Fire Pump Control and Check Valve

Model 42T-20

The BERMAD model 42T-20 is an elastomeric, hydraulically operated, self actuated Non Return Fire Pump Pressure Control Valve, designed for advanced fire protection systems meeting the NFPA-20 guidelines.

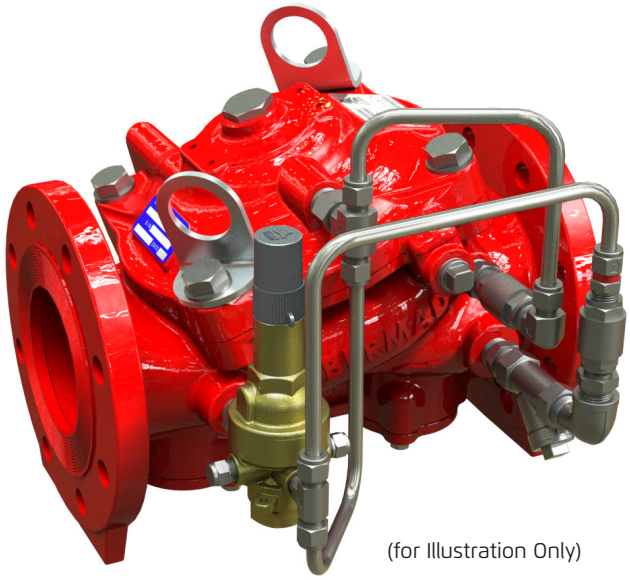
The 42T-20 is used for controlling the flow and pressure at the pump discharge, performing also as a non return check valve.

The 42T-20 prevents pump startup surge, typically caused by the accelerated water flow during the fire pump starts.

The valve also helps to prevent 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.

As an option the 42T-20 can be fitted with a valve position indicator that can include a limit switch suitable for industrial monitoring systems.



(for Illustration Only)

Benefits and Features

- **Safety and reliability**
  - Time-proven, simple, safe actuation
  - Single piece, rugged, elastomeric VRSD technology
  - Obstacle-free, uninterrupted flow path
  - stem-less guide with no mechanical moving parts
- **High performance**
  - Straight-through flow with Minimal pressure loss
  - Energy efficient
  - Fast, smooth response to pressure fluctuations
  - Certified for 20/25 bar (300/365 psi)
- **Designed for advanced fire protection systems**
  - Meets the requirements of the NFPA-20 standard
  - Face-to-face length standardized to ISO 5752, EN 558-1
- **Quick and easy maintenance**
  - In-line serviceable
  - No mechanical moving parts
  - Quick cover removal without detaching control trim

Approvals

c UL us LISTED	UL-Listed Special System Water Control Valves, Pressure Reducing (VLMT) Sizes 1½" -16"
DNV	Det Norske Veritas Type Approval
ABS TYPE APPROVAL PROGRAM	ABS American Bureau of Shipping Type Approval
Lloyd's Register	Lloyd's Register Type Approval

Typical Applications

- Pump discharge control
- Fire Pump surge prevention
- Sprinkler feed systems
- Branch pressure regulating and check valve
- Foam Systems

Additional Features

- Sea water compatibility
- Large control filter for dirty water supply
- High Build epoxy coating
- Stainless steel seat ring
- Valve linear position indicator/switch

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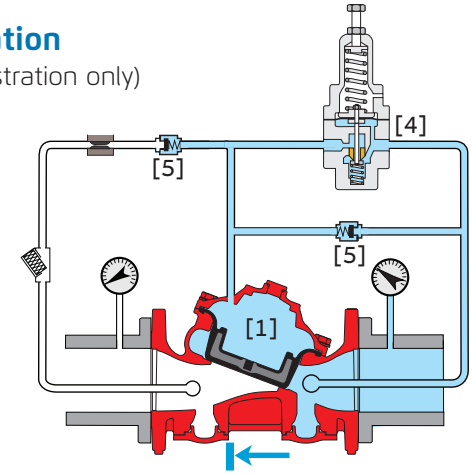
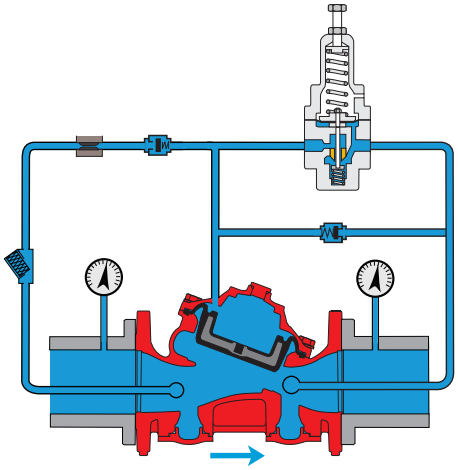
Operation

