# Level Control Valve

## with Bi-Level Electronic Float

## Model: FP 450-65

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

## Description

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 pre-set low level and shutts at pre-set high level.

## Features and Benefits

- **Line-pressure driven –** Independent operation
- **Bi-Level electric float switch**
  - On/off service
  - No hydraulic sensing tubes
  - Suited to various float switches
- **Solenoid controlled**
  - Low power consumption
  - Normally Open or Normally Closed main valve
- **One-piece molded elastomeric moving part –** No maintenance required
- **Dynamically restrained actuation**
  - Non-slam closing
- **Balanced rolling-**diaphragm
  - High flow capacity
  - Very low opening & closing pressure requirement
- **In-line serviceable –** Easy maintenance
- **Flexible design –** Easy addition of features
- **External installation –** Pilot operated

## 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.

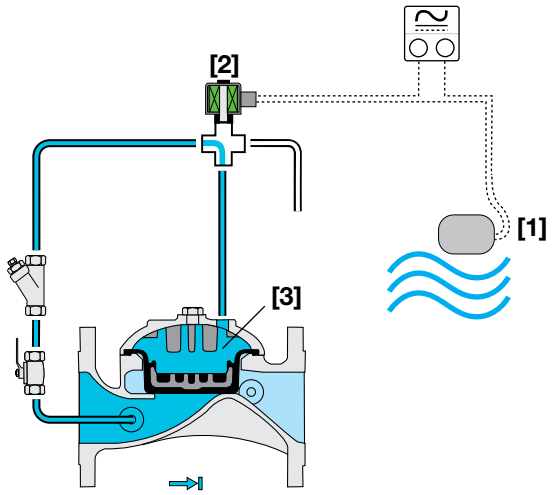
## Operation

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 level drop, the solenoid is energized, causing the control chamber **[3]** to vent, opening the main valve. Should the level rise, the solenoid is de-energized, and pressure is applied to the control chamber harnessing line pressure to close the main valve.

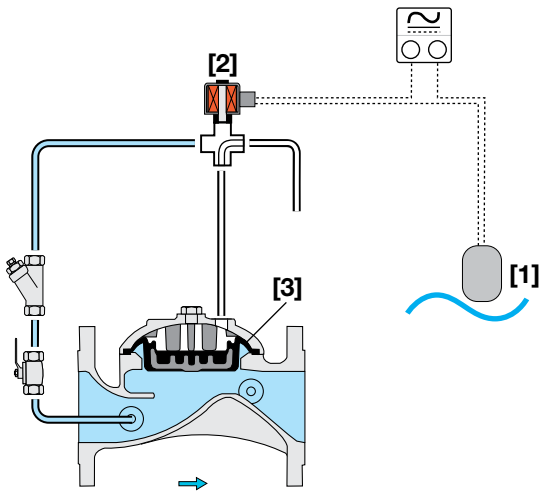
For 8" (200 mm) valves and larger, an accelerator quickens valve response.

* 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 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.

