High Pressure, Pressure Reducing Valve

- Flow and leakage reduction
- Cavitation damage protection
- Throttling noise reduction
- Burst protection
- System maintenance savings

The Model 820 High Pressure, Pressure Reducing Valve is a hydraulically operated, piston actuated control valve that reduces higher upstream pressure to lower constant downstream pressure regardless of fluctuating demand or varying upstream pressure.

Features and Benefits

- **Robust structure, piston actuated** – High pressure service
- **Line pressure driven** – Independent operation
- **In-line serviceable** – Easy maintenance
- **Double chamber design** – Moderated valve reaction
- **Flexible design** – Easy addition of features
- **Variety of accessories** – Perfect mission matching
- **"Y" or angle, wide body** – Minimized pressure loss
- **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

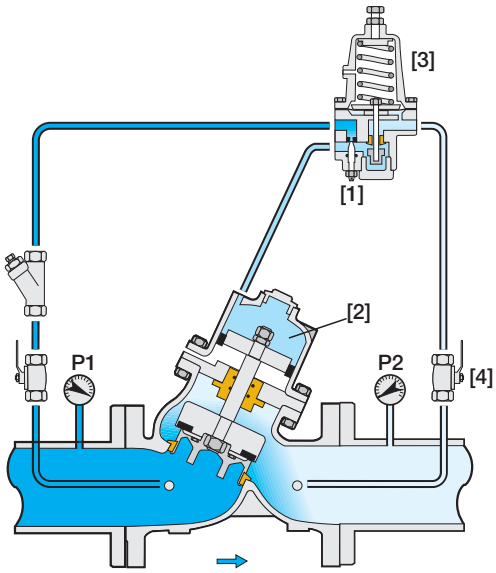
Major Additional Features

- Solenoid control – **820-55**
- Check valve – **820-20**
- Solenoid control & check valve – **820-25**
- Proportional – **820-PP**
- Emergency pressure reducing valve – **820-PP-59**
- Downstream over pressure guard – **820-48**
- Electrically selected multi-level setting – **820-45**
- Electronic multi-level setting, Type 4T – **820-4T**
- Electronic pressure reducing valve – **828-03**

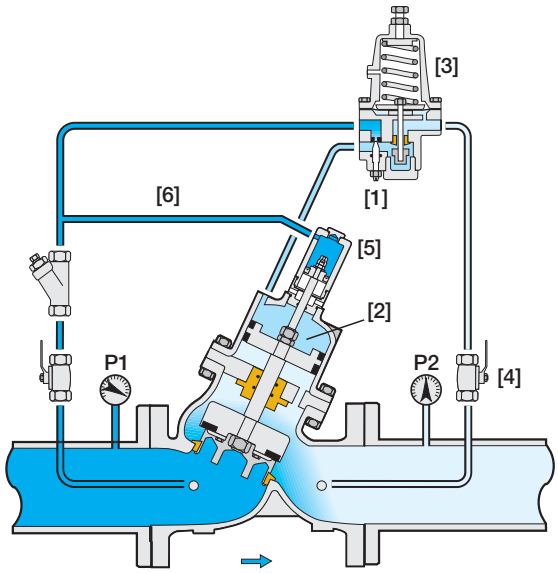
Operation

The Model 820 is a pilot controlled valve equipped with an adjustable, 2-Way, pressure reducing pilot. The needle valve **[1]** continuously allows flow from the valve inlet into the upper control chamber **[2]**. The pilot **[3]** senses downstream pressure. Should this pressure rise above pilot setting, the pilot throttles, enabling pressure in the upper control chamber to accumulate, causing the main valve to throttle closed, decreasing downstream pressure to pilot setting.
Should downstream pressure fall below pilot setting, the pilot releases the accumulated pressure, and the main valve modulates open. The needle valve controls the closing speed. The downstream cock valve **[4]** enables manual closing.
Two Models are available, the Standard, Double Chamber 820-PB and the Single Chamber 820-PA*.
The Model 820-PA requires auxiliary closing force. In the size range 6-20"; DN150-500, it is equipped with an auxiliary closing piston **[5]** connected to valves inlet via a control tube **[6]**. In the size range 1 1/2-4"; DN40-100, an auxiliary closing spring replaces the piston and the tube.

