44, 77-PS\UL

Pressure Sustaining/Relief Valve

IOM

Installation • Operation • Maintenance

Installation, Operation & Maintenance

This document specifies the operating concept of AQUESTIA pressure sustaining/relief valve model 44,77-X-PS\UL (X refers to valve size in Inch), UL listed when trimmed per the following technical data sheet

Please review the safety instructions at the end of this document prior to commissioning the valve for use

Installation, Operation & Maintenance

PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

General description

77 model

Aquestia-OCV pressure relief valve models 44,77-X-PS\UL and, are hydraulically-operated, pilot controlled, diaphragm activated, resilient, disk globe and angle type, automatic control valves. The valve modulates to maintain a steady, predetermined pressure in the network. Should the upstream pressure exceed the required set point, the valve opens, releasing the excessive pressure. When the pressure falls below the set value, the valve closes drip tight.

Operating pressures

- Pressure rating up to 16 bar \ 230 psi
- Minimum system pressure 1.5 bar \ 20 psi
- UL listed Pressure set point range 1.5-12 bar (20-175 psi)
  - For 44 model 2 3 inch 175 (1206)
  - For 77 model 2,3,4,6,8 inch 175 (1206)

44 model

Available end connections

- Flanged: 2” – 8”
  (UL Listed based on ANSI150.)
- Threaded: 2” – 3” (NPT / BSP)

Available body & cover and trim materials

Body & Cover	Valve Fitting	Valve Tubing	Diaphragm
Ductile Iron ASTM A536*	Brass*	Copper*	NR*
Stainless Steel ASTM CF8M	SST316	SST316	Neoprene
Cast Steel ASTM A216 WCB	Super Duplex 2507	Super Duplex 2507	EPDM
Ni-Al Bronze ASTM B148 gr.C95800	Aluminum-Bronze	Cu-Ni 90/10	NBR
	MONEL®	MONEL®	

* Standard material

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Pre-Installation (**refer to fig. 1 – System P&ID**)

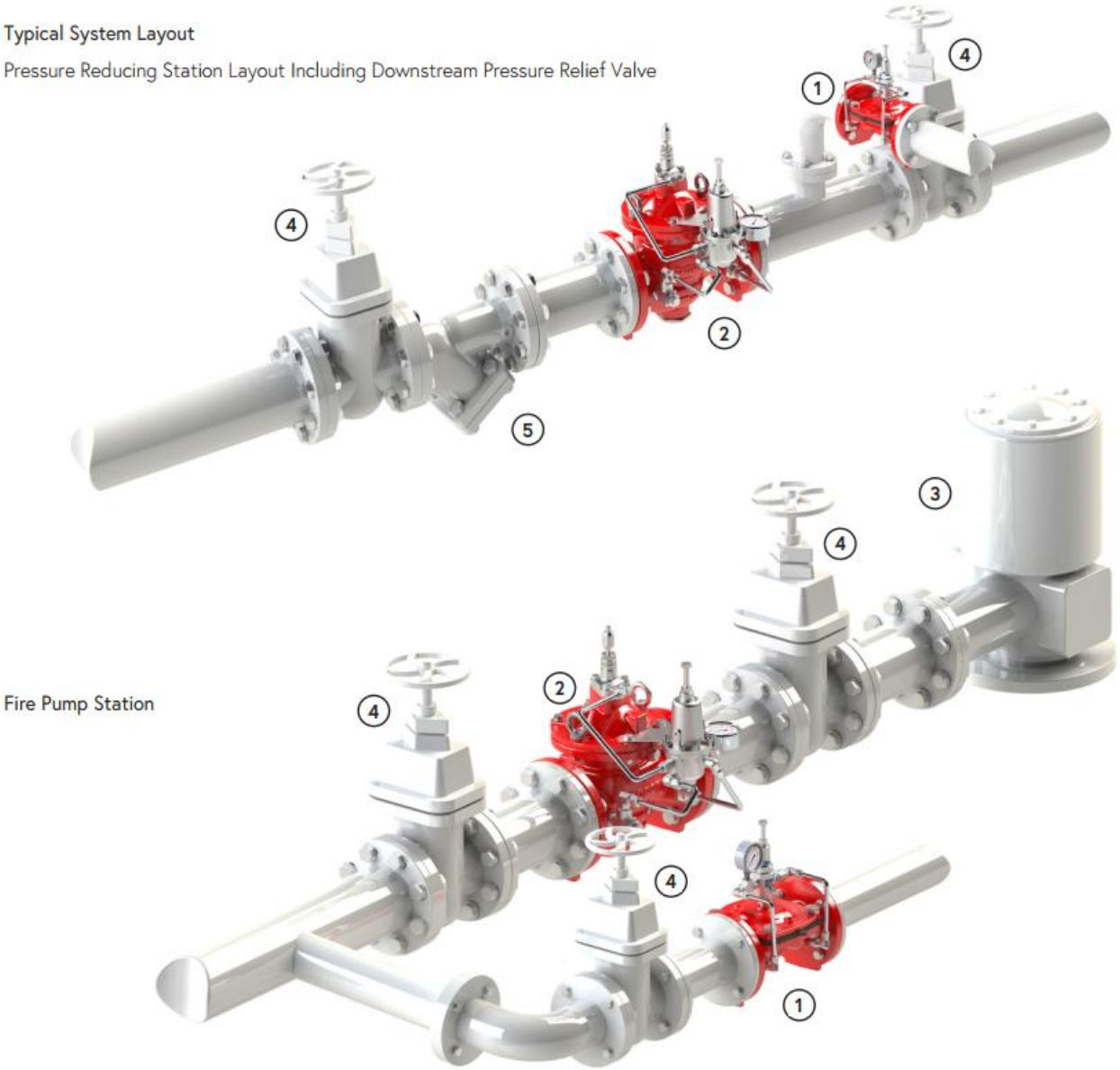
Note: All installation rules specified in NFPA 13, NFPA 14 and NFPA 25 standards should be followed when the valve is installed. These valves are set to maintain upstream pressures and flows and are to be tested after installation in accordance with NFPA 13 or NFPA 14 or both, whichever is applicable.
The valves should be tested periodically, in accordance with NFPA 25.

