Flange Mounted Pressure Controls
Relief, Unloading & Check Valves - 06, 08, 10 & 12 Size
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>CPF1S-06 SAE 3/4&quot;</td>
<td></td>
<td></td>
<td>100 l/min</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(26 USgpm)</td>
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<td>11</td>
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<tr>
<td>CPF1S-08 SAE 1&quot;</td>
<td></td>
<td></td>
<td>300 l/min</td>
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<tr>
<td>CPF1S-10 SAE 1 1/4&quot;</td>
<td>Relief, single pressure</td>
<td>275 bar (4000 psi)</td>
<td>100 l/min (26 USgpm)</td>
<td>6 bar (91 psi)</td>
<td>13</td>
</tr>
<tr>
<td>CPF1S-12 SAE 1 1/2&quot;</td>
<td></td>
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<td>600 l/min (160 USgpm)</td>
<td>6 bar (91 psi)</td>
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<tr>
<td>CPF1V-12 (code 62) SAE 1 1/2&quot;</td>
<td>Relief, single pressure with vent</td>
<td>350 bar (5000 psi)</td>
<td>100 l/min (26 USgpm)</td>
<td>6 bar (91 psi)</td>
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<td>100 l/min</td>
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<tr>
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<tr>
<td>CPF2S-10 SAE 1 1/4&quot;</td>
<td>Relief, single pressure with vent</td>
<td>275 bar (4000 psi)</td>
<td>Internal Drain 7 bar (102 psi) @ 600 l/min (160 USgpm)</td>
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<tr>
<td>CPF2S-12 SAE 1 1/2&quot;</td>
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<td>3.5 bar (51 psi)@ 100 l/min (26.4 USgpm)</td>
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<td>3.5 bar (51 psi)@ 100 l/min (26.4 USgpm)</td>
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<td>300 l/min</td>
<td>4 bar (58 psi)@ 300 l/min (80 USgpm)</td>
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<td>Internal Drain 7 bar (102 psi)@ 600 l/min (160 USgpm)</td>
<td>4 bar (58 psi)</td>
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<tr>
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<td>600 l/min</td>
<td>7 bar (102 psi)@ 600 l/min (160 USgpm)</td>
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<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
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<td>Internal Drain 7 bar (102 psi)@ 600 l/min (160 USgpm)</td>
<td>4 bar (58 psi)</td>
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<td>600 l/min</td>
<td>7 bar (102 psi)@ 600 l/min (160 USgpm)</td>
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<td>3.5 bar (51 psi)@ 100 l/min (26.4 USgpm)</td>
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<td>Model/Size: Unloading Valves</td>
<td>Function</td>
<td>Max. Pressure</td>
<td>Max. Flow</td>
<td>∆P P to T in Unloaded Position</td>
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<tr>
<td>UPF1S-06 SAE 3/4&quot;</td>
<td>Unloading without check</td>
<td>100 l/min</td>
<td>Internal Drain 3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
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<td>UPF1S-C*-06 SAE 3/4&quot;</td>
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<td>275 bar</td>
<td>3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
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<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
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<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
<td>41</td>
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<td>UPF1S-C*-10 SAE 1 1/4&quot;</td>
<td>Unloading with check</td>
<td>350 bar</td>
<td>4.9 bar (71 psi) @ 600 l/min (160 USgpm)</td>
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<tr>
<td>UPF1S-12 SAE 1 1/2&quot;</td>
<td>Unloading without check</td>
<td>275 bar</td>
