SIEMENS

SIGUARD 3SE3 position switches with separate actuators

SIGUARD 3SE3 position switches with separate actuators

Protection of personnel and machinery is a prime consideration in sites with a high safety risk. SIGUARD (R) 3SE3 position switches with separate actuators provide a full range of devices for monitoring and locking of protective covers. Easy to mount, SIGUARD position switches with a separate actuator are the obvious solution. The separate coded actuator is fixed directly to the protective cover, and is inserted in the opening on the switch when the cover is closed. If the protective cover is opened, the actuator is pulled out, thus breaking the NC contact and therefore the electric circuit. All devices meet the required safety standards for protective cover interlocking to EN 1088. The switches meet the testing principles for applications with a personal safety feature to GS-ET15 and GS-ET19 and can be used in safety circuits up to cat. 4 to EN 954-1.
All NC contacts feature positive opening to EN 947-5-1 and DIN VDE 0660 T200.

SIGUARD 3SE3 24 and 3SE3 25 – position switch have a host of functions

Very few switch types offer as many functions in a single device as our SIGUARD 3SE3 24 and 3SE3 25 position switch . The 3SE3 24 switches are generally equipped with 3 contacts (2 NC contacts + 1 NO contact), thus allowing for a signalling function even if both NC contacts have a two-channel connection. The 3SE3 25 type with one NC contact has a much smaller housing and therefore provides an economical solution for simple applications. It's extremely compact design in a plastic housing meets IP 67 degree of protection.

The actuator is triple coded and also available as a radius actuator for small actuation radii. The pull-out force of the actuator is between 5 N and 30 N and can be increased to 100 N with a ball catch. The SIGUARD 3SE3 24 and 3SE3 25 position switches can be operated from the side or from above without having to turn the head of the device.

Advantages at a glance:

- Plastic housing in IP 67
- Two housing lengths with 3 or 1 contact
- NC contacts with positive opening operation ⊕
- Direction of approach from side and from above; head can be turned by 180 degrees
- Standard and radius actuators

When standards have to be met – SIGUARD position switches with separate actuators

Standard housings with mounting dimensions according to EN 50041 and EN 50047 mean that SIGUARD position switches with separate actuators can be used for all applications. Two different contact configurations, 2 NC, or 1NO+1NC are available in both the metal version with a 40 mm width or in the 31 mm wide plastic version. The actuator buttons can each be turned through 4 x 90 degrees and can be actuated from 4 or 5 directions.

Advantages at a glance:

- Plastic or metal housing in IP 66 and IP 67
- Standard housing to EN 50047 and EN 50041
- Actuation from 4 or 5 directions
- NC contacts with positive opening operation ⊕
- Standard and radius actuators

As safe as houses – SIGUARD position switches with locking

To ensure the safety of the machine, protective covers must remain closed whilever the machine is in operation. To avoid having to fit additional locks and bolts, switch types 3SE37 in plastic and 3SE38 in metal have additional integrated solenoids that only release the protective covers if a particular signal is given. Before this, the actuator cannot be pulled out and remains locked up to a pull-out force of 2000 N. The mechanical safety of the SIGUARD position switch also ensures that the NC contact is never closed when the protective covers are open (fail safe closing). These switch types contain contacts that are operated by a solenoid and contacts that switch when the actuator is removed. The NC contacts act as safety contacts, which allows every status of the protective covers to be evaluated. Switch types 3SE38 3 and 3SE38 4 even have a signaling function to indicate that status visually. Locking is implemented in the SIGUARD position switches with locking in two different versions, with spring energy (spring locking) or with solenoid energisation (electromagnetic locking). If the switch has to be released e.g. on power loss or during installation (without the 24 V voltage) this can be done manually using an auxiliary release.

