



SIGUARD Safety Systems—Safety Integrated

SIGUARD Position Switches

3SE2 100 to 3SE3 170 / 3SE2 303 / 3SE2 404
Metal enclosure and open type

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Application

The function of the position switches (limit switches) is to produce electrical signals corresponding to the positions of the moving machinery.

The units are suitable for use in any climate.

Specifications

DIN VDE 0660 Part 200 or IEC 60 947-5-1.

The 3SE2 100 and 3SE2 120 position switches with metal enclosures with the exception of types 3SE. 1.0-8. correspond to Swiss regulations (SUVA). The following actuator types have been approved:

- Plunger – B
- Overtravel plunger – C
- Roller plunger – D
- Roller lever – E
- Angular roller lever – F
- Roller crank – GW

In addition, the open-type 3SE3 position switches and the 3SE3 switch inserts are also permitted.

Safety position switches

The 3SE. position switches with metal enclosures and snap-action contacts as well as devices with slow-action contacts can be used as safety position switches in control systems conforming to EN 60 204-1, VDE 0113 Part 1 or IEC 60 204-1.

Construction

The 3SE position switches are available in die-cast narrow or wide aluminium enclosures or as open-type units.

The 3SE2 100 position switches with narrow enclosure and overtravel plunger, roller plunger, rod and roller crank actuators conform to EN 50 041. These specifications define the most important fixing dimensions, operating points, enclosure types and actuator types.

The position switches have one or two cable entries. The cable entry has a 1/2"-NPT steel-conduit thread (3SE3) or M 20 x 1.5 thread (3SE2) for glands, thread lengths 6 mm or steel-conduit thread, (see also Accessories, Page 9/35).

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.

- The position switches with roller lever are approached perpendicular to the plunger axis and position switches with angular roller lever are approached in parallel with the plunger axis.
- The roller crank actuators, adjustable-length roller crank actuators and rod actuators can be operated from both sides and be positioned from 10° to 10° on the actuating spindle. The rollers of the actuators are made from wear resistant plastic.
- The spring rod can be approached from any direction.

- The forked lever actuator has two defined switching positions. The actuating element causes changeover from one position to the other. This actuator is suitable for two-channel operation.

The open-type 3SE. position switches are available exclusively with a plunger actuator.

Important:

The 3SE. position switches with metal enclosure are not permitted to be used as stops.

Contacts

The position switches (limit switches) are available with snap-action contacts, slow-action contacts or slow-action make-before-break contacts.

The 3SE. position switches with a metal enclosure are available with 2, 3 or 4 contacts.

The movable normally closed and normally open switch contacts are electrically isolated from each other and are suitable for switching voltages of different potentials.

Contact reliability

The movable switch contacts are double moving contacts (in 3SE. ...-8 they are single moving 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.

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

Principle of operation

Positive opening

The opening contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger (positive-opening).

In order to ensure this positive opening, the position switch must be actuated in such a way that the nominal travel (Pages 9/38 to 9/51) and angle for the positive opening are substantially exceeded.

Warning - Connection of Pg 13.5 to M20 x 1.5 connecting thread

Due to international agreements the PG system (Pg. 13.5), familiar for decades, is being converted to the metric system (M20 x 1.5). This conversion affects the following SIGUARD standard mechanical limit switch lines:

- 3SE3200.. / 3SE3210.. / 3SE3230.. in molded plastic enclosure (pages 9/11 through 9/26)
- 3SE3100.. / 3SE3120.. / 3SE3303.. / 3SE3404.. in metal enclosures (pages 9/27 through 9/57)

The 3SE3170 line (1/2" - NPT) remains unchanged.

To convert a 3SE3 (pg 13.5) to a M20 x 1.5 connecting thread simply change the 4th character in the catalog number to 2.

Pg 13.5 catalog number = 3SE3120-1GW

Equivalent M20 x 1.5 catalog number = 3SE2120-GW

Siemens will continue to provide 3SE3 limit switches as "Replacement" products for as long as quantities last. All new existing installations should use the 3SE2 devices.

