



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-Certificate:
Ex ia, Ex d
- Connection heads:
aluminium, PA, PP, ABS

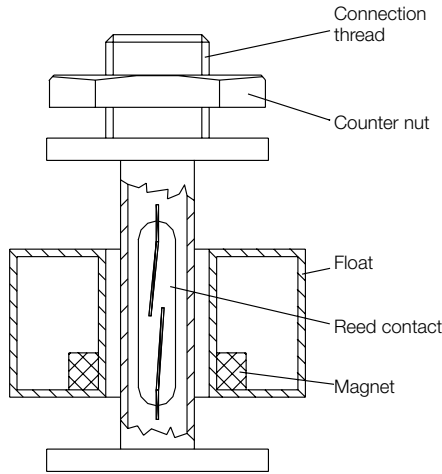
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Design



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 Ex ia						
F = ATEX Ex d						

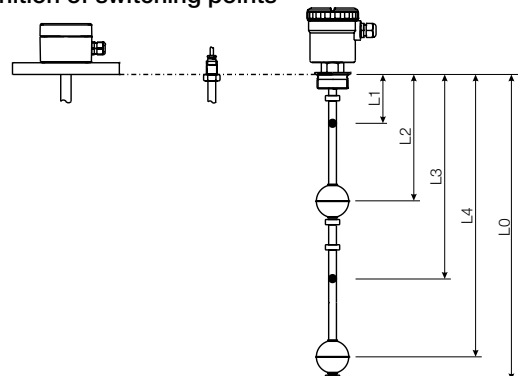
***Please note:**

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





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.

Max. wires/pins for electrical connection

Head/cable	Wires/pins
M01 ... M04	6
M05 ... M20	9
Model 1	9
Model 2/4	9
Model 3	9
Model 5	9
Model 6	9
Model 7	3
Model 8	6
Model 9	9
Model L	9

1 N/O -N/C = 2 wires/pins
1 changeover = 3 wires/pins

ATEX-Certificate:

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

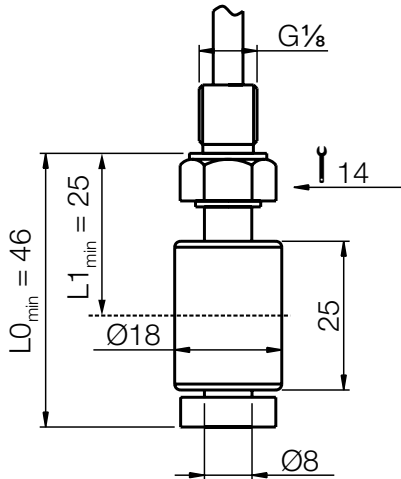
Temperature monitoring

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

Option: PT100 available

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:	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 $\frac{1}{8}$ 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 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

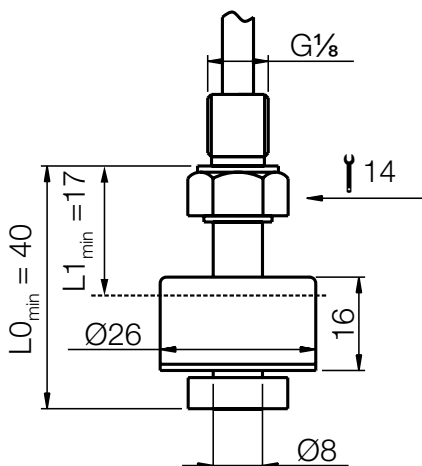
⁴⁾ Please specify in writing length and type of cable

