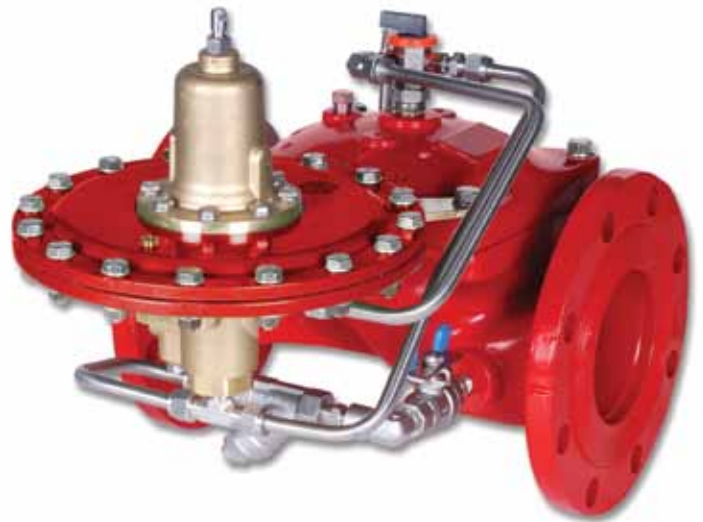


## Level Control Valve with Altitude Pilot

### Model: FP 450-80

- High level reservoirs & water towers
- Energy cost critical systems
- Systems with poor water quality
- Inherent refreshing
- Level sustaining at reservoir outlet



### Description

The Model FP 450-80 Level Control Valve is a hydraulically controlled, diaphragm actuated, control valve that shuts at pre-set high reservoir level and fully opens in response to an approximately one-meter (three-foot) level drop, as sensed by the 3-Way altitude pilot mounted on the main valve.

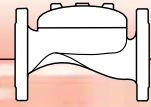
### Features and Benefits

- **Line-pressure driven** – Independent operation
- **Bi-level altitude pilot**
  - No float, simple installation
  - On/Off service
  - Suitable for low quality water
- **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
- **External installation**
  - Easy access to valve
  - Easy level setting
  - Less wear and tear
- **In-line serviceable** – Easy maintenance
- **Flexible design** – Easy addition of features

### Major Additional Features

- 2-14 meter Setting Altitude Pilot – **FP 450-80-M6**
- 5-22 meter Setting Altitude Pilot – **FP 450-80-M5**
- 15-35 meter Setting Altitude Pilot – **FP 450-80-M4**
- 25-70 meter Setting Altitude Pilot – **FP 450-80-M8**
- Modulating altitude control – **FP 450-82**
- Pressure sustaining (for 450-80) – **453-80**
- Pressure sustaining (for 450-82) – **453-82**

For further options, See relevant BERMAD publications.



## Operation

The Model FP 450-80 is a pilot controlled valve equipped with an adjustable, 3-way, altitude pilot. The pilot senses the static head of the reservoir level via a tube [1] connected to a “still point” at the bottom of the reservoir.

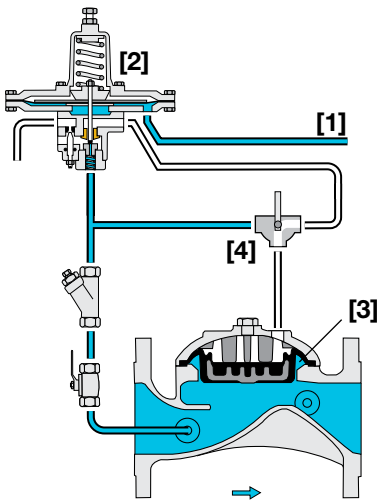
Should static head rise to pilot setting, the pilot [2] applies pressure to the control chamber [3] via cock valve [4], powering the main valve to shut.

Should static head fall below pilot setting by approximately 1m (3 ft), the pilot vents the control chamber, causing the main valve to fully open.

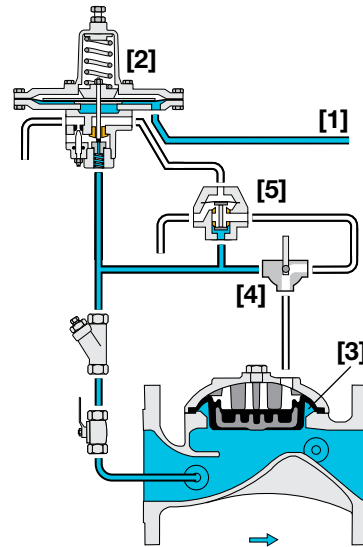
The 3-way cock valve [4] enables manual closing of the main valve.

