



Level Sensors Reed Contact Chain



measuring
•
monitoring
•
analysing

MM



- Measuring length: max. 6000 mm
- Measuring accuracy:
0.5% for L = 2000 mm
- Pressure: max. 30 bar
- Temperature max.: 130 °C
- Connection: G 3/8" ... G 2, 3/8" ... 2" NPT
flange: DN 40 ... DN 125, ANSI 1 1/2" ... 4"
- Material: stainless steel, PVC, PP, PVDF
- Connection heads:
aluminium, PA, PP, ABS, stainless steel
- Constant level indication regardless of
conductivity, pressure and temperature
- Interface level measurement (option)
- ATEX-Certificate: Ex ia, Ex d

N2



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

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Description

KOBOLD level sensors/transmitters are used for continuous level indication and monitoring of all types of liquids. It is based on the float principle with magnetic transmission in a 3-wire potentiometer circuit.

Its simple design with only one moving part, the float, makes the transmitter particularly reliable.

A range of sensors in different materials and designs, and with different connections, are available for measured-value acquisition.

Specific designs are available.

Function principle

A float with a magnetic system switch small reed contacts through the guide tube.

The reed switches with resistances form a measuring chain that generates a voltage proportional to the height of the level. This sensing technique is similar to the operation of a sliding contact on a resistance potentiometer.

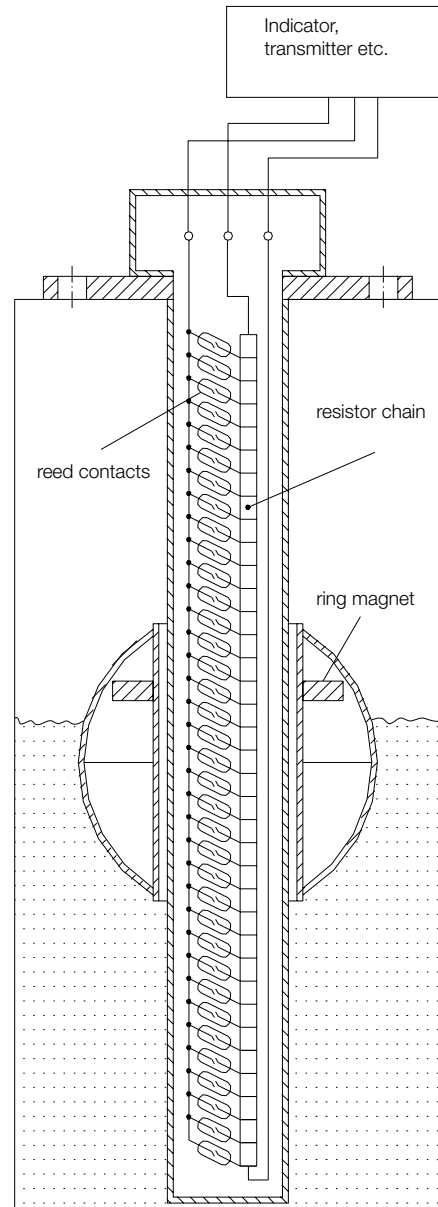
The voltage sampled from the chain is transferred to a transmitter (option) which output a current signal proportional to the liquid level or, depending on the design, also allows limit values to be monitored.

The transmitter can be mounted in the terminal box or as an external instrument. Local analogue or digital indication can also be provided.

Applications

- Waste water and clarification plants
- Feed and batching tanks
- Chemical tanks
- Manufacturing industry
- Power plants
- Pharmaceutical industry
- Beverage and food industry

