



3SE3 1 SIGUARD Position Switches Metal-enclosed, with Moulded Cable

Description · Technical data

Description

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 moulded cable of 2 m in length and can therefore be installed in the smallest spaces.

Both the housing and the actuator head are made of metal and therefore meet the high IP 67 degree of protection. Various actuator heads, in the form of roller plungers, overtravel plungers and roller cranks, are available.

They can either be fitted with slow-action contacts or snap-action contacts. The NC contact complies in each case with the requirements for positive opening according to IEC 60 947-5-1.

The 3SE3 1 position switch with moulded cable is available in different sizes: The 3SE3 180 switch series has a **30 mm housing** to the EU standard with drilled holes at a spacing of 20 mm.

The housing of the 3SE 160 series is **40 mm** wide in accordance with the requirements of the US market with drilled holes at a spacing of 25 mm.

Technical data

Speed	1 to 1500 mm/s
Switching frequency	30/minute
Rated insulation voltage U_i	500 V
Conventional thermal current I_{th}	10 A
Pollution degree	Class 3
Ambient temperature	-35°C to +85°C
Mechanical endurance	10 × 10 ⁶ operations
Electrical endurance	500 000 operations
Contact opening	2 × 1.25 mm
Connecting cable (2 m)	V5F-5 × 0.75 mm ² (18 AWG); bn-bu: S, bk-bk: NC, ye/gy: 0 V IP 67
Degree of protection	IP 67

Selection and ordering data

2 contacts · Degree of protection IP 67

	Actuator	Enclosure with mm	3SE3 1 position switches with 2 snap-action contacts		3SE3 1 position switches with 2 slow-action contacts		Weight approx. kg
			Order No.	Price 1 unit	Order No.	Price 1 unit	
3SE3 1.0-1C			 Identification number 11 acc. to EN 50 013		 Identification number 11 acc. to EN 50 013		
3SE3 1.0-1D	<i>Overtravel plunger</i>	30 40 (with M12 thread fixing)	3SE3 180-1C 3SE3 160-1C		3SE3 180-0C 3SE3 160-0C	0.3 0.33	
	<i>Roller plunger</i>	30 40	3SE3 180-1CJ 3SE3 160-1CJ		3SE3 180-0CJ 3SE3 160-0CJ	0.31 0.34	
3SE3 1.0-1G	<i>Roller crank</i>	30 40 (with M12 thread fixing)	3SE3 180-1D 3SE3 160-1D		3SE3 180-0D 3SE3 160-0D	0.31 0.34	
		30 40	3SE3 180-1DJ 3SE3 160-1DJ		3SE3 180-0DJ 3SE3 160-0DJ	0.32 0.35	
		30 40	3SE3 180-1G 3SE3 160-1G		3SE3 180-0G 3SE3 160-0G	0.35 0.38	

Contacts and travel

Switch block	Nominal travel
Internal circuit diagram	0-line Ref. line acc. to EN 50 041
Terminal designation acc. to EN 50 013	** Positive opening acc. to IEC 60 947-5-1-3
Snap-action contacts 1 NO + 1 NC	3SE3 1.0-1C., -1D. 3SE3 1.0-1G

Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.

3SE3 1, 3SE3 2 SIGUARD Position Switches

Moulded-Plastic/Metal-Enclosed, with Separate Actuator



Description

Application

Safety position switches (limit switches) with separate actuator are used where the position of doors, covers or safety screens must be monitored for safety reasons. For example, they are used together with 3TK28 back-up combination units, up to safety category 4.

Design

The compact position switch can only be operated with the matching triple-coded actuator. Simple overruling by hand or auxiliary devices is impossible.

Positive opening

The switch can be used in safety circuits due to the positive opening of the NC and positive closing of the NO contacts by pulling the actuator. The position switch must not be used as an end stop.

The actuator with actuation from the side can be turned through $4 \times 90^\circ$. It cannot be interchanged with actuators of the standards switches.

Contact reliability

The moving contacts are designed as double break contacts (for 3SE...-8, as single break contacts). This increases the contact reliability even when the switch has to be operated with low voltages and currents, e. g. DC 5 V/1 mA.

The switching point of the snap action contacts is independent of the switching corrosion: Mounting dimensions when using the switch as a safety position switch is as follows: 20 mm (moulded-plastic), 30 mm (metal-enclosed), or the switch has to be locked with a pin or has a stop fitted.