1. The pressure relief valve is factory trimmed for both vertical (with the upstream positioned at the bottom) and horizontal installation - out of the box, requiring no changes or tooling
2. Flow direction must match the engraved direction arrow on the valve body.
3. Horizontal assembly is recommended for maintenance purposes. Vertical assembly is allowed, in case the system design demands it.
4. Sufficient space for maintenance should be left around the pressure relief valve.
5. A manual isolating valve (supplied by 3rd party) should be assembled upstream of the pressure relief valve, for maintenance purposes.
6. As per UL 1739, for valves intended for use in sprinkler systems:
   7.1 A pressure relief valve of not less than 1/2 inch (13 mm) in size must be installed downstream of the pressure reducing valve; and
   7.2 Pressure gauges shall be installed on the inlet and outlet sides of the pressure reducing valve.

Fig. 1 – General layout
General drawing – not to scale

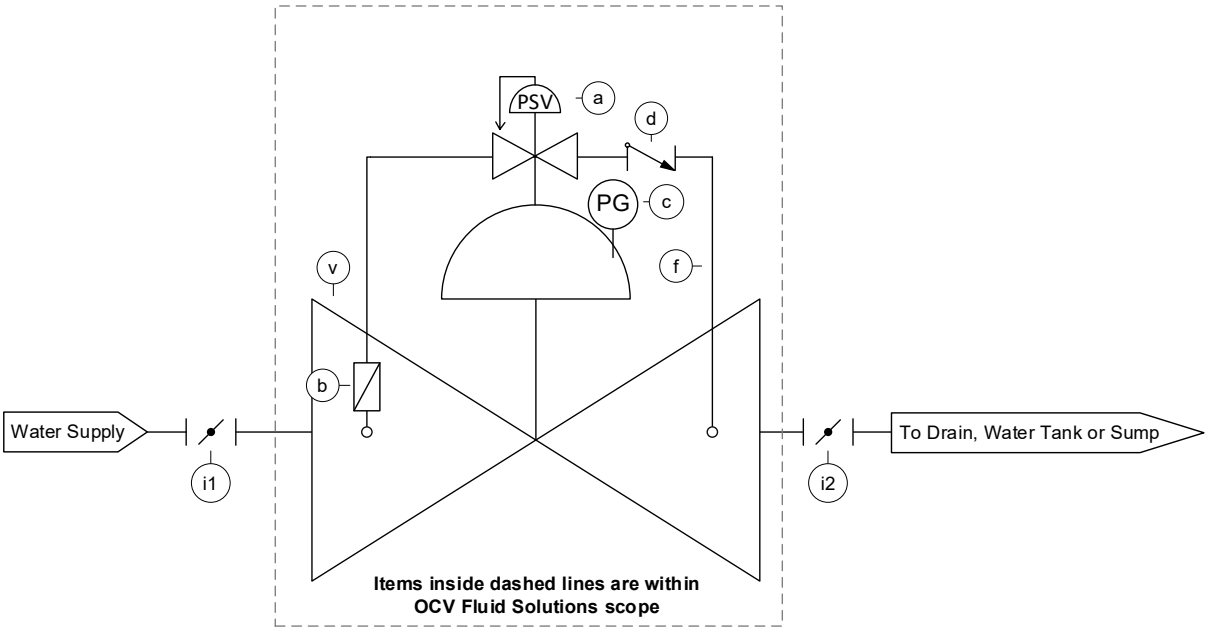
The typical installation of the OCV 44, 77 PS\UL is as shown:

