

# WFD and WFDT(NR)

## Waterflow Detector



Conventional Initiating Devices

### GENERAL

#### WFD SERIES

The System Sensor WFD Series Waterflow Detectors are compatible with Schedule 10 through 40 steel pipe, sizes 2" through 8" (50.8 mm through 203.2 mm), and can be mounted in a vertical or horizontal position.

Robust construction. WFD Series detectors are contained in a rugged, NEMA 4-rated enclosure. Designed for both indoor and outdoor use, the WFD Series operates across a wide temperature range: 32°F to 120°F (0°C to 49°C).

Reliable performance. UL-Listed models are equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form-C) synchronized switches are enclosed in a durable terminal block to assure reliable performance.

False-alarm immunity. WFD Series detectors incorporate a mechanical retard feature, which minimizes the risk of false alarm due to pressure surges or air trapped in the sprinkler system. Additionally, the mechanical retard's unique sealed design is immune to dust and other contaminants.

Simplified operation. The WFD Series is designed to simplify installation. Two conduit openings permit easy attachment to the local alarm system. The retard mechanism and dual SPDT switches are field-replaceable.

#### WFDT/WFDTNR T-TAP MODELS

The System Sensor WFDT Retard and WFDTNR Non-Retard T-Tap Waterflow Detectors are designed for branch-line signaling in larger systems and for primary signaling in residential systems. Both models fit any tee that has a 1" (25.4 mm) NPT branch, including: 1" (25.4 mm), 1.25" (31.75 mm), and 1.5" (38.1 mm) NPT threaded ferrous and brass tees; 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm), and 2" (50.8 mm) copper sweat tees; Central, Spears®, and Victaulic® 1" (25.4 mm) CPVC tees; and 1.5" (38.1 mm) polybutylene tees.

Design. The design of the WFDT and WFDTNR makes them easy to install and simple to maintain. Either can be mounted in the vertical or horizontal position. Two conduit openings permit easy attachment to the local alarm system. The retard mechanism (models WFDT(A) only) and switch assemblies are field-replaceable.

Features. Nine different flexible plastic paddles fit 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm), and 2" (50.8 mm) tees. Sizes are marked clearly on the paddle for ease of installation. Plastic paddles slip over the actuating lever and are securely fastened with one screw. The handy depth gauge ensures the proper installation depth and clearance of the detector to the tee.

Construction. The WFDT(A) and WFDTNR include a durable tamper-resistant enclosure and a rugged switch assembly. The long-lasting covers completely enclose the electrical components to keep out dust and dirt. Improved self-guiding security screws and removal tools make these detectors resistant to tampering and simplify field maintenance. Dual SPDT switches are enclosed in a durable terminal block for added strength.



WFD Series Waterflow Detector

### FEATURES

- WFD30-2 models install in 2" (50.8 mm) hole sizes.
- UL-Listed models are NEMA 4-rated (WFD Series).
- Sealed retard mechanism (WFD Series and models WFDT(A)) assures that the retard is not contaminated by dust and dirt when the cover is removed.
- Visual switch activation (WFD Series and models WFDT(A)) permits installer to accurately set retard under noisy conditions.
- Rugged dual SPDT switches are enclosed in a durable terminal block.
- Durable construction: metal enclosure; heavy-duty aluminum pipe saddles; impact-resistant cover protects mechanism; steel U-bolts provide secure mounting.
- Tamper-resistant assembly; optional tamper indicator.
- Accommodates up to 12 AWG (3.25 mm<sup>2</sup>) wire.
- 100% synchronization activates both alarm panel and local bell simultaneously.
- 1" (25.4 mm) through 8" (203.2 mm) models available.
- Schedule 10/40 pipe.
- Water resistant.
- SEMS clamping plate.
- Can be vertically or horizontally mounted.
- Improved self-guiding security screws and removal tool.
- Adjustable pneumatic delay (0 to 70 seconds) prevents false alarms due to water surges.
- Serviceable without draining pipe.
- Requires no power to operate sensing mechanism.
- Useful for waterflow rates up to 15 feet per second (4.57 meters per second).

## OPERATION

Water flowing in the pipe deflects the detector's vane, which operates a linkage to release the pneumatic delay shaft. The stop on the shaft then releases the switch levers at a rate determined by the presetting of the pneumatic delay mechanism. When the shaft and its stops have pulled far enough away, the spring operated switch levers actuate both SPDT switches, which each have N.O. and N.C. terminals that can be used to initiate an alarm or auxiliary indication.

When water stops flowing, the vane is no longer deflected and a spring draws the actuator arm of the linkage back against the stops on the pneumatic delay shaft, closing the switch levers and returning the device to its normal condition. Observe switch activation with cover open.

The pneumatic delay mechanism is adjustable within a range of 0 to 70 seconds. It incorporates an automatic, noncumulative reset to accommodate a sequence of surges without acquiring an accumulated delay greater or less than the preset value. As shipped, the adjustment dial is set for a delay of 20-30 seconds; but any value within the 0- to 70-second range can be selected in the field.

## APPLICATIONS

Detectors are used in wetpipe sprinkler systems to signal waterflow of 4 to 10 GPM. The flow could be due to the opening of one or more sprinkler heads or test valves, or it could be due to leakage or rupture of the piping.

By the appropriate choice of installation sites, the detectors can be used to signal general flow (installed in mains) or flow by zones (installed in branch lines). Either horizontal or vertical pipes can be utilized.

Common usages of these waterflow detectors include operating a bell or horn at the riser and signaling a control panel or master box.

If the detectors are used at the upper limits of their temperature ranges, especially at a 100% duty cycle, their working life may be significantly shortened.

The vane and linkage of the waterflow detectors CAN BE DAMAGED by the sudden rush of water when the control valve opens. DO NOT USE vane-type waterflow detectors in drypipe sprinkler systems, deluge systems, or pre-action systems. Use a pressure-actuated detector on such systems instead.

## SPECIFICATIONS

### WFD SERIES

**Static Pressure Rating:** 450 PSI.

**Triggering Threshold Bandwidth (flow rate):** 4 to 10 GPM.

**Maximum Surge:** 18 feet per second (FPS) (5.4864 m/sec).

**Compatible Pipe:** steel water pipe, schedule 10 through 40.

**Contact Ratings:** two sets of SPDT (Form-C) contacts; 10.0 A @ 125/250 VAC; 2.5 A @ 24 VDC only.

**Conduit Entrances:** two openings for 0.5" (12.7 mm) conduit. One open, one knock-out type.

**Operating Temperature Range:** 32°F to 120°F (0°C to 49°C).

**Enclosure Rating:** NEMA 4, suitable for indoor/outdoor use (UL Listed only).

**Cover Tamper Switch:** standard for ULC models; optional for UL models (P/N 546-7000).

**Shipping Weights:** 4.2 lbs. (1.9 kg) for WFD20; 4.3 lbs. (1.95 kg) for WFD25; 4.5 lbs. (2.04 kg) for WFD30 and WFD30-2; 4.7 lbs. (2.13 kg) for WFD35; 5.2 lbs. (2.36 kg) for WFD40; 6.3 lbs. (2.86 kg) for WFD50; 6.8 lbs. (3.08 kg) for WFD60; 7.5 lbs. (3.4 kg) for WFD80.

**Service Use:** NFPA 13 for Automatic Sprinkler; NFPA 13D for One- or Two-Family Dwelling; NFPA 13R for Residential Occupancies up to Four Stories; NFPA 72 for National Fire Alarm Code.

**Warranty:** 3 years.

**U.S. Patent Numbers:** 3,845,259 • 4,782,333 • 5,213,205

### WFDT AND WFDTNR MODELS

**Static Pressure Rating:** 250 PSI.

**Triggering Threshold Bandwidth (flow rate):** 4 to 10 GPM.

**Maximum Surge:** 18 feet per second (FPS) (5.4864 m/sec).

**Compatible Tee Fittings:** threaded ferrous and brass tees, copper sweat tees, CPVC tees, and polybutylene tees.

**Contact Ratings:** two sets of SPDT (Form-C) contacts; 10.0 A @ 125/250 VAC; 2.5 A @ 24 VDC.

**Overall Dimensions (installed):** WFDT: 4.5" (114.30 mm) x 3.75" (95.25 mm) x 6.7" (170.18 mm). WFDTNR: 3.75" (95.25 mm) x 3.25" (82.55 mm) x 4.25" (107.95 mm).

**Conduit Entrances:** 2 openings for 0.5" (12.7 mm) conduit.

**Operating Temperature Range:** 32°F to 120°F (0°C to 49°C).

**Enclosure Rating:** UL indoor/outdoor rating.

**Cover Tamper Switch:** standard for ULC models; optional for UL models (P/N 546-7000).

**Shipping Weights:** 2.6 lbs. (1.2 kg) for WFDT; 1.5 lbs. (0.7 kg) for WFDTNR.

**Service Use:** NFPA 13 for Automatic Sprinkler; NFPA 13D for One- or Two-Family Dwelling; NFPA 13R for Residential Occupancies up to Four Stories; NFPA 72 for National Fire Alarm Code.

**Warranty:** 3 years.

**U.S. Patent Numbers:** 3,845,259 • 4,782,333 • 5,213,205

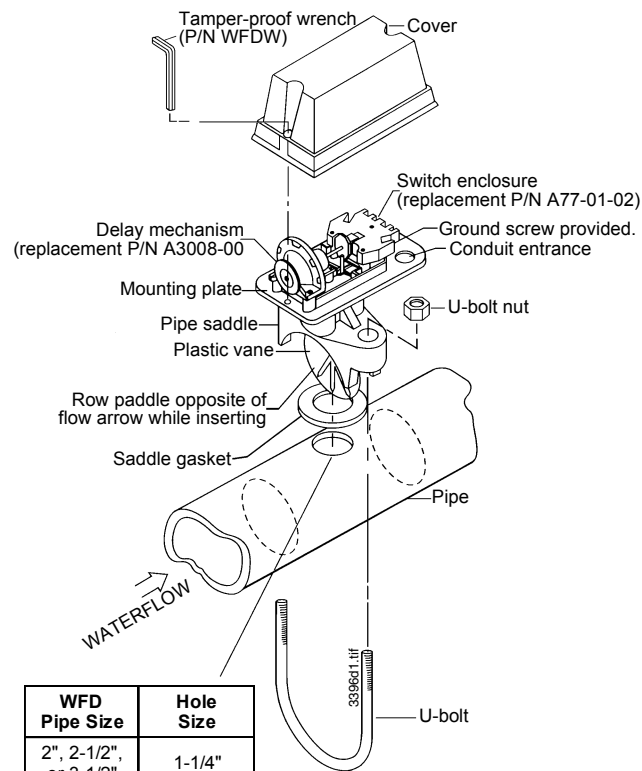
## ARCHITECTURAL/ENGINEERING SPECIFICATIONS

### WFD SERIES

Vane-type waterflow detectors shall be installed on system piping as designated on the drawing and/or as specified herein. Detectors shall mount on any clear pipe span of the appropriate nominal size, either a vertical upflow or horizontal run, at least 6" (152.4 mm) from any fittings which may change water direction, flow rate, or pipe diameter; or no closer than 24" (0.6096 m) from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 450 psi for 2" (50.8 mm) to 8" (203.2 mm) pipes. The detector shall respond to waterflow in the specified direction after a preset time delay which is field-adjustable. The delay mechanism shall be a sealed mechanical pneumatic unit with visual indication of actuation. The actuation mechanism shall include a polyethylene vane inserted through a hole in the pipe and connected by a mechanical linkage to the delay mechanism. Outputs shall consist of dual SPDT switches (Form-C contacts). Two conduit entrances for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. Unless noted, enclosures shall be NEMA 4 Listed by Underwriters Laboratories Inc. All detectors shall be Listed by Underwriters Laboratories Inc. for indoor or outdoor use.

## WFDT or WFDTNR Models

Model shall be a WFDT or WFDTNR as manufactured by System Sensor. T-tap waterflow detectors shall be installed on a tee that has a 1" (25.4 mm) NPT branch, including: 1" (25.4 mm), 1.25" (31.75 mm), or 1.5" (38.1 mm) threaded ferrous or brass tees; 1" (25.4 mm) to 2" (50.8 mm) copper sweat tees; Central, Spears®, or Victaulic® brand 1" (25.4 mm) CPVC tees; or 1.5" (38.1 mm) polybutylene tee as designated on the drawings and/or specified herein. Detectors shall mount on any clear pipe span of the appropriate size, either a vertical or horizontal run at least 6" (152.4 mm) from any fittings or valves which may change water direction, flow rate, or pipe diameter; or no closer than 24" (0.6096 m) from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 250 psi. The retard t-tap detector shall be a sealed mechanical pneumatic unit with visual indication of actuation. The actuation mechanism shall include a polyethylene vane inserted through the tee fitting and connected by a mechanical linkage to the delay mechanism. The non-retard t-tap detector shall respond with no time delay



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to waterflow in the specified direction and range. Outputs shall consist of dual SPDT switches (Form-C contacts). Two conduit entrances (one of which is knock-out type) for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. All detectors shall be Listed by Underwriters Laboratories Inc. for indoor or outdoor use.

