Level Control Valve
with Bi-Level Electric Float

Model FP 450-65

- Reservoir filling
  - Very low supply pressure
  - Low noise generation
  - Energy cost critical systems
  - Systems with poor water quality

The Model FP 450-65 Level Control Valve with Bi-Level Electric Float is a hydraulically operated, diaphragm actuated, control valve that controls reservoir filling in response to an electric float switch signal.
The valve fully opens at a pre-set low level and closes at a pre-set high level.

(for Illustration Only)

Features and Benefits

- **Line-Pressure Driven**
  - Independent operation
- **Bi-Level Electric Float Switch**
  - On/Off - non modulating
  - No hydraulic sensing tubes
  - Suited to various types of level sensors
  - Solenoid Controlled
  - Low power consumption
  - Normally open / normally closed
- **Rugged Reliability**
  - Single-piece fully supported rolling diaphragm
  - Obstacle-free unobstructed flow path
  - Suitable for poor quality water
- **Hydraulically Restrained Actuation**
  - Non-slam closing
  - Quiet and smooth operation
- **High Performance**
  - High flow capacity
  - Low operating pressure
- **External Installation**
  - Easy access to valve
  - Simple level setting
  - Less wear and tear
- **In-line Serviceable**
  - Quick and easy maintenance
- **Flexible Design**
  - Simple addition of factory supplied features

Major Additional Features

- Closing surge prevention – **450-65-49**
- Hydraulic float back-up – **450-65-66**
- Altitude pilot back-up – **450-65-80**
- Relief override – **450-65-3Q**
- Pressure sustaining valve – **453-65**
- Flow control valve – **457-65-U**

For further options, See relevant BERMAD publications.

Operation

The Model FP 450-65 is a solenoid controlled valve equipped with a bi-level, electric float switch* and a solenoid pilot**.

The float switch [1] closes at a pre-set low level energizing the solenoid [2], and opens at a pre-set high level, de-energizing The solenoid.

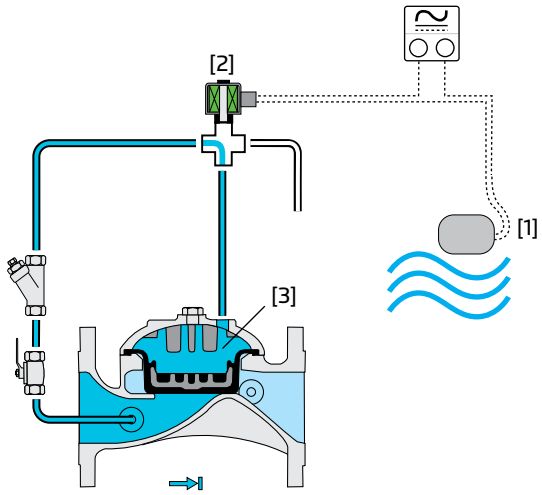
Should the water level drop to the pre-set low level, the float position will close the electric circuit and will energize the solenoid, causing the control chamber [3] to vent and thereby opening the main valve to fill the reservoir.

When the water level has risen to the pre-set high level, the float position will open the electric circuit and de-energize the solenoid, causing pressure to accumulate in the main valve control chamber closing the main valve.

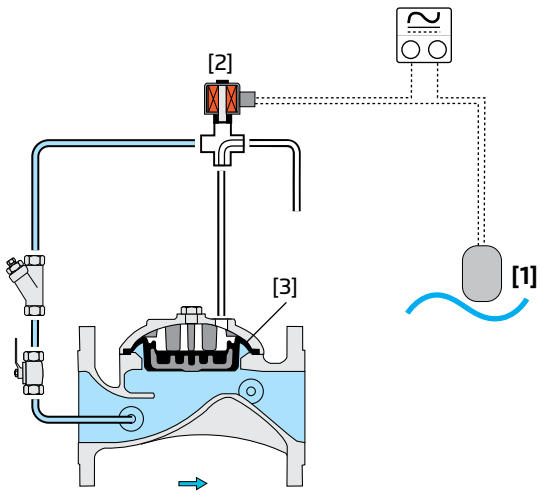
For 8" (200 mm) valves and larger, an accelerator quickens valve response.

* Other switching means are available.

** Normally closed, and normally open main valves are available.



Valve Closed



Valve Open

Engineer Specifications

The Level Control Valve shall control reservoir filling in response to an electric float switch signal, opening at pre-set low level and shutting at pre-set high level.

Main Valve: The main valve shall be an elastomeric type globe (or angle) valve with a rolling-diaphragm. The valve shall have an **unobstructed flow path**, with no stem guide or **supporting ribs**. The body and cover construction material shall be ductile iron. All external bolts and nuts shall be of Stainless Steel 316. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

Actuation: Valve actuation shall be accomplished by a fully peripherally supported, one-piece balanced rolling-diaphragm, vulcanized with a rugged radial seal disk. The diaphragm assembly shall be the only moving part.

