



30-PS\UL

Pressure Relief Valve

IOM

Installation • **O**peration • **M**aintenance



Installation, Operation & Maintenance

This document specifies the operating concept of OCV pressure reducing valve model 30-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

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PRESSURE RELIEF VALVE MODEL 30-PS\UL

General description

OCV's pressure relief valve models 30-X-PS\UL and 30A-X-PS\UL, are hydraulically-operated, pilot controlled, diaphragm activated, resilient, disk globe and angle type, automatic control valves. The valve accurately maintains a set pipeline pressure regardless of pump start and stop conditions. When the system's upstream pressure exceeds the required set point, the valve modulates to maintain a steady, predetermined pressure in the network. When pressure falls below the set value, the valve closes drip tight.



Operating pressures

- Pressure rating up to 25 bar \ 375 psi
- Minimum system pressure 1.5 bar \ 22 psi

Available end connections

- Flanged: 2" – 6"
- Grooved: 2" – 6"

Available body & cover and trim materials

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

* Standard material

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PRESSURE RELIEF VALVE MODEL 30-PS/UL

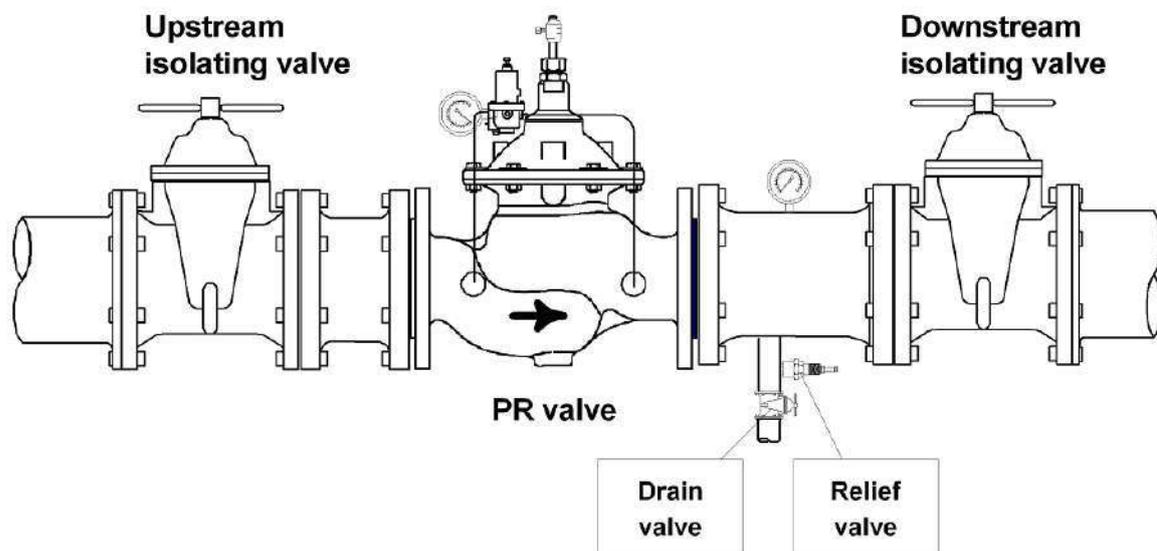
Pre-Installation (refer to fig. 1 – System P&ID)

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 provide downstream 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 reducing 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 purpose. Vertical assembly is allowed, in case the system design demands it.
4. Sufficient space for maintenance should be left around the pressure reducing valve.
5. A manual isolating valve (supplied by 3rd party) should be assembled upstream and downstream of the pressure reducing valve, for maintenance purposes.
6. A drain valve (supplied by 3rd party), at least 1" (25mm) in size, should be installed on the pipeline, downstream of the pressure reducing valve.
7. 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

