

Magnetic float switch For vertical installation Model FLS (models with Ex approval: 60, AL-ADF)

KSR data sheet LM 30.01



for further approvals
see page 3

Applications

- Level measurement for almost all liquid media
- Pump and level control and monitoring of distinct filling levels
- Chemical, petrochemical, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry

Special features

- Large range of application due to the simple, proven functional principle
- For harsh operating conditions, long service life
- Operating limits:
 - Operating temperature: $T = -196 \dots +350 \text{ }^{\circ}\text{C}$
 - Operating pressure: $P = \text{Vacuum to } 40 \text{ bar}$
 - Limit density: $\rho \geq 300 \text{ kg/m}^3$
- Wide variety of different electrical connections, process connections and materials
- Explosion-protected versions



Fig. left: Stainless steel version, mounting thread
Fig. right: Plastic version, flange connection

Description

A float with a permanent magnet moves reliably along with the liquid level on a guide tube. Within the guide tube is fitted a reed contact (inert gas contact), which is energised, through the non-magnetic walls of the float and guide tube, by the approach of the float magnet. By using a magnet and reed contact the switching operation is non-contact, free from wear and needs no power supply. The contacts are potential-free. Magnetic float switches are also available with multiple switch points.

The switch functions always refer to a rising liquid level: normally open, normally closed or change-over contact.

Through the use of a float for a max. of 2 switch points a bistable switch behaviour can be achieved, meaning that the switching status also remains available, when the filling level continues to rise above or drop below the switch point.

The float switch is simple to mount and maintenance-free, so the costs of mounting, commissioning and operation are low.

Further special features

- Process connection, guide tube and float from stainless steel 1.4571, plastic or Buna
- Universal signal processing:
Connection direct to a PLC is possible, NAMUR connection, signal amplification / contact protection relays
- Works independently of foaming, conductivity, dielectricity, pressure, vacuum, temperature, vapours, condensation, bubble formation, boiling effects and vibrations.
- Multiple functionality in a single instrument - up to 8 potential-free contacts
- Exact repeatability of the switch points
- Magnetic float switches qualify as passive electrical equipment in accordance with 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 Ex ib.

Options

- Customer-specific solutions
- Special versions for interface layer detection
 $\Delta\rho \geq 100 \text{ kg/m}^3$
- Process connection, guide tube and float from stainless steel 1.4435, 1.4539, titanium, Hastelloy (others on request)

Model overview

Model	Description of the version	Approval							
		with-out	Ex i	Ex d	GL	ABS	DNV	3-A	CE
FLS-SE	Standard with cable, safety extra-low voltage	x			x				
FLS-SF	Standard with cable, low voltage	x			x				x
FLS-SA	Standard with case or connector, low voltage	x			x	x	x		x
FLS-SB	Standard with case or connector, safety extra-low voltage	x			x	x	x		
60	Intrinsically safe, Ex i		x		x	x	x		x
AL-ADF	Flameproof enclosure, Ex d			x					x
FLS-ME	Miniature with cable, safety extra-low voltage	x							
FLS-MB	Miniature with case or connector, low voltage	x							
FLS-PF	with cable, low voltage	x							x
FLS-PA	with case or connector, low voltage	x							x
FLS-HE	with cable, safety extra-low voltage	x							
FLS-HA	with case, low voltage	x							x
FLS-HA3	with case, low voltage							x	x

Materials

Model	Materials									Temperature range
	Stain- less steel 1.4571 (316Ti)	Stain- less steel 1.4404 (316L)	Titanium 3.7035 (grade 2)	Stain- less steel 1.4435 (316L)	Stain- less steel 1.4571 (316Ti) / PP	Stain- less steel 1.4571 (316Ti) / PA	Stain- less steel 1.4571 (316Ti) / brass	PVC, PP, PVDF	Stain- less steel 1.4571 (316Ti) / Buna (NBR)	
FLS-SE	x	x	x	x	x	x	x		x	-30 ... +150 °C
FLS-SF	x	x	x	x	x	x	x		x	-30 ... +150 °C
FLS-SA	x	x	x	x	x	x	x		x	-196 ... +350 °C
FLS-SB	x	x	x	x	x	x	x		x	-196 ... +350 °C
60	x			x						-50 ... +180 °C
AL-ADF	x			x						-10 ... +120 °C
FLS-ME	x	x			x				x	-30 ... +130 °C
FLS-MB	x	x			x				x	-30 ... +130 °C
FLS-PF								x		-10 ... +100 °C
FLS-PA								x		-10 ... +100 °C
FLS-HE		x		x						-30 ... +150 °C
FLS-HA		x		x						-40 ... +200 °C
FLS-HA3		x		x						-40 ... +200 °C

Ex approvals

Explosion protection	Ignition protection type	Model	Zone	Approval number
ATEX	Ex i	60	Zone 0, gas	KEMA 01 ATEX1053 X II 1/2G Ex ia IIC T3 ... T6
ATEX + GL	Ex i + GL	60	Zone 0, gas	KEMA 01 ATEX1053 X II 1/2G Ex ia IIC T3 ... T6 + GL - 96 716 - 95 HH
ATEX	Ex d	AL-ADF	Zone 1, gas/dust	TÜV 13 ATEX 7399 X II 2G Ex d IIC T6 Gb / II 2 D Ex tb IIIC T80 °C Db
IECEx	Ex d	AL-ADF	Zone 1, gas/dust	IECEx TUR 09.0002X -40 °C <= Ta <= +55 °C Ex d IIC T6 Ex tD A21 IP 65 T80 °C

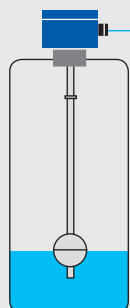
Type approval

Directive	Model	Approval number
GL	FLS-S	GL - 96 716 - 95 HH
ABS	FLS-S	ABS-02-HG286246-2-PDA
DNV	FLS-S	DNV - A-11453
GOST, EAC	FLS-S, FLS-P; FLS-H	959333
3-A	FLS-H	3-A Sanitary Standards, 1698

Application examples

Full detector (Ex i)

intrinsically safe



Hazardous area

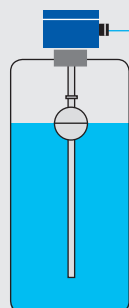


Intrinsically safe relay
e.g. KR 24 Ex

Non-hazardous area



intrinsically safe

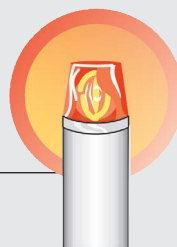


Hazardous area



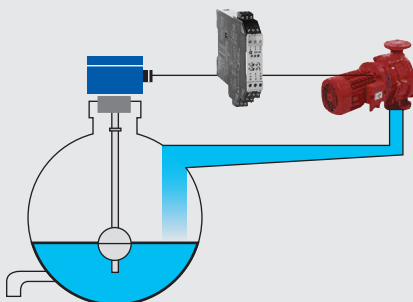
Intrinsically safe relay
e.g. KR 24 Ex

Non-hazardous area

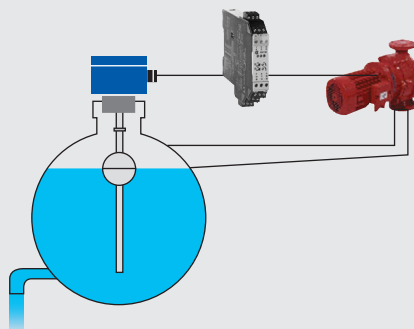


Level control (min/max control)

