

400Y Torrent Dry-Pipe Valve



Installation Operation Maintenance Manual (IOM)

Rev. 31.07.2017

Safety First

BERMAD believes that the safety of personnel working with and around our equipment is the most important consideration. Please read all safety information below and any other relevant source before attempting to perform any maintenance function. Comply with all approved and established precautions for working with your type of equipment and/or environment. Authorized personnel should perform all maintenance tasks.

Prior to performing a procedure, read it through to the end and understand it. If anything is not clear, ask the appropriate authority. When performing a procedure, follow the steps in succession without omission.

1. General

The Bermad 400Y-DP Dry Pipe Valve is equipped with URV Low Pressure Actuator type pilot valve and Air Release Accelerator (AR), which locks it into an open position during system activation.

The BERMAD 400Y-Y Water Control Valve designed for vertical or horizontal installation, it has straight-through design provides high flow capabilities with minimum head loss and the removable cover enables quick in-line service. The elastomeric assembly can be easily removed from the valve body with no need for disassembling of the valve from the line.

1.1 Optional Features

- Valve Position Indicator and Namur interface for industrial switch box
- Valve Seat Ring
- Alarm Pressure Switches
- Water Motor Alarm
- Seawater construction

1.2 Approvals

The Bermad 400Y-DP Dry Pipe Valve is UL Listed and FM Approved when installed with specific components & accessories. Refer to the current UL and/or FM fire protection equipment directory. Consult Bermad for any component approval recently to appear in any equipment directory.

1.3 Principal Of Operation

The Bermad 400Y-DP that is assembled with specific trim is suitable for systems that include adequate detecting and piping systems with open nozzles; the valve prevents water from entering the system piping and kept closed by pressure applied to the control chamber through a restricted priming line.

In the SET position (Fig 1-a), the water pressure supplied through the priming line is trapped in the control chamber of the water control valve and presses the valve seal disc down, thereby sealing the valve and keeping the system piping dry. Under FIRE conditions, when the pressure is released from the control chamber (Fig 1-b) by the opening of the automatic releasing device or by manual release, the water control valve opens and allows the inlet supply water to flow unrestricted through the valve and into the system piping and alarm devices.

WARNING: Whenever the handle of the Manual Emergency Release is pulled, pressure is released from the control chamber, the water control valve will open, and water will flow into system piping and alarm devices.

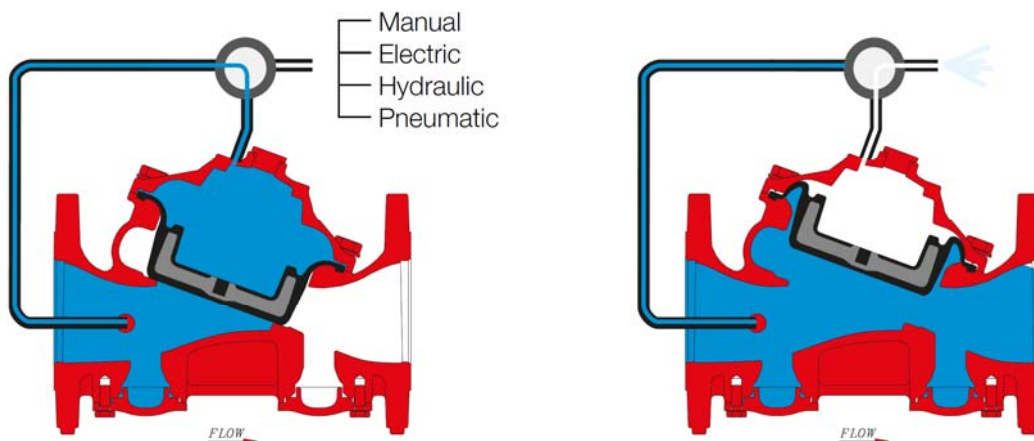


Fig 1 - a: Valve Closed (Set Position)

Fig 1 - b: Valve Open (Operating Conditions)

Table No. 1: Pressure Ratings

Valve End Connections	Standard	Rating/ Class	Max Working Pressure	
			barg	psig
Flanged	ANSI B16.5 / 16.42	#150	17.4	250
Flanged	ANSI B16.5 / 16.42	#300	25	365
Flanged	ISO 7005-2	PN16	16	235
Flanged	ISO 7005-2	PN25	25	365
Grooved	ANSI / AWWA C606	365	25	365

