


# FS10

## Vertically-Mounted Magnetic Float Level Sensor

- reliable and robust, heavy duty technology
- mounting thread, tank fittings or flange
- installation at top or bottom of vessel
- versions made of stainless steel, Titanium, PVC, PP or PVDF
- N/C, N/O or SPDT contacts available
- Pmax: 80 bar, Tmax: 300 °C
- max. tube length: 6000 mm
-  Ex-Version acc. to ATEX



### Description:

The FS10 level sensor is based on a float with magnetic transmission technology. The sensor is comprised of a guide tube with embedded Reed contacts, one or more floats with fitted ring magnets and a process connection module. The float is raised by the rising liquid in the tank and operates a Reed contact through the guide tube wall by means of the magnetic field produced by permanent magnets located in the float. This Reed contact can be designed as a NO, NC or changeover function.

Float stops mounted on the guide tube prevent the float from passing the contact, this assures bistable switching. Consequently, a maximum of 2 contacts per float can be operated. If more contacts are fitted, more floats must be used.

### Applications:

FS10 magnetic float level sensors are suitable for monitoring the level of practically all liquids, e.g. as a full or empty tank sensor, for controlling valves and pumps and for alarm function. The potential free Reed contacts fitted in the level sensor make it an ideal control element when coupled with PLC controllers

## Versions:

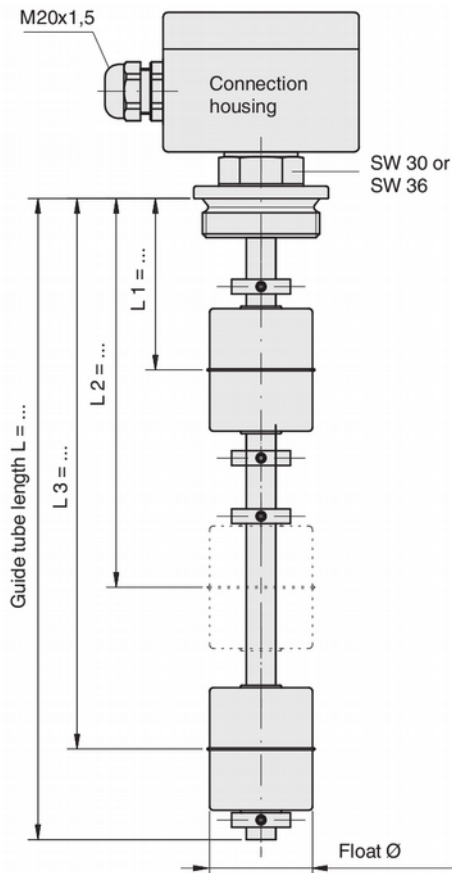
- Standard (stainless steel)
- Miniature version (stainless steel)
- Plastic version (PVC, PP, PVDF)
- Ex version (on request)
- ECTFE coating (on request)

## Structure of the measuring instrument:

Each magnetic float level sensor consists of the three key modules below, which, depending on requirements, are available in different models:

- guide tube
- float
- process connection

Secondary instrumentation like contact protection relays complete the measuring system.



## Guide tube:

The guide tube is the key component in the level sensor: it houses the reed contacts and can be supplied in a variety of materials and diameters.

## Float:

The choice of float is based on the liquid being monitored (corrosion, density), the process parameters (pressure, temperature) and the guide tube materials and diameters. The available float models are listed in the following table.

The selection of the adequate float is best done by technical advise by PKP engineers. Special floats (e.g. electropolished, increased length, etc.) on request.

