

Level sensor With reed-chain technology Model FLR

KSR data sheet FLR



Applications

- Level measurement for almost all liquid media
- Chemical, petrochemical, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food industry, pharmaceutical industry

Special features

- Process- and system-specific solutions possible
- Operating limits:
 - Operating temperature: $T = -80 \dots +200 \text{ }^\circ\text{C}$
 - Operating pressure: $P = \text{Vacuum to } 80 \text{ bar}$
 - Limit density: $\rho \geq 400 \text{ kg/m}^3$
- Wide variety of different electrical connections, process connections and materials
- Optionally with programmable and configurable head-mounted transmitter for 4 ... 20 mA field signals, HART®, PROFIBUS® PA and FOUNDATION™ Fieldbus
- Explosion-protected versions

Description

The model FLR sensors with reed-chain technology are used for level measurement in liquid media. They work on the float principle with magnetic transmission.

The float's magnetic system in the guide tube actuates a resistance measuring chain that corresponds to a 3-wire potentiometer circuit. The measurement voltage generated by this is proportional to the fill level.

The measurement voltage is very finely-stepped due to the contact separation of the measuring chain and is thus virtually continuous. Resolutions between 5 and 18 mm are available depending on the requirements.



Level sensor with reed-chain technology,
model FLR-S, flange connection

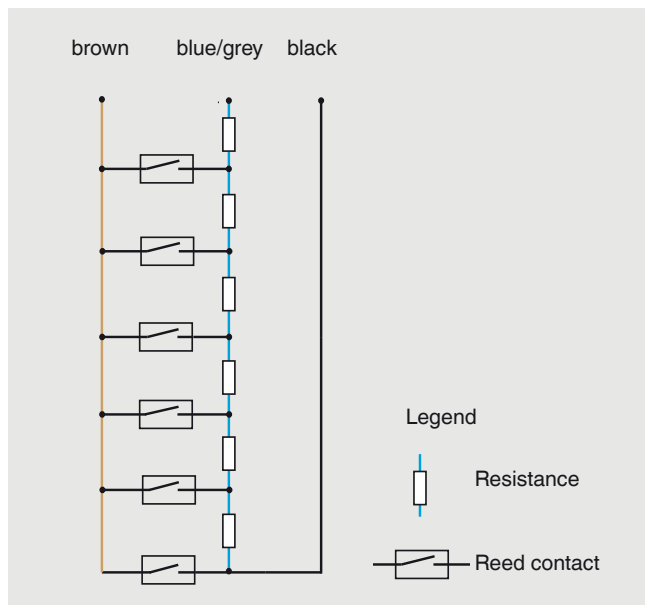
Further special features

- Large scope of application due to the simple, proven functional principle
- Process connection, guide tube and float from stainless steel 1.4571 or plastic
- For harsh operating conditions, long service life
- Continuous measurement of levels, independent of physical and chemical changes of the media such as: Foaming, conductivity, dielectric, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects, density change
- Signal transmission over long distances
- Simple installation and commissioning, onetime calibration only, no recalibration necessary
- Level displayed proportional to volume or height
- High repeatability
- Interface measurement and overall level from Δ density 50 kg/m³
- Level sensors with reed-chain technology qualify as passive electrical equipment in accordance with DIN IEC 60079-11 and can be installed in "zone 1" hazardous areas without certification, so long as the equipment is operated in a certified intrinsically safe circuit with a minimum explosion protection of EEx ib.

Options

- Customised solutions
- Programmable and configurable head-mounted transmitters in connection housing, output signal 4 ... 20 mA, 2-wire, for HART®, PROFIBUS® PA and FOUNDATION™ Fieldbus
- Process connection, guide tube material and float from stainless steel 1.4435, 1.4539, titanium, Hastelloy (others on request)
- In combination with limit switch, stepless setting of the limit values over the entire measuring range

Internal circuit diagram of the reed sensors



Model overview

Sensor model	Description	Materials						Titanium 3.7035 (grade 2)	PVC	PP	PVDF	Buna
		Stainless steel			Titanium							
		1.4571 (316Ti)	1.4404 (316L)	1.4435 (316L)	1.4571 (316Ti) / PP	1.4571 (316Ti) / PA	1.4571 (316Ti) / Ms					
FLR-S	Reed-chain sensor, standard version	x	x	x	x	x	x	x				x
FLR-P	Reed-chain sensor, plastic version								x	x	x	
FLR-H	Reed-chain sensor, sterile version		x	x								

Sensor model	Approval											Temperature range (process)
	without	Ex i	Ex d	GL	Ex i + GL	ABS	DNV	Bureau Veritas	3-A	FM	GOST	
FLR-S	x	x	x	x	x	x	x	x		x		-80 ... +200 °C
FLR-P	x											-10 ... +100 °C
FLR-H	x								x		x	-20 ... +200 °C

Ex approvals

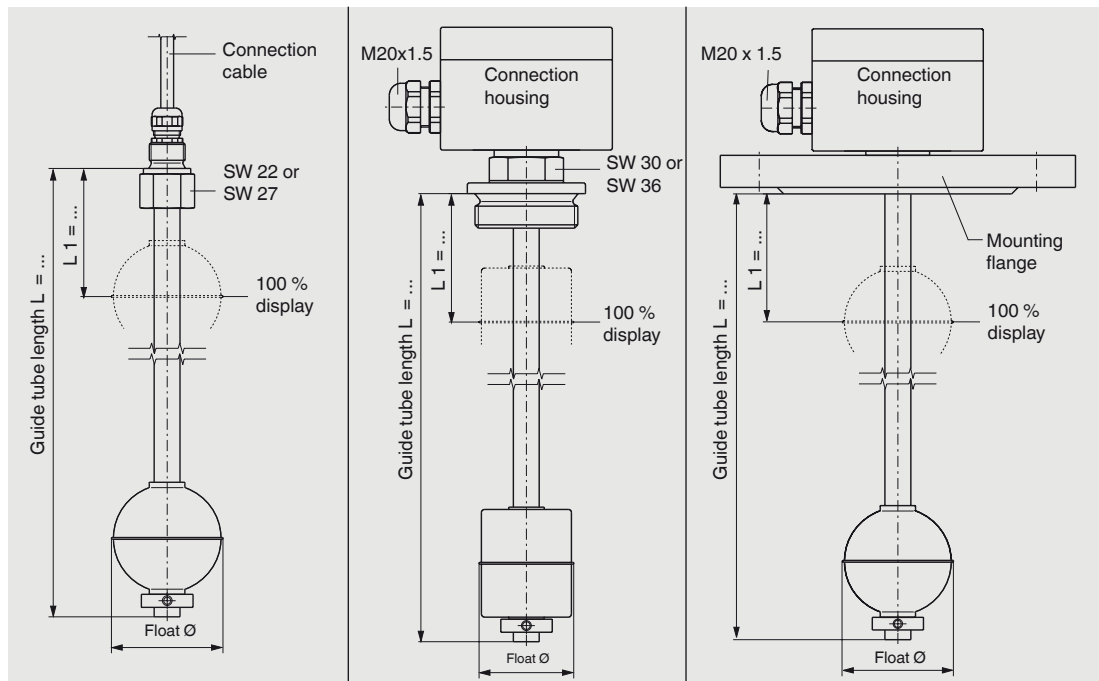
Explosion protection	Ignition protection type	Model	Zone	Approval number
ATEX	Ex i	FLR-S	Zone 0/1/2	KEMA 01 ATEX 1152 X II 1/2G Ex ia IIC T4 ... T6 - II 2 D T80 °C IP 6X
	Ex d	FLR-S	Zone 1/2	TÜV 13 ATEX 7399 X II 2G Ex d IIC T6 Gb / II 2 D Ex tb IIIC T80 °C Db
	Ex d	FLR-S	Zone 1/2	IECEX TUR 09.0002X -40 °C <= ta <= +55 °C Ex d IIC T6 Ex tD A21 IP 65 T80 °C
	Ex i + GL	FLR-S	Zone 1/2	KEMA 01 ATEX 1152 X II 1/2G Ex ia IIC T4 ... T6 - II 2 D T80 °C IP 6X + GL-14788-99 HH
	Ex i + DNV	FLR-S	Zone 1/2	KEMA 01 ATEX 1152 X II 1/2G Ex ia IIC T4 ... T6 - II 2 D T80 °C IP 6X + DNV-A-11452

Type approval

Explosion protection	Model	Approval number
GL	FLR-S	GL-14788-99 HH
DNV	FLR-S	DNV-A-11452
GOST	FLR-S, FLR-P	0959333
3-A	FLR-H	3-A Sanitary Standards

