

# Float switch

## For the process industry, vertical installation

### Models FLS-S, FLS-M, FLS-P, FLS-H

WIKA data sheet LM 30.01



for further approvals  
see page 3

#### Applications

- Level measurement for almost all liquid media
- Pump and level control and monitoring of distinct filling levels
- Chemical, petrochemical industry, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry

#### Special features

- Large range of application due to the simple, proven functional principle
- For harsh operating conditions, long service life
- Operating limits:
  - Operating temperature:  $T = -50 \dots +350 \text{ }^\circ\text{C}$
  - Operating pressure:  $P = \text{Vacuum up to 40 bar}$
  - Limit density:  $\rho \geq 300 \text{ kg/m}^3$
- Wide variety of different electrical connections, process connections and materials
- Explosion-protected versions

#### Description

A float with a permanent magnet moves reliably along with the liquid level on a guide tube. Within the guide tube is fitted a reed contact (inert gas contact), which is energised, through the non-magnetic walls of the float and guide tube, by the approach of the float magnet. By using a magnet and reed contact the switching operation is non-contact, free from wear and needs no power supply. The contacts are potential-free. Float switches are also available with multiple switch points.

The switching functions always refer to a rising liquid level: Normally open, normally closed or change-over contact.



**Fig. left: Stainless steel version, mounting thread, model FLS-S**

**Fig. right: Plastic version, flange connection, model FLS-P**

Through the use of a float for a max. of 2 switch points a bistable switch behaviour can be achieved, meaning that the switching status also remains available, when the filling level continues to rise above or drop below the switch point.

The float switch is simple to mount and maintenance-free, so the costs of mounting, commissioning and operation are low.

## Further special features

- Process connection, guide tube and float from stainless steel 1.4571, plastic or Buna
- Universal signal processing:  
Connection direct to a PLC is possible, NAMUR connection, signal amplification / contact protection relays
- Works independently of foaming, conductivity, dielectricity, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects and vibrations
- Multiple functionality in a single instrument - up to 8 potential-free contacts
- Exact repeatability of the switch points
- Float switches qualify as simple apparatus in accordance with EN 60079-11 section 5.7 and can be installed in "zone 1" hazardous areas without certification, so long as the equipment is operated in a certified intrinsically safe circuit with a minimum explosion protection of Ex ib.

## Options

- Customer-specific solutions
- Special versions for interface layer detection  
 $\Delta\rho \geq 100 \text{ kg/m}^3$
- Process connection, guide tube and float from stainless steel 1.4435, 1.4539, titanium, Hastelloy (others on request)

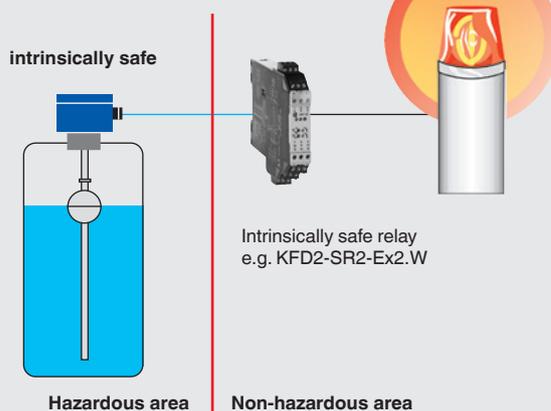
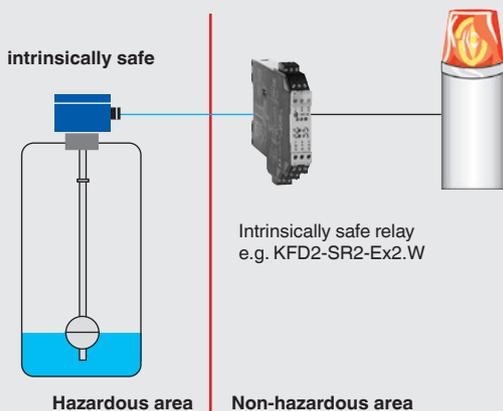
## Model overview

| Model                          | Description   | Materials         |                  |                  |                           |                           |                           |                             |                                 |                       |
|--------------------------------|---|-------------------|------------------|------------------|---------------------------|---------------------------|---------------------------|-----------------------------|---------------------------------|-----------------------|
|                                |   | Stainless steel   |                  |                  |                           |                           |                           |                             | Titanium<br>3.7035<br>(grade 2) | PVC /<br>PP /<br>PVDF |
|                                |   | 1.4571<br>(316Ti) | 1.4404<br>(316L) | 1.4435<br>(316L) | 1.4571<br>(316Ti)<br>/ PP | 1.4571<br>(316Ti)<br>/ PA | 1.4571<br>(316Ti)<br>/ Ms | 1.4571<br>(316Ti)<br>/ Buna |                                 |                       |
| FLS-SE                         | Standard version, cable connection, safety extra-low voltage                | x                 | x                | x                | x                         | x                         | x                         | x                           | x                               | -                     |
| FLS-SF                         | Standard version, cable connection, low voltage                             | x                 | x                | x                | x                         | x                         | x                         | x                           | x                               | -                     |
| FLS-SA                         | Standard version, connection housing or connector, low voltage              | x                 | x                | x                | x                         | x                         | x                         | x                           | x                               | -                     |
| FLS-SB                         | Standard version, connection housing or connector, safety extra-low voltage | x                 | x                | x                | x                         | x                         | x                         | x                           | x                               | -                     |
| FLS-SBI<br>(60)                | Intrinsically safe, Ex i  | x                 | x                | -                | -                         | -                         | -                         | -                           | x                               | -                     |
| FLS-SAD<br>FLS-SBD<br>(AL-ADF) | Flameproof enclosure, Ex d  | x                 | x                | -                | -                         | -                         | -                         | -                           | -                               | -                     |
| FLS-ME                         | Miniature design, cable connection, safety extra-low voltage                | x                 | x                | -                | x                         | -                         | -                         | x                           | -                               | -                     |
| FLS-MB                         | Miniature design, connection housing or connector, safety extra-low voltage | x                 | x                | -                | x                         | -                         | -                         | x                           | -                               | -                     |
| FLS-PF                         | Plastic version, cable connection, low voltage                              | -                 | -                | -                | -                         | -                         | -                         | -                           | -                               | x                     |
| FLS-PA                         | Plastic version, connection housing or connector, low voltage               | -                 | -                | -                | -                         | -                         | -                         | -                           | -                               | x                     |
| FLS-HE                         | Pharmaceutical version, cable connection, safety extra-low voltage          | -                 | x                | x                | -                         | -                         | -                         | -                           | -                               | -                     |
| FLS-HA                         | Pharmaceutical version, connection housing, low voltage                     | -                 | x                | x                | -                         | -                         | -                         | -                           | -                               | -                     |
| FLS-HA3                        | Sterile version (3-A), connection housing, low voltage                      | -                 | x                | x                | -                         | -                         | -                         | -                           | -                               | -                     |
| FLS-F                          | Food version, connection housing, low voltage                               | -                 | x                | x                | -                         | -                         | -                         | -                           | -                               | -                     |

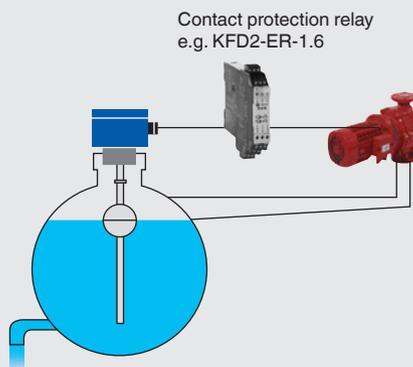
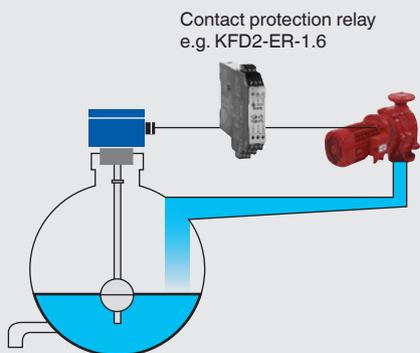


# Application examples

## Full detector (Ex i)

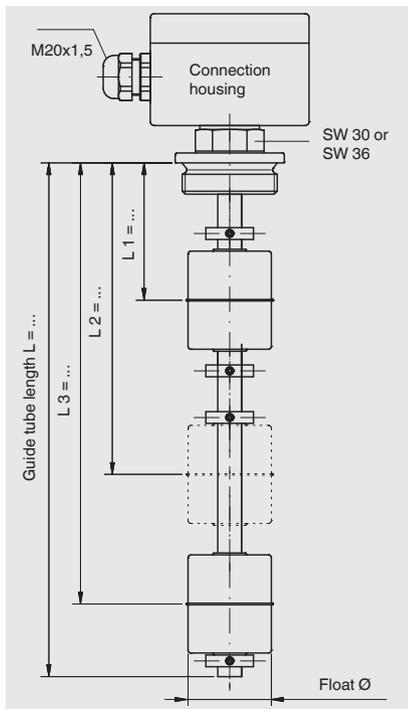


## Level control (min/max control)

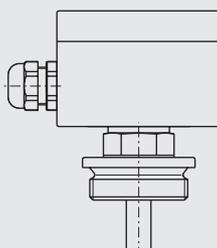


## Standard version with connection housing or connector, models FLS-SA, FLS-SB

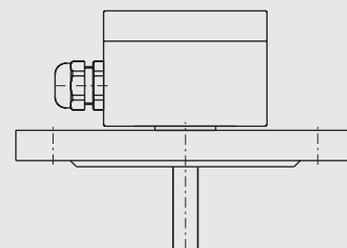
Process connection, guide tube and float from stainless steel 1.4571 (316Ti)