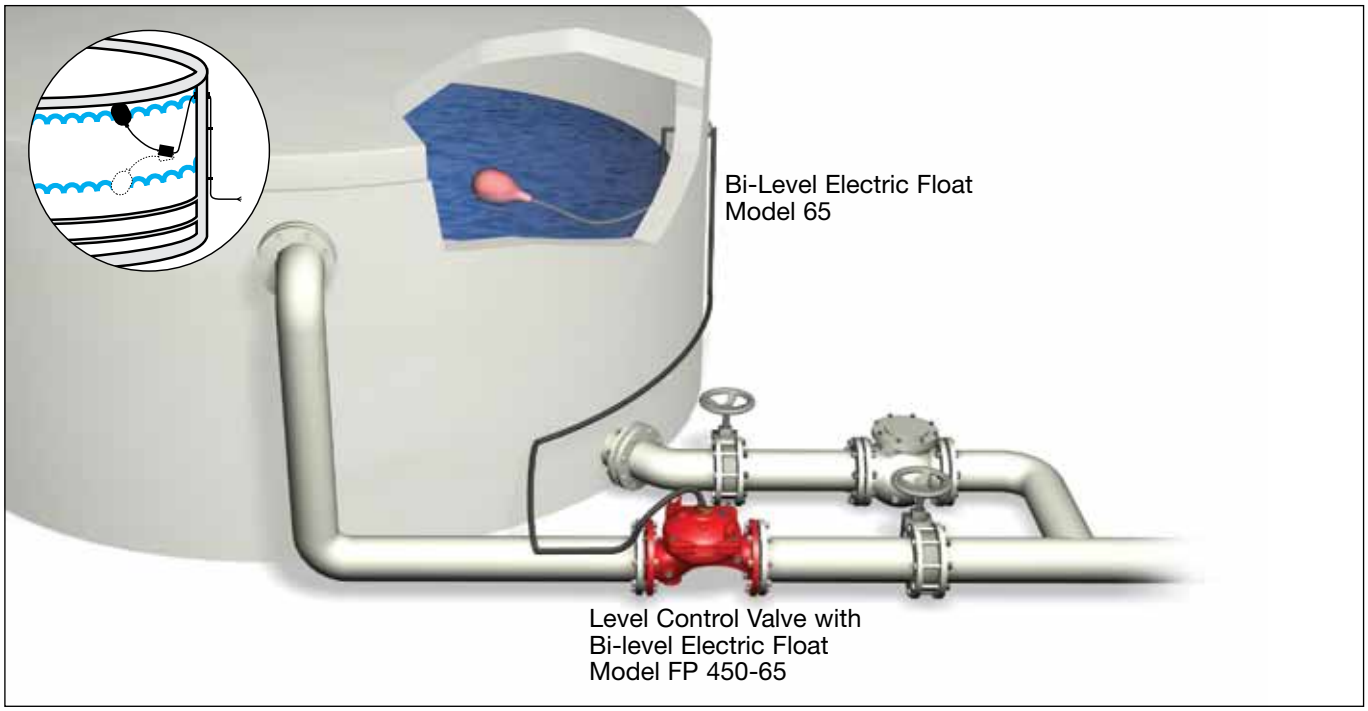
**Control System:** The control system shall consist of an electrical level sensor, a solenoid pilot (for 10" and larger valves, an accelerator shall be added to the solenoid), an isolating cock valve, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested.

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

## Typical Applications

### Infrastructure Installation

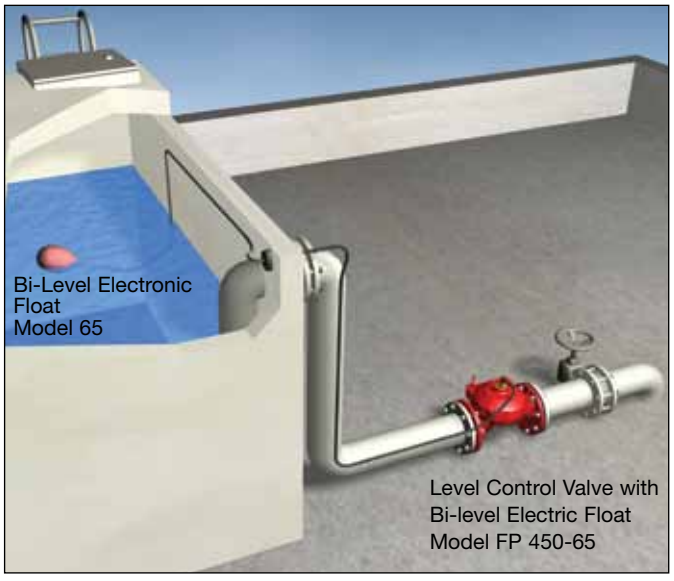
Reservoirs vary in their characteristics – location, elevation, filling and emptying flow and pressure, surface area, etc. These various characteristics require various level control valve solutions.
The Model FP 450-65 is the ideal solution for level control in reservoirs – shallow and deep, low and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




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

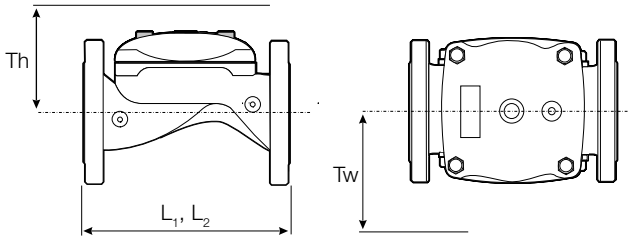
### Rooftop Reservoirs

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 prioritize pressure to upper floor consumers or fire protection system, install the
Model FP 430-UF Pressure Sustaining Valve upstream from the Model FP 450-65.




Level Control Valve with
Bi-level Electric Float
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 | 500 | 19 11/16 | 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 – 50°C (33 – 122°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**
- High Build Epoxy Fusion-Bonded with UV Protection, Anti-Corrosion

### 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