

## Level Control Valve with Altitude Pilot

(Sizes 3" - 6"; DN80-150)

### Description:

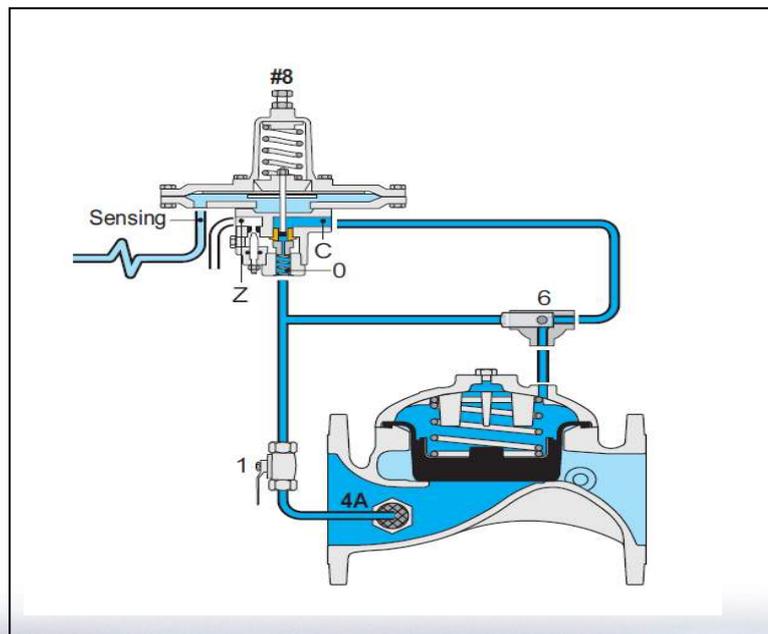
The BERMAD Model IR-450-80-XZ Level Control Valve with Altitude Pilot is a hydraulically operated, diaphragm actuated control valve. The valve hydraulically shuts at preset reservoir high level and fully opens in response to an approximately one-meter (three-foot) level drop, as sensed by the 3-way altitude pilot mounted on the main valve.

### Installation:

1. Ensure enough space around the valve assembly for future maintenance and adjustments.
2. Prior to valve installation, flush the pipeline to insure flow of clean fluid through the valve.
3. For future maintenance, install Isolation gate valves upstream and downstream from Bermad control valve.
4. Install the valve in the pipeline with the valve flow direction arrow in the actual flow direction.
5. For best performance, it is recommended to install the valve horizontally and upright.
6. After installation carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
7. It is highly recommended to install a strainer Bermad model 70F upstream from the IR-450-80-XZ, to prevent debris from damaging valve operation.
8. Prepare a 1" female threaded "Hydrostatic level sensing port"; consist of a cock-valve and a filter, at a "still-point" at the bottom of the reservoir.

**Note:** The drainage pipe might provide this "still-point", a location not influenced by flow velocity as in filling and outflow pipes.

9. Pull a 1/2" sensing tube, from the "level sensing port" at the bottom of the reservoir, to the valve. Install a 1/2" female thread adaptor at the valve-side end of the sensing tube. Ensure tube protection by a covered cable-canal. Apply a fixed effective tubes route.
10. Connect the control tube end, using 3/8" copper or reinforced plastic tube, to the altitude pilot and to the "level sensing port", according to control drawing below.



