

## Model: 400E-5M

### Bermad Hydraulically Controlled Anti-Columnning Deluge Valve, with Easylock Manual Reset

#### Installation Operation Maintenance



 LISTED



Model: FP-400E-5M Size: 2"-12"

## 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 from 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. Description

Bermad Model 400E-5M Deluge valve is recommended for systems that include high-elevated wet pilot-line with closed fusible plugs. The Deluge valve is actuated by a PORV (6B fig.1), which permits local release of pressure from the control chamber (instead of the traditional remote release by the wet pilot release system), in order to avoid the water-columning on the control chamber and ensure quick opening even when the release device is elevated and/or is remotely located. The PORV Actuator is normally held closed by pressure maintained in the wet pilot system.

In fire conditions, operation of a releasing device of the wet pilot system causes pressure in the release system piping to drop, causing the PORV to open, releasing trapped water pressure from the control chamber and opening the Deluge Valve, allowing water to enter the system. Water will flow from any open sprinklers and/or spray nozzles on the system. Deluge systems are commonly used where, when the system operates, it is desirable to simultaneously spray water or foam from all open nozzles on the system

## 2. Approvals

BERMAD 400E-5M Deluge Valve is UL Listed when installed with specific components & accessories. Refer to the current UL Directory. Consult the manufacturer for any component approval recently to appear in the UL fire protection equipment directory.

## 3. Installation

### NOTES:

- Wet Pilot height must be adjusted to the specific system elevation, see "Placing in Service" chapter.
- Any deviation in trim size or arrangement may adversely affect the proper operation of the Deluge Valve.
- All the wet pilot system devices, such as Thermostatic releases and/or fixed temperature releases, must be compatible and UL listed for use with the particular Deluge System. Refer to current "UL Listed Fire Protection Equipment Directory".

**WARNING:** The Deluge Valve and trim must be installed only in areas where they will not be subjected to freezing temperatures.



## Installation Instructions

- 3.1. Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
- 3.2. Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line may render the valve inoperable.
- 3.3. Install the valve in the pipeline with the valve flow arrow on the body casting in the proper direction. Ensure that the valve is positioned so that the cover/actuator can be easily removed for future maintenance.
- 3.4. Ensure that the EMR is Mounted Vertically (with the reset button up), and all other components are positioned correctly as per the appropriate drawing.
- 3.5. The water supply priming line must be connected to the upstream of the system control valve.
- 3.6. Subjected to all other instructions, drawings and technical specifications, which describe Bermad Deluge Valve, installed in their proper positions the components comprising the Deluge Trim Package, according to the drawing relevant to the specific type, hereby enclosed.
- 3.7. Install also the additional accessories, which appear in the drawing and which must be installed as shown in the drawing, although they are not packed together with the Bermad Deluge Valve itself.
- 3.8. An "Inspector's Test Connection" must be installed on the highest point of the wet pilot line to test the PORV adjustment point and simulate opening of a release.

## 4. Equivalent Length

Deluge Valve Equivalent Length Value (Steel Pipe), for use in hydraulically calculated systems:

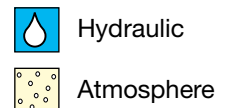
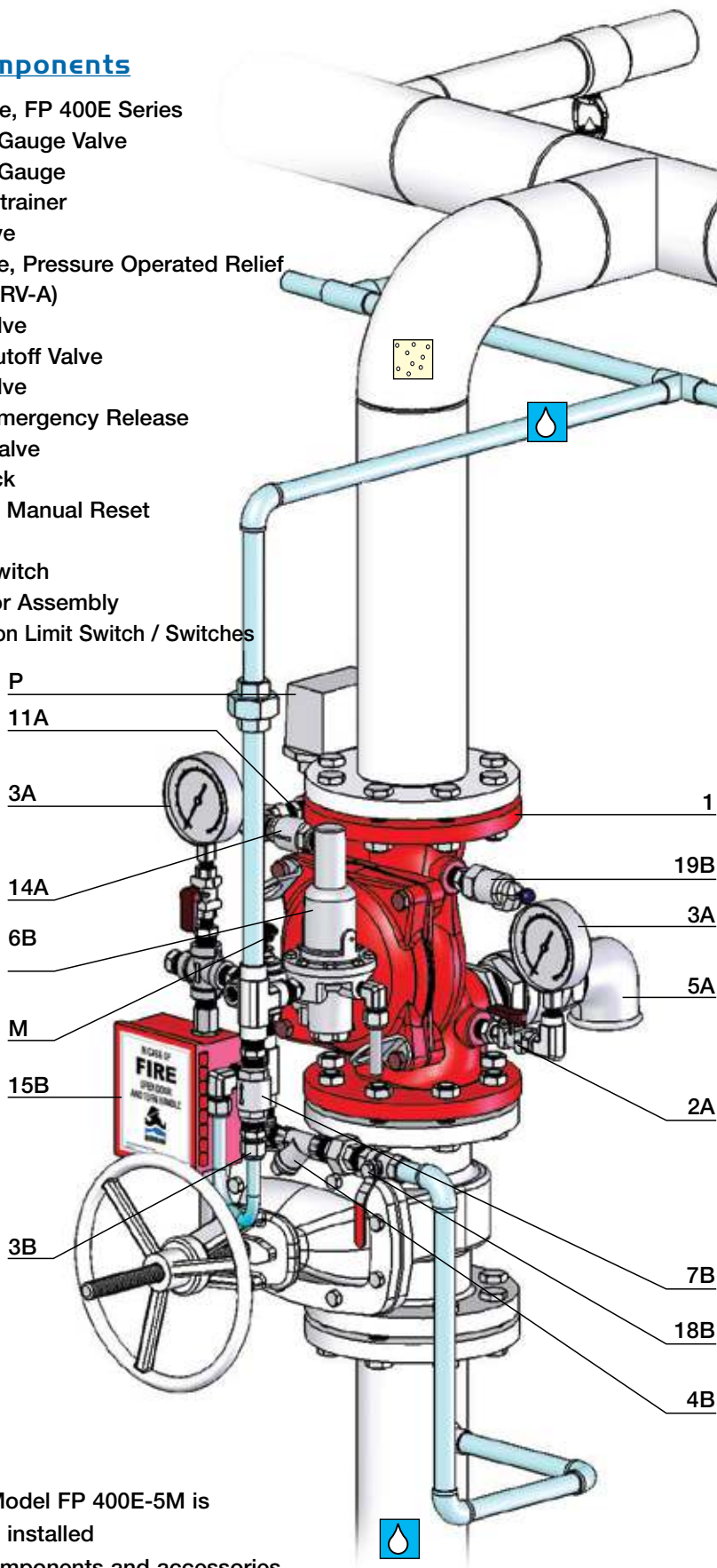
Valve Size	Equivalent Length Value Meter (Ft)
2"	9.1 (30) of 2" pipe
2½"	12.1 (40) of 2½" pipe
3"	13.7 (45) of 3" pipe
4"	14 (46) of 4" pipe
6"	27.4 (90) of 6" pipe
8"	45.7 (150) of 8" pipe



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## System Components

- 1 - Main Valve, FP 400E Series
  - 2A - Pressure Gauge Valve
  - 3A - Pressure Gauge
  - 4B - Priming Strainer
  - 5A - Drain Valve
  - 6B - Adjustable, Pressure Operated Relief Valve (PORV-A)
  - 7B - Check Valve
  - 11A - Alarm Shutoff Valve
  - 14A - Check Valve
  - 15B - Manual Emergency Release
  - 18B - Priming Valve
  - 19B - Drip Check
  - M - EasyLock Manual Reset
- Optional**
- P - Pressure Switch
  - W - Water Motor Assembly
  - S - Valve Position Limit Switch / Switches



### UL Listed

The BERMAD Model FP 400E-5M is UL-Listed when installed with specific components and accessories.



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## 5. Optional Equipment

- 5.1. Provide a Water Motor Alarm, it shall be assembled and installed according to instructions within it's package.
- 5.2. If required, provide an Alarm Pressure Switch (P fig.1), to either activate an electric alarm, or shut down desired equipment. Connect it with according to manufacturer instructions.
- 5.3. It is a recommended practice to provide an "Inspector's Test Connection" on the hydraulic release system. The inspector's Test Connection should be equipped with a ball valve (normally locked closed) capable of being opened to simulate the opening of a release.

## 6. Placing in Service/Resetting the System

- 6.1. Check the entire release system for leaks. Replace any fused temperature-release plugs.
- 6.2. Check all manual releases, making certain all valve handles are returned to the closed position.
- 6.3. Open the priming-line valve (18B fig.1), this allows water pressure to fill the wet pilot system slowly.
- 6.4. Push and hold the EMR's reset button, this allows upstream water pressure to fill the Deluge Valve's control chamber and the PORV (6B fig.1).
- 6.5. When the control chamber pressure gauge (3A fig.1) indicates full service-line pressure and is no longer rising, the release system is reset.
- 6.6. Check the entire release system for leaks.
- 6.7. Slowly Open the supply Isolating Valve and check that no water flows into the system.
- 6.8. Depress the Drip Check (19B fig.1) and drain any water from the system side of the Deluge Valve.

