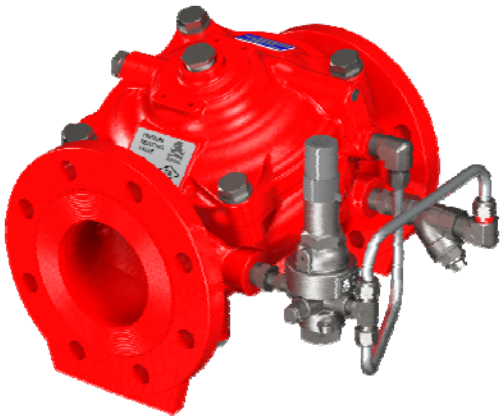
Model: 42T

Bermad Pressure Reducing Valve



Installation

Operation

Maintenance

Manual (IOM)

Safety First

BERMAD believes that the safety of personnel working with and around our equipment is the most important consideration. Please read all safety information below and from any other relevant source before attempting to perform any maintenance function. Comply with all approved and established precautions for working with your type of equipment and/or environment. Authorized personnel should perform all maintenance tasks.
Prior to performing a procedure, read it through to the end and understand it. If anything is not clear, ask the appropriate authority. When performing a procedure, follow the steps in succession without omission.

1. Description

Bermad 42T Pressure-Reducing Valve is a pilot-operated, diaphragm-actuated, straight-through flow type with low pressure-loss. It is an automatic pressure control valve that reduces higher inlet pressure to lower constant outlet pressure regardless of fluctuating flow-rates and/or varying inlet pressure.

2. Pressure and Flow Ratings

The Bermad 42T pressure-reducing valves size 3", 4", 6", 8" and 10" are rated for the following pressure and flow capacities detailed in table 1.

Table 1: Pressure Ratings and Flow Capacity

Valve Size in (mm)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)
Max. Inlet pressure bar (psi)	25 (365)	25 (365)	25 (365)	25 (365)	25 (365)
Outlet pressure setting range, bar (psi)	4 - 12 (60-175)	4 - 12 (60-175)	4 - 12 (60-175)	4 - 12 (60-175)	4 - 12 (60-175)
Max. recommended flow m3/h (GPM)	82 (360)	145 (640)	330 (1450)	580 (2570)	910 (4000)
Pilot Valve model	2-PB	2-PB	2-PB	2-UL	2-UL
Min. recommended Pressure Relief Valve Size, inch (mm)	1-1/2" (40)	2" (50)	2" (50)	3" (80)	4" (100)

NOTE: maximum ΔP across the valve shall not accede 12 bar / 175 psi to prevent conditions, at higher ΔP a Two-Stage pressure reducing system is recommended (see figure 1)

3. Head Loss

3.1 The minimum ΔP across the valve is 0.4 bar (5.8 psi). In cases where the inlet pressure falls below or is equal to the intended outlet pressure, the outlet pressure shall be determined according to the "Valve Outlet Pressure Fall-off Chart".

3.2 In the case of zero (static) flow through the valve, the maximum increase in the downstream (outlet) pressure above the set pressure of the valve will not exceed 0.5 bar (7.2 psi).

Table 2: Valve Head Loss Data

Valve Size in (mm)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)
CV (Kv)	190 (219)	345 (398)	790 (912)	1160 (1340)	1430 (1652)
Leq m (ft), see Note 1	8 (25)	8 (26)	13 (43)	27 (89)	55 (179)

Note 1: Valve Equivalent Length Value (Steel Pipe), for use in hydraulically calculated system

4. Approvals

The Bermad 42T pressure reducing valve is UL Listed and FM Approved when installed with specific system components as described in this installation manual.
Consult Bermad for any component approval recently to appear in any equipment directory.

NOTE: A Pressure Relief Valve, UL/FM approved size 1-1/2" or larger must be supplied for installation with every pressure reducing valve, see table 1 for recommended size.

5. Installation

5.1 Allow enough room around the Bermad 42T pressure reducing valve assembly for any adjustments and future maintenance/disassembly work.

5.2 Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Failure to do this might result in the valve being rendered inoperable.

5.3 A UL-listed and FM approved indicating valves should be installed upstream and downstream of the Bermad 42T pressure-reducing valve to allow future maintenance, see figure 1.

5.4 Install the valve in the pipeline with the valve flow arrow on the body casing in the proper direction. Use the lifting eye provided on the main valve cover for lifting and lowering the valve.

5.5 The Bermad 42T pressure-reducing valve is suitable for horizontal or vertical installation. Ensure that the valve is positioned so that the cover is facing upwards and can be easily removed for future maintenance.

5.6 After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings.

5.7 A listed/approved pressure relief valve shall be installed in accordance with NFPA 13. The pressure relief valve must be installation with every pressure reducing valve, install the pressure relief valve offline, downstream of the Bermad 42T pressure reducing valve, see figure 1.

NOTE: The pressure relief valve shall be set to open at 0.5 – 1.0 bar (8 – 16 psi) above the 42T valve setting, see table 1 for recommended size.

5.8 Install a listed/approved pressure gauge on both the upstream & downstream of the Pressure Reducing Control Valve. See installation drawing, see figure 1 for indicated installation.

