

**PROFI  
MESS**



**GMBH**

**2019**

**Level Switches**



# Level Switches

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## Conductive Level Monitoring /

**KS-01** / Low-Cost Conductive Level Switch

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**KS-01D** / Compact Low-Cost Conductive Level Switch to Screw-In

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**ER-01** / Conductive Electrode Relay

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**KS-02** / Conductive Level Switch for Vertical Mounting

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**KS-03** / Conductive Level Switch for Vertical Mounting with Changeover Outputs

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**WD-03** / Conductive Water-Leak-Detector

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## Capacitive Level Monitoring /

**FC-01** / Capacitive Level Switch for Liquids, Bulk Goods and Slurry

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## Level-Monitoring with Floater /

**FS-01** / Rugged Suspension Float Switch

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**FS-01EX** / Rugged Suspension Float Switch with ATEX Approval

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**FS-03** / Low-Cost Suspension Float Switch

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**FS-05** / Extra Slender Suspension Float Switch

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**FS-08** / Suspended Float Switch with Internal Weight

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**FS-16** / Teflon® Float Switch for Side Mounting

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**FS-17** / Stainless Steel Float Switch for Side Mounting

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**FS-10** / Suspension Float Switch for Bulk Goods

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**FS-04** / Rugged Float Switch for Horizontal Mounting with Shipping Approval

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**LS-10N** / Float Switch for Level Detection

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**LS-14** / Flap Float Switch for Horizontal Mounting made from Plastics

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**LS-15** / Flap Float Switch for Horizontal Mounting made of Stainless Steel

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**LS-15P** / Flap Float Switch for Horizontal Mounting made of Stainless Steel with Plug Connection

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**LS-16** / Miniature Float Switch for Vertical Mounting made from Plastics

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**LS-17** / Miniature Float Switch for Vertical Mounting made of Stainless Steel

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**LS-18** / Angled Miniature Float Switch for Vertical Mounting made of Stainless Steel

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## Optoelectronic Level Monitoring /

**FO-01** / Optoelectronic Level Switch for Vertical and Horizontal Mounting

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**FO-02N** / Optoelectronic Compact Level Switch

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**FO-03** / Optoelectronic Level Switch with under Pressure changeable Electronic Unit

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**FO-04** / Optoelectronic Level Switch for General Applications

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**FO-05** / Optoelectronic Level Switch High-Temperature Version

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## Vibrating Fork /

**FV-01** / Tuning Fork Switch for Liquids

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## Pressure Bell Level-Monitoring /

**FD-02** / Pressure Bell Switch for Level Monitoring

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## Level Monitoring with Rotating Vane /

**DF-02** / Rotating Vane Switch for Bulk Goods

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## Membrane Level-Monitoring /

**MS-04** / Membrane Level Switch for Bulk Goods

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# KS-01/D

## Conductive Level Switches



## Features

/ Low-cost electrodes

/ sideways mounting

/ Easy to assemble

/ No mechanics

/ Low maintenance requirements

## Description:

The KS-01/KS-01D series of conductive level switches is intended for obtaining the level of conductive fluids in combination with an electrode relay (e.g. ER-01). In case of no fluid between the two electrodes of the KS-01D or the vessel and the electrode of the KS-01, the circuit, provided by the electrode relay, is open and no current flows. As soon as liquid connects the electrodes, a flow of current is picked up by the electrode relay which transmits a switching signal. The KS-01 includes just one electrode, which is insulated against the vessel. The KS-01D contains two electrodes, both flush mounted in a plastic thread from polypropylene.

## Application:

- for determining limit level in vessels with conductive fluids
- full or empty reporting
- level controlling between two levels
- overload security
- dry-run protection



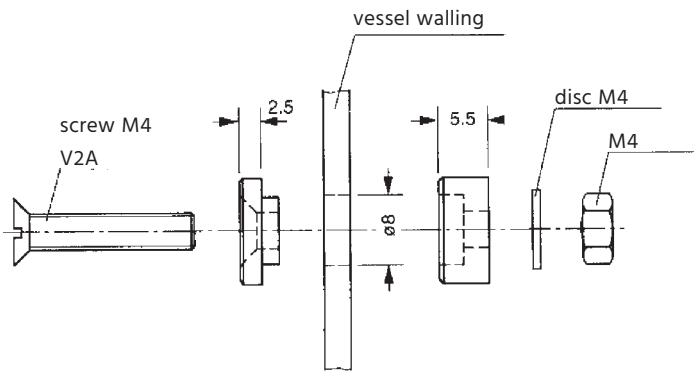
## Technical Spec. KS-01:

**Screw fit electrode /** stainless steel V2A with Teflon socket

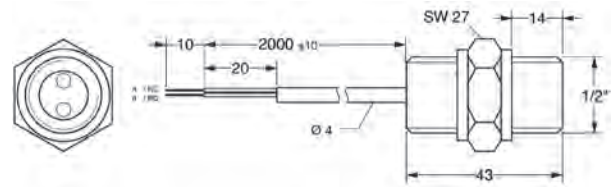
## Technical Spec. KS-01D:

**max. Pressure /** 6 bar  
**max. Media temp. /** -5...+105°C  
**Process connection /** G 1/2"-male  
**Electrical connection /** 2 m infused cable PVC,  
 2 wire, 0,25 mm<sup>2</sup> each

## Dimensions KS-01 in mm:



## Dimensions KS-01D in mm:



## Ordering Codes:

<b>Order number</b>	<b>KS-01.</b>	<b>1</b>
<b>KS-01 Screw fit electrode</b>		
<b>Material /</b>		
1 = stainless steel / teflon		

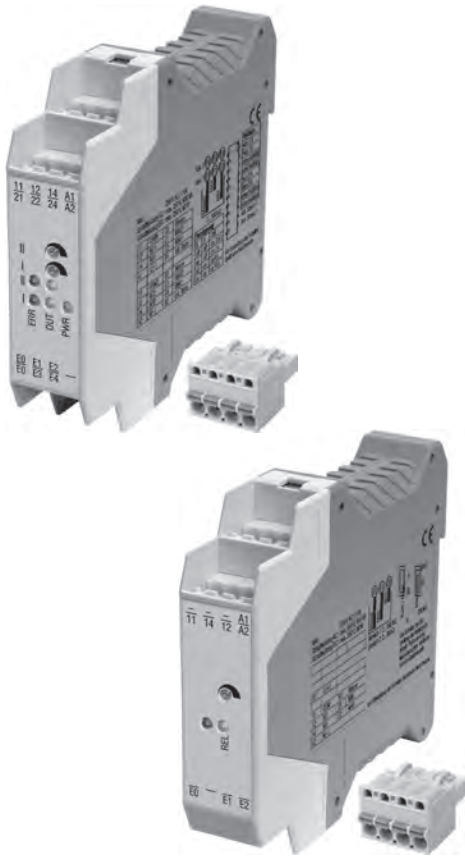
## Ordering Codes:

<b>Order number</b>	<b>KS-01D.</b>	<b>1</b>
<b>KS-01D Level switch</b>		
<b>Material /</b>		
1 = stainless steel / polypropylene		



# ER-01

## Conductive Electrode Relay



## Features

- / Single or dual channels
- / 24 V DC or 230 V AC
- / Secured galvanic isolation
- / MIN-MAX control
- / Limit value identification  
in conductive fluids
- / Operating and  
closed-circuit switchable

## Description:

The ER-01 electrode relay outputs a measuring voltage to a ground electrode and to one or more additional electrodes. While immersing the ground electrode and another electrode into the fluid that needs to be monitored, a low AC measuring current flows signaling the presence of a medium. Flow of this AC is intercepted by ER-01 and evaluated. Possible electrolytic disintegration of the medium and hazardous contact voltages are safely avoided, since the measuring current is very low and is not capable of generating any galvanic elements.

The ER-01 series of electrode relays can also be used as simple contact network relay in which, for example, potential-free REED contacts replace the electrodes. This is an important aspect if the maximum power rating of the REED emitter is insufficient for connecting the required heavy loads.

## Application:

Electrode relays are used in combination with conductive rod screw type or suspended electrodes (see also Profimess' KS-...), if the level of conductive fluids needs to be registered, controlled or regulated. In this, limit level switching (overflow and dry run) as well as MIN-MAX controls can be implemented. In this case, the relay at the output is changed over when one of the two limit levels is activated, with the result that the filling level reciprocates between these two predefined levels.



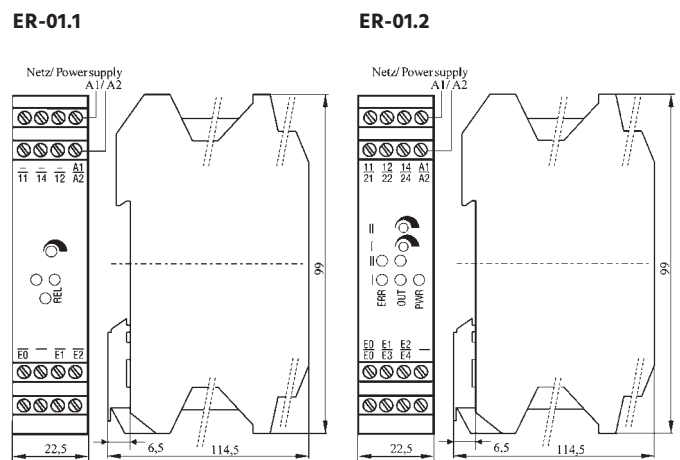
## Electrical Specifications:

<b>Supply voltage /</b>	ER-01.x.24: 24 V DC ER-01.x.230: 230 V AC, 48-62 Hz (24 V AC, 42 V AC, 48 V DC, 115 V AC and 127 V AC on request)
<b>Power consumption /</b>	max. 1 W / VA
<b>Input /</b>	
Open-circuit voltage:	≤ 10 VAC
Short-circuit current:	≤ 5 mA
Switching delay:	fixed about 0.5 s (0.5 s to 10 s switchable in 4 respectively 16 steps on request)
Sensitivity range:	2. . .300 kOhm
<b>Output /</b>	
Contacts:	one potential-free change-over- contact per channel (optionally additional change-over-contact for single channel version)
Switching voltage:	min. 5 V max. 250 VAC, max. 150 VDC
Switching current:	min. 5 mA <b>Single channel version:</b> max. 5 A bei $\cos \varphi = 1$ max. 3 A/AC bei $\cos \varphi = 0,7$ max. $\cos \varphi = 1$ <b>Two channel version:</b> max. 3 A at $\cos \varphi = 1$ max. 1 A/AC at $\cos \varphi = 0,7$ max. $\cos \varphi = 1$
<b>Operating-/closed- circuit current /</b>	switchable
Switching load:	min. 300 mW <b>Single channel version:</b> max. 1250 VA 150 W (30 VDC/5 A) <b>Two channel version:</b> max. 750 VA 150 W (30 VDC/5 A) 18 W (150 VDC/0.12 A)
<b>Protection class /</b>	terminals IP20, housing IP40
<b>CE marking /</b>	as per low voltage directive EN61010-1 as per EMV directive EN61326-1
<b>Options /</b>	EX approval: interface detection for media of different conductivities  approval for overfill protection as per German WHG (German Water Resources Act)

## Technical Specifications:

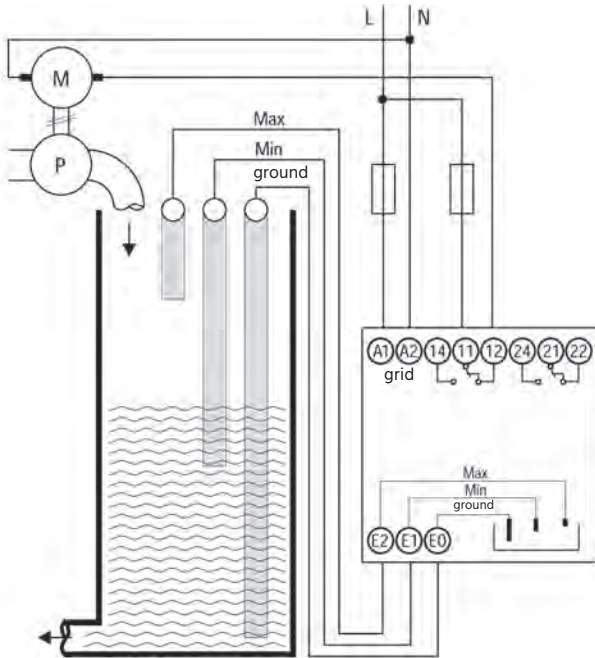
<b>Operating temperature /</b>	-20. . .+60°C
<b>Storage temperature /</b>	-30. . .+80°C
<b>Weight /</b>	ca. 150 g
<b>Dimensions /</b>	99.0 x 22.5 x 114.5 mm (L x B x T)
<b>Connectors /</b>	plug-in terminals

## Dimensions in mm:

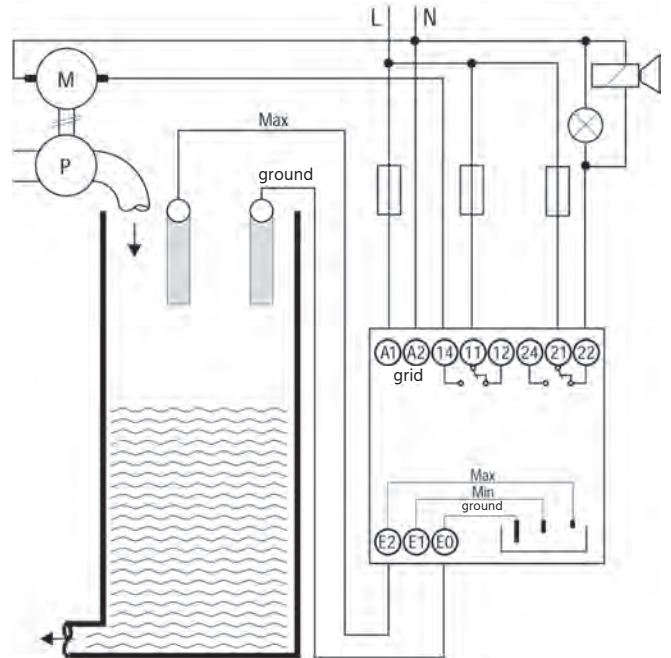


### Connection examples 1 channel relay

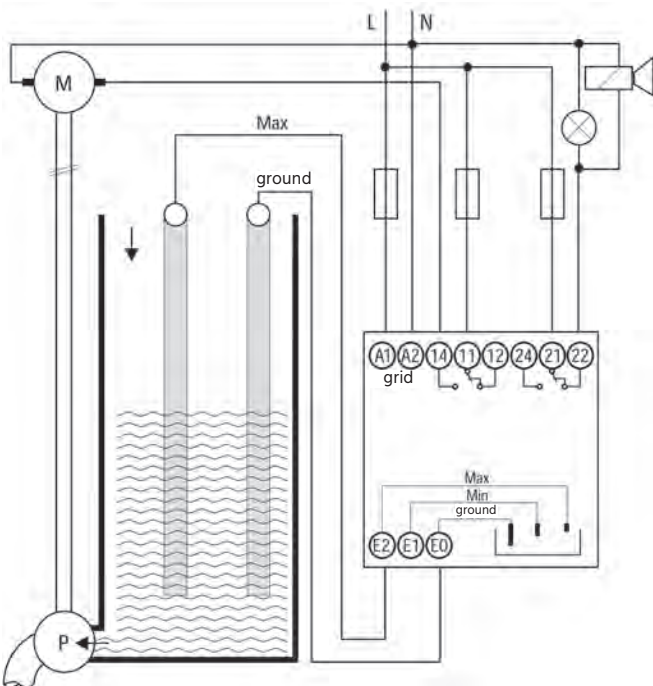
Connection example for filling  
 Limit level detection in active current operation  
 (min/max operation)



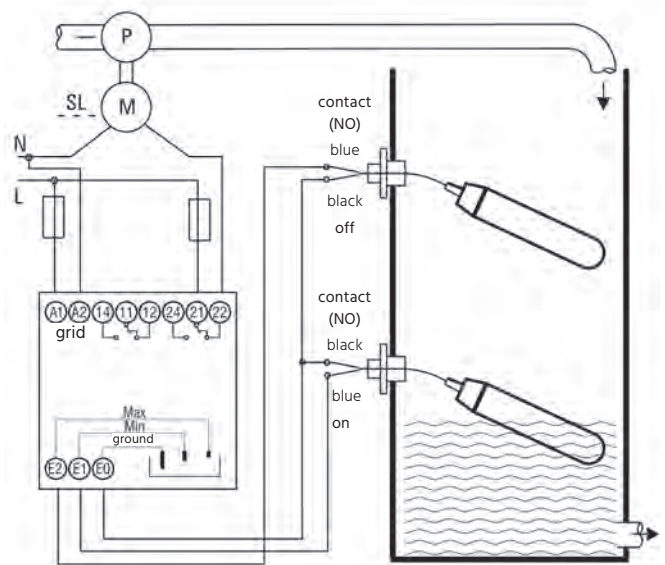
Connection example for overflow  
 Limit level detection in standby current operation  
 (Optional: 1 channel relay, 2 change-over contacts)



Connection example for dry run  
 Limit level detection in active current operation  
 (Optional: 1 channel relay, 2 change-over contacts)



Connection example for filling  
 Limit level detection in active current operation  
 with float switches



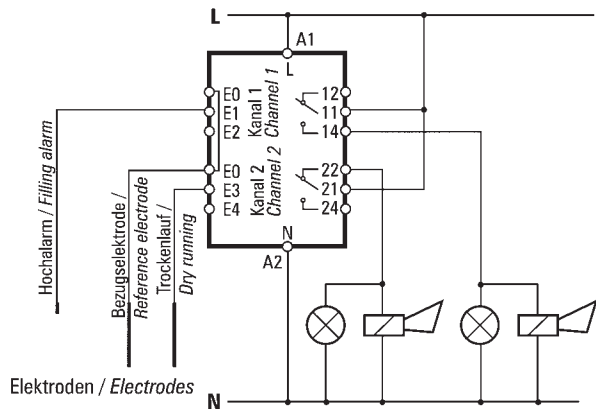
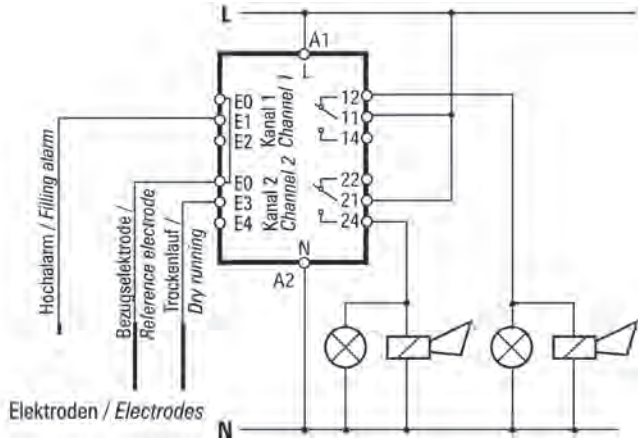




### Connection examples 2 channel relay

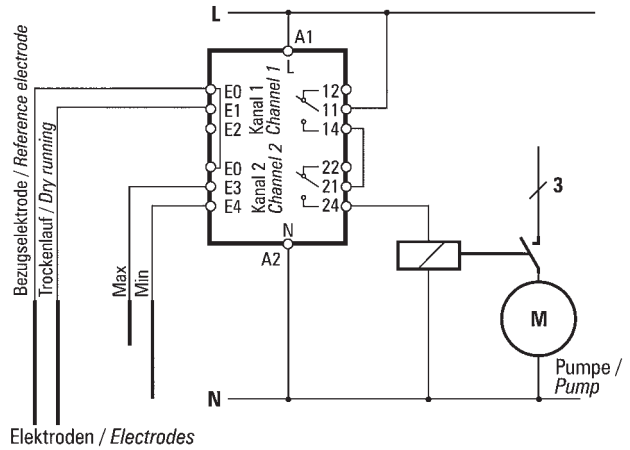
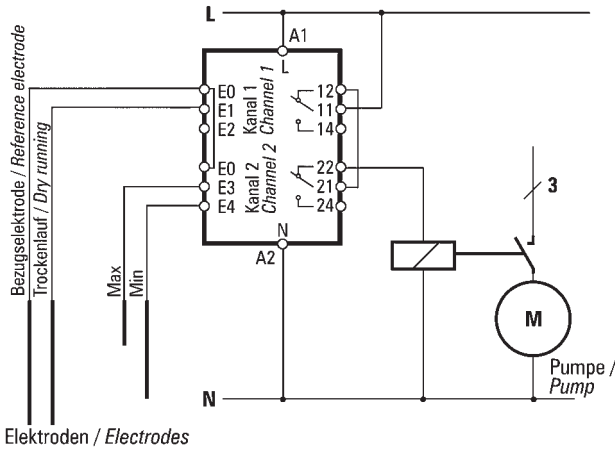
Channel 1: high alarm,  
Channel 2: dry run standby current, high alarm, dry run

Channel 1: high alarm,  
Channel 2: dry run active current, high alarm, dry run



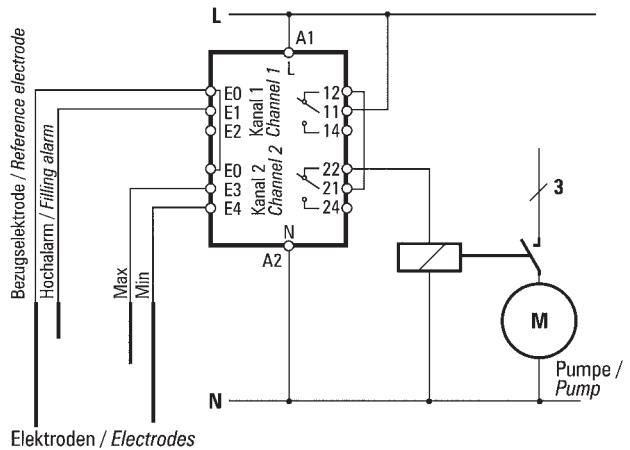
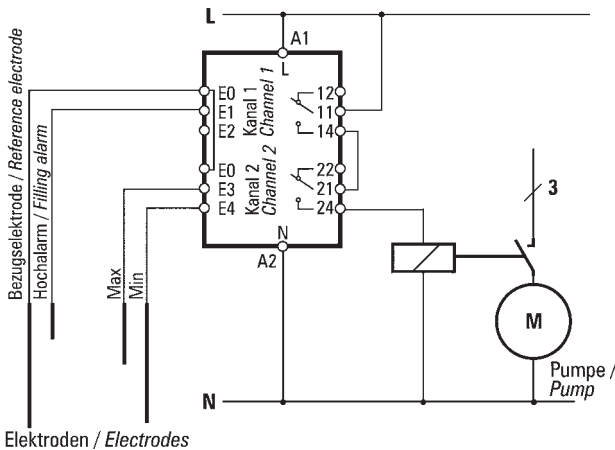
Channel 1: dry run,  
Channel 2: min/max standby current, empty container

Channel 1: dry run,  
Channel 2: min/max active current, empty container



Channel 1: high alarm,  
Channel 2: min/max standby current, fill container

Channel 1: high alarm,  
Channel 2: min/max active current, fill container





# KS-02

## Conductive Level Switch



## Features

**/ Single or multiple electrodes  
(up to 5 setpoints)**

**/ Easy to assemble**

**/ Electrode rods made of st. steel**

**/ Electrode relay for limit values,  
pump control or pump control  
with overflow and dry-run pro-  
tection (see Data sheet ER-01)**

## Description:

The KS-02 series of conductive level switches is intended, in combination with the electrode relay ER-01, for obtaining the level of conductive fluids. An AC voltage is connected to an electrode insulated from the vessel. When the medium contacts this electrode, a small current flows from the electrode through the medium to the vessel wall (in the case of plastic vessels to a separate ground electrode). This flow of current is picked up by the electrode relay and transmitted as a switching signal.

## Application:

- for determining limit level in vessels with conductive fluids
- full or empty reporting
- level control between two levels
- overflow protection
- dry-run protections

Benefits:

- no mechanical moving components
- independent of specific weight of medium
- compact design
- possible to mount vertically or horizontally



## Versions:

- KS-02.01. . .05:** Single electrode with fixed screw on thread or with cutting ring joint for adjusting the electrode length  
**Electrical connection:** PVC or silicon cable or polyester terminal housing
- KS-02.25. . .28:** Multiple electrodes  
 max. number of electrodes depends on size of joint  
**Electrical connection:** polyester terminal housing

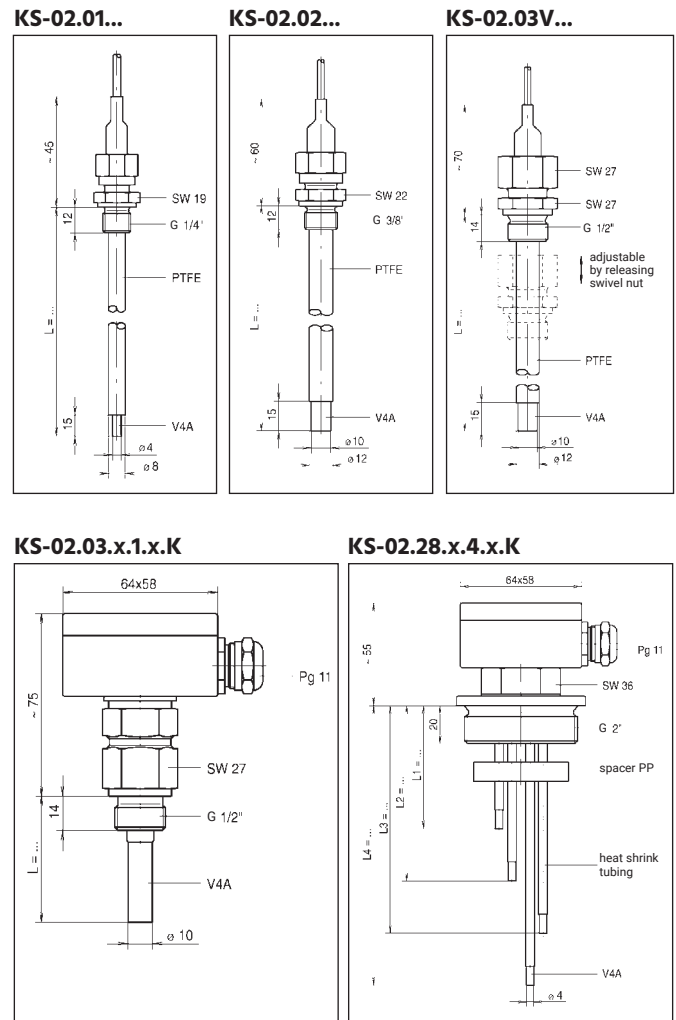
## Technical Specifications:

- max. Pressure /** 1 bar (single electrode), up to 100 bar, on request pressureless (multiple electrodes)
- max. Media temp. /** +100°C (single electrodes)  
 +80°C (single electrodes, adjustable and multiple electrodes)
- Coating /** Teflon

## Dimensions in mm:

## Ordering Codes:

Order number	KS-02.	01.	2.	3.	1.	xP.	L1
<b>KS-02 Conductive Level Switch</b>							
<b>Process connection /</b>							
<b>Single electrodes</b>							
01 = G 1/4" male							
01V = G 1/4" male adjustable							
02 = G 3/8" male							
02V = G 3/8" male adjustable							
03 = G 1/2" male							
03V = G 1/2" male adjustable							
05 = G 1" male							
<b>Multiple electrodes</b>							
25 = G 1" male (max. 2 Electrodes)							
26 = G 1 1/4" male (max. 3 Electrodes)							
27 = G 1 1/2" male (max. 3 Electrodes)							
28 = G 2" male (max. 5 Electrodes)							
99 = special type connection							
<b>Material for process connection /</b>							
2 = stainless steel							
3 = PP (starting from G 1 1/2")							
<b>Number of electrodes /</b>							
1..5							
<b>Electrode material /</b>							
1 = stainless steel							
<b>Electrical connection /</b>							
<b>Single electrodes only</b>							
xP = PVC cable, x = length in m (standard = 3 m) T = -5...+80°C							
xS = Silicone cable, x = length in m (standard = 3 m) T = -5...+80°C							
<b>Single or multiple electrodes</b>							
K = polyester terminal connection housing (starting from G 3/8")							
9 = special type connection							
<b>Other details /</b>							
L1, L2, L3... = length of individual electrodes from sealing edge of screw joint							





# KS-03

## Compact Conductive Level Switch



## Features

**/ With integrated electronics**

**/ 24 V DC supply**

**/ One switching point or**

**MIN/MAX control**

**/ Adjustable sensitivity**

**/ Electrode material SS, Titanium,**

**Hastelloy or Tantalum**

**/ Plastic or stainless steel head**

## Description:

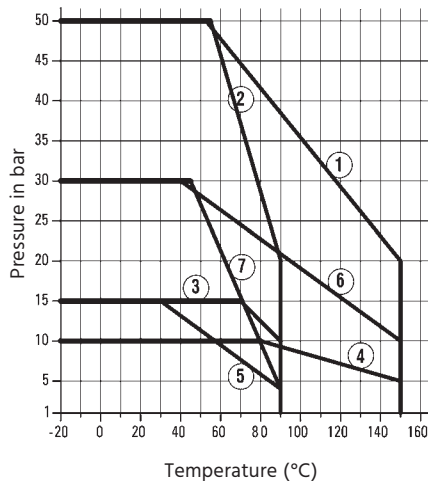
Inside the connector head of the KS-03 compact conductive switch is an electronic unit that is supplied with 24 V DC to provide a weak AC voltage to the switch's electrode rods. Whenever a conductive fluid establishes a connection between two of the electrodes, it results in an AC current which is recognized by the electronic components; subsequently it activates at the output an NO contact either as a limit switch or as MIN-MAX control. In this way, any excess or shortfall of allowed fill level can be monitored, or a particular level between two predefined levels (emptying or filling) can be maintained.

## Application:

The compact conductive switch KS-03 is unbeatable in its versatility. The connector head and the screw joints can be made of plastics or stainless steel; the electrode rods can be made of Hastelloy, Titanium, Tantalum or stainless steel where the rods can be insulated partially or fully using different materials. The electronic component in the connector head of KS-03 offers the option of four different settings of sensitivity which enable under circumstances also capturing interfaces between two fluids with KS-03 if the fluids are adequately different in their conductivity. The attractive pricing and compact design of KS-03 make the device an ideal choice for a number of applications in practically every type of automation in the industry.



## Pressure & Temp.-Curves:



- Curve 1:** stainless steel screw fitting with PTFE-coated electrodes
- Curve 2:** stainless steel screw fitting with PA-coated electrodes
- Curve 3:** PPH-screw fitting with PTFE-coated electrodes
- Curve 4:** PTFE-screw fitting with PTFE-coated electrodes
- Curve 5:** PA or PVDF-screw fitting (special design)
- Curve 6:** stainless steel screw fitting (special design) with PTFE-coated electrodes
- Curve 7:** stainless steel screw fitting (special design) with PA-coated electrodes

## Technical Specifications:

<b>Operating temp. /</b>	see Pressure-Temperature curves
<b>Connection thread /</b>	G1"-male, G1 ¼"-male, G1 ½"-male or G2 ¾"-swivel nut
<b>Screw con. material /</b>	PPH, PTFE or stainless steel 1.4571
<b>Electrode material /</b>	stainless steel 1.4571, Titanium, Hastelloy B, Hastelloy C or Tantalum
<b>Coating material /</b>	polyamide or PTFE
<b>Coating length /</b>	full (entire rod, 10 mm at the end blank) or partial (up to approx. 250 mm from top)
<b>Rod diameter /</b>	4 mm or 6 mm
<b>Rod length /</b>	max. 6000 mm
<b>Spacer /</b>	one spacer every 1000 mm required

## Electrical Specifications:

<b>Supply voltage /</b>	20...30 VDC, potential-free (ungrounded)
<b>Power consumption /</b>	max. 2 W
<b>Switching voltage /</b>	max. 230 V AC / DC, min. 5 VDC (CMOS-Relay)
<b>Switching current /</b>	max. 0.1 A AC / DC, min. < 1 mA
<b>Switching load /</b>	max. 25 VA / W
<b>Sensitivity /</b>	3 k...100 kOhm in four levels (3, 10, 30, 100 selectable)
<b>Operating temp. electronics /</b>	-20...+85°C
<b>Storage temp. electronics /</b>	-30...+85°C
<b>Protection class /</b>	IP65

## Ordering Codes:

Order no. **KS-03. PP. 3. 1. 2. VA. 6. TI. 1. 2**

### KS-03 Compact Level Switch

#### Connector head /

PP = polypropylene  
VA = stainless steel

#### No. of electrodes /

2 = 2 electrodes  
3 = 3 electrodes

#### Screw fitting /

1 = standard (PPH for PP-head, VA for SS-head)  
2 = PTFE (Polytetrafluorethylene)

#### Connecting thread /

1 = G 1"-male (only for 2 electrodes)  
2 = G 1 ¼"-male  
3 = G 1 ½"-male  
4 = G 2 ¾"-swivel nut

#### Rod material /

VA = stainless steel 1.4571  
HB = Hastelloy B  
HC = Hastelloy C  
TI = Titanium  
TA = Tantalum  
HBTA = Tantalum tip 100 mm, basic rod Hastelloy B

#### Rod diameter /

4 = 4 mm  
6 = 6 mm

#### Coating /

PA = Polyamide (only for VA rod)  
TI = partially insulated PTFE  
VI = fully insulated PTFE

#### Sealing /

1 = Viton (standard)  
2 = Kalrez

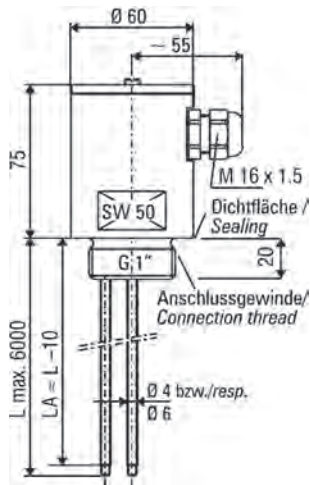
#### Electronic components /

0 = none  
1 = 1 limit value (NC, opening when the level reaches the setpoint)  
2 = MIN-MAX control (connecting thread  $\geq$  G 1 ¼")

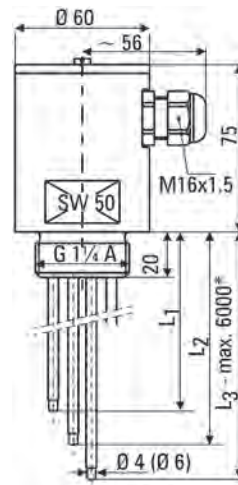


# Dimensions in mm:

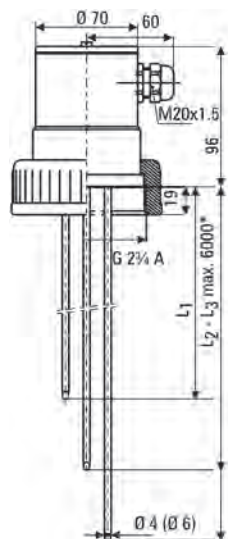
Dim. KS-03.PP.2.x.1



Dim. KS-03.PP.3.x.2



Dim. KS-03.PP.3.x.4

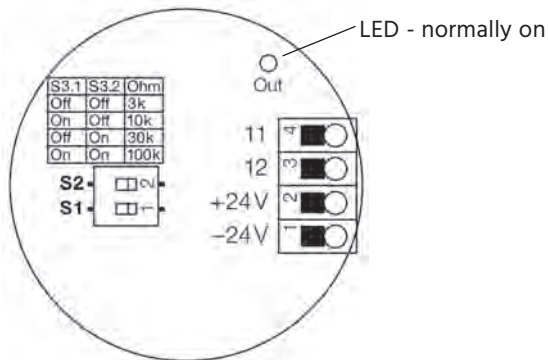


Dim. KS-03.VA.3.x.2



\*greater lengths on request

# Electrical Connection:





# WD-03

## Water Leak Detector

### Description:

The water-leak-detector WD-03 series detects conductive liquids e.g. water in drip pans beneath containers. The WD-03 reacts with visible and audible alarms, as soon as it detects a leak, therefore avoiding expensive damages. The operating principle of WD-03 bases on the conductivity of water or another conductive liquid. The contacts at the bottom of WD-03 detect the resistance alteration that takes place, as soon as these contacts are wetted by the leaking fluid and get therefore galvanically connected. Model WD-03.B is battery powered and offers an audible alarm, a visible alarm by red LED and a solid-state-relay output. A yellow LED indicates also, when the battery is weak. Models WD-03.DN, and WD-03.DY are 11. . 27 V AC/DC line powered and include a DPDT-relay. An additional green LED indicates the active supply voltage. Mounting bracket MB is included. It enables the user to adjust the mounting height of WD-03, if it is placed at the bottom of a drip pan, and the unit shall be mounted in an increased position to avoid false alarms. The mounting height of WD-03 is therefore adjustable down to 0.8 mm ground clearance. The bracket can be attached to a flat surface by using either the attached adhesive strips or mounting screws. Of course, WD-03 may also be mounted to the side wall of a drip pan.

