Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Magnetic Level Switches

for liquids

measuring • monitoring • analysing

M01-M20

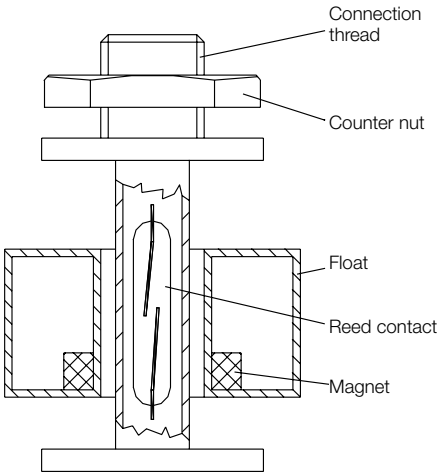
- Switch points: max. 4
- p_{max}: 100 bar; t_{max}: 150 °C
- Connection:
  G⅛, G⅜, G½ ,G1, G1½
  G2, 1" NPT, 1½" NPT,
  2" NPT, PG7 male,
  DIN and ANSI flanges,
  special connections
- Material:
  stainless steel, brass,
  PVC-U, PP, NBR, PVDF
- ATEX-Certification
  Ex ia, Ex d
- Connection heads:
  aluminium, PA, PP, ABS

N1

KOBOLD companies worldwide:
ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com

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 = G⅛
R10 = G⅜
R15 = G½
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 Ex ia
F = ATEX Ex d

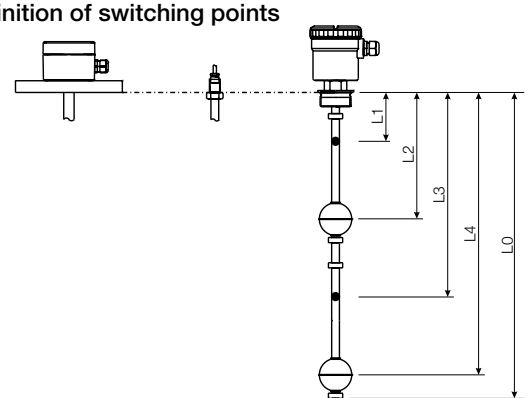
*Please note:

Contact state referred to empty tank. 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



1/07-2016

Float designs

Model	Form	Materials	Float outside Ø [mm]	Height [mm]	Bore hole Ø [mm]	Min. Liquid density [kg/dm³]	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:

Ⓔx II 1 GD Ex ia IIC T6 Ga / Ex ia IIIC T85°C Da -20 ≤ Ta ≤ +60°C (LOM 14ATEX2075 X)

Ⓔx II 1/2 G Ex d IIC T1...T6 Ga/Gb
II 2D Ex t IIIC T410 °C Db (LOM 14ATEX2075 X)

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

Supplementary devices:

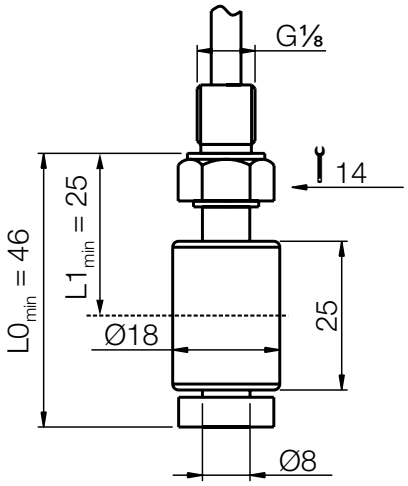
1. Contact protection relays/isolation switching amplifier

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 Details

N/O contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	100 $V_{AC/DC}$ / 0.5 A / 3 VA ATEX Ex ia: U_i: 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:	IP64
Min. liquid density:	>0.6 kg/dm³
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