The moulded-plastic safety position switches have mountings in accordance with EN 50 047 and the metal-enclosed safety position switches have mountings in accordance with EN 50 041. Our scope of supply includes a SIGUARD position switch with separate actuator outside of the standards but with the conventional points which these forms have.

The matching of the economical mounting situation can be done by simply turning the actuator head by 180° , whereby each two ways make it possible to have four different operating directions.

When used the switch has only one opening so that no external bodies can get into the switch, so that the switch operation is not influenced.

The extraction force of the actuator is 30 N or 5 N. The option of an actuator with ball locating for this type allows the extraction force to be increased to 100 N. The switch is available in two housings of the same width but different lengths with 2 NC/1 NO or 1 NC.

The switch is fitted by using two elongated or round holes (all have a clearance of 40 mm) and can be mounted from the front. Three Pg 11 cable inlets allow different connection directions and wiring methods.

Radius actuator

SIGUARD position switches with radius actuators are particularly suitable for rotatable protection devices. The movable actuation key allows even small radii to be approached. Breaking of the actuator due to inaccurate approach is prevented.

Approvals

The 3SE3 200 moulded-plastic enclosed safety position switch and the 3SE3 120 metal-enclosed safety position switch have been given an approval test certificate from the BIA (Berufsgenossenschaftliches Institut für Arbeitssicherheit) and the Schweizer Unfallversicherungsanstalt (SUVA).

The 3SE3 243 and 3SE3 257 metal-enclosed safety position switches also have been given an approval test certificate from the BIA (Berufsgenossenschaftliches Institut für Arbeitssicherheit).

Technical data

Rated insulation U_i		500 V				
Short-circuit protection ¹⁾ DIAZED-fused		Utilization category gL/gG 6 A, Characteristic quick response: 10 A				
Mechanical endurance		$> 1 \times 10^6$ make-break operations				
Electrical endurance		$> 1 \times 10^6$ make-break operations with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors 0.5×10^6 make-break operations when interrupting I_e / AC-15 at 230 V With DC, 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.				
Rated operational voltage U_e Conventional free-air thermal current I_{th}		AC 500 V, over AC 380 V only equal potential 10 A				
Rated operational current I_e		AC 40 to 60 Hz				
		DC				
	U_e V	I_e / AC-12 A	I_e / AC-15 A	U_e V	I_e / DC-12 A	I_e / DC-13 A
	24	10	10	24	10	10
	125	10	10	48	6	4
	230	10	6	110	4	1
	400	10	4	220	1	0.4
	500	10	3	440	0.5	0.2
Cable entry	3SE3 1 3SE3 2 3SE3 257, 3SE3 243	Pg 13.5 Pg 13.5 3 × Pg 11				
Ambient temperature	3SE3 2 3SE3 1	-30 to +85 °C -40 to +85 °C				
Degree of protection DIN VDE 0470 and IEC 60 529	3SE3 200 3SE3 1, 3SE3 24, 3SE3 25	IP 67 IP 67				
Conductor cross-section	3SE3 1, 3SE3 2 3SE3 257, 3SE3 243	max. $2 \times 2.5 \text{ mm}^2$, solid, max. $2 \times 1.5 \text{ mm}^2$, finely-stranded with end sleeve $1 \times 0.5 - 1.5 \text{ mm}^2$, solid or finely-stranded with end sleeve $2 \times 0.5 - 1 \text{ mm}^2$, solid or finely-stranded with end sleeve				
Mounting position		any				

1) Without any welding acc. to DIN VDE 0660 Part 200.



3SE3 1, 3SE3 2 SIGUARD Position Switches Moulded-Plastic/Metal-Enclosed, with Separate Actuator