Table No. 2: 400Y Flow Ratings

Valves sizes	1.5"	2"	3"	4"	6"	8"	10"
Kv (Cv)	68 (79)	80 (92)	190 (219)	345 (398)	790 (912)	1160 (1340)	1355 (1652)
Leq m (ft), (Note 1)	2 (6)	4 (14)	8 (25)	8 (26)	13 (43)	27 (89)	55 (179)

Note 1: Valve Equivalent Length Value (Steel Pipe), for use in hydraulically calculated system

2. Installation

Notes:

- Proper operation of the FP 400-Torrent Deluge Valves depends upon their trim being installed in accordance with the appropriate trim configuration guidelines.
- Any deviation in trim size or arrangement may adversely affect the proper operation of the deluge valve.
- All the pilot system devices must be UL-Listed, FM Approved and compatible with the particular system. Refer to current "Fire Protection Equipment Directory".

Warning: The deluge valve and trim must be installed only in areas where they will not be subject to freezing temperatures.

2.1 Installation Instructions

- 2.1.1 Allow enough room around the valve assembly for any adjustments and future maintenance.
- 2.1.2 Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc.
Warning: not flushing the line may result in the valve being rendered inoperable.
- 2.1.3 Install the valve on the pipeline so that the valve flow arrow designated on the body casing points in the desired direction. Ensure that the valve is positioned so that the cover can be easily removed for future maintenance.
- 2.1.4 Install a Listed indicating valve upstream of the Dry Pipe valve (supervised "open").
- 2.1.5 Install another Listed Indicating Valve downstream of the Dry Pipe Valve (supervised "open") to shut off and isolate the sprinkler piping in order to allow water flow testing and maintenance.
- 2.1.6 Install a Drain Valve of appropriate size downstream of the Dry Pipe Valve (normally closed), this drain valve shall be installed between the Dry Pipe valve and the downstream Indicating Valve for flow test and accumulated water drain.
- 2.1.7 The water supply priming line must be connected to the upstream of the main isolating valve.
- 2.1.8 Subject to all other instructions, drawings and technical specifications, which describe Bermad Valve, install in their proper positions the components comprising the Water Control Trim Package, according to the drawing relevant to the specific type, hereby enclosed.
- 2.1.9 Install the necessary accessories, which appear in the drawing.
- 2.1.10 All additional accessories, although not packed together with the BERMAD Dry Pipe valve, must be installed as shown in the relevant drawing and other illustrations.
- 2.1.11 Install additional accessories that are required by the NFPA codes or by authorities having jurisdiction.
- 2.1.12 After installation in the main line, carefully inspect/correct any damaged accessories, piping, tubing, or fittings; ensure that there are no leaks.

2.2 System Air-Pressure Requirements

The system shall maintain a pneumatic pressure between 1.5-1.6 barg (22-23 psi), requiring a dry, clean, dependable and continuous compressed-air source using an Air Maintenance Device which includes a pressure regulator, restriction orifice and a ½" normally closed by-pass valve, the Air Maintenance Device should be provided with a downstream pressure gauge to indicate system pressure.

A dry nitrogen-gas can be an alternative for air pressure system.

Note: In refrigerated areas, the supply air dew point must be maintained below the lowest temperature to which the Dry piping might be exposed. Introducing moisture into system piping exposed to freezing temperatures can create ice blockage, which could interfere with the system's correct operation. At the least, the air supply should be taken from refrigerated areas at the lowest system temperature. The air supply must be carefully regulated to prevent clogging by frost deposits.

2.3 Temperature Considerations

The Water Control Valve, all interconnecting water piping and trim components must be installed in an accessible, clearly visible area maintained at a minimum temperature of 4°C.

Note: The Water Control Valve must be installed only in areas where it will not be subjected to freezing temperatures. No heat tracing is allowable for the Water Control Valve or for interconnecting piping. Avoid situations in which the dry sprinkler network is exposed to extreme temperature variations. A rise in the temperature of the compressed air might increase pressure to more than that recommended.

3. Operations

The Bermad Dry-Pipe Control Valve is best suited for automatic dry sprinkler systems. Dry-Pipe Valves are defined as systems that admit water to sprinkler piping only upon operation of automatic sprinkler and/or pneumatic pressure drop in the system-piping network. The sprinkler piping is automatically supervised.

The system includes a Bermad Water Control Valve with Dry-Pipe Control Trim, attached to dry sprinkler-piping system with automatic sprinklers.