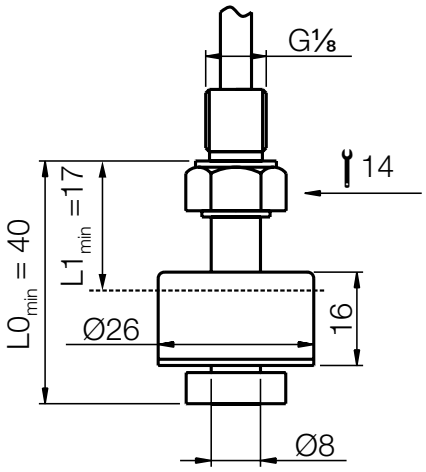
Model	Guide tube[1)]	Process connection	Contact L1	Contact L2	Contact L3[2)]	Electr. connection	ATEX
M01- (NBR float)	**M** = brass **E** = 1.4404 **P** = PVC	**R05** = G⅛ **XXX** = see following pages for different connection heads	**S** = N/O **C** = N/C **W** = SPDT	**X** = without **S** = N/O **C** = 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 **F**[6)] = ATEX Ex d

[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
[6)] Only available with guide tube option »E« (1.4404) and connection head »L«

1/07-2016

Mini switches

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	100 $V_{AC/DC}$ / 0.5 A / 3 VA ATEX Ex ia: U_i: 40 V

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

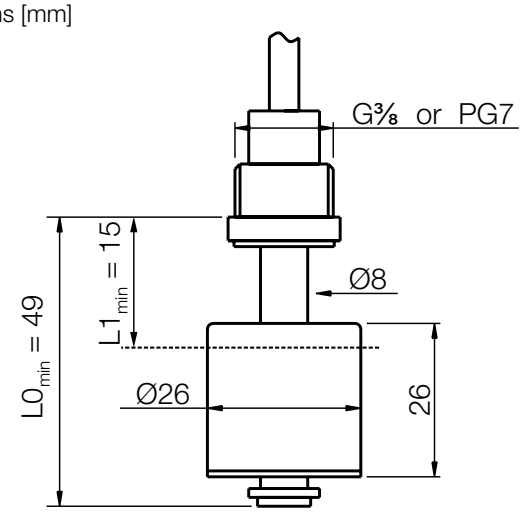
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP64
Min. liquid density:	>0.65 kg/dm³
Max. pressure (at 20°C):	3 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	80°C
Max. length of guide tube:	2 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅛ **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 **F**[6)] = ATEX Ex d

[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
[6)] Only available with guide tube option »E« (1.4404) and connection head »L«

Mini Switches

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	100 $V_{AC/DC}$ / 0.5 A / 3 VA ATEX Ex ia: U_i: 40 V

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

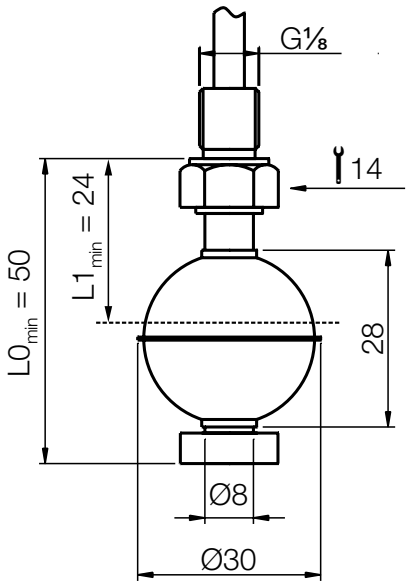
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP64
Min. liquid density:	>0.9 kg/dm³
Max. pressure (at 20°C):	3 bar
Max. temperature:	55°C
Max. length of guide tube:	1 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	32 mm (for special 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** = G⅜ **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**[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 Ex ia

[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 Details

N/O contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 0.5 A / 10 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	100 $V_{AC/DC}$ / 0.5 A / 3 VA ATEX Ex ia: U_i: 40 V