Contact protection relay
e.g. KR 230



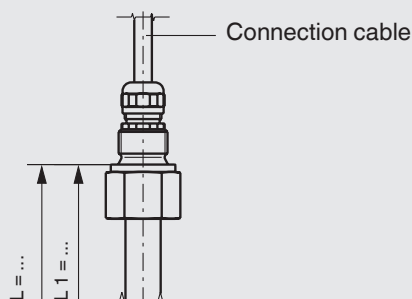
Contact protection relay
e.g. KR 24



Magnetic float switch, standard version, model FLS-S

Process connection, guide tube and float from stainless steel 1.4571 (316Ti)

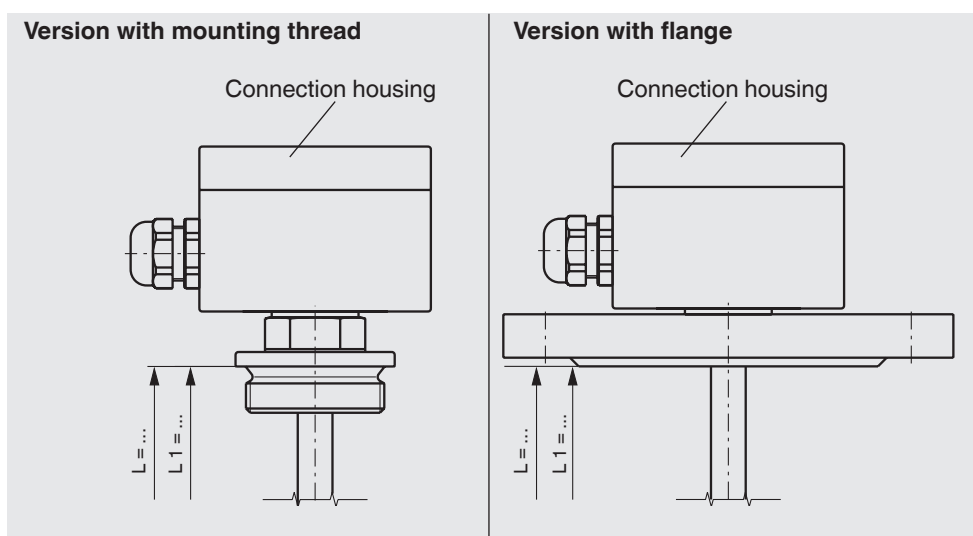
Version with mounting thread and connection cable



Specifications	Version FLS-SE Safety extra-low voltage	Version FLS-SF Low voltage
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	
Process connection	Mounting thread upwards G 3/8" or G 1/2" (others on request)	
Guide tube diameter	12, 14 or 18 mm	
Guide tube length L	≤ 3,000 mm for guide tube diameter 12 or 14 mm ≤ 6,000 mm for guide tube diameter 18 mm	
Float	Material stainless steel 1.4571 (option: Buna (NBR), titanium) Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	-10 ... +80 °C for PVC and PUR cable -30 ... +150 °C for silicone cable Observe the temperature range of the float and the connection housing	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	6 x NO or NC, or 4 x SPDT for PVC and PUR cable 5 x NO or NC, or 3 x SPDT for silicone cable	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function	
Normally open, normally closed	AC 50 V; 100 VA; 1 A DC 75 V; 50 W; 0.5 A	AC 250 V; 100 VA; 1 A DC 250 V; 50 W; 0.5 A
Change-over	AC 50 V; 40 VA; 1 A DC 75 V; 20 W; 0.5 A	AC 250 V; 40 VA; 1 A DC 250 V; 20 W; 0.5 A
Mounting position	Vertical ±30°	
Ingress protection	IP65 per EN/IEC 60529	
Materials	Stainless steel 1.4404, 1.4435, 1.4539, titanium, Hastelloy and others on request	

Magnetic float switch, standard version, model FLS-S

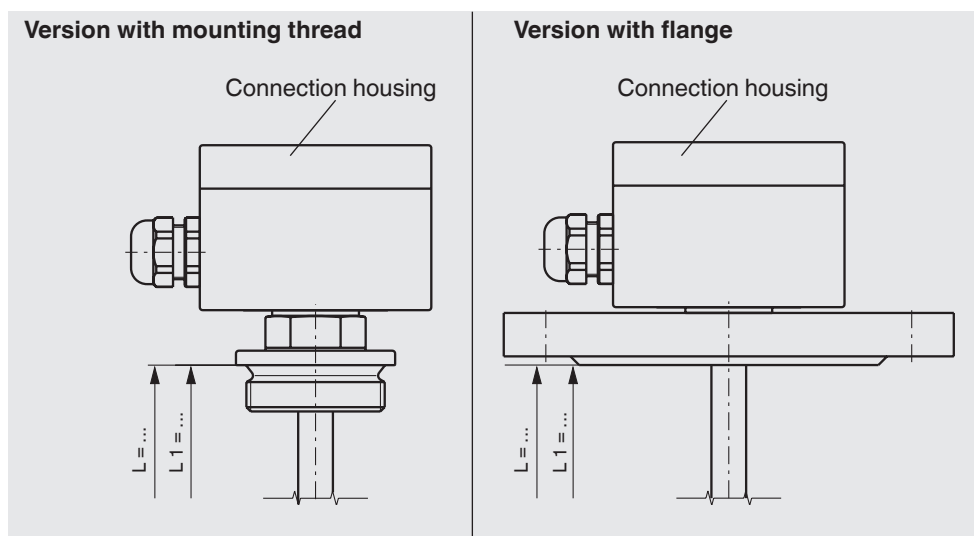
Process connection, guide tube and float from stainless steel 1.4571 (316Ti)



Specifications	Version FLS-SA Low voltage	Version FLS-SB Safety extra-low voltage
Electrical connection	■ Connection housing ■ Coupler connector	Connection housing ■ Aluminium 64 x 58 x 34 mm, with 1 contact ■ Aluminium 80 x 75 x 57 mm, 2 or more contacts ■ Option: Polypropylene, polyester, stainless steel
Process connection	Mounting thread downwards G 1 1/2" or G 2" Mounting flange DIN DN 50 ... DN 200, PN 6 ... PN 100, DIN EN 1092 DN 50 ... DN 200, PN 6 ... PN 100, ANSI 2" ... 8", class 150 ... 600 (others on request)	
Guide tube diameter	12, 14 or 18 mm	
Guide tube length L	≤ 3,000 mm for guide tube diameter 12 or 14 mm ≤ 6,000 mm for guide tube diameter 18 mm	
Float	Material stainless steel 1.4571 (option: Buna (NBR), titanium) Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	■ Standard: -30 ... +150 °C ■ High-temperature version: +150 ... +300 °C ■ Low-temperature version: -196 ... -30 °C Observe the temperature range of the float and the connection housing	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	6 x NO or NC, or 4 x SPDT	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function	
Normally open, normally closed	AC 250 V; 100 VA; 1 A DC 250 V; 50 W; 0.5 A	AC 50 V; 100 VA; 1 A DC 75 V; 50 W; 0.5 A
Change-over	AC 250 V; 40 VA; 1 A DC 250 V; 20 W; 0.5 A	AC 50 V; 40 VA; 1 A DC 75 V; 20 W; 0.5 A
Mounting position	Vertical ±30°	
Ingress protection	IP65 per EN/IEC 60529	
Materials	Stainless steel 1.4404, 1.4435, 1.4539, titanium, Hastelloy and others on request	