### Features

- / Cost-effective
- / Protection against short-circuit
- / Protection against corrosion
- / Easy to install
- / Battery or line powered
- / Audible and visible alarms
- / Green LED indicates supply voltage
- / Relay output

### Application:

The WD-03 series is used to detect water and other conductive, nonaggressive liquids. The units are simply mounted beneath HVAC facilities, dishwashers, washing machines, refrigerators, compressors or electrical facilities to detect draining conductive fluids. The WD-03 series is very affordable and offers a reliable protection against the significant cost following the spilling of liquids into sensible areas.



## Versions:

### Supply voltage /

WD-03.B: 3 V CR2450 lithium metal battery, user replaceable, lifespan app. 5 years steady state, app. 48 hours during alarm condition

WD-03.DN: 11. . .27 V AC/DC

WD-03.DY: 11. . .27 V AC/DC

### Alarms /

WD-03.B: audible alarm: min. 85 dB at one foot distance  
LED-Alarm: red LED

WD-03.DN: audible alarm: none,  
LED-Alarm: red LED

WD-03.DY: audible alarm: min. 85 dB at one foot distance  
LED-Alarm: red LED

### Relay outputs /

WD-03.B: one SPST-Relay, normally opened, SSR (Solid-State-Relay)

WD-03.DN: one DPDT Relay

WD-03.DY: one DPDT Relay

## Electrical Specifications:

### Switching load /

WD-03.B: max. 250 mA at 24 VDC

WD-03.DN, WD-03.DY: max. 1 A at 24 VAC/DC

### Power consumption /

WD-03.B: 0.9 mA steady state, 3.0 mA during alarm condition

WD-03.DN, WD-03.DY: 30 mA steady state, 85 mA during alarm condition

### Electrical connection /

1,5 m cable, PVC-insulated, 22 AWG, UL plenum rated

## Technical Specifications:

### Materials /

ABS and Polycarbonat with flammability classification UL 94 V-0

### Protection class /

WD-03.B and WD-03.DY: submersible up to ¾ of the body height. Beyond this point, water will penetrate into the loudspeaker.  
WD-03.DN: IP68, submersible

### Temperature range /

0. . .50°C

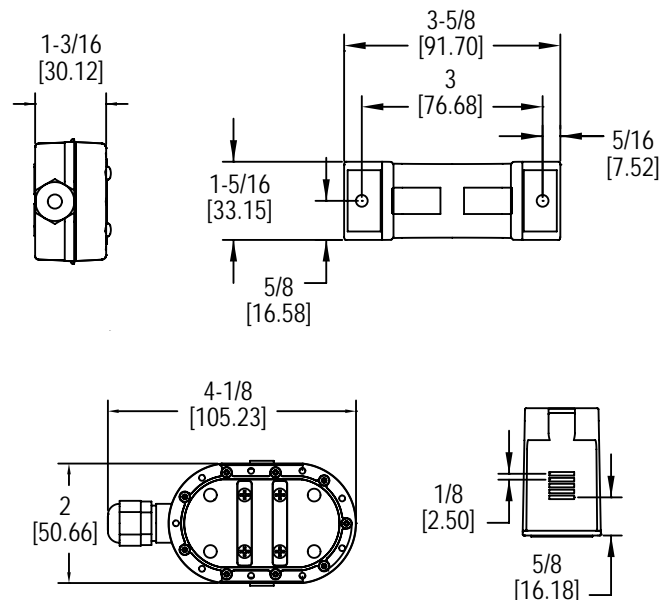
### Weight /

ca. 138 g;

### Approvals /

CE, RoHS

## Dimensions in inch [mm]:



## Ordering Codes:

### Order number

WD-03. B. MB

### WD-03 Water Leak Detector

### Version /

B = battery powered with SPST relay  
DN = line powered with DPDT relay, 11. . .27 V AC/DC, no audible alarm  
DY = line powered with DPDT relay, 11. . .27 V AC/DC, with audible alarm

### Accessories /

0 = none  
MB = additional mounting bracket, one piece is included





# FC-01

## Limit Level Switch for Bulk Goods, Fluids, Slurries, Interface and Foam Detection



## Features

- / Easy to mount
- / Maintenance-free
- / No moving components
- / Adjustable sensitivity

## Description:

The FC-01 series of capacitive limit level switches utilizes the different dielectric constant between air and the medium being monitored in order to detect its presence. A plate capacitor, whose electrical properties depend on the dielectric number of the medium surrounding it, is situated within a protective tube made of plastic. The capacity  $C$  of this capacitor is captured by measuring the impedance of a circuit loaded with high-frequency current and evaluated. The response sensitivity of the FC-01 can be adjusted directly on the device by means of a simple potentiometer. In the event of a switching operation, the current in the supplying 2-wire loop drops from 20 mA to 4 mA (or increases inversely depending on the polarity) and a potential-free transistor or relay output switches through.

## Application:

The FC-01 is suited for monitoring solid and fluid media including slurries and foam. Selectively, the sensor material is made out of Kynar or abrasion-resistant Ryton so that even hostile and abrasive materials can be detected without problem. The range for temperature is kept at a generous range of  $-30 \dots +100^{\circ}\text{C}$  or  $-10 \dots +100^{\circ}\text{C}$  in order to allow a maximum of 10 bar pressure in the entire range. Also with regard to the downstream evaluating electronics the user has no limits. The „Current Sink“ output operates along with 2-wire feeder devices and the potential-free transistor or relay output can connect to DC and AC voltages up to 30 (60) V. The FC-01 can be provided with terminal housing for harsh atmospheric conditions or with fixed cable cord and optionally as intrinsically safe version for Zone 0 or Zone 20 (barrier required). For applications in chemically aggressive areas a fully synthetic version is available, which offers a process connection made of PPS instead of stainless steel. The chemical resistance of the FC-01, its insensitivity to high vibrations, its accuracy and, not the least, it's affordable price render the FC-01 into a universal device that is capable of replacing a tuning fork-switch, a rotating vane sensor or a float switch in many places.



# Electrical Specifications:

<b>Supply voltage /</b>	standard 12. . .33VDC, intrinsically safe 10. . .30VDC
<b>Output signal /</b>	falling or rising current 20 on 4 mA or 4 on 20 mA, depending on connection
<b>Switching output /</b>	transistor: 30 V DC/AC, max. 82 mA
<b>Switching output fully synthetic version /</b>	relay: 60 VDC, 30 VAC, max. 1 A (limited to 35 VDC / 16 VAC when mounted in wet locations)
<b>Repeatability /</b>	2 mm
<b>Dielectric constant /</b>	min. 1.5
<b>Protection class /</b>	IP65 with cable cord IP68 with housing
<b>Certificates /</b>	Int. safe (barrier required): CSA/FM Class I, II und III, Div. 1, Groups A, B, C, D, E, F, G, T4 ATEX II 1 GD 1/2GD EEx ia IIC T4. . .T6 T107°C

# Technical Specifications:

<b>Measuring length /</b>	100 mm
<b>Ambient temperature /</b>	-30. . .+85°C Fully synthetic: -10. . .+85°C
<b>Media temperature /</b>	-30. . .+100°C Fully synthetic: -10. . .+100°C
<b>Pressure /</b>	-1. . .10bar
<b>Media /</b>	fluids, bulk goods, slurries, interfaces, foam
<b>Process connection /</b>	¾" NPT [(conical), ANSI/ASME B1.20.1  R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]  G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
<b>Connection material /</b>	st. steel 1.4404 or PPS
<b>Sensor material /</b>	PPS (PVDF optional)
<b>Housing material /</b>	thermoplastic Polyester
<b>Lid material /</b>	thermoplastic polycarbonat (PC), transparent
<b>Cable /</b>	1 m, 4 x 0,5 mm <sup>2</sup> shielded, polyester hood
<b>Cable insertion /</b>	½"-NPT (M20 x 1.5 on request)
<b>Sealing /</b>	FKM (optional FFKM)

# Ordering Codes:

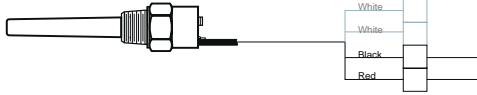
<b>Order number</b>	<b>FC-01.</b>	<b>1.</b>	<b>1.</b>	<b>1.</b>	<b>0.</b>	<b>0.</b>	<b>0</b>
<b>FC-01 Limit Level Switch</b>							
<b>Process connection /</b> 1 = ¾"-NPT thread 2 = R 1"- thread (BSPT) 3 = G 1"- thread (BSPP), not for fully synth. version							
<b>Device version /</b> 1 = standard with cable cord (1 meter), process connection made of stainless steel 2 = version with housing and clamp block, process connection made of stainless steel 2 = fully synthetic version with housing and clamp block, process connection made of PPS							
<b>Sensor material /</b> 1 = Ryton (PPS) 2 = Kynar (PVDF), not for fully synthetic version							
<b>Overfill protection /</b> 0 = none 1 = with (as per German Federal Water act WHG)							
<b>Approvals /</b> 0 = none 1 = ATEX, II 1 GD 1/2GD EEx ia IIC T4. . .T6 T107°C, not for fully synthetic version							
<b>Additional protection sleeve (FC-01.1 with ¾"-NPT conn.) /</b> 0 = none 1 = protection sleeve made of PPS with process connection ¾"-NPT-male 2 = protection sleeve made of PPS with process connection R1"-male							



# Electrical Connection:

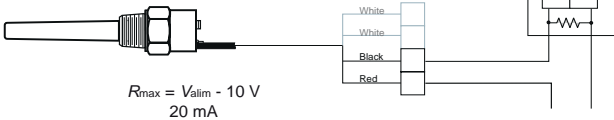
## Cable Version (not intrinsically safe):

### MIN / MAX alarm



polarity as required for desired operation  
DC 12...33 V

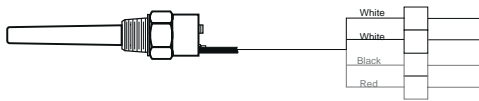
### 4/20 mA loop alarm



$$R_{max} = \frac{V_{lim} - 10 V}{20 \text{ mA}}$$

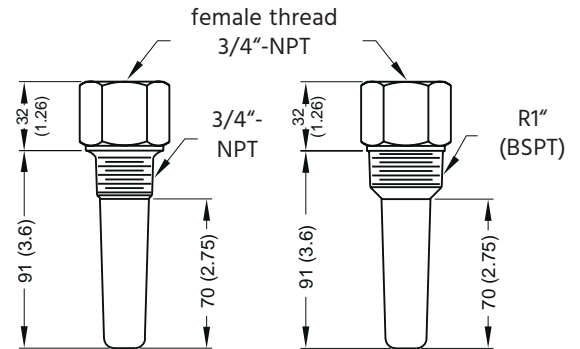
supply  
DC 12...33 V

### Solid state Switch

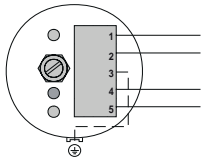


Transistor  
DC 30 V / AC 30 V (peak)  
82 mA max.  
DC 12...33 VDC

## Optionale separate prot. sleeve:



## Housing and fully synthetic version



### Terminal operations

- 1 mA current loop (+V or -V)
  - 2 mA current loop (+V or -V)
  - 3 ground
  - 4 solid state/relay
  - 5 solid state/relay
- solid state/relay normally open in unpowered state, relay just available for fully synthetic version

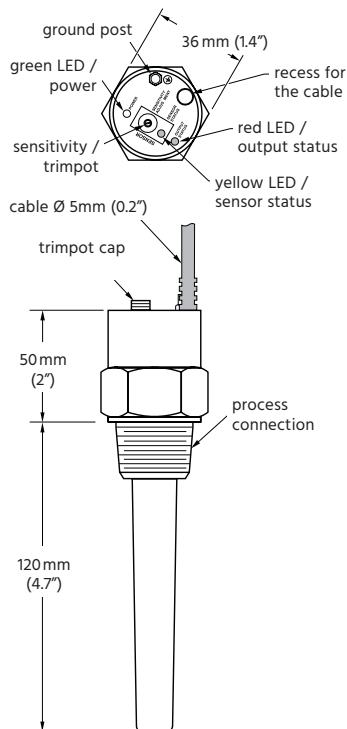
### Cable equivalent

- red wire
- black wire
- cable shield
- white wire
- white wire

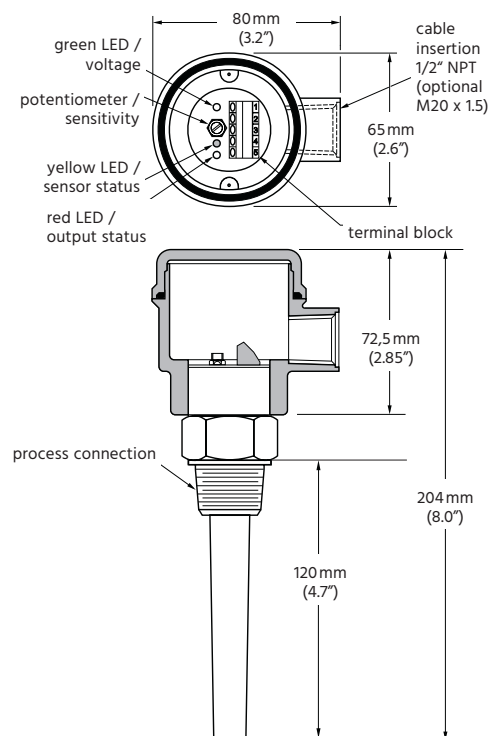
**Note:** use protection diode for inductive load!

# Dimensions in mm:

## Standard Version



## Housing Version





# FS-01

## Float Switch

## Features

- / Easy to assemble
- / Cost-effective
- / Any mounting position
- / No response lag
- / Maintenance-free
- / Reliable
- / High switching load

## Description:

The FS-01 series of float switch operates according to the principle of buoyancy. A hollow float is lifted by the raising level of fluid as long as a switching operation is triggered at an angle of 25° to the horizontal line. The switch can be suspended by means of a screw joint directly in the vessel or, in the case of open vessels, from above. The setpoint is determined by the weight that is always included in the delivery package. The FS-01 consists of an extremely rough, nearly unbreakable polypropylene float. The switch is, therefore, almost unsinkable even due to excessive mechanical stress.

## Application:

The FS-01 level switch is suited for level monitoring in fluids as in all types of industrial applications of direct pump controlling thanks to its high power rating. It can be used especially as control for MIN, MAX, FULL, EMPTY, OVERFILL and DRY-RUN.



## Technical Specifications:

<b>max. Pressure /</b>	3.5 bar
<b>max. Media temp. /</b>	85°C
<b>Float /</b>	PP
<b>Media density /</b>	0.7...1.15 g/cm <sup>3</sup>
<b>Float weight /</b>	200 g without cable
<b>Adjustable weight /</b>	250 g movable on cable
<b>Switching angle /</b>	± 25° to the horizontal line

## Electrical Specifications:

<b>Contact /</b>	micro-switch as change-over contact 12, 24, 48 VAC/VDC and 250 VAC - 50/60 Hz 16 A (resistive), 6 A (inductive)
<b>Cable /</b>	3 x 1 mm <sup>2</sup> , neoprene
<b>Cable weight /</b>	115 g/m
<b>Protection class /</b>	IP 68

## Ordering Codes:

**Order number** FS-01. 1

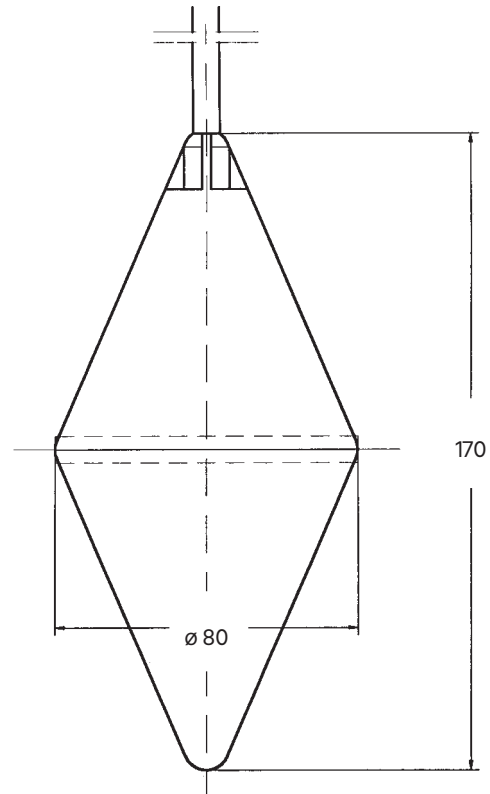
**FS-01 Float Switch**

**Cable length /**

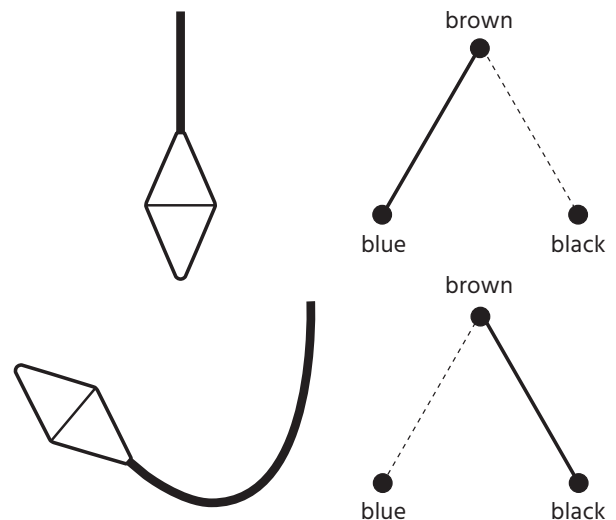
- 1 = 5 m cable
- 2 = 10 m cable

specific lengths on request

## Dimensions in mm:



## Electrical Connection:





# FS-01EX

## Float Switch

## Features

- / ATEX approval for Zone 0 and 20,  
gases, dust and vapours**
- / HR HY (Hypalon) -coated  
float for hostile media**
- / HR HY (Hypalon) cable**
- / Non-Ex-version with  
high switching load**
- / Ex-version with gold contacts  
for intrinsically safe operation**

## Description:

In the same way as the simple FS-01, the FS-01EX operates according to the principle of buoyancy. A hollow float is lifted by the raising level of fluid as long as a switching operation is triggered at an angle of 25° to the horizontal line. The float switch can be inserted from the side by means of a screw joint directly in the vessel or, suspended from above with a weight as the pivot into the vessel or duct. The float of the FS-01EX is made of polypropylene as the basic material which is fully coated with HR HY (Hypalon). This material, also used for the FS-01EX cable, has excellent resistance to chemically hostile media. In the Ex version, the FS-01EX has gold-plated contacts instead of a standard micro-switch and must therefore be evaluated by an intrinsically safe power circuit.

## Application:

The FS-01EX level switch is suited for level monitoring in chemically hostile fluids as they frequently occur, for example, in sewage treatment plants or pump sumps in contaminated soils. The switch is supplied always in the Hypalon-coated version and the standard version can be loadable with 16 (6) A at 250 VAC. In the ATEX approved variant, the mechanical design remains unchanged; however, the micro-switch is designed for an intrinsically safe power circuit.



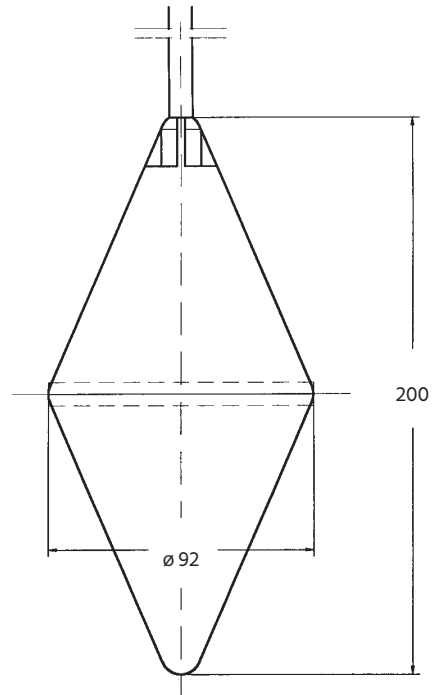
## Technical Specifications:

<b>max. Pressure /</b>	4 bar
<b>max. Mediatemp. /</b>	<b>FS-01EX.x.1</b> - without approval: max. 90°C <b>FS-01EX.x.2</b> - with approval: T6 and Ta at ambient temperature from -20. . .+70°C
<b>Float /</b>	PP, fully HR HY (Hypalon) coated
<b>Media density /</b>	0,8. . .1,10 g/cm <sup>3</sup>
<b>Float weight /</b>	300 g without cable
<b>Adjustable weight /</b>	250 g movable on cable
<b>Switching angle /</b>	± 25° to the horizontal line

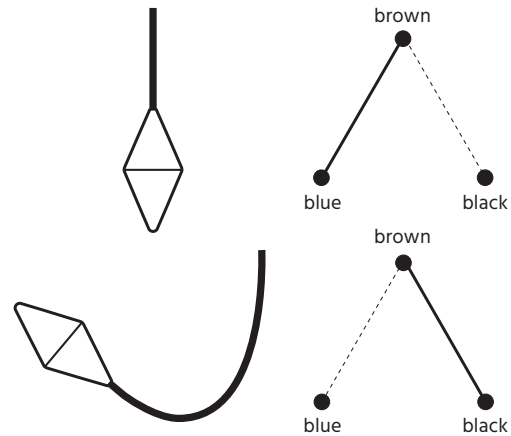
## Electrical Specifications:

<b>Switching element /</b>	microswitch as change-over contact
<b>Switching power /</b>	<b>FS-01EX.x.1</b> - without approval 12, 24, 48 VAC/VDC und 250 VAC - 50/60 Hz 16 A (ohmic), 6 A (inductive)  <b>FS-01EX.x.2</b> - with approval max. 24 VAC/VDC-10mA max. 12 VAC/VDC-100mA must be operated with intrinsically safe isolated switching amplifier
<b>Version 1GD:</b>	U <sub>o</sub> ≤ 30 V, I <sub>o</sub> ≤ 100 mA, P <sub>o</sub> ≤ 0.75 W, L <sub>i</sub> ≤ 2 μH, C <sub>i</sub> ≤ 203 pF at 2 m cable (additionally 0.36 mH per kilometer cable)
<b>Ignition protection type /</b>	ATEX II 1 GD Ex ia IIC T6 Ga Ex ta IIIC T70°C Da IP68
<b>Cable /</b>	3 x 1 mm <sup>2</sup> , HR HY (Hypalon)
<b>Cable weight /</b>	110 g/m
<b>Protection class /</b>	IP 68

## Dimensions in mm:



## Electrical Connection:



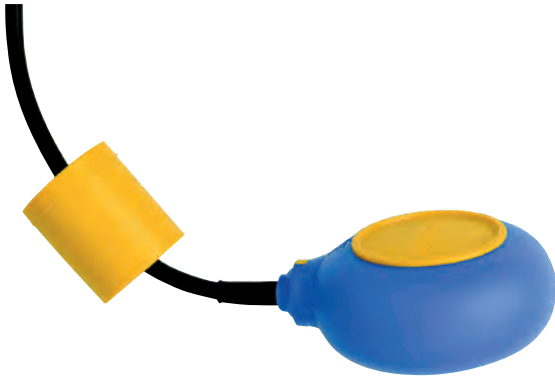
## Ordering Codes:

<b>Order number</b>	<b>FS-01EX.</b>	<b>1.</b>	<b>2</b>
<b>FS-01EX Float Switch</b>			
<b>Cable length /</b>	1 = 5 m cable 2 = 10 m cable		
<b>Approval /</b>	1 = without 2 = ATEX Zone 0		



# FS-03

## Float Switch



## Features

/ Low-cost design

/ 2 chamber system

/ Compatible with drinking-water

/ Mercury-free

## Description:

The FS-03 float switch operates according to the principle of buoyancy. A hollow float is lifted by the raising level of fluid as long as a switching operation is triggered at an angle of 45° to the horizontal line. The switch can be suspended by means of a screw joint directly in the vessel or, in the case of open vessels, from above. The setpoint is determined by the counterweight that must be ordered separately. The FS-03 consists of a polypropylene float with a total of two hollow spaces sealed against each other. The switch is, therefore, unsinkable even due to mechanical damages. As regards the cable material, the user has a choice between PVC or Neoprene.

## Application:

The FS-03 level switch is suited for level monitoring in fluids as in all types of industrial applications of direct pump controlling thanks to its high power rating. The switch is small in size and its switching behavior is individually adjustable through a variable weight. It can be used especially as control for MIN, MAX alarm, DRY-RUN and as pump control. The affordable price of FS-03 makes the switch highly recommendable for series deployment in large numbers.





# Versions:

## FS-03 Float Switch

**Cable material:** The FS-03 is selectively provided with a PVC or Neopren cable.

**Cable length:** The cable length can be selected from among 5, 10 and 20 meters.

# Electrical Specifications:

<b>Contact /</b>	change-over, 10A ohmic (4A inductive) for 250VAC
<b>Life span /</b>	min. 10 million switching operations
<b>Protection class /</b>	IP 68
<b>Electrical connection /</b>	cable diameter 9 mm, 3-wire with a cross-section of 1 mm <sup>2</sup>

# Technical Specifications:

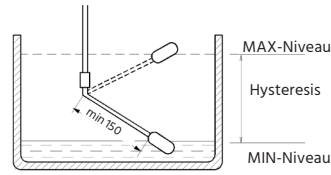
<b>Float material /</b>	polypropylene
<b>Float volume /</b>	430 cm <sup>3</sup>
<b>Float diameter /</b>	100 mm
<b>Float weight /</b>	250 g without cable
<b>Counterweight /</b>	polystyrene
<b>Media density /</b>	at least 0,8 g/cm <sup>3</sup>
<b>Media temperature /</b>	0 bis +50°C
<b>Pressure /</b>	max. 1 bar
<b>Switching angle /</b>	± 45° to the horizontal line

# Ordering Codes:

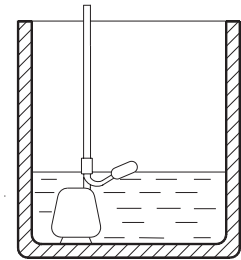
<b>Order number</b>	<b>FS-03.</b>	<b>P.</b>	<b>10.</b>	<b>1</b>
<b>FS-03 Float Switch</b>				
<b>Cable material /</b> P = PVC N = Neopren				
<b>Cable length /</b> 05 = 5 m 10 = 10 m 20 = 20 m				
<b>Counterweight /</b> 0 = without counterweight 1 = with counterweight				

# Functionality:

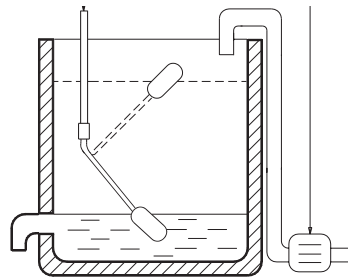
Pump control



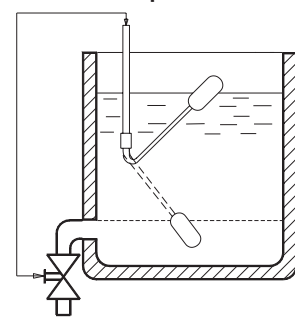
Dry-run protection



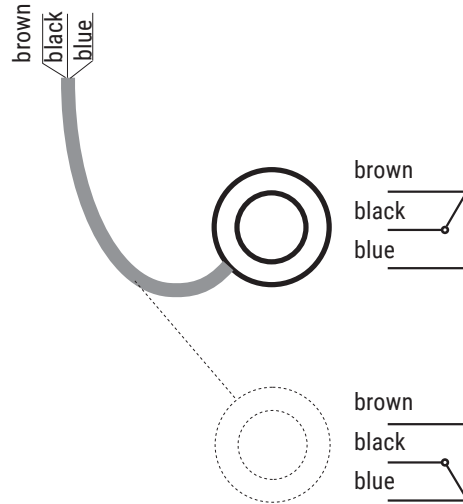
MIN-Alarm



Overfill protection



# Electrical Specifications:





# FS-05

## Float Switch for Mounting through 1" Bushings

### Description:

The FS-05 plastic float switch is a level switch in which a ball actuates a micro-switch depending on the inclination angle of the float cylinder. The single pole change-over contact changes its switching status depending on if the axis of the FS-05 is inclined by more than 20° positively or negatively to the horizontal line (fluid surface). On the basis of this action, the FS-05 is ideal suited for automating emptying and filling fluid vessels. The special feature of the cylindrical design of this series of float switch is that the maximum external diameter of the floating body does not exceed 29 mm, thereby allowing to insert the switch through an inch-system bushing into the vessel. The high switching capacity allows the user to switch pumps or large magnetic valves directly using the FS-05. In this, for safety-technical reasons, a contact protective relay such as the PROFIMESS MSR-10 should be deployed whenever there is a possibility of humans coming into contact with the measuring medium.

### Application:

The FS-05 series of float switches is used in large numbers across several industries. Their excellent price to performance ratio often allows the user to decide in favor of such a plastic switch as against, for example, tuning fork switches or capacitive limit switches. Moreover, expensive downstream electronic units can be avoided since the FS-05 is capable of processing relatively high performance directly. Particularly, if ferrite particles in the measuring medium cause adhesions or float jamming with conventional float magnetic switches, the FS-05 with its non-magnetic switching element can be a dependable alternative.

The FS-05 can be mounted in two different ways. The float switch can be attached either sideways by means of a conventional cable joint so that the cable length projecting into the vessel determines the angle of switching and, therefore, the setpoints or, the FS-05 can be suspended vertically from above. The response points are determined by the position of the displaceable counter weight which is optionally available.

## Features

/ High pressure resistance

/ Cost-effective

/ High switching load

/ Neoprene cable

/ Opt. available with counter weight



## Electrical Specifications:

<b>Switching element /</b>	micro-switch as change-over contact
<b>Electrical connection /</b>	cable 3 x 0,75 mm <sup>2</sup>
<b>Switching load /</b>	250 VAC - 50/60 Hz 12 A (resistive), 6 A (inductive)
<b>Contacts /</b>	silver / nickel
<b>Protection class /</b>	IP68

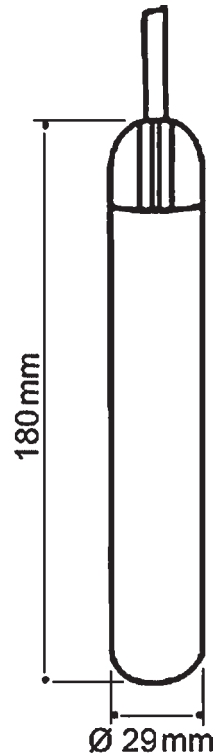
## Technical Specifications:

<b>Function /</b>	omni-directional float switch
<b>Measuring medium /</b>	fluid media
<b>Density range /</b>	0.75...1.5 g/cm <sup>3</sup>
<b>max. Pressure /</b>	5.5 bar
<b>max. Media temperature /</b>	85°C
<b>Float material /</b>	copolymer polypropylen
<b>Cable material /</b>	neoprene
<b>Weight without cable /</b>	60 g
<b>Cable weight /</b>	55 g per meter
<b>Adjustable weight /</b>	175g (optional)
<b>Standard cable lengths /</b>	5 m and 10 m (other lengths on request)
<b>Switching angle /</b>	± 20°

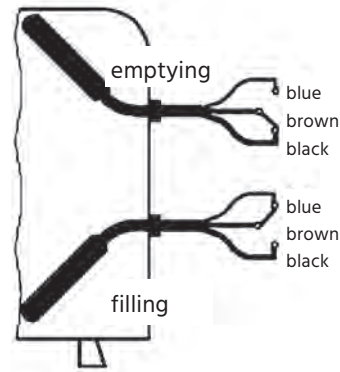
## Ordering Codes:

<b>Order number</b>	<b>FS-05.</b>	<b>05.</b>	<b>0</b>
<b>FS-05 Float Switch</b>			
<b>Cable length /</b>			
05 = 5 m neoprene-cable			
10 = 10 m neoprene-cable			
<b>Adjustable weight /</b>			
0 = none			
1 = with adjustable weight			

## Dimensions in mm:



## Electrical Connections:





# FS-08

## Suspended Float Switch with Internal Weight



## Features

- / Cost-effective
- / Easy to assemble
- / Any mounting position
- / No response delay
- / Maintenance-free
- / Reliable
- / Media temperatures up to 70°C
- / Small switching hysteresis
- / High switching capacity

## Description:

The series FS-08 consists of robust plastic float switches for water applications in two different sizes. The main advantage of this series is its internal weight, which allows the float to pass through grease or oil layers that tend to form in wastewater pumping stations and ensure a reliable detection of levels below these layers. The rounded design of the float and the relocation of the external weight inside also reduces the sensitivity to impurities and deposits. A smaller manufactured size for applications in containers with limited spatial conditions, e.g. like shafts and wells, is available. The FS-08 float switch operates according to the principle of buoyancy. A hollow float is lifted by the raising level of fluid until a switching operation is triggered at an angle of 45° to the horizontal line. The switch can be suspended by means of a screw joint directly in the vessel or, in the case of open vessels, from above.

## Application:

The FS-08 level switch is suited for level monitoring in fluids as in all types of industrial applications of direct pump controlling thanks to its high power rating. It can be used especially as high or low level alarm, as overflow or dry-running protection and as well as pump control. Compatible mediums are clear, clean fluids, rain water, sewage water, slightly aggressive fluids like oils and mud etc.



