

# 3SF1 AS-Interface Position Switches

## 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 switch 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.

### Design

The 3SF1 switches are available in four different enclosure sizes:

- Plastic and metal enclosures according to EN 50047, 31 mm wide, with M12 connector socket
- Molded-plastic and metal enclosures according to EN 50041, 40 mm wide, with M12 connector socket
- Molded-plastic enclosures, 50 mm wide, with M12 plug and M12 socket
- Metal enclosures, 56 mm wide, with M12 plug and M12 socket

### 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.

### Benefits

The new generation of 3SF1 position switches offers:

- ASIsafe Electronics integrated in the enclosure, with low power consumption < 60 mA
- An extensive range of actuators
- Status display with three LEDs

### Application

With the 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.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. And many different actuator variants are available to match the mechanical configuration of the moved machined parts. Dimensions, fixing points and characteristics are largely in accordance with the EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

### Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Switchgear and Controlgear, General) and IEC 60947-5-1 (Electromechanical Control Circuit Devices).

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

### Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 position switch it is possible to achieve category 2 according to ISO 13849-1 (EN 954-1) or SIL 1 according to IEC 61508.

Categories 3 or 4 according to ISO 13849-1 (EN 954-1) or SIL 2 or 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

## More information

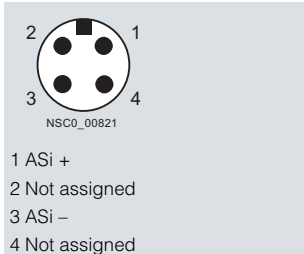
Type	3SF1 1..., 3SF1 2..	
General data		
Standards	IEC 60947-5-1, EN 60947-5-1, EN 1088	
According to AS-Interface specification		
• I/O configuration / ID configuration		7/B
• ID1 code/ID2 code (Hex)		F/F
• Power consumption, overall	mA	≤ 60
Inputs		
• Low signal range	Contact open	
• High signal range	Contact closed, $I_{in}$ dynamic ( $I_{peak} \geq 5\text{ mA}$ )	
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 <sup>6</sup> operating cycles	
• With separate actuator, 3SF1 ...-.V..	1 × 10 <sup>6</sup> operating cycles	
PFH value		
Probability of failure upon request of the safety function, with 1 actuation per hour and B10 = 5 × 10 <sup>6</sup>		
• Basic switches	4 × 10 <sup>-9</sup> 1/h	
• With separate actuator, 3SF1 ...-.V..	2 × 10 <sup>-9</sup> 1/h	
• Hinge switch, 3SF1 ...-.U..	2 × 10 <sup>-9</sup> 1/h	
Shock resistance acc. to IEC 60068-2-27		
30 g/11 ms		

Type		3SF1 234	3SF1 134	3SF1 244	3SF1 214	3SF1 114	3SF1 124
Enclosures							
Enclosures							
• Material		Ultramid A3X2G7			Zinc diecasting GD Zn Al4 Cu1		
• Width	mm	31	40	50	31	40	56
• Dimensions acc. to EN		EN 50047	EN 50041	--	EN 50047	EN 50041	--
<b>Degree of protection</b> acc. to EN 60529		IP65	IP66/IP67 <sup>1)</sup>				
Ambient temperature							
• During operation	°C	-25 ... +60					
• Storage, transport	°C	-40 ... +80					
Mounting position		Any					

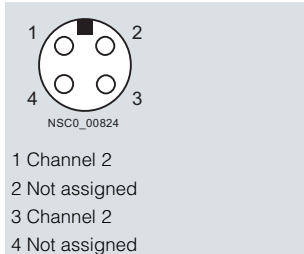
<sup>1)</sup> For twist actuators with spring rod and rod actuators: IP65/IP67.

## Connector assignment

## M12 connector socket, 4-pole



## M12 socket, 4-pole



## 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)				

# 3SF1 AS-Interface Position Switches

**Molded-plastic enclosures**  
**Enclosure width 31 mm acc. to EN 50047/50 mm**

## Selection and ordering data

### Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

1 or 2 contacts · 3 LEDs · Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm) · M12 connector socket

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		

### Basic switches (with rounded plunger<sup>1)</sup>) - Enclosure width 31 mm according to EN 50047



#### With teflon plunger

With M12 connector socket, 4-pole,  
 channel 1 on NC contact,  
 channel 2 on NC contact

Slow-action contacts	2 NC	24 V DC	⤵ B	<b>3SF1234-1KC05-1BA1</b>	1	1 unit	121
Snap-action contacts	2 NC	24 V DC	⤵ B	<b>3SF1234-1LC05-1BA1</b>	1	1 unit	121