Selection and ordering data

2 contacts · Moving double-break contacts ¹⁾

Actuation/Fixing	Enclosure width	Length of actuator	3SE3 position switches		3SE3 1 position switches		Wght. appr.	
			with 2 slow-action contacts	with 2 slow-action contacts	with 2 slow-action contacts	with 2 slow-action contacts		
			<p>6 mm stroke</p> <p>Identification number 11 acc. to EN 50 013</p>		<p>6 mm stroke</p> <p>Identification number 02 acc. to EN 50 013</p>			
			Order No.	Price	Order No.	Price		
			Preferred type	1 unit		1 unit		kg
Moulded-plastic enclosed IP 65								
<p>3SE3 200-0XX03</p> <p>Side actuation</p> <ul style="list-style-type: none"> • Mounting acc. to EN 50 047 <p>Front-end actuation</p> <ul style="list-style-type: none"> • Mounting acc. to EN 50 047 	31		→ 3SE3 200-0XX03		→ 3SE3 200-6XX03		0.18	
			→ 3SE3 200-0XX04		→ 3SE3 200-6XX04		0.18	
<p>3SX3 196</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard actuator 		50 70					0.18 0.18	
<p>3SE3 200-0XX13</p> <p>5 directions of approach</p> <ul style="list-style-type: none"> • Mounting acc. to EN 50 047 	31		→ 3SE3 200-0XX13		→ 3SE3 200-6XX13		0.18	
<p>3SX3 220</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard • With transverse fixing • Radius actuator 		44 36 44					0.1 0.1 0.1	
	<p>3SX3 222</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard • With transverse fixing • Radius actuator 							
Metal-enclosed IP 67								
<p>3SE3 120-0XX</p> <p>Side actuation</p> <ul style="list-style-type: none"> • Mounting acc. to EN 50 041 	40		→ 3SE3 120-0XX		→ 3SE3 120-6XX		0.3	
<p>3SX3 197</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard • With transverse fixing • Radius actuator (universal) 		79 79 90					0.3 0.3 0.3	
	<p>3SX3 206</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard • With transverse fixing • Radius actuator (universal) 							
		<p>3SX3 203</p> <p>Actuator</p> <ul style="list-style-type: none"> • Standard • With transverse fixing • Radius actuator (universal) 						

See for operation, operating speed and travel on page 8/45.

→ Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.

1) Supplied without actuator.

3SE3 2 SIGUARD Position Switches Moulded-Plastic Enclosed, with Separate Actuator



Selection and ordering data

3 contacts · Moving double-break contacts¹⁾

Actuation/Fixing	Enclosure width	Length of actuator	3SE3 position switches with 3 slow-action contacts	Wght. app.	3SE3 position switches with 1 slow-action contact	Wght. app.	
			<p>Identification number 12 acc. to EN 50 013</p>		<p>Identification number 01 acc. to EN 50 013</p>		
	mm	mm	Order No.	Price	Order No.	Price	
			Preferred type	1 unit		1 unit	kg

Moulded-plastic enclosed IP 67

3SE3 243-0XX Side and front-end actuation



- Extraction force 5 N 52
- Extraction force 30 N 52
- With automatic ejection 52

→ 3SE3 243-0XX40	0.14
→ 3SE3 243-0XX	0.14
→ 3SE3 243-0XX30	0.14

→ 3SE3 257-6XX40	0.10
→ 3SE3 257-6XX	0.10
→ 3SE3 257-6XX30	0.10

Actuator

3SX3 218



- Standard actuator ($r_{min.} = 150$ mm) 27

3SX3 218	
3SX3 228	

- Radius actuator (universal) ($r_{min.} = 38$ mm) 33

3SX3 228



- Ball locating (up to 100 N)

3SX3 217	
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Accessories

3SX3 217



- Slit cover (1 set = 3 units)

3SX3 233	
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See for operation, operating speed and travel on page 8/45.

→ Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.

1) Supplied without actuator.



3SE3 1, 3SE3 2 SIGUARD Position Switches

Moulded-Plastic/Metal-Enclosed, with Separate Actuator

Operation, operating speed and travel

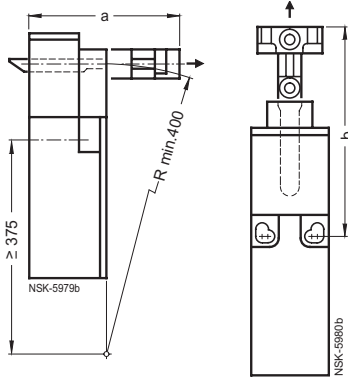
Actuator	Operation by a separate bar	Switch blocks	Nominal travel and related terminals	Minimum force required in direction of operation on extraction
	v_{max} max. operating speed \rightarrow direction of operation Radius operation: for all approach directions	Internal circuit diagram Terminal designation acc. to EN 50 013	 Operation in actuator head; NC closed	