### Mounting thread



### Flange

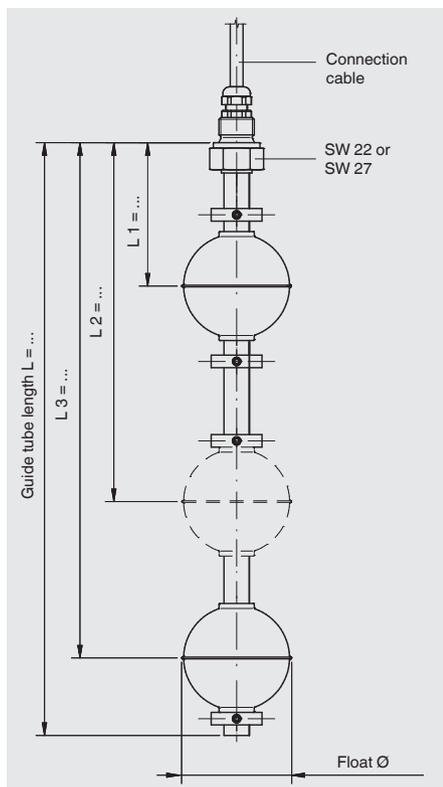


Reference point for NPT thread deviating from drawing  
Please contact WIKA personnel.

|                                       | Model FLS-SA, low voltage   | Model FLS-SB, safety extra-low voltage  |
|---------------------------------------|---|---|
| <b>Electrical connection</b>          | <ul style="list-style-type: none"> <li>■ Connection housing<br/>Aluminium 64 x 58 x 34 mm, with 1 contact<br/>Aluminium 80 x 75 x 57 mm, 2 or more contacts<br/>Option: Polypropylene, polyester, stainless steel</li> <li>■ Coupler connector<br/>DIN EN 175301-803 (previously DIN 43650, 4-pin)<br/>M12 (4- or 8-pin)</li> </ul> |   |
| <b>Process connection</b>             | <ul style="list-style-type: none"> <li>■ Mounting thread downwards<br/>G 1 1/2"<br/>G 2"<br/>Others on request</li> </ul>   | <ul style="list-style-type: none"> <li>■ Mounting flange<br/>DIN DN 50 ... DN 200, PN 6 ... PN 100<br/>DIN EN 1092-1 DN 50 ... DN 200, PN 6 ... PN 100<br/>ANSI 2" ... 8", Class 150 ... 600</li> </ul> |
| <b>Guide tube diameter</b>            | 12 mm / 14 mm / 18 mm   |   |
| <b>Guide tube length L</b>            | ≤ 3,000 mm for guide tube diameter 12 or 14 mm<br>≤ 6,000 mm for guide tube diameter 18 mm  |   |
| <b>Float</b>                          | Material: Stainless steel 1.4571 (option: Buna (NBR), titanium)<br>Float diameter: 44 ... 120 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)   |   |
| <b>Temperature range</b>              | Observe the temperature range of the float and the connection housing<br>Temperature range of the connector on request  |   |
| Standard version                      | -30 ... +180 °C   |   |
| High-temperature version              | -30 ... +250 °C   |   |
| Low-temperature version               | -50 ... +180 °C   |   |
| Maximum temperature version           | -30 ... +350 °C   |   |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level  |   |
| <b>Max. number of contacts</b>        | 6 x NO or NC, or 4 x SPDT   |   |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)  |   |
| <b>Distance between switch points</b> | Minimum 20 mm (depending on the selection of the float and the contacts)  |   |
| <b>Switching power</b>                |   |   |
| Normally open, normally closed        | AC ≤ 230 V; 100 VA; 1 A    DC ≤ 230 V; 50 W; 0.5 A  | AC < 50 V; 100 VA; 1 A    DC < 75 V; 50 W; 0.5 A  |
| Change-over                           | AC ≤ 230 V; 40 VA; 1 A    DC ≤ 230 V; 20 W; 0.5 A   | AC < 50 V; 40 VA; 1 A    DC < 75 V; 20 W; 0.5 A   |
| <b>Mounting position</b>              | Vertical ±30°   |   |

## Standard version with cable connection, models FLS-SE, FLS-SF

Process connection, guide tube and float from stainless steel 1.4571 (316Ti)

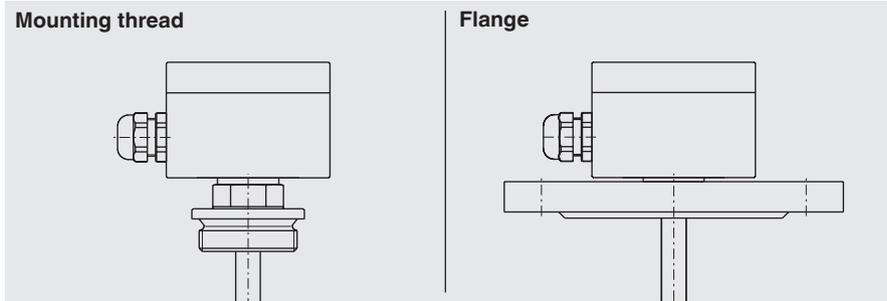
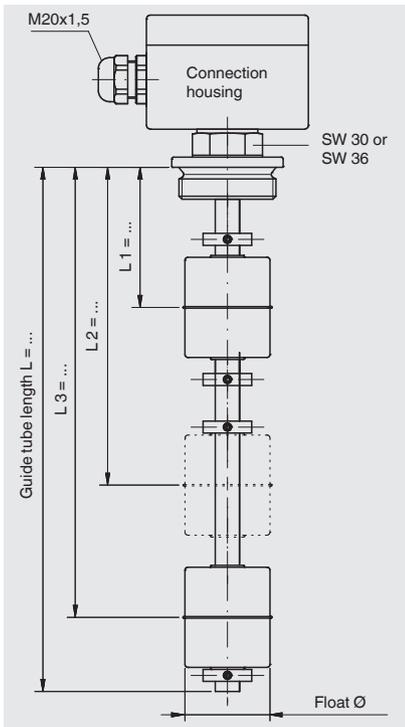


|                                       | Model FLS-SF, low voltage   | Model FLS-SE, safety extra-low voltage           |
|---------------------------------------|---|--|
| <b>Electrical connection</b>          | Connection cable<br>■ PVC<br>■ Silicone<br>■ PUR  |  |
| <b>Process connection</b>             | Mounting thread upwards: G 3/8" or G 1/2"<br>Others on request  |  |
| <b>Guide tube diameter</b>            | 12 mm / 14 mm / 18 mm   |  |
| <b>Guide tube length L</b>            | ≤ 3,000 mm for guide tube diameter 12 or 14 mm<br>≤ 6,000 mm for guide tube diameter 18 mm  |  |
| <b>Float</b>                          | Material: Stainless steel 1.4571 (option: Buna (NBR), titanium)<br>Float diameter: 44 ... 120 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18) |  |
| <b>Temperature range</b>              | PVC/PUR cable: -10 ... +80 °C<br>Silicone cable: -30 ... +180 °C<br>Observe the temperature range of the float  |  |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level  |  |
| <b>Max. number of contacts</b>        | 6 x NO or NC, or 4 x SPDT for PVC and PUR cable<br>5 x NO or NC, or 3 x SPDT for silicone cable   |  |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)  |  |
| <b>Distance between switch points</b> | Minimum 20 mm (depending on the selection of the float and the contacts)  |  |
| <b>Switching power</b>                |   |  |
| Normally open, normally closed        | AC ≤ 230 V; 100 VA; 1 A<br>DC ≤ 230 V; 50 W; 0.5 A  | AC < 50 V; 100 VA; 1 A<br>DC < 75 V; 50 W; 0.5 A |
| Change-over                           | AC ≤ 230 V; 40 VA; 1 A<br>DC ≤ 230 V; 20 W; 0.5 A   | AC < 50 V; 40 VA; 1 A<br>DC < 75 V; 20 W; 0.5 A  |
| <b>Mounting position</b>              | Vertical ±30°   |  |

