PRESSURE CONTROL VALVES

DIRECT OPERATED VALVES
- Pressure relief valve VVP (NG 6, 10) 5
- Pressure relief valve VVB2-10 (NG 6) 9

PILOT OPERATED VALVES
- Pressure relief valve RT (NG 6, 10) 13
- Pressure relief valve VP-RT (NG 6, 10) 17
POCLAIN HYDRAULICS

Hydraulic components - Pressure control valves

PRESSURE RELIEF VALVE VVP

• NG 6, 10
• Up to 400 bar [3,045 PSI]
• Up to 60 L/min [31.7 GPM]
• For fitting into a block.
• For independent mounting.
• Two pressure setting elements (set screw, rotary knob).

Operation

These valves consist of a housing (1), a hardened seat (2), a poppet (3), with a damping spool (4), a spring (5), and a pressure setting element (6).

The P-line of this pressure relief valve is connected with the hydraulic system. The pressure of the hydraulic fluid acts on the front side of the pilot poppet (3), and the force of the spring (5) set by the pressure setting element (6) is applied to the poppet from the opposite side. When the system pressure exceeds the valve set by the pressure setting element (6) the pilot poppet moves off the seat (2), and frees the flow of the hydraulic fluid in the direction from P towards T.

The damping spool (4) prevents vibrations of the pilot poppet when opening or closing the flow way of the hydraulic flow. Loosening of the pressure setting element is prevented by a counternut (8).

Features

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>50 [13.2]</td>
<td>400 [5 801]</td>
<td>-30 to +70 [-22 to + 158]</td>
<td>2.8 to 380 [12.9 to 1760]</td>
<td>NAS 1638</td>
<td>0.4 [0.88]</td>
<td>0.5 [1.10]</td>
</tr>
<tr>
<td>10</td>
<td>120 [31.7]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5 [1.10]</td>
<td>0.6 [1.32]</td>
</tr>
</tbody>
</table>

Direct operated pressure relief valves type VVP are used to maintain and limit the pressure in a hydraulic system.
Hydraulic components - Pressure control valves

POCLAIN HYDRAULICS

Dimensions

Tightening torque for fixing:
Nominal size 6 M6=80 Nm [708 in.lbf].
Nominal size 10 M10=140 Nm [1 239 in.lbf].

Customer specified setting can be secured by means of a stamp and a wire.

<table>
<thead>
<tr>
<th>Type</th>
<th>a</th>
<th>b</th>
<th>Øc</th>
<th>e</th>
<th>Øf</th>
<th>Øg</th>
<th>Øh</th>
<th>i</th>
<th>j</th>
<th>k</th>
<th>l</th>
<th>m</th>
<th>n</th>
<th>o</th>
<th>Øp</th>
<th>Ør</th>
<th>s</th>
<th>s1</th>
<th>s2</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVP-6</td>
<td>72</td>
<td>94</td>
<td>34</td>
<td>1,5</td>
<td>24,9</td>
<td>15</td>
<td>65</td>
<td>56,5</td>
<td>45</td>
<td>30</td>
<td>19</td>
<td>15</td>
<td>35</td>
<td>6</td>
<td>25H9</td>
<td>32</td>
<td>6</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2.83]</td>
<td>[3.70]</td>
<td>[1.34]</td>
<td>[1.50]</td>
<td>[2.36]</td>
<td>[0.98]</td>
<td>[0.59]</td>
<td>[2.56]</td>
<td>[2.22]</td>
<td>[1.77]</td>
<td>[1.18]</td>
<td>[0.75]</td>
<td>[0.59]</td>
<td>[1.36]</td>
<td>[0.24]</td>
<td>[1.26]</td>
<td>[0.24]</td>
<td>[0.75]</td>
<td></td>
</tr>
<tr>
<td>VVP-10</td>
<td>68</td>
<td>90</td>
<td>38</td>
<td>1,5</td>
<td>31,9</td>
<td>18,5</td>
<td>80</td>
<td>67,5</td>
<td>52</td>
<td>35</td>
<td>23</td>
<td>18</td>
<td>41</td>
<td>10</td>
<td>32H9</td>
<td>36</td>
<td>10</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2.67]</td>
<td>[3.54]</td>
<td>[1.50]</td>
<td>[2.36]</td>
<td>[1.25]</td>
<td>[0.73]</td>
<td>[3.15]</td>
<td>[2.66]</td>
<td>[2.05]</td>
<td>[1.38]</td>
<td>[0.90]</td>
<td>[0.71]</td>
<td>[1.61]</td>
<td>[0.39]</td>
<td>[1.42]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Connecting dimensions / connection P-VVP-6, P-VVP-10

When fitting, the excess ports for oil supply and discharge must be closed by means of suitable screw.