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

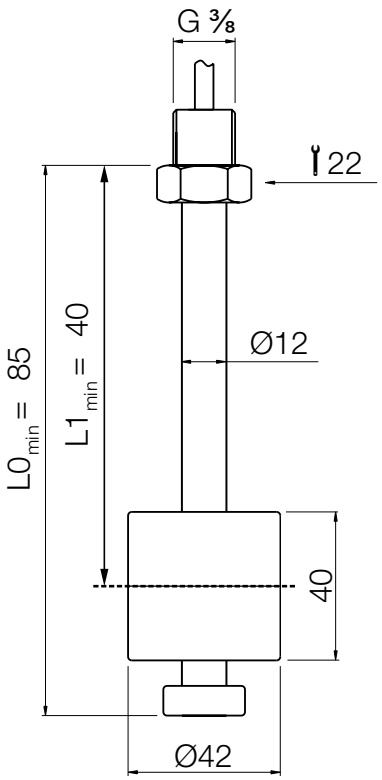
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP64
Min. liquid density:	>0.8 kg/dm³
Max. pressure (at 20°C):	15 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	2 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅛ **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 Ex ia **F**[6)] = ATEX Ex d

[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
[6)] Only available with guide tube option »E« (1.4404) and connection head »L«

Cylindrical float made of polypropylene

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

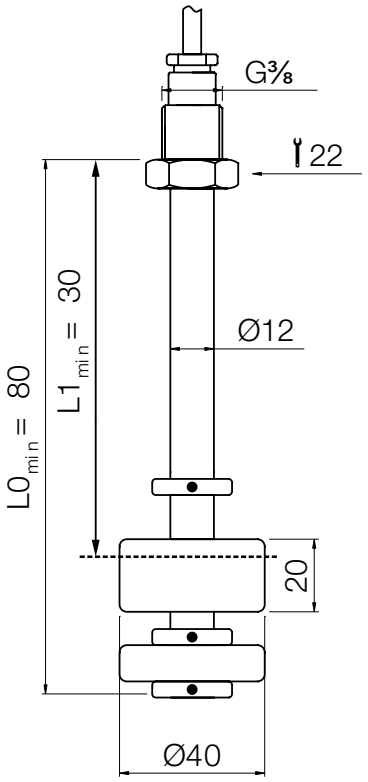
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.6 kg/dm³
Max. pressure (at 20°C):	3 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	80°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅜ **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 Ex ia **F**[5)] = ATEX Ex d

[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
[5)] Only available with guide tube option »E« (1.4404) and connection head »L«

High-pressure applications

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

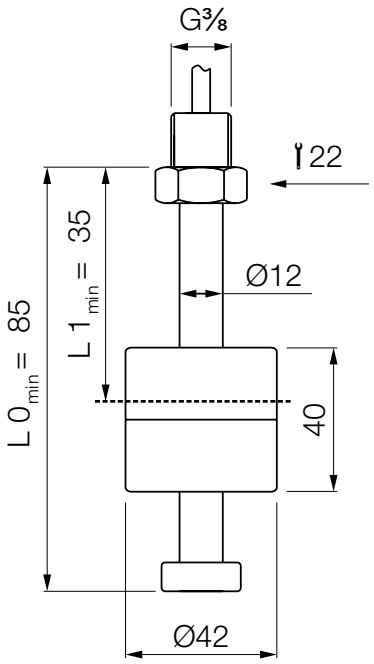
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.9 kg/dm³
Max. pressure (at 20°C):	100 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	90°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅜ **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 Ex ia **F**[5] = ATEX Ex d

[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
[5] Only available with guide tube option »E« (1.4404) and connection head »L«

Cylindrical float and tube made of PVC

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 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:	>0.9 kg/dm³
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

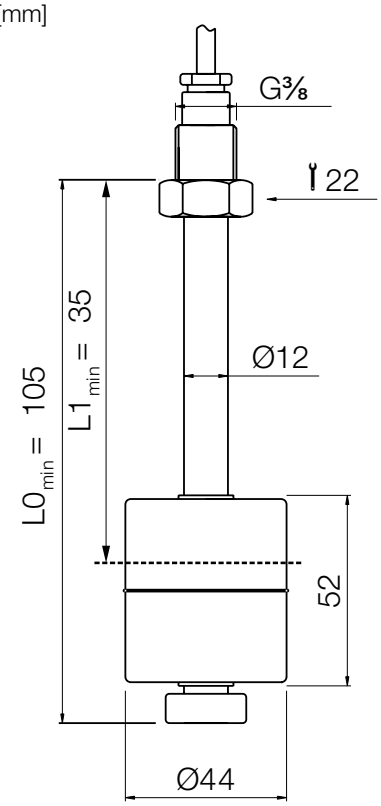
Model	Guide tube[1]	Process connection	Contact L1	Contact L2	Contact L3	Contact L4[2]	Electr. connection	ATEX
M07- (PVC float)	**P** = PVC	**R10** = G⅜ **XXX** = see following pages for different connection heads	**S** = N/O **C** = N/C **W** = SPDT	**X** = without **S** = N/O **C** = N/C **W** = SPDT	**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 Ex ia