# Intrinsically safe (Ex i), model FLS-SBI (60)

II 1/2G Ex ia IIC T6 ... T1 Ga/Gb or II 2D Ex ib IIIC T80°C ... T230°C Db

Process connection, guide tube and float from stainless steel 1.4571 (316Ti)



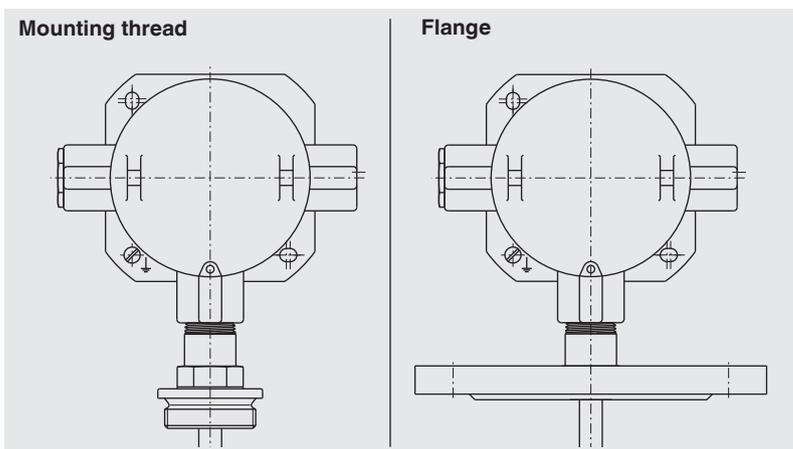
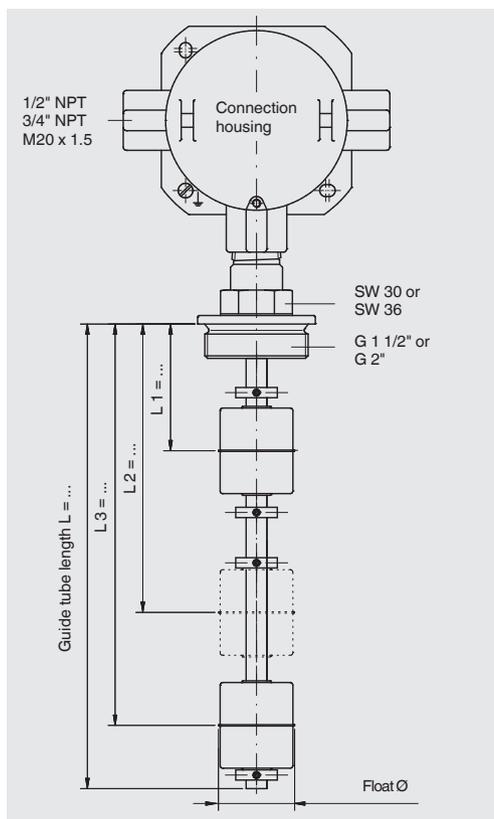
Reference point for NPT thread deviating from drawing  
Please contact WIKA personnel.

| Model FLS-SBI   |  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
|---|--|-------------|-------------|-------------|------------|------------|----|----|---------------------|-------------|-------------|-------------|-------------|------------|------------|---|------------|------------|------------|------------|------------|------------|
| <b>Electrical connection</b>                                | Connection housing: Aluminium<br>Option: Polyester, stainless steel  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Process connection</b>                                   | <ul style="list-style-type: none"> <li>■ Mounting thread downwards<br/>G 1 1/2" or G 2"</li> <li>■ Mounting flange                             <ul style="list-style-type: none"> <li>- DIN DN 50 ... DN 200, PN 6 ... PN 100</li> <li>- DIN EN 1092 DN 50 ... DN 200, PN 6 ... PN 100</li> <li>- ANSI 2" ... 8", Class 150 ... 600</li> </ul> </li> </ul> Others on request   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Guide tube diameter</b>                                  | 12 mm / 14 mm / 18 mm  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Guide tube length L</b>                                  | ≤ 3,000 mm for guide tube diameter 12 or 14 mm<br>≤ 6,000 mm for guide tube diameter 18 mm   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Float</b>  | Material: Stainless steel 1.4571 (option: Buna (NBR), titanium)<br>Float diameter: 44 ... 120 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Temperature class</b>                                    | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>T1</th> <th>T2</th> <th>T3</th> <th>T4</th> <th>T5</th> <th>T6</th> </tr> </thead> <tbody> <tr> <td>Process temperature</td> <td>Max. 180 °C</td> <td>Max. 180 °C</td> <td>Max. 180 °C</td> <td>Max. 130 °C</td> <td>Max. 95 °C</td> <td>Max. 80 °C</td> </tr> <tr> <td>Ambient temperature at connection housing (T<sub>a</sub>)</td> <td>Max. 80 °C</td> <td>Max. 80 °C</td> <td>Max. 80 °C</td> <td>Max. 80 °C</td> <td>Max. 65 °C</td> <td>Max. 50 °C</td> </tr> </tbody> </table> |             | T1          | T2          | T3         | T4         | T5 | T6 | Process temperature | Max. 180 °C | Max. 180 °C | Max. 180 °C | Max. 130 °C | Max. 95 °C | Max. 80 °C | Ambient temperature at connection housing (T <sub>a</sub> ) | Max. 80 °C | Max. 80 °C | Max. 80 °C | Max. 80 °C | Max. 65 °C | Max. 50 °C |
|   | T1   | T2          | T3          | T4          | T5         | T6         |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| Process temperature   | Max. 180 °C  | Max. 180 °C | Max. 180 °C | Max. 130 °C | Max. 95 °C | Max. 80 °C |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| Ambient temperature at connection housing (T <sub>a</sub> ) | Max. 80 °C   | Max. 80 °C  | Max. 80 °C  | Max. 80 °C  | Max. 65 °C | Max. 50 °C |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
|   | → Versions with optional circuits (e.g. resistor connection, NAMUR or temperature contacts), as well as surface temperature (EPL Db) at dust protection see operating instructions   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Switching function</b>                                   | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Max. number of contacts</b>                              | 6 x NO or NC, or 4 x SPDT for guide tube diameter 12, 14 or 18 mm  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Switch position</b>                                      | Dimensions L1, L2, L3 ... (from sealing face, starting from top)   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Distance between switch points</b>                       | Minimum 20 mm (depending on the selection of the float and the contacts)   |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Switching power</b>                                      | Only for connection to a certified intrinsically safe circuit with max.<br>U <sub>i</sub> = 36 V      I <sub>i</sub> = 100 mA      C <sub>i</sub> = 0 nF      L <sub>i</sub> = 0 μH  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |
| <b>Mounting position</b>                                    | Vertical ±30°  |             |             |             |            |            |    |    |                     |             |             |             |             |            |            |   |            |            |            |            |            |            |

# Flameproof enclosure (Ex d), models FLS-SAD, FLS-SBD (AL-ADF)

II 2G Ex d IIC T6 Gb or II 2D Ex tb IIIC T80 °C Db

Process connection, guide tube and float from stainless steel 1.4571

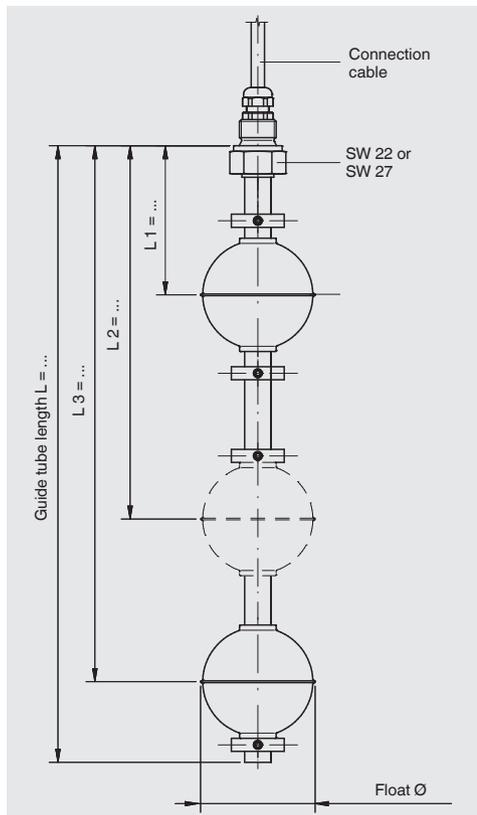


Reference point for NPT thread deviating from drawing  
Please contact WIKA personnel.

