



Magnetic Level Switches for Liquids



measuring
•
monitoring
•
analysing

M01-M20



- Switch points: max. 4
- p_{\max} : 100 bar; t_{\max} : 150 °C
- Connection:
G 1/8, G 3/8, G 1/2, G 1, G 1 1/2
G 2, 1" NPT, 1 1/2" NPT,
2" NPT, PG 7 male,
DIN and ANSI flanges,
special connections
- Material:
Stainless steel, brass,
PVC-U, PP, NBR, PVDF
- ATEX-Certification
- Connection heads:
Aluminium, PA, PP, ABS

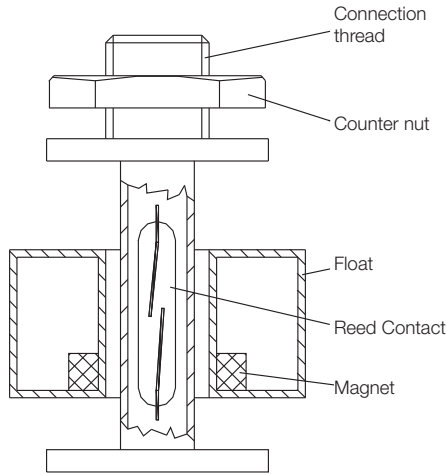
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Design



Description

Magnetic level switches are used for the monitoring and control of liquid levels in vessels. Magnetic level switches are manufactured to customer specification.

An overview of types available with minimum lengths of guide tube is set out on the following pages. Please refer to this overview when placing your order. Furthermore any limits can be specified within the limits found in the brochure.

For example:

- Longer guide tube
- Longer connection cable
- Different cable materials
- Several contacts and different contact operations
- Wide range connections and electrical terminal boxes
- Different materials

Method of Operation

Kobold magnetic float switches are fitted with a hermetically sealed contact which is situated in the tube.

The float sliding on the tube contains a ring magnet whose magnetic field switches the sealed contact in a non contacting fashion. The sealed contacts are available as N/O, N/C or changeover contacts.

The float sliding up and down on the liquid is the only moving part in the Kobold magnetic float switches.

Advantages

- Simple installation
- Long electrical service life due to sealed contacts
- High-degree of operational reliability with air gap between guide tube and floats
- Installation in top or bottom of vessel
- Several levels can be monitored with one float
- Open/close function or changeover contact available

Model Codes

| | M07 | P | R10 | SCXX | P | E |
|--|-----|---|-----|------|---|---|
| Model | | | | | | |
| Guide tube material | | | | | | |
| E = stainless steel 1.4404 | | | | | | |
| M = brass | | | | | | |
| P = PVC | | | | | | |
| S = PVDF | | | | | | |
| Process connection | | | | | | |
| R05 = G 1/8 | | | | | | |
| R10 = G 3/8 | | | | | | |
| R15 = G 1/2 | | | | | | |
| PG7 = Pg7, | | | | | | |
| 1R6...9AC = connection box with thread or flange connection | | | | | | |
| No. of contacts and function* | | | | | | |
| S = N/O contact, | | | | | | |
| C = N/C contact | | | | | | |
| W = changeover contact | | | | | | |
| X = no contact | | | | | | |
| Electr. connection | | | | | | |
| 0 = with housing | | | | | | |
| P = 1 m PVC-cable | | | | | | |
| S = 1 m silicone cable | | | | | | |
| L = 1 m PVC cable (stock model) | | | | | | |
| Y = special length and type | | | | | | |
| ATEX | | | | | | |
| 0 = without | | | | | | |
| E = ATEX | | | | | | |

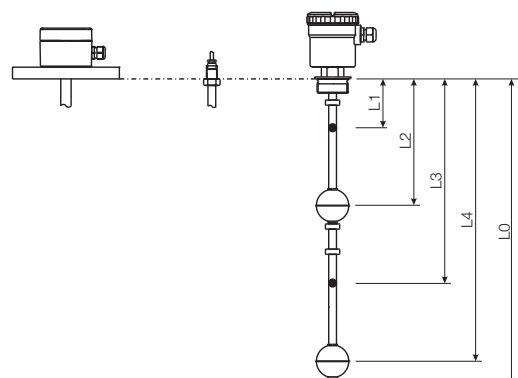
***Please note:**

Contact operation refers to a rising level. Simply link letters for several contacts. The first letter represents the topmost contact, the second letter the second contact from the top, and so on. The position of the contacts, measured from the sealing edge of the connection screwing, must also be specified.

L1 = highest contact (mm) from the top (sealing edge)
 L2 = second contact (mm) from the top (sealing edge)
 and so forth

Guide tube length is designated as L0 (see dimensional drawings)

Definition of switching points



Float designs

| Model | Form | Materials | Float outside Ø [mm] | Height [mm] | Bore hole Ø [mm] | Min. Liquid density [kg/dm ³] | Max. temperature | Nominal pressure at 20 °C |
|-------------------|-------------------------|------------------------|----------------------|-------------|------------------|---|------------------|---------------------------|
| M01 | Cylinder solid material | NBR | 18 | 25 | 10 | > 0.6 | 80 °C | 10 bar |
| M02 | Cylinder hollow | PP | 26 | 16 | 10 | > 0.65 | 80 °C | 3 bar |
| M03 | Cylinder hollow | PVC-U | 26 | 26 | 10 | > 0.9 | 55 °C | 3 bar |
| M04 | Ball hollow | Stainless steel 1.4404 | 30 | 28 | 9 | > 0.8 | 150 °C | 15 bar |
| M05 | Cylinder hollow | PP | 42 | 40 | 14 | > 0.6 | 80 °C | 3 bar |
| M06 ¹⁾ | Cylinder solid material | PP | 40 | 20 | 14 | > 0.9 | 90 °C | 100 bar |
| M07 | Cylinder hollow | PVC-U | 42 | 40 | 14 | > 0.9 | 55 °C | 3 bar |
| M08 | Cylinder hollow | Stainless steel 1.4404 | 44 | 52 | 15 | > 0.65 | 150 °C | 20 bar |
| M10 | Ball hollow | Stainless steel 1.4404 | 52 | 52 | 15 | > 0.6 | 150 °C | 30 bar |
| M11 | Ball hollow | Stainless steel 1.4404 | 52 | 52 | 15 | > 0.6 | 150 °C | 30 bar |
| M13 | Cylinder hollow | PVDF | 38 | 60 | 18 | > 0.6 | 125 °C | 2 bar |
| M16 | Cylinder hollow | PVC-U | 60 | 60 | 18 | > 0.8 | 55 °C | 3 bar |
| M20 | Ball hollow | Stainless steel 1.4404 | 95 | 95 | 20.8 | > 0.5 | 150 °C | 15 bar |

