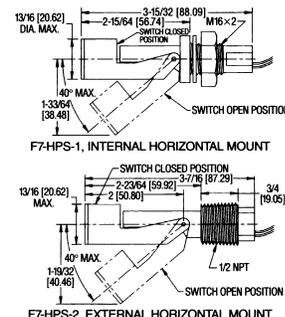
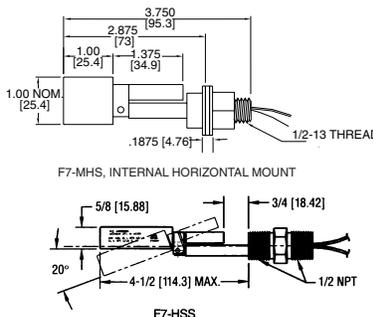




**SERIES F7 LIQUID LEVEL SWITCHES**

**Specifications – Installation and Operating Instructions**



**SPECIFICATIONS**

**Electrical Rating (Maximum):**

- F7-SB, -SS2 AC: 25VA, 1.0A, 200 V DC: 10W, 1.0A, 200V
  - F7-PP, -BT, -HSS, -MHS AC: 25VA, 1.0A, 200 V DC: 10W, 1.0A, 200V
  - F7-HPS-1, -2 AC: 25VA, 1.0A, 200 V DC: 10W, 1.0A, 200V
- (F7-HSS is rated explosion-proof for Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III).

**Mounting Connection:** 1/8" NPTM (all vertical mount), 1/2" NPTM (F7-HPS-2, F7-HSS), M16 x 2 (F7-HPS-1), 1/2" x 13 thread (F7-MHS)

**Wire leads:** 22 AWG x 18" (46 cm), vertical mount models; 22 AWG x 39" (1 m), models F7-HPS-1, -2; 22 AWG x 24" (61 cm), models F7-HSS, -MHS.

**Magnet:** Alnico (F7-SB, -PP, -BT, -HPS), ceramic (F7-SS2, -HSS, -MHS).

**Weight:** 2 oz. (58 g), F7-SB; 1.2 oz. (34g), F7-SS2; 0.8 oz. (23 g), F7-PP; 0.7 oz.. (20 g), F7-BT; 1.5 oz. (43 g), F7-HPS-1; 2 oz. (57 g), F7-HPS-2 and -MHS; 3 oz. (94 g), F7-HSS.

**DIMENSIONS, INCHES (MM) - Vertical Mount**

Model Number	(A) Stem Length	(B) Float Diameter	(C) Float Height	(D) Actuation from HEX*
F7-SB	2.75 (70)	1.13 (29)	1.38 (35)	1.2 (31)
F7-SS2	2.06 (52)	1.0 (25)	1.0 (25)	0.73 (19)
F7-PP	2.18 (55)	1.18 (30)	1.0 (25)	0.69 (18)
F7-BT	2.18 (55)	1.18 (30)	1.0 (25)	0.69 (18)

\*Distance between HEX and liquid (S.G. = 1) level @ actuation pt. will vary with specific gravity changes.

**PHYSICAL DATA**

Model Number	Material Float/Stem	Max. Temp.	Max. Press.	Min. S.G.	Approx. Deadband
<b>Vertical Mount</b>					
F7-SB	Buna-N & Epoxy/ 316SS	220°F 105°C	150 psig 10 bar	0.60	1/16" 2 mm
F7-SS2	316/SS (CYC)/ 316SS	300°F 149°C	450 psig 31 bar	0.75	1/16" 2 mm
F7-PP	Polypropylene & Epoxy/ Polypropylene	220°F 105°C	100 psig 6.89 bar	0.60	1/8" 4 mm
F7-BT	Buna-N & Epoxy/ PBT*	220°F 105°F	150 psig 10 bar	0.45	1/8" 4 mm
<b>Horizontal Mount</b>					
F7-HPS -1, -2	Polysulfone/ Polysulfone	185°F 85°C	150 psig 10 bar	0.85	3/16" 5 mm
F7-HSS	316SS/316SS	392°F 200°C	300 psig 20.7 bar	0.60	1/8" 4 mm
F7-MHS	316 SS/316SS	392°F 200°C	100 psig 6.89 bar	0.70	3/16" 5 mm

\* PBT - Polybutylene Terephthalate

Series F7 Level Switches provide simple, inexpensive control of liquid level within tanks or similar vessels. Switch ratings are suitable for many solid state control systems and monitors or alarms. Simple relay interfaces can be used for higher current applications. Two basic styles offer a choice of vertical or horizontal mounting. Hermetically sealed reed switches are actuated by magnets permanently bonded inside the float and can be easily adapted to open or close a circuit on rising or falling levels.

**SWITCH ACTION (Normally open/Normally closed)**

**Vertical Models**

Vertical mount models are shipped with normally open switch contacts which close as the float rises toward the mounting threads. Reverse switch action by removing the float, rotating it end-for-end and replacing it on the stem.

**Horizontal Models**

Horizontal models are in the normally open position when the indicating arrow points up (float is down), and normally closed when the arrow points down (float is up).

**INSTALLATION**

Choose a location away from fill pipes, drains, or other areas where turbulence or wave motion might occur. Turbulence will cause false actuation and shorten contact life. Excess contaminants in fluid may inhibit float operation and occasional wipe-down may be necessary. Care should be taken that switches are always operated within electrical ratings. Read and understand all safety precautions on back of this sheet before installing.