[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

1/07-2016

Cylindrical float made of stainless steel 1.4404

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

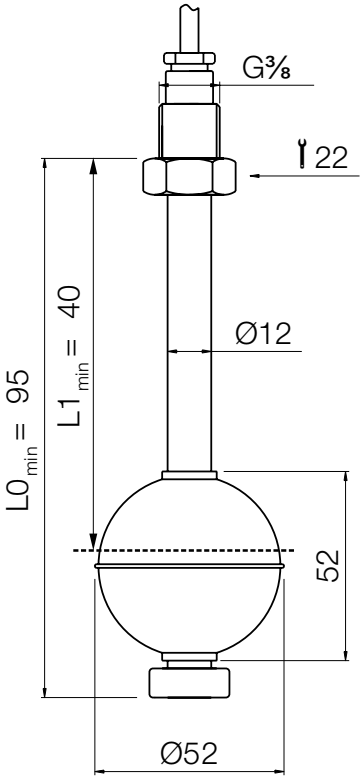
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.65 kg/dm³
Max. pressure (at 20°C):	20 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅜ **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 Ex ia **F**[5] = ATEX Ex d

[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
[5] Only available with guide tube option »E« (1.4404) and connection head »L«

Ball float made of stainless steel 1.4404

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

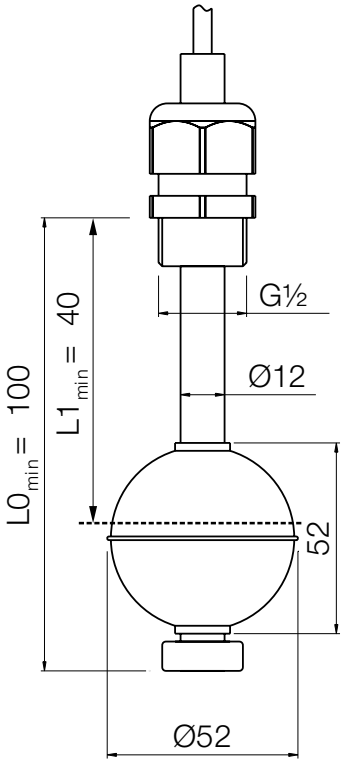
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.6 kg/dm³
Max. pressure (at 20°C):	30 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from 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** = G⅜ **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 Ex ia **F**[5] = ATEX Ex d

[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
[5] Only available with guide tube option »E« (1.4404) and connection head »L«

Adjustable for height

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

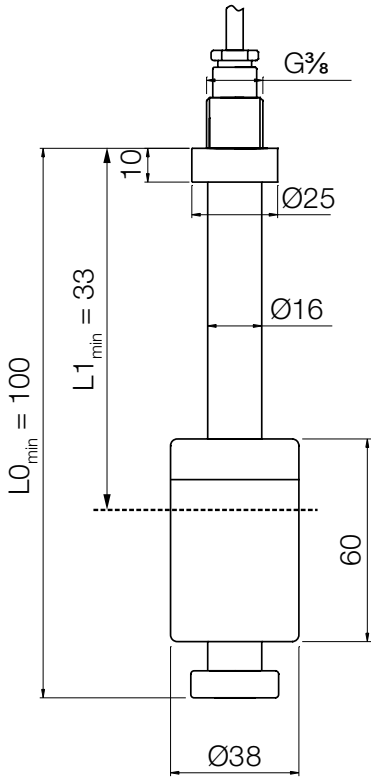
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.6 kg/dm³
Max. pressure (at 20°C):	30 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	4 m
Switch point min. distance from end of meas. tube:	45 mm (for special 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** = G½	**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	**0** = without **E** = ATEX Ex ia

