



Water Flow Detector Fig. RDWFDTN

Important

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

The model RDWFDTN is a vane-type waterflow detector for use in wet-pipe fire sprinkler systems only. Vane-type waterflow detectors shall not be used as the sole initiating device in both deluge and preaction systems; waterflow detectors used in these types of systems may result in an unintended discharge caused by a surge, trapped air or a short retard time.

Warning

Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.

Shock hazard: Disconnect power source before servicing. Serious injury or death could result.

Risk of explosion: Not for use in hazardous locations. Serious injury or death could result.

Principles of Operation

Vane-type waterflow detectors mount to water-filled pipes in fire sprinkler systems. Waterflow in the pipe deflects a vane, which produces a switched output, usually after a specified delay.

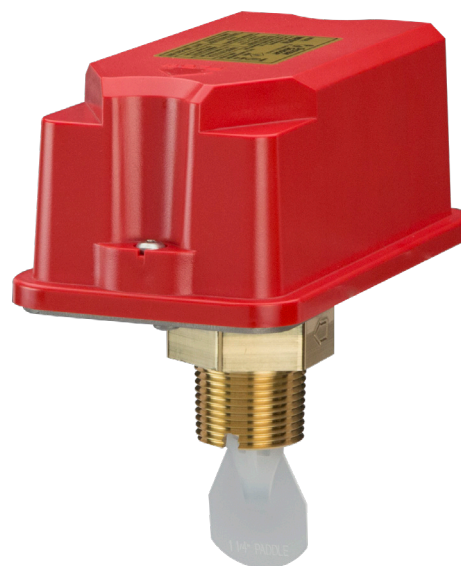
All RDWFDTNs have a pneumatically controlled mechanical delay mechanism. Delays do NOT accumulate; they reset if the flow of water stops or drops below minimum triggering flow rate before the entire delay has elapsed. All detectors will activate on a sustained flow of water of 10 gallons per minute (gpm) or greater downstream of the device.

Compatible Pipe Tee/Riser

The RDWFDTN is supplied with 12 paddles. One paddle is provided for each size of the threaded, sweat or plastic tee. See Figure 1 and approximate tee depth chart. Each paddle has an indication that shows the pipe size and type of tee to be used with. The RDWFDTN also fits 1", 1½", and 2" riser manifolds when used with paddle tree.

Approximate Tee Depth Requirements

Tee Depth	Threaded	Sweat	Spears (no insert)	Spears (with insert)
1" x 1" x 1"	2 1/8"	1 3/4"	2 1/8"	2 13/16"
1 1/4" x 1 1/4" x 1"	2 1/2"	2 1/8"	N/A	N/A
1 1/2" x 1 1/2" x 1"	2 3/4"	2 1/4"	3"	N/A
2" x 2" x 1"	3 1/4"	2 3/4"	N/A	N/A



Specification

Max. Working Pressure	25.8 bar (375 psi)
Contact Ratings	Two sets of SPDT (Form C) 10A @ 125/250V AC, 2.5A @ 24V DC
Triggering Threshold Bandwidth	4 to 10 gpm
Dimensions	101.6 × 88.9 × 170 mm (4" H × 3.5" W × 6.7" D)
Operating Temperature Range	0°C to 66°C (32°F to 150°F)
Enclosure Rating	NEMA Type 4, as tested by UL

Water Flow Detector

Fig. RDWFDTN

Installation Guidelines

Before installing any waterflow alarm device, be thoroughly familiar with:

NFPA 72: National Fire Alarm Code

NFPA 13: Installation of Sprinkler Systems

NFPA 25: Inspection, Testing, and Maintenance of Water-based Fire Protection Systems, Section 5.3.3.2

NFPA 13D: Standard for 1 and 2 Family Dwellings and Manufactured Homes

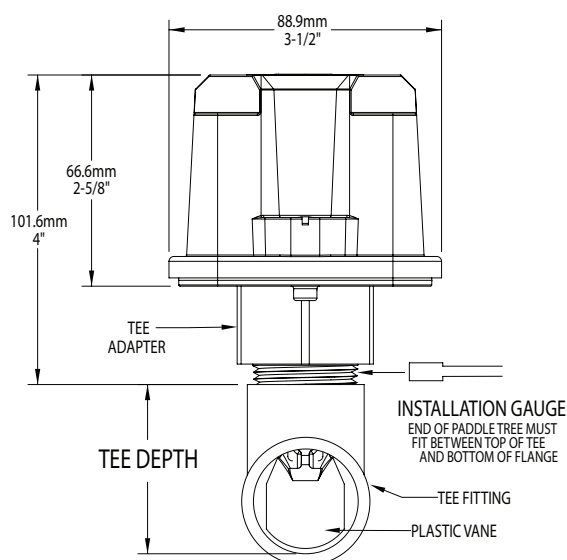
NFPA 13R: Standard for Multi-family Dwellings

Also, follow other applicable NFPA standards, local codes 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. Rapidrop 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 inspection. See Figure 1 for mounting dimensions.
2. Locate the detector 6 to 7 feet above the floor to protect from accidental damage.
3. On horizontal runs, position the detector on top or 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 6 inches from a fitting which changes the direction of the waterflow, or no less than 24 inches from a valve or drain.
5. BE SURE DIRECTION-OF-FLOW ARROW AND DIRECTIONAL COVER MATCHES ACTUAL DIRECTION OF FLOW IN THE PIPE. See Figure 5.

