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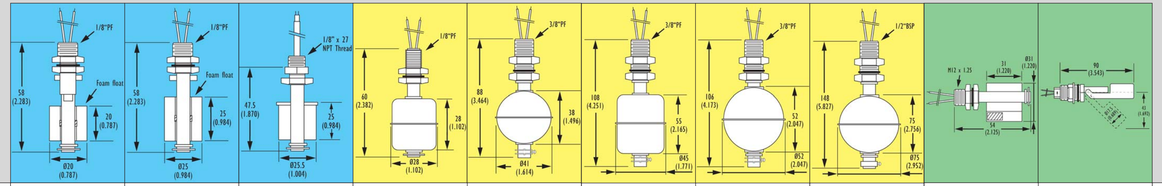
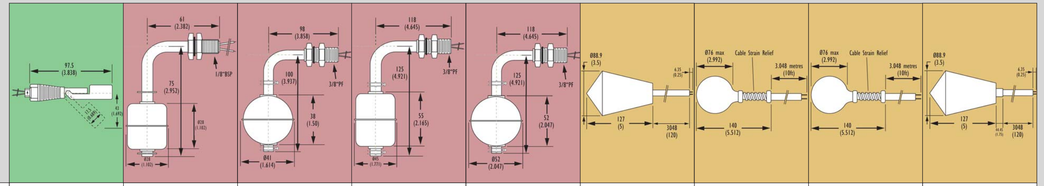
FLOAT SWITCHES



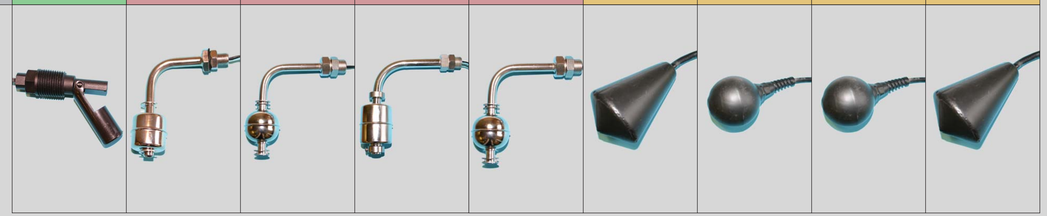
Options / Features	• Smallest Float		• Also available with longer 70mm shaft	• Highest grade Stainless Steel available						
Mounting Position	Vertical			Vertical					Horizontal	
Type	VFP11	VFP21	P219	VFS30	VFS40	VFS45	VFS50	VFS75	HFP12	HFP21
Contact Form / style	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Open and Normally Closed	Normally Closed	Normally Open and Normally Closed	Normally Open
Switching Voltage Max. V	125Vac	240Vac / 200Vdc	400Vac / dc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc
Switching Current Max. A	0.5	0.5	2.0	1.0	0.5	0.5	0.5	2.0	0.5	0.5
Switching Capacity Max. VA	10	50	40	50	50	50	50	40	50	50
Contact Resistance Max. mohms	200	200	80	200	200	200	200	200	200	200
Suitable specific gravity	0.8	0.8	0.75	0.8	0.7	0.65	0.55	0.45	0.78	0.75
Operating Temp. °C	-20 +80	-20 +80	-20 +80	-10 +120	-10 +120	-10 +120	-10 +120	-10 +120	-20 +80	-20 +80
Material	Polyproylene	Polypropylene	Polypropylene	316 Stainless Steel	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel	Polypropylene	Polypropylene
	UL1007 AWG 22 30cm (11.81ins)	UL1007 AWG 22 30cm (11.81ins)	0.5mm² PVC 100cm (39.37ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	PVC AWG 22 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)

AWG to mm² Cross Reference table

AWG	mm²
30	0.05
28	0.08
26	0.14
24	0.25
22	0.34
21	0.38
18	0.75
17	1.0
16	1.5
14	2.5
12	4
10	6
8	10
6	16
4	25
2	35
1	50
1/0	70
2/0	95
4/0	120
300MCM	150
350MCM	185
500MCM	240



