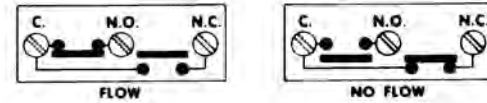


Liquid Flow Switches

The flow of liquids in pipelines plays an important role in industry and commerce. Under most circumstances it is essential to know whether or not there is a flow in a pipeline, and to act upon that knowledge. That is the reason for, and the function of, McDonnell & Miller Flow Switches.

A complete line of Liquid Flow Switches has been developed for a wide range of applications and literally hundreds of uses, including:

- Air Conditioning
- Hot Water Space Heating Systems
- Hot Water Supply Systems
- Pump Systems
- Water Cooled Equipment
- Blending or Additive Systems
- Liquid Transfer Systems
- Fire Sprinkler Systems
- Water Treatment Systems
- Swimming Pool Chlorination
- Industrial Laser Coolant System



In the tables of flow rates included in this catalog the word “Flow” means that switch will close one circuit and open the other, when flow rate is increased to the rate shown.

The words “No-Flow” mean the switch will reverse position—open first circuit and close the second—when flow rate is decreased to the rate shown.

NOTE: DO NOT USE LIQUID FLOW SWITCHES ON SYSTEMS WITH FLOW GREATER THAN 10 FEET (3M) PER SECOND.

| Flow Switches | NEMA Enclosure |
|----------------------------------|---|
| All Models | Type 1—General purpose indoor |
| FS-254, FS1W, FS6W, FS7-4W, FS8W | Type 4X—Watertight, Dust tight and Corrosion resistant |
| FS7-4E | Type 7—Hazardous Location (Class 1—Group C or D) Type 9—Hazardous Location (Class 2—Group E, F or G) |

Models FS74E, FS74SE Flow Switches are Underwriters Laboratories Inc. Listed for use in these hazardous locations:

Class I, Division I, Group C – Atmospheres containing ethylether vapors, ethylene or cyclopropane.

Class I, Division I, Group D – Atmospheres containing gasoline, petroleum, naphtha, benzene, butane, propane, alcohols, acetone, benzol, lacquer solvent vapors or natural gas.

Class II, Division I, Group E – Atmospheres containing dust of aluminum, magnesium or their commercial alloys.

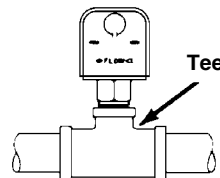
Class II, Division I, Group F – Atmospheres containing carbon black, coal or coke dust.

Class II, Division I, Group G – Atmospheres containing flour, starch or grain dusts.

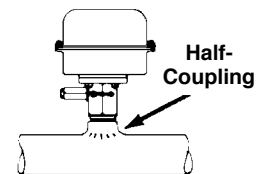
Note: For other listings contact the factory.