Figure 1. Mounting Dimensions



Mounting Instructions

1. The RDWFDTN waterflow detector is designed to fit only the appropriate tee fitting. NOTE: The outlet branch of tee must have a 1-inch NPT thread. Do not use a reducer to achieve the correct thread size. Failure to follow this instruction will result in failure of the detector to report a waterflow condition.
2. RDWFDTN units are shipped without paddles mounted to the actuator. Select the correct size paddle for the type of tee being used. Align hole on stem of paddle with hole on actuator lever. Fasten together using a #4-40x3/8-inch fillister head screw supplied in bag assembly. See Figure 2. Use only the screw provided with the unit. Drive screw head through hole in paddle until it seats to actuator lever surface. No washer is required. For paddle replacement refer to Maintenance section.
3. Carefully roll the vane opposite the direction of flow and insert through tee. Thread detector onto tee fitting and tighten with wrench. Use of thread sealant or tape is recommended. Use height gauge (located at end of paddle tree) to ensure proper depth of detector on tee fitting. See Figure 1. Height gauge must fit between top of tee fitting and under side of hex tee adapter. A gap between gauge and tee adapter is acceptable. When correctly installed, the detector must face in the proper direction of waterflow and be aligned with the pipe, the provided directional cover illustrates flow direction for device.
4. Remove the cover. 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 and directional cover point in the right direction, otherwise a waterflow condition will go unreported. See Figure 2 and Figure 5.

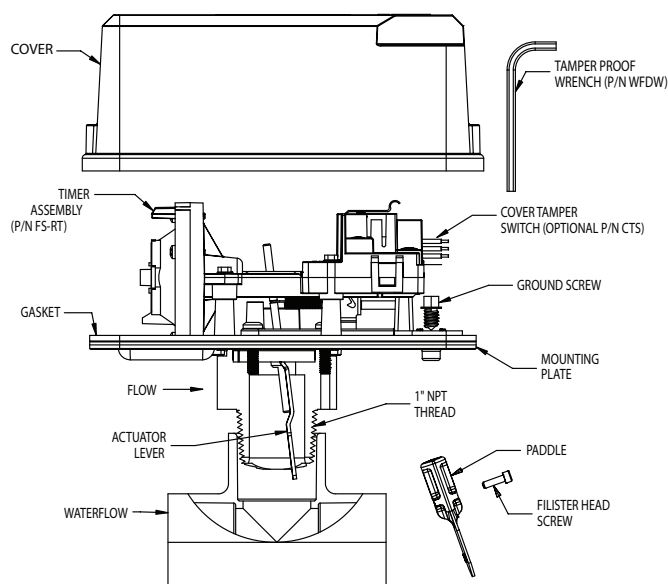
Pre-Operation Test

1. Fill the sprinkler system with water and check for leaks around the RDWFDTN. If there is a leak, check to see that the fittings are tight. If leak persists, drain the system and remove the detector (see removal instructions under Maintenance). Check for damaged threads or cracked fitting. 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. 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.

Water Flow Detector

Fig. RDWFDTN

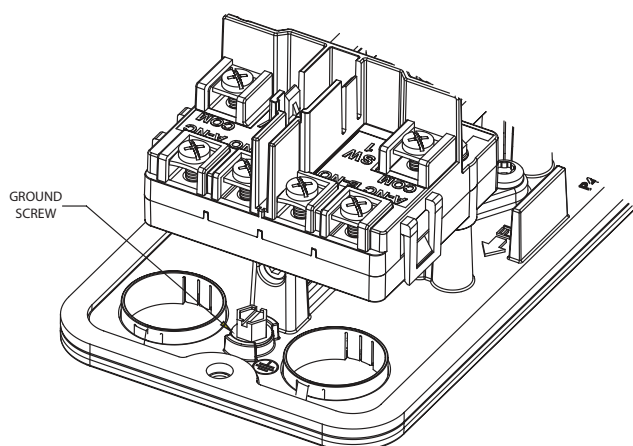
Figure 2. Assembly Diagram



Field Wiring

1. The RDWFDTN has 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 6 depending on the application.
2. When connected to a listed sprinkler/fire alarm control panel, the initiating circuit must be unable to be silenced.
3. A ground screw is provided with all units. When grounding is required, clamp wire with screw in hole located between conduit entrance holes. See Figure 3.
4. Use proper waterproof conduit fittings where required.

