

SHS3 Series



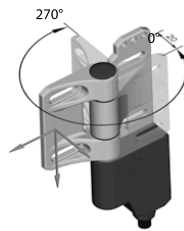
- **Easy to install and tamper-resistant** - the switch mechanism is safely integrated in the hinge
- **No actuator** - no alignment necessary since the actuator is an integral part of the switch
- **No mechanical deterioration** - due to the actuator free switching
- **Reliably operating** - there is no alignment issues between the switch and actuator
- **Tamper-resistant** - the hinged switch can not be defeated with an extra actuator

New Design With Fine Adjustment

The new SHS3 series offers the next generation of hinged safety switch development. It is now unnecessary to replace switches when misalignment of safety doors or gates may occur due to mechanical stress created by accidents or instability. The SHS3 features a fine adjustment system that allows the trip point to be fine tuned to correct for changes to the door or gate, even after the switching point has been set.

Reusable

The SHS3 can be reused even when the entire system needs to be converted: With the aid of a change kit, the user can redefine the switching point without effecting the protection rating of IP67.



Safe:

With suitable system layout, the switch can be used up to performance level PL_e. Following variants are available:

- 2 positive opening safety contacts
- 2 positive opening safety contacts with additional normally-open signaling contact
- With integrated AS interface Safety at Work.

Greater Application Range

The SHS3 has a swivel range from 0° to 270°. The switching point is also freely selectable. The SHS3 hinge switch has virtually no limits in terms of its installation flexibility. Not only does the SHS3 enable front and interior installation, right-hinged or left-hinged mounting or freely selectable direction of electric connection, but thanks to the switching point which can be set in an angle range of 270°, this hinge switch can also be installed in places that were previously not possible.

Flexible:

- Freely and repeatedly adjustable switching point
- Switching point freely adjustable by user over a range of 270°
- Uncomplicated re-adjustment even of set switching point by $\pm 1.5^\circ$ thanks to integrated fine adjustment system
- Slots for mounting on sections and welded structures
- In addition to the plug connection version, an SHS3 with fixed cable connection at the back is also available
- Right and left hinged systems possible for optimum cable routing
- Mounting between sections while maintaining the required finger guard gap

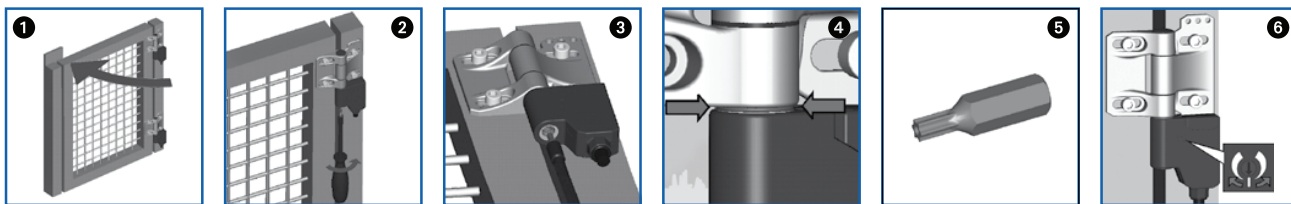
Fast:

To connect the SHS3 even more efficiently, the two contacts are designed as normally-closed contacts with Ultra-Lock technology, thus enabling connection with an M12 cable.

Reliable:

- The protection rating is IP67
- The load-bearing hinge is made from stainless steel while the switching system is housed in a high quality plastic enclosure

SHS3 Series



On delivery, the SHS3 hinge switch allows for all possible settings. With your specific application you define and lock the safe status of the hinged safety equipment (the closed position) (Fig. 1).

The adjusting screw located in axial direction in the switching system is then tightened with the special bit supplied with the hinge switch. The arrangement of the adjusting screw makes it possible to adjust the switching point in all installation positions (Fig. 2+3)

After establishing a form-fit connection, a green ring in the gap between the stainless steel hinge and switch enclosure indicates that the switching point has been set correctly at a min. torque of 2 Nm/+10% (Fig. 4).

A red ring at this point additionally indicates wear, e.g. caused by abrasive substances. With the same special bit you can not only freely adjust the switching point to suit your application but you can also change the mounting arrangement of your safety equipment from right-hinged to left-hinged (Fig. 5).

