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McDonnell & Miller

Installation & Maintenance Instructions
MM-623(A)

Waterflow Indicators

Underwriters' Laboratories Listed For Service on Distribution, Branch Piping or Mainline Fire Sprinkler Systems

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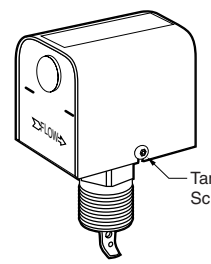
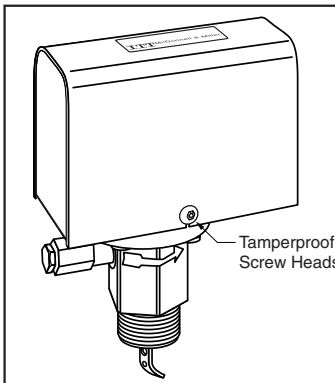


Series FS4-3F

Series FS4-3F
For 1" to 1½" pipe

Maximum Operating Pressure: 160 PSI (11.3 kg/cm²)
Minimum Temperature: 32°F (0°C) (ambient or fluid)
Maximum Temperature: 300°F (149°C)



Series FS7-4F

Series FS7-4F
For 1¼" to 2½" pipe

Maximum Operating Pressure: 300 PSI (21 kg/cm²)
Minimum Temperature: 32°F (0°C) (ambient or fluid)
Maximum Temperature: 300°F (149°C)

Electrical Ratings

Voltage	Motor Switch Rating (Amperes)		Pilot Duty	Direct Current Ratings
	Full Load	Locked Rotor		
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC 50 or 60 cycles	0.3A @ 120 VDC
240 VAC	3.7	22.2		0.15A @ 240 VDC

⚠ WARNING

- **Before using product, read and understand instructions.**
- **Save these instructions for future reference.**
- **All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of plumbing, steam and electrical equipment and/or systems in accordance with all applicable codes and ordinances.**
- **To prevent electrical shock, turn off the electrical power before making electrical connections.**
- **To prevent an electrical fire or equipment damage, electrical wiring insulation must have a rating of 167˚F (75˚C) if the liquid's temperature exceeds 180˚F (82˚C).**
- **To prevent electrocution, when the electrical power is connected to the waterflow indicator, do not touch the terminals.**
- **Make sure Waterflow Indicator electrical cover is secured before turning on electric power.**

Failure to follow this warning could cause property damage, personal injury or death.

SPECIFICATIONS

Waterflow Indicators provide an economical and positive way of detecting the flow of water in any distribution, branch or mainline piping of a fire sprinkler system, in size range of 1" through 2 1/2" pipe.

Connected electrically to various types of alarm or signal devices, they indicate when any sprinkler head or heads are open.

By detecting and signaling when sprinkler heads do open, Waterflow Indicators can help to pinpoint the location of the fire, speed up supplementary firefighting activities, minimize water damage and assist in evacuation of the premises.

NOTE: Many sprinkler systems also employ the use of a large primary Waterflow Indicator equipped with a time retard mechanism and installed where the main water supply is connected to the sprinkler system. On these systems where main supply lines are no larger than 2 1/2" NPT, the FS7-4F or FS7-4DF can be used as this primary indicator; where supply line is larger than 2 1/2" NPT they are used only in the distribution or branch systems (sometimes referred to as "partial systems").

FS4-3F and its variations are used only in the distribution or branch systems (sometimes referred to as "Partial systems"). However, on main water supply lines up to and including 1 " pipe, the FS4-3F Series can be used as the primary water flow indicator.

FS3-4F has SPDT switch. Can be wired to make one circuit, break a second circuit, when flow starts or stops.

FS4-3DF has two SPDT switches. Provides complete versatility in wiring two separate circuits.

FS4-3F-20 has one SPDT switch and 20-second time delay relay, which minimizes false signals caused by minor pressure variations. Time delay is 100% encapsulated; Input–120 volt AC; Output–1 ampere RMS steady state maximum, 20 milliamperes minimum.

FS4-3DF-20 has two SPDT switches and one 20-second time delay relay.

FS7-4F–Has one SPDT switch. The switch can be wired to make one circuit, break a second circuit, when flow starts or stops.

FS7-4DF–Has two SPDT switches. They provide complete versatility in wiring two separate circuits.