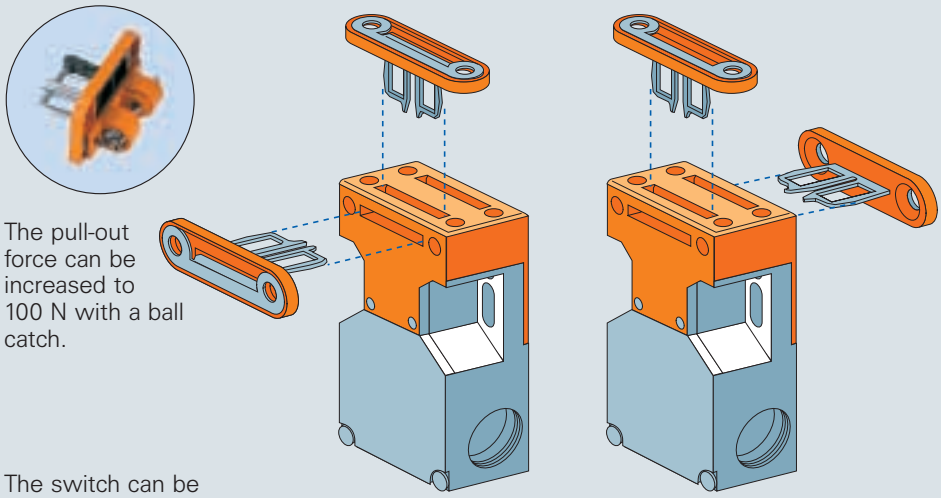
Advantages at a glance:

- Integrated solenoid locking with 24 V, 110 V and 230 V coil voltage
- Plastic or metal housing in degree of protection IP 66 or IP 67
- Max. locking force of 1200 N or 2000 N
- Actuation from 4 or 5 directions
- NC contacts with positive opening operation ⊕
- Separate evaluation of the solenoid position and protective door (actuator)
- Standard and radius actuators
- Auxiliary release sealable and with key
- Visual signaling device