<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
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<tr>
<td>UPF1V-12 (code 62) SAE 1 1/2&quot;</td>
<td>Unloading without check</td>
<td>350 bar</td>
<td>3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
<td>45</td>
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<td>UPF2S-06 SAE 3/4&quot;</td>
<td>Unloading with vent without check</td>
<td>100 l/min</td>
<td>Internal Drain 3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
<td>46</td>
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</tr>
<tr>
<td>UPF2S-C*-06 SAE 3/4&quot;</td>
<td>Unloading with vent and check</td>
<td>275 bar</td>
<td>4.9 bar (71 psi) @ 600 l/min (160 USgpm)</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>UPF2S-08 SAE 1&quot;</td>
<td>Unloading with vent without check</td>
<td>300 l/min</td>
<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
<td>52</td>
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</tr>
<tr>
<td>UPF2S-C*-08 SAE 1&quot;</td>
<td>Unloading with vent and check</td>
<td>275 bar</td>
<td>3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>UPF2S-10 SAE 1 1/4&quot;</td>
<td>Unloading with vent without check</td>
<td>600 l/min</td>
<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>UPF2S-C*-10 SAE 1 1/4&quot;</td>
<td>Unloading with vent and check</td>
<td>350 bar</td>
<td>4.9 bar (71 psi) @ 600 l/min (160 USgpm)</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>UPF2S-12 SAE 1 1/2&quot;</td>
<td>Unloading with vent without check</td>
<td>275 bar</td>
<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
<td>56</td>
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</tr>
<tr>
<td>UPF2V-12 (code 62) SAE 1 1/2&quot;</td>
<td>Unloading with vent without check</td>
<td>350 bar</td>
<td>3.5 bar (51 psi) @ 100 l/min (26,4 USgpm)</td>
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<tr>
<td>UPF2S-C*-12 SAE 1 1/2&quot;</td>
<td>Unloading with vent and check</td>
<td>275 bar</td>
<td>Internal Drain 7.5 bar (109 psi) @ 600 l/min (160 USgpm)</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>Model/Size: Check Valve</td>
<td>Function</td>
<td>Max. Pressure</td>
<td>Max. Flow</td>
<td>Pressure Drop</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>--------------</td>
<td>------</td>
</tr>
<tr>
<td>DCPFS-08 SAE 1&quot;</td>
<td></td>
<td>275 bar</td>
<td>114 l/min</td>
<td>13 bar (187 psi) @114 l/min (30 USgpm) - 3.4 bar (50 psi) cracking press. 9.4 bar (137 psi) @114 l/min (30 USgpm) - 0.3 bar (5 psi) cracking press.</td>
<td>59  62</td>
</tr>
<tr>
<td>DCPFS-10 SAE 1 1/4&quot;</td>
<td>Right Angle Check valve</td>
<td>350 bar</td>
<td>120 l/min</td>
<td>1.4 bar (20 psi) @120 l/min (32 USgpm) - 0.3 bar (5 psi) cracking press. 2.4 bar (35 psi) @120 l/min (32 USgpm) - 1.7 bar (25 psi) cracking press.</td>
<td>60  62</td>
</tr>
<tr>
<td>DCPFS-12 SAE 1 1/2&quot;</td>
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<td>378 l/min</td>
<td>300 l/min</td>
<td>3.4 bar (49 psi) @300 l/min (80 USgpm) - 0.3 bar (5 psi) cracking press. 3.4 bar (49 psi) @300 l/min (80 USgpm) - 1.7 bar (25 psi) cracking press.</td>
<td>60  62</td>
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<tr>
<td>DICPFS-06 SAE .75&quot;</td>
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<td>280 bar</td>
<td>600 l/min</td>
<td>8.3 bar (120 psi) @600 l/min (160 USgpm) - 0.3 bar (5 psi) cracking press. 8.3 bar (120 psi) @600 l/min (160 USgpm) - 1.7 bar (25 psi) cracking press.</td>
<td>60  62</td>
</tr>
<tr>
<td>DICPFS-10 SAE 1 1/4&quot;</td>
<td>In-Line Check valve</td>
<td>207 bar</td>
<td>207 l/min</td>
<td>4.1 bar (60 psi) @750 l/min (200 USgpm) - 0.3 bar (5 psi) cracking press. 5.9 bar (85 psi) @750 l/min (200 USgpm) - 1.7 bar (25 psi) cracking press.</td>
<td>60  62</td>
</tr>
</tbody>
</table>
**Introduction**