Design of sensor



Float designs

Type	Form	Materials	Float outside Ø [mm]	Height [mm]	Bore hole Ø [mm]	Min. liquid density [kg/dm³]	Temperature range	Nominal pressure at 20 °C
M05	Cylinder hollow	PP	42	40	14	>0.6	-10 ... +80°C	3 bar
M07	Cylinder hollow	PVC-U	42	40	14	>0.9	0 ... +60°C	3 bar
M08	Cylinder hollow	Stainless steel 1.4404	44	52	15	>0.65	-20 ... +130°C	20 bar
M10	Ball hollow	Stainless steel 1.4404	52	52	15	>0.6	-20 ... +130°C	30 bar
M13	Cylinder hollow	PVDF	38	60	18	>0.6	-10 ... +125°C	2 bar
M15	Cylinder hollow	PP	60	60	18	>0.4	-10 ... +80°C	6 bar
M16	Cylinder hollow	PVC-U	60	60	18	>0.6	0 ... +60°C	3 bar
M20	Ball hollow	Stainless steel 1.4404	95	95	20.8	>0.5	-20 ... +130°C	15 bar

ATEX-Certificate:

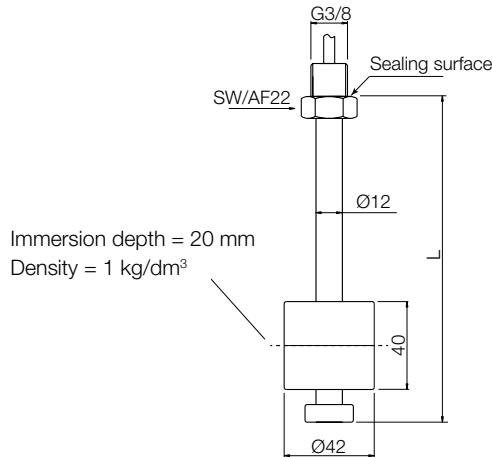
⊕ II 1 G Ex ia IIC T6 Ga (LOM 06ATEX2054X (supplement no. 3))
-20 ≤ Ta ≤ +60 °C

⊕ II 1/2G Ex d II C T1 ... T6 Ga/Gb (LOM 14ATEX2075 X)
II 2D Ex t IIIC T410 ... T85 °C Db

Possible options available (in case of cable electrical connection):

- PT100 (3-wire, category B)
- Temperature switch (N/C contact) at 65 °C, 80 °C or 105 °C (other switching outputs on request)
- Interface level measurement at density difference 150 g/l

Design PP



Technical Details

Min. length of guide tube: 300 mm
 Max. length of guide tube: 2000 mm
 Guide tube and screwed fitting: PP
 Min. liquid density: >0.6 kg/dm³
 Max. pressure (at 20°C): 3 bar
 Temperature range: -10°C ... +80°C
 Max. temperature PVC cable: 70°C
 Max. temp. silicone cable: 80°C
 Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
 10 Ω for each 10 mm, when total length ≥1900 mm
 Installation position: vertical ±30°
 Cable length: 1000 mm
 Protection: IP 65
 Connection heads: see following pages

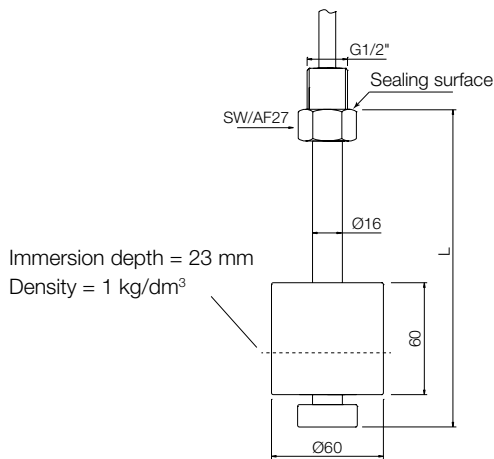
Model	Type	Process connection	Output	ATEX
MM-	M05	R10 = G 3/8 N10 = 3/8" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0", 5350B (ATEX) for approval option "E"