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

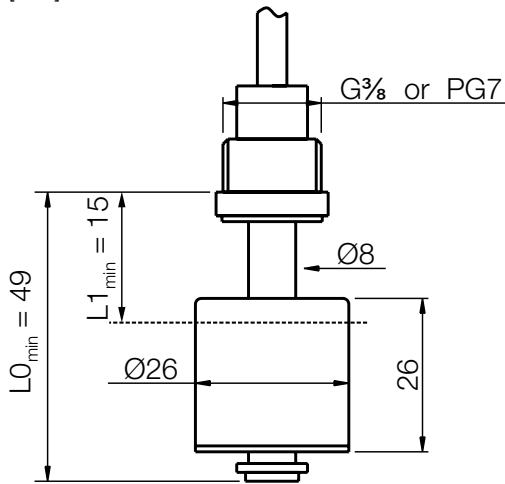
Cable length:	1 m
Installation position:	vertical $\pm 30^\circ$
Protection type:	IP 64
Min. liquid density:	>0.65 kg/dm ³
Max. pressure (at 20°C):	3 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	80°C
Max. length of guide tube:	2 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	23 mm
Switch point min. distance between contacts:	between L1 and L2: 28 \pm 3 mm between L2 and L3: 28 \pm 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 $\frac{1}{8}$ 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	O 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	O = 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/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) 34 mm (for L0: 49 mm)
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 = G $\frac{3}{8}$ 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.

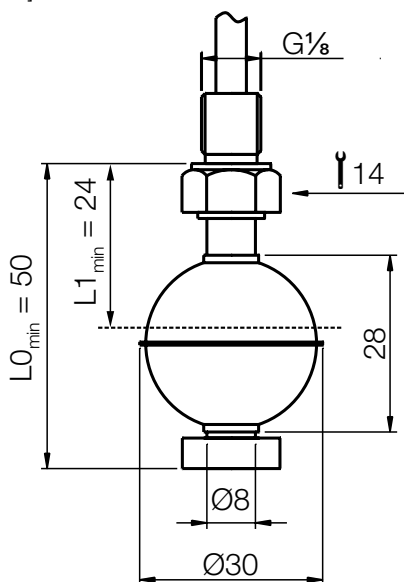
³⁾ Stock model always with one contact and minimum guide tube length, without ATEX, including counter nut

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

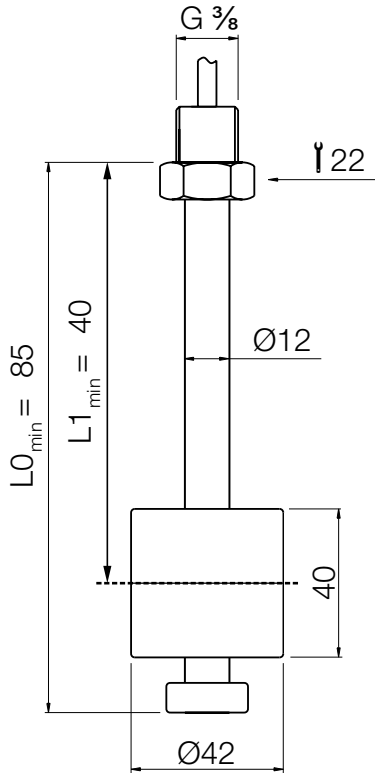
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP 64
Min. liquid density:	>0.8 kg/dm ³
Max. pressure (at 20°C):	15 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	2 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	30 mm (for special length) 26 mm (for L0: 50 mm)
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	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

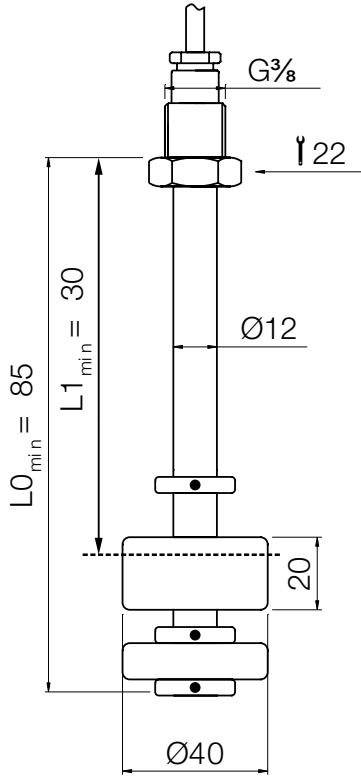
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.6 kg/dm ³
Max. pressure (at 20°C):	3 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	80°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	45 mm
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 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