|  | Model FLS-SAD   | Model FLS-SBD   |
|--|---|---|
| <b>Electrical connection</b>                   | Connection housing: Aluminium<br>Option: Stainless steel  |   |
| <b>Process connection</b>                      | <ul style="list-style-type: none"> <li>■ Mounting thread downwards<br/>G 1 1/2" or G 2"</li> <li>■ Mounting flange<br/>DIN DN 50 ... DN 350, PN 6 ... PN 40<br/>ANSI 2" ... 14", Class 150 ... 300</li> </ul> Others on request |   |
| <b>Guide tube diameter</b>                     | 12 mm / 14 mm   |   |
| <b>Guide tube length L</b>                     | ≤ 4,000 mm for guide tube diameter 12 mm<br>≤ 6,000 mm for guide tube diameter 14 mm  |   |
| <b>Float</b>                                   | Material: Stainless steel 1.4571<br>Float diameter: 44 ... 80 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)   |   |
| <b>Temperature range (process temperature)</b> | T4<br>≤ 120 °C  | T5<br>≤ 95 °C   |
| <b>Switching function</b>                      | Change-over SPDT - on rising level  |   |
| <b>Max. number of contacts</b>                 | 4 x SPDT  |   |
| <b>Switch position</b>                         | Dimensions L1, L2, L3 ... (from sealing face, starting from top)  |   |
| <b>Distance between switch points</b>          | Minimum 20 mm (depending on the selection of the float and the contacts)  |   |
| <b>Switching power</b>                         | AC ≤ 230 V; 100 VA; 1.5 A<br>DC ≤ 230 V; 60 W; 1.5 A  | <ul style="list-style-type: none"> <li>■ With series resistance<br/>AC &lt; 50 V; 40 VA; 150 mA<br/>DC &lt; 75 V; 20 W; 150 mA</li> <li>■ With NAMUR circuit per DIN EN 60947-5-6<br/>AC &lt; 50 V; 40 VA; 7 mA<br/>DC &lt; 75 V; 20 W; 7 mA</li> </ul> |
| <b>Mounting position</b>                       | Vertical ±30°   |   |

## Miniature design, models FLS-ME, FLS-MB

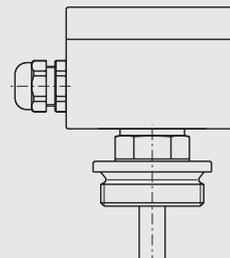
Process connection, guide tube 8 mm and float from stainless steel 1.4571 (316Ti)



Mounting thread and connection cable



Mounting thread and connection housing

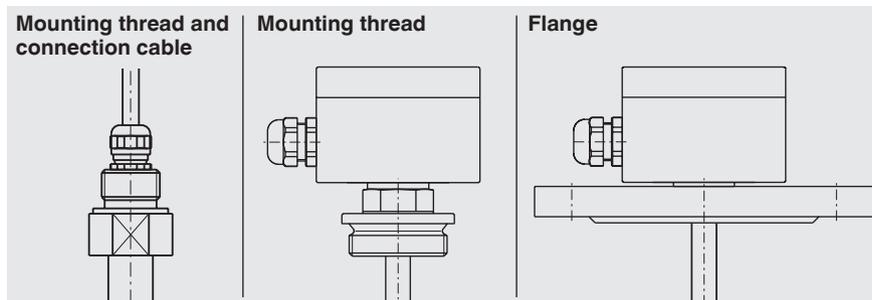
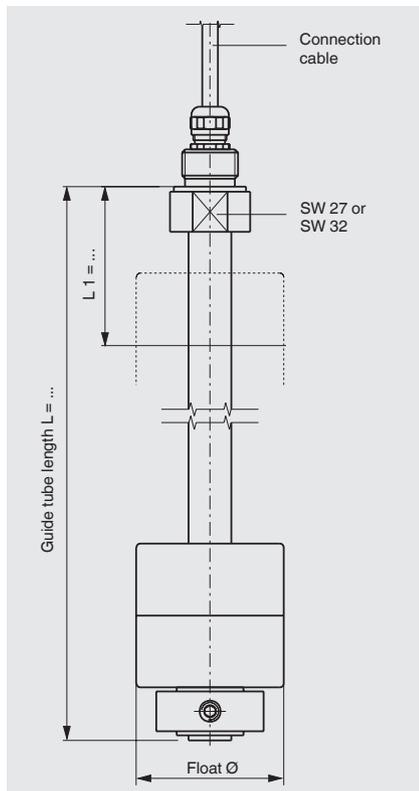


|                                       | Model FLS-ME   | Model FLS-MB   |                           |                 |
|---------------------------------------|--|--|---------------------------|-----------------|
| <b>Electrical connection</b>          | Connection cable<br>■ PVC<br>■ Silicone<br>■ PUR   | ■ Connection housing: Aluminium 64 x 58 x 34 mm<br>■ Coupler connector<br>DIN EN 175301-803 (previously DIN 43650, 4-pin)<br>M12 (4- or 8-pin) |                           |                 |
| <b>Process connection</b>             | Mounting thread upwards<br>G 1/8"<br>Others on request   | Mounting thread downwards<br>G 3/4" or G 1"<br>Others on request   |                           |                 |
| <b>Guide tube diameter</b>            | 8 mm   |  |                           |                 |
| <b>Guide tube length L</b>            | ≤ 500 mm   |  |                           |                 |
| <b>Float</b>                          | Material: Stainless steel 1.4571 (option: Buna (NBR), titanium, PP)<br>Float diameter from 20 ... 35 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18) |  |                           |                 |
| <b>Temperature range</b>              | PVC/PUR cable  | -10 ... +80 °C   | Buna (NBR), PP            | -10 ... +80 °C  |
|                                       | Silicone cable   | -30 ... +150 °C  | Stainless steel, titanium | -30 ... +150 °C |
|                                       | Observe the permissible temperature range of the float.  |  |                           |                 |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level   |  |                           |                 |
| <b>Max. number of contacts</b>        | 3 x NO or NC, or 2 x SPDT  |  |                           |                 |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)   |  |                           |                 |
| <b>Distance between switch points</b> | Minimum 20 mm (depending on the selection of the float and the contacts)   |  |                           |                 |
| <b>Switching power</b>                |  |  |                           |                 |
| Normally open, normally closed        | AC < 50 V; 10 VA; 0.5 A  |  | DC < 75 V; 5 W; 0.25 A    |                 |
| Change-over                           | AC < 50 V; 5 VA; 0.25 A  |  | DC < 75 V; 2.5 W; 0.15 A  |                 |
| Versions FLS-MF, FLS-MA <sup>1)</sup> | AC ≤ 230 V; 10 VA; 0.5 A   |  | DC ≤ 230 V; 5 W; 0.25 A   |                 |
| <b>Mounting position</b>              | Vertical ±30°  |  |                           |                 |

1) FLS-MF (connection cable), FLS-MA (connection housing or connector) versions on request

## Plastic version, models FLS-PA, FLS-PF

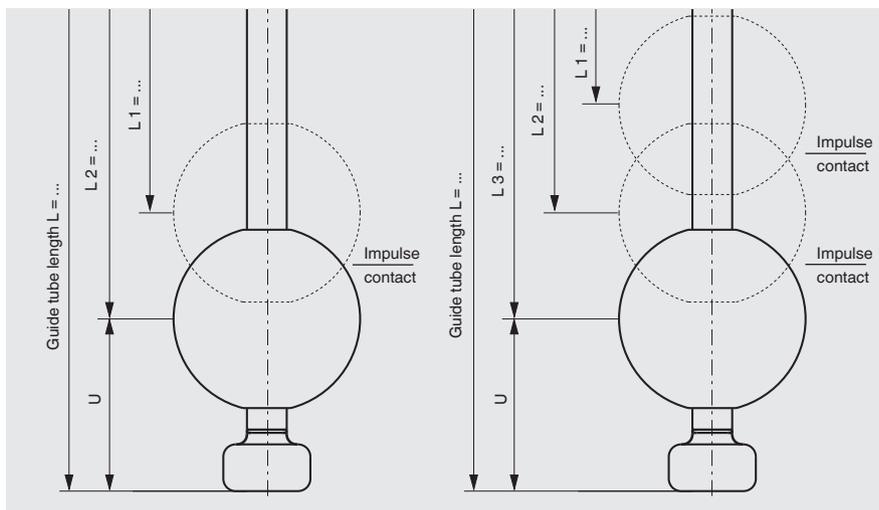
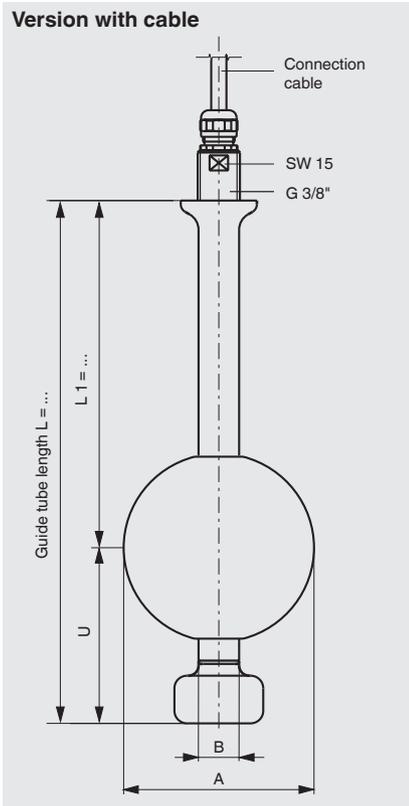
Process connection, guide tube and float from PVC, PP or PVDF



