

Model 420-HY Pressure Regulating Hydrant 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 Model 420-HY Pressure-Reducing Valve is a manually operated pressure control valve that reduces higher inlet pressure to lower constant outlet pressure, regardless of fluctuating flow-rates and/or varying inlet pressure. It is a pilot-operated, diaphragm-actuated, low pressure-loss valve. Valve differential pressure powers the diaphragm actuator open or closed. The actuator design enables quick and smooth valve action. According to the downstream pressure, the pilot valve regulates main valve opening.

Models and Sizes

Models and Sizes covered by this document include the BERMAD Pressure-Reducing Valve 420-HY, sizes 1½", 2", 2.5", 3", 4" and 6" are available in Globe pattern, sizes 2", 2.5", 3" and 4" are available in Angle pattern.

Operating Pressure Rating

All sizes have a maximum rated inlet pressure of 235 psi (16 bar).

Outlet pressure setting for all sizes is limited to 100 psi (6.9 bar).

When setting the outlet pressure, the inlet pressure should be at least 15 psi (1 bar) higher than the set outlet pressure.

In the case of zero (static) flow through the valve, the maximum increase in the downstream (outlet) pressure above the set pressure of the valve will not exceed 8 psi (0.5 bar).

Table 1

Flow Capacity Table

| Valve Size [in (mm)] | 2 (50) | 2.5 (65) | 3 (80) | 4 (100) | 6 (150) |
|---|----------------|----------------|----------------|----------------|----------------|
| Max. Inlet pressure [psi (bar)] | 250 (17) | 250 (17) | 250 (17) | 250 (17) | 250 (17) |
| Outlet pressure adjustable range [psi (bar)] | 30-100 (0-6.9) | 30-100 (0-6.9) | 30-100 (0-6.9) | 30-100 (0-6.9) | 30-100 (0-6.9) |
| Maximum flow-rate [GPM (LPM)] | 150 (568) | 300 (1140) | 500 (1892) | 800 (3028) | 1800 (6813) |
| Minimum required flow-rate for Pilot Setting [GPM (LPM)]* | 75 (284) | 150 (568) | 250 (946) | 400 (1514) | 900 (3406) |

*Required flows to be established through the valve to properly adjust the set pressure