**Flange Mounted Valve Benefits**

- Direct mounting to pump flange reduces potential leak points for superior leak resistance.
- Reduced installed costs and space requirements.
- Excellent repeatability and stable performance from cartridge design main stage parts.
- High response due to small trapped volume.
- Easier installation and servicing of components.
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.
- Fast opening and closing action and stable performance from cartridge design.
- Minimum unloaded pressure drop due to short piping runs.
- Viton seals provide multi-fluid capability without the need to change seals.

**Sizes**

- 06 – 3/4” flange
- 08 – 1” flange
- 10 – 1 1/4” flange
- 12 – 1 1/2” flange

**General Description**

**Relief Valves**

Vickers space saving CPF relief valves improve machine reliability and uptime by limiting the pressure in a hydraulic circuit to the desired maximum, thereby protecting the hydraulic pump and system from pressure peaks. The CPF relief valves are designed to mount on a wide range of SAE pump outlet port flanges to eliminate intervalve piping and fittings.

Direct pump flange mounting of the valves reduces installation costs and provides a highly leak–resistant, compact pump control package.

CPF relief valves are of two–stage design with a fast–acting poppet type main stage for simple, long-lasting and effective operation. The pilot stage features a sensitive adjustment mechanism which allows setting of the pressure in fine increments over a wide range – up to the maximum rating of the valve.

The pressure setting adjustment choices available for the CPF relief valves are the standard screw-type adjuster with locknut, an optional knurled hand knob with set screw lock or a micrometer knob with or without keylock. External remote control/vent connections are available on all models. Additional optional features include various pressure setting ranges and many solenoid valve options on valves so equipped.

These CPF relief valves have excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. The many available control options make it possible to choose the optimum valve model for industrial and mobile applications. Additionally, CPF valves use many of the same parts of other Vickers products to insure proven durability. For over 70 years, the Vickers name has been synonymous with long, trouble–free service.

**Unloading Valves**

Unloading valves are used in accumulator charging circuits where a pressure regulator is required to automatically unload the pump. This is done by diverting the pump delivery to the reservoir at low pressure when the desired accumulator pressure is reached. Also, the UPF unloading valve can be used to unload the low pressure side of a double pump.

The UPF unloading valves are designed to mount directly on SAE pump outlet port flanges to eliminate intervalve piping and fittings. Direct pump flange mounting of the valves reduces installation costs and provides a highly leak resistant, compact pump control package.

UPF unloading valves are of two-stage design with a fast acting poppet type main stage for simple, long-lasting, and effective operation. The pilot stage features a sensitive adjustment mechanism which allows setting of the pressure in fine increments over a wide range – up to the maximum rating of the valve.

The pressure setting adjustment choices available for the UPF unloading valves are the standard screw-type adjuster with locknut or optional adjusters with or without keylock. Gage connections for pump and system pressures are available on all models. Additional optional features include various pressure setting ranges and many solenoid valve options on valves so equipped.

Unloading valves may be ordered with or without the integral check valve.

**Check Valves**

DCPF/DICPF flange mounted right angle and in-line check valves are ruggedly designed for superior shock resistance, reliability and long life.

The check valves may be mounted directly on an SAE pump outlet port flange or may be stacked with a CPF relief valve to provide a pump unloading function. The DCPF/DICPF check valves are not intended for use as an unloading check.

The right angle and in-line check valves are offered in sizes matching the CPF relief valves.
Relief Valve Without Venting

Flange Sizes

- 06 - 3/4 inch flange
- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange

Benefits

- Direct mounting to pump flange reduces potential leak points for superior leak resistance.
- Reduced installed costs and space requirements.
- Excellent repeatability and stable performance from cartridge design mainstage parts.
- Easier installation and servicing of components (stackable design).
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>CPF1S—06</th>
<th>CPF1S—08</th>
<th>CPF1S—10</th>
<th>CPF1S—12</th>
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</thead>
<tbody>
<tr>
<td>Maximum flow</td>
<td>100 l/min (26 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
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<tr>
<td>Maximum pressure:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P port</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)*</td>
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<tr>
<td>T port</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
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</table>

* The CPF1V-12 (code 62 flange) has a P port max. pressure rating of 350 bar (5000 psi).

Hydraulic Response

06 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 3450 bar (50000 psi) /second. Maximum overshoot < 8%.

08 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2900 bar (42000 psi) /second. Maximum overshoot < 10%.

10/12 Sizes: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2600 bar (37500 psi) /second. Maximum overshoot < 10%.

General Description

This Vickers CPF1S relief valve features flange mounting for increased design flexibility and reduced external piping. The valve is designed for direct mounting on the SAE flange outlet port of a pump. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

Pressure relief valves are used to limit or control pressure by directing system flow to the reservoir when system pressure reaches the setting of the valve. System overload is thereby prevented and peak pressures which could damage the pump and actuating components are eliminated.

