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# WFDE Vane-type Waterflow Detector

## SPECIFICATIONS

Contact Ratings:	10 A @ 125/250 VAC ~ ; 2.5 A @ 24 VDC ---
Triggering Flow Rate:	Refer to Table 1
Static Pressure Rating (maximum):	17.25 bar (250 psi) (1725 KPa); 16 bar (VdS)
Operating Temperature Ranges:	0°C to 68°C (32°F to 155°F)
Compatible Pipe:	Steel Water Pipe (Refer to Table 1)
Shipping Weight:	1.8 – 3.2 Kilograms
Enclosure Rating:	Nema4/IP54

EC-certificate Number: 0786-CPD-40151  
 EN12259-5

## IMPORTANT

### Please Read Carefully And Save

This instruction manual contains important information about the installation and operation of waterflow detectors. Purchasers who install waterflow detectors for use by others must leave this manual or a copy of it with the user.

Read all instructions carefully before beginning. Follow only those instructions that apply to the model you are installing.

### CAUTION

Use vane-type waterflow detectors in wet-pipe systems only. DO NOT USE IN DRY-PIPE, DELUGE, OR PRE-ACTION SYSTEMS. The sudden inrush of water in such systems may break the vane or damage the mechanism.

Do not use in potentially explosive atmospheres. Do not leave unused wires exposed.

## PRINCIPLES OF OPERATION

Vane type waterflow detectors mount to water-filled pipes in sprinkler systems. Waterflow in the pipe deflects a vane. Deflection of the vane produces a switched output, usually after a specified delay. All WFDEs have a pneumatically controlled mechanical delay mechanism. Delays are noncumulative; they reset if the flow of water stops or drops below minimum triggering flow rate before the entire delay has elapsed. All detectors will activate on a sustained flow of water greater than the maximum specified in Table 1, but will not activate if the flow rate is less than the minimum specified in Table 1.

This System Sensor installation manual covers the following waterflow detectors for sprinkler/fire alarm applications.

TABLE 1:

Model Number	DN Ref. Pipe Size (mm (in))	VdS		Triggering Flow Rate (liters/min)	LPCB	
		Nominal Pipe O.D. (mm)	Wall Thickness (mm)		Nominal Pipe O.D. (mm)	Wall Thickness (mm)
WFD20E	50 (2)	60.3	2.3/2.9	30-57	60.3	3.6
WFD25E	66 (2.5)	76.1	2.6/2.9		76.0	3.6
WFD30-2E	80 (3)	88.9	2.9/3.2		88.8	4.0
WFD40E	100 (4)	114.3	3.2/3.6		114.1	4.5
WFD60E	150 (6)	168.3	4.0/4.5		165.1	5.0
WFD80E	200 (8)	219.1	4.5/5.9		219.1	6.3

## STEEL PIPE COMPATIBILITY

### CAUTION

DO NOT USE THE ABOVE MODELS ON COPPER PIPE. The clamping forces of the mounting bolts may collapse the pipe sufficiently to prevent the detector from functioning properly.

DO NOT INSTALL STEEL OR IRON PIPE SECTIONS IN COPPER PIPING FOR MOUNTING A WATERFLOW DETECTOR. Incompatibility between the dissimilar metals will cause bimetallic corrosion.

## INSTALLATION GUIDELINES

Before installing any waterflow alarm device, be thoroughly familiar with national codes of practice and the requirements of the authority having jurisdiction.

Failure to follow these directions may result in failure of the device to report a waterflow condition. System Sensor is not responsible for devices that have been improperly installed, tested or maintained.

1. Mount the detector where there is adequate clearance for installation and removal and a clear view of it for inspections. See Figure 1 for mounting dimensions.
2. Locate the unit 1.8 – 2.1 meters above the floor to protect from damage.
3. On horizontal runs, position the detector on top or on the side of the pipe. Do not mount it upside down because condensation may collect in the housing and impair the operation of the detector. For vertical flow applications, mount detector on pipe where upflow conditions exist. Failure to do so may prevent unit from operating properly.
4. Mount detector at least 15 cm from a fitting which changes the direction of the water flow, or no closer than 61 cm from a valve or drain.
5. BE SURE DIRECTION-OF-FLOW ARROW MATCHES ACTUAL DIRECTION OF FLOW IN THE PIPE.

