



## 68P-DE\HRV\PR

Hydraulically Actuated, Anti-Columnning  
Pressure Reducing Deluge Valve

### IOM

**I**nstallation • **O**peration • **M**aintenance



## Installation, Operation & Maintenance

This document specifies the operating concept of OCV deluge valve model 68P-X-DE\HRV\PR (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

## DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR

### General Description

OCV's pressure regulating, deluge and pre-action valve model 68P-X-DE\HRV\PR is a globe/weir-type hydraulic valve, actuated automatically or manually. The valve is mounted on the upstream side of a fire-suppression sprinkler system, preventing flow into the system in its "ready" position.



#### Pressure rating

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

#### UL listed outlet pressure setting range

- 2" - 10": 20 bar \ 300 psi

#### Available end connections

- Flanged: 2" – 10" (Including 2.5")
- Grooved: 2" – 8" (Including 2.5")

#### Available body & cover and trim materials

| Body & Cover                     | Valve Fitting     | Valve Tubing      | Diaphragm |
|----------------------------------|-------------------|-------------------|-----------|
| Ductile Iron A536*               | Brass*            | Copper*           | Neoprene* |
| CF8M/ASTM A-316                  | SST316            | Cu-Ni 90/10       | NR        |
| Ni-Al-Bronze ASTM B148 gr.C95800 | SST304 ASTM A 351 | SST316            | EPDM      |
| Cast Steel ASTM A 216 WCB        | Super Duplex 2507 | Super Duplex 2507 | NBR       |
|                                  | Aluminum-Bronze   |                   |           |
|                                  | MONEL®            |                   |           |

\* Standard material

## DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR

### General Description

Deluge valve actuation:

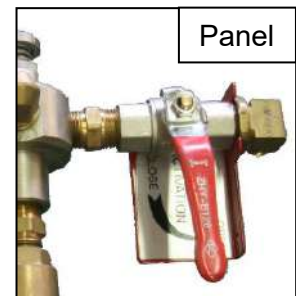
1. The deluge valve is actuated when pressure in the pilot-line drops to a preset value.
2. In case of failure of the automatic actuation system, manual emergency actuation is possible.
3. When actuated the deluge valve limits the downstream pressure to a fixed & steady pre-set value, regardless of upstream pressure or flow fluctuations.

Manual emergency actuation:

1. The manual emergency actuation valve [b2] may be located inside a metal box or over a plate. If in a box – first lift the cover - and turn the handle as shown on the plaque in the box.

Closing the deluge valve is possible only after:

1. Restoring pressure in the pilot-line.
2. Closing the manual emergency actuation ball valve [b2].

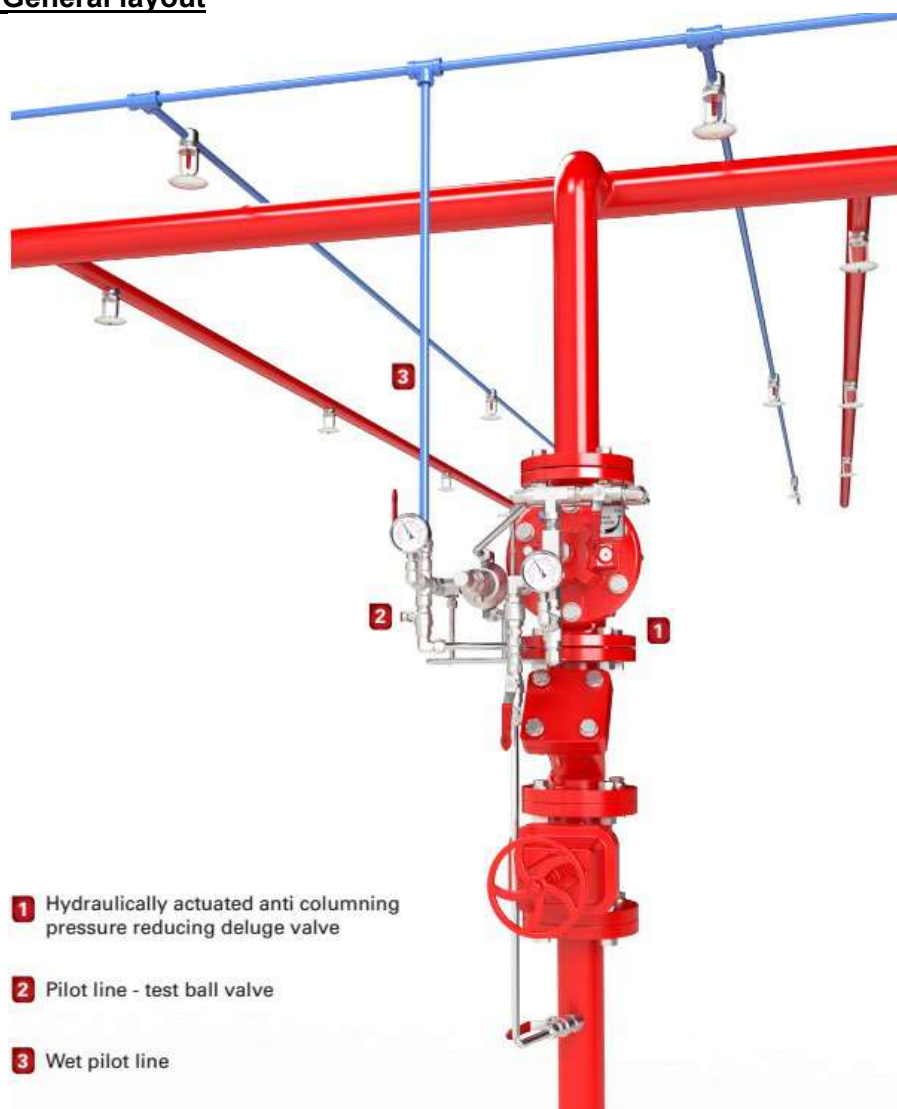


## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Pre-Installation Recommendations (refer to fig. 2 – System P&ID)**

1. The valve is factory trimmed for both vertical and horizontal installation - out of the box, requiring no changes or tooling.
2. The valve may be installed either vertically (with the upstream positioned at the bottom) or horizontally.
3. Sufficient space for maintenance should be left around the deluge valve.
4. Manual isolating valves (gate type, butterfly type or equivalent - not supplied) should be assembled upstream and downstream of the deluge valve for maintenance purposes.
5. A drain facility for the water drained during the valve's test & working procedures should be prepared.

**Fig. 1- General layout**



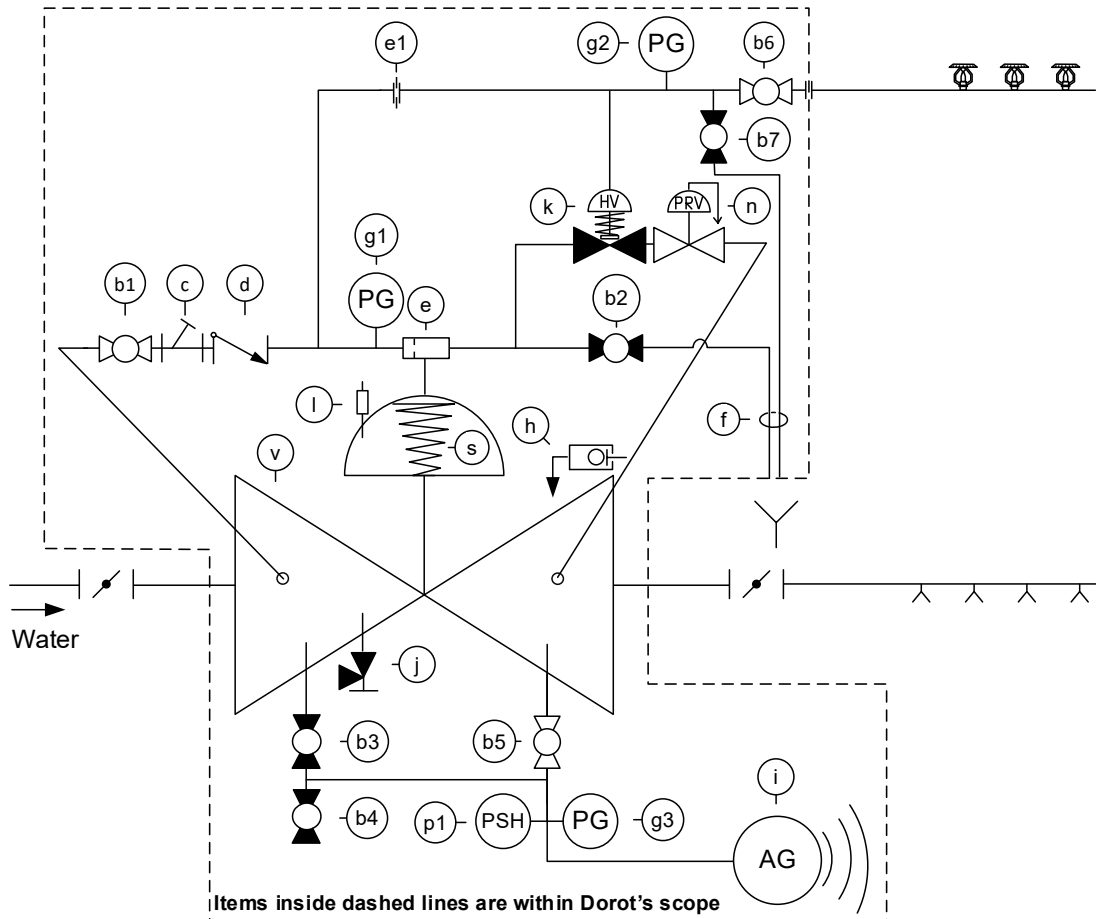
## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Installation** (refer to fig. 2 – System P&ID)

1. The deluge valve should be positioned in such a way that allows easy access to the emergency manual actuation valve [b2].
2. The priming control trim's ball valve [b1] should be connected to the deluge valve's upstream port.
3. Connect the water motor alarm (optional) to the alarm trim's isolation ball valve [b5].
4. Connect the pilot-line to the pilot-line's isolation ball valve [b6].
5. The drain valve [j], the outlet pipes of the pilot-line's test ball valve [b7] and the emergency manual valve [b2], should be drained.

## DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR

**Fig. 2- System P&ID**

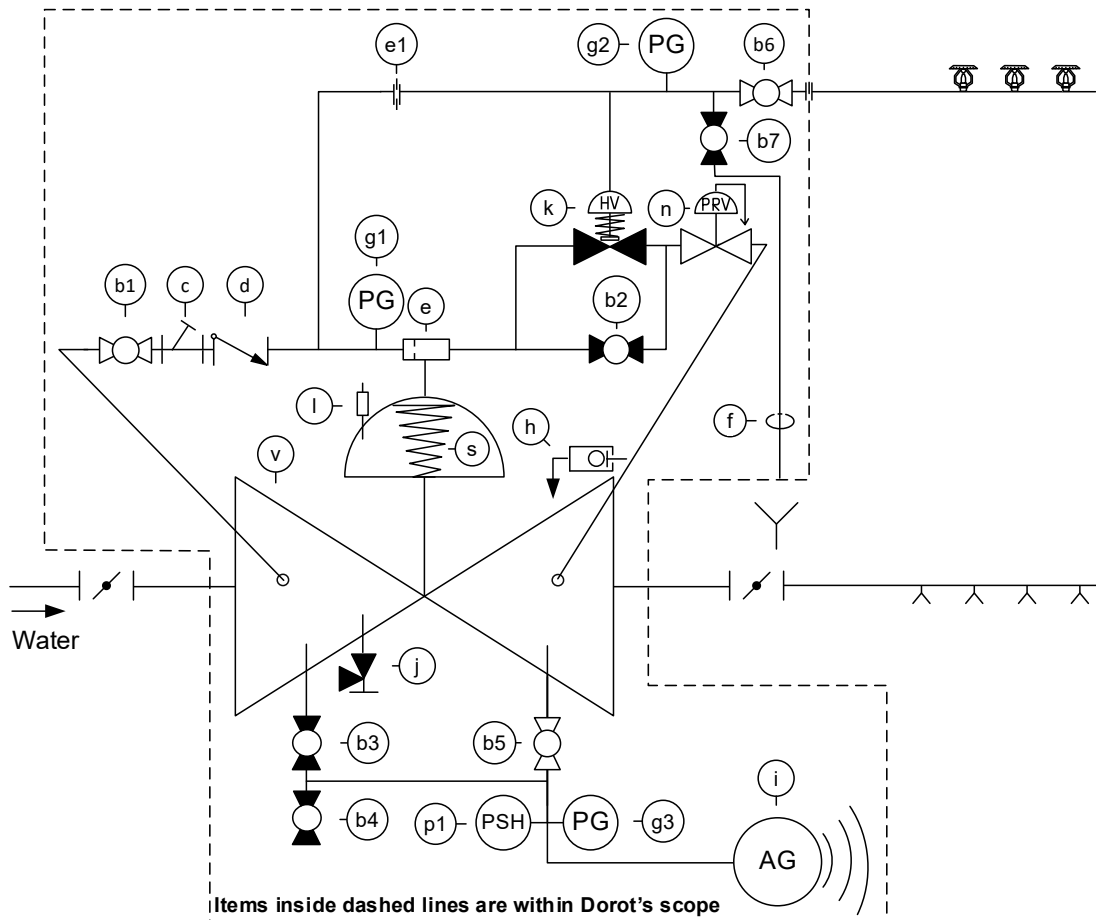


| Integral System Items |                                   |
|-----------------------|-----------------------------------|
| Item #                | Description                       |
| v                     | Hydraulic valve                   |
| b1                    | Priming line ball valve           |
| b2                    | Emergency manual activation valve |
| b6                    | Pilot-line - isolation ball valve |
| b7                    | Pilot-line - test ball valve      |
| c                     | Y-Type strainer                   |
| d                     | Check valve                       |
| e                     | T Restrictor                      |
| e1                    | Restrictor                        |
| f                     | 1/2" tube                         |
| g1, g2                | Pressure gauge                    |
| h                     | Drip valve                        |
| k                     | 66-2UL-relay                      |
| n                     | Pressure reducing pilot           |
| s                     | Spring                            |

| Optional System Items |                                     |
|-----------------------|-------------------------------------|
| Item #                | Description                         |
| b3                    | Alarm trim - test ball valve        |
| b4                    | Alarm trim - drain\purge ball valve |
| b5                    | Alarm trim - isolation ball valve   |
| g3                    | Pressure gauge                      |
| i                     | Water motor alarm                   |
| j                     | Drain valve                         |
| l                     | Indicator Rod                       |
| p1                    | Pressure switch high - water        |

## DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR

**Fig. 3- System P&ID – with regulated manual emergency actuation**



| Integral System Items |                                   |
|-----------------------|-----------------------------------|
| Item #                | Description                       |
| v                     | Hydraulic valve                   |
| b1                    | Priming line ball valve           |
| b2                    | Emergency manual activation valve |
| b6                    | Pilot-line - isolation ball valve |
| b7                    | Pilot-line - test ball valve      |
| c                     | Y-Type strainer                   |
| d                     | Check valve                       |
| e                     | T Restrictor                      |
| e1                    | Restrictor                        |
| f                     | 1/2" tube                         |
| g1, g2                | Pressure gauge                    |
| h                     | Drip valve                        |
| k                     | 66-2UL-relay                      |
| n                     | Pressure reducing pilot           |
| s                     | Spring                            |

| Optional System Items |                                     |
|-----------------------|-------------------------------------|
| Item #                | Description                         |
| b3                    | Alarm trim - test ball valve        |
| b4                    | Alarm trim - drain\purge ball valve |
| b5                    | Alarm trim - isolation ball valve   |
| g3                    | Pressure gauge                      |
| i                     | Water motor alarm                   |
| j                     | Drain valve                         |
| l                     | Indicator Rod                       |
| p1                    | Pressure switch high - water        |



## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Control Trim Connection (refer to fig. 2 – System P&ID)**

1. The upstream control trim includes the following items:
  - Priming control trim's ball valve [b1].
  - Y-Type strainer [c]
  - Check valve [d].
  - T-restrictor [e].
3. The 66-2UL relay [k] has two positions:
  - 'Closed' - prevents draining of the deluge valve's control chamber.
  - 'Open' - allows draining of the control chamber, thus opening the deluge valve.
4. The pressure reducing pilot valve [n] is connected to a downstream port of the deluge valve. When actuated, the deluge valve limits the downstream pressure to a fixed & steady pre-determined value, regardless of upstream pressure or flow fluctuations.
5. A water motor alarm [i] may be connected to the deluge valve via an optional alarm trim. The alarm trim consists of:
  - Ball valve [b5], which is normally-open.
  - Ball valve [b3], which is normally-closed and allows testing the alarm without opening the deluge valve.
  - Ball valve [b4], which is normally-closed and allows draining the alarm trim and purging it from corrosive fluids if necessary.
5. A low-pressure drip valve (relief valve) [h], is mounted on a downstream port of the deluge valve, as a safety device against faulty sealing of the deluge valve, which may be caused by foreign objects or unclean water. The drip valve allows small quantities of water to be drained from the system but shuts instantly when the deluge valve is actuated and high pressure is present.
6. An upstream port on the deluge valve allows connecting a drain valve [j] (available upon request).
7. Pressure gauges [g1, g2, g3] allow visual inspection of the upstream, downstream and pilot-line pressures.
8. A pressure switch [p1] (optional), may be connected to the control chamber or to the deluge valve's downstream port, allowing an electric indication of opening of the deluge valve.

## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Commissioning Procedure (refer to fig. 2 – System P&ID)**

The following procedures should be carried out as written, in addition to relevant NFPA demands or other local applicable regulations.

It is recommended that the installation and adjustment be performed by qualified personnel.

**Note:**

Ball valves b3-b5 are part of the water motor alarm trim which is optional. Ignore any reference to them if they do not exist.

Verify the following:

1. The isolating valve upstream of the deluge valve is closed.
2. Valves [b1, b5, b6] are open (their handles are parallel to the pipe axis).
3. Valves [b2, b3, b4, b7, j] are closed (their handles are perpendicular to the pipe axis).
4. Ensure the designed water pressure in the pilot-line.

Commissioning:

1. Ensure minimal designed pressure, upstream of the deluge valve.
2. Open the drain valve downstream of the deluge valve.
3. Slightly open the upstream isolating valve, allowing the pipe section upstream of the valve to fill until no air is released through the drain valve; wait for the valve to close, indicated by water flow stopping in the downstream drain valve.
4. Close the downstream drain valve.
5. Fully open the both isolating valves.
6. The deluge valve is now set for service.

Optional manual emergency actuation commissioning test:

1. Open the manual emergency actuation valve [b2]. The deluge valve will open.
2. To close the deluge valve refer to “General Description”.

## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Commissioning Procedure (refer to fig. 2 – System P&ID)**

Automatic actuation commissioning:

1. Gradually open the pilot-line – test ball valve [b7] to simulate the rupture of sprinklers. The deluge valve will open.
2. The 66-2UL [k] relay is factory set at 2 bars. If on-site calibration is required - gradually close the adjustment bolt of the 66-2UL relay [k] until water start leaking from its drain pipe. Open the bolt until leaking stops.  
*If on-site calibration is not required – disregard this stage.*
3. The pressure reducing pilot valve [n], is factory set according to the client's specification (if not specified – the pressure reducing pilot is set at 4 bars). If on-site calibration is required - gradually open the adjustment bolt of the pressure reducing pilot valve [n] until the downstream pressure reaches the required set-point.  
*If on-site calibration is not required – disregard this stage.*
4. Gradually close the pilot-line – test ball valve [b7].
5. To close the deluge valve refer to “General Description”.

Test the water motor alarm (if applicable):

1. Close ball valve [b5].
2. Open ball valve [b3]. The water motor alarm will sound.
3. Close ball valve [b3] and drain the water motor alarm pipeline through ball valve [b4]. Close this valve when water stops flowing.