## Float models and dimensions (Table 1):

Type	Material	Min. DN of thread or flange	Ø ID/OD [mm]	Min. density [kg/m <sup>3</sup> ]	Max. press. [bar]	Max. temp. [C°]
<b>Cylinder float</b>						
E1027	stainless steel	1" / DN40	10 / 27	790	16	100
E1544		1 ½" / DN50	15 / 44	820	16	300
EE1445	VA ECTFE	2" / DN65	14 / 45	780	16	*)
T1544	Titan	1 ½" / DN50	15 / 44	720	16	300
B0920	Buna	1" / DN40	9 / 20	940	3	80
B0923		1" / DN40	9 / 23	800	3	80
B0925		1" / DN40	9 / 25	790	3	80
B1330		1 ½" / DN50	13 / 30	680	3	80
B1540		1 ½" / DN50	15 / 40	580	3	80
B1950		2" / DN65	19 / 50	500	3	80
PV1444	PVC	1 ½" / DN50	14 / 44	650	3	60
PV2255		2" / DN65	22 / 55	800	3	60
PV2655		2" / DN65	26 / 55	920	3	60
PV2580		- / DN80	25 / 80	570	3	60
PP0927	PP	1" / DN40	9 / 27	760	3	80
PP0935		1 ½" / DN50	9 / 35	680	3	80
PP1444		1 ½" / DN50	14 / 44	480	3	80
PP2255		2" / DN65	22 / 55	580	3	80
PP2655		2" / DN65	26 / 55	670	3	80
PP2580		- / DN80	25 / 80	430	3	80
PF1444	PVDF	1 ½" / DN50	14 / 44	780	3	100
PF2255		2" / DN65	22 / 55	820	3	100
PF2655		2" / DN65	26 / 55	1140	3	100
PF2580		- / DN80	25 / 80	430	3	100
<b>Ball float</b>						
E0929	stainless steel	1 ½" / DN50	9 / 29	980	6	100
E0929H		1 ½" / DN50	9 / 29	1070	25	100
E1552		2" / DN65	15 / 52	770	40	300
E1562		- / DN65	15 / 62	600	32	300
E1583		- / DN80	15 / 83	410	25	300
E2380		- / DN80	23 / 80	680	25	300
E2398		- / DN100	23 / 98	600	25	300
E23105		-	23 / 105	530	25	300
E23120		-	23 / 120	390	25	300
EE1453		VA-ECTFE	2" / DN65	14 / 53	740	25
EE1463	- / DN65		14 / 63	590	25	*)
EE1484	- / DN100		14 / 84	400	25	*)
EE2281	- / DN80		22 / 81	720	25	*)
EE2299	- / DN100		22 / 99	680	25	*)
EE22106	-		22 / 106	630	25	*)
EE22121	-	22 / 121	460	25	*)	
T0929	Titan	1 ½" / DN50	9 / 29	820	30	100
T1552		2" / DN65	15 / 52	710	25	300
T1552M		2" / DN65	15 / 52	850	60	300
T1552H		2" / DN65	15 / 52	1060	80	300
T1562		- / DN65	15 / 62	510	25	300
T1583		- / DN100	15 / 83	280	25	300
T2380		- / DN80	23 / 80	670	25	300
T2396		- / DN100	23 / 96	500	25	300
T23105		-	23 / 105	370	25	300
T23120		-	23 / 120	330	25	300

\*) Maximum process temperature depends on media.

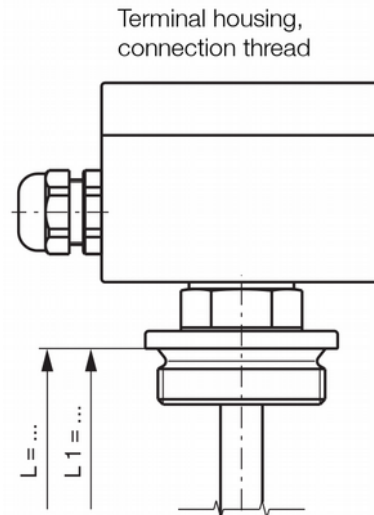
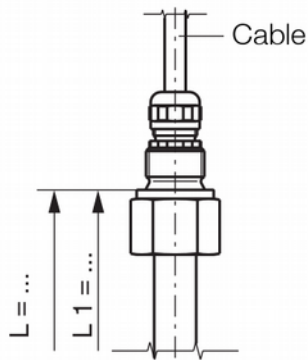
## Process connection:

Typically, the magnetic float level sensors are screwed in the top of the vessel from inside with a male-threaded fitting (NPT or G, 1/8" to 2"). When installed in this fashion, the devices are supplied with a PVC or silicone-jacket connection cable.