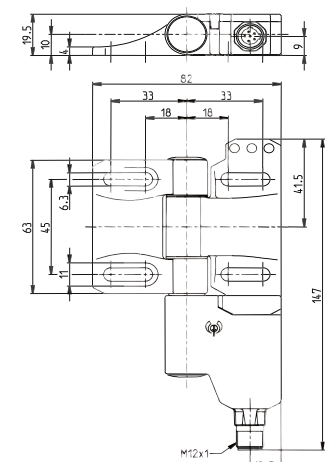
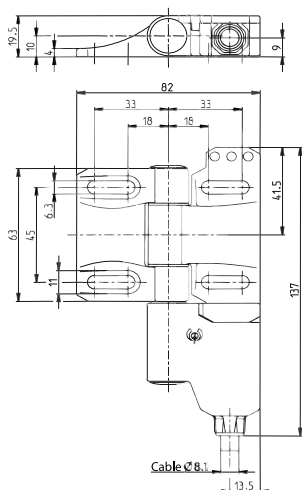
Fine adjustment

The set switching point can be subsequently varied by up to $\pm 1.5\%$ by turning the adjusting screw in the corresponding direction (Fig. 6).

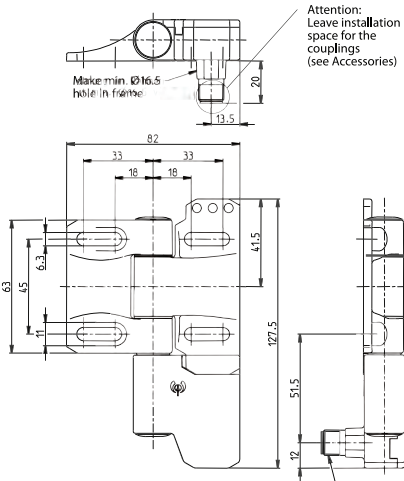
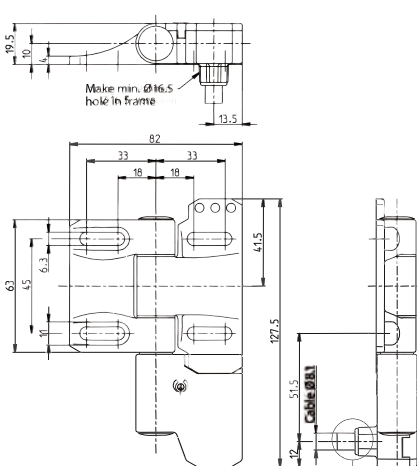
In many cases this fine adjustment makes it unnecessary to replace the switch or readjust the switching point due to mechanical deformation of the safety guard. The switching angle should generally be selected as small as possible.

Dimensioned drawings

SHS3...KA...

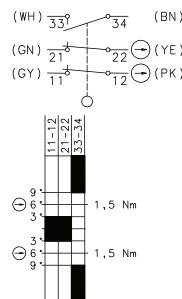


SHS3...KR...

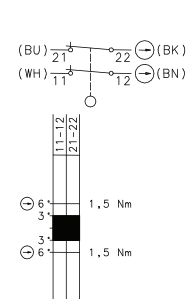


Contact Information

U15Z
2 NC contacts,
2 NO contacts (Zb)



A2Z
2 NC contacts (Zb)



Setting point freely selectable in range from 0°... 270° and 0°... 180°

Tolerances:

- Switching angle (opening) $\pm 1.5^\circ$
- Positive opening torque 10 %
- Positive opening angle $\pm 1.5^\circ$