Sensor, standard version, model FLR-S

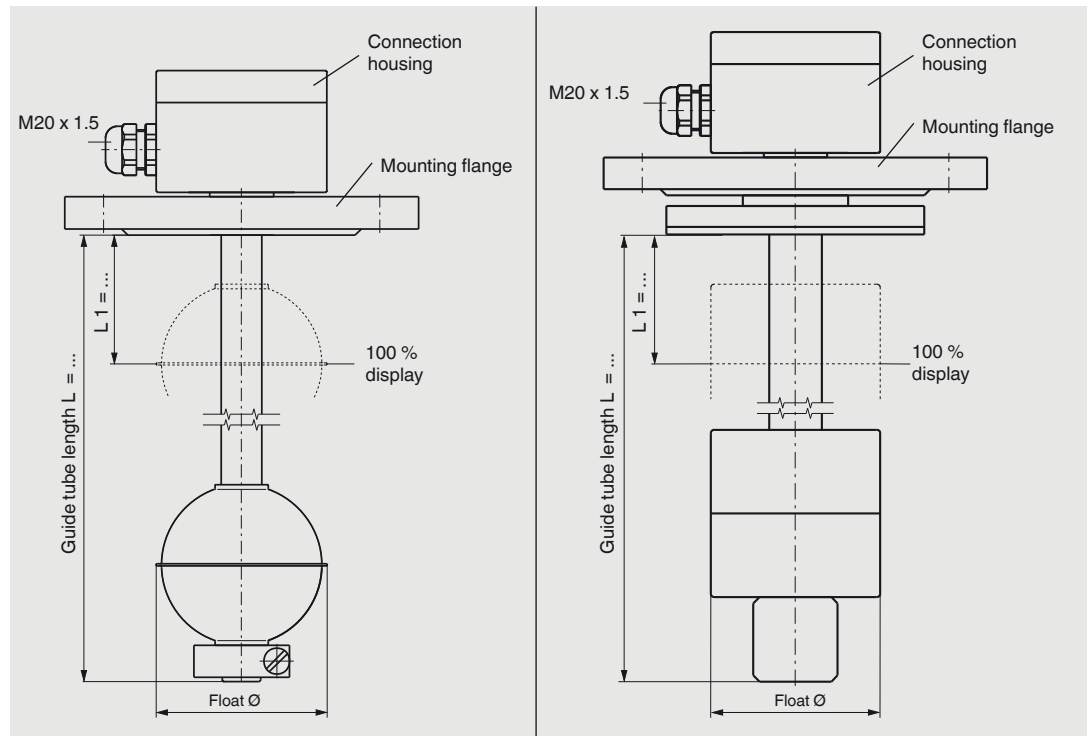
Process connection, guide tube material and float from stainless steel 1.4571



	Mounting thread (without connection housing)			Mounting thread			Flange		
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR			Connection housing ■ Aluminium 80 x 75 x 57 mm Option: Polypropylene, polyester, stainless steel					
Process connection	Mounting thread upwards G 3/8" (others on request)			Mounting thread downwards G 1 1/2" or G 2"			Mounting flange ■ DIN DN 50 ... DN 200, PN 6 ... PN 100 ■ ANSI 2" ... 8", class 150 ... 600		
			G 1/2" (others on request)						
Guide tube diameter	8 mm	12 or 14 mm	18 mm	8 mm	12 or 14 mm	18 mm	8 mm	12 or 14 mm	18 mm
Guide tube length L max.	500 mm	3,000 mm	6,000 mm	500 mm	3,000 mm	6,000 mm	500 mm	3,000 mm	6,000 mm
Float	Material stainless steel 1.4571 (Option: Buna, titanium) Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)								
Max. operating pressure	80 bar, see table page 14 and 15								
Temperature range standard	PVC-/PUR cable -10 ... +80 °C Silicone cable -10 ... +120 °C			-20 ... +120 °C Option: ■ High-temperature version: +120 ... +200 °C Option: ■ Low-temperature version: -80 ... -20 °C					
Contact separation	K 18 = 18 mm (not with option high and low temperature version) K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm								
Overall resistance of the measuring chain	Length and separation dependent								
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened								
Mounting position	Vertical ±30°								
Ingress protection	IP 65 per EN 60529 / IEC 60529								
Materials	Stainless steel 1.4571, 1.4404, 1.4435, 1.4439, titanium 3.7035 (grade 2), Hastelloy and others on request								

Sensor, E-CTFE coated or PTFE sheathed, model FLR-S

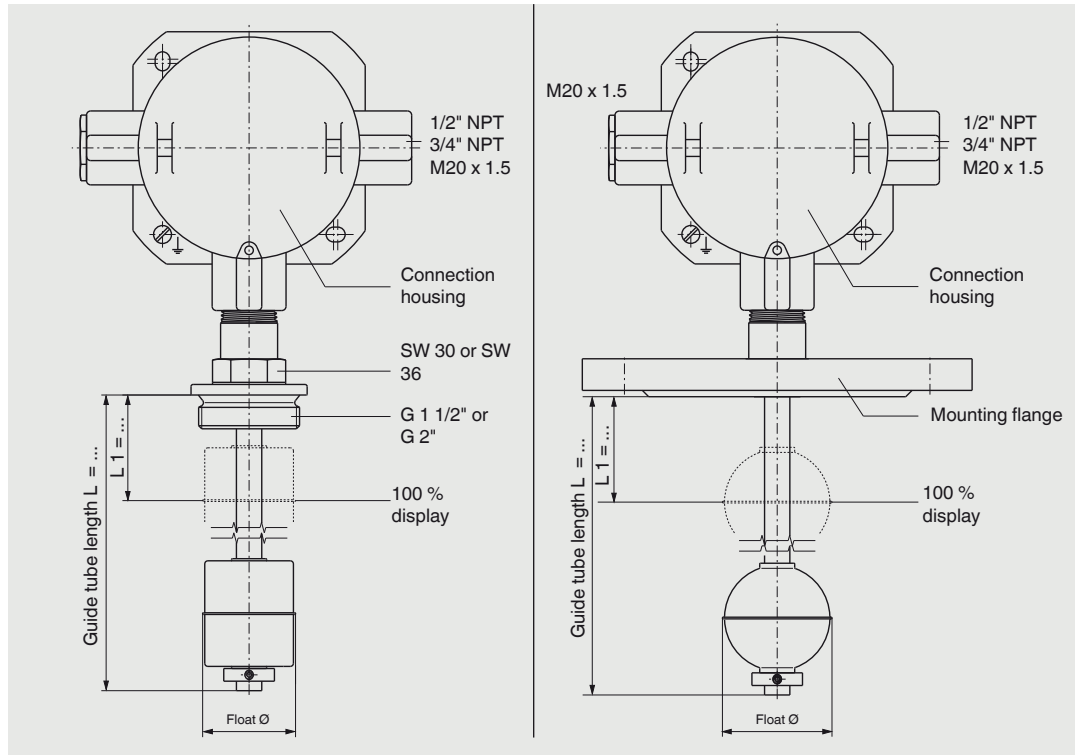
Process connection, guide tube and float from stainless steel 1.4571



	Flange, E-CTFE coated	Flange, PTFE sheathed
Electrical connection	Connection housing ■ Aluminium 80 x 75 x 57 mm Option: Polypropylene, polyester, stainless steel	
Process connection	Mounting flange ■ DIN DN 50 ... DN 200, PN 6 ... PN 100 ■ ANSI 2" ... 8", class 150 ... 600	
Guide tube diameter	18 mm	25 mm, PTFE sheath = 3.5 mm thick
Guide tube length L max.	4,000 mm	5,000 mm
Float	Material ■ Stainless steel 1.4571, E-CTFE coated ■ PVDF ■ PDFE Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)	
Max. operating pressure	see table page 14 and 15	
Temperature range	Depending on medium	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of the measuring chain	Length and separation dependent	
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened	
Mounting position	Vertical ±30°	
Ingress protection	IP 65 per EN 60529 / IEC 60529	
Materials	Stainless steel 1.4571, E-CTFE coated, or PTFE sheathed (option: anti-static)	

Reed sensor, explosion-protected version Ex d, flameproof enclosure, model FLR-S

TÜV 13 ATEX 7399 X II 2G Ex d IIC T6 Gb / II 2 D Ex tb IIIC T80 °C Db
 IECEx TUR 09.0002X -40 °C <= ta <= +55 °C Ex d IIC T6 Ex tD A21 IP 65 T80 °C
 Process connection, guide tube and float from stainless steel 1.4571