The system is now operational and in a standby mode.  
 Ensure that the following Set Conditions are met.

### Set Conditions (Normal Conditions)

Item	Status
All Main Isolating Valves	<b>OPEN</b> and sealed with tamperproof seals
All Manual Releases	<b>CLOSE</b> position and sealed
Alarm Shut-Off Valve (11A)	<b>OPEN</b> position
Priming Ball Valve (18B)	<b>OPEN</b>
Control-Chamber Gauge	<b>OPEN</b> gauge valve, the Pressure Gauge indicates rate of pressure in Control-Chamber
Upstream Pressure Gauge	<b>OPEN</b> gauge valve, the Pressure Gauge indicates the upstream supply pressure to the Deluge Valve
Drip-Check Device (19B)	<b>VENTED:</b> Push the knob to confirm that there is no leakage.
Control Panel & Detections	Are in service and in a stand-by position.
Releasing Devices	<b>CLOSED</b> with no leaking



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## 7. Removing the System from Service

**WARNING:** Do not shutoff the pressure supply and Do not apply lower pressure than normal for maintenance without closing the Main Isolating Supply Valve first.

When taking deluge system out of service, a fire patrol should be established in 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 representative should also be notified when the system is being taken out of service.

## 8. Removing Instructions

- 8.1. Shut off the main supply-isolating valve.
- 8.2. Close the Priming line valve (18B fig.1) to Deluge Valve Control chamber.
- 8.3. Open all drain valves.
- 8.4. Release the water pressure from the control chamber of the Deluge Valve by pulling the Manual emergency release (15B fig.1).
- 8.5. Place "Fire Protection System Out of Service" signs in the area protected by the system.