(for illustration only)

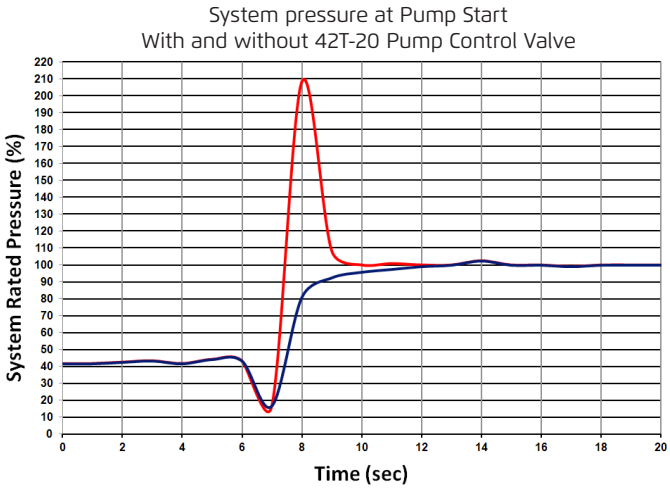




Valve Closed - The BERMAD 42T-20 control valve is kept shut tight when the pump is idle by way of the jockey pump pressure held in the valve's control chamber [1] by the check valves [5]. Under the same principle the 42T-20 acts as a system non-return valve, preventing water from flowing back to the pump after pump shut down.

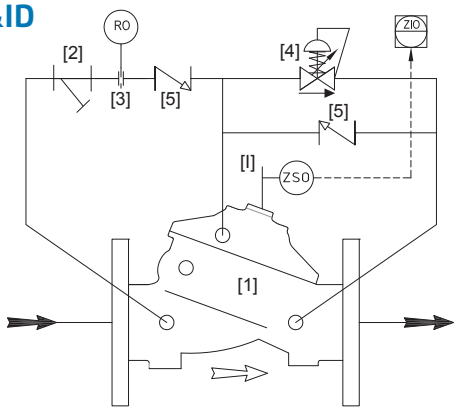
Valve Open - At pump start up the energy of the initial surge from the pump start will be arrested by the closed valve, preventing downstream pressure spikes and water surge in the system piping.
The valve will continue to open in a controlled manner as pressure is released from the valve control chamber through the pilot valve [4] (see graph below).

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 rise in system pressure.



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

Optional System Items*

I Visual indicator

ZSO Limit switch

* See also factory fitted items under the *Valve Code Designations* on the last page

System Installation

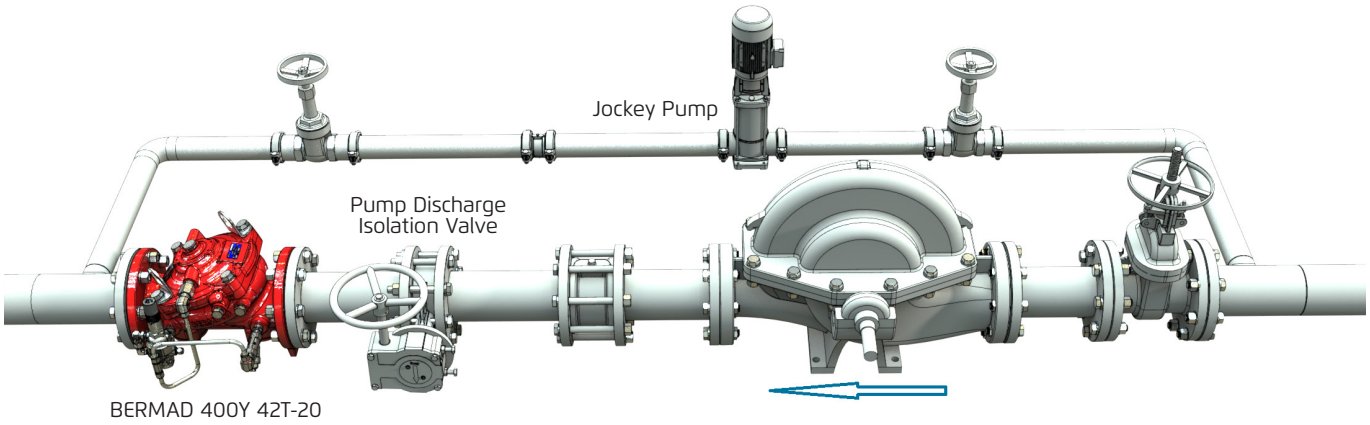
A typical installation of the BERMAD model 42T-20 is where the valve is installed downstream of the fire pump discharge isolation valve.