1. OCV 44, 77 PS\UL Pressure Relief Valve
2. Pressure Reducing Valve (OCV 30 PR\UL or OCV 129FC)
3. Pump
4. Isolation Valve
5. Strainer



PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

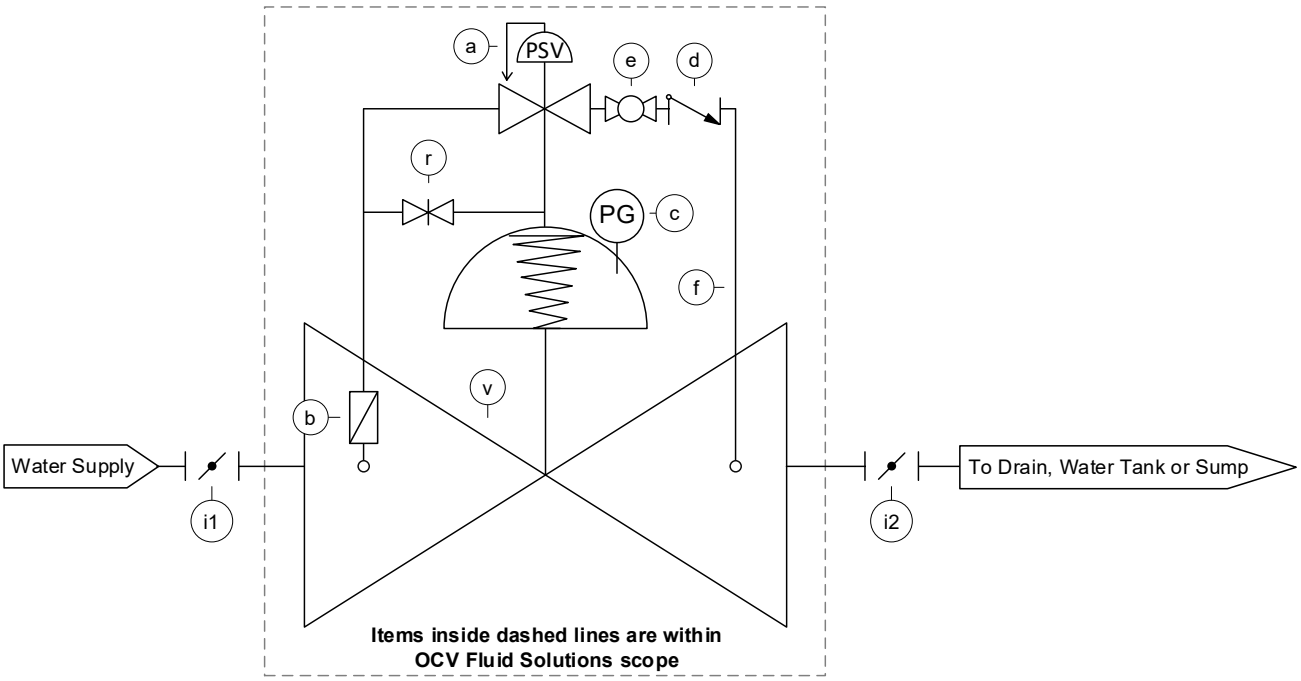
Fig. 2.1- System P&ID- 44, 77-PS\UL - 2" - 3"