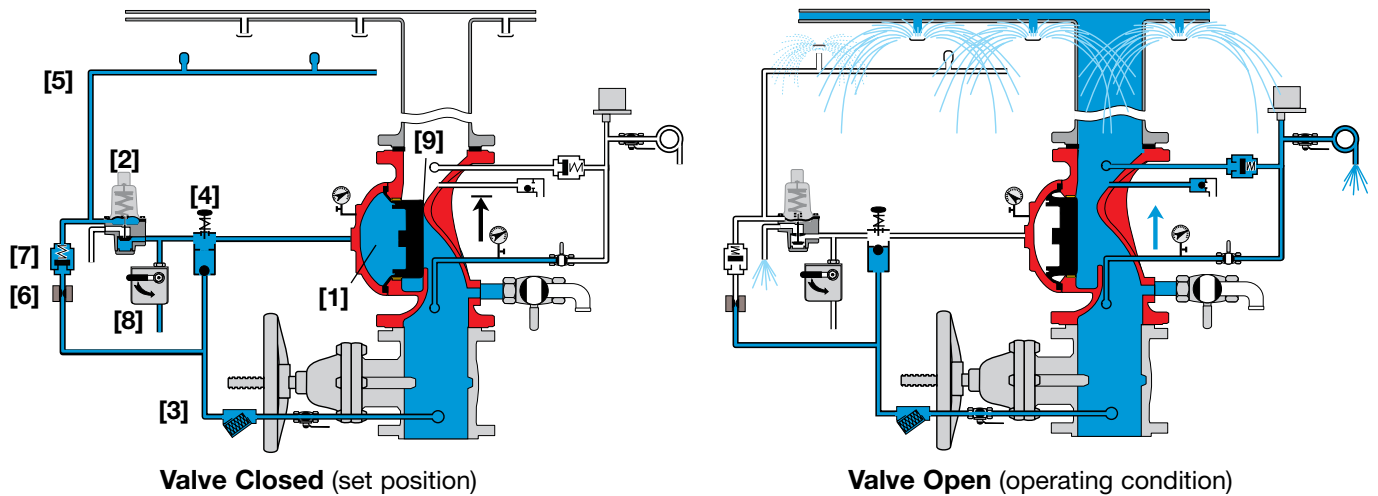
## 9. Operation

In the SET position, line-pressure supplied to both the main valve's control chamber (1) and to a Pressure Operated Relief Valve (PORV) (6B fig.1) via the priming line, through an Easy Lock Manual Reset device (EMR), and the wet-pilot-line restriction (3B fig.1), is trapped by the EMR's internal check valve, by the PORV held closed, and by a closed Manual Emergency Release (18B fig.1). The trapped line-pressure holds the main valve's diaphragm and plug against the valve seat, sealing it drip-tight and keeping the system piping dry. The PORV is held closed by the line-pressure in the wet pilot line. In FIRE or TEST conditions, the pilot-line hydraulic pressure-drop opens the PORV. Line-pressure is then released from the main valve's control chamber through the opened PORV. The EMR prevents line-pressure from entering the control chamber, thereby allowing the main valve to latch open and water to flow into the system piping and to the alarm device.

**WARNING:** Whenever the handle of the Emergency Manual Release (15B fig.1) is pulled, the Deluge Valve opens, and water flows into the system's piping and to the alarm devices, the Deluge Valve will closed again only when the reset button on the EMR is manually pressed.



**Figure 2: Operation Drawing**



## 10. Maintenance and Inspection Test

### WARNING:

- Do not shutoff the pressure supply and Do not apply lower pressure than normal for maintenance without closing the Main Isolating Supply Valve first.
- 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.

- 10.1. 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 signaled.
- 10.2. In any of the following inspections or testing procedures, if an abnormal condition exists, see Abnormal Conditions for possible cause and corrective action.
- 10.3. See NFPA Pamphlet No. 25 and also relevant publications by authorities having jurisdiction.

## 11. Weekly Inspection

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

## 12. Monthly Inspection and Test

- 12.1. Complete Weekly Inspection.
- 12.2. Test the water-motor alarm and/or electric alarm, by turning the alarm test valve (1A fig.1) to the open position. The alarm should sound. Turn to close position.
- 12.3. Depress the Drip Check (19B fig.1) to release accumulated water and to check main valve leakage (Significant water accumulation on the system side may indicate a sealing problem).

## 13. Semi-Annual Inspection

- 13.1. Complete Weekly and Monthly Inspection and Test.
- 13.2. Inspect the Pneumatic release system, Drain condensation from release-lines and service the dehydrator if necessary.



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## 14. Annual Inspection and Test

- 14.1. Complete Weekly and Monthly inspections.
- 14.2. Place the system out of service (See "Removing The System From Service" above).
- 14.3. Trip the release-line system.
- 14.4. The interior of the Deluge Valve should be cleaned and inspected.
- 14.5. The interior of the PORV (6B fig.1), including its diaphragm and seal, should be inspected and cleaned.
- 14.6. Place the system back in service. (See instructions "Placing the System in Service").
- 14.7. The Deluge Valve, trim, auxiliary devices and manual release must be activated at full flow.
- 14.8. Note: The system will be flooded! Take all necessary precautions to drain water and prevent damage in the area protected by the system.
- 14.9. The manual emergency release handle (15B fig.1) is to be pulled. The Deluge Valve should open and discharge water. Observe upstream Pressure Gauge (3A fig.1) while full flow is on. Inspect all system nozzles.
- 14.10. Take all additional measures as required by NFPA-25 «Standard for the Inspection Testing and Maintenance of Water-Based Fire Protection Systems.»
- 14.11. Clean the priming strainer (4B fig.1) prior to resetting the Deluge Valve.

## 15. Abnormal Conditions

- 15.1. Alarm Pressure Switch Fails to Sound
  - A. Check for obstructions in the alarm test line.
  - B. Clean the alarm-line strainer (if a water motor alarm is installed).
  - C. Make certain the alarm is free to operate.
  - D. Test the electrical circuit to the electric alarm (if utilized).
- 15.2. False Trip
  - A. Check for Malfunctioning EMR device.
  - B. PORV (6B fig.1) out of order.
- 15.3. Leakage Through Deluge Valve
  - A. Check for clogged priming strainer (4B fig.1).
  - B. Leaking control trim system or leaking wet pilot line.
  - C. Damaged deluge valve internal elastomer or seat.
  - D. PORV (6B fig.1) not properly sealed.
- 15.4. Deluge Valve Will Not Reset
  - A. The EMR Device is clogged or not reset properly
  - B. Check for clogged priming strainer (4B fig.1), the screen should be properly cleaned.
  - C. Closed priming valve (18B fig.1).
  - D. Check for Foreign object lodged between seal and valve seat.
  - E. Check for leaking wet pilot line.
  - F. Clogged orifice assy. (3B fig.1).
- 15.5. 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.

