303–0WW** 	25 Ncm
2 NO + 1 NC  Ident. No. **21**	**3SE2 303–1VW, 3SE2 303–1WW** 	25 Ncm
1 NO + 2 NC **with make-before-break**  Ident. No. **12**	**3SE2 303–2VW, 3SE2 303–2WW** 	25 Ncm
2 NO + 1 NC **with make-before-break**  Ident. No. **21**	**3SE2 303–3VW, 3SE2 303–3WW** 	25 Ncm

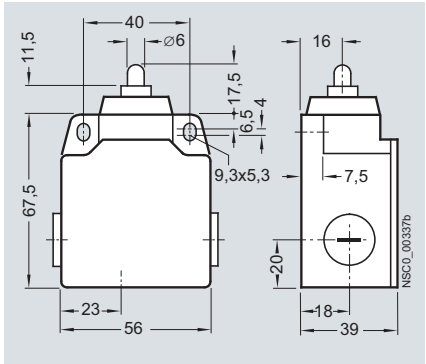
1) Max. operating angle 70°.
Max. deflection for adjustment purposes 90°.

Dimensional drawings

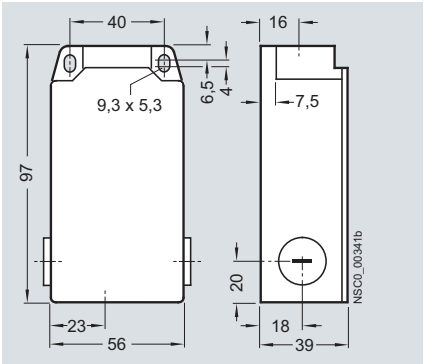
3SE2 120
narrow enclosure, 2 contacts, with plunger



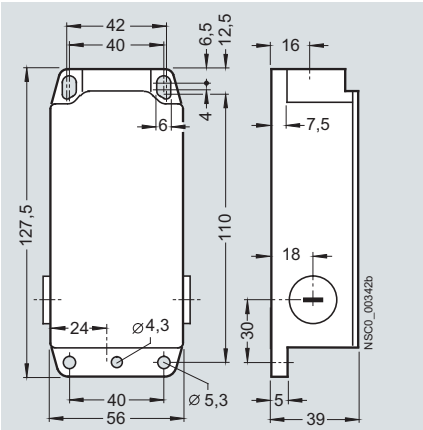
3SE2 100
wide enclosure, 2 contacts, with plunger



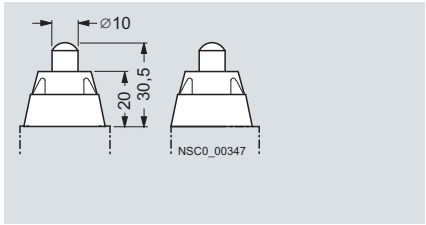
3SE2 303
wide enclosure, 3 contacts



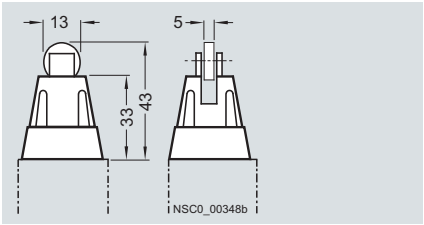
3SE2 404
wide enclosure, 4 contacts



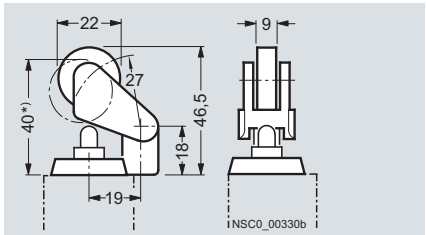
Rounded plunger, type B



Roller plunger, type C

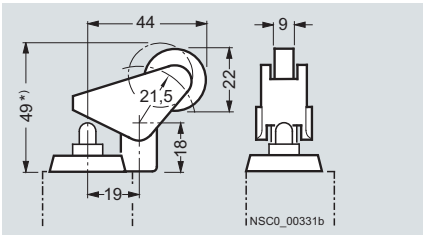


Roller lever



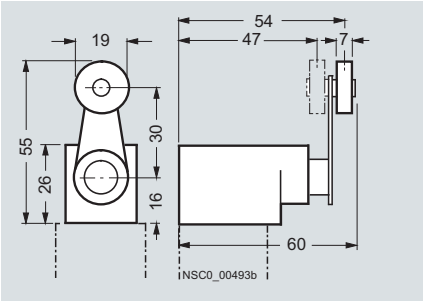
* Lever in final position

Angular roller lever

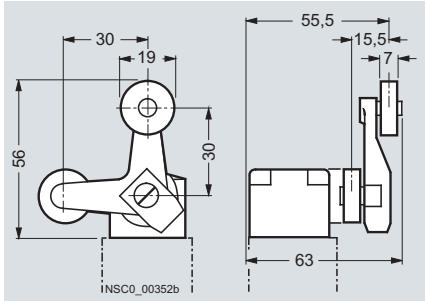


* Lever in final position

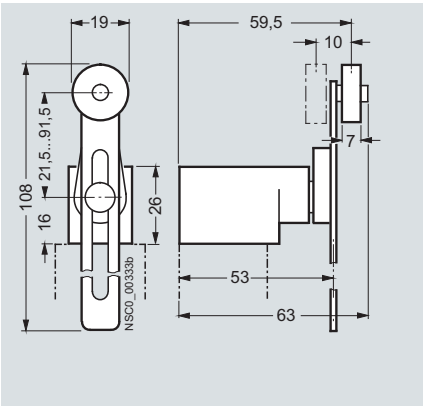
Twist lever, type A



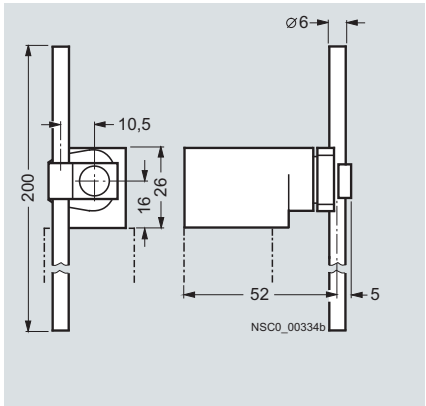
Fork lever



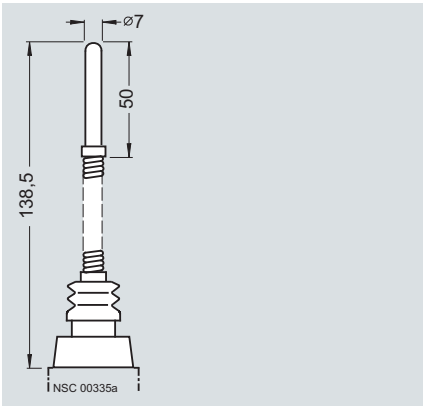
Twist lever, adjustable length



Rod actuator, adjustable length, type D



Spring rod



3SE3, metal enclosures, compact design with molded cable

Overview

In harsh industrial environments and in installations with limited space, the small 3SE3 160 and 3SE3 180 compact switches are ideal. The switches are already equipped with a molded cable of 2 m in length and can therefore be installed in the smallest of spaces.

Both the enclosure and the actuator head are made of metal and comply with the high IP67 degree of protection. The roller plunger, rounded plunger and twist lever are available as twist actuators.

The contact block is designed with snap-action contacts 1 NO + 1 NC. The NC contact complies with the requirements for positive opening acc. to IEC 60947-5-1.

The 3SE3 1 position switch with molded cable is available in different sizes:

- The 3SE3 180 series complies with the EU standard and features a 30 mm wide enclosure with drilled holes at a distance of 20 mm.
- The 3SE3 160 series meets the requirements of the US market and features a 40 mm wide enclosure with drilled holes at a distance of 25 mm.

Technical specifications

Type		3SE3 160, 3SE3 180
Rated insulation voltage U_i	V	500
Degree of pollution		Class 3
Rated operational voltage U_e	V	500 AC; over 380 V AC only for equal potential
Conventional thermal current I_{th}	A	10
Mechanical endurance		10×10^6 operating cycles
Electrical endurance		500 000 operating cycles
Switching frequency		30 operating cycles/min
Contact opening	mm	2 × 1.25
Stroke	mm	5
Actuating speed up to 80 % operating distance		
• 3SE3 1.0-.C.	m/s	≤1
• 3SE3 1.0-.D.		
- Vertical	m/s	≤1
- Lateral	m/s	≤0.5
• 3SE3 1.0-.G.	m/s	≤1.5
Connecting cable (2 m)		PVC, 5 x 0.75 mm² (18 AWG)
Terminals		BN-BU: NC, BK-GN/YE: NC, GN/YE: 0 V
Degree of protection		IP67
Ambient temperature	°C	–30 ... +85

Configuration

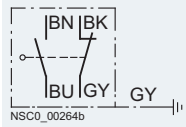
Contact blocks and operating travel or angle of actuators

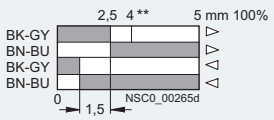
Contact blocks	Nominal travel		
Terminal designation acc. to EN 50013	0-line	Reference line acc. to EN 50041	Contact closed
	**	Positive opening ⊖ acc. to IEC 60947-5-1	Contact open

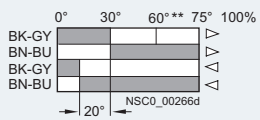
Snap-action contacts 1 NO + 1 NC

3SE3 1.0–1C., –1D.

3SE3 1.0–1G



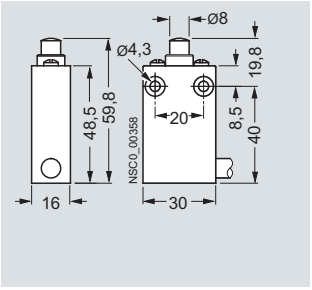




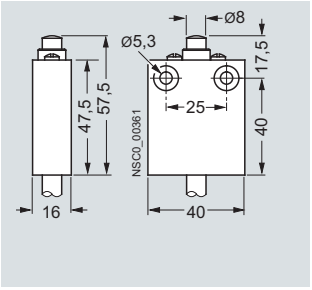
Color codes:
BK = Black
BN = Brown
BU = Blue
GY = Green/yellow

Dimensional drawings

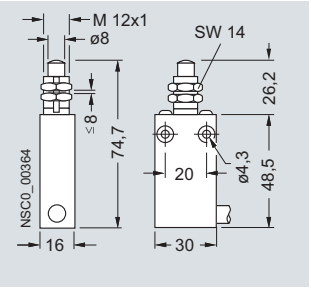
3SE3 180-1C



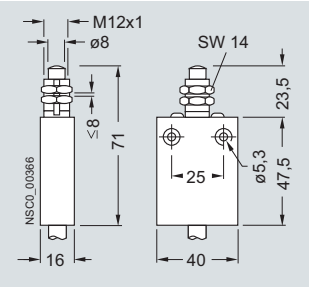
3SE3 160-1C



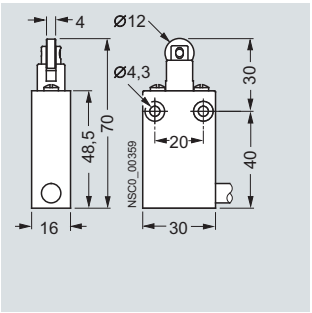
3SE3 180-1CJ



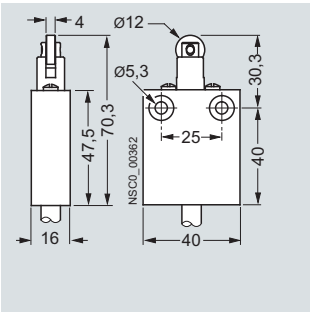
3SE3 160-1CJ



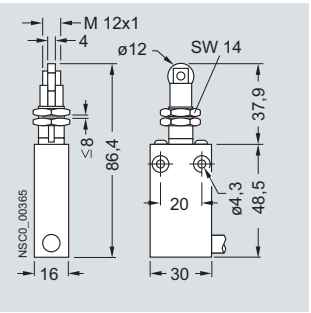
3SE3 180-1D



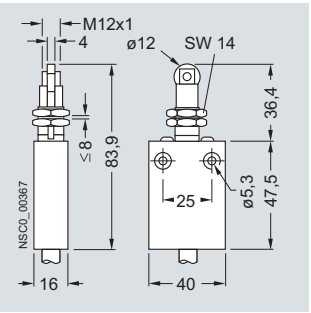
3SE3 160-1D



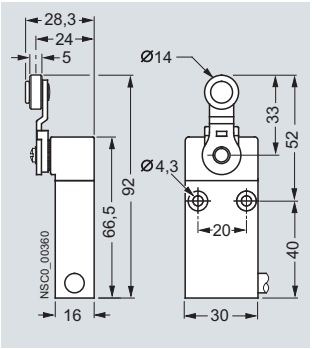
3SE3 180-1DJ



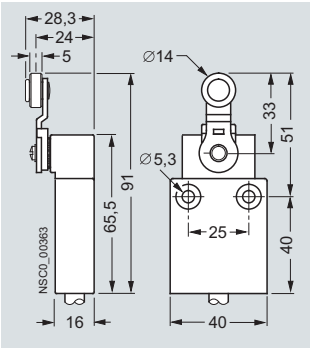
3SE3 160-1DJ



3SE3 180-1G



3SE3 160-1G



All switches complete with cable,
2 m long

Open-Type

3SE5, open-type design

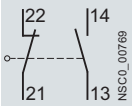
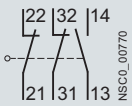
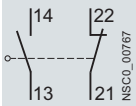
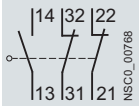
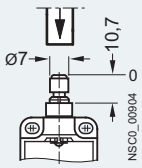
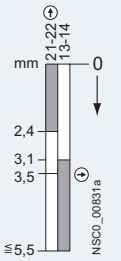
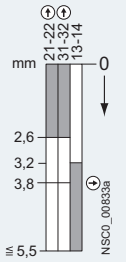
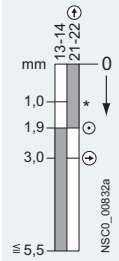
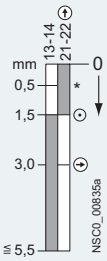
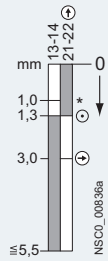
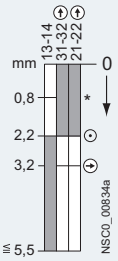
Overview

Their compact design makes these switches particularly suitable for use in confined conditions. The fixing dimensions and operating points are according to EN 50047.