1. Oil discharge when fitted independently.
2. Oil supply when fitted independently.
3. Oil supply when fitted on a tank cover.
4. Oil discharge when fitted on a tank cover.

<table>
<thead>
<tr>
<th>Size</th>
<th>Øa</th>
<th>Øb</th>
<th>c</th>
<th>Ød</th>
<th>Masse kg [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>59d9 [2.32]</td>
<td>24 [0.94]</td>
<td>M18x1,5</td>
<td>2,5 [5.51]</td>
<td></td>
</tr>
</tbody>
</table>
Hydraulic components - Pressure control valves

**ΔP-Q Performance curves**

Measured at 50°C [122°F] and viscosity of 32 mm²/s [148 SUS].

![Graph showing ΔP-Q Performance curves for Size 6 and Size 10.](image)

**Model code**

- **V V P**
- **-**
- **-**
- **-**
- **-**
- **-**

- **Size**
  - Size 6: 6
  - Size 10: 10

- **Pressure setting range [PSI]**
  - To 50 [725]: 50
  - To 100 [1,450]: 100
  - To 200 [2,900]: 200
  - To 315 [4,568]: 315
  - To 400 [5,807]: 400

- **Pressure setting element**
  - Set screw with protective cap: A
  - Rotary knob: B

- **Seal type**
  - NBR seals for mineral oil HL, HLP to DIN 51524
  - No designation
  - FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380

- **Special requirements to be briefly specified**
POCLAIN HYDRAULICS

Hydraulic components - Pressure control valves

PRESSURE RELIEF VALVE VVB2-10

- NG 6
- Up to 210 bar [3,045 PSI]
- Up to 60 L/min [15.8 GPM]

- Direct in-line mounting.
- Threaded connections to ISO 9974 (Metric), ISO 1179 (BSPP/Gas).
- Five different pressure setting elements.

Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>6</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>210 [3,045] Bar [PSI]</td>
</tr>
<tr>
<td>Flow rate</td>
<td>60 [15.8] L/min [GPM]</td>
</tr>
<tr>
<td>Pressure setting range</td>
<td>120 [1,740], 160 [2,320], 200 [2,900] Bar [PSI]</td>
</tr>
<tr>
<td>Oil temperature range</td>
<td>-10 to +70 °C [-14 to +158 °F]</td>
</tr>
<tr>
<td>Viscosity range</td>
<td>15 to 380 mm²/s [69.5 to +1,760 SUS]</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 4406-1999</td>
</tr>
<tr>
<td>Mass</td>
<td>1.85 [4.08] kg [lbs]</td>
</tr>
<tr>
<td>Seal type</td>
<td>NBR seals for mineral oil HL, HLP, to DIN 51524</td>
</tr>
</tbody>
</table>

Hydraulic symbol

A-P-Q Performance curves

Measured at 50°C [122°F] and viscosity of 32 mm²/s [148 SUS].

![A-P-Q Performance curves graph]

A = 120 bar [1740 PSI]
B = 160 bar [2320 PSI]
C = 200 bar [2900 PSI]
Hydraulic components - **Pressure control valves**

**POCLAIN HYDRAULICS**

**Dimensions**

![Diagram of hydraulic components: Pressure control valves](image)

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Dimensions**

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Key Measurements**

- **A**: Inner hexagonal key
  - **B**: Inner hexagonal key and protective cap
  - **G**: Knob
  - **K**: Fixed setting
  - **S**: Exterior key

![Diagram of hydraulic components: Pressure control valves](image)

**POCLAIN HYDRAULICS**

**Dimensions**

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Key Measurements**

- **A**: Inner hexagonal key
  - **B**: Inner hexagonal key and protective cap
  - **G**: Knob
  - **K**: Fixed setting
  - **S**: Exterior key

![Diagram of hydraulic components: Pressure control valves](image)

**POCLAIN HYDRAULICS**

**Dimensions**

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Key Measurements**

- **A**: Inner hexagonal key
  - **B**: Inner hexagonal key and protective cap
  - **G**: Knob
  - **K**: Fixed setting
  - **S**: Exterior key

![Diagram of hydraulic components: Pressure control valves](image)

**POCLAIN HYDRAULICS**

**Dimensions**

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Key Measurements**

- **A**: Inner hexagonal key
  - **B**: Inner hexagonal key and protective cap
  - **G**: Knob
  - **K**: Fixed setting
  - **S**: Exterior key

![Diagram of hydraulic components: Pressure control valves](image)

