

Bermad Level Control Valve With Bi-Level Vertical Float

Model: FP 450-66

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 450-66 Level Control Valve with Bi-Level Vertical Float is a hydraulically controlled, diaphragm actuated control valve that controls reservoir filling in response to a hydraulic on/off float pressure commands.

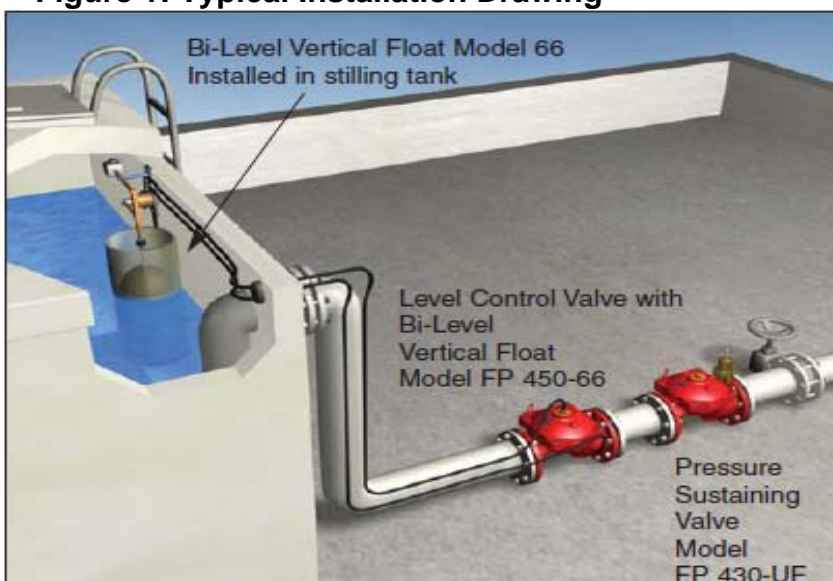
The Valve is an automatic self-controlled, diaphragm actuated that controls reservoir filling to maintain constant water level, regardless of fluctuating demand. The valve opens at pre-set low level and shuts at pre-set high level.

3. Approvals

BERMAD 450-66 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:

Figure 1: Typical Installation Drawing



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.

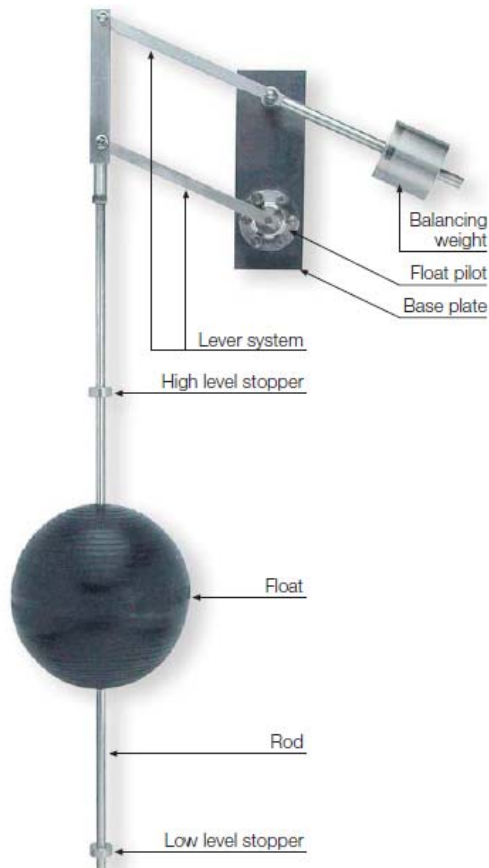
Isolation valves should be installed upstream and downstream of the valve to allow for future maintenance operations.

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, 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.

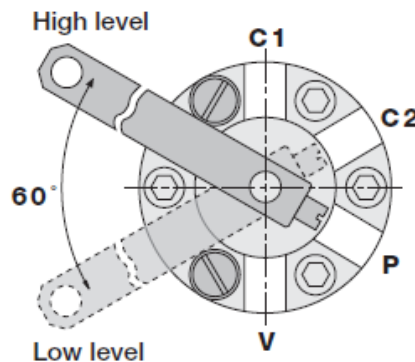
A pilot line pipe of 3/8" minimum diameter should be installed to connect between the water filter (7) on the main Bermad valve to the float pilot valve (5) on the reservoir.

Figure 2: Float Pilot Valve Model 66



Float Pilot Valve Connections:

Port	Reservoir inlet	Reservoir outlet
C1	Upper control chamber	Lower control chamber
C2	Lower control chamber (or plugged)	Upper control chamber
P	Upstream pressure	Upstream pressure
V	Vent	Vent



4.2 In Line Static Test

4.2.1 Open Valve Static Test

CLOSE the priming ball valve (10) to isolate the pilot system to prevent dirt from entering into the pilot system.