¹⁾ For model M06, one float is required for each switch point.
For all other floats two contacts can be operated with one float.

ATEX-Certificate:

 II 1 GD Ex ia IIC T6 Ga / Ex ia IIIC T85 °C Da
-20 ≤ Ta ≤ +60 °C

Mounting instructions

Float switches can also be fitted in the bottom of vessels.

Important: *The contact operation is then reversed.*

Damping tube for agitated liquids

Float switches with damping tube for agitated or dirty liquids can be supplied upon request.

Temperature monitoring

Float switches with integrated temperature switch, fixed switch point between 60 °C and 150 °C upon request.

Option: Pt100 available

Supplementary devices:

1. Contact protection relays/isolation switching amplifier

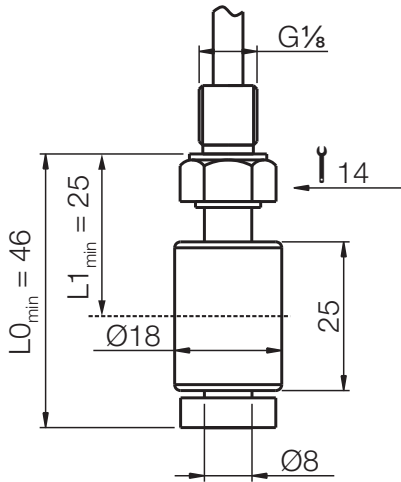
We recommend the use of contact protection relays in conjunction with sealed contacts.

Contact protection relays have the following advantages:

- No contact overloads arising from sparking and high currents, which can, for example, be caused by self-induced emf when switching solenoid valves.
- Float switches are electrically isolated from the high voltage power supply system.
- Protection for persons who come into contact with liquids according to VDE 0100.
- Standard models:
Model MSR 10, 1 channel
Model MSR 20, 2 channels
Model MSR 11, 1 changeover bistable
- ATEX-models:
Model KFD2-SR2-Ex1.W 1 channel, 1 relay output, supply 20 ... 30 V_{DC}
Model KFA6-SR2-Ex1.W 1 channel, 1 relay output, supply 207 ... 253 V_{AC}
Model KFD2-SR2-Ex2.W, 2 channels, 2 relays output, supply 20 ... 30 V_{DC}
Model KFA6-SR2-Ex2.W, 2 channels, 2 relays output, supply 207 ... 253 V_{AC}

Mini Switches

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| Changeover contact*: | 100 V _{AC/DC} / 0.5 A / 3 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

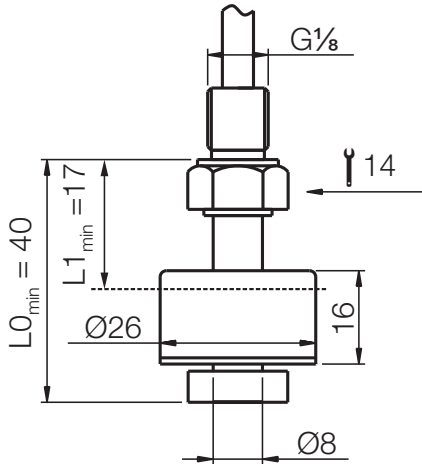
| | |
|---|--|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 64 |
| Min. liquid density: | > 0.6 kg/dm ³ |
| Max. pressure (at 20°C): | 3 bar (PVC tube), 10 bar (brass, 1.4404 tube) |
| Max. temp. PVC cable: | 55°C (PVC tube), 70°C (brass, 1.4404 tube) |
| Max. temp. silicone cable: | 55°C (PVC tube), 80°C (brass, 1.4404 tube) |
| Max. length of guide tube: | 1 m (PVC tube), 2 m (brass, 1.4404 tube) |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 21 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 28 ±3 mm between L2 and L3: 35 ±3 mm |
| Hysteresis: | 3 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 ²⁾ | Electr. connection | ATEX |
|----------------------------|---|---|---|---|---|--|---------------------------------------|
| M01- (NBR float) | M = brass E = 1.4404 P = PVC | R05 = G ¹ / ₈ XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | XX = without SX = N/O CX = N/C | 0 ⁵⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable L ³⁾ = 1 m PVC-cable (stock model) Y ⁴⁾ = special length and type | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 3 pieces N/O, N/C, or 2 SPDT contacts.
³⁾ Stock model always with one contact and minimum guide tube length, without ATEX
⁴⁾ Please specify in writing length and type of cable
⁵⁾ only with connection head

Mini switches

Dimensions [mm]



Technical Data

N/O contact*: 230 V_{AC/DC} / 0.5 A / 10 VA
ATEX-version: U; 40 V

N/C contact*: 230 V_{AC/DC} / 0.5 A / 10 VA
ATEX-version: U; 40 V

Changeover contact*: 100 V_{AC/DC} / 0.5 A / 3 VA
ATEX-version: U; 40 V

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

Cable length: 1 m

Installation position: vertical ±30°

Protection type: IP 64

Min. liquid density: > 0.65 kg/dm³

Max. pressure (at 20°C): 3 bar

Max. temp. PVC cable: 70°C

Max. temp. silicone cable: 80°C

Max. length of guide tube: 2 m

Connection heads: see following pages

Switch point min. distance from end of meas. tube: 20 mm (for special length)

