



# FLOAT & DISPLACER TYPE LEVEL SWITCHES

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## FLOAT & DISPLACER TYPE LEVEL SWITCHES

Float & Displacer Type Level Switches are designed for long life and versatile applications in liquid level control using operating principles of Float /Displacer Mechanisms.

- Ideal for industrial applications such as pump control and high or low alarm duty on tanks and pressure vessels.
- Rugged, industrial level switches specifically designed for variety of applications.
- High Pressure and High Temperature application capabilities in different models.
- Wide variety of internationally accepted Agency Approvals for Safe Use.
- Versatile switching mechanisms for retro-fit situations.

### PRODUCT VARIANTS INCLUDE

VFS Series	VERTICAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES
MVFS Series	MINI VERTICAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES
MHFS Series	MINI HORIZONTAL MOUNTING FLOAT LEVEL SWITCHES
BVFS Series	BEND VERSION TYPE MAGNETIC FLOAT LEVEL SWITCHES
HFS Series	HORIZONTAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES
MLS Series	EXTERNAL CHAMBER LEVEL SWITCHES
CFS Series	CABLE SUSPENDED FLOAT OPERATED LEVEL SWITCHES
DLS Series	DISPLACER TYPE MAGNETIC LEVEL SWITCHES

### APPROVALS / CERTIFICATIONS



ISO - 9001- 14001-45001 Certified



Conformité\_Européenne



Pressure Equipment Directive  
2014/68/EU



ATEX 2014/34/EU



IECEx Approved



ABS - Type Approved Product



CIMFR / PESO / CCOE

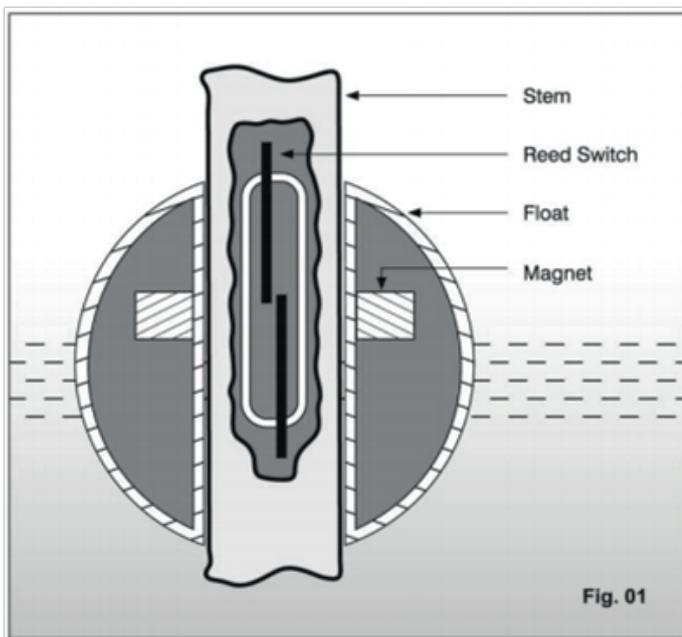
# 1. VFS SERIES - VERTICAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES

Vertical Float Switches are established and reliable technique in industry for single / multiple liquid level sensing and control in open or pressurized vessels. It offers trouble free service in conductive / non-conductive liquids under widely varying temperatures, pressures, liquid viscosity and corrosive conditions. Besides, it provides high repeatability and effects of shocks / vibrations are minimal.

## 1.1 CONSTRUCTION & OPERATION

Vertical mounting type float switches operate on below principle.

- **Use of magnetic Reed switch as sensing element.**  
A float encircling a fixed stationary stem is equipped with powerful permanent magnets. As the float rises or lowers with liquid level the magnetic field generated by the magnet that is present within the float actuates a hermetically sealed reed switch mounted inside the stem. This in turn makes or breaks the contact of the reed switch. (Refer fig.01)



## 1.2 GENERAL SPECIFICATIONS

Enclosure	Cast Al., Weather-proof to IP 67, Ex-proof IP 66 to Gr. IIA, IIB & Gr.IIC, DIN Polyamide connector
Gland Connection	Brass, ¾" ET / ½" NPT/ M20 x 1.5
Guided Stem MOC	SS316 / SS304 / Brass / SS316L / PP
Float MOC x Size	SS316 x Ø28, Ø30, Ø41, Ø45, Ø52, Ø63 : SS316L x Ø52 : PU foam x Ø25, Ø35 : PP x Ø25, Ø46, PVDF x Ø48
Stem OD	Ø8, Ø12.7 in SS316 / SS304 / Brass / SS316L, Ø16 in PP
Operating Temperature	SS316 - float Ø52, Ø41 Up to 150°C, float Ø28, Ø30 Up to 100°C SS316L - float Ø52 up to 150°C , PU foam - float Ø25, Ø35 Up to 60°C, PP float Ø 25, Ø46 up to 60°C, PVDF: Ø48 up to 120°C.
Operating pressure max.	SS316 – float Ø52, Ø41 Up to 20Kg/cm², float Ø28, Ø30 upto 8Kg/cm², SS316L float dia. 52mm up to 40Kg/cm², PU foam - float Ø25, Ø35-Atmospheric, PP up to 5kg/cm², PVDF up to 5kg/cm².
Min. specific gravity	0.65
No. of floats	Single / Multiple (Max. 4) (More available on request)
Process connections	Flanged / Threaded / Triclover Flange special constructions as per application
Pre-set levels	1 to 4 (Factory set) (More available on request)
Switch type	Glass encapsulated hermetically sealed reed contacts
Switching capacity	SPST - 15VA / 100VA SPDT - 3VA / 50VA
Differential	Fixed (10 ± 2mm)
Accuracy / Repeatability	± 2mm / ± 1mm
Load	Resistive / Inductive
Insulation	100 Mega-Ohms at 500 VDC
Special Features	Intrinsically safe to Ex ia, Gr. IIA, IIB

# 1.3 ORDERING INFORMATION FOR VERTICAL MOUNTING FLOAT LEVEL SWITCHES

SPECIFY PART NO. → VFS **1** **2** **3** **4** **5**  
 VFS       
 Example: VFS **B** **A** **1** **S1** **1**

1	TERMINAL TYPE
A	Cable
B	DIN Polyamide (upto 2 levels)
C	Weather Proof IP 67/SS304
D	Weather Proof IP 67/Cast Al.
E	Ex. Proof IP 66 Gr IIA , IIB , IIC
F	Aluminium Junction Box
G	Polycarbonate Enclosure
O	Others

3	DIA. OF STEM WITH MATERIAL
1	Dia. 8mm - SS304
2	Dia. 12.7mm - SS304
3	Dia. 16.0mm - PP
4	Dia. 8mm - PP
5	Dia. 8mm - SS316
6	Dia. 12.7mm - SS316
7	Dia. 12.7mm - SS316L
O	Others

5	ELECTRICAL SPECIFICATIONS
1	SDN 102
2	SDN 104
3	SDN 202
4	SDN 204
↓	Refer table below

2	CONNECTION TYPE																														
	<table border="1"> <thead> <tr> <th>Size Of Flange</th> <th>Adapter</th> </tr> </thead> <tbody> <tr><td>A</td><td>Dia. 75mm-60mm PCD 0 ¼" BSP</td></tr> <tr><td>B</td><td>Dia. 75mm-65mm PCD 1 1" BSP</td></tr> <tr><td>C</td><td>Dia. 100mm-80mm PCD 2 1½" BSP</td></tr> <tr><td>D</td><td>2" #150 ANSI 3 2" BSP</td></tr> <tr><td>E</td><td>2 ½" #150 ANSI 4 2" NPT</td></tr> <tr><td>F</td><td>2 ½" BS 10 - E 5 3/8" BSP</td></tr> <tr><td>G</td><td>2" BS 10 - E 6 1/8" NPT</td></tr> <tr><td>H</td><td>1 ½" #150 ANSI O Others</td></tr> <tr><td>I</td><td>3" BS 10 - E</td></tr> <tr><td>J</td><td>3" #150 ANSI</td></tr> <tr><td>K</td><td>Dia. 45mm-38mm PCD</td></tr> <tr><td>L</td><td>Dia. 58.7mm-51mm PCD</td></tr> <tr><td>M</td><td>Square 92 x 92</td></tr> <tr><td>O</td><td>Others</td></tr> </tbody> </table>	Size Of Flange	Adapter	A	Dia. 75mm-60mm PCD 0 ¼" BSP	B	Dia. 75mm-65mm PCD 1 1" BSP	C	Dia. 100mm-80mm PCD 2 1½" BSP	D	2" #150 ANSI 3 2" BSP	E	2 ½" #150 ANSI 4 2" NPT	F	2 ½" BS 10 - E 5 3/8" BSP	G	2" BS 10 - E 6 1/8" NPT	H	1 ½" #150 ANSI O Others	I	3" BS 10 - E	J	3" #150 ANSI	K	Dia. 45mm-38mm PCD	L	Dia. 58.7mm-51mm PCD	M	Square 92 x 92	O	Others
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Please Note:  
 Flange / Adapter Material Available in variants of  
 Stainless Steel / Mild Steel / Aluminium / Brass

4	FLOAT TYPE																																																				
	<table border="1"> <thead> <tr> <th>Type</th> <th>Material</th> <th>Float</th> <th>Stem</th> </tr> </thead> <tbody> <tr><td>S1</td><td>SS316</td><td>Dia. 28mm</td><td>Dia. 8mm</td></tr> <tr><td>S2</td><td>SS316</td><td>Dia. 30mm</td><td>Dia. 8mm</td></tr> <tr><td>S3</td><td>SS316</td><td>Dia. 41mm</td><td>Dia. 12.7mm</td></tr> <tr><td>S4</td><td>SS316</td><td>Dia. 52mm</td><td>Dia. 12.7mm</td></tr> <tr><td>S5</td><td>SS316L</td><td>Dia. 52mm</td><td>Dia. 12.7mm</td></tr> <tr><td>S6</td><td>SS316</td><td>Dia. 45mm</td><td>Dia. 12.7mm</td></tr> <tr><td>P1</td><td>PU</td><td>Dia. 25mm</td><td>Dia. 8mm</td></tr> <tr><td>P2</td><td>PP</td><td>Dia. 25mm</td><td>Dia. 8mm</td></tr> <tr><td>P3</td><td>PU</td><td>Dia. 35mm</td><td>Dia. 12.7mm</td></tr> <tr><td>P4</td><td>PP</td><td>Dia. 46mm</td><td>Dia. 16mm</td></tr> <tr><td>P5</td><td>PVDF</td><td>Dia. 48mm</td><td>Dia. 16mm</td></tr> <tr><td>S0</td><td>Others</td><td></td><td></td></tr> </tbody> </table>	Type	Material	Float	Stem	S1	SS316	Dia. 28mm	Dia. 8mm	S2	SS316	Dia. 30mm	Dia. 8mm	S3	SS316	Dia. 41mm	Dia. 12.7mm	S4	SS316	Dia. 52mm	Dia. 12.7mm	S5	SS316L	Dia. 52mm	Dia. 12.7mm	S6	SS316	Dia. 45mm	Dia. 12.7mm	P1	PU	Dia. 25mm	Dia. 8mm	P2	PP	Dia. 25mm	Dia. 8mm	P3	PU	Dia. 35mm	Dia. 12.7mm	P4	PP	Dia. 46mm	Dia. 16mm	P5	PVDF	Dia. 48mm	Dia. 16mm	S0	Others		
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P5	PVDF	Dia. 48mm	Dia. 16mm																																																		
S0	Others																																																				

## ELECTRICAL SPECIFICATIONS

Model Type	SDN 102	SDN 104	SDN 202	SDN 204
Switching Voltage (Max.)	200 V DC 125 V AC	300 V DC 240 V AC	28 V DC 28 V AC	500 V DC 250 V AC
Switching Current (Max.)	0.5A	3A	0.25 A	1.5A
Contact Rating	15VA	100VA	3VA	50VA
Contact Form	SPST	SPST	SPDT	SPDT

- The REED contacts are potential free and the specified values are maximum threshold. Recommended voltage range is 12-36V DC.
- For Higher Rating Reed Switches - Please consult factory.