5.9 Install the Bermad 42T pressure-reducing valve in accordance with the Standard for Installation of Fire Sprinkler Systems, NFPA 13, or the Standard for Installation of Standpipe and Hose System, NFPA 14, as appropriate. The Bermad 42T pressure-reducing valve is to be tested after installation in accordance with NFPA 13.

5.10 The Bermad 42T pressure-reducing valve is to be inspected, tested and maintained in accordance with the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

6. Optional Instrument

6.1 Valve Position Indicator (code I)

This option provides the means for Visual Indicating of the Main valve Valve Seal Disc Position at all times, by detecting the motion of the valve internal elastomer assembly.

6.2 Valve Position Limit Switch (code S, or S9)

The Valve Position Limit Switch option is highly recommended for indication of the valve operation. It is recommended to provide an Electric Remote Valve Position Signal.

Caution: Verify that the switch is certified to suit to the hazardous location of the valve location.

6.3 Large Control Filter – Mark "F"

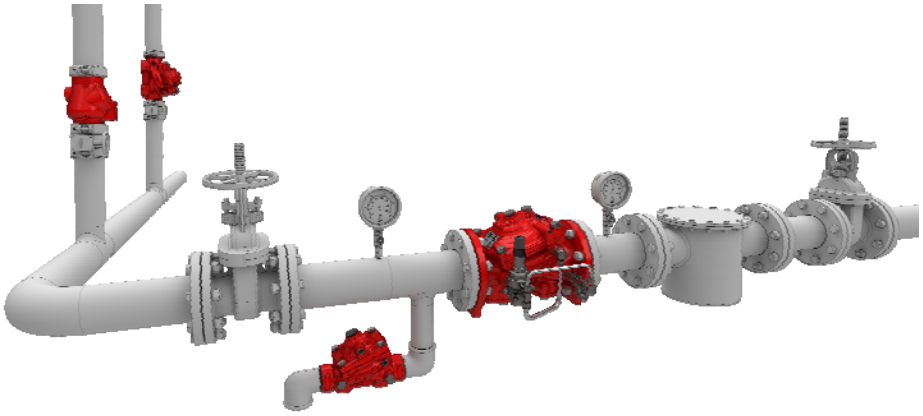
This "F" option provides extra capacity means for filtering of the water supplied to the pilot system, it is recommended for those cases where there is any doubt as to the level of particulate matter in the water.

Figure 1: Typical Installation Drawings

Pressure Control to suit system pressure-rating

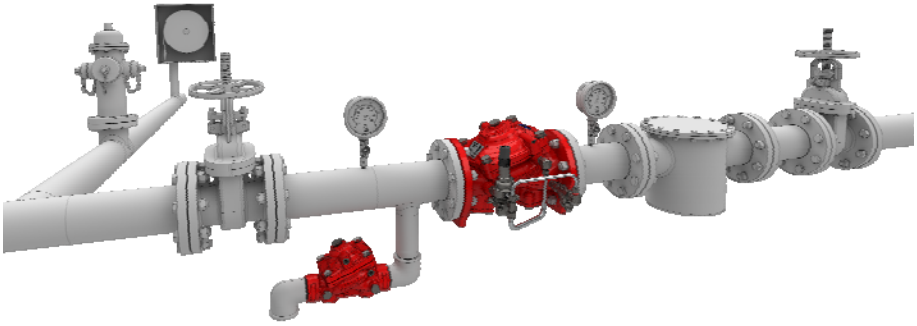
Sprinkler System
Pressure Control

- Reduces high, unstable pressure supply to a precise, preset, stable downstream
- Adjusting the required pressure to suit sprinklers recommended pressure / flow rate
- Pressure control station for sectional floor



Hose System
Pressure Reducing

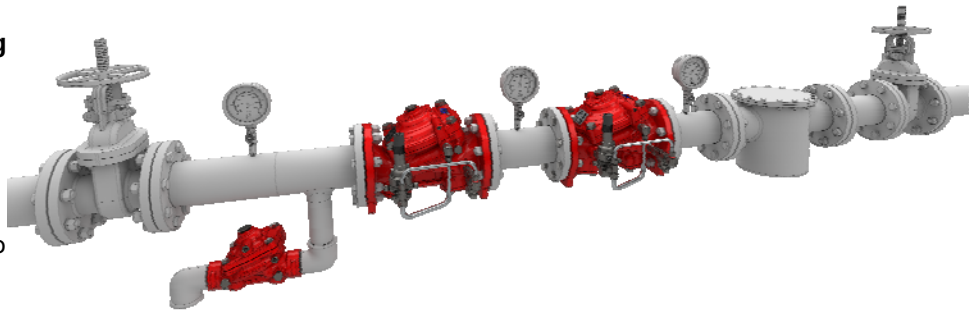
- Reduces high water-pressure to a specific downstream pressure supply to the fire hoses
- Limiting the fire hoses pressure, adjusting to suit hose pressure to 7 bar (100 psi) to meet NFPA14 regulations for maximum allowable hose pressure supply.



