



DPR

Direct Pressure Reducing valve

General

The DOROT pressure reducing valve is of the balanced seat type. The inlet pressure, when acting on the two openings A and B with the same section, is compensated, and does not exert any force on the pin-plug system when the degree of valve opening changes.

Two forces act on the diaphragm: The outlet pressure creates a force that tends to close the plug, and is opposed by the spring mechanical force, that tends to open the plug. This results in the pressure reducing valve acting like a balanced seat type, where the outlet pressure is almost unaffected by variations in inlet pressure.

Applications

The pressure reducing valve maintains, by varying its pressure loss, the outlet pressure at a constant value when inlet pressure or the flow-rate are varying.

Direct-acting PRV are used:

- To maintain a requested pressure constantly below the max. permissible value.
- To save water. By controlling the pressure of the outlets, excessive withdrawal of water is prevented, Undetected Leakages are reduced.
- In compressed air systems: to keep the constant air pressure regardless of fluctuations in the pressure of the compressors.
- To reduce and stabilize the pressure in the outlet of tanks or storage cylinders.

DPR

Diaphragm pressure reducing valve with single balanced seat. Ensures min. pressure drops with high flow rates. Downstream pressure set by means of the setting screw (4) and is locked with lock nut (3)

Models	Size	
DPR-1/2	1/2"	12mm
DPR-3/4	3/4"	20mm
DPR-1	1"	25mm
DPR-11/4	1 1/4"	32mm
DPR-11/2	1 1/2"	40mm
DPR-2	2"	50mm

DPR-P

Like DPR, but with pressure gauge Ø50 for reading downstream pressure

Models	Size	
DPR-P-1/2	1/2"	12mm
DPR-P-3/4	3/4"	20mm
DPR-P-1	1"	25mm
DPR-P-11/4	1 1/4"	32mm
DPR-P-11/2	1 1/2"	40mm
DPR-P-2	2"	50mm

DPR

Sizing

Excessive flow velocity generates too-high pressure drop and noisy performance.

Hence, it is very important that the valve size will be selected properly, considering the maximal flow rate the valve is supposed to regulate.

The diagrams at the right side, allow the selection of the valve size according to the flow velocity, that is caused by the flow rate (bottom axis).

It is recommended to select the valve that operates at flow velocity of 1-2m/s (water systems) and 10-20m/s (air systems).

Examples of Sizing

Example 1 (cavitation- see next page)

Operating conditions:

Inlet pressure $P_1 = 14$ bar

Outlet pressure $P_2 = 3$ bar

The cavitation diagram indicates that the valve works constantly in the red zone.

To avoid rapid deterioration, two valves can be used, connected in serial configuration:

Upstream valve: pressure difference 14 to 6 bar (green zone)

Downstream valve: pressure difference 6 to 3 bar (green zone).

Example 2 (flow rate-see next page)

Pressure reducing valve DPR/N with:

Inlet pressure (min.) $P_1 = 8$ bar

Outlet pressure $P_2 = 4$ bar

Max. flow rate $Q = 50$ l/min

The flow rate / speed diagram indicates that a diameter of 20 or 25 can should be used. The pressure drop diagram (next page) indicates the minimal DP:

DPR-3/4 $Q = 50$ l/min DP = 1.1 bar

DPR-1 $Q = 50$ l/min DP = 0.68 bar

Cavitation

The cavitation diagram shows three zones of valve operation in relation to the upstream and downstream pressures, namely:

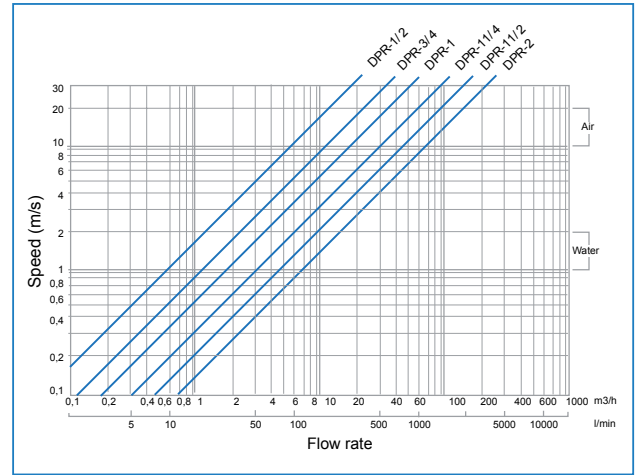
zone C: normal duty, no cavitation

zone B: medium duty, possible cavitation

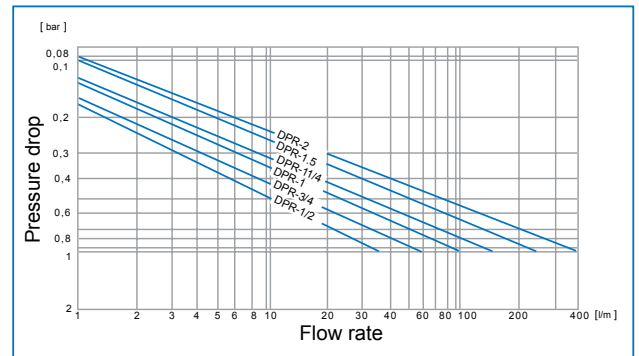
zone A: heavy duty, the valve cavitates.

Continuous operation in the red cavitation zone causes rapid deterioration of the internal parts. If the pressure reducing valve is to be used in the red zone, please contact DOROT Engineering Department.

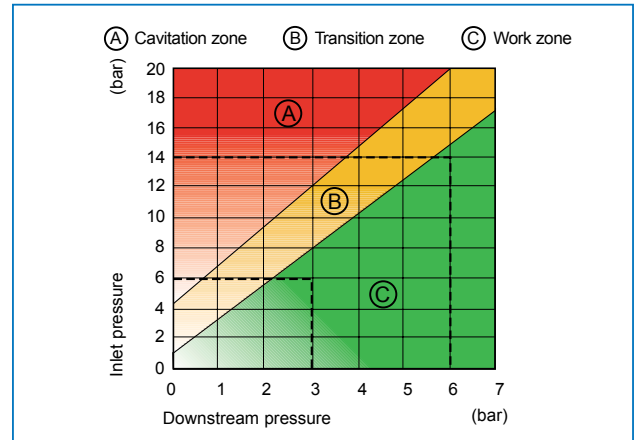
Flow rate / speed diagram



Flow rate - Pressure drop diagram



Cavitation diagram



Application

Water, air and neutral (non aggressive) gases.

Approvals

- DVGW approval (Arbeitsblatt W 375)
- LGA approval (DPR-N-1/2 to 11/4) according to DIN 4109 class I (noise below 20 dB)
- SVGW approval (W/TPW101).
- TIN approval (Poland)
- CSTB approval (NF P 43-006) (DPR-N-1/2, DPR-N-3/4).
- KTW certification for all materials in contact with water.

Design Features

Body	Shot-blasted brass OT58
Cap	Shot-blasted brass OT58
Plug	Brass OT58
outlet / Inlet connections	Brass OT58
Diaphragm	NBR with nylon fabric
Seal and O-ring	NBR
Spring	Galvanized steel
Setting screw and lock nut	Brass OT58
Filters	Stainless steel

Technical Characteristics

Max. upstream pressure	25 bar
Downstream pressure (outlet)	1.5 to 6 bar
Connections	M to M Union connections
Outlet pressure adjustment (screw 4)	Clockwise rotation increases pressure Counter-clockwise rotation decreases pressure
Outlet pressure gauge (DPR-Ponly)	Pressure gauge Ø50, scale 0 to 6 bar
Max. operating temperature	30°C

Overall dimensions (mm)

Size	L	L1	H	H1
1/2"	97	187	135	48
3/4"	110	215	155	58
1"	120	236	182	66
1 1/4"	140	260	227	75
1 1/2"	160	284	255	82
2"	175	315	262	88