SHS3 Series

Product selection for die-cast zinc version

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction		Required cable coupling / type	Mounting
					radial	axial		
601.9490.050	SHS3Z-U15Z-KA5 R	2NC/1NO	230 V	AC/DC		Cable		Right
601.9490.051	SHS3Z-U15Z-KA5 L	2NC/1NO	230 V	AC/DC		Cable		Left
601.9490.052	SHS3Z-U15Z-KR5 R	2NC/1NO	230 V	AC/DC	Cable			Right
601.9490.053	SHS3Z-U15Z-KR5 L	2NC/1NO	230 V	AC/DC	Cable			Left
601.9490.054	SHS3Z-U15Z-SA R	2NC/1NO	230 V	AC/DC		M12	D	Right
601.9490.055	SHS3Z-U15Z-SA L	2NC/1NO	230 V	AC/DC		M12	D	Left
601.9490.056	SHS3Z-U15Z-SR R	2NC/1NO	230 V	AC/DC	M12		D	Right
601.9490.063	SHS3Z-U15Z-SR L	2NC/1NO	230 V	AC/DC	M12		D	Left
601.9490.057	SHS3Z-U1Z-SA R	1NC/1NO	230 V	AC/DC		M12	E	Right
601.9490.058	SHS3Z-U1Z-SA L	1NC/1NO	230 V	AC/DC		M12	E	Left
601.9490.059	SHS3Z-U1Z-SR R	1NC/1NO	230 V	AC/DC	M12		E	Right
601.9490.060	SHS3Z-A2Z-SA R	2NC	230 V	AC/DC		M12	E	Right
601.9490.061	SHS3Z-A2Z-SA L	2NC	230 V	AC/DC		M12	E	Left
601.9490.062	SHS3Z-A2Z-SR R	2NC	230 V	AC/DC	M12		E	Right
601.9490.049	SHS3Z-HINGE							

Product selection for stainless steel version

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction		Required cable coupling / type	Mounting
					radial	axial		
601.9390.023	SHS3-U15Z-KA 5 L	2NC/1NO	230 V	AC/DC		Cable		Left
601.9390.022	SHS3-U15Z-KA 5 R	2NC/1NO	230 V	AC/DC		Cable		Right
601.9390.025	SHS3-U15Z-KR 5 L	2NC/1NO	230 V	AC/DC	Cable			Left
601.9390.024	SHS3-U15Z-KR 5 R	2NC/1NO	230 V	AC/DC	Cable			Right
601.9390.035	SHS3-U15Z-SA L	2NC/1NO	230 V	AC/DC		M12	D	Left
601.9390.034	SHS3-U15Z-SA R	2NC/1NO	230 V	AC/DC		M12	D	Right
601.9390.037	SHS3-U15Z-SR L	2NC/1NO	230 V	AC/DC	M12		D	Left
601.9390.036	SHS3-U15Z-SR R	2NC/1NO	230 V	AC/DC	M12		D	Right
601.9390.040	SHS3-A2Z-SA-R	2NC	230 V	AC/DC		M12	E	Right
601.9390.041	SHS3-A2Z-SA-L	2NC	230 V	AC/DC		M12	E	Left
601.9390.044	SHS3-A2Z-SR-R	2NC	230 V	AC/DC	M12		E	Right
601.9390.042	SHS3-U1Z-SA-R	1NC/1NO	230 V	AC/DC		M12	E	Right
601.9390.043	SHS3-U1Z-SA-L	1NC/1NO	230 V	AC/DC		M12	E	Left
601.9390.045	SHS3-U1Z-SR-R	1NC/1NO	230 V	AC/DC	M12		E	Right
601.9390.038	SHS3-HINGE (blank hinge)							Both sides

Product selection for stainless steel version in IP 69K

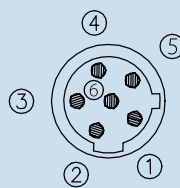
Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction		Required cable coupling / type	Mounting
					radial	axial		
6019390064	SHS3-U15Z-KA5-R-IPX	2NC/1NO	230 V	AC/DC		Cable		Right
6019390065	SHS3-U15Z-KA5-L-IPX	2NC/1NO	230 V	AC/DC		Cable		Left
6019390066	SHS3-U15Z-KA5-R-IPX	2NC/1NO	230 V	AC/DC	Cable			Right
6019390067	SHS3-U15Z-KA5-L-IPX	2NC/1NO	230 V	AC/DC	Cable			Left
6019390068	SHS3-7-KA5-IPX/7-KA5-IPX	2 x 1NC/1NO	230 V	AC/DC		Cable		Both sides