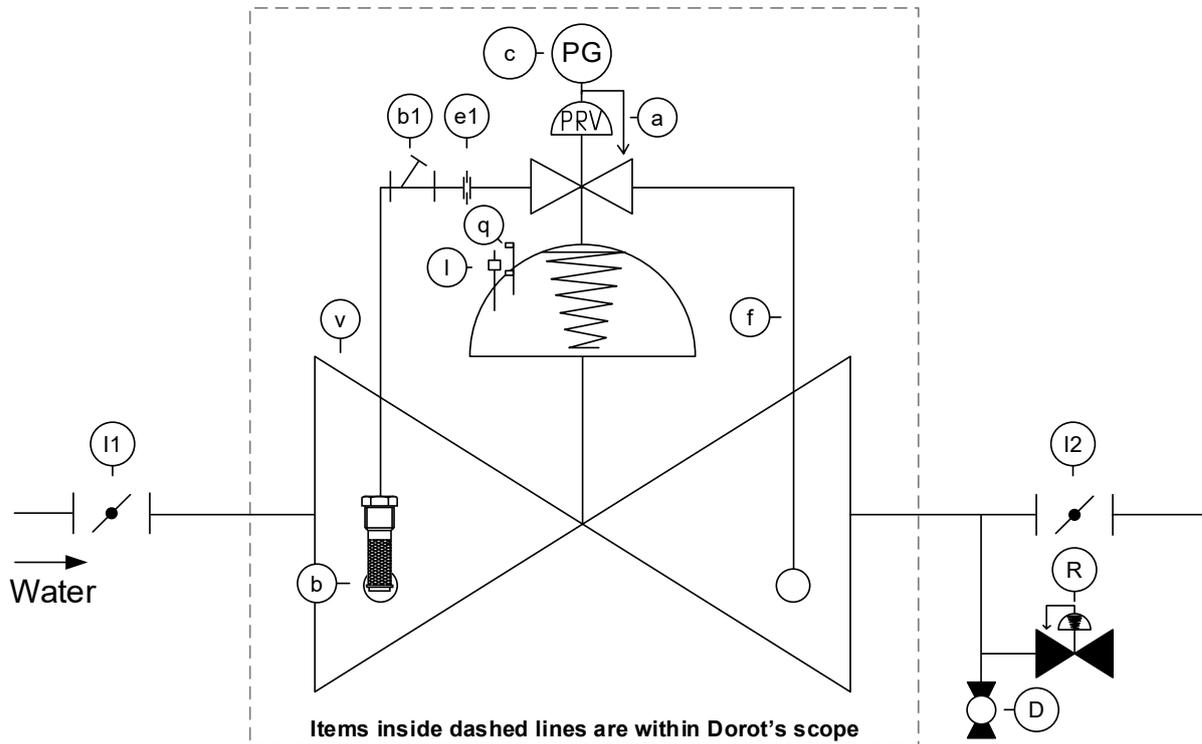
General drawing – not to scale



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PRESSURE RELIEF VALVE MODEL 30-PSIUL

Fig. 2.1- System P&ID- 30-PSIUL - 2" - 6"



Integral System Components	
Item #	Description
v	Hydraulic valve
a	68-410 pressure reducing pilot
b	Self flushing filter
c	Pressure gauge
e1	Restrictor
f	1/2" tube

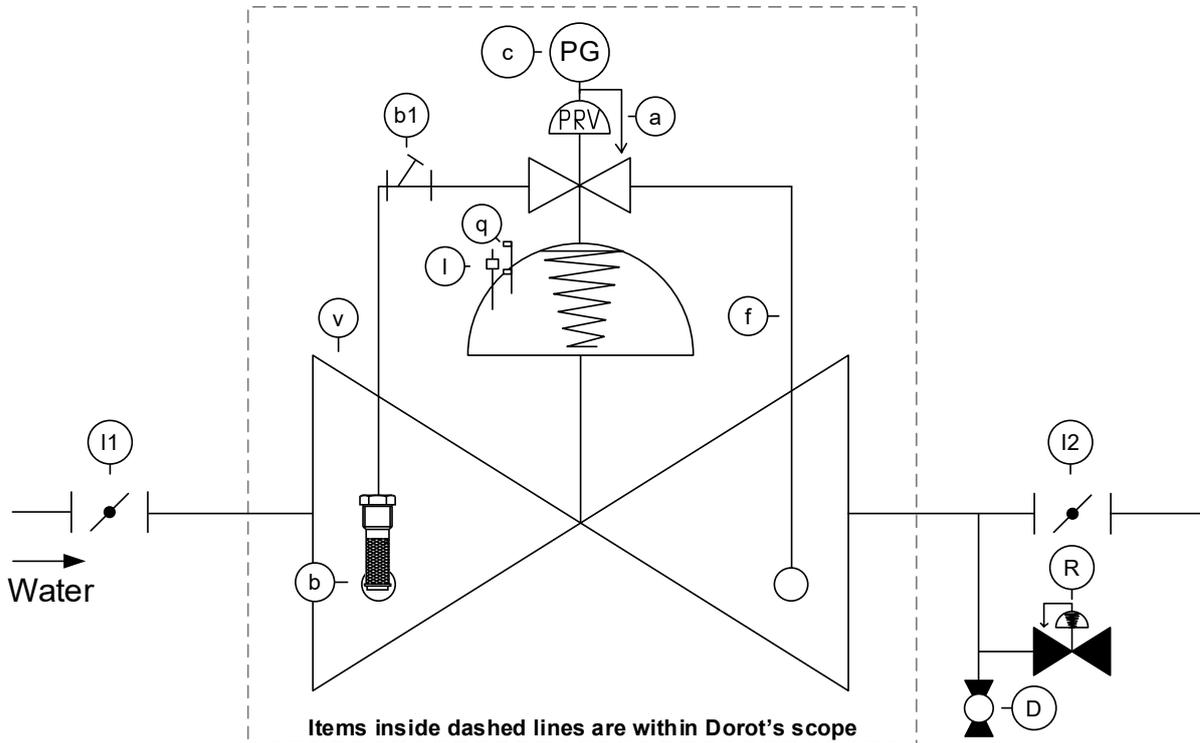
Optional System items	
Item #	Description
b1	Optional Y-type strainer
I	Indicator rod
q	Proximity switch
R	Pressure relief valve