To mount the float level sensor from outside through the top of the vessel the device must be fitted with a tank fitting (NPT or G, 1", 1 1/2", or 2" male thread) or with flanges. In this case it is recommended, that the diameter of the tank fitting or flange is large enough to allow the float to pass through the opening in the top of vessel. In the standard version, an adjustable stop ring is fixed to the end of the guide tube, therefore the float can be removed and afterwards mounted from inside the vessel, if the diameter of the process connection is too small.



## Miniature Version, Stainless Steel:



### Technical Data:

<b>Guide tube diameter:</b>	8 mm
<b>Guide tube length L:</b>	max. 500 mm
<b>Guide tube material:</b>	st. st. 1.4571 titanium (others on request)
<b>Process connection:</b>	
cable version:	screw in connection to top, G 1/8 male
housing version:	screw in connection to bottom, G 3/4 AG, G 1 male
<b>Temperature range:</b>	
with PVC-cable:	-10...+80 °C
with silicone cable:	-30...+150 °C
housing version:	
NBR / PP-Float:	-10...+80 °C
st. st. / titanium float.:	-10...+100 °C
	Tmax for floats: see table 1
<b>Float:</b>	stainless steel 1.4571 NBR PP titanium
<b>Float diameter:</b>	20...35 mm
<b>Mounting position:</b>	vertical +/- 30°

### Possible Float Types:

(see table 1 also)

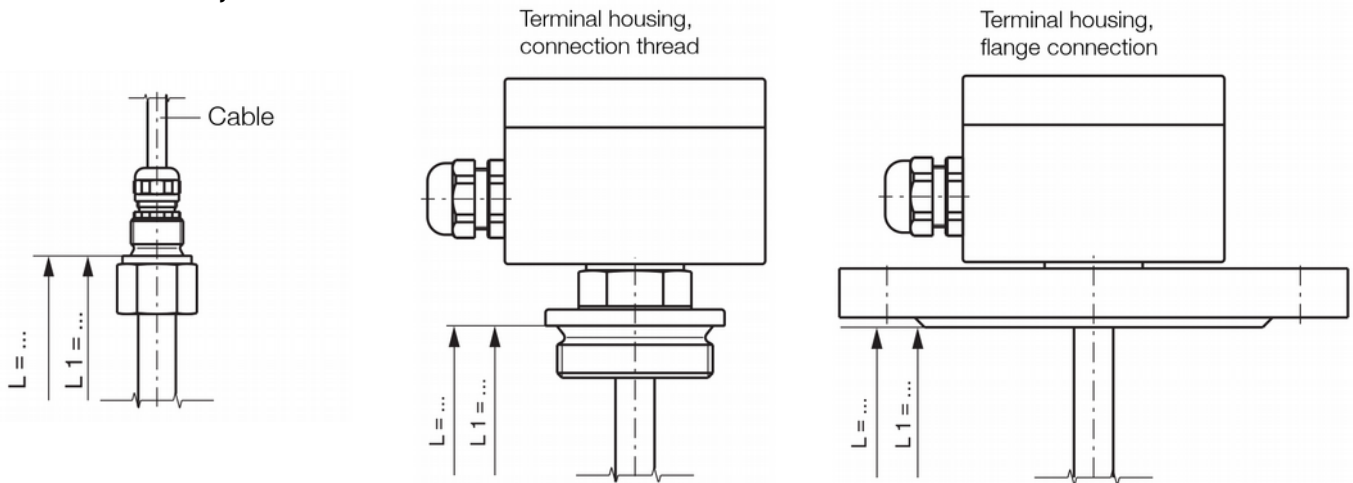
E1027  
B0920  
B0923  
B0925  
E0929  
E0929H  
T0929