Figure 3. Knockout Plug Removal



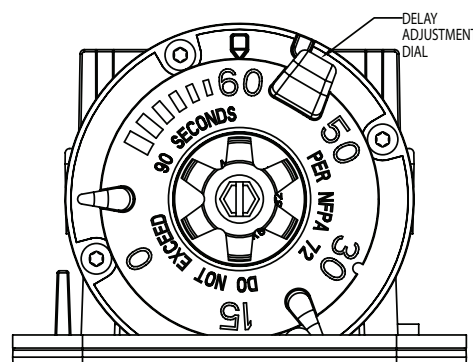
Mechanical Delay Adjustment

The pneumatic delay is preset at approximately 30 seconds 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 0-90 seconds maximum. See Figure 4. As a point of reference when setting time delay in dark environments the notch in the dial indicates an approximate 30 second time delay and the larger of the three tabs indicates an approximate 60 second time delay.

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 time delay and causing false alarms. If this happens, increase the delay. If the delay is already at maximum, replace the mechanical delay assembly.

Figure 4. Delay Adjustment Dial



NOTE: RETARD TIME MAY EXCEED 90 SECONDS. ADJUST AND VERIFY THAT TIME DOES NOT EXCEED 90 SECONDS. NUMBER ON DIAL IS APPROXIMATE TIME DELAY IN SECONDS

Water Flow Detector

Fig. RDWFDTN

Operational Test

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

1. Replace the cover and tighten the security screws with the tamper proof 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.

Figure 5. Directional Cover

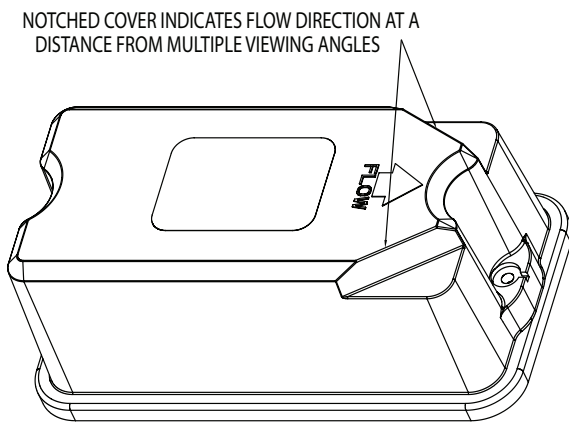
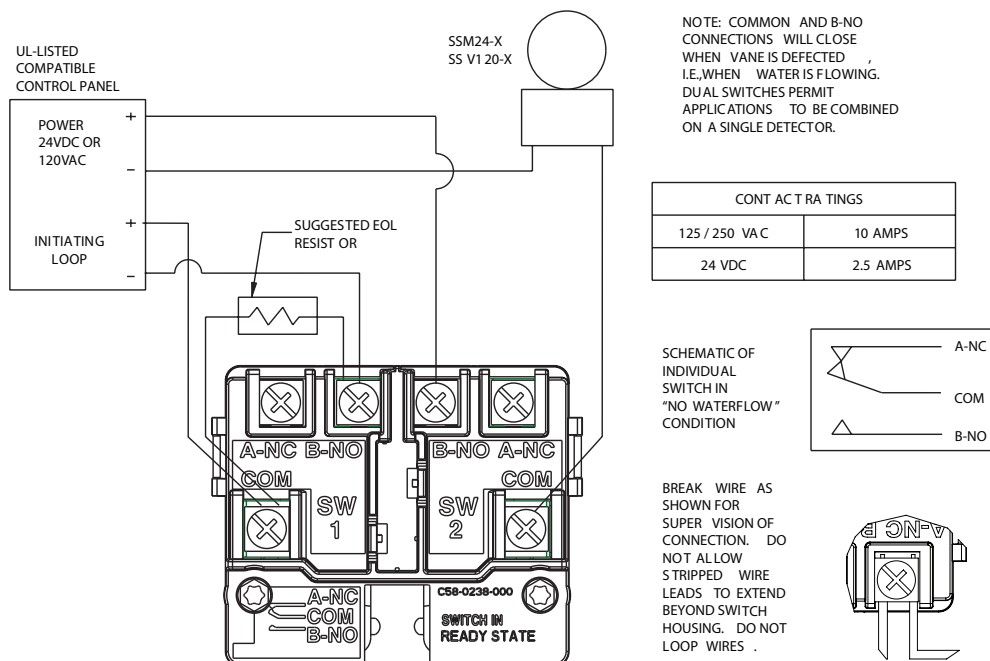


Figure 6. Wiring Diagram



Maintenance

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

Inspect detectors in accordance with applicable NFPA codes and standards and/or the authority having jurisdiction for leaks and replace if leaks occur. Test detectors at least quarterly as described under Operational Testing to insure proper operation. Test more often if required by the authority having jurisdiction.

Under normal conditions Rapidrop waterflow detectors should provide years of trouble-free service. However, if the delay mechanism becomes faulty, a replacement kit is available. To replace the delay mechanisms, request Part No. FS-RT. Complete instructions are enclosed with replacement parts. The delay mechanism can be easily replaced without removing the detector from the pipe or draining the pipe. If damage occurs to paddle, order replacement kit, request Part No. PRK9. Refer to procedure below for removal of detector on pipe. Do not repair or replace any other waterflow detector components in the field. If any other 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. Unscrew RDWFDTN from tee fitting.
4. Lift detector clear of pipe.