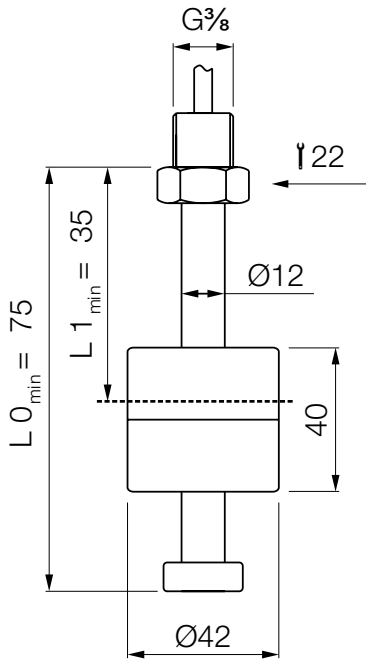
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP 65
Min. liquid density:	>0.9 kg/dm ³
Max. pressure (at 20°C):	100 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	90°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	55 mm
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 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

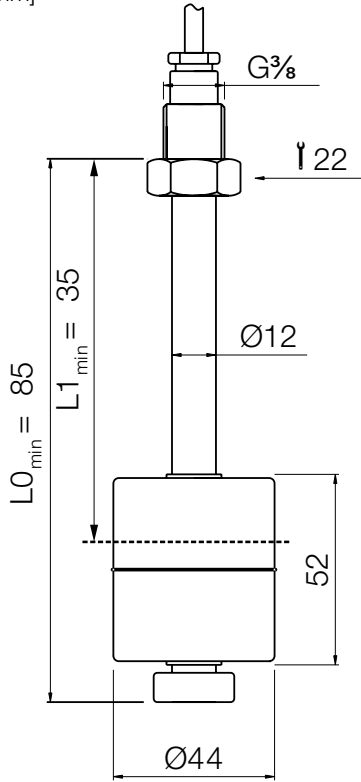
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP 65
Min. liquid density:	>0.9 kg/dm ³
Max. pressure (at 20°C):	3 bar
Max. temp. PVC cable:	55°C
Max. temp. silicone cable:	55°C
Max. length of guide tube:	2 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	40 mm
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 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

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

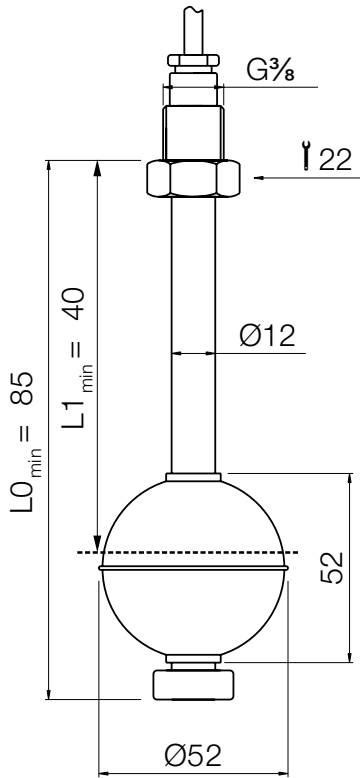
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP 65
Min. liquid density:	>0.65 kg/dm ³
Max. pressure (at 20°C):	20 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance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

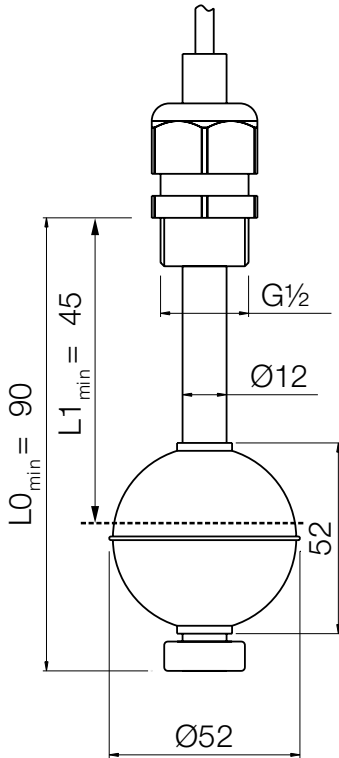
Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	IP65
Min. liquid density:	>0.6 kg/dm ³
Max. pressure (at 20°C):	30 bar
Max. temp. PVC cable:	70°C
Max. temp. silicone cable:	150°C
Max. length of guide tube:	4 m
Connection heads:	see following pages
Switch point min. distance from end of meas. tube:	45 mm
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 = 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 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

