

## Bermad Level Control Valve with Modulating Horizontal Float

Model: FP 450 - 60

### 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 450-60 Level Control Valve with modulating horizontal float pilot valve, is an automatic self controlled, diaphragm actuated valve that controls reservoir filling to maintain constant water level, regardless of fluctuating demand.

## 3. Approvals

BERMAD 450-60 Deluge 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:

### 4.1 Installation Instructions

Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.

Thoroughly flush the pipeline to remove any dirt, scale, debris, etc. Failure to do this may result in the valve being inoperable.

Isolation valves should be installed upstream and downstream of the valve to allow for future maintenance operations.

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. For best performance, install the valve horizontally with the cover up.

Ensure that the valve is positioned so that the valve cover can be easily removed for future maintenance.

Install the float pilot valve (5) on the water reservoir, it should be fitted to a 1/2" male threaded pipe that was fixed to the reservoir's wall, slightly higher than the maximum desired water level. Ensure that the float assembly is free to rotate without any obstruction and that the entire float pilot valve is easily accessible for future maintenance.

A pilot line pipe of 1/2" minimum diameter should be installed to connect between the cock valve (6) on the main Bermad valve to the float pilot valve (5) on the reservoir.

## 4.2 In Line Static Test

### 4.2.1 Open Valve Static Test

CLOSE the priming ball valve (7) to isolate the pilot system to prevents dirt from entering into the pilot system and OPEN the pilot line cock valve (6).

OPEN the upstream and downstream Isolation valves slowly, this will allow the valve to open fully and water to flow to the reservoir.

**CAUTION:** the valve will open fully, ensure that this will not cause system damage. Check for leaks at the flange connections, fittings, etc.

### 4.2.2 Closed Valve Static Test

CLOSE the cock valve (6) and OPEN the priming ball valve (7), This will trap the main valve in a closed position while the upstream pipeline is pressurized.

Check the valve seat leakage by observing the filling pipe inlet in the reservoir. Inspect the valve cover for leak, tighten the cover bolts if necessary. Check also the flange connections, fittings, etc.

## 5. Valve Equivalent Length

Control 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 Model FP 450-60 is a float-controlled valve equipped with a 2-way, horizontal float pilot assembly. The needle valve (1) continuously allows flow from the valve inlet into the control chamber (2).

The float (3) is attached to the float pilot valve arm (4). The location of the float assembly and the position of the float determines the level setting.

Should the level rise toward the setting, the float pilot valve (5) throttles, pressure in the control chamber accumulates causing the main valve to throttle closed, reducing filling rate, and eventually closing drip tight. Should the level fall, the float pilot releases pressure from the control chamber causing the valve to modulate open. The needle valve controls the closing speed. The cock valve (6) enables manual closing.

### Operation Instructions/Start-up:

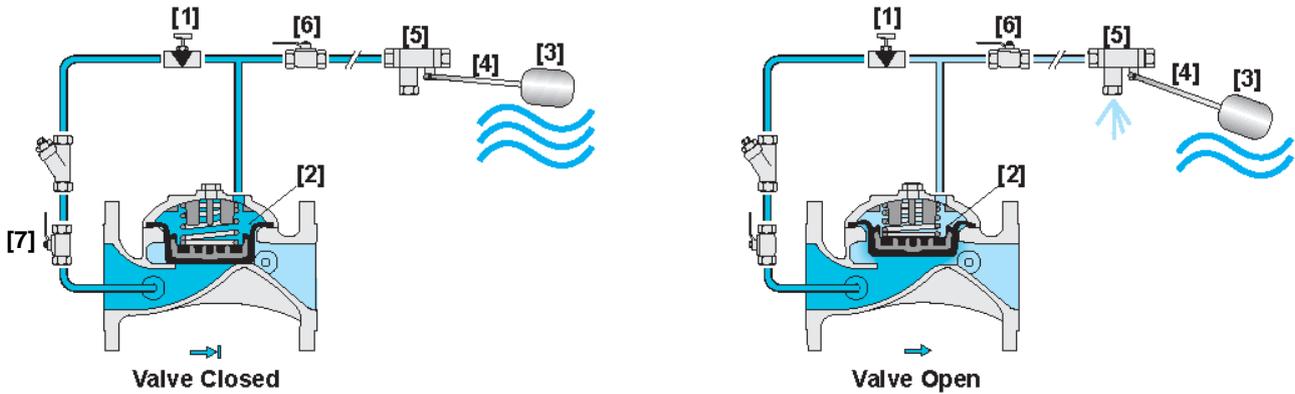
6.1 OPEN the pilot line cock valve (6) and OPEN the priming ball valve (7).

6.2 Open the upstream and downstream Isolation valves slowly, this will allow the valve to open and water to fill reservoir.

6.2 Lift the Float Arm (4) to the upper closed position, ensure that the main valve closes.



## 7. Figure 1: Operation Drawing



## 8. Maintenance and Inspection Test

### 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 control filter / strainer	Annually
Seat inspection	Annually
Valve freedom of movement	Annually
Sealing	Annually
Needle valve operation	Annually
Inspect and/or replace diaphragm heavy duty	3 years
Inspect and/or replace diaphragm light duty	5 years

### 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.

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

### Part List

Bermad has a convenient and easy to use Ordering Guide for valve spare-parts and control system components.

Bermad Company has a complete inventory of parts. Shipment on any part is made the same day the order is received.

Stocking distributors in many regions also have an inventory of parts. Contact your local representative.

It is not recommended to store spare rubber parts for long periods (e.g. years). Rubber in improper storage conditions can harden, have ozone cracking, grow mold bloom and heat aging. Order new rubber parts when required.

## 9. Trouble-Shooting

Symptom	Probable Cause	Action
Valve fails to open	Insufficient inlet pressure	Check/create inlet pressure.
	Isolating cock valve closed	Turn the valve handle to open position.
	Reservoir is full	Check reservoir water level.
	Needle valve is too open	Close fully needle screw CW, then open ½ turn CCW.
	Float Pilot valve not opened	Inspect that the Float Arm (4) is go down to the open position, ensure that water flows from the float pilot valve.
Valve fails to close.	Filter (4) blocked	Remove filter cap and screen to flash and clean.
	Priming ball valve closed	Turn the valve handle to open position
	Needle valve is closed	Open ½ turn CCW.
	Debris trapped in main valve	Inspect valve interior. Remove the valve cover and inspect the seat and the elastomer seal aria. Refer to FP 400 data.
	Diaphragm in main valve is leaking	Remove the valve cover and inspect the diaphragm assembly. Refer to FP 400 data.
	Float Pilot valve not properly operated	Lift the Float Arm (4) to the upper closed position, ensure that the pilot valve completely closes, replace if leaks.
Valve fails to regulate	Filter (4) blocked	Remove filter cap and screen to clean.
	Priming ball valve closed	Turn the valve handle to open position
	Blocked Pilot line	Check and clean.
	Float Pilot valve not properly operated	Lift the Float Arm (4) to the upper closed position, ensure that the pilot valve completely closes, replace if leaks.

