



Explosion Proof Water Flow Detector

Fig. RDWFDN

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 RDWFDEXP 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.

Do NOT use any of the RDWFDEXP 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 causes bimetallic corrosion.

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 sprinkler systems. Waterflow in the pipe deflects a vane, which produces a switched output—usually after a specified delay. All waterflow detectors have a pneumatically controlled mechanical delay mechanism. Delays do NOT accumulate; they reset if the flow of water stops before the entire delay has elapsed.

All switches actuate when the water flow rate is 10 gallons per minute or greater, but will not actuate if the flow rate is less than 4 gallons per minute. This Rapidrop installation manual covers the following waterflow detectors for sprinkler/fire alarm applications.

Caution

Contact the appropriate personnel regarding the proper tools and procedures when installing this device in a "HAZARDOUS" area. Disconnect supply circuits before opening the cover, to reduce the chances of ignition of hazardous atmospheres. Secure the cover and cover screws prior to activating circuits. Tighten cover screws to 4.5 Nm min.



Specification

Max. Working Pressure	31 bar (450 psi)
Contact Ratings	10A @ 125/250V AC, 2.5A @24V DC
Triggering Threshold Bandwidth	4 to 10 gpm
Dimensions	101 × 223 × 178 mm (4" H × 8.8" W × 7" D)
Operating Temperature Range	0°C to 49°C (32°F to 120°F)
Compatible Pipe	Steel water pipe, schedule 10 through 40
Enclosure Rating	NEMA Type 4, as tested by UL
Hazardous Atmosphere Classification	Class I, Groups B, C, D Div. 1 Class II, Groups E, F, G Div. 1 Class III Div. 1

Sizes

Model	Pipe Size		Pipe Schedule
	mm	in	
RDWFD20EXP	DN50	2"	10 thru 40
RDWFD25EXP	DN65	2 1/2"	10 thru 40
RDWFD30-2EXP	DN80	3"	10 thru 40
RDWFD40EXP	DN100	4"	10 thru 40
RDWFD50EXP	DN125	5"	10 thru 40
RDWFD60EXP	DN150	6"	10 thru 40
RDWFD80EXP	DN200	8"	10 thru 40



Explosion Proof Water Flow Detector Fig. RDWFDN

Installation Guidelines

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

NFPA 72: National Fire Alarm Code

NFPA 13: Installation of Sprinkler Systems, Sect. 3.17

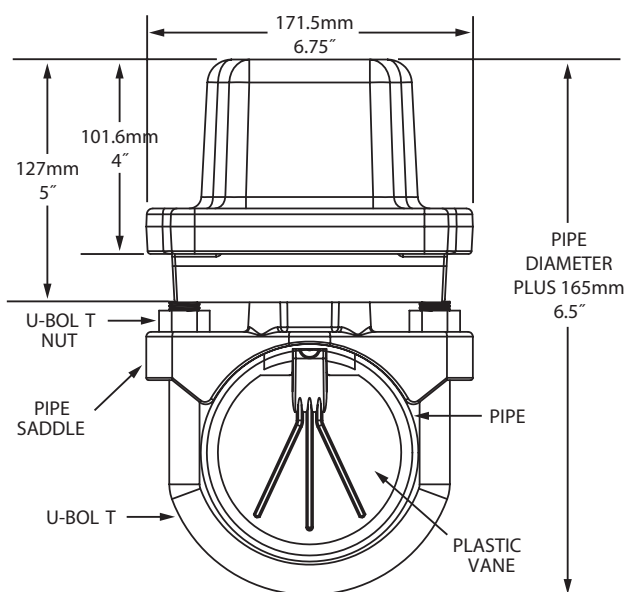
NFPA 25: Inspection, Testing and Maintenance of Sprinkler Systems, Sect. 5.3.3.2

Other applicable NFPA standards, local codes, and the requirements of the authority having jurisdiction

NOTE: Installation methods other than those listed in this installation manual may prevent the device from reporting the flow of water in the event the associated fire sprinkler system is activated by a fire. 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 inspections. 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 the 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 the detector on pipe through which water flows upward. Otherwise, the unit may not operate properly.
4. Mount the detector at least 6 inches from a fitting that changes the direction of waterflow and no less than 24 inches from a valve or drain.
5. Be sure the direction-of-flow arrows and directional cover match the direction of flow in the pipe. See Figure 6.

Figure 1. Mounting Dimensions



Mounting Instructions

The model RDWFDN 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

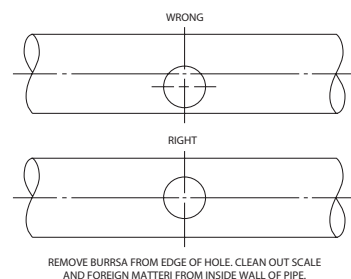
1. Drain the pipe.
2. Cut a hole in the pipe at the desired location. Center the hole on the pipe, as shown in Figure 2, and be sure the hole is perpendicular to the center of the pipe. Before drilling, use a punch or scribe to mark the drill site to prevent the bit from slipping. If the hole is off 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 1 for hole size.
3. Remove burrs and sharp edges from the hole. Clean and remove all scale and foreign matter from the inside of the pipe for a distance equal to the pipe diameter on either side of the hole to ensure free movement of the vane. Clean the outside of the pipe to remove dirt, metal chips, and cutting lubricant.
4. Seat the gasket against the saddle and mount the detector directly to the pipe. Carefully roll the vane opposite the direction of flow and insert it through the hole (see Figure 3). Seat the saddle firmly against the pipe so that the locating boss goes into the hole.
5. Install the U-bolt, tightening the nuts alternately to ensure a uniform seal (see Table 1 for torque values).
6. Remove the 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 cause before proceeding.