Reset the deluge valve:

1. To recommission the deluge valve refer to “Commissioning”.

## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Periodical Check-up and Maintenance**

In case of valve actuation due to a fire event, this procedure must be carried out immediately after the event has ended and the fire-suppression system is returned to its "ready" position. The owner of the valve is responsible for the setting, inspecting, routine testing and the maintenance of the valve as written, in compliance with NPFA directives or other local applicable regulations.

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

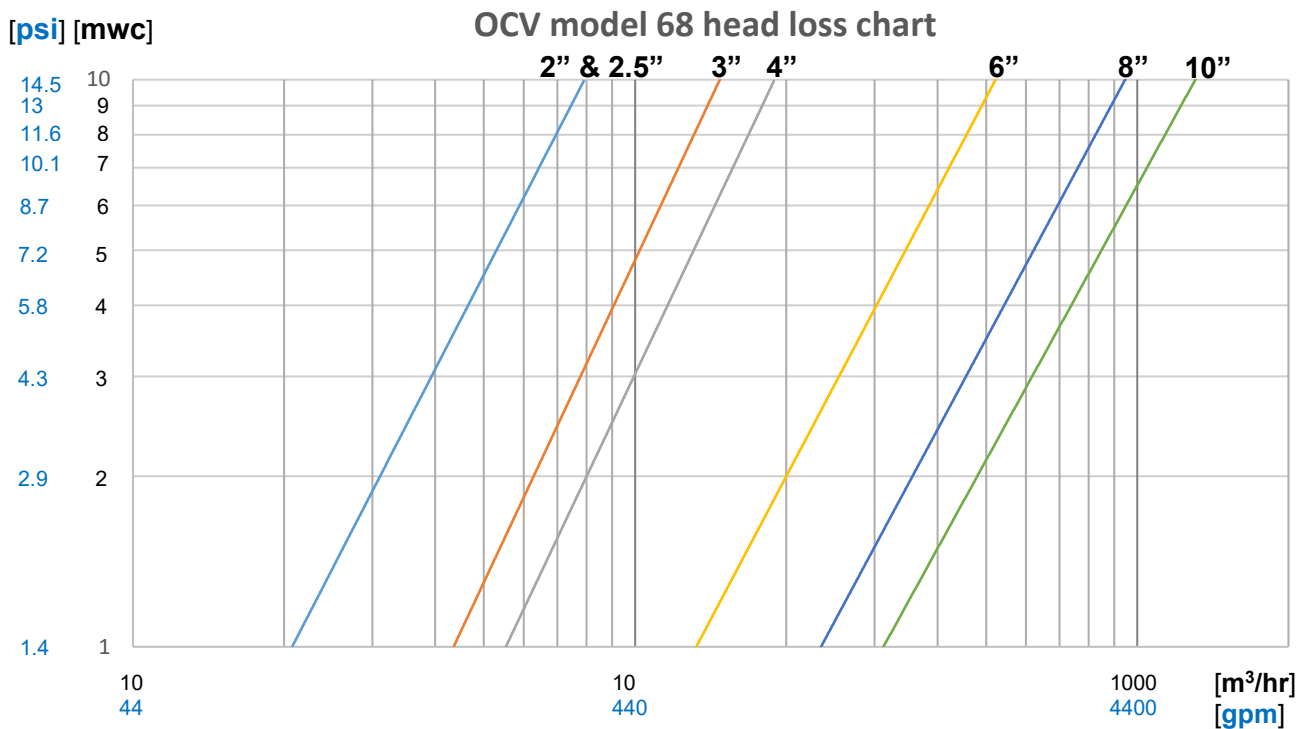
As some of the tests may sound an alarm, it is necessary to alert the local personnel and local fire-fighting authorities before the test is carried out.

1. Repeat the "Commissioning Procedure" steps above.
2. Inspect Y-Type strainer [c]: close ball valve [b1], open the cover of the Y-Type strainer, remove the screen element, clean and reassemble.
3. Open ball valve [b1].

## DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR

Design Data (Flanged & grooved end connections)

### Head loss chart



### Hydraulic characteristics

| Valve Size   |             | 50 (2") | 65 (2.5") | 80 (3") | 100 (4") | 150 (6") | 200 (8") | 250 (10") |
|--|-------------|---------|-----------|---------|----------|----------|----------|-----------|
| <b>K<sub>v</sub></b>                                 | m³/hr @ 1   | 78      | 78        | 120     | 200      | 550      | 800      | 1300      |
| <b>C<sub>v</sub></b>                                 | gpm @ 1 psi | 91      | 91        | 140     | 234      | 643      | 935      | 1519      |
| <b>K Factor</b>                                      | -           | 1.7     | 1.7       | 3.7     | 4.2      | 2.8      | 4.2      | 3.9       |
| <b>Equivalent Pipe Length @ C<sub>HW</sub> = 120</b> | meters      | 3.7     | 13.3      | 16.4    | 18.9     | 20.9     | 42.5     | 51.2      |
|  | feet        | 12      | 44        | 54      | 62       | 69       | 139      | 168       |
| <b>Control Chamber Displacement Volume</b>           | Liters      | 0.18    | 0.18      | 0.3     | 0.5      | 2        | 4.8      | 6.2       |
|  | Gallons     | 0.05    | 0.05      | 0.08    | 0.13     | 0.53     | 1.27     | 1.64      |

- 66-2UL relay pressure adjustment range: 0.6-9 bar \ 9-130 psi.