## MOUNTING INSTRUCTIONS

1. Drain the pipe.
2. Cut a hole in the desired location. Center the hole in the pipe as shown in Figure 2, and be sure the hole is perpendicular to the center of the pipe. If the hole is off center, the vane will bind against the inside wall of the pipe. Use a drill or hole saw to cut a hole of the proper diameter. See Table 2 for hole size. Before drilling, use a punch or scribe to mark the drill site to keep the bit from slipping.

### CAUTION

When drilling out hole, make certain that center of hole saw cut does not remain in pipe.

TABLE 2:

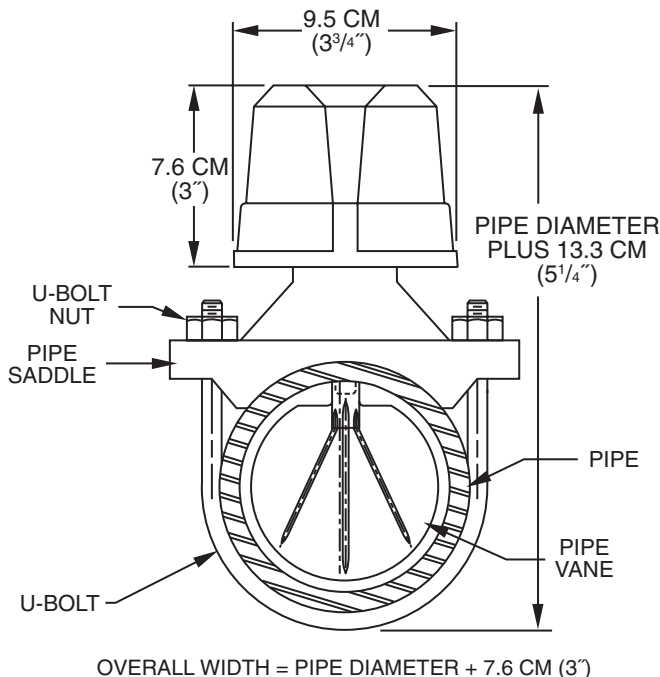
MODEL NUMBER	HOLE DIAMETER	TORQUE SETTING
WFD20E	31.8 mm +1.6 mm 1 1/4 in + 1/16 in	40.7 - 47.5 NT-M 30 - 35 FT-LBS
WFD25E		
WFD30-2E	50.8 mm + 1.6 mm 2 in + 1/16 in	74.6 - 81.3 NT-M 55 - 60 FT-LBS
WFD40E		
WFD60E		
WFD80E		

3. Remove burrs and sharp edges from hole. Clean out scale and foreign matter from inside wall of pipe to ensure free movement of the vane. Clean the outside of the pipe to remove dirt, metal chips, and cutting lubricant.
4. Seat the saddle gasket against the saddle and mount detector directly to pipe. Carefully roll the vane opposite the direction of flow and insert it through the hole (see Figure 5). Seat the saddle firmly against the pipe so that the locating boss goes into the hole.
5. Install the U-bolt around the pipe. Thread both nuts onto the U-bolt and tighten them alternately to ensure a uniform seal. See Table 2 for torque values.
6. Remove the metal cover with the tamper proof wrench provided. Move the actuator lever back and forth to check for binding. If the vane binds, remove the detector and correct the problem before proceeding.