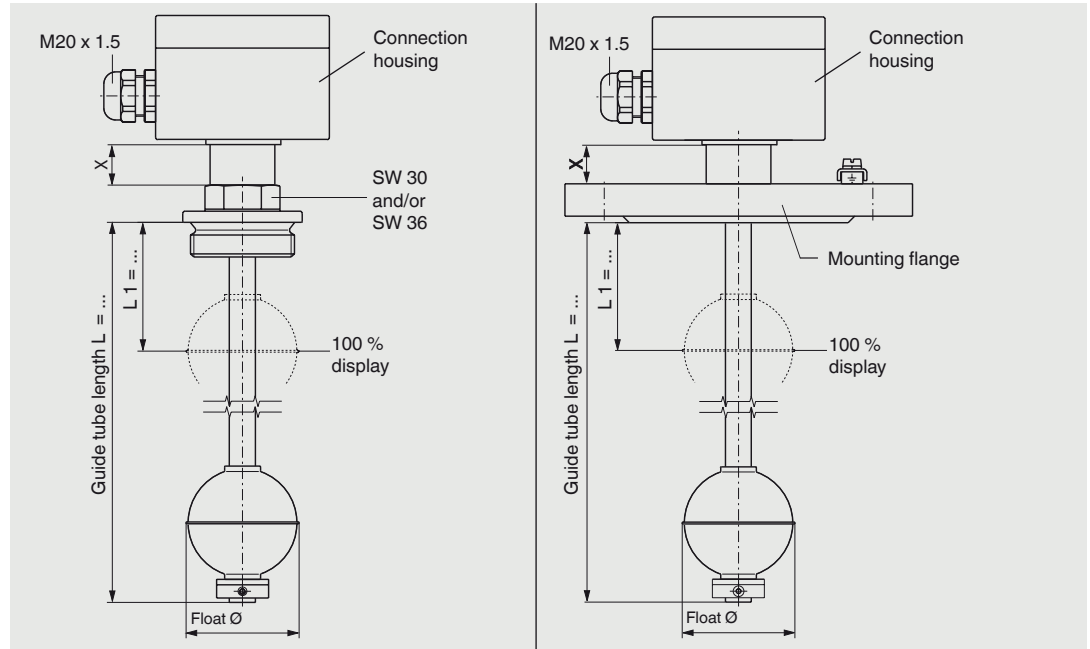


	Mounting thread	Flange
Electrical connection	Connection housing ■ Aluminium Option: Stainless steel	
Process connection	Mounting thread downwards G 1 1/2" or G 2" (others on request)	Mounting flange ■ DIN DN 50 ... DN 350, PN 6 ... PN 40 ■ ANSI 2" ... 14", class 150 ... 300
Guide tube diameter	12 and 14 mm	18 mm
Guide tube length L max.	3,000 mm	5,000 mm
Float	Material stainless steel 1.4571 Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)	
Max. operating pressure	See table page 14 and 15	
Temperature range	T4: 120 °C, T5: 95 °C, T6: 80 °C	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of the measuring chain	Length and separation dependent	
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened	
Mounting position	Vertical ±30°	
Ingress protection	IP 65 per EN 60529 / IEC 60529	
Materials	Stainless steel 1.4571	

Sensor, explosion-protected version, intrinsically safe, model FLR-S

KEMA 01 ATEX 1052 X II 1/2G Ex ia IIC T4 ... T6 - II 2 D T80 °C IP 6X

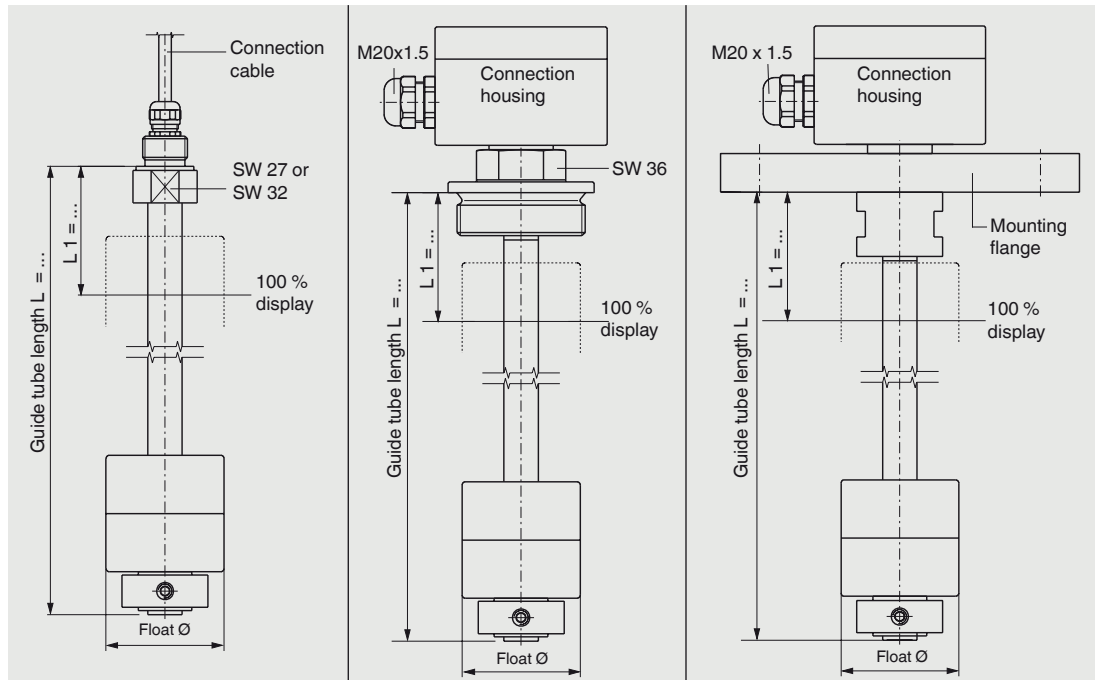
Process connection, guide tube and float from stainless steel 1.4571



Mounting thread		Flange	
Electrical connection	Connection housing ■ Aluminium 80 x 75 x 57 mm Option: Stainless steel, polyester		
Process connection	Mounting thread downwards G 1 1/2" or G 2" (others on request)	Mounting flange ■ DIN DN 50 ... DN 200, PN 6 ... PN 100 ■ ANSI 2" ... 8", class 150 ... 600	
Guide tube diameter	12, 14 or 18 mm		
Guide tube length L max.	See variants A and B on page 16		
Float	Material stainless steel 1.4571 (Option: Buna, titanium) Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)		
Max. operating pressure	see table page 14 and 15		
Temperature class	T4	T5	T6
Surface temperature	Max. 135 °C	100 °C	85 °C
Process temperature	Max. 100 °C	65 °C	50 °C
Ambient temperature at connection housing	Max. 60 °C	60 °C	60 °C
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm		
Overall resistance of the measuring chain	Length and separation dependent		
Control circuit	Ignition protection type EEx ia IIC, only for connection to a certified intrinsically safe control circuit Transmitter external with max. 120 mA, max. 28 V Head-mounted transmitter in accordance with transmitter approvals		
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened		
Mounting position	Vertical ±30°		
Ingress protection	IP 65 per EN 60529 / IEC 60529		
Materials	Stainless steel 1.4571, 1.4404, titanium 3.7035 (grade 2), Hastelloy and others on request		

Sensor, plastic version, polypropylene, model FLR-P

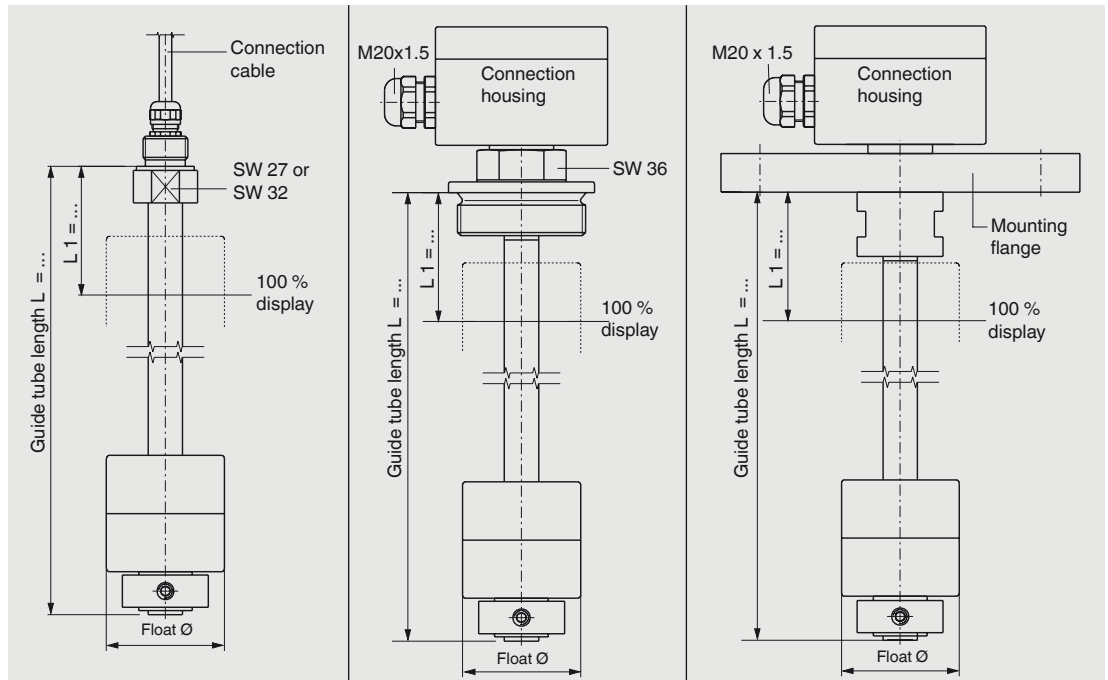
Process connection, guide tube and float from polypropylene