**MOUNTING**

Install vertical mount models in an appropriate 1/8" NPT fitting. Vertical models mount internally, oriented within 30° of vertical, or select optional fittings for external mounting. Models F7-HPS-1 and F7-MHS must be mounted internally, which means the switch must be secured to the wall of the tank or vessel from the inside. Install horizontal model F7-HPS-1 in a 5/8" (16 mm) hole or model F7-MHS in a 1/2" (12.7 mm) hole. Secure into place with the nut provided. Tank wall should not exceed 1/8" (3 mm). Model F7-HPS-2 requires a horizontal 1/2" NPT female fitting and can be fitted to the tank or vessel from the outside. Model F7-HSS requires a horizontal 1/2" NPT female fitting and can be mounted from the inside or outside (internally or externally) of the tank or vessel.

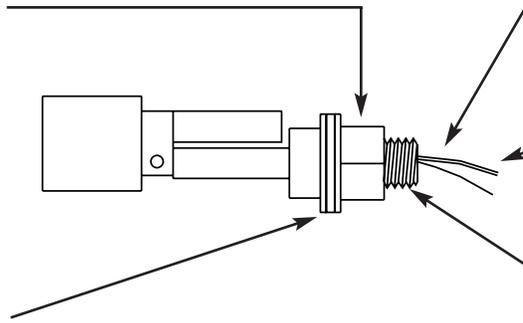
## Installation Notes-

Do not subject reed switch controls to excessive shock or vibration or any of the following:

- Bending or placing force loads on reed switch housing.
- Over-torquing fittings on reed switch housing.
- Placing pull-out force on lead wires.

Do not exceed 1.5 pounds/foot (2 N/m) tightening torque. Excessive torque may cause premature switch element or housing failure.

Gasket seal for internal mounting units should be pre-assembled before insertion through tank wall. Wall thickness should not exceed 1/8" (3mm).



Avoid installations where wiring entering the device is submerged or exposed to excessive amounts of liquid or humidity condensate.

When preparing wires for termination, avoid pulling against the resin seal or end plug of the float switch.

Units with tapered pipe threads should be treated with Teflon® based thread compound or tape before insertion in fitting. Sufficient torque is achieved at hand-tight plus one half turn.

## CIRCUIT INFORMATION FOR REED SWITCH PROTECTION

### READ INFORMATION BELOW BEFORE INSTALLING YOUR NEW REED SWITCH CONTROL!

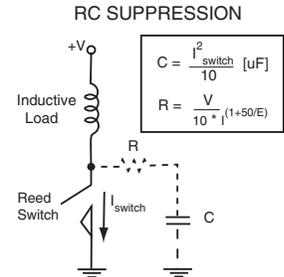
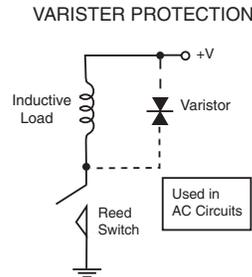
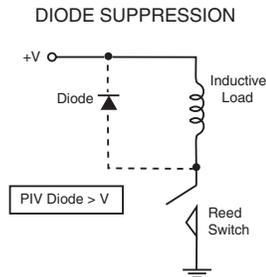
Exceeding the current capacity of this Reed Switch control may cause **FAULTY OPERATION!** Be aware of the inductive and capacitive or lamp loads you may be placing on your Reed Switch Control. The circuits below outline possible solutions to preventing overloads due to inrush or surge currents exceeding maximum or when the switch current and product of the inductive back EMF exceed the switch's power rating. Also, the circuit for prevention of overload when switching filament lamps (low "cold" resistance) is outlined below. Failure to follow these measures to protect Reed Switch Contacts may cause the contacts to weld together or result in premature wear.

### Possible Circuit Solutions Indicated by Dashed Lines

#### Inductive Loads

##### Possible causes-

An electromagnetic relay, electromagnetic solenoid, electromagnetic counter with inductive component as circuit load.

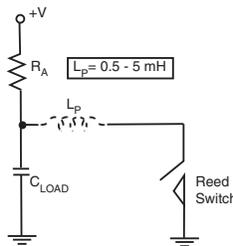


#### Capacitive Loads

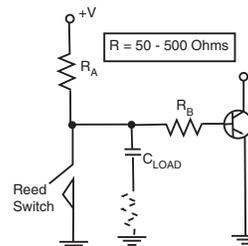
##### Possible causes-

A capacitor connected in series or parallel with Reed Switch Control. In a closed circuit, a cable length (usually greater than 50m [162.5 ft]) used to connect reed switch may also introduce static capacitance.

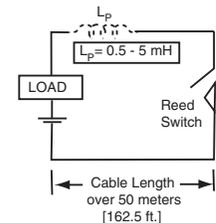
**SURGE LIMITER FOR CAPACITANCE IN SERIES**



**RESISTOR PROTECTION FOR CAPACITIVE LOAD**



**INDUCTIVE PROTECTION FOR CABLE LENGTH CAPACITANCE**

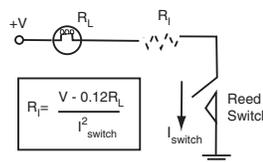


#### Lamp Loads

##### Possible causes-

A tungsten filament lamp load.

**CURRENT LIMITING RESISTOR IN SERIES**



**CURRENT LIMITING RESISTOR IN PARALLEL**