## 1.4 VERTICAL FLOAT LEVEL SWITCH INSTALLED IN A CHAMBER

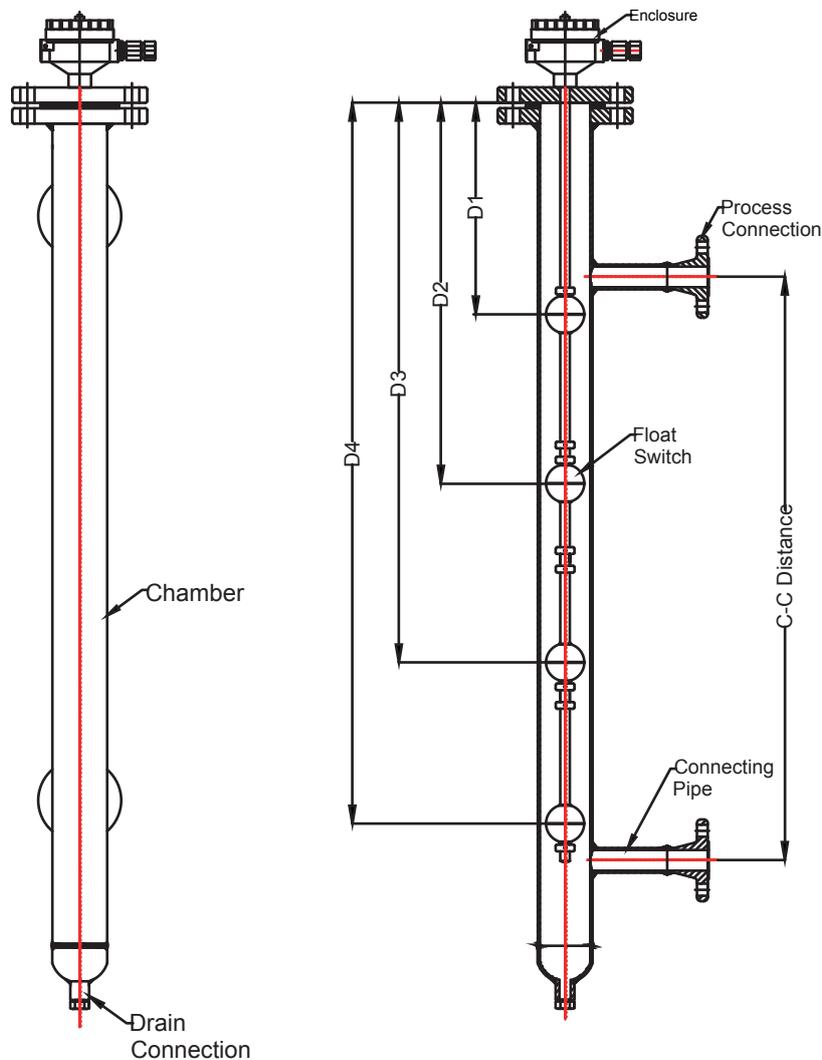
Wherever it is not possible or desirable to install Vertical Float switches directly onto the vessel, switches can be installed in an External Chamber. This arrangement gives smooth level control irrespective of turbulence in the process vessel and prevents accidental damages to the switch during shutdown or maintenance of the vessel. Chambers are used in applications which require isolations of process, High Pressure / High Temperature applications, Corrosive applications, Onshore / Offshore installations.

**Main function of these chambers are:**

- Level Measurement
- Interface Measurement / Control.

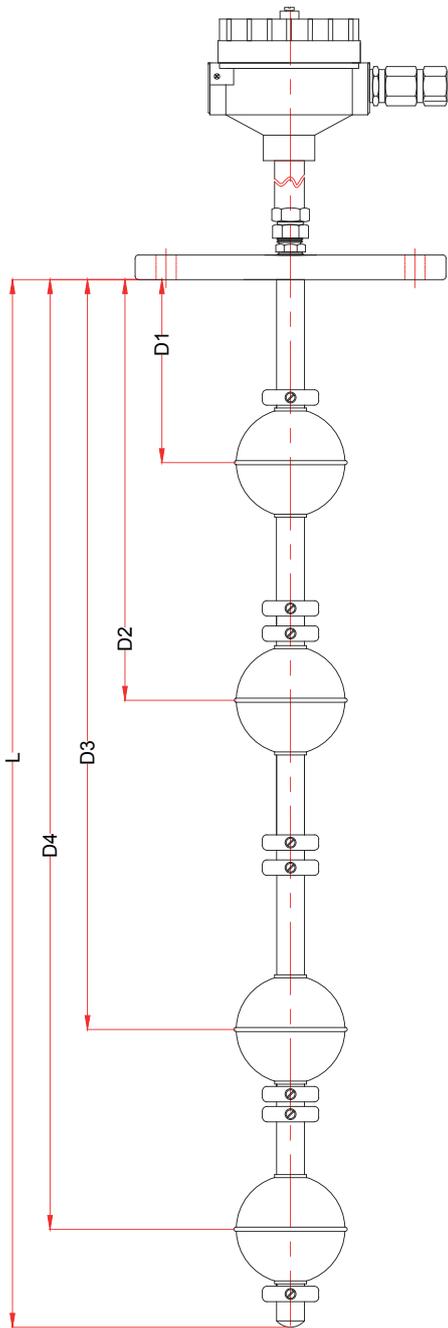
### FEATURES

- Available for Low Pressure and High Pressure applications.
- Wide range of material of construction to suit different environmental conditions.
- Wide range of end connection types / sizes to choose from.
- A variety of chamber mounting arrangements provided to suit existing nozzles.

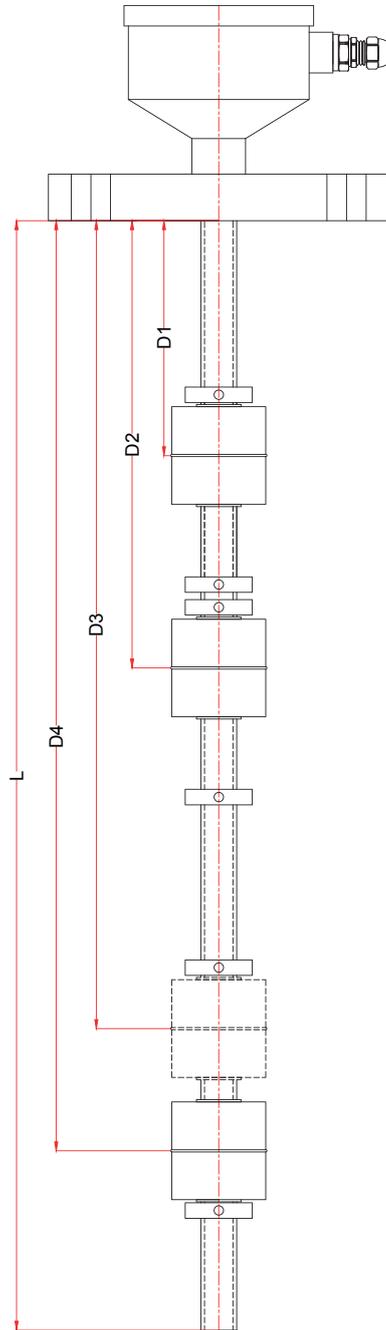


\* For ordering Information of External Chamber refer External Chamber Catalog.

# 1.5 ACCESSORIES



VFS-Ferrule-Model



VFS-PTFE-Model

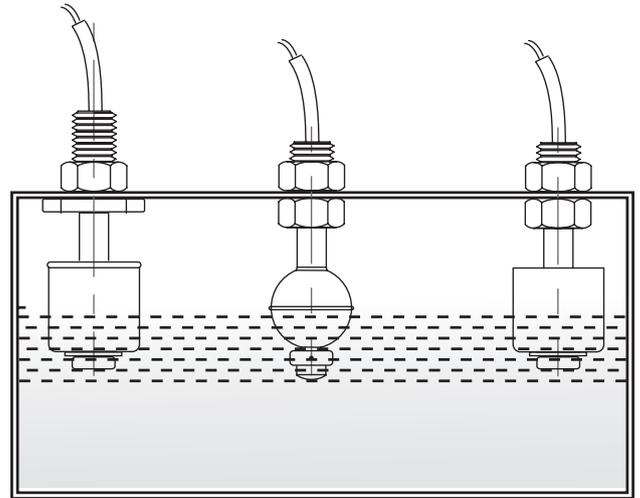
## 2. MINI VERTICAL MOUNTING MAGNETIC FLOAT SWITCHES – MVFS

MVFS are installed vertically and can be side mounted through an elbow. They provide actuation at high, low or intermediate liquid levels. The switch actions can be reversed from N/O to N/C & vice versa by simply changing the float direction.

### 2.1 APPLICATIONS

Hot Water / Coffee Servers, Vending Machines, Ice Makers, Humidifiers, Food Industry, Air Conditioning & Refrigeration, Analysers, Engines, Agricultural Machines, Hydraulic, Lubricating & Oil Filtration Equipment's, Industrial Working Machines, Spark Erosion Machines & SPMs.