The CPF1S valve has excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. CPF relief valves are of two-stage design with a fast-acting poppet type main stage for simple, long-lasting and effective operation. The many available control options make it possible to choose the optimum valve model for each application.
## CPF1* Model Series

### Model Code

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>CPF 1 * - ** - * - * - (B) - (RC) - (1) - 20</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
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### Details

<table>
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<tr>
<th>Code</th>
<th>Description</th>
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<td>Valve Function</td>
</tr>
<tr>
<td>C</td>
<td>Relief</td>
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<tr>
<td>2</td>
<td>Mounting Type</td>
</tr>
<tr>
<td>PF</td>
<td>Pump flange mounting</td>
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<td>3</td>
<td>Unit Type</td>
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<tr>
<td>1</td>
<td>Single pressure without vent</td>
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<tr>
<td>4</td>
<td>Flange Type</td>
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<td>S</td>
<td>SAE J518 4-bolt flange standard series code 61 (available in all sizes)</td>
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<tr>
<td>V</td>
<td>SAE J518 4-bolt high pressure series code 62 (size 12 only)</td>
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<tr>
<td>5</td>
<td>Valve Size</td>
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<td>3/4 inch</td>
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<tr>
<td>08</td>
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<td>10</td>
<td>1 1/4 inch</td>
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<td>6</td>
<td>Pressure Range</td>
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<tr>
<td>A</td>
<td>10 - 50 bar (145 - 725 psi)</td>
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<tr>
<td>B</td>
<td>10 - 100 bar (145 - 1450 psi)</td>
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<tr>
<td>F</td>
<td>10 - 207 bar (145 - 3000 psi)</td>
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<tr>
<td>G</td>
<td>10 - 275 bar (145 - 4000 psi)</td>
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<tr>
<td></td>
<td>350 bar (5000 psi) - (CPF¹V-12 models only)</td>
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<td>7</td>
<td>Control Type</td>
</tr>
<tr>
<td>W</td>
<td>Screw adjust with locknut</td>
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<tr>
<td>H</td>
<td>Handknob adjust without keylock</td>
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<tr>
<td>K</td>
<td>Micrometer adjust with keylock</td>
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<td>Thread Type (remote control/vent connection)</td>
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<td>SAE-6 O-ring boss port (.5625-18 UNF-2B thd.)</td>
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<tr>
<td>B</td>
<td>BSP-G 1/4 (1/4&quot; BSP)</td>
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<td>Remote Control</td>
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<td>External drain</td>
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<td>Design Number, 20 Series</td>
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Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.
**CPF1S-06/08-**-20 with remote control

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) max. flow

**CPF1S-06/08-P-**-20 without remote control

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) max. flow

External drain models only.

**CPF1S-10/12-**-20 with remote control

-10/12 size 600 l/min (160 USgpm) max. flow

**CPF1S-10/12-P-**-20 without remote control

-10/12 size 600 l/min (160 USgpm) max. flow

External drain models only.

---

患症者

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Pressure Curves

CPF1S-06

Typical Pressure Override
Internal Drain
External Drain

Pressure Drop bar

Flow l/min

Flow USgpm

Pressure Drop psi

CPF1S-08

Typical Pressure Override
Internal Drain
External Drain

Pressure Drop bar

Flow l/min

Flow USgpm

Pressure Drop psi
CPF1S-10

Typical Pressure Override
Internal Drain
External Drain

Flow USgpm

Pressure Drop bar

Flow l/min

CPF1S-12
CPF1V-12

Typical Pressure Override
Internal Drain
External Drain

Flow USgpm

Pressure Drop bar

Flow l/min
Installation Dimensions

CPF1S-06 3/4” Flange - Single Pressure Relief Valve without Vent

mm (inch)

Pressure adjusting lock screw (5/64” hex key req’d to lock/unlock set screw)

Pressure port (P port) - ∅ 19.0 (.75) SAE Code 61 4-bolt flange connection thru

Tank port (T port) - ∅ 19.0 (.75) SAE Code 61 4-bolt flange connection thru

Pressure adjustment (clockwise rotation increases pressure)


External drain port (when ordered per model code) - .4375-20 UNF-2B thd. for 1/4” O.D. tubing - G 1/8 BSP thd.

