

HTW-F61KB Series Liquid Flow Switch

HTW-F61 Liquid Flow Switches are Single - Pole, Double - Throw (SPDT) flow switches that are used in liquid lines carrying water, ethylene glycol, or other liquids not classified as hazardous. They can be wired to energize one device and de-energize another device powered from the same source when liquid flow either exceeds or drops below the set flow rate.

Note: The F61 Flow Switch cannot be used where the liquid in the pipes will drop below the liquid's freezing point, causing an internal freeze-up.

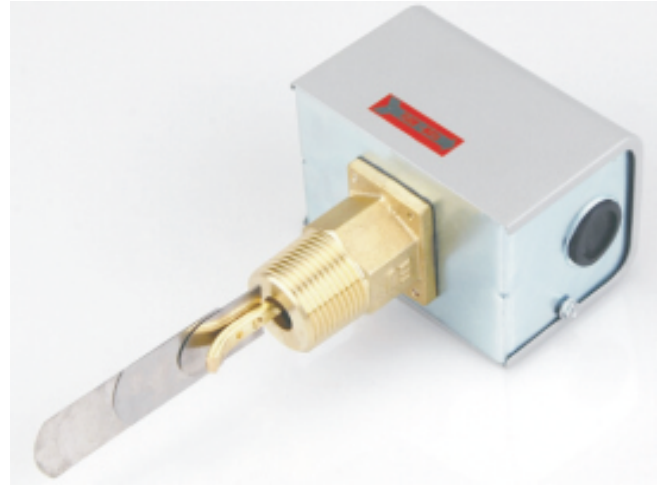


Figure 1: F61KB Flow Switch

IMPORTANT: F61 Flow Switches are designed for use only as operating controls. Where an operating control failure would result in personal injury and /or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against or warn of control failure.

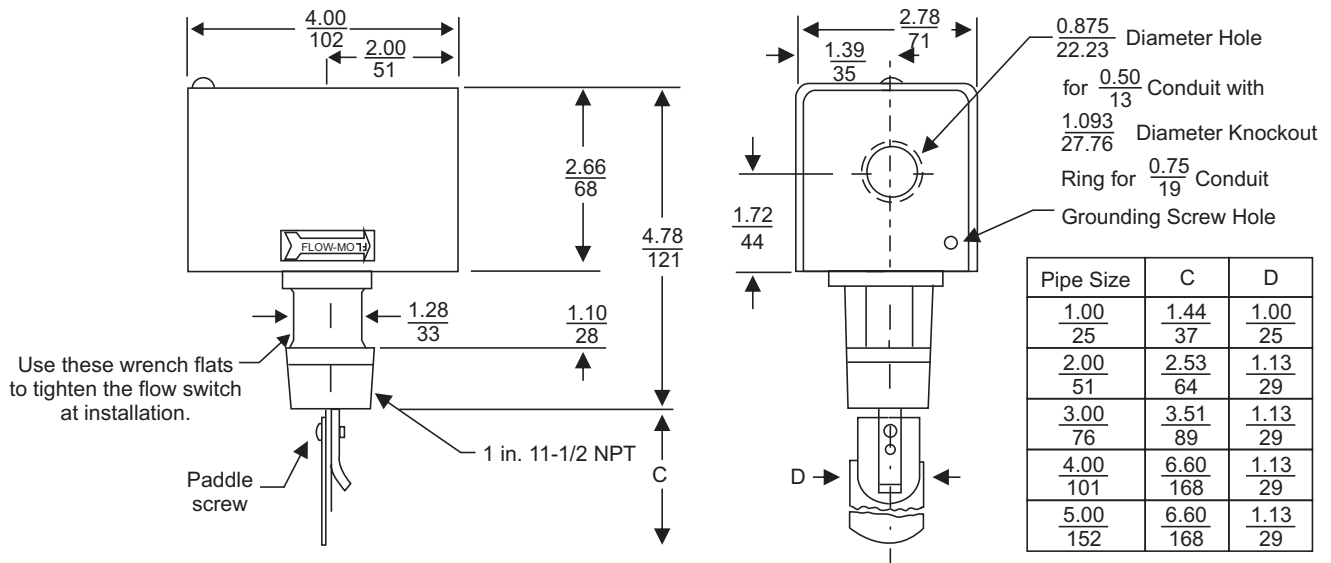


Figure 2: F61KB Dimensions (in./mm)