The Bermad Water Control Valve remains locked by water trapped in the control chamber. The closed valve prevents unintentional water flow into the sprinkler-system piping.

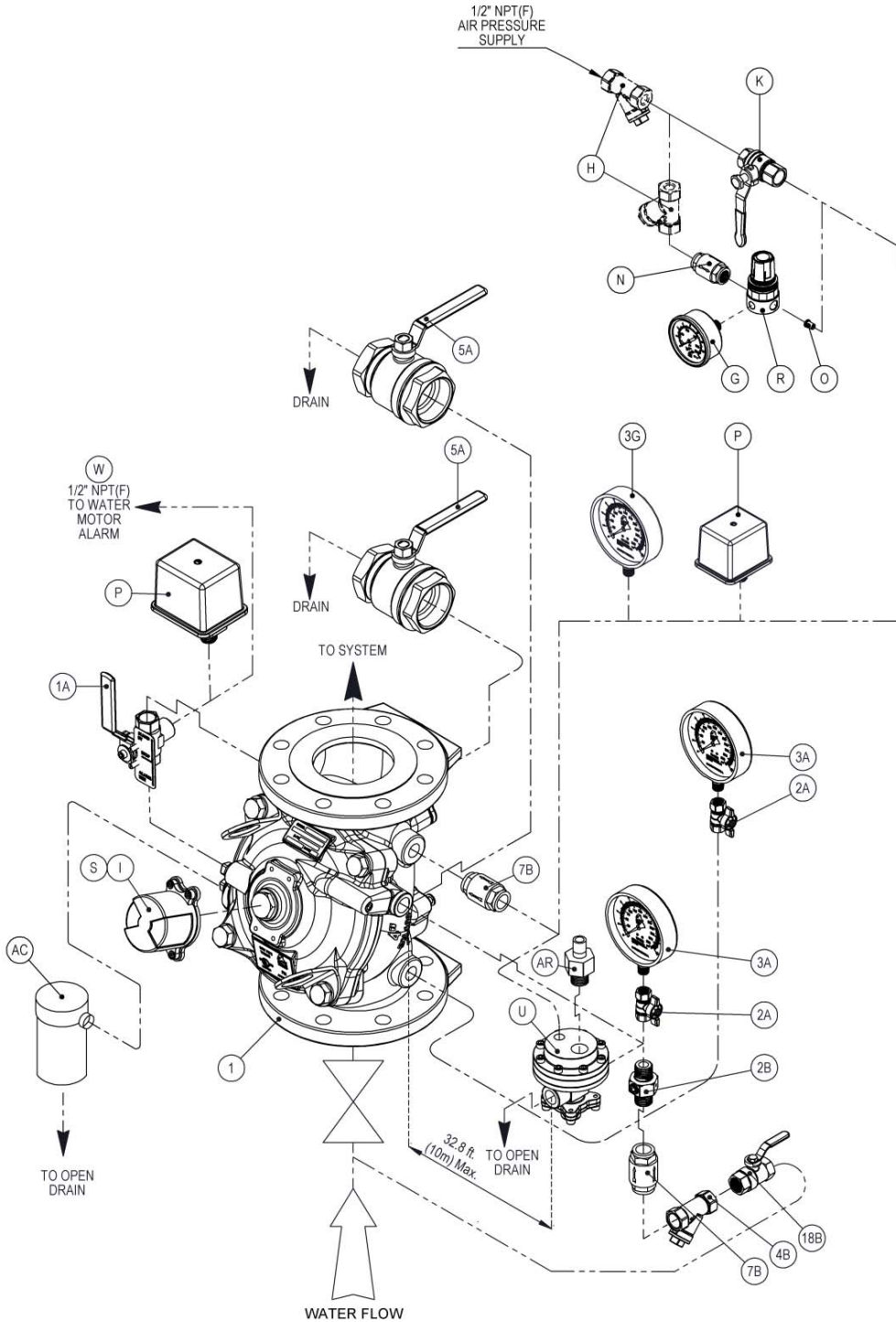
To flow water into the sprinkler piping, the URV Low Air Pressure Actuator must be activated by the loss of pneumatic system pressure due to sprinkler operation and release the pressure, causing the Air Release Accelerator to activate and Bermad Water Control Valve to open and allow water flow into the piping system, the trapped open Air Release Accelerator prevents line-pressure from entering the control chamber of the URV, latching the main valve open and allowing water to flow into the system piping and to the alarm devices.