Options / Features		• Highest grade Stainless Steel available				• 10 Amp Switching	• Normally open normally closed contacts • Choice of operating angles		• Electronic • 10 Amp version available (WFP10-10)
Mounting position	Horizontal	Horizontal				Horizontal			
Type	HFP32	HFS30	HFS40	HFS45	HFS50	FP10 / FP210-13	BF32A-0	WBF31A-0	WFP3-10
Contact Form / Style	Normally Open	Normally Open and Normally Closed	Normally Open and Normally Closed	Reversable	Normally Open and Normally Closed	Open or Closed (Optional) FP10: 1 contact FP210-13: 2 contacts	Open or Closed (Optional) 1 contact	Open or Closed (Optional) 1 contact Mercury Free	Normally Open
Switching Voltage Max. V	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac / 200Vdc	240Vac	240Vac	1.5 - 50Vdc	280Vac
Switching Current Max. A	0.5	0.5	0.5	1.0	0.5	10	2	0.15	3
Switching Capacity Max VA	50	50	50	50	50	10A 120Vac / 3A 240Vdc	BF32A-0: 2A 120Vac 1A 240Vdc BF310A-0: 10A 120Vac 5A 240Vdc	0.12A 12Vac / 0.15A 120Vac	660
Contact Resistance Max. mohms	200	200	200	200	200	3	3	3	N/A On-State voltage Vpeak=1.6V
Suitable specific gravity	0.75	0.8	0.7	0.65	0.55	Differential Angle: 10 degrees	Differential Angles: BF32A-0: 8° BF32A35-0: 25° BF32A65-0: 65° BF310A-0 8°	Differential Angle: 15 deg. Max.	Differential Angle: 15 deg. Max.
Operating Temp. °C	-20 +80	-10 +120	-10 +120	-10 +120	-10 +120	70 Max.	70 Max.	70 Max.	70 Max.
Material	Polypropylene	316 Stainless Steel	304 Stainless Steel	304 Stainless Steel	304 Stainless Steel	Polyurethane with PVC coating	Polypropylene with PVC coating	Polypropylene with PVC coating	Polyurethane with PVC coating
Cable	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	XLPE (UL3266 AWG 22) 30cm (11.81ins)	FP10:18/2 Type SJ00W FP210-13:16/4 Type SJ00W	18/2 AWG Type SJ00W	18/2 AWG Type SJ00W	18/2 AWG Type SJ00W



Contact Form

Most switch actions on our Float Switches can be changed from Normally Open to Normally Closed by refitting and reversing the float on its stem. See individual specifications for details. For cable tether type floats specification on the contact type required (Normally Open or Normally Closed) should be given by the customer, in order for us to supply the correct type for your application. Normally Open and Normally Closed refer to the switches position at rest in a dry tank.

Customization

Overleaf you will find our most common types of Float Switches available. If you require something different to those shown (longer length vertical or horizontal stem or longer cable length), then simply ask our sales office who will be pleased to help you with your application.

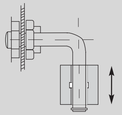
Material Selection

Stainless Steel: Ideal for high pressures, high temperatures and in corrosive environments such as food equipment, industrial tanks or where durable long ife in general use is required.

General Use Plastics: Polypropylene, PVC and Polycarbonate are a good choice for use in acids or food applications, or just for general use. They are generally the most economic option, and can be easily custom moulded with additional features for OEM applications.

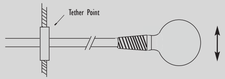
OPERATION

Side Mounting



Vertical Mounting

Cable Tether



Specific Gravity

Specific Gravity (SG) is the ratio of an objects density in relation to that of water. Water has a specific gravity of 1 when at sea level. Liquids or substances with a specific gravity lower than 1.0 will float in water.
It is important to select the correct float switch and float for your application. For example a float switch with a specific gravity of 0.8 will float well in water but will sink in alcohol which is around 0.72 SG. Our sales office will be pleased to assist you with your application, and establish whether a custom floating magnet is required.
The table on the reverse of this catalogue may be used for reference.

Multi-Level Float Switches

Aside from the Float Switches overleaf, we are also able to offer multi-level float switches where switching at multiple levels is required. These are all fully customizable to your specifications.
We are also able to offer Stainless Steel Float kits. These DIY Float kits have been designed to enable easy construction of a prototype or small quantity of switch assemblies and come with housings, Stainless Steel tubes, union connectors, floats, and reed switches.
We can also provide an assembly service if required.
If you cannot find what you require for your application, please speak to our sales office, who will be pleased to listen to your requirements, and offer you a solution.

