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 – 826-03
**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 1/4-4”; 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.

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**Pilot System Specifications**

**Standard Materials:**

- **Pilot:**
  - Body: Brass or Stainless Steel 316
  - Elastomers: Synthetic Rubber
  - Spring: Galvanized Steel or Stainless Steel
  - Internal parts: Stainless Steel

- **Tubing & Fittings:**
  - Stainless Steel 316 or Copper & Brass

- **Accessories:**
  - Stainless Steel 316, Brass and Synthetic Rubber Elastomers

**Pilot Adjustment Range:**

- 1 to 16 bar; 15 to 230 psi - Standard
- 0.8 to 10 bar; 11 to 150 psi
- 2 to 30 bar; 30 to 430 psi *
- 2 to 45 bar; 30 to 650 psi *
- * with high pressure kit

**Notes:**

- Inlet pressure, outlet pressure and flow rate are required for optimal sizing and cavitation analysis
- Recommended continuous flow velocity: 0.3-6.0 m/sec ; 1-20 ft/sec
- Minimum operating pressure: 2.0 bar; 30 psi
- The model 820-PA is equipped with either an auxiliary closing spring (1 1/4-4” / 40-100mm) or an auxiliary closing piston (6-20” / 150-500mm) thus causing an additional head loss of:

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>Additional Head Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4&quot; (40-100mm)</td>
<td>1.0 bar</td>
</tr>
<tr>
<td>6&quot; (150mm)</td>
<td>12% of upstream pressure</td>
</tr>
<tr>
<td>8&quot; (200mm)</td>
<td>6.5% of upstream pressure</td>
</tr>
<tr>
<td>10&quot; (250mm)</td>
<td>10% of upstream pressure</td>
</tr>
<tr>
<td>12-14&quot; (300-350mm)</td>
<td>7% of upstream pressure</td>
</tr>
<tr>
<td>16-20&quot; (400-500mm)</td>
<td>4% of upstream pressure</td>
</tr>
</tbody>
</table>
**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.
## Technical Data

### Size Range:
- DN40-500 ; 1 1/2 – 20"

### End Connections (Pressure Ratings):
- Flanged: ISO PN16, PN25, PN40 ; ANSI Class 150, 300, 400
- Threaded: BSP or NPT

### Available on request

### Valve Patterns:
- "Y" (globe) & angle

### Working Temperature:
- Water up to 80°C ; 180°F

### Standard Materials:
- **Body**: Cast Carbon Steel; Ductile Iron; Stainless Steel 316
- **Cover**: Stainless Steel 316; Bronze
- **Internals**: Stainless Steel & Bronze
- **Seals**: Synthetic Rubber
- **Coating**: Fusion Bonded Epoxy, RAL 5005 (Blue) approved for drinking water or Electrostatic Polyester Powder

### Flow Data & Dimensions Table

| DN / Size     | 40  | 0.5 | 50  | 1.5 | 65  | 2.5 | 80  | 3   | 100 | 4   | 150 | 6   | 200 | 8   | 300 | 12   | 400 | 16   | 500 | 20   |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Kv / Cv - "Y"  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Kv / Cv - "A"  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| L (mm / inch) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| W (mm / inch) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| H (mm / inch) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| R (mm / inch) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Weight (Kg/lb) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| **Kv / Cv**    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

### Differential Pressure Calculation

\[
\Delta P = \left( \frac{Q}{Kv;Cv} \right)^2
\]

- \( \Delta P \) = Differential Pressure for fully open valve (bar; psi)
- \( Q \) = Flow rate (m³/h; gpm)
- \( Kv \) = Metric system - valve flow coefficient
- \( Cv \) = US system - Valve flow coefficient

**Note:** Use Bermad’s Waterworks Settings for reservoir level data, flow data, tubing & fittings materials, operational data (according to model), pressure data, flow data, reservoir level data, coatings, etc.

### Ordering Guide

- **Size**
- **Main model**
- **Additional features**
- **Pattern**
- **Body material**
- **End connection**
- **Coating**
- **Voltage & main valve position**

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**Warning:**
- Tubing & fittings materials
- Operational data (according to model)
- Pressure data
- Flow data
- Reservoir level data
- Settings
- Use Bermad’s Waterworks Ordering Guide

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**Contact:**
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**Technical Details:**
- **Volume**:
  - **Capacity**:
  - **Flow rate**
  - **Pressure**
  - **Temperature**

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**Specifications:**
- **Body Material**
- **Coating**
- **Pressure Class**
- **Temperature Range**
- **Flow Rate**
- **Pressure Loss**
- **Weight**

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**Additional Information:**
- **Technical Notes**
- **Installation Guide**
- **Maintenance**
- **Warranty**