For key removal

“W” model (screw w/locknut max. extension)

“K” model (micrometer w/keylock max. extension)

“H” model (handknob) max. extension

Ref.
CPF1S-08 1” Flange -
Single Pressure Relief Valve
without Vent

mm (inch)

Tank port (T port)
Ø 25.4 (1.00) SAE Code 61
4-bolt flange connection thru

Pressure adjusting lock screw
(5/64” hex key req’d. to
lock/unlock set screw)

Pressure port (P port)
Ø 25.4 (1.00) SAE Code 61
4-bolt flange connection thru

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4” O.D. tubing
- G 1/8 BSP thd.
CPF1S-10 11/4” Flange -
Single Pressure Relief Valve
Without Vent

mm (inch)

Pressure adjusting lock screw
(3/64” hex key req’d. to
lock/unlock set screw)

For key removal

“W” model
(screw w/locknut
max. extension)

“K” model
(micrometer w/keylock
max. extension)

“H” model (handknob) max. extension

Pressure port (P port) -
∅ 31.8 (1.25) SAE Code 61
4-bolt flange connection thru -

Tank port (T port) -
∅ 31.8 (1.25) SAE Code 61
4-bolt flange connection thru -

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4” O.D. tubing
- G 1/8 BSP thd.

For key removal
CPF1S-12 – Code 61
CPF1V-12 – Code 62
1½” Flange -
Single Pressure Relief Valve
Without Vent

mm (inch)

Tank port (T port) -
∅ 38.1 (1.50) SAE Code 61 4-bolt flange (For CPF1V-12, Code 62 4-bolt flange) connection thru -

Pressure port (P port) -
∅ 38.1 (1.50) SAE Code 61 4-bolt flange (For CPF1V-12, Code 62 4-bolt flange) connection thru -

Pressure adjusting lock screw
(5/64" hex key req'd. to lock/unlock set screw)

“W” model
(screw w/locknut max. extension)

“H” model (handknob)
max. extension

Gage port or remote control port
- .5625-18 UNF-2B thd. for 5/8" O.D. tubing
- G 1/4 BSP thd.

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.
CPF2*-06/08/10/12-**-20

Relief Valve with Venting

Flange Sizes
- 06 - ¾ inch flange
- 08 - 1 inch flange
- 10 - 1 ¼ inch flange
- 12 - 1 ½ inch flange

Benefits
- Excellent repeatability and stable performance from cartridge design mainstage parts.
- Reduced installed costs and space requirements.
- Easier installation and servicing of components.
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.
- Direct mounting to pump flange reduces potential leak points for superior leak resistance.

### Ratings

<table>
<thead>
<tr>
<th></th>
<th>CPF2S-06</th>
<th>CPF2S-08</th>
<th>CPF2S-10</th>
<th>CPF2S-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum flow</td>
<td>100 l/min (26 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
</tr>
<tr>
<td>Maximum pressure:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P port</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)*</td>
</tr>
<tr>
<td>T port</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
</tr>
</tbody>
</table>

* The CPF2V-12 (code 62 flange) has a max. P port pressure rating of 350 bar (5000 psi).

### Pilot Valve Max. T Port Pressure Rating

- 100 bar (1450 psi) for DG4V-3S valve
- 210 bar (3045 psi) for DG4V-3 valve AC
- 210 bar (3045 psi) for DG4V-3 valve DC

### Electrical Response

Electrical response is defined as the time from initiation of power to the solenoid, to the initiation of pressure rise, with 1.5 liters (.4 USgpm) of oil under compression:

- **06 size** –
  - @100 l/min (26 USgpm) = DC - 200 ms
  - AC - 160 ms

- **08 size** –
  - @300 l/min (80 USgpm) = DC - 210 ms
  - AC - 175 ms

- **10/12 size** –
  - @300 l/min (80 USgpm) = DC - 180 ms
  - AC - 160 ms

### Hydraulic Response

- **06 Size:** Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 3450 bar (50000 psi) /second. Maximum overshoot < 8%.
- **08 Size:** Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2900 bar (42000 psi) /second. Maximum overshoot < 10%.
- **10/12 Sizes:** Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2600 bar (37500 psi) /second. Maximum overshoot < 10%.