Out Of Scope items	
Item #	Description
I1	Upstream isolating valve
I2	Downstream isolating valve
D	Drain valve

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PRESSURE RELIEF VALVE MODEL 30-PS\UL

Fig. 2.2- System P&ID- 30-PS\UL - 8" - 10"



Integral System Components	
Item #	Description
v	Hydraulic valve
a	CXPR pressure reducing pilot
b	Self flushing filter
c	Pressure gauge
f	1/2" tube

Optional System items	
Item #	Description
b1	Optional Y-type strainer
l	Indicator rod
q	Proximity switch
R	Pressure relief valve

Out Of Scope items	
Item #	Description
I1	Upstream isolating valve
I2	Downstream isolating valve
D	Drain valve

PRESSURE RELIEF VALVE MODEL 30-PS\UL Commissioning Procedure 2" – 6" (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.

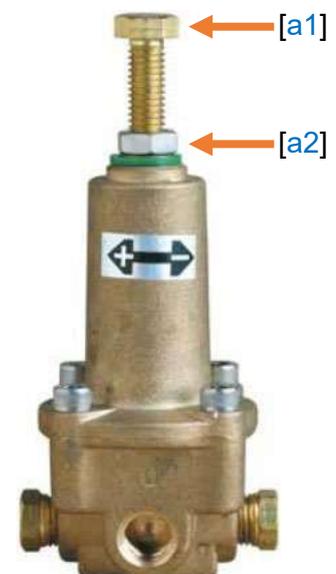
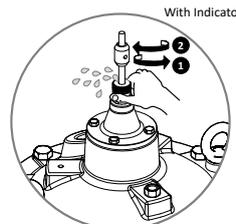
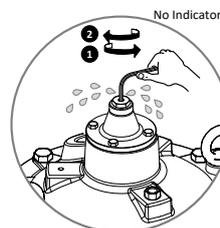
1. Completely close the downstream isolating valve [I2] and open the downstream drain valve [D].
2. Open the upstream isolating valve [I1]. The pressure reducing valve will open and water will flow through the downstream drain valve [D].
3. Bleed the air out of system following the air-bleed instructions below.
4. The pressure reducing pilot valve [a], is factory set according to the client's specification (if not specified – the pressure reducing pilot is set at 4 bar).
5. If on-site calibration is required, adjust downstream pressure as follows:
 - 5.1. Open the locking nut [a2].
 - 5.2. In case downstream pressure is too low, turn the adjusting bolt [a1] clockwise to increase downstream pressure until it reaches the required set-point.
 - 5.3. In case downstream pressure is too high, turn the adjusting bolt [a1] counter-clockwise to reduce downstream pressure.
 - 5.4. When the required pressure has been reached, lock the adjusting bolt [a1] by tightening the locking nut [a2].
 - 5.5. Check the valve's set-point by opening and then partially closing the downstream drain valve [D].
6. Close the downstream drain valve [D] and fully open both isolating valves [I1 & I2].
7. The pressure reducing valve is now set for service.

Bonnet air-bleeding

Bonnet air-bleeding should be done with the control-chamber pressurized (main-valve closed).

Open the air bleed screw on the top of the bonnet using an Allen key and close it when only water and no air is discharged (refer to the drawing on the top right).

In case an indicator-rod is assembled, using hand force only, release and tighten the round nut at the top of the indicator-guide.



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PRESSURE RELIEF VALVE MODEL 30-PS\UL

Commissioning Procedure 8" – 10" (refer to fig. 2.2 – 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.