Separate operation

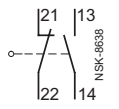
Side operation
 $v_{max} = 1.5 \text{ m/s}$

End operation, axial
 $v_{max} = 1 \text{ m/s}$

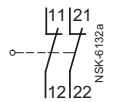
3SE3 200-XX03, -XX04



Slow-action contacts



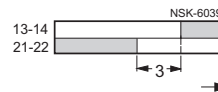
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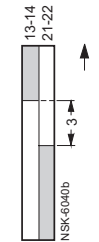
Identification number **02**

Actuator	a	b
Short	42 to 45	66.5 to 69
Long	62 to 65	86.5 to 89

perpendicular to plunger axis



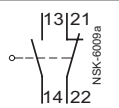
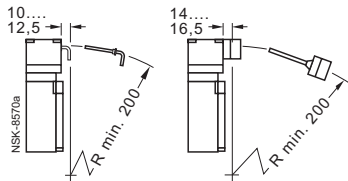
end operation



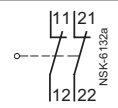
10 N

Side and axial operation (4 x 90°)

3SE3 200-XX13



Identification number **11**

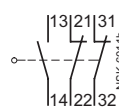
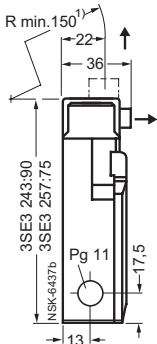


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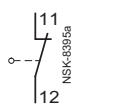
10 N

Side and axial operation

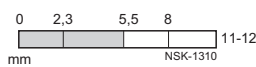
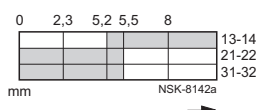
3SE3 243-XX..., 3SE3 257-XX...



Identification number **12**



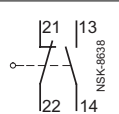
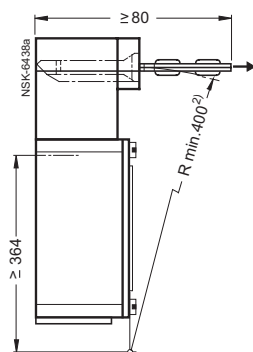
Identification number **01**



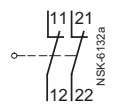
30 N or 5 N

Side operation
 $v_{max} = 1 \text{ m/s}$

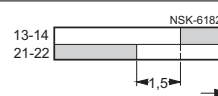
3SE3 120-XX



Identification number **11**



Identification number **02**



10 N

1) Radius operator: $R_{min} > 38 \text{ mm}$.
 2) Radius operator (universal): $R_{min} > 70 \text{ mm}$.

3SE3 7, 3SE3 8 SIGUARD Position Switches Moulded-Plastic/Metal-Enclosed, with Tumbler



Description

Application

SIGUARD position switches with tumbler 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. operation of moving parts after the machine has been switched off). The safety switch with tumbler basically has two main functions:

- Enabling the machine with closed and locked protective system
- Locking the machine with opened protective system.

Design

The separate actuator operates in a similar way to the coding of a key and protects against manipulation. It transmits the locking force to the protection system and helps to monitor its position.

In the standard version, the SIGUARD position switch locks by means of spring force and releases by means of electromagnetic force (closed-circuit principle). When a power failure occurs, it prevents components which are still rotating from opening.

For emergency situations or in setup mode, the switch is equipped with an auxiliary release which is secured against unauthorized use either with a seal or lock. This means that release is still possible even when a power failure occurs.

The second version offers locking by means of electromagnetic force and release by means of spring force (open-circuit principle). This version has an advantage when it is important to get at components when a power failure has occurred.

SIGUARD position switches with tumblers are offered in moulded-plastic or metal housings.

The contact arrangement can be selected with either 2 contacts (fail-safe monitoring of the position of the magnets with positive opening NC contacts) or 4 contacts (additional monitoring of the actuator or position of the protective doors).

The mechanical design of the switches complies with the requirements of the fail-safe principle in accordance with EN 1088, whereby it is not possible to close the NC contacts when the door is open.

Operation

The operating mechanism with side actuation can be adjusted through $4 \times 90^\circ$. The switch is also accessible from the top.

A universal radius actuator is available for small actuating radii; the actuator can be moved in all 4 directions.

The actuators are not included in the scope of supply of the switch and must be ordered separately.