## Electrical Specifications:

<b>Switching element /</b>	microswitch as changeover contact
<b>Switching power /</b>	
FS-08.1.x:	12, 24, 48 VAC / VDC and 250 VAC - 50/60 Hz 16 A (ohmic), 6 A (inductive)
FS-08.2.x:	250 VAC / VDC - 50/60 Hz 10 A (ohmic), 4 A (inductive)
<b>Cable /</b>	3 x 0.75 mm <sup>2</sup> , PVC
<b>Contacts /</b>	silver / nickel
<b>Protection class /</b>	IP68

## Technical Specifications:

<b>Size /</b>	
FS-08.1.x (small):	height 140 mm, Ø 70 mm
FS-08.2.x (large):	height 165 mm, Ø 100 mm
<b>Function /</b>	omni-directional float switch
<b>Measuring medium /</b>	fluid media
<b>Media density /</b>	0.95 to 1.05 g/cm <sup>3</sup>
<b>max. Pressure /</b>	
FS-08.1.x:	3.5 bar
FS-08.2.x:	2.0 bar
<b>max. Media temp. /</b>	+70°C
<b>Float material /</b>	polypropylen
<b>Cable material /</b>	PVC
<b>Weight without cable /</b>	
FS-08.1.x:	400 g
FS-08.2.x:	775 g
<b>Cable weight /</b>	65 g per meter
<b>Counterweight /</b>	internal
<b>Switching angle /</b>	app. 45° from the horizontal line
<b>Switching hysteresis /</b>	approx. 10°

## Dimensions in mm:

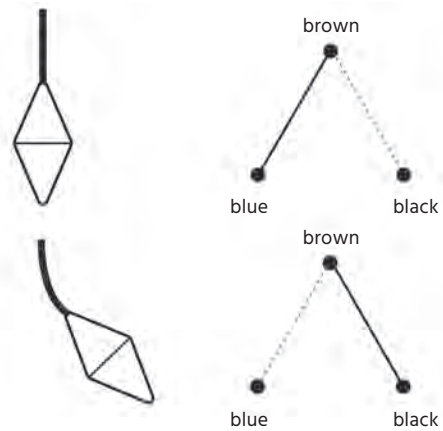
FS-08.1.x



FS-08.2.x



## Electrical Connections:



## Ordering Codes:

<b>Order number</b>	<b>FS-08.</b>	<b>1.</b>	<b>06</b>
<b>FS-08 Float Switch</b>			
<b>Size /</b>			
1 = small - 140 mm x 70 mm (height x diameter)			
2 = large - 165 mm x 100 mm (height x diameter)			
<b>Cable length /</b>			
06 = 6 m cable			
10 = 10 m cable			
□□ = other lengths			



# FS-16

## PTFE Float Switch for Side Mounting



## Features

- / High chemical resistance
- / Media temperature up to 150°C
- / High switching load
- / Easy to assemble
- / Reliable
- / Mercury free
- / Rod versions

## Description:

The FS-16 series comprises Teflon® float switches having both an excellent temperature and a brilliant chemical resistance. The body of the float switch is made of PTFE with an integrated built-in reed contact. In addition, the cable outlet of the FS-16 can be supplied with a PTFE bellows, so that the cable does not come into contact with the medium. Furthermore, custom-made float switch combinations of up to three floats in a rod version, with a maximum length of three meters are possible. The FS-16 float switch operates according to the principle of buoyancy. A hollow float is lifted by the raising level of fluid as long as a switching operation is triggered at an angle of 20° to the horizontal line. The determination of the setpoint is performed by the lateral installation of the float switch on the desired height.

## Application:

The main area of application is the detection of fluid levels (overflow and dry-running). By using at least two floats, one working as a maximum contactor and the other as a minimum contactor, in combination with a bistable contact protection relays from Profimess, automatic level control can be achieved. Design and material selection predestine this float switch for hot, extremely aggressive or contaminated liquids.

### Contact protection relais:

We recommend the use of contact protection relays in combination with our float switches.

- Especially for protection of individuals with regard to liquid contact
- Control for automatic filling or emptying via bistable interval relay with locking feature (see also multifunction relay MSR in the section accessories)



## Version:

### FS-16 PTFE Float Switch for Side Mounting

FS-16.1.x.x - PTFE Float Switch - with bellows

FS-16.2.x.x - PTFE Float Switch - without bellows

## Technical Specifications:

### Process connection /

FS-16.1.x.x: G 1/2" - male thread

FS-16.2.x.x: cable outlet

### Float size /

Ø 55 mm, height 130 mm

### Function /

omni-directional float switch

### Measuring medium /

fluid media

### Media density /

 $\rho \geq 0.75 \text{ g/cm}^3$ 

### max. Pressure /

1 bar

### max. Operating temp. /

+ 150°C

### Float material /

PTFE (Teflon®)

### Cable material /

SIL (silicone), FEP (Teflon®)

### Cable length /

2000 mm (basic length)

### Switching angle /

± 20° from the horizontal line

### Switching hysteresis /

approx. 100 mm

## Electrical Specifications:

### Switching element /

reed contact

### Contact /

change-over

### Switching voltage /

24...250 VAC and 24...150 VDC

### Switching current /

1 mA...1 A

### Switching power /

0.01...60 VA / 60 W

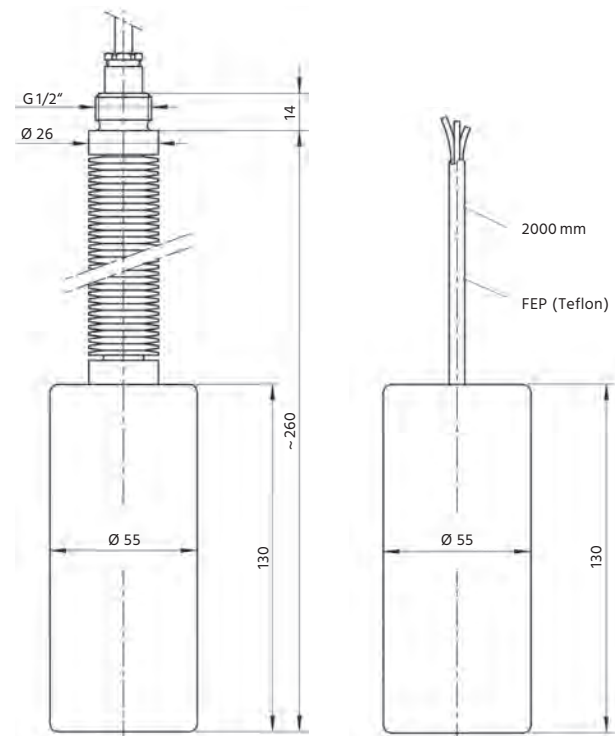
### Protection class /

IP68

### Option /

Namur-switching: 1 kΩ / 12 kΩ (for connection at „Namur“ relays only)

## Dimensions in mm:



## Ordering Codes:

<b>Order number</b>	<b>FS-16.</b>	<b>1.</b>	<b>02.</b>	<b>1.</b>	<b>0</b>
---------------------	---------------	-----------	------------	-----------	----------

<b>FS-16 PTFE Float Switch for Side Mounting</b>
--

### Version /

1 = with bellows
2 = without bellows

### Cable length /

02 = 2 m cable
[ ] [ ] = other lengths

### Cable material /

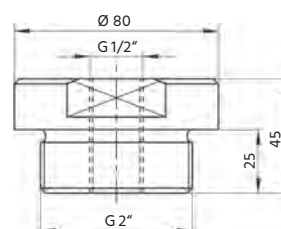
1 = FEP
2 = SIL (for versions with bellows only)

### Options (multiple selection such as /1/99 possible) /

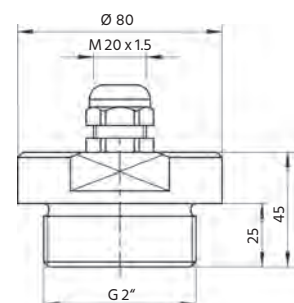
0 = none
1 = NAMUR switching (1 kΩ / 12 kΩ)
2 = PTFE cable gland, G 2", for version with bellows
3 = PTFE cable gland, G 2", for version without bellows
99 = Special (please specify in detailed text)

## Accessories: 2" PTFE cable gland:

### for FS-16.1



### for FS-16.2





## Version:

FS-16S PTFE Float Switch Rod Version

## Technical Specifications:

<b>Process connection /</b>	as per DIN EN 1092-1
with one float:	flange DN 65
with several floats:	flange DN 100
<b>Float type /</b>	with bellows (FS-16.1)
<b>Float size /</b>	Ø 55 mm, height 130 mm
<b>max. Number of floats /</b>	3
<b>Function /</b>	omni-directional float switch
<b>Measuring medium /</b>	fluid media
<b>Media density /</b>	$\rho \geq 0.75 \text{ g/cm}^3$
<b>max. Operating temp. /</b>	+ 150°C
<b>max. Pressure /</b>	1 bar
<b>Float material /</b>	PTFE (Teflon®)
<b>Rod material /</b>	stainless steel, PTFE coated
<b>max. Rod length /</b>	3000 mm
<b>Switching angle /</b>	$\pm 20^\circ$ from the horizontal line
<b>Switching hysteresis /</b>	approx. 100 mm

## Ordering Codes:

**Order number**      **FS-16S.**    **1.**    **□.**    **□□□□.**    **0**

**FS-16S PTFE Float Switch Rod Ver.**

**Float Type /**

1 = with bellows

**Number of floats /**

[ ] = 1..3

**Rod length L /**

[ ] [ ] [ ] [ ] = in mm (max. 3000 mm, meas. from the bttm. edge of the flange)

**Optionen (multiple selection such as /1/99 possible) /**

0 = none

1 = NAMUR switch (1 kΩ / 12 kΩ)

99 = Special (please specify in detailed text)

**Other specifications:**

• Position of the 1st float:                    L1 = xxxx mm

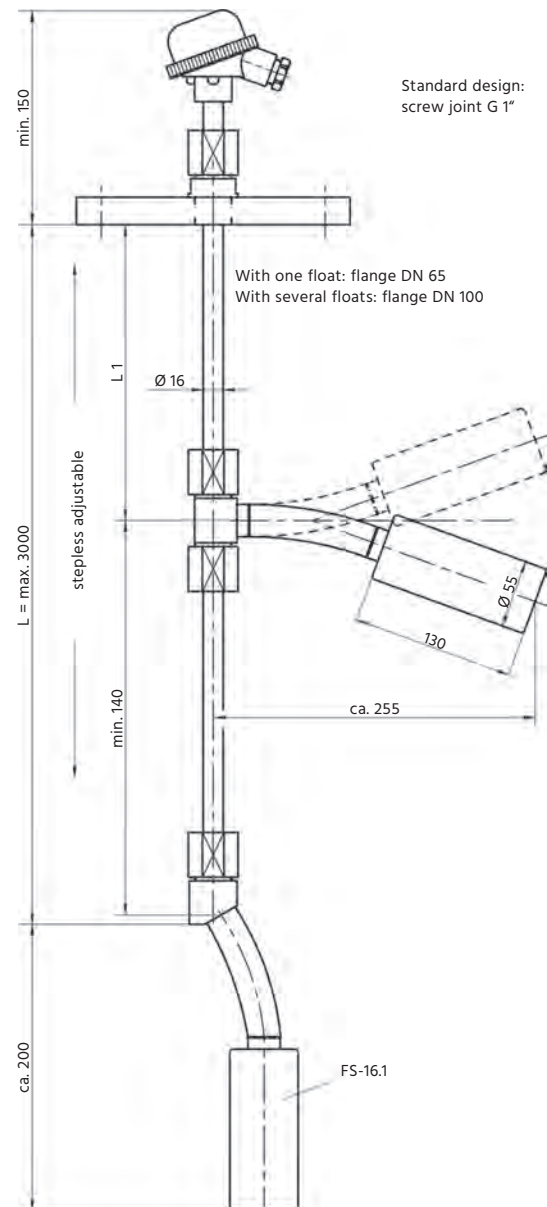
• Position of the x. float:                    Lx = xxxx mm

(All length specifications are measured from the bottom edge of the flange)

## Electrical Specifications:

<b>Switching element /</b>	reed contact
<b>Contact /</b>	change-over
<b>Switching voltage /</b>	24...250 VAC and 24...150 VDC
<b>Switching current /</b>	1 mA...1 A
<b>Switching power /</b>	0.01...60 VA / 60 W
<b>Protection class /</b>	IP68
<b>Option /</b>	
Namur switching:	1 kΩ / 12 kΩ (for connection at „Namur“ relays only)

## Dimensions in mm:







# FS-17

## Stainless Steel Float Switch for Side Mounting



## Features

- / Wetted parts stainless steel
- / High chemical resistance
- / Media temperature up to 150°C
- / Up to 15 bar
- / High switching load
- / Easy to assemble
- / Reliable
- / Mercury free
- / Rod versions

## Description:

The FS-17 series comprises rugged stainless steel float switches having both an excellent temperature and a high pressure resistance. This series is available in two different designs. Furthermore, custom-made float switch combinations of up to five floats in a rod version, with a maximum length of five meters are possible. The FS-17 float switch operates according to the principle of buoyancy. A hollow float is lifted up by the raising level of fluid until a switching operation is triggered at an angle of 20° to the horizontal line. The determination of the setpoint is performed by the lateral installation of the float switch on the height of the desired position. The complete FS-17 is designed so that the float is hermetically sealed with the pipe inlet.

## Application:

The main area of application is the detection of fluid levels (overflow and dry-running). By using at least two floats, one acting as a maximum contactor and the other as a minimum contactor and in combination with a bistable contact protection relays, automatic level control can be achieved. Design and material selection predestine this float switch for very aggressive, pasty or hot liquids.

### Contact protection relays:

We recommend the use of contact protection relays in combination with our float switches.

- Especially for protection of individuals with regard to liquid contact
- Control for automatic filling or emptying via bistable interval relay with locking feature (see also multifunction relay MSR in the section accessories)



## Versions:

### FS-17 Stainless Steel Float Switch for Side Mounting

FS-17.1.x.x - Stainless Steel Float Switch - spherical shape

FS-17.2.x.x - Stainless Steel Float Switch - cylindrical shape

## Technical Specifications:

<b>Process connection /</b>	R 1/2"-male thread
<b>Float size /</b>	
FS-17.1.x.x:	Ø 132 mm
FS-17.2.x.x:	Ø 80 mm, height 180 mm
<b>Function /</b>	omni-directional float switch
<b>Measuring medium /</b>	fluid media
<b>Media density /</b>	$\rho \geq 0.8 \text{ g/cm}^3$
<b>max. Pressure /</b>	
FS-17.1.x.x:	15 bar
FS-17.2.x.x:	6 bar
<b>max. Operating temp. /</b>	+ 150°C
<b>Float material /</b>	stainless steel 1.4571
<b>Hose material /</b>	stainless steel corrugated hose (1.4404) with st. steel wire braid (1.4301)
<b>Cable material /</b>	silicone (non-wetted part)
<b>Cable length /</b>	2000mm (basic length), 270mm of which with a st. steel 1.4404 corrugated hose
<b>Switching angle /</b>	$\pm 20^\circ$ from the horizontal line
<b>Switching hysteresis /</b>	approx. 100 mm

## Ordering Codes:

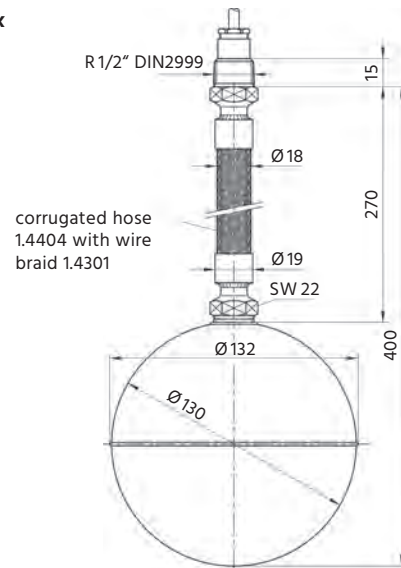
<b>Order number</b>	<b>FS-17.</b>	<b>1.</b>	<b>02.</b>	<b>0</b>
<b>FS-17 Stainless Steel Float Switch for Side Mounting</b>				
<b>Float type /</b>				
1 = spherical shape				
2 = cylindrical shape				
<b>Cable length /</b>				
02 = 2 m cable				
[] [] = other lengths				
<b>Options (multiple selection such as /1/99 possible) /</b>				
0 = none				
1 = NAMUR switching (1 k $\Omega$ / 12 k $\Omega$ )				
2 = PTFE-gland, G 2", for version with bellows				
3 = PTFE-gland, G 2", for version without bellows				
99 = special (please specify in detailed text)				

## Electrical Specifications:

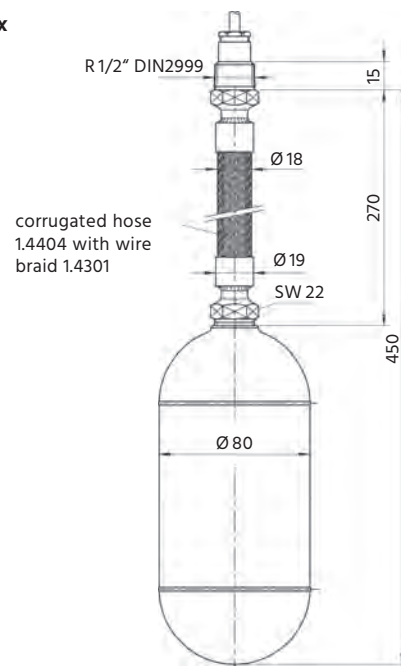
<b>Switching element /</b>	reed contact
<b>Contact /</b>	change-over
<b>Switching voltage /</b>	24 . . 250 VAC and 24 . . 150 VDC
<b>Switching current /</b>	1 mA . . 1 A
<b>Switching power /</b>	0.01 . . 60 VA / 60 W
<b>Protection class /</b>	IP68
<b>Option /</b>	
Namur switching:	1 k $\Omega$ / 12 k $\Omega$ (for connection at „Namur“ relays only)

## Dimensions in mm:

FS-17.1.x.x



FS-17.2.x.x







# FS-10

## Float Switch for Bulk Solids

### Description:

The FS-10 plastic float switch is a level switch in which, depending on the angle of inclination of the floating cylinder, a ball activates a microswitch. The switch works as soon as the vertical axis of the FS-10 is tilted by more than 10° towards right or left. Due to this action, the FS-10 is ideally suited for shutting down a filling operation for grain, flour, granulate material or powders in silos or other containers. There are three basic models of FS-10 available which are different with regard to their applicability in explosion-prone areas. The simplest design does not have the EX approval and is made of a polypropylene hollow body and a Neopren cable. This easily affordable device is capable of covering 80% of all applications. Both the ATEX approved models are allowed either only for dust materials or for gases and dust materials highly prone to explosions. In these devices the basic body is surrounded additionally by a shell made of HR HY (Hypalon), an excellent resistant material, where also the cable is made of this material. In the case of the purely EX variant for dust material, up to 240 V AC / 1A can be connected directly through FS-10 regardless of the EX-approval; the supply system for the gas and dust EX model of FS-10 is handled by an intrinsically safe isolated switching amplifier.

## Features

/ ATEX approval for dust and gases in zones 0 and 20

/ Double-shell housing with HR HY (Hypalon) coating

/ High switching capacity due to microswitches

/ Neopren or HR HY (Hypalon) cables

/ Optionally available with counter weights

### Application:

The FS-10 series of flow switches offers the ideal solution wherever a bulk material filling operation needs to be shut down in a container. These devices are cost-effective, extremely robust and water-proofed and can be installed easily. The three models of FS-10 cover nearly every type of applications as they comply with the highest requirements for protection against explosion and media resistance. The FS-10 is fixed directly to the cable and suspended into the silo, where optionally a counter weight on the cable acts as the pivot; alternatively FS-10 can be inserted by means of a cable gland. At the output point of FS-10 a potential-free changeover-contact is available which is capable of connecting up to 20A at 250 V AC depending on the design of the device.



## Electrical Specifications:

<b>Switching element /</b>	microswitch as changeover contact
<b>Electrical conn. /</b>	cable 3 x 1 mm <sup>2</sup>
<b>Protection class /</b>	IP68
<b>Switching power /</b>	<p><b>non-Ex version FS-10.xx.O:</b> 20 (8) A ohmic (inductive) at max. 250 V AC, 50/60 Hz</p> <p><b>dust EX version FS-10.xx.1:</b> 1 A at max. 240 V AC, 50/60 Hz, must be operated with 1A/240 V fuse</p> <p><b>gas- &amp; dust EX version FS-10.xx.2:</b> max. 24 V AC/DC with max. 10 mA or 12 V AC/DC with max. 100 mA, must be operated with intrinsically safe isolated switching amplifier, U<sub>o</sub> ≤ 30 V, I<sub>o</sub> ≤ 100 mA, P<sub>o</sub> ≤ 0.75 W, L<sub>i</sub> ≤ 2 μHenry, C<sub>i</sub> ≤ 203 pF at 2 m cable (additionally 0.36 mH per kilometer cable)</p>
<b>Contacts /</b>	<p><b>non-Ex version FS-10.xx.O:</b> Ag/ Cd oxide</p> <p><b>dust EX version FS-10.xx.1:</b> Ag</p> <p><b>Gas- &amp; dust EX version FS-10.xx.2:</b> gold-plated</p>
<b>Ignition protection class /</b>	<p><b>dust EX version FS-10.xx.1:</b> ATEXEx ta IIIC T70°C Da IP68</p> <p><b>gas- &amp; dust EX version FS-10.xx.2:</b> ATEX II 1 GD Ex ia IIC T6 Ga Ex ta IIIC T70°C Da IP68</p>

## Technical Specifications:

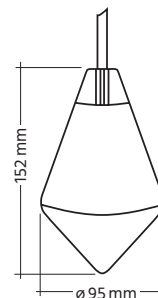
<b>Function /</b>	omni-directional float switch
<b>Measuring medium /</b>	bulk materials such as powders, granulates or grains
<b>Media temperature /</b>	<p>non-Ex version FS-10.xx.O: max. 85°C</p> <p>EX versions FS-10.xx.(1 or 2): T<sub>a</sub> at ambient temperature from -20. . . +70°C</p>
<b>Float material /</b>	Copolymer Polypropylene, in EX versions with HR HY coating
<b>Cable material /</b>	<p>non-Ex version FS-10.xx.O: Neopren</p> <p>EX versions FS-10.xx.(1 or 2): HR HY (Hypalon)</p>
<b>Weight without cable /</b>	<p>non-Ex version FS-10.xx.O: 462 g</p> <p>EX versions FS-10.xx.(1 or 2): 495 g</p>
<b>Cable weight /</b>	<p>non-Ex version FS-10.xx.O: 115 g per meter</p> <p>EX- versions FS-10.xx.(1 or 2): 110 g per meter</p>
<b>Load weight /</b>	250 g
<b>Standard cable lengths /</b>	5 m and 10 m (other lengths on request)
<b>Switching angle /</b>	± 10° from the vertical line

## Ordering Codes:

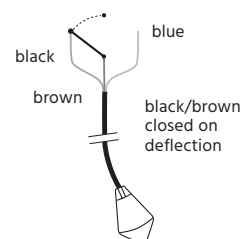
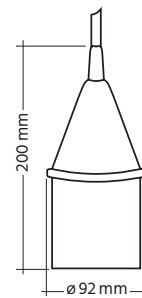
<b>Order number</b>	<b>FS-10.</b>	<b>10.</b>	<b>1.</b>	<b>1</b>
<b>FS-10 Floating Switch</b>				
<b>Cable length /</b>				
05 = 5 m cable				
10 = 10 m cable				
□□ = other lengths				
<b>Ignition protection class /</b>				
0 = none				
1 = dust EX Zone 20, 21 oder 22				
2 = dust EX and gas EX Zone 20, 21, 22 and Zone 0, 1, 2				
<b>Load weight /</b>				
0 = none				
1 = with load weight				

## Dimensions in mm:

FS-10.xx.0



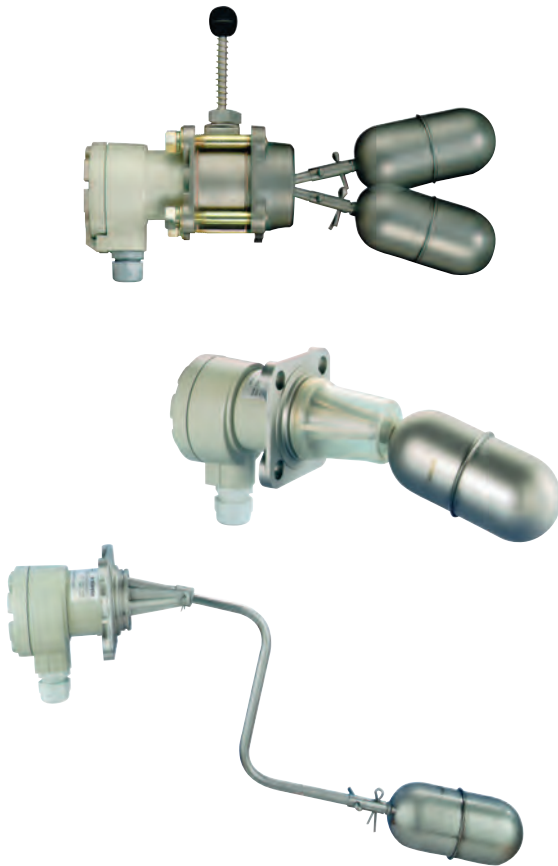
FS-10.xx.(1 &amp; 2)





# FS-04

## Float Switch for Horizontal or Vertical Mounting



## Features

/ Suitable in ship-building

/ Cost-effective

/ Robust

/ Square flange or thread connection

/ DN80 to DN150 flange

/ Fixed and adjustable hysteresis

/ Explosion proof version

/ SIL 1

## Description:

A float spatially completely separated from the outer side of the vessel moves up and down along with the fluid being monitored. This movement is transmitted by means of a permanent magnet at the end of the float to a change-over contact mounted in an aluminium switch housing which triggers a switching operation when the float reaches the center position. The float can be provided with a rod extension so as to generate different switching hystereses and switching points. The switch housing can be supplied with protection type IP68 so that also applications under water (up to 20 m water column) can be included. Optionally, PROFIMESS GMBH supplies a prefabricated proven counter-flange that is compatible with the standard connection of the FS-04 with square flange and test actuators for a „dry“ simulation of the switching operation.

## Application:

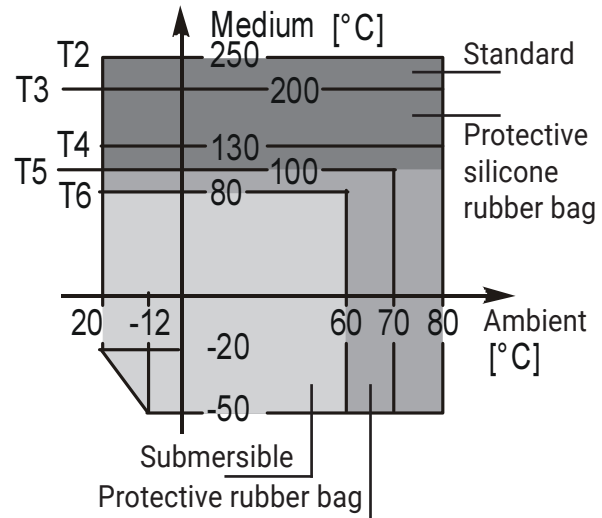
The FS-04 series of magnetic float switches is used for limit value switching in fluids. The switches are passive components and operate without any auxiliary power source. Thanks to the wide range of operating temperatures and pressure, including various mounting positions on top, on the side, under water or in potentially explosive areas as well as media-contacted components in stainless steel, the switches can be deployed in many ways. In ship-building, particularly, the FS-04 has gained a significant position since it has an extremely robust design and can be used for operation under the harsh conditions on board without a problem in contrast to many other types of switches.



## Technical Specifications:

<b>max. Pressure /</b>	PN25
<b>Weight /</b>	1.8 .. 3.5 kg
<b>Wet components /</b>	stainless steel (rubber or silicone for version with protective rubber bag)
<b>Housing material /</b>	Aluminium casting, paint coated
<b>Ambient temp. /</b>	-20. . . +80°C submersible ver. -20. . . +60°C
<b>Media temperature /</b>	standard version: -20. . . +250°C, protective rubber bag: -20. . . +100°C, prot. silicone rubber bag: -20. . . +200°C, submersible version: -20. . . +80°C
<b>Media density /</b>	0.7 g/ccm without extension  0.8 g/ccm to 300 mm extension for float diameter 64 mm  0.85 g/ccm to 300 mm extension for float diameter 52 mm
<b>Certificates /</b>	Atex, Germanischer Lloyd
<b>Option /</b>	Test actuator: with the test actuator the functioning of FS-04 can be checked without dismantling the switch and without changing the level. The test actuator is available as simple steel or stainless steel version.
<b>Counter-flange /</b>	92 mm square counter-flange can be supplied in steel or stainless steel versions which are prepared for direct welding on to the vessel. They can be provided with extended spacer bolts for using a test actuator.
<b>Explosion protection /</b>	The switch housing is available in pressure-compression encapsulation, in which case the protection against ignition is EEx dme IIC T6. . . T2.

## Temperature diagramm:



## Float Table:

Float Ø in mm	Rod length in mm			
	0, 100	200	300	1000-3000
52	0.7	0.8	0.85	-
64	0.7	0.8	0.8	-
124	-	-	-	0.7

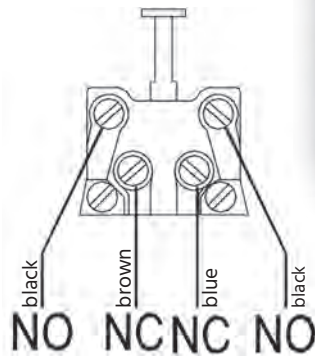


## Electrical Specifications:

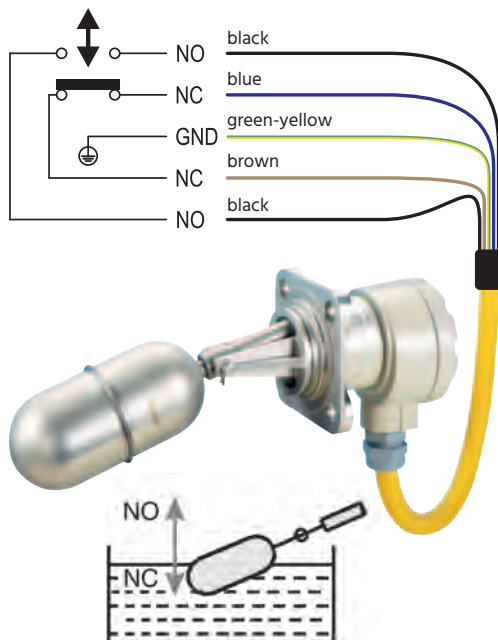
<b>Switching element /</b>	1 micro-switch with two switching contacts (NO and NC)
<b>Switching load norm. /</b>	250V AC12 10A, 220V DC13 0.6A
<b>Switching load Ex /</b>	250V AC12 2.5A, 220V DC13 0.3A
<b>El. connection /</b>	M20 x 1.5, in under water version molded cable with a cross-section of 5 x 1,5 mm <sup>2</sup> (please specify cable length while ordering)
<b>Protection class /</b>	IP 65 except for the under water version IP 68 to 20 meter water column

## Electrical Specifications:

### Standard-Version:



### Submersible version:



## Ordering Codes:

**Order number** FS-04. 1. A. 1. 1. 1. 0

### FS-04 Float Switch

#### Mounting position /

- 1 = horizontal
- 2 = vertical

#### Version /

- A = standard
- G = standard with protective rubber bag
- S = standard with protective silicon rubber bag
- U = under water (only with cable IP 68)\*
- V = under water with protective rubber bag
- Z = under water with protective silicon rubber bag

#### Hysteresis /

- 1 = fixed hysteresis
- 2 = adjustable hysteresis (horizontal mounting pos. only, not with protective bag)

#### Process connection /

- 1 = 92 square flange PN 25
- 2 = DN 80 PN 25 steel
- 3 = DN 100 PN 25 steel
- 3a = DN 125 PN 25 steel
- 3b = DN 150 PN 25 steel
- 4 = DN 80 PN 25 stainless steel 1.4571
- 5 = DN 100 PN 25 stainless steel 1.4571
- 5a = DN 125 PN 25 stainless steel 1.4571
- 5b = DN 150 PN 25 stainless steel 1.4571
- B = 2" BSP thread (horiz. mounting position and fixed hysteresis only)
- N = 2" NPT thread (horiz. mounting position and fixed hysteresis only)

#### Rod length in [mm] /

- 1 = 0 mm
- 2 = 100 mm
- 3 = 200 mm
- 4 = 300 mm
- 5 = Z-shaped (not for adjustable hysteresis)
- 6 = L-shaped (not for adjustable hysteresis)

#### Counter flange /

- 0 = none
- 1 = with steel flange without test device
- 2 = with steel flange for test device
- 3 = with steel flange incl. test device
- 7 = with st. steel flange without test device
- 8 = with st. steel flange for test device
- 9 = with st. steel flange incl. test device

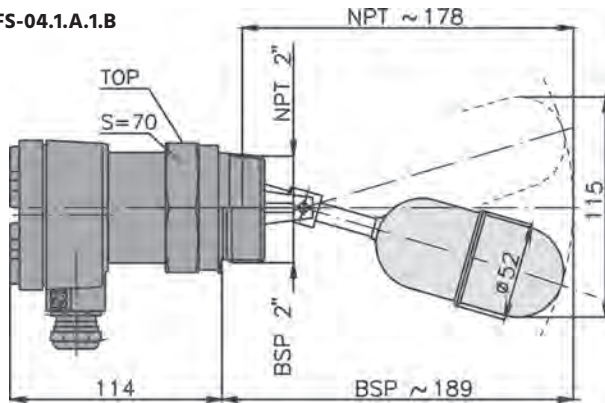
\* please specify the desired cable length while ordering!