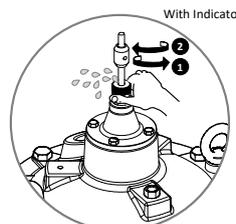
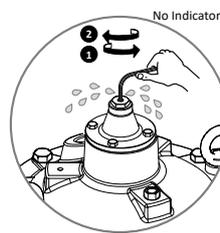
1. Completely close the downstream isolating valve [I2] and open the downstream drain valve [D].
2. Open the upstream isolating valve [I1]. The pressure reducing valve will open and water will flow through the downstream drain valve [D].
3. Bleed the air out of system following the air-bleed instructions below.
4. The pressure reducing pilot valve [a], is factory set according to the client's specification (if not specified – the pressure reducing pilot is set at 4 bar).
5. If on-site calibration is required, adjust downstream pressure as follows:
 - 5.1. Open the needle bolt [a3] by 1 turn and lock it with the needle bolt's locking nut [a4].
 - 5.2. Open the locking nut [a2].
 - 5.3. In case downstream pressure is too low, turn the adjusting bolt [a1] clockwise to increase downstream pressure until it reaches the required set-point.
 - 5.4. In case the downstream pressure is too high, turn the adjusting bolt [a1] counter-clockwise to reduce downstream pressure.
 - 5.5. When the required pressure has been reached, lock the adjusting bolt [a1] by tightening the locking nut [a2].
 - 5.6. Check the valve's set-point by opening and then partially closing the downstream drain valve [D].
 - 5.7. Adjust response time using the needle bolt [a3]. Opening the bolt accelerates valve response. Do not close the needle bolt [a3] all the way as it will prevent the pressure reducing valve from closing.
6. Close the downstream drain valve [D] and fully open both isolating valves [I1 & I2].
7. The pressure reducing valve is now set for service.

Bonnet air-bleeding

Bonnet air-bleeding should be done with the control-chamber pressurized (main-valve closed).

Open the air bleed screw on the top of the bonnet using an Allen key and close it when only water and no air is discharged (refer to the drawing on the top right).

In case an indicator-rod is assembled, using hand force only, release and tighten the round nut at the top of the indicator-guide.



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PRESSURE RELIEF VALVE MODEL 30-PS\UL Pilot connection

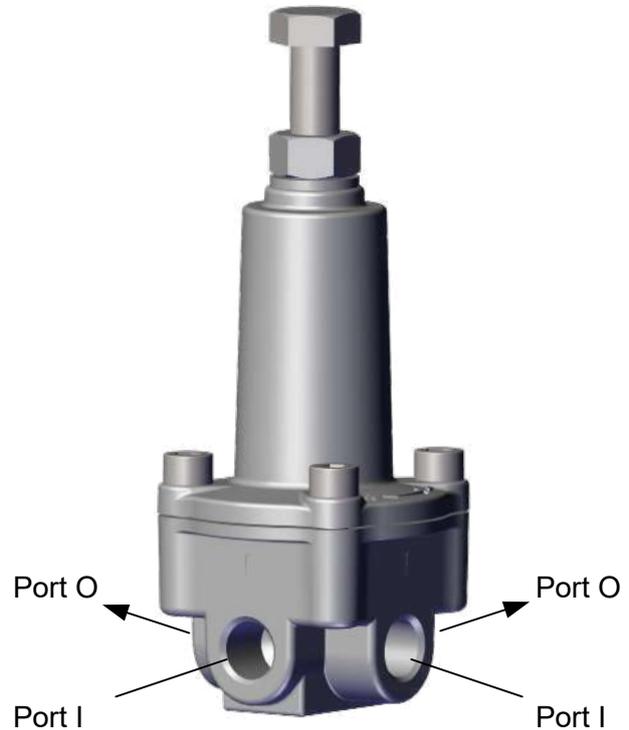
68-410 Pressure reducing pilot (for valve sizes: 2"-6")

Ports O connect to:

- Downstream sensing
- Downstream pressure gauge

Ports I connect to:

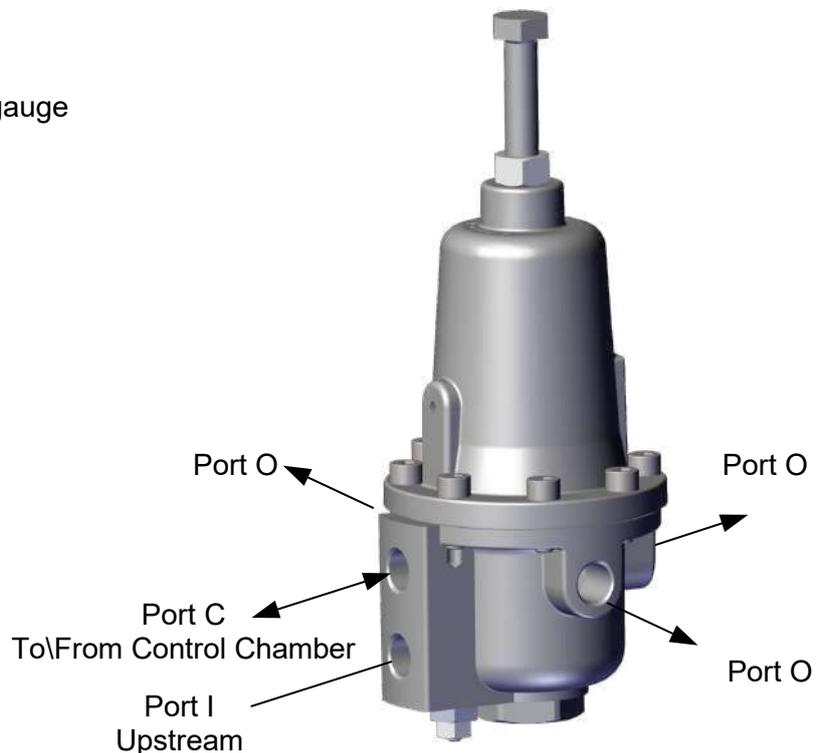
- Upstream
- To\From Control Chamber



CXPR Pressure reducing pilot (for valve sizes: 8"-10")