[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 Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 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/dm³
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

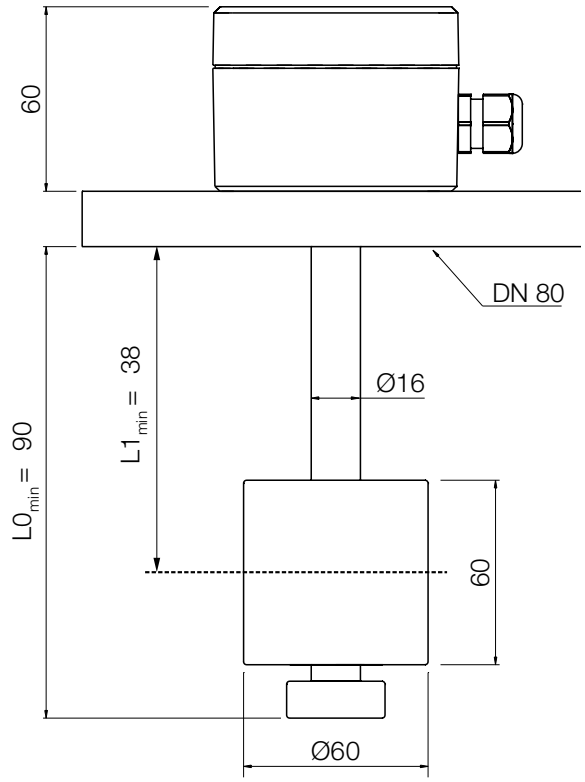
Model	Guide tube[1)]	Process connection	Contact L1	Contact L2	Contact L3	Contact L4[2)]	Electr. connection	ATEX
M13- (PVDF float)	**S** = PVDF	**R10** = G⅜ **XXX** = see following pages for different connection heads	**S** = N/O **C** = N/C **W** = SPDT	**X** = without **S** = N/O **C** = N/C **W** = 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 Ex ia

[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

1/07-2016

PVC flange design

Dimensions [mm]



Technical Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

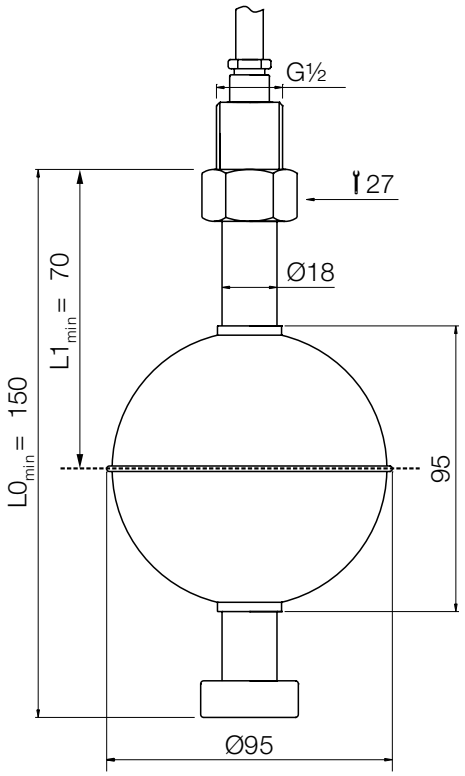
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.8 kg/dm³
Max. pressure (at 20°C):	3 bar
Max. temp.:	55°C
Max. length of guide tube:	3 m
Switch point min. distance from end of meas. tube:	50 mm (for special length)
Switch point min. distance between contacts:	between 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 Ex ia

[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 Details

N/O contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
N/C contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V
Changeover contact*:	230 $V_{AC/DC}$ / 1 A / 60 VA ATEX Ex ia: U_i: 40 V