**POCLAIN HYDRAULICS**

**Dimensions**

- **A**: Inner hexagonal key
- **B**: Inner hexagonal key and protective cap
- **G**: Knob
- **K**: Fixed setting
- **S**: Exterior key

**Key Measurements**

- **A**: Inner hexagonal key
  - **B**: Inner hexagonal key and protective cap
  - **G**: Knob
  - **K**: Fixed setting
  - **S**: Exterior key
POCLAIN HYDRAULICS

Hydraulic components - Pressure control valves

Model code

V V B 2 - 1 0 - - - -

Pressure setting range [PSI]
- 120 [1740] 120
- 160 [2 320] 160
- 200 Bar [2 900 PSI] 200

Pressure setting element
- Inner hexagonal key A
- Inner hexagonal key and protective cap B
- Knob G
- Fixed setting K
- Exterior key S

Threaded connections
- M18 x 1,5 No designation
- G 3/8 3/8

Special requirements to be briefly specified
POCLAIN HYDRAULICS

Hydraulic components - Pressure control valves

PRESSURE RELIEF VALVE RT

- NG 4, 6, 10
- Up to 350 bar [3,045 PSI]
- Up to 60 L/min [26.4 GPM]
- For independent fitting into a block.
- Two pressure setting ranges.

Operation

Pilot operated pressure relief valves type RT are used for maintaining and limiting the pressure in a hydraulic system. These valves consist of a housing of cartridge design (1), main spool insert (2) with a spring (3), pilot poppet (4), spring (5) and pressure setting element (6).

The P-line of this pressure relief valve is connected with the hydraulic system. The hydraulic medium pressure acts on the front side of the main spool insert. The bores (7,8) permit the introduction of pilot oil into the pressure chamber (9) and the application of pressure to the opposite side of the main spool insert and the front side of the pilot poppet. The pressure balance in the system and pressure chamber holds this pressure relief valve in closed position till the pressure in system exceeds this value the pilot poppet moves off the valve seat, freeing the pilot oil discharge through the bore (10). A pressure drop in the pressure chamber rises the main spool insert, thus clearing the hydraulic medium flow way in the direction from P towards port T.

Loosening of the pressure setting element (6) is prevented by a counternut (11).

Features

<table>
<thead>
<tr>
<th>Size</th>
<th>Flow rate [L/min]</th>
<th>Pressure setting range [bar]</th>
<th>Oil temperature range [°C/°F]</th>
<th>Viscosity range [mm²/s]</th>
<th>Filtration</th>
<th>Mass [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG 4</td>
<td>4</td>
<td>315 [4 568]</td>
<td>-20 to +70 [-4 to + 158]</td>
<td>15 to 380 [69.5 to + 1,760]</td>
<td>NAS 1638</td>
<td>0.15 [0.33]</td>
</tr>
<tr>
<td>NG 6</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.18 [0.40]</td>
</tr>
<tr>
<td>NG 10</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hydraulic components - Pressure control valves

POCLAIN HYDRAULICS

Dimensions

Tightening torque for fixing Md=30 Nm.

The value set on the pressure setting element is protected by means of a lead stamp Ø11 and a wire Ø1,1 mm.

Note: Ports P and T can be located optionally at any place on the circumference.

<table>
<thead>
<tr>
<th>Size</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>D</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>4, 6</td>
<td>96</td>
<td>64</td>
<td>53</td>
<td>6</td>
<td>20,5</td>
<td>36</td>
<td>30</td>
<td>26</td>
<td>14</td>
<td>4,8</td>
<td>M20x1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[3.78]</td>
<td>[2.52]</td>
<td>[2.09]</td>
<td>[0.24]</td>
<td>[0.81]</td>
<td>[1.18]</td>
<td>[1.02]</td>
<td>[0.55]</td>
<td>[0.19]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>97</td>
<td>61</td>
<td>50</td>
<td>10,5</td>
<td>24,5</td>
<td>40</td>
<td>36</td>
<td>25,7</td>
<td>15</td>
<td>5,2</td>
<td>M24x1</td>
<td></td>
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<tr>
<td></td>
<td>[3.82]</td>
<td>[2.40]</td>
<td>[1.97]</td>
<td>[0.41]</td>
<td>[0.96]</td>
<td>[1.57]</td>
<td>[1.42]</td>
<td>[1.34]</td>
<td>[0.59]</td>
<td>[0.20]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ΔP-Q Performance curves

Measured at 50°C [122°F] and viscosity of 32 mm²/s [148 SUS].

Size 4

Flow
**ΔP-Q Performance curves**

Measured at 50°C [122°F] and viscosity of 32 mm²/s [148 SUS].