|                                       | Model FLS-PF   | Model FLS-PA   |
|---------------------------------------|--|--|
| <b>Electrical connection</b>          | Connection cable<br>■ PVC<br>■ PUR   | ■ Connection housing<br>Polypropylene 80 x 82 x 55 mm<br>Polyester 80 x 75 x 55 mm<br>■ Coupler connector<br>DIN EN 175301-803 (previously DIN 43650, 4-pin)<br>M12 (4- or 8-pin)                  |
| <b>Process connection</b>             | Mounting thread upwards<br>G 3/8"<br>others on request   | Mounting thread downwards<br>■ G 1 1/2"<br>■ G 2"<br>Flange<br>■ DIN DN 50 ... DN 200, PN 6 ... PN 100<br>■ DIN EN 1092-1 DN 50 ... DN 200, PN 6 ... PN 100<br>■ ANSI 2" ... 8", Class 150 ... 600 |
| <b>Guide tube diameter</b>            | 12 mm / 16 mm / 20 mm  |  |
| <b>Guide tube length L</b>            | ≤ 500 mm for guide tube diameter 12 mm<br>≤ 3,000 mm for guide tube diameter 16 mm<br>≤ 5,000 mm for guide tube diameter 20 mm                                 |  |
| <b>Float</b>                          | Material: PVC, PP or PVDF<br>Float diameter from 44 ... 80 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18) |  |
| <b>Temperature range</b>              | For float material PVC 0 ... 60 °C<br>For float material PP -10 ... +80 °C<br>For float material PVDF -10 ... +100 °C  |  |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level   |  |
| <b>Max. number of contacts</b>        | 6 x NO or NC, or 4 x SPDT  |  |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)   |  |
| <b>Distance between switch points</b> | Minimum 20 mm (depending on the selection of the float and the contacts)   |  |
| <b>Switching power</b>                |  |  |
| Normally open, normally closed        | AC ≤ 230 V; 100 VA; 1 A  | DC ≤ 230 V; 50 W; 0.5 A  |
| Change-over                           | AC ≤ 230 V; 40 VA; 1 A   | DC ≤ 230 V; 20 W; 0.5 A  |
| <b>Mounting position</b>              | Vertical ±30°  |  |

# Pharmaceutical version, models FLS-HA, FLS-HE

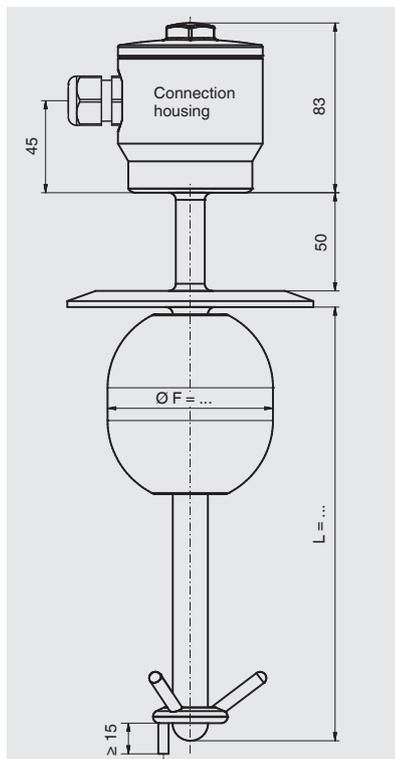
Process connection, guide tube and float from stainless steel



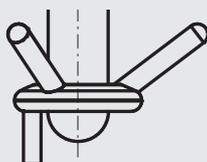
|                                       | Model FLS-HA  | Model FLS-HE  |
|---------------------------------------|---|---|
| <b>Electrical connection</b>          | Connection housing:<br>■ Stainless steel  | Connection cable<br>■ PVC<br>■ Silicone<br>■ PUR  |
| <b>Process connection</b>             | <ul style="list-style-type: none"> <li>■ Mounting thread upwards G 3/8"</li> <li>■ Mounting flange per DIN or ANSI</li> <li>■ Threaded connection per DIN 11851</li> <li>■ Clamp pipe connection per DIN 32676</li> <li>■ Ingot connection</li> </ul> Others on request |   |
| <b>Guide tube diameter</b>            | 17.2 mm (stainless steel 1.4435 or 1.4539, surface ground and polished)   |   |
| <b>Guide tube length L</b>            | ≤ 5,000 mm  |   |
| <b>Float</b>                          | Material: Stainless steel 1.4435 or 1.4539<br>Float diameter from 44 ... 120 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)  |   |
| <b>Temperature range</b>              | PVC/PUR cable   | -10 ... +80 °C  |
|                                       | Silicone cable  | -30 ... +150 °C   |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level  |   |
| <b>Max. number of contacts</b>        | 6 x NO or NC, or 4 x SPDT   | 6 x NO or NC, or 4 x SPDT for PVC and PUR cable<br>3 x NO or NC, or 2 x SPDT for silicone cable |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)  |   |
| <b>Distance between switch points</b> | Minimum 20 mm (depending on the selection of the float and the contacts)  |   |
| <b>Switching power</b>                |   |   |
| Normally open, normally closed        | AC ≤ 230 V; 100 VA; 1 A<br>DC ≤ 230 V; 50 W; 0.5 A  | AC < 50 V; 100 VA; 1 A<br>DC < 50 V; 50 W; 0.5 A  |
| Change-over                           | AC ≤ 230 V; 40 VA; 1 A<br>DC ≤ 230 V; 20 W; 0.5 A   | AC < 50 V; 40 VA; 1 A<br>DC < 50 V; 20 W; 0.5 A   |
| <b>Mounting position</b>              | Vertical ±30°   |   |

## Sterile version (3-A), model FLS-HA3

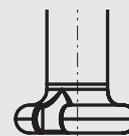
Process connection, guide tube and float from stainless steel