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 Ex ia

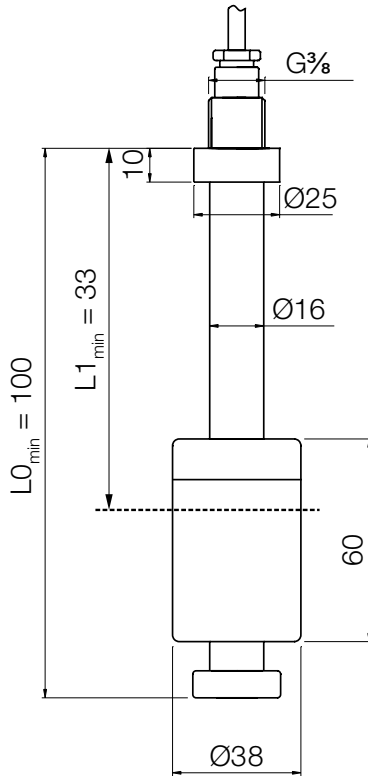
¹⁾ Please specify in writing total and contact lengths

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 $\pm 30^\circ$
Protection type:	IP 65
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:	67 mm
Switch point min. distance between contacts:	between L1 and L2: 45 \pm 3 mm between L2 and L3: 80 \pm 3 mm between L3 and L4: 45 \pm 3 mm

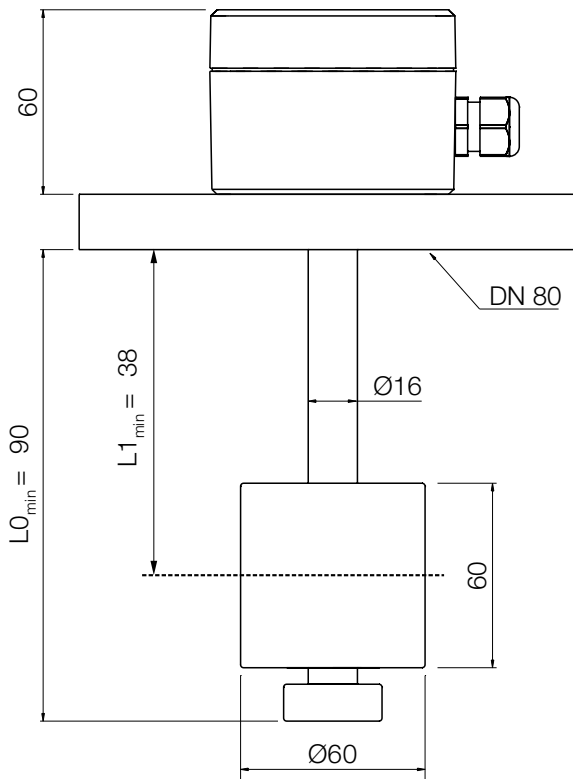
Hysteresis: 5 mm

Model	Guide tube ¹⁾	Process connection	Contact L1	Contact L2	Contact L3	Contact L4 ²⁾	Electr. connection	ATEX
M13- (PVDF float)	S = PVDF	R10 = G $\frac{3}{8}$ 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 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

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: 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: 52 mm
 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

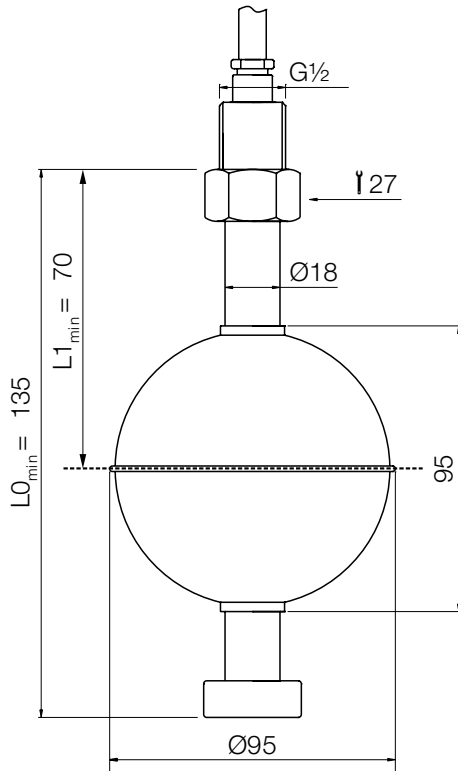
Model	Guide tube ¹⁾	Process connection	Contact L1	Contact L2	Contact L3	Contact L4 ²⁾	Electr. connection	ATEX
M16- (PVC float)	P = PVC	F80 = DN80	S = N/O C = N/C W = SPDT	X = without S = N/O C = N/C W = SPDT	X = without S = N/O C = N/C W = SPDT	X = without S = N/O C = N/C	0 = with housing	0 = without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