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

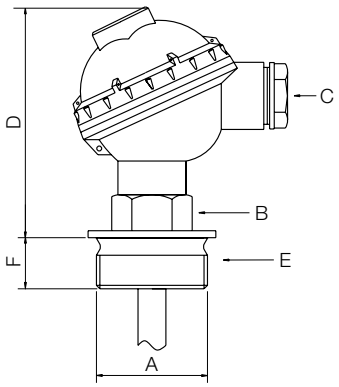
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.5 kg/dm³
Max. pressure (at 20°C):	15 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	6 m
Switch point min. distance from end of meas. tube:	90 mm (for special length)
Switch point min. distance between contacts:	between L1 and L2: 45 ±3 mm between L2 and L3: 110 ±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
M20- (1.4404 float)	**E** = 1.4404	**R15** = G½	**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	**0** = without **E** = ATEX Ex ia **F**[4)] = ATEX Ex d

[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 available for head model L

1/07-2016

Model 1



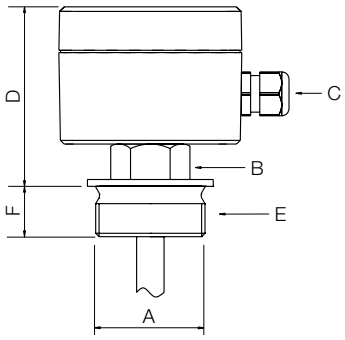
PP screwed cover housing

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



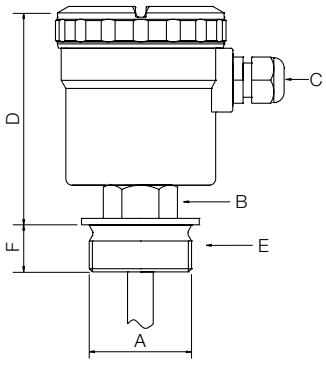
Aluminium housing

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



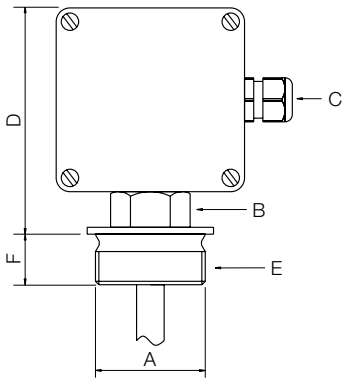
PA screwed cover housing

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



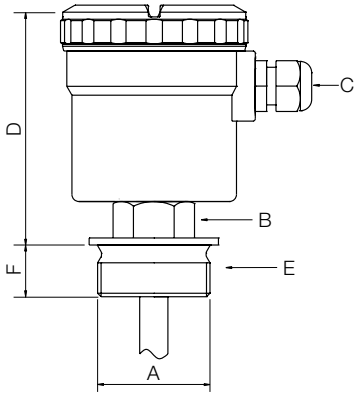
ABS Housing

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



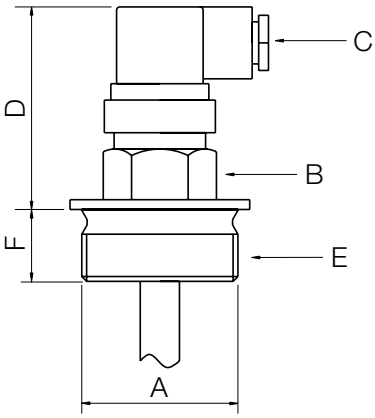
PA Screwed cover housing

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

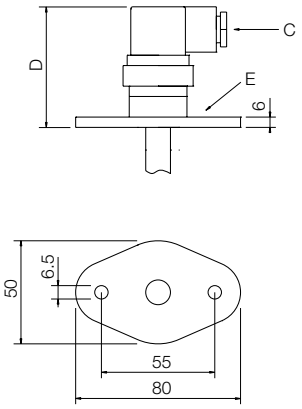
Dimensions and materials

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.