## **DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**

### **Design Data (Flanged & grooved end connections)**

#### **Regulating pressures**

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

#### **Note:**

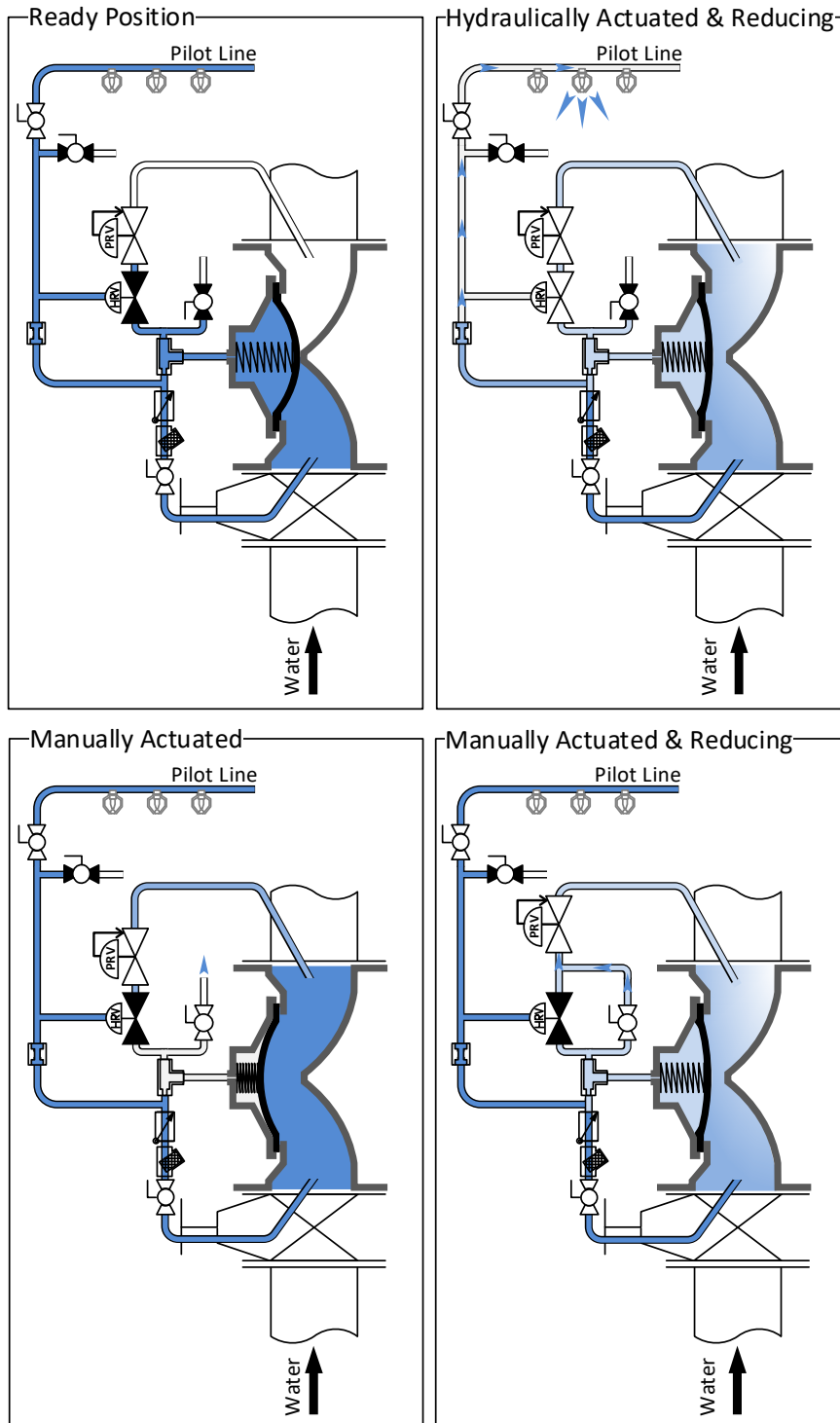
- The minimal head loss across the valve reaches 1.2 bar (18 psi) at a maximal flow velocity of 5.5 m/s (18 ft/s).
- The valve maintains the preset downstream pressure at the adjusted value, unless upstream pressure drops below the designated downstream pressure + 1.2 bar (18 psi).
- Downstream pressure 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 ½ the maximal flow.

#### **Maximal flow rates:**

| <b>Valve Size - Inch (mm)</b> | <b>Flow Rate [m<sup>3</sup>/hr]</b> | <b>Flow Rate [gpm]</b> |
|-------------------------------|-------------------------------------|------------------------|
| 2" & 2.5"(50 & 65)            | 40                                  | 170                    |
| 3" (80)                       | 100                                 | 440                    |
| 4" (100)                      | 155                                 | 680                    |
| 6" (150)                      | 350                                 | 1540                   |
| 8" (200)                      | 622                                 | 2736                   |
| 10" (250)                     | 971                                 | 4274                   |

\* Calculated at an industry accepted flow velocity of 5.5 m/s

**DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HRV\PR**  
**Operation Modes**

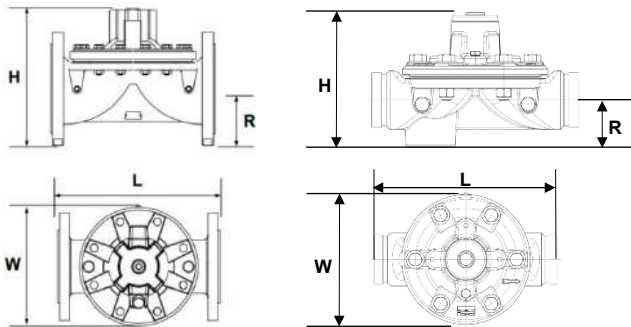


## DELUGE VALVE MODEL 68-DE\HRV\PR

### Basic Valve Dimensions

| Valve Size |               | 50 (2")    |                                 | 65 (2.5")                      |                                 | 80 (3")                         |                                 | 100 (4")                        |                                 | 150 (6")                        |                                  | 200 (8")                         |                                  | 250 (10")                        |      | 300 (12")                      |      |     |
|------------|---------------|------------|---------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|------|--------------------------------|------|-----|
|            |               | mm         | inch                            | mm                             | inch                            | mm                              | inch                            | mm                              | inch                            | mm                              | inch                             | mm                               | inch                             | mm                               | inch | mm                             | inch |     |
| Dimensions | 68            | L          | 228                             | 8 <sup>7</sup> / <sub>8</sub>  | 233                             | 9 <sup>3</sup> / <sub>16</sub>  | 310                             | 12 <sup>3</sup> / <sub>16</sub> | 356                             | 14                              | 436                              | 17 <sup>1</sup> / <sub>8</sub>   | 530                              | 20 <sup>13</sup> / <sub>16</sub> | 636  | 25                             | N/A  | N/A |
|            |               | H          | 169                             | 6 <sup>5</sup> / <sub>8</sub>  | 185                             | 7 <sup>5</sup> / <sub>16</sub>  | 237                             | 9 <sup>5</sup> / <sub>16</sub>  | 263                             | 10 <sup>5</sup> / <sub>16</sub> | 378                              | 14 <sup>13</sup> / <sub>16</sub> | 481                              | 18 <sup>7</sup> / <sub>8</sub>   | 546  | 21 <sup>1</sup> / <sub>2</sub> | N/A  | N/A |
|            |               | R          | 85                              | 3 <sup>5</sup> / <sub>16</sub> | 92.5                            | 3 <sup>11</sup> / <sub>16</sub> | 105                             | 4 <sup>1</sup> / <sub>8</sub>   | 120                             | 4 <sup>11</sup> / <sub>16</sub> | 150                              | 5 <sup>7</sup> / <sub>8</sub>    | 180                              | 7                                | 215  | 8 <sup>3</sup> / <sub>8</sub>  | N/A  | N/A |
|            |               | W*         | 175                             | 6 <sup>7</sup> / <sub>8</sub>  | 185                             | 7 <sup>5</sup> / <sub>16</sub>  | 200                             | 7 <sup>13</sup> / <sub>16</sub> | 260                             | 10 <sup>3</sup> / <sub>16</sub> | 320                              | 12 <sup>5</sup> / <sub>8</sub>   | 400                              | 15 <sup>11</sup> / <sub>16</sub> | 495  | 19 <sup>3</sup> / <sub>8</sub> | N/A  | N/A |
|            | Weight kg/lbs | 10 / 22    | 14.5 / 32                       | 30 / 66.1                      | 38 / 83.8                       | 75 / 165.3                      | 123 / 271                       | 190 / 419                       | N/A                             | N/A                             | N/A                              | N/A                              | N/A                              | N/A                              | N/A  | N/A                            | N/A  | N/A |
| 68 Grooved | L             | 243        | 9 <sup>5</sup> / <sub>8</sub>   | 253                            | 10                              | 336                             | 13 <sup>3</sup> / <sub>16</sub> | 380                             | 15                              | 440                             | 17 <sup>5</sup> / <sub>16</sub>  | 556                              | 21 <sup>7</sup> / <sub>8</sub>   | N/A                              | N/A  | N/A                            | N/A  |     |
|            | H             | 143        | 5 <sup>5</sup> / <sub>8</sub>   | 143                            | 5 <sup>5</sup> / <sub>8</sub>   | 220                             | 8 <sup>11</sup> / <sub>16</sub> | 229                             | 9                               | 337                             | 13 <sup>5</sup> / <sub>16</sub>  | 433                              | 17                               | N/A                              | N/A  | N/A                            | N/A  |     |
|            | R             | 55         | 2 <sup>3</sup> / <sub>16</sub>  | 55                             | 2 <sup>3</sup> / <sub>16</sub>  | 77                              | 3                               | 86.5                            | 3 <sup>3</sup> / <sub>8</sub>   | 114                             | 4 <sup>1</sup> / <sub>2</sub>    | 139                              | 5 <sup>1</sup> / <sub>2</sub>    | N/A                              | N/A  | N/A                            | N/A  |     |
|            | W*            | 172        | 6 <sup>13</sup> / <sub>16</sub> | 172                            | 6 <sup>13</sup> / <sub>16</sub> | 236                             | 9 <sup>5</sup> / <sub>16</sub>  | 261                             | 10 <sup>5</sup> / <sub>16</sub> | 326                             | 12 <sup>13</sup> / <sub>16</sub> | 400                              | 15 <sup>11</sup> / <sub>16</sub> | N/A                              | N/A  | N/A                            | N/A  |     |
|            | Weight kg/lbs | 6.2 / 13.7 | 6.4 / 14                        | 14.5 / 32                      | 21 / 46.3                       | 38.5 / 85                       | 66 / 145.5                      | N/A                             | N/A                             | N/A                             | N/A                              | N/A                              | N/A                              | N/A                              | N/A  | N/A                            | N/A  | N/A |

\* Valve width

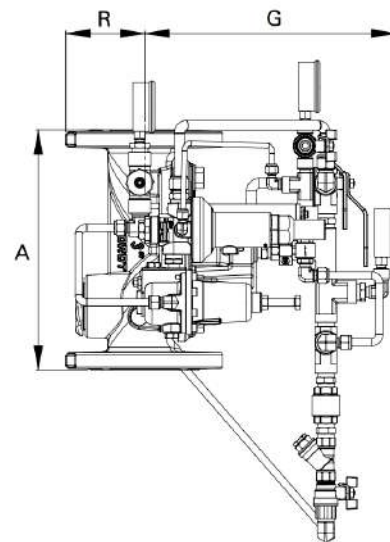
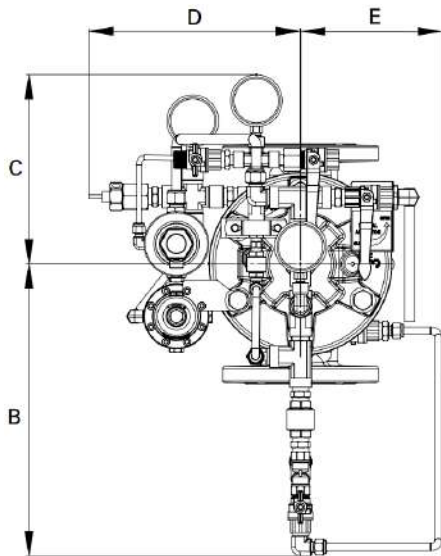




**DELUGE PRESSURE REDUCING VALVE MODEL 68P-DE\HR\PR**  
**Trim Dimensions (Flanged & grooved end connections)**

| Valve size |   | 2" (50)  |     | 2.5"(65) |      | 3"(80)   |     | 4"(100)  |     | 6"(150)  |     | 8"(200)  |     | 10"(250) |     |
|------------|---|----------|-----|----------|------|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|
|            |   | Inch     | mm  | Inch     | mm   | Inch     | mm  | Inch     | mm  | Inch     | mm  | Inch     | mm  | Inch     | mm  |
| Dimension  | A | 9 1/8    | 230 | 9 3/16   | 233  | 12 3/16  | 310 | 14       | 356 | 17 3/16  | 436 | 20 7/8   | 530 | 25 1/8   | 636 |
|            | B | 14 13/16 | 376 | 14 13/16 | 376  | 14 13/16 | 376 | 14 13/16 | 376 | 14 13/16 | 376 | 14 13/16 | 376 | 14 13/16 | 376 |
|            | C | 9 5/8    | 244 | 9 5/8    | 244  | 9 5/8    | 244 | 9 5/8    | 244 | 9 5/8    | 244 | 10 3/8   | 265 | 12 1/2   | 318 |
|            | D | 10 3/8   | 264 | 10 3/8   | 264  | 10 7/8   | 277 | 11 5/16  | 288 | 12 5/8   | 320 | 13 5/16  | 338 | 14 5/16  | 364 |
|            | E | 6 11/16  | 170 | 6 11/16  | 170  | 7 3/16   | 183 | 7 5/8    | 194 | 8 7/8    | 226 | 9 5/8    | 244 | 10 5/8   | 270 |
|            | R | 3 5/16   | 85  | 3 5/8    | 92.5 | 4 1/8    | 105 | 4 11/16  | 120 | 5 7/8    | 150 | 7 1/8    | 180 | 8 1/2    | 215 |
|            | G | 10 5/8   | 268 | 10 5/8   | 268  | 12 13/16 | 324 | 12 13/16 | 324 | 16 1/8   | 409 | 18 5/8   | 472 | 19 1/2   | 494 |

\* Dimensions are approximate



## **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 pressures 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 pressure reducing 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.*