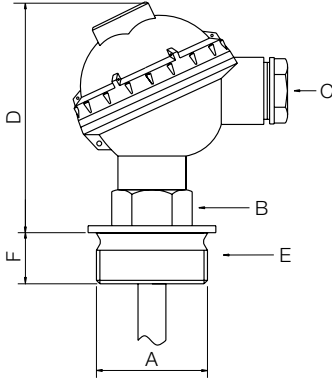
* Note: contact state referred to empty tank and switch point distance refer to a density 1.0 kg/dm³

Cable length:	1 m
Installation position:	vertical ±30°
Protection type:	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:	65 mm
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 = G 1/2 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 = without cable P = 1 m PVC-cable S = 1 m silicone cable Y³⁾ = special length and type	0 = without E = ATEX Ex ia F⁴⁾ = 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«

Model 1



PP screwed cover housing

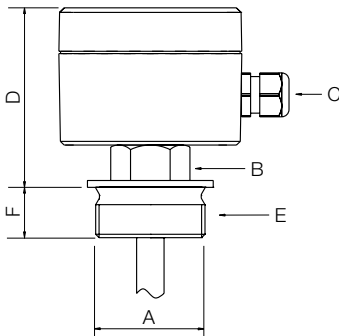
Dimensions and materials

Model	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length (F) ²⁾	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⁾ Size of process connection must be according with float size

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

Model 2/4



Aluminium housing

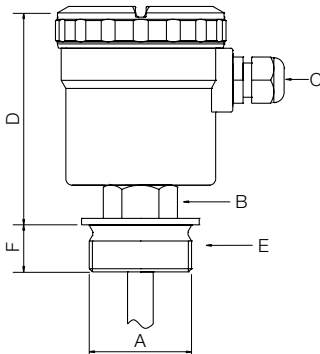
Dimensions and materials

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

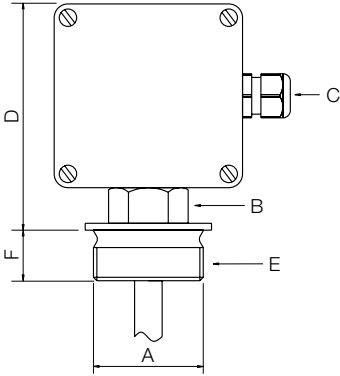
Dimensions and materials

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



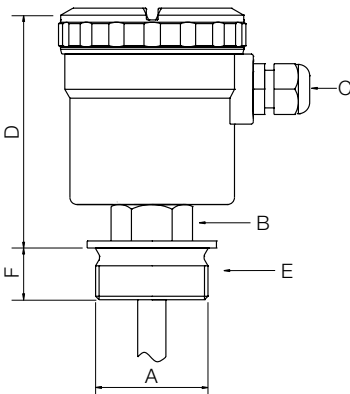
ABS Housing

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



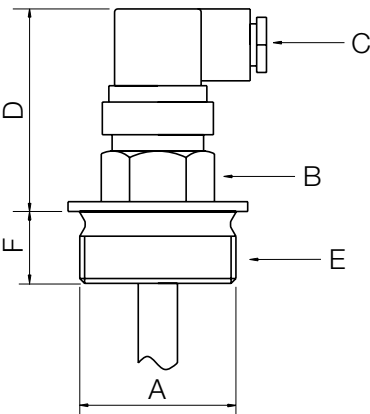
PA Screwed cover housing

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



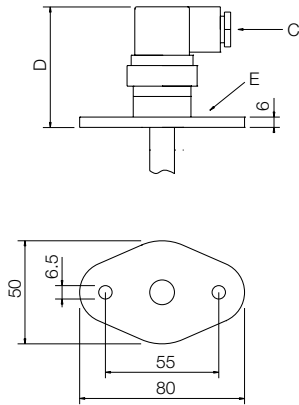
Threaded process connection with PA connector DIN 43650 (3 pin), DIN VDE 0627 (6 pin)