Integral System Components	
Item #	**Description**
v	Hydraulic valve
a	68-500, Pressure relief pilot
b	Self flushing strainer
c	Pressure gauge
d	Check valve
f	Tube

Out Of Scope items	
Item #	**Description**
i1, i2	Isolating valve

Fig. 2.2- System P&ID- 44, 77-PS\UL - 4" - 8"



Integral System Components	
Item #	**Description**
v	Hydraulic valve
a	68-710, Pressure relief pilot
b	Self flushing strainer
c	Pressure gauge
d	Check valve
e	2-way Ball valve
r	Needle valve
f	Tube

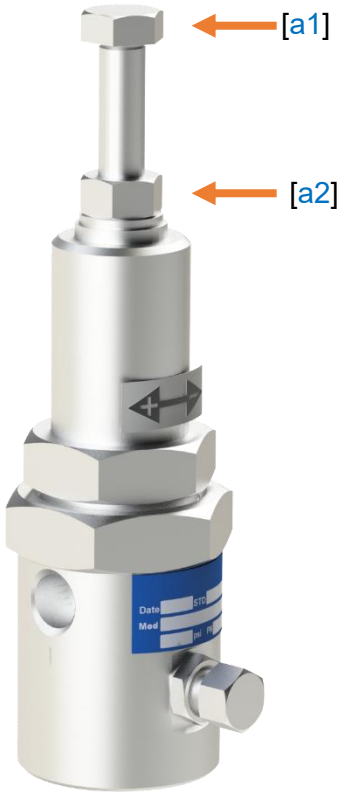
Out Of Scope items	
Item #	**Description**
i1, i2	Isolating valve

PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

Commissioning Procedure 2" – 8" (**refer to fig. 2.1 – P&ID**)

Note: The procedures below are additional to the basic inspection, testing and maintenance procedures as specified in NFPA 25 standard. These valves are to be tested periodically after installation in accordance with NFPA 25.

1. Start the pump or otherwise start the system flowing.
2. The pressure relief pilot valve [a], is factory set according to the client's specification (if not specified – the pressure relief pilot is set at 4 bar).
3. If on-site calibration is required, adjust upstream pressure as follows:
   - 3.1. Open the locking nut [a2].
   - 3.2. In case upstream pressure is too low, turn the adjusting bolt [a1] clockwise to increase upstream pressure until it reaches the required set-point.
   - 3.3. In case upstream pressure is too high, turn the adjusting bolt [a1] counter-clockwise to reduce upstream pressure.
   - 3.4. When the required pressure has been reached, lock the adjusting bolt [a1] by tightening the locking nut [a2].
   - 3.5. Check the valve's set-point by increasing the main system operating pressure until the relief valve opens to relieve excess flow.
   - 3.6. Return the main system operating pressure to the desired setting.
4. The pressure relieving valve is now set for service.
5. For 4-6 inch valve, needle valve is available in the trim design to calibrate valve reaction to closing operation.



PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

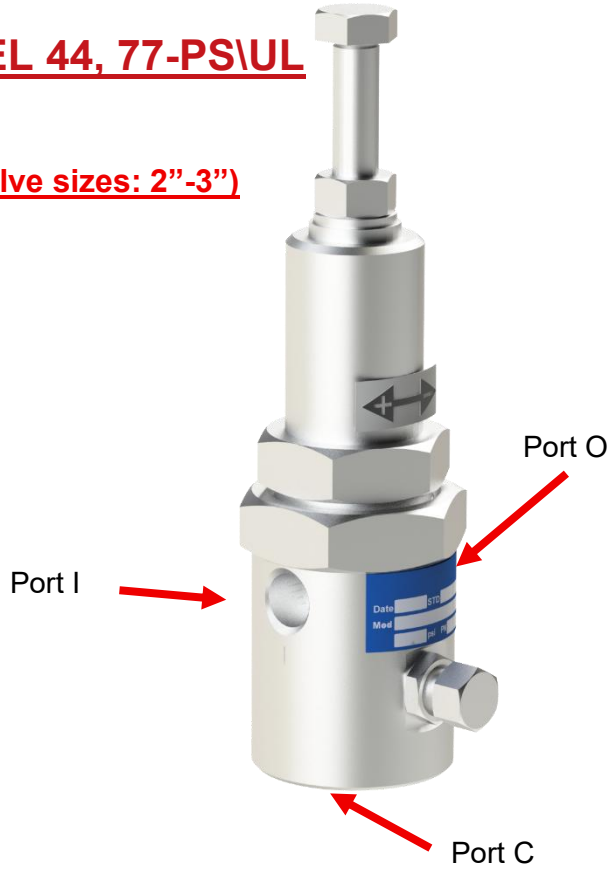
Pilot connection

68-500 Pressure sustaining/relief pilot (for valve sizes: 2”-3”)

Ports I connect to:
- Upstream sensing port

Ports C connect to:
- To Control Chamber

Ports O connect to:
- To Downstream port



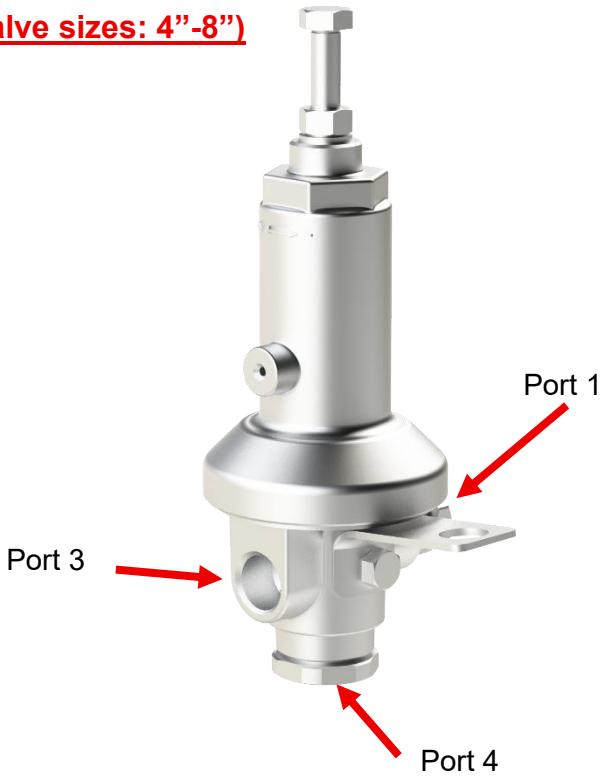
68-710 Pressure sustaining/relief pilot (for valve sizes: 4”-8”)

Ports 1 connect to:
- Upstream sensing port

Ports 2 connect:
- Plugged

Ports 3 connect to:
- To Downstream port

Ports 4 connect to:
- To Control Chamber



PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

Recommended Periodic Check-up and Maintenance

(**refer to figures 1, 2.1, 2.2**)

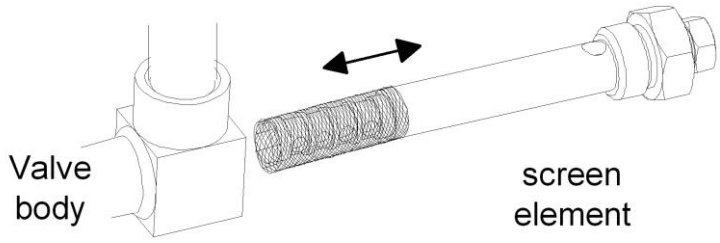
The owner of the valve is responsible for the setting, inspecting, routine testing and the maintenance of the valve as written, in compliance with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to standards of local authorities having jurisdiction.
It is recommended that all tests and maintenance procedures be carried out by qualified personnel.

Inspecting the pressure relief valve

1. Open the downstream drain valve [D]. Set the downstream drain valve [D] to lower and higher flows, allowing water to flow through the pressure reducing valve. Examine the pressure reducing valve's response by inspecting the pressure indicated on the downstream pressure gauge [c].
2. Close the downstream drain valve [D] (downstream pressure should rise by approximately 0.5 bar).