### General Description

This Vickers CPF2S relief valve features flange mounting for increased design flexibility and reduced external piping. The valve is designed for direct mounting on the SAE flange outlet port of a pump. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

Pressure relief valves are used to limit or control pressure by directing system flow to the reservoir when system pressure reaches the setting of the valve. System overload is thereby prevented and peak pressures which could damage the pump and actuating components are eliminated. The CPF2S relief valves also provide a means of limiting system pressure to the relatively low vented pressure by directing pilot flow to tank by de-energizing the solenoid operated DG4V–3 valve.

The CPF2S valve has excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. CPF relief valves are of two–stage design with a fast–acting poppet type main stage for simple, long–lasting and effective operation. The many available control options make it possible to choose the optimum valve model for each application.
# CPF2* Model Series

## Model Code

```plaintext
C PF 2 * - *** - ** - (B) - (RC) - (1) - 3 (S) (V) M - (S) ***** (L) - * * - 20
```

<table>
<thead>
<tr>
<th></th>
<th>Valve Function</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>C - Relief</td>
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<table>
<thead>
<tr>
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<th>Mounting Type</th>
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<tr>
<td>2</td>
<td>PF - Pump flange mounting</td>
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<table>
<thead>
<tr>
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<th>Unit Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2 - Single pressure with vent</td>
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<table>
<thead>
<tr>
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<th>Flange Type</th>
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<tbody>
<tr>
<td>4</td>
<td>S - SAE J518 4-bolt flange standard series code 61 (available in all sizes)</td>
</tr>
<tr>
<td></td>
<td>V - SAE J518 4-bolt high pressure series code 62 (size 12 only)</td>
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<tr>
<td>5</td>
<td>06 - ¾ inch</td>
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<tr>
<td></td>
<td>08 - 1 inch</td>
</tr>
<tr>
<td></td>
<td>10 - 1 ¼ inch</td>
</tr>
<tr>
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<td>12 - 1 ½ inch</td>
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<tr>
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<th>Pressure Range</th>
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<tbody>
<tr>
<td>6</td>
<td>A - 10 - 50 bar (145 - 725 psi)</td>
</tr>
<tr>
<td></td>
<td>B - 10 - 100 bar (145 - 1450 psi)</td>
</tr>
<tr>
<td></td>
<td>F - 10 - 207 bar (145 - 3000 psi)</td>
</tr>
<tr>
<td></td>
<td>G - 10 - 275 bar (145 - 4000 psi) - 350 bar (5000 psi) (CPF2V-12 models only)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>W - Screw adjust with locknut</td>
</tr>
<tr>
<td></td>
<td>H - Handknob adjust without key</td>
</tr>
<tr>
<td></td>
<td>K - Micrometer adjust with keylock</td>
</tr>
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</table>

<table>
<thead>
<tr>
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<th>Thread Type (remote control/Vent connection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Blank - SAE-6 O-ring boss port (.5625-18 UNF-2B thd.)</td>
</tr>
<tr>
<td></td>
<td>B - BSP-G ¼/4 (1/4&quot; BSPF)</td>
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<tr>
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<th>Remote Control</th>
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<tr>
<td>9</td>
<td>Blank - No remote control</td>
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<tr>
<td></td>
<td>RC - Remote control</td>
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<tr>
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<th>Pilot Drain</th>
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<tbody>
<tr>
<td>10</td>
<td>Blank - Internal drain</td>
</tr>
<tr>
<td></td>
<td>1 - External drain</td>
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<table>
<thead>
<tr>
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<th>Vent Valve</th>
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<tbody>
<tr>
<td>11</td>
<td>3S - Standard performance</td>
</tr>
<tr>
<td></td>
<td>3 - High performance</td>
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</table>

Uses OBL type spool/spring. Other features are optional. Refer to Vickers literature # GB-C-2015B Solenoid Operated Directional Control Valves catalog.