Installation

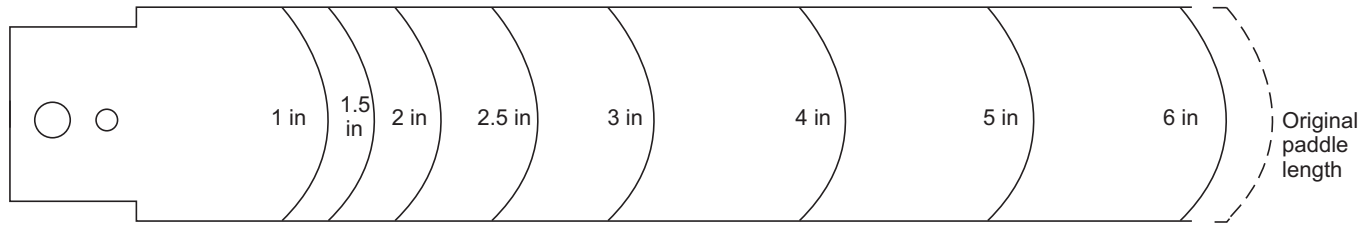


Figure 3: Trimming Template for the Extra Paddle

IMPORTANT: To allow the switch to detect changes in the flow condition, the paddle must not touch the pipe or any restrictions in the pipe.

- The F61 comes with a 3-piece paddle (1 in., 2 in. and 3 in. segments) installed, Each piece is removable. Adjust the paddle to the size of the pipe in which it will be installed. For 1 in., 2 in. or 3 in. pipe, use the paddle segments as supplied.
- Mount the F61 in a section of pipe where there is a straight run of at least five pipe diameters on each side of the flow switch.

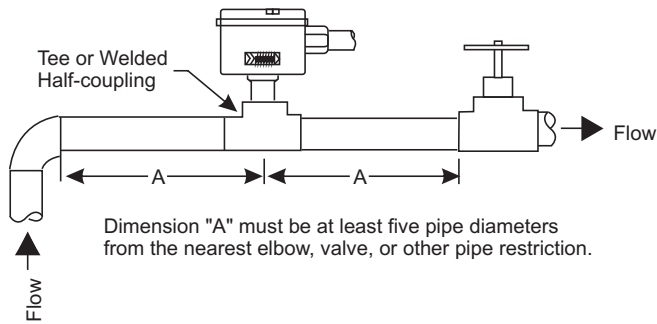


Figure 4: Typical Installation

- The switch should be mounted so the terminals or wire leads are easily accessible for wiring.

Note: These flow switches must not be subjected to water hammer. If a fast-closing valve is located downstream of the flow switch, a suitable water hammer arrester must be used.

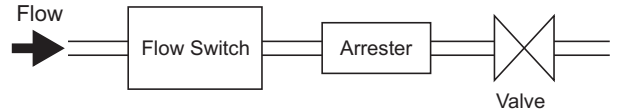


Figure 5: Arrester Location Schematic

- Mount the flow switch in a standard 1 in.x1in.x1in. tee for 1 in. pipe installation. Use a reducing tee for larger size of pipe to keep the flow switch close to the pipe and provide adequate paddle length in the flow stream.



CAUTION: Equipment damage hazard.

To avoid damaging the switch, do not tighten the switch to the tee by grasping the switch enclosure. Use only the wrench flats provided.

- Screw the flow switch in position so the flat of the paddle is at a right angle to the flow. The arrow on the side of the case must point in direction of the flow.
- The F61 Flow Switch may be mounted in a horizontal pipe line or a vertical pipe line with upward liquid flow. It is not recommended for installations where flow is downward. When mounted in a vertical pipe line with upward flow, the switch will trip at a slightly higher flow than shown in Table 1 due to the effect of gravity on the switch mechanism.

Wiring



WARNING: Shock hazard.

To avoid possible electric shock or damage to the equipment, disconnect the power supply before the wiring connections or adjustments are made.

Make all wiring connections using copper conductors only.

Install all wiring in accordance with the National Electric Code and local regulations.

Adjustments



CAUTION: Improper operation hazard.

The switch is factory set at approximately the minimum flow rate (see Table 1). Do not set lower than the factory setting as this may result in the switch failing to return to a 'no flow' position.



CAUTION: Equipment damage hazard.

Sealed settings (screws marked with black paint) are not intended to be changed. Adjustment attempts may damage the control or cause loss of calibration, voiding the warranty.