All dimensions are nominal, in millimetres unless otherwise stated. If further information is required, individual datasheets are available on our websites, and on CD.
As part of the groups policy of continued product improvement, specifications may change without notice. Our sales office will be pleased to help you with the latest information on our products.

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SPECIFIC GRAVITY

Liquid	Temp. °C	SG	Liquid	Temp. °C	SG	Liquid	Temp. °C	SG
Tap Water (reference)	15	1.0	Glycerin	25	1.263	Pyridine	25	0.982
Beer	15	1.01	Glycerol	25	1.129	Sea Water	25	1.028
Carbon Tetrachloride	15	1.59	Kerosene	15	0.78 - 0.82	Sodium Chloride 5%	15	1.037
Corn Oil	15	0.924	Lard Oil	15	0.91 - 0.93	Sodium Hydroxide	15	1.22
Crude Oil	15	0.79	Linseed Oil	25	0.932	Sorbaldehyde	25	0.898
Caster Oil	25	0.959	Mercury	25	13.63	Stearic Acid	25	0.941
Citric Acid	25	1.665	Methane	-164	0.466	Styrene	25	0.906
Coconut Oil	15	0.927	Milk	15	1.02 - 1.05	Sulphuric Acid 20%	15	1.14
Creosote	15	1.070	Olive Oil	15	0.703	Sulphuric Acid 95%	15	1.839
Diesel	15	0.88 - 0.94	Peanut Oil	15	0.92	Terpinene	25	0.850
Ethane	-89	0.572	Phenol	25	1.075	Toluene	25	0.865
Ether	25	1.10	Propane	-40	0.585	Triethylene Glycol	15	1.125
Gasoline (Petrol)	15	0.68 - 0.74	Propylene Glycol	25	0.968	Turpentine	25	0.871

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Float Switches

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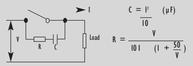
DESCRIPTION

Reed Float Switches are designed to fit into tanks or containers containing liquid. They are operated by a magnet fitted into the float assembly and a Reed Switch fitted into the stem of the float body. When the float moves past the Reed Switch inside the float body, the reed contacts operate (open or close). When the float moves back to its original position the reed switch contacts will also return to their orginal state. In conjunction with a pump, this principle allows control over the liquid level.
The cable tether type float switches use either Mercury or a Mercury free contact in place of a Reed Switch, and it is the differential angle of the Tilt Switch inside the float that determines the point at which the contacts will operate (open or close).

CONTACT PROTECTION

Inductive Loads

A reverse voltage is generated by stored energy in an inductive load when reed contacts open. This voltage can reach very high levels and is capable of damaging the contacts. An RC network may be used as shown below to give protection.

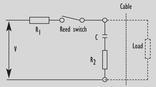


$$C = I^2 \frac{(\mu F)}{10}$$

$$R = \frac{V}{10\,I\left(1 + \frac{50}{V}\right)}$$

Capacitive Loads

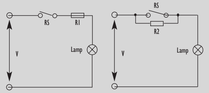
Unlike inductive loads, capacitive and lamp loads are prone to high inrush currents which can lead to faulty operation and even contact welding. When switching charged capacitors (including cable capacitance) a sudden unloading can occur, the intensity of which is determined by the capacity and length of the connecting leads to the switch. This inrush peak can be reduced by serial resistors. The value is dependent on the particular application but should be as high as possible to ensure that the inrush current is within the allowable limits.



The above diagram illustrates a resistor/capacitor network for protecting a Reed Switch against high inrush currents. R_1 and/or R_2 are used depending upon circuit conditions.

Lamp Loads

With lamp load applications it is important to note that cold lamp filaments have a resistance 10 times smaller than already glowing filaments. This means that when being turned-on, the lamp filament experiences a current flow 10 times greater than when already glowing. This high inrush current can be reduced to an acceptable level through the use of a current-limiting resistor. Another possibility is the parallel switching of a resistor across the switch. This allows just enough current to flow to the filament to keep it warm, yet not enough to make it glow.



Lamp load with parallel or current limiting resistor across the switch

Switch Ratings

The load switching capacity of most float switches can be significantly increased with the addition of Relay Units, ask our sales office for details.

All dimensions are nominal, in millimetres unless otherwise stated. If further information is required, individual datasheets are available on our websites, and on CD.
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