The Dry-Pipe Valves are mostly used where sprinkler piping may be exposed to freezing temperatures.

Warning: Whenever the Manual Emergency Release (15B) is activated, the Water Control Valve will open allows water to flow into the sprinkler piping system.

Note: The Valve must be installed where it will not be subjected to freezing temperatures, when installed in freezing conditions the FP 400Y-DP must be located in a heated structure and air supply must be dried in order to prevent from water residuals and humidity from freezing within the system and piping.

3.1 Model 400Y-DP trim illustration: Dry-Pipe Valve



Model 400Y-DP Components List

Item	Description	Qty	Note
1	400Y Water Control Valve	1	1
1A	Alarm Test Valve 1/2"	1	
2A	Gauge Valve 1/4"	3	
2B	Restriction Orifice	1	
3A	Pressure Gauge 4"	3	2
4B	Priming Strainer 1/2"	1	
5A	Drain Valve	2	4
7B	Priming Check valve 1/2"	2	
18B	Priming Valve - 1/2" Ball Valve	1	
F	Fittings and Tubing	Lot	3
U	URV Low Air Pressure Actuator	1	
AR	Air Release Accelerator	1	

Optional Accessories

P	Water-flow Alarm Pressure Switch (PSH)
P2	Low Pressure Switch (PSL)
I	Valve Visual Position Indicator
S	Valve Limit Switch
W	Water Motor Alarm
R	Air Pressure Regulator
O	Restriction Orifice
K	N.C. Ball Valve
G	Air Pressure Gauge
H	Air-Line Filter
1C	Air Pressure Regulator
2C	Restriction Orifice
3C	Ball Valve
4C	Strainer
5C	Ball Valve
AC	Automatic Water Drain

Notes:

- (1) Suitable for Vertical or Horizontal installation
- (2) UL-Listed, FM approved
- (3) Fitting material: Galvanized / Brass / S.S or corrosion resistant equivalent
- (4) For 1½ & 2": ¾" Drain Valve
For 3": 1½" Drain Valve
For 4" and larger: 2" Drain Valve

4. Placing in Service/Resetting

The Dry Pipe valve and the control trim shall be placed in Service in accordance to the most recent IOM procedures for the specific model.

- 4.1 Close the supply Isolating Valve.
- 4.2 Close the emergency release valves.
- 4.3 Apply supervisory air pressure to the system's piping and set the pressure as per paragraph 2.2.
- 4.4 Close All Drain Valves.
- 4.5 Open the priming-line valve, pull the AR reset lever, this allows upstream water pressure to fill the Water Control Valve's control chamber.
- 4.6 When the control chamber pressure gauge indicates full upstream pressure and is no longer rising, the release system is reset.
- 4.7 Open the downstream Drain Valve to drain any water from the downstream side of the valve.
- 4.8 Slowly Open the supply Isolating Valve and check that no water flows into the system.

The system is now operational and in a standby mode.

Ensure that the following Set Conditions are met.

Table No.2: Set Conditions (Normal Conditions) Table

Item	Status
All Main Isolating Valves	OPEN and sealed with tamperproof seals
All Manual Releases	CLOSE position and sealed
Alarm Shut-Off Valve (11A)	OPEN position
Priming Ball Valve (18B)	OPEN
Control-Chamber Gauge	OPEN gauge valve, the gauge indicates pressure in control-chamber
Upstream Pressure Gauge	OPEN gauge valve, the gauge indicates supply pressure to deluge valve
Drip-Check Device (19B)	VENTED : Push the knob to confirm that there is no leakage
Alarm Panel (if installed)	IN SERVICE and in there stand-by position.
Supervised Air System	ON , maintained to 1.5-1.6 bar (22-23 psi) and functioning properly
Releasing Devices	CLOSED with no leaking

5. Maintenance

Bermad Dry Pipe Valve requires no lubrication, packing or tightening and requires minimum maintenance.

Warning: Do not turn off the water supply to make repairs without placing a roving fire patrol in the area covered by the system. The patrol should continue until the system is back in service.

- Prior to turning off any valves or activating any alarms, notify local security guards and the central alarm station, if used, so that a false alarm will not be raised.
- In any of the following inspections or testing procedures, if an abnormal condition exists, see "Abnormal Conditions" for possible cause and corrective action.
- See NFPA Pamphlet No. 25 and also relevant publications by authorities having jurisdiction.

