

Bermad Hydraulically Controlled On-Off Deluge Valve

Model: 400E-5D



INSTALLATION OPERATION MAINTENANCE

Application Engineering
BERMAD

Model: FP 400E-5D Sizes: 2"-12"

Hydraulically Controlled, On-Off Deluge Valve

1. 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"

2. Description

BERMAD Hydraulically Controlled Deluge valve with 5D trim is actuated by an HRV - Hydraulic Relay Valve (26B), which permits local release of top chamber pressure (instead of the usual remote top chamber release by the hydraulic release system), in order to ensure quick opening even when the release device is distant.

The Deluge Valve requires a wet pilot line system including hydraulic releases.

The HRV (26B) is normally held closed by pressure maintained in the hydraulic release system.

The 5D trim may also use a Normally Closed hydraulic release system with thermostatic releases and/or fixed temperature releases to release water pressure directly from the Deluge Valve top chamber.

In fire conditions, operation of a releasing device on the hydraulic release system causes pressure in the release system piping to drop, causing the HRV to open, releasing to the atmosphere trapped water pressure from the top chamber and opening the Deluge Valve, allowing water to enter the system piping.

The releasing device in the Normally Closed hydraulic release system holds the pressure in the top chamber of the Deluge Valve. The opening of the device in a fire condition releases trapped water pressure from the top chamber, opening the Deluge Valve allowing water to enter the piping 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 from all open sprinklers and/or nozzles on the system.

3. Australian Standard SSL

BERMAD 400E-5D Deluge Valve is Australian Standard SSL when installed with specific components & accessories.

4. Installation

Subject to all other instructions, drawings and technical specifications which describe the Bermad Deluge Valve, install in their proper positions the components comprising the Deluge Trim Package, according to the drawing relevant to the specific valve, hereby enclosed.

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.

Any deviation in trim size or arrangement may adversely affect the proper operation of the Deluge Valve.

Refer also to NFPA 13 or the applicable installation standards, codes and authorities having jurisdiction.

Model: FP 400E-5D Sizes: 2"-12"