Approach and actuation options

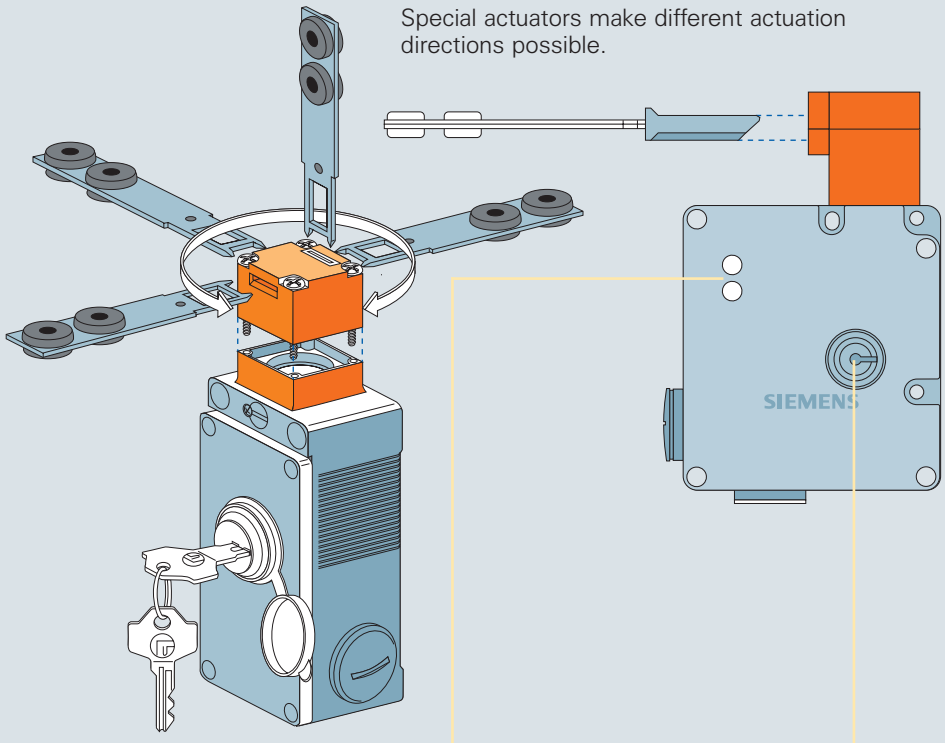
Approach and actuation options

SIGUARD position switches with separate actuators are suitable for protective covers because they are so simple to operate. No additional approach guides are necessary. All actuator heads can therefore be operated from every direction. Most types can also be operated from above. The actuator can be mounted almost anywhere on the protective cover. Additional options include radius operation, visual signaling device, or increased pull-out force of the actuator.



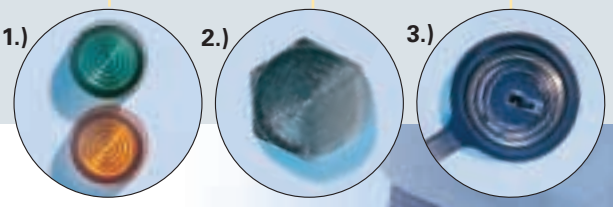
The pull-out force can be increased to 100 N with a ball catch.

The switch can be operated from different directions without turning the actuator head.



Special actuators make different actuation directions possible.

Manual release with key by authorised personnel, 5 possible actuation directions make operation easier.



1) Visual signaling device: The status of the solenoid (locked/not locked) and the protective door (open/closed) are indicated by 2 LEDS in the cover.
2) Sealable auxiliary release: The switched can be released manually by turning a screw in the cover with a tool (screwdriver). The screw can be sealed to guard against unauthorised access.
3) Auxiliary release with lock: The switch can be released by authorised personnel with a key in an emergency situation.

Plastic/metal enclosed SIGUARD 3SE3 position switches with a separate actuator

Selection criteria and ordering data

2 contacts moving double-break contacts

3SE3 200.-0XX03

3SX3 196

3SE3 200.-0XX13

3SX3 220

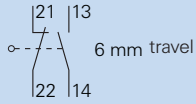
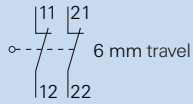
3SX3 222

3SE3 120.-0XX

3SX3 197

3SX3 206

3SX3 203

Operation/mounting	Housing width mm	Length of actuator mm	**3SE3 Position switch** with 2 slow-action contacts	**3SE3 1 Position switch** with 2 slow-action contacts
			 code number 11 to EN 50 013	 code number 02 to EN 50 013
Plastic enclosed IP 65			**Order No.**	**Order No.**
Actuation from side				
• Mounting acc. to EN 50 047	31		**3SE3 200-0XX03**	**3SE3 200-6XX03**
Actuation from front				
• Mounting acc. to EN 50 047	31		**3SE3 200-0XX04**	**3SE3 200-6XX04**
Actuator				
• Standard actuator		50	**3SX3 196**	
		70	**3SX3 195**	
5 approach directions	31		**3SE3 200-0XX13**	**3SE3 200-6XX13**
Actuator				
• Standard		44	**3SX3 220**	
• with transverse mounting		36	**3SX3 221**	
• Radius actuator		44	**3SX3 222**	
Metal enclosed				
Actuation from side				
• Mounting according to EN 50 041	40		**3SE3 120-0XX**	**3SE3 120-6XX**
Actuator				
• Standard		79	**3SX3 197**	
• with transverse mounting		79	**3SX3 206**	
• Universal radius actuator		90	**3SX3 203**	

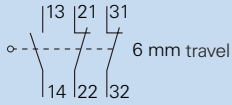
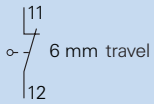
3 contacts moving double-break contacts

