

## SHS3 Series



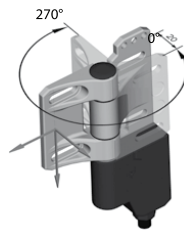
- **Easy to install and tamper-resistant** - the switch mechanism is safely integrated in the hinge
- **No actuator** - no alignment necessary since the actuator is an integral part of the switch
- **No mechanical deterioration** - due to the actuator free switching
- **Reliably operating** - there is 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<sub>e</sub>. 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

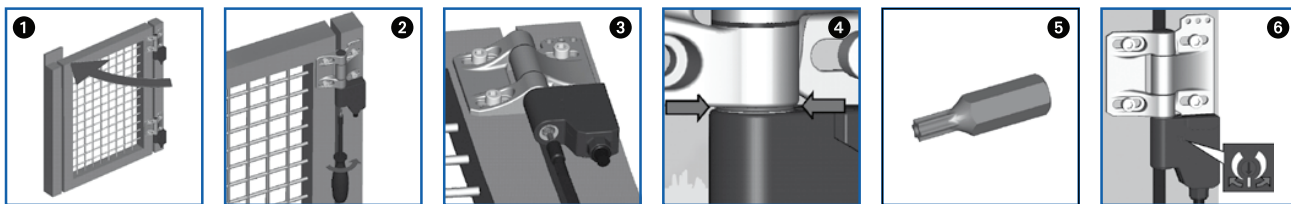
### Fast:

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).

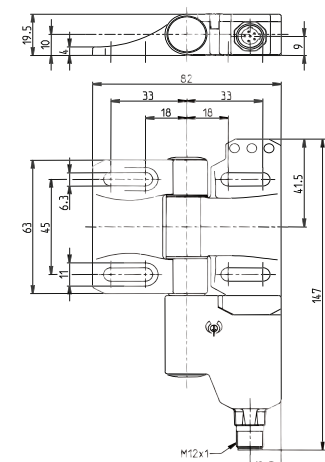
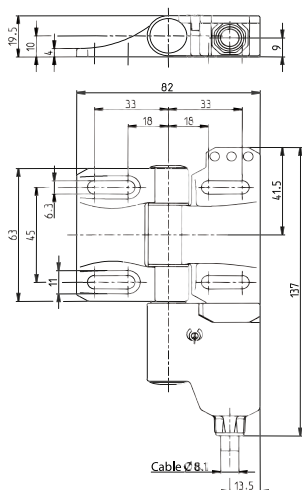
**Fine adjustment**

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).

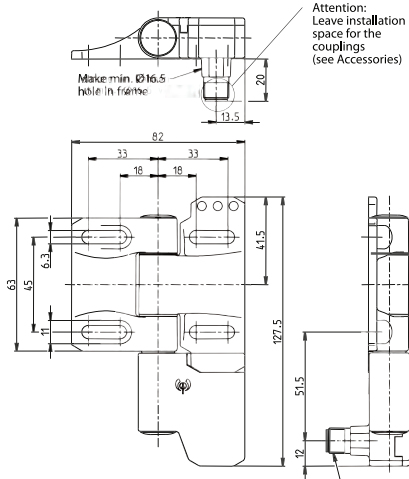
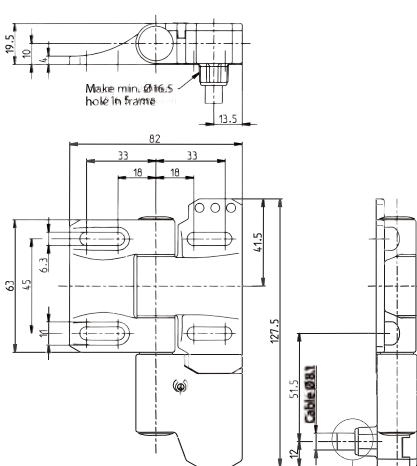
In many cases this fine adjustment makes it unnecessary to replace the switch or readjust the switching point due to mechanical deformation of the safety guard. The switching angle should generally be selected as small as possible.

**Dimensioned drawings**

**SHS3...KA...**

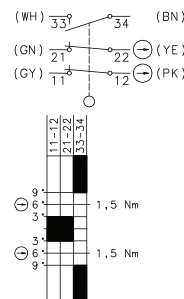


**SHS3...KR...**

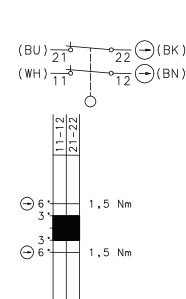


**Contact Information**

**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**

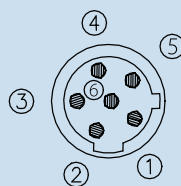
| Article number | Designation              | Switching contact | Max. switching voltage | Type of voltage | Type of connection and direction |       | Required cable coupling / type | Mounting   |
|----------------|--------------------------|-------------------|------------------------|-----------------|----------------------------------|-------|--------------------------------|------------|
|                |                          |                   |                        |                 | 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 |
|---------------------|-------------------------|--------------|----------------|----------------|-----------------|
| <b>325.1006.291</b> | AN-KAB.SH3 2M STRAIGHT  | 2 m          | Straight       | 6              | M12 BG version  |
| <b>325.1006.292</b> | AN-KAB.SH3 5M STRAIGHT  | 5 m          | Straight       | 6              | M12 BG version  |
| <b>325.1006.293</b> | AN-KAB.SH3 10M STRAIGHT | 10 m         | Straight       | 6              | M12 BG version  |
| <b>325.1006.294</b> | AN-KAB.SH3 2M ELBOW     | 2 m          | Elbow          | 6              | M12 BG version  |
| <b>325.1006.295</b> | AN-KAB.SH3 5M ELBOW     | 5 m          | Elbow          | 6              | M12 BG version  |
| <b>325.1006.296</b> | AN-KAB.SH3 10M ELBOW    | 10 m         | Elbow          | 6              | M12 BG version  |

