FP-450-65

Electric Float Control Valve

Installation

Operation

Maintenance

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".

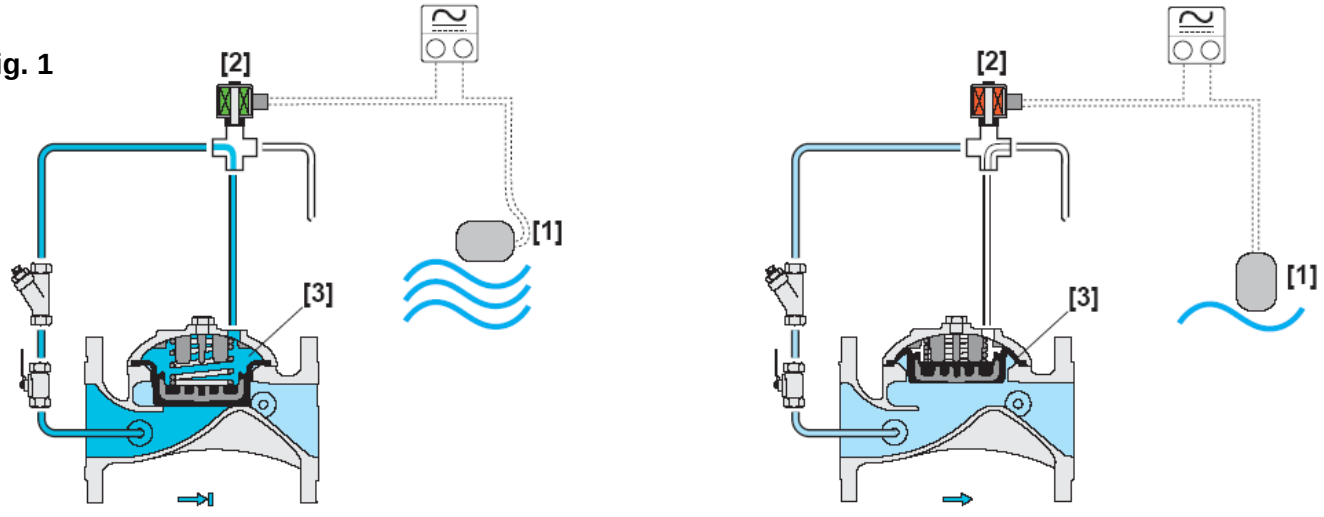
1. Description

The Model 450-65 Electrical Float Control Valve is an on / off automatic control valve designed for low level and high level control of water in reservoirs and storage tanks. It fully opens and closes drip-tight in response to an electric float switch and a solenoid pilot valve. It is a pilot controlled, hydraulically operated, diaphragm actuated globe valve. The valve operates independently of valve differential pressure. The Single-chambered diaphragm actuator always has full differential pressure to develop maximum power and immediate reaction. The lower control chamber is vented to atmosphere and the upper control chamber is alternately pressurized or vented by the opening and closing of a 3-way solenoid activated by an electric float pilot who senses low and high water levels. The 3-way operation allows the main valve to be fully opened even at very low system pressures which provides minimum head loss across the valve.

2. Principal Of Operation

The electric float switch senses a low and high water level in the tank or reservoir and alternatively energizes and de-energizes a solenoid valve that pressurizes or vents the upper control chamber of the main valve. The Model 450-65 can be configured to provide either main valve closing at high level or low level. For high level closing the float ball rises causing the electric float switch to de-energize the standard normally open solenoid which pressurizes the upper control chamber causing the main valve to close and stop fill flow to the tank. As tank level drops the main valve remains closed until the float switch energizes the solenoid which vents the upper chamber causing the main valve to open and start fill flow to the tank. The sequence of pressurizing and venting the upper control chamber is reversed for low-level closing.
The electric float switch and solenoid pilot valve can be supplied in various voltages and ratings.

Fig. 1



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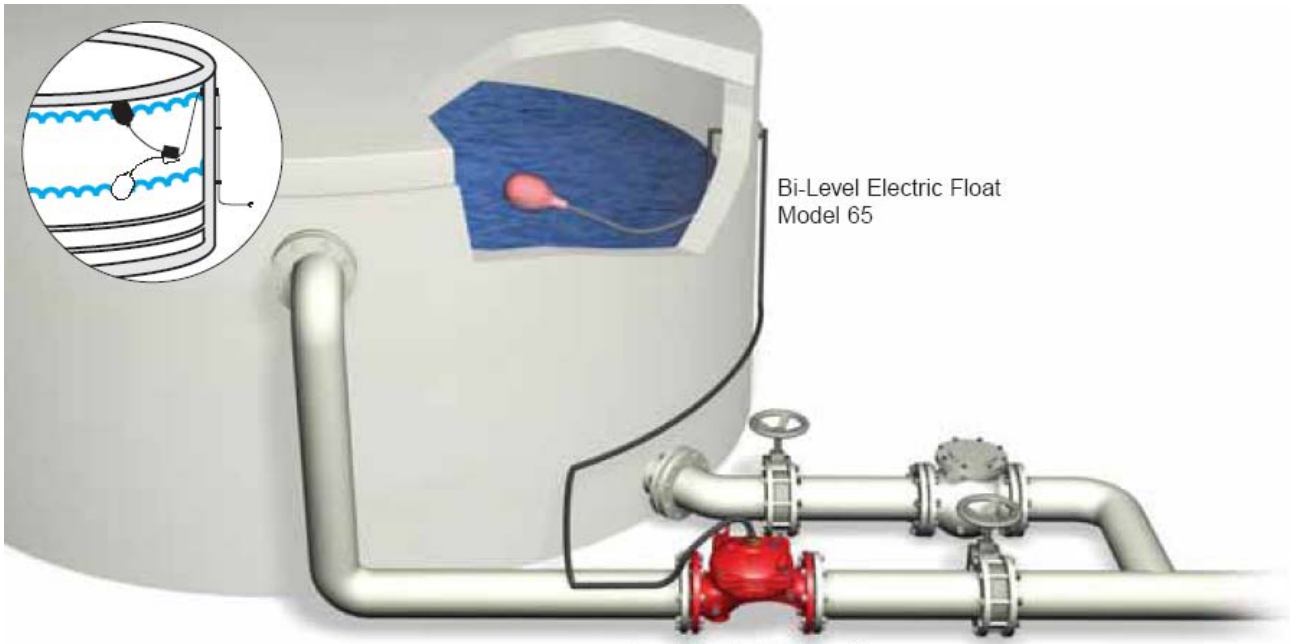
Approvals