The switches are equipped with two or three contacts in slow-action or snap-action versions. The stroke is 6 mm.

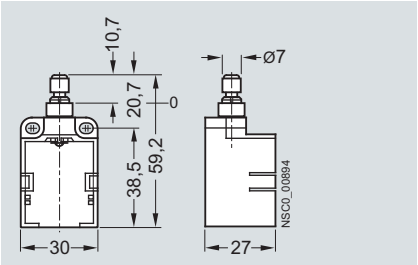
The empty enclosure can be equipped with all switch block variants (see page 12).

Configuration

Operation by bar (standard)	Slow-action contacts		Snap-action contacts	
⊙ Operating point acc. to EN 50047 (snap-action) * Operating point on return (snap-action) ** Positive opening ⊖ acc. to EN 60947-5-1 v_{max} Max. actuating speed 0-line Commencement of plunger travel → Direction of operation ■ Contact closed □ Contact open	**1 NO + 1 NC**  Ident. No. **11**	**1 NO + 2 NC**  Ident. No. **12**	**1 NO + 1 NC**  Ident. No. **11**	**1 NO + 2 NC**  Ident. No. **12**
Rounded plungers	Actuation along plunger axis		Actuation along plunger axis			
3SE5 250-0. C05  v_{max} = 0.5 m/s Minimum force required in direction of operation: 9 N	**-0BC05** 	**-0KC05** 	**-0CC05** 	**-0AC05**[1]  Short stroke	**-0AC05**[1]  Switching interval 2 × 2 mm	**-0LC05** 

1) The empty enclosure and contact block must be ordered separately.

Dimensional drawings



Configuration

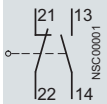
Operation, actuating speed and travel of actuators

Operation by bar (standard)

* Operating point on return (snap-action)
** Positive opening ⊖ acc. to EN 60947-5-1
v_{max} Max. actuating speed
0-line Commencement of plunger travel
→ Direction of operation
Contact closed
Contact open
Return travel

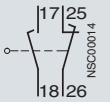
Slow-action contacts

1 NO + 1 NC



Ident. No. **11**

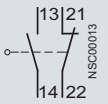
1 NO + 1 NC with make-before-break



Ident. No. **11**

Snap-action contacts

1 NO + 1 NC

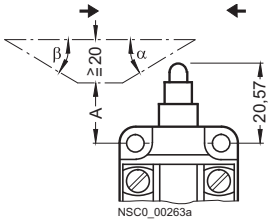


Ident. No. **11**

Rounded plungers

3SE3 020-.A, 3SE3 023-.A

Actuation along plunger axis:
v_{max} = 1.5 m/s
Lateral actuation:



Actuators can be in the form of a bar, cam, stop etc.

A ≥ 15 mm; A** ≥ 17.5 mm

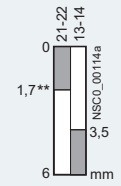
A = Actuating bar spacing = Distance from center of the fixing hole up to lower edge of the contact bar

A** = Actuating bar spacing for positive opening acc. to IEC 60204-1 (VDE 0113 Part 1) for snap-action contacts

α_{max} = 30°, β_{max} = 30°
v_{max} = 0.5 m/s

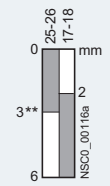
Actuation along plunger axis

3SE3 020-0A



Minimum force required along plunger axis 8 N

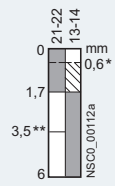
3SE3 020-3A



Minimum force required along plunger axis 8 N

Actuation along plunger

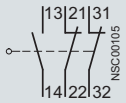
3SE3 020-1A



Minimum force required along plunger axis 6 N

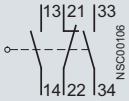
Slow-action contacts

1 NO + 2 NC



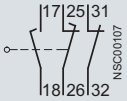
Ident. No. **12**

2 NO + 1 NC



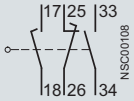
Ident. No. **21**

1 NO + 2 NC with make-before-break



Ident. No. **12**

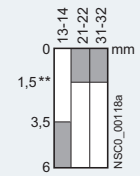
2 NO + 1 NC with make-before-break



Ident. No. **21**

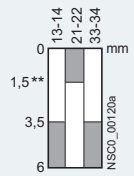
Actuation along plunger axis

3SE3 023-0A



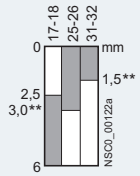
Minimum force required along plunger axis 11 N

3SE3 023-1A



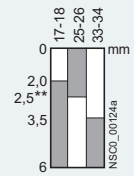
Minimum force required along plunger axis 13 N

3SE3 023-2A



Minimum force required along plunger axis 11 N

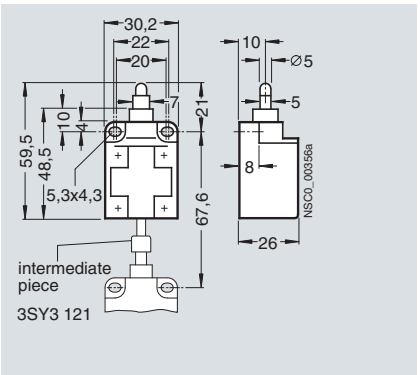
3SE3 023-3A



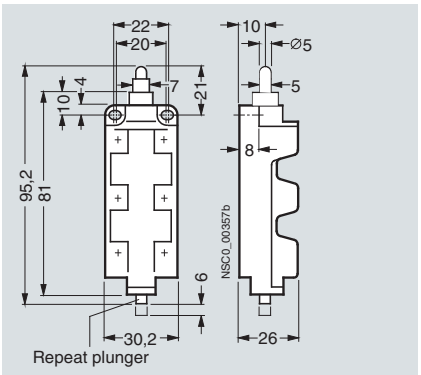
Minimum force required along plunger axis 13 N

Dimensional drawings

3SE3 020-.A



3SE3 023-.A



General data

Overview

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

3SE5 position switches with separate actuator have the same enclosures as the standard switches (modular system).

Design

Enclosure sizes

The 3SE5 switches are available in various enclosure sizes:

- Plastic enclosures according to EN 50047 (31 mm wide), 1 cable entry
- Plastic enclosures (50 mm wide), 2 cable entries
- Metal enclosures according to EN 50041 (40 mm wide), 1 cable entry
- Metal enclosures (56 mm wide), 3 cable entries

Also available is a switch in the 3SE2 series, which has arisen in this form according to general market requirements:

- Plastic enclosures outside of the standards, enclosure width 52 mm.

Enclosure versions

Various basic versions can be selected for the enclosures of the 3SE5 series:

- Available with two- or three-pole switching elements designed as slow-action contacts
- Optional LED status display
- With mounted four or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Similarly with a combination of connector socket and LED indicators
- With increased corrosion protection
- Metal enclosures for explosion protection (ATEX) (see page 57)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 58)

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The switches can also be approached from above.

The actuator head of the 3SE2 243 and 3SE2 257 switches with special enclosures cannot be changed. The switches can be approached from the two broad sides and from above.

The actuators are not included in the scope of supply of the position switches and must be ordered separately from a choice of six versions to suit the application.

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

Locking devices

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

Blocking inserts with padlock

Dust protection

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments.

Contact reliability

The new switching blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e. g. 1 mA at 5 V DC.

Positive opening

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

Technical specifications

Type		3SE5 1..-..V.., 3SE5 2..-..V..	
General data			
Standards		IEC 60947-5-1, EN 60947-5-1	
Rated insulation voltage U_i	V	400	
Degree of pollution acc. to EN 60664-1		Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	400 AC; over 300 V AC only for equal potential	
Conventional thermal current I_{th}	A	6	
Rated operational current I_e		2-pole	3-pole
• With alternating current 50/60 Hz		I_e /AC-15	I_e /AC-15
- At 24 V	A	6	6
- At 120 V	A	6	3
- At 240 V	A	3	1.5
• For direct current		I_e /DC-13	I_e /DC-13
- At 24 V	A	3	3
- At 125 V	A	0.55	0.55
- At 250 V	A	0.27	0.27
Short-circuit protection[1]			
• With DIAZED fuse links, operational class gG	A	6	
• With miniature circuit breaker, Char. C	A	1	
Mechanical endurance		1 ×10^6 operating cycles	
Electrical endurance			
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		10 ×10^6 operating cycles	
• For AC-15 utilization category		0.1 ×10^6 operating cycles when interrupting I_e/AC-15 at 240 V	
• For DC-13 utilization category		With DC current the endurance of the switching element depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.	
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6000 operating cycles/h	
Operating point with snap-action contacts		Independent of contact erosion, constant throughout the endurance of the switch	
Rated data acc. to , , **and** .			
• Rated voltage	V	300	
• Uninterrupted current	A	6	
• Switching capacity		Heavy duty, A 300/ B 300 /Q 300	

Type		3SE5 23.	3SE5 24.	3SE5 11.	3SE5 12.
Enclosure					
Enclosure					
• Material		Ultramid A3X2G7		Zinc diecasting GD Zn Al4 Cu1	
• Width	mm	31	50	40	56
• Dimensions acc. to EN		EN 50047	--	EN 50041	--
Degree of protection acc. to EN 60529		IP65	IP66/IP67		
Ambient temperature					
• During operation	°C	–25 ... +85			
• In operation, switch with LEDs	°C	–25 ... +70			
• Storage, transport	°C	–40 ... +90			
Mounting position		Any			
Connection					
Cable entry		1 × (M20 × 1.5)	2 × (M20 × 1.5)	1 × (M20 × 1.5)	3 × (M20 × 1.5)
Conductor cross-sections[2]					
• Solid	mm^2	2 × (0.5 ... 1.5)			
• Finely stranded with end sleeve	mm^2	2 × (0.5 ... 1.5)			
Tightening torque, contact block	NM	0.8 ... 1.0			
Protective conductor connection inside enclosure		--		M3.5	

1) Without any welds according to EN 60947-5-1.

2) For the maximum number of connectable conductors for the respective contact block see operating instructions. Download from: http://www.siemens.com/automation/service&support

General data

Type		3SE2 257-.XX..		3SE2 243-.XX..	
General data					
Standards		IEC 60947-5-1, EN 60947-5-1			
Rated insulation voltage U_i	V	500			
Degree of pollution acc. to EN 60664-1		Class 3			
Rated operational voltage U_e	V	500 AC; over 380 V AC only for equal potential			
Conventional thermal current I_{th}	A	10			
Rated operational current I_e					
• For alternating current 40 ... 60 Hz		I_e/AC-12	I_e/AC-15	I_e/AC-12	I_e/AC-15
- At 24 V	A	10	10	10	10
- At 125 V	A	10	10	10	10
- At 230 V	A	10	6	10	4
- At 400 V	A	10	4	10	4
- At 500 V	A	10	3	10	3
• For direct current		I_e/DC-12	I_e/DC-13		
- At 24 V	A	10	10		
- At 48 V	A	6	4		
- At 110 V	A	4	1		
- At 220 V	A	1	0.4		
- At 440 V	A	0.5	0.2		
Short-circuit protection[1], DIAZED fuse links					
• gL/gG operational class	A	6			
• Characteristic quick	A	10			
Mechanical endurance		> 1 × 10^6 operating cycles			
Electrical endurance					
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		> 1 × 10^6 operating cycles			
• For AC-15 utilization category		0.5 ×10^6 operating cycles when interrupting I_e/AC-15 at 230 V			
• For DC-13 utilization category		With DC current the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.			
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6 ×10^3 operating cycles/h			

Type	3SE2 243, 3SE2 257	3SE2 243, 3SE2 257
Enclosure		
Enclosure		
• Material	Fiber-glass strengthened thermoplast	
• Type acc. to EN	--	
• Width	52 mm	
Degree of protection acc. to EN 60529	IP67	
Ambient temperature		
• During operation	–30 ... +85 °C	
• During storage, transport	--	
Mounting position	Any	
Connection		
Cable entry	1 × (M20 × 1.5)	1 × (M16 × 1.5)
Conductor cross-sections		
• Solid	1 × (0.5 ... 1.5 mm²), 2 × (0.5 ... 1 mm²)	
• Finely stranded with end sleeve	1 × (0.5 ... 1.5 mm²), 2 × (0.5 ... 1 mm²)	
Protective conductor connection Inside enclosure	--	

1) Without any welds according to IEC 60947-5-1.