1/07-2016

Model 7PP, 8PP

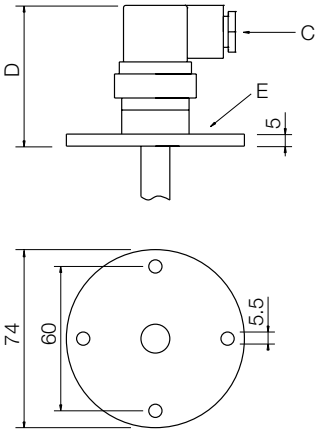


Oval flange process connection with PA connector DIN 43650

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

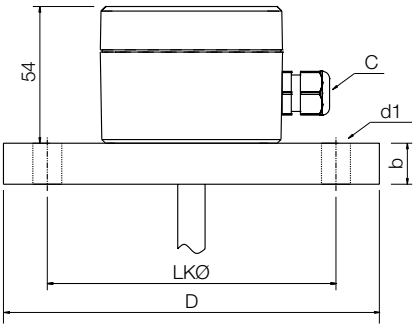


Round flange process connection with PA connector DIN 43650

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

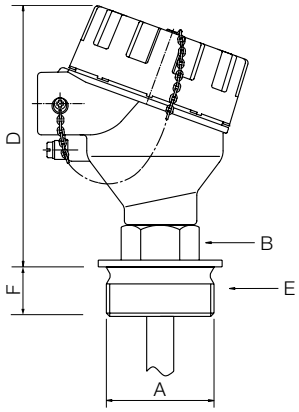


Flanged process connection acc. DIN EN1092-1 PN16 / ANSI B 16.5 150 lbs with aluminium housing

Dimensions and materials

Model	Flange size 1.4404	D	b	LK Ø	d1	Electrical connection (C)	t_{max}
9...	**...F8** = DN 40	150	16	110	4 x Ø 18	M16 x 1.5	90°C
	...F9 = DN 50	165	18	125	4 x Ø 18		
	...F0 = DN 65	185	18	145	4 x Ø 18		
	...FB = DN 80	200	20	160	4 x Ø 18		
	...FC = DN 100	220	20	180	8 x Ø 18		
	...FD = DN 125	250	22	210	8 x Ø 18		
	...A8 = 1½"	127	17.5	98.6	4 x Ø 15.7		
	...A9 = 2"	152.4	19.1	120.7	4 x Ø 19.1		
	...A0 = 2½"	177.8	22.4	139.7	4 x Ø 19.1		
	...AB = 3"	190.5	23.9	152.4	4 x Ø 19.1		
	...AV = 3½"	215.0	23.9	177.8	8 x Ø 19.1		
	...AC = 4"	228.6	23.9	190.5	8 x Ø 19.1		

Model L



Aluminium housing, for application ATEX II GD Ex d IIC T1...T6

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}
L...	...**R6** = G 1	27 AF	M20 x 1.5	145 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.

Technical Details

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)

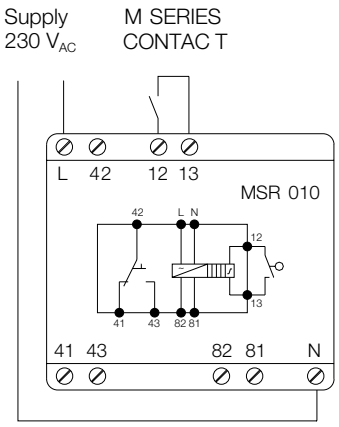
ATEX-approval:	II (1) G [Ex ia] IIC, II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX-:	
U_o:	10.6 V
I_o:	19.1 mA
P_o:	51 mW
U_m:	253 V_{AC}
Power supply:	207 ... 253 V_{AC}, 45 ... 65 Hz
Power consumption:	max. 1 W
Relay Output:	max. 253 V_{AC}, 2A
Details:	see datasheet