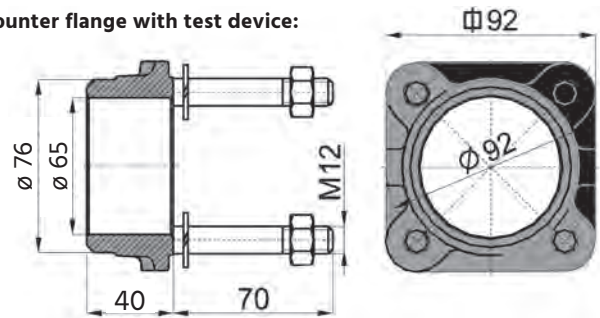


# Dimensions in mm:

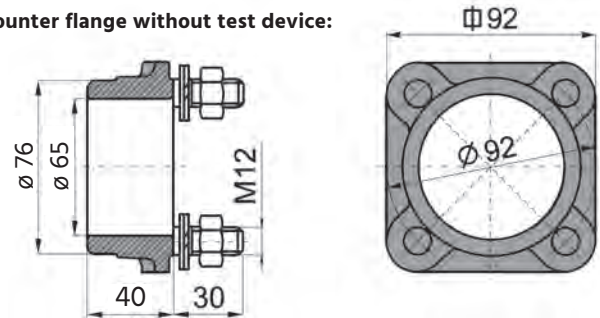
FS-04.1.A.1.B



Counter flange with test device:

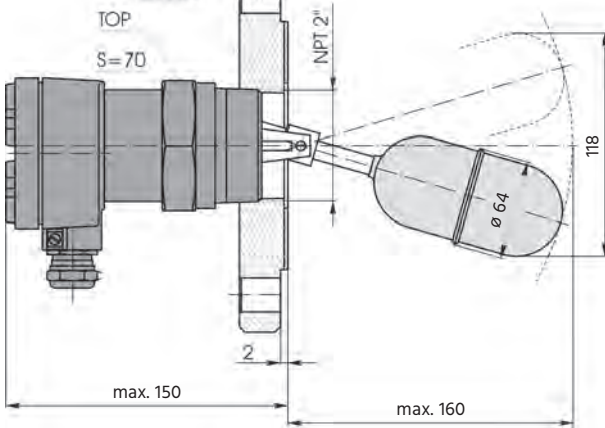


Counter flange without test device:

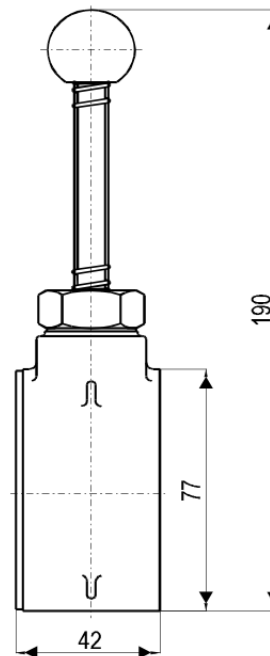


FS-04.1.A.1.2

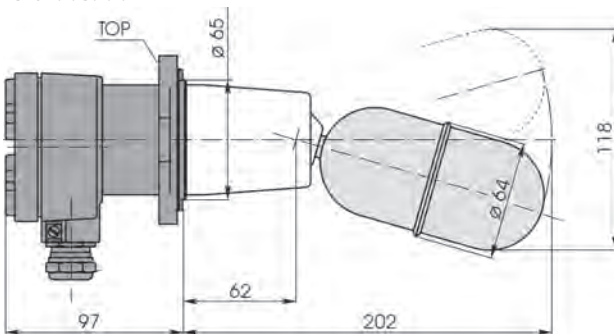
- NA 80
- NA 100
- NA 125
- NA 150



Test device:

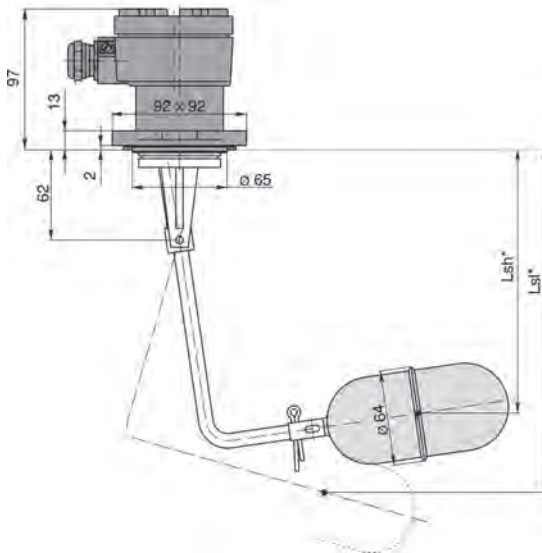


FS-04.1.G.1.1.1

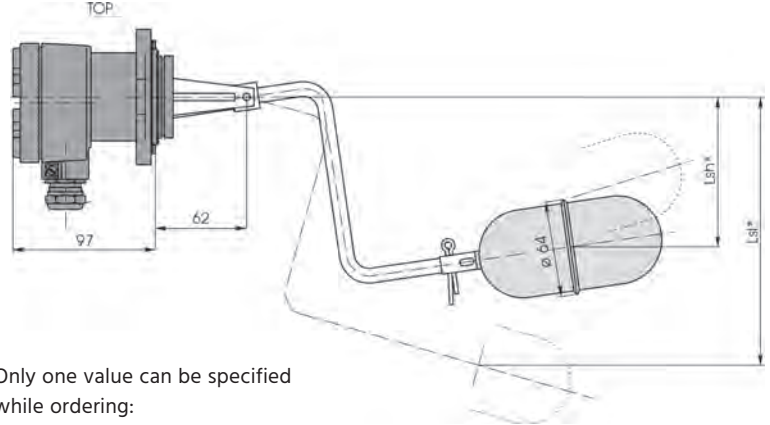




FS-04.2.A.1.1.6



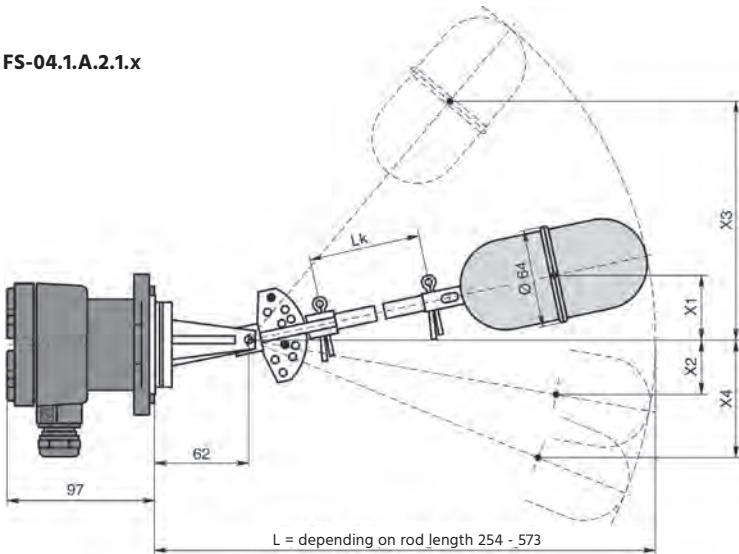
FS-04.1.A.1.1.5



Only one value can be specified while ordering:

$L_{sh}$  = upper switching point  
 $L_{sl}$  = lower switching point

FS-04.1.A.2.1.x

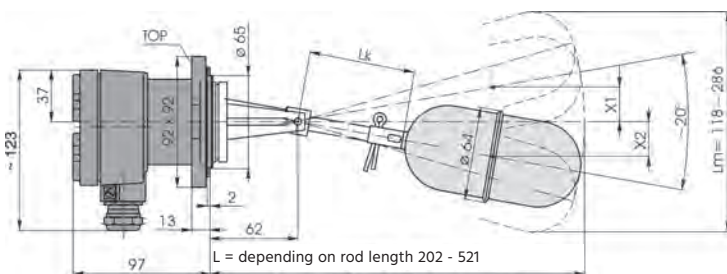


FS-04.x.x.2.x.x

Data refers to water 20°C; Tolerance: +/- 5mm

Lk = rod length [mm]	0	100	200	300
L = mounting length [mm]	254	373	473	573
x1 = min. upper switching dist. [mm]	28	55	78	100
x2 = min. lower switching dist. [mm]	28	55	78	100
x3 = max. upper switching dist. [mm]	100	193	270	350
x4 = max. lower switching dist. [mm]	100	193	270	350

FS-04.1.A.1.1.x



FS-04.x.x.1.x.x

Data refers to water 20°C; Tolerance: +/- 5mm

Lk = rod length [mm]	0	100	200	300
L = mounting length [mm]	202	321	421	521
Lm = total deflection [mm]	118	180	234	286
x1 = switching point top [mm]	12	30	46	62
x2 = switching point bottom [mm]	12	30	46	62



# LS-10N

## Float Switch for Level Detection

## Features

- / Up to 15 m insertion length
- / Up to 150 bar and 250°C
- / Top, bottom or lateral mounting
- / Contacts available as NC-contact, NO-contact or change-over contact
- / High repeatability of set points
- / Optionally with temperature sensor
- / Customized designs
- / Stainless steel (ECTFE or PFA coated), Titanium, Alloy C, Brass, PVC, PP, PA, PVDF

## Description:

The LS-10N series of level switches operates according to the principle of a float with magnetic transmission. The switch consists of a sliding tube with embedded reed contacts, one or more floats in which ring magnets are mounted, and a connecting module. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float through the sliding tube wall. The reed contact can be designed to function as a NC-contact, NO-contact or change-over contact.

## Application:

The LS-10N level switches are suited for monitoring the level of nearly all types of fluid media as an alarm for full or empty levels, for controlling valves and pumps or for alert signals. By deploying potential-free reed contacts, the level switches provide an ideal switching element in combination with PLC controls (apply PLC-contact or series resistor).



# Ordering Codes:

<b>Order number</b>	LS-10N.	[ ] [ ] [ ] [ ] [ ] .	[ ] [ ] [ ] [ ] [ ] .	S.	S.	LNO [ ] .LNO [ ] ...	0.	0.	S.	S.	S.	0.	0
<b>LS-10N Float Switch</b>													
<b>Version /</b>													
[ ] [ ] [ ] [ ] (e.g. VAG2G)													
<b>Ins. length (L)* or center dist. for lateral connections (M) in mm /</b>													
[ ] [ ] [ ] [ ] ( *measured from the sealing edge of relevant connection joint )													
<b>Electrical connection /</b>													
S = acc. to variant standard K = connection cable; specify cable length and material in detailed text E = aluminium terminal box flat F = aluminium terminal box high DA = aluminium terminal box, flameproof enclosure for Ex d VA = stainless steel terminal box, flameproof enclosure for Ex d PA = polyester terminal box BA = ABS terminal box S1A (B) = connector M12, 3-pole ( B = connector M12, 8-pole ) S2A = plug Hirschmann DIN 43650 S3A (B) = plastic plug HTS straight ( B = aluminium plug HTS straight ) S4A (B) = plastic plug HTS angulate ( B = aluminium plug HTS angulate )													
<b>Float type /</b>													
S = acc. to variant standard [ ] [ ] [ ] [ ] = special float type as per table spherical or cylindrical float ( table 1 or 2 )													
<b>Level switching contact [ position in mm from the sealing edge of relevant connection joint ] /</b>													
LNO [ ] = NO-contact [ ] increasing level LNC [ ] = NC-contact [ ] increasing level LUS [ ] = change-over-contact [ ] increasing level  <b>Example:</b> LNO [ 100 ] LNC [ 580 ] = 2 contacts in engaging sequence from the sealing edge of relevant connection joint Contact No. 1 = NO-contact, position in 100 mm from the sealing edge of relevant connection joint Contact No. 2 = NC-contact, position in 580 mm from the sealing edge of relevant connection joint													
<b>Temperature switching contact [ temperature setpoint in °C ] /</b>													
0 = none TNO [ ] = NO-contact [ ] increasing temperature TNC [ ] = NC-contact [ ] increasing temperature <b>Example:</b> TNO [ 90 ] = NO-contact, setpoint at +90°C													
<b>Temperature sensor /</b>													
0 = none A = with built-in resistor Pt100, 3-wire B = with built-in resistor Pt1000, 3-wire 9 = special ( please specify in detailed text )													
<b>Material sliding tube and process connection /</b>													
S = acc. to variant standard 9 = special (please specify in detailed text)													
<b>Sliding tube diameter /</b>													
S = acc. to variant standard 9 = special (please specify in detailed text)													
<b>Process connection /</b>													
S = acc. to variant standard 9 = special (please specify in detailed text)													
<b>Approvals /</b>													
0 = none 1 = with approval ( please specify in detailed text e.g. Ex i, Ex d, WHG, GOST, PED, GL, BV, ABS )													
<b>Options (multiple selections possible e.g. B/D ) /</b>													
0 = none A = counter plug M12x1 for electrical connection S1A or S1B B = contact function - protective circuit with 22 Ω / 0.21 W resistor C = contact function - protective circuit according to NAMUR EN 60947 D = contact function - high temperature 180°C to 250°C 9 = special ( please specify in detailed text )													

When ordering, please specify in detailed text: medium, medium density, operating pressure, operating temperature and special issues



## Versions:

Every float switch consists of following three main component groups which are available in different versions depending on the technical requirements:

- sliding tube
- float
- process connection

### Sliding tube:

The sliding tube is the core of the float switch as it holds the reed contacts and it can be supplied in a number of materials and diameters.

### For example:

- stainl. steel ( Ø 8 mm, 12 mm, 14 mm, 16 mm, 18 mm, 40 mm)
- stainless steel electropolished (Ø 8 mm, 12 mm, 14 mm, 16 mm, 18 mm, 40 mm) / Ra appr. 0.8 µm (not attestable)
- stainless steel ECTFE coated (Ø 11 mm, 17 mm)
- stainless steel PFA coated (Ø 11 mm, 17 mm)
- Titanium (Ø 12 mm, 14 mm, 18 mm)
- Alloy C (Ø 12 mm, 18 mm)
- PVC (Ø 8 mm, 12 mm, 16 mm, 20 mm)
- PP (Ø 8 mm, 12 mm, 16 mm, 20 mm)
- PVDF (Ø 12 mm, 16 mm, 20 mm)

### Float:

Each variant has a matching float. However, if the application requires other values in terms of maximum pressure, temperature or low specific gravity, an alternative float can also be fitted in as far as it fits with its bore on the sliding tube of that variant. Table 1 and 2 provides an overview of spherical and cylindrical floats, their dimensions, weights and immersion depths.

### Process connection:

Various options are available as mechanical and electrical connections to the float switch. The following pages offer an overview about which variant suits to which process connections. Depending on whether the float fits through the threaded bore or not, the connecting threads are directed in different versions. "Up" installation through the interior, or "down" for the installation from the outside. If the electrical connection is realized via a cable, the maximum temperature on the cable sheath must be taken into account. Standard cable with PVC sheath ranges from -20...+80°C, the version with silicone sheath ranges from -60...+180°C. Other materials such as Teflon cord can also be offered on request for temperatures up to +200°C.

## Switching contacts level:

These contacts are defined as normally open, normally closed or change-over with increasing level. The following switching values<sup>(1)</sup> are based on:

### Reed contact values - Sliding tube < 12 mm

Function	Normally open	N. closed	change over
Switching voltage	150 V	150 V	150 V
Switching current	0.5 A	0.5 A	0.5 A
Switching load	10 VA	10 VA	10 VA

### Reed contact values - Sliding tube ≥ 12 mm

Function	Normally open	N. closed	change over
Switching voltage	230 V	230 V	230 V
Switching current	1.0 A	0.5 A	0.5 A
Switching load	100 VA	40 VA	40 VA

## Switching Contact Temp.:

In addition, the float switch for level detection can be equipped with a temperature switching contact. This contact is defined as NO or NC with increasing temperature. The following switching values<sup>(1)</sup> are based on:

Function	Normally open	Normally closed
Switch rating	230 V / 0.5 A / 40 VA	230 V / 0.5 A / 40 VA
Operating range	+80...+160°C	+50...+160°C
Graduation	every 5 K	every 5 K
Accuracy	± 5 K	± 5 K
Hysteresis	30 K ± 15 K	30 K ± 15 K
Sliding tube	≥ Ø 11 mm	≥ Ø 11 mm

## Temperature Sensors:

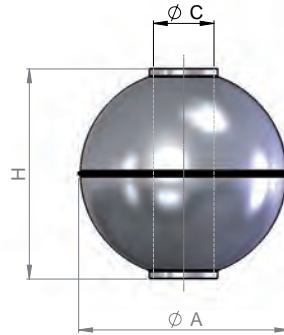
In the sliding tube of the LS-10N an additional temperature sensor can be installed as a Pt100 or Pt1000. The measuring resistors meet the following specifications:

Function	Normally open	Normally closed
Actuation temp.	-70...+400°C	-70...+400°C
Tolerance	Class B	Class B
Properties	from IEC 751	from IEC 751
Connection Type	2-, 3-, or 4-wire	2-, 3-, or 4-wire
Sliding tube	≥ Ø 8 mm	≥ Ø 8 mm

<sup>(1)</sup> The values shown are maximum values when using earth conductor. In some cases it is not always technically possible to provide an earth conductor, for example versions with cable- or plug connection and multiple number of contacts. Designs without earth connection should use low voltage only, for example contact protection relays or external protective earth. The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.



# Table 1: Spherical Float - Dimensions

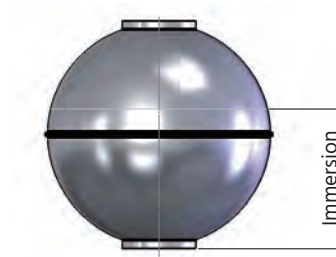


\* = Design temperature 200°C, higher temperatures after calculating  
 \*\* = acc. to Atex (conductive)

Type	Material	ØA	H	ØC	Density min.	Pressure range	Temperature range	L1 min.	U min.	Float distance min.	Mass
		(mm)	(mm)	(mm)	(kg/m <sup>3</sup> )	(bar)	(°C)	(mm)	(mm)	(mm)	(g)
K29S9.4E	St. Steel	29	28	9.4	900	-1...+35	-156...+200	35	30	45	7
K42S9.4E	St. Steel	42	42	9.4	650	-1...+15	-156...+200	45	40	60	19
K52S15E1	St. Steel	52	52	15	680	-1...+30*	-156...+250	55	45	70	35
K52S15E2	St. Steel	52	52	15	750	-1...+50*	-156...+250	55	45	70	40
K62S15E	St. Steel	62	62	15	630	-1...+25*	-156...+250	60	50	80	60
K72S15E	St. Steel	72	71.5	15	530	-1...+25*	-156...+250	65	50	90	83
K82S15E	St. Steel	82	81	15	400	-1...+25*	-156...+250	70	55	100	88
K72S24.4E	St. Steel	72	70	24.4	620	-1...+25*	-156...+250	60	60	90	86
K80S23E1	St. Steel	80	75	23	630	-1...+25*	-156...+250	70	60	95	114
K80S23E2	St. Steel	80	73	23	750	-1...+40*	-156...+250	50	55	100	145
K98S23E	St. Steel	98	96	23	570	-1...+25*	-156...+250	80	70	115	222
K29S9.4T	Titan	29	28	9.4	700	-1...+15	-10...+150	35	30	45	6
K44S12T	Titan	44	44	12	780	-1...+100*	-10...+250	50	40	60	25
K52S14T	Titan	52	52	14	650	-1...+24	-10...+150	55	45	70	35
K52S15T	Titan	52	52	15	780	-1...+150*	-10...+250	55	45	70	42
K62S14T	Titan	62	62	14	450	-1...+25	-10...+150	60	50	80	41
K82S14T	Titan	82	80	14	500	-1...+16	-10...+150	70	55	100	108
K80S24T	Titan	80	76	24	600	-1...+16	-10...+150	70	60	95	103
K52S15A	Alloy C	52	52	15	1260	-1...+55*	-196...+250	55	45	70	68
K62S15A	Alloy C	62	62	15	700	-1...+25*	-196...+250	60	50	80	65
K82S15A	Alloy C	82	81	15	500	-1...+16*	-196...+250	70	55	100	95
K72S24.4A	Alloy C	72	70	24.4	830	-1...+25*	-196...+250	60	60	90	116
K80S23A	Alloy C	80	75	23	730	-1...+18*	-196...+250	70	60	95	125
K98S23A	Alloy C	98	96	23	550	-1...+16*	-196...+250	80	70	115	208
K53S14EC1	ECTFE coat.	53	53	14	900	-1...+40	-78...+150	70	70	80	49
K53S14EC2**	ECTFE coat.	53	53	14	900	-1...+40	-78...+150	70	70	80	49
K73S23EC1	ECTFE coat.	73	71	23	750	-1...+25	-78...+150	70	70	105	105
K73S23EC2**	ECTFE coat.	73	71	23	750	-1...+25	-78...+150	70	70	105	105
K53S14PF1	PFA coat.	53	53	14	950	-1...+40*	-100...+250	70	70	80	52
K53S14PF2**	PFA coat.	53	53	14	950	-1...+40*	-100...+250	70	70	80	52
K73S23PF1	PFA coat.	73	71	23	800	-1...+25*	-100...+250	70	70	105	110
K73S23PF2**	PFA coat.	73	71	23	800	-1...+25*	-100...+250	70	70	105	110



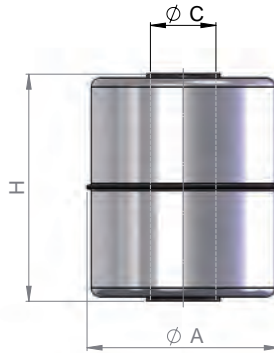
# Spherical Float Immersion depth



Type	Specific weight of the medium (kg/m <sup>3</sup> )											
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
	Immersion depth (mm)											
K29S9.4E						20.3	18.5	17.2	16.2	15.3	14.6	14.0
K42S9.4E				31.1	27.4	25.0	23.1	21.6	20.4	19.4	18.5	17.7
K52S15E1				38.6	34.1	31.1	28.8	27.0	25.5	24.2	23.1	22.2
K52S15E2					38.6	34.5	31.7	29.6	27.8	26.4	25.1	24.1
K62S15E				40.8	36.7	33.7	31.4	29.2	27.9	26.6	25.4	24.4
K72S15E			51.1	44.8	40.5	37.3	34.8	32.8	31.0	29.6	28.3	27.2
K82S15E	61.3	50.3	44.1	39.7	36.5	33.9	31.8	30.1	28.6	27.3	26.2	25.2
K72S24.4E				50.5	45.2	41.4	38.6	36.2	34.3	32.7	31.3	30.1
K80S23E1				56.2	49.9	45.6	42.3	39.7	37.5	35.7	34.1	32.8
K80S23E2					54.5	49.7	46.0	43.1	40.7	38.7	37.0	35.5
K98S23E			75.8	65.2	58.6	53.8	50.1	47.1	44.5	42.4	40.5	38.9
K29S9.4T				21.9	19.3	17.5	16.3	15.2	14.4	13.7	13.1	12.6
K44S12T					34.0	30.0	27.5	25.6	24.0	22.7	21.7	20.7
K52S14T				39.1	34.4	31.3	29.0	27.1	25.6	24.3	23.3	22.3
K52S15T					40.9	36.1	33.0	30.6	28.8	27.2	25.9	24.8
K62S14T		41.9	36.2	32.5	29.7	27.6	25.9	24.5	23.2	22.2	21.3	20.5
K82S14T		60.1	51.2	45.7	41.7	38.6	36.1	34.0	32.3	30.8	29.5	28.3
K80S24T			60.4	51.8	46.6	42.8	39.9	37.5	35.6	33.9	32.4	31.2
K52S15A										40.7	37.5	35.1
K62S15A				48.0	42.0	38.1	35.2	33.0	31.1	29.5	28.2	27.0
K82S15A		53.5	46.5	41.8	38.3	35.6	33.3	31.5	29.9	28.6	27.4	26.3
K72S24.4A						53.0	48.1	44.5	41.8	39.5	37.6	36.0
K80S23A				62.5	54.0	48.9	45.1	42.2	39.8	37.8	36.1	34.6
K98S23A			70.7	61.8	55.9	51.5	48.0	45.2	42.8	40.7	39.0	37.4
K53S14EC1						39.6	36.7	33.0	30.9	29.2	27.7	26.5
K53S14EC2**						39.6	36.7	33.0	30.9	29.2	27.7	26.5
K73S23EC1				59.8	51.5	46.5	43.0	40.2	37.9	36.0	34.4	33.0
K73S23EC2**				59.8	51.5	46.5	43.0	40.2	37.9	36.0	34.4	33.0
K53S14PF1							37.7	34.6	32.3	30.4	28.9	27.6
K53S14PF2**							37.7	34.6	32.3	30.4	28.9	27.6
K73S23PF1					54.4	48.7	44.8	41.8	39.3	37.3	35.6	34.1
K73S23PF2**					54.4	48.7	44.8	41.8	39.3	37.3	35.6	34.1



## Table 2: Conical Float - Dimensions



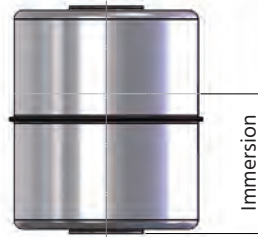
\* = Design temperature 200°C, higher temperatures after calculating  
 \*\* = acc. to Atex (conductive)

Type	Material	ØA	H	ØC	Density min.	Pressure range	Temperature range	L1 min.	U min.	Float distance min.	Mass
		(mm)	(mm)	(mm)	(kg/m <sup>3</sup> )	(bar)	(°C)	(mm)	(mm)	(mm)	(g)
Z27S10E	St. Steel	27	31	10	800	-1...+6	-156...+200	30	30	45	7.8
Z44S15E	St. Steel	44	52	15	800	-1...+25*	-156...+250	50	45	70	43
Z44S14T	Titan	44	52	14	750	-1...+15	-10...+150	50	45	70	37
Z44S15A	Alloy C	44	52	15	1000	-1...+45*	-196...+250	50	45	70	52
Z18S11NB	NBR	18	25	11	800	-1...+6	-20...+80	15	40	40	2.5
Z19.5S8.4NB	NBR	19.5	20	8.4	850	-1...+6	-20...+80	15	35	35	3.3
Z23S8.4NB	NBR	23	25	8.4	800	-1...+6	-20...+80	15	40	40	5
Z25S09NB	NBR	25	14	9	800	-1...+6	-20...+80	15	30	30	3.5
Z30S13NB	NBR	30	45	13	700	-1...+6	-20...+80	20	65	60	14
Z40S15NB	NBR	40	30	15	700	-1...+6	-20...+80	25	50	45	17
Z50S20NB	NBR	50	45	20	700	-1...+6	-20...+80	30	70	60	41
Z42S14PC	PVC	42	44	14	800	-1...+1	-15...+60	50	40	65	32
Z54S22PC	PVC	54	55	22	750	-1...+1	-15...+60	65	50	75	64
Z78S25PC	PVC	78	80	25	600	-1...+1	-15...+60	80	65	100	164
Z28S08PP	PP	28	29	8	800	-1...+1	-10...+80	35	35	45	9
Z44S13PP	PP	44	43	13	700	-1...+1	-10...+80	50	40	65	25
Z44S21PP	PP	44	69	21	800	-1...+1	-10...+80	50	55	90	45
Z56S21PP	PP	56	54	21	600	-1...+1	-10...+80	65	50	75	50
Z80S24PP	PP	80	79	24	500	-1...+1	-10...+80	80	65	100	126
Z44S13PD	PVDF	44	55	13	850	-1...+1	-10...+100	50	55	70	46
Z56S21PD	PVDF	56	69	21	800	-1...+1	-10...+100	65	60	90	90
Z80S24PD	PVDF	80	79	24	700	-1...+1	-10...+100	80	65	100	192
Z45S14EC1	ECTFE coat.	45	53	14	950	-1...+25	-78...+150	70	70	80	54
Z45S14EC2**	ECTFE coat.	45	53	14	950	-1...+25	-78...+150	70	70	80	54
Z45S14PF1	PFA coat.	45	53	14	1000	-1...+25*	-100...+250	70	70	80	57
Z45S14PF2**	PFA coat.	45	53	14	1000	-1...+25*	-100...+250	70	70	80	57





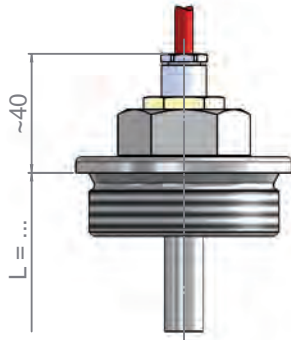
# Conical Float Immersion depths



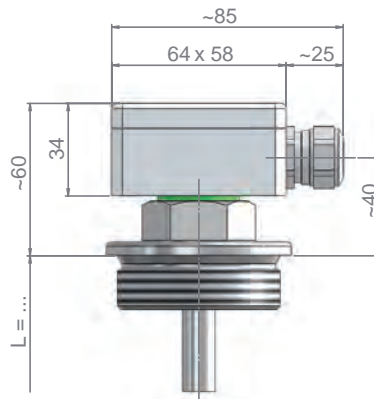
Type	Specific weight of the medium (kg/m <sup>3</sup> )											
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
	Immersion depth (mm)											
Z27S10E					23.6	21.0	18.9	17.2	15.8	14.6	13.5	12.6
Z44S15E					44.5	39.5	35.6	32.3	29.6	27.4	25.4	23.7
Z44S14T					37.6	33.4	30.0	27.3	25.0	23.1	21.5	20.0
Z44S15A							43.0	39.1	35.9	33.1	30.7	28.7
Z18S11NB					19.6	17.4	15.7	14.3	13.1	12.1	11.2	10.5
Z19.5S8.4NB						15.2	13.6	12.4	11.3	10.5	9.7	9.1
Z23S8.4NB					17.4	15.4	13.9	12.6	11.6	10.7	9.9	9.3
Z25S09NB					10.2	9.1	8.2	7.4	6.8	6.3	5.9	5.5
Z30S13NB				34.8	30.5	27.1	24.4	22.2	20.3	18.8	17.4	16.3
Z40S15NB				22.5	19.7	17.5	15.7	14.3	13.1	12.1	11.1	10.5
Z50S20NB				35.5	31.1	27.6	24.9	22.6	20.7	19.1	17.8	16.6
Z42S14PC					32.5	28.9	26.0	23.6	21.7	20.0	18.6	17.3
Z54S22PC					41.9	37.2	33.5	30.5	27.9	25.8	23.9	22.3
Z78S25PC			63.8	54.6	47.8	42.5	38.3	34.8	31.9	29.4	27.3	25.5
Z28S08PP					24.1	21.4	19.3	17.5	16.0	14.8	13.8	12.8
Z44S13PP				29.0	25.4	22.6	20.3	18.5	16.9	15.6	14.5	13.5
Z44S21PP					56.0	49.7	44.8	40.7	37.3	34.4	32.0	29.8
Z56S21PP			43.6	37.4	32.7	29.1	26.2	23.8	21.8	20.1	18.7	17.5
Z80S24PP		58.8	49.0	42.0	36.7	32.7	29.4	26.7	24.5	22.6	21.0	19.6
Z44S13PD						41.5	37.4	34.0	31.1	28.7	26.7	24.9
Z56S21PD					58.9	52.4	47.1	42.8	39.3	36.2	33.7	31.4
Z80S24PD				64.0	56.0	49.8	44.8	40.7	37.3	34.4	32.0	29.9
Z45S14EC1							41.6	37.8	34.7	32.0	29.7	27.7
Z45S14EC2**							41.6	37.8	34.7	32.0	29.7	27.7
Z45S14PF1							43.9	39.9	36.6	33.8	31.4	29.3
Z45S14PF2**							43.9	39.9	36.6	33.8	31.4	29.3
K73S23EC1				59.8	51.5	46.5	43.0	40.2	37.9	36.0	34.4	33.0



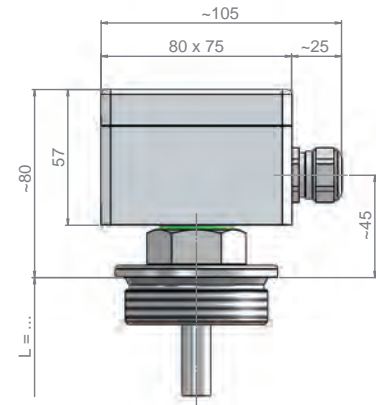
# Table 3: Electrical Connection

**Connection Type K**  
Connecting cable

**Material:** as defined cable  
**Cable gland:** PG or M  
**Prot. class:** IP55 (optional IP68)  
**Ambient temp.:** -40...+200°C  
**No. of contact clamps:** max. -

**Connection Type E**  
Aluminium socket

**Material:** Al coated RAL 7001  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 8

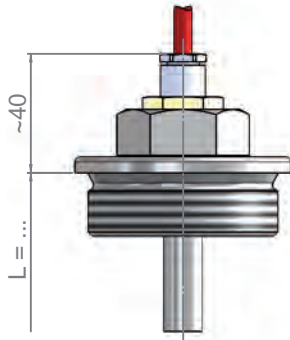
**Connection Type F**  
Aluminium socket

**Material:** Al coated RAL 7001  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 12

Version	● = compatible	/	○ = incompatible
VAG18PVC	●		●
VAG18SIL	●		●
VAG38PVC	●		●
VAG38SIL	●		●
VAG112G	●		●
VAG2G	●		●
VAF80G	●		●
VAF100G	●		●
VAF80FLEX	●		●
VAG1FLEX	●		●
VAVG12SIL	●		●
VAVG2G	●		●
VAWG38PVC	●		●
VAWG2G	●		●
VAFBHHG	●		●
VAFBHVH	●		●
VASBHHS	●		●
VASBHHG	●		●
VAFOPAS	●		●
VAFOVAS	●		●
VASG38SIL	●		●
VASMRG	●		●
VAG2HGG	●		●
VAG2HKG	●		●
VAG112PSG	●		●
VAG112PPG	●		●
MG18PVC	●		●
MG18SIL	●		●
MG38PVC	●		●

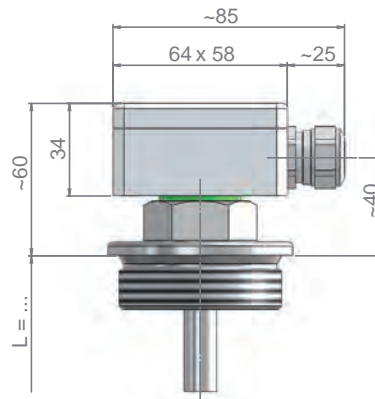


**Connection Type K**  
Connecting cable



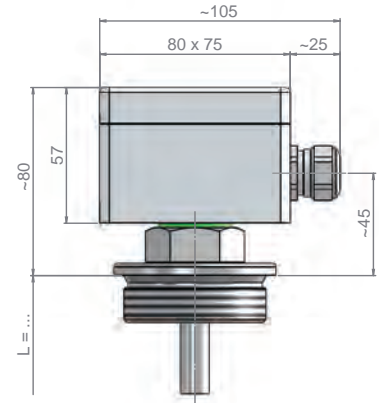
**Material:** as defined cable  
**Cable gland:** PG or M  
**Prot. class:** IP55 (optional IP68)  
**Ambient temp.:** -40...+200°C  
**No. of contact clamps:** max. -

**Connection Type E**  
Aluminium socket



**Material:** Al coated RAL 7001  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 8

**Connection Type F**  
Aluminium socket

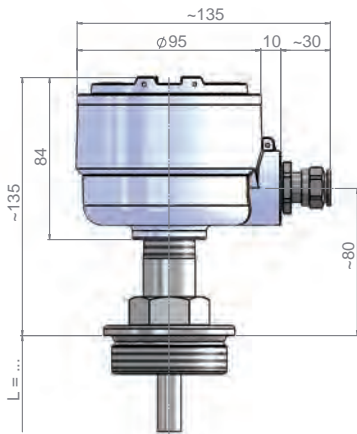


**Material:** Al coated RAL 7001  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 12

Version	● = compatible	/	○ = incompatible
MG38SIL	●	●	●
MG112G	●	●	●
MG2G	●	●	●
PAG112FLEX	●	●	●
PAG2FLEX	●	●	●
VAF80GT	○	○	●
MG112GT	○	○	●
TG38PVC	●	●	●
TG38SIL	●	●	●
TG112G	●	●	●
TG2G	●	●	●
TF65G	●	●	●
TF100G	●	●	●
ALCG38SIL	●	●	●
ALCF80G	●	●	●
PVCG38PVC	●	○	○
PVCG1PVC	●	○	○
PPG18PVC	●	○	○
PPG38PVC	●	○	○
PPG1PVC16	●	○	○
PPG1PVC20	●	○	○
PPG2G	●	○	○
PPF65G	●	○	○
PVDFG38SIL	●	○	○
PVDFG1SIL	●	○	○
VAEBF50G	○	●	●
VAEBF80G	○	●	●
VAPBF50G	○	●	●
VAPBF80G	○	●	●