	Mounting thread (without connection housing)	Mounting thread	Flange
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	Connection housing ■ Polyester 80 x 75 x 55 mm	
Process connection	Mounting thread, upwards ■ G 1/2" (guide tube Ø 16 mm) ■ G 1" (guide tube Ø 20 mm) (others on request)	Mounting thread, downwards G 2" (others on request)	Mounting flange ■ DIN DN 65 ... DN 125, PN 10, form A ■ ANSI 2 1/2" ... 5", class 150 FF
Guide tube diameter	16 or 20 mm (strengthened with a metallic inner tube)		
Guide tube length L max.	■ 3,000 mm (guide tube Ø 16 mm) ■ 5,000 mm (guide tube Ø 20 mm)		
Float	Material polypropylene Float diameter from 44 ... 80 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)		
Max. operating pressure	3 bar		
Temperature range	-10 ... +80 °C		
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm		
Overall resistance of the measuring chain	Length and separation dependent		
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened		
Mounting position	Vertical ±30°		
Ingress protection	IP 65 per EN 60529 / IEC 60529		

Sensor, plastic version, PVDF, model FLR-P

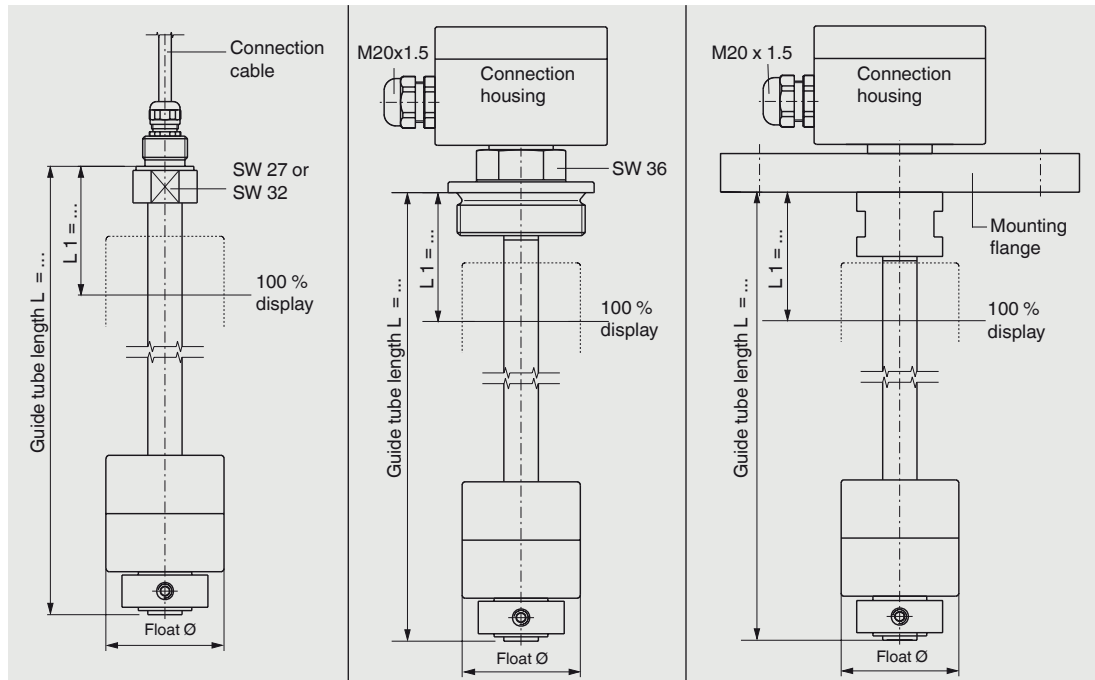
Process connection, guide tube and float from PVDF



	Mounting thread (without connection housing)	Mounting thread	Flange
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	Connection housing ■ Polyester 80 x 75 x 55 mm	
Process connection	Mounting thread, upwards ■ G 1/2" (guide tube Ø 16 mm) ■ G 1" (guide tube Ø 20 mm) (others on request)	Mounting thread, downwards- G 2" (others on request)	Mounting flange ■ DIN DN 65 ... DN 125, PN 10, form A ■ ANSI 2 1/2" ... 5", class 150 FF
Guide tube diameter	16 or 20 mm (strengthened with a metallic inner tube)		
Guide tube length L max.	■ 3,000 mm (guide tube Ø 16 mm) ■ 5,000 mm (guide tube Ø 20 mm)		
Float	Material PVDF Float diameter from 44 ... 80 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)		
Max. operating pressure	3 bar		
Temperature range	-10 ... +100 °C		
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm		
Overall resistance of the measuring chain	Length and separation dependent		
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened		
Mounting position	Vertical ±30°		
Ingress protection	IP 65 per EN 60529 / IEC 60529		

Sensor, plastic version, PVC, model FLR-P

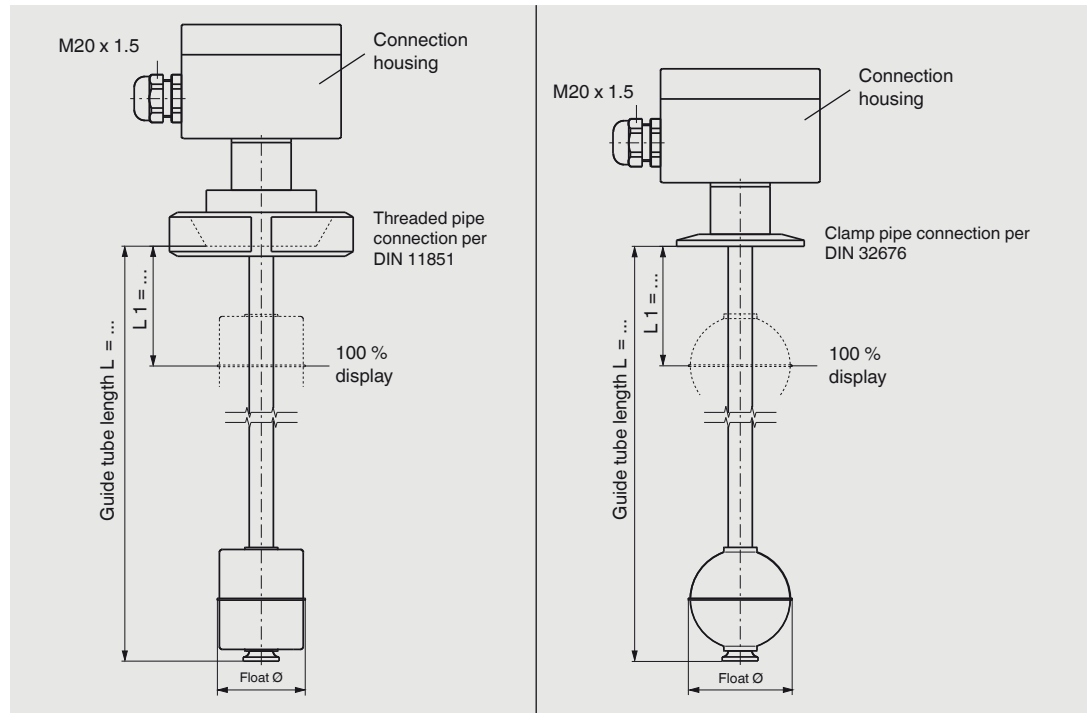
Process connection, guide tube and float from PVC