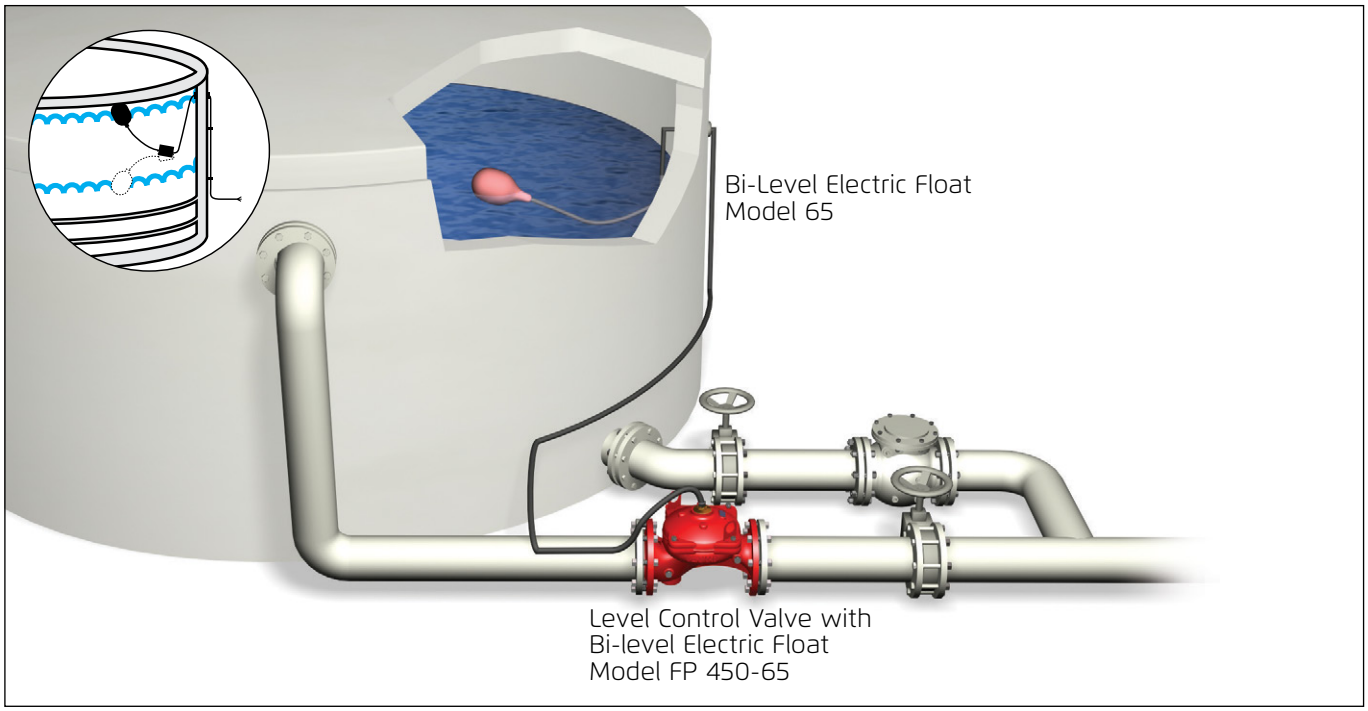
Control System: The control system shall consist of an electrical level sensor, a solenoid pilot (for 8" and larger valves, an accelerator shall be added to the solenoid), an isolating cock valve, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.

Quality Assurance: The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.

Typical Applications

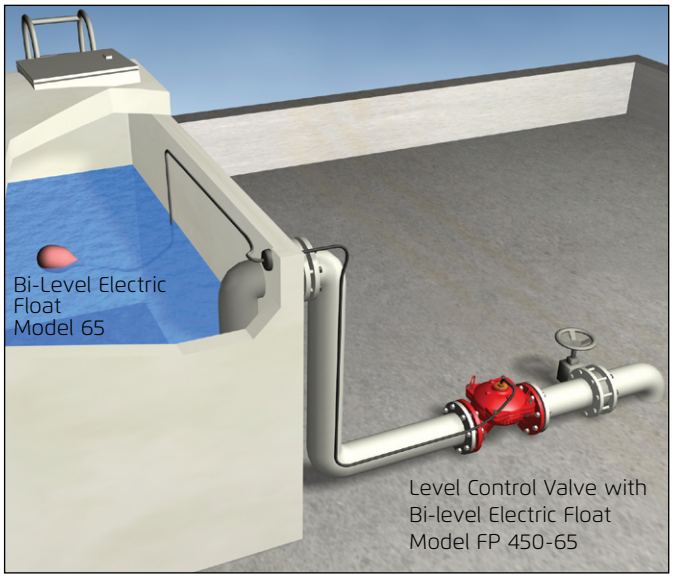
Infrastructure Installation

Reservoirs vary in their characteristics – location, elevation, filling and emptying flow and pressure, surface area, etc. These various characteristics require various level control valve solutions.
The Model FP 450-65 is the ideal solution for level control in reservoirs – shallow and deep, low and high elevation, rooftop and basement, in water towers, and wherever electric power is available.