With separate float bracket



With welded tube end

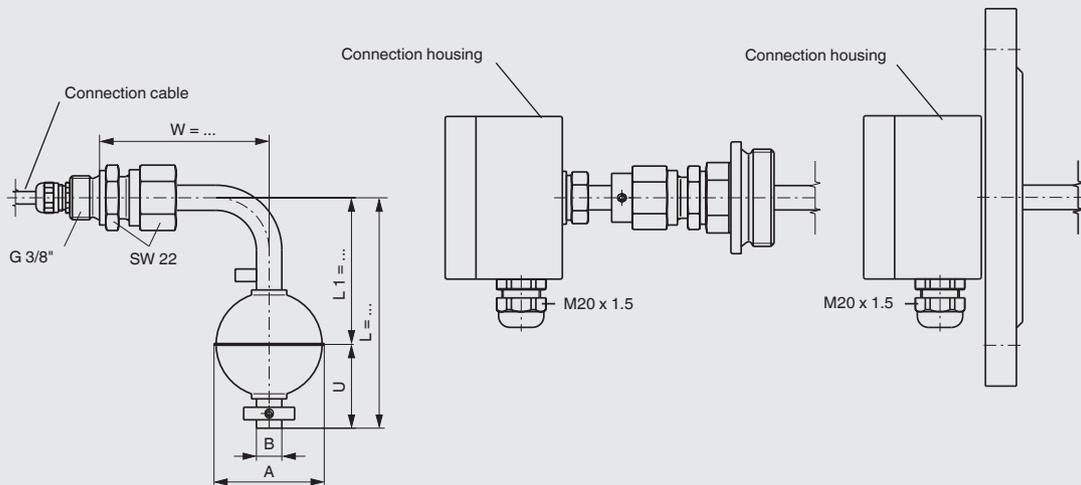


|                                       | Model FLS-HA3<br>with separate float bracket   | Model FLS-HA3<br>with welded pipe connection |
|---------------------------------------|--|--|
| <b>Electrical connection</b>          | Connection housing: stainless steel  |  |
| <b>Process connection</b>             | <ul style="list-style-type: none"> <li>■ Clamp pipe connection ISO 2852, DN 32 ... DN 100 or 1.5" ... 4"</li> <li>■ Clamp pipe connection DIN 32676, DN 32 ... DN 100 or 1.5" ... 4"</li> <li>■ Aseptic mounting thread downwards DIN 11864-1, DN 32 ... DN 100 or 1.5" ... 4"</li> <li>■ Aseptic liner DIN 11864-1, DN 32 ... DN 100 or 1.5" ... 4"</li> <li>■ Aseptic flange connection DIN 11864-2 (DN 32 ... DN 50 or 1.5" ... 2"</li> <li>■ Aseptic clamp connection DIN 11864-3, DN 32 ... DN 100 or 1.5" ... 4"</li> <li>■ VARIVENT® (form F,N and G)</li> <li>■ BioConnect® threaded connection, DN 32 ... DN 100 or 1,5" ... 2"</li> <li>■ BioConnect® flange connection, DN 32 ... DN 100 or 1.5" ... 2"</li> <li>■ BioConnect® clamp connection, DN 32 ... DN 100 or 1.5" ... 4"</li> </ul> |  |
| <b>Guide tube diameter</b>            | 12 mm / 14 mm / 17.2 mm (stainless steel 1.4435 or 1.4539, surface ground or polished, $R_a < 0.8 \mu\text{m}$ )   |  |
| <b>Guide tube length L</b>            | ≤ 5,000 mm   |  |
| <b>Float</b>                          | Material: Stainless steel 1.4435 or 1.4539<br>Float diameter: 50 ... 80 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)  |  |
| <b>Temperature range</b>              |  |  |
| Process temperature                   | -40 ... +200 °C  |  |
| Ambient temperature                   | -40 ... +85 °C   |  |
| <b>Switching function</b>             | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level   |  |
| <b>Max. number of contacts</b>        | 3 x NO or NC, or 3 x SPDT  |  |
| <b>Switch position</b>                | Dimensions L1, L2, L3 ... (from sealing face, starting from top)   |  |
| <b>Distance between switch points</b> | Minimum 50 mm (depending on the selection of the float and the contacts)   |  |
| <b>Switching power</b>                |  |  |
| Normally open, normally closed        | AC ≤ 230 V; 100 VA; 1 A<br>DC ≤ 230 V; 50 W; 0.5 A   |  |
| Change-over                           | AC ≤ 230 V; 40 VA; 1 A<br>DC ≤ 230 V; 20 W; 0.5 A  |  |
| <b>Mounting position</b>              | Vertical ±30°  |  |

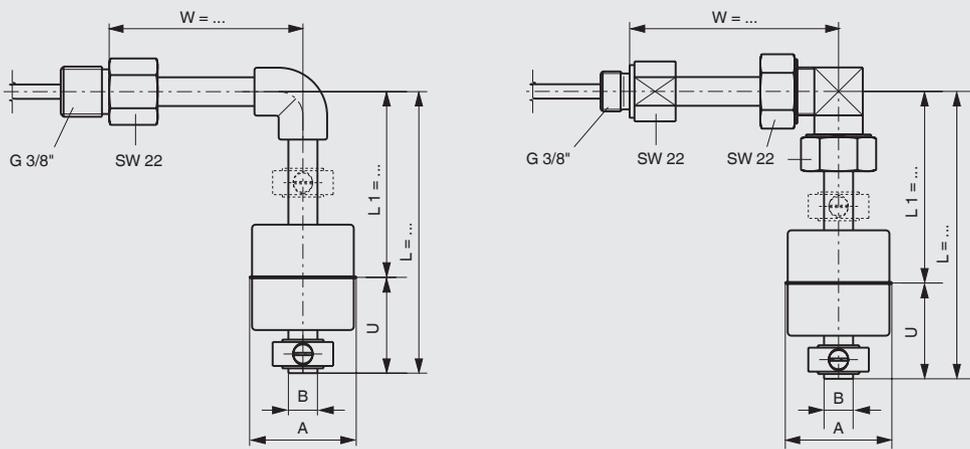
## Optional versions

| Model        | Angled version | Adjustable guide tube | ECTFE coating | Special flange from polyamide or brass | Food version |
|--------------|----------------|-----------------------|---------------|--|--------------|
| FLS-SE       | X              | X                     | -             | -                                      | X            |
| FLS-SF       | X              | X                     | -             | -                                      | X            |
| FLS-SA       | X              | X                     | X             | X                                      | X            |
| FLS-SB       | X              | X                     | X             | X                                      | X            |
| FLS-SBI (60) | X              | -                     | -             | -                                      | -            |
| FLS-ME       | X              | X                     | -             | -                                      | -            |
| FLS-MB       | X              | X                     | -             | -                                      | -            |
| FLS-PF       | X              | -                     | -             | -                                      | -            |
| FLS-PA       | X              | -                     | -             | -                                      | -            |

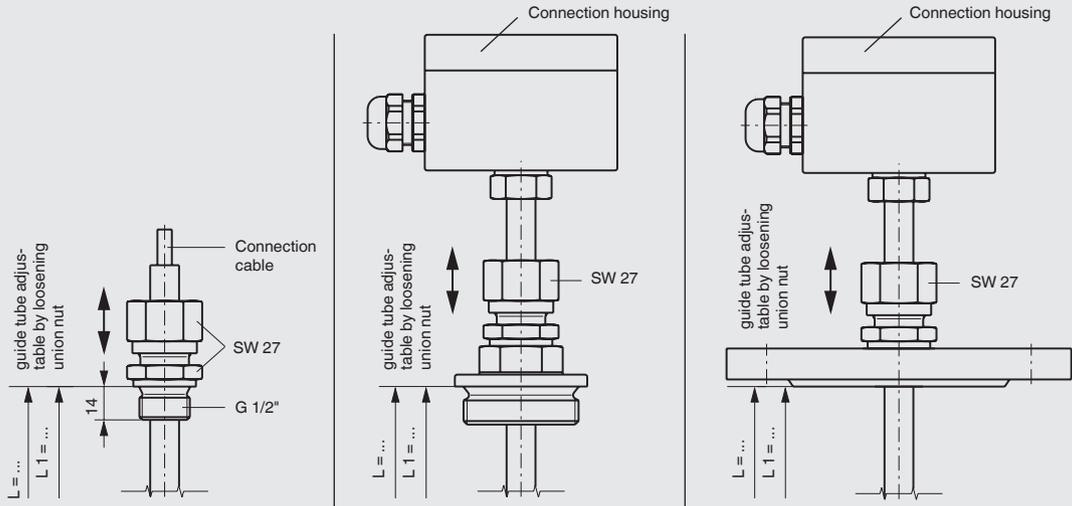
### Angled version, material: Metal



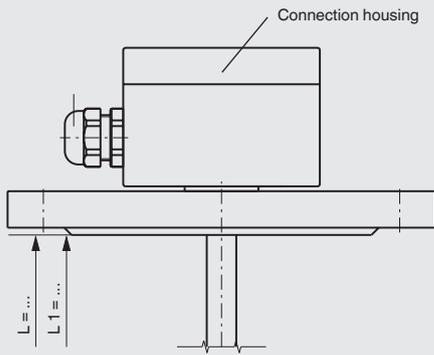
### Angled version, material: Plastic



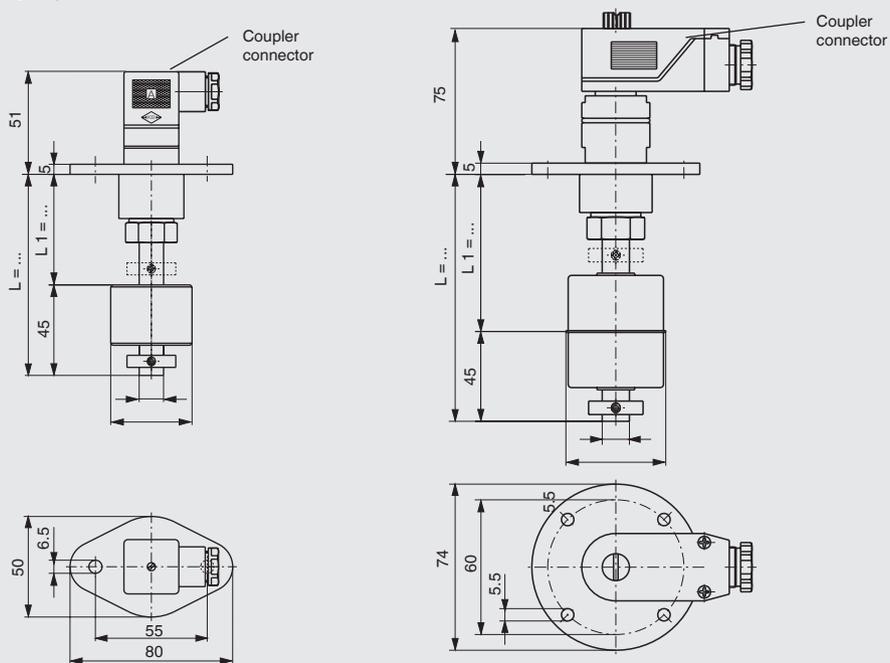
### Version with adjustable guide tube



### Version with ECTFE coating

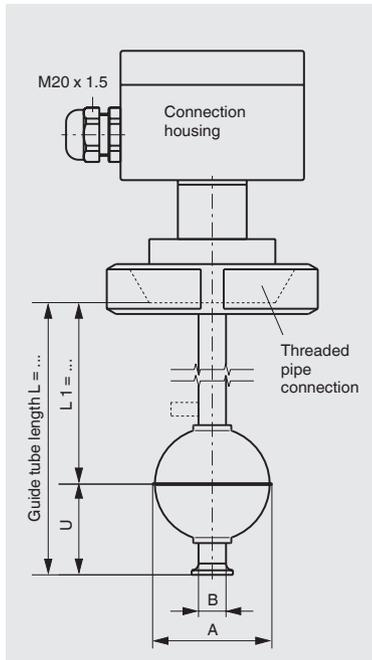


### Special flange from polyamide or brass

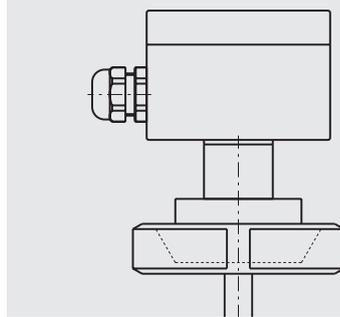


## Food version for float switch, model FLS-F

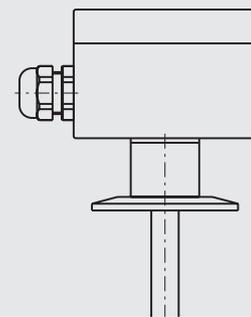
Process connection, guide tube and float from stainless steel