Switch point min. distance between contacts: between L1 and L2: 28 ±3 mm
between L2 and L3: 28 ±3 mm

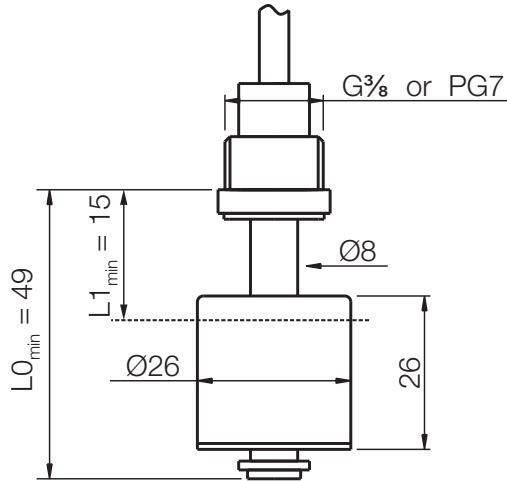
Hysteresis: 3 mm

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 ²⁾ | Electr. connection | ATEX |
|---------------------------|---------------------------------------|---|---|---|---|--|---------------------------------------|
| M02- (PP float) | M = brass E = 1.4404 | R05 = G 1/8 XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | XX = without SX = N/O CX = N/C | 0 ⁵⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable L ³⁾ = 1 m PVC-cable (stock model) Y ⁴⁾ = special length and type | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 3 pieces N/O, N/C, or 2 SPDT contacts.
³⁾ Stock model always with one contact and minimum guide tube length, without ATEX
⁴⁾ Please specify in writing length and type of cable
⁵⁾ only with connection head

Mini Switches

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| Changeover contact*: | 100 V _{AC/DC} / 0.5 A / 3 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

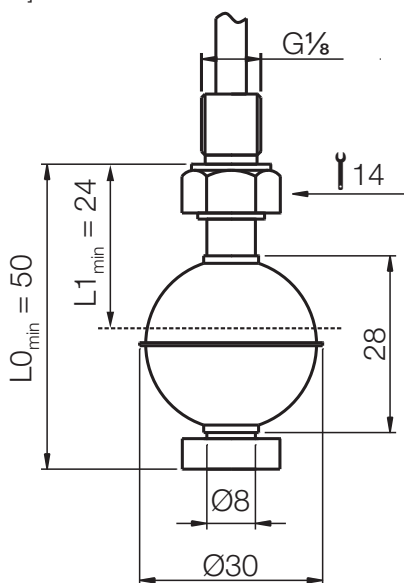
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|--|--|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 64 |
| Min. liquid density: | > 0.9 kg/dm ³ |
| Max. pressure (at 20°C): | 3 bar |
| Max. temperature: | 55°C |
| Max. length of guide tube: | 1 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 32 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 28 ±3 mm between L2 and L3: 36 ±3 mm |
| Hysteresis: | 3 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 ²⁾ | Electr. connection | ATEX |
|----------------------------|--------------------------|--|---|---|---|--|---------------------------------------|
| M03- (PVC float) | P = PVC | R10 = G¾ PG7 = Pg7 XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | XX = without SX = N/O CX = N/C | 0 ³⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable L ³⁾ = 1 m PVC-cable (stock model) Y ⁴⁾ = special length and type | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 3 pieces N/O, N/C, or 2 SPDT contacts.
³⁾ Stock model always with one contact and minimum guide tube length, without ATEX, including counter nut
⁴⁾ Please specify in writing length and type of cable
⁵⁾ only with connection head

Mini switches

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 0.5 A / 10 VA ATEX-version: U; 40 V |
| Changeover contact*: | 100 V _{AC/DC} / 0.5 A / 3 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

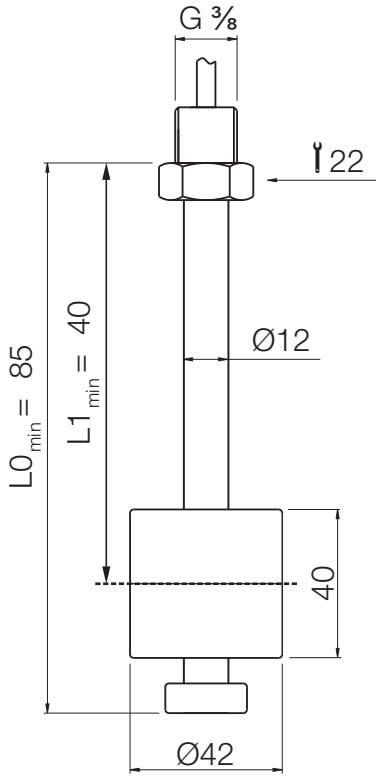
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|--|--|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 64 |
| Min. liquid density: | > 0.8 kg/dm ³ |
| Max. pressure (at 20°C): | 15 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 150°C |
| Max. length of guide tube: | 2 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 30 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 28 ±3 mm between L2 and L3: 38 ±3 mm |
| Hysteresis: | 3 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 ²⁾ | Electr. connection | ATEX |
|-------------------------------|---------------------------------------|--|---|---|---|---|---------------------------------------|
| M04- (1.4404 float) | M = brass E = 1.4404 | R05 = G _{1/8} XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | XX = without SX = N/O CX = N/C | 0⁵⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable L³⁾ = 1 m PVC-cable (stock model) Y⁴⁾ = special length and type | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 3 pieces N/O, N/C, or 2 SPDT contacts.
³⁾ Stock model always with one contact and minimum guide tube length, without ATEX
⁴⁾ Please specify in writing length and type of cable
⁵⁾ only with connection head