Inspecting the self- flushing filter

1. Close the upstream isolating valve [I1 & I2].
2. Remove the screen element of the self-flushing filter [b] as described in the drawing:

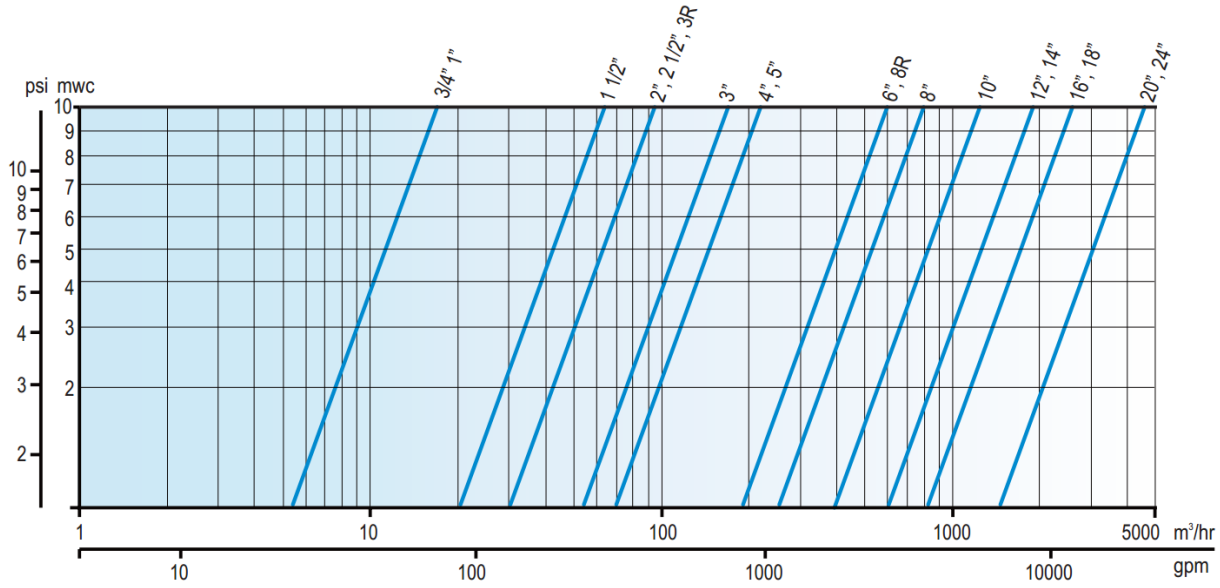


3. Clean and then reassemble the screen element into its housing.
4. If a Y-type strainer is installed (optional), loosen and remove its plug and the screen element. Clean and reassemble the screen element into its housing and reassemble the plug.
5. To reset the pressure reducing valve, refer to "Commissioning Procedure".

PRESSURE RELIEF VALVE MODEL 44, 77-PS\UL

Design Data

Head loss chart (full open valve)



*Refer to available diameter and end connections list

Hydraulic characteristics

*UL listed diameter: 2-8 inch.

Valve Size		25 (1")	40 (1.5")	50 (2")	65 (2.5")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
K_v	m³/hr @ 1 bar	17	64	95	95	170	220	600	800	1250	1900
C_v	gpm @ 1 psi	20	75	110	110	200	260	700	930	1460	2220
K Factor	-	2.2	1.0	1.1	3.2	2.3	3.3	2.2	4.0	4.0	3.6
Equivalent Pipe Length @ C_{HW} = 120	meters	2	2	3	9	9	16	18	42	55	62
	feet	7	6	8	30	28	52	58	139	181	202
Control Chamber Displacement Volume	Liters	0.03	0.07	0.16	0.16	0.60	0.60	1.80	4.70	6.50	9.40
	Gallons	0.01	0.02	0.04	0.04	0.16	0.16	0.48	1.24	1.72	2.48

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Design Data

Relief pressures

- Maximal adjustable inlet pressure: 12 bar \ 175 psi
- Minimal adjustable inlet pressure: 1.5 bar \ 22 psi

Note:

- The valve maintains the preset upstream pressure at the adjusted value, unless upstream pressure drops below the designated upstream pressure.
- The minimal upstream pressure shall be at least 1.7 bar (25 psi) higher than the required set value for setting purposes.