![Pressure Performance Curves](image1.png)

**Model code**

| Size 4  | 4 |
|-------------------------------|
| Size 6  | 6 |
| Size 10 | 10 |

**Pressure setting range [PSI]**
- To 100 [7 450] 100
- To 315 [4 568] 315

**Seal type**
- NBR seals for mineral oil HL, HLP to DIN 51524
- FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380
- No designation

**Special requirements to be briefly specified**
PRESSURE RELIEF VALVE VP-RT

- NG 6, 10
- Up to 350 Bar [3,045 PSI]
- Up to 100 l/min [26.4 GPM]

- Connecting dimensions to ISO 4401.
- For vertical stacking - sandwich plate design.
- Two pressure setting ranges.

**Operation**

These valves consist of a stack plate (1), pressure relief valve housing (2), main spool insert (3) with a spring (4), pilot poppet (5), spring (6) and pressure setting element (7). The P-line of this pressure relief valve is connected with the hydraulic system. The hydraulic medium pressure acts on the front side of the main spool insert (3). The bores (8,9) permit the introduction of pilot oil into the pressure chamber (10) and the application of pressure to the opposite side of the main spool insert. This pressure relief valve remains in closed position till the system pressure exceeds the valve set at the spring (6). A pressure rise in the system above the value set by the pressure setting element (7), provokes the movement of the pilot poppet (5) of the seat, freeing the pilot oil discharge through the bores (9) and (11). A pressure drop in the pressure chamber (10) rises the main spool insert (3), thus clearing the hydraulic medium flow in the direction from port P towards port T. Loosening of the pressure setting element is prevented by a counternut (12).

**Features**

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure setting range</td>
<td>Bar [PSI]</td>
<td>315 [4,568]</td>
</tr>
<tr>
<td>Oil temperature range</td>
<td>°C [°F]</td>
<td>-20 to +70 [-4 to +158]</td>
</tr>
<tr>
<td>Viscosity range</td>
<td>mm²/s [SUS]</td>
<td>15 to 380 [69.5 to 1,760]</td>
</tr>
<tr>
<td>Filtration</td>
<td>NAS 1638</td>
<td>8</td>
</tr>
<tr>
<td>Mass</td>
<td>kg [lbs]</td>
<td>1.2 [2.64] - 1.7 [3.75] (D)</td>
</tr>
</tbody>
</table>

Pilot operated pressure relief valves type VP-RT of sandwich plate design, for vertical stacking, are used for maintaining and limiting the maximum pressure in a hydraulic system.
### Dimensions

#### VP-RT-6

<table>
<thead>
<tr>
<th>Size</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP-RT-6-EA</td>
<td>154 [6.06]</td>
<td>-</td>
<td>-</td>
<td>90 [3.54]</td>
<td>9 [0.35]</td>
</tr>
<tr>
<td>VP-RT-6-EB</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>154 [6.06]</td>
<td>40,5 [1.59]</td>
</tr>
<tr>
<td>VP-RT-6-EP</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>121 [4.76]</td>
<td>40 [1.57]</td>
</tr>
<tr>
<td>VP-RT-6-DAB</td>
<td>245 [9.64]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VP-RT-10-EA</td>
<td>161 [6.34]</td>
<td>-</td>
<td>100,5 [3.96]</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VP-RT-10-EB</td>
<td>-</td>
<td>161 [6.34]</td>
<td>-</td>
<td>18 [0.71]</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes:**

13. O-ring. Size 6: 9,25x1,78
Size 10: 12x2.

14. Nameplate

The value set on the pressure setting element is protected by means of a lead stamp Ø11 [0.43 dia.] and a wire Ø1,1 [0.04 dia.].

---

**Required quality of the mating surface**

---

**Image:**

Hydraulic components - Pressure control valves

POCLAIN HYDRAULICS
**ΔP-Q Performance curves**

Measured at 50°C [122°F] and viscosity of 32 mm²/s [148 SUS].

![Graphs showing ΔP-Q Performance curves for Size 6 and Size 10](image1)

**Model code**

Size
- Size 6: 6
- Size 10: 10

Relief function from → to
- A → T: EA
- B → T: EB
- P → T: EP
- A → T and B → T (only for size 6): D
- A ↔ B and B ↔ A (only for size 6): DBA

Pressure setting range [PSI]
- 100 [1 450]
- 315 [4 568]

Seal type
- NBR seals for mineral oil HLP to DIN 51524
- No designation
- FPM seals for HETG, HEES, HEPG to VDMA 24568 and ISO 15380
- E

Special requirements to be briefly specified
Thirteen subsidiaries and a worldwide network of more than 150 distributors and partners …