

## **Pressure Reducing Valve with Multi Level Setting, Electrically Controlled Type 4R**

(Sizes 1½-14"; DN40-350)

### **Description**

The Model 720-45-4R Pressure Reducing Valve with Electrically Selected Multi Level Setting, Type 4R is a hydraulically operated, diaphragm actuated control valve that reduces higher upstream pressure to lower downstream pressure regardless of fluctuating demand or varying upstream pressure. A unique Pressure Controlled Bios Unit (PCBU) integrated on the pilot, responds to an electric signal switching pressure levels by changing the pilot's set point.

### **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. After installation carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
7. Cross-Check solenoid specifications with design requirements and solenoid/coil label.
8. Pull and connect a 3-wired cable to the solenoid, from the control panel to the valve solenoid. 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.
9. Install a pressure gauge (instead of the plastic plug on the pilot)
10. It is highly recommended to install a strainer Bermad model 70F upstream from the pressure reducing valve to prevent debris from damaging valve operation.
11. Install a pressure relief valve Bermad model 73Q, downstream from the 720-45-4R, for protection against momentary pressure peaks.
12. Install a **Pressure Management Designated Controller** on or near the valve and connect it according to the **Controller User Guide for Time and/or Flow Operating Modes**.

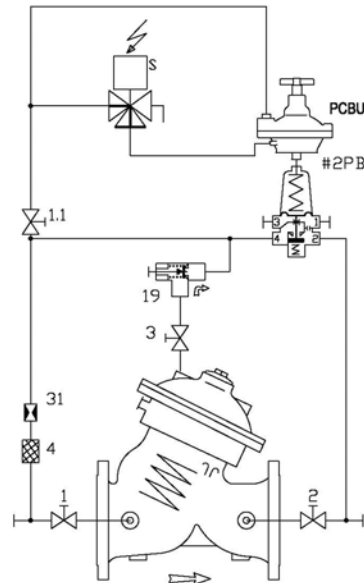
### **Commissioning & Calibration**

1. Close cock valve [1.1] (handle vertical to cock-valve body) and start the calibration procedure with the control tubes to the PCBU, disconnected.
2. Confirm that cock valves [1], [2] & [3] are open (handle parallel to cock-valve body).
3. Open fully the upstream isolating valve and partially the downstream isolating valve, to fill-up, in a slow and controlled manner, the consumers line downstream from the pressure reducing system.
4. Confirm that the supply pressure and the flow through the system are typical. If necessary, create flow by opening a hydrant, or reduce the flow/pressure by adjusting the downstream/upstream isolating valves.
5. Vent air from the valve's control loop by loosening cover tube fitting at the highest point, allowing all air to bleed. Retighten the tube fitting eyebolt.
6. The Model 720-45-4R is factory set according to the design high and low pressure request. The high and low set pressures are marked on the pilot's label.
7. To change the set pressures, follow the below steps:
  - 7.1. Fully close PCBU upper flow stem CW.
  - 7.2. Unlock the pilots locking nut and slowly turn the pilot adjusting screw (together with the PCBU assembly) Clock-Wise to increase set HIGH pressure and Counter -Clock-Wise to decrease it.
  - 7.3. After the HIGH pressure is stabilized, lock the pilots locking nut. Open slowly the PCBU upper flow stem CCW (allowing the PR Valve to react & stabilize), until the pressure reaches the desired LOW pressure.
  - 7.4. Connect the control tubes to the PCBU according to the below drawing, open cock valve [1.1].
8. Check valve electrical pressure level switching feature by Energizing/De-Energize the solenoid to switch valve modes to high set pressure and back to low set pressure.
9. The restriction [31] enables the 2-Way control & reduces valve closing speed.
10. The one way flow control [19] is factory set fully open. To decrease opening speed or to stabilize the valve reaction, turn the needle valve CW.
11. Relief Valves should be set 1 bar above system highest set-pressure.

## Control Drawing

### PARTS LIST

1	2W Cock Valve
1.1	2W Cock Valve
2	2W Cock Valve
3	2W Cock Valve
4	Control Filter
31	Restriction Orifice
19	One Way Flow Control MT Type
#2PB	2W PB PR Pilot
S	3W Solenoid
PCBU	Pilot Calibrating Bias Unit



## Trouble-Shooting

- Valve fails to Open:** Check for sufficient inlet pressure, create demand/flow, confirm pilot setting, check cock valves status & tube connections.
- Valve fails to Close:** Create demand/flow, confirm pilot setting, check needle & cock valves status, clean control filter & detect for clogged ports or fittings, check if any debris trapped in the main valve, confirm diaphragm is not leaking.
- Valve fails to Regulate:** Check needle valves setting, release air trapped in the control chamber, check power supply to solenoid & confirm solenoid coil is not burned, check cock valves status & tube connections, confirm controller & sensors functioning.

See also Pressure Management Designated Controller User Guide for Time and Flow Operating modes

## Preventative Maintenance

- System operating conditions that effect on the valve, should be checked periodically to determine 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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