For 8” valves and larger, an accelerator [5] quickens valve response.

Size Range 1½”-6”



Size Range 8”-12”



## Engineer Specifications

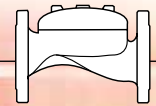
The Level Control Valve shall shut at pre-set high reservoir level and fully open in response to an approximately one-meter (three-foot) level drop, as sensed by the 3-way altitude pilot mounted on the main valve.

**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 a 3-way, altitude pilot valve with a covered, centered spring and 8” (200 mm) sensing diaphragm, (for 10” and larger valves, an accelerator shall be added), an isolating cock valve, a 3-way cock valve, and a filter. All fittings shall be of stainless steel. The assembled valve shall be hydraulically tested.

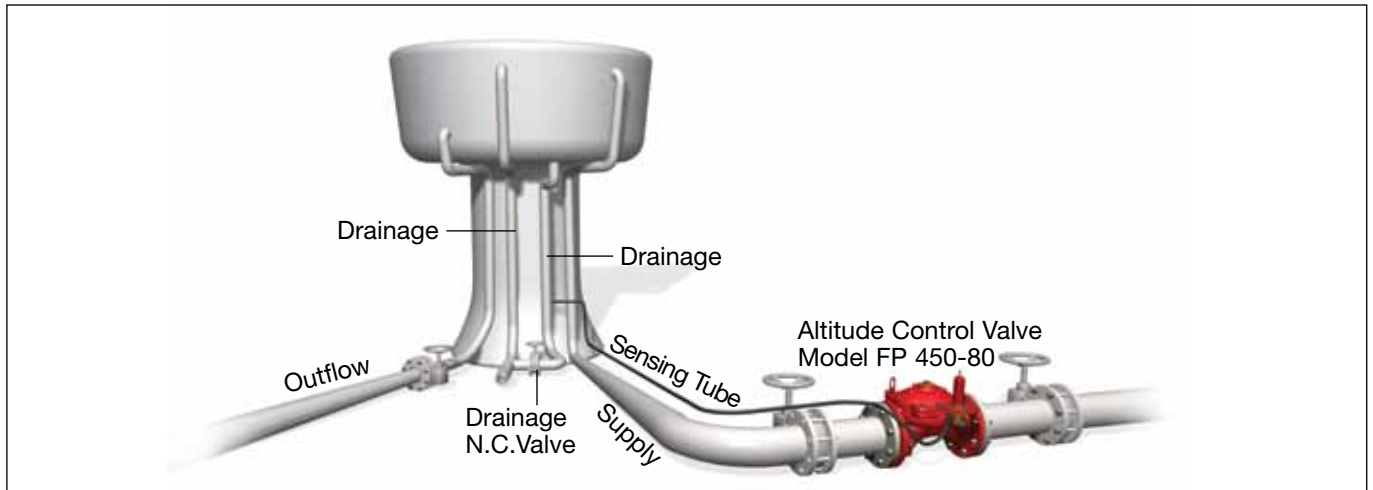
**Quality Assurance:** The valve manufacturer shall be certified according to the ISO 9000 and 9001 Quality Assurance Standard.



## Typical Applications

### Bi-Level Water Towers

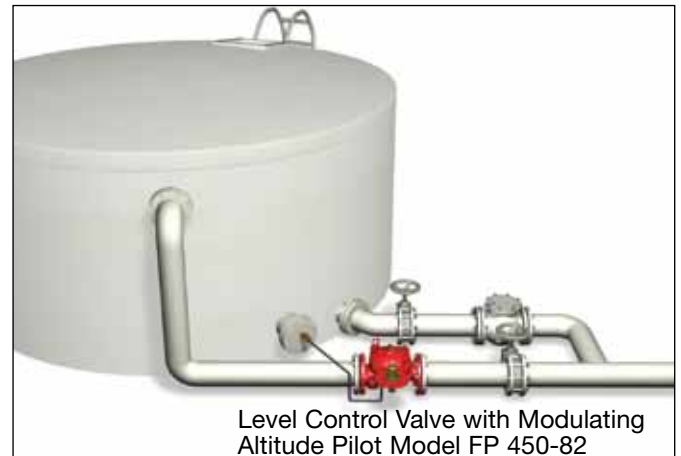
The Model FP 450-80 senses the static head of the water level in the tank by means of a high sensitivity pilot. To do so accurately, the sensing tube end must be connected to a “still point” at the bottom of the tank. The drainage pipe provides this “still point”, a location not influenced by flow velocity as in filling and outflow pipes.