Configuration

Operation and operating travel of actuators

Operation by a separate actuator
⊖ Positive opening acc. to EN 60947-5-1
v_{max} Max. actuating speed
→ Direction of operation

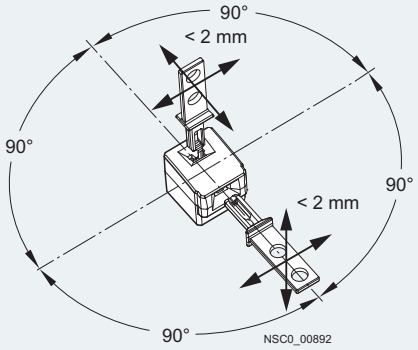
Contact blocks
Terminal designation acc. to EN 50013

Nominal travel
Contact closed
Contact open
Actuator in actuator head: NC is closed

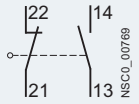
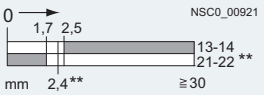
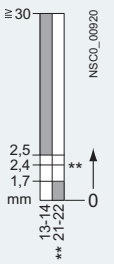
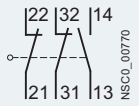
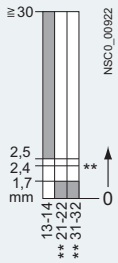
Separate actuators

Standard actuators

Axial and lateral actuation (4 × 90°)

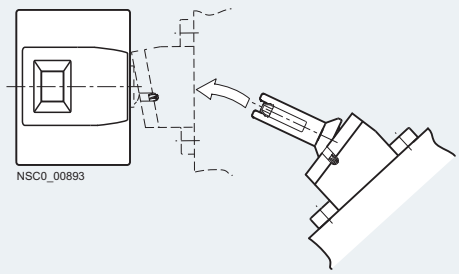


Minimum force required in operating direction 30 N (on retraction)

Slow-action contacts	Lateral actuation	Axial actuation
1 NO + 1 NC	**3SE5 ...-.RV..**	**3SE5 ...-.RV..**
 Ident. No. **11**		
1 NO + 2 NC	**3SE5 ...-.QV..**	**3SE5 ...-.QV..**
 Ident. No. **12**		

Radius actuators (all directions of approach)

Example: direction of approach from the left

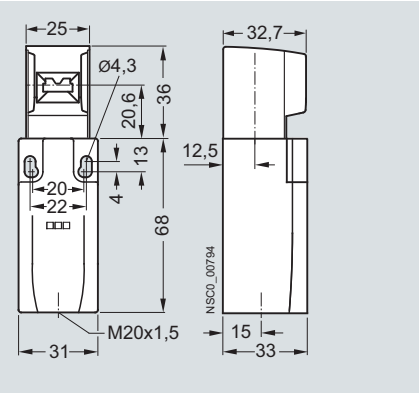


For connector assignment, see page 12.

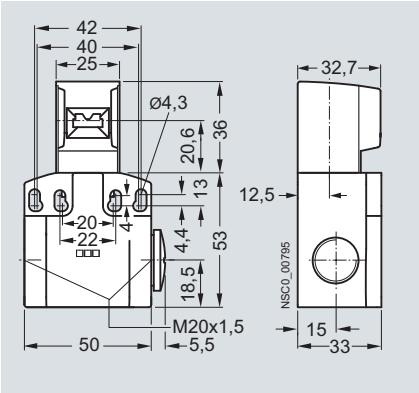
Dimensional drawings

Complete units

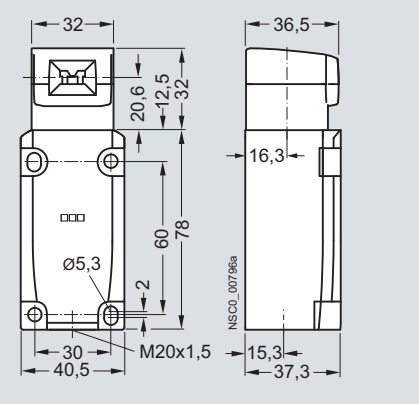
Enclosure width 31 mm
3SE5 23.-.QV40, 3SE5 23.-.RV40



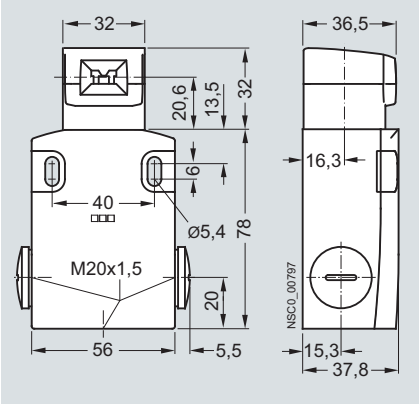
Enclosure width 50 mm
3SE5 24.-.QV40, 3SE5 24.-.RV40



Enclosure width 40 mm
3SE5 11.--.QV10, 3SE5 11.-.RV10

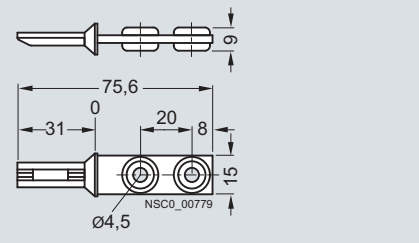


Enclosure width 56 mm
3SE5 12.-.QV10, 3SE5 12.-.RV10

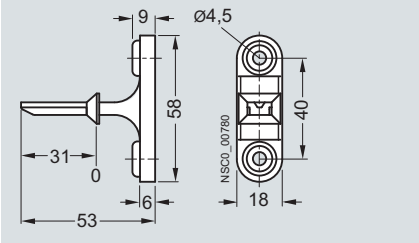


Actuators

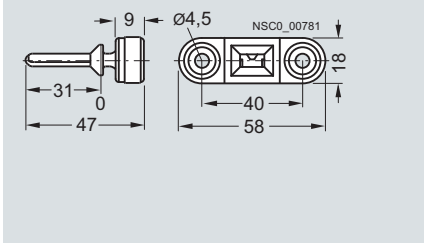
3SE5 000-0AV01
standard actuator



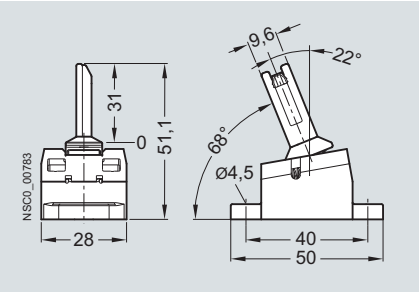
3SE5 000-0AV02
actuator with vertical fixing



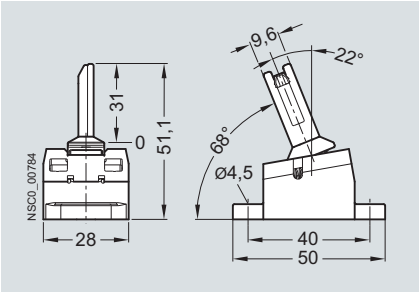
3SE5 000-0AV03
actuator with horizontal fixing



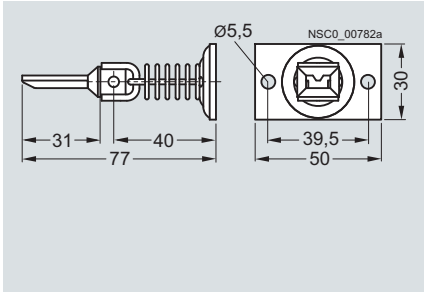
3SE5 000-0AV04
radius actuator, approach from left



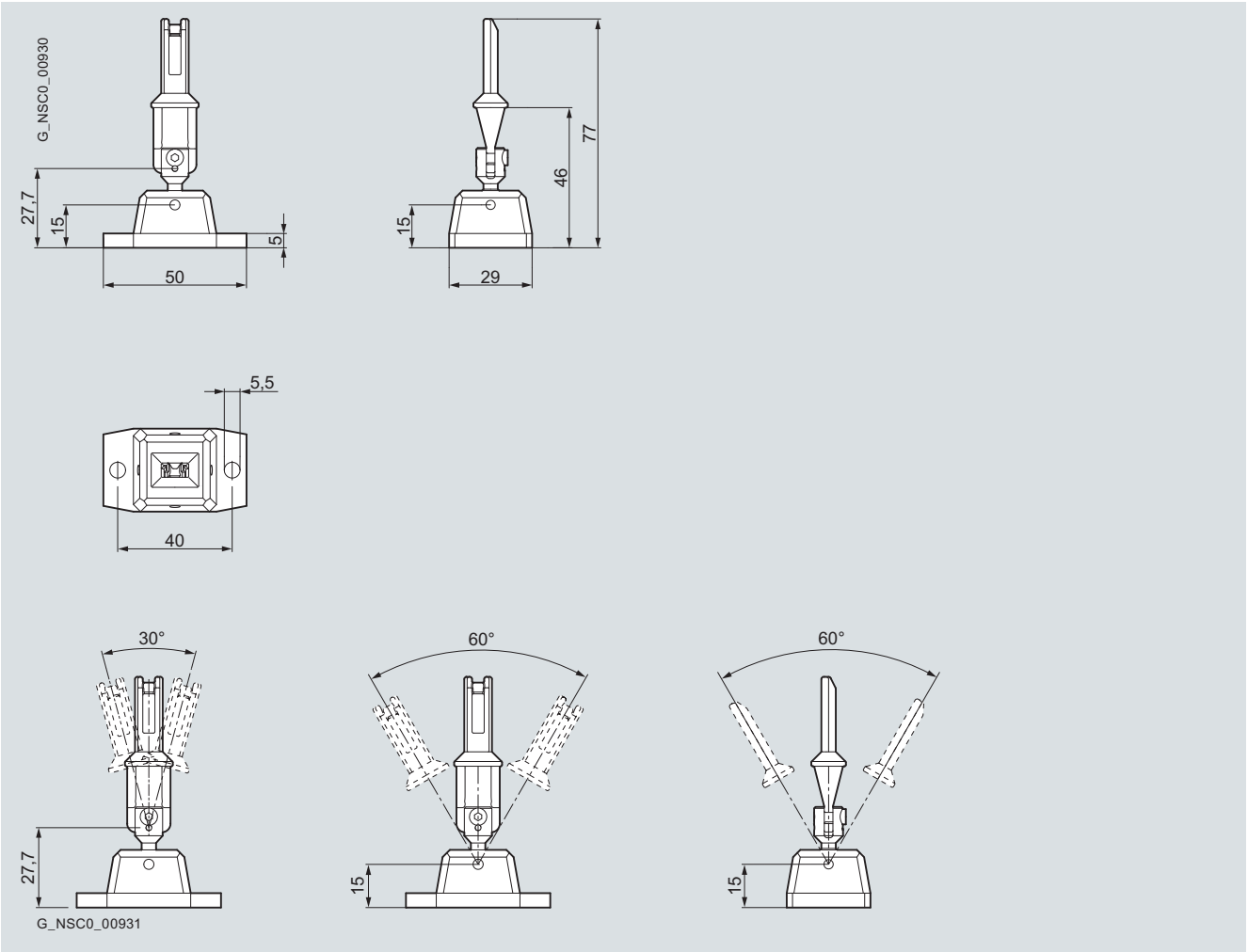
3SE5 000-0AV06
radius actuator approach from right



3SE5 000-0AV05
universal radius actuator



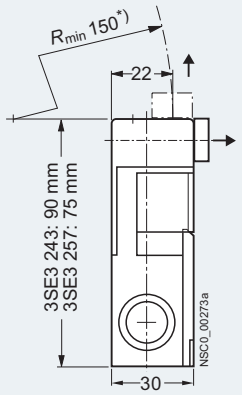
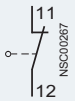
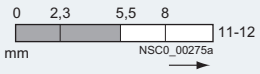
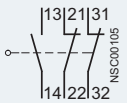
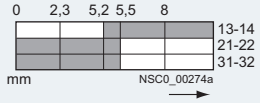
3SE5 000-0AV07
universal radius actuator, heavy duty



3SE2, plastic enclosures

Configuration

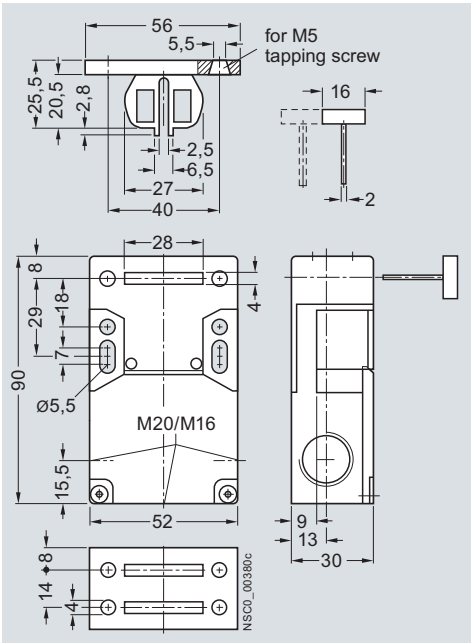
Operation and operating travel of actuators

Operation by a separate actuator	**Contact blocks**	**Nominal travel**	Minimum force required in operating direction on retraction
v_{max} Max. actuating speed → Direction of operation Radius actuation: for all directions of approach	Terminal designation acc. to EN 50013	Contact closed Contact open Actuator in actuator head: NC is closed	
Separate actuators			
Standard and radius actuators	*Slow-action contacts*	Lateral actuation	
Axial and lateral actuation 	**1 NC**  Ident. No. **01**	**3SE2 257–.XX..** 	30 N or 5 N
	1 NO + 2 NC  Ident. No. **12**	**3SE2 243–.XX..** 	30 N or 5 N

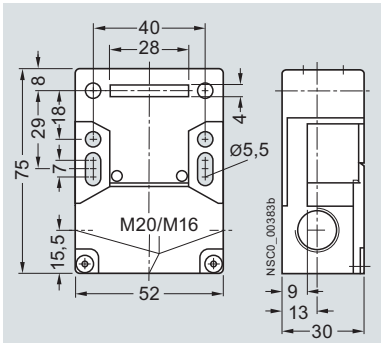
*) Radius actuator: R_{min} > 38 mm.