Threaded pipe connection per DIN 11851

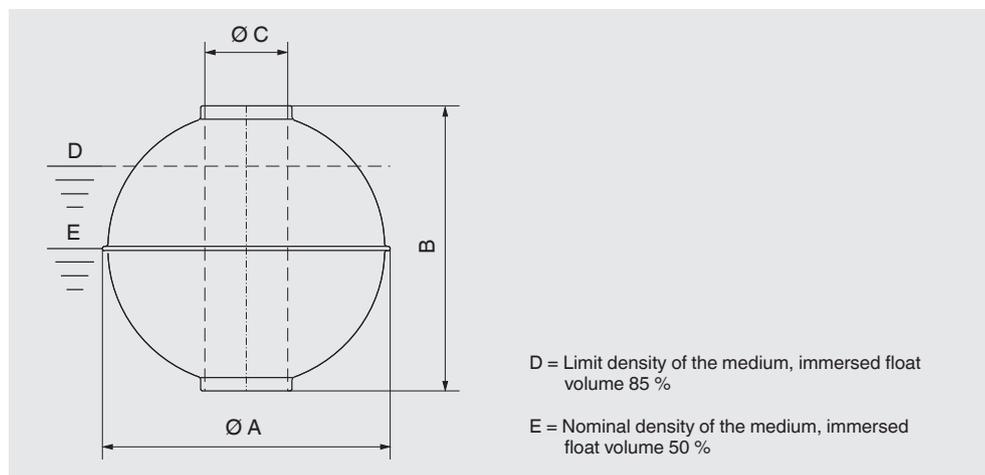


Clamp pipe connection per DIN 32676



|  | Threaded pipe connection   | Clamp pipe connection  |
|--|--|--|
| <b>Electrical connection</b>                   | Connection housing: <ul style="list-style-type: none"> <li>■ Aluminium 64 x 58 x 34 mm, with 1 contact</li> <li>■ Aluminium 80 x 75 x 57 mm, 2 or more contacts</li> </ul> Option: Polypropylene, polyester, stainless steel |  |
| <b>Process connection</b>                      | Threaded pipe connection per DIN 11851, downwards DN 50 ... DN 150 others on request   | Clamp pipe connection per DIN 32676, DN 25 ... DN 100 or 1" ... 4" others on request |
| <b>Guide tube diameter</b>                     | 12 mm / 14 mm / 18 mm  |  |
| <b>Guide tube length L</b>                     | ≤ 3,000 mm for guide tube diameter 12 or 14 mm<br>≤ 6,000 mm for guide tube diameter 18 mm   |  |
| <b>Float</b>                                   | Material stainless steel 1.4435 or 1.4404, option electropolished<br>Float diameter from 44 ... 80 mm<br>Float selection depending on guide tube diameter and process conditions (see page 16, 17, 18)                       |  |
| <b>Temperature range (process temperature)</b> | -30 ... +180 °C  |  |
| <b>Switching function</b>                      | Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level   |  |
| <b>Max. number of contacts</b>                 | 3 x NO or NC, or 3 x SPDT  |  |
| <b>Switch position</b>                         | Dimensions L1, L2, L3 ... (from sealing face, starting from top)   |  |
| <b>Distance between switch points</b>          | Minimum 50 mm (depending on the selection of the float and the contacts)   |  |
| <b>Switching power</b>                         |  |  |
| Normally open, normally closed                 | AC ≤ 230 V; 100 VA; 1 A<br>DC ≤ 230 V; 50 W; 0.5 A   |  |
| Change-over                                    | AC ≤ 230 V; 40 VA; 1 A<br>DC ≤ 230 V; 20 W; 0.5 A  |  |
| <b>Mounting position</b>                       | Vertical ±30°  |  |

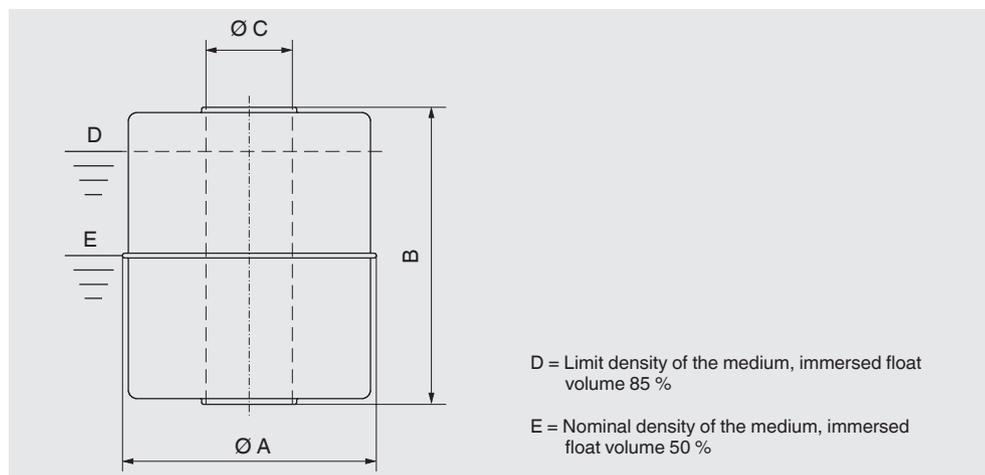
## Spherical float



| Material                                   | Version | Suits guide tube Ø in mm | Ø A in mm | B in mm | Ø C in mm | Max. operating pressure in bar | Max. operating temp. in °C | Limit density 85 % in kg/m <sup>3</sup> | Order no. |
|--|---------|--------------------------|-----------|---------|-----------|--------------------------------|----------------------------|---|-----------|
| <b>Stainless steel 1.4571</b>              | V29A    | 8                        | 29        | 28      | 9         | 25                             | 100                        | 920                                     | 027355    |
|  | V52A    | 12                       | 52        | 52      | 15        | 40                             | 250                        | 700                                     | 005462    |
|  | V52T    | 12                       | 52        | 52      | 15        | 40                             | 350                        | 730                                     | 033560    |
|  | V62A    | 12                       | 62        | 61      | 15        | 32                             | 250                        | 590                                     | 005473    |
|  | V83A    | 12                       | 83        | 81      | 15        | 25                             | 250                        | 430                                     | 005485    |
|  | V80A    | 18                       | 80        | 76      | 23        | 25                             | 250                        | 680                                     | 005478    |
|  | V98A    | 18                       | 98        | 96      | 23        | 25                             | 250                        | 600                                     | 005489    |
|  | V105A   | 18                       | 105       | 103     | 23        | 25                             | 250                        | 530                                     | 020652    |
|  | V120A   | 18                       | 120       | 117     | 23        | 25                             | 250                        | 390                                     | 021721    |
| <b>Titanium 3.7035</b>                     | T29A    | 8                        | 29        | 28      | 9         | 30                             | 100                        | 700                                     | 005522    |
|  | T52A    | 12                       | 52        | 52      | 15        | 25                             | 300                        | 570                                     | 005525    |
|  | T62A    | 12                       | 62        | 62      | 15        | 25                             | 300                        | 505                                     | 005536    |
|  | T83A    | 12                       | 83        | 81      | 15        | 25                             | 300                        | 350                                     | 005544    |
|  | T80A    | 18                       | 80        | 76      | 23        | 25                             | 300                        | 665                                     | 112263    |
|  | T98A    | 18                       | 98        | 96      | 23        | 25                             | 300                        | 495                                     | -         |
|  | T105A   | 18                       | 105       | 103     | 23        | 25                             | 300                        | 370                                     | -         |
|  | T120A   | 18                       | 120       | 117     | 23        | 25                             | 300                        | 330                                     | -         |
| <b>Stainless steel 1.4571 ECTFE coated</b> | VEC53A  | 12                       | 53        | 53      | 14        | 25                             | Depending on medium        | 850                                     | 111415    |
|  | VEC63A  | 12                       | 63        | 62      | 14        | 25                             | Depending on medium        | 590                                     | -         |
|  | VEC84A  | 12                       | 84        | 82      | 14        | 25                             | Depending on medium        | 400                                     | -         |
|  | VEC81A  | 18                       | 81        | 77      | 22        | 25                             | Depending on medium        | 720                                     | -         |
|  | VEC99A  | 18                       | 99        | 97      | 22        | 25                             | Depending on medium        | 675                                     | -         |
|  | VEC106A | 18                       | 106       | 104     | 22        | 25                             | Depending on medium        | 630                                     | -         |
|  | VEC121A | 18                       | 121       | 118     | 22        | 25                             | Depending on medium        | 460                                     | -         |

Note: The optimum float will be selected after a feasibility test carried out by WIKA.