### Electrical Data:

<b>Electrical connection:</b>	cable made of PVC cable made of silicone terminal housing: aluminium 64x58x34 mm
<b>Switching function:</b>	N/O N/C SPDT (on rising level)
<b>Max. number of contacts:</b>	3 x N/O or N/C 1 x SPDT
<b>Switching position:</b>	dimension L1, L2, L3 (from sealing surface, starting from the top)
<b>Switching point distance:</b>	min. 20 mm
<b>Switching capacity:</b>	depending on switching function (please observe contact protection action, exact details see type plate)
N/O and N/C:	50 VAC, 10 VA, 0,5 A 75 VDC, 5 W, 0,25 A
SPDT:	50 VAC, 5 VA, 0,25 A 75 VDC, 2,5 W, 0,15 A
<b>Protection class:</b>	
cable version:	IP 54
housing version:	IP 65



## Standard Version, Stainless Steel:



### Technical Data:

**Guide tube diameter:** 12, 14, 18 mm  
**Guide tube length L:** max. 3000 mm (Ø 12, 14 mm)  
 max. 6000 mm (Ø 18 mm)  
**Guide tube material:** stainless steel 1.4571  
 titanium  
 (others on request)

**Process connection:**  
 cable version: screw in connection to top,  
 G 3/8 male, G 1/2 male  
 housing version: screw in connection to  
 bottom, G 1 1/2 male, G 2  
 male  
 flange connections:  
 DIN DN 50...DN 200  
 PN 6... PN 100  
 ANSI 2" ...8", Class 150...600

**Temperature range:**  
 with PVC-cable: -10...+80 °C  
 with silicone cable: -30...+150 °C  
 housing version: -30...+150 °C  
 optional: high temp. version:  
 +150 °C...+300 °C  
 low temperature version:  
 -196...-30 °C  
 Tmax for floats: see table 1

**Float:** stainless steel 1.4571  
 NBR  
 titanium

**Float diameter:** 44...120 mm

**Mounting position:** vertical +/- 30°

### Electrical Data:

**Electrical connection:** cable made of PVC  
 cable made of silicone  
 terminal housing:  
 aluminium  
 64x58x34 mm (1 contact)  
 80x75x57 mm  
 (from 2 contacts)

**Switching function:** N/O  
 N/C  
 SPDT  
 (on rising level)

**Max. number of contacts:** 6 x N/O or N/C  
 4 x SPDT

**Switching point distance:** dimens. L1, L2, L3, (from seal-  
 ing surface, starting from top)

**Switching point distance:** min. 20 mm

**Switching capacity:** depending on switching  
 function (please observe  
 contact protection action,  
 exact details see type plate)