<table>
<thead>
<tr>
<th></th>
<th>Manual Override Options</th>
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<tr>
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<th>Electrical Options Flag</th>
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<tr>
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<th>Spool Position Monitoring Switch</th>
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<thead>
<tr>
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<th>Solenoid Type/Electrical Connections</th>
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<table>
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<tr>
<th></th>
<th>Indicator Lights</th>
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<table>
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<tr>
<th></th>
<th>Tank Rating Pressure</th>
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<tbody>
<tr>
<td>15</td>
<td>2 - 10 bar (145 psi) for spool position indicator models.</td>
</tr>
<tr>
<td></td>
<td>5 - 100 bar (1450 psi) for standard performance models, DG4V-3S, with AC or DC solenoids.</td>
</tr>
<tr>
<td></td>
<td>6 - 207 bar (3000 psi) for high performance models, DG4V-3, with AC solenoids.</td>
</tr>
<tr>
<td></td>
<td>7 - 207 bar (3000 psi) for high performance models, DG4V-3 with DC solenoids.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Design Number, 20 series</th>
</tr>
</thead>
</table>

Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.

EN417 – Normally closed, energize to vent relief
Circuit Schematics

CPF2S-06/08-*-20

CPF2S-10/12-*-20
CPF2V-12-*-20

External drain models only.

Gage

0.6 mm

0.7 mm

0.9 mm

1.0 mm

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) max. flow

-10/-12 size 600 l/min (160 USgpm) max. flow
Pressure Curves

**CPF2S-06**

Typical Pressure Override
Internal Drain
External Drain

Vented $\Delta P$ to $T$

Typical Pressure Override
Internal Drain
External Drain

**CPF2S-08**

Typical Pressure Override
Internal Drain
External Drain

Vented $\Delta P$ to $T$
CPF2S-10

Typical Pressure Override
Internal Drain
External Drain

Vented \( \Delta P \) to \( T \)
Internal Drain
External Drain

CPF2S-12
CPF2V-12

Typical Pressure Override
Internal Drain
External Drain

Vented \( \Delta P \) to \( T \)
Internal Drain
External Drain
Installation Dimensions

CPF2S-06 3/4” Flange - Single Pressure Relief Valve With Vent

mm (inch)

Pressure port (P port) - ∅ 19.0 (.75) SAE Code 61
4-bolt flange connection thru -

External drain port (when ordered per model code)
- .4375-20 UNF-2B thd. for 3/8” O.D. tubing
- G 1/8 BSP thd.

Pressure adjusting lock screw (5/64" hex key req’d to lock/unlock set screw)

For key removal

Pressure adjustment (clockwise rotation increases pressure)

“W” model (screw w/locknut max. extension)

“K” model (micrometer w/keylock max. extension)

“H” model (handknob) max. extension

Gage port or remote control port
- .5625-18 UNF-2B thd. for 5/8” O.D. tubing
- G 1/4 BSP thd.

Tank port (T port) - ∅ 19.0 (.75) SAE Code 61
4-bolt flange connection thru -
CPF2S-08 1” Flange -
Single Pressure Relief Valve
With Vent

mm (inch)

Tank port (T port) -
Ø 25.4 (1.00) SAE Code 61
4-bolt flange connection thru

Pressure port (P port) -
Ø 25.4 (1.00) SAE Code 61
4-bolt flange connection thru

Pressure adjusting lock screw
(5/64” hex key req’d. to
lock/unlock set screw)

For key removal

Pressure adjustment
(clockwise rotation
increases pressure)

“W” model -
(screw w/locknut
max. extension)

“K” model -
(micrometer w/keylock
max. extension)

“H” model (handknob) max. extension

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4” O.D. tubing
- G 1/8 BSP thd.
CPF2S-10 1¼” Flange -
Single Pressure Relief Valve
With Vent

mm (inch)

Pressure port (P port) -  
∅ 31.8 (1.25) SAE Code 61
4-bolt flange connection thru

Pressure adjusting lock screw
(5/64" hex key req’d to lock/un-
lock set screw)

For key removal

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.

“W” model
(screw w/locknut
max. extension)

“K” model
(micrometer w/keylock
max. extension)

“H” model (handknob) max. extension

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.

“W” model
(screw w/locknut
max. extension)

“K” model
(micrometer w/keylock
max. extension)

“H” model (handknob) max. extension

155,0 (6.10)

118,3 (4.66)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.