Approvals

The metal-enclosed SIGUARD position switches with tumbler have been awarded a test certificate from the BIA (**B**erufsgenossenschaftliches **I**nstitut für **A**rbeitssicherheit).

The switches are approved for use with locking devices that accord to EN 1088 and EN 292, Parts 1 and 2.

Technical data

Rated insulation voltage U_i	UC 250 V					
Power consumption U_s	5.5 W					
Short-circuit protection ¹⁾ DIAZED-fuses Mechanical endurance Electrical endurance	Utilization category gL/gG: 6 A, Characteristic quick response: 10 A 1×10^6 operating cycles 1×10^6 operating cycles with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) 0.5×10^6 operating cycles when interrupting I_e / AC-15 at 230 V With DC, 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.					
for AC-15 duty for DC-13 duty						
Rated operational current I_e	AC 40 to 60 Hz			DC		
	U_e V	I_e / AC-12 A	I_e / AC-15 A	U_e V	I_e / DC-12 A	I_e / DC-13 A
	24	10	4	24	10	3
	60	10	4	60	5	1.5
	110	10	4	110	2.5	0.7
	230	10	4	230	1	0.3
Cable entry	Pg 13.5					
Ambient temperature	-30 to +70 °C					
Degree of protection acc. to DIN VDE 0470 and IEC 60 529	IP 66					
Conductor cross-section	2 × 2.5 mm ² , solid, 2 × 1.5 mm ² , finely stranded with end sleeves					
Mounting position	any					
Rated operational voltage U_e	DC 24 V AC 110-130 V/AC 230 V 50/60 Hz					
Conventional free-air thermal current I_{th}	10 A					



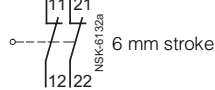


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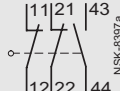

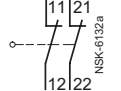





3SE3 7 SIGUARD Position Switches Moulded-Plastic Enclosed, with Tumbler

Selection and ordering data

2 or 4 contacts · Degree of protection IP 66 · 5 directions of approach · Locking force 1200 N ¹⁾

Tumbler	Design	3SE3 7 position switches		3SE3 7 position switches		3SE3 7 position switches		Weight app. kg				
		with 2 slow-action contacts (position monitoring of magnet)	with 2 slow-action contacts (position monitoring of magnet)	Position monitoring of actuator	Position monitoring of magnet							
3SE3 76-2XX00 		 6 mm stroke Identification number 11 acc. to EN 50 013	 6 mm stroke Identification number 02 acc. to EN 50 013	 Identification number 01 acc. to EN 50 013	 Identification number 01 acc. to EN 50 013	Order No.	Price 1 unit	Order No.	Price 1 unit	Order No.	Price 1 unit	
	Spring actuated lock	Standard with sealable aux. release	→ 3SE3 76□-2XX00	→ 3SE3 76□-8XX00	→ 3SE3 76□-7XX00							
		Aux. release with lock	→ 3SE3 76□-2XX01	→ 3SE3 76□-8XX01	→ 3SE3 76□-7XX01							
Magnetic field lock	–	→ 3SE3 75□-2XX00	→ 3SE3 75□-8XX00	→ 3SE3 75□-7XX00								
Order No. suffix												
Rated operational voltage of solenoid												
• DC 24 V			0		0		0		0		0	
• AC 230 V			1		1		1		1		1	
• AC 110 V			2		2		2		2		2	

Tumbler	Design	3SE3 7 position switches		3SE3 7 position switches		Weight app. kg			
		with 4 slow-action contacts Position monitoring of magnet	Position monitoring of actuator	with 4 slow-action contacts Position monitoring of magnet	Position monitoring of actuator				
		 Identification number 12 acc. to EN 50 013	 Identification number 01 acc. to EN 50 013	 Identification number 02 acc. to EN 50 013	 Identification number 02 acc. to EN 50 013	Order No.	Price 1 unit	Order No.	Price 1 unit
Spring actuated lock	Standard with sealable aux. release	→ 3SE3 76□-3XX00		→ 3SE3 76□-6XX00					
	Aux. release with lock	→ 3SE3 76□-3XX01		→ 3SE3 76□-6XX01					
Magnetic field lock	–	→ 3SE3 75□-3XX00		→ 3SE3 75□-6XX00					
Order No. suffix									
Rated operational voltage of solenoid									
• DC 24 V			0		0		0		0
• AC 230 V			1		1		1		1
• AC 110 V			2		2		2		2

Actuator	Order No.	Price 1 unit	Weight app. kg
3SX3 226 • Standard actuator	3SX3 226		
 • Transverse fixing	3SX3 227		
• Radius actuator	3SX3 222		
3SX3 227 3SX3 222 			

See for operation, operating speed and travel on page 8/51.

→ Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.


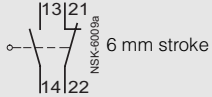
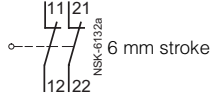


1) Supplied without actuator.

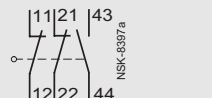

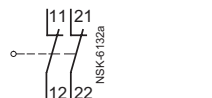
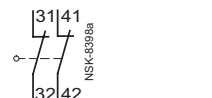
3SE3 8 SIGUARD Position Switches Metal-Enclosed, with Tumbler



Selection and ordering data

2 or 4 contacts · Degree of protection IP 66 · 5 directions of approach · Locking force 1200 N¹⁾

3SE3 86.-2XX01	Tumbler	Design	3SE3 8 position switches		3SE3 8 position switches		3SE3 8 position switches		Weight app. kg	
			with 2 slow-action contacts (position monitoring of magnet)	with 2 slow-action contacts (position monitoring of magnet)	with 2 slow-action contacts (position monitoring of actuator)	with 2 slow-action contacts (position monitoring of magnet)	with 2 slow-action contacts (position monitoring of actuator)	with 2 slow-action contacts (position monitoring of magnet)		
			 6 mm stroke NSK-6009a Identification number 11 acc. to EN 50 013	 6 mm stroke NSK-6132a Identification number 02 acc. to EN 50 013	 NSK-6395a Identification number 01 acc. to EN 50 013	 NSK-6396a Identification number 01 acc. to EN 50 013				
	Spring actuated lock	Standard with sealable aux. release	→	3SE3 86□-2XX00	→	3SE3 86□-8XX00	→	3SE3 86□-7XX00		
		Aux. release with lock	→	3SE3 86□-2XX01	→	3SE3 86□-8XX01	→	3SE3 86□-7XX01		
Magnetic field lock	–	→	3SE3 85□-2XX00	→	3SE3 85□-8XX00	→	3SE3 85□-7XX00			
Order No. suffix										
Rated operational voltage of solenoid										
• DC 24 V			0	0	0	0	0			
• AC 230 V			1	1	1	1	1			
• AC 110 V			2	2	2	2	2			

	Tumbler	Design	3SE3 8 position switches		3SE3 8 position switches		Weight app. kg
			mit 4 slow-action contacts Position monitoring of magnet	mit 4 slow-action contacts Position monitoring of actuator	mit 4 slow-action contacts Position monitoring of magnet	mit 4 slow-action contacts Position monitoring of actuator	
			 NSK-6397a Identification number 12 acc. to EN 50 013	 NSK-6015a Identification number 01 acc. to EN 50 013	 NSK-6132a Identification number 02 acc. to EN 50 013	 NSK-6398a Identification number 02 acc. to EN 50 013	
Spring actuated lock	Standard with sealable aux. release	→	3SE3 86□-3XX00		→	3SE3 86□-6XX00	
	Aux. release with lock	→	3SE3 86□-3XX01		→	3SE3 86□-6XX01	
Magnetic field lock	–	→	3SE3 85□-3XX00		→	3SE3 85□-6XX00	
Order No. suffix							
Rated operational voltage of solenoid							
• DC 24 V			0		0		
• AC 230 V			1		1		
• AC 110 V			2		2		

Actuator	Order No.	Price 1 unit	Weight app. kg
3SX3 226	• Standard actuator 3SX3 226		
	• Transverse fixing 3SX3 227		
	• Radius actuator 3SX3 222		
3SX3 227	3SX3 222		
			

See for operation, operating speed and travel on page 8/51.

→ Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.

1) Supplied without actuator.



3SE3 8 SIGUARD Position Switches Metal-Enclosed, with Tumbler

Description

Application

SIGUARD position switches with tumbler 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. operation of moving parts after the machine has been switched off). The safety switch with tumbler basically has two main functions:

- Enabling the machine with closed and locked protective system
- Locking the machine with opened protective system.