Mounting Methods

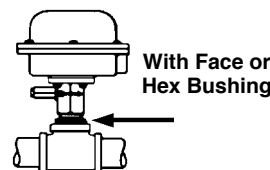
With Tee



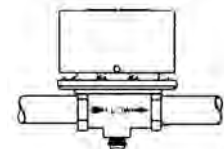
With Welded Half-Coupling



Hex or Face Bushing
FS7-4W



With Body Tapped for Direct Installation
(Series FS1, FS5 and FS6)
FS6



Liquid Flow Switch Specification Chart

| General Purpose Applications | | | | | | | | | | | | | | | |
|-------------------------------|-----------------------|------------|------|--------------|--------------------|-------|--------|-------|--------|------------------|------|---------------------------|-----------|-------------------------------|------------------|
| Model Number | Use on NPT Pipe Sizes | Connection | | Wetted Parts | | | | | | Maximum Pressure | | Fluid Temperature °F (°C) | | Minimum Ambient Temp. °F (°C) | Switch Enclosure |
| | | | | psi | kg/cm ² | Min. | Max. | | | | | | | | |
| | in. | NPT | BSPT | Brass | Stainless Steel | Monel | Buna N | Viton | Solder | | | | | | |
| FS4-3 | 1-6 | • | | • | • | • | | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS251 | 1-6 | • | | • | • | • | 2 | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS4-3D ¹ | 1-6 | • | | • | • | • | | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS4-3J | 1-6 | | • | • | • | • | | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS4-3RPT | 1-6 | • | | • | • | • | | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS4-3S | 1-6 | • | | | • | • | | | • | 160 | 11.3 | 32 (0) | 300 (149) | 32 (0) | General Purpose |
| FS5-3/4 | 3/4 | • | | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-1 | 1 | • | | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-D-3/4 ¹ | 3/4 | • | | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-D-1 ¹ | 1 | • | | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-J-1 | 1 | | • | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-DJ-3/4 ¹ | 3/4 | | • | • | | | 3 | | | 150 | 10.5 | 32 (0) | 250 (121) | 32 (0) | General Purpose |
| FS5-S-1 | 1 | • | | | • | | • | | | 150 | 10.5 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS5-DS-1 ¹ | 1 | • | | | • | | • | | | 150 | 10.5 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS254 | 1-6 | • | | • | • | • | 2 | | • | 160 | 11.3 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS8-W | 1-6 | • | | • | • | • | | | • | 160 | 11.3 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS8-WJ | 1-6 | | • | • | • | • | | | • | 160 | 11.3 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| High Sensitivity Applications | | | | | | | | | | | | | | | |
| FS6-3/4 | 3/4 | • | | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS6-1 | 1 | • | | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS6-J-3/4 | 3/4 | | • | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS6-J-1 | 1 | | • | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS6-W-3/4 | 3/4 | • | | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS6-W-1 | 1 | • | | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS6-WJ-3/4 | 3/4 | | • | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS6-WJ-1 | 1 | | • | • | | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |
| FS1 | 1/2 | • | | • | • | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS1-J | 1/2 | | • | • | • | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | General Purpose |
| FS1-W | 1/2 | • | | • | • | | | • | | 100 | 7 | 32 (0) | 225 (107) | 32 (0) | NEMA 4-X |

¹ "D" Denotes 2 SPDT Switches

² EPDM O-ring

³ Ethylene-Propylene Elastomer

⁴ Brazed

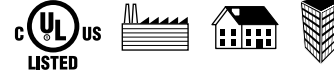
NEMA 4X flow switches are water tight, dust tight and corrosion resistant

NEMA7, 9 flow switches are rated for hazardous duty

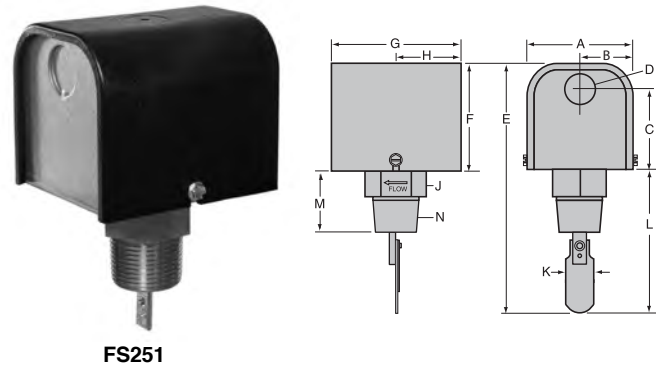
NOTE: DO NOT USE LIQUID FLOW SWITCHES ON SYSTEMS WITH FLOW GREATER THAN 10 FEET (3M) PER SECOND.

Flow Switches – Liquid

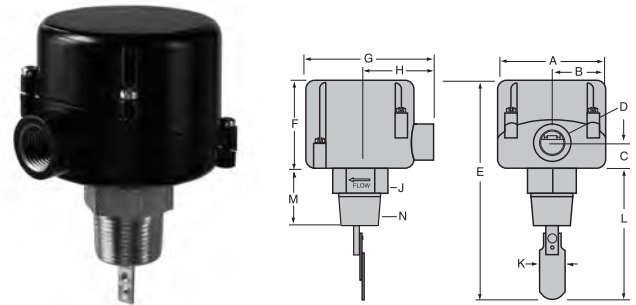
Series 250 General Purpose Liquid Flow Switches



- Universal design serves the widest variety of applications
- For starting or stopping electrically operated equipment such as signal lights, alarms, motors, automatic burners, metering devices and others
- Replacement for common flow switches from Johnson/Penn, Potter/Taco, Watts, Hydrolevel and other manufacturers
- 1" NPTM Pipe Connection
- Sensitivity adjusting screw makes flow adjustment easy
- Single pole, double throw snap switch
- EPDM O-ring sealed
- Four stainless steel paddles included - 1", 2", 3" and 6" (25, 50, 80 and 150mm)
- Minimum temperature (fluid or ambient) 32°F (0°C)
- Maximum temperature 225°F (107°C)
- Maximum operating pressure 160 psi (11.3 kg/cm²)
- **Models:**
FS251 - NEMA1 enclosure
FS254 - NEMA4 enclosure