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

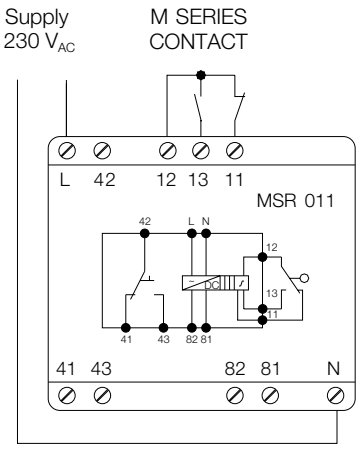
ATEX-approval:	II (1) G [Ex ia] IIC, II (1) D [Ex ia] IIIC
Ex / I.S. data, ATEX-:	
U_o:	10.5 V
I_o:	13 mA
P_o:	34 mW
U_m:	253 V_{AC}
Power supply:	20 ... 30 V_{DC}, 45 ... 65 Hz
Power consumption:	max. 0.9 W
Relay Output:	max. 253 V_{AC}, 2A
Details:	see datasheet

Standard models

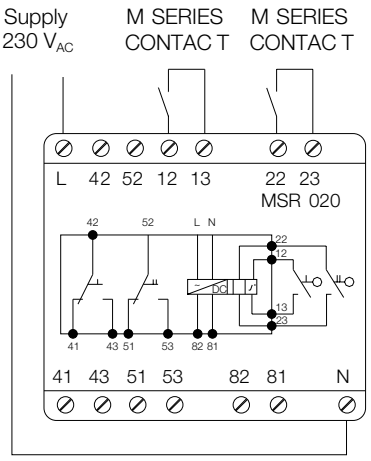
MSR010



MSR011

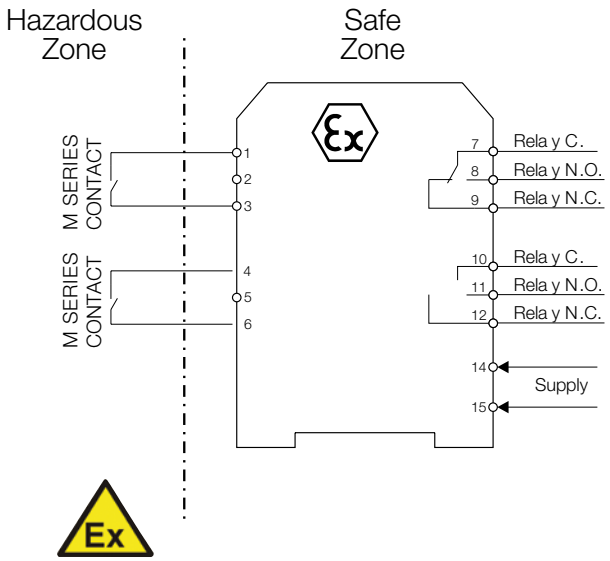


MSR020



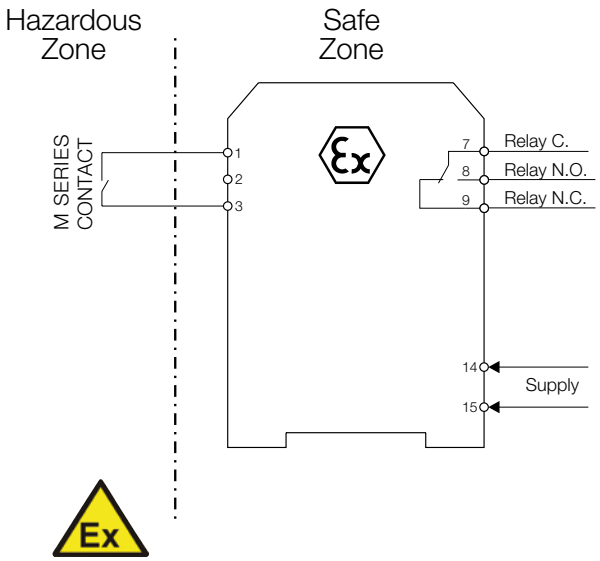
ATEX Ex ia models

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



KFD2-SR2-Ex2.W supply: 20 ... 30 V_{DC}
KFA6-SR2-Ex2.W supply: 207 ... 253 V_{AC}

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



KFD2-SR2-Ex1.W supply: 20 ... 30 V_{DC}
KFA6-SR2-Ex1.W supply: 207 ... 253 V_{AC}