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Technical data

Rated insulation voltage U_i	500 V					
Pollution degree	Class 3 acc. to DIN VDE 0110					
Short circuit protection ¹⁾ , DIAZED-fuse links	Utilization category gL/gG 6 A, quick response characteristic 10 A					
Rated operational voltage U_e	AC 500 V, over AC 380 V only for equal potential					
Conventional free-air thermal current I_{th}	10 A					
Rated operational current I_e	AC 40 to 60 Hz			DC		
	U_e	I_e / AC-12	I_e / AC-15	U_e	I_e / DC-12	I_e / DC-13
	V	A	A	V	A	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	
Mechanical endurance	30 × 10 ⁶ operating cycles (15 × 10 ⁶ für 3SE3 2.0-8.)					
Electrical endurance	10 × 10 ⁶ operating cycles with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors					
<ul style="list-style-type: none"> • for AC-15 duty • for DC-13 duty 	0.5 × 10 ⁶ operating cycles when interrupting I_e / AC-15 at 230 V					
Operating frequency	6 × 10 ³ operating cycles per hour with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors					
Operating accuracy	0.05 mm for repeated switching, measured at the plunger of the switch block.					
Operating point	With snap-action contacts independent of contact wear constant throughout the life of the switch					
Ambient temperature	−30 to +85 °C					
Degree of protection DIN VDE 0470 and IEC 60 529	IP 67					
<ul style="list-style-type: none"> • with metal enclosure • open-type • electrical plug and socket connection 	IP 20 (terminals), IP 40 (switching chamber)					
Enclosure cable entry	IP 65					
Enclosure cable entry	1 × 1/2"-NPT (3SE3); 1 × M 20 × 1.5 (3SE2) or 2 × M20 × 1.5 (3SE2)					
Conductor cross-sections	2 × 2.5 mm ²					
<ul style="list-style-type: none"> • solid • finely stranded with end sleeve 	2 × 1.5 mm ²					
Installation angle	Any					
Enclosure material	Metal (GD – AISi 12)					
Protective conductor terminal	M 3.5 inside enclosure					
CE , UL and CSA ratings (with metal enclosure) <ul style="list-style-type: none"> • rated voltage <ul style="list-style-type: none"> - for 3SE: ...0–8. • continuous current • switching capacity <ul style="list-style-type: none"> - for 3SE: ...–8. 	AC 600 V AC 300 V 10 A Heavy Duty, A 600/Q 600 Heavy Duty, A 300/Q 300					

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

Selection and ordering data

2 contacts · Moving double break contacts · IP 67 degree of protection · EN 50 041 · Special width 56 mm

40 mm wide	56 mm wide ²⁾	Actuator design to EN 50 041	Enclosure width	3SE. position switches with 2 slow-action contacts	3SE. position switches with 2 slow-action contacts	Weight approx.		
				Order No.	Price 1 unit	Order No.	Price 1 unit	kg
		Actuator ¹⁾	mm					
		Plunger	–	40	→ 3SE□ 1□0-0B	→ 3SE□ 1□0-6B		0.2
				56	→ 3SE2 100-0B	→ 3SE2 100-6B		0.23
		Overtravel plunger	B	40	→ 3SE□ 1□0-0C	→ 3SE□ 1□0-6C		0.22
				56	→ 3SE2 100-0C	→ 3SE2 100-6C		0.25
		Roller plunger	C	40	→ 3SE□ 1□0-0D	→ 3SE□ 1□0-6D		0.24
				56	→ 3SE2 100-0D	→ 3SE2 100-6D		0.27
		Roller lever	–	40	→ 3SE□ 1□0-0E	→ 3SE□ 1□0-6E		0.22
		Actuator made of moulded plastic		56	→ 3SE2 100-0E	→ 3SE2 100-6E		0.25
		Angular roller lever	–	40	→ 3SE□ 1□0-0F	→ 3SE□ 1□0-6F		0.23
		Actuator made of moulded plastic		56	→ 3SE2 100-0F	→ 3SE2 100-6F		0.25
		Roller crank						
		• finely adjustable from 10° to 10°	A	40	→ 3SE□ 1□0-0GW	→ 3SE□ 1□0-6GW		0.3
				56	→ 3SE2 100-0GW	→ 3SE2 100-6GW		0.32
		• adjustable length, finely adjustable from 10° to 10°	–	40	3SE□ 1□0-0UW	3SE□ 1□0-6UW		0.35
				56	3SE2 100-0UW	3SE2 100-6UW		0.37
		Rod actuator	D					
		finely adjustable from 10° to 10°						
		• Moulded plastic rod		40	3SE□ 1□0-0WW	3SE□ 1□0-6WW		0.35
				56	3SE2 100-0WW	3SE2 100-6WW		0.37
		• Aluminium rod		40	3SE□ 1□0-0VW	3SE□ 1□0-6VW		0.35
				56	3SE2 100-0VW	3SE2 100-6VW		0.37
		Switch body						
		with switch block			3SE□ 1□0-0A	3SE□ 1□0-6A		
		without actuator			3SE2 100-0A	3SE2 100-6A		
		Order No. suffix						
		• with metric connecting thread M 20 × 1.5			2.2	2.2		
		• with 1/2" - NPT connecting thread			3.7	3.7		

For operation, operating speed and travel, see Pages 9/38 to 9/44.

See **WARNING**, page 9/27.

→ Positive opening acc. to IEC 60 947-5-1, Appendix K, and DIN VDE 0660 Part 200.

1) The actuator heads can be subsequently exchanged (see Page 9/34).
2) For conduit thread adaptors see page 9/35.

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3SE2 100 to 3SE3 170
Metal enclosure

Selection and ordering data

2 contacts · Moving double break contacts · IP 67 degree of protection · EN 50 041 · Special width 56 mm

40 mm wide	56 mm wide ²⁾	Actuator design to EN 50 041	Enclosure width	3SE. position switches with 2 slow-action contacts	3SE. position switches with 2 slow-action make before-break contacts	Weight approx.		
				Order No.	Price 1 unit	Order No.	Price 1 unit	kg
Actuator ¹⁾			mm					
Plunger		–	40	3SE□ 1□0-7B		3SE□ 1□0-3B		0.2
			56	3SE2 100-7B		3SE2 100-3B		0.23
Overtravel plunger		B	40	3SE□ 1□0-7C		3SE□ 1□0-3C		0.22
			56	3SE2 100-7C		3SE2 100-3C		0.25
Roller plunger		C	40	3SE□ 1□0-7D		3SE□ 1□0-3D		0.24
			56	3SE2 100-7D		3SE2 100-3D		0.27
Roller lever		–	40	3SE□ 1□0-7E		3SE□ 1□0-3E		0.22
Actuator made of moulded plastic			56	3SE2 100-7E		3SE2 100-3E		0.25
Angular roller lever		–	40	3SE□ 1□0-7F		3SE□ 1□0-3F		0.23
Actuator made of moulded plastic			56	3SE2 100-7F		3SE2 100-3F		0.25
Roller crank		A	40	3SE□ 1□0-7GW		3SE□ 1□0-3GW		0.3
• finely adjustable from 10° to 10°			56	3SE2 100-7GW		3SE2 100-3GW		0.32
• adjustable length, finely adjustable from 10° to 10°		–	40	3SE□ 1□0-7UW		3SE□ 1□0-3UW		0.35
			56	3SE2 100-7UW		3SE2 100-3UW		0.37
Rod actuator		D						
finely adjustable from 10° to 10°								
• Moulded plastic rod			40	3SE□ 1□0-7WW		3SE□ 1□0-3WW		0.35
			56	3SE2 100-7WW		3SE2 100-3WW		0.37
• Aluminium rod			40	3SE□ 1□0-7VW		3SE□ 1□0-3VW		0.35
			56	3SE2 100-7VW		3SE2 100-3VW		0.37
Switch body								
with switch block				3SE□ 1□0-7A		3SE□ 1□0-3A		
without actuator				3SE2 100-7A		3SE2 100-3A		

Order No. suffix

- with metric connecting thread M 20 × 1.5
- with 1/2" - NPT connecting thread

2 . 2
3 . 7

2 . 2
3 . 7

For operation, operating speed and travel, see Pages 9/38 to 9/43.

See **WARNING**, page 9/27.

➔ Positive opening acc. to IEC 60 947-5-1, Appendix K, and DIN VDE 0660 Part 200.

- 1) The actuator heads can be subsequently exchanged (see Page 9/34).
- 2) For conduit thread adaptors see page 9/35.