### TYPICAL INSTALLATION INSIDE TANKS / LIQUID CONTAINERS



M-SS



M-SS  
(BRASS VERSION)



M-SS  
(CONNECTOR VERSION)



M-PU



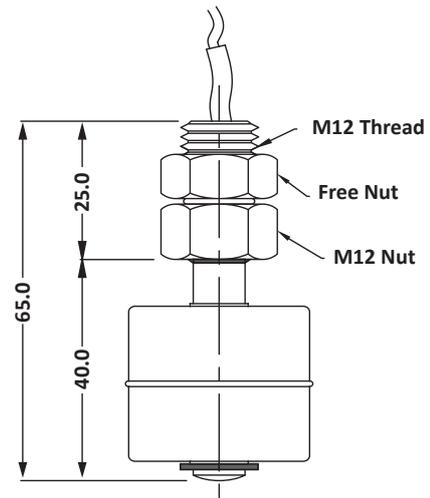
M-PP

**Type M-SS**

Stem Material	304/316/316L.
Float Material	SS 316
Process Connection	M12 Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø 28 mm
Specific Gravity	0.7
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 70°C
Mounting Position	Vertical

**Electrical Specifications**

Switch Capacity	15 VA (NO)
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires

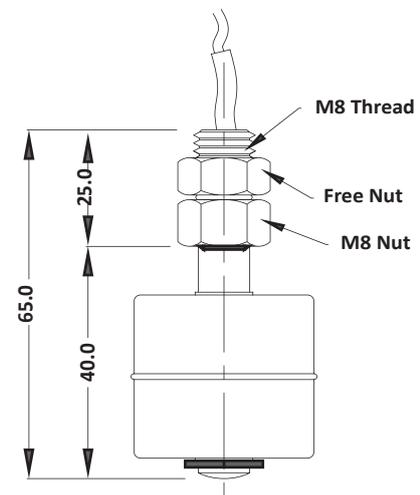


**Type M-SS**

Stem Material	304/316/316L.
Float Material	SS 316
Process Connection	M8 Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø 28 mm
Specific Gravity	0.7
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 70°C
Mounting Position	Vertical

**Electrical Specifications**

Switch Capacity	15 VA (NO)
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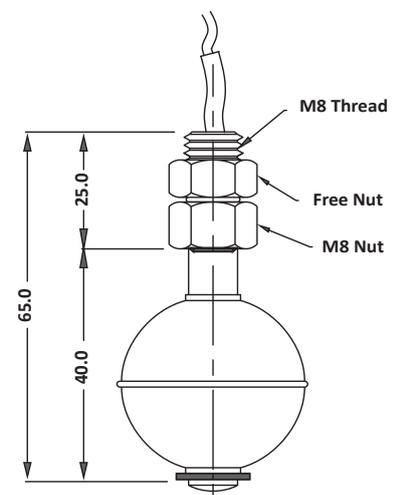


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Termination	PVC X 1000mm extn. Lead wires



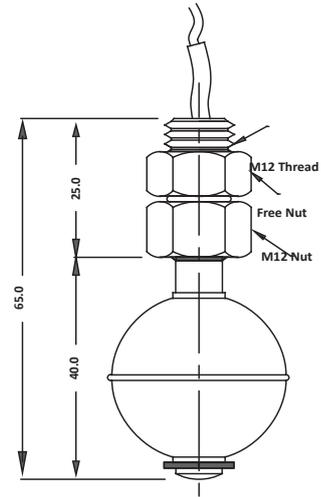
\* Extension possible - Consult factory

## Type M-SS (Brass Version)

Stem Material	Brass
Float Material	SS 316
Process Connection	M12 Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø30 mm
Specific Gravity	0.7
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 70°C
Mounting Position	Vertical

### Electrical Specifications

Switch Capacity	15 VA (NO)
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires

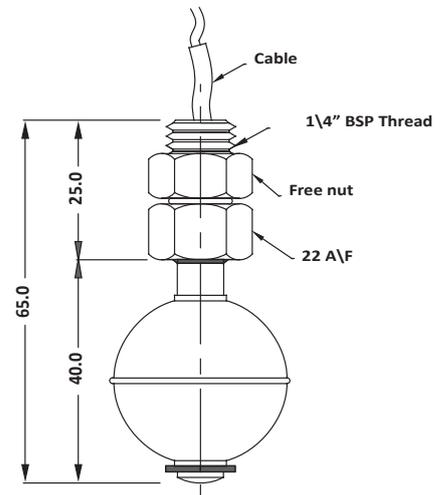


## Type M-SS (Brass Version)

Stem Material	Brass
Float Material	SS 316
Process Connection	1/4" BSP(M) Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø 28 mm
Specific Gravity	0.7
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 70°C
Mounting Position	Vertical

### Electrical Specifications

Switch Capacity	15 VA (NO)
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires



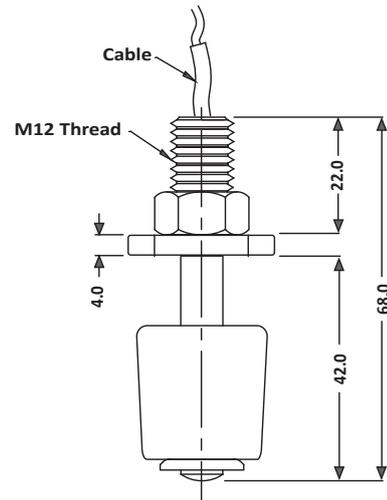
\* Extension possible - Consult factory

## Type M-PU

Stem Material	PP
Float Material	PU Foam
Process Connection	1/4" BSP (M) Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø 28 mm
Specific Gravity	0.7
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 50°C
Mounting Position	Vertical

### Electrical Specifications

Switch Capacity	15 VA (NO)
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires

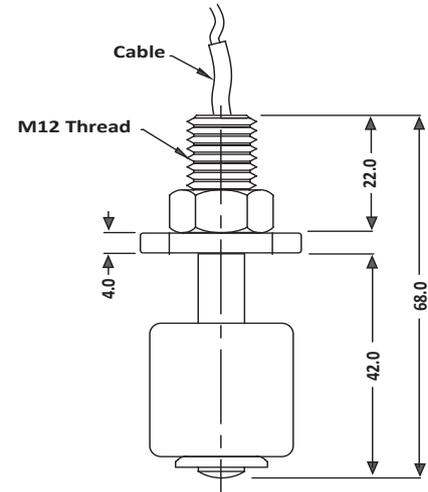


## Type M-PP

Stem Material	PP
Float Material	PP
Process Connection	M12 (M) Thread with Lock Nut
Guide Stem	Ø 8 mm
Guide Stem Length	40 mm *
Float	Ø 28 mm
Specific Gravity	0.8
Design Pressure	1 Kg/cm <sup>2</sup>
Design Temperature	Upto 60°C
Mounting Position	Vertical

### Electrical Specifications

Switch Capacity	15 VA (NO)
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires



\* Extension possible - Consult factory

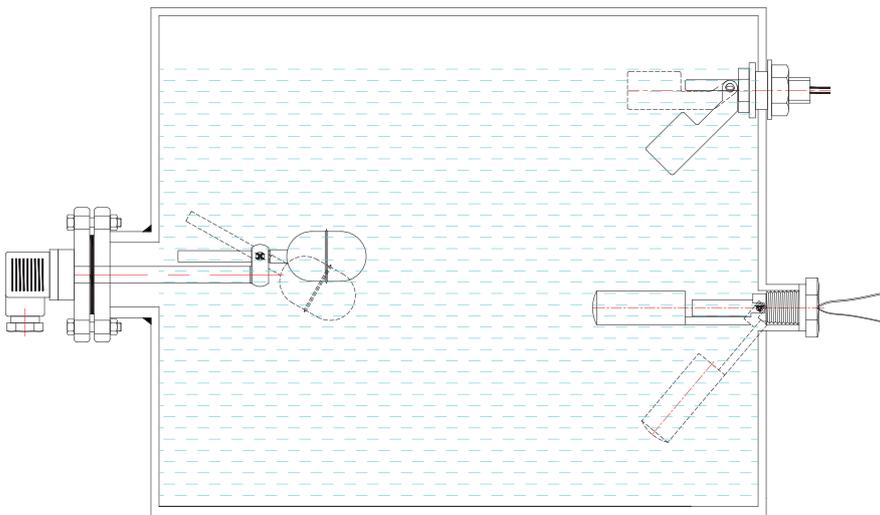
### 3. MINI HORIZONTAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES - MHFS

'MHFS' Are installed horizontally, and can be mounted vertically for some application like flow detection. They provide actuations at high, low or intermediate liquid levels and the switch action can be reversed by re-orientation of mounting.

#### 3.1 APPLICATIONS

- Hot Water / Coffee Servers
- Vending Machines
- Ice Makers
- Humidifiers
- Food Industry
- Air Conditioning & Refrigeration
- Analysers
- Engines
- Agricultural Machines
- Hydraulic
- Lubricating & Oil Filtration Equipment's
- Special Purpose Machines

#### 3.2 INSTALLATION MODES



M-SPP



M-SSS



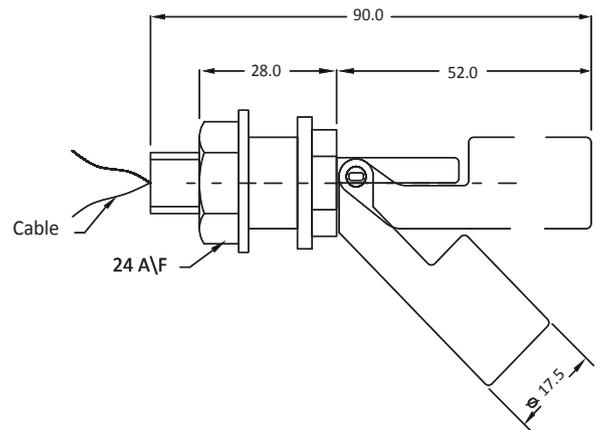
M-SSS WITH THREAD

## Type M-SPP

Stem Material	PP
Float Material	PP
Process Connection	M16 Thread with Lock Nut
Guide Stem	Ø 8 mm
Probe Length	90 mm *
Float	Ø 17.5 X 52 mm
Specific Gravity	0.8
Design Pressure	1 Kg/cm <sup>2</sup>
Design Temperature	Upto 60°C
Mounting Position	Vertical

## Electrical Specifications

Switch Capacity	15 VA
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires
Contacts	SPST

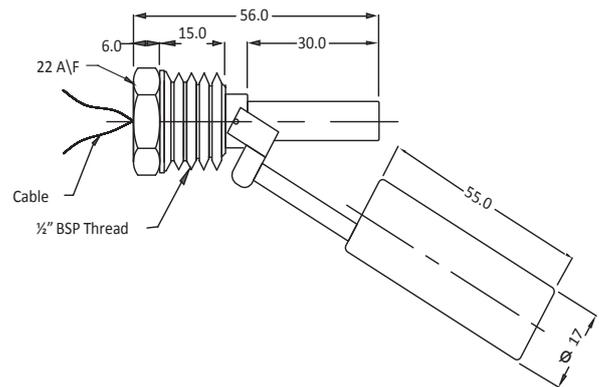


## Type M-SSS (BSP)

Material Type	304/316/316L.
Float Material	SS 304
Process Connection	½" BSP Thread
Probe Length	Up to 100 mm *
Float	Ø 17 X 55 mm
Specific Gravity	0.8
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Upto 80°C
Mounting Position	Horizontal

## Electrical Specifications

Switch Capacity	15 VA
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires
Contacts	SPST

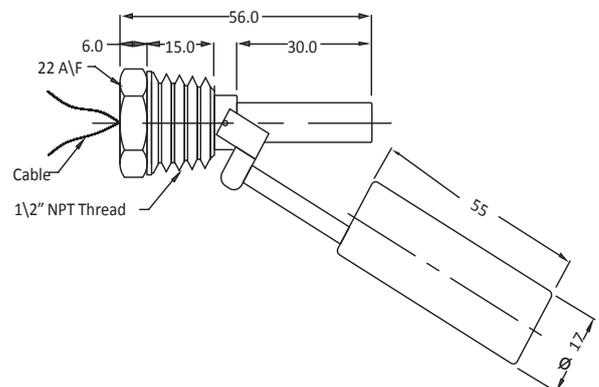


## Type M-SSS (NPT)

Material Type	304/316/316L
Float Material	SS 304
Process Connection	½" NPT Thread
Probe Length	110 mm *
Float	Ø 17 X 55 mm
Specific Gravity	0.8
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Up to 80°C
Mounting Position	Horizontal