3SE3 243.-0XX

3SX3 218

3SX3 228

3SX3 217

Operating/mounting	Housing width mm	Length of actuator mm	**3SE3 Position switch** with 3 slow-action contacts	**3SE3 Position switch** with 1 slow-action contact
			 code number 11 to EN 50 013	 code number 02 to EN 50 013
Plastic enclosed IP 67			**Bestell-Nr.**	**Bestell-Nr.**
Actuation from the side and from the front				
• Pull-out force 5 N	52		**3SE3 243-0XX40**	**3SE3 257-6XX40**
• Pull-out force 30 N	52		**3SE3 243-0XX**	**3SE3 257-6XX**
• with automatic ejection	52		**3SE3 243-0XX30**	**3SE3 257-6XX30**
Actuator				
• Standard actuator		27	**3SX3 218**	
• Universal radius actuator		33	**3SX3 228**	
• Ball catch (max. 100 N)			**3SX3 217**	

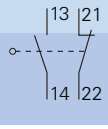
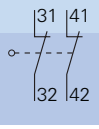
Safety function in acc. to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200

Metal enclosed SIGUARD 3SE3 8 position switches with locking

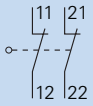
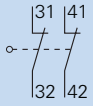
Selection criteria and ordering data

4 contacts moving double-break contacts increased locking force 2000 N, IP67

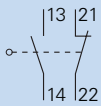
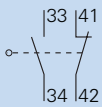
3SE3 84.-0XX00

Locking	Version	**3SE3 8 Position switch** with 4 slow-action contacts Position monitoring of actuator  	Position monitoring of solenoid 
		Order No.	
Spring locking	Standard with auxiliary release sealable	➔ **3SE3 84.-0XX00**	
	Auxiliary release, with lock	➔ **3SE3 84.-0XX01**	
Electromagnetic locking	Standard	➔ **3SE3 83.-0XX00**	

3SE3 84.-6XX01

Locking	Version	**3SE3 8 Position switch**  	
		Order No.	
Spring locking	Standard with auxiliary release sealable	➔ **3SE3 84.-6XX00**	
	Auxiliary release, with lock	➔ **3SE3 84.-6XX01**	
Electromagnetic locking	Standard	➔ **3SE3 83.-6XX00**	

3SE3 84.-1XX20

Locking	Version	**3SE3 8 Position switch**  	
		Order No.	
Spring energy locked	Standard with auxiliary release sealable	**3SE3 84.-1XX00**	
	Auxiliary signaling device	➔ **3SE3 84.-1XX01**	
	Visual signaling device	➔ **3SE3 84.-1XX20**	
	Visual signaling device and auxiliary release with lock	➔ **3SE3 84.-1XX32**	
Electromagnetic locking	Standard	➔ **3SE3 83.-1XX00**	
	with visual signaling device	➔ **3SE3 83.-1XX20**	
Order No. extension Rated operating voltage of solenoid			
24 V DC		**0**	
230 V AC		**1**	
110 V AC		**2**	

		Actuator	Length of actuator	**Order No.**
3SX3 197 	3SX3 203 	Standard actuator	79 mm	**3SX3 197**
		Radius actuator (universal)	90 mm	**3SX3 203**
3SX3 207 	3SX 206 	Standard actuator for direction of approach from left	132 mm	**3SX3 207**
		Standard actuator with transverse mounting	132 mm	**3SX3 206**

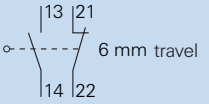
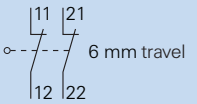
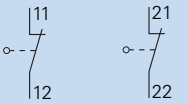
➔ Safety function in acc. to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200

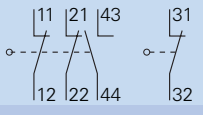
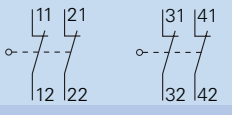
Plastic enclosed SIGUARD 3SE3 7 position switch with locking