FS4-3F, FS4-3DF, FS4-3F-20, FS4-3DF-20 Applications

Pipe Size	Paddle to Use Length (*see illustration)	TEE Size NPT
FS4-3F models, 1" NPT	1 11/32" as furnished (only)	1" x 1" x 1" Tee
FS4-3F models, 1 1/4" NPT	Trim to template as indicated	1 1/4" x 1 1/4" x 1" Tee (Paddle must be bowed for insertion into 1 1/4" tee)
FS4-3F models, 1 1/2" NPT	2 1/16" as furnished (only)	1 1/2" x 1 1/2" x 1" Tee (Paddle must be bowed for insertion into 1 1/2" tee)

FS7-4F & FS7-4DF Applications

Pipe Size	Paddle to Use Length (*see illustration)	TEE Size NPT
1 1/4" NPT	1 13/16" as furnished (only)	1 1/4" x 1 1/4" x 1 1/4" Tee
1 1/2" NPT	Trim to template as indicated	1 1/2" x 1 1/2"" x 1 1/4" Tee
2" NPT	2 9/16" as furnished (only)	2" x 2" x 1 1/4" Tee
2 1/2" NPT	3" as furnished (only)	2 1/2"x 2 1/2" x 1 1/4" Tee (Paddle must be bowed to insert into 1 1/4" NPT opening)

* FS4-3F/FS7-4F paddle template on page 3

INSTALLATION –

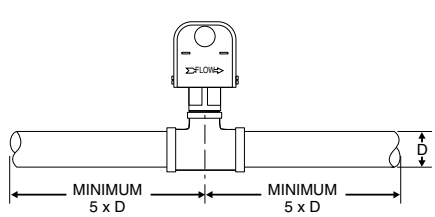
Waterflow Indicators are designed to be used in standard iron/steel pipe tees.

Location: The Waterflow Indicator should be located in a horizontal section of pipe where there is a straight run of at least 5 pipe diameters on each side of the Waterflow Indicator.

Avoid: Locations adjacent to elbows, orifices and valves.

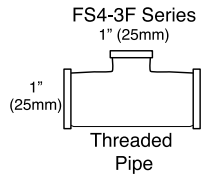
Mounting: The Waterflow Indicator must be installed vertically and upright as shown for horizontal locations only.

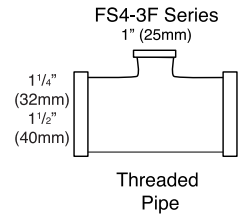
DO NOT USE IN COPPER/ BRASS SWEAT FITTING TEES

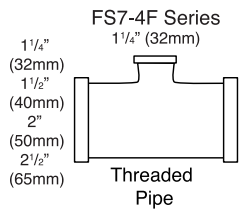


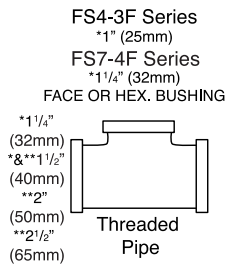
INSTALLATION (cont'd)

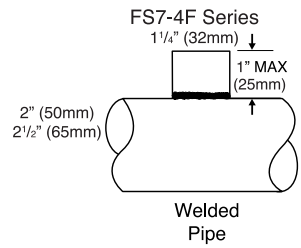
The Waterflow Indicator must be installed in the pipe using a threaded tee connection or welding fitting of minimum length such as a half coupling. Use a face or hex bushing to reduce the tee outlet if a reduced tee outlet thread size fitting is not available.











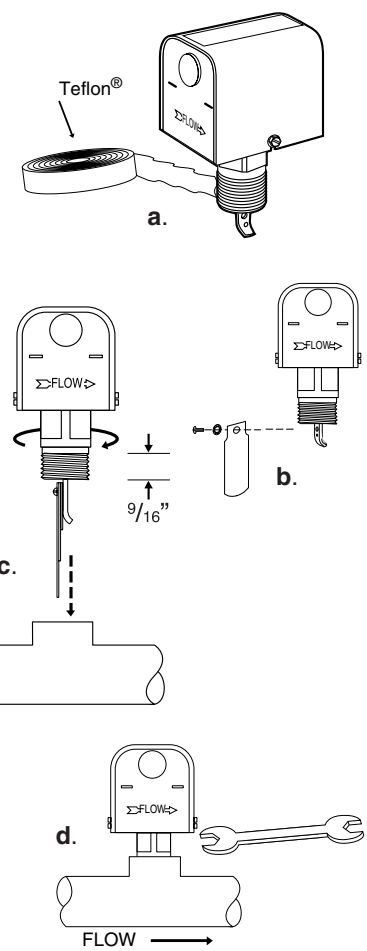
a. Apply pipe sealing compound or Teflon® tape to the Waterflow Indicator pipe threads.