Magnetic float switch, intrinsically safe version Ex i, model 60

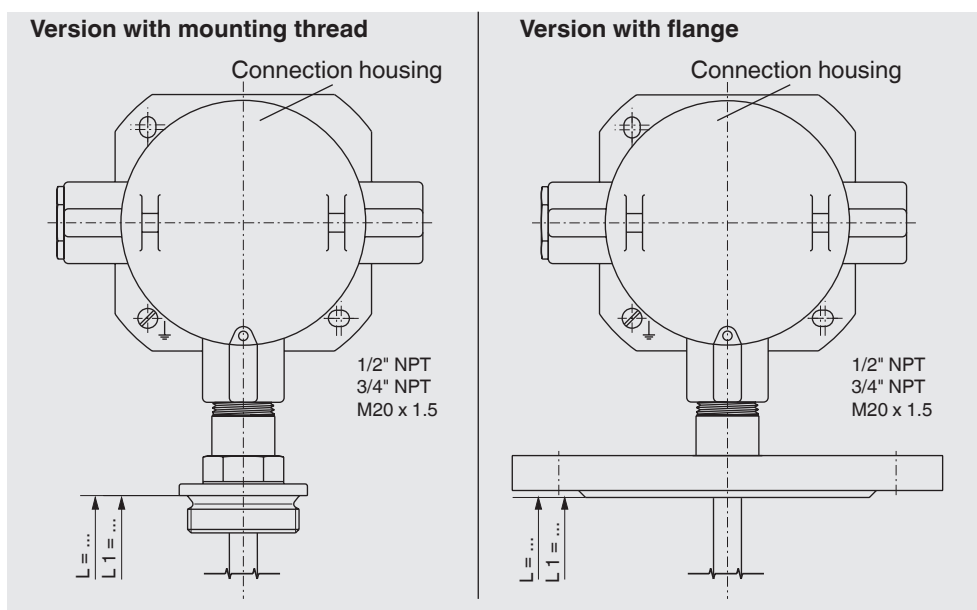
Process connection, guide tube and float from stainless steel 1.4571 (316Ti)



Specifications	Version 60-ARV	Version 60-AFV			
Electrical connection	Connection housing: ■ Aluminium 64 x 58 x 34 mm, with 1 contact ■ Aluminium 80 x 75 x 57 mm, 2 or more contacts ■ Option: Polypropylene, polyester, stainless steel				
Process connection	Mounting thread downwards, G 1 1/2" or G 2" Mounting flange DIN DN 50 ... DN 200, PN 6 ... PN 100, DIN EN 1092 DN 50 ... DN 200, PN 6 ... PN 100, ANSI 2" ... 8", class 150 ... 600 (others on request)				
Guide tube diameter	8, 12, 14 or 18 mm				
Guide tube length L	≤ 500 mm for guide tube diameter 8 mm ≤ 3,000 mm for guide tube diameter 12 or 14 mm ≤ 6,000 mm for guide tube diameter 18 mm				
Float	Material stainless steel 1.4571 (option: Buna (NBR), titanium) Float diameter from 20 ... 120 mm Float selection depending on guide tube diameter and process conditions				
Temperature range	Temperature class	T3	T4	T5	T6
	Process temperature	≤ 180 °C	≤ 130 °C	≤ 95 °C	≤ 80 °C
	Ambient temperature	≤ 60 °C	≤ 60 °C	≤ 60 °C	≤ 60 °C
Switching function					
max. number of contacts	3 x NO or NC, or 1 x SPDT for guide tube diameter 8 mm 6 x NO or NC, or 4 x SPDT for guide tube diameter 12, 14 or 18 mm				
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)				
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)				
Safety-related maximum values	Only for connection to a certified intrinsically safe circuit with max. U _i = 36 V, I _i = 100 mA, C _i = 0 nF, L _i = 0 μH				
Mounting position	Vertical ±30°				
Ingress protection	IP65 per EN/IEC 60529				
Materials	Stainless steel 1.4404, 1.4435, 1.4539, titanium, Hastelloy and others on request				
Approval number ATEX	KEMA 01 ATEX1053 X II 1/2G Ex ia IIC T3 ... T6				
Approval number ATEX + GL	KEMA 01 ATEX1053 X II 1/2G Ex ia IIC T3 ... T6 + GL - 96 716 - 95 HH				

Magnetic float switch, explosion-protected version Ex d, flameproof enclosure, model AL-ADF

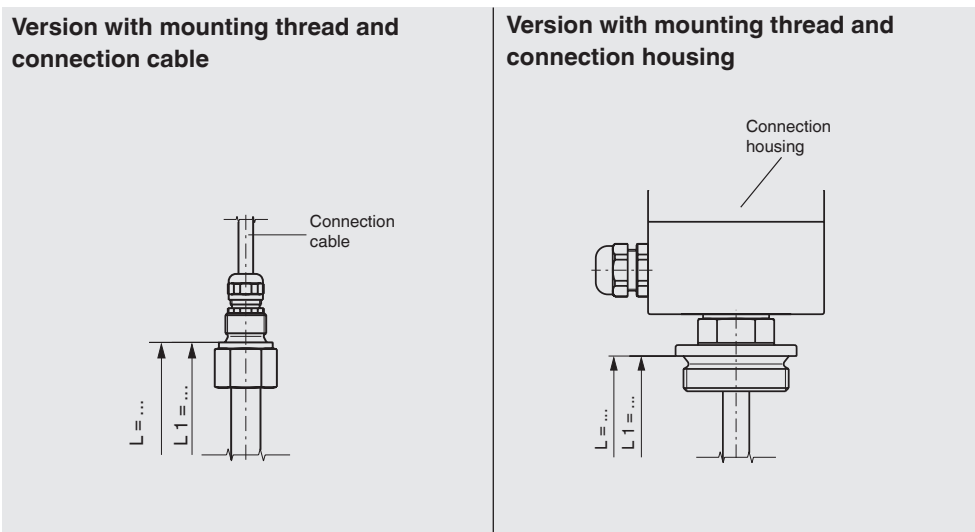
Process connection, guide tube and float from stainless steel 1.4571 (316Ti)



