

## Bermad Model: 405-02 Manually Operated Hydraulic Valve



### INSTALLATION OPERATION MAINTENANCE

Application Engineering

BERMAD

## 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's 405-02 Fire Protection Control Valves are Elastomeric- type globe valves that are rolling-diaphragm actuated, with an integral solid, resilient seal.

These automatic control valves are designed for vertical or horizontal installation and are available in diameter sizes from 2" to 12" (DN50 to DN300).

The BERMAD 405-02 valves are used for water flow control for a Monitor, on-off systems or Water/Foam systems where speed control opening is required. These valves are manufactured from materials suitable for seawater and freshwater/ foam solution applications.

The 400 Water Control Valve is held closed by system water pressure trapped in the control chamber. When the releasing system operates, pressure is released from the control chamber, and the seal disc opens to allow water to flow into the system.

The design of the 400 valve body includes a single, full bore seat with unobstructed flow path, free of any in-line ribs, supporting cage, or shafts.

The unique hydro-dynamic globe design provides high flow capabilities with minimum head loss. The cover is removable via four fastening bolts (up to 10") for quick in-line inspection and servicing.

The internal design of the 400 valve is based on innovative technology using advanced rubber-based materials to achieve a solid, one-piece, elastomeric assembly including flexible fiber reinforced diaphragm, vulcanized with a rugged radial seal disk, and together providing resilient, drip-tight sealing.

The elastomeric assembly is carefully balanced and peripherally supported to avoid tension and protect the elastomer, resulting in long-life, controlled actuation, even under harsh conditions.

The elastomeric assembly can be easily removed from the valve body with no need for disassembling the valve from the line.

## 3. Approvals

BERMAD's 405-02 Valve is Lloyd's Register and ABS approved when installed with specific components & accessories. Refer to the current directory. Consult the manufacturer for any component

## 4. Installation

Proper operation of the Bermad Valves depends upon their trim being installed in accordance with the appropriate

Trim configuration.

**Warning:** The Water Control valve and trim must be installed only in areas where they will not be subject to freezing

## Installation Instructions

- 4.1 Allow enough room around the valve assembly for any adjustments and future maintenance.
- 4.2 Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line may result in the valve's becoming inoperable.
- 4.3 Install the valve in the pipeline so that the valve flow arrow appearing on the body casting is pointing in the desired direction. Ensure that the valve is positioned so that the cover can be easily removed for future maintenance.
- 4.4 Ensure that the Control Trim is mounted properly and all other components are positioned correctly as per illustration.
- 4.5 After installation in the main line, carefully inspect/correct any damaged accessories, piping, tubing, or fittings. Ensure that there are no leaks.
- 4.6 Install the components comprising the Water Control Trim Package in their proper positions in compliance with all instructions, drawings, and technical specifications describing the BERMAD Fire protection Valve, according to the relevant illustration.
- 4.7 All additional accessories, although not packed together with the BERMAD Water Control Valve, must be installed as shown in the relevant P&ID and other illustrations.

## 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. Placing in Service/Resetting the System

The Water Control valve and the control trim shall be placed in service in accordance to the most recent IOM procedures for the specific model.

After all relevant instructions are performed, slowly open the supply-isolating valve and check that no water flows into the system.

The system is now operational and in stand-by mode.



## 7. Removing the system

### Removing the System from Service

**Warning:** When taking the fire protection 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's representative should also be notified when the system is being taken out of service

- 7.1 Shut off the main supply-isolating valve.
- 7.2 Close the priming line valve to the Bermad valve control chamber.
- 7.3 Open all drain valves.
- 7.4 Release the water pressure from the control chamber of the Water Control valve by pulling the manual emergency release.
- 7.5 Place "Fire Protection System out of Service" signs in the area protected by the system.

## 8. Operation

The Bermad model FP-405-02 is a simple designed, manually operated on/off valve equipped with opening speed control. This valve is particularly suited for industrial hydrants. This valve is equipped with a restriction orifice to restrict the opening time of the valve.

The BERMAD 400 Water Control Valve (assembled with specific trim) prevents water from entering system piping until required.

The Water Control valve is kept closed by pressure applied to the control chamber through a restricted priming line.

In the SET position, the water pressure supplied through the priming line is trapped in the control chamber of the

Water Control valve by a check valve, and by the normally closed release device.

The pressure trapped in the control chamber of the Water Control valve presses the valve seal disc down, thereby sealing the valve and keeping the system piping dry.

Under conditions of FIRE, when the pressure is released from the control chamber 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 through the valve and into the system piping and alarm devices.

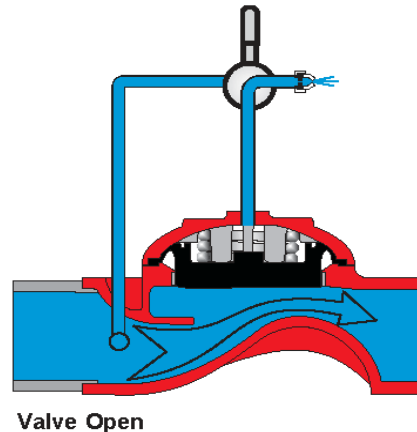
### Valve Closed (Set Position)

Line pressure applied to the control chamber of the valve creates a superior force that moves the valve to the closed position and provides drip tight sealing.

### Valve Open (Operating Conditions)

Releasing the pressure from the control chamber to atmosphere or some other lower pressure zone causes the line pressure acting on the seal disc to move the valve to the open position.

## 9. Figure 2: Operation Drawing



## 10. 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.

- 10.1 Prior to turning off any valves or activating any alarms, notify local security guards and the central alarm station, if used, to avoid signaling a false alarm.
- 10.2 The Water Control valve and the control trim shall be maintained with accordance to the most recent IOM procedures for the specific model. A periodic test schedule should be established also with accordance to the site conditions and owner regulations.
- 10.3 Take all additional measures as required by NFPA-25 "standard for the inspection, testing, and maintenance of water-based fire protection systems".
- 10.4 The system should be checked weekly for "Normal Conditions".
- 10.5 Clean the priming strainer prior to any resetting of the Water Control valve.
- 10.6 The Water Control valve must be activated at full flow at least annually. Take all necessary precautions to drain water and prevent damage in the area protected by the system.
- 10.7 After about five years of operation, replacement of the diaphragm assembly is recommended. Remove the Cover, clean the valve body from sediments, clean the control tubing entry holes, and install a new diaphragm assembly.

## 11. Spare Parts

- 11.1 The Diaphragm Assembly is the only spare part needed for the main Water Control valve, It is not recommended to store spare rubber parts for long periods (rubber in improper storage conditions can harden and crack).
- 11.2 Contact your Bermad representative and order new rubber parts when required.

## 12. Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Valve fails to open	Insufficient inlet pressure.	Check/create inlet pressure.
	Clogged restriction orifice	Open and clean orifice assembly.
	Indicating valves closed.	Open.
Valve fails to hold set static outlet pressure	Filter screen (4) blocked.	Remove filters cap and screen to clean.
	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat and disc seal.
	Diaphragm in main valve is leaking.	<b>Caution:</b> This test will cause the valve to go fully open. Close downstream indicating valve or omit this test if this may cause damage. Test for leakage. Close indicating valves and remove the plug in the main valve cover. If a continuous flow exists, the diaphragm is damaged or loose.

## 13. 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.