Two-Stage Pressure Reducing System

- Reduces high pressure differential

  to a low preset, stable downstream
- Backup pressure control valve to secure pressure zone rating



7. Operation

The pressure-regulating pilot senses downstream pressure and modulates the upper control chamber causing the main valve to throttle, thus maintaining constant downstream pressure. When the downstream pressure falls below the pilot setting, the pilot opens, pressure in the upper control chamber decreases, and the main valve modulates open to increase downstream pressure and maintain pilot setting.
If the downstream pressure rises above the pilot setting, the pilot valve closes, pressure in the upper chamber increases and the main valve throttles close to decrease downstream pressure to the pilot setting.
The pressure-reducing pilot is equipped with an adjusting screw to preset the desired downstream pressure and an internal factory preset restrictor to control the closing speed.

Starting -up

When performing this procedure refer to figure 2.

7.1 Open a hydrant, relief valve, drain valve, or other flow-consumer downstream of the Bermad 42T “Y” type Pressure-Reducing Valve, creating a system demand.

7.2 Fully open upstream indicating valve

7.3 Gradually open downstream indicating valve to fully open, allowing flow through the Bermad 42T Pressure-Reducing Valve.

7.4 Wait for downstream pressure stability.

7.5 Slowly close the flow-consumer that was opened in step #1 above to fully close.

7.6 There is no flow; the pressure on the downstream side of the system that is reflected through the pressure gauge. Should be according to the factory pre-set adjusted pressure plus up to an additional 10%.

Readjusting

The pilot valve is factory pre-set according to the stated demands of the customer.
The pre-set is clearly indicated on the pilot valve tag. If readjustment to either the pressure or valve response is required, follow the following steps.

7.7 When readjusting the outlet pressure, the inlet pressure should be at least 20 psi (1.4 bar) higher than the set outlet pressure.

7.8 Ensure that there is minimum flow through the main valve (see Table 1, for minimum flow rate for pilot valve setting).

7.9 Free the tension between the adjusting screw on the pressure reducing pilot valve (4 in figure 2) and the fastening nut by turning the fastening nut counterclockwise.

7.10 By alternately turning the adjusting screw on the pilot valve a half turn and then reading the downstream pressure, gradually adjust the pressure:

Counterclockwise to decrease (-) the downstream pressure,
Or Clockwise to increase (+) the downstream pressure.

7.11 Repeat the Starting-up procedure, steps 6.1-6.5.

Caution: If needle valve is furnished (optional), changes in the adjustment of the needle valve have great impact on the valve performance. The needle valve is factory set at one-half turn open to one and one-half turn open. The maximum number of turns is 3 from fully closed to fully open. More than 3 turns toward open might cause the valve to perform at less than optimal functioning. Perform step 6.5 with this in mind.

Figure 2a: Operation Drawing, size 3" to 6"

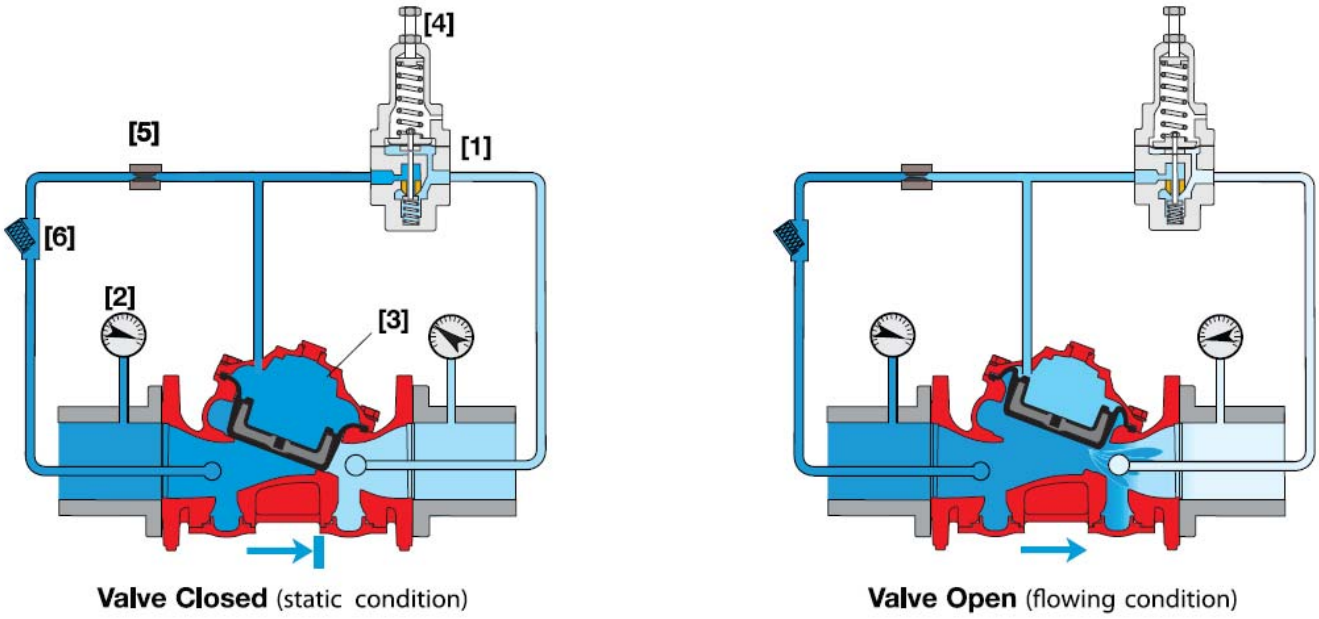
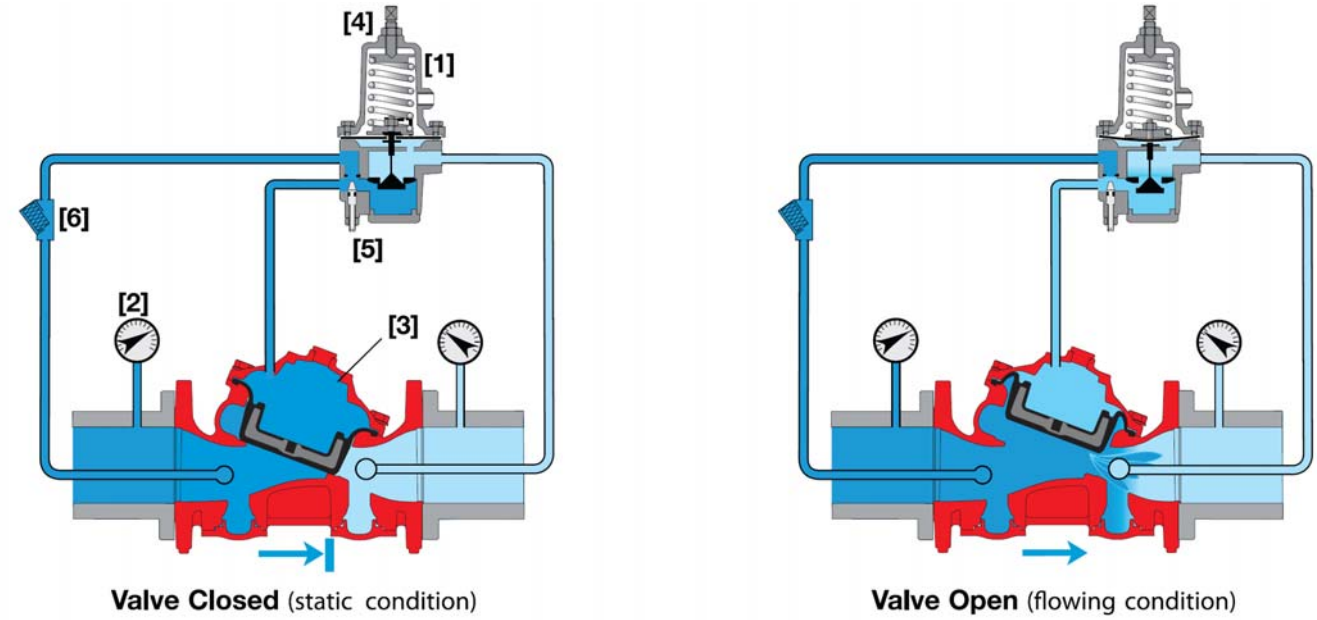