## **Commissioning & Calibration:**

1. Confirm that cock valves [1] is open (handle parallel to cock-valve body), and that cock valve [6] is directing the pilots to valve control chamber (according to the flow arrow on the handle)
2. Open fully the upstream and the downstream isolating valves & confirm that the supply pressure is typical.
3. Fill up the reservoir until the level reach its desired shut-off level.  
**Note:** To save the water & time involved with filling and emptying the reservoir, simulate upper & Low levels by temporary connecting a transparent plastic tube to the pilots sensing chambers. Locate the open-end of this tube at the reservoir roof, fill it with water to simulate the higher level and partially empty it to simulate the lower level.
4. Vent air from the valve's control loop & the pilot sensing chamber by loosening tube fittings at the highest points, allowing all air to bleed. Retighten the tube fittings eyebolts.
5. The Model 450-80-XZ is factory set according to the design upper level request. The set closing level is marked on the pilot's label.
6. Allow the 450-80-XZ to open by ensuring reservoir level is approximately 1 meter lower than the marked pilot setting, and fill-up the reservoir. Confirm the 450-80-XZ closes as level reaches the closing set level as marked on the pilot.
7. Simulate reservoir level drop as per the note at paragraph 3 above or allow the water level to drop by consuming from the reservoir or by draining it. Ensure the 450-80-XZ remains closed until water level drop approximately one meter (three foot) below the closing set level as marked on the pilot, switches at that point and opens fully.  
**Note:**
  - The 450-80-XZ opening process is involved with its control chamber drained to waste, through port [Z] of the pilot.
  - The opening level is not adjustable. It's a pilot fixed feature, which is activated approximately one-meter below the set shut-off level.
8. For changing the level setting, unlock the pilot locking nut and perform the below specified procedure:
  - 8.1. Turn cock valve [6] to "Close" position (flow arrow on the handle directing valve upstream to the valve control chamber).  
**Note:** The 450-80-XZ is now closed.
  - 8.2. Slowly turn the pilot adjusting screw Clock-Wise to the maximum spring compression.
  - 8.3. Simulate (or confirm – lower by consuming from the reservoir / rise by opening the 450-80-XZ) reservoir level to 30cm (1 foot) below the desired upper (closing) level.
  - 8.4. Disconnect the tube connected to the pilot port [C].
  - 8.5. Turn slowly the pilot adjusting screw Counter-Clock-Wise until water starts draining through its port [C]. Re-turn the pilot adjusting screw Clock-Wise until draining is stopped.
  - 8.6. Simulate (or rise) reservoir level to the desired upper (closing) level. The drain from pilot port [C] should restart.
  - 8.7. Re-connect the tube connected to pilot port [C] & reset cock valve [6] to "Open" position. Lock the pilot locking nuts.
  - 8.8. To increase **opening speed** turn the pilot integral needle valve Counter-Clock-Wise.

## Trouble-Shooting:

Symptoms	Cause	Remedy
Valve fails to open	<ol style="list-style-type: none"> <li>1. Cock valve position.</li> <li>2. Pilot Setting.</li> <li>3. Not sufficient inlet pressure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm Cock valve (1+6) is open.</li> <li>2. Confirm pilot setting.</li> <li>3. Check for sufficient inlet pressure-</li> </ol>
Valve fails to close	<ol style="list-style-type: none"> <li>1. Cock valve (1) is close.</li> <li>2. Control circuit is clogged.</li> <li>3. Pilot setting.</li> <li>4. Debris-</li> <li>5. Diaphragm-</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm Cock valve (1) is open.</li> <li>2. Check for any debris trapped in the valve control circuit</li> <li>3. Confirm Pilot setting.</li> <li>4. Check for any debris trapped in the valve body.</li> <li>5. Check diaphragm is not leaking-</li> </ol>

## Preventive

### Maintenance:

1. System operating conditions that effect on the valve should checked periodically to determent the required preventative maintenance schedule.
2. Maintenance instructions:
  - 2.1. Tools required:
    - 2.1.1. Metric and imperial wrenches
    - 2.1.2. Anti-seize grease
    - 2.1.3. Visual inspection to locate leaks and external damages
  - 2.2. Functional inspection including closing, opening and regulation.
  - 2.3. Close upstream and downstream isolating valves (and external operating pressure when used)
  - 2.4. Once the valve is fully isolated vent pressure by loosening a plug or a fitting.
  - 2.5. Open the screw nuts and remove the cover unit from the valve body. Disassemble necessary control tubs.
  - 2.6. It is highly recommended to stock a reserve parts assembly for each size. This allows minimum system field work.  
Disassemble the cover and examine the inside parts carefully for signs of wear, corrosion, or any other abnormal conditions.
  - 2.7. Replace worn parts and all the Elastomers. Lubricate the bolts and screws threads with Anti seize grease.
  - 2.8. Winterizing /freezing prevention: drain the valve & the valve accessories (pilot, solenoid) on time.

### Spare Parts

Bermad has a convenient and easy to use ordering guide for valve spare-parts and control system components. For solenoid, valves refer to model and S/N on solenoid tags.

Pub # : IOMIR-450-80-XZ-3" 6"	By : YG 11/13	Rev: YG 11/13	File name : IOMIR450-80-XZ-3"-6"- 11/13	PT1AE08-01
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