Ports O connect to:

- Downstream sensing
- Downstream pressure gauge



Installation, Operation & Maintenance

PRESSURE RELIEF VALVE MODEL 30-PSI\UL **Recommended Periodical 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.

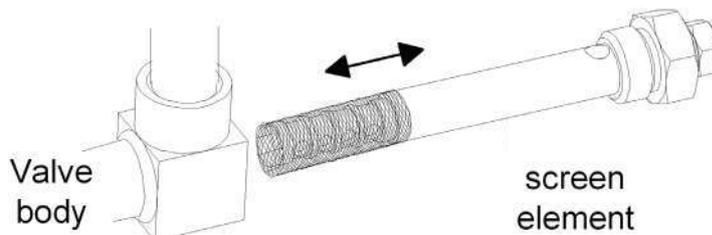
It is recommended that all tests and maintenance procedures be carried out by qualified personnel.

Inspecting the downstream pressure

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 both upstream and downstream isolating valves [I1 & I2].
2. Remove the screen element of the self-flushing filter [b] as described in the drawing:

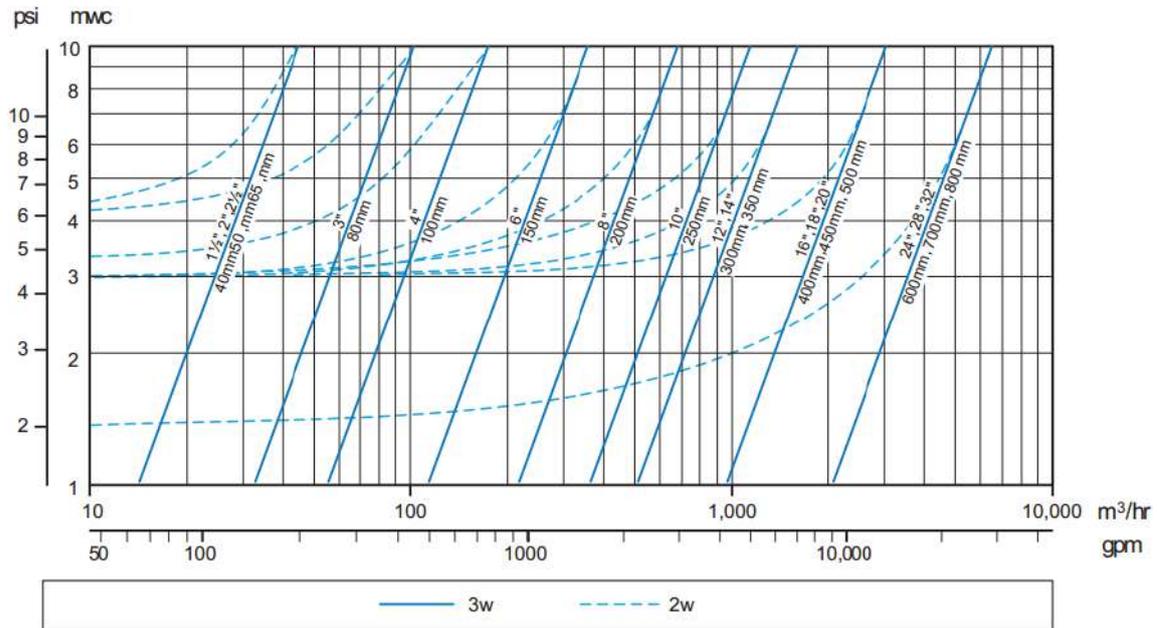


3. Clean and then reassemble the screen element into its housing.
4. If a Y-type strainer is installed (optional), loosen and remove its plug and the screen element. Clean and reassemble the screen element into its housing and reassemble the plug.
5. To reset the pressure reducing valve, refer to "Commissioning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

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PRESSURE RELIEF VALVE MODEL 30-PSI/UL Design Data

Head loss chart



*Refer to available diameter and end connections list

Hydraulic characteristics

*UL listed diameters

Valve Size		50 (2")	65 (2.5")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")
K_v	m ³ /hr @ 1 bar	43	43	115	167	407	676	1160
C_v	gpm @ 1 psi	50	50	133	193	470	781	1341
K Factor	-	5.4	15.4	5.0	5.7	4.9	5.6	4.6
Equivalent Pipe Length @ C_{HW} = 120	meters	11	40	18	26	37	58	63
	feet	37	131	58	87	120	190	207
Control Chamber Displacement Volume	Liters	0.10	0.10	0.30	0.70	1.50	4.30	9.70
	Gallons	0.03	0.03	0.08	0.18	0.40	1.14	2.56