* Apply Model 820-PA when required pressure-reduction ratio (P1/P2) is less than 2.5.



Model 820-PB
Apply when P1/P2>2.5



Model 820-PA
Apply when P1/P2<2.5

Engineer Specifications

The Pressure Reducing Valve shall reduce higher upstream pressure to lower preset downstream pressure regardless of fluctuating demand or varying upstream pressure.

Main Valve: The main valve shall be a center guided, piston 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. 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 piston and the main valve. 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.

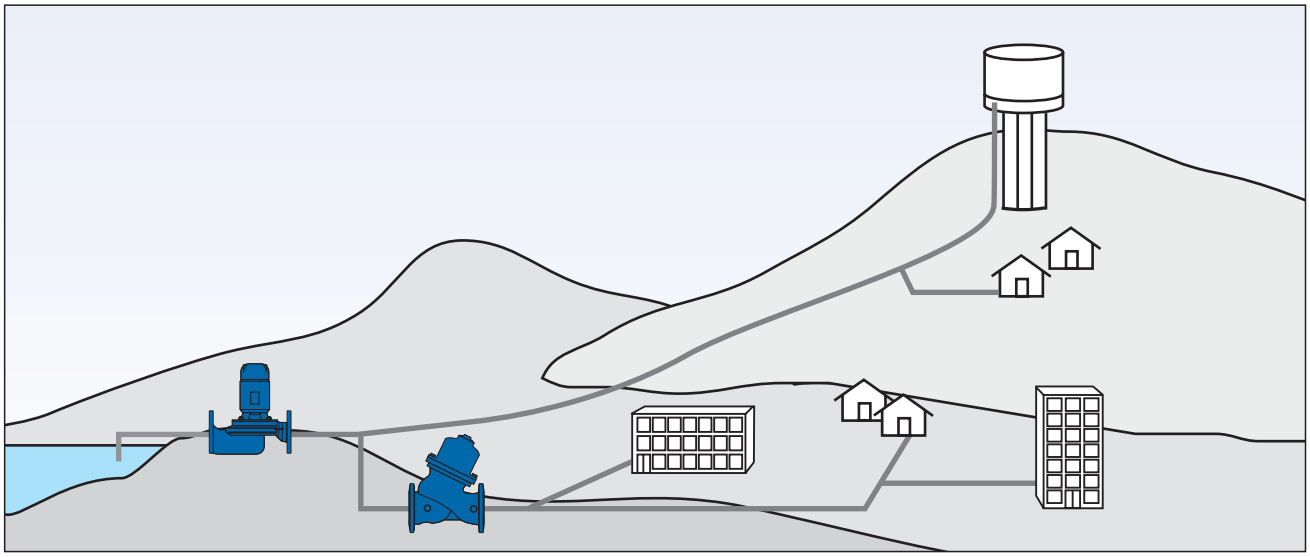
Control System: The control system shall consist of a 2-Way adjustable, direct acting, pressure reducing pilot valve, a needle valve, isolating cock valves, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer requirements.

Quality Assurance: The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard.