Design PP

for low densities



Technical Details

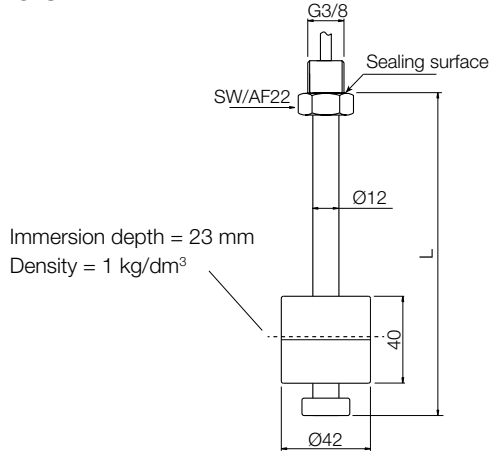
Min. length of guide tube: 300 mm
 Max. length of guide tube: 5000 mm
 Guide tube and screwed fitting: PP
 Min. liquid density: >0.4 kg/dm³
 Max. pressure (at 20°C): 6 bar
 Temperature range: -10°C ... +80°C
 Max. temperature PVC cable: 70°C
 Max. temp. silicone cable: 80°C
 Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
 10 Ω for each 10 mm, when total length ≥1900 mm
 Installation position: vertical ±30°
 Cable length: 1000 mm
 Protection: IP 65
 Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M15	R15 = G 1/2 N15 = 1/2" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0", 5350B (ATEX) for approval option "E"

Design PVC-U



Technical Details

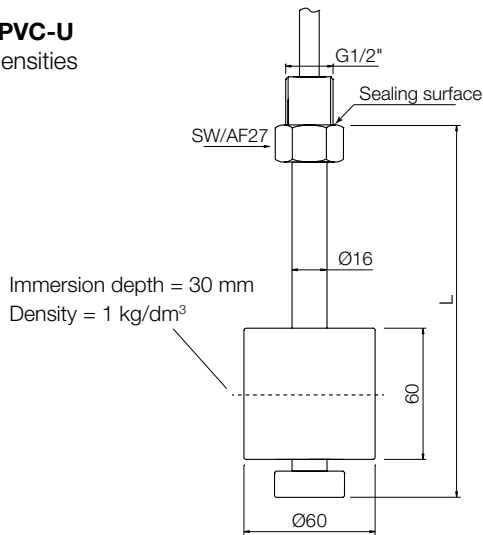
- Min. length of guide tube: 300 mm
- Max. length of guide tube: 2000 mm
- Guide tube and screwed fitting: PVC-U
- Min. liquid density: >0.9 kg/dm³
- Max. pressure (at 20°C): 3 bar
- Temperature range: 0°C... +60°C
- Max. temperature PVC cable: 60°C
- Max. temp. silicone cable: 60°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M07	R10 = G 3/8 N10 = 3/8" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0", 5350B (ATEX) for approval option "E"

Design PVC-U
for low densities



Technical Details

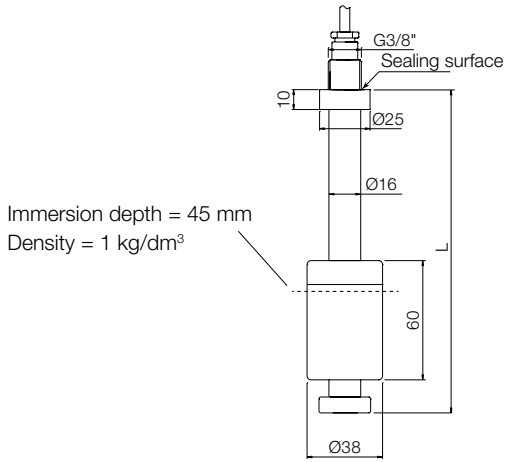
- Min. length of guide tube: 300 mm
- Max. length of guide tube: 5000 mm
- Guide tube and screwed fitting: PVC-U
- Min. liquid density: >0.6 kg/dm³
- Max. pressure (at 20°C): 3 bar
- Temperature range: 0°C... +60°C
- Max. temperature PVC cable: 60°C
- Max. temp. silicone cable: 60°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M16	R15 = G 1/2 N15 = 1/2" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0", 5350B (ATEX) for approval option "E"

