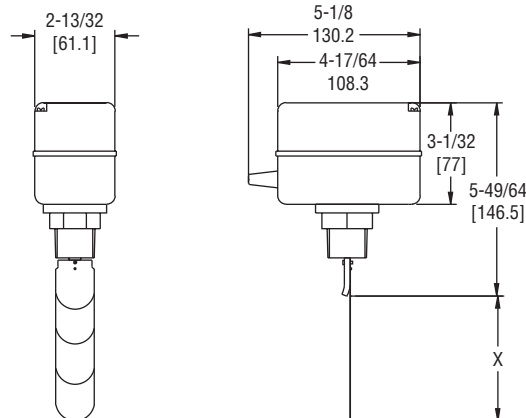




## Model FS-2 Paddle Flow Switch

### Specifications - Installation and Operating Instructions



The **Model FS-2 Paddle Flow Switch** offers an economical flow proving solution. Custom set points tailored for the application are enabled by field adjustable vane layers and a set point adjustment screw. The FS-2 features an aluminum weatherproof housing for outdoor installation. Paddles are adjustable to fit 1" to 8" size pipe. FS-2 is ideal for use in "flow or no flow" applications in cold and hot water systems.

#### FEATURES

- Field Adjustable Paddle
- Field Adjustable Set Point
- Weatherproof Construction

#### INSTALLATION

Unpack and remove any packing material found in the lower housing. Install in piping with the arrow pointing in the direction of flow. The switch must be installed vertically on horizontal pipe runs. To ensure a steady working flow, make certain to keep the paddle flow switch a safe distance from sources of turbulence such as elbows, valves, pumps, etc. The recommended minimum distance upstream and downstream of the flow switch is about 5 times the pipe's diameter.

**Note:** When installed, make sure that the vane has full range of motion and is not hindered by contacting the wall of a pipe, bushing, or tee.

#### SPECIFICATIONS

**Service:** Compatible liquids.

#### Wetted Materials:

Bellow: Tin-bronze;  
Vane: Stainless Steel;  
Body: Forged brass.

**Temperature Limit:** 230°F (110°C).

**Pressure Limit:** 145 psig (10 bar).

**Enclosure Rating:** IP64.

**Switch Type:** SPDT snap switch.

**Electrical Rating:** 10A res, 3A ind @ 250 VAC.

**Electrical Connection:** Cable gland with attached wire leads.

**Process Connection:** 1" male NPT.

**Mounting Orientation:** Switch must be installed vertically on horizontal pipe runs.

**Set Point Adjustment:** Four vane combinations and an adjustment screw.

**Enclosure:** Die-cast aluminum alloy.

**Weight:** 28.22 oz (0.8 kg).

**Agency Approvals:** CE.

#### Electrical Connections

Connect wire leads in accordance with local electrical codes and switch action required. N.O. contact will close and N.C. contact will open when flow increases to the actuation point. They will return to "normal" condition when flow decreases to the deactuation point. Brown = Common, Blue = Normally Open, Black = Normally Closed, and Yellow/Green = Earth Ground.

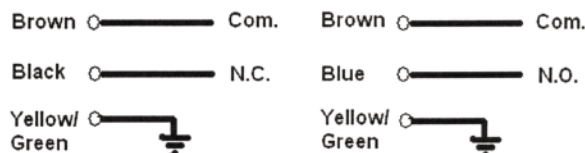


Figure 1

## ADJUSTMENT OF FLOW RATE SETTING

Determine the correct blade length, which is based on the size of your pipe (see Table 1). Remove only those layers which are too long. Leave the smaller layers on to reinforce the vane. To remove vane layers, proceed as follows:

- Remove the screw and lockwasher holding the layers together. Do not lose these parts.
- Remove the unwanted layers.
- Resecure the vane with the original screw and lockwasher.
- With a hammer, lightly peen the end of the screw so that it can not back out.
- If you lose the screw or lockwasher, do not replace with other parts which may corrode and break. That will void the warranty and might cause severe damage to equipment located downstream of the switch.