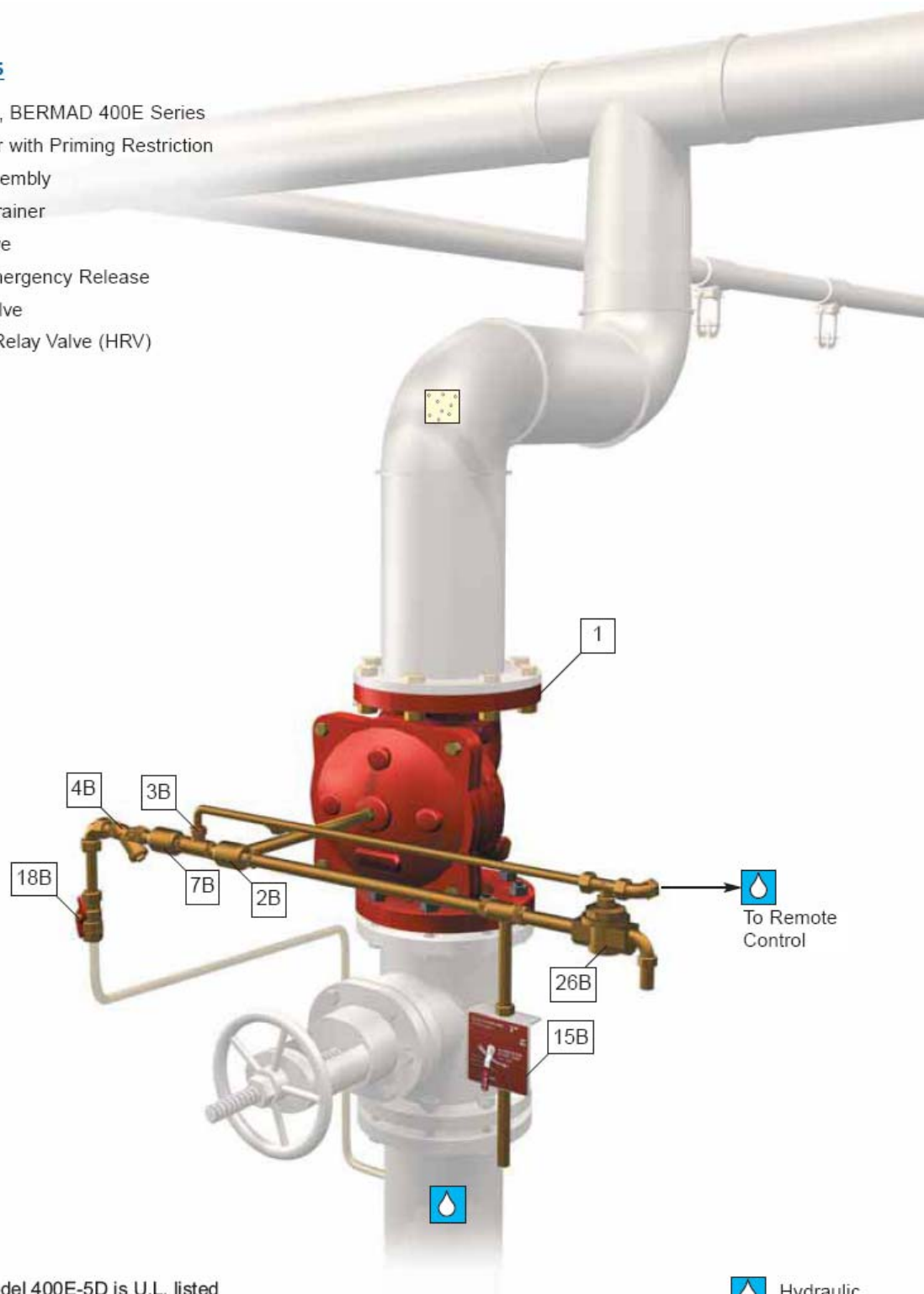
- 4.1. The Deluge Valve and trim must be installed only in areas where they will not be subjected to freezing temperatures.
Note: Pilot height value should not exceed that appearing on Table 1, "Maximum Allowed Elevation Above Valve".
- 4.2. All the hydraulic release system devices, such as Thermostatic releases and/or fixed temperature releases, must be compatible for use with the particular Deluge System.

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Figure 1: Installation Drawing

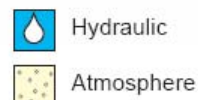
Components

- 1 - Main Valve, BERMAD 400E Series
- 2B - Accelerator with Priming Restriction
- 3B - Orifice Assembly
- 4B - Priming Strainer
- 7B - Check Valve
- 15B - Manual Emergency Release
- 18B - Priming Valve
- 26B - Hydraulic Relay Valve (HRV)



Note

The BERMAD Model 400E-5D is U.L. listed
The installation shall include Indicating and
Drain Components.



5. 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

6. Optional Equipment

If required, order a pressure switch to either activate an electric alarm, or shut down desired equipment.

7. Placing in Service/Resetting the System

- 7.1. Check the entire release system for leaks. Replace any fused thermostatic release, fixed-temperature-releases.
- 7.2. Check all emergency releases, making certain all valve handles are returned to the closed position.
- 7.3. Open priming-line valve (18B) and allow pressurized water to flow to the hydraulic release system, to the HRV (26B) and to the top chamber of the Deluge Valve.
- 7.4. When the pressure gauge on the top chamber indicates full service-line pressure and is no longer rising, the release system is reset.
- 7.5. Check the entire release system for leaks.
- 7.6. Open the system control valve slowly. No water should flow into system.
- 7.7. Depress the Drip Check (19B) and drain any water from the system side of the Deluge Valve.
- 7.8. The system is now in service.

8. Removing the System from Service

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 taken out of service.

9. Removing Instructions

- 9.1. Shut off the main supply valve.
- 9.2. Priming- line valve (18B) to Deluge Valve should be closed.
- 9.3. Open all drain valves.
- 9.4. Release the water pressure from the hydraulic release system. This may be accomplished by opening the emergency release (15B).
- 9.5. Place "Fire Protection System Out of Service" signs in the area protected by the system.



