

## Level Control & Pressure Sustaining Valve with Bi-Level Electrical Float

(Sizes 1½" -16"; DN40-400)

### Description

Hydraulically operated, level control and pressure sustaining control valve that controls reservoir filling and reservoir level. During filling the valve sustains minimum upstream pressure regardless of fluctuating flow or reservoir level.

Reservoir filling is in response to a Bi-level electric float switch signal opening at a pre-set low level and shutting off at a pre-set high level.

### Installation

1. Ensure enough space around the valve assembly for future maintenance and adjustments
2. Prior to valve installation, flush the pipeline to ensure a flow of clean fluid through the valve
3. For future maintenance, install Isolation Valves upstream and downstream of the control valve
4. Install the valve in the pipeline with the valve flow direction arrow in the actual flow direction. When applicable 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 Bermad strainer (model 70F) upstream of the control valve, to prevent debris from damaging the valve's operation
7. Install the float switch at a still place inside the reservoir.  
**Note:** Float switch cable must be connected to a fixed point inside the reservoir and free of any obstructions along its full length.  
Apply a hook or another fixing-point above the desired shutting-level.
8. Cross-Check solenoid specifications with design requirements and solenoid/coil label.
9. Electric design/wiring must be carried out by authorized electrical engineer/electrician and comply with Electrical Codes.
10. Determine the loose cable length, to approximately 2 times longer than the reservoir maximum estimated level differential.
11. Thread the floating-weight on the cable and slide it along the cable until it's located away from the float-switch slightly more than half of the reservoir level differential.
12. Tie the cable to the fixing-point at the reservoir wall, using plastic zippers.
13. Pull and connect a 3-wired cable, from the control panel to the valve, for the solenoid actuation. Pull and connect a 3-wired cable, from the control panel to the float switch. Ensure approved cable protection. Confirm that the wires data meet solenoid specifications.  
**Note:** Energizing the solenoid coil when it is not fixed in its place, is dangerous and might burn the coil.

