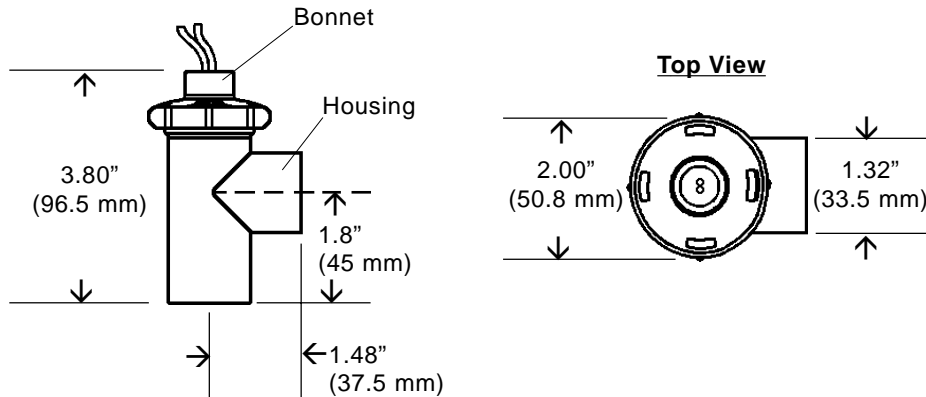


Shuttle-Type Flow Switches

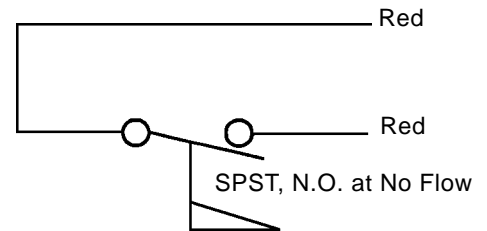
FS-500 Series

Instruction Bulletin No. 170660

Ref. Dimensions . . .



Typical Wiring Diagram . . .



Switch Ratings Max. Resistive Load

VA	Volts	Amps AC	Amps DC
20	0 - 30	.4	.3
	120	.17	.13
	240	.08	.06

Specifications . . .

<u>Materials</u>	Polypropylene, Hydrolytically Stable Glass-Reinforced [†]
Housing, Bonnet, Shuttle, Shuttle Cap	
O-Ring	Viton [®] or Buna N
Spring	316 Stainless Steel
Retaining Clip	PH 15-7 Mo Stainless Steel
Operating Pressure, Maximum	100 PSIG @ +70°F
	50 PSIG @ +180°F
Operating Temperature, Maximum	212°F (100°C)
Set Point Accuracy	± 20%
Set Point Differential	± 20%, Maximum
Switch (See "Switch Ratings")	SPST, N.O. Pilot Duty: 20 VA, 120-240 VAC or VDC
J-Box with 5A Relay	120 VAC 50/60 Hz Contacts: 5A-240 VAC Res. 1/3 HP - 120 VAC 5A - 28 VDC Res.
Inlet/Outlet Ports	3/4" Female NPT
Electric Termination	
	Pilot
J-Box	6' Cable

Standard Models . . .

Part Number	Switch Actuation Set Point on Increasing Flow
Pilot Duty	
170231	0.25 GPM ± 20%
170232	0.50 GPM ± 20%
170233	1.00 GPM ± 20%
170234	2.50 GPM ± 20%
170235	5.00 GPM ± 20%
J-Box w/5A Relay	
175901	0.25 GPM ± 20%
175902	0.50 GPM ± 20%

Note: Standard units are designed with springs for positive return of the shuttle at no-flow condition. This allows the flow switch to be mounted in any orientation, but actuation set points will vary from the stated values. Contact the Factory for further information.



This product is suitable for Class I and Class II applications only, per the requirements of standard EN60730 and any additional specific requirements for a particular application or medium being sensed. Class I compliance of metal bodied units requires a ground connection between the metal body and the earthing system of the installation. Class I compliance of plastic bodied units in contact with a conductive medium requires that the medium be effectively earthed so as to provide an earthed barrier between the unit and accessible areas. For Class III compliance, a supply at safety extra-low voltage (SELV) must be provided. Please consult the Factory for compliance information on specific part numbers.