The jockey pump discharge pipe shall be connected downstream of the BERMAD 42T-20 control valve.

The 42T-20 is especially suited for this fire pump function, having an exceptionally high flow capacity and low pressure loss, owing to the unobstructed internal elastomeric construction and straight through flow path.

When the 42T-20 is fully open, it presents the least possible pressure loss delivering the maximum volume of firewater to the extinguishing devices.

The BERMAD 400Y 42T-20 has the high operational reliability inherent with elastomeric valves not having any bearings or shafts that might stick if the valve is to be dormant for long periods. As is often the case with fire protection systems. In addition the peripherally supported VRSD diaphragm (Vulcanized Radial Seal Disk) ensures many years of trouble free high pressure performance.



(for Illustration Only)

Engineer Specifications

The Fire Pump Control Valve shall be suitable to control the flow and pressure at the pump discharge, performing also as a non return check valve.

The Control Valve shall be UL listed as a Pilot Operated Pressure Control Valve with a Check Valve feature for fire protection, meeting the NFPA-20 and NFPA-13 guidelines.

The valve shall be with a straight-through body design and shall have an unobstructed flow path, with no stem guide or supporting ribs.

Valve actuation shall be accomplished by a single-piece, rolling diaphragm bonded with a rugged radial seal disk that shall be the only moving part.

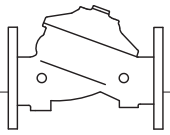
The cover and valve body shall be ductile iron to ASTM A536 GR 65-45-12 coated internally and externally with a high build corrosion resistant epoxy coating.

The valve pilot system shall include a Balanced Pressure Control Pilot Valve, Y-type strainer, spring return check valve, a restrictor and Stainless Steel 316 tubing and fittings.

Removing the valve cover for inspection or maintenance shall be inline and shall not require removal of the control trim.

The valve and its entire control trim shall be supplied pre-assembled and hydraulically tested by a factory certified to ISO 9000 and 9001 standards.

BERMAD Fire Protection



Model FP 400Y - 42T-20

400Y Series

Technical Data

Available Sizes (inch)

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

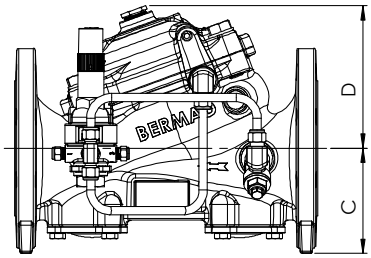
Pressure Rating

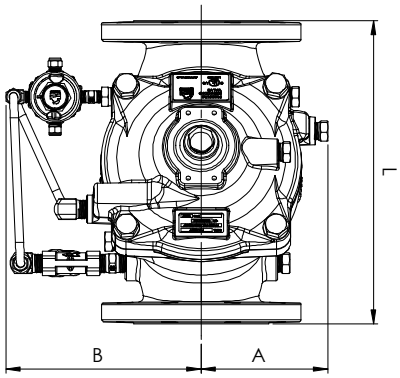
- ANSI#150 - 16 bar / 235 psi
- ANSI#300 - 1½" to 10" 25 bar/365 psi
  12" to 16" 21 bar/300 psi
- Grooved/Threaded - 25 bar/365 psi
- Standard Setting Range* - 4 to 12 bar (60 - 175 psi)