5.1 Removal Instructions

Warning: When taking the Dry-Pipe Valve and its sprinkler network out of service, a roving fire patrol should survey the system area. If automatic fire alarm signaling equipment is utilized, the proper authority should be notified that the system is being removed from service. The insuring body and owner's representative should also be notified when the system is being taken out of service.

- 5.1.1 Shut off the main supply-isolating valve.
- 5.1.2 Close the pneumatic pressure supply to the system.
- 5.1.3 Close the priming line valve to the Bermad valve control chamber.
- 5.1.4 Open all drain valves to drain all the water from the system.
- 5.1.5 Release the water pressure from the control chamber of the water control valve by pulling the manual emergency release.
- 5.1.6 Place "Fire Protection System Out of Service" signs in the area protected by the system.

5.2 Inspection

5.2.1 Weekly Inspection

- 5.2.1.1 The system should be checked for Set Condition. See above "Set Condition (Normal condition)".
- 5.2.1.2 Observe the upstream pressure gauge: it should indicate that the normal supply of water pressure to the Deluge Valve is maintained.

5.2.2 Monthly Inspection and Test

- 5.2.2.1 Complete Weekly Inspection.

Warning: Manually activating the alarm may affect the Detection System Control Panel, which in turn can cause a general alarm. Take all of the necessary precautions in order to prevent causing a general false alarm.

- 5.2.2.2 Water-Flow Alarm: By turning the Alarm-Test Valve (1A) to the open position. The alarm should sound.
- 5.2.2.3 Open the downstream drain valve to release any accumulation of water. The dripping should stop completely.

5.2.3 Annual Inspection and Test

- 5.2.3.1 Complete Weekly and Monthly and inspections.
- 5.2.3.2 Close the Sprinkler-System Isolating Valve, to isolate the sprinkler system.
- 5.2.3.3 The Water Control Valve trim, releasing devices such as manual release must be activated at full flow.
- 5.2.3.4 Trip test the Dry Pipe Valve with the Control Panel. Operate the detecting system by operating both the Heat Detectors and the Low-Pressure Switch (P2). The release should be tripped according to the method suggested by the manufacturer of the Control Panel.
- 5.2.3.5 Observe upstream Pressure Gauge while full flow is on.

Note: Water will be discharged to the drain. In cases where a Sprinkler- Piping Isolating Valve is not installed, other arrangement must be made in order to perform the trip test without causing water damage.

- 5.2.3.6 Place the system out of service. (See "Removal instructions").
- 5.2.3.7 The interior of the Deluge Valve should be cleaned and inspected.
- 5.2.3.8 The interior of the URV, including its diaphragm and seal, should be inspected and cleaned.
- 5.2.3.9 Place the system back in service. (See instructions "Placing the System in Service").
- 5.2.3.10 Take all additional measures as required by NFPA-25 "Standard for the Inspection Testing and Maintenance of Water-Based Fire Protection Systems."
- 5.2.3.11 Clean the priming strainer prior to resetting the valve.

5.3 Abnormal Conditions

5.3.1 Alarm Pressure Switch Fails to Sound

- 5.3.1.1 Check for obstructions in the alarm test line.
- 5.3.1.2 Clean the alarm-line strainer (if a water motor alarm is installed).
- 5.3.1.3 Make certain the alarm is free to operate.
- 5.3.1.4 Test the electrical circuit to the electric alarm (if utilized).

5.3.2 False Trip

Check for any of the following possible causes:

- 5.3.2.1 Check for Malfunctioning Manual Emergency Release device.
- 5.3.2.2 Check and test the URV and the AR activation.

5.3.3 Leakage through Water Control Valve

Check for any of the following possible causes:

- 5.3.3.1 Check for clogged priming strainer.
- 5.3.3.2 Leaking control trim system.
- 5.3.3.3 Damaged main valve internal elastomer or seat.

5.3.4 Water Control Valve Will Not Reset

Check for any of the following possible causes:

- 5.3.4.1 The Manual Emergency Release device is clogged or not reset properly.
- 5.3.4.2 Check for clogged priming strainer, the screen should be properly cleaned.
- 5.3.4.3 Closed priming valve.
- 5.3.4.4 Check for Foreign object lodged between seal and valve seat.

5.3.5 Difficulty in Performance

Where difficulty in performance is experienced, the manufacturer or his authorized representative should be contacted if any field adjustment is to be made.