ASIsafe basic switch

### Basic switches (with rounded plunger<sup>1)</sup>) - Enclosure width 50 mm



#### With teflon plunger

With M12 connector socket, 4-pole,  
 channel 1 on NC contact,  
 channel 2 on M12 socket, right

Slow-action contacts	1 NC	24 V DC	⤵ B	<b>3SF1244-1KC05-1BA2</b>	1	1 unit	121
Snap-action contacts	1 NC	24 V DC	⤵ B	<b>3SF1244-1LC05-1BA2</b>	1	1 unit	121

ASIsafe basic switch



⤵ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, usable in safety circuits.

<sup>1)</sup> On enclosure widths 31 mm and 50 mm the basic switch is a complete unit with rounded plunger.

Note: For selection aid, see page 9/12.

# 3SF1 AS-Interface Position Switches

**Molded-plastic enclosures**  
Enclosure width 31 mm acc. to EN 50047/50 mm

Version	Roller diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
	mm		Order No.	Price per PU		
<b>Operating mechanisms</b>						
 Roller plunger	<b>Roller plungers, type C acc. to EN 50047</b>					
	Plastic rollers	10	⊙ A	<b>3SE5000-0AD03</b>	1	1 unit 102
	High-grade steel rollers	10	⊙ B	<b>3SE5000-0AD04</b>	1	1 unit 102
 With central fixing	<b>Roller plungers with central fixing</b>					
	Plastic rollers	10	⊙ B	<b>3SE5000-0AD10</b>	1	1 unit 102
	High-grade steel rollers	10	⊙ B	<b>3SE5000-0AD11</b>	1	1 unit 102
 Roller lever	<b>Roller levers, type E acc. to EN 50047</b>					
	Metal lever, plastic roller	13	⊙ A	<b>3SE5000-0AE10</b>	1	1 unit 102
	Metal lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AE11</b>	1	1 unit 102
	High-grade steel lever, plastic roller	13	⊙ B	<b>3SE5000-0AE12</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AE13</b>	1	1 unit 102
 Angular roller lever	<b>Angular roller levers</b>					
	Metal lever, plastic roller	13	⊙ A	<b>3SE5000-0AF10</b>	1	1 unit 102
	Metal lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AF11</b>	1	1 unit 102
	High-grade steel lever, plastic roller	13	⊙ A	<b>3SE5000-0AF12</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AF13</b>	1	1 unit 102
<b>Twist actuators with lever</b>						
 Twist actuator	<b>Twist actuators, plastic (without lever)</b>					
	Switching right or left, adjustable		⊙ A	<b>3SE5000-0AK00</b>	1	1 unit 102
<b>Levers for twist actuators</b>						
 Twist lever	<b>Twist levers, type A acc. to EN 50047</b>					
	Metal lever, plastic roller	19	⊙ A	<b>3SE5000-0AA21</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA22</b>	1	1 unit 102
	Metal lever, roller with ball bearing	19	⊙ B	<b>3SE5000-0AA23</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA25</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA31</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA32</b>	1	1 unit 102
 Twist lever, adjustable length	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA24</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA26</b>	1	1 unit 102
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA60</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA61</b>	1	1 unit 102
	Metal lever, plastic roller	50	⊙ B	<b>3SE5000-0AA67</b>	1	1 unit 102
	Metal lever, rubber roller	50	⊙ B	<b>3SE5000-0AA68</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA62</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA63</b>	1	1 unit 102

⊙ Positively driven actuator, usable in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# 3SF1 AS-Interface Position Switches


**Metal enclosures**  
Enclosure width 31 mm according to EN 50047

## Selection and ordering data

### Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 connector socket

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
							
Order No.				Price per PU			

### Basic switches (with rounded plunger<sup>1)</sup>) · Enclosure width 31 mm according to EN 50047



#### With plunger

With M12 connector socket, 4-pole,  
channel 1 on NC contact,  
channel 2 on NC contact

Slow-action contacts	2 NC	24 V DC	⤵ B	<b>3SF1214-1KC05-1BA1</b>	1	1 unit	121
Snap-action contacts	2 NC	24 V DC	⤵ B	<b>3SF1214-1LC05-1BA1</b>	1	1 unit	121

ASIsafe basic switch









⤵ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, usable in safety circuits.

<sup>1)</sup> On enclosure width 31 mm the basic switch is a complete unit with rounded plunger.

Note: For selection aid, see page 9/12.