Figure 2b: Operation Drawing, size 8" to 10"



8. Maintenance and Inspection Test

8.1 Normal Conditions

WARNING: Do not turn off the water supply to make repairs without placing a roving fire patrol in the area covered by the system. The patrol should continue until the system is back in service.

Prior to turning off any valves or water supply, notify local site fire officials.

In any of the following inspections or testing procedures, if an abnormal condition exists, see Troubleshooting for possible cause and corrective action.

The Bermad 42T Pressure-Reducing Valve is to be inspected, tested and maintained in accordance with the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

8.1.1 All main isolating valves should indicate a fully open position.

8.1.2 Upstream pressure gauge should (2 figure 2) reflect the upstream pressure supplied to the valve.

8.1.3 Downstream pressure gauge should be according to the system design criteria.

8.2 Quarterly Inspection

8.2.1 The system should be checked for normal condition.

8.2.2 Check that the main valve, pilot system, accessories, tubing & fittings, are all in good condition, damage free and not leaking.

8.2.3 The fastening nut of the pilot valve (4 figure 2) adjusting screw , should be fastened tightly.

8.3 Annual Inspection and Test

8.3.1 Complete Quarterly Inspection.

8.3.2 Conduct a flow test in systems nominal flow. The downstream pressure gauge should show the adjusted downstream pressure, and according to the system design criteria, this pressure should be stable.
If re-adjusting is needed it should be according to paragraph 5.

8.4 Five-Years Inspection and Test

8.4.1 Complete Weekly and Monthly inspections.

8.4.2 Place the system out of service (See “Removing the System from Service” above).

8.4.3 The interior of the Control Valve should be cleaned and inspected.

8.4.4 The Elastomeric Diaphragm Assembly shall be inspected for wear, and shall be replaced with a new Diaphragm.

8.4.5 Place the system back in service. (See instructions "Placing the System in Service").

8.4.6 The valve and the pilot system must be activated at full flow.

8.4.7 Take all additional measures as required by NFPA-25 "Standard for the Inspection Testing and Maintenance of Water-Based Fire Protection Systems."