Design PVDF



Technical Details

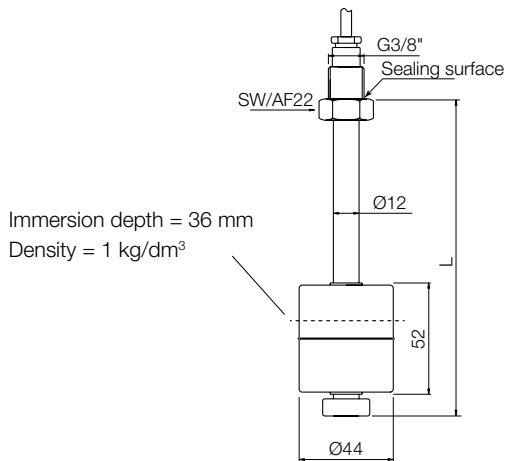
- Min. length of guide tube: 300 mm
- Max. length of guide tube: 5000 mm
- Guide tube and screwed fitting: PVDF
- Min. liquid density: >0.6 kg/dm³
- Max. pressure (at 20°C): 2 bar
- Temperature range: -10°C ... +125°C
- Max. temperature PVC cable: 70°C
- Max. temp. silicone cable: 125°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M13	R10 = G 3/8 N10 = 3/8" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0", 5350B (ATEX) for approval option "E"

Design stainless steel 1.4404



Technical Details

- Min. length of guide tube: 300 mm
- Max. length of guide tube: 6000 mm
- Guide tube and screwed fitting: stainless steel 1.4404
- Min. liquid density: >0.65 kg/dm³
- Max. pressure (at 20°C): 20 bar
- Temperature range: -20°C ... +130°C
- Max. temperature PVC cable: 70°C
- Max. temp. silicone cable: 130°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M08	R10 = G 3/8 N10 = 3/8" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia F ⁴⁾ = Ex d

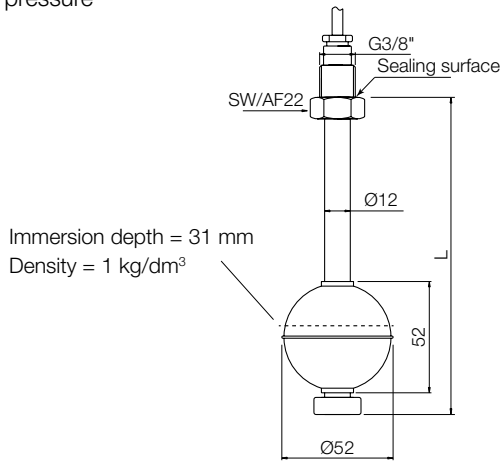
Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval option "0" and "F", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval option "0" and "F", 5350B (ATEX) for approval option "E"
⁴⁾ Only available for head models: L, C, E.



Design stainless steel 1.4404

for high pressure



Technical Details

- Min. length of guide tube: 300 mm
- Max. length of guide tube: 6000 mm
- Guide tube and screwed fitting: stainless steel 1.4404
- Min. liquid density: >0.6 kg/dm³
- Max. pressure (at 20°C): 30 bar
- Temperature range: -20°C ... +130°C
- Max. temperature PVC cable: 70°C
- Max. temp. silicone cable: 130°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

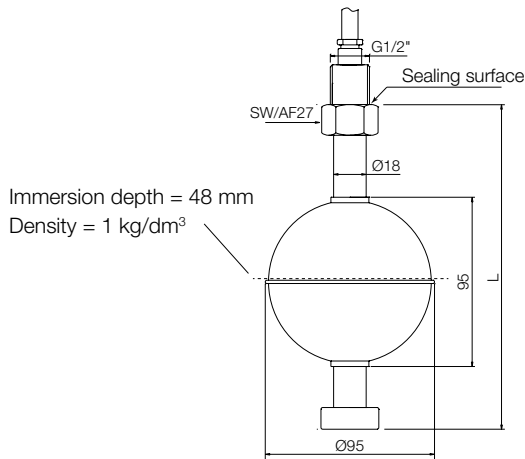
Model	Type	Process connection	Output	ATEX
MM-	M10	R10 = G 3/8 N10 = 3/8" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia F ⁴⁾ = Ex d

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval options "0" and "F", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval options "0" and "F", 5350B (ATEX) for approval option "E"
⁴⁾ Only available for head models: L, C, E.