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

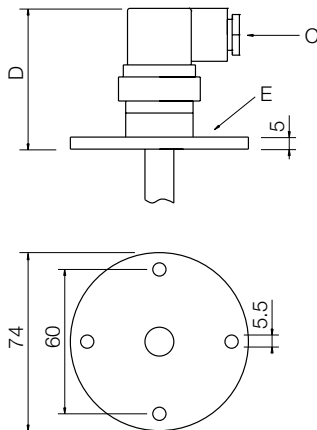


Oval flange process connection with PA connector DIN 43650 (3 pin), DIN VDE 0627 (6 pin)

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

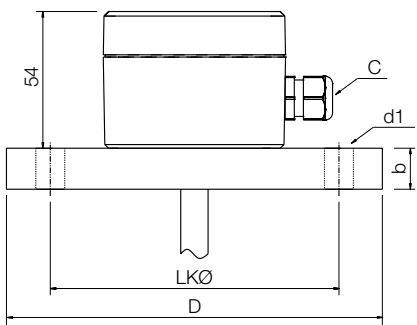


Round flange process connection with PA connector DIN 43650 (3 pin), DIN VDE 0627 (6 pin)

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

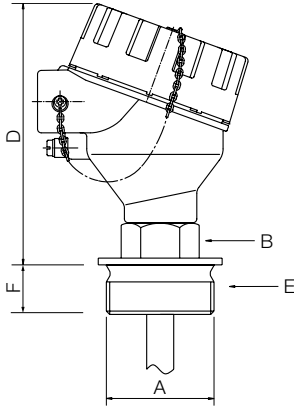
Dimensions and materials

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		

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.

Heads Selector for Magnetic Level Model M

Heads	M01 Ø18 mm	M02 Ø26 mm	M03 Ø26 mm	M04 Ø30 mm	M05 Ø42 mm	M06 Ø40 mm	M07 Ø42 mm	M08 Ø44 mm	M10 Ø52 mm	M11 Ø52 mm	M13 Ø38 mm	M16 Ø60 mm	M20 Ø95 mm
1R6	x	x	x	x									
1R8	x	x	x	x	x	x	x	x			x		
1R9	x	x	x	x	x	x	x	x	x	x	x		
1N6	x	x	x										
1N8	x	x	x	x	x	x	x				x		
1N9	x	x	x	x	x	x	x	x	x	x	x		
2R6	x	x	x	x									
2R8	x	x	x	x	x	x	x	x			x		
2R9	x	x	x	x	x	x	x	x	x	x	x		
2N6	x	x	x										
2N8	x	x	x	x	x	x	x				x		
2N9	x	x	x	x	x	x	x	x	x	x	x		
3R6	x	x	x	x									
3R8	x	x	x	x	x	x	x	x			x		
3R9	x	x	x	x	x	x	x	x	x	x	x		
3N6	x	x	x										
3N8	x	x	x	x	x	x	x				x		
3N9	x	x	x	x	x	x	x	x	x	x	x		
4R6	x	x	x	x									
4R8	x	x	x	x	x	x	x	x			x		
4R9	x	x	x	x	x	x	x	x	x	x	x		
4N6	x	x	x										
4N8	x	x	x	x	x	x	x				x		
4N9	x	x	x	x	x	x	x	x	x	x	x		
5R6	x	x	x	x									
5R8	x	x	x	x	x	x	x	x			x		
5R9	x	x	x	x	x	x	x	x	x	x	x		



Heads Selector for Magnetic Level Model M (continued)