Specifications	Model AL-ADF
Electrical connection	Connection housing: ■ Aluminium ■ Option: Stainless steel
Process connection	Mounting thread downwards, G 1 1/2" or G 2" Mounting flange DIN DN 50 ... DN 200, PN 6 ... PN 100, DIN EN 1092 DN 50 ... DN 200, PN 6 ... PN 100, ANSI 2" ... 8", class 150 ... 600 (others on request)
Guide tube diameter	12, 16 or 20 mm
Guide tube length L	≤ 500 mm for guide tube diameter 12 mm ≤ 3,000 mm for guide tube diameter 16 mm ≤ 5,000 mm for guide tube diameter 20 mm
Float	Material stainless steel 1.4571 (option: Buna (NBR)) Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions
Temperature range	Temperature class T4 T5 T6 Process temperature ≤ 120 °C ≤ 95 °C ≤ 80 °C
Switching function	Change-over SPDT - on rising level
max. number of contacts	4 x SPDT
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)
Switching power	Depending on the switching function
Change-over	AC 250 V; 100 VA; 1.5 A DC 250 V; 60 W; 1.5 A
Mounting position	Vertical ±30°
Ingress protection	IP65 per EN/IEC 60529
Materials	Stainless steel 1.4404, 1.4435, 1.4539, Hastelloy and others on request

Magnetic float switch, miniature design, model FLS-M

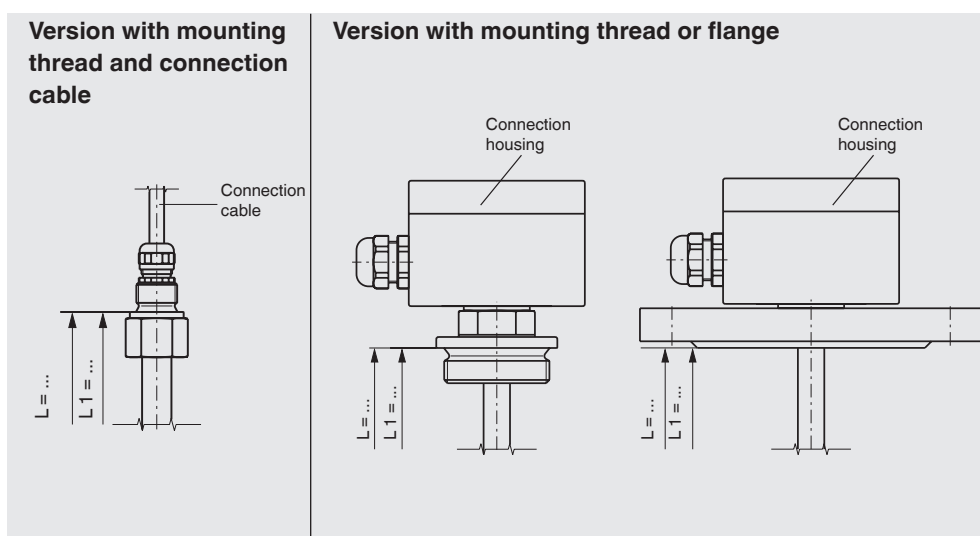
Process connection, guide tube 8 mm and float from stainless steel 1.4571 (316Ti)



Specifications	Version FLS-ME	Version FLS-MB
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	■ Connection housing aluminium 64 x 58 x 34 mm ■ Coupler connector
Process connection	Mounting thread upwards G 1/8" (others on request)	Mounting thread downwards G 3/4" G 1" (others on request)
Guide tube diameter	8 mm	
Guide tube length L	500 mm	
Float	Material: Stainless steel 1.4571 (option: Buna (NBR), titanium) Float diameter from 20 ... 35 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	■ -10 ... +80 °C for PVC and PUR cable ■ -30 ... +150 °C for silicone cable Observe the permissible temperature range of the float.	■ -10 ... +80 °C for float material Buna (NBR) or PP ■ -10 ... +100 °C for float material stainless steel or titanium
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	3 x NO or NC, or 1 x SPDT	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function. Please observe contact protection measures.	
Normally open, normally closed	AC 50 V; 10 VA; 0.5 A DC 75 V; 5 W; 0.25 A	
Change-over	AC 50 V; 5 VA; 0.25 A DC 75 V; 2.5 W; 0.15 A	
Mounting position	Vertical ±30°	
Ingress protection	IP54 per EN/IEC 60529	IP65 per EN/IEC 60529
Materials	Stainless steel 1.4404, 1.4435, 1.4539, titanium, Hastelloy and others on request	

Magnetic float switch, plastic version, model FLS-P

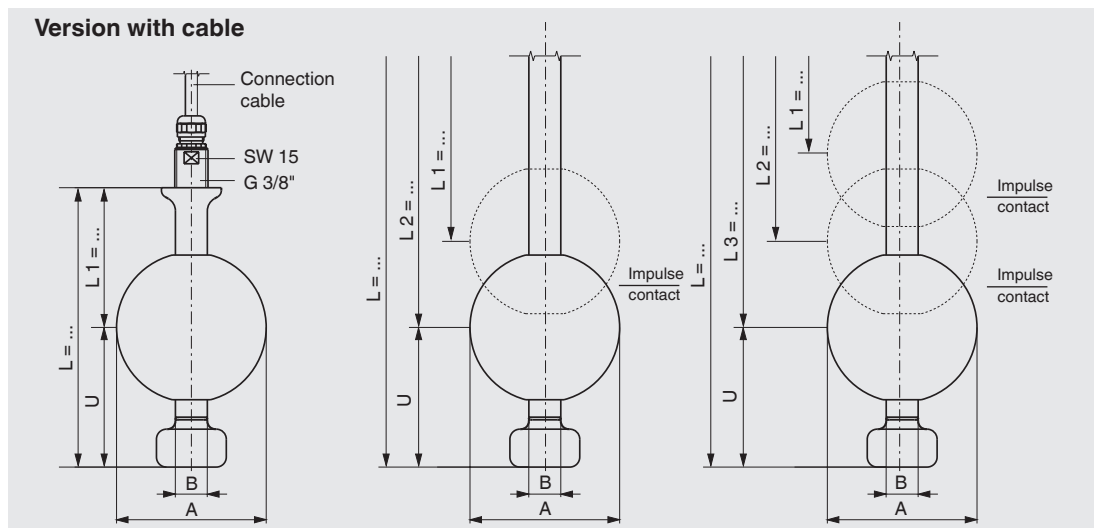
Process connection, guide tube and float from PVC, PP or PVDF



Specifications	Version FLS-PF	Version FLS-PA
Electrical connection	Connection cable ■ PVC ■ PUR	■ Connection housing polypropylene 80 x 82 x 55 mm ■ Connection housing polyester 80 x 75 x 55 mm ■ Coupler connector
Process connection	Mounting thread upwards G 1/8" (others on request)	Mounting thread downwards G 1 1/2" G 2" Flange DIN DN 50 ... DN 200, PN 6 ... PN 100 DIN EN 1092 DN 50 ... DN 200, PN 6 ... PN 100 ANSI 2" ... 8", class 150 ... 600
Guide tube diameter	12, 16 or 20 mm	
Guide tube length L	≤ 500 mm for guide tube diameter 12 ≤ 3,000 mm for guide tube diameter 16 mm ≤ 5,000 mm for guide tube diameter 20 mm	
Float	Material: PVC, PP or PVDF Float diameter from 44 ... 80 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	■ 0 ... 60 °C for float material PVC ■ -10 ... +80 °C for float material PP ■ -10 ... +100 °C for float material PVDF	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	6 x NO or NC, or 4 x SPDT	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function	
Normally open, normally closed	AC 250 V; 100 VA; 1 A DC 250 V; 50 W; 0.5 A	
Change-over	AC 250 V; 40 VA; 1 A DC 250 V; 20 W; 0.5 A	
Mounting position	Vertical ±30°	
Ingress protection	IP54 per EN/IEC 60529	IP65 per EN/IEC 60529
Materials	PVC, PP, PVDF and others on request	