Design stainless steel 1.4404

for low densities



Technical Details

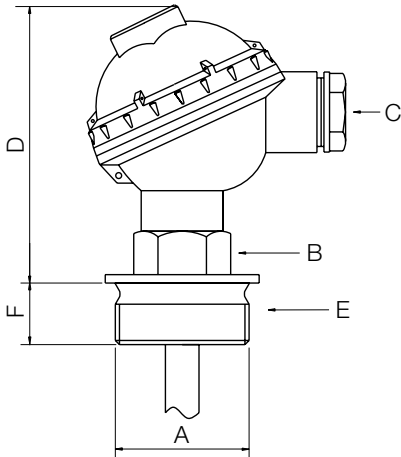
- Min. length of guide tube: 300 mm
- Max. length of guide tube: 6000 mm
- Guide tube and screwed fitting: stainless steel 1.4404
- Min. liquid density: >0.5 kg/dm³
- Max. pressure (at 20°C): 15 bar
- Temperature range: -20°C ... +130°C
- Max. temperature PVC cable: 70°C
- Max. temp. silicone cable: 130°C
- Max. resistance of meas. chain: 36 Ω for each 10 mm, when total length <1900 mm
10 Ω for each 10 mm, when total length ≥1900 mm
- Installation position: vertical ±30°
- Cable length: 1000 mm
- Protection: IP 65
- Connection heads: see following pages

Model	Type	Process connection	Output	ATEX
MM-	M20	R15 = G 1/2 N15 = 1/2" NPT XXX = see page 8 - 11	P = resistance output 1 m PVC S = resistance output 1 m silicone Y ¹⁾ = resistance output, special cable 2 = resistance output, no cable M = transmitter 4 - 20 mA 2-wire (5333D) H = transmitter 4 - 20 mA HART® (5337) ²⁾ F = transmitter Profibus®/Fieldbus® (5350) ³⁾	0 = without E = Ex ia F ⁴⁾ = Ex d

Note: Please specify the length »L« in clear text.

¹⁾ Please specify in writing length and type of cable
²⁾ 5337A for approval options "0" and "F", 5337D (ATEX) for approval option "E"
³⁾ 5350A for approval options "0" and "F", 5350B (ATEX) for approval option "E"
⁴⁾ Only available for head models: L, C, E.

Model 1



PP screwed cover housing

Dimensions and materials

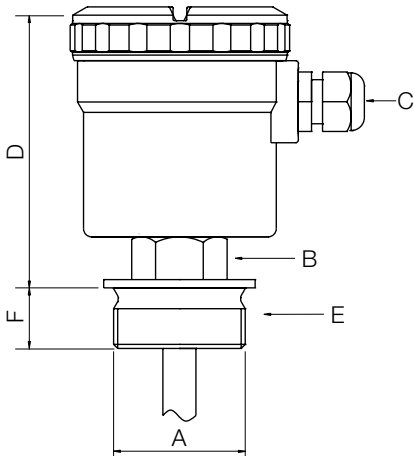
Model	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
1	R8 = G 1½	30 AF	PG16	100 mm	PP	22 mm	90°C ²⁾
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	

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

²⁾ Max. temperature 85°C if transmitter output is selected

³⁾ Length L includes thread length

Model 3



PA screwed cover housing

Dimensions and materials

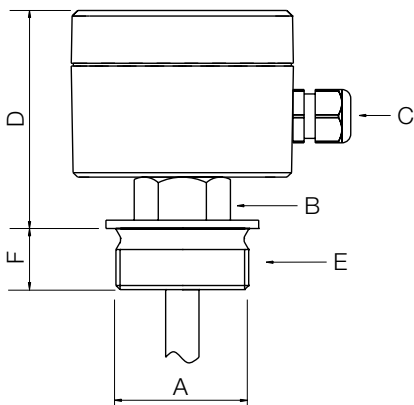
Model	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
3	R8 = G 1½	30 AF	M16x1.5	104 mm	1.4404	22 mm	90°C ²⁾
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	

