

## **Bermad Level Control Valve with Modulating Horizontal Float Pilot valve**

**One Way Flow**

**Model: FP 450 - 80**

**Installation  
Operation  
Maintenance**

## 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

The Model 450-80 Level Control Valve, One Way Flow is an automatic control valve designed to control the high water level in reservoirs and tanks without the need for external control devices such as floats, etc. It is a pilot controlled, hydraulically operated, diaphragm actuated globe valve design. The valve diaphragm is line pressure activated, controlled by a 3-way Level pilot valve to open or close.

## 3. Approvals

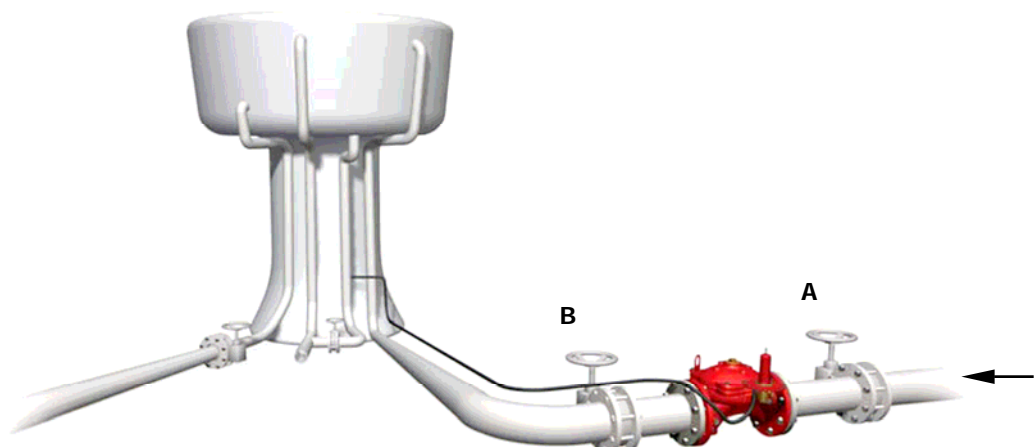
BERMAD 400 Valve is Lloyd’s Register and ABS approved when installed with specific components & accessories. Refer to the current Directory. Consult the manufacturer for any component approval recently to appear in the fire protection equipment directory.

## 4. Installation

### Installation Instructions

- 4.1 Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
- 4.2 Thoroughly flush the pipeline to remove any dirt, scale, debris etc. Failure to do this may result in the valve being inoperable.
- 4.3 Isolation valves A and B should be installed upstream and downstream of the main valve to allow maintenance.

**Figure 1:  
Installation  
Drawing**



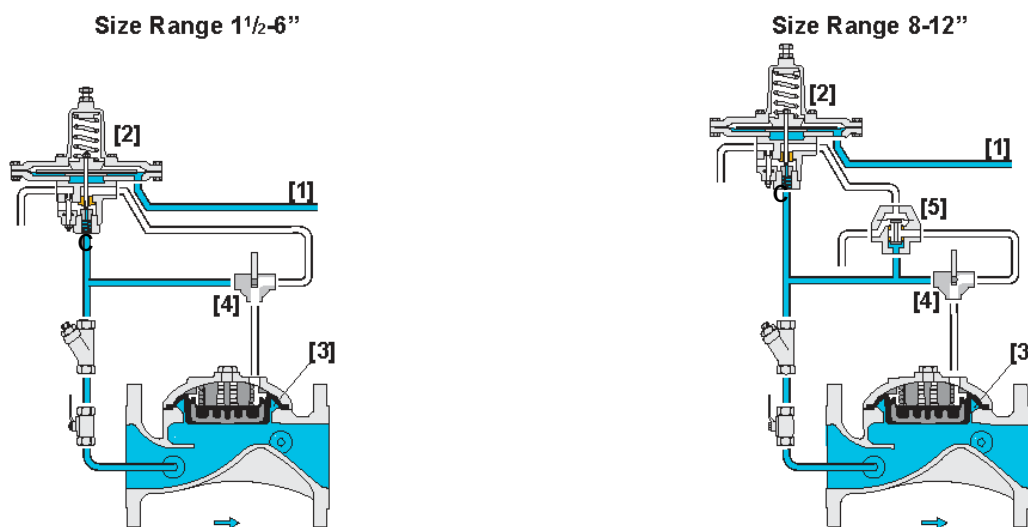
- 4.4 Install the valve in the pipeline with the valve flow arrow on the body casting in the proper direction. Use the lifting eye provided on the main valve cover for raising and lowering the valve. It is highly recommended to install a strainer upstream from the 450-80 valve, for best performance, install the valve horizontally with the cover up.
- 4.5 Prepare a 1" female threaded "Hydrostatic level sensing port"; consist of a full-port block valve, at a "still-point" at the bottom of the reservoir.
 