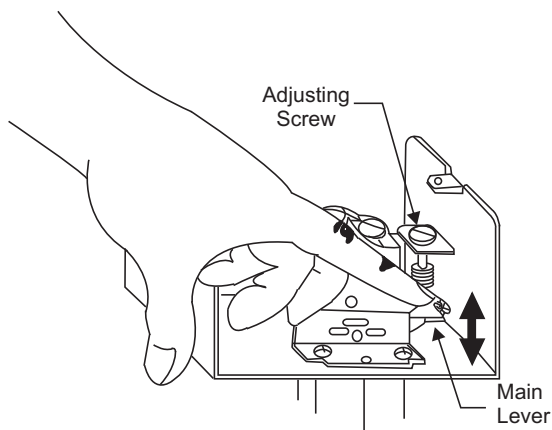


Figure 6: Minimum Adjustment

To adjust the setting of the flow switch:

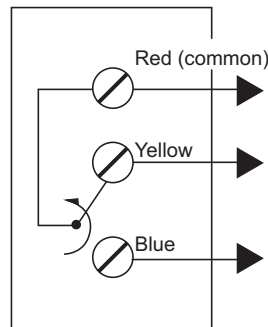
1. Remove the F61 cover.
2. For higher flow rates, turn the adjusting screw clockwise. To lower the flow rate after it has been raised from the factory setting, turn the adjusting screw counterclockwise.
3. Check to see that the flow switch is not set lower than the factory setting by depressing the main lever numerous times. If the lever fails to "click" upon return at any time, turn the adjusting screw clockwise until the lever clicks upon return every time.

Checkout Procedure

The circuit between the red and the yellow leads (terminals) will close when sufficient liquid flows through the pipe to trip the F61 (see Table 1). A low flow indicator light or signal, when used, will activate when the liquid flow decreases or ceases.

Before leaving the installation, observe at least three complete operating cycles to be sure that the F61 and the system to which it is connected are functioning correctly

Action of Switch on an Increase in Flow Above the Setpoint



Action of Switch on a Decrease in Flow Above the Setpoint

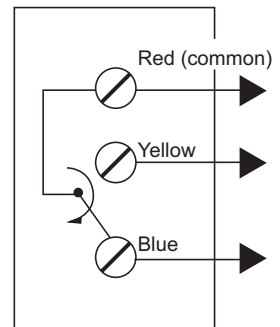


Figure 7: Switch Action

Table 1: Typical Flow Rates

Pipe Size(in.)		GPM(m ³ /hr)Required to Actuate Switch									
		1	1-1/4	1-1/2	2	2-1/2	3	4*	5*	6*	8*
Minimum Adjustment	Flow Increase R to Y Closes**	4.2 (1.0)	5.8 (1.3)	7.5 (1.7)	13.7 (3.1)	18.0 (4.1)	27.5 (6.2)	65.0 (14.8) 37.0+ (8.4)	125.0 (28.4) 57.0+ (12.9)	190.0 (43.1) 74.0+ (16.8)	375.0 (85.2) 205.0+ (46.6)
	Flow Decrease R to B Closes**	2.5 (0.6)	3.7 (0.8)	5.0 (1.1)	9.5 (2.2)	12.5 (2.8)	19.0 (4.3)	50.0 (11.4) 27.0+ (6.1)	101.0 (22.9) 41.0+ (9.3)	158.0 (35.9) 54.0+ (12.3)	320.0 (72.7) 170.0+ (38.6)
Maximum Adjustment	Flow Increase R to Y Closes**	8.8 (2.0)	13 (3.0)	19.2 (4.4)	29.0 (6.6)	34.5 (7.8)	53.0 (12.0)	128.0 (29.1) 81.0+ (18.4)	245.0 (55.6) 118.0+ (26.8)	375.0 (85.2) 144.0+ (32.7)	760.0 (172.6) 415.0+ (94.2)
	Flow Decrease R to B Closes**	8.5 (1.9)	12.5 (2.8)	18.0 (4.1)	27.0 (6.1)	32.0 (7.3)	50.0 (11.4)	122.0 (27.7) 76.0+ (17.3)	235.0 (53.4) 111.0+ (25.2)	360.0 (81.8) 135.0+ (30.7)	730.0 (165.8) 400.0+ (90.8)

* Flow rates for these sizes are calculated.

+ GPM figures are for a switch with a 6 in. paddle, For 4 in. And 5 in. Line pipe, the 6 in. Paddle is trimmed to a 4 in. and 5 in. length, respectively.

** For switching action, refer to Figure 7.

Specifications

Product	HTW-F61 KB Flow Switch			
Maximum Liquid Pressure	150psig(1034kPa)			
Minimum Liquid Temperature	32° F(0°C)			
Maximum Liquid Temperature	250° F(121°C)			
Electrical Ratings	120VAC	208VAC	240VAC	277VAC
Horsepower	1	1	1	-
Full Load Amperes	16.0	8.8	8.0	-
Locked Rotor Amperes	96.0	52.8	48.0	-
Non-inductive Amperes	16.0	16.0	16.0	16.0
Pilot Duty	125VA at 24/277VAC			
Wiring Connection	Screw Type Terminals			
Pipe Connector	1 in. 11-1/2 NPT Threads			

Conduit Connection One 7/8 in.(22mm) Hole for 1/2 in. Conduit with 1-3/32 in. (28mm) knockout Ring for 3/4 in. Conduit