8.5 Abnormal Conditions

SYMPTOM	PROBABLE CAUSE	REMEDY
Valve fails to regulate	Restrictor is Blocked	Dismount the Connecting tube and Clean and flash the restriction.
	Air trapped in main valve cover.	Loosen cover tube fitting at the highest point, allow the air to escape and re-tighten.
	Filter screen (4) blocked.	Remove filters cap and screen to clean.
Valve fails to open	Insufficient inlet pressure.	Check/create inlet pressure.
	No downstream demand.	Create demand/flow.
	Insufficient pilot valve spring compression.	Turn adjusting screw CW on pilot valve (4 figure 2).
	Indicating valves closed.	Open.
Valve fails to hold set static outlet pressure	Filter screen (4) blocked.	Remove filters cap and screen to clean.
	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat and disc seal.
	Diaphragm in main valve is leaking.	**CAUTION**: This test will cause the valve to fully open. Close downstream indicating valve or omit this test if this may cause damage. Test for leakage. Close indicating valves and remove the plug in the main valve cover. If a continuous flow exists, the diaphragm is damaged or loose.

NOTE: Large Capacity Filter where the filter screen frequently becomes blocked:

In cases where the filter screen frequently becomes blocked, it is recommended replacing the standard filter with BERMAD’s Large Filter Mark “F” (see paragraph 6.3).

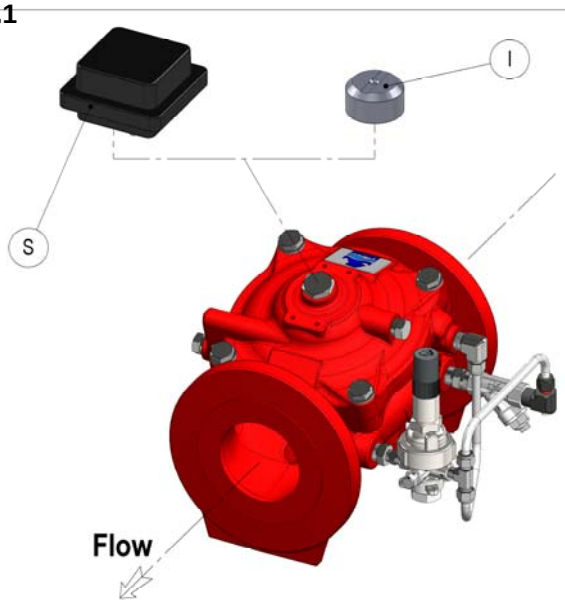
8.6 Difficulty in Performance

Where difficulty in performance is experienced, the manufacturer or his authorized representative should be contacted if any field adjustment is to be made.

9. General Arrangement (GA) and Outline Dimension Drawings

Figure 3A: GA Drawing for Size 3 - 6"

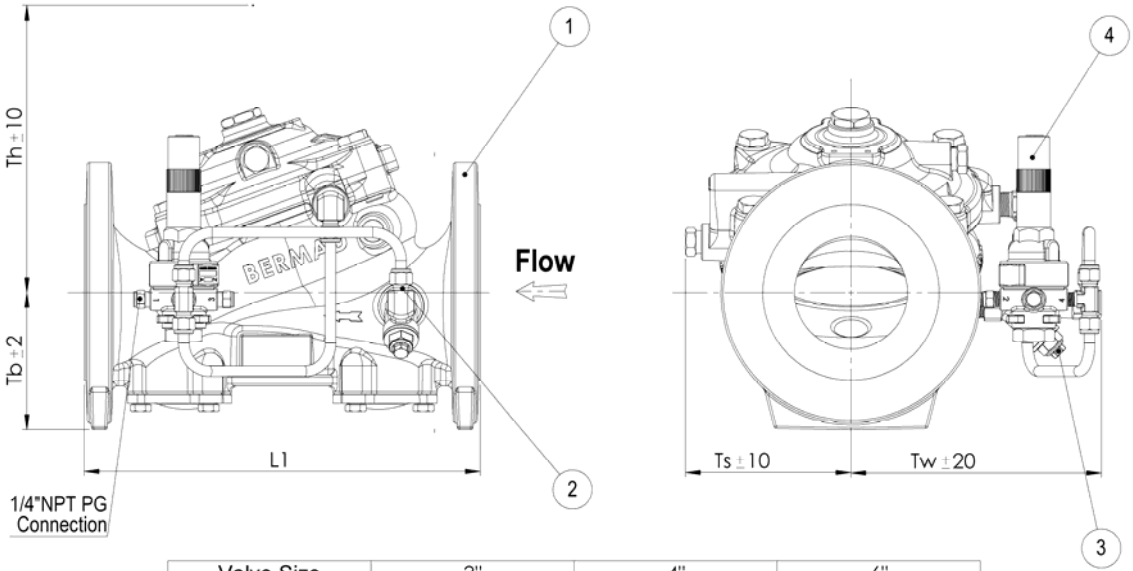
9.1



Item No.	Desciption	Qty
1	Main Valve Bermad 400-Y Series	1
2	Restricting orifice insert	1
3	Priming Y Filter	1
4	Pressure Reducing Pilot Valve 2-PB	1

