

Proportional Pressure Reducing Valve

WW-720-PD

- Long downhill lines
 - Serial pressure reduction
 - Leakage and burst protection
- High differential pressure systems
 - Protection against cavitation damage
 - Throttling noise reduction

The Model 720-PD Proportional Pressure Reducing Valve is a hydraulically operated, diaphragm actuated control valve that reduces higher upstream pressure to lower downstream pressure at a fixed ratio.



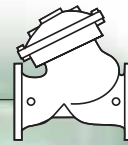
Features and Benefits

- **Line pressure driven** – Independent operation
- **Elegant simplicity**
 - Most cost effective
 - Simple to maintain
 - Minimal external accessories
- **Variety of reduction ratios** – Perfect mission matching
- **Built-in check feature** – Replacing line sized check valve
- **In-line serviceable** – Easy maintenance
- **Double chamber**
 - Moderated valve reaction
 - Protected diaphragm
- **Flexible design** – Easy addition of features
- **Semi-straight flow** – Non-turbulent flow
- **Stainless Steel raised seat** – Cavitation damage resistant
- **Obstacle free, full bore** – Uncompromising reliability
- **V-Port Throttling Plug** – Low flow stability

Major Additional Features

- Solenoid control – **720-PD-55**
- Closing & opening speed control – **720-PD-03**
- Emergency pressure reducing valve – **720-PD-59**
- Pressure sustaining – **723-PD**

See relevant BERMAD publications.



Operation

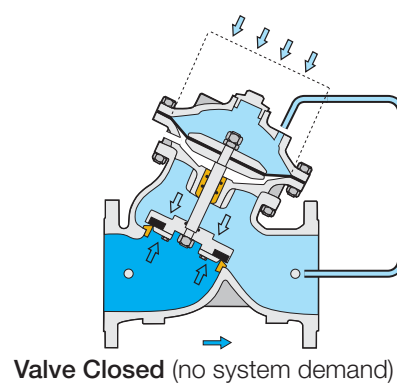
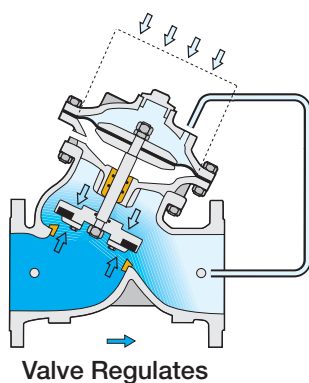
The Model 720-PD is a pilotless, double chambered, control valve. The downstream pressure is applied as the closing force on the top side of both the diaphragm and the seal disk areas. The upstream pressure is applied as the opening force on the bottom side of the seal disk area.

The net force, resulting from the two opposing dynamic forces acting on the actuator's diaphragm and seal, determines the degree to which the valve is open. The valve seeks the point where these forces are equal. As the ratio of the areas of the seal disk and the diaphragm is constant, the ratio of the upstream and downstream pressures is constant as well.

A rise in downstream pressure causes a momentary increase of the closing force. As a result, the valve throttles closed reducing downstream pressure according to the constant ratio.

Adding a V-Port Throttling Plug modifies valve ratio by increasing the effective diaphragm area.

When demand is zero, downstream pressure rises in proportion to the ratio, causing the valve to shut off.



Engineer Specifications

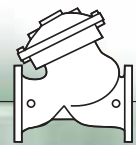
The Proportional Pressure Reducing Valve shall reduce higher upstream pressure to lower downstream pressure at a fixed ratio. The valve's control loop shall not consist of any pilot.

Main Valve: The main valve shall be a center guided, diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

Actuator: The actuator assembly shall be double chambered with a sealed inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit. The stainless steel valve shaft shall be center guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.

Control System: The control system shall consist of a control tube connecting the upper control chamber to the valve outlet. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested to customer requirements.