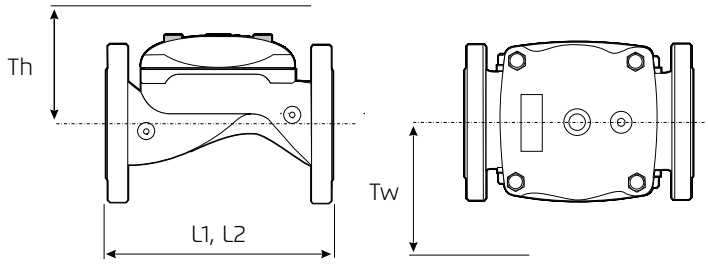


Rooftop Reservoirs

Rooftop reservoir level control is attained by electric control of the basement pumps according to reservoir level. As overflow of a rooftop reservoir can cause costly damage, additional backup protection is recommended. The Model FP 450-65 is suited to this function. When open, it presents minimal interference, but when needed, it shuts off securely.
To ensure supply pressure to upper floor consumers or the fire protection system, install the Model FP 420 or 42T Pressure Control Valve upstream from the Model FP 450-65.



Technical Data



Size		2"		2½"		3"		4"		6"		8"		10"		12"	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
Dimensions	L_1 (1)	205	8 1/2	205	8 1/2	257	10 1/8	320	12 9/16	415	16 5/16	500	19 11/16	605	23 13/16	725	28 1/2
	L_2 (2)	180	7 1/16	210	8 1/4	255	10 1/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tw	284	11 3/16	284	11 3/16	300	11 3/16	313	12 5/16	341	13 7/16	415	16 5/16	443	17 7/16	481	18 15/16
	Th	210	8 1/4	210	8 1/4	215	8 7/16	243	9 9/16	315	12 3/8	350	13 3/4	382	15	430	6 15/16

Notes:
1. L_1 is for flanged valves.
2. L_2 is for threaded NPT or ISO-7-Rp.
3. Tw & Th are max. for pilot system.
4. Data is for envelope dimensions, component positioning may vary.
5. Provide space around valve for maintenance.

Connection Standard
- Flanged: ANSI B16.42 (Ductile Iron), B16.5 (Steel & Stainless Steel), B16.24 (Bronze) ISO PN16
- Grooved: ANSI/AWWA C606 for 2, 3, 4, 6 & 8"
- Threaded: NPT or ISO-7-Rp for 2, 2½ & 3"

Water Temperature
- 0.5 – 60°C / 33 – 140°F

Available Sizes
- Globe: 1½, 2, 2½, 3, 4, 6, 8, 10 & 12"
- Angle: 2, 3 & 4"

Pressure Rating
- Max. inlet: 250 psi (17 bar)

Manufacturers Standard Materials

Main valve body and cover
- Ductile Iron ASTM A-536

Main valve internals
- Stainless Steel & Elastomer

Control Trim System
- Brass control components/accessories
- Stainless Steel 316 tubing & fittings

Elastomers
- Polyamide fabric reinforced Polyisoprene, NR

Coating
- Electrostatic Powder Coating Polyester, Red (RAL 3002)

Optional Materials

Main valve body
- Carbon Steel ASTM A-216 WCB
- Stainless Steel 316
- Ni-Al-Bronze ASTM B-148

Control Trim
- Stainless Steel 316
- Monel® and Al-Bronze
- Hastelloy C-276

Elastomers
- NBR
- EPDM

Coating
- Corrosion resistant fusion-bonded High Build epoxy coating with UV protection

Float switch Data

Max. Current: 16A@250V

Fluid specific weight: 0.95-1.10

Working temperature:
Water up to 60°C (140°F)

Dimensions:
- Length – 124 mm (4.9")
- Width – 90 mm (3.5")
- Cable length – 4.9 m (16 ft.)

Solenoid Electrical Data:

Voltages:
- (ac): 24, 110-120, 220-240, (50-60 Hz)
- (dc): 12, 24, 110, 220

Power Consumption:
- (ac): 30 VA, inrush; 15 VA (8W), holding or 70 VA, inrush; 40 VA (17.1W), holding
- (dc): 8-11.6W

Values might vary according to specific solenoid model