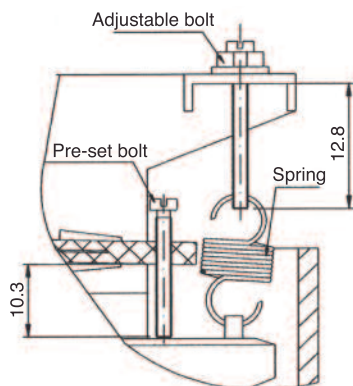


Figure 2: Adjustment

Once you have the correct vane length, you can then adjust the flow rate setting by means of the adjustable bolt shown in Figure 2. Fully tighten the adjustable bolt to obtain the minimum flow rate setting. Fully loosen the adjustable bolt to obtain the maximum flow rate setting. The adjustable bolt can be adjusted and set according to practical requirements. See Table 1 for the limiting flow rate settings in relation to the pipe diameter and blade length.

**Note:** The Model FS-2 is shipped with the adjustable bolt fully tightened, in the minimum setting. Also, the pre-set bolt shown in Figure 2 has been adjusted before leaving the factory. Users should not adjust this by themselves. Adjustment of the pre-set bolt could lead to switch malfunction and possibly void the warranty.

TABLE 1: FLOW RATE CHART

| Pipe Diameter (inch) | Blade Length in (mm) Dim. X | Approximate Actuation and Deactuation Flow Rates for Water |               |                 |                |
|----------------------|-----------------------------|------------------------------------------------------------|---------------|-----------------|----------------|
|                      |                             | Minimum Setting                                            |               | Maximum Setting |                |
|                      |                             | GPM (LPM)                                                  |               | GPM (LPM)       |                |
|                      |                             | Actuate                                                    | Deactuate     | Actuate         | Deactuate      |
| 1                    | 1.34 (34)                   | 4.0 (15.0)                                                 | 1.8 (6.7)     | 8.8 (33.3)      | 6.6 (25.0)     |
| 1-1/4                | 1.34 (34)                   | 5.3 (20.0)                                                 | 2.6 (10.0)    | 11.4 (43.3)     | 8.4 (31.7)     |
| 1-1/2                | 2.24 (57)                   | 7.0 (26.7)                                                 | 4.0 (15.0)    | 14.5 (55.0)     | 11.4 (43.3)    |
| 2                    | 2.24 (57)                   | 14.1 (53.3)                                                | 9.7 (36.7)    | 31.3 (118.3)    | 22.5 (85.0)    |
| 2-1/2                | 3.46 (88)                   | 18.5 (70.0)                                                | 15.4 (58.3)   | 35.2 (133.3)    | 30.8 (116.7)   |
| 3                    | 3.46 (88)                   | 27.7 (105.0)                                               | 25.1 (95.0)   | 52.8 (200.0)    | 46.2 (175.0)   |
| 4                    | 3.46 (88)                   | 59.4 (225.0)                                               | 52.8 (200.0)  | 123.3 (466.7)   | 114.5 (433.3)  |
| 5                    | 6.57 (167)                  | 52.8 (200.0)                                               | 39.6 (150.0)  | 132.1 (500.0)   | 123.3 (466.7)  |
| 6                    | 6.57 (167)                  | 75.7 (286.7)                                               | 52.8 (200.0)  | 154.1 (583.3)   | 140.9 (533.3)  |
| 8                    | 6.57 (167)                  | 184.9 (700.0)                                              | 158.5 (600.0) | 396.3 (1500.0)  | 374.2 (1416.7) |

## MAINTENANCE

Inspect and clean wetted parts at regular intervals. The cover should be in place at all times to protect the internal components from dirt, dust, and weather. Disconnect the device from the supply circuit before opening to prevent ignition of hazardous atmosphere.

The Model FS-2 Paddle Flow Switch is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.



Hitma Instrumentatie

www.hitma-instrumentatie.nl  
info@hitma-instrumentatie.nl  
+31 (0)297 - 514 833

België / Belgique

www.hitma-instrumentatie.be  
info@hitma-instrumentatie.be  
+32 (0)2 - 387 28 64