## Electrical Specifications

Switch Capacity	15 VA
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Leadwires
Contacts	SPST

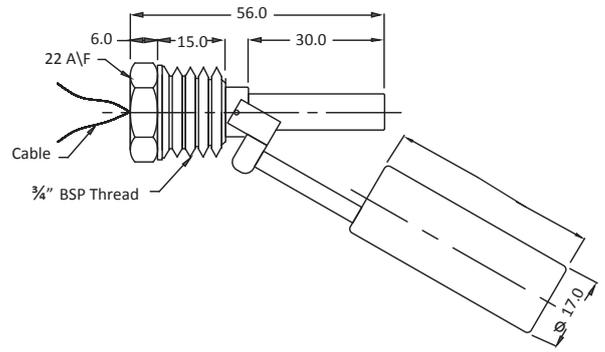


**Type M-SSS-O-SS304**

Material Type	304/316/316L
Float Material	SS 304
Process Connection	3/4" BSP Thread
Probe Length	110 mm *
Float	Ø 17mm
Specific Gravity	0.8
Design Pressure	2 Kg/cm <sup>2</sup>
Design Temperature	Up to 80°C
Mounting Position	Horizontal

**Electrical Specifications**

Switch Capacity	15 VA
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Leadwires
Contacts	SPST

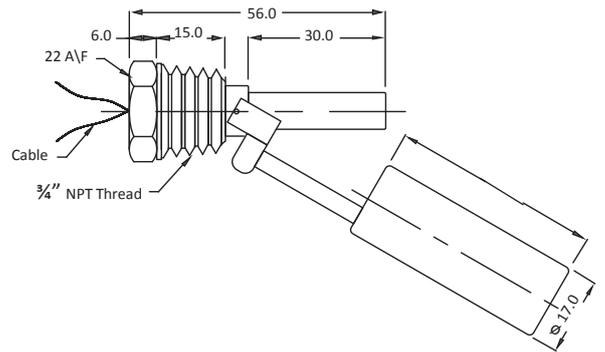


**Type M-SSS-O-SS316**

Material Type	304/316/316L
Float Material	SS 304
Process Connection	3/4" NPT Thread
Probe Length	110 mm *
Float	Ø 17 mm
Specific Gravity	2 Kg/cm <sup>2</sup>
Design Pressure	Up to 80°C
Design Temperature	Horizontal
Mounting Position	SPST

**Electrical Specifications**

Switch Capacity	15 VA
Switching Voltage	125V AC / 200 V DC
Switching Current	0.25A
Switch Action	Reversible
Carry Current	0.5A
Termination	PVC X 1000mm extn. Lead wires

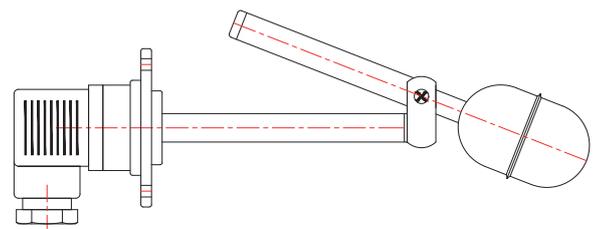


**Type M-SSS With (Flanged)**

Termination	DIN Polyamide
Material Type	304/316/316L
Float Material	SS 304
Process Connection	75x65 PCD Flange
Probe Length	150 mm *
Float	Ø 45 X 60 mm
Specific Gravity	0.8
Design Pressure	5 Kg/cm <sup>2</sup>
Design Temperature	Up to 110°C
Mounting Position	Horizontal

**Electrical Specifications**

Switch Capacity	100 VA
Switching Voltage	240V AC / 300 V DC
Switch Action	2A
Carry Current	3A
Termination	DIN Connector
Contacts	SPST



\* For Extended Probe Length, Consult Factory.

## 4. BEND VERSION MAGNETIC FLOAT LEVEL SWITCHES- BVFS

Bend version float switches are used for applications where in there is a mounting constraint from the top. These bend version level switches have rugged construction and can be used for both indoor & outdoor applications.

### 4.1 CONSTRUCTION AND OPERATION

Magnetic Reed switch being the sensing element, the float switch operates on a simple principle. A float encircling a fixed stationary stem, is equipped with powerful permanent magnet. As the float rises or falls with liquid level, the magnetic field generated by the magnet that is present within the float actuates a hermetically sealed Reed switch mounted inside the stem at a preset level. This in turn makes or breaks the contact of the Reed switch.

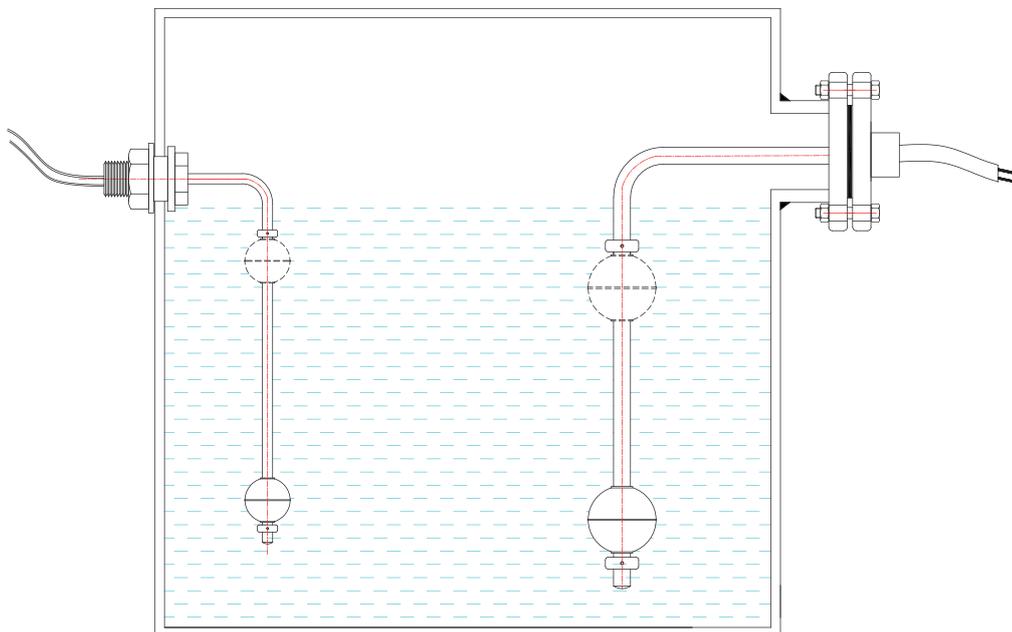


**Bend version with  
Weather Proof enclosure**



**Bend version with  
free lead cable**

### TYPICAL INSTALLATION INSIDE THE TANKS



## 4.2 GENERAL SPECIFICATIONS

Enclosure	Cast Al., Weather-proof to IP67 Ex-proof to IP66 Gr. IIA & IIB DIN Polyamide connector.
Conduit Connection	Brass, ¾" ET / ½" NPT / M20 x 1.5
Guided Stem MOC	SS316 SS304
Float MOC x Size	SS316 x Ø25, Ø28, Ø30, Ø41, Ø52, Ø89, PU Foam X Ø25, and Ø35
Stem OD	Ø8, Ø12.7 in SS316 / SS304
Operating Temperature	SS316-Ø52, Ø41 up to 150°, Ø25, Ø28, and Ø30 up to 100°C. PU Foam- Ø25, Ø35 up to 60°C.
Operating pressure max.	SS316-Ø52, Ø41 up to 20 Kg/cm², Ø25, Ø28, Ø30 up to 8Kg/cm². PU Foam- Ø25, Ø35 –Atmospheric
Min. specific gravity	0.7
No. of Floats	Single / Multiple (Max. 4) (More available on request)
Process Connections	Flanged / Triclover Flange / Threaded
Pre-set Levels	1 to 4 (Factory Set) (More available on request)
Switch type	Glass encapsulated hermetically sealed Reed contacts.
Switching capacity	15VA (NO) / 100VA (NO) or 3VA (1C/O) / 50VA (1C/O)
Differential	Fixed (10± 2 mm)
Accuracy / Repeatability	± 2mm / ± 1mm
Load	Resistive / Inductive
Insulation	100 Mega-Ohms at 500V DC
Special features	Intrinsically safe to Ex ib, Gr. IIA, IIB

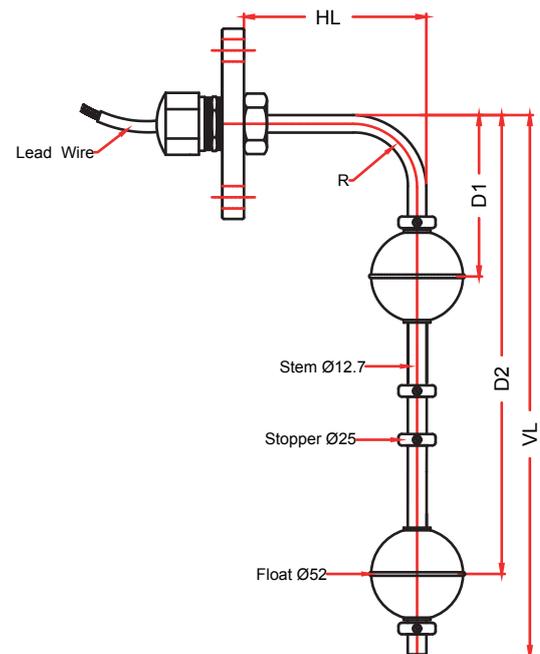
## 4.3 ORDERING INFORMATION

Specify part no., as given in the catalog for vertical mounting magnetic float level switches, guide stem length, preset levels D1, D2, D3 etc., Specific gravity, operating temperature & pressure.