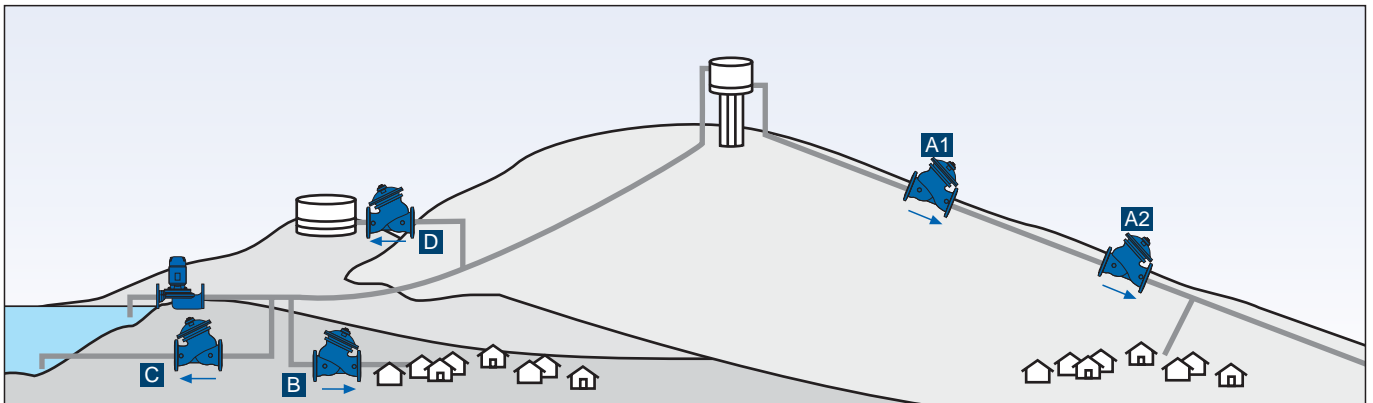
Quality Assurance: The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards.



Typical Applications

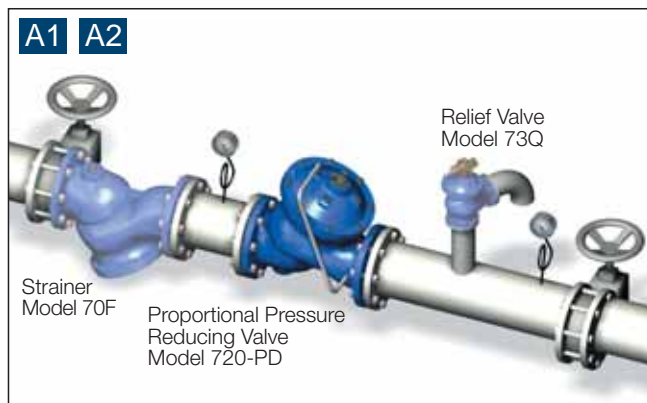
There are two major applications for the Model 720-PD Proportional Pressure Reducing Valve:

- Long downhill lines:
 - ▢ Systems A1 and A2 prevent the downhill line from exceeding its pressure rating.
- High differential pressure systems:
 - ▢ System B reduces cavitation damage and noise level by distributing the load of the high differential pressure.
 - ▢ System C illustrates protecting a circulation valve from high differential pressure and resultant severe cavitation.
 - ▢ System D shows protecting a level control valve from high differential pressure.

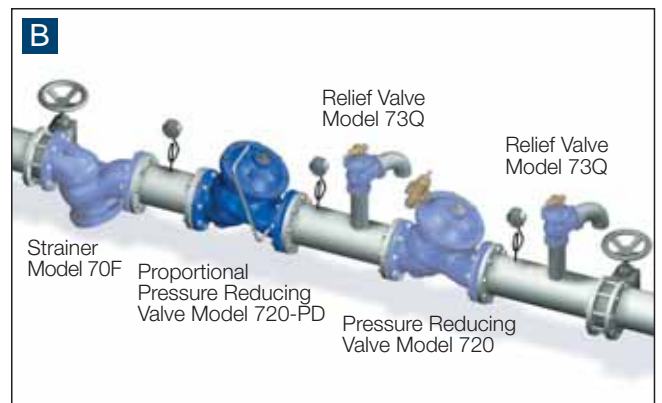


Typical Installations

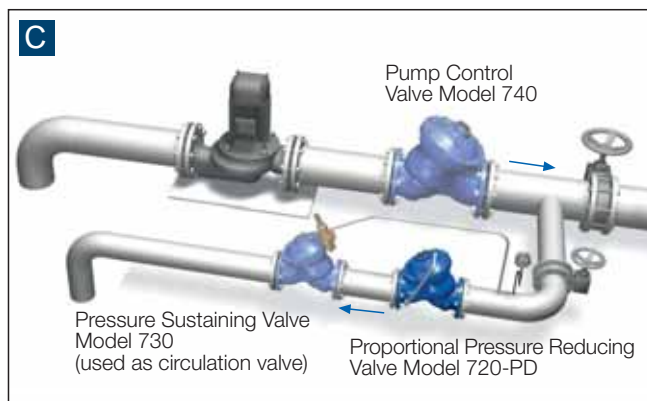
Downhill Serial Pressure Reducing



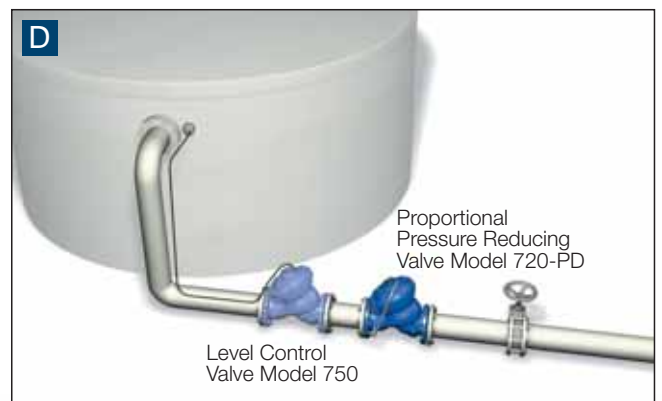
High Differential Pressure Reducing System



High Differential Pressure Circulation System



High Differential Pressure Level Control System





WW-720-PD

For full technical details, refer to Engineering Section.

WW-700 Series

Pressure Reducing

Technical Data

Dimensions and Weights

Size	A, B	C	L	H	Weight
mm inch	mm inch	mm inch	mm inch	mm inch	kg lbs
40 1 1/2"	350 14	180 7	205 8.1	239 9.4	9.1 20
50 2	350 14	180 7	210 8.3	244 9.6	10.6 23
65 2 1/2"	350 14	180 7	222 8.7	257 10.1	13 29
80 3"	370 15	230 9	250 9.8	305 12.0	22 49
100 4"	395 16	275 11	320 12.6	366 14.4	37 82
150 6"	430 17	385 15	415 16.3	492 19.4	75 165
200 8"	475 19	460 18	500 19.7	584 23.0	125 276
250 10"	520 21	580 23	605 23.8	724 28.5	217 478
300 12"	545 22	685 27	725 28.5	840 33.1	370 816
350 14"	545 22	685 27	733 28.9	866 34.1	381 840
400 16"	645 26	965 38	990 39.0	1108 43.6	846 1865
450 18"	645 26	965 38	1000 39.4	1127 44.4	945 2083
500 20"	645 26	965 38	1100 43.3	1167 45.9	962 2121

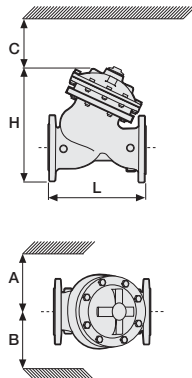
Data is for Y-pattern, flanged, PN16 valves

Weight is for PN16 basic valves

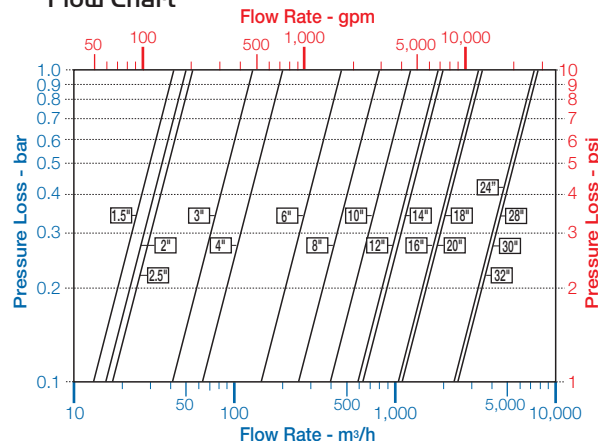
"C" enables removing the actuator in one unit

"L", ISO standard lengths available

For more dimensions and weights tables, refer to Engineering Section



Flow Chart



Data is for Y-pattern, flat disk valves

For more flow charts, refer to Engineering Section

Main Valve

Valve Patterns: "Y" (globe) & angle

Size Range: 1 1/2"-32" (40-800 mm)

End Connections (Pressure Ratings):

Flanged: ISO PN16, PN25

(ANSI Class 150, 300)

Threaded: BSP or NPT

Others: Available on request

Working Temperature:

Water up to 80°C (180°F)

Standard Materials:

Body & Actuator: Ductile Iron

Internals:

Stainless Steel, Bronze & coated Steel

Diaphragm:

NBR Nylon fabric-reinforced

Seals: NBR

Coating:

Fusion Bonded Epoxy, RAL 5005 (Blue)

NSF & WRAS approved or Electrostatic

Polyester Powder, RAL 6017 (Green)

Reduction Ratios Table

Valve Size	Plug Type	
	Flat-Disc	V-Port
1 1/2- 2 1/2"	3.7	4.0
40- 65 mm	2.5	2.7
3"	2.6	2.9
80 mm	2.2	2.4
4"	2.5	2.8
100 mm	2.0	2.2
6"	2.5	2.7
150 mm	2.0	2.2
8"	2.4	2.6
200 mm	2.0	2.2
10"	2.3	2.5
250 mm	2.0	2.2
12-14"	2.2	2.4
300-350 mm	2.0	2.2
16-20"	2.2	2.3
400-500 mm	2.0	2.2

Standard ratio

Optional ratio

- The reduction ratios are based on flow velocity of 2.0-3.0 m/sec.
- Reduction ratio may vary at extreme flow velocity & upstream pressure.
- 24-32" (600-800 mm) reduction ratio: 2.2

Control System

Standard Materials:

Accessories:

Bronze, Brass, Stainless Steel & NBR

Tubing: Copper or Stainless Steel

Fittings: Forged Brass or Stainless Steel

How to Order

Please specify the requested valve in the following sequence: (for more options, refer to Ordering Guide).

Sector	Size	Primary Feature	Additional Feature	Pattern	Body Material	End Connections	Coating	Voltage & Position	Tubing & Fittings	Additional Attributes
WW	6"	720	PD	Y	C	16	EB	-	CB	VI
Waterworks	1 1/2 - 32"	Proportional Pressure Reducing	Oblique (up to 20") Angle (up to 18") Globe (24-32" only)	Y A G	Ductile Iron Standard Cast Steel St. Steel 316 Nickel Alumin. Bronze	Epoxy FB Blue Polyester Green Polyester Blue Uncoated	EB PG PB UC	Copper Tubing & Brass Fittings Plastic Tubing & Brass Fittings St. St. 316 Tubing & Fittings	CB PB NN	Valve Position Indicator V-Port Throttling Plug Electric Limit Switch St. St. 316 Internal Trim (Closure & Seat) St. St. 316 Actuator Internal Assembly Delrin Bearing Viton Elastomers for Seals & Diaphragm Pressure Gauge
Automatic Regulation Override		09	ISO-16	16		24VAC/50Hz - N.C.	4AC			I
Solenoid Controlled		55	ISO-25	25		24VAC/50Hz - N.O.	4AO			V
Electric Override		59	ANSI-150	A5		24VDC - N.C.	4DC			S
Proportional Standard Ratio		PD	ANSI-300	A3		24VDC - N.O.	4DO			T
Proportional Optional Ratio		PD2	JIS-16	J6		24VDC - L.P.	4DP			D
			JIS-20	J2		220VAC/50-60Hz N.C.	2AC			R
						220VAC/50-60Hz N.O.	2AO			E
										6

Use when additional electric control feature is selected

Multiple choices permitted



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