

## Differential Pressure Sustaining Valve

(Sizes 1½"-16"; DN40-400)

### Description

Hydraulically operated, differential pressure-sustaining control valve that sustains minimum pre-set differential pressure between two local or remote points, regardless of fluctuating flow or varying upstream pressure

### 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. After installation carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
8. It is recommended to install a high-quality differential pressure gauge next to the valve, at a visible location, for calibration & follow-up.
9. For Remote Sensing Prepare two 1/2" female threaded sensing ports, including a cock-valve, at the points where differential pressure sustaining is required & pull 3/8" or 1/2" sensing tubes to the valve. Anchor the tube in place, using an efficient route. Ensure tube protection by a sleeve or by a covered cable-canal.

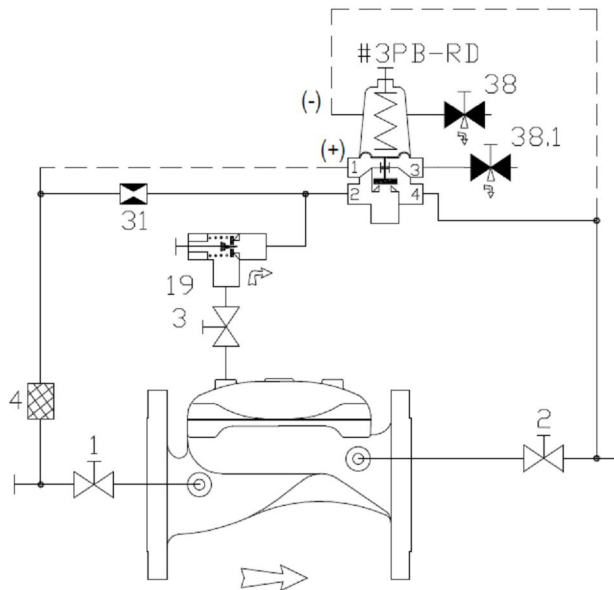
### Commissioning & Calibration

1. Confirm that cock valves [1], [2] & [3] are open (handle parallel to cock-valve body).
2. 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 differential pressure sustaining valve.  
**Note:** When differential pressure ( $\Delta P$ ) is below the setting, the valve is closed
3. Confirm that the supply pressure and the flow through the system are typical.
4. Vent air from the valve's control loop by loosening a tube fitting at the highest point, allowing all air to bleed. Retighten the tube fitting.
5. The valve is factory set according to design definitions. The set  $\Delta P$  is marked on the pilot's label.
6. Connect the high-quality mobile  $\Delta P$  gauge tubes to the valve as follow:
  - 6.1. Internal sensing type valve:  
HIGH PRESSURE (+) to the upstream plugged "T" & LOW PRESSURE (-) to the downstream plugged "T".
  - 6.2. External sensing type valve:  
HIGH PRESSURE to manometer cock valve [38.1] & LOW PRESSURE to manometer cock valve [38].
7. If the set  $\Delta P$  is either different from the design or the requirements have been changed follow the steps described below:
  - 7.1. Simulate the requested  $\Delta P$  by regulating the  $\Delta P$  gauge HIGH, LOW & BYPASS needle valves.  
**Note:** When gauge  $\Delta P$  is below the setting, the valve is closed and vice versa.
  - 7.2. Unlock the pilot locking nut and slowly turn the pilot adjusting screw Clock-Wise until the valve closes & seals. Re-turn Counter-Clock-Wise until the valve starts opening.
  - 7.3. Lock the pilot locking nut and confirm both upstream & downstream isolating valves are fully open.
8. 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 clockwise.
9. The Restriction [31] enables the 2-Way control & reduces valve closing speed.

## Control Drawing

### PARTS LIST

1	2W Cock Valve
2	2W Cock Valve
3	2W Cock Valve
4	Control Filter
19	One Way Flow Control MT Type
31	Restriction Orifice (on valves > 8" needle valve)
38	Manometer Cock Valve (w/vent)
#3PB-R	2W PB PS Pilot R Sensing
---	Internal Sensing



## Trouble-Shooting

- Valve fails to Open:** Check for sufficient inlet pressure /  $\Delta P$ , create demand/flow, confirm pilot setting, and check cock & needle valves status.
- Valve fails to Close:** Create demand/flow, confirm pilot setting, check cock & needle 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.
- Valve fails to Regulate:** Confirm pilot setting, release air trapped in the control chamber, check cock & needle valves status.

## Preventative Maintenance

- System operating conditions that affect the valve should be checked periodically to determine the required preventative maintenance schedule.
- Maintenance instructions:
  - Tools required:
    - Metric and imperial wrenches
    - Anti seize grease
  - Periodical maintenance
    - Visual inspection to locate leaks and external damage
    - Functional inspection including: closing, opening and regulation
  - 5 yearly scheduled maintenance
    - Close upstream and downstream isolating valves (also close any external sensing pressure when used)
    - Once the valve is fully isolated, vent residual pressure by loosening a plug or fitting
    - Disassemble necessary control hubs, unscrew the cover fastening bolts and remove the cover.
    - Inspect the diaphragm and sealing area on the valve body
    - Replace the diaphragm if worn or damaged
    - 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 at <http://www.bermad.com/downloads>

For solenoid valves refer to model and S/N on solenoid tags.

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