Design

The separate actuator operates in a similar way to the coding of a key and protects against manipulation. It transmits the locking force to the protection

system and helps to monitor its position.

In the standard version, the SIGUARD position switch locks by means of spring force and releases by means of electromagnetic force (closed-circuit principle). When a power failure occurs, it prevents components which are still rotating from opening. For emergency situations or in setup mode, the switch is equipped with an auxiliary release. This means that release is still possible even when a power failure occurs.

The second version offers locking by means of electromagnetic force and release by means of spring force (open-circuit principle). This version has an advantage when it is important to get at components when a power failure has occurred. The SIGUARD position switches with tumbler meet the requirements of EN 50 041 with regard to their mounting dimensions.

Operation

The operating mechanism with side actuation can be adjusted through $4 \times 90^\circ$. A special, lengthened actuator is included in the scope of delivery for the approach direction from the left. A universal radius actuator is available for small actuating radii; the actuator can be moved in all 4 directions.

Optical signalling device

The signalling device gives an optical indication of the position of the lock and of the protective device by means of 2 LEDs in the enclosure (only in the case of contact arrangements 1 NO/1 NC + 1 NO/1 NC).

Approvals

The metal-enclosed SIGUARD position switches with tumbler have been awarded a test certificate from the BIA (Berufsgenossenschaftlichen Instituts für Arbeitssicherheit).

The switch is approved for locking devices according to EN 1088 and EN 292, Parts 1 and 2.

Protective device	Tumbler	Indication	Meaning
Closed	Open	Yellow and green	Actuator free to be pulled
Closed	Closed	Green	Actuator locked
Open	Open	Yellow	Actuator pulled

Technical data

Rated insulation voltage U_i	UC 250 V					
Power consumption at U_s	5.2 W					
Short-circuit protection ¹⁾ DIAZED-fuses Mechanical endurance Electrical endurance	Utilization category gL/gG: 6 A, Characteristic quick response: 10 A 1×10^6 operating cycles 1×10^6 operating cycles with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors 0.5×10^6 operating cycles when interrupting I_e / AC-15 at 230 V With DC, 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.					
for AC-15 duty for DC-13 duty						
Rated operational voltage U_e	DC 24 V AC 110-130 V/AC 230 V 50/60 Hz					
Conventional thermal current I_{th}	10 A					
Rated operational current I_e	AC 40 to 60 Hz			DC		
	U_e V	I_e / AC-12 A	I_e / AC-15 A	U_e V	I_e / DC-12 A	I_e / DC-13 A
	24	10	4	24	10	3
	60	10	4	60	5	1.5
	110	10	4	110	2.5	0.7
	230	10	4	230	1	0.3
Cable entry	Pg 13.5					
Ambient temperature	-30 to +70 °C					
Degree of protection acc. to DIN VDE 0470 and IEC 60 529	IP 67					
Conductor cross-section	$2 \times 2.5 \text{ mm}^2$, solid $2 \times 1.5 \text{ mm}^2$, finely stranded with end sleeve					
Mounting position	any					

1) Without any welding acc. to DIN VDE 0660 Part 200.

3SE3 8 SIGUARD Position Switches Metal-Enclosed, with Tumbler



Selection and ordering data

4 contacts · Moving double break contacts · Degree of protection IP 67 · Heavy duty version · Locking force 2000 N 1)

Tumbler	Design	3SE3 8 position switches		
1 NO + 1 NC/2 NC		with 4 slow-action contacts		
Position monitoring of actuator	Position monitoring of magnet			
Identification number 11 acc. to EN 50 013	Identification number 02 acc. to EN 50 013	Order No.	Price 1 unit	Weight app. kg
Spring actuated lock	Standard with sealable aux. release	→ 3SE3 84□-0XX00		
	Aux. release with lock	→ 3SE3 84□-0XX01		
Magnetic field lock	Standard	→ 3SE3 83□-0XX00		
2 NC/2 NC				
Position monitoring of actuator	Position monitoring of magnet			
Identification number 02 acc. to EN 50 013	Identification number 02 acc. to EN 50 013			
Spring actuated lock	Standard with sealable aux. release	→ 3SE3 84□-6XX00		
	Aux. release with lock	→ 3SE3 84□-6XX01		
Magnetic field lock	Standard	→ 3SE3 83□-6XX00		
1 NO + 1 NC/1 NO + 1 NC				
Position monitoring of actuator	Position monitoring of magnet			
Identification number 11 acc. to EN 50 013	Identification number 11 acc. to EN 50 013			
Spring actuated lock with optical signalling equipment	Sealable aux. release	→ 3SE3 84□-1XX20		
	Aux. release with lock	→ 3SE3 84□-1XX32		
Magnetic field lock	Standard	→ 3SE3 83□-1XX00		
	with optical signalling equipment	→ 3SE3 83□-1XX20		
Order No. suffix				
Rated operational voltage of solenoid				
• DC 24 V				0
• AC 230 V				1
• AC 110 V				2