	Mounting thread (without connection housing)	Mounting thread	Flange
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	Connection housing ■ Polyester 80 x 75 x 55 mm	
Process connection	Mounting thread, upwards ■ G 1/2" (guide tube Ø 16 mm) ■ G 1" (guide tube Ø 20 mm) (others on request)	Mounting thread, downwards G 2" (others on request)	Mounting flange ■ DIN DN 65 ... DN 125, PN 10, form A ■ ANSI 2 1/2" ... 5", class 150 FF
Guide tube diameter	16 or 20 mm (strengthened with a metallic inner tube)		
Guide tube length L max.	■ 3,000 mm (guide tube Ø 16 mm) ■ 5,000 mm (guide tube Ø 20 mm)		
Float	Material PVC Float diameter from 44 ... 80 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)		
Max. operating pressure	3 bar		
Temperature range	0 ... +60 °C		
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm		
Overall resistance of the measuring chain	Length and separation dependent		
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened		
Mounting position	Vertical ±30°		
Ingress protection	IP 65 per EN 60529 / IEC 60529		

Sensor, sterile version, model FLR-H

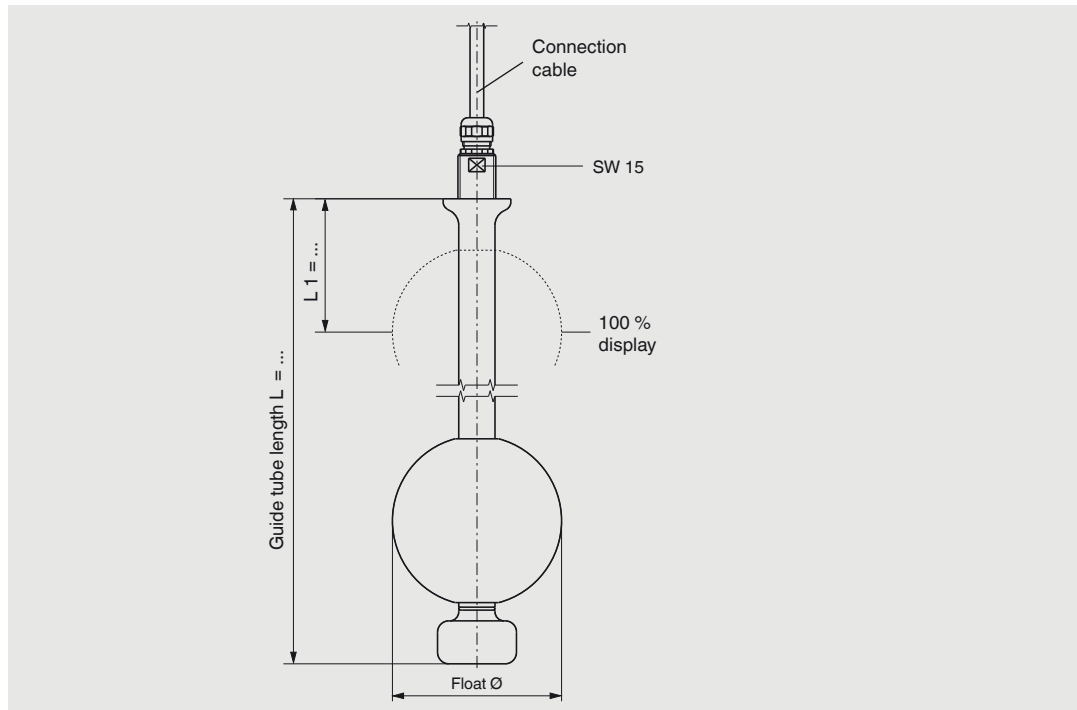
Process connection, guide tube and float from stainless steel 1.4435 (316L) or 1.4404 (316L), surface ground and polished Ra < 0.8 µm or Ra < 0.4 µm, alternatively electropolished



	Threaded pipe connection per DIN 11851	Clamp pipe connection per DIN 32676
Electrical connection	Connection housing ■ Aluminium 80 x 75 x 57 mm Option: Polypropylene, polyester, stainless steel	
Process connection	Threaded pipe connection per DIN 11851, downwards DN 50 ... DN 150 (others on request)	Clamp pipe connection per DIN 32676, DN 25 ... DN 100 or 1" ... 4" (others on request)
Guide tube diameter	12 or 14	18 mm
Guide tube length L max.	3,000 mm	6,000 mm
Float	Material stainless steel 1.4435 or 1.4404, option electropolished Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)	
Max. operating pressure	see table page 14 and 15	
Temperature range standard	-20 ... +120 °C Option: ■ High-temperature version: +120 ... +200 °C Option: ■ Low-temperature version: -80 ... -20 °C	
Contact separation	K 18 = 18 mm (not with high- and low-temperature version) K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of the measuring chain	Length and separation dependent	
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened	
Mounting position	Vertical ±30°	
Ingress protection	IP 65 per EN 60529 / IEC 60529	
Materials	Stainless steel 1.4435 (316L) or 1.4404 (316L)	

Sensor, sterile version, model FLR-H

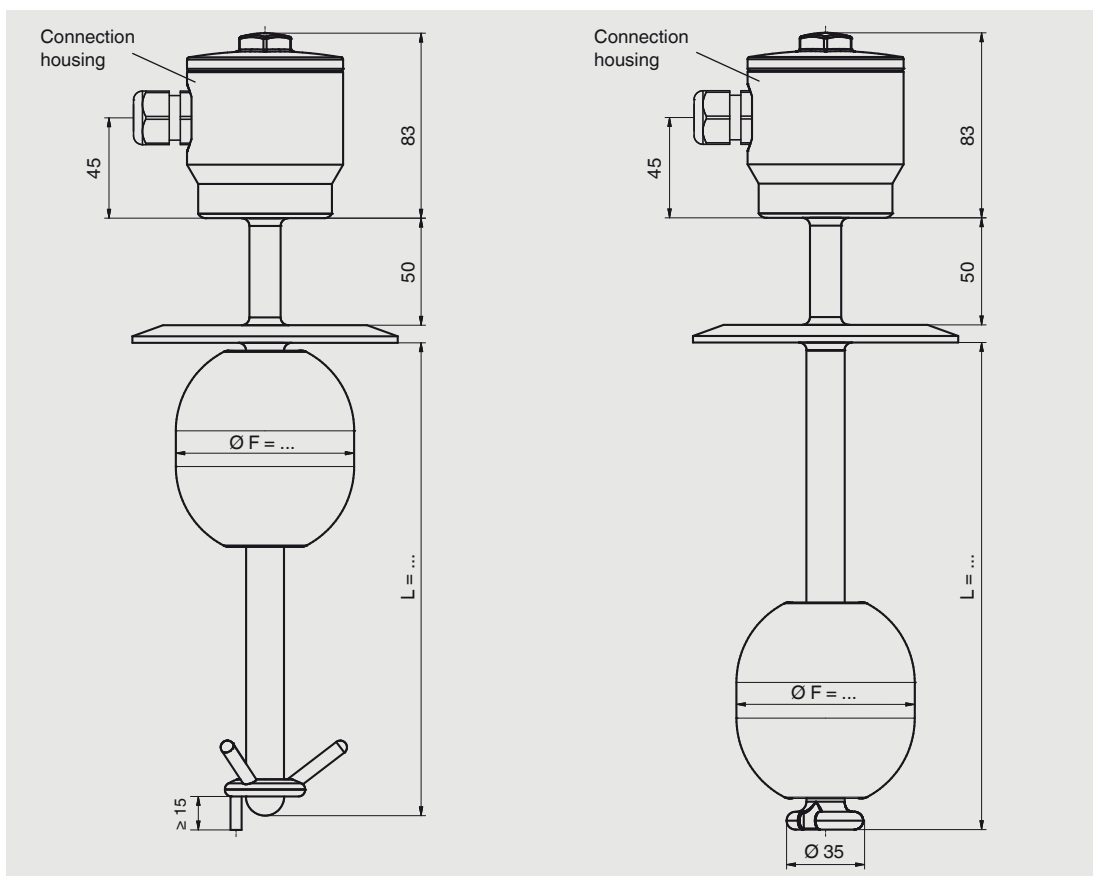
Process connection, guide tube and float from stainless steel 1.4435 (316L) or 1.4404 (316L), surface ground and polished Ra < 0.8 µm or Ra < 0.4 µm, alternatively electropolished