10. Operation

The BERMAD Model 400E-5D is suitable for systems that include wet pilot lines with closed fusible plugs (thermal releases), and piping systems with a wide variety of open nozzles. The typical wet pilot line is installed in the covered area and connected to the valve trim. Providing boosted local pressure release from its control chamber, the Model 400E-5D is recommended for systems with remote and/or elevated pilot line fusible plugs.

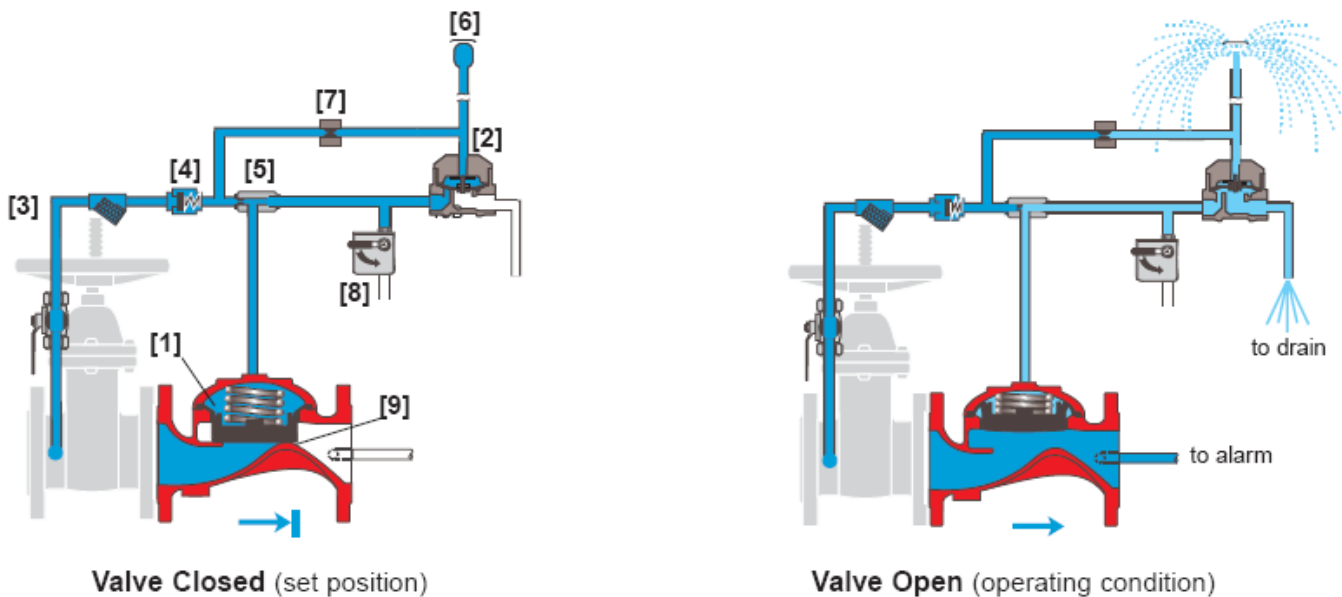
In the SET position line pressure, which is supplied to both the main valve's control chamber [1] and a Hydraulic Relay Valve (HRV) [2] by the priming line [3], through a Check Valve [4], an Accelerator [5] with priming restriction and the wet pilot line [6] restriction [7], is trapped by the Check Valve, by the closed HRV, by the closed wet pilot line and by a closed Manual Emergency Release [8]. The trapped pressure holds the main valve's diaphragm and plug against the valve seat [9], sealing it drip tight and keeping the system piping dry. The HRV is held closed by the pressure in the wet pilot line.

Under FIRE or TEST conditions, a pilot line hydraulic pressure drop opens the HRV causing water to exit through the Accelerator faster than it can be supplied. Pressure is then released from the main valve's control chamber through the opened HRV, or the Manual Emergency Release, allowing the main valve to fully open and water to flow into the system piping and to the alarm device (if mounted).

11. Manual Operation

Whenever the handle of the Manual Emergency Release (8) is pulled, pressure is released from the top chamber, the Deluge Valve will open, and water will flow into system piping and alarm devices.