### “Always Full” - Shallow Reservoirs

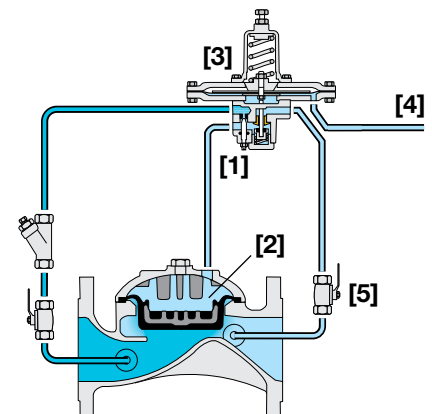
In these reservoirs, the water level should be kept as constant as possible.

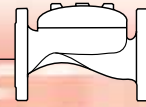
The Level Control Valve with modulating altitude pilot Model FP 450-82 is well suited to fulfill this requirement. The altitude pilot is highly sensitive to changes and accurately maintains level within a few centimeters. To do so, the sensing tube end must be connected to a “still point” at the bottom of the reservoir.



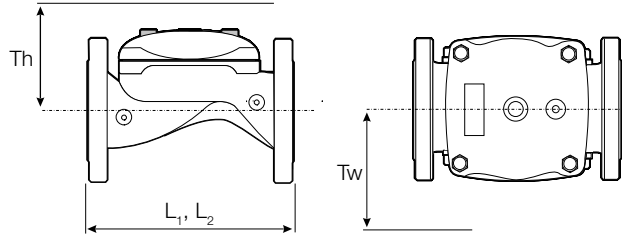
### Level Control Valve with Modulating Altitude Pilot Model FP 450-82

The Model FP 450-82 modifies the Model FP 450-80 “On-Off” feature into a modulating feature to maintain an “always full” reservoir. The needle valve [1] continuously allows flow from valve inlet into the control chamber [2]. The pilot [3] senses static head via sensing tube [4]. Should the static head rise towards pilot setting, the pilot throttles, causing the main valve to throttle closed, reducing filling rate, eventually closing drip tight. The downstream cock valve [5] enables manual control closing.





## Technical Data



Size	1½, 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 <sub>1</sub> <sup>(1)</sup>	205	8½	205	8½	257	10⅛	320	12 <sup>9</sup> / <sub>16</sub>	415	16 <sup>5</sup> / <sub>16</sub>	500	19 <sup>11</sup> / <sub>16</sub>	605	23 <sup>13</sup> / <sub>16</sub>	725	28½
	L <sub>2</sub> <sup>(2)</sup>	180	7 <sup>1</sup> / <sub>16</sub>	210	8¼	255	10 <sup>1</sup> / <sub>16</sub>	N/A	N/A	N/A	N/A	500	19 <sup>11</sup> / <sub>16</sub>	N/A	N/A	N/A	N/A
	Tw	284	11 <sup>3</sup> / <sub>16</sub>	284	11 <sup>3</sup> / <sub>16</sub>	300	11 <sup>3</sup> / <sub>16</sub>	313	12 <sup>5</sup> / <sub>16</sub>	341	13 <sup>7</sup> / <sub>16</sub>	415	16 <sup>5</sup> / <sub>16</sub>	443	17 <sup>7</sup> / <sub>16</sub>	481	18 <sup>15</sup> / <sub>16</sub>
	Th	210	8¼	210	8¼	215	8 <sup>7</sup> / <sub>16</sub>	243	9 <sup>9</sup> / <sub>16</sub>	315	12 <sup>3</sup> / <sub>8</sub>	350	13¾	382	15	430	6 <sup>15</sup> / <sub>16</sub>

**Notes:**

- L<sub>1</sub> is for flanged valves.
- L<sub>2</sub> is for threaded NPT or ISO-7-Rp.
- Tw & Th are max. for pilot system.
- Data is for envelope dimensions, component positioning may vary.
- 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

### Altitude Pilot Data

#### Standard Materials:

- Body & cover: Brass, Bronze or Stainless Steel
- Elastomers: NBR (Buna N)
- Springs: Galvanized Steel or Stainless Steel
- Internals: Stainless Steel
- Diaphragm covers: Fusion bonded epoxy coated Steel or Stainless Steel

#### General Information

- Altitude Adjustment Range Table:

Code	meter	feet
M6	2-14	7-46
M5	5-22	17-72
M4	15-35	49-115
M8	25-70	82-230

- Shut-off level repeatability: 10 cm (4")
- Re-opening level: approx. 1m (3 ft) below shut-off level