	Mounting thread (without connection housing)	Mounting thread (without connection housing)
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	Connection housing ■ Aluminium 80 x 75 x 57 mm
Process connection	Mounting thread downwards G 3/8" (others on request)	■ Mounting flange per DIN or ANSI ■ Threaded connection per DIN 11851 ■ Clamp pipe connection per DIN 32676 ■ Ingold sanitary fitting
Guide tube diameter	17.2 mm (material stainless steel 1.4435, 1.4439 or 1.4404, surface ground and electropolished)	
Guide tube length L max.	5,000 mm	
Float	Material stainless steel 1.4439 or 1.4404, surface ground and electropolished Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions (see page 14 and 15)	
Max. operating pressure	25 bar	
Temperature range standard	PVC/PUR cable -10 ... +80 °C Silicone cable -10 ... +120 °C	-20 ... +120 °C Option: ■ High-temperature version: +120 ... +200 °C Option: ■ Low-temperature version: -80 ... -20 °C
Contact separation	K 18 = 18 mm (not with high- and low-temperature version) K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of the measuring chain	Length and separation dependent	
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened	
Mounting position	Vertical ±30°	
Ingress protection	IP 65 per EN 60529 / IEC 60529	
Materials	Stainless steel 1.4435, 1.4439 and 1.4404	

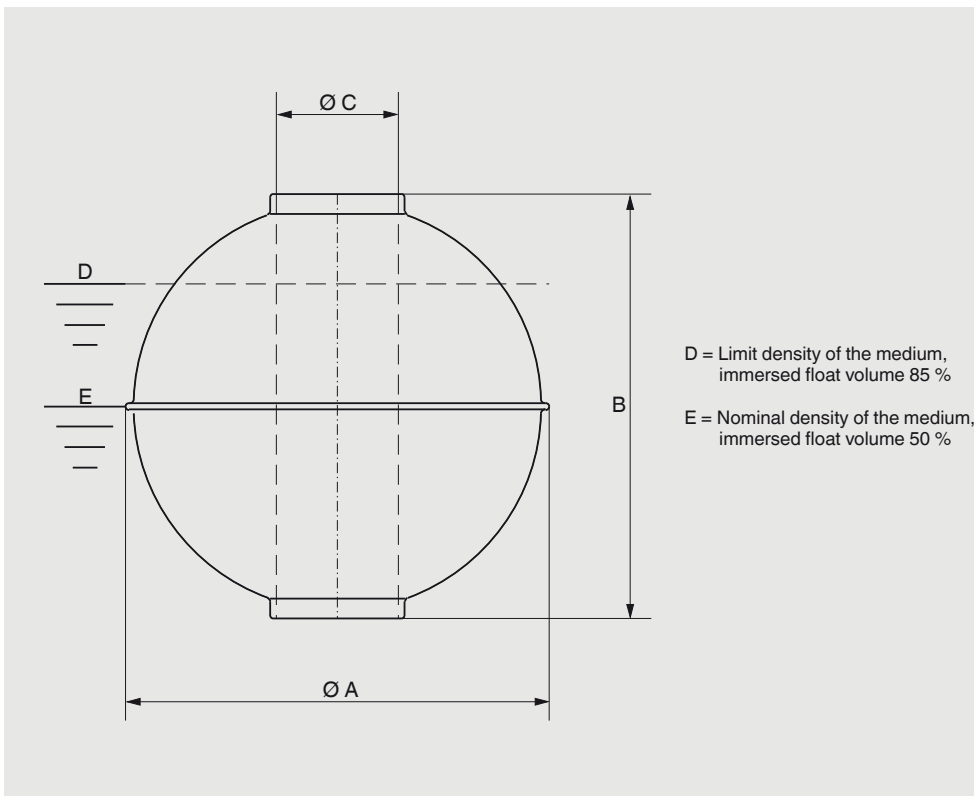
Sensor, sterile version, 3-A certified, model FLR-H

Process connection, guide tube and float from stainless steel 1.4435 (316L) or 1.4404 (316L), surface ground and polished Ra < 0.8 µm or Ra < 0.4 µm, alternatively electropolished



	Version with separate float bracket	Version with welded pipe end
Electrical connection	Connection housing Stainless steel (1.4571) with cable gland M20 x 1.5 (polyamide or hygienic design)	
Process connection	<ul style="list-style-type: none"> ■ Clamp connection ISO 2852 (DN 32 ... DN 100 or 1.5" ... 4") ■ Clamp connection DIN 32676 (DN 32 ... DN 100 or 1.5" ... 4") ■ Aseptic mounting thread downwards DIN 11864-1 (DN 32 ... DN 100 or 1.5" ... 4") ■ Aseptic collar connecting sleeve DIN 11864-1 (DN 32 ... DN 100 or 1.5" ... 4") ■ Aseptic flange connection DIN 11864-2 (DN 32 ... DN 50 or 1.5" ... 2") ■ Aseptic clamp connection DIN 11864-3 (DN 32 ... DN 100 or 1.5" ... 4") ■ VARIVENT® (form F, N and G) ■ BioConnect® threaded connection (DN 32 ... DN 100 or 1.5" ... 2") ■ BioConnect® flange connection (DN 32 ... DN 100 or 1.5" ... 2") ■ BioConnect® clamp connection (DN 32 ... DN 100 or 1.5" ... 2") 	
Guide tube diameter	12, 14 or 17.2 mm (stainless steel 1.4435 or 1.4404, surface ground and polished, Ra < 0.8 µm)	
Guide tube length L max.	6,000 mm	
Float	Material stainless steel 1.4435 or 1.4404 Float diameter 50 or 80 mm Float selection depending on guide tube diameter	
Max. operating pressure	10 bar	
Temperature range	<ul style="list-style-type: none"> ■ Medium standard -40 ... +200 °C ■ Sensor housing -40 ... +85 °C 	
Contact separation	K 18 = 18 mm K 15 = 15 mm K 10 = 10 mm K 5 = 5 mm	
Overall resistance of the measuring chain	Length and separation dependent	
Connection cable to transmitter	Cable length max. 2,000 m, 3-wire, screened	
Mounting position	Vertical ±30°	
Ingress protection	IP 68 per EN 60529 / IEC 60529	

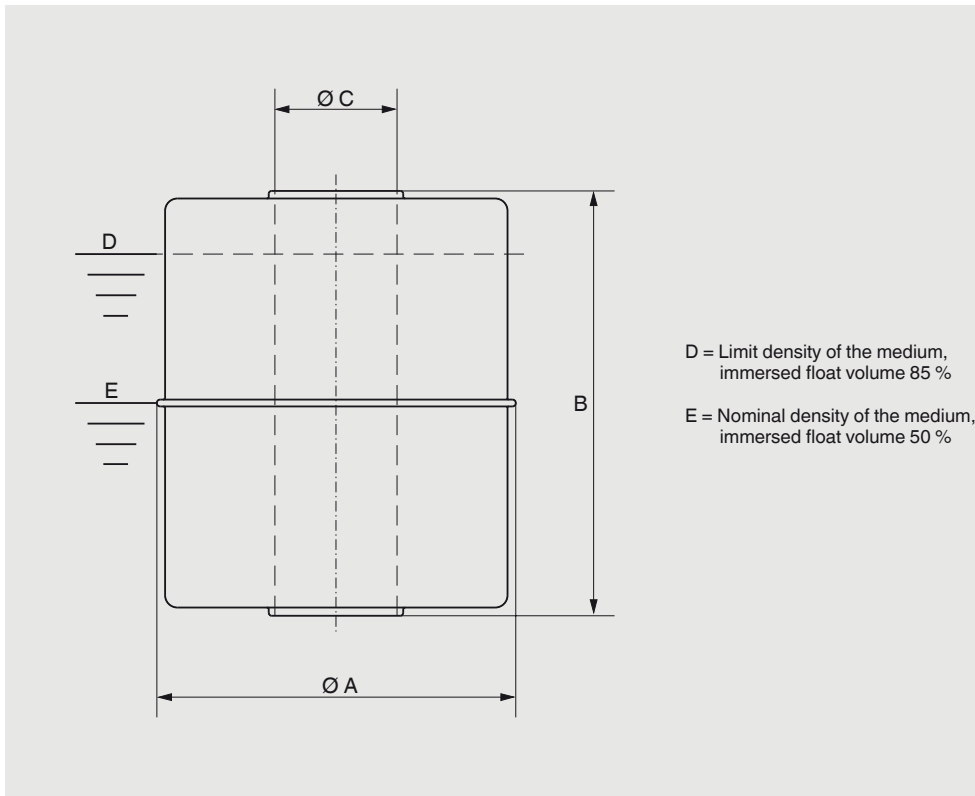
Spherical floats (K)