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PRESSURE RELIEF VALVE MODEL 30-PSI\UL Design Data

Regulating pressures

- Maximal adjustable outlet pressure: 20 bar \ 300 psi
- Minimal adjustable outlet pressure: 2 bar \ 30 psi

Note:

- The minimal head loss across the valve reaches 1.2 bar (18 psi) at a maximal flow velocity of 5.5 m/s (18 ft/s).
- The valve maintains the preset downstream pressure at the adjusted value, unless upstream pressure drops below the designated downstream pressure + 1.2 bar (18 psi).
- Downstream pressure may exceed the adjusted value by 0.5 bar (7 psi) when the flow through the valve is stopped gradually.
- The minimal upstream pressure shall be at least 1.7 bar (25 psi) for setting purposes with the flow at 1/2 the maximal flow.

Maximal continuous recommended flow rates:

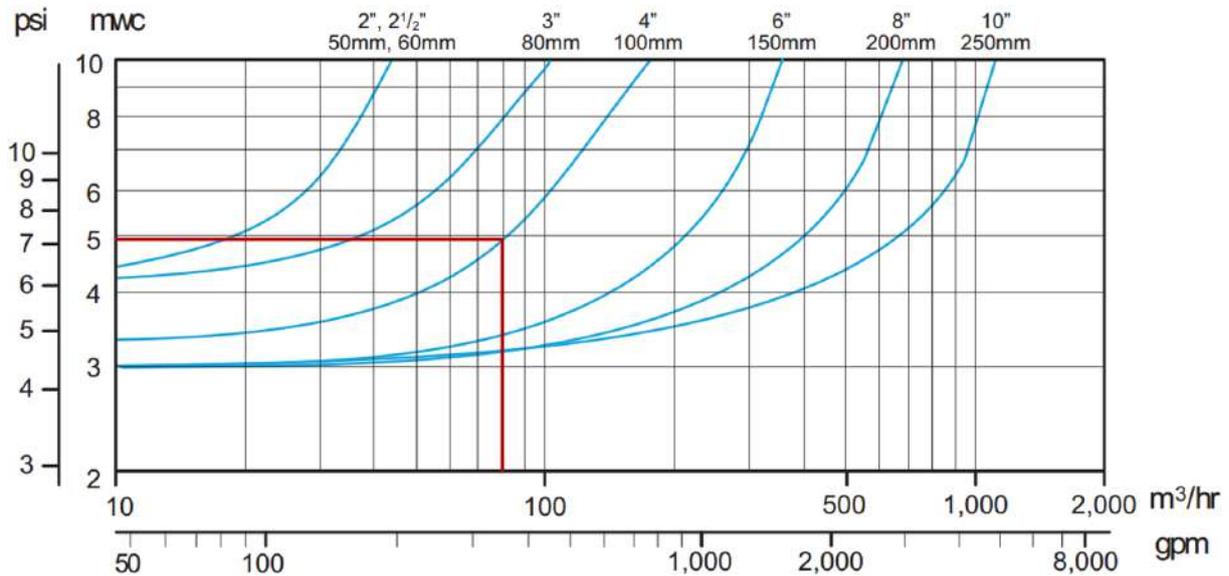
Valve Size - Inch (mm)	Flow Rate [m ³ /hr]	Flow Rate [gpm]
2" (50)	40	170
2½" (65)	66	290
3" (80)	100	440
4" (100)	155	680
6" (150)	350	1550
8" (200)	622	2740
10" (250)	971	4275

* Calculated at a flow velocity of 5.5 m/s

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PRESSURE RELIEF VALVE MODEL 30-PS\UL Design Data

Determining downstream pressure when upstream pressure is below the required set-point



* 2-Way head loss chart

Example – refer to red line

Example: Determine the downstream pressure for a 4" 30-PS\UL valve, set at a downstream pressure of 4 bar at a flow rate of 80 m³/hr, when the upstream pressure is 3 bar.