Dimensional drawings

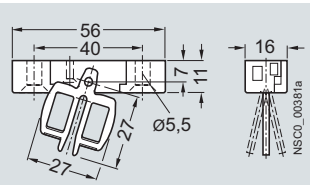
3SE2 243, lateral and front-end actuation, with 3SX3 218 standard actuator



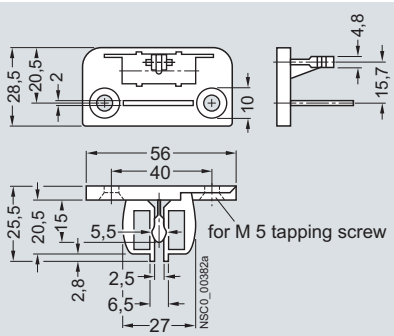
3SE2 257, lateral and front-end actuation



3SX3 228 universal radius actuator



3SX3 217 actuator with ball locating



Overview

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i. e. follow-on motion of the shutdown machine).

The safety position switches with solenoid interlocking are comprised of a switch part with electromechanical interlock and a mechanical actuator which has to be ordered separately.

They are rugged protective devices that enable the greatest possible safety for man and machine.

The position switches with solenoid interlocking are offered in plastic or metal enclosures.
Dimensions (W × H × D):

- 3SE5 3: 54 mm × 185 mm × 43.5 mm,
- 3SE2 8: 90 mm × 100 mm (+ head 41.3 mm) × 45 mm.

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The 3SE5 3 switches can also be approached from above.

The actuators are not included in the scope of supply of the position switches and must be ordered separately from a choice of six versions to suit the application.

Actuation data:

- Maximum actuating speed v_{max} = 1.5 m/s
- Minimum actuating speed v_{min} = 0.4 mm/s
- Minimum force in the direction of actuation F_{min} = 30 N

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

Locking devices

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

Dust protection

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments.

Solenoid interlocking

There are two versions for locking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Magnetic field lock (open-circuit principle)

The spring-actuated switch is equipped with an auxiliary release for emergency situations or setup mode. Available as options (only 3SE5):

- Escape release or
- Emergency release

Contact blocks

The position switches with solenoid interlocking have one switching block each for:

- Monitoring the actuator or the position of the protective door
- Monitoring the position of the solenoid

The mechanical design of the switch corresponds to the requirements of the failsafe principle to EN 1088.

Optical signaling equipment

The position switches with solenoid interlocking are available with an optional optical signaling device.

The signaling device indicates the switch position of the lock and the protective device optically by means of 2 LEDs on the front.

Protective device	Solenoid interlocking	Display	Meaning
Closed	Released		Actuator to be pulled
Closed	Closed		Actuator locked
Open	Open		Actuator pulled

Note:
The voltage of the LEDs at the monitored contacts must be the same as the operational voltage of the magnet (same potential).

General data

Technical specifications

Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84	
General data					
Standards		IEC 60947-5-1, EN 60947-5-1			
Rated insulation voltage U_i	V	250			
Degree of pollution acc. to EN 60664-1		Class 3			
Rated impulse withstand voltage U_{imp}	kV	4		6	
Rated operational voltage U_e					
• DC	V	24		24	
• AC 50/60 Hz	V	230		110 ... 130	230
Conventional thermal current I_{th}	A	6		10	
Rated operational current I_e					
• With alternating current 50/60 Hz		I_e /AC-15 or B300		I_e /AC-12	I_e /AC-15
- At 24 V	A	6		10	4
- At 120 V	A	3		10	4
- At 230 V	A	1.5		10	4
• For direct current		I_e /DC-13 or Q300		I_e/DC-12	I_e /DC-13
- At 24 V	A	3		10	3
- At 60 V		--		5	1.5
- At 110 V		--		2.5	0.7
- At 125 V	A	0.55		--	--
- At 220 V		--		1	0.3
- At 250 V	A	0.27		--	--
Magnet					
• Locking force, max.	N	1300	2600	1820	
• Locking force acc. to GS-ET 19	N	1000	2000	1400	
• Power consumption at U_c	W	3.5		5.2	
Short-circuit protection[1]					
• With DIAZED fuse links, operational class gG	A	6		6	
• Characteristic quick				10	
• With miniature circuit breaker, Char. C	A	0.5		--	
Mechanical endurance		1×10^6 operating cycles		1×10^6 operating cycles	
Electrical endurance					
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		1×10^6 operating cycles		1×10^6 operating cycles	
• For AC-15 utilization category		1×10^5 operating cycles, when interrupting I_e /AC-15 at 230 V		0.5×10^6 operating cycles, when interrupting I_e/AC-15 at 230 V	
• For DC-13 utilization category		With DC current the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given.			
Switching frequency With 3RH11, 3RT10 16 to 3RT10 26 contactors		6×10^3 operating cycles/h			
Shock resistance acc. to IEC 60068-2-27		30 *g*/11 ms		--	

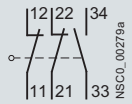
Type		3SE5 322	3SE5 312	3SE2 83, 3SE2 84
Enclosure				
Enclosure material		Ultramid A3X2G7	Zinc diecasting GD Zn Al4 Cu1	Aluminum (GD - AlSi 12)
Degree of protection acc. to EN 60529		IP66/IP67		IP67
Ambient temperature				
• During operation	°C	–25 ... +60		–30 ... +70
• During storage, transport	°C	–40 ... +80		--
Mounting position		Any		
Connection				
Cable entry		M 20 × 1.5		M 20 × 1.5
Conductor cross-sections				
• Solid	mm²	1 × (0.5 ... 1.5)		2 × 2.5
• Finely stranded with end sleeve	mm²	2 × (0.5 ... 0.75)		2 × 1.5
Protective conductor connection Inside enclosure		--	M3.5	

1) Without any welds according to IEC 60947-5-1.

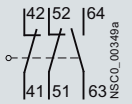
Schematics

3SE5

Monitoring the actuator:
Slow-action contacts 1 NO + 2 NC



Monitoring the solenoid:
Slow-action contacts 1 NO + 2 NC



Configuration

Operation and operating travel of actuators

Operation by a separate actuator
⊖ Positive opening acc. to EN 60947-5-1
v_{max} Max. actuating speed
→ Direction of operation

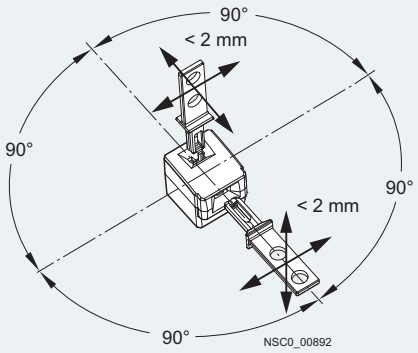
Contact blocks
Terminal designation acc. to EN 50013

Nominal travel
Contact closed
Contact open
Actuator in actuator head: NC is closed

Separate actuators with solenoid interlocking

Standard actuators

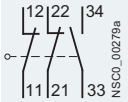
Axial and lateral actuation (4 × 90°)



Minimum force required in operating direction 30 N (on retraction)

Slow-action contacts

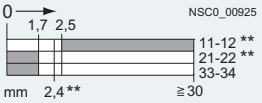
1 NO + 2 NC



Ident. No. **12**

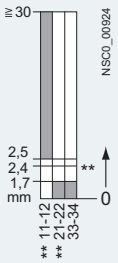
Lateral actuation

3SE5 3..-.S...



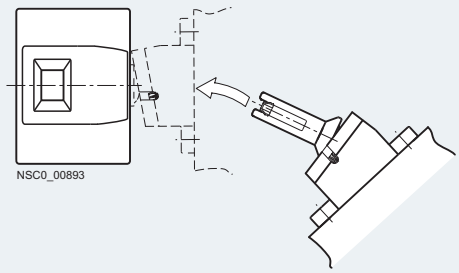
Axial actuation

3SE5 3..-.S...



Radius actuators (all directions of approach)

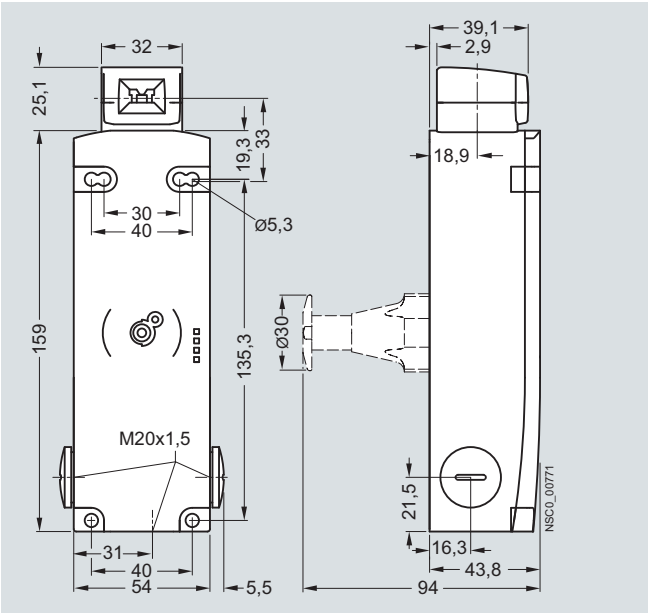
Example: Direction of approach from the left



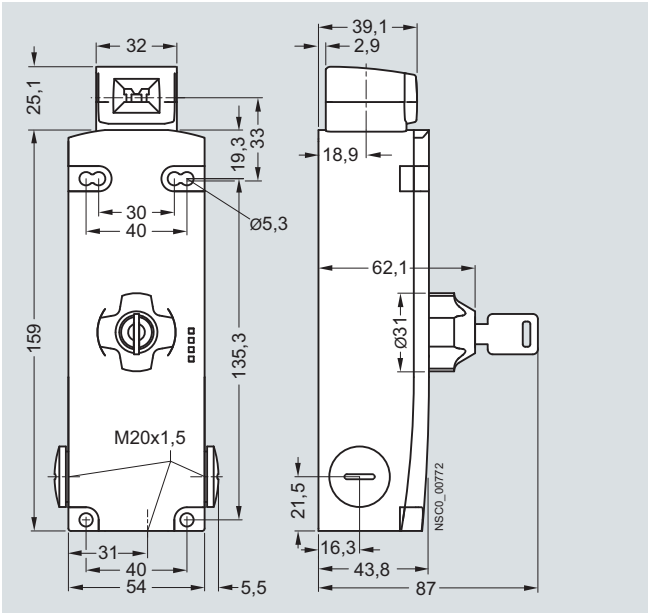
3SE5, plastic and metal enclosures

Dimensional drawings

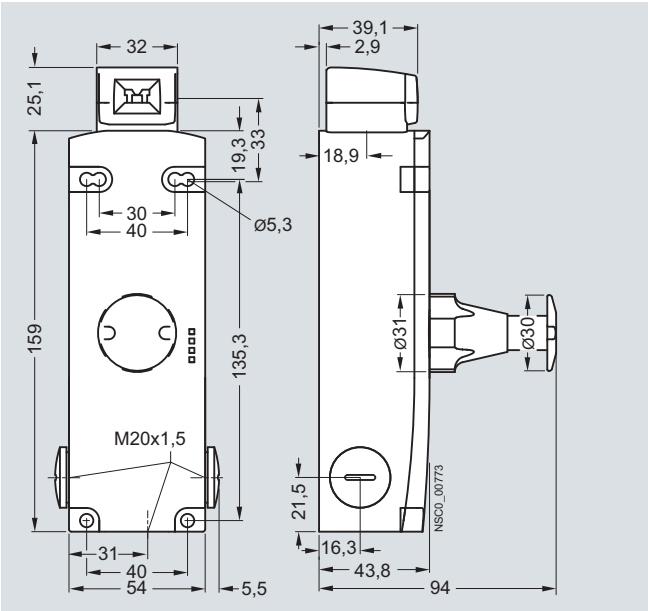
Spring-actuated lock, with auxiliary release
3SE5 322-.SD2., 3SE5 322-.SG2., 3SE5 322-.SJ2.,
3SE5 312-.SD1., 3SE5 312-.SG1., 3SE5 312-.SJ1.,



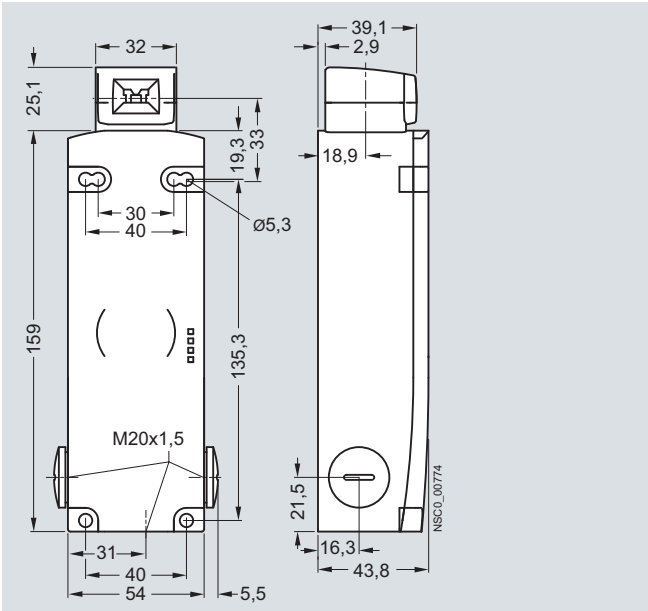
Spring-actuated lock, with auxiliary release with lock
3SE5 322-.SE2.,
3SE5 312-.SE1.