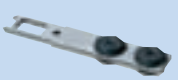
Selection criteria and ordering data

2 or 4 contacts IP 66 5 directions of actuation locking force 1200 N

3SE3 76.-2XX00

Locking	Version	**3SE3 7 Position switch** with 2 slow-action contacts (position monitoring of solenoid) 	**3SE3 7 Position switch** with 2 slow-action contacts (position monitoring of solenoid) 	**3SE3 7 Position switch** with 2 slow-action contacts Position monitoring of actuator / Position monitoring of solenoid 
		Order No.	**Order No.**	**Order No.**
Spring locking	Standard with auxiliary release sealable	**3SE3 76.-2XX00**	**3SE3 76.-8XX00**	**3SE3 76.-7XX00**
	Auxiliary release with lock	**3SE3 76.-2XX01**	**3SE3 76.-8XX01**	**3SE3 76.-7XX01**
Electro-magnetic locking	-	**3SE3 75.-2XX00**	**3SE3 75.-8XX00**	**3SE3 75.-7XX00**
Order No. extension Rated operating voltage of solenoid				
24 V DC		**0**	**0**	**0**
230 V AC		**1**	**1**	**1**
110 V AC		**2**	**2**	**2**

Locking	Version	**3SE3 7 Position switch** with 4 slow-action contacts Position monitoring of solenoid / Position monitoring of actuator 	**3SE3 7 Position switch** with 4 slow-action contacts Position monitoring of solenoid / Position monitoring of actuator 
		Order No.	**Order No.**
Spring locking	Standard with auxiliary release sealable	**3SE3 76.-3XX00**	**3SE3 76.-6XX00**
	Auxiliary release with lock	**3SE3 76.-3XX01**	**3SE3 76.-6XX01**
Electro-magnetic locking	-	**3SE3 75.-3XX00**	**3SE3 75.-6XX00**
Order No. extension Rated operating voltage of solenoid			
24 V DC		**0**	**0**
230 V AC		**1**	**1**
110 V AC		**2**	**2**

Actuator		**Order No.**
3SX3 222		• Standard actuator **3SX3 226** • Transverse mounting **3SX3 227** • Radius actuator **3SX3 222**
3SX3 226		
3SX3 227		

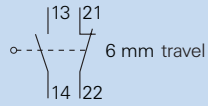
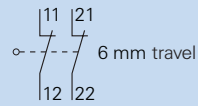
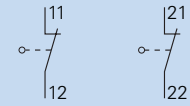
Safety function in acc. to IEC 60 947-5-1-3 and DIN VDE 0660 Part 200

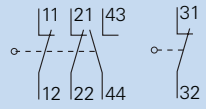
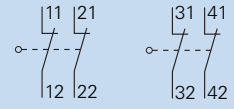
Metal closed SIGUARD 3SE3 8 position switch with locking

Selection criteria and ordering data

2 or 4 contacts IP 66 5 directions of actuation locking force 1200 N

3SE3 86.-2XX01

Locking	Version	**3SE3 8 Position switch** with 2 slow-action contacts (position monitoring of solenoid) 	**3SE3 8 Position switch** with 2 slow-action contacts (position monitoring of solenoid) 	**3SE3 8 Position switch** with 2 slow-action contacts Position monitoring of actuator / Position monitoring of solenoid 
		Order No.	**Order No.**	**Order No.**
Spring locking	Standard with auxiliary release sealable	**3SE3 86.-2XX00**	**3SE3 86.-8XX00**	**3SE3 86.-7XX00**
	Auxiliary release with lock	**3SE3 86.-2XX01**	**3SE3 86.-8XX01**	**3SE3 86.-7XX01**
Electro-magnetic locking	-	**3SE3 85.-2XX00**	**3SE3 85.-8XX00**	**3SE3 85.-7XX00**
Order No. extension Rated operating voltage of solenoid				
24 V DC		**0**	**0**	**0**
230 V AC		**1**	**1**	**1**
110 V AC		**2**	**2**	**2**