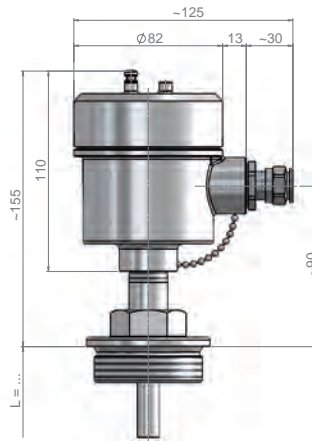


**Connection Type DA (Exd)**  
Aluminium socket



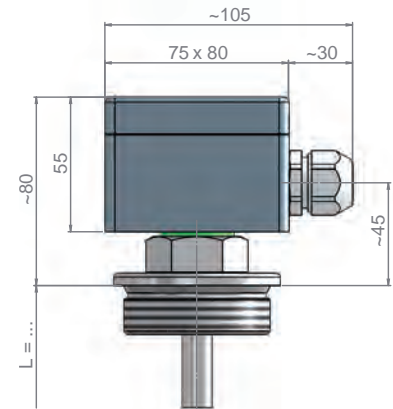
**Material:** Al coated RAL 9006  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP68  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 8

**Connection Type VA (Exd)**  
St. Steel socket



**Material:** St. Steel A4 (SS316)  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP67 (Exd / IP68)  
**Ambient temp.:** -40...+85°C  
**No. of contact clamps:** max. 12

**Connection Type PA**  
Polyester socket



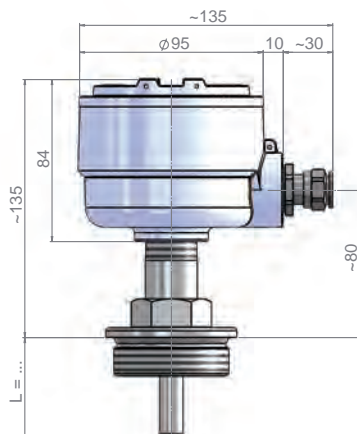
**Material:** Polyester  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -10...+100°C  
**No. of contact clamps:** max. 12

Version	● = compatible / ○ = incompatible		
VAG18PVC	●	●	○
VAG18SIL	●	●	○
VAG38PVC	●	●	○
VAG38SIL	●	●	○
VAG112G	●	●	○
VAG2G	●	●	○
VAF80G	●	●	○
VAF100G	●	●	○
VAF80FLEX	●	●	○
VAF1FLEX	●	●	○
VAVG12SIL	●	●	○
VAVG2G	●	●	○
VAWG38PVC	●	●	○
VAWG2G	●	●	○
VAFBHHG	●	●	○
VAFBHVH	●	●	○
VASBHHS	●	●	○
VASBHHG	●	●	○
VAFOPAS	●	●	○
VAFOVAS	●	●	○
VASG38SIL	●	●	○
VASMRG	●	●	○
VAG2HGG	●	●	○
VAG2HKG	●	●	○
VAG112PSG	●	●	○
VAG112PPG	●	●	○
MG18PVC	○	○	○
MG18SIL	○	○	○
MG38PVC	○	○	○



### Connection Type DA (Exd)

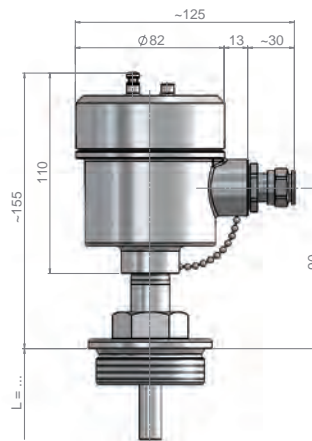
Aluminium socket



**Material:** Al coated RAL 9006  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP68  
**Ambient temp.:** -40...+100°C  
**No. of contact clamps:** max. 8

### Connection Type VA (Exd)

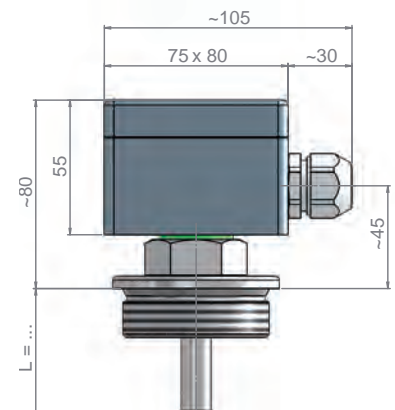
St. Steel socket



**Material:** St. Steel A4 (SS316)  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP67 (Exd / IP68)  
**Ambient temp.:** -40...+85°C  
**No. of contact clamps:** max. 12

### Connection Type PA

Polyester socket

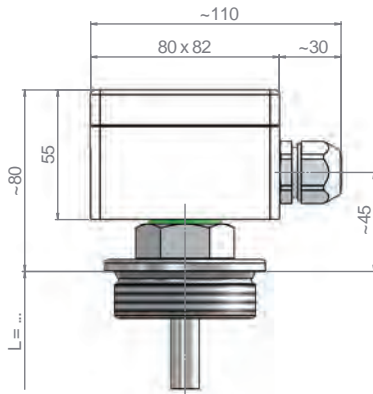


**Material:** Polyester  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -10...+100°C  
**No. of contact clamps:** max. 12

Version	● = compatible	/	○ = incompatible
MG38SIL	○		○
MG112G	○		○
MG2G	○		○
PAG112FLEX	○		●
PAG2FLEX	○		●
VAF80GT	○		●
MG112GT	○		●
TG38PVC	●		○
TG38SIL	●		○
TG112G	●		○
TG2G	●		○
TF65G	●		○
TF100G	●		○
ALCG38SIL	●		○
ALCF80G	●		○
PVCG38PVC	○		●
PVCG1PVC	○		●
PPG18PVC	○		●
PPG38PVC	○		●
PPG1PVC16	○		●
PPG1PVC20	○		●
PPG2G	○		●
PPF65G	○		●
PVDFG38SIL	○		●
PVDFG1SIL	○		●
VAEBF50G	●		●
VAEBF80G	●		●
VAPBF50G	●		●
VAPBF80G	●		●

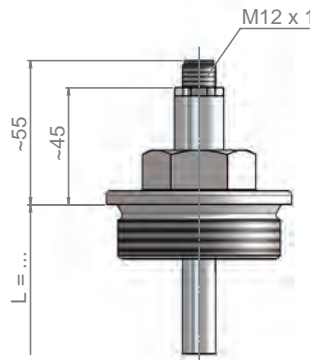


**Connection Type BA**  
ABS socket



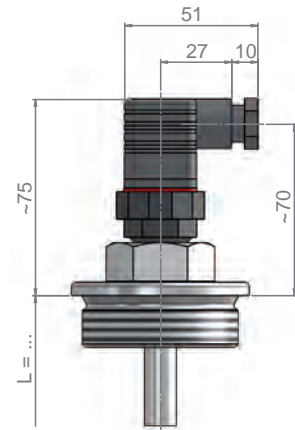
**Material:** ABS  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 12

**Connection Type S1A(B)**  
Plug connection M 12 3-wire (8-wire)



**Material:** Brass / PA  
**Cable gland:** PG9  
**Prot. class:** IP67  
**Ambient temp.:** -25...+90°C  
**Anz. Kontaktkl.:** S1A max. 3 (S1B max. 8)

**Connection Type S2A**  
Connector Hirschmann DIN 43650



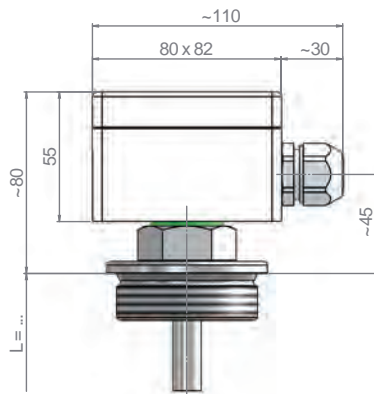
**Material:** PA  
**Cable gland:** M16  
**Prot. class:** IP65  
**Ambient temp.:** -40...+125°C  
**No. of contact clamps:** max. 3

Version	● = compatible	/	○ = incompatible	
VAG18PVC	○		○	●
VAG18SIL	○		○	●
VAG38PVC	○		○	●
VAG38SIL	○		○	●
VAG112G	○		○	●
VAG2G	○		○	●
VAF80G	○		○	●
VAF100G	○		○	●
VAF80FLEX	○		○	●
VAG1FLEX	○		○	●
VAVG12SIL	○		○	●
VAVG2G	○		○	●
VAWG38PVC	○		○	●
VAWG2G	○		○	●
VAFBHGG	○		○	●
VAFBHVG	○		○	●
VASBHHS	○		○	●
VASBHHG	○		○	●
VAFOPAS	○		○	●
VAFOVAS	○		○	●
VASG38SIL	○		○	●
VASMRG	○		○	●
VAG2HGG	○		○	●
VAG2HKG	○		○	●
VAG112PSG	○		○	●
VAG112PPG	○		○	●
MG18PVC	○		●	●
MG18SIL	○		●	●
MG38PVC	○		●	●



### Connection Type BA

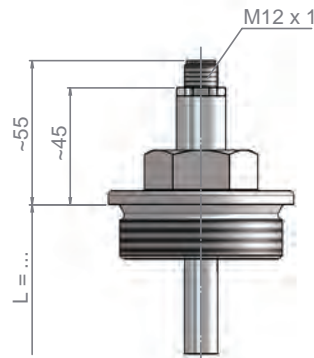
ABS socket



**Material:** ABS  
**Cable gland:** M20 x 1,5  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 12

### Connection Type S1A(B)

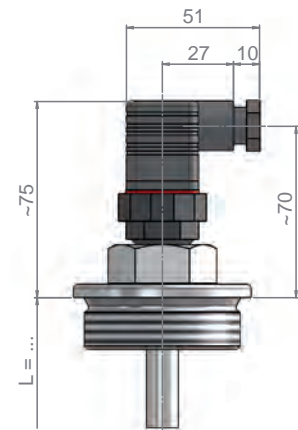
Plug connection M 12 3-wire (8-wire)



**Material:** Brass / PA  
**Cable gland:** PG9  
**Prot. class:** IP67  
**Ambient temp.:** -25...+90°C  
**Anz. Kontaktkl.:** S1A max. 3 ( S1B max. 8 )

### Connection Type S2A

Connector Hirschmann DIN 43650

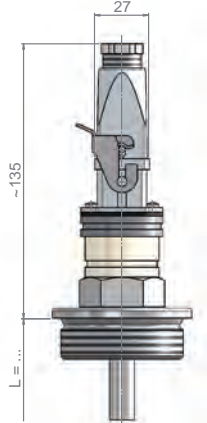


**Material:** PA  
**Cable gland:** M16  
**Prot. class:** IP65  
**Ambient temp.:** -40...+125°C  
**No. of contact clamps:** max. 3

Version	● = compatible	/	○ = incompatible
MG38SIL	○	●	●
MG112G	○	●	●
MG2G	○	●	●
PAG112FLEX	●	○	○
PAG2FLEX	●	○	○
VAF80GT	●	○	○
MG112GT	●	○	○
TG38PVC	○	○	●
TG38SIL	○	○	●
TG112G	○	○	●
TG2G	○	○	●
TF65G	○	○	●
TF100G	○	○	●
ALCG38SIL	○	○	●
ALCF80G	○	○	●
PVCG38PVC	●	○	●
PVCG1PVC	●	○	●
PPG18PVC	●	○	●
PPG38PVC	●	○	●
PPG1PVC16	●	○	●
PPG1PVC20	●	○	●
PPG2G	●	○	●
PPF65G	●	○	●
PVDFG38SIL	●	○	●
PVDFG1SIL	●	○	●
VAEBF50G	●	○	○
VAEBF80G	●	○	○
VAPBF50G	●	○	○
VAPBF80G	●	○	○

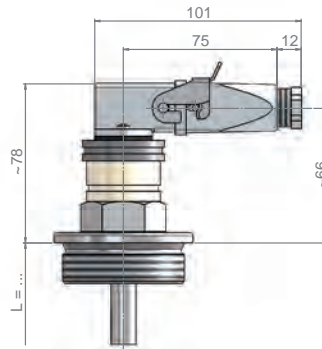


**Connection Type S3A(B)**  
Connector HTS straight



**Material:** S3A = Plastic / S3B = Aluminium  
**Cable gland:** PG11  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 6

**Connection Type S4A(B)**  
Connector HTS angled



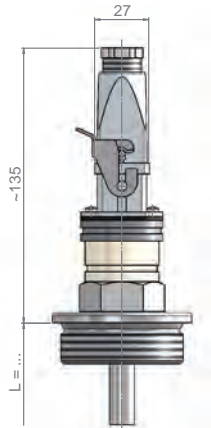
**Material:** S4A = Plastic / S4B = Aluminium  
**Cable gland:** PG11  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 12

Version	● = compatible	/	○ = incompatible
VAG18PVC	○		○
VAG18SIL	○		○
VAG38PVC	○		○
VAG38SIL	○		○
VAG112G	○		○
VAG2G	○		○
VAF80G	○		○
VAF100G	○		○
VAF80FLEX	○		○
VAG1FLEX	○		○
VAVG12SIL	○		○
VAVG2G	○		○
VAWG38PVC	○		○
VAWG2G	○		○
VAFBHHG	○		○
VAFBHVH	○		○
VASBHHS	○		○
VASBHVG	○		○
VAFOPAS	○		○
VAFOVAS	○		○
VASG38SIL	○		○
VASMRG	○		○
VAG2HGG	○		○
VAG2HKG	○		○
VAG112PSG	○		○
VAG112PPG	○		○
MG18PVC	○		●
MG18SIL	○		●
MG38PVC	○		●



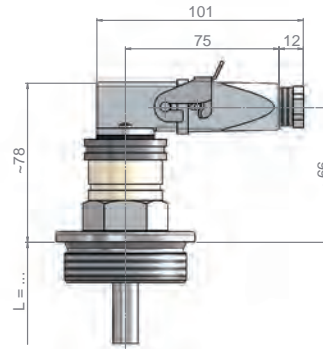


**Connection Type S3A(B)**  
Connector HTS straight



**Material:** S3A = Plastic / S3B = Aluminium  
**Cable gland:** PG11  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 6

**Connection Type S4A(B)**  
Connector HTS angled

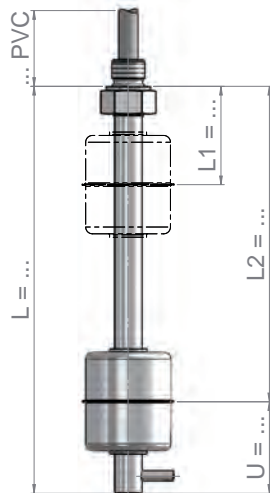


**Material:** S4A = Plastic / S4B = Aluminium  
**Cable gland:** PG11  
**Prot. class:** IP65  
**Ambient temp.:** -10...+80°C  
**No. of contact clamps:** max. 12

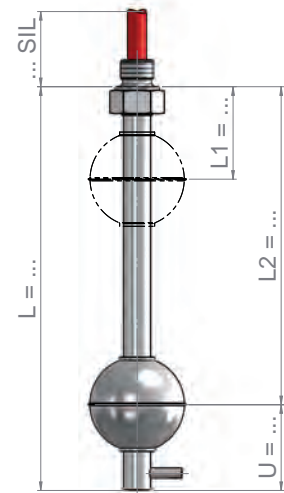
Version	● = compatible	/	○ = incompatible
MG38SIL	○		●
MG112G	○		●
MG2G	○		●
PAG112FLEX	○		●
PAG2FLEX	○		●
VAF80GT	○		○
MG112GT	○		○
TG38PVC	○		○
TG38SIL	○		○
TG112G	○		○
TG2G	○		○
TF65G	○		○
TF100G	○		○
ALCG38SIL	○		○
ALCF80G	○		○
PVCG38PVC	●		●
PVCG1PVC	●		●
PPG18PVC	●		●
PPG38PVC	●		●
PPG1PVC16	●		●
PPG1PVC20	●		●
PPG2G	●		●
PPF65G	●		●
PVDFG38SIL	●		●
PVDFG1SIL	●		●
VAEBF50G	○		○
VAEBF80G	○		○
VAPBF50G	○		○
VAPBF80G	○		○

**Float switch made of stainless steel with upward thread connection**

Version: VAG18PVC



Version: VAG18SIL

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1/8"-male upwards
<b>Sliding tube /</b>	ø 8 mm
<b>Insertion length /</b>	≤ 1000 mm
<b>Float /</b>	Z27S10E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1...+6 bar
<b>Design temp. /</b>	-20...+80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 30 mm, U = 30 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 45 mm

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1/8"-male upwards
<b>Sliding tube /</b>	ø 8 mm
<b>Insertion length /</b>	≤ 1000 mm
<b>Float /</b>	K29S9.4E
<b>spec. Weight /</b>	≥ 900 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1...+35 bar
<b>Design temp. /</b>	-30...+180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 35 mm, U = 30 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 45 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	2
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	-
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

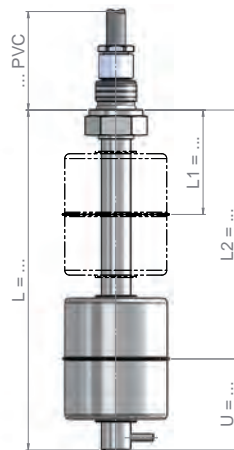
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	150 V / 0.5 A / 10 VA
max. Contacts:	2
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	-
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

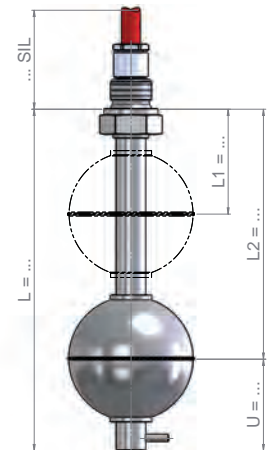


## Float switch made of stainless steel with upward thread connection

Version: VAG38PVC



Version: VAG38SIL



### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+25 bar
<b>Design temp. /</b>	-20. . .+80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+30 bar
<b>Design temp. /</b>	-30. . .+180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

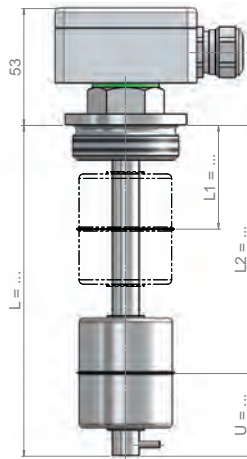
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

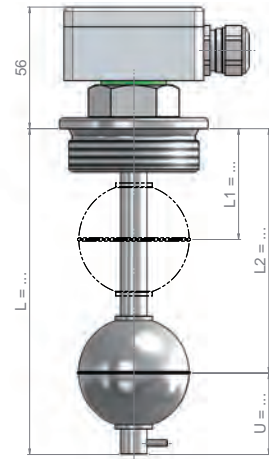
\*\* ATEX = if length of instrument ≥ 4 m please choose diff. material quality for guide tube and float

**Float switch made of stainless steel with downward thread connection**

Version: VAG112G



Version: VAG2G

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+25 bar
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-male downwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+30 bar
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

**Electrical Specifications:**

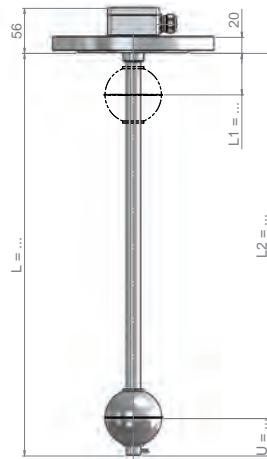
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

\*\* ATEX = if length of instrument ≥ 4 m please choose diff. material quality for guide tube and float

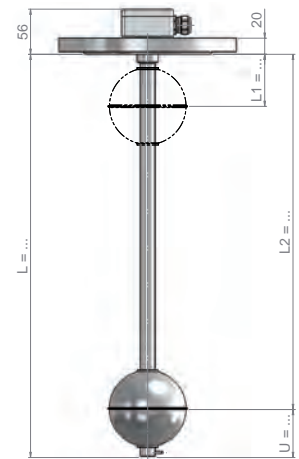


## Float switch made of stainless steel with flange connection

Version: VAF80G



Version: VAF100G



### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 18 mm
<b>Insertion length /</b>	≤ 6000 mm**
<b>Float /</b>	K72S24.4E
<b>spec. Weight /</b>	≥ 620 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 60 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 90 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 18 mm
<b>Insertion length /</b>	≤ 6000 mm**
<b>Float /</b>	K98S23E
<b>spec. Weight /</b>	≥ 570 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 80 mm, U = 70 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 115 mm

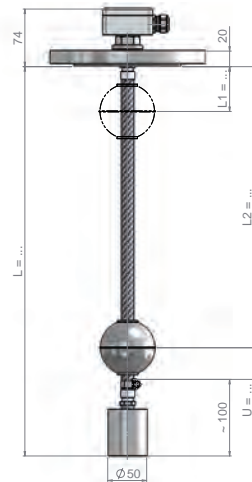
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

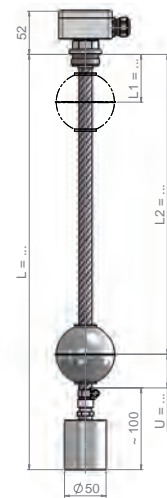
\*\* ATEX = if length of instrument ≥ 4 m please choose diff. material quality for guide tube and float

**Float switch made of stainless steel - flexible**

Version: VAF80FLEX



Version: VAGIFLEX

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	Ø 16 mm
<b>Insertion length /</b>	≤ 15000 mm**
<b>Float /</b>	K72S24.4E
<b>spec. Weight /</b>	≥ 620 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . .+180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 60 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 90 mm

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1"-male downwards
<b>Sliding tube /</b>	Ø 16 mm
<b>Insertion length /</b>	≤ 15000 mm**
<b>Float /</b>	K72S24.4E
<b>spec. Weight /</b>	≥ 620 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . .+180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 60 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 90 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, SIL1

**Electrical Specifications:**

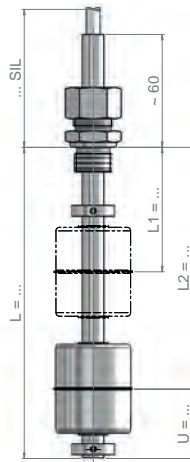
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, SIL1

\*\* ATEX = if length of instrument ≥ 4 m please choose diff. material quality for guide tube and float



## Float switch made of stainless steel - adjustable

Version: VAVG12SIL



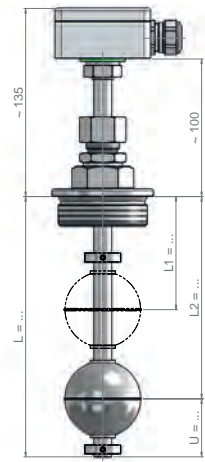
### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G ½"-male downwards
<b>Sliding tube /</b>	ø 12 mm, adjustable
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. .+.3 bar
<b>Design temp. /</b>	-30. .+.180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

Version: VAVG2G



### Technical Specifications:

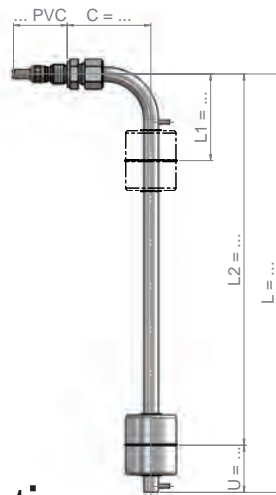
<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-male downwards
<b>Sliding tube /</b>	ø 12 mm, adjustable
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. .+.3 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. .+.180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

**Float switch made of stainless steel - angled**

Version: VAWG38PVC

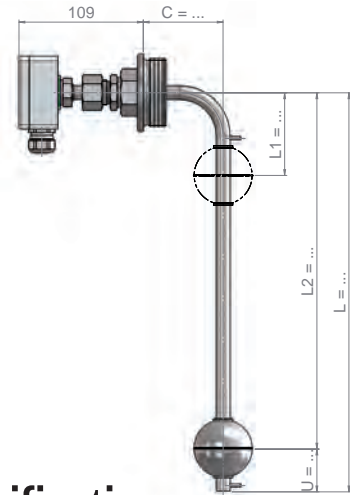
**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-AG
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+25 bar
<b>Design temp. /</b>	-20. . .+80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 75 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

Version: VAWG2G

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-AG
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+30 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 75 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Electrical Specifications:**

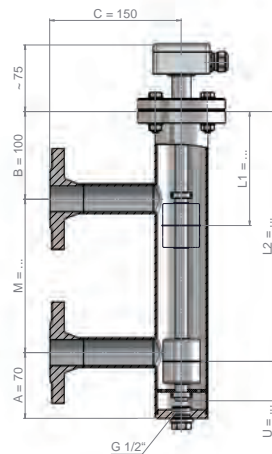
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1



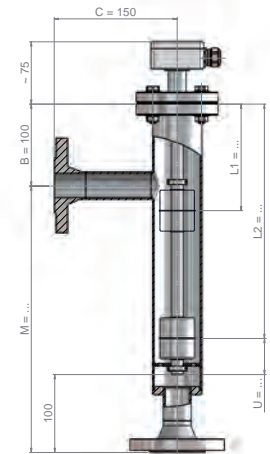


## Float switch with bypass tube made of stainless steel

Version: VAFBHHG



Version: VAFBHVG



### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN25 / PN16 / Form B1
<b>Bypassgehäuse /</b>	∅ 60.30 x 2.00 mm
<b>Mittenabstand /</b>	M ≤ 1000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-30. . . +180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 130 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

### Technical Specifications:

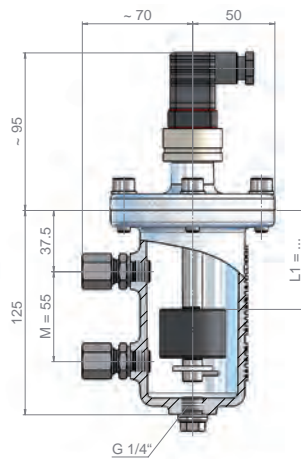
<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN25 / PN16 / Form B1
<b>Bypassgehäuse /</b>	∅ 60.30 x 2.00 mm
<b>Mittenabstand /</b>	M ≤ 1000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 130 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

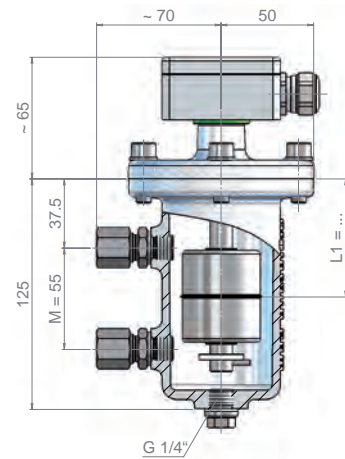
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

**Float switch with bypass tube made of aluminium**

Version: VASBHHS



Version: VASBHHG

**Technical Specifications:**

<b>Materials /</b>	St. Steel/ Aluminium/ Buna
<b>El. connection /</b>	Connector Hirschmann DIN 43650
<b>Process conn. /</b>	Comp. type fitting / $\varnothing$ 10 mm
<b>Bypassgehäuse /</b>	$\varnothing$ 64.00 x 3.50 mm, Aluminium
<b>Mittenabstand /</b>	M = 55 mm
<b>Float /</b>	Z40S15NB
<b>spec. Weight /</b>	$\geq$ 700 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +6 bar
<b>Design temp. /</b>	-30. . . +80°C
<b>Mounting pos. /</b>	vertical $\pm$ 30°
<b>min. Dimensions /</b>	L1 $\geq$ 25 mm, U = - Contact clearance: - Float clearance: -

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

**Technical Specifications:**

<b>Materials /</b>	St. Steel/ Aluminium
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Comp. type fitting / $\varnothing$ 10 mm
<b>Bypassgehäuse /</b>	$\varnothing$ 64.00 x 3.50 mm, Aluminium
<b>Mittenabstand /</b>	M = 55 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	$\geq$ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +6 bar
<b>Design temp. /</b>	-30. . . +150°C (optional 250°C)
<b>Mounting pos. /</b>	vertical $\pm$ 30°
<b>min. Dimensions</b>	L1 $\geq$ 45 mm, U = - Contact clearance: - Float clearance: -

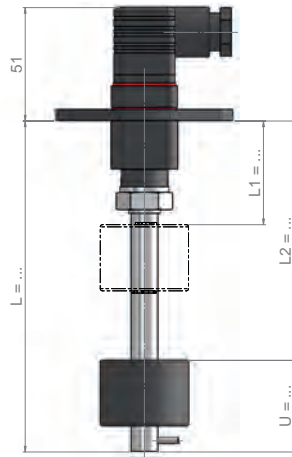
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 V
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

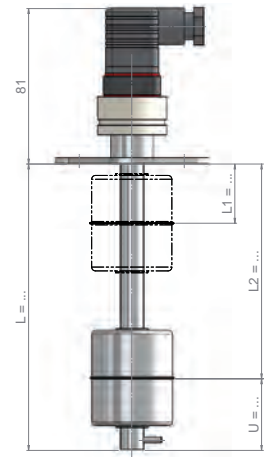


## Float switch made of stainless steel - with oval flange

Version: VAFOPAS



Version: VAFOVAS



### Technical Specifications:

<b>Materials /</b>	St. Steel/ Aluminium/ Buna
<b>El. connection /</b>	Connector Hirschmann DIN 43650
<b>Process conn. /</b>	Standard Oval flange 80 x 50 mm, PA
<b>Sliding tube /</b>	∅ 12 mm (optional 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	Z40S15NB
<b>spec. Weight /</b>	≥ 700 kg/m <sup>3</sup>
<b>Design pressure /</b>	0...+0.5 bar
<b>Design temp. /</b>	-10...+80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 50 mm, Contact clearance: ≥ 20 mm Float clearance: ≥ 45 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	2
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	2
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	NO or NC
Approvals:	PED, BV, SIL1

### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Connector Hirschmann DIN 43650
<b>Process conn. /</b>	Standard Oval flange 80 x 50 mm
<b>Sliding tube /</b>	∅ 12 mm (optional 14 mm)
<b>Insertion length /</b>	≤ 5000 mm**
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1...+1 bar
<b>Design temp. /</b>	-30...+150°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions</b>	L1 ≥ 35 mm, U = 45 mm, Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

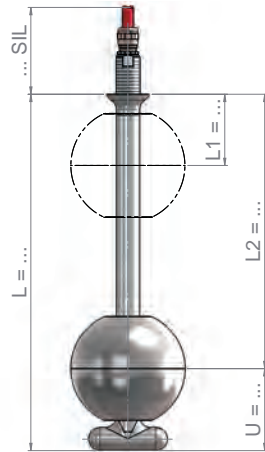
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	2
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 V
max. Contacts:	2
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, SIL1

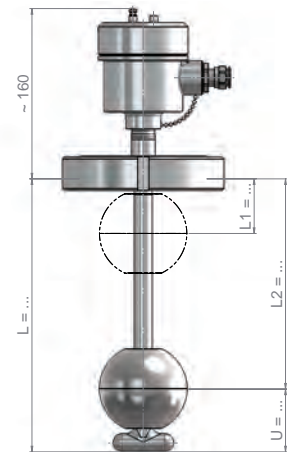
\*\* ATEX = if length of instrument ≥ 4 m please choose diff. material quality for guide tube and float

**Float switch made of stainless steel - 3A sanitary standard**

Version: VASG38SIL



Version: VASMRG

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti) roughness depth wetted $\leq 0,4 \mu\text{m}$
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	$\varnothing 16 \text{ mm}$
<b>Insertion length /</b>	$\leq 5000 \text{ mm}^{**}$
<b>Float /</b>	K80S23E2
<b>spec. Weight /</b>	$\geq 750 \text{ kg/m}^3$
<b>Design pressure /</b>	-1. . .+40 bar
<b>Design temp. /</b>	-30. . .+180°C
<b>Mounting pos. /</b>	vertical $\pm 30^\circ$
<b>min. Dimensions /</b>	L1 $\geq 50 \text{ mm}$ , U = 55 mm Contact clearance: $\geq 20 \text{ mm}$ Float clearance: $\geq 100 \text{ mm}$

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti) roughness depth wetted $\leq 0,4 \mu\text{m}$
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	G 2"-AG
<b>Sliding tube /</b>	$\varnothing 16 \text{ mm}$
<b>Insertion length /</b>	$\leq 5000 \text{ mm}^{**}$
<b>Float /</b>	K80S23E2
<b>spec. Weight /</b>	$\geq 750 \text{ kg/m}^3$
<b>Design pressure /</b>	-1. . .+6 bar
<b>Design temp. /</b>	-30. . .+180°C
<b>Mounting pos. /</b>	vertical $\pm 30^\circ$
<b>min. Dimensions /</b>	L1 $\geq 50 \text{ mm}$ , U = 55 mm Contact clearance: $\geq 20 \text{ mm}$ Float clearance: $\geq 100 \text{ mm}$

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, 3A, SIL1

**Electrical Specifications:**

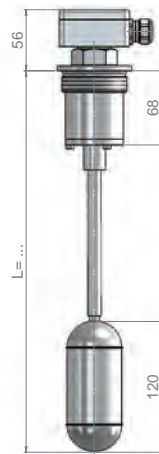
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, 3A, SIL1

\*\* ATEX = if length of instrument  $\geq 4 \text{ m}$  please choose diff. material quality for guide tube and float

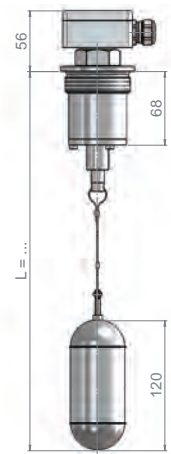


## Float switch made of stainless steel - with hub float

Version: VAG2HGG



Version: VAG2HKG



### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-AG
<b>Schw.-Gestänge /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 500 mm
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1: -, U = - Contact clearance: - Float clearance: -

### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-AG
<b>Schw.-Gestänge /</b>	-
<b>Insertion length /</b>	≤ 3000 mm
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . .+16 bar
<b>Design temp. /</b>	-30. . .+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions</b>	L1: -, U = - Contact clearance: - Float clearance: -

### Electrical Specifications:

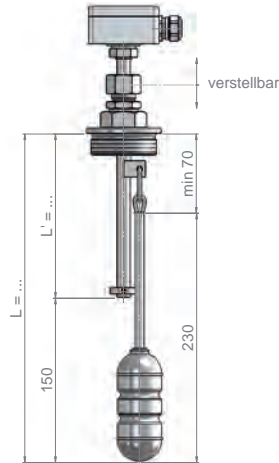
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	-
Approvals:	ATEX, PED, GOST, SIL1