Magnetic float switch, pharmaceutical version, model FLS-H

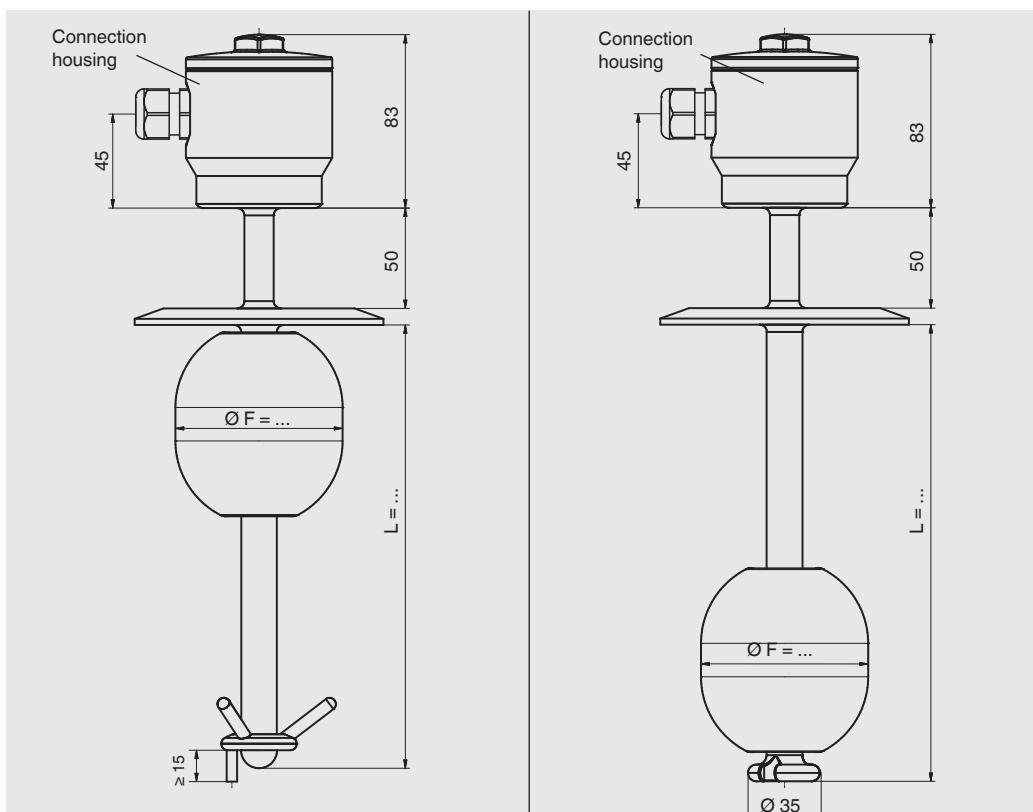
Process connection, guide tube and float from stainless steel



Specifications	Version FLS-HE	Version FLS-HA
Electrical connection	Connection cable ■ PVC ■ Silicone ■ PUR	Connection housing ■ Stainless steel
Process connection	■ Mounting thread upwards G 3/8 ■ Mounting flange per DIN or ANSI ■ Threaded connection per DIN 11851 ■ Clamp pipe connection per DIN 32676 ■ Ingold sanitary fitting (others on request)	
Guide tube diameter	17.2 mm (stainless steel 1.4435 or 1.4539, surface ground and polished)	
Guide tube length L	≤ 5,000 mm	
Float	Material: Stainless steel 1.4435 or 1.4539 Float diameter from 44 ... 120 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	■ -10 ... +80 °C for PVC and PUR cable ■ -30 ... +150 °C for silicone cable	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	6 x NO or NC, or 4 x SPDT for PVC and PUR cable 3 x NO or NC, or 2 x SPDT for silicone cable	6 x NO or NC, or 4 x SPDT
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 20 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function	
Normally open, normally closed	AC 50 V; 100 VA; 1 A DC 50 V; 50 W; 0.5 A	AC 250 V; 100 VA; 1 A DC 250 V; 50 W; 0.5 A
Change-over	AC 50 V; 40 VA; 1 A DC 50 V; 20 W; 0.5 A	AC 250 V; 40 VA; 1 A DC 250 V; 20 W; 0.5 A
Mounting position	Vertical ±30°	
Ingress protection	IP65 per EN/IEC 60529	
Materials	Stainless steel 1.4435 or 1.4539	

Magnetic float switch, 3-A hygienic version, model FLS-HA3

Process connection, guide tube and float from stainless steel

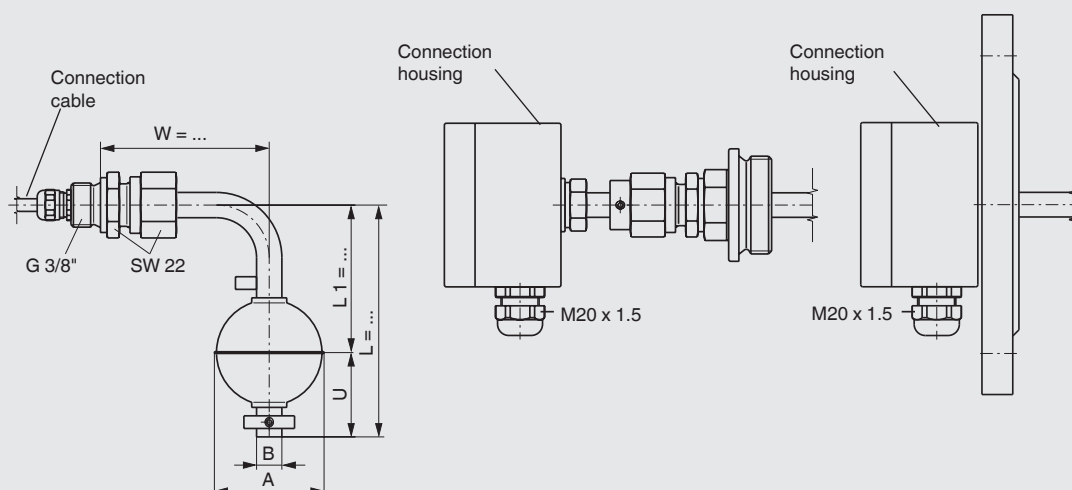


Specifications	Version FLS-HA3 with separate float bracket	Version FLS-HA3 with welded pipe connection
Electrical connection	Connection housing ■ Stainless steel	
Process connection	■ Clamp connection ISO 2852 (DN 32 ... DN 100 or 1.5" ... 4") ■ Clamp connection DIN 32676 (DN 32 ... DN 100 or 1.5" ... 4") ■ Aseptic mounting thread downwards DIN 11864-1 (DN 32 ... DN 100 or 1.5" ... 4") ■ Aseptic liner 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 1.4539, surface ground and polished, Ra < 0.8 µm)	
Guide tube length L	≤ 5,000 mm	
Float	Material: Stainless steel 1.4435 or 1.4539 Float diameter of 50 or 80 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	Process temperature: -40 ... +200 °C Ambient temperature: -40 ... +85 °C	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	3 x NO or NC, or 3 x SPDT	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 50 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function. Please observe contact protection measures.	
Normally open, normally closed	AC 250 V; 50 VA; 1 A	DC 250 V; 50 W; 0.5 A
Change-over	AC 250 V; 50 VA; 1 A	DC 250 V; 20 W; 0.5 A
Mounting position	Vertical ±30°	
Ingress protection	IP65 per EN/IEC 60529	
Materials	Stainless steel 1.4435 or 1.4539	