Material	Suits guide tube \varnothing mm	$\varnothing A$ mm	B mm	$\varnothing C$ mm	Max. operating pressure bar	Max. operating temperature °C	Limit density 85 % kg/m^3	Order no.
Stainless steel 1.4571	12	52	52	15	40	250	727	020913
	12	62	61	15	32	250	597	026026
	12	83	81	15	25	250	412	021089
	18	80	76	23	25	250	617	005479
	18	98	96	23	25	250	561	005490
	18	105	103	23	25	250	520	005494
	18	120	117	23	25	250	394	026726
	18-30	120	116	38	25	250	537	-
	18-30	200	192	56	16	250	581	005503
Titanium 3.7035	12	52	52	15	25	250	623	-
	12	52	52	15	60	250	790	-
	12	52	52	15	80	250	997	-
	12	62	62	15	25	250	482	005538
	12	83	81	15	25	250	343	005544
	18	80	76	23	25	250	866	005543
	18	98	96	23	25	250	536	-
	18	105	103	23	25	250	416	005549
	18	120	117	23	25	250	315	115002
Stainless steel 1.4571 E-CTFE coated	18	81	77	22	25	depending on medium	634	-
	18	99	97	22	25	depending on medium	653	-
	18	106	104	22	25	depending on medium	595	-
	18	121	118	22	3	depending on medium	435	-

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

Cylindrical floats (Z)



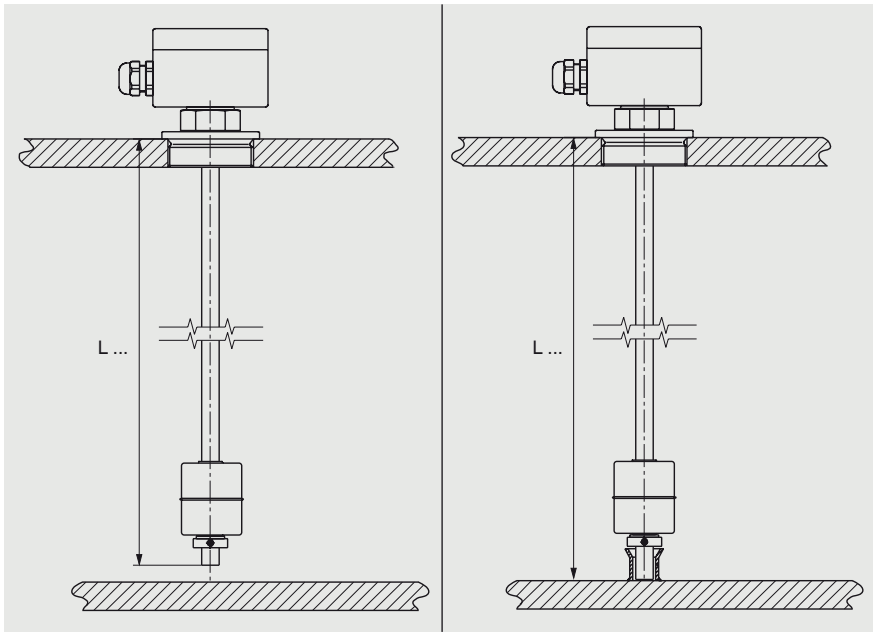
Material	Suits guide tube \varnothing mm	$\varnothing A$ mm	B mm	$\varnothing C$ mm	Max. operating pressure bar	Max. operating temperature °C	Limit density 85 % kg/m ³	Order no.
Stainless steel 1.4571	12	44	52	15	16	250	740	034196
Titanium 3.7035	12	44	52	15	16	250	645	022639
PVC	16	55	54	22	3	60	805	033696
	20	80	79	25	3	60	577	033697
Polypropylene	16	55	54	22	3	80	592	033700
	20	80	79	25	3	80	438	033701
PVDF	16	55	69	22	3	100	809	033698
	20	80	79	25	3	100	706	033699
PTFE	16-20	80	100	28	3	depending on medium	667	115056
	16-20	90	100	28	3	depending on medium	584	-

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

Determination of the max. guide tube length L for explosion-protected version, intrinsically safe

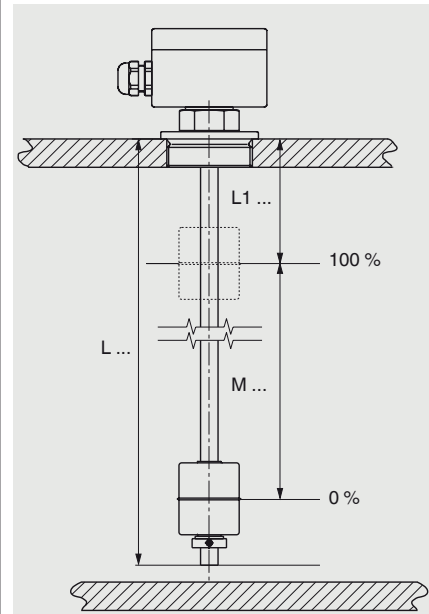
Version A: Fixed to the tank ceiling

Version B: Fixed to the tank ceiling and floor



Guide tube	Max. guide tube length L	
	Version A	Version B
Ø 12 x 1	660 mm	3,500 mm
Ø 14 x 1	940 mm	5,000 mm
Ø 14 x 2	1,600 mm	6,000 mm
Ø 18 x 2	3,000 mm	6,500 mm

Illustration with the required dimensions for ordering



Legend

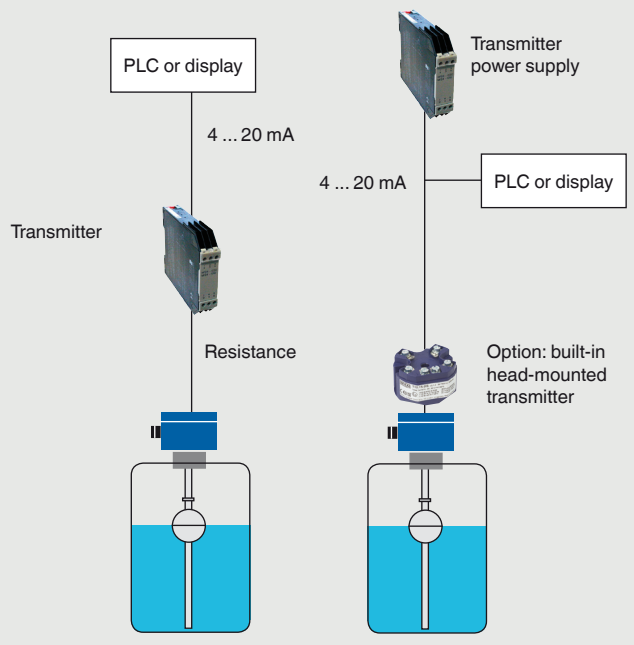
- L1 = 100 % Mark (distance sealing face-float center)
- M = measuring range (distance 0 ... 100 %)
- L = guide tube length and/or. insertion length of the sensor

On ordering, the dimension L1 and the guide tube length (immersion length) L must be given.

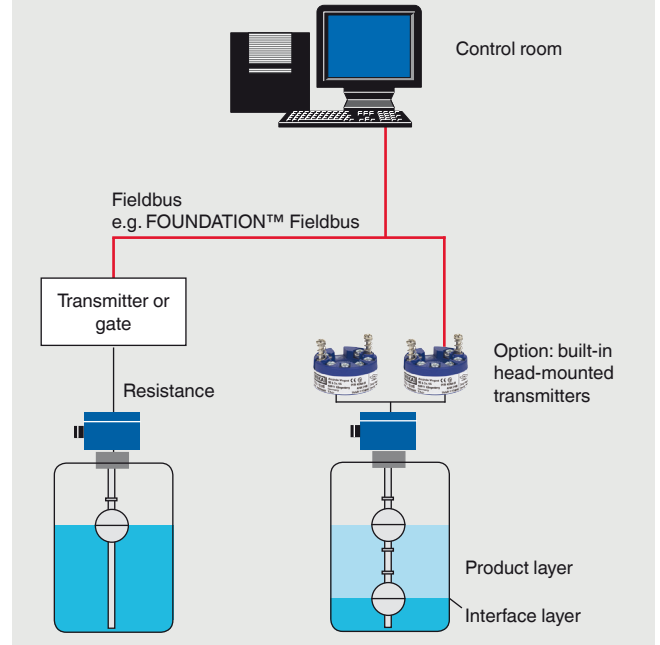
Subsequent alteration of the measuring range is not possible.