Pressure adjustment
(clockwise rotation increases pressure)

188,5 (7.42)

186,9 (7.36)

136,1 (5.36)

67,0 (2.64)

1.9 (.08)

167,0 (6.57)

109,0 (4.29)

144,4 (5.69)

189,4 (7.46)

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4" O.D. tubing
- G 1/8 BSP thd.
CPF2S-12 – Code 61
CPF2V-12 – Code 62
1 1/2” Flange -
Single Pressure Relief Valve
With Vent

Pressure port (P port) -
∅ 38.1 (1.50) SAE Code 61 4-bolt flange (For CPF1V-12, Code 62 4-bolt flange) connection thru

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

Tank port (T port) -
∅ 38.1 (1.50) SAE Code 61 4-bolt flange (For CPF1V-12, Code 62 4-bolt flange) connection thru

Pressure adjusting lock screw (%64” hex key req’d to lock/unlock set screw)

For key removal

“W” model
(screw w/locknut max. extension)

“K” model
(micrometer w/keylock max. extension)

“H” model (handknob) max. extension

External drain port
(when ordered per model code)
- .4375-20 UNF-2B thd. for 1/4” O.D. tubing
- G 3/8 BSP thd.
Bi-Pressure & Tri-Pressure Relief Valves With Venting

Flange Sizes
- 06 - 3/4 inch flange
- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange

Benefits
- Excellent repeatability and stable performance from cartridge design mainstage parts.
- Reduced installed costs and space requirements.
- Easier installation and servicing of components.
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.
- Direct mounting to pump flange reduces potential leak points for superior leak resistance.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>CPF3/4S—06</th>
<th>CPF3/4S—08</th>
<th>CPF3/4S—10</th>
<th>CPF3/4S—12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum flow</td>
<td>100 l/min (26 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
</tr>
<tr>
<td>P port pressure</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)*</td>
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<tr>
<td>T port pressure</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
</tr>
</tbody>
</table>

* The CPF2V-12 (code 62 flange) has a max. P port pressure rating of 350 bar (5000 psi).

Pilot Valve Max. T Port Pressure Rating
- 100 bar (1450 psi) for DG4V-3S valve
- 210 bar (3045 psi) for DG4V-3 valve AC
- 210 bar (3045 psi) for DG4V-3 valve DC

Electrical Response
- Time from initiation of power to the solenoid, to the initiation of pressure rise, with 1.5 liters (.4 USgpm) of oil under compression:
  - 06 size – @100 l/min (26 USgpm) = DC - 200 ms
  - 08 size – @300 l/min (80 USgpm) = DC - 210 ms
  - 10/12 size – @300 l/min (80 USgpm) = DC - 180 ms

Hydraulic Response
- 06 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 3450 bar (50000 psi) /second. Maximum overshoot < 8%.
- 08 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2900 bar (42000 psi) /second. Maximum overshoot < 10%.
- 10/12 Sizes: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2600 bar (37500 psi) /second. Maximum overshoot < 10%.

General Description
This Vickers CPF3/4S relief valve features flange mounting for increased design flexibility and reduced external piping. The valve is designed for direct mounting on the SAE flange outlet port of a pump. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

Pressure relief valves are used to limit or control pressure by directing system flow to the reservoir when system pressure reaches the setting of the valve. System overload is thereby prevented and peak pressures which could damage the pump and actuating components are eliminated.

This valve features an integrally mounted 3-position solenoid vent valve which requires no additional piping. Energizing the “a” or “b” solenoid selects pressure setting (2) or (1) respectively. With neither solenoid energized the relief valve is vented to limit system pressure to the maximum vent pressure. The CPF4S tri-pressure relief valve is a pressure control unit which can be used to electrically select any one of three preset pressures, or two pressures and vent with the CPF3S.

The CPF3/4S relief valve has excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. CPF relief valves are of two-stage design with a fast-acting poppet type main stage for simple, long-lasting and effective operation. The many available control options make it possible to choose the optimum valve model for each application.
# CPF3/4* Model Series

## Model Code

| C | PF | * | * | * | - | * | * | * | * | * | - | (B) | - | (RC) | - | (1) | - | 3 | (S) | (V) | - | M | - | (S*) | - | *** | (L) | - | * | * | - | 20 |

### 1. Valve Function
- **C** - Relief

### 2. Mounting Type
- **PF** - Pump flange mounting

### 3. Unit Type
- **3** - Bi-pressure with max. pressure override
- **4** - Tri-pressure

### 4. