Differential Pressure Requirements

Each valve size, at each % setting option, requires a minimum ΔP (Differential Pressure) to ensure the PICV is within its working range. For flow rates in between settings, extrapolation of position can be used. The pump speed should be set to ensure that the required differential pressure is always available. By setting the differential pressure across the least favoured PICV to the value stated in the above table, it ensures that minimum pump energy is used, therefore, reducing system running costs and CO₂ emissions. To set pump speed to achieve this; whilst measuring ΔP, increase pump speed until ΔP is at, or just above, the minimum shown in the table above. Flow rate verification should be carried out using separate Flow Measurement Devices (FMD) where fitted. In line with CIBSE & BSRIA recommendations, we recommend that as a minimum requirement, FMDs are installed in all branches. Where flow rate verification is required at terminals, FMDs may also be installed at each terminal. Terminal flow rates can also be confirmed by measuring branch flow rates and closing individual terminal PICVs one at a time and measuring the reduction in flow at the branch. Care should be taken to ensure that reduced flow rates are still within the measuring range of the branch FMD, i.e. that the measured “signal” doesn’t drop below 1kPa.

<table>
<thead>
<tr>
<th>DN15</th>
<th>DN15 SF</th>
<th>DN15 LF</th>
<th>DN15 HF</th>
<th>DN20 SF</th>
<th>DN20 LF</th>
<th>DN20 HF</th>
<th>DN25 SF</th>
<th>DN25 LF</th>
<th>DN25 HF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔP (kPa)</td>
<td>Flow (l/s)</td>
<td>ΔP (kPa)</td>
<td>Flow (l/s)</td>
<td>ΔP (kPa)</td>
<td>Flow (l/s)</td>
<td>ΔP (kPa)</td>
<td>Flow (l/s)</td>
<td>ΔP (kPa)</td>
<td>Flow (l/s)</td>
</tr>
<tr>
<td>2</td>
<td>0.008</td>
<td>0.060</td>
<td>25</td>
<td>0.100</td>
<td>20</td>
<td>0.070</td>
<td>20</td>
<td>0.075</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>0.015</td>
<td>0.080</td>
<td>20</td>
<td>0.140</td>
<td>21</td>
<td>0.105</td>
<td>20</td>
<td>0.130</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>0.020</td>
<td>0.110</td>
<td>25</td>
<td>0.160</td>
<td>22</td>
<td>0.135</td>
<td>24</td>
<td>0.160</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>0.030</td>
<td>0.150</td>
<td>35</td>
<td>0.240</td>
<td>23</td>
<td>0.180</td>
<td>36</td>
<td>0.210</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>0.050</td>
<td>0.200</td>
<td>40</td>
<td>0.280</td>
<td>24</td>
<td>0.220</td>
<td>44</td>
<td>0.255</td>
<td>27</td>
</tr>
<tr>
<td>7</td>
<td>0.080</td>
<td>0.300</td>
<td>50</td>
<td>0.370</td>
<td>25</td>
<td>0.350</td>
<td>50</td>
<td>0.390</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>0.100</td>
<td>0.350</td>
<td>65</td>
<td>0.420</td>
<td>26</td>
<td>0.340</td>
<td>60</td>
<td>0.400</td>
<td>35</td>
</tr>
<tr>
<td>9</td>
<td>0.125</td>
<td>0.400</td>
<td>75</td>
<td>0.460</td>
<td>28</td>
<td>0.420</td>
<td>70</td>
<td>0.450</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>0.150</td>
<td>0.450</td>
<td>90</td>
<td>0.510</td>
<td>30</td>
<td>0.420</td>
<td>85</td>
<td>0.520</td>
<td>45</td>
</tr>
</tbody>
</table>
LIMITS OF USE
These valves have been categorised in accordance with the Pressure Equipment Directive–PED. The fluid to be transported is limited to group 2 liquids i.e. non-hazardous. On no account must these valves be used on any group 1 liquids, group 1 gases or group 2 gases.

INSTALLATION
These instructions are issued as guidelines only and do not cover all installed conditions. If unsure, please contact our Technical Helpline before installation.

- Crane FS products are designed for installation and use within suitably designed systems reflecting CIBSE, BSRIA and HVAC guidelines. Particular care should be taking with regards to:
  - accessibility to valve for setting/adjustment
  - tube cutting
  - jointing
  - bracketing/supports
- orientation: whilst the PICV can operate correctly in different orientations, there are recommendations regarding the orientation of actuators - Please refer to separate actuator IOM
- would normally be installed on return pipework, i.e. after the equipment it is controlling, but can be installed in flow if required.
- ensure direction of flow is correct - indicated by forged arrow on body.
- D995 operates between a minimum and maximum pressure drop across the valve - see commissioning.
- PICV’s are not designed as isolation valves. Dedicated isolation valves should be installed to isolate against system pressure, i.e. for maintenance etc., when disconnecting/draining pipework.
- systems should be installed with strainers to protect the PICV and other installed items.

COMMISSIONING
The D995 controls the flow rate depending on its set position, therefore, removing the need to measure the flow rate. The D995 maintains a constant differential pressure across its internal seat, any excess pressure being removed by the internal differential pressure controller. To ensure that sufficient pressure is available for the differential pressure controller to control the flow rate correctly, a differential pressure reading should be taken using the test points provided.

When taking differential pressure readings, it is important that the system is running at full load, i.e. at their set position. This ensures that differential pressure readings are carried out in the most unfavourable conditions, guaranteeing optimum performance in normal running conditions.

To ensure that all PICVs are working at the required differential pressure, it is necessary to check the least favoured / index PICV. By verifying the least favoured PICV is set to the required differential pressure, all other PICVs must have a higher differential pressure. However, we would also recommend that a selection of other PICVs are tested along the circuit to verify this.

SET POSITION
The PICV set position can be established by use of lookup table on page 4

- Identify installed valve from marking on side of body
- Check flow rate required
- Read across chart:
  - Valve = DN15 SF
  - Required flow rate = 0.15 l/sec
  - Set position = 6

To set the flow rate, using your hand, turn the dial to close the valve (position 0), then re-open the valve by turning the dial anti-clockwise until position 6 is reached. Please note at no point should any tools, such as spanners, be used to set the dial.

INSTALLATION CONT.
Please note this valve must not be used for end of line service or as an isolation valve. In order for the valve to function as intended water quality should be maintained at all times (e.g. as per BSRIA BG50 or equivalent).

FLUSHING
Control valves, like the PICV, are sized to give good control over the system flow, therefore have been designed with small convoluted flow paths. Even when fully open these flow paths may not allow adequate water velocities for flushing of the coil. In line with BSRIA recommendations, it is recommended that a flushing point be located between the coil and the PICV. This allows the coil to be flushed without the water passing through the PICV. As per the Dominator Peak Pro range.

SET POSITION
The PICV set position can be established by use of lookup table on page 4

- Identify installed valve from marking on side of body
- Check flow rate required
- Read across chart:
  - Valve = DN15 SF
  - Required flow rate = 0.15 l/sec
  - Set position = 6

To set the flow rate, using your hand, turn the dial to close the valve (position 0), then re-open the valve by turning the dial anti-clockwise until position 6 is reached. Please note at no point should any tools, such as spanners, be used to set the dial.