Maximum continuously recommended flow rates:

Valve Size - Inch (mm)	Flow Rate [m^3/hr]	Flow Rate [gpm]
2" (50)	40	170
3" (80)	100	440
4" (100)	155	680
6" (150)	350	1550
8" (200)	622	2740

* Calculated at a flow velocity of 5.5 m/s

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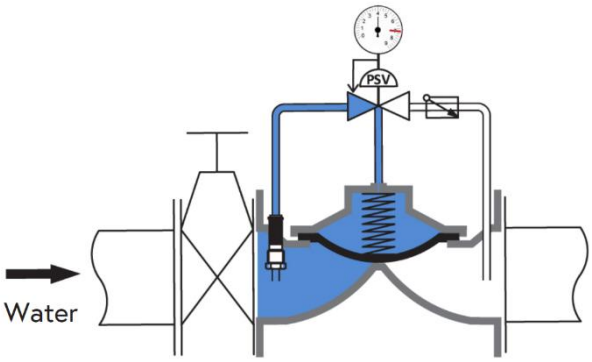
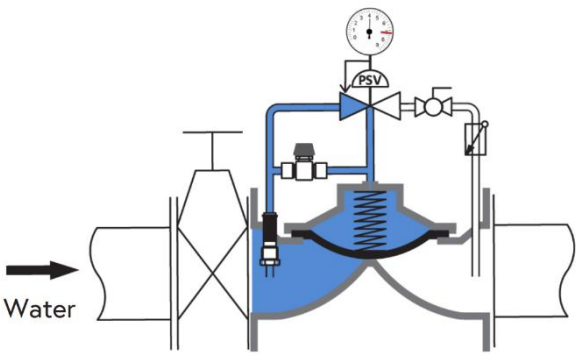
Operation Modes

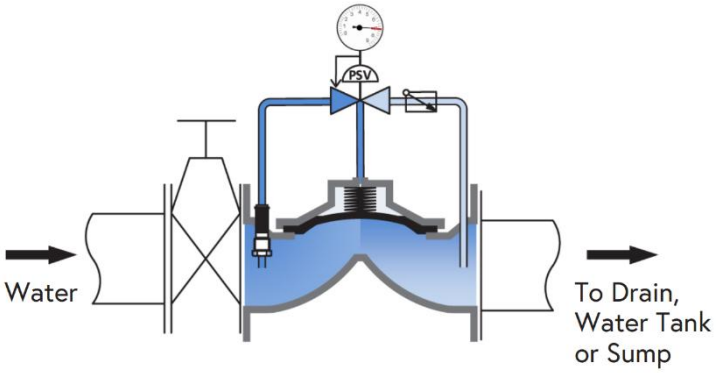
Closed Position 2”-3”



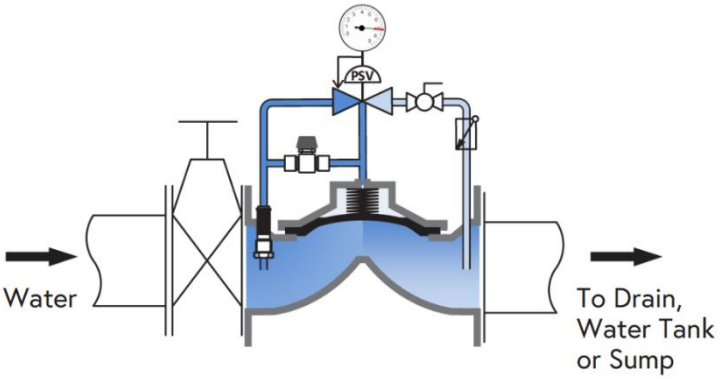
Closed Position 4”-8”



Pressure Relief 2”-3”



Pressure Relief 4”-8”