Locking	Version	**3SE3 8 Position switch** with 4 slow-action contacts Position monitoring of solenoid / Position monitoring of actuator 	**3SE3 8 Position switch** with 4 slow-action contacts Position monitoring of solenoid / Position monitoring of actuator 	
		Order No.	**Order No.**	
Spring locking	Standard with auxiliary release sealable	**3SE3 86.-3XX00**	**3SE3 86.-6XX00**	
	Auxiliary release with lock	**3SE3 86.-3XX01**	**3SE3 86.-6XX01**	
Electro-magnetic locking	-	**3SE3 85.-3XX00**	**3SE3 85.-6XX00**	
Order No. extension Rated operating voltage of solenoid				
24 V DC		**0**	**0**	
230 V AC		**1**	**1**	
110 V AC		**2**	**2**	

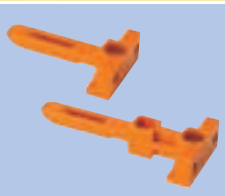
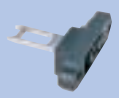
Actuator		**Order No.**
3SX3 222		• Standard actuator **3SX3 226** • Transverse mounting **3SX3 227** • Radius actuator **3SX3 222**
3SX3 226		
3SX3 227		

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

Switch and actuator – a perfect couple

SIGUARD 3SE3 position switches with a separate actuator can be assembled using different switches and actuators to meet individual customer requirements.

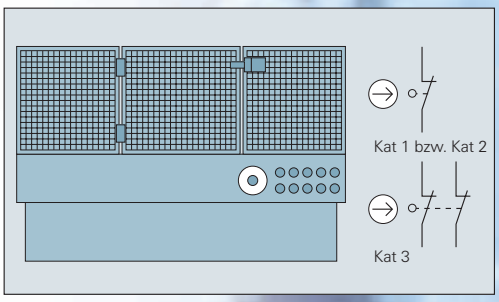
A range of fixtures are available for mounting the actuators to a variety of different protective cover profiles. Radius actuators which can be mounted close to door hinges round off the product range perfectly.

Switches/actuators	Standard actuators for longitudinal mounting	Standard actuators for transverse mounting	Radius actuators	Actuators for direction of approach from the left
 3SE3 200-.XX03 3SE3 200-.XX04	-	 3SX3 196 (50 mm) 3SX3 195 (70 mm)	-	-
 3SE3 200-.XX13	 3SX3220	 3SX3 221	 3SX3 222	-
 3SE3 24.-.XX.. 3SE3 25.-.XX..	-	 3SX3 218	 3SX3 228	-
 3SE3 120-.XX	 3SX3197	 3SX3 206	 3SX3 203	-
 3SE3 7..-.XX.. 3SE3 85.-.XX.. 3SE3 86.-XX..	 3SX3226	 3SX3 227	 3SE3 222	-
 3SE3 83.-.XX 3SE3 84.-.XX	 3SX3197	 3SX3 206	 3SX3 203	 3SX3207

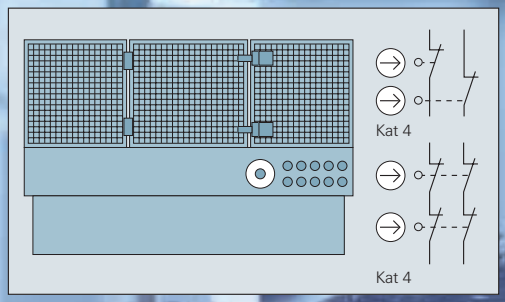
Application examples for protective cover interlocking

Protective cover interlocks are used to protect machine operators from flying material and chips and the machines from unauthorized access. Failsafe monitoring of the entire safety circuit up to Category 4 acc. to EN 954-1 can be specified, depending on the danger potential of the machine. SIGUARD 3SE3 position switches provide an optimum system in conjunction with our SIGUARD 3TK28 safety combinations for protective cover interlocking with and without active locking. The safety circuit can usually only be broken by de-energisation, i.e. NC contacts with positive opening operation.