### CAUTION

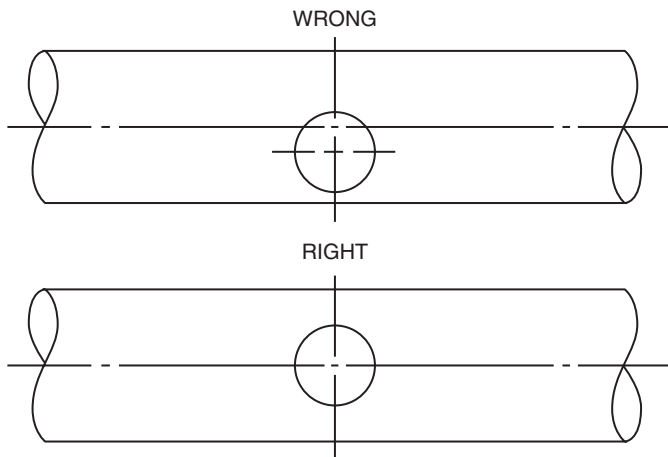
Be sure the direction-of-flow arrow points in the correct direction, otherwise a waterflow condition will go unreported. See Figure 5.

**FIGURE 1. MOUNTING DIMENSIONS:**



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**FIGURE 2. LOCATION OF MOUNTING HOLE:**



REMOVE BURRS FROM EDGE OF HOLE. CLEAN OUT SCALE AND FOREIGN MATTER FROM INSIDE WALL OF PIPE.

W0106-00

**PREOPERATION TESTING**

1. Fill the sprinkler system and check for leaks around the WFDE. If it leaks, first check for proper torque on U-bolt nuts. If leak persists, drain the system and remove the detector (see removal instructions under Maintenance). Check for dirt or foreign objects under the gasket. Check that pipe surface is not dented. Reinstall the detector and check again for leaks. Do not proceed until all leaks have been stopped.
2. Connect an ohmmeter or continuity tester across (COM and B-NO) terminal switch contacts (see Figure 3). The ohmmeter should show an open circuit, no continuity.
3. Deflect the actuator lever and hold it until the pneumatic delay shaft releases the switch buttons. The ohmmeter or continuity tester should show a short circuit after the delay has elapsed. If there is no delay, check the setting of the delay adjustment dial.

**FIELD WIRING**

1. All models have two SPDT switches. Switch contacts (COM and B-NO) are closed when water is flowing and open when water is not flowing. Connect the switches as shown in Figure 3 depending on the application.
2. When connected to a listed sprinkler/fire alarm control panel, the initiating circuit must be non-silenceable.

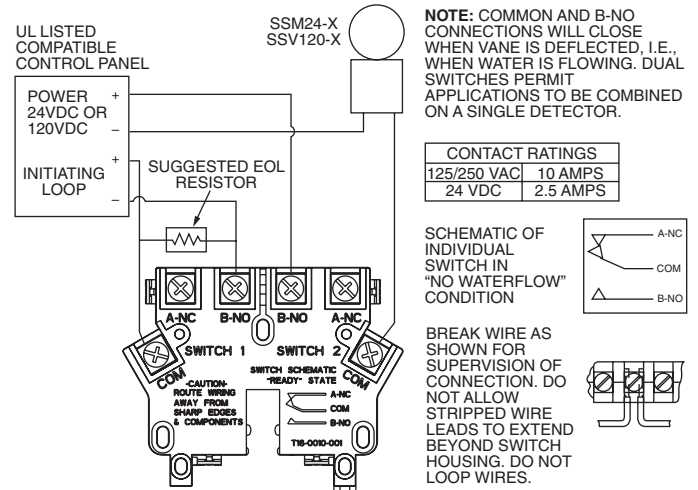
3. A ground screw is provided with all WFDE units. When grounding is required, clamp wire with screw in hole located between conduit entrance holes, see Figure 6.
4. Use proper waterproof conduit fittings where required.
5. A 22.2 mm conduit hole is provided for electrical connection. An additional 22.2 mm diameter knockout is provided for multiple line connections.

**WARNING**

High Voltage. Electrocutation Hazard. Do not handle live AC wiring or work on a device to which AC power is applied. Doing so may result in severe injury or death.

When utilizing switches at voltages greater than 74VDC  $\overline{\overline{\overline{\quad}}}$  or 49VAC  $\sim$  means to provide all-pole disconnection must be incorporated in the field wiring, such as a circuit breaker.