To find the downstream pressure when upstream pressure is below the required set-point:

- Determine the flow rate through the valve (example; $Q_{\text{example}} = 80 \text{ m}^3/\text{hr}$)
- Determine the head loss through the valve at the corresponding flow rate (example; Head loss $_{\text{example}} = 5\text{m} \approx 0.5 \text{ bar}$)

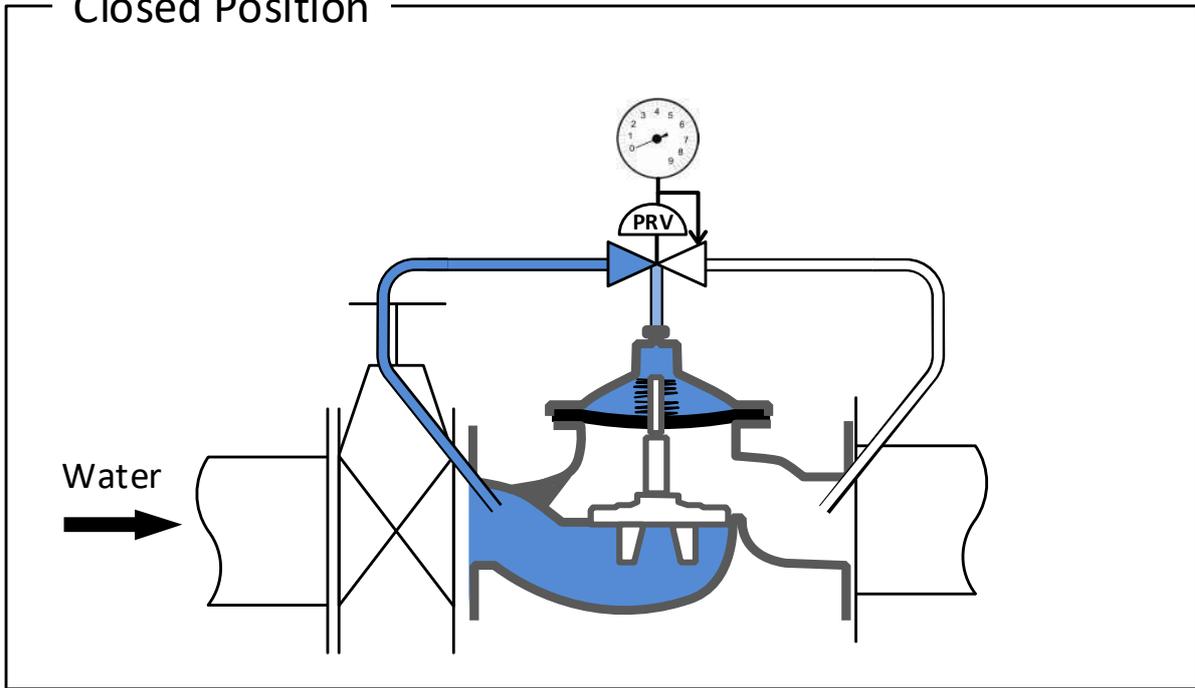
Downstream pressure calculation

Downstream pressure $_{\text{example}} = \text{upstream pressure}_{\text{example}} - \text{Head loss}_{\text{example}}$

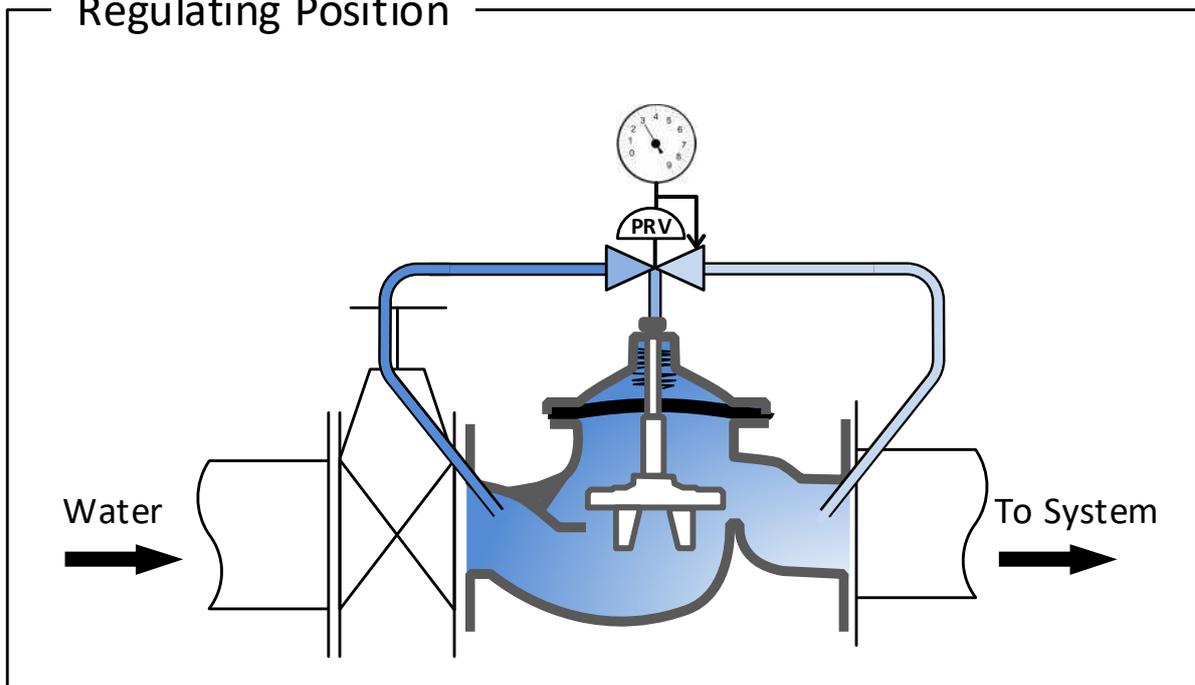
Downstream pressure $_{\text{example}} = 3 \text{ bar} - 0.5 \text{ bar} = \mathbf{2.5 \text{ bar}}$