# 3SF1 AS-Interface Position Switches

**Metal enclosures**  
Enclosure width 31 mm according to EN 50047

Version	Plunger or roller diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
	mm		Order No.	Price per PU		
<b>Operating mechanisms</b>						
 Plain plunger	<b>Plain plungers</b>					
	High-grade steel plungers	10	⊙ A	<b>3SE5000-0AB01</b>	1	1 unit 102
 Roller plunger	<b>Roller plungers, type C acc. to EN 50047</b>					
	Plastic rollers	10	⊙ A	<b>3SE5000-0AD03</b>	1	1 unit 102
	High-grade steel rollers	10	⊙ B	<b>3SE5000-0AD04</b>	1	1 unit 102
 With central fixing	<b>Roller plungers with central fixing</b>					
	Plastic rollers	10	⊙ B	<b>3SE5000-0AD10</b>	1	1 unit 102
	High-grade steel rollers	10	⊙ B	<b>3SE5000-0AD11</b>	1	1 unit 102
 Roller lever	<b>Roller levers, type E acc. to EN 50047</b>					
	Metal lever, plastic roller	13	⊙ A	<b>3SE5000-0AE10</b>	1	1 unit 102
	Metal lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AE11</b>	1	1 unit 102
	High-grade steel lever, plastic roller	13	⊙ B	<b>3SE5000-0AE12</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AE13</b>	1	1 unit 102
 Angular roller lever	<b>Angular roller levers</b>					
	Metal lever, plastic roller	13	⊙ A	<b>3SE5000-0AF10</b>	1	1 unit 102
	Metal lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AF11</b>	1	1 unit 102
	High-grade steel lever, plastic roller	13	⊙ A	<b>3SE5000-0AF12</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	13	⊙ B	<b>3SE5000-0AF13</b>	1	1 unit 102
<b>Twist actuators with lever</b>						
 Twist actuator	<b>Twist actuators, plastic (without lever)</b>					
	Switching right or left, adjustable		⊙ A	<b>3SE5000-0AK00</b>	1	1 unit 102
<b>Levers for twist actuators</b>						
 Twist lever	<b>Twist levers, type A acc. to EN 50047</b>					
	Metal lever, plastic roller	19	⊙ A	<b>3SE5000-0AA21</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA22</b>	1	1 unit 102
	Metal lever, roller with ball bearing	19	⊙ B	<b>3SE5000-0AA23</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA25</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA31</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA32</b>	1	1 unit 102
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
 Twist lever, adjustable length	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA24</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA26</b>	1	1 unit 102
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA60</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA61</b>	1	1 unit 102
	Metal lever, plastic roller	50	⊙ B	<b>3SE5000-0AA67</b>	1	1 unit 102
	Metal lever, rubber roller	50	⊙ B	<b>3SE5000-0AA68</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA62</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA63</b>	1	1 unit 102

⊙ Positively driven actuator, usable in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).

# 3SF1 AS-Interface Position Switches

## Metal enclosures

Enclosure width 40 mm acc. to EN 50041/56 mm

### Selection and ordering data

#### Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

1 or 2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 connector socket

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		

#### Basic switches · Enclosure width 40 mm according to EN 50041



With M12 connector socket, 4-pole, channel 1 on NC contact, channel 2 on NC contact

Slow-action contacts	2 NC	24 V DC	⊕ B	<b>3SF1114-1KA00-1BA1</b>	1	1 unit	121
Snap-action contacts	2 NC	24 V DC	⊕ B	<b>3SF1114-1LA00-1BA1</b>	1	1 unit	121

ASIsafe basic switch

#### Basic switches · Enclosure width 56 mm



With M12 connector socket, 4-pole, channel 1 on NC contact, channel 2 on M12 socket, right

Slow-action contacts	1 NC	24 V DC	⊕ B	<b>3SF1124-1KA00-1BA2</b>	1	1 unit	121
Snap-action contacts	1 NC	24 V DC	⊕ B	<b>3SF1124-1LA00-1BA2</b>	1	1 unit	121

ASIsafe basic switch

⊕ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, usable in safety circuits.

*Note: For selection aid, see page 9/12.*

Version	Plunger or roller diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
		mm	Order No.	Price per PU		

#### Operating mechanisms



Plain plunger

##### Plain plungers

High-grade steel plungers	10	⊕ A	<b>3SE5000-0AB01</b>	1	1 unit	102
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Rounded plunger

##### Rounded plungers, type B, acc. to EN 50041

High-grade steel plungers, with 3 mm overtravel	10	⊕ B	<b>3SE5000-0AC02</b>	1	1 unit	102
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Roller plunger














##### Roller plungers, type C acc. to EN 50041

High-grade steel roller, with 3 mm overtravel	13	⊕ B	<b>3SE5000-0AD02</b>	1	1 unit	102
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⊕ Positively driven actuator, usable in safety circuits.