Spring-actuated lock, with escape release
3SE5 322-.SF2.,
3SE5 312-.SF1.



Magnetic field lock
3SE5 322-.SB2.,
3SE5 312-.SB1.

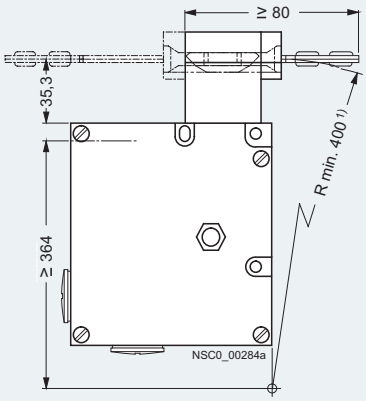
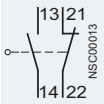
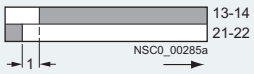
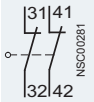


The plastic enclosures have knock-out openings behind the connecting thread; they are delivered therefore without protective caps.

For actuators see page 46.

Configuration

Operation, actuating speed and travel of actuators

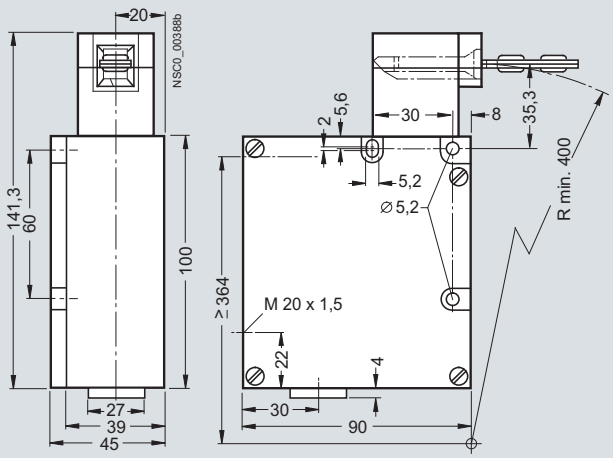
Operation by a separate actuator	Contact blocks	Nominal travel	Minimum force required in operating direction on retraction
v_{max} Max. actuating speed → Direction of operation	Terminal designation acc. to EN 50013	Contact closed Contact open Actuator in actuator head; NC is closed	
Separate actuators with solenoid interlocking			
Standard and radius actuators	*Slow-action contacts*	Lateral actuation	
Lateral actuation (4 × 90°)	**1 NO + 1 NC**	**3SE2 8..-0XX.., 3SE2 8..-1XX..**	10 N Locking force: max. 1820 N, duration 5 s 2)
	 Ident. No. **11**		
v_{max} = 1.5 m/s	**2 NC**	**3SE2 8..-6XX..**	
	 Ident. No. **02**		

1) Universal radius actuator: R_{min} > 70 mm.

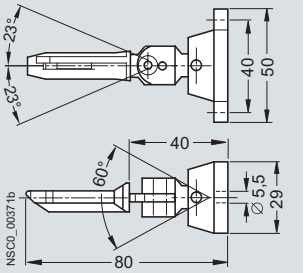
2) Destruction of internal parts will result if this value is exceeded.

Dimensional drawings

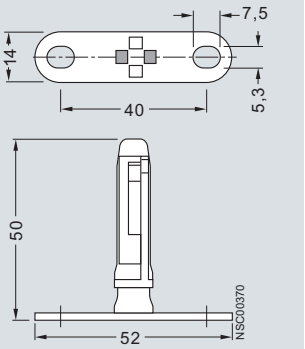
3SE2 83.-.XX, 3SE2 84.-.XX
metal enclosure, lateral actuation



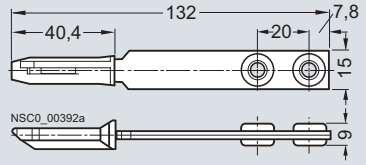
3SX3 203
universal radius actuator



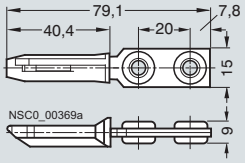
3SX3 206 standard actuator
for transverse fixing



3SX3 207 actuator
for direction of approach from the left side



3SX3 197 standard actuator
for lengthwise fixing



Hinge Switches

General data

Overview

The hinge switches are used in those areas where the position of swivelable protective devices such as doors or flaps must be monitored. The position of the doors and hinge switches is converted into electric signals with the switches. The switches allows shutdown and signaling without delay in the event of a small opening angle through the snap-action contacts with an operating angle of 10°.

3SE5 hinge switches have the same enclosures as the standard switches (modular system).

Hinge switches

Design

Enclosure sizes

The 3SE5 switches are available as complete units in two enclosure sizes:

- Plastic enclosures according to EN 50047 (31 mm wide), 1 cable entry
- Metal enclosures according to EN 50041 (40 mm wide), 1 cable entry

Enclosure versions

Various basic versions can be selected for the enclosures:

- Available with two or three-pole switching elements designed as snap-action contacts
- Metal enclosures for explosion protection (ATEX) (see page 57)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 58)

For a description of the basic switches see page 6.

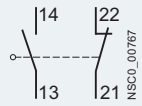
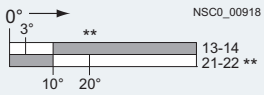
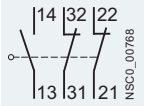
Operating mechanism

The hinge switches are provided for mounting on hinges. The actuator head is included in the scope of supply. There are two versions:

- Operating mechanism with hollow shaft, diameter inside 8 mm, outside 12 mm
- Operating mechanism with solid shaft, diameter 10 mm

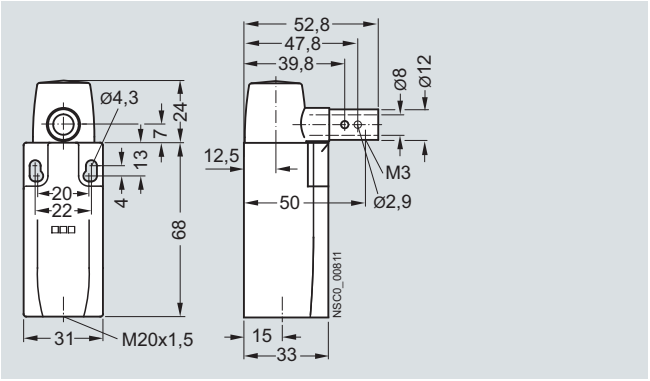
Configuration

Contact blocks and operating travel of actuators

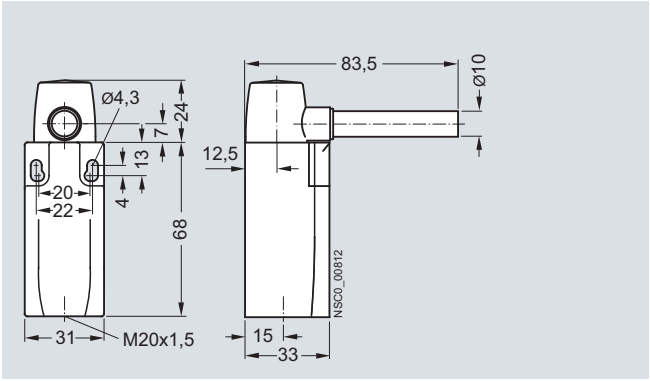
Contact blocks Terminal designation acc. to EN 50013	Nominal travel Contact closed Contact open	Contact blocks Terminal designation acc. to EN 50013	Nominal travel
Hinge switches		*Snap-action contacts*	
1 NO + 1 NC	**3SE5 ...-0HU2.**	**1 NO + 2 NC**	**3SE5 ..-0LU2.**
			
Ident. No. **11**		Ident. No. **12**	

Dimensional drawings

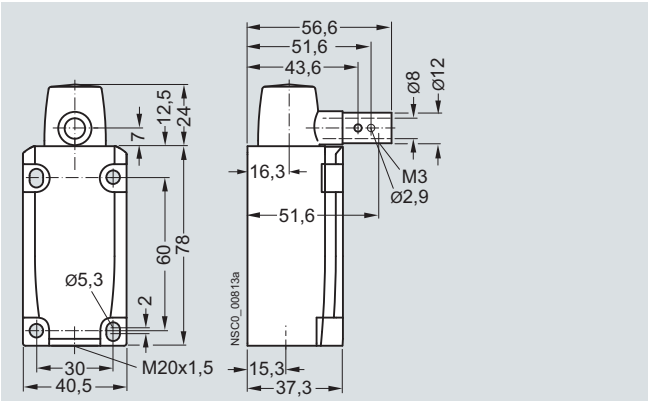
Enclosure width 31 mm with hollow shaft 3SE5 232-0.U21



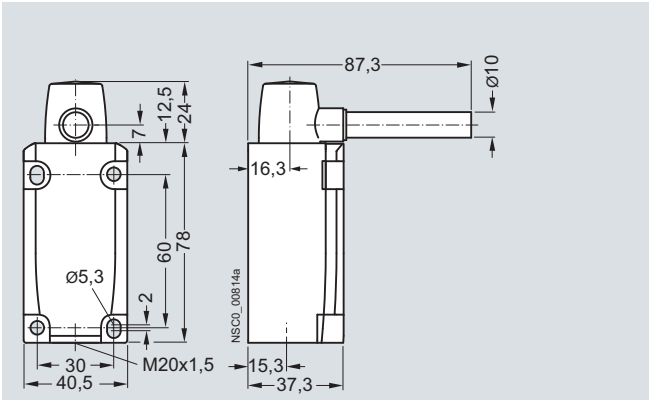
Enclosure width 31 mm with solid shaft 3SE5 232-0.U22



Enclosure width 40 mm with hollow shaft 3SE5 112-0.U21



Enclosure width 40 mm with solid shaft 3SE5 122-0.U22



Hinge Switches

3SE2, plastic enclosures
With integrated hinge

Overview

The hinge switches are used for monitoring and protecting hinged protective devices such as doors and flaps.

Characteristics

- Special design, with 2 × M20 × 1.5 connecting thread
- Degree of protection IP65
- 3 contacts
- Operating angle of 4° or 8°

Design

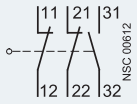
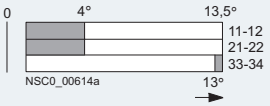
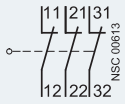
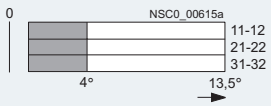
The 3SE2 283 hinge switch has an integrated electromechanical contact block that is actuated when the hinged protective cover is opened. If the cover is opened by 4° or 8°, the NC contact is positively opened by a direct (not spring-action) mechanism. These positively driven contacts guarantee interruption of the electric circuit and stopping of the machine. The NO contact is closed when the cover is moved by 13.5°.