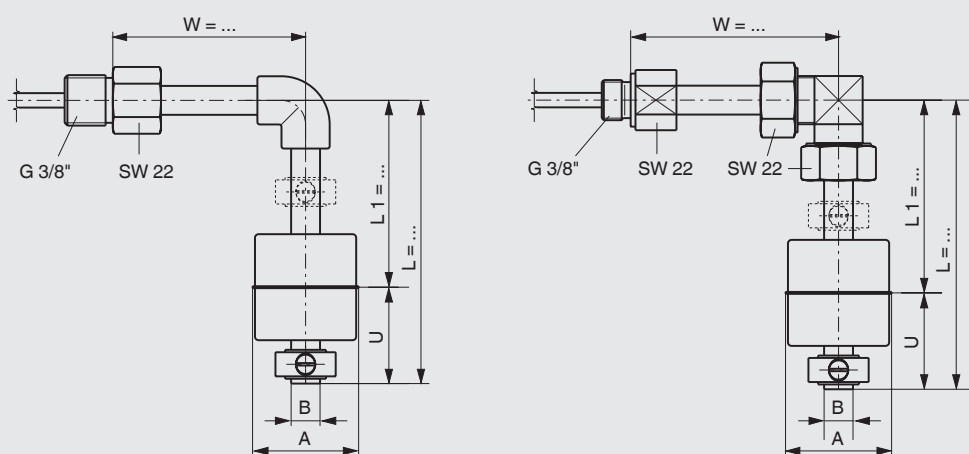
Options

Model	Angled version	Adjustable guide tube	ECTFE coating	Special flange from polyamide or brass	Food version
FLS-SE	x	x			x
FLS-SF	x	x			x
FLS-SA	x	x	x	x	x
FLS-SB	x	x	x	x	x
60					
AL-ADF					
FLS-ME	x	x			
FLS-MB	x	x			
FLS-PF	x				
FLS-PA	x				