# 3SF1 AS-Interface Position Switches

**Metal enclosures**  
Enclosure width 40 mm acc. to EN 50041/56 mm

Version	Roller diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
	mm		Order No.	Price per PU		
<b>Operating mechanisms</b>						
	<b>Roller levers</b>					
	Metal lever, plastic roller	22	⊙ A	<b>3SE5000-0AE01</b>	1	1 unit 102
	Metal lever, high-grade steel roller	22	⊙ B	<b>3SE5000-0AE02</b>	1	1 unit 102
	High-grade steel lever, plastic roller	22	⊙ B	<b>3SE5000-0AE03</b>	1	1 unit 102
	<b>Angular roller levers</b>					
	Metal lever, plastic roller	22	⊙ A	<b>3SE5000-0AF01</b>	1	1 unit 102
	Metal lever, high-grade steel roller	22	⊙ B	<b>3SE5000-0AF02</b>	1	1 unit 102
	High-grade steel lever, plastic roller	22	⊙ B	<b>3SE5000-0AF03</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	22	⊙ B	<b>3SE5000-0AF04</b>	1	1 unit 102
<b>Twist actuators with lever</b>						
	<b>Twist actuators, metal (without lever)</b>					
	• For twist levers, switching right or left, adjustable		⊙ A	<b>3SE5000-0AH00</b>	1	1 unit 102
	- For enclosure width 40 and 56 mm		⊙ B	<b>3SE5000-0AT10</b>	1	1 unit 102
	<b>Levers for twist actuators</b>					
	<b>Twist levers 27 mm, offset, type A, acc. to EN 50041</b>					
	Metal lever, plastic roller	19	⊙ A	<b>3SE5000-0AA01</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ A	<b>3SE5000-0AA02</b>	1	1 unit 102
	Metal lever, roller with ball bearing	19	⊙ B	<b>3SE5000-0AA03</b>	1	1 unit 102
	Metal lever, 2 plastic rollers	19	⊙ B	<b>3SE5000-0AA04</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA05</b>	1	1 unit 102
	Metal lever, plastic roller	50	⊙ B	<b>3SE5000-0AA07</b>	1	1 unit 102
	Metal levers, rubber roller	50	⊙ B	<b>3SE5000-0AA08</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA11</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA12</b>	1	1 unit 102
	<b>Twist levers 35 mm, offset</b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA15</b>	1	1 unit 102
	<b>Twist levers 30 mm, straight<sup>1)</sup></b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA24</b>	1	1 unit 102
	Metal lever, plastic roller	30	⊙ B	<b>3SE5000-0AA26</b>	1	1 unit 102
	<b>Twist levers, adjustable length, with grid hole</b>					
	Metal lever, plastic roller	19	⊙ B	<b>3SE5000-0AA60</b>	1	1 unit 102
	Metal lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA61</b>	1	1 unit 102
	Metal lever, plastic roller	50	⊙ B	<b>3SE5000-0AA67</b>	1	1 unit 102
	Metal lever, rubber roller	50	⊙ B	<b>3SE5000-0AA68</b>	1	1 unit 102
	High-grade steel lever, plastic roller	19	⊙ B	<b>3SE5000-0AA62</b>	1	1 unit 102
	High-grade steel lever, high-grade steel roller	19	⊙ B	<b>3SE5000-0AA63</b>	1	1 unit 102
	<b>Fork levers (for switches with snap-action contacts only)</b>					
	Metal lever, 2 plastic rollers	19	⊙ B	<b>3SE5000-0AT01</b>	1	1 unit 102
	Metal lever, 2 high-grade steel rollers	19	⊙ B	<b>3SE5000-0AT02</b>	1	1 unit 102
	High-grade steel lever, 2 plastic rollers	19	⊙ B	<b>3SE5000-0AT03</b>	1	1 unit 102
	High-grade steel lever, 2 high-grade steel rollers	19	⊙ B	<b>3SE5000-0AT04</b>	1	1 unit 102

⊙ Positively driven actuator, usable in safety circuits.

<sup>1)</sup> Can be clinch mounted (turned through 180°, rear of lever).



# 3SF1 AS-Interface Position Switches

## With Separate Actuator

### 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.



3SF1 position switches with head for 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  $4 \times 90^\circ$ . 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 metal enclosure 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.