BERMAD 450-65 has no special certifications. Consult the manufacturer for any component approval recently to appear in the fire protection equipment directory.

3. Installation

1. Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
2. Thoroughly flush the pipeline to remove any dirt, scale, debris, etc. Failure to do this may result in the valve being inoperable.
3. Isolation valves should be installed upstream and downstream of the valve to allow for future maintenance operations.
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. For best performance, install the valve horizontally with the cover up. Ensure that the valve is positioned so that the actuator assembly can be easily removed for future maintenance.
5. After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
6. The float ball should be placed where the liquid surface is free from turbulence. If this is not possible a stilling well must be placed around the float ball to protect it.
7. The float control assembly should be positioned higher than the high level water setting and with adequate space between the reservoir wall and the float ball.
8. Electrically connect the solenoid and float switch in accordance with all applicable codes.



Level Control Valve with
Bi-level Electric Float
Model FP 450-65

4. In Line Static Test

4.1. Open Valve Static Test

Close cock valve (4 fig.1) to isolate the pilot control system. This prevents dirt from entering into the control loop.
Remove the cover plug on the main valve.
Caution: This will allow the valve to open fully. Ensure that this will not cause system damage.
Inspect and correct any leaks at the flange connections, fittings etc.
Replace the cover plug.

4.2. Closed Valve Static Test

Open cock valve (4 fig.1) and, if provided, place 4-way on/off/auto valve in automatic position.
Ensure solenoid allows upstream pressure to upper chamber by setting the manual operator correctly. The main valve will close. Vent any trapped air in the main valve cover by loosening the tube fitting at the highest point on the cover. This will trap the main valve in a closed position while the upstream pipeline is pressurized.
Check the valve cover and diaphragm area for leaks, and tighten the actuator bolts if necessary.

5. Start-Up Operation

NOTE: Check the solenoid voltage specification marked on the solenoid cover for compatibility with the electrical service to avoid coil burn-out.

1. The electric float switch (1 fig.1) should have been installed at a level higher than the high water level required and in a place where the liquid is free from turbulence. If this is not possible a stilling well must be placed around the float to protect it from turbulence. Ensure adequate clearance between the float and the tank wall.
2. Adjust the upper and lower water levels by moving the float and noting switch movement
3. Open cock valve (4 fig.1) and, if provided, place 4-way on/off/auto valve on automatic.
4. Energize /de-energize the solenoid by moving the float ball. The main valve should respond as required.

6. Preventative Maintenance Schedule

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

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

7. Field Maintenance Instruction

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.
Valve Overhaul: after about three years of operation, replacement of important parts and diaphragm is recommended. Remove the actuator, clean the valve body from sediments, clean the control tubing entry holes, install a new diaphragm and other Elastomers.
FILTER CLEANING. The filter used in the valve is a Y pattern filter. The filter should be cleaned manually every time the valve is opened for internal inspection.

8. Part List

Bermad has a convenient and easy to use Ordering Guide for valve spare-parts and control system components. (See attached pages with spare part list and illustrated parts breakdown).
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	No electrical supply.	Check/create electrical supply.
	Insufficient inlet pressure.	Check/create inlet pressure.
	Solenoid: a. Plunger stuck b. Ports are blocked c. No reaction - "no click" or coil is burnt out.	a. Check and clean plunger b. Check and clean ports c. Replace the coil. Check that the power supply voltage is the same as the solenoid spec.
	No demand. Tank is full.	Slightly drain the tank to check operation
	Float pilot trapped in closed (upper) position	Check float assembly and. electrical connection
	Float pilot is in a poor location.	Relocate the pilot to a non- turbulent surface of the tank or install a stilling well
Valve fails to close	Filter (5 fig.1) blocked	Remove filter cap and screen to clean.
	Cock valve (4 fig.1) closed.	Open cock valve (4 fig.1).
	Solenoid: a. Remains energized b. Ports are blocked	a. De-energize solenoid b. b. Check and clean ports.
	Float valve trapped in open (lower) position.	Check float valve for proper operation Slightly reduce pressure to the pilot closing cock valve (4 fig.1) slightly.
	Float valve is in a poor location.	Relocate the pilot to a non- turbulent surface of the tank or install a stilling well
	Float valve is blocked	Remove the pilot, clean and replace.

Valve fails to close	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat
	Diaphragm in main valve is leaking	Test for leakage. Close cock valves (4 fig.1)and remove cover plug in the main valve cover. If a continuous flow exists, the diaphragm is damaged or loose. **Caution:** This test will cause the valve to go fully open. Close downstream gate valve or omit this test if it may cause damage.