**FIGURE 3. FIELD WIRING:**



W0356-00

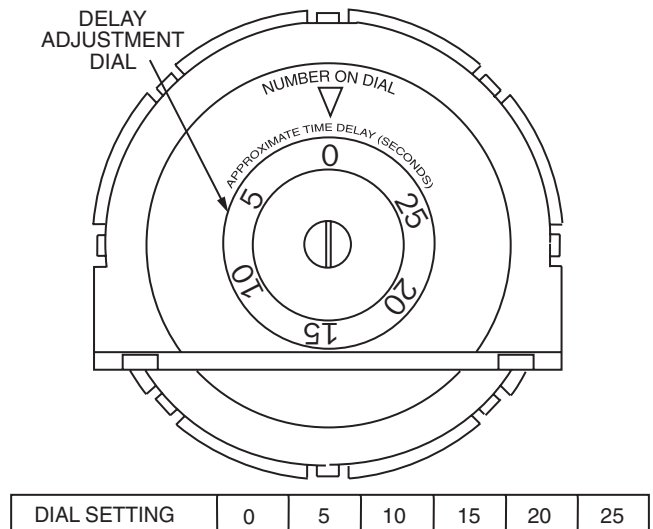
**MECHANICAL DELAY ADJUSTMENT**

The pneumatic delay is preset at dial setting 25 at the factory. To adjust the delay, turn the adjustment dial on the delay mechanism. Turn clockwise to increase the delay, counterclockwise to decrease the delay. Delay can be adjusted over a range from 0 to 30 seconds maximum, see Figure 4.

NOTE: Set the delay to the minimum required to prevent false alarms due to flow surges.

After extended service, parts of the detector may become worn reducing the delay time and causing false alarms. If this happens, increase the delay.

**FIGURE 4. DELAY ADJUSTMENT DIAL:**



DIAL SETTING EQUALS DELAY IN SECONDS REFERENCE ONLY.

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### OPERATIONAL TESTING

Always notify the central station monitoring waterflow alarms before repairing, maintaining or testing waterflow alarm devices.

1. Replace the cover and tighten the security screws with the security wrench. Store the wrench in a secure place.
2. Open the inspector's test valve and time how long it takes for the detector to indicate a flow condition. The detector should remain activated until the inspector's test valve is closed. Air pockets in the sprinkler system may increase the apparent time delay.

### MAINTENANCE

To prevent accidental water damage, control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.

Inspect detectors monthly for leaks. If leaks are found, replace the detector. Test detectors at least quarterly as described under Operational Testing above to insure proper operation. Test more often as required by applicable codes or standards.

Under normal conditions System Sensor waterflow detectors should provide years of trouble-free service. If any part of the detector does not perform properly, replace the entire detector. Failure to follow this instruction may result in failure of the detector to report a waterflow condition.

Proceed as follows to remove a detector:

1. Drain the pipe.
2. Turn off electrical power to the detector, and then disconnect wiring.
3. Loosen nuts and remove U bolts.
4. Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
5. Lift detector clear of pipe.