## Agency Listings and Approvals

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

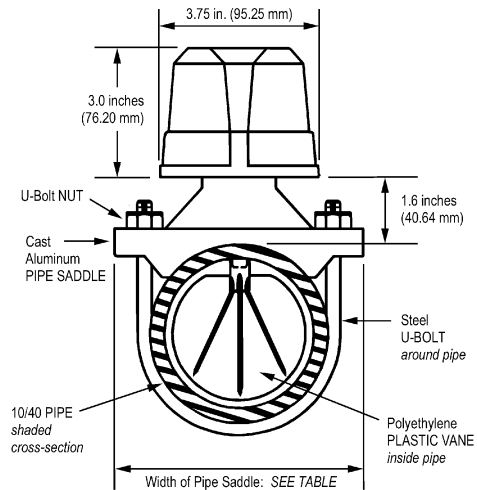
- **UL Listed:** S739
- **ULC Listed:** S739
- **MEA Listed:** 167-93-E
- **CSFM:** 7770-1653:114
- **FM Approved**

## Mechanical Delay Adjustment

Dial Setting	0	1	2	3	4	5
Seconds (±50%)	0	15	30	45	55	70

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## WFD Dimensions (installed)



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## WFD Dimensions (installed)

Detector Model	Pipe Saddle Width
WFD20	4.6" (116.84 mm)
WFD25	4.6" (116.84 mm)
WFD30-2	5.2" (132.08 mm)
WFD35	5.7" (144.79 mm)
WFD40	6.8" (172.72 mm)
WFD50	7.8" (198.12 mm)
WFD60	9.0" (228.60 mm)
WFD80	10.8" (274.32mm)

## Ordering Information

WFD Series Detectors			
UL Models	ULC Models	Pipe Size	Hole Size
WFD20	WFD20A	2.0" (50.8 mm)	1.25" (31.75 mm)
WFD25	WFD25A	2.5" (63.5 mm)	1.25" (31.75 mm)
WFD30-2	WFD30-2A	3.0" (76.2 mm)	2.00" (50.8 mm)
WFD35	WFD35A	3.5" (88.9 mm)	1.25" (31.75 mm)
WFD40	WFD40A	4.0" (101.6 mm)	2.00" (50.8 mm)
WFD50	WFD50A	5.0" (127 mm)	2.00" (50.8 mm)
WFD60	WFD60A	6.0" (152.4 mm)	2.00" (50.8 mm)
WFD80	WFD80A	8.0" (203.2 mm)	2.00" (50.8 mm)

WFDT(NR) T-Tap Detectors	
Model Number	Description
WFDT	Waterflow detector. Fits: 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm) ferrous and brass threaded tees; 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm), 2" (50.8 mm) copper sweat tees; 1" (25.4 mm) CPVC tees; and 1.5" (38.1 mm) polybutylene tees.

Accessories and Replacement Parts	
Model Number	Description
WFDW	Tamper-proof wrench for metal cover, WFD, WFDT(NR).

WFD Series Detectors		
UL Models	Pipe Size	Hole Size
WFD20	2.0" (50.8 mm)	1.25" (31.75 mm)
WFD25	2.5" (63.5 mm)	1.25" (31.75 mm)
WFD30-2	3.0" (76.2 mm)	2.00" (50.8 mm)
WFD35	3.5" (88.9 mm)	1.25" (31.75 mm)
WFD40	4.0" (101.6 mm)	2.00" (50.8 mm)
WFD50	5.0" (127 mm)	2.00" (50.8 mm)
WFD60	6.0" (152.4 mm)	2.00" (50.8 mm)
WFD80	8.0" (203.2 mm)	2.00" (50.8 mm)

WFDT(NR) T-Tap Detectors	
Model Number	Description
WFDT	Waterflow detector. Fits: 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm) ferrous and brass threaded tees; 1" (25.4 mm), 1.25" (31.75 mm), 1.5" (38.1 mm), 2" (50.8 mm) copper sweat tees; 1" (25.4 mm) CPVC tees; and 1.5" (38.1 mm) polybutylene tees.

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