**Note:** The drainage pipe might provide this "still-point".
- 4.6 A sensing line with at least 1/2" tube of stainless steel should be connected from the "level sensing port" at the bottom of the reservoir to the altitude pilot valve sensing port which is located on the lower side of the sensing diaphragm see (2) on figure 2.
- 4.7 This placement will ensure accurate static pressure sensing. If possible, the sense line should be sloped upwards from the altitude pilot valve toward the reservoir to minimize air pockets from forming in the pilot.
- 4.8 After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings.

## 5. Startup

- 5.1 Confirm that the supply ball valve is open and that selector valve [4] is directing the pilots to valve control chamber (according to the flow arrow on the handle).
- 5.2 Open fully the upstream and the downstream isolating valves & confirm that the supply pressure is typical.
- 5.3 Fill up the reservoir until the level reaches its desired shut-off level.
- 5.4 Vent air from the valve's control loop & the pilot sensing chamber by loosening tube fittings at the highest points, allowing all air to bleed. Retighten the tube fittings eyebolts.
- 5.5 The valve is factory calibrated, the closing setting level is marked on a sticker placed on the pilot valve.
- 5.6 Allow the valve to open by ensuring reservoir level is approx 1 meter lower then the setting. Confirm the valve closes as level reaches the closing set level.
- 5.7 **Note:** the altitude change can be simulate by connecting an accurate gauge to the sensing line, close the sensing block valve (para. 4.5) and open connecting fitting on the sensing line to bleed the water column. The valve shall remains closed until water level drop approx one meter (three foot) below the closing set level.

Figure 2: Operation Drawing



## 6. Calibration

- 6.1 For changing the closing level setting, perform the below procedure:
- 6.2 Turn selector valve [4] to "Close" position (flow arrow on the handle directing valve upstream to the valve control chamber), verify that the valve is now closed.
- 6.3 Slowly turn the pilot valve adjusting screw Clock-Wise to the maximum spring compression.
- 6.4 Simulate reservoir level to 30cm (1 foot) below the desired upper (closing) level.
- 6.5 Disconnect the tube connected to the pilot port [C].
- 6.6 Unlock the pilot valve-locking nut and turn slowly the adjusting screw Counter-Clock-Wise until water starts draining through port [C]. Re-turn the pilot adjusting screw Clock-Wise until draining is stopped.
- 6.7 Raise (or simulate) the reservoir level to the desired closing level. The drain from port [C] should restart.
- 6.8 Re-connect the tube to the pilot port [C] & rotate selector valve [4] to "Open" position.
- 6.9 Lock the pilot valve locking nuts.
- 6.10 To increase opening speed turn the pilot integral needle valve Counter-Clock-Wise.

## 7. Maintenance and Inspection Test

### 7.1 Maintenance Schedule

The following procedure suggestions are a maintenance guide. These procedure suggestions will vary depending on the type of fluid and operation conditions.

Description	Norm
Clean filter	Annually
Seat inspection	Annually
Seal inspection	Biannually or longer
Indicator Stem freedom of rotation	Annually
Valve freedom of movement	Annually
Sealing	Annually
Needle valve operation	Annually
Pressure gauge	Semi Annually
Seat damage	Annually
Inspect and/or replace diaphragm heavy duty	3 years
Inspect and/or replace diaphragm light duty	5 years

### 7.2 Field Maintenance Instructions

Bermad valves require no lubrication, no packing tightening, and require a minimum of maintenance. A periodic inspection schedule should be established to determine how the flow, the erosion, the dissolved minerals and the suspended particles are affecting the valve.

After about three years of operation, replacement of important parts and diaphragm is recommended. Remove the valve cover, clean the valve body from sediments, clean the control tubing entry holes, and install a new main valve diaphragm and replace pilot valve other Elastomers.

Filter cleaning - The filter should be cleaned manually every time the valve is opened for internal inspection.

## 8. Trouble-Shooting

Symptom	Probable Cause	Action
Valve Fails To Open	Insufficient inlet pressure	Check/create inlet pressure.
	3-way Selector valve closed	Turn the 3-way valve to "automat" position.
	Priming ball valve closed	Open
	Reservoir is full. Compression.	Check reservoir water level.
	Insufficient pilot spring	Turn the adjusting screw CW on pilot .
Valve Fails To Close	Filter (4) blocked	Remove filter cap and screen to clean.
	Priming ball valve closed	Open ball.
	Debris trapped in main valve.	Inspect valve interior. Remove the cover. Check the seat and disc seal. Refer also to Model FP 400 data.
	Diaphragm in main valve is leaking	Test for leakage. Close main isolating valve. Open valve cover and check diaphragm elastomer.
	Altitude Pilot valve is not well calibrated	Readjust according to paragraph 6
Valve Fails To Regulate (Not Accurate)	Filter (4) blocked	Remove filter cap and screen to clean.
	Priming ball valve closed	Open ball.
	Sensing line blocked.	Check and clean.
	Level Pilot valve not properly adjusted	Readjust pilot valve according to paragraph 6.