

Pressure-Regulating Valve

Description

Model 420 Pressure Reducing Valve is an automatic control valve designed to reduce a higher inlet pressure to a lower constant outlet pressure, regardless of fluctuating flow rates and/or varying inlet pressure. It is a pilot-controlled, hydraulically operated diaphragm-type globe or angle 405 valve.

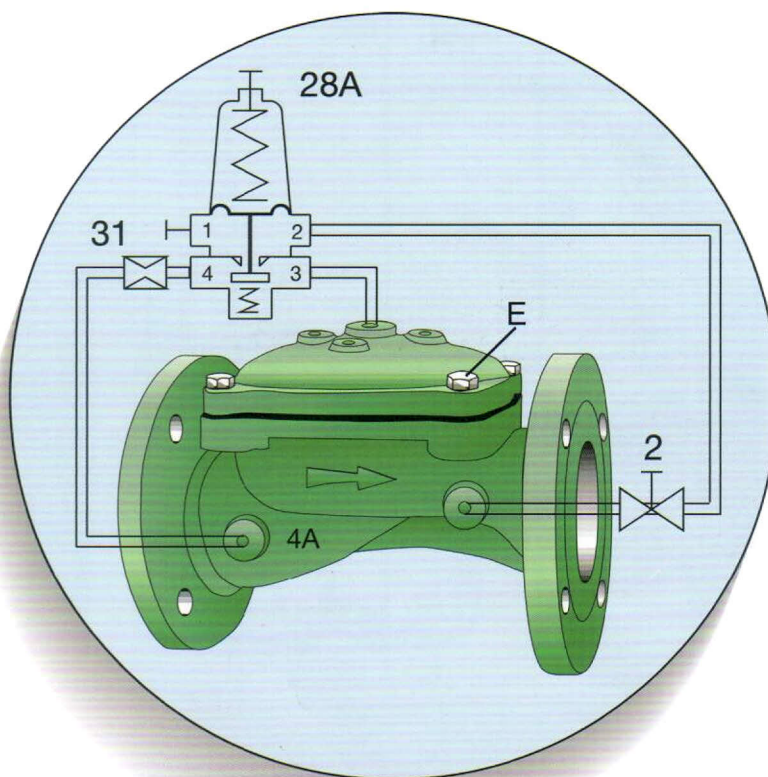
The pressure-regulating pilot senses down-stream pressure and modulates open or close, causing the main valve to throttle, thus maintaining constant delivery pressure. The pressure-regulating pilot has an adjusting screw to preset the desired pressure.

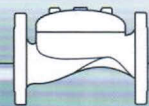
When down-stream pressure falls below the pilot setting, the pilot and main valve modulate open to increase pressure and maintain pilot setting. When down-stream pressure rises above the pilot setting, the pilot and main valve throttle close to decrease pressure and maintain pilot setting.



Control list

400-G	RAM 400-Globe
28A	2-way Pressure-Reducing, Pilot Valve,
4A	In line, Self Flushing Filter (or Y-Strainer)
31	Control Orifice
2	Cock Valve
E	Cover: 4 Screws



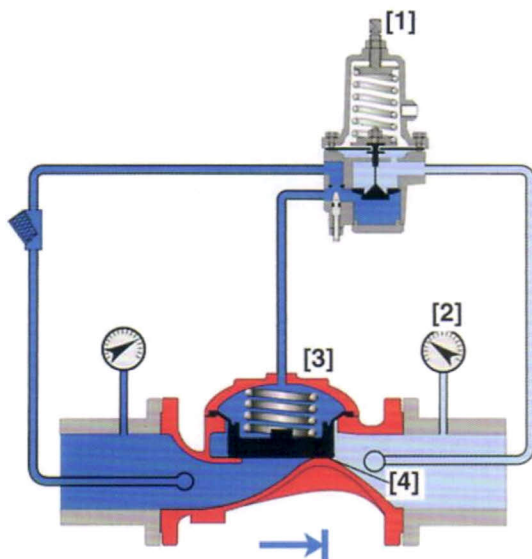


Operation

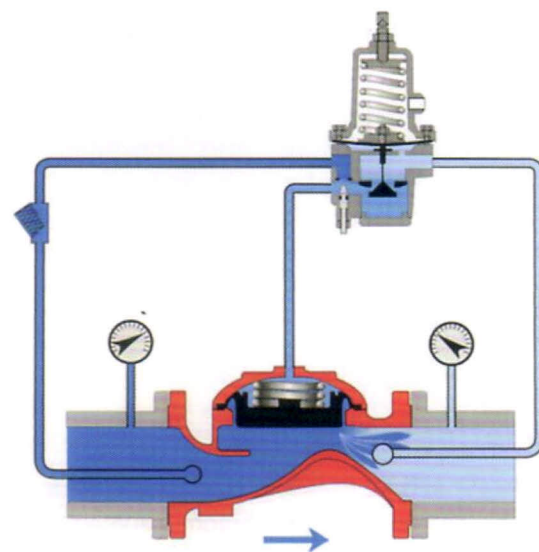
The BERMAD Model 420, pilot operated pressure reducing valve automatically and accurately reduces upstream water pressure to a specific, adjustable value. The 420 operates under both flowing and non-flowing (static) conditions. The Pressure Reducing Pilot [1] senses downstream pressure [2] and in real time modulates the main valve [3] to maintain the constant downstream pressure.

In no-flow static conditions, should the downstream pressure start rising above pilot setting, the pilot closes, shutting the main valve bubble tight [4] to maintain the allowable downstream pressure.

And reduce of water hammer.

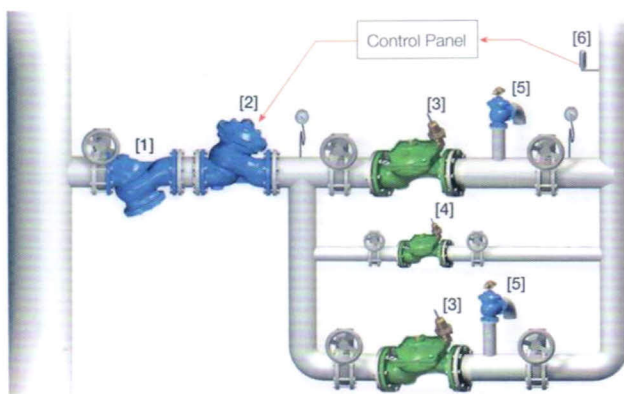


Valve Closed (static condition)

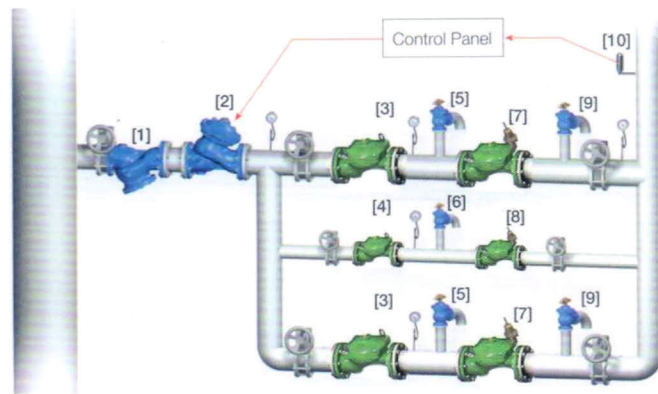


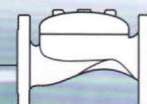
Valve Open (flowing condition)

Higher-Zone Installation



Lower-Zone (Two Stage) Installation





Pressure-Reducing Systems in Hi-Rise Buildings

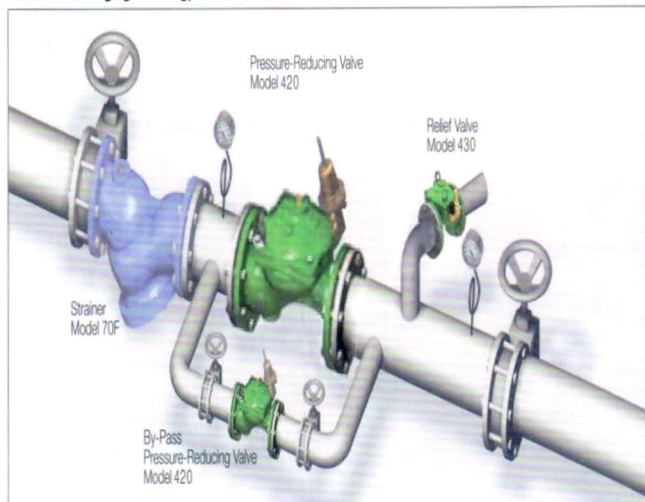
Water supply system design requirements for hi-rise buildings present unique issues:

- Supply cut-off is unacceptable and single-source supply is common.
- Valves are located in areas where water damage can be extremely expensive.
- Pressure-reducing systems are often located next to prestigious residential and office space. Extraneous noise and maintenance activities are to be avoided.
- The main supply line of hi-rise buildings is exposed to greater head at lower zones while pressure for the consumer must be kept within recommended levels. As a result, lower zone pressure-reducing systems deal with greater differential pressure.

The **Model 420 Pressure-Reducing Valves** together with BERMAD'S accumulated experience address these issues and provide appropriate solutions.

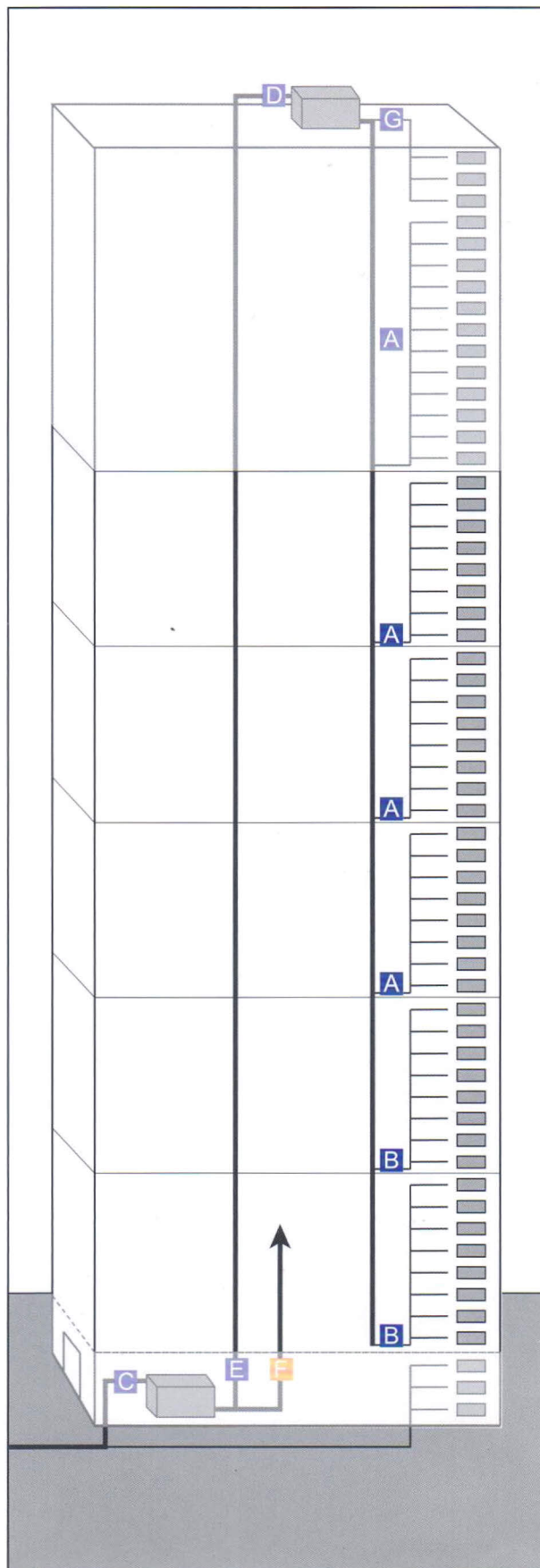
- A** Higher-zone pressure reducing system installation
- B** Lower-zone pressure reducing system (two-stage) installation
- C** Bottom reservoir level control system
- D** Roof reservoir level control system
- E** Potable water pumping system
- F** Fire protection pumping system
- G** Upper floors pumping system

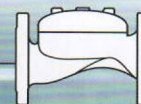
Pressure-Reducing System - Typical Installation



In addition to the **Model 420 Pressure-Reducing Valve**, BERMAD recommends that the system also includes:

- **Strainer Model 70F** prevents debris from damaging valve operation
- **Relief Valve Model 430** provides:
 - Protection against momentary pressure peaks
 - Visual indication of need for maintenance
- **By-Pass Pressure-Reducing Valve** saves on maintenance costs. The larger (more costly to maintain) valve operates during peak demand. The smaller by-pass valve cuts operating hours of the larger valve, achieving greater return on investment.