Cylindrical float made of polypropylene

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

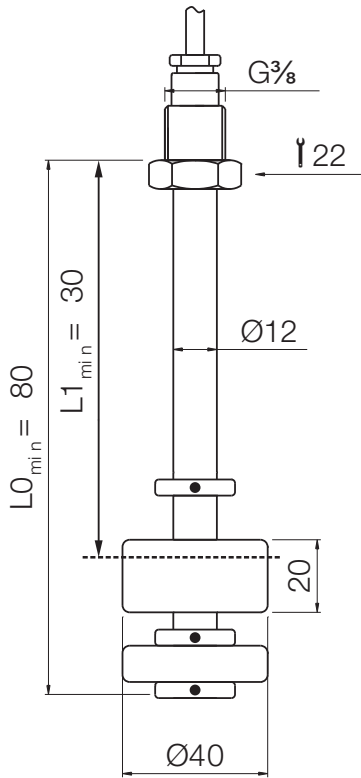
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|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.6 kg/dm ³ |
| Max. pressure (at 20°C): | 3 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 80°C |
| Max. length of guide tube: | 4 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 45 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 ±3 mm between L2 and L3: 54 ±3 mm between L3 and L4: 45 ±3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|---------------------------|---------------------------------------|--|---|---|---|--|--|---------------------------------------|
| M05- (PP float) | M = brass E = 1.4404 | R10 = G ^{3/8} XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | O ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

High-pressure applications

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

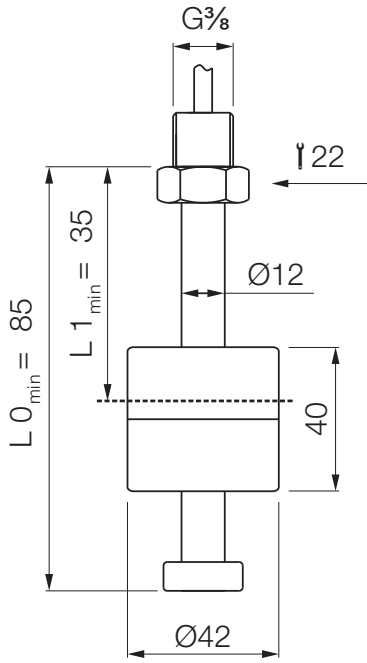
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|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.9 kg/dm ³ |
| Max. pressure (at 20°C): | 100 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 90°C |
| Max. length of guide tube: | 4 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 50 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 70 ±7 mm between L2 and L3: 70 ±7 mm between L3 and L4: 70 ±7 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|---------------------------|---------------------------------------|--|---|---|---|--|--|---------------------------------------|
| M06- (PP float) | M = brass E = 1.4404 | R10 = G ^{3/8} XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | O ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

Cylindrical float and tube made of PVC

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

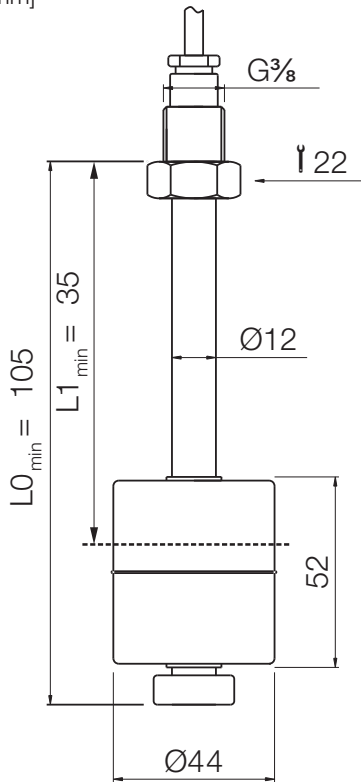
| | |
|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.9 kg/dm ³ |
| Max. pressure (at 20°C): | 3 bar |
| Max. temp. PVC cable: | 55°C |
| Max. temp. silicone cable: | 55°C |
| Max. length of guide tube: | 2 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 45 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 ±3 mm between L2 and L3: 54 ±3 mm between L3 and L4: 45 ±3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|----------------------------|--------------------------|---|---|---|---|--|--|---------------------------------------|
| M07- (PVC float) | P = PVC | R10 = G 3/8 XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | O ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

Cylindrical float made of stainless steel 1.4404

Dimensions [mm]



Technical Data

N/O contact*: 230 V_{AC/DC} / 1 A / 60 VA
ATEX-version: U; 40 V

N/C contact*: 230 V_{AC/DC} / 1 A / 60 VA
ATEX-version: U; 40 V

Changeover contact*: 230 V_{AC/DC} / 1 A / 60 VA
ATEX-version: U; 40 V

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

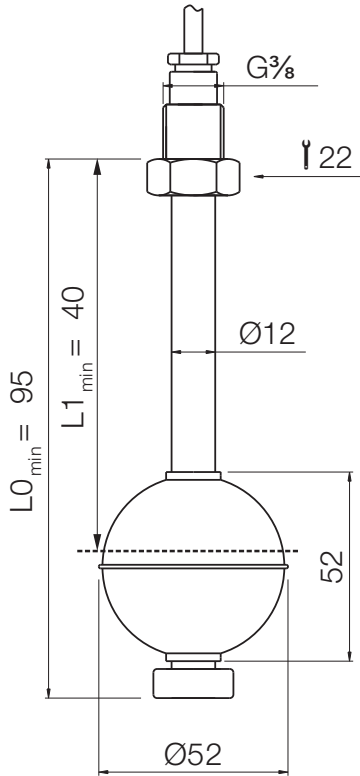
Cable length: 1 m
Installation position: vertical ±30°
Protection type: IP 65
Min. liquid density: > 0.65 kg/dm³
Max. pressure (at 20°C): 20 bar
Max. temp. PVC cable: 70°C
Max. temp. silicone cable: 150°C
Max. length of guide tube: 4 m
Connection heads: see following pages
Switch point min. distance from end of meas. tube: 50 mm (for special length)
Switch point min. distance between contacts: between L1 and L2: 45 ±3 mm
between L2 and L3: 66 ±3 mm
between L3 and L4: 45 ±3 mm
Hysteresis: 5 mm

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|-------------------------------|---------------------------------------|---|---|---|---|--|--|---------------------------------------|
| M08- (1.4404 float) | M = brass E = 1.4404 | R10 = G ³ / ₈ XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | O ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

Ball float made of stainless steel 1.4404

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

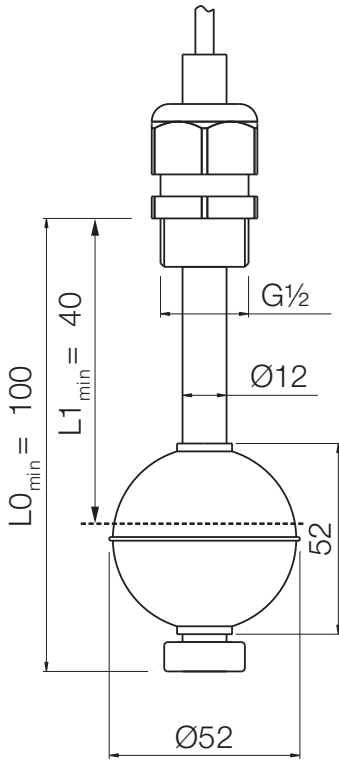
| | |
|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.6 kg/dm ³ |
| Max. pressure (at 20°C): | 30 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 150°C |
| Max. length of guide tube: | 4 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 45 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 ±3 mm between L2 and L3: 66 ±3 mm between L3 and L4: 45 ±3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|-------------------------------|---------------------------------------|--|---|---|---|--|--|---------------------------------------|
| M10- (1.4404 float) | M = brass E = 1.4404 | R10 = G¾ XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | O ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts.
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

Adjustable for height

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

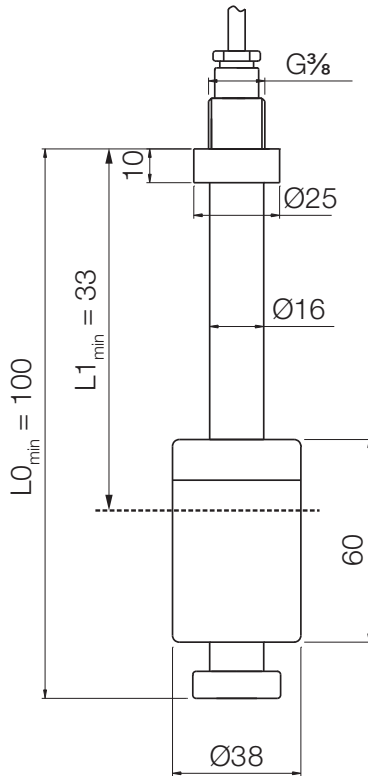
| | |
|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.6 kg/dm ³ |
| Max. pressure (at 20°C): | 30 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 150°C |
| Max. length of guide tube: | 4 m |
| Switch point min. distance from end of meas. tube: | 45 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 ±3 mm between L2 and L3: 66 ±3 mm between L3 and L4: 45 ±3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|-------------------------------|---------------------------------------|--------------------|---|---|---|--|---|---------------------------------------|
| M11- (1.4404 float) | M = brass E = 1.4404 | R15 = G 1/2 | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ Max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts.
³⁾ Please specify in writing length and type of cable

PVDF design

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

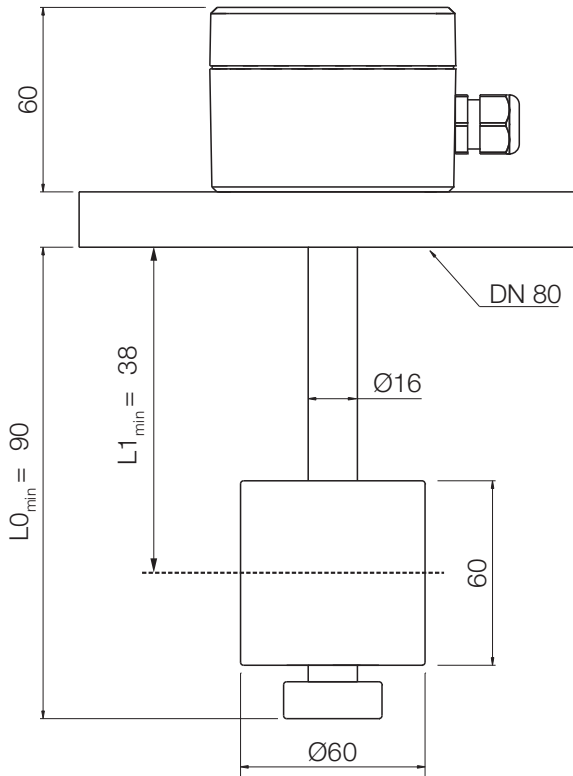
| | |
|--|---|
| Cable length: | 1 m |
| Installation position: | vertical ±30° |
| Protection type: | IP65 |
| Min. liquid density: | > 0.6 kg/dm ³ |
| Max. pressure (at 20°C): | 2 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 125°C |
| Max. length of guide tube: | 3 m |
| Connection heads: | see following pages |
| Switch point min. distance from end of meas. tube: | 75 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 ±3 mm between L2 and L3: 80 ±3 mm between L3 and L4: 45 ±3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|-----------------------------|--------------------------|---|---|---|---|--|--|---------------------------------------|
| M13- (PVDF float) | S = PVDF | R10 = G ³ / ₈ XXX = see following pages for different connection heads | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | 0 ⁴⁾ = with housing P = 1 m PVC-cable S = 1 m silicone cable Y ³⁾ = special length and type | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts
³⁾ Please specify in writing length and type of cable
⁴⁾ only with connection head

PVC flange design

Dimensions [mm]



Technical Data

N/O contact*: 230 V_{AC/DC} / 1 A / 60 VA

ATEX-version: U; 40 V

N/C contact*:

230 V_{AC/DC} / 1 A / 60 VA

ATEX-version: U; 40 V

Changeover contact*:

230 V_{AC/DC} / 1 A / 60 VA

ATEX-version: U; 40 V

* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

Installation position:

vertical ±30°

Protection type:

IP 65

Min. liquid density:

> 0.8 kg/dm³

Max. pressure (at 20°C):

3 bar

Max. temp.:

55°C

Max. length of guide tube:

3 m

Switch point min. distance from end of meas. tube:

50 mm (for special length)

Switch point min. distance between contacts:

between L1 and L2: 45 ±3 mm
between L2 and L3: 80 ±3 mm
between L3 and L4: 45 ±3 mm

Hysteresis:

5 mm

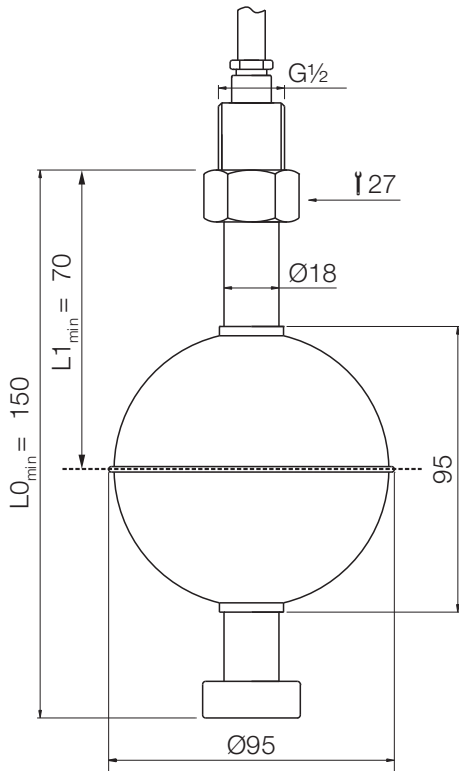
| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|----------------------------|--------------------------|--------------------|---|---|---|--|-------------------------|---------------------------------------|
| M16- (PVC float) | P = PVC | F80 = DN80 | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | 0 = with housing | 0 = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths

²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts

Heavy-duty design

Dimensions [mm]



Technical Data

| | |
|----------------------|---|
| N/O contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| N/C contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |
| Changeover contact*: | 230 V _{AC/DC} / 1 A / 60 VA ATEX-version: U; 40 V |

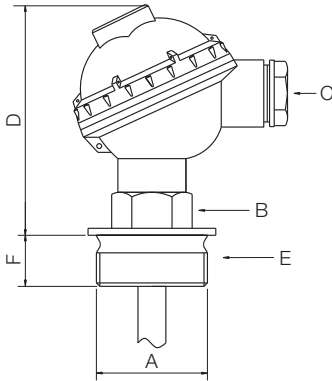
* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

| | |
|--|---|
| Cable length: | 1 m |
| Installation position: | vertical $\pm 30^\circ$ |
| Protection type: | IP 65 |
| Min. liquid density: | > 0.5 kg/dm ³ |
| Max. pressure (at 20°C): | 15 bar |
| Max. temp. PVC cable: | 70°C |
| Max. temp. silicone cable: | 150°C |
| Max. length of guide tube: | 6 m |
| Switch point min. distance from end of meas. tube: | 90 mm (for special length) |
| Switch point min. distance between contacts: | between L1 and L2: 45 \pm 3 mm between L2 and L3: 110 \pm 3 mm between L3 and L4: 45 \pm 3 mm |
| Hysteresis: | 5 mm |

| Model | Guide tube ¹⁾ | Process connection | Contact L1 | Contact L2 | Contact L3 | Contact L4 ²⁾ | Electr. connection | ATEX |
|-------------------------------|--------------------------|------------------------------|---|---|---|--|--|---------------------------------------|
| M20- (1.4404 float) | E = 1.4404 | R15 = G $\frac{1}{2}$ | S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C W = SPDT | X = without S = N/O C = N/C | P = 1 m PVC-cable Y ³⁾ = special length and type | O = without E = ATEX |

¹⁾ Please specify in writing total and contact lengths
²⁾ max. number of contacts 4 pieces N/O, N/C, or 3 SPDT contacts.
³⁾ Please specify in writing length and type of cable

Model 1



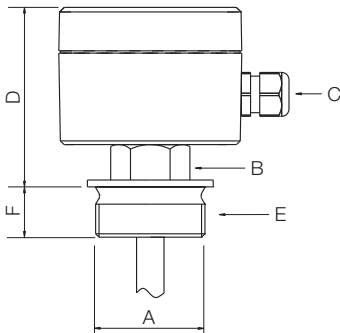
PP screwed cover housing

Dimensions and materials

| Model ¹⁾ | Process connection (A) ²⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ³⁾ (F) | t _{max} |
|---------------------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 1... | ...R6 = G 1 | 27 AF | PG16 | 100 mm | PP | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |

¹⁾ Attention maximum 6 poles
²⁾ Size of process connection must be according with float size
³⁾ Given lengths L0, L1... are always with thread included.

Model 2/4



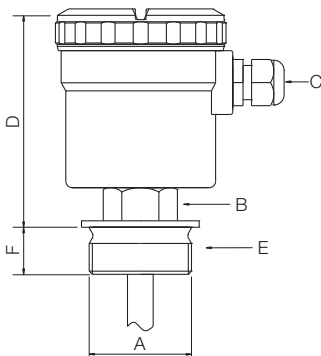
Aluminium housing

Dimensions and materials

| Model | Process connection (A) ¹⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ²⁾ (F) | t _{max} |
|-------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 2... | ...R6 = G 1 | 27 AF | M16 x 1.5 | 73 mm | Brass | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |
| 4... | ...R6 = G 1 | 27 AF | M16 x 1.5 | 73 mm | 1.4404 | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |

¹⁾ Size of process connection must be according with float size
²⁾ Given lengths L0, L1... are always with thread included.

Model 3



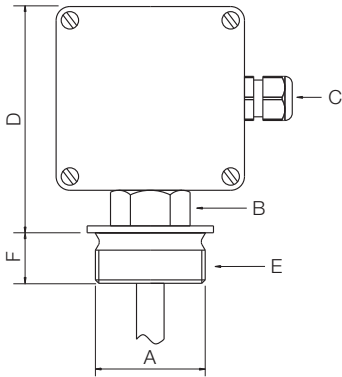
PA screwed cover housing

Dimensions and materials

| Model | Process connection (A) ¹⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ²⁾ (F) | t _{max} |
|-------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 3... | ...R6 = G 1 | 27 AF | M16 x 1.5 | 104 mm | 1.4404 | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |

¹⁾ Size of process connection must be according with float size
²⁾ Given lengths L0, L1... are always with thread included.

Model 5



ABS Housing

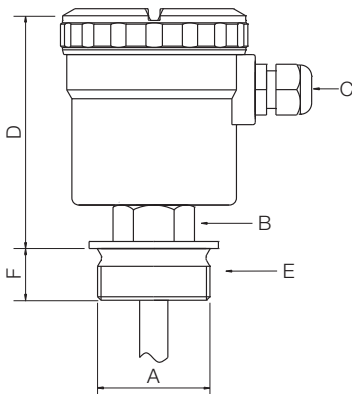
Dimensions and materials

| Model | Process connection (A) ¹⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ²⁾ (F) | t _{max} |
|-------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 5... | ...R6 = G 1 | 27 AF | M16 x 1.5 | 100 mm | PVC | 18 mm | 55°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |

¹⁾ Size of process connection must be according with float size

²⁾ Given lengths L0, L1... are always with thread included.

Model 6



PA Screwed cover housing

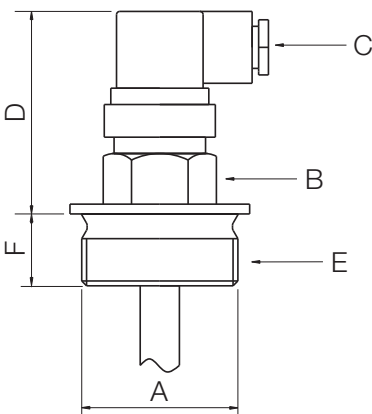
Dimensions and materials

| Model | Process connection (A) ¹⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ²⁾ (F) | t _{max} |
|-------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 6... | ...R8 = G 1½ | 30 AF | M16 x 1.5 | 104 mm | PVDF | 22 mm | 90°C |
| | ...N8 = 1½" NPT | | | | | 25 mm | |

¹⁾ Size of process connection must be according with float size

²⁾ Given lengths L0, L1... are always with thread included.

Model 7/8



Threaded process connection with PA connector DIN 43650

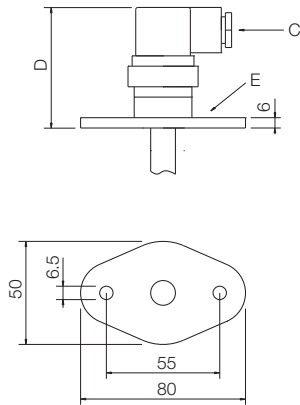
Dimensions and materials

| Model | Process connection (A) ¹⁾ | Width across flats (B) | Electrical connection (C) | Overall height (D) | Screwed fitting (E) | Thread length ²⁾ (F) | t _{max} |
|-----------------|--------------------------------------|------------------------|---------------------------|--------------------|---------------------|---------------------------------|------------------|
| 7... (3-pin) | ...R6 = G 1 | 27 AF | M16 x 1.5 | 65 mm | PP | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |
| 8... (6-pin) | ...R6 = G 1 | 27 AF | PG7 | 50 mm | PP | 18 mm | 90°C |
| | ...R8 = G 1½ | 30 AF | | | | 22 mm | |
| | ...R9 = G 2 | 36 AF | | | | 24 mm | |
| | ...N6 = 1" NPT | 27 AF | | | | 25 mm | |
| | ...N8 = 1½" NPT | 30 AF | | | | 25 mm | |
| | ...N9 = 2" NPT | 36 AF | | | | 27 mm | |

¹⁾ Size of process connection must be according with float size

²⁾ Given lengths L0, L1... are always with thread included.

Model 7PP, 8PP

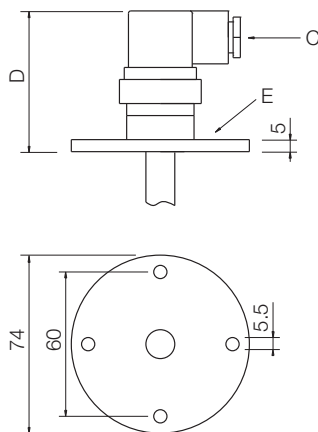


Oval flange process connection with PA connector DIN 43650

Dimensions and materials

| Model | Electrical connection (C) | Overall height (D) | Oval flange (E) | t _{max} |
|-----------------------|---------------------------|--------------------|-----------------|------------------|
| 7PP (3-pin) | M16 x 1.5 | 65 mm | PP | 90°C |
| 8PP (6-pin) | PG7 | 45 mm | PP | 90°C |

Model 7MS...8PV

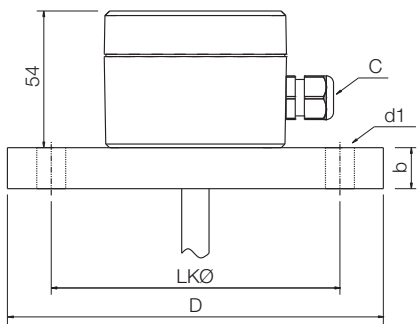


Round flange process connection with PA connector DIN 43650

Dimensions and materials

| Model | Flange (E) | Overall height (D) | Electrical connection (C) | t _{max} |
|-------------|-----------------------|--------------------|---------------------------|------------------|
| 7... | ...MS = Brass | 65 mm | 3-pole M16 x 1.5 | 90°C |
| | ...VA = 1.4404 | | | |
| | ...PV = PVC | | | |
| 8... | ...MS = Brass | 45 mm | 6-pole PG7 | 90°C |
| | ...VA = 1.4404 | | | |
| | ...PV = PVC | | | |