Typical Applications

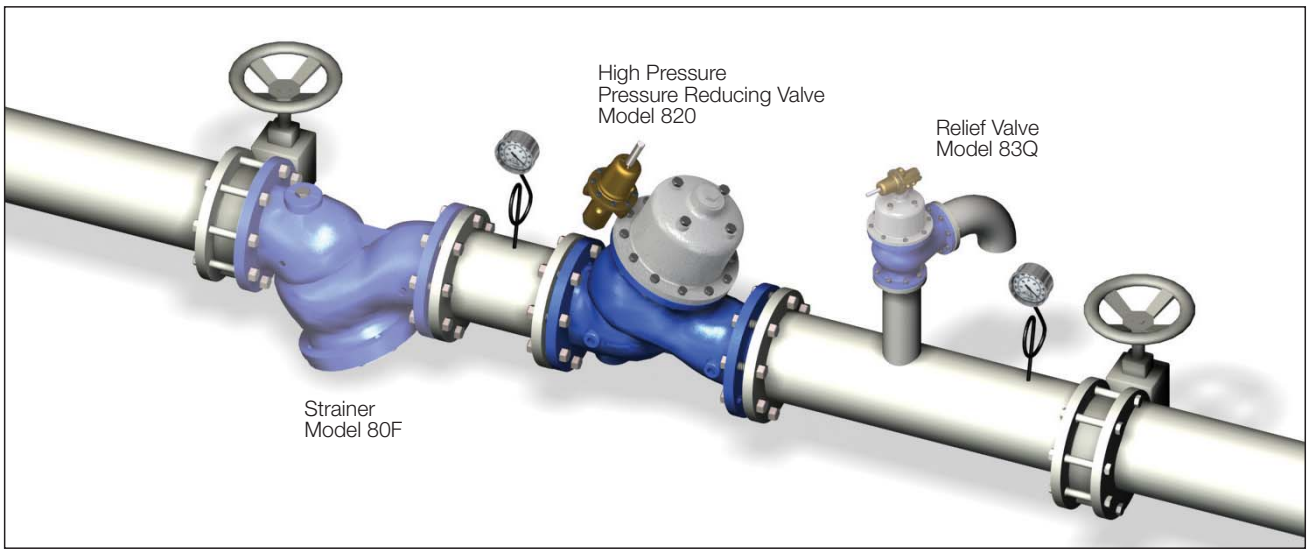
Pressure Reducing System for Municipal Networks

Network design requires establishing various pressure zones due to topography, distances, demands, energy costs, reservoir availability, etc.



The pump supplies water to the network and to the reservoir. System pressure is too high for the residential neighborhood, requiring a pressure reducing system.

Pressure Reducing System – Typical Installation

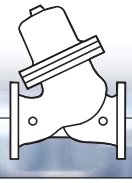


In addition to the **Model 820 High Pressure, Pressure Reducing Valve**, BERMAD recommends that the system also include:

- **High Pressure Strainer** Model 80F preventing debris from damaging valve operation
- **High Pressure, Pressure Relief Valve** Model 83Q providing:
  - Protection against momentary pressure peaks
  - Visual indication of need for maintenance

For more information on BERMAD Pressure Reducing Systems, see BERMAD publication 720, Pressure Reducing Valve.

BERMAD Waterworks



800 Series

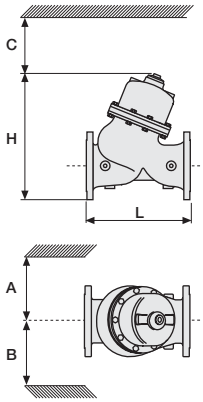
Model 820

Technical Data

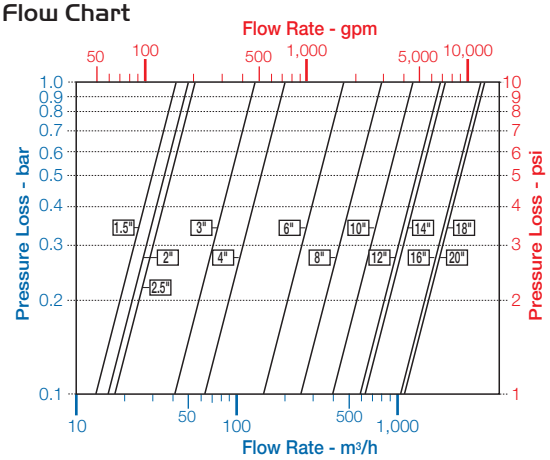
Dimensions and Weights

Size		A, B		C		L		H		Weight	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs
40	1½"	210	8	180	7	205	8.1	260	10.2	11.8	26
50	2	210	8	180	7	210	8.3	265	10.4	15	33
65	2½"	210	8	180	7	222	8.7	278	10.9	18.4	40
80	3"	230	9	230	9	264	10.4	332	13.1	32	70
100	4"	255	10	275	11	335	13.2	422	16.6	56	123
150	6"	290	11	385	15	433	17	542	21.3	106	233
200	8"	335	13	460	18	524	20.6	666	26.2	190	418
250	10"	380	15	580	23	637	25.1	783	30.8	307	675
300	12"	405	16	685	27	762	30	961	37.8	505	1111
350	14"	405	16	685	27	767	30.2	996	39.2	549	1208
400	16"	505	20	965	38	1024	40.3	1179	46.4	1070	2354
450	18"	505	20	965	38	1030	40.5	1208	47.6	1095	2409
500	20"	505	20	965	38	1136	44.7	1241	48.9	1129	2484