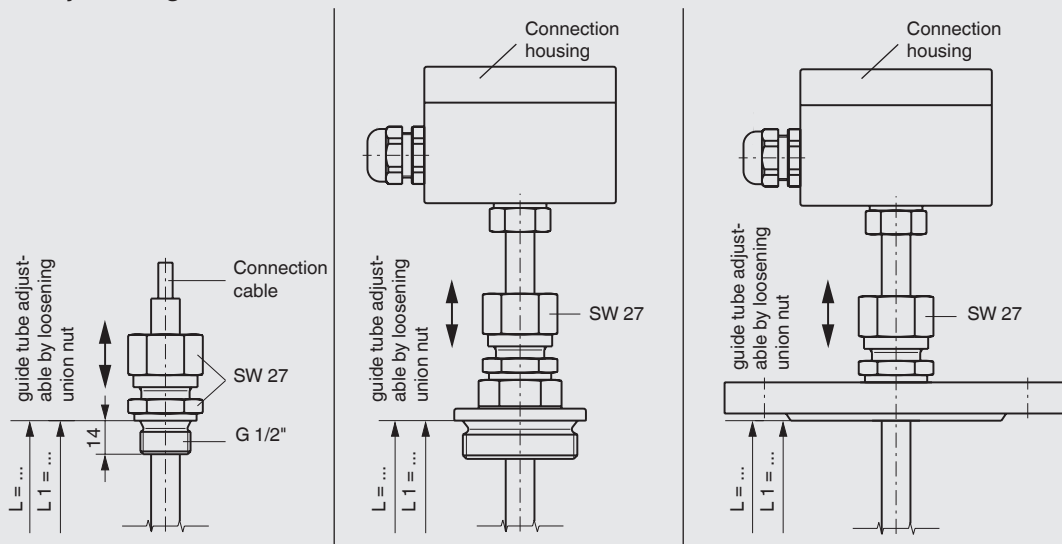
Angled version, material: Metal



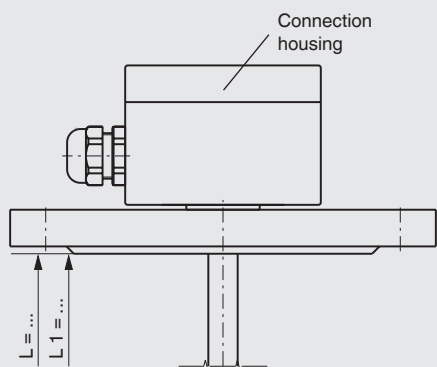
Angled version, material: Plastic



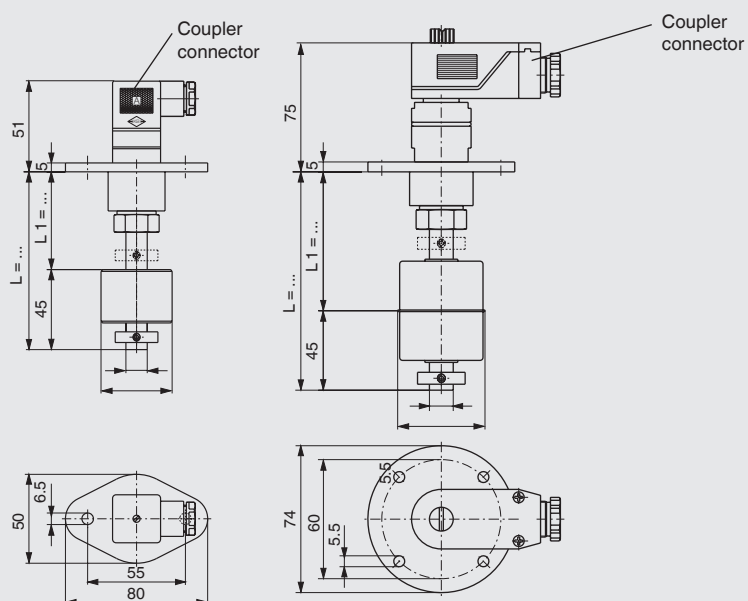
Version with adjustable guide tube



Version with ECTFE coating

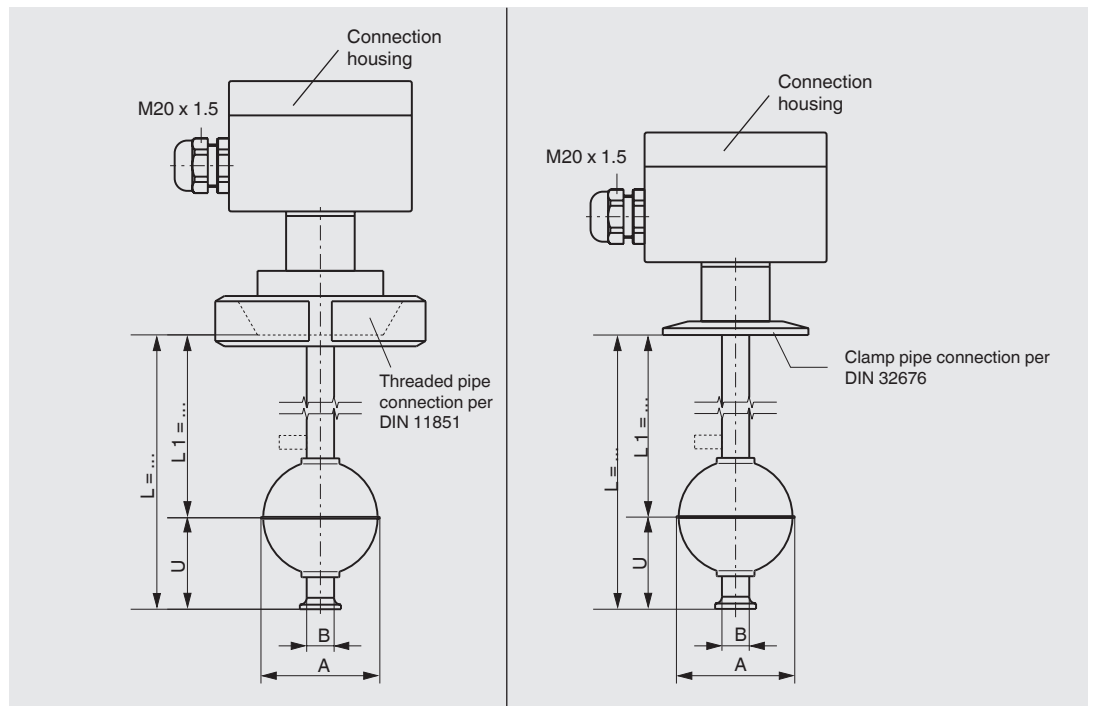


Special flange from polyamide or brass



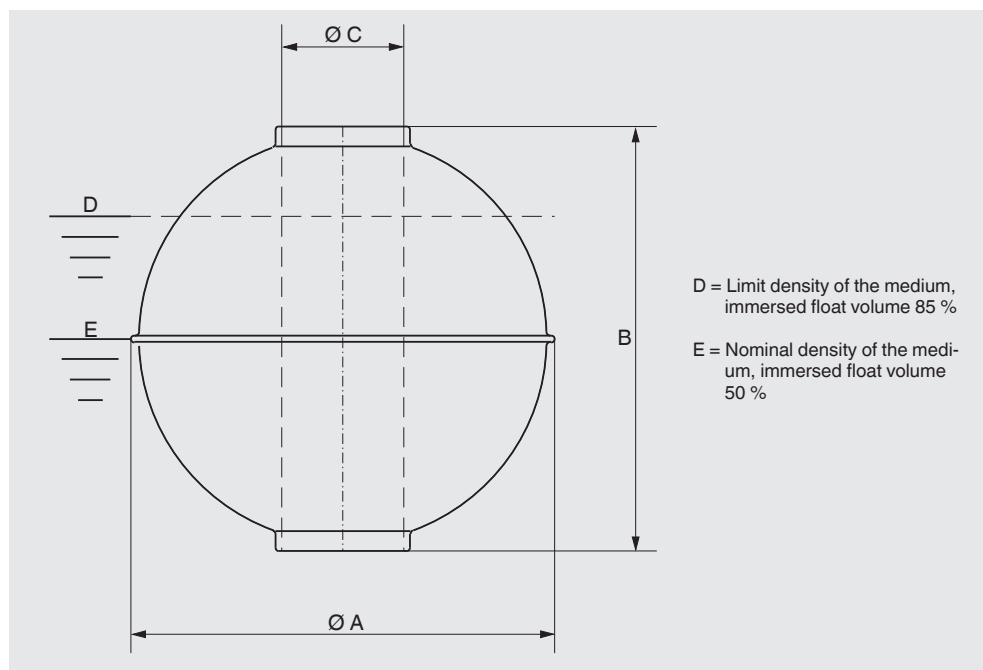
Food version

Process connection, guide tube and float from stainless steel



Specifications	Version with threaded pipe connection	Version with clamp pipe connection
Electrical connection	Connection housing ■ Aluminium 64 x 58 x 34 mm, with 1 contact ■ Aluminium 80 x 75 x 57 mm, 2 or more contacts ■ 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	≤ 3,000 mm	≤ 6,000 mm
Float	Material stainless steel 1.4435 or 1.4404, option electropolished Float diameter from 44 ... 80 mm Float selection depending on guide tube diameter and process conditions	
Temperature range	Process temperature: -30 ... +150 °C	
Switching function	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) contact - on rising level	
max. number of contacts	3 x NO or NC, or 3 x SPDT	
Switch position	Dimensions L1, L2, L3 ... (from sealing face, starting from top)	
Distance between switch points	Minimum 50 mm (depending on the selection of the float and the contacts)	
Switching power	Depending on the switching function. Please observe contact protection measures.	
Normally open, normally closed	AC 250 V; 100 VA; 1 A	DC 250 V; 50 W; 0.5 A
Change-over	AC 250 V; 40 VA; 1 A	DC 250 V; 20 W; 0.5 A
Mounting position	Vertical ±30°	
Ingress protection	IP65 per EN/IEC 60529	
Materials	Stainless steel 1.4435 or 1.4539	

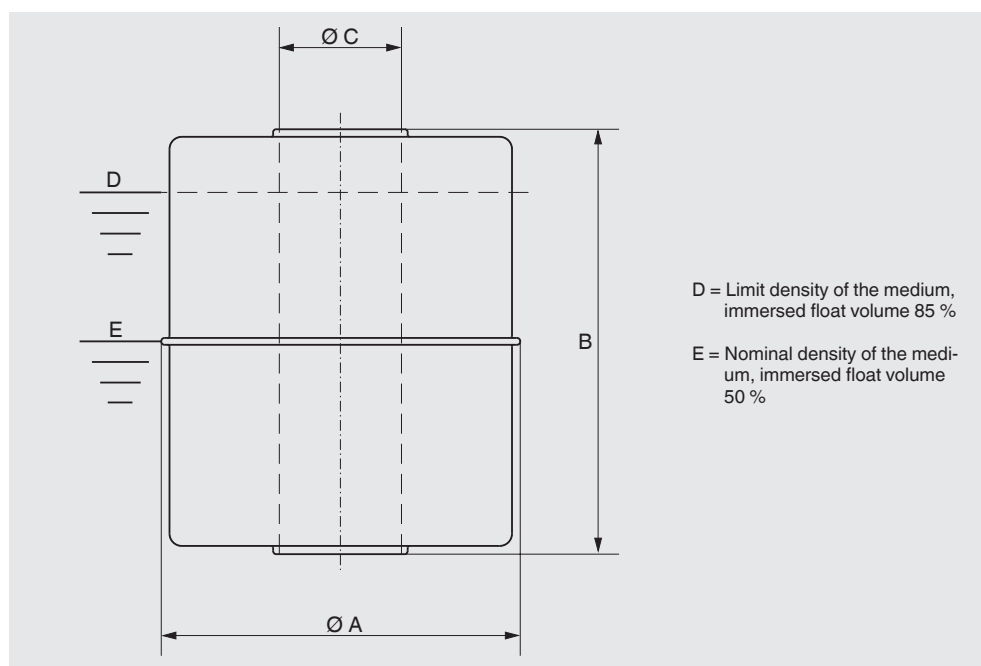
Spherical float (K)