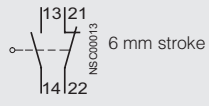












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Metal enclosure

Selection and ordering data

2 contacts · Moving double break contacts · IP 67 degree of protection · EN 50 041 · Special width 56 mm

40 mm wide		56 mm wide ²⁾		Actuator design to EN 50 041	Enclosure width	3SE. position switches with 2 snap-action contacts		3SE3 position switches with 2 snap-action contacts		Weight approx.									
						 6 mm stroke Identification number 11 acc. to EN 50 013, switch block 3SE3 000-1A ²⁾		 6 mm stroke Identification number 02 acc. to EN 50 013 switch block 3SE3 000-8AV00 ²⁾ 											
Actuator ¹⁾			mm			Order No.	Price 1 unit	Order No.	Price 1 unit	kg									
 NSC00096	Plunger	–	40	→	3SE□ 1□0-1B	→	3SE2 120-8BV00	→	3SE2 100-8BV00	0.2									
			56	→	3SE2 100-1B	→	3SE2 100-8BV00	→	3SE2 100-8BV00	0.23									
 NSC00097	Overtravel plunger	B	40	→	3SE□ 1□0-1C	→	3SE2 120-8CV00	→	3SE2 100-8CV00	0.22									
			56	→	3SE2 100-1C	→	3SE2 100-8CV00	→	3SE2 100-8CV00	0.25									
 NSC00098	Roller plunger	C	40	→	3SE□ 1□0-1D	→	3SE2 120-8DV00	→	3SE2 100-8DV00	0.24									
			56	→	3SE2 100-1D	→	3SE2 100-8DV00	→	3SE2 100-8DV00	0.27									
 NSC00099	Roller lever	–	40	→	3SE□ 1□0-1E	→	3SE2 120-8EV00	→	3SE2 100-8EV00	0.22									
		Actuator made of moulded plastic		56	→	3SE2 100-1E	→	3SE2 100-8EV00	→	3SE2 100-8EV00	0.25								
 NSC00093	Angular roller lever	–	40	→	3SE□ 1□0-1F	→	3SE2 120-8FV00	→	3SE2 100-8FV00	0.23									
		Actuator made of moulded plastic		56	→	3SE2 100-1F	→	3SE2 100-8FV00	→	3SE2 100-8FV00	0.25								
 NSC00094	Roller crank	• finely adjustable from 10° to 10°	A	40	→	3SE□ 1□0-1GW	→	3SE2 120-8GW00	→	3SE2 100-8GW00	0.3								
				56	→	3SE2 100-1GW	→	3SE2 100-8GW00	→	3SE2 100-8GW00	0.32								
 NSC00099	• adjustable length, finely adjustable from 10° to 10°	–	40		3SE□ 1□0-1UW		3SE2 120-8UW00		3SE2 100-8UW00	0.35									
			56		3SE2 100-1UW		3SE2 100-8UW00		3SE2 100-8UW00	0.37									
 NSC00010	Rod actuator	finely adjustable from 10° to 10°	D																
											• Moulded plastic rod	40		3SE□ 1□0-1WW		3SE2 120-8WW00		3SE2 100-8WW00	0.35
												56		3SE2 100-1WW		3SE2 100-8WW00		3SE2 100-8WW00	0.37
											• Aluminium rod	40		3SE□ 1□0-1VW		3SE2 120-8VW00		3SE2 100-8VW00	0.35
		56		3SE2 100-1VW		3SE2 100-8VW00		3SE2 100-8VW00	0.37										
 NSC00095	Spring rod	–	40		3SE□ 1□0-1R		3SE2 120-8RV00		3SE2 100-8RV00	0.23									
			56		3SE2 100-1R		3SE2 100-8RV00		3SE2 100-8RV00	0.25									
 NSC00101	Fork lever, latching	–	40		3SE□ 1□0-1T		–		–	0.3									
			56		3SE2 100-1T		–		–	0.32									
Switch body																			
with switch block						3SE□ 1□0-1A		3SE2 120-8A											
without actuator						3SE3 100-1A		3SE2 100-8A											

Order No. suffix

- with metric connecting thread M 20 × 1.5
- with 1/2" - NPT connecting thread

2.2
3.7

For operation, operating speed and travel, see Pages 9/38 to 9/44.

See WARNING, page 9/27.

- Positive opening acc. to IEC 60 947-5-1, Appendix K, and DIN VDE 0660 Part 200.

- 1) The actuator heads can be subsequently exchanged (see Page 9/34).
- 2) For conduit thread adaptors see page 9/35.