Data is for Y-pattern, PN25,40/ANSI300,400 valves
Weight is for basic valves
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: 1½–20" (40-500 mm)*
End Connections (Pressure Ratings):
Flanged: ISO PN16, PN25, PN40 (ANSI Class 150, 300, 400)
Others: Available on request
Working Temperature:
Water up to 80°C (180°F)
Standard Materials:
Body: Carbon Steel or Ductile Iron
Cover (piston cylinder):
Bronze or Stainless Steel
Internals:
Stainless Steel & Bronze
Seals: NBR
Coating:
Fusion Bonded Epoxy, RAL 5005 (Blue) NSF & WRAS approved or Electrostatic Polyester Powder, RAL 6017 (Green)

* 16-20" (400-500mm) valves are rated PN25 (Class 300)

Control System

Standard Materials:
Accessories:
Bronze, Brass, Stainless Steel & NBR
Tubing: Copper or Stainless Steel
Fittings: Forged Brass or Stainless Steel
Pilot Standard Materials:
Body: Brass, Bronze or Stainless Steel
Elastomers: NBR
Springs: Galvanized Steel or Stainless Steel
Internals: Stainless Steel

Additional Head Loss Table

The model 820-PA is equipped with either an auxiliary closing spring (1½-4" / 40-100mm) or an auxiliary closing piston (6-20" / 150-500mm) thus causing an additional head loss of:

Size	Additional Head Loss
1½-4" (40-100mm)	1.0 bar
6" (150mm)	12% of upstream pressure
8" (200mm)	6.5% of upstream pressure
10" (250mm)	10% of upstream pressure
12-14" (300-350mm)	7% of upstream pressure
16-20" (400-500mm)	4% of upstream pressure

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	Additonal Attributes
WW	6"	820	PB	Y	S	40	EB	–	NN	VI
Waterworks	1½ - 20"	Pressure Reducing								

Oblique (up to 20")	Y
Angle (up to 18")	A

Cast Steel	S
Ductile Iron Standard	C
St. Steel 316	N
Nickel Alumin. Bronze	U

ISO-16	16
ISO-25	25
ISO-40	40
ANSI-150	A5
ANSI-300	A3
ANSI-400	A4
JIS-16	J6
JIS-20	J2
JIS-30	J3

Epoxy FB Blue	EB
Polyester Green	PG
Polyester Blue	PB
Uncoated	UC

24VAC/50Hz - N.C.	4AC
24VAC/50Hz - N.O.	4AO
24VDC - N.C.	4DC
24VDC - N.O.	4DO
24VDC - L.P.	4DP
220VAC/50-60Hz N.C.	2AC
220VAC/50-60Hz N.O.	2AO

Use when additional electric control feature is selected.

Copper Tubing & Brass Fittings	CB
St. St. 316 Tubing & Fittings	NN

Valve Position Indicator	I
V-Port Throttling Plug	V
Large Control Filter	F
Electric Limit Switch	S
Valve Position Transmitter	Q
St. St. 316 Control Accessories	N
St. St. 316 Internal Trim (Closure & Seat)	T
St. St. 316 Actuator Internal Assembly	D
Delrin Bearing	R
Viton Elastomers for Seals & Diaphragm	E
Pressure Gauge	6

Multiple choices permitted

Double chambered	PB
Single chambered	PA
No Additional Feature	00
Closing and Opening Speed Control	03
Automatic Regulation Override	09
Check Valve	20
Solenoid Controlled & Check Valve	25
Multi-Setting Levels - Electrically Selected	45
Downstream Over Pressure Guard	48
Hydraulic Control	50
Solenoid Controlled	55
Electric Override	59

Multiple choices permitted

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