Figure 2: Operation Drawing



12. Maintenance and Inspection Test

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.

- 12.1. 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.
- 12.2. In any of the following inspections or testing procedures, if an abnormal condition exists, see Abnormal Conditions (§17) for possible cause and corrective action.
- 12.3. See NFPA Pamphlet No.25.

13. Normal Conditions

- 13.1. All main control valves are open and sealed with tamperproof seals.
- 13.2. The alarm shut off valve is in the OPEN position.
- 13.3. The priming-line valve (18B) OPEN.
- 13.4. The priming-line gauge valve should be OPEN and gauge should reflect the hydraulic release system service pressure
- 13.5. Upstream pressure gauge valve OPEN and gauge should reflect the upstream pressure.
- 13.6. Hydraulic Release Systems – no leaks in system

14. Weekly Inspection

- 14.1. The system should be checked for normal condition.
- 14.2. Observe the upstream pressure gauge: it should indicate that the normal supply of water pressure to the Deluge Valve is maintained.

15. Monthly Inspection and Test

- 15.1. Complete Weekly Inspection.
- 15.2. Test the water-motor alarm (10A) or electric alarm (optional) by turning the alarm test valve (1A) to the open position. The alarm should sound. Turn to close position
- 15.3. Depress the Drip Check (19B) to release accumulation. (Significant water accumulation on the system side may indicate a sealing problem).

16. Annual Inspection and Test

- 16.1. Complete Weekly and Monthly inspections
- 16.2. Place the system out of service (See instructions above).
- 16.3. Trip the release-line system, clean all strainers (4A, 4B), and priming-line restriction (2)
- 16.4. The interior of the Deluge Valve should be inspected and cleaned.
- 16.5. The interior of the HRV, including its Diaphragm and Seal, should be inspected and cleaned.
- 16.6. Place the system back in service. (See instructions "Placing the System in Service").
- 16.7. The Deluge Valve, Trim, Auxiliary Devices and Manual Release must be activated at full flow.
- 16.8. Note: The system will be flooded! Take all necessary precautions to drain water and prevent damage in the area protected by the Deluge system.
- 16.9. Trip test the Deluge System with an Electric Release Control Panel. The release may be tripped by the method suggested by the Release Control Panel manufacturer. Reset the system.
- 16.10. The Manual Emergency Valve Release Handle (2) is to be pulled and tested. The Deluge Valve should open and discharge water.
- 16.11. Observe pressure on the upstream Pressure Gauge while full flow is on. Inspect all nozzles in the system. Take all additional measures as required by NFPA 25 "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems."

17. Abnormal Conditions

17.1. Alarm Pressure Switch Fails to Sound

- A. Clean the alarm-line strainer or water-motor alarm strainers.
- B. Test for obstructions in the alarm test line
- C. Make certain the water-motor alarm is free to operate.
- D. Test the electrical circuit to the electric alarm (if utilized).

17.2. False Trip

Check for any of the following possible causes:

- A. Plugged priming restriction (2) or strainer (4B).
- B. Plugged Orifice Assy.(30B) or strainer (4B).
- C. Malfunction or leaking release system.
- D. HRV (26B) out of order.

17.3. Leakage through Deluge Valve

Check for any of the following possible causes:

- A. Partially plugged Priming Restriction (2).
- B. Leaking release system
- C. Leaking Release System.
- D. Damaged deluge valve seat HRV out of order.

17.4. Deluge Valve Will Not Reset

Check for any of the following possible causes:

- A. An open main control valve
- B. System not properly drained
- C. Closed priming-line valve (18B).
- D. Damaged Deluge Valve seat or seal
- E. Foreign object lodged between seal disc and valve seat.
- F. HRV (26B) not properly sealed

17.5. Electric Release System Will Not Reset

- A. Leak in release line
- B. Plugged Orifice Assy. (30B).
- C. Thermostatic Release or Fixed-temperature release open.
- D. Manual Emergency Release (15B) open.
- E. HRV (26B) not properly sealed.

17.6. 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.