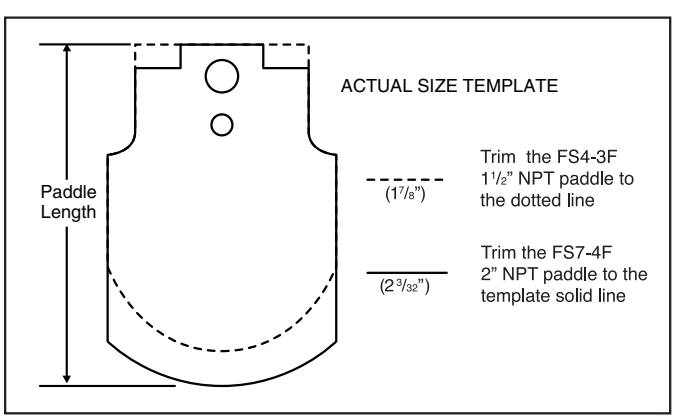
NOTE: Do not apply sealant to first threads as this Waterflow Indicator is grounded (earthed) via the pipe mounting.

b. Attach the properly sized paddle. (See chart on page 2) Tighten the screw through the lock washer and paddle onto the paddle arm to 12-16 in•lb. (1.5-2 N•m) torque. Only one paddle is required for each pipe installation. Carefully bow the paddle on 2½" NPT FS7-4F Series and 1¼" NPT & 1½" NPT FS4-3F Series installations.

c. Insert the Waterflow Indicator into the pipe tee. Turn the Waterflow Indicator two (2) or three (3) revolutions clockwise until tight. Do not put excessive force on cover when turning. **Do not twist the housing to tighten into position.**

d. Place an **adjustable** wrench on Waterflow Indicator body to tighten to final position. Final position is with arrow on housing aligned in the same direction as liquid flow. **Approximately 9/16" of the thread will be turned into the tee +/- one turn.**





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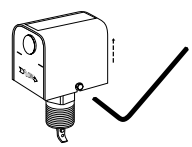
Electrical Installation

Cover Removal or Installation Procedure

a. To remove the cover, loosen but do not remove the two cover screws **using the special tamper-proof wrench.**

b. Place the cover on the Waterflow Indicator sliding the slots behind the two loose cover screws. Push the cover down into the Waterflow Indicator.

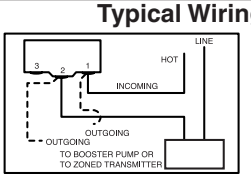
c. Tighten the cover screws to a torque of 10 lb.•in(1.13 N•m).



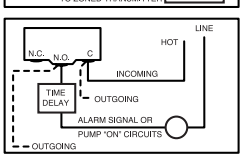
Electrical Conduit Connection

Connect electrical conduit to Waterflow Indicator electrical enclosure. Follow accepted electrical practices when installing fittings and making connections. Refer to and follow local codes and standards when selecting the types of electrical fittings and conduit to connect to Waterflow Indicator.

Typical Wiring—All Models



To actuate water sprinkler booster pump or zoned transmitter.

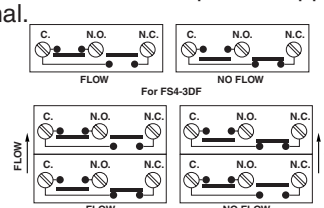


To actuate time relay alarm and signal system when flow occurs.

For Canadian controls, connectors are assembled to common and normally open terminals.

NOTE: Use field wire connectors packed in carton when microswitch terminal is used as a common binding post.

If the Waterflow Indicator will be used to actuate a signal, alarm or other device when flow occurs, connect the wire from that device to the "N.O." contact. Connect the "Hot" power supply wire to "C"terminal.



To Install Time Delay Relay, refer to the instructions for that device.

Testing

Place cover on Waterflow Indicator and turn on power. Initiate fluid flow through the system. Observe the device being activated by the Waterflow Indicator to determine if device is operating as required.

Turn off fluid flow to determine if device is operating as required.

Repeat initiating and turning off fluid flow several times to test Waterflow Indicator and device for proper operation.

- If operating as required, put system into service.
- If not operating as required, Waterflow Indicator may need to be repositioned. The paddle may be contacting the interior of the tee. Tighten or loosen the body by 1 full turn to free the paddle.

MAINTENANCE

Inspect paddles annually.

Replace Waterflow Indicator every 5 years.

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