Actuator	Length of actuator	Order No.	Price 1 unit	Weight app. kg
3SX3 197	Standard actuator	79 mm	3SX3 197	
3SX3 207	– for approach from the left	132 mm	3SX3 207	
3SX3 206	– with transverse fixing	50 mm	3SX3 206	
3SX3 203	Radius actuator (universal)	80 mm	3SX3 203	

See for operation, operating speed and travel on page 8/51.

→ Safety function according to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200.

1) Supplied without actuator.



3SE3 SIGUARD Position Switches

Moulded-Plastic/Metal-Enclosed, with Tumbler

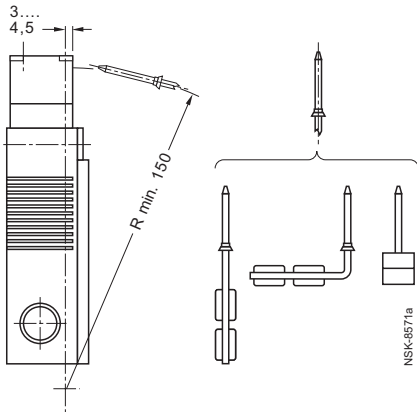
Operation, operating speed and travel

Actuator	Operation with separate actuator	Switch block	Nominal travel and related terminals	Minimum force required in direction of operation
	v_{max} max. operating speed \rightarrow direction of operation	Internal circuit diagram Terminal designation acc. to EN 50 013	 contact closed contact open	Actuator in actuator head; NC is closed

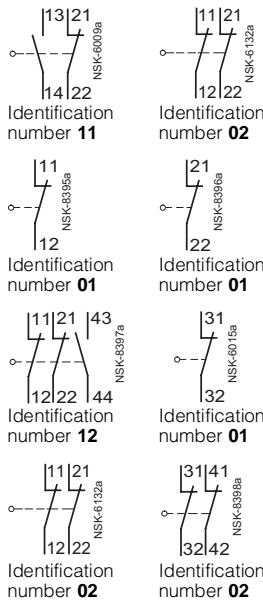
With tumbler

Side, axial actuation (4 x 90°)

3SE3 75.-.XX...,
3SE3 76.-.XX...,
3SE3 85.-.XX...,
3SE3 86.-.XX...



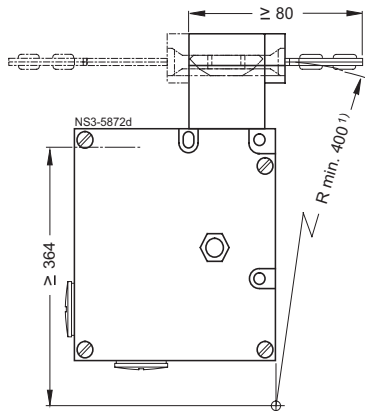
Slow-action contacts



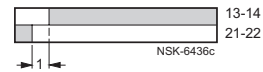
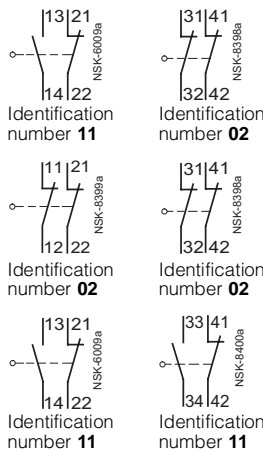
10 N

Side actuation (4 x 90°)

3SE3 83.-.XX...,
3SE3 84.-.XX...



v_{max} = 1.5 m/s
 max. locking force: 2000 N, 5 s long²⁾



10 N

1) Radius actuator (universal): $R_{min} > 70$ mm.
 2) If exceeded: Internal parts destroyed.