N/O and N/C: 250 VAC, 100 VA, 1 A  
 250 VDC, 50 W, 0,5 A

SPDT: 250 VAC, 40 VA, 1 A  
 250 VDC, 20 W, 0,5 A

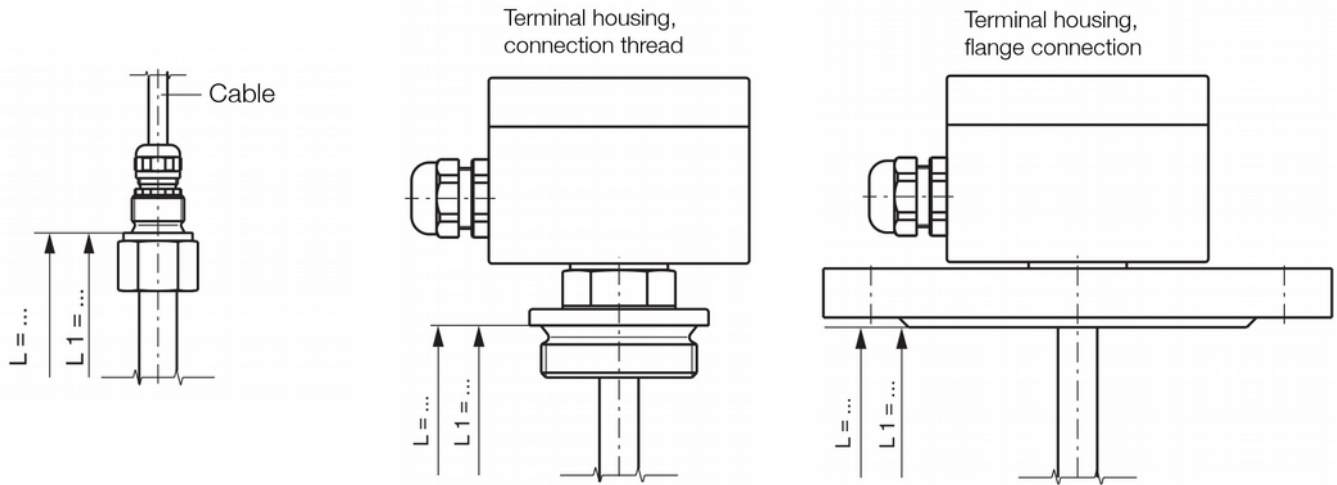
**Protection class:** IP 65

### Possible Float Types:

Guide tube diameter		
12 mm	14 mm	18 mm
E1544	E1544	B1950
EE1445	T1544	E2380
T1544	B1540	E2398
B1330	E1552	E23105
B1540	E1562	E23120
E1552	E1583	EE2281
E1562	T1552	EE2299
E1583	T1552M	EE22106
EE1453	T1552H	EE22121
EE1463	T1562	T2380
EE1484	T1583	T2396
T1552		T23105
T1552M		T23120
T1552H		
T1562		
T1583		



## Plastic Version, PVC, PP or PVDF:



### Technical Data:

<b>Guide tube diameter:</b>	12, 16, 20 mm
<b>Guide tube length L:</b>	max. 500 mm (Ø 12 mm) max. 3000 mm (Ø 16 mm) max. 5000 mm (Ø 20 mm)
<b>Guide tube material:</b>	PVC PP PVDF
<b>Process connection:</b>	
cable version:	screw in connection to top, G 3/8 male
housing version:	screw in connection to bottom, G 1 1/2, G 2 male
	flange connection: DIN DN 50...DN 200 PN 6... PN 100
	ANSI 2"...8", Class 150...600
<b>Temperature range:</b>	
PVC:	0...60 °C
PP:	-10...+80 °C
PVDF:	-10...+100 °C
<b>Float</b>	PVC, PP, PVDF
<b>Float diameter</b>	44...80 mm
<b>Mounting position</b>	vertical +/- 30°



### Electrical Data:

<b>Electrical connection:</b>	cable made of PVC terminal housing: PP: 80x82 x55 PE: 80x75x55 mm
<b>Switching function:</b>	N/O N/C SPDT (on rising level)
<b>Max. number of contacts:</b>	6 x N/O or N/C 4 x SPDT
<b>Switching position:</b>	dimension L1, L2, L3, (from sealing surface, starting from the top)
<b>Switching point distance:</b>	min. 20 mm
<b>Switching capacity:</b>	depending on switching function (please observe contact protection action, exact details see type plate)
	N/O and N/C: 250 VAC, 100 VA, 1 A 250 VDC, 50 W, 0,5 A
	SPDT: 250 VAC, 40 VA, 1 A 250 VDC, 20 W, 0,5 A
<b>Protection class:</b>	
cable version:	IP 54
housing version:	IP 65

### Possible Float Types:

(see table 1 also)

Guide tube diameter		
12 mm	16 mm	20 mm
B1380	B1950	PV2255
B1540	PV2255	PV2655
PV1440	PP2255	PV2580
PP1444	PF2255	PP2655
PF1444		PP2580
		PF2255
		PF2655
		PF2580