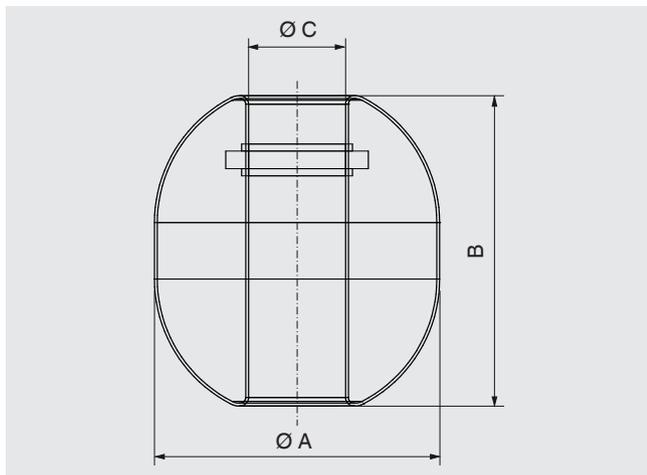
## Cylindrical float



| Material                                    | Version  | Suits guide tube Ø in mm | Ø A in mm | B in mm | Ø C in mm | Max. operating pressure in bar | Max. operating temp. in °C | Limit density 85 % in kg/m <sup>3</sup> | Order no. |
|---|----------|--------------------------|-----------|---------|-----------|--------------------------------|----------------------------|---|-----------|
| <b>Stainless steel 1.4571</b>               | V27A     | 8                        | 27        | 31      | 10        | 16                             | 100                        | 787                                     | 009679    |
|   | V29A/40  | 12                       | 29        | 40      | 13,4      | 10                             | 180                        | 720                                     | 030352    |
|   | V44A     | 12                       | 44        | 52      | 15        | 16                             | 300                        | 720                                     | 009681    |
|   | V44T     | 12                       | 44        | 52      | 15        | 16                             | 350                        | 780                                     | 033561    |
| <b>Titanium 3.7035</b>                      | T44A     | 12                       | 44        | 52      | 15        | 16                             | 300                        | 720                                     | 009744    |
| <b>Buna (NBR)</b>                           | B20A     | 8                        | 20        | 20      | 9         | 3                              | 80                         | 940                                     | 009719    |
|   | B23A     | 8                        | 23        | 25      | 9         | 3                              | 80                         | 800                                     | 009721    |
|   | B25A     | 8                        | 25        | 14      | 9         | 3                              | 80                         | 790                                     | 009720    |
|   | B30A     | 8                        | 30        | 45      | 13        | 3                              | 80                         | 680                                     | 034047    |
|   | B40A     | 12                       | 40        | 30      | 15        | 3                              | 80                         | 580                                     | 009728    |
|   | B40A/120 | 12                       | 40        | 120     | 15        | 3                              | 80                         | 410                                     | 14377687  |
|   | B50A     | 18                       | 50        | 45      | 19        | 3                              | 80                         | 500                                     | 009725    |
| <b>PVC</b>                                  | P44A     | 12                       | 44        | 44      | 14        | 3                              | 60                         | 650                                     | 033790    |
|   | P55A     | 16                       | 55        | 54      | 22        | 3                              | 60                         | 800                                     | 033793    |
|   | P80A     | 20                       | 80        | 79      | 25        | 3                              | 60                         | 570                                     | 033796    |
| <b>Polypropylene</b>                        | PP27A    | 8                        | 27        | 29      | 9         | 3                              | 80                         | 755                                     | 015516    |
|   | PP35A    | 8                        | 35        | 33      | 9         | 3                              | 80                         | 675                                     | 100347    |
|   | PP44A    | 12                       | 44        | 44      | 14        | 3                              | 80                         | 480                                     | 015514    |
|   | PP55A    | 16                       | 55        | 54      | 22        | 3                              | 80                         | 580                                     | 033792    |
|   | PP80A    | 20                       | 80        | 79      | 25        | 3                              | 80                         | 430                                     | 033795    |
| <b>PVDF</b>                                 | PF44A    | 12                       | 44        | 55      | 14        | 3                              | 100                        | 780                                     | 033791    |
|   | PF55A    | 16                       | 55        | 69      | 22        | 3                              | 100                        | 820                                     | 116235    |
|   | PF80A    | 20                       | 80        | 79      | 25        | 3                              | 100                        | 680                                     | 033797    |
| <b>Stainless steel 1.4571 E-CTFE coated</b> | VEC45A   | 12                       | 45        | 53      | 14        | 16                             | Depending on medium        | 891                                     | 114412    |

Note: The optimum float will be selected after a feasibility test carried out by WIKA.

## Hygienic float



| Material               | Model                   | Suits guide tube Ø in mm | Ø A in mm | B in mm | Ø C in mm | Max. operating pressure in bar | Max. operating temp. in °C | Limit density 85 % in kg/m <sup>3</sup> | Order no. |
|------------------------|-------------------------|--------------------------|-----------|---------|-----------|--------------------------------|----------------------------|---|-----------|
| Stainless steel 1.4435 | V80/88/A34/3A/35, axial | 18                       | 80        | 55      | 23        | 16                             | 250                        | 790                                     | 129383    |
|                        | V50/55/17/A34/3A/35     | 12                       | 50        | 55      | 16.8      | 16                             | 250                        | 955                                     | 129583    |
|                        | V55/70/A34/3A/35 axial  | 12                       | 55        | 70      | 17        | 16                             | 250                        | 780                                     | 14462858  |

Note: The optimum float will be selected after a feasibility test carried out by WIKA.

## Contact protection measures

The reed contacts should be protected against any voltage or current spikes that might occur.

Depending on the different load types different protective circuits are used.



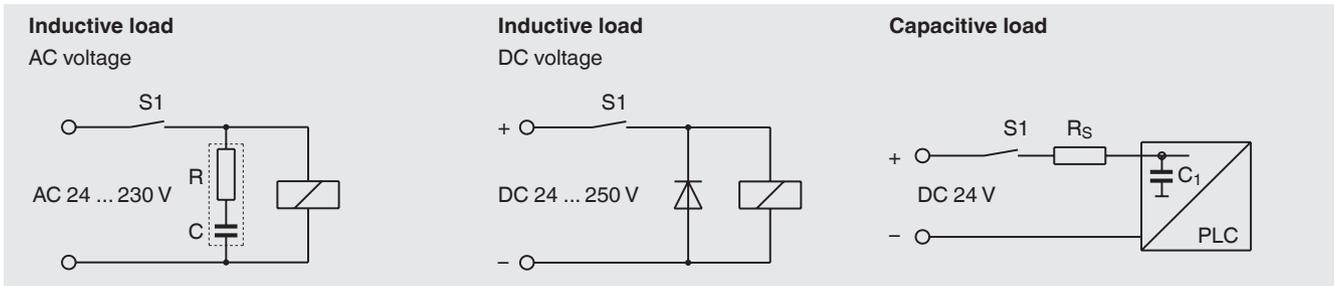
Model KFD2-ER-1.6



RC element

| Contact protection relays | Contacts                      | Input        | Power supply   | Ex marking       | Order no. |
|---------------------------|-------------------------------|--------------|----------------|------------------|-----------|
| KFD2-ER-1.6               | 1 x change-over AC 250 V, 2 A | 2 x contacts | DC 20 ... 30 V | -                | 123806    |
| KFD2-SR2-Ex2.W            | 2 x change-over AC 253 V, 2 A | 2 x contacts | DC 20 ... 30 V | II 1GD Ex ia IIC | 124344    |
| KFA6-ER-1.6               | 1 x change-over AC 250 V, 2 A | 2 x contacts | AC 230 V       | -                | 124341    |
| KFA6-SR2-Ex2.W            | 2 x change-over AC 253 V, 2 A | 2 x contacts | AC 230 V       | II 1GD Ex ia IIC | 123794    |

| RC element | Capacitance  | Resistance   | Voltage  | Order no. |
|------------|--------------|--------------|----------|-----------|
| B3/110     | 0.33 $\mu$ F | 470 $\Omega$ | AC 110 V | 126529    |
| B3/230     | 0.33 $\mu$ F | 820 $\Omega$ | AC 230 V | 126530    |



## Ordering information

To order the described product the order number (if available) is sufficient.

Alternatively:

Model / Version / Electrical connection / Process connection / Guide tube diameter / Guide tube length L / Information about contact (switching function, number of switch points, switch position) / Process specifications (operating temperature and pressure, limit density) / Options

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