#### Benefits

The new generation of 3SF1 position switches with separate actuator offers:

- ASIsafe Electronics integrated in the enclosure, with low power consumption  $< 60 \text{ mA}$
- An extensive range of actuators
- Status display with three LEDs

#### Application

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

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

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions, fixing points of the enclosure are in accordance with EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

#### Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Switchgear and Controlgear, General) and IEC 60947-5-1 (Electromechanical Control Circuit Devices).

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

#### Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 position switch it is possible to achieve Category 3 according to ISO 13849-1 (EN 954-1) or SIL 2 according to IEC 61508.

Category 4 according to ISO 13849-1 (EN 954-1) or SIL 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

# 3SF1 AS-Interface Position Switches

## With Separate Actuator

Molded-plastic enclosures  
Enclosure width 31 mm / 50 mm

### Overview

- Contacts: 1 or 2 slow-action contacts
- Status display with 3 LEDs 24 V DC;  
1: F-IN1, 2: F-IN2, 3: AS-I/FAULT
- Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm)

### Selection and ordering data

Version <sup>1)</sup>	Contacts	DT	Complete units	PU (UNIT, SET, M)	PS*	PG
			Order No.	Price per PU		

#### Enclosure width 31 mm according to EN 50047



##### 5 directions of approach

With M12 connector socket, 4-pole;  
channel 1 on NC contact,  
channel 2 on NC contact

Slow-action contacts

2 NC

⤵ B

**3SF1234-1QV40-1BA1**

1

1 unit

121

#### Enclosure width 50 mm



##### 5 directions of approach

With M12 connector socket, 4-pole;  
channel 1 on NC,  
channel 2 on M12 socket, right

Slow-action contacts

1 NC

⤵ B

**3SF1244-1QV40-1BA2**

1

1 unit

121

⤵ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Supplied without actuator. Please order separately.

# 3SF1 AS-Interface Position Switches




## With Separate Actuator

**Metal enclosures**  
**Enclosure width 31 mm / 40 mm / 56 mm**

### Overview

- Contacts: 1 or 2 slow-action contacts
- Status display with 3 LEDs 24 V DC;  
1: F-IN1, 2: F-IN2, 3: AS-I/FAULT
- Degree of protection IP66/IP67

### Selection and ordering data

Version <sup>1)</sup>	Contacts	DT	Complete units	<div><input type="checkbox"/></div> PU (UNIT, SET, M)	PS*	PG
			Order No.	Price per PU		
Enclosure width 31 mm according to EN 50047						
	<b>5 directions of approach</b> With M12 connector socket, 4-pole; channel 1 on NC contact, channel 2 on NC contact Slow-action contacts		2 NC	⊙ B	<b>3SF1214-1QV40-1BA1</b>	1    1 unit    121
Enclosure width 40 mm according to EN 50041						
	<b>5 directions of approach</b> With M12 connector socket, 4-pole; channel 1 on NC contact, channel 2 on NC contact Slow-action contacts		2 NC	⊙ B	<b>3SF1114-1QV10-1BA1</b>	1    1 unit    121
Enclosure width 56 mm						
	<b>5 directions of approach</b> With M12 connector socket, 4-pole; channel 1 on NC, channel 2 on M12 socket, right Slow-action contacts		1 NC	⊙ B	<b>3SF1124-1QV10-1BA2</b>	1    1 unit    121

⊙ Positive opening according to IEC 60947-5-1, Appendix K.






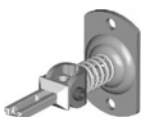



<sup>1)</sup> Supplied without actuator. Please order separately.