3. Approvals

BERMAD 420 -HY 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

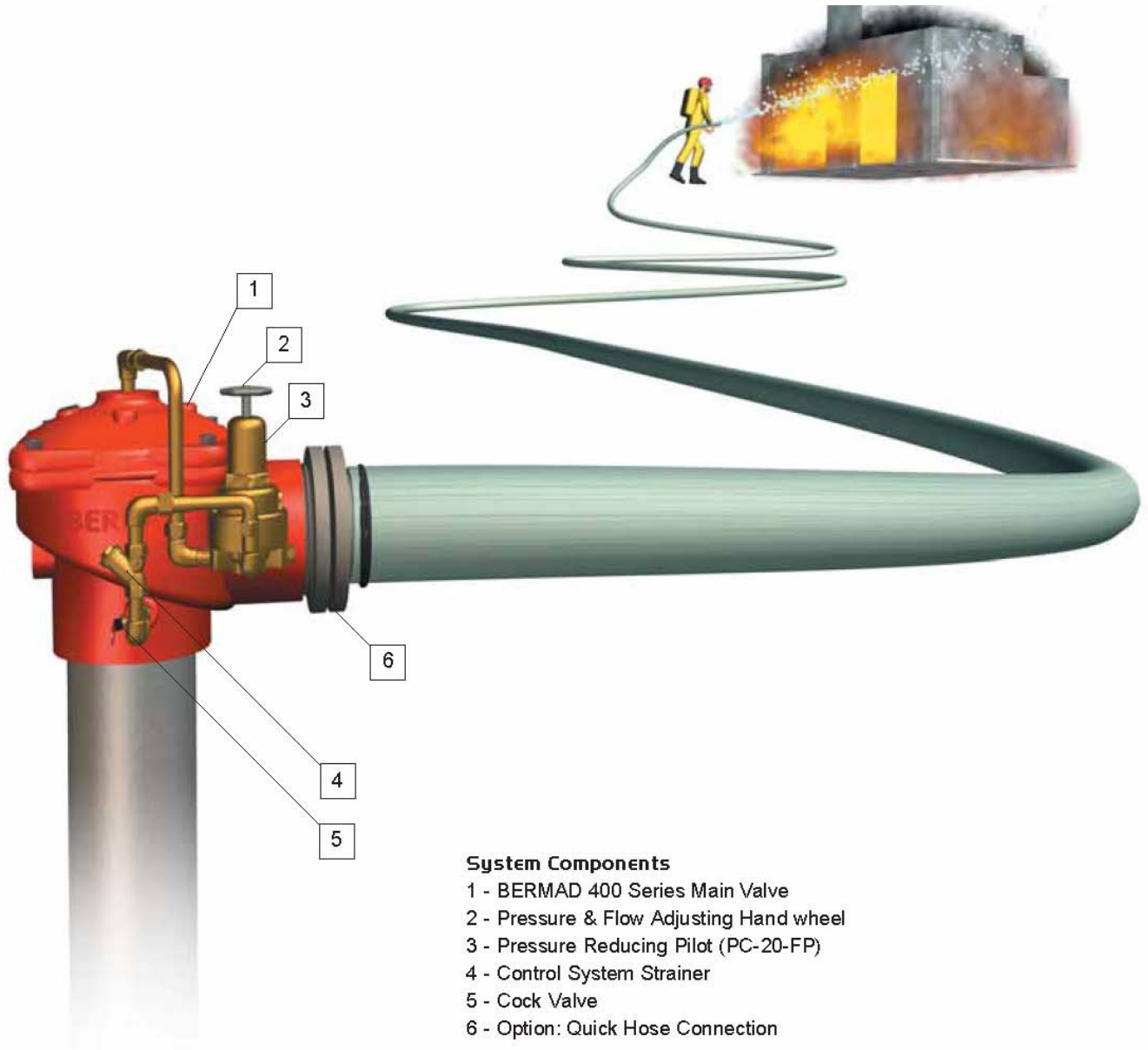
4. Installation

Installation Instruction:

- 4.1 Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
- 4.2 Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Failure to do this might result in the valve being inoperable.
- 4.3 Listed indicating valves should be installed upstream and downstream of the BERMAD Model 420-HY valve to allow future maintenance.
- 4.4 Install the valve in the pipeline with the valve flow arrow on the body casting in the proper direction. Use the lifting eye provided on the main valve cover for lifting and lowering the valve.
- 4.5 The Model 420-HY is intended for horizontal installation only. Ensure that the valve is positioned so that the actuator can be easily removed for future maintenance.
- 4.6 After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
- 4.7 Install a pressure relief valve downstream of the Bermad valve.
- 4.8 Install a pressure gauge on both the upstream & downstream of the Pressure Reducing Control Valve.
- 4.9 Install the Model 420-HY valve in accordance with the Standard for Installation of Standpipe and Hose Systems, NFPA 14, as appropriate. The Model 420-HY valve is to be tested after installation in accordance with owner regulations and the Authorities Having Jurisdiction.
- 4.10 The Model 420-HY valve is to be inspected, tested and maintained in accordance with the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

Model: FP - 420- Sizes: 2"-12"