Caution

Be sure the direction-of-flow arrow and directional cover point in the correct direction or else waterflow will go unreported. See Figure 3 and Figure 6.

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

Figure 2. Mounting Hole Location



Model	Hole Size	Torque
20, 25	31.8 mm (1 1/4")	40 - 47 Nm
30, 40, 50, 60, 80	50.8 mm (2")	74 - 81 Nm

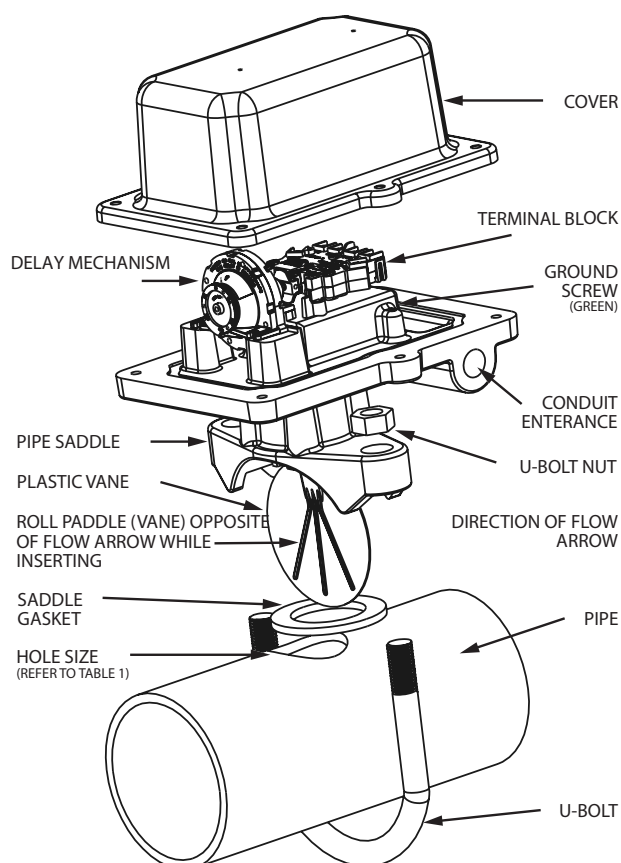
Explosion Proof Water Flow Detector

Fig. RDWFDN

Pre-Operation Test

1. Fill the fire sprinkler system and check for leaks around the waterflow detector. If it leaks, first check for the proper torque on the U-bolt nuts. If the leak persists, drain the system and remove the detector (refer to Maintenance). Check for dirt or foreign objects under the gasket, and make sure that the 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 the COM and B-NO switch terminals. The ohmmeter should indicate an open circuit.
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.

Figure 3. Assembly Diagram



Field Wiring

1. All models have two SPDT switches. Switch contacts COM and B-NO are closed when water is flowing and open when it is not. Connect the switches, as shown in Figure 5, depending on the application.
2. When connected to a listed fire sprinkler/fire alarm control panel, the initiating circuit must be unable to be silenced.
3. A ground screw is provided with all waterflow detectors. 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.

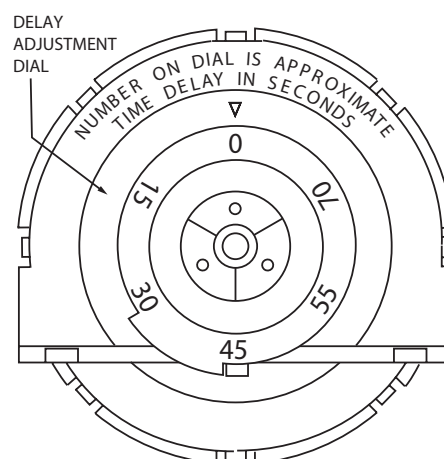
Mechanical Delay Adjustment

The pneumatic delay is preset at the factory to 30 seconds. To adjust the setting, turn the adjustment dial clockwise to increase the delay, counterclockwise to decrease it. The delay is adjustable from 0 to 90 seconds max. See Figure 4.

NOTE: Set the delay to the minimum required to prevent false alarms from 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. If the delay is already at the maximum, replace the mechanical delay assembly.

Figure 4. Delay Adjustment Dial



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 WITH AN ACCURACY OF $\pm 50\%$

Explosion Proof Water Flow Detector Fig. RDWFDN

Operational Testing

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

1. Replace the cover and tighten the tamper proof 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 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 in accordance with applicable NFPA codes and standards and/or the Authority Having Jurisdiction for leaks and replace if a leak occurs. Test detectors at least quarterly, as described under Operational Testing, to ensure 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 mechanism, request Part No. FS-RT. Complete instructions are enclosed with replacement parts. The mechanism can be easily replaced without removing the detector from the pipe or draining the pipe. Do not repair or replace any other waterflow detector components. If any other part of the detector does not perform properly, replace the entire detector. Installation methods other than those listed in this installation manual may prevent the device from reporting the flow of water in the event the associated sprinkler system is activated by a fire. Rapidrop is not responsible for devices that have been improperly installed, tested, or maintained.

To remove a detector:

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

Figure 5. Wiring Diagram