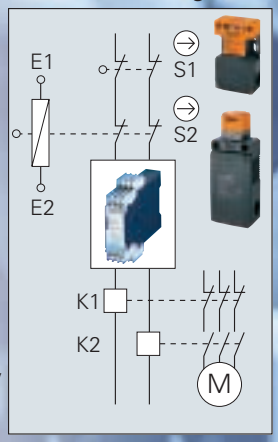
Application of SIGUARD 3SE3 position switch



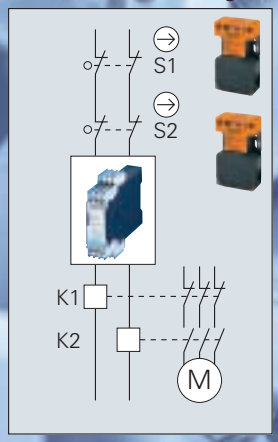
Application of two SIGUARD 3SE3 position switches



Protective cover interlock with active locking

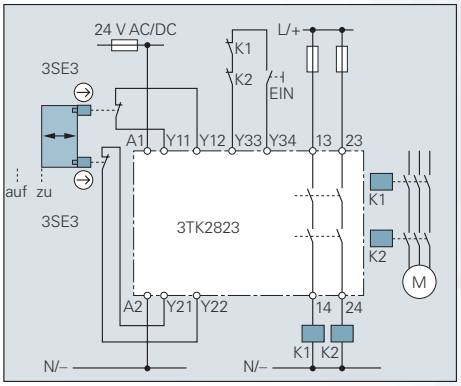


Protective cover interlock without active locking

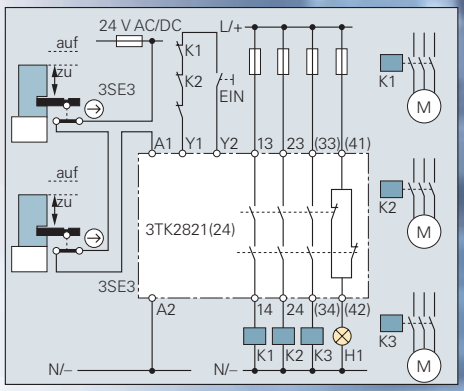


Highest Category 4 for protective cover interlocking demand redundant fault monitoring of the entire safety circuit.

Two-channel safety circuit without locking (Cat. 4)



Single-channel safety circuit with feedback (Cat. 2)



Integration of SIGUARD position switches in conjunction with SIGUARD safety combinations to form an overall concept. Redundant monitoring of protective covers with and without locking up to Cat. 4 acc. to EN 954-1 or up to Cat. 3 with cascading of several protective doors.

Technical data

Plastic/metal enclosed SIGUARD 3SE3 position switches with separate actuator

Rated insulation voltage V_i		500 V
Short-circuit protection		Utilization category gL/gG 6 A.
DIAZED fuse-links		Characteristic quick-response 10 A
Mechanical endurance		>1x10^6 make-break operations
Electrical endurance		>1x10^6 make-break operations with contactors 3TH4, 3TF40 to 3TF43
for utilization category AC-15		0.5x106 break operations I_e/AC-15 at 230 V
for utilization category DC-13		With DC the endurance of the contacts depends not only on the breaking current but also on the voltage, from the inductance of the electric circuit and from the switching speed. Generally applicable specifications cannot be given.
Cable entry	3SE3 1	Pg 13.5
	3SE3 2	Pg 13.5
	3SE3 257. 3SE3 243	3xPg 11
Ambient temperature	3SE3 2	-30 to +85 °C
	3SE3 1	-40 to +85 °C
Degree of protection to DIN VDE 0470 and IEC 60 529	3SE3 200	IP 65
	3SE3 1. 3SE3 24. 3SE3 25	IP 67
Conductor cross-section		max. 2x2.5 mm^2, solid max. 2x1.5 mm^2, solid with end sleeve
	3SE3 257. 3SE3 243	1x0.5 - 1.5 mm^2, solid or finely stranded with end sleeve
Mounting position		any
Rated operational voltage V_e		500 V AC. Above 380 V AC same potential only
Conventional thermal current I_{th}		10 A