Options

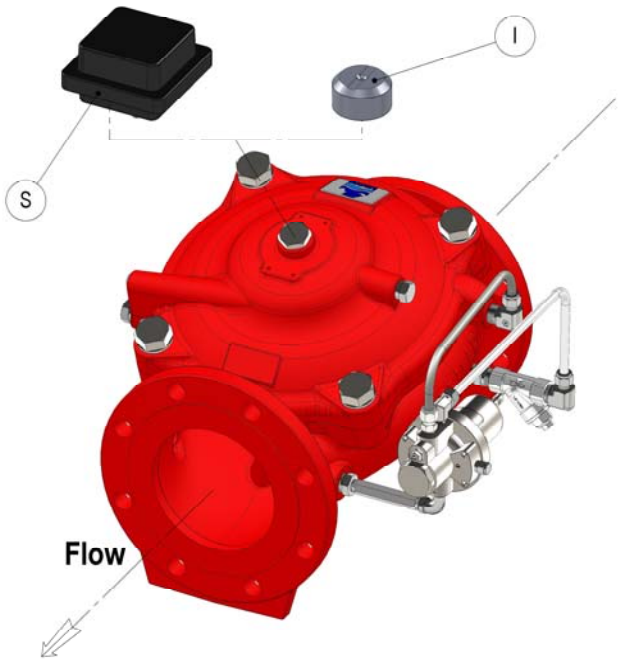
I	Vaive Position Indicator
S	Limit Switch Assembiy



Valve Size	3"	4"	6"
DN	80	100	150
L1	310	350	480
Ts	100	145	160
Tw	210	225	240
Tb	100	120	140
Th	190	245	285

Note: Dimension in mm

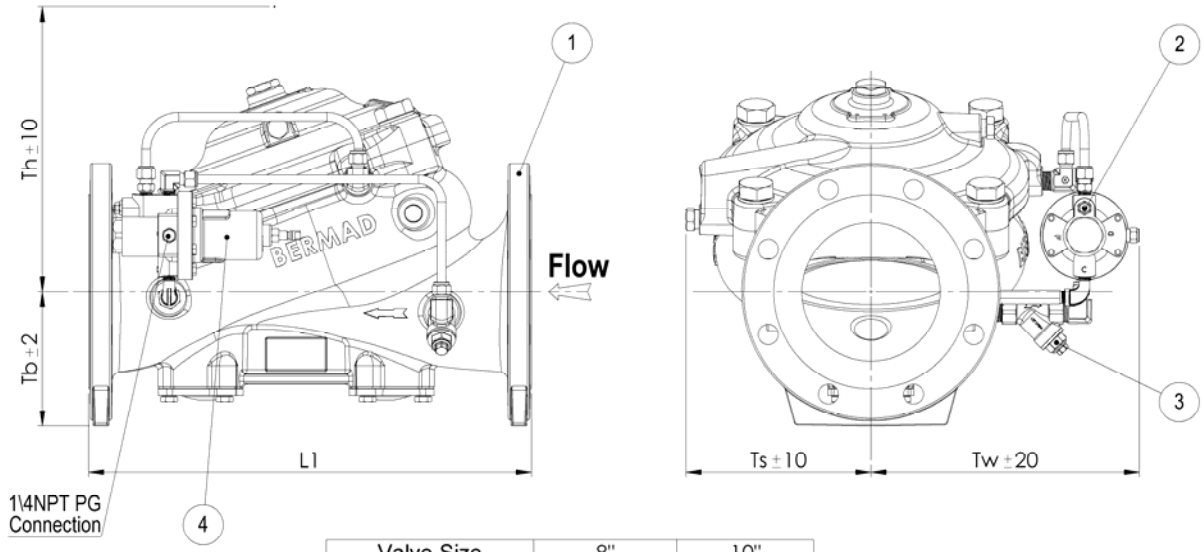
Figure 3A: GA Drawing for Size 8 - 10"



Item No.	Desciption	Qty
1	Main Valve Bermad 400-Y Series	1
2	Adjustable needle valve	1
3	Priming Y Filter	1
4	Pressure Reducing Pilot Valve 2-UL	1