Technical specifications

Type		3SE2 283
Rated insulation voltage U_i	V	250
Conventional thermal current I_{th}	A	2.5
Rated operational current I_e		
• At AC-15, 120 V	A	4.2
• At AC-15, 250 V	A	2
• At DC-13, 24 V	A	1
Min. make-break capacity		> 5 V/1 mA
Short-circuit protection		
• Operational class gG	A	2
Mechanical endurance		> 1 × 10^6 operating cycles
Switching frequency		1200 operating cycles/hour
Positive opening		2 mm after opening point
Enclosure material		Plastic
Degree of protection		IP65
Ambient temperature	°C	–25 ... +65
Shock resistance		30 *g*/18 ms
Resistance to vibrations		20 *g* /10 ... 200 Hz
Cable entry		2 × (M20 × 1.5)
Screw terminals		0.5 ... 1.5 mm²/AWG 15

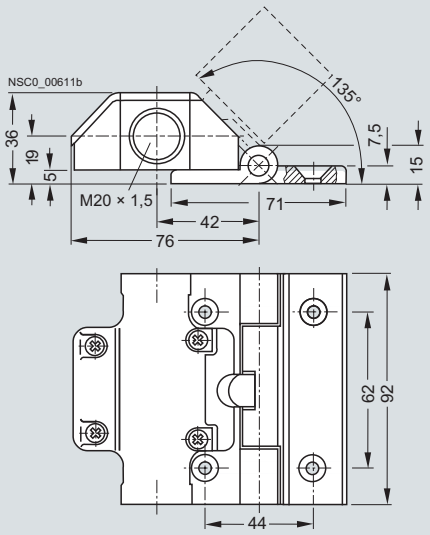
Configuration

Contact blocks and operating travel of actuators (operating angle 4°)

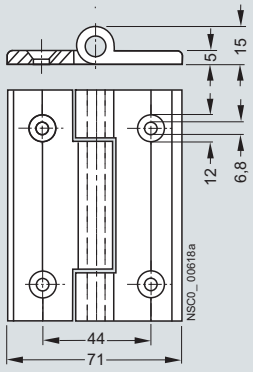
Contact blocks Terminal designation acc. to EN 50013	Nominal travel Contact closed / Contact open	Contact blocks Terminal designation acc. to EN 50013	Nominal travel
Hinge switches		*Slow-action contacts*	
1 NO + 2 NC	**3SE2 283-0GA4.**	**3 NC**	**3SE2 283-6GA4.**
			
Ident. No. **12**		Ident. No. **03**	

Dimensional drawings

3SE2 283-.GA.3 hinge switch with hinge



3SX3 225 additional hinge



Overview

The position switch in the metal enclosure including the hinge switch and the switch with a separate actuator is also available in versions for operation in areas with a gas explosion hazard and in areas with combustible dust.

To achieve the maximum possible safety in these areas, the legislators of most countries have drawn up requirements in the form of laws, regulations and standards which these switches comply with to the letter.

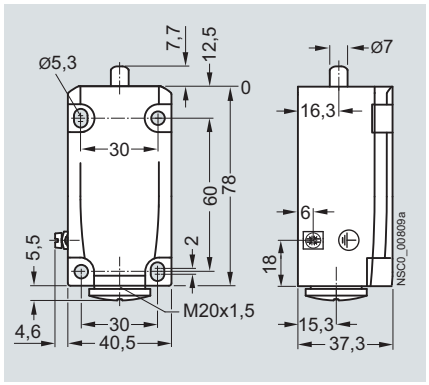
These switches comply with Directive 94/4/EC (ATEX 95) of the European Union and are approved for Zone 22.

The switches have a grounding screw on the outside of the enclosure. The connection openings are closed with protective caps upon delivery.

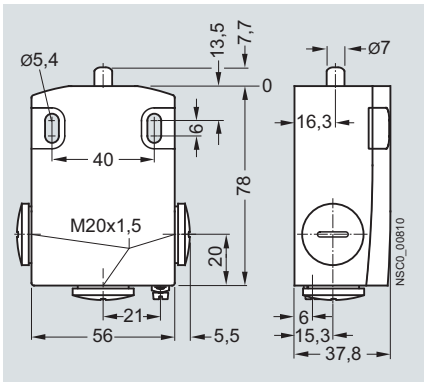
See Chapter 20 "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Dimensional drawings

Enclosure width 40 mm, EN 50041, ATEX, with M20 × 1.5 connecting thread 3SE5 112



Enclosure width 56 mm, ATEX, with M20 × 1.5 connecting thread 3SE5 122



For dimensional drawings of the operating mechanisms, see pages 20 and 21.

For actuation, see pages 16 to 18.

General data

Overview

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

Examples of selection options in the modular system

Modular system

The position switches of the 3SF1 1.4 and 3SF1 2.4 series are constructed from a modular system comprising different versions of the basic enclosure and an actuator which must be ordered separately. Thanks to the modular design of the switch the end user can select the right solution for his application from numerous versions and install it himself in a very short time.

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red): AS-i/FAULT

Connection

Connection to the AS-Interface is by means of a 4-pole M12 connector socket (plastic version) connected to the yellow AS-Interface bus cable.

The wide enclosures (50 or 56 mm) also have an M12 socket for connecting a second position switch. Category 4 according to EN 954-1 is thus achieved.

Technical specifications

Type		3SF1 1.., 3SF1 2..
General data		
Standards		IEC 60947-5-1, EN 60947-5-1, EN 1088
Acc. to AS-Interface specification		
• I/O configuration		0/B
• ID1 code/ID2 code (Hex)		F/F
• Power consumption, overall	mA	≤60
Inputs		
• Low signal range		Contact open
• High signal range		Contact closed, I_{in} dynamic (I_{peak} ≥ 5 mA)
Status display		Green/red dual LED
Rated impulse withstand voltage U_{imp}	kV	0.6
EMC resistance		
• EN 60000-1-2	kV	4
• EN 60000-4-3	V/m	10
• EN 60000-4-4 (A/B)	kV	1/2
Mechanical endurance		
• Basic switches		15 ×10^6 operating cycles
• With spring rod, 3SF1 ...-..R..		10 ×10^6 operating cycles
• With fork lever, 3SF1 1..-..T..		1 ×10^6 operating cycles
• With separate actuator, 3SF1 ...-..V..		1 ×10^6 operating cycles
PFH value		
Probability of failure upon request of the safety function, with 1 actuation per hour and B10 = 5 × 10^6		
• Basic switches		4 ×10^{-9} 1/h
• With separate actuator, 3SF1 ...-..V..		2 ×10^{-9} 1/h
• Hinge switch, 3SF1 ...-..U..		2 ×10^{-9} 1/h
Shock resistance acc. to IEC 60068-2-27		30 *g*/11 ms

Type		3SF1 23.	3SF1 24.	3SF1 11.	3SF1 12.
Enclosure					
Enclosure					
• Material		Ultramid A3X2G7		Zinc diecasting GD Zn Al4 Cu1	
• Width	mm	31	50	40	56
• Dimensions acc. to EN		EN 50047	--	EN 50041	--
Degree of protection acc. to EN 60529		IP65	IP66/IP67[1)]		
Ambient temperature					
• During operation	°C	–25 ... +60			
• Storage, transport	°C	–40 ... +80			
Mounting position		Any			

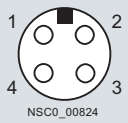
1) For twist actuators with spring rod and rod actuators: IP65/IP67.

Connector assignment

M12 connector socket, 4-pole

1 ASi +
2 Not assigned
3 ASi –
4 Not assigned

M12 socket, 4-pole



1 Channel 2
2 Channel 2
3 Not assigned
4 Not assigned

LEDs

Status display (operating state)

LEDs	No voltage on AS-Interface chip	Communication OK	Communication failed	Slave has address "0"
ASi/Fault (GN/RD)	●	☀	☀	☀

Safe inputs

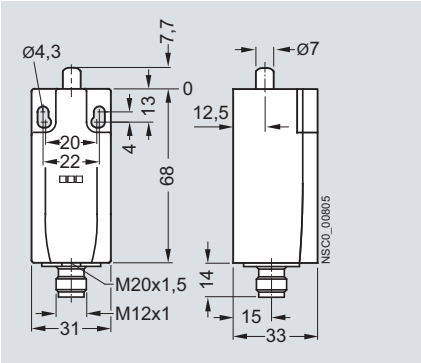
LEDs	Not actuated	Actuated
F-IN1 (YE)	●	☀
F-IN2 (YE)	●	☀

Plastic and metal enclosures

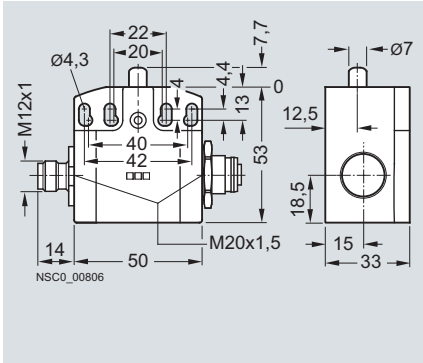
Dimensional drawings

Basic switches (without actuator)

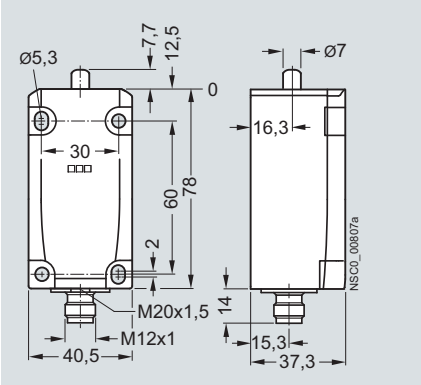
Enclosure width 31 mm, EN 50047
3SF1 234



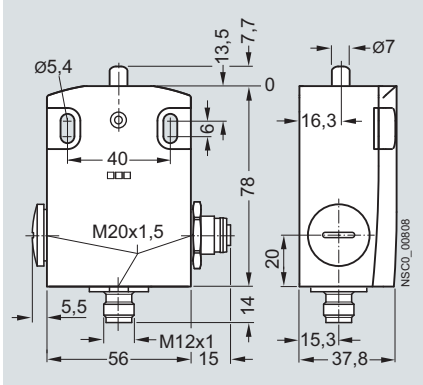
Enclosure width 50 mm
3SF1 244



Enclosure width 40 mm, EN 50041
3SF1 114



Enclosure width 56 mm
3SF1 124



For operating mechanisms, see pages 20 and 21.
For actuation, see pages 20 to 18.

For hinge switches see page 54.

Overview

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 position switches with separate actuator and with integrated ASIsafe Electronics

3SF1 position switches with separate actuator have the same enclosures as the standard switches.

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application.

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments.

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red): AS-i/FAULT

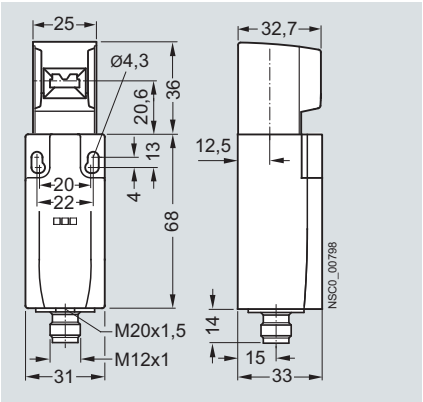
Connection

Connection to the AS-Interface is by means of a 4-pole M12 connector socket (plastic version) connected to the yellow AS-Interface bus cable.

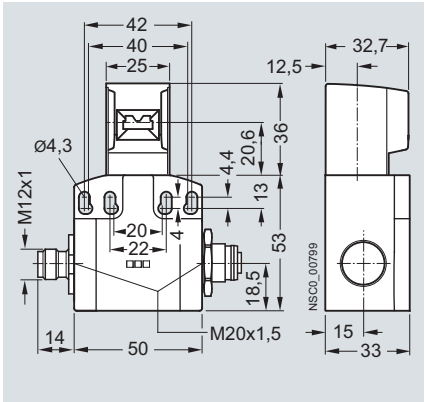
The wide enclosures (50 or 56 mm) also have an M12 socket for connecting a second position switch. Category 4 according to EN 954-1 is thus achieved.

Dimensional drawings

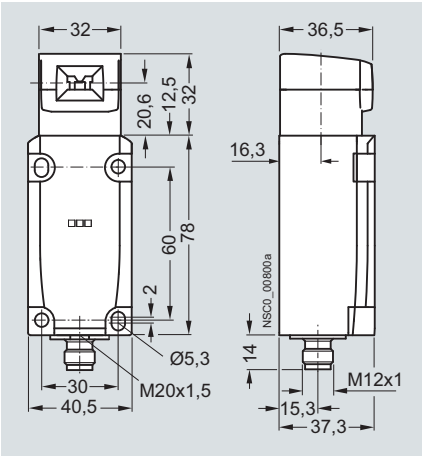
Enclosure width 31 mm, EN 50047
3SF1 234-..V..



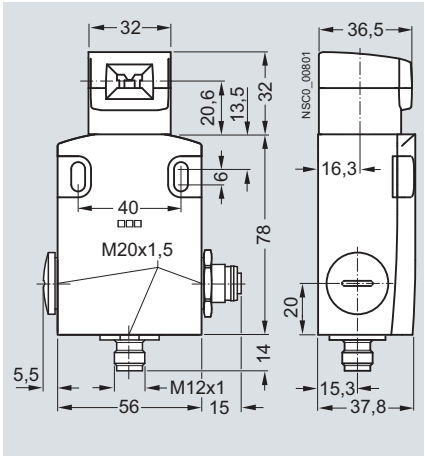
Enclosure width 50 mm
3SF1 244-..V..



Enclosure width 40 mm, EN 50041
3SF1 114-..V..