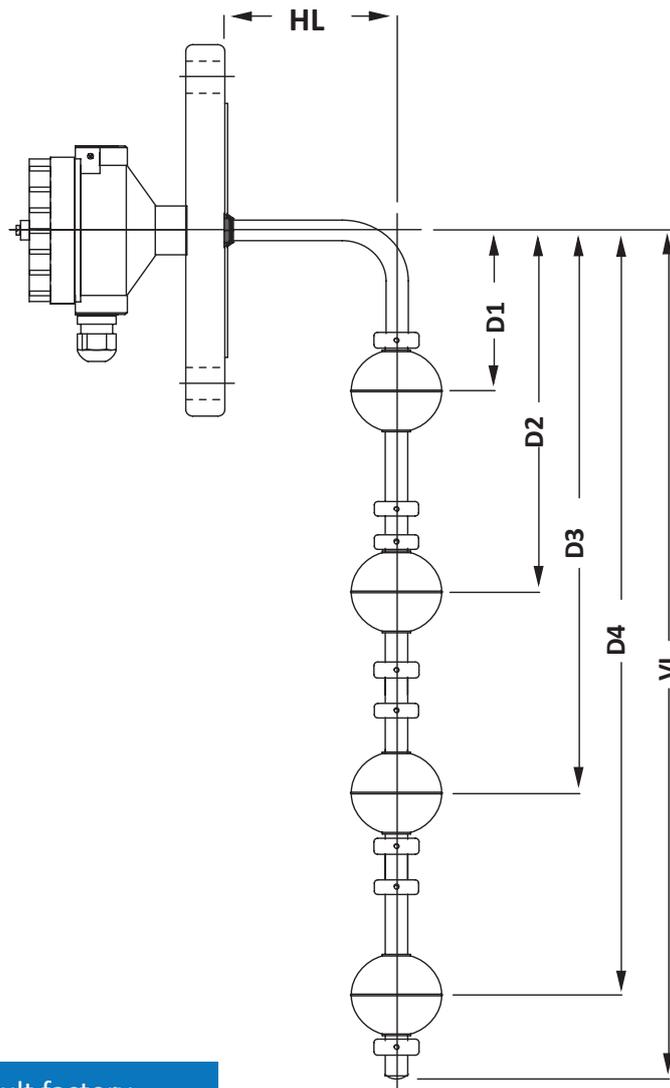
Note:-

- 1: Maximum Number of Contacts: Four
- 2: Change Over Contacts option also available

### CONSTRUCTION DETAILS FOR BEND VERSION FLOAT SWITCHES



Type	BVFS E-D-2-S4-2	BVFS D-D-2-S4-2
Material Type (Wetted Parts)	304 / 316 / 316L	304 / 316 / 316L
Float Material	SS 316	SS 316
Terminal Type	Explosion Proof- IP66 Gr. IIA, IIB, IIC	Weather Proof- IP67 / Cast Al.
Process Connection	2" 150 # ANSI Flange.	2" 150 # ANSI Flange.
Guided Stem	Ø12.7 mm	Ø12.7 mm
Probe Length	Up to 1000 mm *	Up to 1000 mm *
Float	Ø52 mm	Ø52 mm
Specific Gravity	0.8	0.8
Design Pressure	20 Kg/cm <sup>2</sup>	20 Kg/cm <sup>2</sup>
Design Temperature	Up to 150°C	Up to 150°C
Ingress protection Class	IP 66	IP 67
Mounting Position	Horizontal	Horizontal
	<b>Electrical Specifications</b>	<b>Electrical Specifications</b>
Function	Normally Open	Normally Open
Switching Capacity	300 VDC / 240 V AC / 3A / 100VA	300 VDC / 240 V AC / 3A / 100VA
Number of Contacts	4 contacts	4 contacts



\* For Extended lengths, consult factory.

## 5. HFS SERIES - HORIZONTAL MOUNTING MAGNETIC FLOAT LEVEL SWITCHES

HFS is an economical, maintenance free and reliable device used for high or low or intermediate point level switching. It is ideal for tanks with inaccessible tops or bottoms and where insertion depths of top mounted models are exceeded

### 5.1 CONSTRUCTION & OPERATION

The Horizontal mounting float switches uses Magnets and works on the principle of magnetic repulsion.

HFS consists of a free moving pivoted float assembly and a switch enclosure in non - magnetic material to achieve undisturbed magnetic flux. It employs dual magnets, one in the float arm and other in the contact carriers housed in the switch enclosure. A change in liquid level brings the like poles of dual magnets opposite to each other and the resulting repulsion force ensures a changeover of contacts with snap action. The magnetic transmission is glandless, leaving no scope for leakages from vessel into switch housing. These switches are manufactured in various materials, enclosures & special features to suit broad range of media / applications. They are designed to provide high repeatability and to minimize effects of shock, vibration & Pressure.

### 5.2 INSTALLATION OPTIONS

HFS can be mounted both internally & externally through a chamber if installation is required outside the main vessel. External mounting is resorted to, where space is a limiting factor or mechanical devices like stirrers operate within the tank. Besides, in applications like boilers, reaction kettles with external mounting, isolation is possible for regular servicing. The switch is normally side-mounted, however for applications like slurry, top installation is preferred. The switch can be wired directly "to make or break electrical circuits", of burners, heaters, motor pumps, alarms and other such electrically operated devices.

### FEATURES

1. Approved by CMRI for Gr. I, IIA, IIB applications
2. Level switch also available in complete SS316 material
3. Customization on request
4. External chamber option available



Flame proof- SS Enclosure

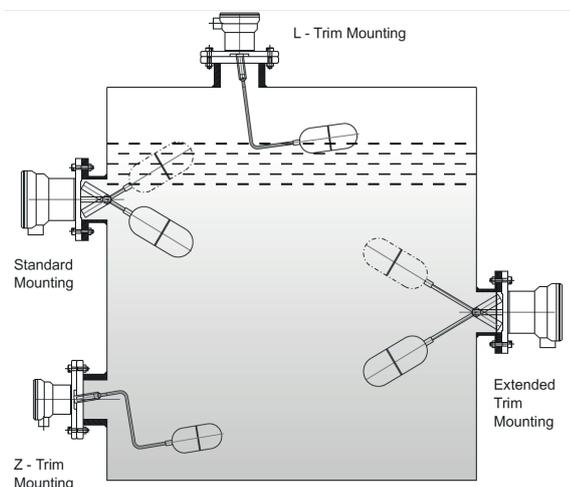


weather proof- Cast Aluminium Enclosure



Complete PP Construction

### TYPICAL INSTALLATION IN A TANK



## 5.3 ORDERING INFORMATION FOR HORIZONTAL MOUNTING MAGNETIC FLOAT SWITCHES

SPECIFY PART NO. → HFS **1** **2** **3** **4** **5** **6** **7**  
 HFS         
 Example: HFS **W** **2** **1** **1** **2** **F3** **1**

1	ENCLOSURE
W	Weather Proof IP 65/ Aluminum
F	Flame Proof / SS304 for Gr. IIA, IIB
G	Flame Proof / SS304 for Gr. IIC
P	Polypropylene
O	Others

2	WETTED PARTS
1	SS304
2	SS316
3	SS316L
4	Polypropylene
5	Titanium
6	Hastelloy C276
7	PVDF
O	Others

3	PROCESS CONNECTION
1	Sq. 92 x 92 PCD, Casted Flange
2	Ø 120mm x 92 PCD
3	Ø 127mm x 98 PCD (1½" #150)
4	Ø 152mm x 121 PCD (2" #150)
5	Ø 152mm x 114 PCD (2" BS 10 - E)
6	Ø 190mm x 152.4 PCD (3" #150)
7	Ø 165mm x 127 PCD (2½" BS 10 - E)
8	Ø 178mm x 140 PCD (2½" #150)
9	Ø 230mm x 190 PCD (4" #150)
10	1.5" NPT (M)
11	2" NPT (M)
O	Others

4	SWITCH TYPE
1	250V AC / 5A 1SPDT (Micro Switch)
2	250V AC / 5A 2SPDT (Micro Switch)
3	Hermetically Sealed Micro Switch - 250V AC / 5A (1 SPDT)
4	Hermetically Sealed Micro Switch - 250V AC / 5A (1 DPDT) *

5	PRESSURE & TEMPERATURE RATING
1	Ambient pressure & temperature
2	10 kg/cm <sup>2</sup> , 150°C
3	10 kg/cm <sup>2</sup> , 180°C
4	20 kg/cm <sup>2</sup> , 180°C
5	40 kg/cm <sup>2</sup> , 200°C
6	100 kg/cm <sup>2</sup> , 150°C
O	Others

6	FLOAT	
Type	Material	Float Dia
F1	SS304	50mm
F2	SS304	57mm
F3	SS316	57mm
F4	PP	60mm
F5	PP	53mm
F6	SS316L	46mm
F7	SS316L	50mm
F8	SS316	50mm
F0	Others	Others

7	ACCESSORIES
N	Not Applicable
1	Counter Flange
2	Counter Flange with Test Lever
3	Counter Flange Stub
4	Chamber
O	Others

\* Consult Factory

## 5.4 HORIZONTAL FLOAT LEVEL SWITCH INSTALLED IN A CHAMBER

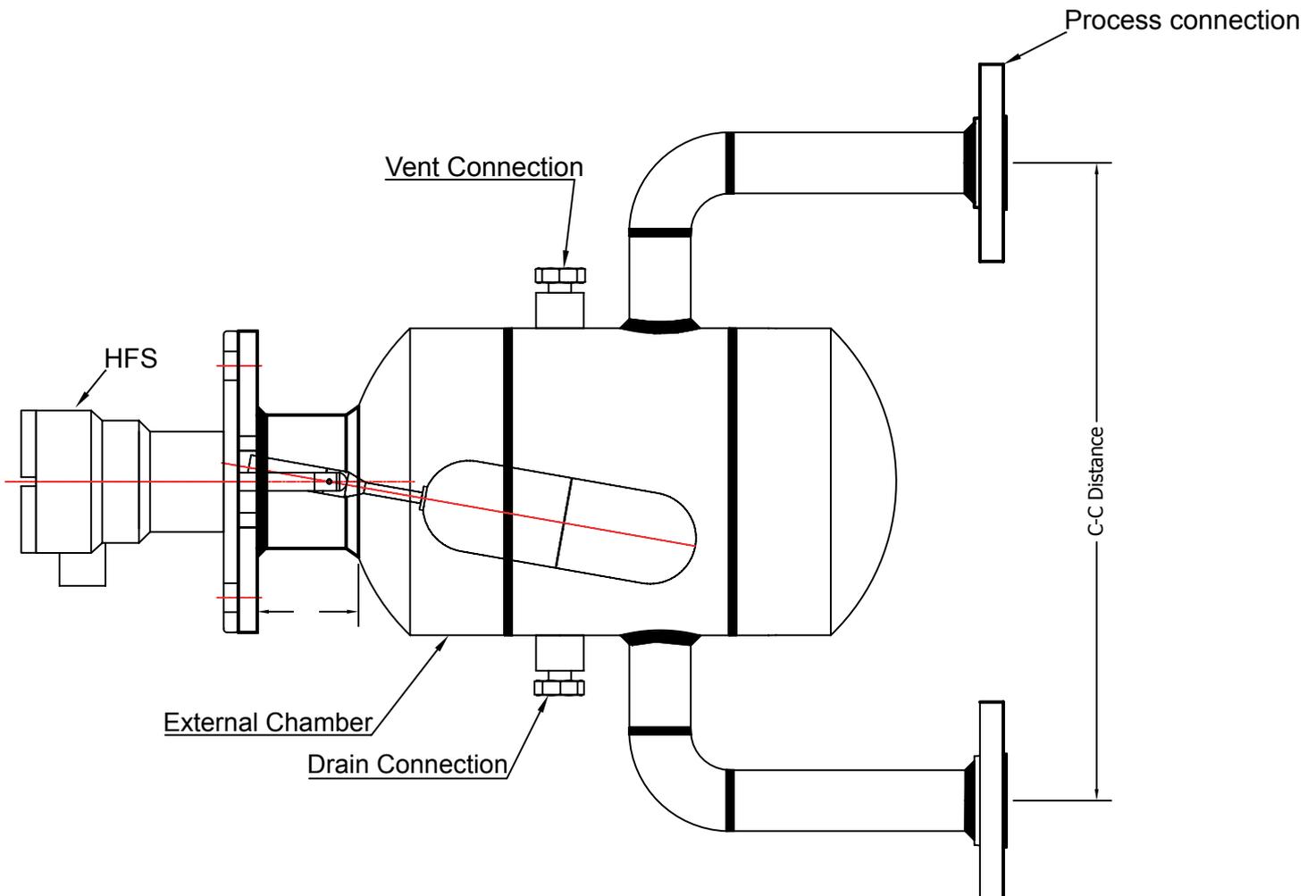
Wherever it is not possible or desirable to install Horizontal Float switches directly onto the vessel, switches can be installed in an External Chamber. This arrangement gives smooth level control irrespective of turbulence in the process vessel and prevents accidental damages to the switch during shutdown or maintenance of the vessel. Chambers are used in applications which require isolations of process, High Pressure / High Temperature applications, Corrosive applications, Onshore / Offshore installations.