### Electrical Specifications:

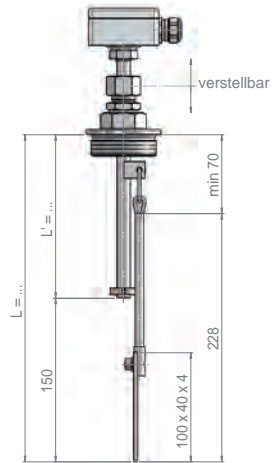
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	2
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	-
Approvals:	ATEX, PED, GOST, SIL 1

**Float switch made of stainless steel - with pendulum switch**

Version: VAG112PSG



Version: VAG112PPG

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Schw.-Gestänge /</b>	ø 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>spec. Weight /</b>	≥ 1000 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1...+3 bar
<b>Design temp. /</b>	-30...+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L': ≥ 150 mm, U = - Contact clearance: - Float clearance: -

**Technical Specifications:**

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	ø 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Flat paddle 100 x 40 mm
<b>spec. Weight /</b>	-
<b>Design pressure /</b>	-1...+3 bar
<b>Design temp. /</b>	-30...+180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L': ≥ 150 mm, U = - Contact clearance: - Float clearance: -

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	-
Approvals:	PED, SIL1

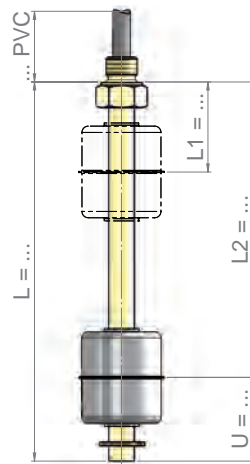
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	-
Temp.-contact:	-
Approvals:	PED, SIL1

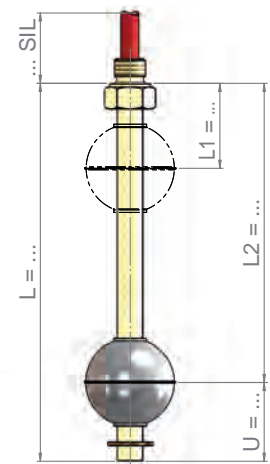


## Float switch made of brass with upward thread connection

Version: MG18PVC



Version: MG18SIL



### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1/8"-male upwards
<b>Sliding tube /</b>	ø 8 mm
<b>Insertion length /</b>	≤ 1000 mm
<b>Float /</b>	Z27S10E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. .+.6 bar
<b>Design temp. /</b>	-10. .+.80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 30 mm, U = 30 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 45 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	2
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	-
Approvals:	PED, SIL1

### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 1/8"-male upwards
<b>Sliding tube /</b>	ø 8 mm
<b>Insertion length /</b>	≤ 1000 mm
<b>Float /</b>	K29S9.4E
<b>spec. Weight /</b>	≥ 900 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. .+.6 bar
<b>Design temp. /</b>	-10. .+.150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions</b>	L1 ≥ 35 mm, U = 30 mm, Contact clearance: ≥ 20 mm Float clearance: ≥ 45 mm

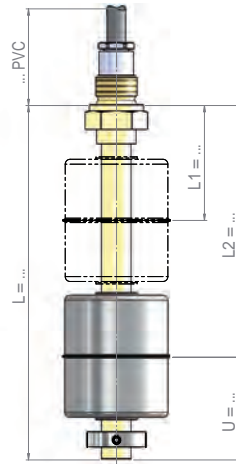
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 V
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	-
Approvals:	PED, SIL1

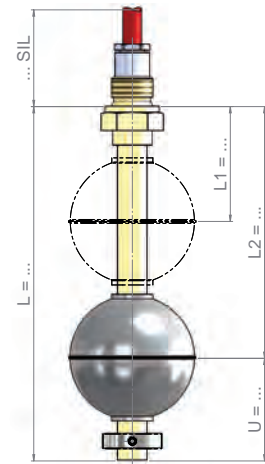


## Float switch made of brass with upward thread connection

Version: MG38PVC



Version: MG38SIL



### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	ø 12 mm (optional ø 14 mm)
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

### Electrical Specifications:

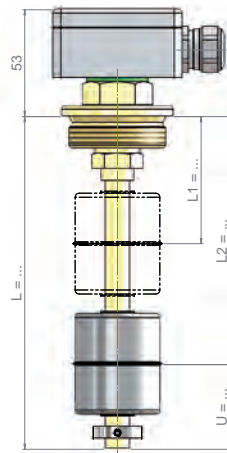
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1



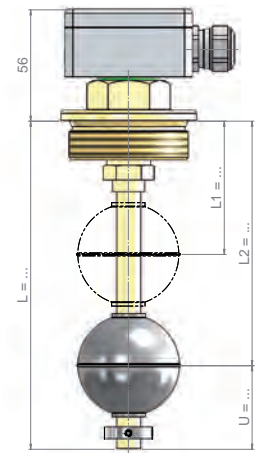


## Float switch made of brass with downward thread connection

Version: MG112G



Version: MG2G



### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Technical Specifications:

<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-male downwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

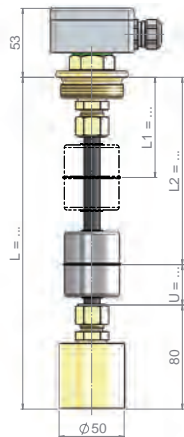
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

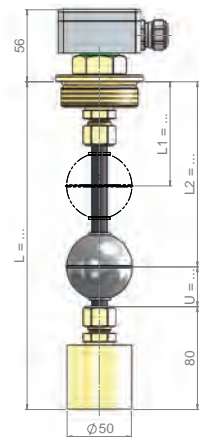


**Float switch made of Polyamide - flexible**

Version: PAG112FLEX



Version: PAG2FLEX



**Technical Specifications:**

<b>Materials /</b>	Polyamid, Brass, St. Steel
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	ø 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Technical Specifications:**

<b>Materials /</b>	Polyamid, Brass, St. Steel
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-male downwards
<b>Sliding tube /</b>	ø 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S15E1
<b>spec. Weight /</b>	≥ 680 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

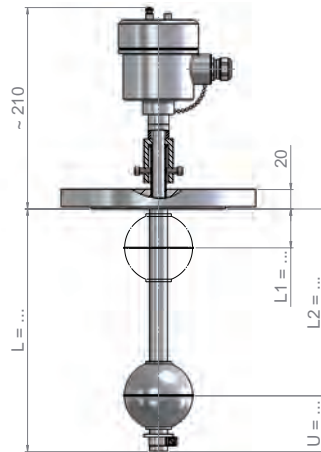
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

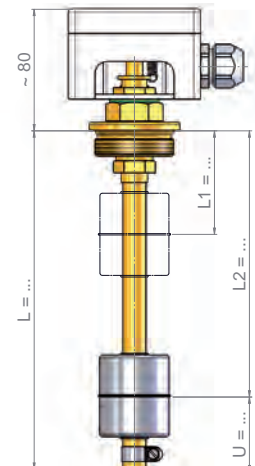


## Float switch made of stainless steel / brass - with test function

Version: VAF80GT



Version: MG112GT



### Technical Specifications:

<b>Materials /</b>	1.4404/ 1.4435/ 1.4571 (316L/ 316Ti)
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 18 mm
<b>Insertion length /</b>	≤ 6000 mm
<b>Float /</b>	K72S24.4E
<b>spec. Weight /</b>	≥ 620 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 60 mm, U = 60 mm Contact clearance: ≥ 90 mm Float clearance: ≥ 90 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, GL, BV, ABS, WHG, SIL1

### Technical Specifications:

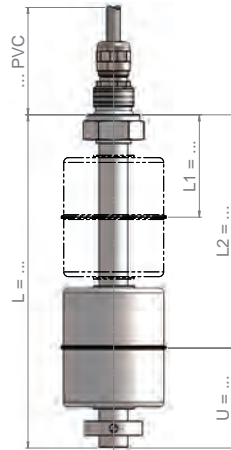
<b>Materials /</b>	Brass (Float St. Steel)
<b>El. connection /</b>	Type BA - ABS socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	∅ 14 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S15E
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar
<b>Design temp. /</b>	-10. . . +100°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 45 mm Contact clearance: ≥ 70 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

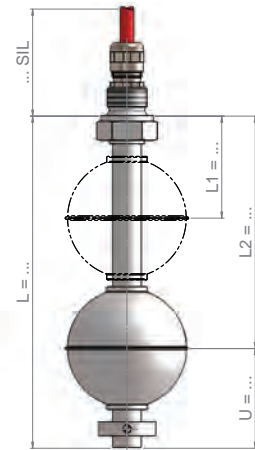
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, SIL1

**Float switch made of Titanium with upward thread connection**

Version: TG38PVC



Version: TG38SIL

**Technical Specifications:**

<b>Materials /</b>	Titan
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S14T
<b>spec. Weight /</b>	≥ 750 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +15 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Technical Specifications:**

<b>Materials /</b>	Titan
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S14T
<b>spec. Weight /</b>	≥ 650 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +24 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

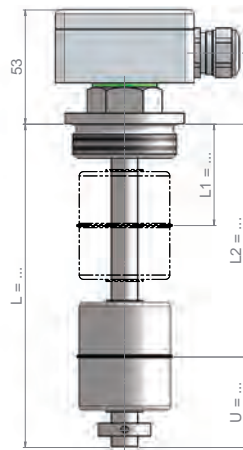
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

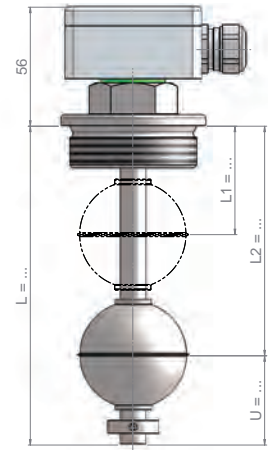


## Float switch made of Titanium with downward thread connection

Version: TG112G



Version: TG2G



### Technical Specifications:

<b>Materials /</b>	Titan
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 1 1/2"-male downwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	Z44S14T
<b>spec. Weight /</b>	≥ 750 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +15 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Technical Specifications:

<b>Materials /</b>	Titan
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	G 2"-male downwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S14T
<b>spec. Weight /</b>	≥ 650 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +24 bar
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Electrical Specifications:

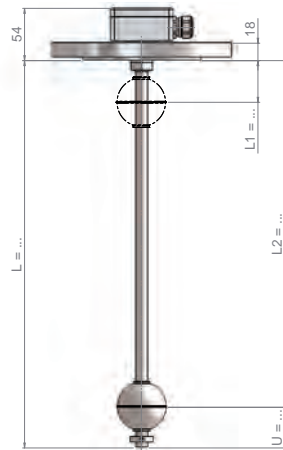
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

### Electrical Specifications:

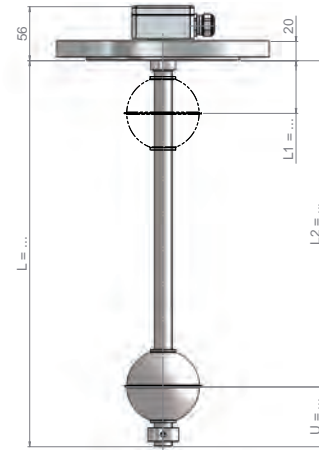
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

**Float switch made of Titanium with flange connection**

Version: TF65G



Version: TF100G

**Technical Specifications:**

<b>Materials /</b>	Titan
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN65 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 5000 mm
<b>Float /</b>	K52S14T
<b>spec. Weight /</b>	≥ 660 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

**Technical Specifications:**

<b>Materials /</b>	Titan
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN100 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 18 mm
<b>Insertion length /</b>	≤ 6000 mm
<b>Float /</b>	K80S24T
<b>spec. Weight /</b>	≥ 600 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-10. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 95 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

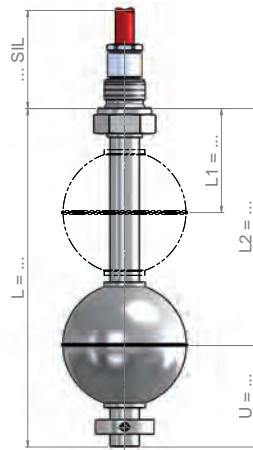
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1



## Float switch made of Alloy C

Version: ALCG38SIL



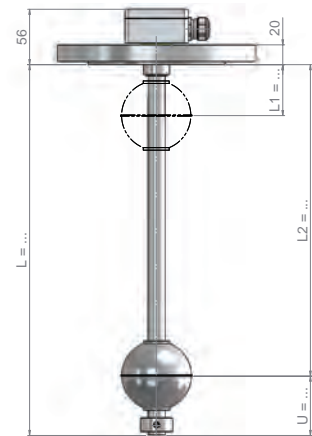
## Technical Specifications:

<b>Materials /</b>	Alloy C
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	K52S15A
<b>spec. Weight /</b>	≥ 1260 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +55 bar
<b>Design temp. /</b>	-40. . . +180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 55 mm, U = 45 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

## Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

Version: ALCF80G



## Technical Specifications:

<b>Materials /</b>	Alloy C
<b>El. connection /</b>	Type E - Aluminium socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 18 mm
<b>Insertion length /</b>	≤ 6000 mm
<b>Float /</b>	K72S24.4A
<b>spec. Weight /</b>	≥ 820 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-40. . . +200°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 60 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 90 mm

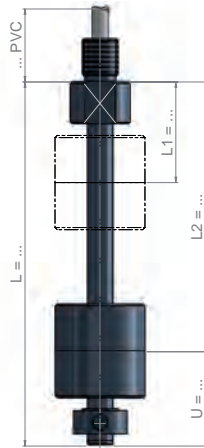
## Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4x (5x with Type F - Alu. socket)
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3x (4x with Type F - Alu. socket)
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, WHG, SIL1

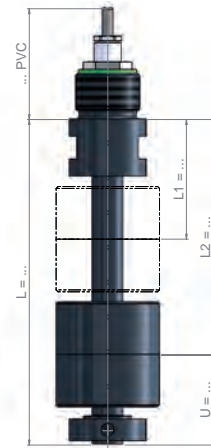


## Float switch made of PVC with upward thread connection

Version: PvcG38Pvc



Version: PvcG1Pvc



### Technical Specifications:

<b>Materials /</b>	PVC
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z42S14PC
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-15. . . +60°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 40 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 65 mm

### Technical Specifications:

<b>Materials /</b>	PVC
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1"-male upwards
<b>Sliding tube /</b>	∅ 16 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z54S22PC
<b>spec. Weight /</b>	≥ 750 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-15. . . +60°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 75 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

### Electrical Specifications:

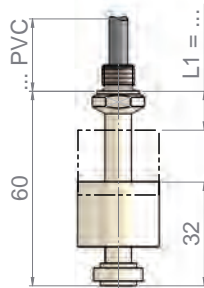
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP65 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1





**Float switch made of Polypropylene with upward thread connection**

Version: PPG18PVC



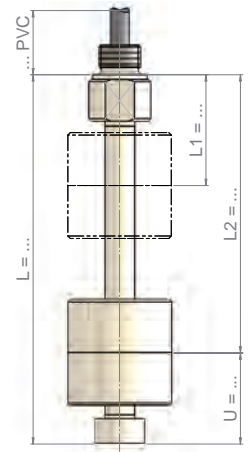
**Technical Specifications:**

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1/8"-male upwards
<b>Sliding tube /</b>	ø 8 mm
<b>Insertion length /</b>	60 mm
<b>Float /</b>	special
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 12 mm, U = 32 mm Contact clearance: - Float clearance: -

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	1
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	1
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

Version: PPG38PVC



**Technical Specifications:**

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	ø 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z44S13PP
<b>spec. Weight /</b>	≥ 700 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 40 mm, U = 40 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 65 mm

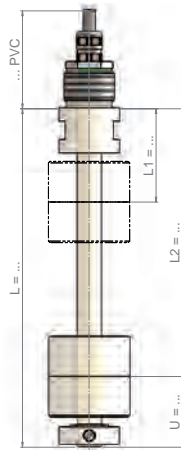
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

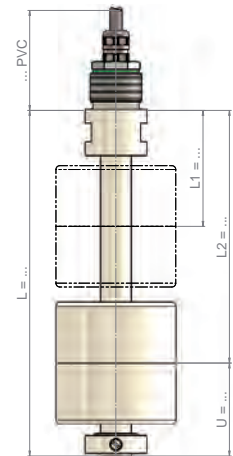


**Float switch made of Polypropylene with upward thread connection**

Version: PPG1PVC16



Version: PPG1PVC20



**Technical Specifications:**

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1"-male upwards
<b>Sliding tube /</b>	ø 16 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z56S21PP
<b>spec. Weight /</b>	≥ 600 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 75 mm

**Technical Specifications:**

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	PVC connecting cable
<b>Process conn. /</b>	G 1"-male upwards
<b>Sliding tube /</b>	ø 20 mm
<b>Insertion length /</b>	≤ 6000 mm
<b>Float /</b>	Z80S24PP
<b>spec. Weight /</b>	≥ 500 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 80 mm, U = 65 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 100 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

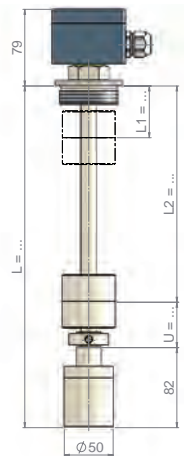
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

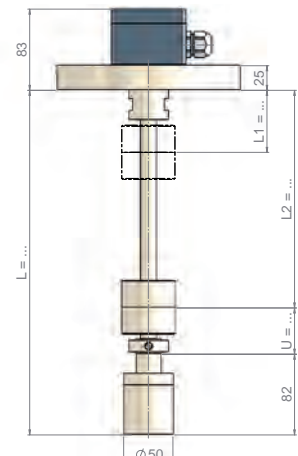


## Float switch made of Polypropylene

Version: PPG2G



Version: PPF65G



## Technical Specifications:

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	Type A - Polyester socket
<b>Process conn. /</b>	G 2"-male upwards
<b>Sliding tube /</b>	Ø 16 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z56S21PP
<b>spec. Weight /</b>	≥ 600 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 75 mm

## Technical Specifications:

<b>Materials /</b>	Polypropylene
<b>El. connection /</b>	Type PA - Polyester socket
<b>Process conn. /</b>	Flange EN DN65 / PN10 / Form A
<b>Sliding tube /</b>	Ø 16 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z56S21PP
<b>spec. Weight /</b>	≥ 600 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +80°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 75 mm

## Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	SIL

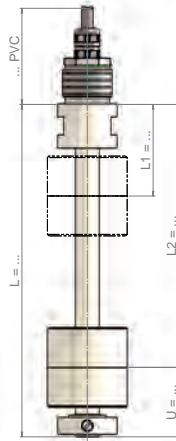
## Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP65
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	SIL

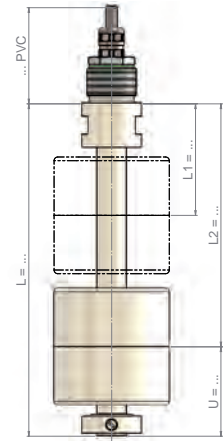


## Float switch made of PVDF with upward thread connection

Version: PVDFG38SIL



Version: PVDFG1SIL



### Technical Specifications:

<b>Materials /</b>	PVDF
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 3/8"-male upwards
<b>Sliding tube /</b>	∅ 12 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z44S13PD
<b>spec. Weight /</b>	≥ 850 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +100°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 50 mm, U = 55 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 70 mm

### Technical Specifications:

<b>Materials /</b>	PVDF
<b>El. connection /</b>	Silicone connecting cable
<b>Process conn. /</b>	G 1"-male upwards
<b>Sliding tube /</b>	∅ 16 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z56S21PD
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +1 bar
<b>Design temp. /</b>	-10. . . +100°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 60 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 90 mm

### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	2
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

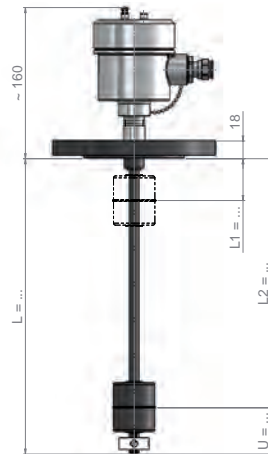
### Electrical Specifications:

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	2
<b>Prot. class /</b>	IP55 (optional IP68)
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	PED, WHG, SIL1

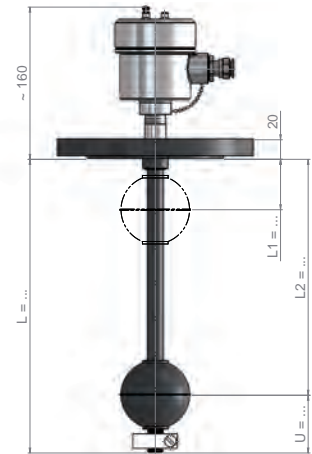


## Float switch made of stainless steel - ECTFE coated

Version: VAEBF50G



Version: VAEBF80G



## Technical Specifications:

<b>Materials /</b>	St. Steel ECTFE coated
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	Flange EN DN50 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 11 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	KZ45S14EC1
<b>spec. Weight /</b>	≥ 950 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 80 mm

## Technical Specifications:

<b>Materials /</b>	St. Steel ECTFE coated
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 17 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	K73S23EC1
<b>spec. Weight /</b>	≥ 750 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +150°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 70 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 105 mm

## Electrical Specifications:

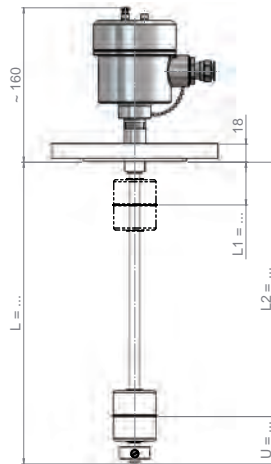
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, BV, WHG, SIL1

## Electrical Specifications:

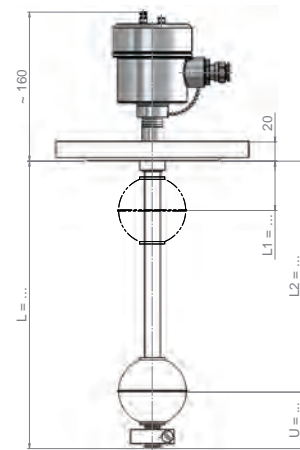
<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, BV, WHG, SIL1

**Float switch made of stainless steel - PFA coated**

Version: VAPBF50G



Version: VAPBF80G

**Technical Specifications:**

<b>Materials /</b>	St. Steel PFA coated
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	Flange EN DN50 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 11 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	Z45S14PF1
<b>spec. Weight /</b>	≥ 1000 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +180°C (optional 250°C)
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 65 mm, U = 50 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 80 mm

**Technical Specifications:**

<b>Materials /</b>	St. Steel PFA coated
<b>El. connection /</b>	Type VA - St. Steel socket
<b>Process conn. /</b>	Flange EN DN80 / PN16 / Form B1
<b>Sliding tube /</b>	∅ 17 mm
<b>Insertion length /</b>	≤ 3000 mm
<b>Float /</b>	K73S23PF1
<b>spec. Weight /</b>	≥ 800 kg/m <sup>3</sup>
<b>Design pressure /</b>	-1. . . +16 bar (temperature-sensitive)
<b>Design temp. /</b>	-30. . . +180°C
<b>Mounting pos. /</b>	vertical ±30°
<b>min. Dimensions /</b>	L1 ≥ 70 mm, U = 70 mm Contact clearance: ≥ 20 mm Float clearance: ≥ 105 mm

**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	3
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	3
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, SIL1

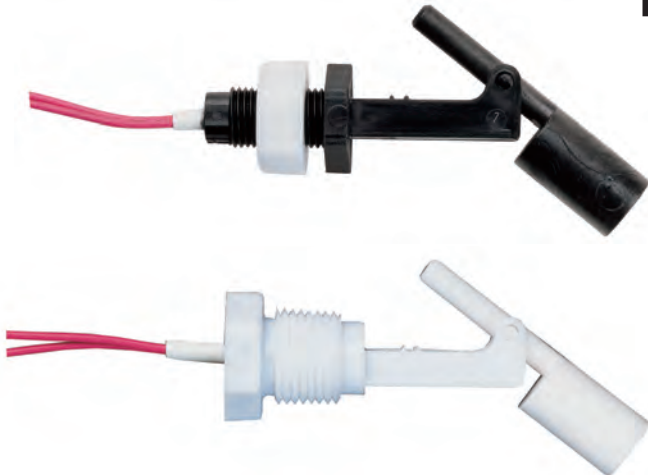
**Electrical Specifications:**

<b>Switching funct. /</b>	closer /NO
Switch rating:	230 V / 1.0 A / 100 VA
max. Contacts:	5
<b>Switching funct. /</b>	opener /NC
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	5
<b>Switching funct. /</b>	change over /U
Switch rating:	230 V / 0.5 A / 40 VA
max. Contacts:	4
<b>Prot. class /</b>	IP67
<b>Optional /</b>	
Temp.-sensor:	Pt100 / Pt1000 IEC 751 Cl. B
Temp.-contact:	NO or NC
Approvals:	ATEX, PED, GOST, SIL1



# LS-14

## Miniature Plastic Float Switch for Side Mounting



## Features

/ Compact design

/ Only one mechanically moving part

/ Sideways mounting into vessel wall

/ PP or Nylon versions

## Description:

The LS-14 series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position of the float switch, the reed contact acts normally opened or normally closed.

## Application:

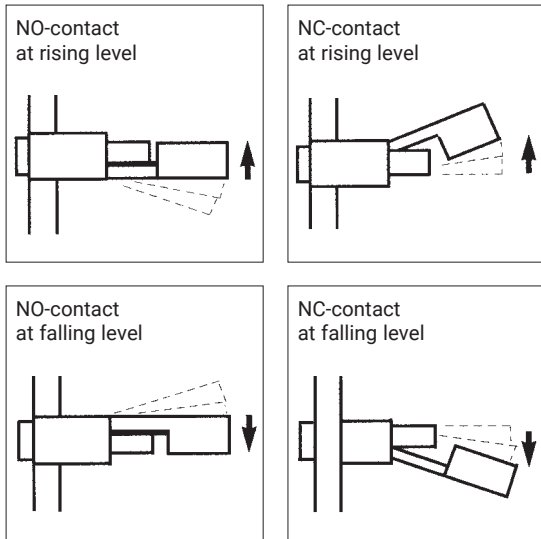
The LS-14 float switches are suited for monitoring the level of nearly all types of fluid media that are non-hostile to the material used as an alarm for full or empty levels, for controlling valves and pumps or for alert signals.



# Technical Specifications:

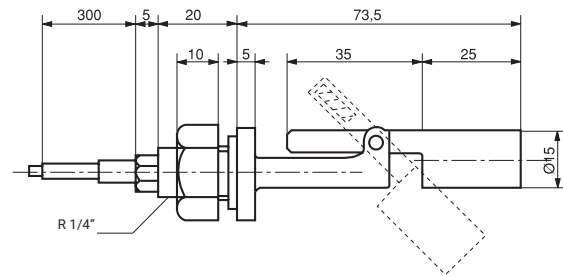
<b>Connecting cable /</b>	0,3 m PE-Litze
<b>Screw thread type /</b>	LS-14.1: R 1/4" male with counter nut LS-14.2: 1/2" NPT male
<b>Material /</b>	LS-14.x.1: PP LS-14.x.2: Nylon (6-N)
<b>Function of contacts /</b>	NO-contact or NC-contact, depending on mounting variant
<b>max. Pressure /</b>	2 bar rel.
<b>max. Temperature /</b>	LS-14.x.1: -10...+80°C LS-14.x.2: -10...+110°C
<b>min. Media density /</b>	0,8 kg/l (smaller on request)
<b>CE marking /</b>	RoHS
<b>Switching load within EU area /</b>	50 V AC/DC, 0,5 A, 25 VA
<b>Switching load outside EU area /</b>	300 V AC/DC, 0,5 A, 50 VA
<b>Initial contact resistance /</b>	150 mΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

# Installation variants:

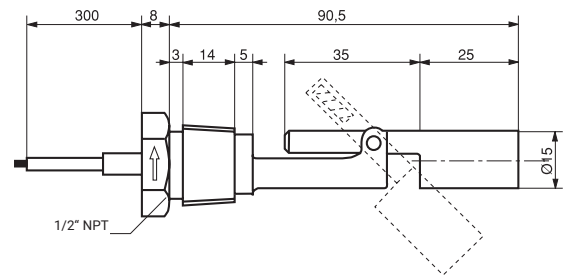


# Dimensions in mm:

## LS-14.1



## LS-14.2



# Handling:

- / It must be ensured that the values given for voltage, current, and power are not exceeded.
- / When switched on, a load must be connected in series.
- / The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- / Not suitable for use in media with ferritic particles.

# Ordering Codes:

<b>Order number</b>	<b>LS-14.</b>	<b>1.</b>	<b>1.</b>	<b>2</b>
<b>LS-14 Miniature Plastic Float Switch</b>				
<b>Connection /</b>				
1 = R 1/4" male				
2 = 1/2" NPT male				
<b>Material /</b>				
1 = Polypropylen				
2 = Nylon (6-N)				
<b>Contact /</b>				
2 = 50 V DC/AC, 0,5 A, 25 VA				





# LS-15

## Miniature Float Switch for Side Mounting



## Features

/ Compact design

/ Only one mechanically moving part

/ Sideways mounting into vessel

/ Fully stainless steel version

## Description:

The LS-15 series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position, the reed contact acts normally opened or normally closed.

## Application:

The LS-15 float switches are suited for monitoring the level of nearly all types of fluid media as an alarm for full or empty levels, for controlling valves and pumps or for alert signals. By deploying potential-free reed contacts, the float switches provide an ideal switching element in combination with PLC controls.



## Technical Specifications:

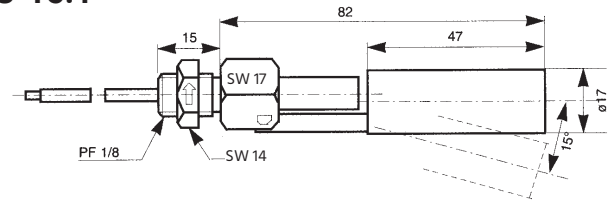
<b>Connecting cable /</b>	0.5 m FEP cord
<b>Screw thread type /</b>	G 1/8"-male, G 1/2"-male or 1/2" NPT-male
<b>Material /</b>	float and float bracket are made of stainless steel 1.4301
<b>Function of contacts /</b>	NO-contact or NC-contact, depending on mounting variant
<b>max. Pressure /</b>	5 bar
<b>max. Temperature /</b>	standard -40...+120°C high-temperature -40...+180°C
<b>min. Media density /</b>	0.8 kg/l (0.9 kg/l for special versions with extra short insertion length)
<b>CE marking /</b>	RoHS
<b>Switching load within EU area /</b>	50 V AC/DC, 0.5 A, 25 VA
<b>Switching load outside EU area /</b>	250 V AC/DC, 0.5 A, 50 VA
<b>Initial contact resistance /</b>	150 mΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

## Handling:

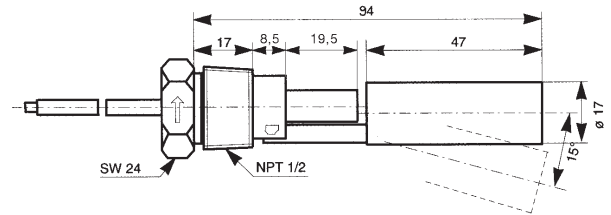
- / It must be ensured that the values given for voltage, current, and power are not exceeded.
- / When switched on, a load must be connected in series.
- / The electrical details apply to ohmic loads.  
Capacitive, inductive and lamp loads must be operated using a protective circuit.
- / Not suitable for use in media with ferritic particles.

## Dimensions in mm:

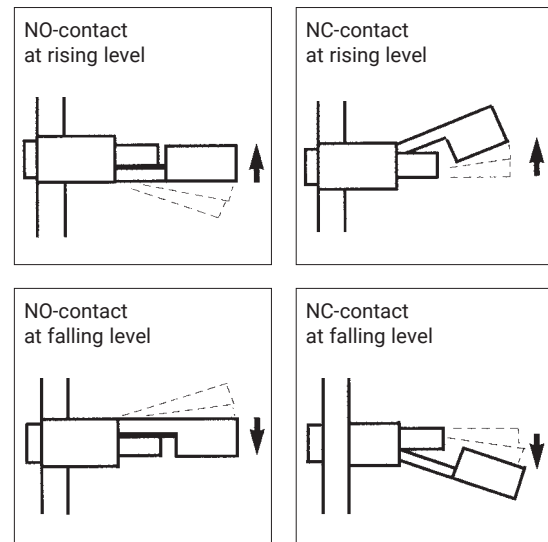
### LS-15.1



### LS-15.2



## Installation variants:



## Ordering Codes:

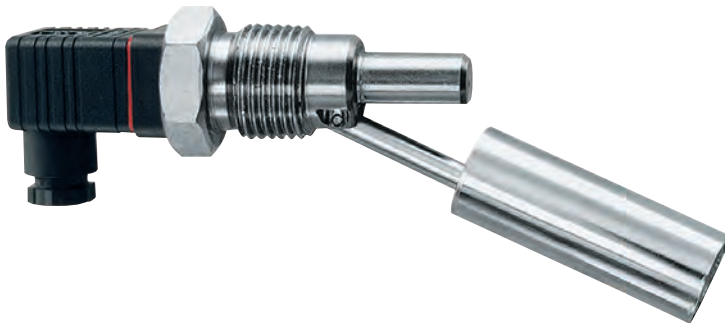
<b>Order number</b>	<b>LS-15.</b>	<b>1.</b>	<b>1</b>
<b>LS-15 Miniature Float Switch for Side Mounting</b>			
<b>Connection /</b>			
1 = G 1/8" male to be mounted from inside (82 mm)			
1a = G 1/8" male to be mounted from inside (54,5 mm)*			
2 = 1/2" NPT male to be mounted from outside (94 mm)			
3 = G 1/2" male to be mounted from outside (94 mm)			
4 = 3/4" NPT male to be mounted from outside (54 mm)			
5 = G 3/4" male to be mounted from outside (54 mm)*			
<b>Temperature range /</b>			
1 = standard -40...+120°C			
2 = high-temperature -40...+180°C			

\*Only standard temperature-range



# LS-15P

## Miniature Float Switch for Side Mounting, Plug Version



## Features

- / Compact design
- / Only one mechanically moving part
- / Sideways mounting into vessel wall
- / Fully stainless steel version
- / Electrical connection with DIN plug

## Description:

The LS-15P series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position, the reed contact acts normally opened or normally closed.

## Application:

The LS-15P float switches are suited for monitoring the level of nearly all types of fluid media as an alarm for full or empty levels, for controlling valves and pumps or for alert signals. By deploying potential-free reed contacts, the float switches provide an ideal switching element in combination with PLC controls.