## Order Code:

Order number: **FS10. 2. 1. 3. G06. 1. 1. E1027. 0**

### Magnetic float level switch

#### Guide tube material:

- 2 = stainless steel
- 3 = PVC
- 4 = PP
- 5 = PVDF
- 7 = titanium
- 9 = special version

#### Guide tube diameter:

- 1 = 8 mm (miniature)
- 2 = 12 mm (standard, plastic)
- 3 = 14 mm (standard)
- 4 = 16 mm (plastic)
- 5 = 18 mm (standard)
- 6 = 20 mm (plastic)
- 9 = special version

#### Material process connection:

- 3 = stainless steel 1.4571
- 4 = PVC
- 5 = PP
- 6 = PVDF
- 7 = stainless steel 1.4435
- 8 = stainless steel 1.4404
- 9 = stainless steel 1.4539

#### Process connection:

G06...FD200/100

(see table "process connections")

#### Electrical connection:

- 1 = terminal housing aluminium
- 2 = terminal housing stainless steel
- 3 = terminal housing (PP or Polyester)
- 4 = plug (please indicate version)
- 6PVC1 = PVC cable 1m
- 6SIL1 = silicone cable 1 m  
(please indicate other length directly)
- 9 = special version

#### Contacts (from top to bottom):

please indicate distance of each contact individually, measured from sealing surface of process connection

- 1 = N/O at rising level
- 2 = N/C at rising level
- 3 = SPDT

#### Float model: (see Table 1)

E1027-T23120

9 = special version

#### Approvals and options:

0 = without  
see Table 12 „Approvals and Options“

## Approvals and options:

Description	Code	for type
High temperature version (150...300 °C)		
Low temperature version (-196...-30 °C)		
Adjustable version	HA	please inquire individually
explosion proof, intrinsic safe acc. to ATEX Ex ia, zone 0, gas	E1	
explosion proof, flame-proof enclosure acc. to ATEX Ex d, Zone 1, gas and dust	E2	
Germanischer Lloyd	GL	
Det Norske Veritas	DNV	
American Bureau of Shipping	ABS	

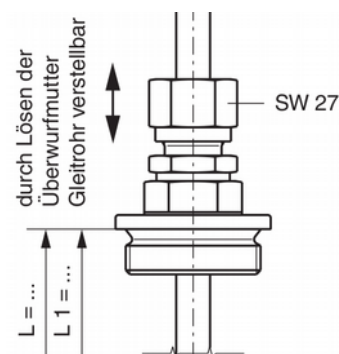
## Process connections:

Miniature version:			
code	connection	tube-Ø	electr. connec.
<b>G06</b>	G 1/8 male	8 mm	cable version
<b>G20</b>	G ¼ male		housing version
<b>G25</b>	G 1 male		
Standard version:			
<b>G10</b>	G 3/8 male	12, 14, 18 mm	cable version
<b>G15</b>	G ½ male		housing version
<b>G40</b>	G 1 ½ male		
<b>G50</b>	G 2 male		
<b>FD50 to FD200...</b>	DIN flange DN 50...DN 200		
<b>.../6 to 100</b>	PN 6...PN 100		
<b>FA2 to FA8...</b>	ANSI flange 2"...8"	12, 16, 20 mm	housing version
<b>.../150 to 600</b>	Class 150 to 600		
Plastic version:			
<b>G10</b>	G 3/8 male	12, 16, 20 mm	cable version
<b>G40</b>	G 1 ½ male		housing version
<b>G50</b>	G 2 male		
<b>FD50 bis FD200...</b>	DIN flange DN 50...DN 200	12, 16, 20 mm	housing version
<b>.../6 bis 100</b>	dimensions like PN 6...PN 100		
<b>FA2 bis FA8...</b>	ANSI flange 2"...8"	12, 16, 20 mm	housing version
<b>.../150 bis 600</b>	Class 150 bis 600		

## Stainless steel terminal housing:



## Version with adjustable tube (option):



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