

MTS PP (F) AND PVDF (L) FLOAT SWITCH

In process containers and storage tanks, the level of liquids needs to be detected in order to correct any unwanted changes (evaporation or delay of the process liquid). There are two types of approaches:

- Level adjustment, to ensure the automatic performance of process sequences (e.g., liquid dosed addition)
- Level control, in order to avoid potential hazards (vacuum or dry operation) for appliances installed in the container (heating, pumps), or to prevent process liquid overflows from the receptacle.

Using float switches, the adjustment and control of liquid levels in a container can be simple and economical. The float is "operational" even without additional electronics!

The float switch operates based on a floating body and its operation is guaranteed only with liquids for which fouling can be excluded.

Also, impurities in the container (e.g., large chips) may affect the freedom of movement of the float switch. If such conditions that make it impossible to use float switches are present, we recommend to use our level sensors in electrically conducting liquids.

The float switch is available in several versions:

- with a contact (with or without a built-in temperature sensor)
- with two contacts
- with three contacts

Switches are mounted as contactors (switching contacts).

STRUCTURE

The magnet embedded in the mobile floating body excites the fixed reed contact on the float switch bar. To ensure an optimal chemical and thermal resistance, the float switch is made of polypropylene (PP) or polyvinyl fluoride (PVDF).

The float switch is available with a 1.6 m long (PG) cable, a small LC (PP) or LC/L (PVDF) terminal casing and a large BC (PP) or BC/L (PVDF) terminal casing.

The cable can be easily mounted on all box versions.

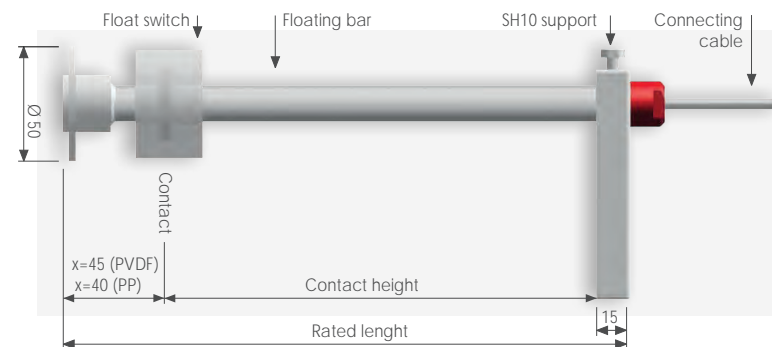
The height of the floating bar can be continuously adjusted and the float switch can be easily fixed on the wall of the vessel in the PG and the LC builds, using the support (SH10) attached to the floating bar. For the BC build, the HB (PP) or HB/L (PVDF) support can be used for an attachment to the rim of the vessel or on crossbars using the EM or the HM mounting sleeve.

TECHNICAL DATA	FLOAT SWITCH TYPES			
	MTSu	MTSt	MTS2u	MTS3u
Number of contacts	1 switch	1 switch	2 switches	3 switches
In-built temperature sensor	no	PT100	no	no
Connection current	max 1,0A	max 1,0A	max 1,0A	max 1,0A
Connection voltage	1V AC/DC 250V AC	1V AC/DC 250V AC	1V AC/DC 250V AC	1V AC/DC 250V AC
Breaking power	max 60VA 60W	max 60VA 60W	max 60VA 60W	max 60VA 60W
Switching delay	no	no	no	no
Connection hysteresis	5mm	5mm	5mm	5mm
Min. conn. dist. contacts 1-2	-	-	25mm	40mm
Min. conn. dist. contacts 1-3	-	-	-	110mm
Minimum rated length	100mm	100mm	125mm	210mm
Possible builds	PG, LC, LC/L, BC, BC/L	PG, LC, LC/L, BC, BC/L	PG, LC, LC/L, BC, BC/L	PG, LC, LC/L, BC, BC/L

PG OUTPUT

The cable (1.6 m standard length) comes out via a leak-tight screw connection (IP64 protection rating); other cable lengths are available on request.

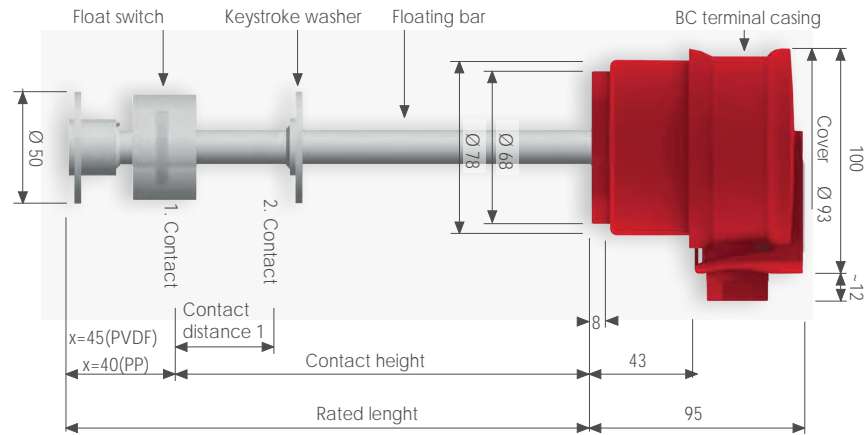
The SH10 support attached to the immersion tube allows you to adjust the height of the immersion tube as desired and to easily attach the temperature sensors to the edge of the vessel.