Installation ...

FS-500 flow switches are for use with metal or plastic piping systems and connect to piping via the 3/4" NPT mating thread forms. The following guidelines are provided to assist with installation for a leak-free seal, without damage to the unit.

1. Apply pipe thread sealant to the male pipe threads.
2. Thread the flow switch onto the male pipe thread until hand-tight.
3. Tighten pipe 1 to 1-1/2 additional turns.
4. If improper seal results, continue turning pipe into unit in 1/4 turn increments.

Do Not Exceed One Additional Turn

Recommended Pipe Sealants: a) Permatex® "No More Leaks" b) Teflon® Thread Tape

Maintenance ...

Disassembling for Cleaning: It is not necessary to remove the unit from the piping system. **CAUTION:** Make sure the system is turned off and that no residual pressure remains in the piping.

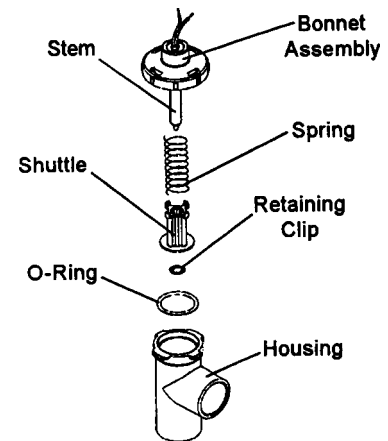
1. The bonnet assembly (see diagram below) is removed by firmly grasping the housing and turning the bonnet 45° counter-clockwise, as indicated on the top of the bonnet. This will unlock the mating tabs on the two parts.
2. The bonnet can now be pulled out of the housing. Be sure to pull on the bonnet, as damage can be done if the lead wires are pulled.

Cleaning: Clean shuttle, stem, spring, retaining clip and inside of housing by lightly scraping and/or wiping. Check O-ring, bonnet assembly, shuttle, and spring for damage. Consult Factory for replacement parts, if necessary.

To Reassemble Unit ...

1. Be sure spring is properly set within clips on shuttle cap.
2. Reposition O-ring in counter-bored shoulder of housing.
3. Insert bonnet assembly into housing, allowing tabs on bonnet to clear mating lugs on housing. Be sure bonnet stem end aligns with centering feature in housing.
4. Bonnet assembly can be locked by firmly grasping housing and turning bonnet 45° clockwise, as indicated on top of bonnet. This will engage mating tabs on the two parts.

(See exploded view at right)



Important Points!

Product must be maintained and installed in strict accordance with the National Electrical Code and GEMS product catalog and instruction bulletin. Failure to observe this warning could result in serious injuries or damages.

An appropriate explosion-proof enclosure or intrinsically safe interface device must be used for hazardous area applications involving such things as (but not limited to) ignitable mixtures, combustible dust and flammable materials.

Pressure and temperature limitations shown on individual catalog pages and drawings for the specified flow switches must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures/temperatures and their frequencies.

Selection of materials for compatibility with the media is critical to the life and operation of GEMS flow switches. Take care in the proper selection of materials of construction; particularly wetted materials.

Life expectancy of switch contacts varies with applications. Contact GEMS if life cycle testing is required.

Ambient temperature changes do affect switch set points, since the specific gravity of a liquid can vary with temperature.

Flow switches have been designed to resist shock and vibration; however, shock and vibration should be minimized.

Liquid media containing particulate and/or debris should be filtered to ensure proper operation of GEMS products.

Electrical entries and mounting points may require liquid/vapor sealing if located in an enclosed tank.

Flow switches must not be field repaired.

Physical damaged sustained by the product may render it unserviceable.



Gems Sensors Inc.
One Cowles Road
Plainville, CT
06062.1198

tel 860.747.3000
fax 860.747.4244