Figure 1: Installation Drawing



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 |

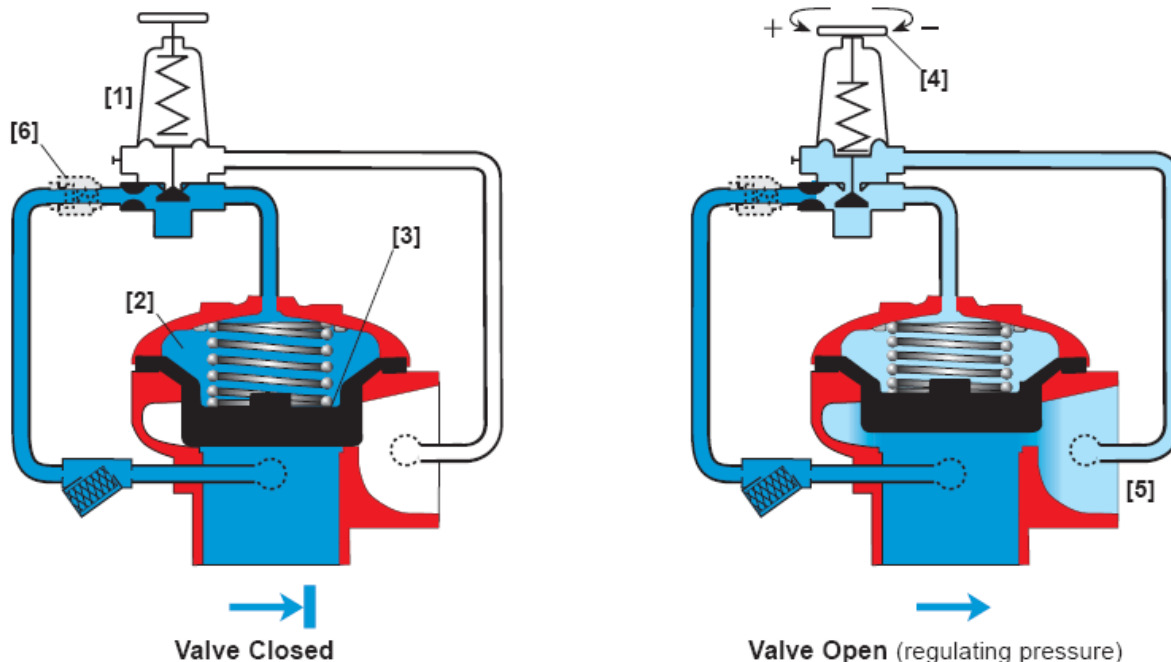
6. Operation

The pressure-regulating pilot senses downstream pressure and modulates the upper control chamber causing the main valve to throttle, thus maintaining constant downstream pressure. When the downstream pressure falls below the pilot setting, the pilot opens, pressure in the upper control chamber decreases, and the main valve modulates open to increase downstream pressure and maintain pilot setting.

Should the downstream pressure rise above the pilot setting, the pilot closes, pressure in the upper chamber increases and the main valve throttles close to decrease downstream pressure to the pilot setting.

The pressure-reducing pilot is equipped with an adjusting screw as shown in figure 2. To increase pressure setting, turn handle counter clockwise, to reduce pressure setting or to close the valve, turn the handle clockwise.

Figure 2: Installation Draw



Model: FP - 420- Sizes: 2"-12"

7. Starting –up

When performing this procedure refer to figure 1.

- 7.1 Open a hydrant, relief valve, drain valve, or other flow-consumer downstream of the Model 420-HY Pressure-Reducing Valve, creating a system demand.
- 7.2 Fully open upstream indicating valve (2).
- 7.3 Gradually open downstream indicating valve to fully open, allowing flow through the Model 420-HY Pressure-Reducing Valve.
- 7.4 Wait for downstream pressure stability.
- 7.5 Slowly close the flow-consumer that was opened in step #1 above to fully close.
There is no flow; the pressure on the downstream side of the system that is reflected through the pressure gauge should be according to the factory pre-set adjusted pressure plus up to an additional 10%.

8. 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.

- 8.1 Prior to turning off any valves or, notify local security guards.
- 8.2 In any of the following inspections or testing procedures, if an abnormal condition exists, see Troubleshooting for possible cause and corrective action.
- 8.3 The Model 420-HY valve is to be inspected, tested and maintained in accordance with the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

9. Normal Conditions

- 9.1 All main isolating valves should indicate a fully open position.
- 9.2 Upstream pressure gauge should reflect the upstream pressure supplied to the valve.
- 9.3 Down stream pressure gauge should be according to the system design criteria.

10. Quarterly Inspection

- 10.1 The system should be checked for normal condition.
- 10.2 Check that the main valve, pilot system, accessories, tubing & fittings, are all in good condition, damage free and not leaking.

11. Annual Inspection and Test

- 11.1 Complete Quarterly Inspection.
- 11.2 Conduct a flow test in systems nominal flow. The down stream pressure gauge should show the adjusted down stream pressure, and according to the system design criteria, this pressure should be stable.

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12. Trouble shooting

| SYMPTOM | PROBABLE CAUSE | REMEDY |
|-------------------------|--|---|
| Valve fails to regulate | Air trapped in main valve cover. | Loosen cover tube fitting at the highest point, allow the air to escape and re-tighten. |
| | Filter screen (4) blocked. | Remove filters cap and screen to clean. |
| | Insufficient inlet pressure. | Check/create inlet pressure. |
| | No downstream demand. | Create demand/flow. |
| Valve fails to open | Insufficient pilot spring compression. | Turn adjusting screw CW on pilot. |
| | | |

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.