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

²⁾ Max. temperature 85°C if transmitter output is selected

³⁾ Length L includes thread length

Model 4



Aluminium housing

Dimensions and materials

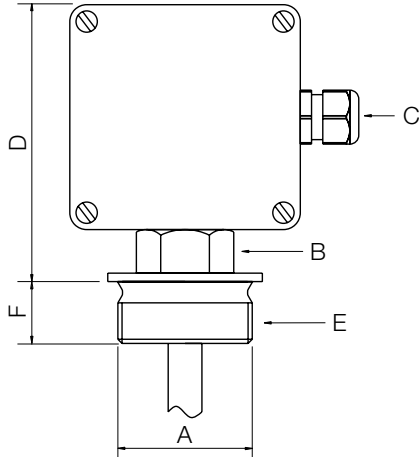
Model	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
4	R8 = G 1½	30 AF	M16x1.5	73 mm	1.4404	22 mm	90°C ²⁾
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	

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

²⁾ Max. temperature 85°C if transmitter output is selected

³⁾ Length L includes thread length

Model 5



ABS housing

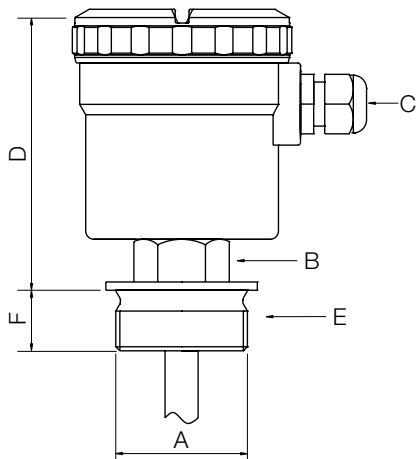
Dimensions and materials

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	R8 = G 1½	30 AF	M16x1.5	100 mm	PVC	22 mm	60°C
	R9 = G 2	36 AF				24 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⁾ Length L includes thread length

Model 6



PA screwed cover housing

Dimensions and materials

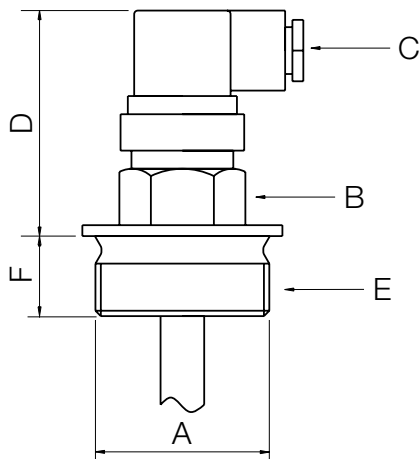
Model	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
6	R8 = G 1½	30 AF	M16x1.5	104 mm	PVDF	22 mm	90°C ²⁾
	N8 = 1½" NPT					25 mm	

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

²⁾ Max. temperature 85°C if transmitter output is selected

³⁾ Length L includes thread length

Model 7



Connector with connecting box

Dimensions and materials

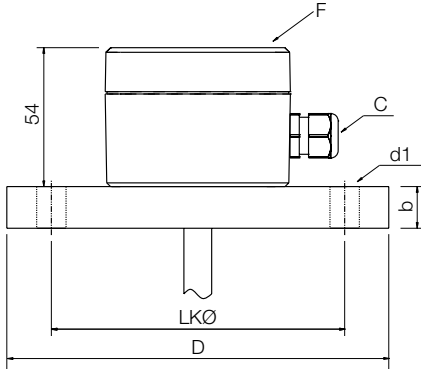
Model ²⁾	Process connection (A) ¹⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
7 (3-pin)	R8 = G 1½	30 AF	M16x1.5	65 mm	PP	22 mm	90°C
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	

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

²⁾ To be chosen only with resistance output

³⁾ Length L includes thread length

Model 9



Flange according to DIN EN 1092-1 PN16/ANSI B 16.5 150 lbs RF

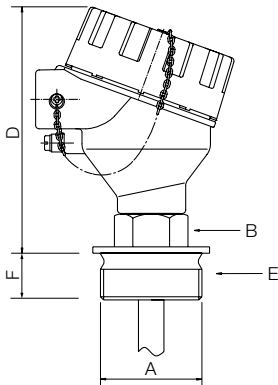
Dimensions and materials

Model	Flange size 1.4404 ¹⁾	D	b	LKØ	d1	Electrical connection (C)	Housing (F)	t _{max}
9	F9 = DN50	165	18	125	4 x Ø18	M16 x 1.5	Al	90°C ²⁾
	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			
AC = 4"	228.6	23.9	190.5	8 x Ø19.1				

¹⁾ Other materials on request (PP, PVDF, PVC-U)

²⁾ Max. temperature 85°C if transmitter output is selected

Model L



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

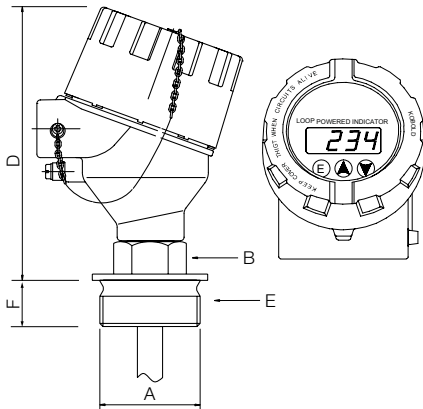
Dimensions and materials

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	R8 = G 1½	30 AF	M20	145 mm	1.4404	22 mm	90°C
	R9 = G 2	36 AF				24 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⁾ Length L includes thread length

Model C/E



Aluminium housing with display for applications ATEX II GD Ex d IIC T1...T6

Dimensions and materials

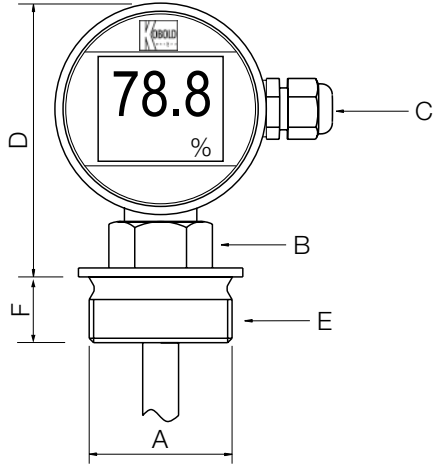
Model ¹⁾	Process connection (A) ²⁾	Width across flats (B)	Electrical connection (C)	Overall height (D)	Screwed fitting (E)	Thread length ³⁾ (F)	t _{max}
C (LCD display)	R8 = G 1½	30 AF	M20	155 mm	1.4404	22 mm	70°C
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	
E (LED display)	R8 = G 1½	30 AF	M20	155 mm	1.4404	22 mm	80°C
	R9 = G 2	36 AF				24 mm	
	N8 = 1½" NPT	30 AF				25 mm	
	N9 = 2" NPT	36 AF				27 mm	

¹⁾ Only with 4...20 mA transmitter. Loop powered display

²⁾ Size of process connection must be according with float size

³⁾ Length L includes thread length

Model D/R



Stainless steel 1.4404 head with touch screen LCD display

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}			
D	R8 = G 1½	SW 30	M16x1,5	112 mm	1.4404	22 mm	80°C			
	R9 = G 2	SW 36				24 mm				
	N8 = 1½" NPT	SW 30				25 mm				
	N9 = 2" NPT	SW 36				27 mm				
R (with 2 relay output)	R8 = G 1½	SW 30							22 mm	
	R9 = G 2	SW 36							24 mm	
	N8 = 1½" NPT	SW 30							25 mm	
	N9 = 2" NPT	SW 36							27 mm	

¹⁾ Only with 4...20 mA transmitter. Loop powered display

²⁾ Size of process connection must be according with float size

³⁾ Length L includes thread length