Enclosure width 56 mm
3SF1 124-..V..



For actuators see page 46.

Overview

The position switches with solenoid interlocking are exceptional, technically safe devices which restrict and prevent an unforeseen or intentional opening of protective doors, protective grilles or other covers as long as a dangerous situation is present (i. e. follow-on motion of the shutdown machine).

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 position switch with solenoid interlocking and with integrated ASIsafe electronics

Operation

The actuator head is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application.

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the actuator head from contamination is available for operation in dusty environments.

Solenoid interlocking

There are two versions for locking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Magnetic field lock (open-circuit principle)

Display

The switches have a status display with four LEDs:

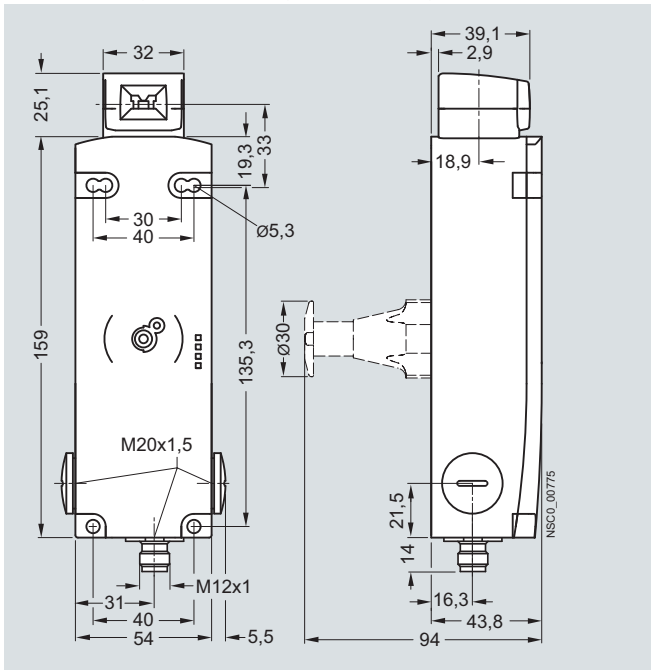
- LED 1 (green): AS-i
- LED 2 (red): FAULT
- LED 3 (yellow): F-IN1
- LED 4 (yellow): F-IN2

Connection

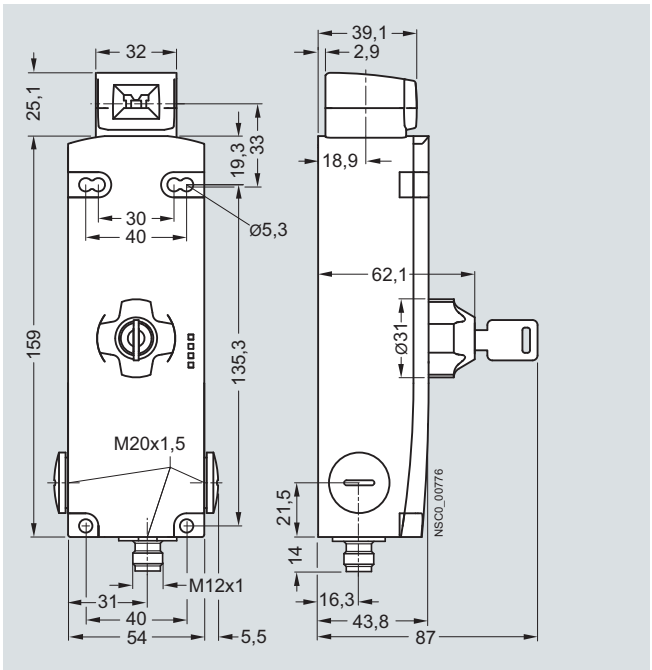
Connection to the AS-Interface is by means of a 4-pole M12 connector socket (plastic version) connected to the yellow AS-Interface bus cable (an additional supply of auxiliary power is not required thanks to the low current consumption of the magnet of max. 170 mA).

Dimensional drawings

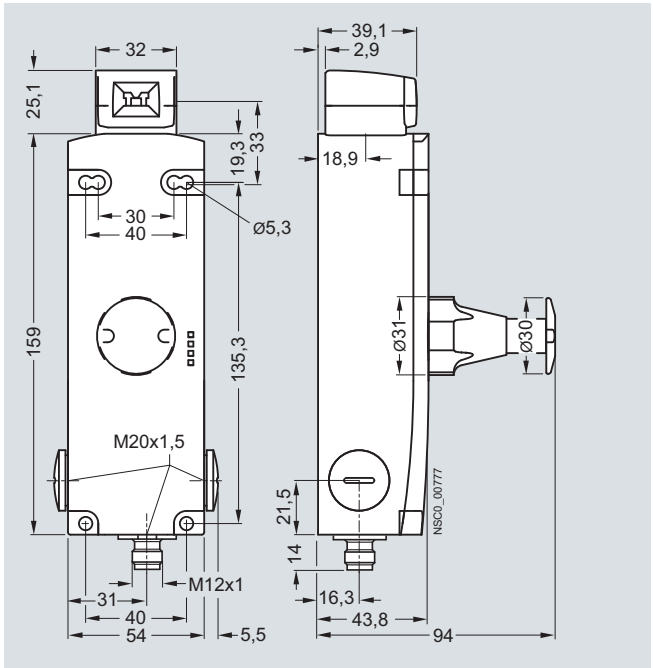
Spring-actuated lock, with auxiliary release
3SF1 324-.SD1., 3SF1 324-.SG1., 3SE5 324-.SJ1.,,
3SF1 314-.SD1., 3SF1 314-.SG1., 3SE5 314-.SJ1.,



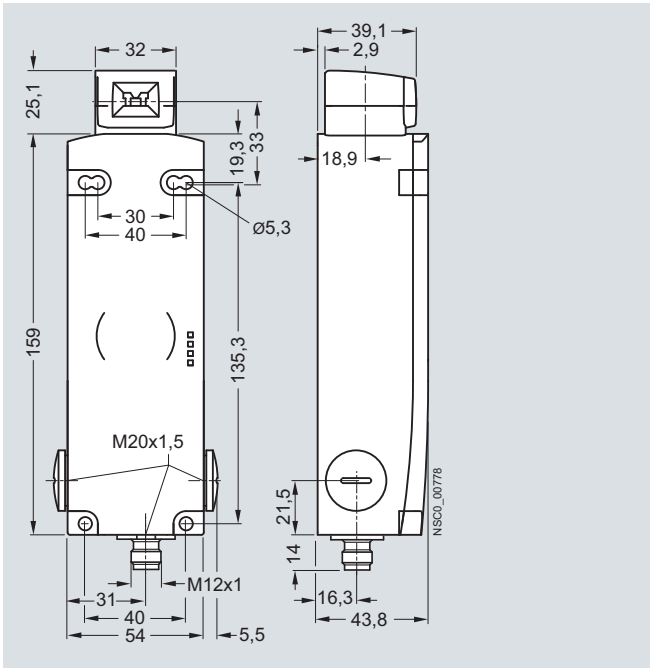
Spring-actuated lock, with auxiliary release with lock
3SF1 324-.SE1.,
3SF1 314-.SE1.



Spring-actuated lock, with escape release
3SF1 324-.SF1.,
3SF1 314-.SF1.



Magnetic field lock
3SF1 324-.SB1.,
3SF1 314-.SB1.



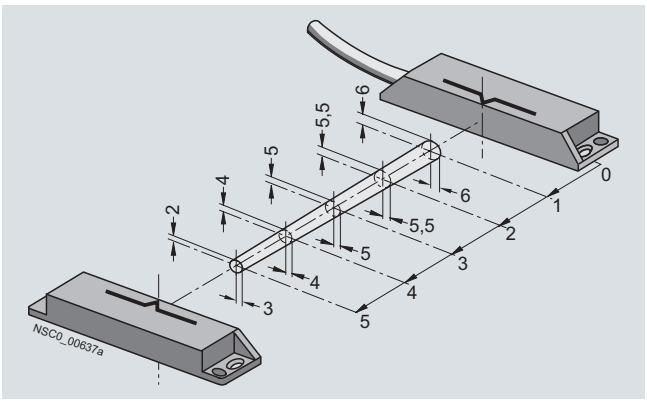
The plastic enclosures have knock-out openings behind the lateral connecting thread; they are delivered therefore without protective caps.

For actuators see page 46.

Overview

A magnetically operated switch is comprised of a coded switching magnet and a switching element (sensor unit). Evaluation requires a safety relay or connection to a bus system.

Design



Enabling range (example)

A magnetic monitoring system is comprised of a coded switching magnet, a contact block (sensor unit) and a monitoring device (see Function).

The contact block and switching magnet must not be installed on ferromagnetic materials because the switching response will be influenced. Spacers can be used to prevent this.

The contact blocks are available with either a connecting cable or connector.

Function

3SE6 806 safety relay

The 3SE6 806 safety relay has two floating enabling circuits (safe circuits) as NO contact circuits and one floating signaling circuit as a NC circuit. The number of enabling circuits can be increased by adding one or more 3TK28 30 expansion modules.

Up to six protective devices (sensors) can be connected to the safety relay. The device has six current-sourcing semiconductor outputs (Y1 ... Y6), which report the state of the connected protective devices.

Crossovers between the sensor circuits as well as ground faults and open circuits are detected by an internal monitor. The device is protected by an internal self-restoring PTC fuse (multifuse).

The green LED indicates the operating state:

- LED POWER on: Supply voltage available
- LED CHA 1 on: All NO contacts of the connected sensors are open
- LED CHA 2 on: All NC contacts of the connected sensors are closed

Combination of monitoring units and magnetically operated switches

Monitoring units		**Magnetically operated switches (switching element + switching magnet)**				**Achievable category** (EN 954-1)/ **Performance level** (EN ISO 13849-1)
		1 NC + 1 NO			2 NC	
		3SE6 605-1BA	3SE6 605-2BA	3SE6 605-3BA	3SE6 604-2BA	
		3SE6 704-1BA	3SE6 704-2BA	3SE6 704-3BA	3SE6 704-2BA	
Relay outputs						
SIRIUS safety relays, 6-fold	3SE6 806-2CD00	✔	✔	✔	--	**Cat. 3**
SIRIUS safety relays	3TK28 26	✔	✔	✔	✔	**Cat. 4/e**
Solid-state outputs						
SIRIUS safety relays	3TK28 40	--	--	--	✔	**Cat. 3/d**
	3TK28 41, 3TK28 42, 3TK28 45	--	--	--	✔	**Cat. 4/e**
SIRIUS safety relays with contactor relay	3TK28 50, 3TK28 51, 3TK28 52	--	--	--	✔	**Cat. 3/d**
	3TK28 53	--	--	--	✔	**Cat. 4/e**
SIRIUS safe load feeders	3RA71 0.	--	--	--	✔	**Cat. 3**
	3RA71 1.	--	--	--	✔	**Cat. 4**
ASIsafe compact safety modules	3RK1 205, 3RK1 405	--	--	--	✔	**Cat. 4**
SIMATIC S7-31xF-2 DP or SIMATIC ET 200M	SM 326 F, 24 DI, DC 24 V, SM 326 F, 8 DI, NAMUR	✔	✔	✔	✔	**Cat. 4**
SIMATIC ET 200S PROFIsafe	4/8 F-DI / 3 F-DO, 24 V DC	✔	✔	✔	✔	**Cat. 3**
	4/8 F-DI, 24 V DC	✔	✔	✔	✔	**Cat. 4**
SIMATIC ET 200eco	4/8 F-DI, 24 V DC	✔	✔	✔	✔	**Cat. 4**
SIMATIC ET 200pro	8/16 F-DI, 24 V DC, 4/8 F-DI / 4 F-DO 2 A, 24 V DC, F-Switch	✔	✔	✔	✔	**Cat. 4**

Magnetic monitoring systems

Technical specifications

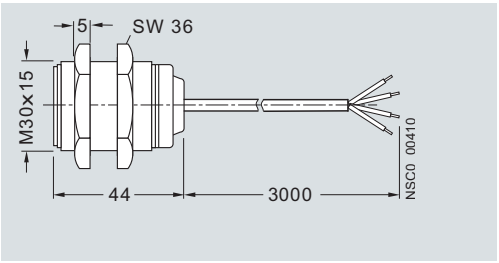
Contact blocks (sensors)				
Type		**3SE6 60.-1BA**	**3SE6 60.-2BA**	**3SE6 60.-3BA**
Design		M30	25 mm × 88 mm	25 mm × 33 mm
Standards		EN 60947-5-3 (in combination with monitoring unit or AS-Interface)		
Mode of operation		Magnetic		
Operational voltage	V	100 AC/DC	120 AC/DC	24 DC
Operational current	mA	400 mA		100 mA
Rating				
• AC	VA	10		--
• DC	W	10		1
Max. switching frequency	Hz	5		
Max. switching interval S_{on} ... S_{off}	mm	5 ... 15		4 ... 14
Enclosure				
Enclosure material		Fiber-glass strengthened thermoplast		
Degree of protection Acc. to EN 60529		IP67		
Ambient temperature				
• During operation	°C	–25 ... +70		
• During storage, transport	°C	–25 ... +70		
Shock resistance		10 *g*/11 ms		
Vibration resistance		10 ... 55 Hz, amplitude 1 mm		
Connection				
• Line		LiYY 4 × 0,25 mm, length 3 m		
• Connector socket		M12	M8	--
Max. cable length (for connection to safety relay)	m	1000		100