**Contact assignments, AC/DC versions**



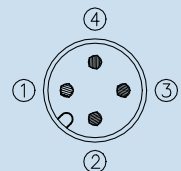
- 1 = White
- 2 = Brown
- 3 = Green
- 4 = Yellow
- 5 = Grey
- 6 = Pink

|                                       |                                  |
|---------------------------------------|----------------------------------|
| 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 <sup>2</sup> : | 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       |
|---------------------|---------------------------------|--------------|----------------|----------------|-----------------------|
| <b>325.1004.310</b> | AN-KAB.SH3 4P 2M STRAIGHT       | 2 m          | Straight       | 4              | M12 BG version        |
| <b>325.1004.311</b> | AN-KAB.SH3 4P 5M STRAIGHT       | 5 m          | Straight       | 4              | M12 BG version        |
| <b>325.1004.312</b> | AN-KAB.SH3 4P 10M STRAIGHT      | 10 m         | Straight       | 4              | M12 BG version        |
| <b>325.1004.313</b> | AN-KAB.SH3 4P 2M ELBOW          | 2 m          | Elbow          | 4              | M12 BG version        |
| <b>325.1004.314</b> | AN-KAB.SH3 4P 5M ELBOW          | 5 m          | Elbow          | 4              | M12 BG version        |
| <b>325.1004.315</b> | AN-KAB.SH3 4P 10M ELBOW         | 10 m         | Elbow          | 4              | M12 BG version        |
| <b>325.1004.316</b> | AN-KAB.SH3 4P U.L. 2M STRAIGHT  | 2 m          | Straight       | 4              | Ultra Lock BG version |
| <b>325.1004.317</b> | AN-KAB.SH3 4P U.L. 5M STRAIGHT  | 5 m          | Straight       | 4              | Ultra Lock BG version |
| <b>325.1004.318</b> | AN-KAB.SH3 4P U.L. 10M STRAIGHT | 10 m         | Straight       | 4              | Ultra Lock BG version |
| <b>325.1004.319</b> | AN-KAB.SH3 4P U.L. 2M ELBOW     | 2 m          | Elbow          | 4              | Ultra Lock BG version |
| <b>325.1004.320</b> | AN-KAB.SH3 4P U.L. 5M ELBOW     | 5 m          | Elbow          | 4              | Ultra Lock BG version |
| <b>325.1004.321</b> | AN-KAB.SH3 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     |
|---------------------|-----------------|
| <b>399.1990.161</b> | SHS3 change kit |
| Containing:         |                 |
| 2 replacement caps  |                 |
| 1 special bit       |                 |
| 1 plastic ring      |                 |

**Installation tool**



| Article number   | Designation                   |
|------------------|-------------------------------|
| <b>191000005</b> | 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



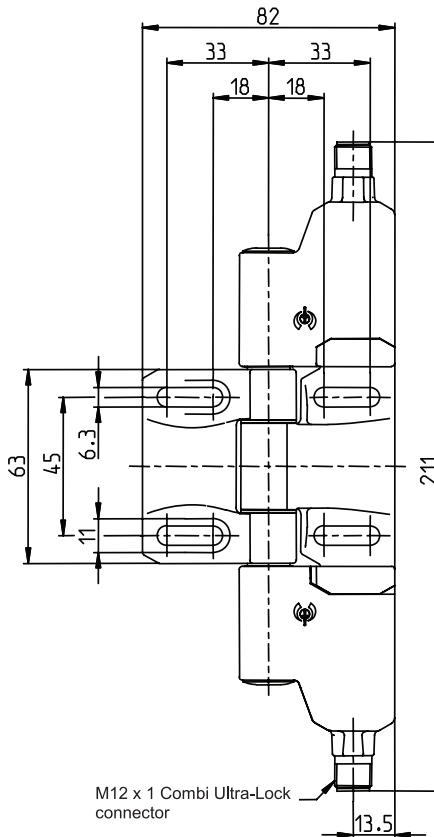
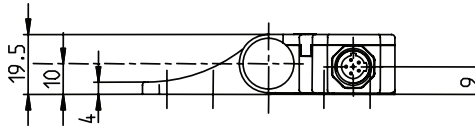
Connector radial  
Installation position  
on the right side



### Technical data SHS3

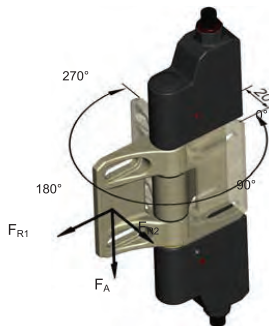
| Electrical data                                |   |   |
|--|---|---|
| Rated insulation voltage                       | $U_i$ max.  | 250 V   |
| Rated operating voltage                        | $U_e$ max.  | 230 V AC; 24 V DC   |
| Conventional thermal current                   | $I_{the}$   | 5 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 <sup>6</sup> 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 <sup>2</sup> , 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