Application examples

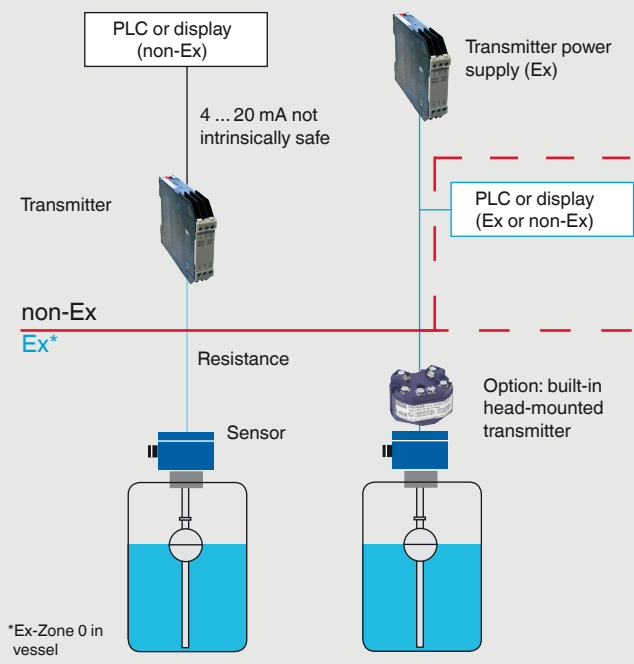
Standard applications



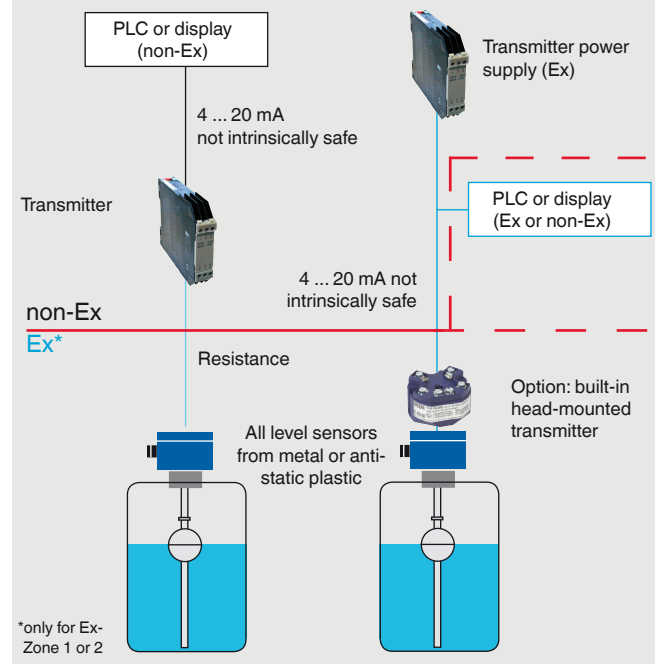
Connection to bus systems



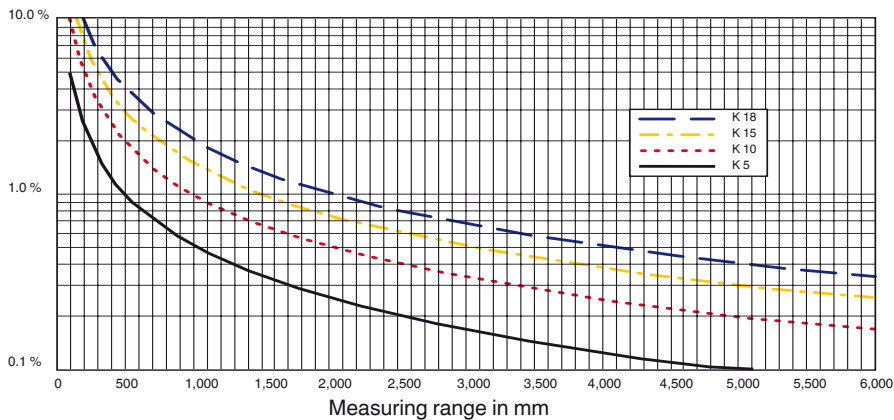
Applications for Ex-Zone 0



Applications for Ex-Zone 1, 2



Measuring accuracy



- Legend
- K 18 Contact separation 18 mm
 - K 15 Contact separation 15 mm
 - K 10 Contact separation 10 mm
 - K 5 Contact separation 5 mm

Head-mounted transmitter



Model TE

Model T32E

Model T53F

Model TLEH

Model	4 ... 20 mA	HART®	PROFIBUS® PA	Fieldbus™	Exi	Display	Order no.
TE	x				x		014832
TS	x						005894
T32E	x	x			x		025216
T32S	x	x					114795
T53F				x	x		025727
T53P			x		x		034422
TLH	x	x				x	019989
TLEH	x	x			x	x	021104

Ordering information

Model / Version / Electrical connection / Process connection / Guide tube diameter / Guide tube length (insertion length) L / Contact separation / 100 % mark L1 / Measuring range M (span 0 % - 100 %) / Process specifications (operating temperature and pressure, limit density) / Options

To order the described floats and head-mounted transmitters the order number is sufficient.

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Appendix

Type Code

Code	1st key	2nd key	3rd key
1	Electrical connection	Process connection	Material process connection
.../.../...	- (none) - connection cable	ER Mounting thread upwards (BSP)	V Stainless steel 1.4571
	A Terminal box Aluminium	R Mounting thread downwards (BSP)	VE Stainless steel electro-polished
	AB Terminal box Polypropylene	ENPT Mounting thread upwards (NPT)	VEC Stainless steel ECTFE-coated
	AP Terminal box Polyester	NPT Mounting thread downwards (NPT)	VTF Stainless steel PTFE-lined
	AV4 Terminal box Stainless steel 1.4571 with screw cap	MR Dairy fitting acc. to DIN 11851	T Titanium
	ADF Terminal box Aluminium flameproof	F Flange (DIN, ANSI, JIS)	HC Hastelloy C
	ASC4 Coupler plug C 164-232-F-4P	FC Clamp-connection acc. to DIN 32676	P PVC
	ASN6R Hirschmann coupler plug N6RAM 2D M20	IS Sanitary nozzle (Ingoldstutzen)	PP Polypropylene
	ASM12 Plug M12x1-4-pole		PF PVDF
2	Process connection		
.../.../...	... Mounting thread size in inches		
	... Dairy pipe fitting size DN 50 - DN 150		
	.../ Flange nominal size	.../ Flange pressure rating	... Flange face
DIN	DN 50 - DN 200	PN 6 - PN 100	Standard Form C optional E, A, F, N
DIN EN	DN 50 - DN 200	PN 6 - PN 100	Standard Form B1 optional B2, A, C, D
ANSI	2" - 8"	Class 150 - 600	Standard RF optional RTJ, FF, LT, LG
JIS	3/8" (DN 10) - 4" (DN 100)	5 K - 63 K	Standard RF optional RTJ, FF, LT, LG
Clamp	DN 25 - DN 100; 1" - 4"		
3	Guide tube material	Contact function	Optional code adder
.../.../...	V Stainless steel 1.4571	K 18 18 mm	/HT.. High temperature* +150 °C ... +200 °C
	VE Stainless steel electro-polished	K 15 15 mm	/TT.. Low temperature -10 °C ... -80 °C
	VEC Stainless steel ECTFE-coated	K 10 10 mm	* only contact separations 5/10/15 mm
	VTF Stainless steel PTFE-lined	K 5 5 mm	
	HC Hastelloy C		/PT100 Temperature probe PT 100 (2-,3- or 4-core)
	P PVC		/..TH.. Temperature switch ... °C - closing or opening
	PP Polypropylene		
	PF PVDF		
4	Option, Head-mounted transmitter in terminal box		
.../.../...	TS 2-wire standard analogue	T53F Intrinsically safe Foundation Fieldbus programmable	
	TE 2-wire intrinsically safe analogue	T53P Intrinsically safe Profibus PA programmable	
	T32.1S 2-wire intrinsically safe HART® programmable	TLH 2-wire HART® programmable with LCD display	
	T32.xS 2-wire HART® programmable	TLEH 2-wire intrinsically safe HART® programmable with LCD display	
	T12 universally programmable	none -	
5	Guide tube length	OD Guide tube	
L.../...	L.../ length in mm	... OD in mm	
6	Float design		
.../...	.../ Material (code 3, 1st key)	... Float OD in mm	
7	Connection cable	Cable material	
.../...	.../ length in Meter	— PVC, grey /SL	
		blau PVC, blue	
		SIL Silicone	
		PUR PUR	
8	Approval		
.../.../...	- none	GL Germanischer Lloyd	
	Ex Ex i	DNV Det Norske Veritas	
	Ex d ATEX	ABS Bureau Veritas	
	Ex d IECEx	3-A 3-A certified	

Ordering example

	Electrical Connection	Process Connection	Guided tube material	Option	Guide tube	Float	Cable	Approval
	design / material	size	contact separation	transmitter	length / Ø		length / material	
Code	1	2	3	4	5	6	7	8
	AFV	50/6/F	VK 15/TT30	TS	L950/12	V44R		

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