## Technical Specifications:

<b>Connecting cable /</b>	plug EN175301-803 shape A
<b>Screw thread type /</b>	1/2" NPT male
<b>Material /</b>	float and float bracket are made of stainless steel
<b>Function of contacts /</b>	NO-contact or NC-contact, depending on mounting variant
<b>max. Pressure /</b>	5 bar
<b>max. Temperature /</b>	Standard -40...+120°C
<b>min. Media density /</b>	0,8 kg/l
<b>CE marking /</b>	RoHS
<b>Switching load within EU area /</b>	50 V AC/DC, 0,5 A, 25 VA
<b>Switching load outside EU area /</b>	300 V AC/DC, 0,5 A, 50 VA
<b>Initial contact resistance /</b>	150 mΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

## Handling:

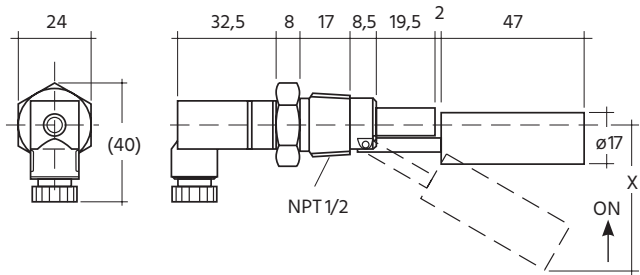
/ It must be ensured that the values given for voltage, current, and power are not exceeded.

/ When switched on, a load must be connected in series.

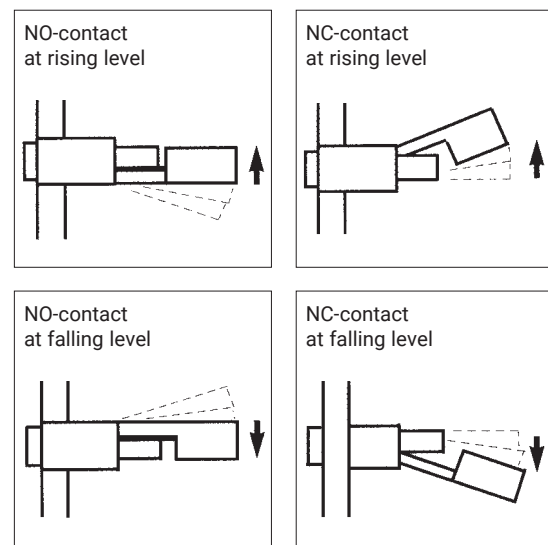
/ The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

/ Not suitable for use in media with ferritic particles.

## Dimensions in mm:



## Installation variants:



## Ordering Codes:

<b>Order number</b>	<b>LS-15P.</b>	<b>1</b>
<b>LS-15P Miniature Float Switch for Side Mounting, Plug Version</b>		
<b>Connection /</b>		
1 = 1/2" NPT male		



# LS-16

## Miniature Plastic Float Switch for Vertical Mounting



## Features

- / Compact design
- / Only one moving part
- / Mounting from top or bottom
- / PP version

## Description:

The LS-16 series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position, the reed contact acts normally opened or normally closed.

## Application:

The LS-16 float switches are suited for monitoring the level of nearly all types of fluid media that are non-hostile to the material used as an alarm for full or empty levels, for controlling valves and pumps or for alert signals.



## Version:

### LS-16 Miniature Plastic Float Switch for Vertical Mounting

Mechanical low-cost float switch made of PP, with contact-free triggering of a reed contact and a screw thread type G 1/8"

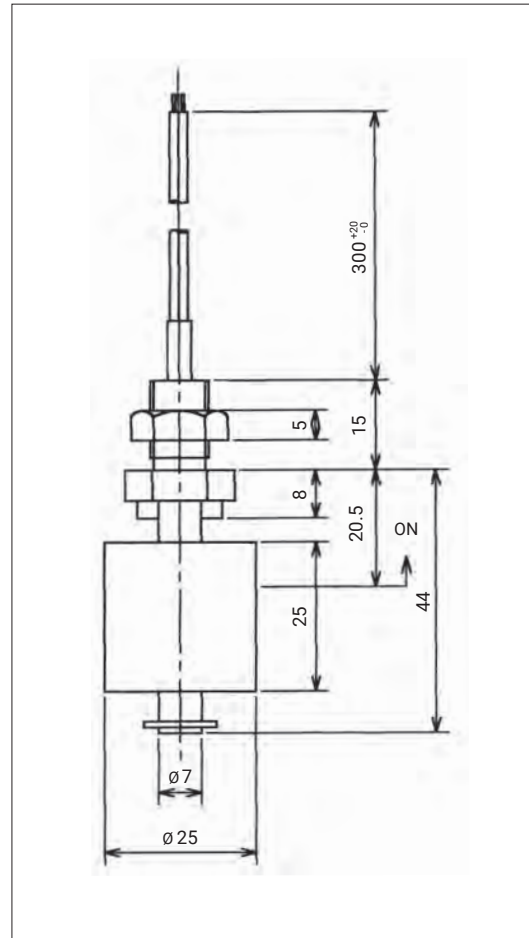
## Technical Specifications:

<b>Connecting cable /</b>	0.3 m PVC cord (AWG22)
<b>Screw thread type /</b>	G 1/8"-male with counter nut
<b>Materials /</b>	float, stem, counter nut and thread are made of PP, stainless steel 1.4301 stopper; tube made of vinyl (non wetted);
<b>Function of contact /</b>	NO-contact or NC-contact depending on installation of the float
<b>max. Pressure /</b>	2 bar
<b>max. Temperature /</b>	-10°C. . .+80°C
<b>min. Media density /</b>	0.8 kg/l
<b>CE marking /</b>	none, max. switching load is limited to 50 V AC/DC within area of application of low-voltage-directive
<b>Switching load within CE area /</b>	50 V AC/DC, 0.5 A, 25 VA
<b>Switching load outside CE area /</b>	300 V AC/DC, 0.5 A, 50 VA
<b>Initial contact resistance /</b>	150 mΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

## Ordering Codes:

**Order number****LS-16****LS-16 Miniature Plastic Float Switch for Vertical Mounting**

## Dimensions in mm:



## Handling:

- / It must be ensured that the values given for voltage, current, and power are not exceeded.
- / When switched on, a load must be connected in series.
- / The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- / Not suitable for use in media with ferritic particles.



# LS-17

## Miniature Stainless Steel Float Switch for Vertical Mounting



## Features

/ Compact design

/ Only one mechanically moving part

/ Mounting from top  
or into vessel bottom

/ Fully stainless steel version

## Description:

The LS-17 series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position, the reed contact acts normally opened or normally closed.

## Application:

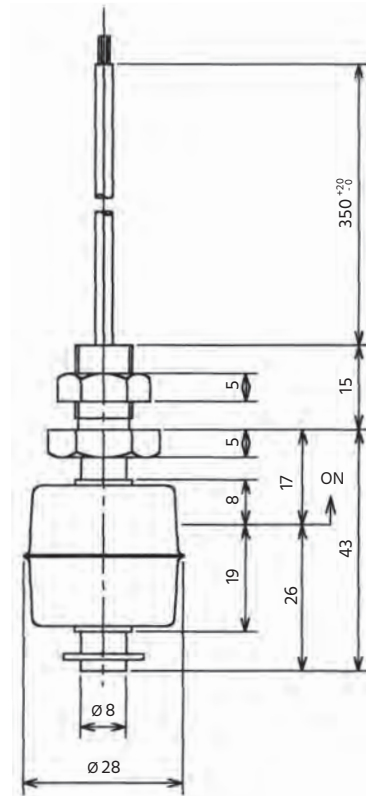
The LS-17 float switches are suited for monitoring the level of nearly all types of fluid media as an alarm for full or empty levels, for controlling valves and pumps or for alert signals. By deploying potential-free reed contacts, the float switches provide an ideal switching element in combination with PLC controls.



## Technical Specifications:

<b>Connecting cable /</b>	0,35 m IRRAXTMB <sub>32</sub> -cord (AWG22)
<b>Screw thread type /</b>	G 1/8" male with counter nut
<b>Material /</b>	float, stem, stopper, counter nut and thread are made of stainless steel 1.4301
<b>Function of contacts /</b>	NO-contact or NC-contact, depending on mounting variant
<b>max. Pressure /</b>	10 bar
<b>max. Temperature /</b>	-40...+120°C
<b>min. Media density /</b>	0,8 kg/l
<b>CE marking /</b>	RoHS
<b>Switching load within EU area /</b>	50 V AC/DC, 0,5 A, 25 VA
<b>Switching load outside EU area /</b>	300 V AC/DC, 0,5 A, 50 VA
<b>Initial contact resistance /</b>	150 mΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

## Dimensions in mm:



## Handling:

- / It must be ensured that the values given for voltage, current, and power are not exceeded.
- / When switched on, a load must be connected in series.
- / The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- / Not suitable for use in media with ferritic particles.

## Ordering Codes:

<b>Order number</b>	<b>LS-17.</b>	<b>1</b>
<b>LS-17 Miniature Stainless Steel Float Switch for Vertical Mounting</b>		
<b>Connection /</b>		
1 = G 1/8" male to be mounted from inside		





# LS-18

## Miniature Stainless Steel Float Switch for Side Mounting



## Features

/ Compact design

/ Only one mechanically moving part

/ Mounted from the side

/ Fully stainless steel version

## Description:

The LS-18 series of level switches operates according to the principle of a float with magnetic transmission. The float is lifted inside the vessel due to the rising fluid level; subsequently, it actuates a reed contact as a result of the magnetic field of the permanent magnet situated in the float. Depending on the mounting position, the reed contact acts normally opened or normally closed.

## Application:

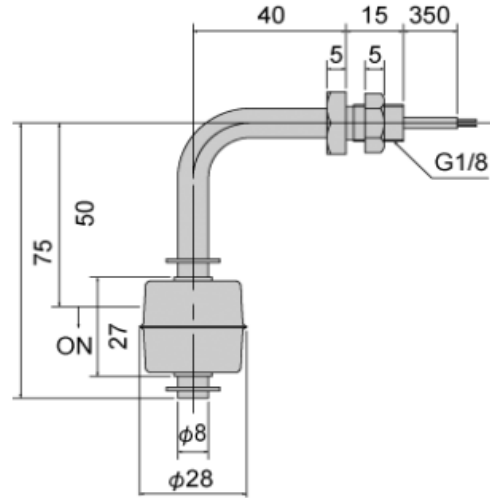
The LS-18 float switches are suited for monitoring the level of nearly all types of fluid media as an alarm for full or empty levels, for controlling valves and pumps or for alert signals. By deploying potential-free reed contacts, the float switches provide an ideal switching element in combination with PLC controls.



## Technical Specifications:

<b>Connecting cable /</b>	0.35 m IRRAXTMB <sub>32</sub> -cord (AWG22)
<b>Screw thread type /</b>	G 1/8" male with counter nut
<b>Material /</b>	float, stem, stopper, counter nut and thread are made of stainless steel 1.4301
<b>Function of contacts /</b>	NO-contact or NC-contact, depending on mounting variant
<b>max. Pressure /</b>	10 bar
<b>max. Temperature /</b>	-40. . . +120°C
<b>min. Media density /</b>	0.8 kg/l
<b>CE marking /</b>	RoHS
<b>Switching load within EU area /</b>	50 V AC/DC, 0.5 A, 25 VA
<b>Switching load outside EU area /</b>	300 V AC/DC, 0.5 A, 50 VA
<b>Initial contact resistance /</b>	150 MΩ (max.)
<b>Insulation resistance /</b>	10 MΩ (min.)

## Dimensions in mm:



## Handling:

- / It must be ensured that the values given for voltage, current, and power are not exceeded.
- / When switched on, a load must be connected in series.
- / The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- / Not suitable for use in media with ferritic particles.

## Ordering Codes:

<b>Order number</b>	<b>LS-18.</b>	<b>1</b>
<b>LS-18 Miniature Stainless Steel Float Switch for Side Mounting</b>		
<b>Connection /</b>		
1 = G 1/8" male to be mounted from inside		



# F0-01

## Optoelectronic Level Switch



## Features

- / Small and compact
- / Easy to mount
- / No mechanical components
- / Easy to maintain

## Description:

An optical sensor is mounted in a robust stainless steel housing. It consists of a quartz glass tip which contains an infrared diode, as a transmitter, and a light-sensitive semi-conductor as the receiver. If no fluid moisture touches the sensor tip, the infrared light will be fully reflected by the inside of the quartz glass. However, as soon as it dips into the medium a large portion of the transmitted light can pass into the fluid. Registering this, the receiver initiates a switching operation at the device's PNP transistor output which is then directly displayed by a green LED.

## Application:

The field of applications for the optoelectronic level switch is the detection of limit values in a number of fluids. The main advantage is that the method of measurement is to a large extent independent of physical parameters like refractive index, colour, density, dielectric constant or conductivity. The extremely compact design guarantees minimum space; consequently, measurements in very small volumes becomes convenient. It can be mounted anywhere and the range of high pressure and temperature assure a broad spectrum of applications.



## Technical Specifications:

<b>max. Pressure /</b>	0...50 bar
<b>max. Media temp. /</b>	-30...+135°C
<b>max. Ambient temp. /</b>	-25...+70°C
<b>Electronic housing /</b>	stainless steel
<b>Sensor housing /</b>	stainless steel
<b>Lighting circuit /</b>	quartz glass
<b>Sealing /</b>	graphite / PTFE
<b>Weight /</b>	approx. 75 g without cable
<b>Accuracy /</b>	± 0.5 mm
<b>Light source /</b>	IR light 930 nm
<b>Ambient light /</b>	max. 10.000 Lux
<b>min. Clearance to opposite-side surface /</b>	> 10 mm (> 20 mm for electropolished surface)
<b>Assembling position /</b>	any
<b>Spanner width /</b>	SW24 at M16 x 1.5 and ½"-NPT SW30 at G½"

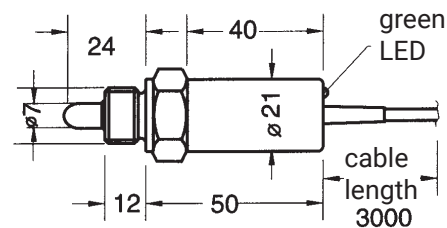
## Ordering Codes:

<b>Order number</b>	<b>FO-01.</b>	<b>1.</b>	<b>2.</b>	<b>1.</b>	<b>1.</b>	<b>0</b>
<b>FO-01 Optoelectronic Level Switch</b>						
<b>Process connection /</b>						
1 = M16 x 1.5 male						
2 = ½" NPT male						
3 = G ½" A male						
<b>Electrical connection /</b>						
1 = 3m PVC cable						
2 = plug connection Binder 713 M12						
<b>Output /</b>						
1 = switching when immersing						
2 = switching when surfacing						
<b>Sensor housing material /</b>						
1 = stainless steel						
99 = special material on request						
<b>Options /</b>						
0 = no option						
1 = counter plug 4-pole Series 713						

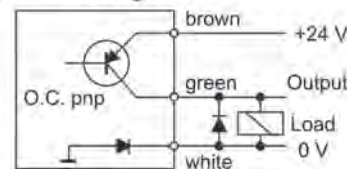
## Electrical Specifications:

<b>Supply voltage /</b>	24 VDC -25...+30%
<b>Consumption /</b>	max. 40 mA
<b>Output /</b>	PNP open collector transistor, short-circuit protected, current, voltage and power limitation
<b>Switching status /</b>	green LED
<b>Switching current /</b>	For Tu = +70°C: 0.5 A
<b>Electrical connection /</b>	PVC cable 3 x 0.14 mm <sup>2</sup> or plug 4-pole Series 713, M12
<b>Protection class /</b>	with cable IP 66 per EN 60 529 with plug IP 65 per EN 60 529

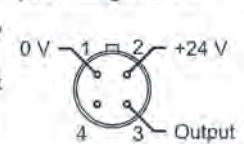
## Dimensions in mm:



Connection diagram



pin assignment





# FO-02N

## Optoelectronic Compact Level Switch



## Features

- / Compact design
- / Integrated electronic switch
- / Low-maintenance
- / Sensorlengths from 65-3000 mm
- / No moving parts
- / Any mounting position
- / Accuracy  $\pm 0,5$  mm

## Description:

An optical sensor is mounted in a robust stainless steel housing. It consists of a borosilicate glass tip which contains an infrared diode, as a transmitter, and a light-sensitive semi-conductor as the receiver. If the sensor tip is not immersed in the fluid, the infrared light will be fully reflected by the inside of the quartz glass. However, as soon as it is immersed into the medium, a large portion of the transmitted light can pass into the fluid. Registering this, the receiver initiates a switching operation at the device's transistor output.

## Application:

The field of application for the optoelectronic level switch include tapping limit values in a number of fluids. The main advantage is, that the method of measurement is to a large extent independent of physical parameters like refractive index, colour, density, dielectric constant or conductivity. The extremely compact design guarantees minimum space requirement. In contrast to the FO-01, the FO-02N can be supplied with measuring lengths of up to 3000 mm, so that the user can select the setpoint freely. The direction of switching for the high-performance transistor output on the device is reversible.



## Versions:

### FO-02N Optoelectronic Compact Level Switch

**Power supply:** The power supply of the FO-02N should be 12 to 32 VDC.

**Sensor length:** The sensor is available in six standard-lengths: 150, 300, 500, 750, 1000 and 1500 mm. Other lengths, up to 3000 mm are available on request.

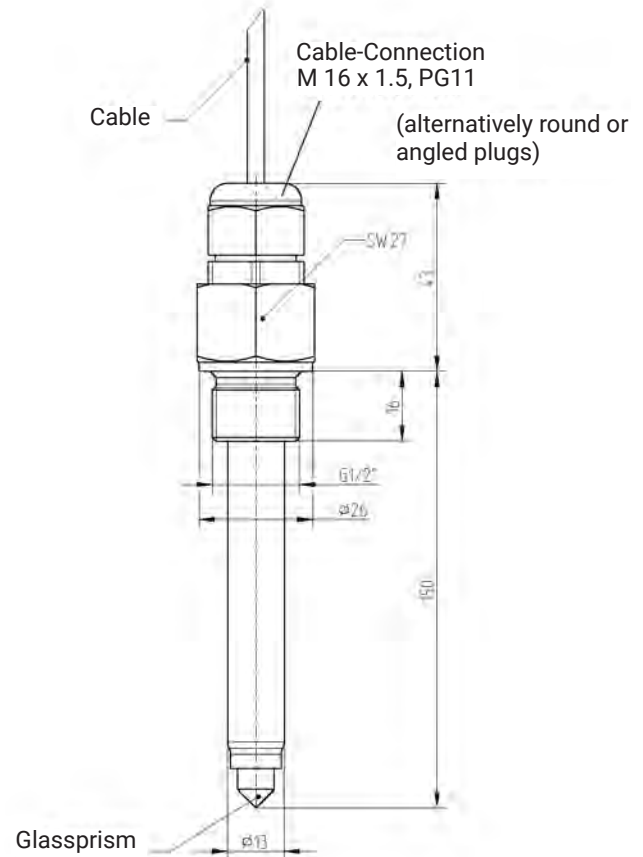
## Technical Specifications:

<b>Accuracy /</b>	± 0.5 mm
<b>Response sensitivity /</b>	factory configured, please specify media, or alternatively with trimmer
<b>Switching delay /</b>	1 s (standard, 0..7s to choose)
<b>max. Pressure /</b>	0..25 bar
<b>max. Mediatemp. /</b>	-30°C to +100°C
<b>max. Ambient-temp. /</b>	-25°C to +70°C
<b>Material /</b>	
Light conductor:	Borosilicateglass
Body and process connection:	Stainless Steel 1.4571
<b>Installation position /</b>	any
<b>min. Distance any opposing surface /</b>	≥ 10 mm
<b>Sensor length /</b>	min. 65 mm - max. 3000 mm
<b>Process connection /</b>	G1/2"

## Electrical Specifications:

<b>Power supply /</b>	DC 12..32V
<b>max. Current consumption /</b>	40 mA
<b>Output /</b>	PNP-Transistor, polarity assured
<b>Electrical connection /</b>	
Round plug:	M 12
PUR-Cable:	Standard length: 2 m or 5 m Diameter: 3 x 0.25 mm <sup>2</sup> Cable-ends: open
Angled plug:	EN 175301-803 A
<b>Switch /</b>	NO (closed in the medium) or NC (open in the medium)
<b>No. of switching points /</b>	1
<b>Protection class /</b>	IP 65

## Dimensions in mm:



## Ordering Codes:

**Order Number:** FO-02N. 3. 4. 2. 0

**FO-02N Optoelectronic Compact Level Switch**

### Electrical connection /

- 1 = 2 m cable PUR
- 2 = 5 m cable PUR
- 3 = round plug M 12 (without counterplug)
- 4 = angled plug EN 175301-803 A

### Sensor length\* /

- 1 = 150 mm
- 2 = 300 mm
- 3 = 500 mm
- 4 = 750 mm
- 5 = 1000 mm
- 6 = 1500 mm

### Output /

- 1 = switch when immersing
- 2 = switch when surfacing

### Option /

- 0 = factory configured (please specify media)
- 8 = switching delay 0..7s (please specify)
- 9 = with Trimmer

\*other lengths up to 3000 mm are available on request.



# FO-03

## Optoelectronic Level Switch



## Features

- / Compact design
- / Under pressure removable electronic part
- / Easy to mount
- / No moving parts
- / Easy to maintain
- / Cost-effective

## Description:

The optoelectronic level switch is used for monitoring of liquid levels. An optical sensor is mounted in a glass fiber reinforced polyamide housing. It consists of a quartz glass tip which contains an infrared diode, as a transmitter, and a light-sensitive semi-conductor as the receiver. If the sensor is not immersed in the fluid, the infrared light will be fully reflected by the inside of the quartz glass. However, as soon as it immerses into the medium a large portion of the transmitted light can pass into the fluid. Registering this, the receiver initiates a switching operation at the potential-free relay output, which is also indicated by a light emitting diode directly. The electronic part can be replaced without opening the process, due to the fact that the screw-in part including the glass prism remains installed.

## Application:

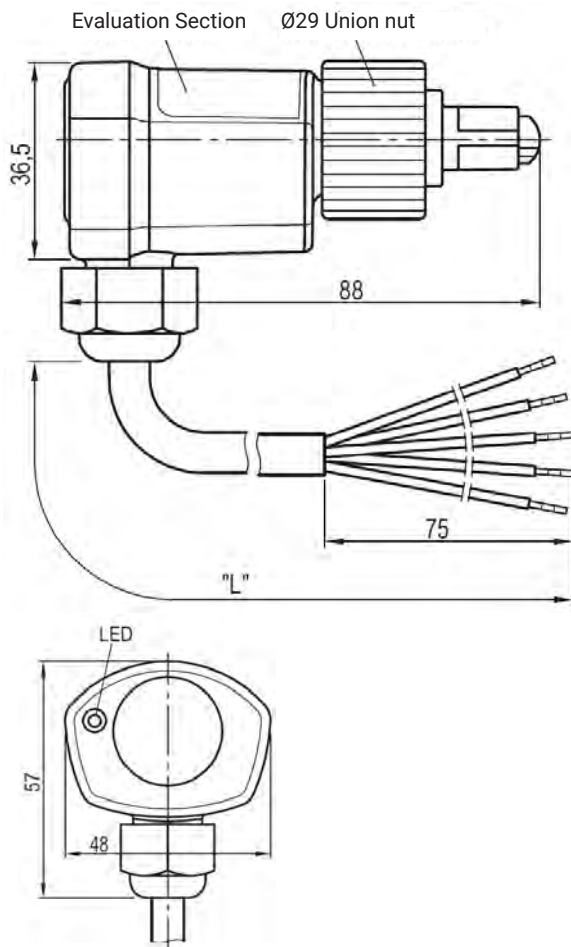
The area of applications for the optoelectronic level switch is the detection of number of fluids. The main advantage is that the method of measurement is to a large extent independent of physical parameters like refractive index, colour, density, dielectric constant or conductivity. The extremely compact design guarantees minimum space; consequently, measurements in very small volumes becomes convenient. The high pressure and temperature ranges assure a broad spectrum of applications.



## Technical Specifications:

<b>max. Pressure /</b>	46 bar (-10...+120°C) 31.5 bar (-30...-10°C)
<b>max. Media temp. /</b>	-30...+100°C
<b>max. Ambient temp. /</b>	-30...+60°C
<b>Electronic housing /</b>	PA66/PA6, fiber reinforced
<b>Screw-in part /</b>	steel nickel-plated
<b>Prisma /</b>	borosilicate glass
<b>Mounting of case to process connection /</b>	union nut
<b>opt. Setpoint indication /</b>	red LED
<b>Minimum distance sensor tip to any opposite wall /</b>	> 10 mm
<b>Switch-on delay time /</b>	3 sec, ± 1 sec

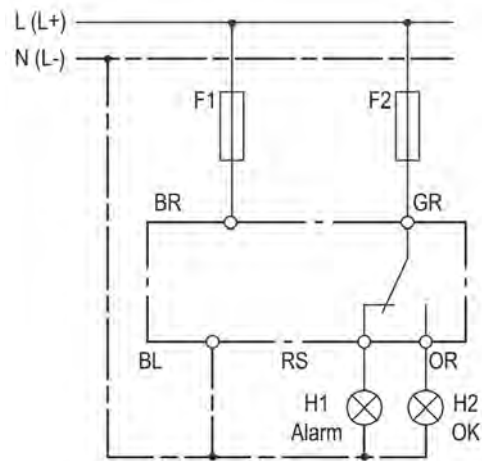
## Dimensions in mm:



## Electrical Specifications:

<b>Supply voltage /</b>	110...230 VAC ±10%, 3 VA or 24 DC/AC ±10%, 3 VA
<b>allowed rel. Humidity /</b>	10-95% r.H. without condensation
<b>Output /</b>	potential-free relay (change-over)
<b>Switching voltage /</b>	min. 24V, 20mA
<b>Switching current /</b>	max. 2.5 A C300
<b>Mech. lifetime /</b>	ca. 10 <sup>6</sup> switch cycles
<b>connection /</b>	1 m PVC cable 5 x 0.75 mm <sup>2</sup>
<b>Protection class /</b>	IP 54

## Electrical Connection:



## Ordering Codes:

<b>Order number</b>	FO-03.	1.	1.	2.	[0][1].	0
<b>FO-03 Optoelectronic Level Switch</b>						
<b>Process connection /</b>						
1 = M20 x 1,5						
2 = 1/2" NPT						
3 = G 1/2" A						
<b>Electrical connection /</b>						
1 = 1 m PVC cable with free cable ends						
<b>Supply voltage /</b>						
1 = 230 VAC ± 10 %						
2 = 24 VDC ± 15 %						
<b>Switch-on delay time /</b>						
[ 0 ][ 5 ] = standard (approx. 5 s)						
[ X ][ X ] = up to approx. 12 s						
<b>Options /</b>						
0 = none						
9 = specify special features in detailed text						





# FO-04

## Optoelectronic Level Switch for General Applications



## Features

- / Compact design
- / Accuracy  $\pm 0.5$  mm
- / Status LED
- / Easy to mount
- / No moving parts
- / Easy to maintain
- / Cost-effective

## Description:

An optical sensor is mounted in a robust stainless steel housing. It consists of a borosilicate glass tip which contains an infrared diode, as a transmitter, and a light-sensitive semi-conductor as the receiver. If no fluid moisture touches the sensor tip, the infrared light will be fully reflected by the inside of the borosilicate glass. However, as soon as it dips into the medium a large portion of the transmitted light can pass into the fluid. Registering this, the receiver initiates a switching operation at the device's PNP transistor output which is then directly displayed by a red LED.

## Application:

The applications for the optoelectronic level switch include tapping limit values in a number of fluids. The main advantage is that the method of measurement is to a large extent independent of physical parameters like refractive index, colour, density, dielectric constant or conductivity. The compact design, the possibility of installation in any position as well as the attractive price level recommends the FO-04 especially for general industrial applications.

### Typical applications:

- level detection of fluids, such as e.g. oil, water, aqueous media, etc.
- full or empty reporting
- overflow protection
- dry run protection



## Technical Specifications:

<b>Accuracy /</b>	± 2 mm
<b>Response sensitivity /</b>	preset, for the detection of watery media and oils
<b>max. Pressure /</b>	0...25 bar
<b>max. Media temp. /</b>	-30...+100°C
<b>max. Ambient temp. /</b>	-25...+70°C
<b>Materials /</b>	
Light guide:	borosilicate glass
Housing and process connection G 3/8" and M 12 x 1:	stainless steel 1.4305
Housing and process connection G 1/2":	stainless steel 1.4571
<b>Mounting position /</b>	any
<b>min. Clearance from the glass tip to an opposite surface /</b>	≥ 10 mm, ≥ 20 mm (electropolished surface) ≥ 30 mm (heavily reflecting surface)
<b>Visual indication of the switching status /</b>	1x yellow LED
<b>Process connection /</b>	G 3/8", G 1/2" or M12 x 1

## Electrical Specifications:

<b>Supply voltage /</b>	12...32 VDC
<b>max. Consumption /</b>	40 mA
<b>Output /</b>	PNP-Transistor, protected against reverse polarity 200 mA switching circuit
<b>Electr. connection /</b>	
Circular connector:	M8 x 1, 3-pin
PUR cable:	standard lengths: 2 m or 5 m diameter: 3 x 0.25 mm <sup>2</sup> cable end: open
<b>Switching function /</b>	NO (closed when immersed) or NC (open when immersed)
<b>Switch points /</b>	1
<b>Protection class /</b>	IP 65 (counter plug screwed on)
<b>Options /</b>	adjustable responsiveness (Trimmer) for other liquids and foaming media
<b>Cable configuration/</b>	BN: U <sub>+</sub> WN: U <sub>-</sub> GN: SP
<b>M8 rounded plug configuration /</b>	1: U <sub>+</sub> 3: U <sub>-</sub> 4: SP

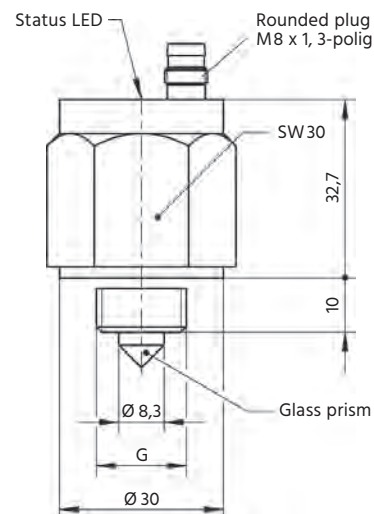


## Ordering Codes:

<b>Order number</b>	<b>FO-04.</b>	<b>1.</b>	<b>3.</b>	<b>1.</b>	<b>1.</b>	<b>1</b>
<b>FO-04 Optoelectronic Level Switch</b>						
<b>Process connection /</b>						
1 = G 1/2" - male						
2 = G 3/8" - male						
3 = M 12 x 1 - male						
<b>Electrical connection /</b>						
1 = 2 m PUR cable						
2 = 5 m PUR cable						
3 = rounded plug M8 x 1, 3-pin (without counter plug)						
<b>Output /</b>						
1 = NC (closed when immersed)						
2 = NO (open when immersed)						
<b>Media /</b>						
1 = water						
9 = other (please specify in text)						
<b>Options /</b>						
0 = none						
1 = counter plug M8 x 1 with 2 m cable						
2 = Trimmer						
9 = other (please specify in text)						

## Dimensions in mm:

Version: FO-04.1.3.x.x.0





# F0-05

## Optoelectronic Level Switch High-Temperature Version



## Features

/ Up to +170°C media temperature

/ Accuracy  $\pm 2$  mm

/ Compact design

/ Easy to mount

/ No moving parts

/ Easy to maintain

## Description:

An optical sensor is mounted in a robust stainless steel housing. It consists of a borosilicate glass tip which contains an infrared diode, as a transmitter, and a light-sensitive semi-conductor as the receiver. If no fluid moisture touches the sensor tip, the infrared light will be fully reflected by the inside of the borosilicate glass. However, as soon as it dips into the medium a large portion of the transmitted light can pass into the fluid. Registering this, the receiver initiates a switching operation at the device's PNP transistor output which is then directly displayed by a red LED.

## Application:

The applications for the optoelectronic level switch include tapping limit values in a number of fluids. The main advantage is that the method of measurement is to a large extent independent of physical parameters like refractive index, colour, density, dielectric constant or conductivity. The compact construction guarantees minimum space; consequently, measurements in very small volumes becomes convenient. The possibility of mounting in any position as well as the property for use with fluids at high temperatures of up to +170°C assure a broad spectrum of applications.

### Typical applications:

- level detection of fluids, such as e.g. oil, water, aqueous media, etc.
- full or empty reporting
- overflow protection
- dry run protection

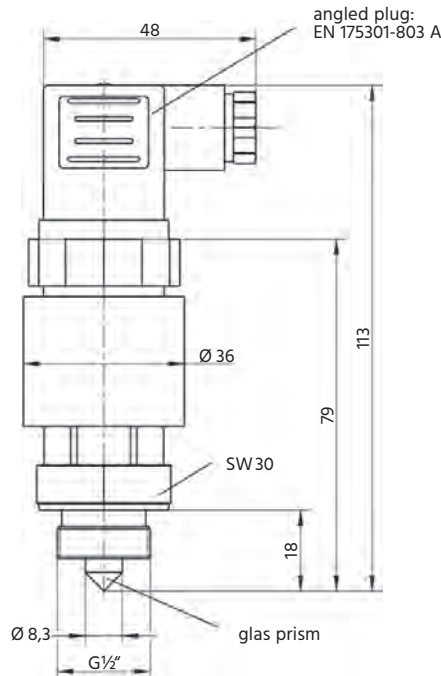


## Technical Specifications:

<b>Accuracy /</b>	± 2 mm
<b>Response sensitivity /</b>	preset, for the detection of watery media and oils
<b>max. Pressure /</b>	0 .. .25 bar
<b>max. Media temp. /</b>	-40 .. .+170°C
<b>max. Ambient temp. /</b>	-30 .. .+80°C
<b>Materials /</b>	
Light guide:	borosilicate glass
Housing:	stainless steel 1.4305 (non wetted part)
Process connection:	stainless steel 1.4571
<b>Mounting position /</b>	any
<b>min. Clearance from the glass tip to an opposite surface /</b>	≥ 10 mm, ≥ 20 mm (electropolished surface)
<b>Process connection /</b>	G ½"-male

## Dimensions in mm:

Pictured: FO-05.1.4.x.x.0



## Electrical Specifications:

<b>Supply voltage /</b>	12 .. .32 VDC
<b>max. Current /</b>	40 mA
<b>Output /</b>	PNP transistor, protected against reverse polarity, 200 mA switching current
<b>Electric. connection /</b>	
circular connector:	M 12 x 1, 4-pin
angular connector:	as per EN 175301-803 A
PUR cable:	standard lengths: 2 m and 5 m diameter: 3 x 0.25 mm <sup>2</sup> cable end: cut to length
<b>Switching function /</b>	NO (closed in medium) or NC (open in medium)
<b>Switch points /</b>	1
<b>Protection class /</b>	IP 65 (counter plug screwed on)
<b>Cable configuration /</b>	BN: U <sub>+</sub> WN: U <sub>-</sub> GN: SP
<b>M12 x 1 rounded plug configuration /</b>	1: U <sub>+</sub> 3: U <sub>-</sub> 4: SP
<b>Angled plug configuration /</b>	1: U <sub>+</sub> 3: U <sub>-</sub> 4: SP



## Ordering Codes:

<b>Order number</b>	<b>FO-05.</b>	<b>1.</b>	<b>3.</b>	<b>1.</b>	<b>1.</b>	<b>1</b>
<b>FO-05 Optoelectronic Level Switch High-Temperature Version</b>						
<b>Process connection /</b>	1 = G ½" male thread					
<b>Electrical connection /</b>	1 = 2 m PUR cable 2 = 5 m PUR cable 3 = circular connector M 12 x 1, 4-pin (without counter plug) 4 = angular connector as per EN 175301-803 A (with counter pl.)					
<b>Output /</b>	1 = switching when immersing (closed in medium) 2 = switching when surfacing (open in medium)					
<b>Medium /</b>	1 = water 9 = special (please specify in detailed text)					
<b>Option /</b>	0 = none 1 = counter plug M 12 x 1, 4-pin 2 = counter plug M 12 x 1 with 2 m cable 9 = special ( please specify in detailed text)					



# FV-01

## Compact Tuning Fork Level Switch



## Features

- / Proven vibration principle
- / Short immersion depth of 40 mm
- / Error monitoring
- / Integrated testing function to ensure fault-free operation

## Description:

The FV-01 is a compact tuning fork level switch for fluids and slurry. It can be used as overflow, high, low and demand applications, as well as pump protection. It is ideal for use in confined spaces. The vibrating fork is piezoelectric driven and vibrates on a mechanical resonance frequency of approximately 1.100 Hz. When the fork is covered by media, this frequency changes. This change will be registered by the built in oscillator, transforming it into a switching signal. Then, the integrated electronic will send this signal to connected devices. The FV-01 works practically without interferences from chemical or physical qualities of the fluid media. It can even be used under harsh conditions, such as turbulences, air bubbles, foam and external vibrations.

