

PRESSURE CONTROL AND CHECK VALVE

Model FP-42T-20

The BERMAD model 42T-20 is an elastomeric, hydraulically operated, self actuated automatic pressure control valve with a check valve feature. This valve is designed for advanced fire protection systems in accordance with the NFPA-13 and NFPA-NFPA20 guidelines.

This valve will reduce a high upstream pressure to a low and stable designed system pressure, the check feature makes this valve ideal for fire system pressure control between floors in high rise buildings. As a fire pump surge control valve the 42T-20 will prevent pump water surge pressure spikes, typically caused by the accelerated water flow during fire pump start-up.

In addition this valve will significantly reduce pump start negative suction pressure, preventing pump cavitation damage.

Due to exceptional reliability, safe actuation and low head loss, the 42T-20 is highly suited for fire pump discharge pressure control applications.



Features & Benefits

- Safety and reliability
 - Low headloss design - Increased safety at reduced pressure supply
 - Time proven, simple design with a fail safe actuation
 - Single piece, rugged elastomeric diaphragm seal - VRSD technology
 - Obstacle-free, uninterrupted flow path
 - No mechanical moving parts
- High performance
 - Fast, smooth response to pressure fluctuations
 - Very high flow efficiency
 - Straight through Y type body
 - PN25/365 psi working pressure
- Specifically-designed for fire protection
 - Face-to-face length standardized to ISO 5752 EN 558-1
 - Accurate and stabilizing pressure control
- Quick and easy maintenance
 - In-line serviceable
 - Fast and easy cover removal

Typical Applications

- Sprinkler feed systems
- Fire pump discharge control
- Surge prevention on pump start up.
- Branch pressure reducing and check valve

Approvals



UL-Listed
Pilot Operated Pressure Reducing and
Pressure Control Type (VLMT)
Sizes 1½" - 16"



FM Approved
Pressure Reducing Valves
Sizes 1½" - 16"



ABS
American Bureau of Shipping
Type Approval



Det Norske Veritas
Type Approval

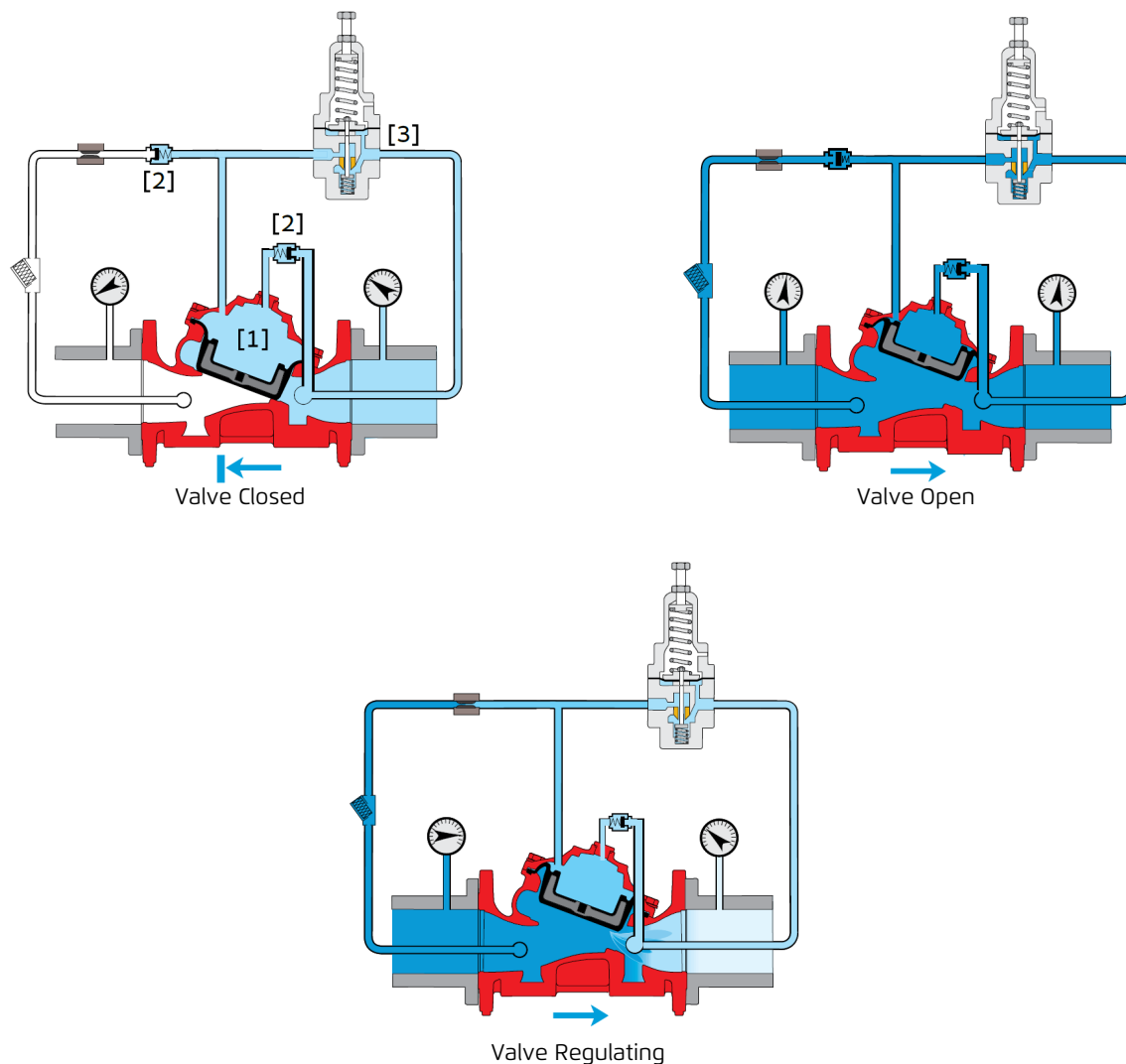


Lloyd's Register
Type Approval

Additional Features

- Corrosion resistant zinc based high build epoxy coating
- Large control filter
- Integrated downstream relief valve
- Valve position limit switches

Operation



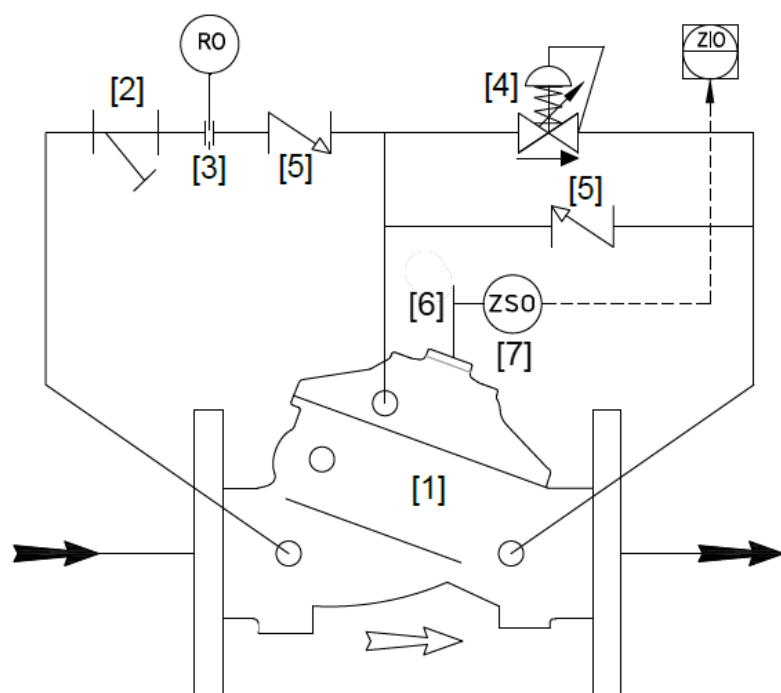
Valve Closed - The BERMAD 42T-20 control valve is kept shut tight when the main pump is idle by way of the jockey or maintenance pump pressure held in the valve's control chamber [1] by the check valves [2]. Under the same principle the 42T-20 acts as a system non-return valve, preventing water from flowing back to the main pump after pump shut down.

Valve Open - At pump start up the energy of the initial surge from the pump start will be arrested by the closed valve, preventing downstream pressure spikes and water surge in the system piping. The valve will continue to open in a controlled manner as pressure is released from the valve control chamber through the pilot valve [3] (see graph below).

Valve Regulating - When required the BERMAD 42T-20 control valve can be calibrated to reduce system pressure, working as a pressure control valve.

The 42T-20 acts as a surge protection valve and a system non return valve. In addition, if required the 42T-20 pilot [4] can be adjusted to control the outlet pressure ensuring a stable and precise pre-set downstream pressure regardless of flow or pressure fluctuations.

System P&ID



Components	
1	BERMAD 400Y valve
2	Y Control filter
3	Restriction orifice
4	Pilot valve
5	Check valve

System Installation

A typical installation of the BERMAD model 42T features a pilot valve for the automatic stable and accurate reduction of water pressure from a high upstream value to a preset lower downstream value, regardless of fluctuating upstream pressure or flow. A unique actuator design ensures quick and smooth valve action.

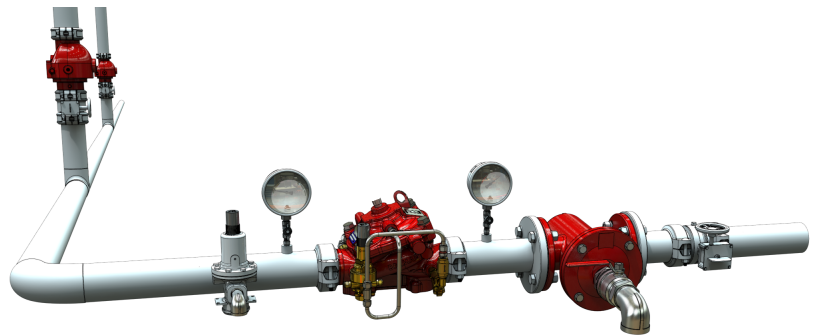
Installed singly, the 42T provides a standard pressure-reducing system. Installed in parallel, two 42T valves provide high flow rates, redundancy, and zero downtime for maintenance. Installed in series, two 42T valves can provide a two-stage, high reduction in pressure and/or added protection to a reduced-pressure zone.

To comply with the requirements outlined in the FM, UL and NFPA standards, a pressure relief valve of at least ½" is to be installed on the downstream side of any pressure reducing valve.

For sizing the required relief valve for optimal performance see the BERMAD recommendation in the "Pressure Relief Sizing for Pressure Reducing Valves" table on the last page.

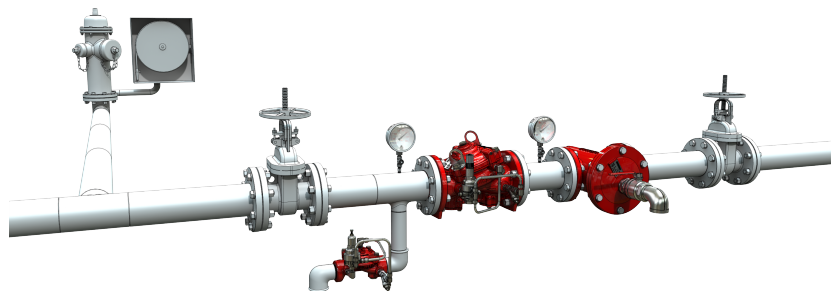
Sprinkler System Pressure Reduction

- Reduces a high, unstable pressure supply to a preset, stable system pressure
- Sets the sprinkler pressure to suit the system design
- For zonal pressure control



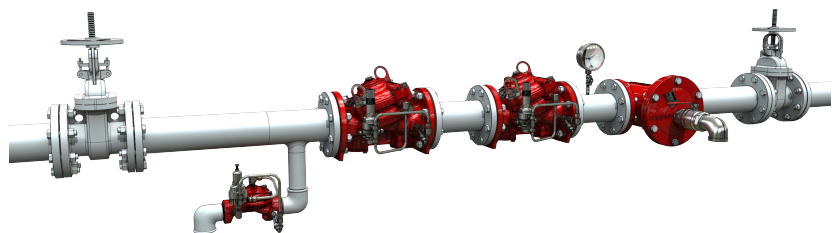
Pressure reducing systems

- Reduces a high/unstable pressure supply to suit fire hose pressure
- Pressure reducing systems



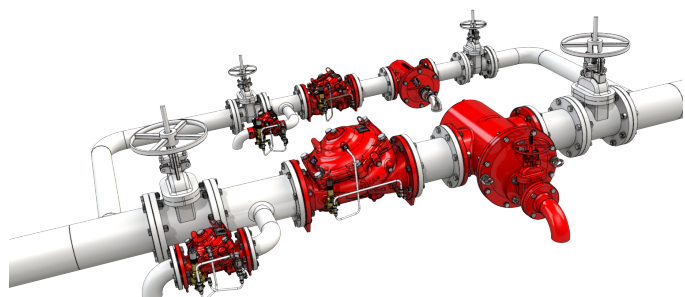
Back-Up / Two-Stage Pressure Reduction

- Backup pressure reducing valve in-line to a master valve to secure pressure zone rating at all times. When in doubt consult BERMAD.



Parallel / Redundancy Pressure Reduction

- Recommended for a wide variation of flow rates. This arrangements enables high and low flow rates as well as providing a full pressure supply redundancy and serviceability with zero down time.

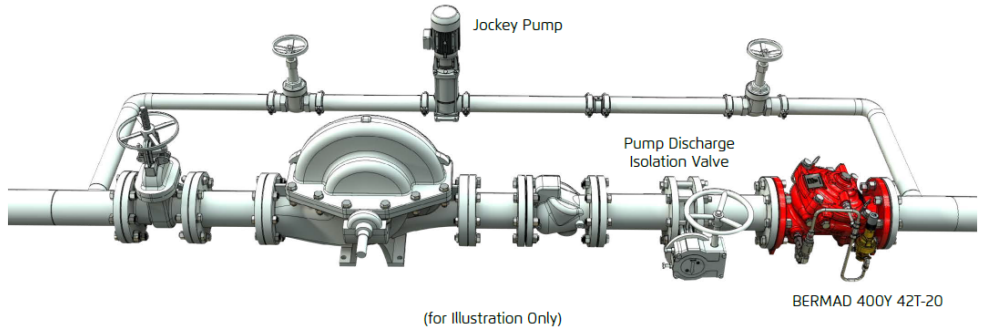


FP-42T-20
Optional System Items

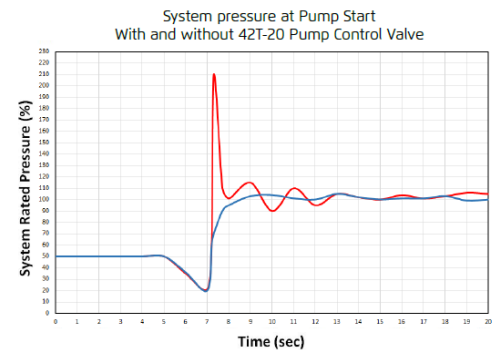


Pressure Gauge

Exd Pressure
Switch - Stainless
Steel Enclosure for
Harsh
Environments



In the graph opposite the red line shows the spike in system pressure at pump start. The blue line shows the system pressure at pump start after installation of the BERMAD 42T-20 with no spike in system pressure.



Suggested Specifications

The pressure control valve shall utilize a check valve feature meeting NFPA 13 and NFPA 20 guidelines. The valve shall be UL-listed and FM-approved, 365-psi/25-bar rated, with a straight-through Ytypebody. The valve shall have an unobstructed flow path, with no stem guide or supporting ribs. The main valve shall have no mechanical moving parts, and the actuation shall utilize a single-piece diaphragm assembly of VRSD technology. The valve shall be coated internally and externally with UV protection. Optional: C5-VH grade of ISO-12944 standard against corrosive conditions. Removing the valve cover for full inspection and maintenance shall be in-line and not require removal of the control trim. The deluge valve and control trim shall be pre-assembled and hydraulically tested by a UL/FM and ISO 9000, 9001 certified factory.

Technical Data

Available Sizes:

Flanged- 1½, 2, 2½, 3, 4, 6, 8, 10, 12, 14 & 16"

Grooved- 1½, 2, 2½, 3, 4, 6, 8"

Pressure Rating:

ANSI#150 - 17.2 bar | 250 psi

ANSI#300 - 1½" to 10" - 25 bar | 365 psi

ANSI#300 - 12" to 16" - 20 bar | 300 psi

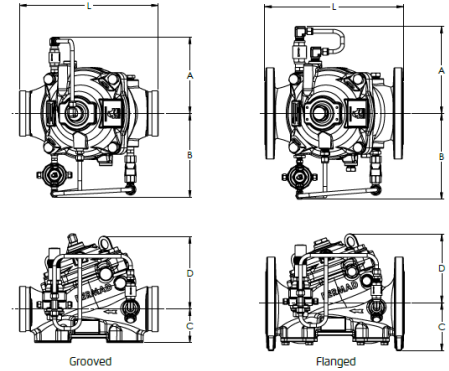
Grooved - 25 bar | 365 psi

Setting range: 2 -16 bar | 30 - 235 psi

Elastomer:

HTNR - Fabric Reinforced High Temperature

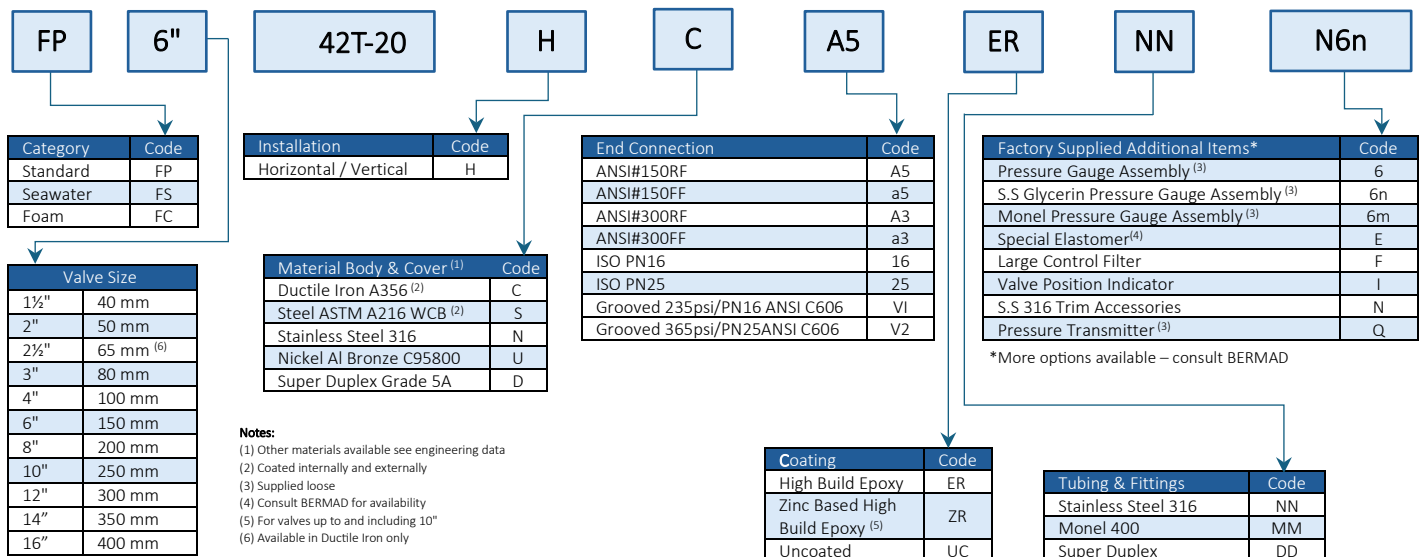
Compound - See engineering data



Valve Size	L #150 mm in	L Grooved mm in	L #300 mm in	A mm in	B mm in	C mm in	øD in	E mm in	F mm in	G mm in	Weight #150 kg lb	Weight #300 kg lb
DN40 1½"	-	-	-	-	-	-	-	-	-	-	-	-
DN50 2"	205 8.1	205 8.1	-	284 11.2	210 8.3	-	-	-	-	-	11 24.2	-
DN65 2½"	205 8.1	-	-	284 11.2	210 8.3	-	-	-	-	-	11 24.2	-
DN80 3"	257 10.1	250 9.8	-	300 11.8	215 8.5	-	-	-	-	-	13 28.6	-
DN100 4"	320 12.6	320 12.6	-	313 12.3	243 9.6	-	-	-	-	-	30 66	-
DN150 6"	415 16.3	415 16.3	-	341 13.4	315 12.4	-	-	-	-	-	70 154	-
DN200 8"	500 19.7	500 19.7	-	415 16.3	350 13.8	-	-	-	-	-	128 282	-
DN250 10"	605 28.7	-	-	443 17.4	382 15	-	-	-	-	-	145 319	-
DN300 12"	725 28.5	-	-	481 18.9	430 16.9	-	-	-	-	-	323 712	-
DN350 14"	980 38.6	-	980 38.6	242 9.5	656 26	272 10.7	-	441 17.4	-	-	356 784	416 915
DN400 16"	1100 43.3	-	1100 43.3	242 9.5	656 25.8	316 12.5	-	415 16.3	-	-	403 886	523 1151

IMPORTANT: Dimensions for the trim envelope or extents refer to a horizontal orientation and may vary with specific component positioning - Apart from the "L" dimension, allow a tolerance of at least ±15%

Valve Code Designations



Pressure Relief Sizing for Pressure Reducing Valves

42T Pressure Reducing Valve Size in. (mm)	1½" (40)	2" (50)	2½" (65)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)
Recommended Relief valve size, in. (mm)	¾" (20)	¾" (20)	¾" (20)	¾" (20)	2" (50)	3" (80)	3" (80)	4" (100)	2 x 4" (2x100)	2 x 4" (2x100)	2 x 4" (2x100)