Rated operational current I_e

Alternating current 40 to 60 Hz			Direct current		
V_e V	I_e A	I_e A	V_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

Plastic/metal enclosed SIGUARD position switches with locking 3SE3 7/ 3SE3 85/ 3SE3 86.

Rated insulation voltage V_i	250 V AC/DC
Power consumption at V_s	5.5 W
Short circuit protection	Utilization category gL/gG 6 A
DIAZED fuse-links	Characteristic quick-response 10 A
Electrical endurance	1x10^6 make-break operations 1x10^6 make-break operations with contactors 3TH4, 3TF40 bis 3TF43
for utilisation category AC-15	0.5x10^6 break operations I_e/AC-15 at 230 V
for utilisation category DC-13	With DC the endurance of the contacts depends not only on the breaking current but also on the voltage, from the inductance of the electric circuit and from the switching speed. Generally applicable specifications cannot be given
Cable entry	Pg 13.5
Ambient temperature	-30 to +70 °C
Degree of protection to DIN VDE 0470 and IEC 60 529	IP 66
Conductor cross-section	2x2.5 mm^2, solid 2x1.5 mm^2, finely stranded with end sleeve
Mounting position	any
Rated operational voltage V_e	24 V DC 110–130 V AC/230 V 50/60 Hz
Conventional thermal current I_{th}	10 A

Rated operational current I_e

Alternating current 40 to 60 Hz			Direct current		
Ue V	Ie/AC-12 A	Ie/AC-15 A	Ve V	Ve/DC-12 A	Ie/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

Metal enclosed SIGUARD position switches with locking 3SE3 83/ 3SE3 84.

Rated insulation voltage V_i	250 V AC/DC
Power consumption at V_s	5.2 W
Short-circuit protection	Utilization category gL/gG 6 A
DIAZED fuse-links	Characteristic quick-response 10 A
Mechanical endurance	1x10^6 make-break operations
Electrical endurance	1x10^6 make-break operations with contactors 3TH4, 3TF40 bis 3TF43
for utilisation category AC-15	0.5x10^6 break operations of Ie/AC-15 at 230 V
for utilisation category DC-13	With DC the endurance of the contacts depends not only on the breaking current but also on the voltage, from the inductance of the electric circuit and from the switching speed. Generally applicable specifications cannot be given
Cable entry	Pg 13.5
Ambient temperature	-30 to +70 °C
Degree of protection to DIN VDE 0470 and IEC 60 529	IP 67
Conductor cross-section	2x2.5 mm^2, solid 2x1,5 mm^2, finely stranded with end sleeve
Mounting position	any
Rated operational voltage V_e	24 V DC 110–130 V AC/230 V AC 50/60 Hz
Conventional thermal current I_{th}	10 A

Rated operational current I_e

Alternating current 40 to 60 Hz			Direct current		
Ue V	Ie/AC-12 A	Ie/AC-15 A	Ve V	Ve/DC-12 A	Ie/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

www.siemens.de

Automation & Drives
Division Low Voltage Controls and Distribution
P.O. Box 32 40, D-91050 Erlangen, Germany

Subject to change without prior notice 10/99

Siemens Aktiengesellschaft

Order No. E20001-A0020-P305-X-7600
Printed in Germany
Dispostelle 27602 SEK 30296
21C6224 B1SG.52.0.01 PA 10995.0