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

OPEN the priming ball valve (10), This will allow water to fill the pilot line and to reach the Float Pilot valve, pull the float Rod (2) and arm to it's upper (closed) position, this will pressurizes the main valve control chamber (6), the valve will close slowly 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 450-66 is a float controlled valve equipped with a 3-ay / 4-way, "last position", bi-level float pilot assembly.

The float (1) slides along the rod (2). When the float reaches either the adjustable high (3) or low (4) level stoppers, it either pulls the rod assembly down or pushes it up, switching the float pilot (5) position. When the float is between the adjustable stoppers, the main valve remains in its last position.

At high level, the float pilot applies pressure to the control chamber (6), powerfully shutting off the main valve. At low level, the float pilot vents the control chamber, powerfully opening the main valve.

For 8" valves and larger, an accelerator (7) quickens valve response.

Operation Instructions/Start-up:

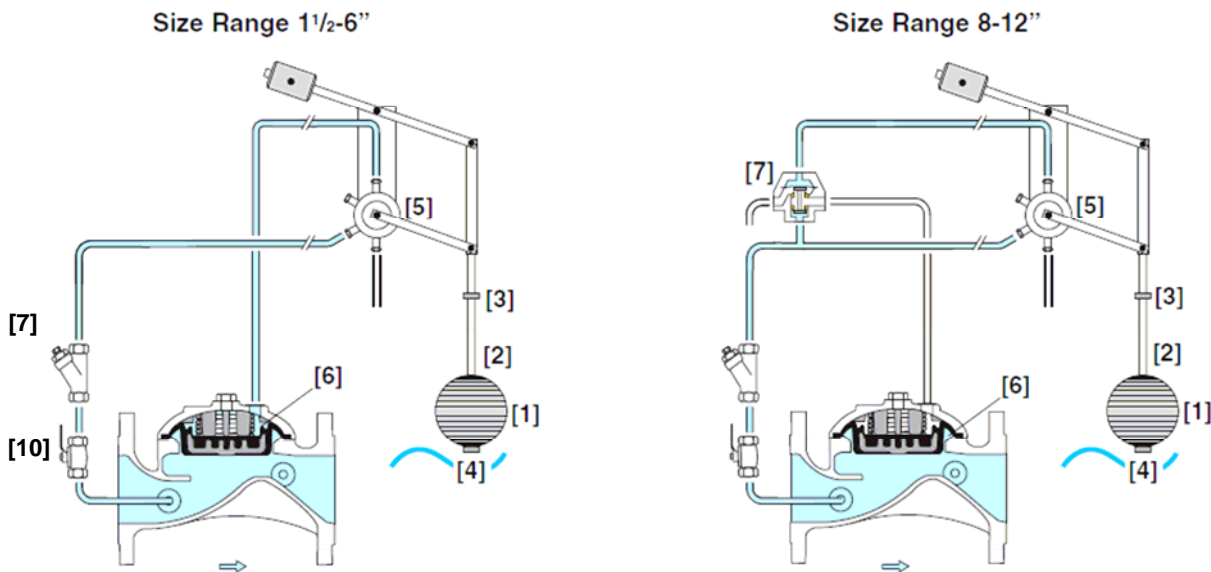
6.1 OPEN the priming ball valve (10).

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 Rod (2) to the upper closed position, ensure that the main valve closes.



7. Figure 2: 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.
	pilot line connecting pipe/tube is blocked	Open the connecting tube to the pilot valve and allow water to flow to the atmosphere. Clean or replace the pipe if necessary.
	Float Pilot valve not opened	Inspect that the Float Arm (2) is go down to the open position, ensure that water is drained through the float pilot valve.
Valve fails to close.	Filter (7) blocked	Remove filter cap and screen to flash and clean.
	Priming valve (10) closed	Turn the valve handle to open position
	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 (2) to the upper closed position, ensure that the pilot valve completely closes, replace if leaks.
	Float height is not properly adjusted	Adjust the float stoppers along the rod (2), adjust the float by the high (3) or low (4) level stoppers.
Valve fails to regulate	Filter (7) blocked	Remove filter cap and screen to clean.
	Priming valve (10) closed	Turn the valve handle to open position
	Blocked Pilot line	Check and clean.
	Float Pilot valve not properly operated	Lift the Float Arm (2) to the upper closed position, ensure that the pilot valve completely closes, replace if leaks.