Heads	M01 Ø18 mm	M02 Ø26 mm	M03 Ø26 mm	M04 Ø30 mm	M05 Ø42 mm	M06 Ø40 mm	M07 Ø42 mm	M08 Ø44 mm	M10 Ø52 mm	M11 Ø52 mm	M13 Ø38 mm	M16 Ø60 mm	M20 Ø95 mm
5N6	x	x	x										
5N8	x	x	x	x	x	x	x				x		
5N9	x	x	x	x	x	x	x	x	x	x	x		
6R8	x	x	x	x	x	x	x	x			x		
6N8	x	x	x	x	x	x	x				x		
7R6	x	x	x	x									
7R8	x	x	x	x	x	x	x	x			x		
7R9	x	x	x	x	x	x	x	x	x	x	x		
7N6	x	x	x										
7N8	x	x	x	x	x	x	x				x		
7N9	x	x	x	x	x	x	x	x	x	x	x		
7PP	x	x	x	x	x		x				x		
7MS	x	x	x	x	x	x	x	x			x		
7VA	x	x	x	x	x	x	x	x			x		
7PV	x	x	x	x	x	x	x	x			x		
8R6	x	x	x	x									
8R8	x	x	x	x	x	x	x	x			x		
8R9	x	x	x	x	x	x	x	x	x	x	x		
8N6	x	x	x										
8N8	x	x	x	x	x	x	x				x		
8N9	x	x	x	x	x	x	x	x	x	x	x		
8PP	x	x	x	x	x		x				x		
8MS	x	x	x	x	x	x	x	x			x		
8VA	x	x	x	x	x	x	x	x			x		
8PV	x	x	x	x	x	x	x	x			x		
For flanged connection, please ensure that float diameter is less than flange hole diameter!													
9F8	x	x	x	x							x		
9F9	x	x	x	x	x	x	x	x			x		
9F0	x	x	x	x	x	x	x	x	x	x	x	x	
9FB	x	x	x	x	x	x	x	x	x	x	x	x	
9FC	x	x	x	x	x	x	x	x	x	x	x	x	x
9FD	x	x	x	x	x	x	x	x	x	x	x	x	x
9A8	x	x	x	x									
9A9	x	x	x	x	x	x	x	x			x		
9A0	x	x	x	x	x	x	x	x	x	x	x	x	
9AB	x	x	x	x	x	x	x	x	x	x	x	x	
9AV	x	x	x	x	x	x	x	x	x	x	x	x	x
9AC	x	x	x	x	x	x	x	x	x	x	x	x	x

Supplementary devices:

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}

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:

U₀: 10.6 V
 I₀: 19.1 mA
 P₀: 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:

U₀: 10.5 V
 I₀: 13 mA
 P₀: 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-:

U₀: 10.6 V
 I₀: 19.1 mA
 P₀: 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

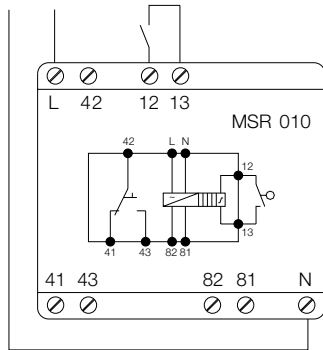
Ex / I.S. data, ATEX-:

U₀: 10.5 V
 I₀: 13 mA
 P₀: 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

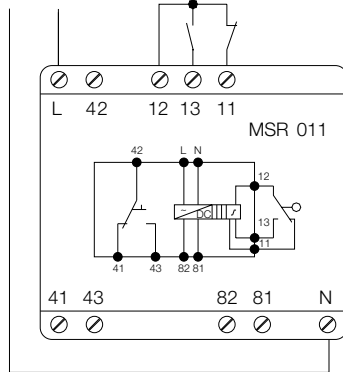
MSR010

Supply 230 V_{AC} M SERIES CONTACT



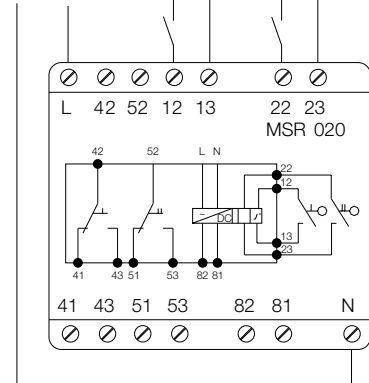
MSR011

Supply 230 V_{AC} M SERIES CONTACT



MSR020

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



ATEX Ex ia 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)