## Application:

The 40 mm long vibrating fork makes the FV-01 ideal for deployment in small pipes and confined installations. The compact level switch was created to be used in all industrial fields with process engineering. The preferred field of application includes liquids and slurries, level monitoring and overflow and dry-running protection.



## Technical Specifications:

### Accuracy /

Switching point:	about 13 mm from the tip
Hysteresis:	2 mm for installation from above
Delay:	about 500 ms (on/off)
Frequency:	about 1100 Hz

### Pressure /

-1 .. .64 bar

### Ambient-temp. /

-40. . .+70 °C

### Media-temp. /

-40. . .+100 °C (standard)  
-40. . .+150 °C (raised)

### Media density /

0,7. . .2,5 g/cm<sup>3</sup>

### Materials /

Housing:	1.4404/316L and plastic PEI
Vibrating fork:	316L (1.4404 or 1.4435)
Process connection:	316L (1.4404 or 1.4435)
Seal:	klingsil C-4400

### Process connection /

Thread (ISO 228 T1):	G ¾"-male, or G 1"-male
Thread, conical:	¾" NPT-male or 1" NPT-male

### Weight /

250 g (housing)

## Ordering Codes:

**Order number** **FV-01. 1. A. 2. 0. 1****FV-01 Compact Vibrating Switch****Process connection /**

- 1 = thread G¾"-male PN 64/316L
- 2 = thread ¾" NPT-male PN 64/316L
- 3 = thread G1"-male PN 64/316L
- 4 = thread 1" NPT-male PN 64/316L
- 9 = other (please specify separately)

**Temperature /**

- A = -40. . .+100°C (standard)
- B = -40. . .+150°C (raised)

**Elektronik /**

- 1 = 2-wire on load in series
- 2 = transistor output PNP DC 10. . .35 V

**Approvals /**

- 0 = none
- 1 = ship-building approval (DNV, GL) - only possible for 150°C version
- 2 = flooding protection from WHG (only with transistor output)

**Electrical connection /**

- 1 = M12 x 1/IP67 (only PNP-output)
- 2 = DIN 43650 incl. plug/IP65

## Electrical Specifications:

### Power supply /

AC 20. . .253 V, 50/60 Hz  
DC 20. . .253 V

### Power consumption /

max. 0,5 W

### Cable glands /

1 x M12 [IP66/IP67 or IP68 (0,2 bar)]

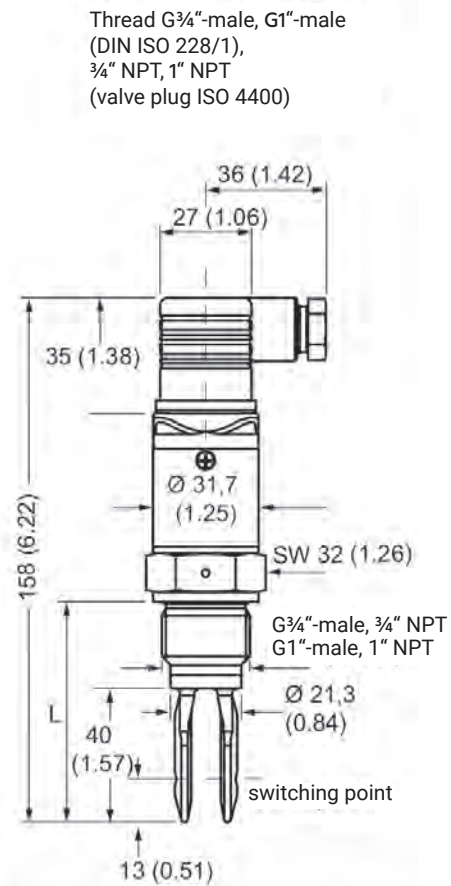
### Protection class /

IP65/Type 4/NEMA 4 (with valve plug  
DIN 43650), IP66/67 or IP68  
(with M12-plug)

### Approvals /

overflow protection acc. to WHG  
Ship-building approvals

## Dimensions in mm:



Thread G¾"-male, G1"-male  
(DIN ISO 228/1),  
¾" NPT, 1" NPT  
(valve plug ISO 4400)

L =  
Length with G¾"-male, ¾" NPT:66 (2.6)  
Length with G1"-male, 1" NPT:69 (2.7)



# FD-02

## Pressure Bell Switch

### Features

- / Level monitoring for fluids
- / Filter and air-duct monitoring
- / Dry-run protection for pumps

### Description:

In pressure bell switches, the static pressure of the fluid is converted into air pressure in suitable pressure transmitters (tube or hose). The rising level of fluid produces a locked up air space in the pressure transmitter as soon as the level reaches the locking edge. If the level continues to rise an overpressure builds up in the tube which on reaching a value of approx. 50 mm of water column actuates a pressure switch. The tube or the hose must be perfectly pressure-tight as, otherwise, the switching point may change due to air losses in the pressure transmitter tube. The FD-02 is factory-adjusted to a switching point of 50 mm of water column so that it is defined as the tube length minus 50 mm. Normally, the FD-02 is supplied without a pressure transmitter tube to allow the user to select the tube material as per his preference and thereby to customize it to the media to be monitored. In the case of warm, viscous or sticky materials, we suggest maintaining a constantly less air bubble formation over a T-piece connected to a pressurized air supply.

### Application:

Pressure bell switches are simple and cost-effective devices for monitoring the level especially in open vessels, sumps and ducts. Since these switches do not have any mechanically moving parts, they are particularly dirt-insensitive. By correctly selecting the pressure transmitter material even hostile media can be monitored economically.



## Versions:

### FD-02 Pressure Bell Switch

**Version:**

FD-02.1 - no housing

FD-02.2 - with housing, R 1/2"-female

FD-02.3 - with housing, R 1/2"-female, R1 1/4"-male

FD-02.4 - with housing, hose joint 40 mm

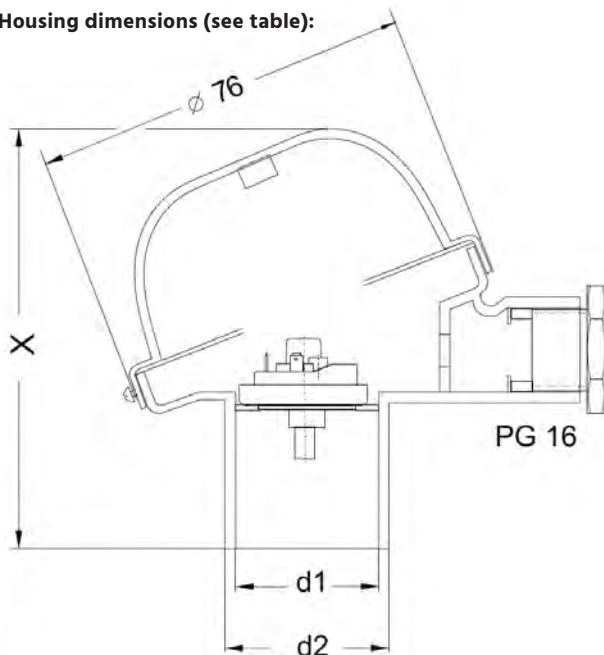
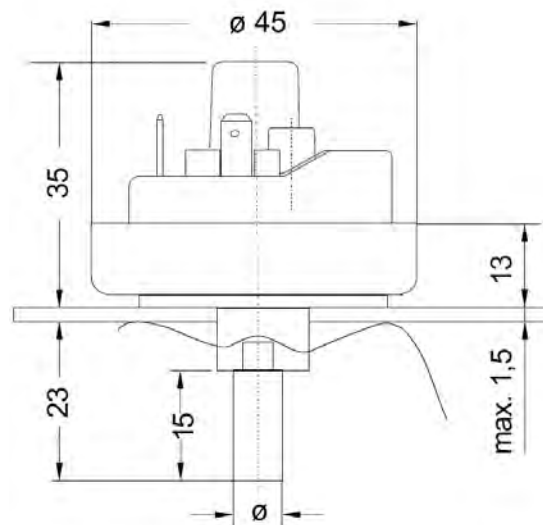
## Electrical Specifications:

**Switching load /** change-over 6 A, 250 V, 50 Hz, ohmic; tested as per VDE 0630**Electrical connection /** flat plug, 6.3 DIN 46248

## Technical Specifications:

**Pressure range /** 0.05 to 1 m water column**Least switching pressure /** 50 mm water column**Least switch back pressure /** 20 mm water column**max. Temperature /** -10...+85°C**Materials /****Housing:** polyamide**Membrane:** nitrile rubber**Pressure chamber:** polyamide, fiberglass reinforced**Hysteresis /** 15%, min. 30 mm water column**Indexing tolerance /** ± 10%, min. +7.5 mm water column

## Dimensions in mm:

**Housing dimensions (see table):****Switch Dimensions FD-02.1 (without housing)**

## Housing Dimensions:

Version	d1	x	d2
FD-02.2	R 1/2" female	78 mm	-
FD-02.3	R 1/2" female	85 mm	R1 1/4" male
FD-02.4	hose	108 mm	40 mm

## Ordering Codes:

**Order number**

FD-02. 2

**FD-02 Pressure Bell Switch****Version /**

1 = no housing

2 = with housing, R 1/2"-female

3 = with housing, R 1/2"-female, R1 1/4"-male

4 = with housing, hose joint 40 mm





# DF-02

## Rotating Vane Level Switch for Industrial Applications

### Features

**/ Robust aluminium pressure cast  
or stainless steel housing**

**/ Easy to assemble**

**/ Can be used as full  
and empty alerter**

**/ Available optionally  
with shaft extension**

**/ Capacity of the contact:  
1mA/4VDC up to 2A/250VAC**

### Description:

A gear motor situated at a certain rotatable angle in the extension of a shaft is held by means of a spring on a stopper. Over the shaft, the motor drives the vane projecting into a vessel. As soon as the filling material reaches the vane, it is prevented from its further rotation. The reverse torque twists the motor from its end position and actuates a switch. Subsequently, a second switch turns off the motor. If the level goes down, the vane is released and the motor is drawn back by the spring into its end position. In this, the motor is switched on again and the output signal is switched back. The gear motor and both the switches are mounted in an aluminium pressure housing. Precise running of the vane shaft is ensured by 2 encapsulated ball-bearings. In the event of a blockage, a retention coupling prevents damage to the motor. A special type sealing on the shaft prevents dust and humidity from infiltrating into the housing and the ball-bearing.

### Application:

The device is suitable for all freely trickling or hardly flowing bulk goods and for goods that tend to bridge, felting or crusting.



## Technical Specifications:

### Materials /

Housing:	Alu pressure casting (Standard), stainless steel (Option)
Sealing ring:	NBR (optionally Viton or PTFE)
Shaft and Vane:	stainless steel 1.4301
Nuts:	steel, Zn plated

### Temperature range /

Ambient temp.:	-20...+70°C
Bulk goods temp.:	-25...+80°C (Standard) (up to +1000°C with high temp.-option)

### Pressure range /

-0.5...+ 5 bar (Standard),  
(optional -0.9...+10 bar)

### Consumption /

4 VA (AC), 4 W (DC)

### Switching load /

potential-free change-over  
1mA/4VDC to 2A/250VAC

### Cable insertion /

1 x M20 x 1,5

### RPM /

1rpm, 5 or 8 rpm on request

### Protection class /

IP 66, IP65 with control lamp

## Seelection guide for measuring vanes:

Lowest bulk weight  $\rho_b$  for which the  
measuring blade can be set.

bulk weight  $\rho_b$  in:

Filling level up to 100 mm above measuring blade

kg/l

t/m<sup>3</sup>

Filling level until blade is completely covered

t/m<sup>3</sup>

kg/l

Measuring blade	Blade size	Spring force setting		Measuring vane for opening
		light	medium	
<b>S2 Socket blade</b>	130 x 30	$\frac{0.2}{0.35}$	$\frac{0.3}{0.5}$	G1 ¼", G1 ½" and all flanges
<b>M1 Socket blade</b>	90 x 28	$\frac{0.15}{0.3}$	$\frac{0.2}{0.5}$	G1", G1 ¼", G1 ½" and all flanges
<b>M2 Socket blade</b>	90 x 40	$\frac{0.1}{0.2}$	$\frac{0.15}{0.3}$	G1 ½" and all flanges
<b>T0 Blade T200</b>	68 x 220	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F70, F100, DN32 PN16, DN100 PN6
<b>T1 Blade T50</b>	98 x 50	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F100 and DN100 PN6
<b>T2 Blade T100</b>	98 x 100	$\frac{0.1}{0.2}$	$\frac{0.2}{0.45}$	F100 and DN100 PN6
<b>X1 Blade X50</b>	98 x 50	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F100 and DN100 PN6
<b>X2 Blade X100</b>	98 x 100	$\frac{0.1}{0.2}$	$\frac{0.2}{0.45}$	F100 and DN100 PN6
<b>X3 Blade X200</b>	180 x 100	$\frac{0.025}{0.05}$	$\frac{0.075}{0.15}$	Must be fitted from inside after mounting the housing
<b>K1 Hinged Blade T230</b>	200 x 30	$\frac{0.05}{0.08}$	$\frac{0.07}{0.12}$	G1 ¼", G1 ½" and all flanges
<b>SG Blade</b>	126 x 8	$\frac{0.45}{0.55}$	$\frac{0.65}{0.75}$	G1 ¼", G1 ½" and all flanges
<b>TG Blade</b>	98 x 8	$\frac{0.5}{0.6}$	$\frac{0.7}{0.8}$	F100 and DN100 PN6

All values given are approximate values and depend on the characteristics of the bulk goods such as consistency and flow behaviour, for example.



# Ordering Codes:

## Order number

DF-02. 1. 0. 1. 0. 1. 1. 1. 3. 1. 1. 0. 0

## DF-02 Rotating Vane Level Switch

### Housing /

- 1 = aluminium compact housing
- 2 = stainless steel round housing

### Ex approval /

- 0 = none
- 1 = dust Ex ATEX II 1D T70°C IP66 (always with function or voltage monitoring)

### Operating voltage /

- 1 = 220-240 VAC, 50-60 Hz
- 2 = 110-120 VAC, 50-60 Hz
- 3 = 48 VAC, 50-60 Hz
- 4 = 24 VAC, 50-60 Hz
- 5 = 24 VDC +10%/-15%

### Self-monitoring /

- 0 = none
- 1 = function monitoring
- 2 = voltage monitoring

### Signal lamps /

- 1 = standard with function LEDs on board
- 2 = calotte for function LEDs (not for Ex-version)
- 3 = signal lamps LED green (not for Ex-version)
- 4 = large signal lamps LED, green (not for Ex-version)

### Bulk material temperature (max. -25°C to 45°C for dust Ex version) /

- 1 = standard -25...+80°C
- 2 = -40...+150°C
- 3 = -25...+200°C
- 4 = -25...+260°C
- 5 = -25...+500°C
- 6 = up to +1000°C on request

### Vessel pressure /

- 1 = standard -0.5...+5 bar (-80...+80mbar for dust Ex version)
- 2 = -0.5...+10 bar
- 3 = -0.9...+10 bar

### Process connection /

- 1 = G 1"-male
- 2 = G1 ¼"-male
- 3 = G1 ½"-male
- 4 = M30x1.5-male
- 5 = M32x1.5-male
- 6 = flange F70, diameter 110 mm, 4 holes with diameter of 9 mm, hole circle 90 mm
- 7 = flange F100, 150x150 mm, 4 holes with diameter of 18 mm, hole circle 170 mm
- 8 = flange DN32 PN10 (stainless steel only)
- 9 = flange DN100 PN6 (stainless steel only)

### Material for process connection /

- 1 = aluminium
- 2 = stainless steel 1.4301

### Measuring vane /

- 0 = no measuring vane
- 1 = S2 bushing vane 130x30 mm inclined, fits through G1 ¼" and G1 ½" and all flange variants
- 2 = M1 bushing vane 90x28 mm, fits through G1", G1 ¼" and G1 ½" and all flange variants
- 3 = M2 bushing vane 90x40 mm, fits through G1 ½" and all flange variants
- 4 = T50 vane 98x50 mm, fits through flanges F100 and DN100
- 5 = T100 vane 98x100 mm, fits through flanges F100 and DN100
- 6 = X50 vane 98x50 mm, fits through flanges F100 and DN100
- 7 = X100 vane 98x100 mm, fits through flanges F100 and DN100
- 8 = X200 vane 180x100 mm, must be fitted from inside after mounting the housing
- 9 = T0 flat paddle 68x220 mm, fits through flanges F70, F100 and DN100
- 10 = SG L rod vane for very rough bulk material mm, fits through G1 ¼" and G1 ½" and all flange variants
- 11 = TG T rod vane for very rough bulk material mm, fits through flanges F100 and DN100
- 12 = T230 flap vane 200x30 mm, fits through G1 ¼", G1 ½" and all flange variants

### Measuring vane reinforcement (for bushings and T vanes only) /

- 0 = no reinforcement
- 1 = with reinforcement

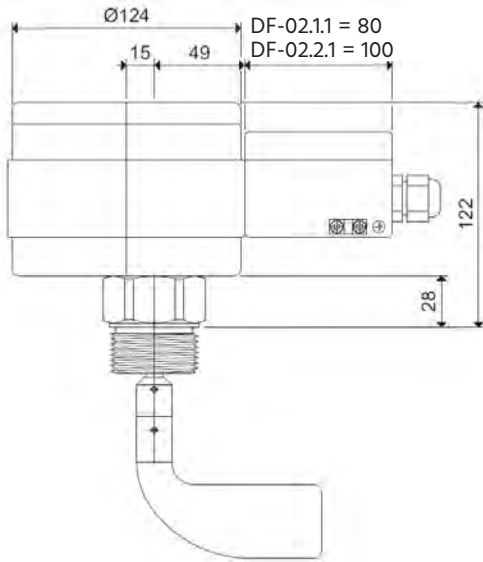
### Options /

- 0 = no options
- 1 = sideways mounting with reinforced bearing
- 2 = with flexible wire rope extension (specify length in detailed text)
- 3 = with rigid shaft extension (specify length in detailed text)

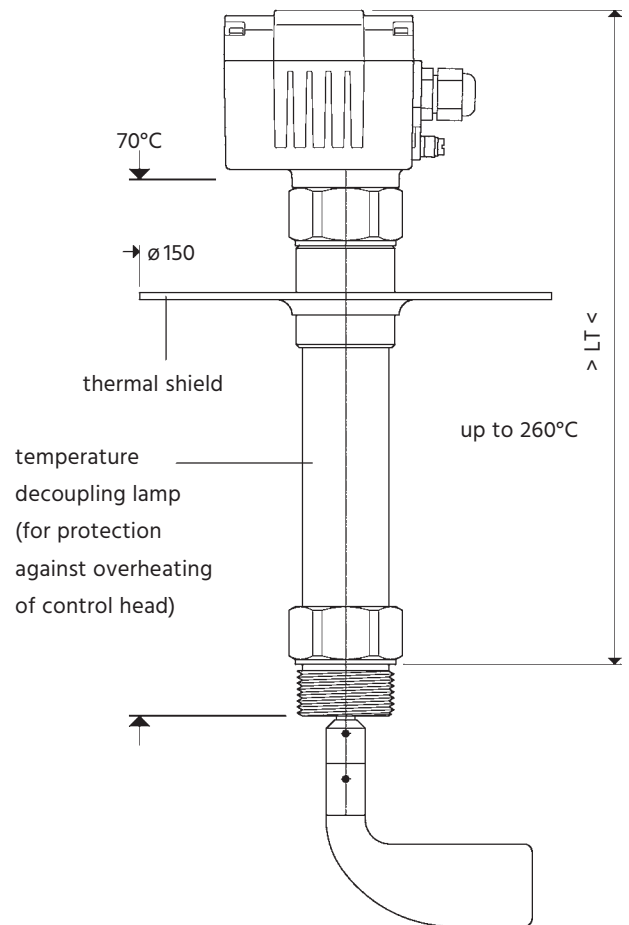
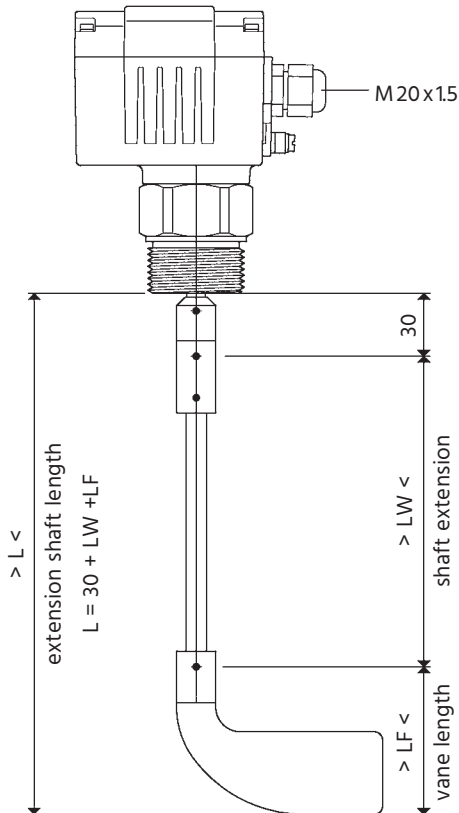
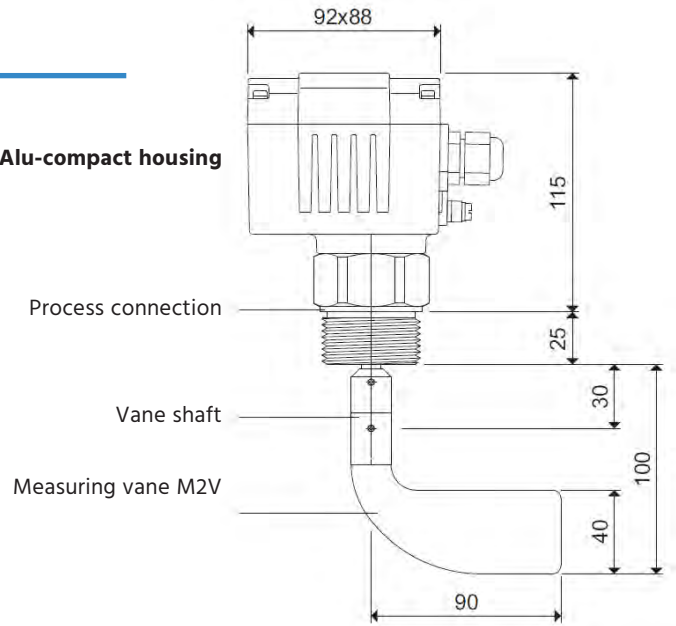


# Dimensions and versions in mm:


St. steel rounded housing



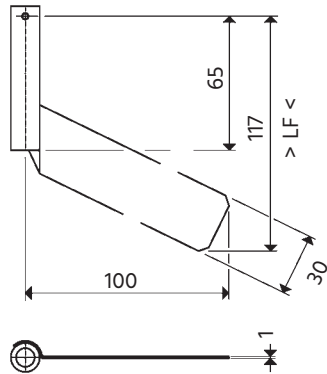
Alu-compact housing



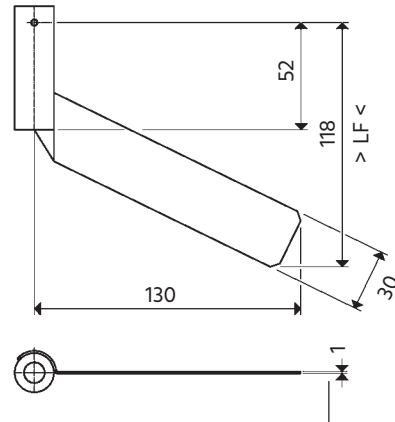


Flame protection for all measuring vanes shown:  II 1GD c IIC TX

**S1 bushing blade**

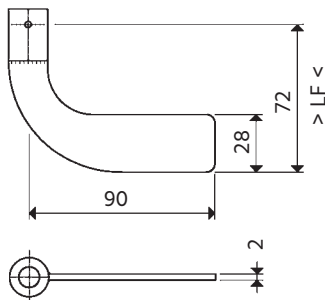


**S2 bushing blade**

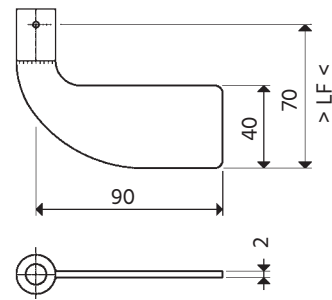


2mm for S2V bushing vane, reinforced

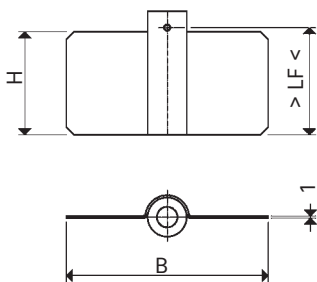
**M1V bushing blade, reinforced**



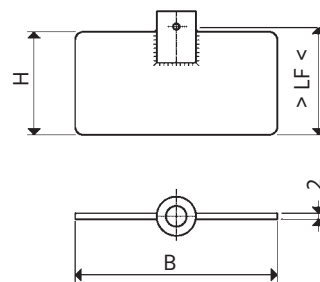
**M2V bushing blade, reinforced**



**T - blade**



**T - blade, reinforced**



	<b>B</b>	<b>H</b>	<b>LF</b>
<b>T1</b>	98	50	52
<b>T2</b>	98	100	102
<b>T3</b>	200	100	102
<b>T5</b>	250	100	102
<b>T8*</b>	250	100	102

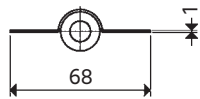
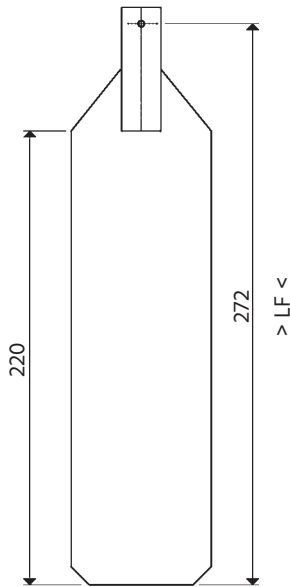
	<b>B</b>	<b>H</b>	<b>LF</b>
<b>T1V</b>	98	50	52
<b>T2V</b>	98	100	102

\* vanes 10 mm thick  
made of rubber NBR, black

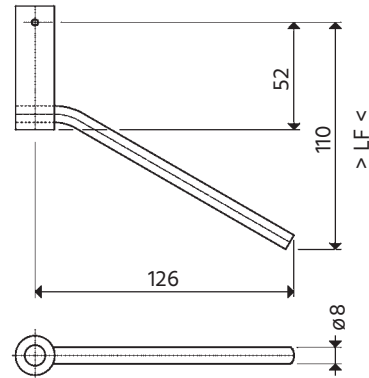


Flame protection for all measuring vanes shown: II 1GD c IIC TX

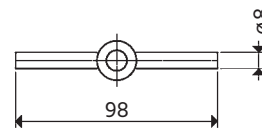
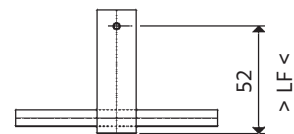
**TO blade**



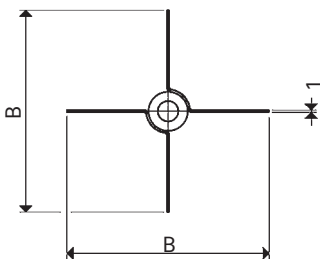
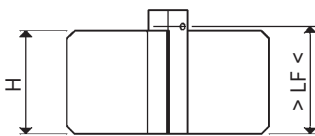
**SG bushing blade, reinforced**



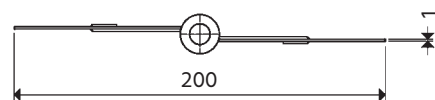
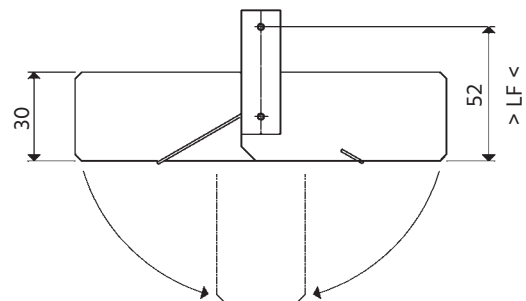
**TG blade, reinforced**



**X blade**



**K1 flap-blade**



	<b>B</b>	<b>H</b>	<b>LF</b>
<b>X1</b>	98	50	52
<b>X2</b>	98	100	102
<b>X3</b>	180	100	102



# MS-04

## Membrane Level Switch for Bulk Goods



## Features

- / Can be used as full & empty detector
- / Easy to assemble
- / Does not require space in the vessel
- / Neopren, Viton or stainless steel membranes
- / High temp. version up to 200°C
- / Output signal: change-over contact with high switching cap. (4 A / 250 V)

## Description:

The MS-04 series of membrane level switches consists of a plastic or aluminium housing with a membrane held in place by a fastening ring. They are mounted aligned into the vessel wall and, therefore, do not project into the vessel. The bulk material applies pressure against the membrane which is prestressed by a spring and thereby actuates a micro-switch. Depending on the type of bulk material and its weight, the devices can be supplied with different membrane diameters and membrane material.

## Application:

The device is suitable for all freely trickling or hardly flowing bulk materials in non-pressurized vessels.



## Technical Specifications:

### Material /

Housing:	plastic, fiber glass reinforced or aluminium
Membrane:	NBR, Viton or stainless steel
Bracket:	aluminium, steel, Zn plated or st. steel

**Mounting position /** any

**Pressure range /** for non-pressurized vessels

**Overpressure security /** 1 bar

**Switching load /** potential-free change-over contact  
4 A / 250 VAC

**Switching voltage /** 24 V. . .250 VAC or 12 V. . .125 VDC

**Cable insert /** screw joint M20 x 1.5

**Protection class /** IP 40  
IP 53 if compensating filter is downwards  
IP 65 with stainless steel membrane  
IP 66 with aluminium housing  
(MS-04.B max. IP 65)

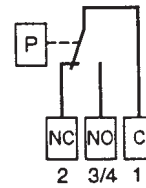
### Temperature range /

Type	Membrane	Schüttguttemperatur
MS-04.E	NBR / Viton	-20. . .+60 °C (housing aluminium +80°C)
MS-04.F	NBR / Viton	-20. . .+60 °C (housing aluminium +80°C)
MS-04.B	NBR	-20. . .+80 °C
	Viton	-20. . .+150 °C
	stainless steel 1.4301	-20. . .+200 °C
MS-04.D	NBR / Viton	-20. . .+70 °C

## Possible Combinations:

Type	Membrane	Mounting ring	Housing
MS-04.E	NBR / Viton	Zn-plated steel / SS	plastic
MS-04.E	SS	SS	aluminium
MS-04.F	NBR / Viton	Zn-plated steel / SS	plastic
MS-04.F	SS	SS	aluminium
MS-04.B	NBR / Viton	aluminium / SS	aluminium
MS-04.D	NBR / Viton	Zn-plated steel / SS	plastic

## Electrical Connection:



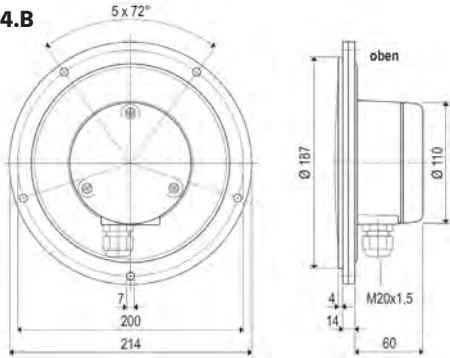
## Ordering Codes:

<b>Order number</b>	<b>MS-04.</b>	<b>E.</b>	<b>N.</b>	<b>N.</b>	<b>K</b>
<b>MS-04 Membrane Level Switch</b>					
<b>Housing design /</b>					
E = Ø 128 mm, standard version					
F = Ø 128 mm, construction for larger vessel wall thickness					
B = Ø 187 mm, construction for high temperature					
D = Ø 128 mm, construction with double-membrane					
<b>Membrane material /</b>					
N = NBR					
V = Viton					
E = stainless steel 1.4301 (with mounting ring in stainless steel only)					
<b>Haltering /</b>					
A = aluminium					
N = Zn-plated steel					
E = stainless steel 1.4301					
<b>Housing /</b>					
A = aluminium					
K = plastic (fiberglass reinforced)					

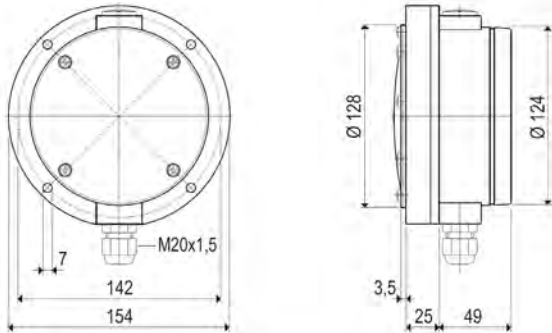


## Dimensions in mm:

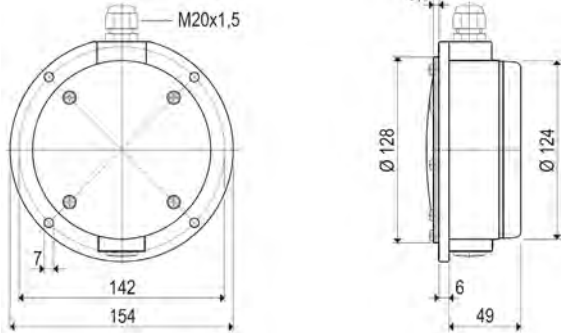
**MS-04.B**



**MS-04.D top**



**MS-04.E**



**MS-04.F**