# 3SF1 AS-Interface Position Switches

## With Separate Actuator

### Accessories

#### Overview

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Actuators</b>						
 3SE5 000-0AV01	<b>Standard actuators</b>					
	<ul style="list-style-type: none"> <li>Length 75.6 mm</li> </ul>					
	▶	<b>3SE5000-0AV01</b>		1	1 unit	102
 3SE5 000-0AV02	<ul style="list-style-type: none"> <li>With vertical fixing, length 53 mm</li> </ul>					
	A	<b>3SE5000-0AV02</b>		1	1 unit	102
 3SE5 000-0AV03	<ul style="list-style-type: none"> <li>With transverse fixing, length 47 mm</li> </ul>					
	A	<b>3SE5000-0AV03</b>		1	1 unit	102
 3SE5 000-0AV04	<b>Radius actuators, length 51 mm</b>					
	<ul style="list-style-type: none"> <li>Direction of approach from the left</li> </ul>					
	A	<b>3SE5000-0AV04</b>		1	1 unit	102
 3SE5 000-0AV6	<ul style="list-style-type: none"> <li>Direction of approach from the right</li> </ul>					
	A	<b>3SE5000-0AV06</b>		1	1 unit	102
 3SE5 000-0AV05	<b>Universal radius actuators, length 77 mm</b>					
	A	<b>3SE5000-0AV05</b>		1	1 unit	102
 3SE5 000-0AV07	<b>Universal radius actuators, heavy-duty</b>					
	<ul style="list-style-type: none"> <li>Length 67 mm</li> <li>Length 77 mm</li> </ul>					
	A	<b>3SE5000-0AV07-1AK2</b>		1	1 unit	102
	A	<b>3SE5000-0AV07</b>		1	1 unit	102
<b>Optional accessories</b>						
 3SE5 000-0AV08-1AA2	<b>Protective caps</b> made of black rubber for the actuator head, to protect the actuator openings from contamination (Only for enclosure width 40 or 56 mm)					
	B	<b>3SE5000-0AV08-1AA2</b>		1	1 unit	102
 3SE5 000-0AV08-1AA3	<b>Blocking inserts</b> , high-grade steel, for actuator head, for up to 8 padlocks					
	C	<b>3SE5000-0AV08-1AA3</b>		1	1 unit	102

# 3SF1 AS-Interface Position Switches

## With Interlocking

### 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.



3SF1 position switch with 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  $4 \times 90^\circ$ . 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 enclosure from contamination is available for operation in dusty environments.

#### Interlocking

There are two versions for locking the actuator:

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

For more explanations see page 9/62.

#### 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 (no additional supply of auxiliary power is required thanks to the low current consumption of the solenoid of max. 170 mA).

#### Benefits

The new generation of 3SF1 3 position switches with solenoid interlocking offers:

- More safety through higher locking forces:
  - 1300 N for the plastic version
  - 2600 N for the metal version
- Various release mechanisms: lock release, escape release and emergency release
- ASIsafe Electronics integrated in the enclosure; connected through 4-pole M12 connector socket
- Current consumption of the solenoid max. 170 mA
- Two contact blocks as standard equipment, hence fewer versions needed
- Same dimensions for all enclosure variants: Plastic, metal
- An extensive range of actuators
- Status display with four LEDs

#### Application

The position switches with interlocking are exceptional safety-related devices which prevent an unforeseen or intentional opening of protective doors, protective grills or other covers as long as a dangerous situation is present (i.e. follow-on motion of the switched off machine).

The safety position switches with interlocking have the following functions:

- Enabling the machine or process with closed and locked protective device
- Locking the machine or process with opened protective device
- Position monitoring of the protective device and solenoid interlocking

#### Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Switchgear and Controlgear, General) and IEC 60947-5-1 (Electromechanical Control Circuit Devices).

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

#### Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

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

3SE5 3 position switches with interlocking bear the VDE test mark.

With a 3SF1 3 position switch with interlocking it is possible to achieve category 3 according to ISO 13849-1 (EN 954-1) or SIL 2 according to IEC 61508.

Category 4 according to ISO 13849-1 (EN 954-1) or SIL 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

# 3SF1 AS-Interface Position Switches

## With Interlocking

Molded-plastic enclosures  
With locking force greater than 1200 N

### Overview

#### 5 directions of approach · Degree of protection IP66/IP67

- Slow-action contacts:
  - Version -1BA1: ASIsafe channel 1 on 1 NC contact from the actuator and channel 2 on 1 NC contact from the solenoid<sup>1)</sup>
  - Version -1BA3: ASIsafe channel 1 on the first NC contact from the actuator and channel 2 on the second NC contact from the actuator
  - Version -1BA4: ASIsafe channel 1 on 2 NC contacts from the actuator and channel 2 on 1 NC contact from the solenoid A discrepancy between the two contacts of the actuator will be evaluated already in the switch.
- Solenoid: Rated operational voltage 24 V DC
- Locking force 1300 N (1000 N according to GS-ET 19)
- Status display with 4 LEDs 24 V DC;
  - 1: AS-i, 2: FAULT, 3: F-IN1, 4: F-IN2

#### Safety level

The new 3SF1 324-1S.21-1BA4 safety position switches are also recommended in the case of series connections for protective door interlocking where reliable diagnostics and quick restart capability of equipment is required.

They feature:

- Feedback from the solenoid and
- No opening of the doors after the solenoid is unlocked.