Material	Version	Suits guide tube $\varnothing$ in mm	$\varnothing A$ in mm	B in mm	$\varnothing C$ in mm	Max. operating pressure in bar	Max. operating temperature in °C	Limit density 85 % in kg/m ³	Order number
Stainless steel 1.4571	V29A	8	29	28	9	6	100	977	5454
	V29A/0.2	8	29	28	9	25	100	1069	27355
	V52A	12	52	52	15	40	300	769	5462
	V62A	12	62	61	15	32	300	597	5511
	V83A	12	83	81	15	25	300	408	5485
	V80A	18	80	76	23	25	300	679	5478
	V98A	18	98	96	23	25	300	597	5489
	V105A	18	105	103	23	25	300	533	20652
	V120A	18	120	117	23	25	300	389	21721
Titanium 3.7035	T29A	8	29	28	9	30	100	822	5522
	T52A	12	52	52	15	25	300	707	5526
	T52A/1	12	52	52	15	80	300	1060	-
	T62A	12	62	62	15	25	300	505	5536
	T83A	12	83	81	15	25	300	278	5544
	T80A	18	80	76	23	25	300	665	112263
	T98A	18	98	96	23	25	300	495	-
	T105A	18	105	103	23	25	300	369	-
	T120A	18	120	117	23	25	300	329	-
Stainless steel 1.4571	VEC53A	12	53	53	14	25	depending on medium	745	-
E-CTFE coated	VEC63A	12	63	62	14	25	depending on medium	591	-
	VEC84A	12	84	82	14	25	depending on medium	403	-
	VEC81A	18	81	77	22	25	depending on medium	718	-
	VEC99A	18	99	97	22	25	depending on medium	675	-
	VEC106A	18	106	104	22	25	depending on medium	633	-
	VEC121A	18	121	118	22	25	depending on medium	459	-

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

Cylindrical floats (Z)



Material	Version	Suits guide tube $\varnothing$ in mm	$\varnothing A$ in mm	B in mm	$\varnothing C$ in mm	Max. operating pressure in bar	Max. operating temperature in °C	Limit density 85 % in kg/m ³	Order number
Stainless steel 1.4571	V27A	8	27	31	10	16	100	787	9679
	V44A	12	44	52	15	16	300	818	9681
Titanium 3.7035	T44A	12	44	52	15	16	300	720	9744
Buna (NBR)	B20A	8	20	20	9	3	80	939	9719
	B23A	8	23	25	9	3	80	802	9721
	B25A	8	25	14	9	3	80	787	9720
	B30A	8	30	45	13	3	80	683	34047
	B40A	12	40	30	15	3	80	581	9728
	B40A/120	12	40	120	15	3	80	409	-
	B50A	18	50	45	19	3	80	498	9725
PVC	P44A	12	44	44	14	3	60	651	33790
	P55A	16	55	54	22	3	60	798	-
	P55A/26	20	55	80	26	3	60	919	-
	P55A/70	16	55	70	22	3	60	674	-
	P80A	20	80	79	25	3	60	573	33796
Polypropylene	PP27A	8	27	29	9	3	80	755	15516
	PP35A	8	35	33	9	3	80	675	100347
	PP44A	12	44	44	14	3	80	478	15514
	PP55A	16	55	54	22	3	80	582	33792
	PP55A/26	20	55	80	26	3	80	669	-
	PP80A	20	80	79	25	3	80	431	33795
PVDF	PF44A	12	44	55	14	3	100	782	33791
	PF55A	16	55	69	22	3	100	821	116235
	PF55A/26	20	55	80	26	3	100	1140	-
	PF80A	20	80	79	25	3	100	681	33797
Stainless steel 1.4571 E-CTFE coated	VEC45A	12	45	53	14	16	depending on medium	782	-

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

Contact protection measures

The reed contacts should be protected against any voltage or current spikes that might occur.

Depending on the different load types different protective circuits are used.



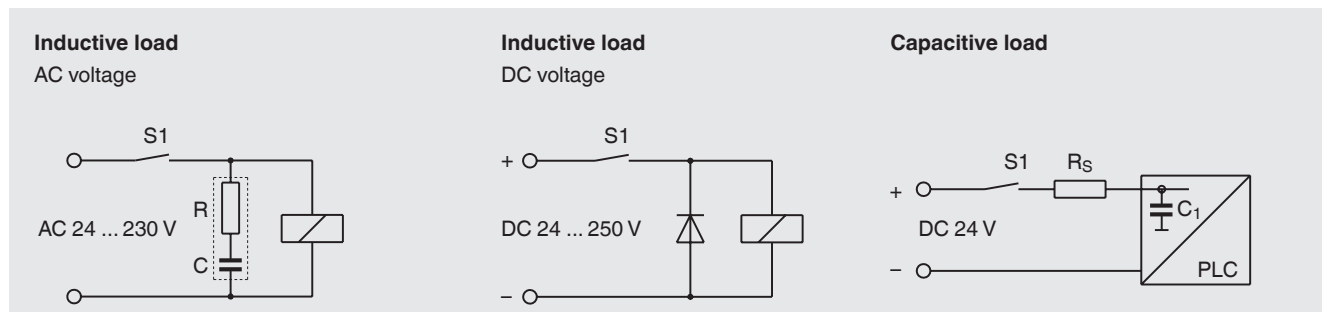
Model KR 24



RC module

Contact protection relays	Contacts	Input	Power supply	Approval number	Order number
KR 24	1 x change-over AC 250 V, 2 A	2 x contacts	DC 20 ... 30 V	-	112941
KR 24-EX	2 x change-over AC 253 V, 2 A	2 x contacts	DC 20 ... 30 V	II 1 GD EEx ia IIC, PTB 02 ATEX 2073	112944
KR 230	1 x change-over AC 250 V, 2 A	2 x contacts	AC 230 V	-	112942
KR 230-EX	2 x change-over AC 253 V, 2 A	2 x contacts	AC 230 V	II 1 GD EEx ia IIC, PTB 02 ATEX 2073	112943

RC module	Capacitance	Resistance	Voltage	Order number
B3/115	0.33 µF	470 Ohm	AC 115 V	110446
B3/230	0.33 µF	1,000 Ohm	AC 230 V	110460



Ordering information

To order the described product the order number (if available) is sufficient.

Alternatively:

Model / Version / Electrical connection / Process connection / Guide tube diameter / Guide tube length L / Information about contact (switching function, number of switch points, switch position) / process specifications (operating temperature and pressure, limit density) / Options

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