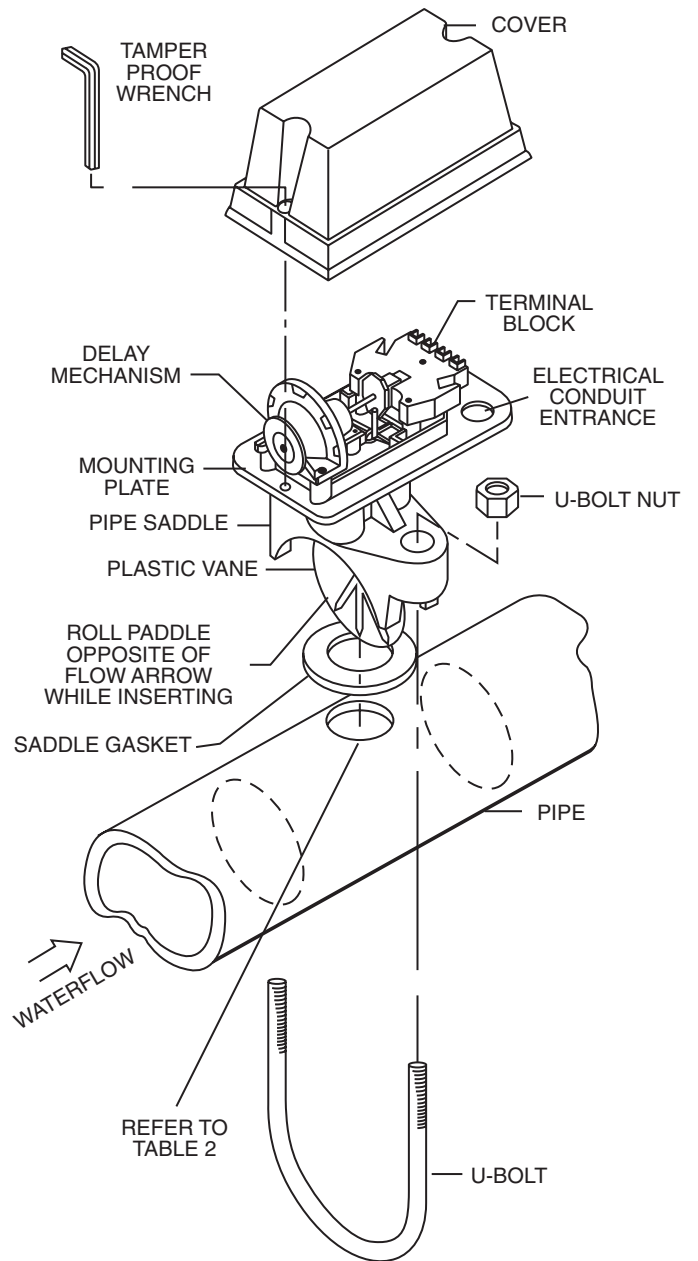
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#### **CAUTION**

If a vane breaks off in a pipe, find and remove it. Failure to do so may restrict the proper flow of water to part of the sprinkler system.

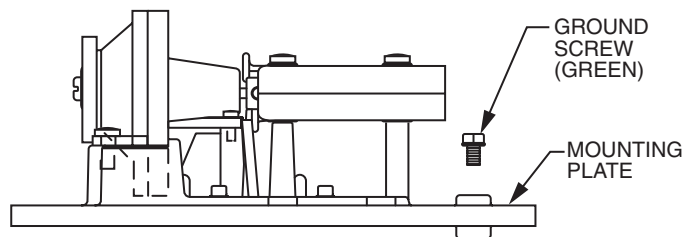
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**FIGURE 5. ASSEMBLY DIAGRAM:**



W0101-02

**FIGURE 6. GROUND SCREW LOCATION:**



W0103-00

## Please refer to insert for the Limitations of Fire Alarm Systems



### THE LIMITATIONS OF WATERFLOW ALARM DEVICES

1. Waterflow detectors may not work or operate properly if sprinkler piping being monitored is plugged with pipe scale, mud, stones or other foreign material. Sprinkler systems should be checked regularly for such blocking material.
2. Alarms generated by the activation of waterflow detectors may not be received by a central station if telephone or other communication lines to the detector are out of service, disabled, or open.
3. Vane-type waterflow detectors have a normal service life of 10–15 years. Hard water systems, however, may reduce waterflow detector service life significantly.
4. Waterflow detectors are not a substitute for insurance. Building owners should always insure property and lives being protected by sprinkler systems.
5. If valves controlling the water supply to a sprinkler system are closed, vane-type waterflow detectors will not work. All valves controlling a sprinkler water supply should be sealed or locked in the normally open position. The normally open position should be monitored by a sprinkler supervisory switch.

### THREE-YEAR LIMITED WARRANTY

System Sensor warrants its enclosed product to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this air duct smoke detector. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the replacement of any part of the product which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Returns Department, RA

# \_\_\_\_\_, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.