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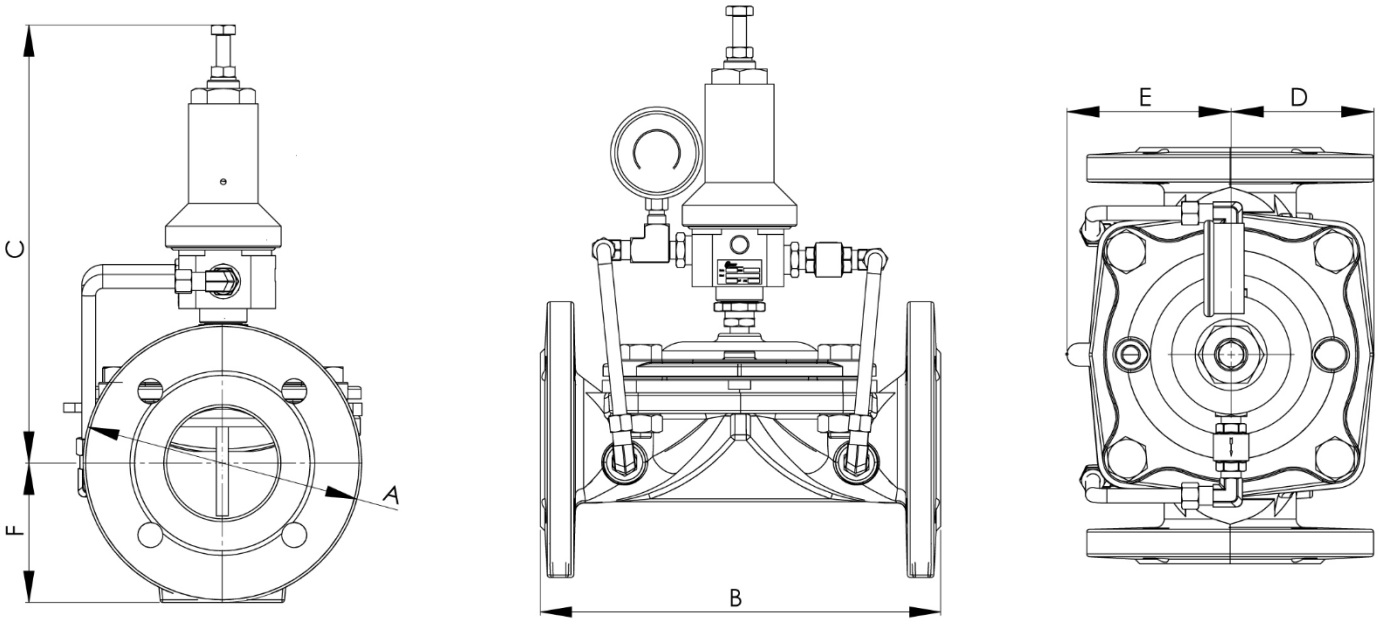
Trim Dimensions

Valve	2" (50)		3" (80)		4" (100)		6" (150)		8" (200)	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
A	6 1/2	166	7 13/16	200	9 1/8	230	11	280	13 1/2	342
B	8 1/8	206	11 3/8	290	12 1/8	309	15 1/2	393	18 5/16	466
C	10 3/16	260	10 3/8	265	12 3/8	315	14 1/8	360	15 1/2	393
D	4 1/8	104	4 1/8	104	4 1/2	115	5 1/2	141	7 5/16	185
E	3 3/16	83	4 1/8	106	4 1/2	115	5 13/16	148 1/2	7 1/2	192
F	3 3/16	83	3 7/8	100	4 1/2	115	5 1/2	140	6 11/16	171



Safety Instructions:

PLEASE NOTE

- Before using this product, read and understand the instructions.
- All procedures must be carried out by qualified personnel.
- Make sure that all applicable safety precautions have been taken in addition to these instructions.
- Read this manual along with all the provided data.
- Save these instructions for future reference.

Before disassembly of any accessory or component:

- All internal pressure must be relieved and all media drained from the system in accordance with all applicable procedures.
- Pressure must be 0 (zero) bar/psi.

Before Installation:

- **Flush the lines upstream of the valve. If anti-corrosion, anti-freeze or any other type of additives are used, please consult the documentation or OCV FP division concerning potential damage to the valve and its components**.
- Remove all external and internal packaging along with any temporary protective material.
- Carefully inspect the valve to ensure that no damage has occurred in transit or during subsequent handling.
- Ensure that the valve is the correct type and size and that the identification markings show that the material and pressure/temperature rating is suitable for the required service conditions.
- Read the installation instructions carefully and follow them.
- Ensure that the valve is lifted safely into position without damaging the valve.
- Ensure that the valve is installed so that it can be safely operated and maintained without putting any people at risk.
- Make sure that a firm footing is provided for the person installing the valve with adequate space around the valve to meet operating and maintenance requirements.
- Ensure that there is adequate lighting for valve installation.
- The valve can be installed in any position, but flow direction should match the engraved arrow on the bonnet.

Failure to follow the instructions set forth in this publication could result in property damage, personal injury, or death from hazards that may be associated with this type of equipment.