With AS-i safety monitor or in DP/AS-i F-Link it is possible to achieve SIL 2 according to IEC 61508 or PL d according to ISO 13849-1.

#### Comparison of versions

Safety switch	Contacts	Achievable safety level	Diagnostics	Reclose condition
Type	Actuator / magnet		Feedback from the solenoid	After unlocking the solenoid (depending on the type of evaluation)
3SF1 324-1S.21-1BA1	1 NC/1 NC	SIL 1 / PL c	✓	Door does <u>not</u> have to be opened
	1 NC/1 NC	SIL 2 / PL d	✓	Door must be opened
3SF1 324-1S.21-1BA3	2 NC	SIL 2 / PL d	--	Door does <u>not</u> have to be opened
3SF1 324-1S.21-1BA4	2 NC/1 NC	SIL 2 / PL d	✓	Door does <u>not</u> have to be opened

✓ yes  
-- no

### Selection and ordering data

Interlock <sup>1)</sup>		Contacts Actuators/ Solenoids	DT	Complete units	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		
<b>1300 N locking force · Enclosure width 54 mm</b>							
	<b>Spring-actuated locks</b>						
	• With auxiliary release	1 NC/1 NC	⊕ B	<b>3SF1324-1SD21-1BA1</b>	1	1 unit	121
		2 NC/--	⊕ B	<b>3SF1324-1SD21-1BA3</b>	1	1 unit	121
	• With auxiliary release with lock	2 NC/1 NC	⊕ B	<b>3SF1324-1SD21-1BA4</b>	1	1 unit	121
		1 NC/1 NC	⊕ B	<b>3SF1324-1SE21-1BA1</b>	1	1 unit	121
3SF1 324-1SD21-...							
	• With escape release from the front	1 NC/1 NC	⊕ B	<b>3SF1324-1SF21-1BA1</b>	1	1 unit	121
		2 NC/1 NC	⊕ B	<b>3SF1324-1SF21-1BA4</b>	1	1 unit	121
	• With escape release from the back and auxiliary release from the front	1 NC/1 NC	⊕ B	<b>3SF1324-1SG21-1BA1</b>	1	1 unit	121
		2 NC/1 NC	⊕ B	<b>3SF1324-1SG21-1BA4</b>	1	1 unit	121
	• With emergency release from the back and auxiliary release from the front	1 NC/1 NC	⊕ B	<b>3SF1324-1SJ21-1BA1</b>	1	1 unit	121
3SF1 324-1SF21-...							
	<b>Solenoid locks</b>						
		1 NC/1 NC	⊕ B	<b>3SF1324-1SB21-1BA1</b>	1	1 unit	121
3SF1 324-1SB21-...		2 NC/--	⊕ B	<b>3SF1324-1SB21-1BA3</b>	1	1 unit	121

⊕ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Supplied without actuator. Please order separately.

For actuators and optional accessories see page 9/93.

# 3SF1 AS-Interface Position Switches

## With Interlocking

**Metal enclosures**  
**With locking force greater than 2000 N**

### Overview

#### 5 directions of approach · Degree of protection IP66/IP67

- Slow-action contacts:  
Version -1BA1: ASIsafe channel 1 on 1 NC contact from the actuator and channel 2 on 1 NC contact from the solenoid
- Solenoid: Rated operational voltage 24 V DC
- Locking force 2600 N (2000 N according to GS-ET 19)
- Status display with 4 LEDs 24 V DC;  
1: AS-i, 2: FAULT, 3: F-IN1, 4: F-IN2

#### Safety level

See page 9/95.

### Selection and ordering data

Interlock <sup>1)</sup>		Contacts Actuators/ Solenoids	DT	Complete units	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		
<b>2600 N locking force · Enclosure width 54 mm</b>							
	<b>Spring-actuated locks</b>						
	• With auxiliary release	1 NC/1 NC	⤵ B	<b>3SF1314-1SD11-1BA1</b>	1	1 unit	121
	• With auxiliary release with lock	1 NC/1 NC	⤵ B	<b>3SF1314-1SE11-1BA1</b>	1	1 unit	121
	• With escape release from the front	1 NC/1 NC	⤵ B	<b>3SF1314-1SF11-1BA1</b>	1	1 unit	121
	• With escape release from the back and auxiliary release from the front	1 NC/1 NC	⤵ B	<b>3SF1314-1SG11-1BA1</b>	1	1 unit	121
	• With emergency release from the back and auxiliary release from the front	1 NC/1 NC	⤵ B	<b>3SF1314-1SJ11-1BA1</b>	1	1 unit	121
	<b>Solenoid locks</b>	1 NC/1 NC	⤵ B	<b>3SF1314-1SB11-1BA1</b>	1	1 unit	121

⤵ Positive opening according to IEC 60947-5-1, Appendix K.