SHS3 Series

SHS3 Cable Type D

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
325.1006.291	AN-KAB.SH53 2M STRAIGHT	2 m	Straight	6	M12 BG version
325.1006.292	AN-KAB.SH53 5M STRAIGHT	5 m	Straight	6	M12 BG version
325.1006.293	AN-KAB.SH53 10M STRAIGHT	10 m	Straight	6	M12 BG version
325.1006.294	AN-KAB.SH53 2M ELBOW	2 m	Elbow	6	M12 BG version
325.1006.295	AN-KAB.SH53 5M ELBOW	5 m	Elbow	6	M12 BG version
325.1006.296	AN-KAB.SH53 10M ELBOW	10 m	Elbow	6	M12 BG version

Contact assignments, AC/DC versions



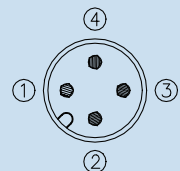
- 1 = White
- 2 = Brown
- 3 = Green
- 4 = Yellow
- 5 = Grey
- 6 = Pink

Core insulation/sheathing material:	PVC (∅ 5.6 mm)
Molding/contact carrier material:	PUR Elastollan R3000
Max. rated voltage:	250 V AC
Max. current carrying capacity:	2.5 A (at 70 °C)
Min./max. temperature range:	-5 °C to +105 °C (moved)
	-40 °C to +105 °C (moved firmly)
Cable configuration mm ² :	LiYwUL2517 6 x 0.34
Protection class when assembled:	IP68

SHS3 Cable Type E

Article number	Designation	Cable length	Connector type	Number of pins	Special feature
325.1004.310	AN-KAB.SH53 4P 2M STRAIGHT	2 m	Straight	4	M12 BG version
325.1004.311	AN-KAB.SH53 4P 5M STRAIGHT	5 m	Straight	4	M12 BG version
325.1004.312	AN-KAB.SH53 4P 10M STRAIGHT	10 m	Straight	4	M12 BG version
325.1004.313	AN-KAB.SH53 4P 2M ELBOW	2 m	Elbow	4	M12 BG version
325.1004.314	AN-KAB.SH53 4P 5M ELBOW	5 m	Elbow	4	M12 BG version
325.1004.315	AN-KAB.SH53 4P 10M ELBOW	10 m	Elbow	4	M12 BG version
325.1004.316	AN-KAB.SH53 4P U.L. 2M STRAIGHT	2 m	Straight	4	Ultra Lock BG version
325.1004.317	AN-KAB.SH53 4P U.L. 5M STRAIGHT	5 m	Straight	4	Ultra Lock BG version
325.1004.318	AN-KAB.SH53 4P U.L. 10M STRAIGHT	10 m	Straight	4	Ultra Lock BG version
325.1004.319	AN-KAB.SH53 4P U.L. 2M ELBOW	2 m	Elbow	4	Ultra Lock BG version
325.1004.320	AN-KAB.SH53 4P U.L. 5M ELBOW	5 m	Elbow	4	Ultra Lock BG version
325.1004.321	AN-KAB.SH53 4P U.L. 10M ELBOW	10 m	Elbow	4	Ultra Lock BG version

Contact assignments, AC/DC versions



- 1 = White
- 2 = Brown
- 3 = Blue
- 4 = Black

Core insulation/sheathing material:	Heat resistant PVC UL 1731 / UL 2517 black
Molding/contact carrier material:	APEX 7500-85 / R3000 Elastollan R3000 neutral
Max. rated voltage:	250 V
Max. current carrying capacity:	4 A
Min./max. temperature range:	At rest -25 °C to +105 °C
	Moved -5 °C to +105 °C
Protection class when assembled:	IP68

Change kit for re-adjusting switching point



Article number	Designation
399.1990.161	SHS3 change kit
Containing:	
2 replacement caps	
1 special bit	
1 plastic ring	