PRESSURE RELIEF VALVE MODEL 30-PSI/UL Operation Modes

Closed Position



Regulating Position



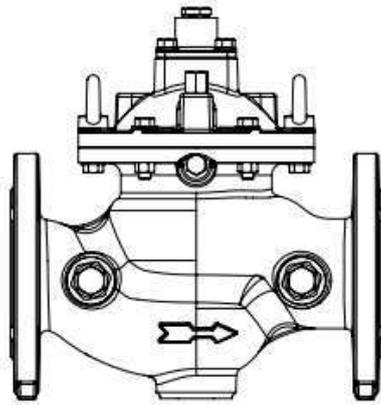
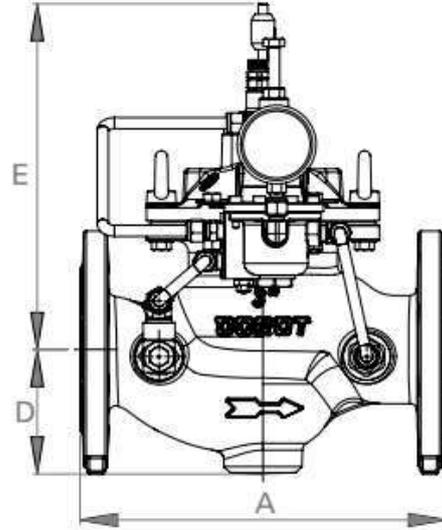
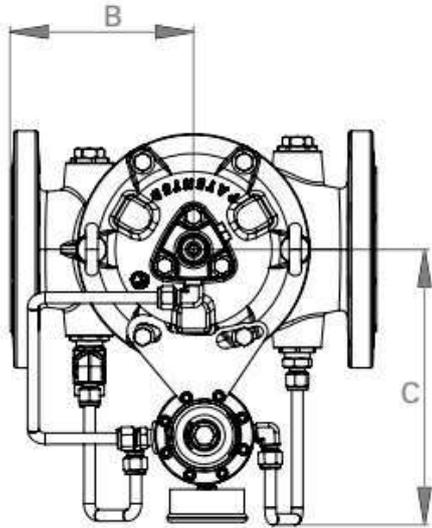
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PRESSURE RELIEF VALVE MODEL 30-PSI\UL Trim Dimensions

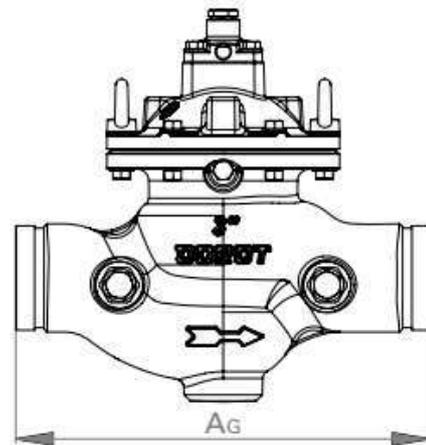
Valve size	2" (50)		2.5" (65)		3" (80)		4" (100)		6" (150)		8" (200)		10" (250)	
Dimension	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
A	9 1/8	230	11 3/16	290	12 3/16	310	13 13/16	350	18 7/8	480	28 13/16	600	28 13/16	730
A _G	9 1/2	215	11 1/8	280	13 13/16	350	14 13/16	376	20 1/2	520	27 1/2	700	N/A	N/A
B	6 1/8	155	6 1/8	155	6 1/8	155	6 7/8	175	9 1/2	240	11 13/16	300	14 3/8	365
C	7 7/8	200	7 7/8	200	9 3/16	234.5	10	253.5	11 7/8	301	13 1/2	342.5	15 11/16	399.5
D	3 5/16	82.5	3 5/8	92.5	3 7/8	100	4 5/8	110	5 5/8	142.5	6 13/16	172.5	8 1/8	205
E	9 5/16	236	9 5/16	236	11 5/8	295	12 1/8	307	15 3/8	390	17 13/16	452	22 1/2	572

* Dimensions are approximate and include an indicator rod

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Flanged



Grooved

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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.