Safety relay		
Type		**3SE6 806-2CD00**
Standards		EN ISO 13849-1, EN 1088
Rated control supply voltage U_s	V	24 DC
Operating range		0.85 ... 1.2 × U_S
Rated power (without signaling circuits Y1 ... Y6)	W	3
Inputs		6 sensors (1 NO or 1 NC)
Outputs		6 signaling outputs, 1 relay output, 2 enabling circuits
Response time		
• Automatic start	ms	Typ. 150
• Manual start	ms	Typ. 25
Release time	ms	Max. 20
Recovery time	ms	350
Signaling circuits		
Max. load current		
• Signaling circuit Y1 ... Y6	mA	20
• Signaling circuit 31, 32	A	2
Enabling circuits		
Switching capacity Enabling circuits 13, 14, and 23, 24		
Conventional thermal current I_{th}	A	6
Rated operational current I_e at rated operational voltage U_e		
• AC-15 at 230 V	A	6 A
• DC-13		
- At 24 V	A	6
- At 115 V	A	0.2
- At 230 V	A	0.1
Short-circuit protection For enabling circuits		
DIAZED fuse links		
• gL (gG) operational class	A	6
• Quick	A	10
Enclosure		
Degree of protection Acc. to EN 60529		IP20
Ambient temperature		
• During operation	°C	–25 ... +45
• During storage, transport	°C	–25 ... +70
Connection		Screw terminals

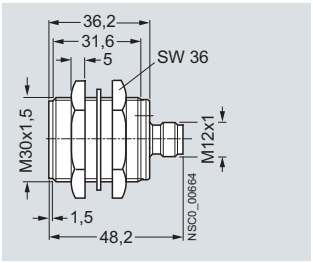
Dimensional drawings

Round magnetically operated switch

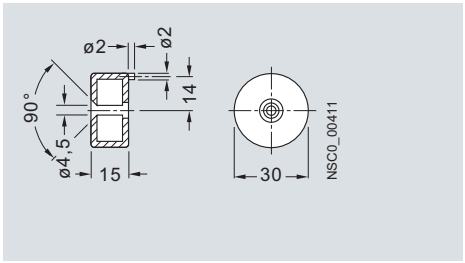
3SE6 605-1BA switching element



3SE6 605-1BA02 switching element

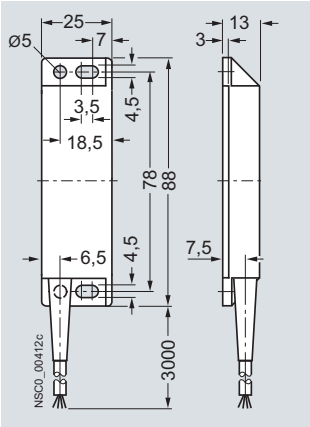


3SE6 704-1BA switching magnet

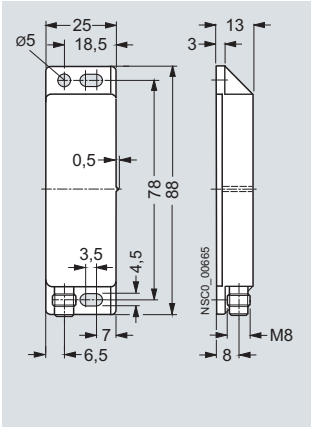


Square magnetically operated switch

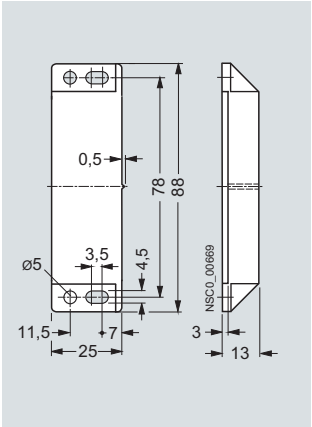
3SE6 60.-2BA switching element



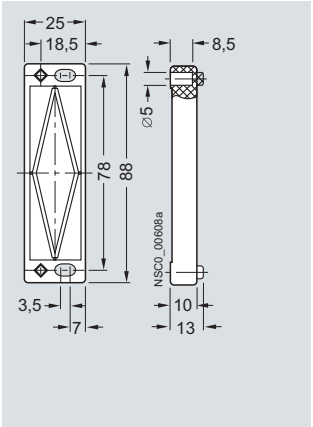
3SE6 60.-2BA01 switching element



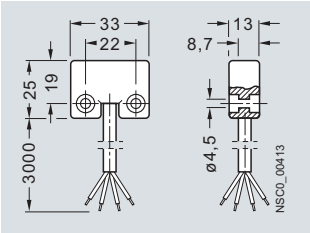
3SE6 704-2BA switching magnet



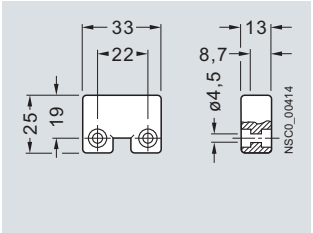
3SX3 260 spacer



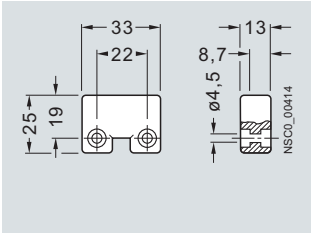
3SE6 605-3BA switching element



3SE6 704-3BA switching magnet

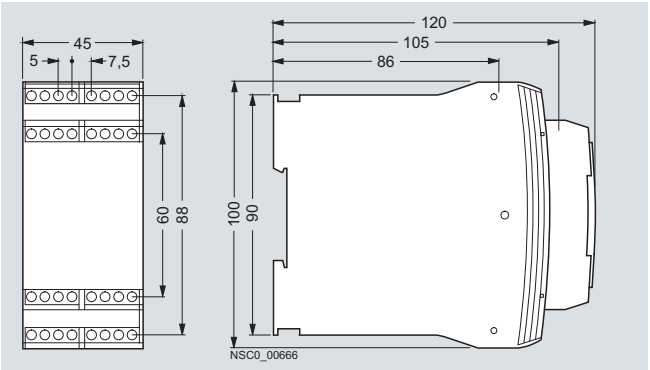


3SX3 261 spacer



Evaluation unit

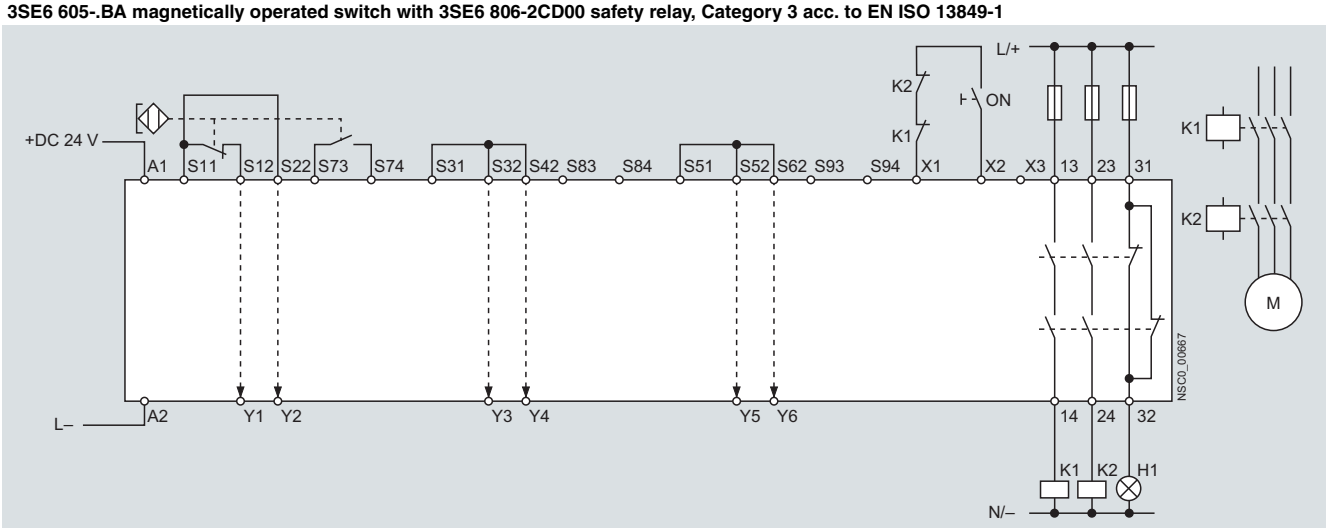
3SE6 806-2CD00 safety relay



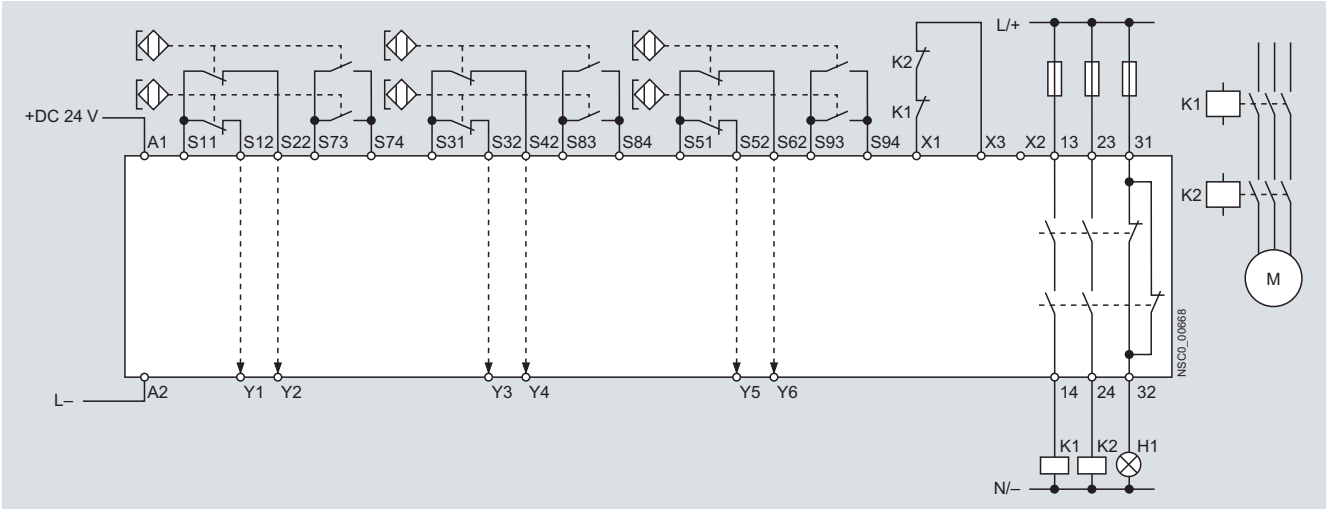
Magnetic monitoring systems

Schematics

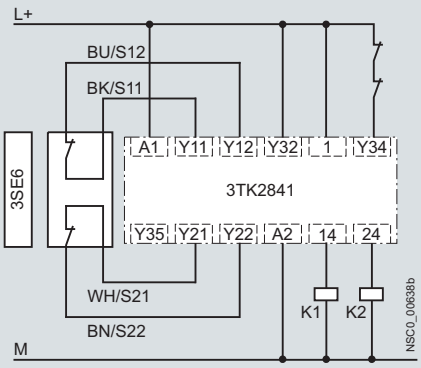
3SE6 605-.BA magnetically operated switch with 3SE6 806-2CD00 safety relay, Category 3 acc. to EN ISO 13849-1



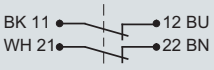
Six 3SE6 605-.BA magnetically operated switches with 3SE6 806-2CD00 safety relay, Category 3 acc. to EN ISO 13849-1



3SE6 604-.BA magnetically operated switch with 3TK28 41 safety relay, Category 4 acc. to EN ISO 13849-1



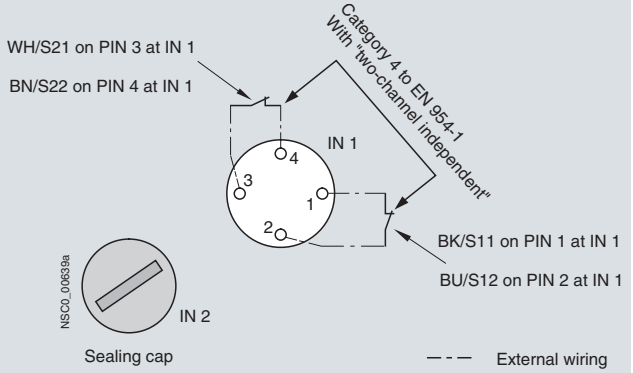
Contact block connection



NSC0_00640a

The specified switch position refers to the basic position when the cover, hinge switch etc. is closed.

3SE6 604-.BA magnetically operated switch to ASIsafe, K45F or K60F safe compact module, Category 4 acc. to EN ISO 13849-1



Color code abbreviations
for the connecting cables acc. to IEC 60757:

BK = black
BU = blue
BN = brown
WH = white

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