BC OUTPUT

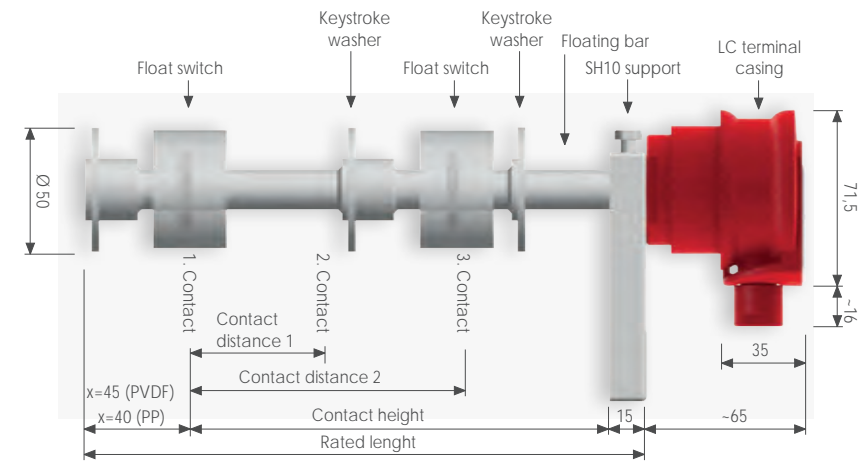
The BC PP terminal casing is used to connect the cable and it has an IP65 protection rating (protected against water jets) according to EN 60529. At extreme thermal stresses (>80°C) or under if subjected to highly oxidising chemical agents (e.g., chromium electrolytes or HNO₃ solutions) the BC/L PVDF terminal casing should be used.

The cable can be connected by unscrewing the cover using the SB mounting key.



LC OUTPUT WITH AN SH10 SUPPORT

The small LC PP or LC/L PVDF terminal casing is used to connect the cable and it has an IP65 protection rating (protected against water jets) according to EN 60529 standards. The cable can be connected by unscrewing the cover using the SL mounting key.



CONTACT POINTS

After the contact points are set, they are fixed and can no longer be changed. For this reason, the first point of contact and the related distances between the other switching contacts and the first point of contact must be set exactly in the order.

The rated length of the float switch can be easily derived from the design.

PG-/ LC BUILD

Rated length = 1.5 cm (support thickness) + Contact height (in cm) + Size X (in cm)

BC BUILD

Rated length = Contact height (in cm) + Size X (in cm)

CODING

MTS - No. of contacts - Rated length - Output type - Sheath material (F-L)

TABLE FOR THE SELECTION OF CONTROL ELECTRONICS AND MONITORING DEVICES

	MTSu	MTSt	MTS2u	MTS3u
Level monitoring	ETS 100	ETS 100	ETS 200	-
Temperature limitation		ETB 100		
Level adjustment			ENR 200	ENR 300
Temperature control	-	MTR	-	-



ETS/ENR LEVEL ELECTRONICS FOR LIQUID LEVEL ADJUSTMENTS (ETS)

Level electronics, in combination with float switches or rod level probes, allow the adjustment and monitoring of the liquid level. ETS/ENR level electronics work according to the principle of conductive filling level measurement and are made specifically for process liquids in treatment technology of surfaces and in galvanotechnics. Sensitivity can be set gradually according to the conductivity of the process liquid. All level electronics are verified according to EN 61326 in relation to electromagnetic compatibility and comply with functional safety according to SIL 2 as per EN 61508

LEVEL MONITORING

ETS100 electronics are used for monitoring the liquid level as MIN or MAX switching contact. If the maximum required level is exceeded or the level is lower than the minimum set level, the contact switches. If the process liquid level returns to the specified limits, the contact switches again. With ETS 200 electronics, two liquid levels can be monitored in a single tank independently.

LEVEL ADJUSTMENT

The ENR300 level regulator is equipped with a switching relay output for MIN/MAX adjustment. An additional switching contact is available for monitoring another level of the minimum or maximum liquid. The ETS410 level electronic device has four discrete signal inputs and four relay outputs.

In this way, four independent levels can be detected in a single tank and, for example, can be analysed using PLC.

The electrical resistance of the signal inputs is 50V DC. If a higher electrical resistance is required (e.g. with pulsed current generators), the EVG 200 voltage ballast can be used with an electrical resistance of 200V DC. It is connected to each input of its level electronics.

Level electronics and voltage are designed for installation in the electric cabinet on a wall-to-wall mounted DIN-rail rail.

TECHNICAL FEATURES	ETS 100	ETS 200	ETS 410
Code	221.X.000100	221.X.000110	221.X.000120
Level switch points	1	2	4
Contacts (zero potential)	1 switch	2 switches	4 switches
Switching status indicator	1 led	2 led	4 led
Power supply	20...230VAC/DC	20...230VAC/DC	20...230VAC/DC
Switching voltage	< 250VAC	< 250VAC	< 60VDC
Switching current	≤ 5A	≤ 5A	≤ 2A
Test function	si	si	si



INPUT	
Switching delay	3s
Output voltage/current	0,1 ... 6V~ / < 5mA~
Response sensitivity	0,05...100kΩ (10μS...2x104μS) adjustable to 16 levels
Electrical resistance	50 VDC
MECHANICAL BUILD	
Casing material	Polyamide PA 6.6
Fire resistant box	V0 (UL94)
Mounting	on DIN bar (according to EN50022)
Dimensions	b = 22,5mm / h = 111mm / t = 115mm
Protection class	IP20 (according to EN60529)
CLIMATE STRESS	
Ambient temperature	-20 ... 60°C
Storage temperature	-40 ... 70°C
Max. air humidity	< 75% (no condensation))