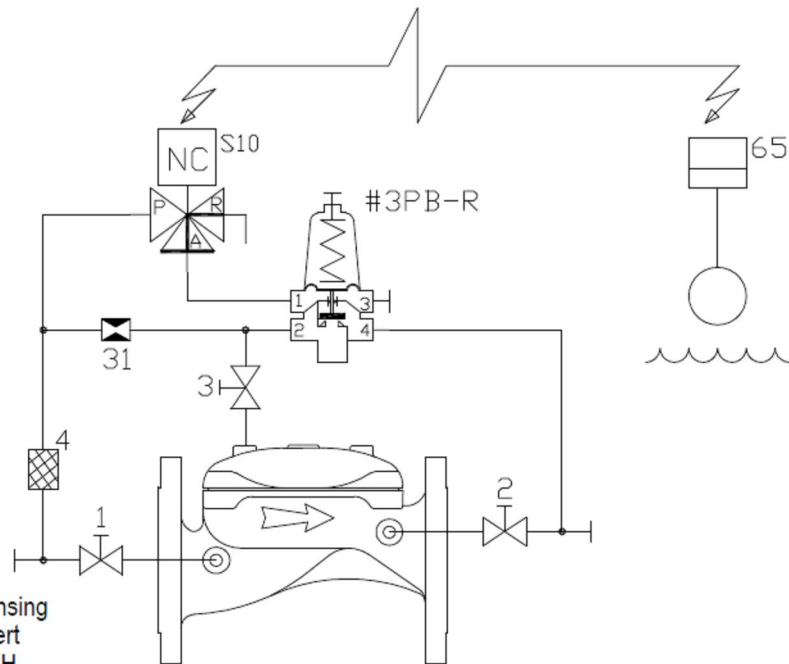
### Commissioning & Calibration

1. Confirm that cock valves [1], [2] & [3] are open (handle parallel to cock-valve body).
2. Confirm that the supply pressure is typical.
3. Open upstream and downstream isolating valves. Allow the valve to open (ensuring the float switch is at its lower position – cable up) and start to fill-up the reservoir, while performing the specified procedure below :
  - 3.1. Calibrating the Pressure Sustaining Pilot & Venting air from the valve control loop:  
The Model valve is factory set to the system minimum allowed pressure. The set pressure is marked on the pilot's label. If the set pressure is either different from the design or the requirements have been changed, follow the below steps:
    - 3.1.1. Close the upstream isolating valve to reduce the valve inlet pressure. Ensure that the valve sustains the upstream pressure, preventing it from decreasing below setting, even when the upstream isolating valve is almost closed.
    - 3.1.2. Unlock the pilot locking nut and slowly turn the pilot adjusting screw Clock-Wise to increase set pressure and Counter-Clock-Wise to decrease it.
    - 3.1.3. After the pressure has stabilized, lock the pilot locking nut and open fully the upstream isolating valve.
    - 3.1.4. During filling the reservoir change manually the float switch position to its upper position (cable down), forcing the valve to close, then to its lower position (cable up), forcing the valve to open. At each position, vent air from the valve control loop by loosening a tube fitting at the highest point, allowing the air to bleed. Retighten the fitting.  
**Note:** The Restriction [31] enables the 2-Way control & reduces valve closing speed.
4. Calibrating shutting upper-level:  
Ensure that the valve closes as the water level reaches the upper set-level. If the valve has not closed, slide the floating-weight along the cable towards the float-switch, to lower level setting or away from the float-switch to raise it, until the valve closes automatically at the desired upper-level. Lock the weight at that point.
5. Calibrating opening lower-level:  
Allow the water level to drop by consuming from the reservoir or by draining it. Ensure the valve remains closed until water level reaches the desired lower-level, switches at that point and opens fully. Pull the cable through its fixing-point, lengthening it to lower the level setting or pull back the cable, shortening it to raise the level setting, until the valve opens automatically at the desired lower-level.
6. **Note:** For switching valve tendency from closing to opening and vice versa, change manually the float-switch position cable-down to close and cable-up to open.

## Control Drawing

### PARTS LIST

1	2W Cock Valve
2	2W Cock Valve
3	2W Cock Valve
4	Control Filter
31	Restriction Orifice
#3PB-R	2W PB PS Pilot R Sensing
S10	3W NC Solenoid Burkert
65	ELEC. FLOAT SWITCH



## Trouble-Shooting

1. **Valve fails to Open:** Check for sufficient inlet pressure, confirm float & pilot setting, check cock valves status
2. **Valve fails to Close:** Confirm float & pilot setting, check cock valves status, clean control filter & detect for clogged ports or fittings, check if any debris trapped in the main valve, confirm that the diaphragm is not worn or damaged
3. **Valve fails to Regulate:** Check cock valves status, release air trapped in the valve's control chamber & the pilot cover

## Preventative Maintenance

1. System operating conditions that affect the valve should be checked periodically to determine 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
  - 2.2. Periodical maintenance
    - 2.2.1. Visual inspection to locate leaks and external damage
    - 2.2.2. Functional inspection including: closing, opening and regulation
  - 2.3. 5 yearly scheduled maintenance
    - 2.3.1. Close upstream and downstream isolating valves (also close any external sensing pressure when used)
    - 2.3.2. Once the valve is fully isolated, vent residual pressure by loosening a plug or fitting
    - 2.3.3. Disassemble necessary control hubs, unscrew the cover fastening bolts and remove the cover.
    - 2.3.4. Inspect the diaphragm and sealing area on the valve body
    - 2.3.5. Replace the diaphragm if worn or damaged
    - 2.3.6. Lubricate all threads with Anti seize grease and replace the cover

## 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 #: IOMEW453-65	By: PG 10/12	Rev: 01PG-10/12	File name: IOMEW453-65_10_12
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