FS251



FS254

Dimensions, in. (mm)

| | A | B | C | D | E | F | G |
|-------|---------|------------------------------------|-------------------------------------|----------|--------------------------------------|--------------------------------------|------------------------------------|
| FS251 | 3 (76) | 1½ (38) | 2 ⁷ / ₃₂ (56) | 7/8 (22) | 8 ⁷ / ₁₆ (211) | 2 ¹⁵ / ₁₆ (75) | 3 ³ / ₈ (86) |
| FS254 | 3¼ (83) | 1 ⁵ / ₈ (41) | ¾ (19) | ½ NPTF | 8 ³ / ₈ (213) | 2¾ (70) | 3 ⁷ / ₈ (98) |

| | H | J | K | L | M | N | ⁰ Turn-in Radius (not shown) |
|-------|--------------------------------------|---------|------------------------------------|-------------------------------------|-------------------------------------|---------|---|
| FS251 | 1 ¹¹ / ₁₆ (43) | 1½ (38) | 1 ¹ / ₈ (29) | 3 ⁷ / ₁₆ (87) | 2 ¹ / ₁₆ (52) | 1" NPTM | 2 ¹⁵ / ₁₆ (59) |
| FS254 | 2¼ (57) | 1½ (38) | 1 ¹ / ₈ (29) | 3 ⁷ / ₁₆ (87) | 1 ⁷ / ₈ (48) | 1" NPTM | 2 ¹⁵ / ₁₆ (59) |

Flow Switches – Liquid

Series 250 (continued) General Purpose Liquid Flow Switches

Flow Rates

| Pipe Size NPT in. | Settings | Mode of Operation | | Max. Flow Rate gpm (lpm) w/o Paddle Damage |
|-------------------|--------------------|-------------------|-------------------|--|
| | | Flow gpm (lpm) | No Flow gpm (lpm) | |
| 1 | Factory or Minimum | 5.8 (22) | 5.1 (19) | 27 |
| | Maximum | 17.6 (66.6) | 6.53 (2.00) | (102) |
| 1¼ | Factory or Minimum | 6.7 (25) | 6.0 (23) | 47 |
| | Maximum | 19.1 (72) | 18.0 (68) | (178) |
| 1½ | Factory or Minimum | 8.4 (32) | 7.0 (26) | 63 |
| | Maximum | 25.3 (96) | 24.1 (91) | (242) |
| 2 | Factory or Minimum | 12.9 (49) | 11.2 (42) | 105 |
| | Maximum | 31.5 (119) | 30.2 (114) | (397) |
| 2½ | Factory or Minimum | 17.9 (68) | 14.5 (55) | 149 |
| | Maximum | 43.2 (164) | 40.0 (151) | (564) |
| 3 | Factory or Minimum | 26.2 (99) | 20.2 (76) | 230 |
| | Maximum | 54.9 (208) | 49.8 (188) | (871) |
| 4 | Factory or Minimum | 42.0 (159) | 33.7 (128) | 397 |
| | Maximum | 75.6 (286) | 68.0 (257) | (1503) |
| 5 | Factory or Minimum | 54.6 (207) | 46.7 (177) | 654 |
| | Maximum | 109.4 (414) | 98.4 (372) | (2475) |
| 6 | Factory or Minimum | 67.7 (256) | 60.2 (228) | 900 |
| | Maximum | 131.1 (496) | 123.5(467) | (3407) |

Values are ± 10%

Electrical Ratings

| Voltage | Motor Switch Rating (Amperes) | | Pilot Duty |
|---------|-------------------------------|--------------|--|
| | Full Load | Locked Rotor | |
| 120 VAC | 7.4 | 44.4 | 125 VA at 120 or 240 VAC 50 or 60 cycles |
| 240 VAC | 3.7 | 22.2 | |

Ordering Information

| Model Number | Part Number | Description | Weight lbs. (kg) |
|--------------|-------------|--------------------------------------|------------------|
| FS-251 | 120611 | General purpose flow switch – NEMA 1 | 1.9 (0.9) |
| FS-254 | 120610 | General purpose flow switch – NEMA 4 | 1.9 (0.9) |

NOTE: DO NOT USE LIQUID FLOW SWITCHES ON SYSTEMS WITH FLOW GREATER THAN 10 FEET (3M) PER SECOND.