

## Level Control Valve with Bi-Level Altitude Control

(Sizes 1½-14"; DN40-350)

### Description

The Model 750-86 Level Control Valve with Bi-Level Altitude Control is a hydraulically operated, diaphragm actuated control valve that hydraulically controls reservoir filling opening at pre-set reservoir low level, and shutting off at pre-set high level. Two 2-Way altitude pilots, mounted on the main valve, continuously sense reservoir water level and control the 750-86 accordingly.

### 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. Use the lifting ring provided on the main valve cover for installing the valve.
5. For best performance, it is recommended to install the valve horizontally and upright. For different valve positions – consult Bermad.
6. It is highly recommended to install a strainer Bermad model 70F upstream from the pressure reducing valve, to prevent debris from damaging valve operation.
7. Prepare a 1" female threaded "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.
8. Pull a ½" sensing tube, from the "level sensing port" at the bottom of the reservoir, to the valve. Install a ½" 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.
9. Connect the control tube end, using ¾" copper or reinforced plastic tube, to both altitude pilots and to the "level sensing port", according to control drawing below.

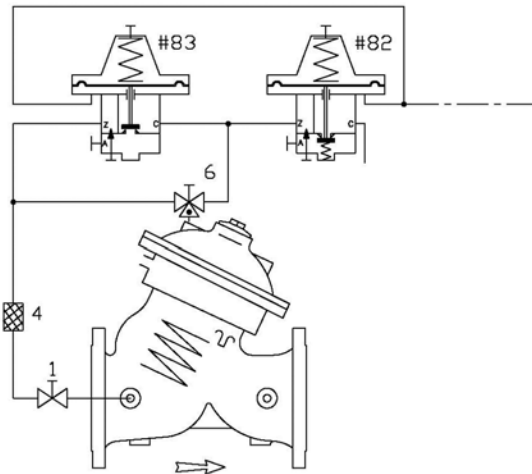
### Commissioning & Calibration

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 pilots sensing chambers by loosening tube fittings at the highest points, allowing all air to bleed. Retighten the tube fittings eyebolts.
5. The Model 750-86 is factory set according to the design upper and lower levels request. The set levels are marked on the pilot's labels (lower level on the #82 pilot & upper level on the #83 pilot).
6. Allow the 750-86 to open by ensuring reservoir level is lower then the marked #82 pilot setting, and fill-up the reservoir, confirming the 750-86 closes as level reaches the marked #83 pilot set level.
7. The 750-86 will reopen when the level drops to #82 pilot setting.
8. Simulate reservoir level drop as per the note at item 3 above or allow the water level to drop by consuming from the reservoir or by draining it. Ensure the 750-86 remains closed until water level reaches the marked #82 pilot, switches at that point and opens fully.  
**Note:** The 750-86 opening process is involved with its control chamber drained to waste, through port [C] of pilot #82.
9. Should the levels setting are either different from the design or the requirements have been changed, unlock the pilots locking nuts and perform the below specified procedure:
  - 9.1. Turn cock valve [6] to "Close" position (flow arrow on the handle directing valve upstream to the valve control chamber).  
**Note:** The 750-86 is now closed.
  - 9.2. Turn both #83 & #82 pilots adjusting screws Counter-Clock-Wise until spring compression is entirely released.
  - 9.3. Simulate (or confirm) reservoir level is at the desired lower (opening) level.
  - 9.4. Turn slowly #82 pilot adjusting screw Clock-Wise until water starts draining through its port [C].
  - 9.5. Simulate (or raise by opening the 750-86) reservoir level to above the desired lower (opening) level. The drain from #82 pilot port [C] should stop.
  - 9.6. Turn #83 adjusting screw Clock-Wise to maximum spring compression & disconnect the tube connected to #83 pilot port [C].
  - 9.7. Turn slowly #83 pilot adjusting screw Counter-Clock-Wise until water starts draining through its port [C].
  - 9.8. Simulate (or lower) reservoir level to below the desired upper (closing) level. The drain from #83 pilot port [C] should stop.
  - 9.9. Re-connect the tube connected to #83 pilot port [C] & reset cock valve [6] to "Open" position.
  - 9.10. When setting is completed, lock the pilots locking nuts.
10. To increase **closing speed** turn the pilot #83 integral needle valve Counter-Clock-Wise.

## Control Drawing

### PARTS LIST

1	2W Cock Valve
4	Control Filter
6	3W Cock Valve
#83	2W Relief Pilot
#82	2W Altitude & PRV
----- Not Supplied By BERMAD	



## Trouble-Shooting

- Valve fails to Open:** Check for sufficient inlet pressure, confirm pilots setting & reservoir level, check cock valve [6] status, check #82 pilot needle valve opening rate, detect for clogged ports or fittings between valve & #82 pilot.
- Valve fails to Close:** Confirm pilot setting & reservoir level, check #83 pilot needle valve opening rate, check cock valve [1] status, clean control filter & detect for clogged ports or fittings at control pressure branch, check if any debris trapped in the main valve, confirm diaphragm is not leaking.
- Valve fails to Regulate:** Check cock valves & needle valve status, release air trapped in the 750-86 control chamber.

## Preventative Maintenance

- System operating conditions that effect on the valve should be checked periodically to determent the required preventative maintenance schedule.
- Maintenance instructions:
  - Tools required:
    - Metric and imperial wrenches
    - Anti seize grease
  - Visual inspection to locate leaks and external damages
  - Functional inspection including: closing, opening and regulation.
  - Close upstream and downstream isolating valves (and external operating pressure when used).
  - Once the valve is fully isolated vent pressure by loosening a plug or a fitting.
  - Open the stud nuts and remove the actuator as one unit from the valve body. Disassemble necessary control tubs.
  - It is highly recommended to stock a reserve actuator assembly for each size. This allows minimum system field work and system down time.
  - Disassemble the actuator and examine its parts carefully for signs of wear, corrosion, or any other abnormal conditions.
  - Replace worn parts and all the Elastomers. Lubricate the bolts and studs threads with Anti seize grease.

## 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.

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