Installation tool



Article number	Designation
191000005	Bit holder 1/4" flexible stem

SHS3 Series

Cable axial
Installation position
on the left side



Connector axial
Installation position
on the right side



Cable radial
Installation position on
the right side



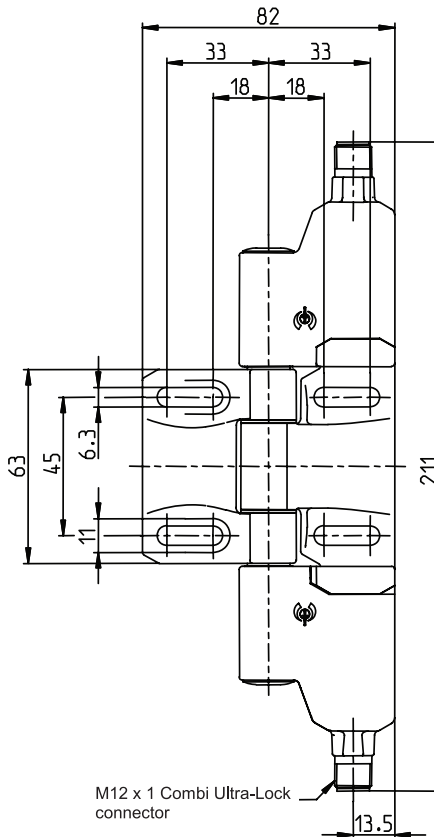
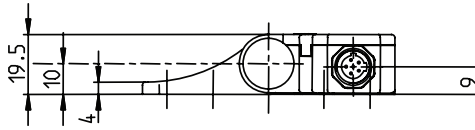
Connector radial
Installation position
on the right side



Technical data SHS3

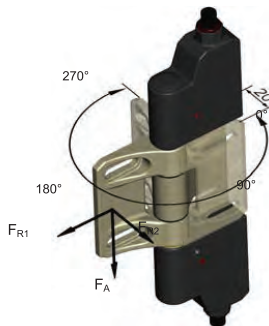
Electrical data		
Rated insulation voltage	U_i max.	250 V
Rated operating voltage	U_e max.	230 V AC; 24 V DC
Conventional thermal current	I_{the}	5 A
Utilization category	U_e / I_e	AC-15, U_e / I_e 230 V / 3 A; DC-13 U_e / I_e 24 V/1A
Short-circuit protection		4 A gL/gG
Protection class		II, Insulated
Mechanical data		
Switch	PBT / Hinge G-X22 Cr Ni 17	
Ambient temperature	-25°C to + 70°C (Connection cable installed)	
Mechanical service life	10 ⁶ switching cycles	
Switching frequency max.	max. 300 switching cycles/hour	
Mounting	4 x M6 Screws DIN EN ISO 7984	
B10d	2 mill.	
Type of connection	Fixed connection cable, 6 x 0.75 mm ² , minimum bending radius = 60 mm	
Weight	approx. 0.7 kg (cable variant)	
Installation position	Any	
Protection class	IP 67 conforming to IEC/EN 60529	
Switching angle	± 3° from setting point	
Positive opening angle	± 6° + 2	
Positive opening torque	1.5 Nm	
Mechanical load	F_{R1} = max. 1200 N, F_{R2} = max. 500 N, F_A = max. 1200 N	
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1		
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

SHS3 Double Series



Double hinge

Thanks to its two switching elements on one hinge, the BG (occupational health and safety)-approved variant of the SHS3 provides two independently adjustable switching points. This arrangement not only makes it possible to monitor the opening of a safety guard but also the direction of opening of swing doors.



swivel range: 0° to 270°

Product selection for stainless steel version

Article number	Designation	Switching contact	Max. switching voltage	Type of voltage	Type of connection and direction	Required cable coupling / type	Mounting
					radial	axial	
601.9390.046	SHS3-2-SA/2-SA	2 x 2NC	230 V	AC/DC		M12	2 x E Both sides
601.9390.047	SHS3-5-SA/5-SA	2 x 1NC/1NO	230 V	AC/DC		M12	2 x E Both sides
601.9390.048	SHS3-7-KA5/7-KA5	2 x 1NC/1NO	230 V	AC/DC		Cable	Both sides
601.9390.039	SHS3-7-SA/7-SA	2 x 2NC/1NO	230 V	AC/DC		M12	2 x D Both sides
601.9390.068	SHS3-7-KA-IPX/7-KA5-IPX*	2 x 2NC/1NO	230 V	AC/DC		M12	2 x D Both sides
601.9390.038	SHS3-HINGE (blank hinge)						Both sides

*IP69-K

Drawing dimensions in mm