Options

I	Valve Position Indicator
S	Limit Switch Assembly

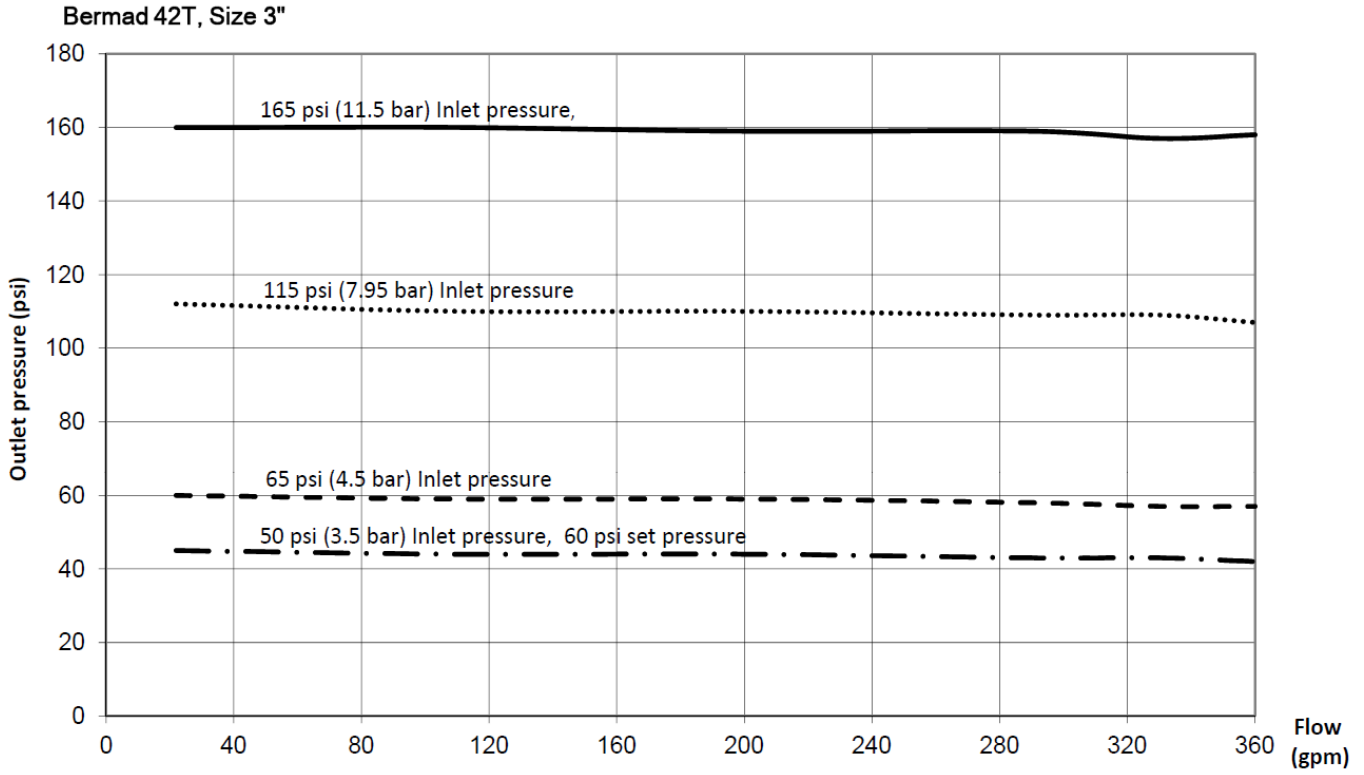


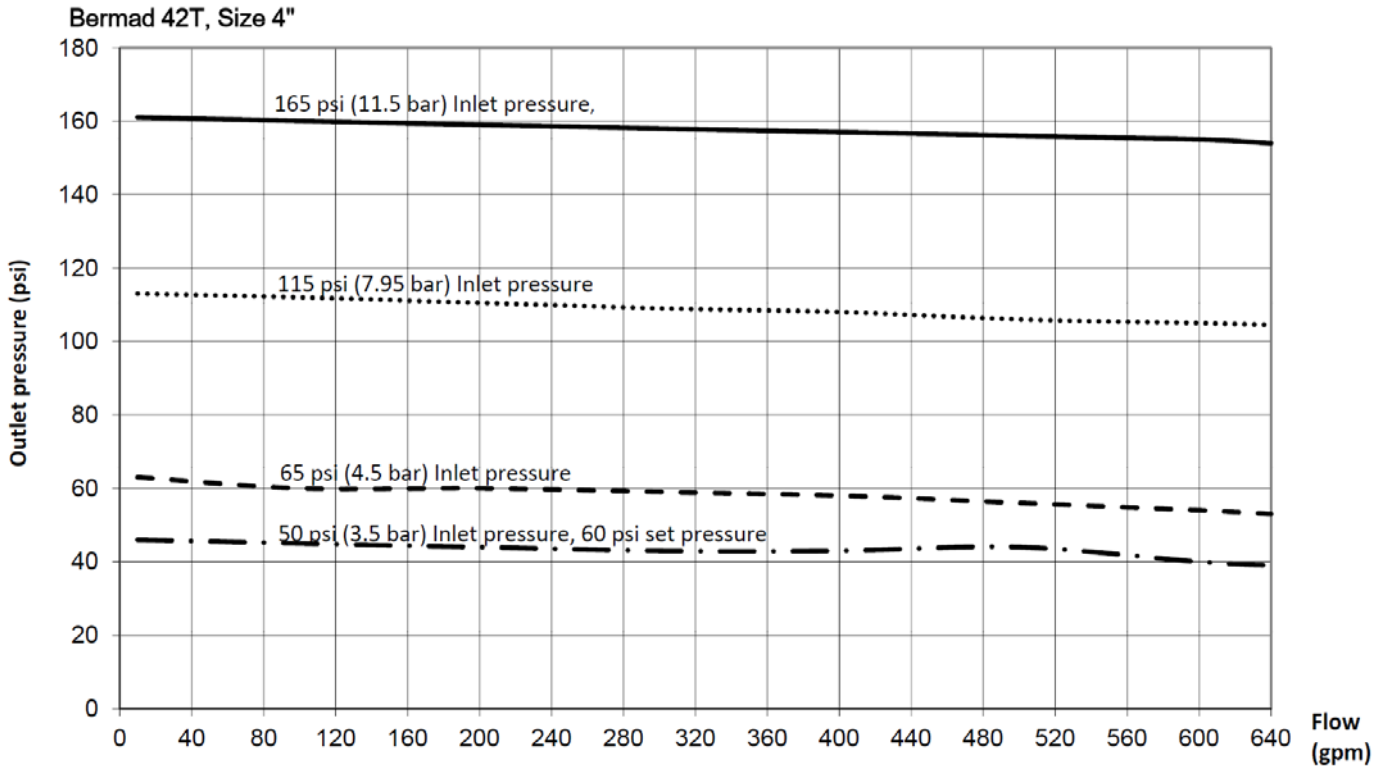
Valve Size	8"	10"
DN	200	250
L1	600	730
Ts	172	204
Tw	310	340
Tb	172	204
Th	336	336

Note: Dimension in mm

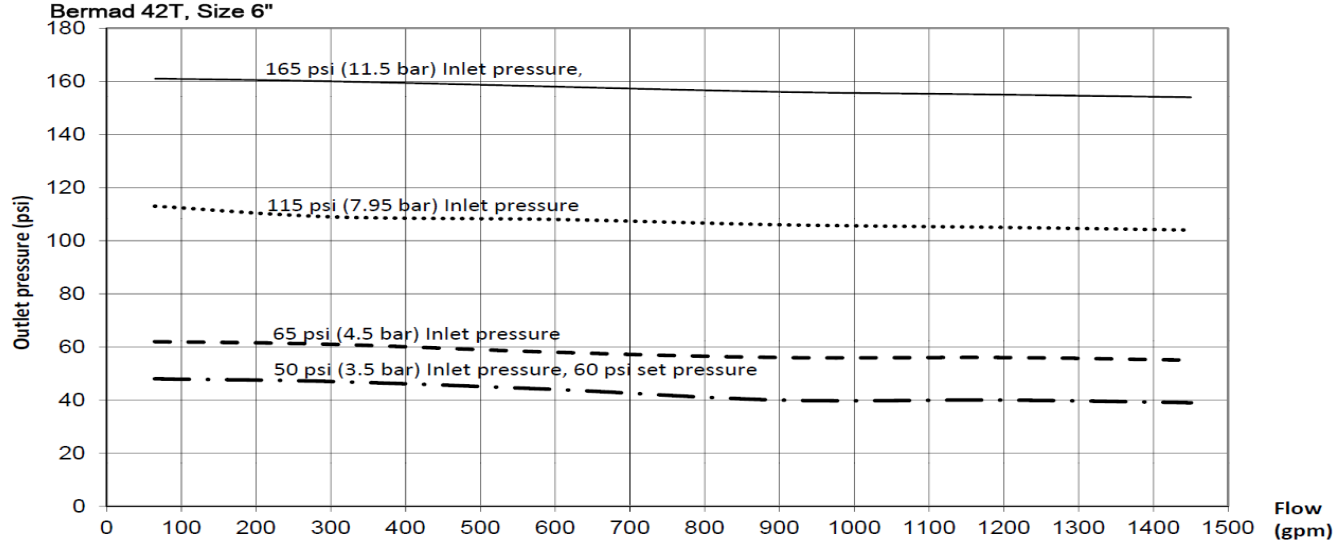
10. Fall-Off Charts - Bermad 42T Pressure Reducing Valve Outlet Pressure Verses Flow,

Should inlet pressure falls below the valve outlet set pressure:

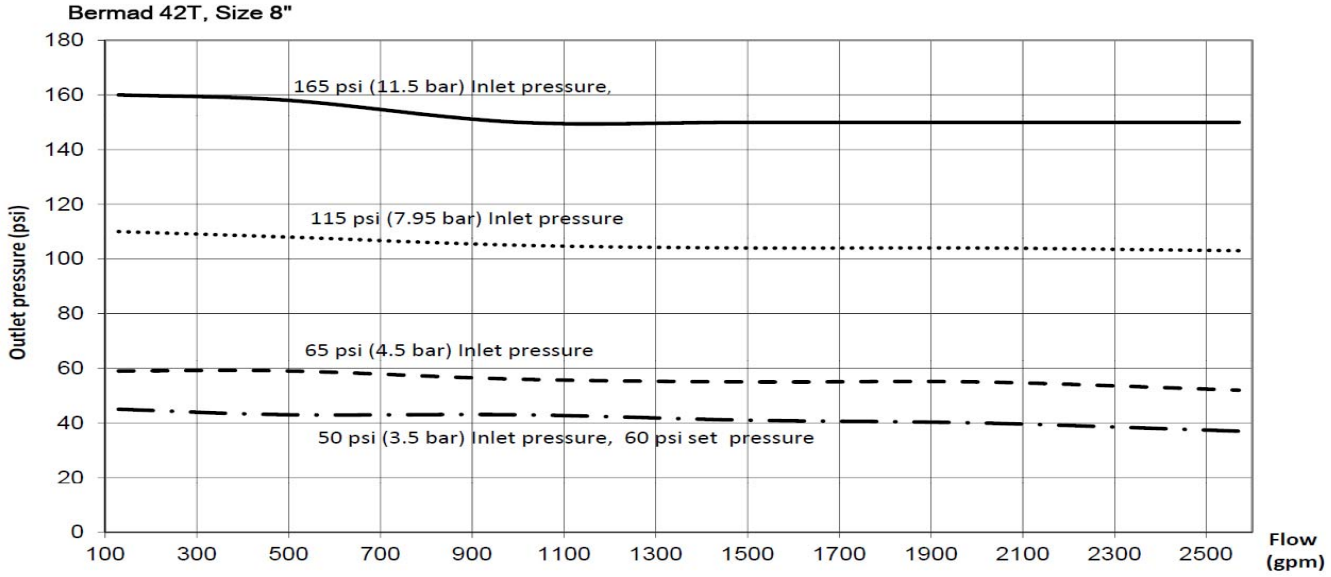




Bermad 42T, Size 6"



Bermad 42T, Size 8"



Bermad 42T, Sise 10"