*For other setting ranges - Consult BERMAD

Elastomer

- HTNR - Fabric Reinforced High Temperature Compound - See engineering data





Valve Size	1½" DN40		2" DN50		3" DN80		4" DN100		6" DN150		8" DN200		10" DN250		12" DN300		14" DN350		16" DN400	
Unit	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	In
L[1]	230	9.1	230	9.1	310	12.2	350	13.8	480	18.9	600	23.6	730	28.7	850	33.5	980	38.6	1100	43.3
L[2]	230	9.1	230	9.1	325	12.8	368	14.5	506	19.9	626	24.6	730	28.7	888	35	980	38.6	1100	43.3
A	77.5	3	77.5	3	100	3.94	115	4.53	140	5.51	172	6.77	204	8	242	9.53	242	9.53	242	9.53
B	155	6.1	155	6.1	251	9.88	266	10.47	372	14.65	490	19.29	490	19.29	656	25.83	656	25.83	656	25.83
C	64	2.52	77	3.03	106	4.17	121	4.76	140	5.51	172	6.77	204	8.03	247	9.72	272	10.71	316	12.44
D	120	4.69	120	4.69	146	5.75	158	6.22	228	9	295	11.65	296	11.65	441	17.36	441	17.36	415	16.3
Kv / Cv [4]	68 / 79		80 / 92		190 / 219		345 / 398		790 / 912		1160 / 1340		1355 / 1565		2370 / 2737		2850 / 3292		3254 / 3758	
Leq [3] :m (ft)	2 / 7		5 / 16		7 / 23		9 / 30		15 / 49		27 / 89		62 / 203		52 / 171		59 / 194		88 / 289	
Kg(lb) flanged#150/ISO16	17.9 / 39.4		19.3 / 42.5		34 / 74.8		44 / 95.8		87.3 / 192		150 / 331		180 / 397		323 / 712		356 / 784		403 / 886	
Kg/lb flanged#300/ISO25	20.3 / 44.5		21.1 / 46.5		38.7 / 85.8		51.4 / 112.8		107 / 235		170 / 401		216 / 484		373 / 822		428 / 943		523 / 1150	

Notes:
[1] Refers to the length dimensions for Raised Face ANSI #150, ISO 16 Flanged, Threaded Grooved valves
[2] Refers to the length dimensions for Raised Face ANSI #300 and ISO 25 Flanged valves
[3] Leq (Equivalent Pipe Length) refers to a fully opened valve with turbulent flow in new steel pipe schedule 40, values given for general consideration only
[4] Kv/Cv values given for a fully opened valve
[5] Exact dimensions for the trim envelope may vary with specific component postioning

Valve Code Designations

FP | 6" | 42T-20 | H | C | A5 | PR | NN | 6nN

Category	Code
Standard	FP
Seawater	FS
Foam Concentrate	FC

Valve Size	
1½"	40 mm
2"	50 mm
3"	80 mm
4"	100 mm
6"	150 mm
8"	200 mm
10"	250 mm
12"	300 mm
14"	350 mm
16"	400 mm

Installation	Code
Horizontal/Vertical	H

Material Body & Cover [2]	Code
Ductile Iron A356 [1]	C
Steel ASTM A216 WCB [1]	S
Stainless Steel 316	N
Nickel Al Bronze C95800	U
Super Duplex Grade 5A	D

End Connections	Code
ANSI#150RF	A5
ANSI#150FF	a5
ANSI#300RF	A3
ANSI#300FF	a3
ISO PN16	16
ISO PN25	25
Grooved 235psi/PN16, ANSI C606	VI
Grooved 365psi/PN25, ANSI C606	V2
Threaded 235psi/PN16, ISO-7-Rp	BP
Threaded 365psi/PN25, ISO-7-Rp	BH
Threaded 235psi/PN16, NPT	NP
Threaded 365psi/PN25, NPT	NH

Coating	Code
Polyester Red	PR
High Build Epoxy	ER
Uncoated	UC

Tubing & Fittings	Code
Stainless Steel 316	NN
Monel	MM
Super Duplex	DD

Factory Fitted Options*	Code
Pressure Gauge Assembly	6
Stainless Steel Glycerin Pressure Gauge Assembly	6n
Monel Pressure Gauge Assembly	6m
Single General Purpose Limit Switch	S
Large Control Filter	F
Valve Position Indicator, Linear	I
Stainless Steel 316 Trim Accessories	N
Stainless Steel 316 Seat	T
Pressure Transmitter	Q

* For more Factory Fitted Options - Contact Bermad

Notes:
[1] Coated internally & externally
[2] Other materials available – see engineering data

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