**Main function of these chambers are:**

- Level Measurement
- Interface Measurement between two liquids.

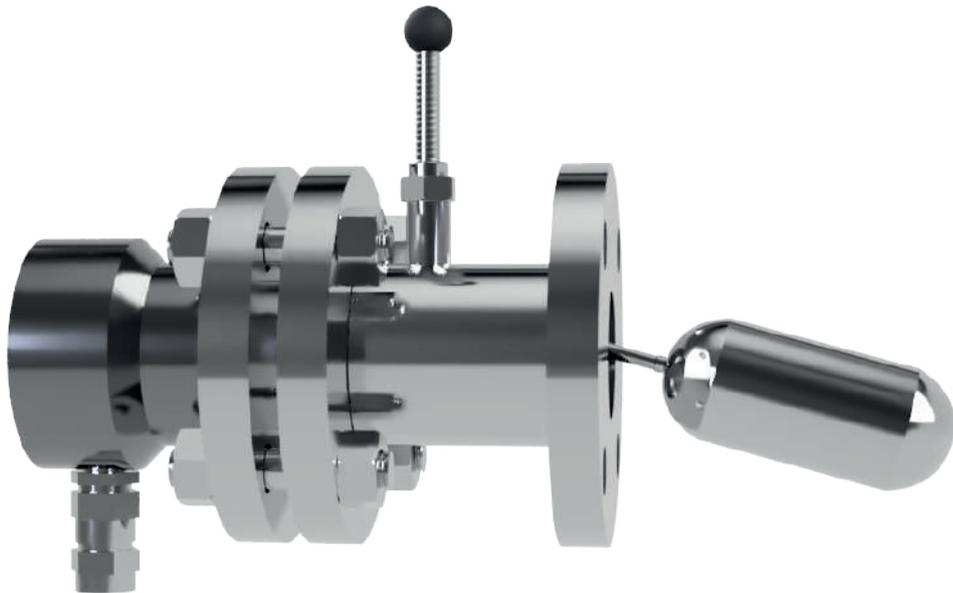
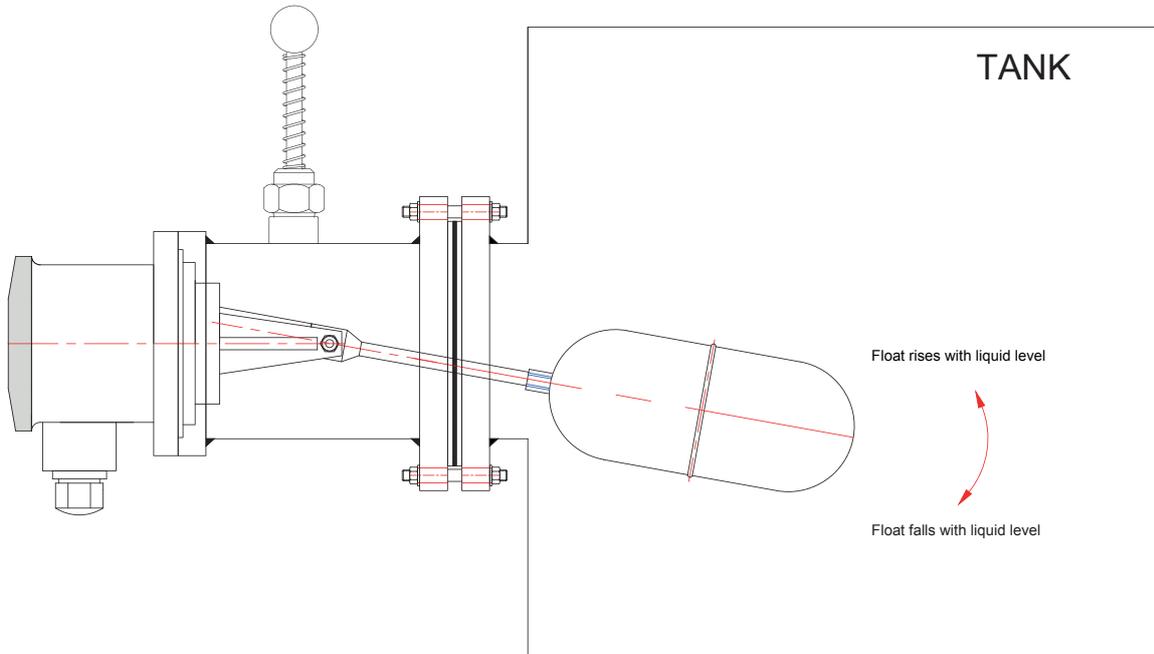
### FEATURES

- Available for Low Pressure and High Pressure applications.
- Wide range of material of construction to suit different environmental conditions.
- Wide range of end connection types / sizes to choose from.
- A variety of chamber mounting arrangements provided to suit existing nozzles.



• For ordering Information of External Chamber refer External Chambers Catalog.

HORIZONTAL FLOAT LEVEL SWITCH WITH TEST LEVER / COUNTER FLANGE



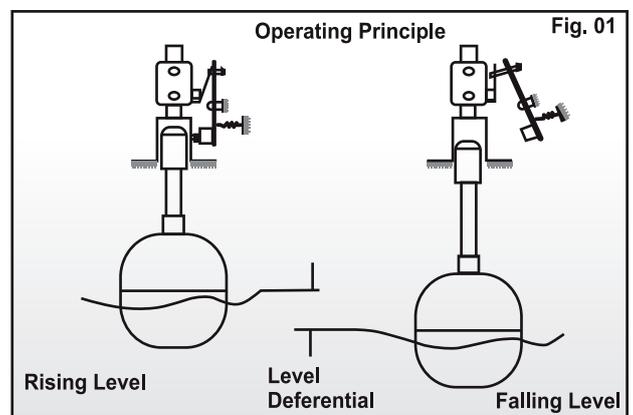
## 6. EXTERNAL CHAMBER LEVEL SWITCHES- MLS

A switch for critical area applications or just general purpose control, a choice of carbon steel chambers is available, or for more vigorous applications we supply a series of 316 stainless steel chambers. A variety of tank and process connections is available to make installation simple and economical.

### 6.1 CONSTRUCTION AND OPERATION

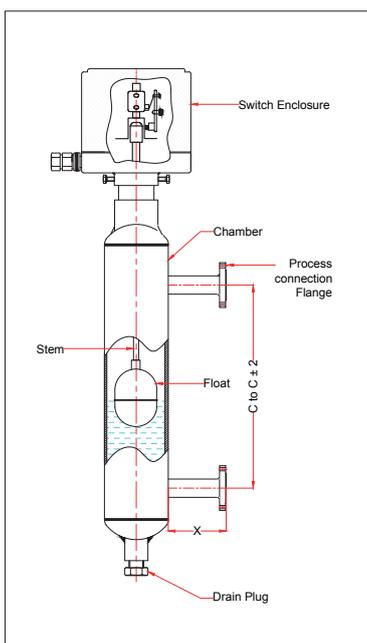
The basic operating includes a magnetic switch action resulting from a change in liquid level, which moves a magnetic attraction sleeve into the field of an externally located magnet. This Principle eliminates problems associated with flexing diaphragm seals. Bellow seals, as well as "fouling" problems encountered by probe type devices.

The illustrations below (refer Fig. 01) demonstrates the operating principle using a float to provide the operating motion. A falling liquid level causes a downward movement of a magnetic attraction sleeve moving it below the magnetic field generated by the externally mounted magnet. The bias spring causes the magnet to pull away from the sealing tube in-turn actuating the switch. The reverse action takes place on rising level, with the attraction sleeve being moved into the magnetic field causing the magnet to pull in towards the sealing tube in-turn actuating the switch.

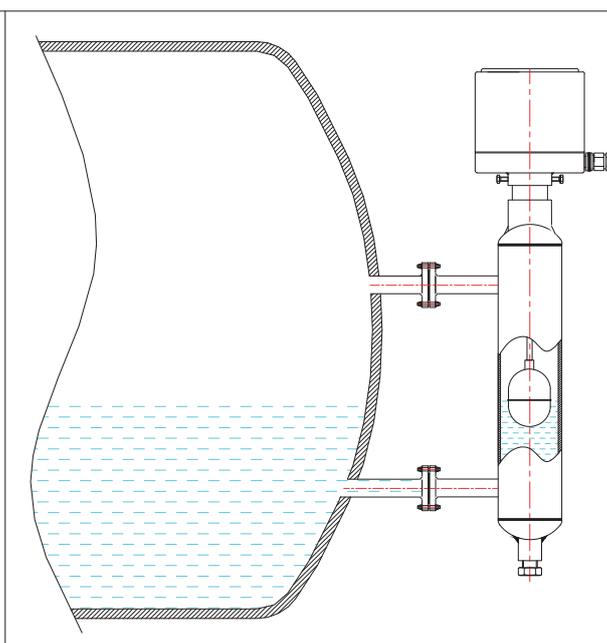


### 6.2 INSTALLATION OPTIONS

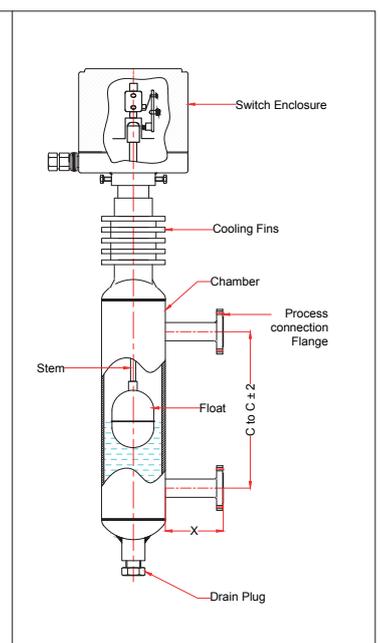
STANDARD CONSTRUCTION



TYPICAL INSTALLATION FOR TANK



HIGH TEMP. CONSTRUCTION



## 6.3 GENERAL SPECIFICATIONS

Enclosure	Cast Al., Weather Proof IP 66
Connection	Brass ¾" ET or ½" NPT
Switch mechanism	Adjustable, Micro switch 5A, 230VAC (SPDT)
Switch action	Bi-stable
No. of switch mechanisms	Max. Three (adjustable)
Control range	150 mm (Approx.)
Operating Differential	25±5mm
Float & Stem	SS304 or SS316
Float size	Ø50x150mm
Chamber MOC (IBR)	CS (IBR grade) / Custom
Chamber MOC (Non-IBR)	CS / SS304 / SS316
Process connection (IBR)	Flanged
Size	25NB, BS 10 - E or ANSI std.
Process connection (Non-IBR)	Flanged
MOC	CS, SS304, BS 10 - E
Size	25NB or ANSI std
C-C distance	300-1000mm *
Vent	½" Plug / Flanged
Max temperature	200°C (without cooling fins) Or 400°C (with cooling fins)
Test Pressure	Up to 50 Kg/cm²
Min. Liquid Specific Gravity	0.8

## 6.4 ORDERING INFORMATION

SPECIFY PART NO. → **MLS** **1** **2** **3** **4** **5** **6**  
**MLS**        
**Example: MLS** **1** **1** **1** **B** **1** **O**

<b>1</b>	<b>APPROVAL</b>
1	None
2	IBR
<b>2</b>	<b>PROCESS CONNECTION</b>
1	1" NB ANSI 150#
2	1.5" NB ANSI 150#
O	Others
<b>3</b>	<b>SWITCHES</b>
1	One
2	Two
3	Three

<b>4</b>	<b>CHAMBER</b>
W	Without
B	CS (IBR)
M	CS (Non IBR)
N	SS304 (Non IBR)
S	SS316 (Non IBR)
O	Others
<b>5</b>	<b>FLOAT &amp; STEM</b>
1	SS304
2	SS316
O	Others
<b>6</b>	<b>DRAIN</b>
1	½" BSP Plug
O	Others

\* Consult factory for long C-C distances

## 7. CABLE SUSPENDED FLOAT OPERATED LEVEL SWITCH – CFS

Cable Suspended Float Operated Level Switch is a simple, user friendly and reliable switch for liquid level detection. The dual chambered float is made of injection moulded tough polypropylene that ensures good waterproof protection. The switching differential is adjustable by adjusting the position of the Adjustable stopper.

The cable of the level switch is a flexible insulated copper cable with a PVC / Neoprene outer insulation. This can be used in Liquid Level Monitoring, Pump control for Potable water, sewage applications.



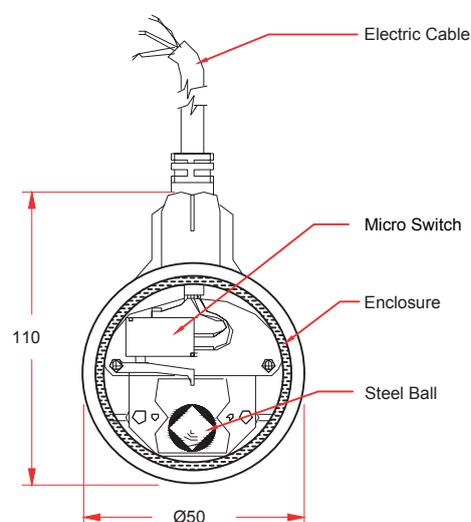
### 7.1 CONSTRUCTION & OPERATION

It consists of a float, integral with a 3 core electric cable. A fixed micro switch and a moving steel ball are enclosed within the float casting. A change in liquid level causes the float to tilt up or down around a pivot, provided in the form of an adjustable stopper or support pipe, at an angle and in the process, actuating a steel ball to move and operate a micro switch plunger to close or open an electrical circuit with potential free contacts, to operate auxiliary electrical devices like alarm, pump and solenoid valve.

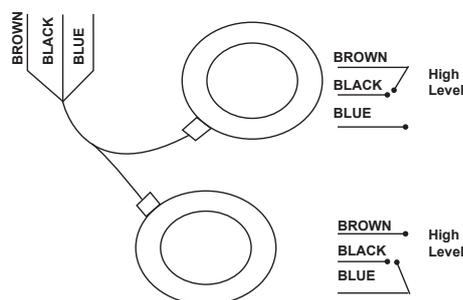
### 7.2 GENERAL SPECIFICATIONS

Float Protection	: Weather Proof IP - 68
Rating of Micro switch	: 10A, 250V AC
Switching Angle	: $\pm 45^\circ$
Max. Temperature	: 50°C
Max. Pressure	: 1 bar
Terminal Enclosure	: Cast Al., Weather Proof IP - 67
Cable gland	: Polyamide x PG
Process connection	: 2", 2 1/2", 3" & 4" ANSI or BS Standard Flange
Integral cable length	: 5 or 10 mtrs. (Larger length on request)
Contact Type	: Micro switch (SPDT)
Float MOC	: PP
Cable	: Neoprene or PVC $\varnothing 9\text{mm}$ With 3 core 1mm <sup>2</sup>
Min. Liquid Specific Gravity	: 0.8
Adjustable Stopper	: PP
Support Pipe	: SS304 / PP / PVC

#### INTERNAL MECHANISM WITHIN THE FLOAT



#### WIRING



**Applications:** Used in Sumps, Sewage, factory drainage, sludgy & soil water containing suspensions for automatic switching of pumps, submerged pumps, solenoid valves, alarms, etc.

## 7.3 INSTALLATION MODES

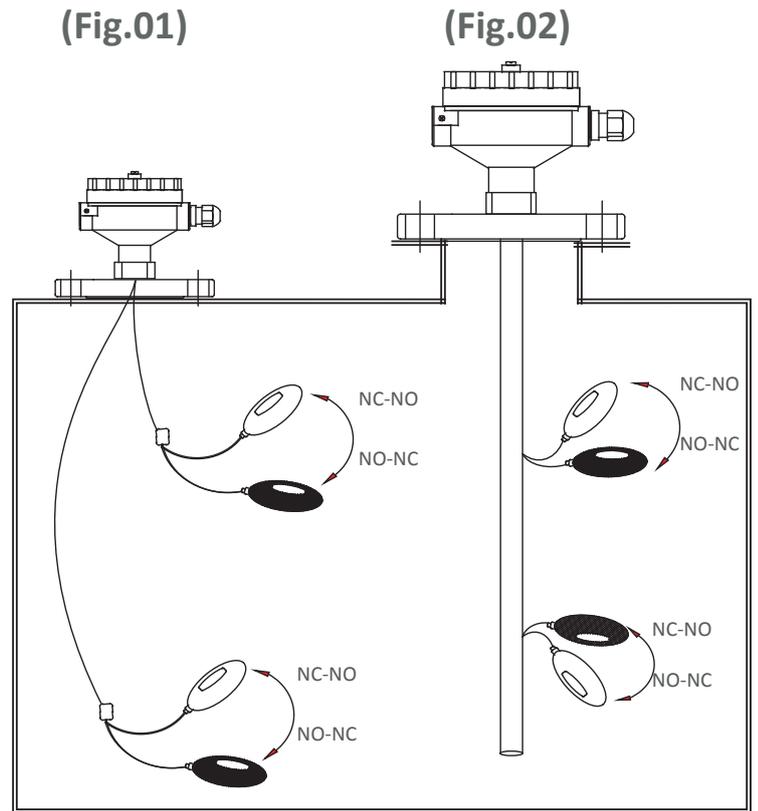
Provide a fixation point to the cable, to act as a pivot for the float to achieve switch actuation at preset level. The location of the fixation point depends on the preset level, float shape, weight and its differential angle.

### TOP MOUNTED WITH ADJUSTABLE STOPPER (Fig.01)

The cable is suspended through a top clamp/flange and an adjustable stopper, which moves freely along its length. It is positioned at a fixed point through an internal O-ring to provide a fixation point.

### TOP MOUNTED WITH SUPPORT PIPE (Fig.02)

A support pipe along with required number of cable float switches is suspended from tank top through a flange. The open cable ends, terminate into an IP65 enclosure. The cables are tied / clamped to the support pipe at various points to provide number of fixation points.



## 7.4 ORDERING INFORMATION FOR CABLE SUSPENDED FLOAT OPERATED LEVEL SWITCH

SPECIFY PART NO. → CFS **1** **2** **3** **4**  
 Example: CFS **A** **1** **1** **1**  
 CFS

1	ENCLOSURE
A	Not Provided
B	Cast Al., Weather Proof IP-67
O	Others

2	CONSTRUCTION
1	Adjustable stopper
2	Support Pipe x CPVC / SS304 / SS316
O	Others

3	ACCESSORIES
1	Not Provided
2	'L' Clamp
3	2 ½" / 3" / 4" ANSI Flange
O	Others

4	NO. OF FLOATS
1	One
2	Two
3	Three
4	Four
0	Others

## 8. DISPLACER TYPE LEVEL SWITCHES - DLS

Displacer type level switches offers the industrial user a wide choice of alarm and control configuration. DLS works on a simple buoyancy principle and is well suited for simple or complex applications, such as forming surging liquids or agitated fluids, and usually costs less than other types of level switches.

### 8.1 CONSTRUCTION & OPERATION

Operation is based on simple buoyancy principle. As the liquid level rises and progressively immerses the displacer elements, the effective weight suspended on the spring reduces and the consequent length of the spring change is used to provide magnet movement and operate the switch. The spring movement causes the magnetic sleeve to attract a pivoted magnet actuating a switch mechanism located outside the barrier tube. Built-in limit stops, prevent over stroking under level surge conditions.

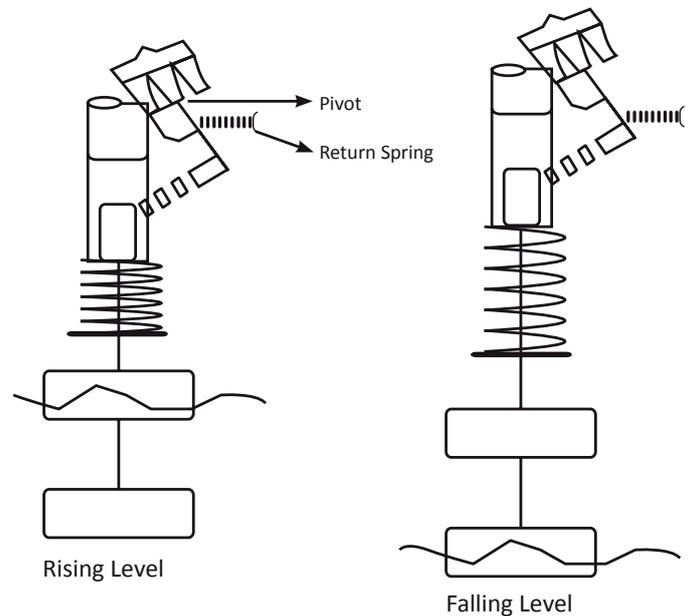
### FEATURES

- Wide choice of switching functions
- Suitable for large tanks up to 15 meters
- Site adjustable switch points
- Customized for high temp, high pressure & vacuum applications.
- Reliable performance in turbulent liquids even without still pipes.
- Easy transportation of longer length switches.
- Enclosure: Weather Proof IP-66  
Ex-proof-IP-66 Gr. IIA & IIB or IIC

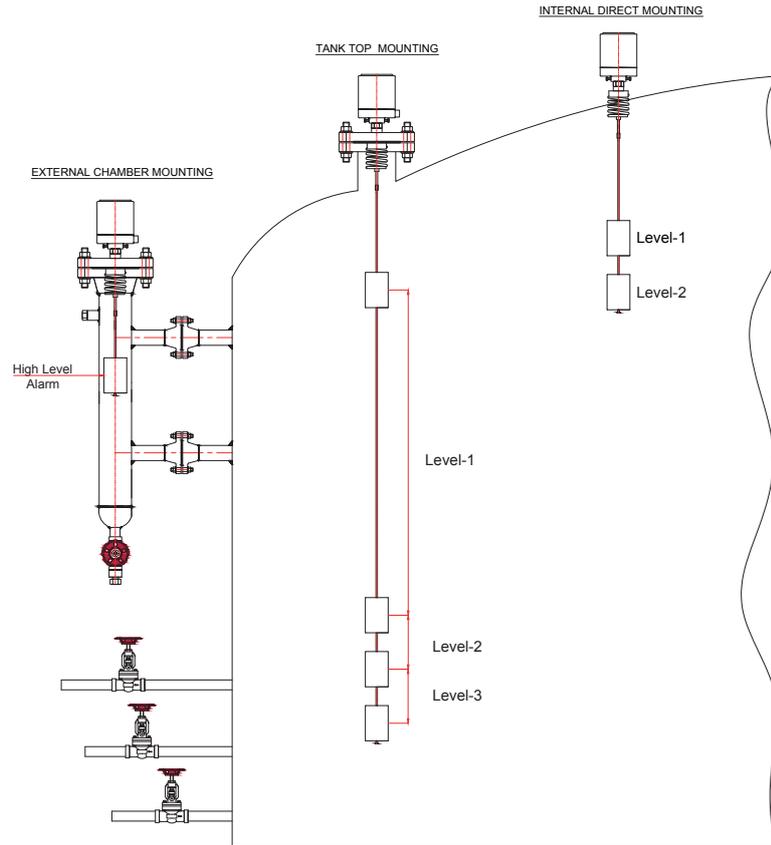


(Fig.01)

(Fig.02)



## 8.2 INSTALLATION OPTIONS



## 8.3 GENERAL SPECIFICATIONS

Enclosure	Cast Al., Weather Proof-IP 66, Cast AL Ex-proof Gr. IIA & IIB or IIC
Conduit Connection	Brass 3/4" ET or 1/2" NPT
Measuring Range	500 mm~15000 mm
Operating Differential	40±5 mm / Adjustable / 65 ±5 mm
Switch Type	Micro switch
Switch Contacts	2 SPDT (2 NO + 2 NC) @ 5A, 230 VAC (Resistive)
Switch Action	Bistable
Terminals	To suit 1.5 mm <sup>2</sup> conduit
Flexible Rope	SS304, SS316, PP, PTFE
Displacer	SS304, SS316, PP, PTFE
Spring Housing	SS316, PP / PTFE Insulation
Spring Material	SS316, SS316L
Process Connection Flanged	MS, SS304, SS316, PP (SS clad), PTFE (SS clad)
Perforated still well	MS, SS304, SS316, PP (65 NB)
External Cage	MS, SS304, SS316, PP (80 NB)
Max. Temperature	0-200°C (without cooling fins) 0-300°C (with cooling fins) Contact factory for temperature more than 300°C
Max. Test Pressure	Vacuum to 40 Kg/cm <sup>2</sup> (Contact factory for pressure more than 40 Kg/cm <sup>2</sup> )
Min. Sp. Gravity	0.7 (Contact factory for Sp. Gr. less than 0.7)

## SINGLE SWITCH MODELS

These instruments are factory calibrated to operate over a narrow level differential band and are ideally suited for liquid level alarm applications, on either high or low level. The operating level is fully adjustable by simply repositioning the displacer along its suspension rope. The differential band is  $\pm 51 \text{ mm}$  (2") in water and varies with liquid specific Gravity



These wide differential units are factory calibrated to actuate as the liquid level reaches a given displacer and to remain actuated until the level reaches a second displacer. The minimum differential band is approximately 152 mm (6") in water and varies with liquid specific gravity. The maximum differential is determined by the length of the displacer suspension cable.



## DUAL SWITCH MODELS

Narrow differential type instruments utilize two switches, each actuated at a different level and each calibrated with a narrow differential band.

Wide differential type displacer level switches are factory calibrated with a choice of several operating sequences.

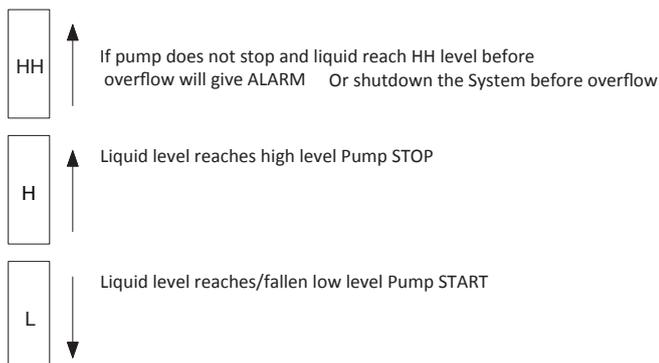
## OPERATING SEQUENCE

Displacer controls offer alternate features to the float-operated control. The sensor is a weight (displacer), heavier than the liquid, which is suspended by a spring. When liquid contacts the displacer, a buoyancy force is produced, which causes the effective weight of the displacer to change. This causes the spring to retract slightly to a new equilibrium position. When the spring retracts, the attraction sleeve also moves upward into the field of the external magnet, thus overcoming the force of the bias spring and actuating the switching element. The switching mechanism operates the same as with vertical float-operated level switches.

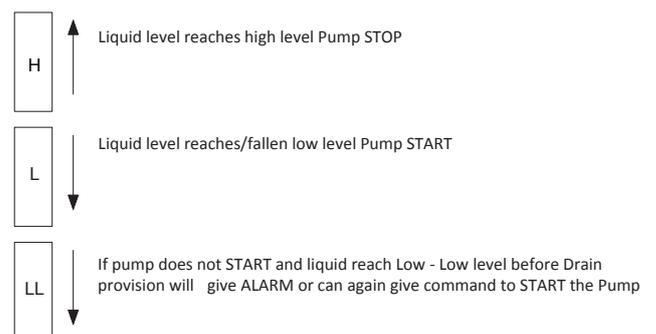


## PUMP CONTROL PLUS ALARM

### Over - Flow Alarm with Pump Operation:



### Drain - Dry Run Protection Alarm with Pump Operation:



## 8.4 ORDERING INFORMATION FOR DISPLACER TYPE LEVEL SWITCHES

SPECIFY PART NO. → DLS **1** **2** **3** **4** **5** **6** **7**

Example: DLS **A** **A** **2** **G** **1** **1** **N**

DLS

1	SWITCH MECHANISMS / DISPLACERS
A	One / One
B	Two / One
C	Two / Two
D	Three / Two
E	Three / Three

2	ENCLOSURE
A	Cast Al., Weather Proof IP65 x ¾" ET
B	Cast Al., Ex-proof IP66 Gr. IIA & IIB x ½" NPT
C	Cast Al., Ex-proof IP66 Gr. IIC x ½"NPT
O	Others

3	DISPLACER MOC
1	SS304
2	SS316
3	PP
4	Teflon
O	Others

4	PROCESS CONNECTION MOC
1	MS
2	SS304
3	SS316
4	PP
5	Teflon
O	Others

### APPLICATIONS

Foaming or Surging fluids, Agitated fluids, Sewage handling, Dirty liquids, Paints, Liquids with solids.

5	PROCESS CONNECTION
1	3" #150 ANSI Flange
2	80 NB, BS 10 - E Flange
O	Others

6	INSTALLATION
1	Internal Direct
2	Perforated Still Well in MS
3	Perforated Still Well in SS304
4	Perforated Still Well in SS316
5	Perforated Still Well in PP
6	External Chamber with 1" NB Flange in MS
7	External Chamber with 1" NB Flange in SS304
8	External Chamber with 1" NB Flange in SS316
9	External Chamber with 1" NB Flange in PP
O	Others

7	HIGH TEMP ARRANGEMENT
N	Not provided
P	Provided

## 8.5 DLS WITH A SINGLE LEVEL DISPLACER IN A CHAMBER

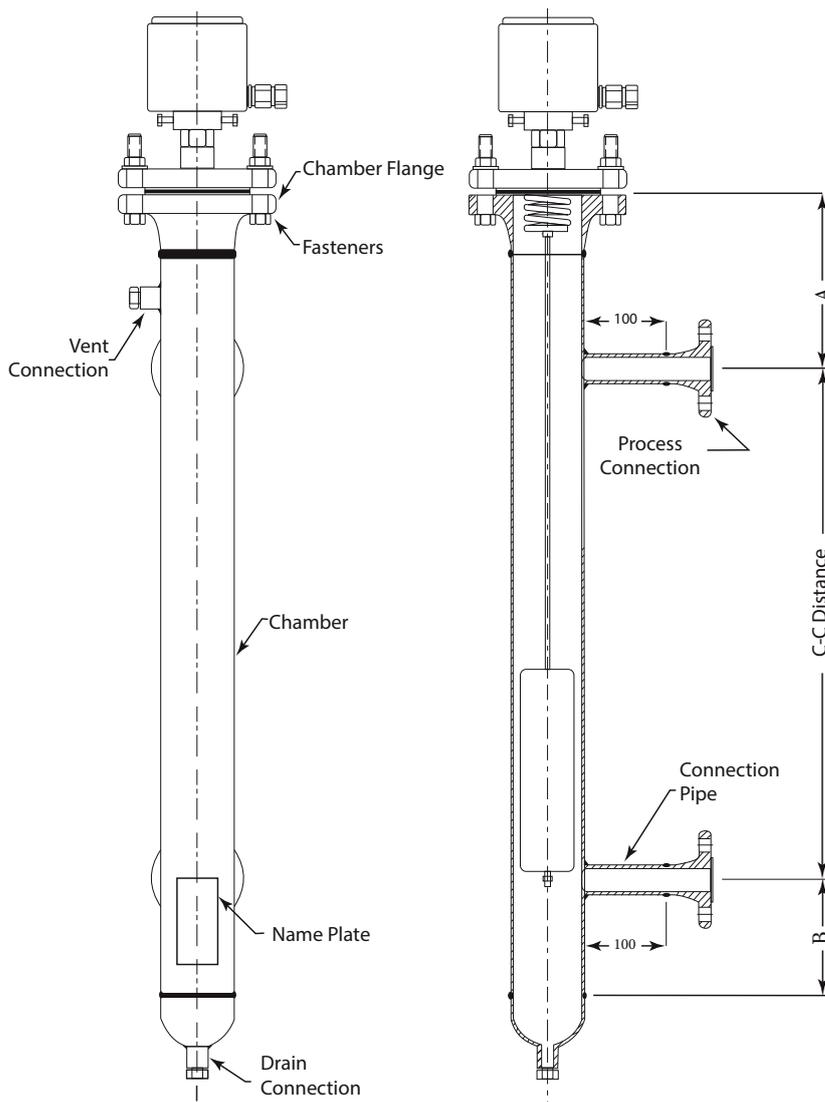
Wherever it is not possible or desirable to install Displacer Type Level Switch directly onto the vessel, switches can be installed in an External Chamber. This arrangement gives smooth level control irrespective of turbulence in the process vessel and prevents accidental damages to the switch during shutdown or maintenance of the vessel. Chambers are used in applications which require isolations of process, High Pressure / High Temperature applications, Corrosive applications, Onshore / Offshore installations.

**Main function of these chambers are:**

- Level Measurement
- Interface Measurement between two liquids.

### FEATURES

- Available for Low Pressure and High Pressure applications.
- Wide range of material of construction to suit different environmental conditions.
- Wide range of end connection types / sizes to choose from.
- A variety of chamber mounting arrangements provided to suit existing nozzles.



### **HQ and Manufacturing - 1**

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Ph no - +91-80-2843 7847 / 7848  
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### **Manufacturing - 2**

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### **Manufacturing - 3**

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