Technical Data

Specifications

Valve Pattern: Globe, Angle

Sizes:

- Globe: 3/4", 1", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12"
- Angle: 2", 3", 4"

Pressure Rating / Working Pressure :

0.5-16 kg/cm² (7-235 psi)

Max. Pressure of Body :

25 kg/cm² (355psi)

Sizes:

End Connections:

- **Female threaded** NPT/BSP

Globe- 3/4", 1", 1 1/2", 2", 2 1/2"

Angle- 2", 3"

- **Grooved (Victaulic):**

Globe- 2", 3", 4"

Angle- 3", 4"

- **Flanged:** ISO-16, ANSI125, BS-D, JIS 10K

Globe: 2", 2 1/2", 3", 4", 6", 8", 10", 12"

Angle: 2", 3", 4"

Max. Temperature Range:

Water up to 80°C (180°F)

Materials:

- Body and cover: 3/4", 1", 1 1/2" Bronze only
 - 2"-12" Cast Iron (ISO185) Option, Ductile Iron, Cast steel, Stainless steel, Bronze, Polyester coated (4 Mil) (100 Micron) (200°C)
 - Diaphragm: Nylon-fabric, Reinforced Natural Rubber. Options: Nitrile; Buna-N; EPDM (Thickness 3 cm up)
 - Diaphragm retainer: Stainless steel (AISI304)
 - Spring: Stainless steel (AISI304)
- (Other materials and coatings available on request).

Tender 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, 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.

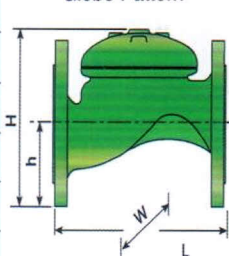
Control System: The control system shall consist of a 2-way adjustable, direct acting, pressure-reducing pilot valve, a needle valve, isolating cock valves, and a filter. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer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

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

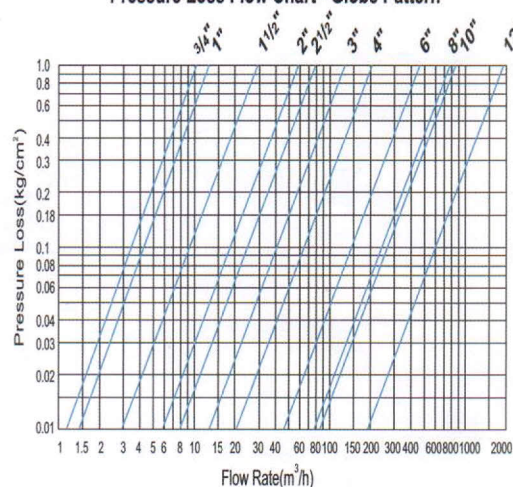
Dimensions and Weights

	Threaded					Grooved (Victaulic)			Flanged							
Size	3/4"	1"	1 1/2"	2"	2 1/2"	2"	3"	4"	2"	2 1/2"	3"	4"	6"	8"	10"	12"
L(mm)	112	112	150	180	210	205	250	320	205	205	210	320	415	500	605	724
H(mm)	67.5	67.5	83	111	133	106	156	190	155	178	187	210	345	430	460	635
Hf*(mm)	-	-	-	205	226	200	255	300	245	260	270	310	550	660	690	930
W(mm)	72	72	90	120	129	120	175	200	155	178	200	200	306	365	405	580
h(mm)	20	20	27.5	38	46	32	46	60	78	89	100	100	140	170	202	240
Weight(kg)	0.95	0.95	1.5	4.0	5.7	5.0	10.6	16.2	9.0	10.5	12.1	19.0	68.0	125.0	140.0	290.0

Globe Pattern



Pressure Loss Flow Chart - Globe Pattern



*Hf = Height with optional flow stem (at open position)