<sup>1)</sup> Supplied without actuator. Please order separately.

For actuators and optional accessories see page 9/93.

# 3SF1 AS-Interface Position Switches

## Hinge Switches

Molded-plastic enclosures  
Enclosure width 31 mm / 50 mm

### Overview

The 3SF1 hinge 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.

The hinge switches are provided for mounting on hinges. There are two actuator variants here:

- Hollow shaft, inner diameter 8 mm, outer 12 mm
- Solid shaft, diameter 10 mm

For the ASIsafe version of the hinge switch, the basic switch and twist actuator must be ordered separately. The basic switches correspond to the position switches of the standard version (only use versions with snap-action contacts).

The standards and approvals are the same as for the 3SF1 standard switches ([see page 9/82](#)).

### Selection and ordering data

#### Modular system

1 or 2 contacts · 3 LEDs · Degree of protection IP65 (31 mm) or IP66/IP67 (50 mm) · M12 connector socket

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		

#### Basic switches · Enclosure width 31 mm according to EN 50047



With teflon plunger,  
with M12 connector socket, 4-pole,  
channel 1 on NC contact,  
channel 2 on NC contact

Snap-action contacts

2 NC

24 V DC



B

3SF1234-1LC05-1BA1

1

1 unit

121

ASIsafe basic switch

#### Basic switches · Enclosure width 50 mm



With teflon plunger,  
with M12 connector socket, 4-pole,  
channel 1 on NC contact,  
channel 2 on M12 socket, right

Snap-action contacts

1 NC

24 V DC



B

3SF1244-1LC05-1BA2

1

1 unit

121

ASIsafe basic switch

#### Actuator heads



With hollow shaft

Operating angle 10°

B

3SE5000-0AU21

1

1 unit

102

Twist actuator with  
hollow shaft



With solid shaft

Operating angle 10°

B

3SE5000-0AU22

1

1 unit

102

Twist actuator with  
solid shaft

➞ Positive opening according to IEC 60947-5-1, Appendix K.



# 3SF1 AS-Interface Position Switches

## Hinge Switches

### Metal enclosures

Enclosure width 31 mm / 40 mm / 56 mm

### Overview

The 3SF1 hinge 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.

The hinge switches are provided for mounting on hinges. There are two actuator variants here:

- Hollow shaft, inner diameter 8 mm, outer 12 mm
- Solid shaft, diameter 10 mm

For the ASIsafe version of the hinge switch, the basic switch and twist actuator must be ordered separately. The basic switches correspond to the position switches of the standard version (only use versions with snap-action contacts).

The standards and approvals are the same as for the 3SF1 standard switches ([see page 9/82](#)).

### Selection and ordering data

#### Modular system

1 or 2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 connector socket

Version	Contacts	LEDs	DT	Modular system	PU (UNIT, SET, M)	PS*	PG
				Order No.	Price per PU		

#### Basic switches · Enclosure width 31 mm according to EN 50047



##### With plunger

With M12 connector socket, 4-pole,  
channel 1 on NC contact,  
channel 2 on NC contact

Snap-action contacts

2 NC

24 V DC



B

**3SF1214-1LC05-1BA1**

1

1 unit

121

ASIsafe basic switch

#### Basic switches · Enclosure width 40 mm according to EN 50041



**With M12 connector socket**, 4-pole,  
channel 1 on NC contact,  
channel 2 on NC contact

Snap-action contacts

2 NC

24 V DC



B

**3SF1114-1LA00-1BA1**

1

1 unit

121

ASIsafe basic switch

#### Basic switches · Enclosure width 56 mm



**With M12 connector socket**, 4-pole,  
channel 1 on NC contact,  
channel 2 on M12 socket, right

Snap-action contacts

1 NC

24 V DC



B

**3SF1124-1LA00-1BA2**

1

1 unit

121

ASIsafe basic switch

#### Actuator heads



Twist actuator with  
hollow shaft

##### Hollow shaft

Operating angle 10°

B

**3SE5000-0AU21**

1

1 unit

102



Twist actuator with  
solid shaft

##### Solid shaft

Operating angle 10°

B

**3SE5000-0AU22**

1

1 unit

102

⊕ Positive opening according to IEC 60947-5-1, Appendix K.