Model 9



Flanged process connection acc. DIN EN1092-1 PN16 / ANSI B 16.5 150 lbs with aluminium housing

Dimensions and materials

| Model | Flange size 1.4404 | D | b | LK Ø | d1 | Electrical connection (C) | t _{max} |
|-------------------|----------------------|-------|-------|-----------|-----------|---------------------------|------------------|
| 9... | ...F8 = DN40 | 150 | 16 | 110 | 4 x Ø18 | M16 x 1.5 | 90°C |
| | ...F9 = DN50 | 165 | 18 | 125 | 4 x Ø18 | | |
| | ...F0 = DN65 | 185 | 18 | 145 | 4 x Ø18 | | |
| | ...FB = DN80 | 200 | 20 | 160 | 4 x Ø18 | | |
| | ...FC = DN100 | 220 | 20 | 180 | 8 x Ø18 | | |
| | ...FD = DN125 | 250 | 22 | 210 | 8 x Ø18 | | |
| | ...A8 = 1½" | 127 | 17.5 | 98.6 | 4 x Ø15.7 | | |
| | ...A9 = 2" | 152.4 | 19.1 | 120.7 | 4 x Ø19.1 | | |
| | ...A0 = 2½" | 177.8 | 22.4 | 139.7 | 4 x Ø19.1 | | |
| | ...AB = 3" | 190.5 | 23.9 | 152.4 | 4 x Ø19.1 | | |
| | ...AV = 3½" | 215.0 | 23.9 | 177.8 | 8 x Ø19.1 | | |
| ...AC = 4" | 228.6 | 23.9 | 190.5 | 8 x Ø19.1 | | | |




Technical Data


Model MSR

Power supply: 230 V_{AC} -10/+6% 50 - 60 Hz
Power consumption: max. 6 VA
Relay output: MSR-010
(1 floating changeover contact)
MSR-020
(2 floating changeover contact)
MSR-011
(1 floating changeover contact
bistable)
max. 250 V_{AC}, 8 A
Details: see datasheet


Model KFA6-SR2-Ex2.W (Double channel)

ATEX-approval:  II (1) G [Ex ia] IIC,
II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX:
U_o: 10.6 V
I_o: 19.1 mA
P_o: 51 mW
U_m: 253 V_{AC}
Power supply: 207 ... 253 V_{AC}, 45 ... 65 Hz
Power consumption: max. 1 W
Relay Output: max. 253 V_{AC}, 2 A
Details: see datasheet


Model KFD2-SR2-Ex2.W (Double channel)

ATEX-approval:  II(1) G [Ex ia] IIC,
II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX:
U_o: 10.5 V
I_o: 13 mA
P_o: 34 mW
U_m: 253 V_{AC}
Power supply: 20 ... 30 V_{DC}
Power consumption: max. 0.9 W
Relay Output: max. 253 V_{AC}, 2 A
Details: see datasheet

Model KFA6-SR2-Ex1.W (Single channel)

ATEX-approval:  II (1) G [Ex ia] IIC,
II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX-:
U_o: 10.6 V
I_o: 19.1 mA
P_o: 51 mW
U_m: 253 V_{AC}
Power supply: 207 ... 253 V_{AC}, 45 ... 65 Hz
Power consumption: max. 1 W
Relay Output: max. 253 V_{AC}, 2A
Details: see datasheet

Model KFD2-SR2-Ex1.W (Single channel)

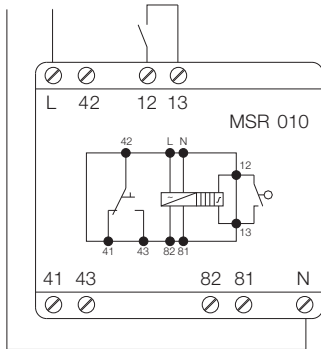
ATEX-approval:  II (1) G [Ex ia] IIC,
II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX-:
U_o: 10.5 V
I_o: 13 mA
P_o: 34 mW
U_m: 253 V_{AC}
Power supply: 20 ... 30 V_{DC}, 45 ... 65 Hz
Power consumption: max. 0.9 W
Relay Output: max. 253 V_{AC}, 2A
Details: see datasheet



Standard models

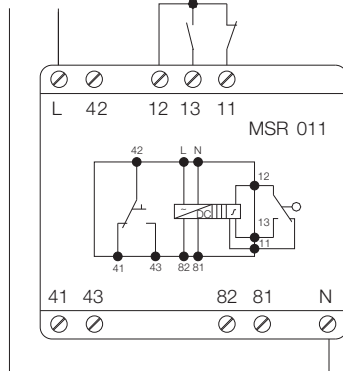
MSR010

Supply 230 V_{AC} M SERIES CONTACT



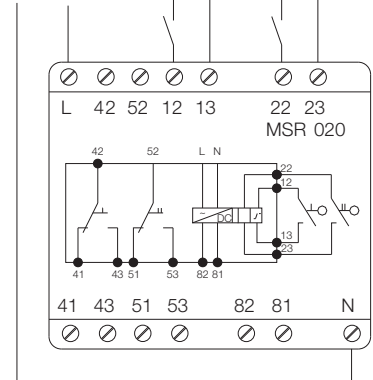
MSR011

Supply 230 V_{AC} M SERIES CONTACT



MSR020

Supply 230 V_{AC} M SERIES CONTACT M SERIES CONTACT



ATEX models

KFD2-SR2-Ex2.W (Double channel)
KFA6-SR2-Ex2.W (Double channel)

KFD2-SR2-Ex1.W (Single channel)
KFA6-SR2-Ex1.W (Single channel)

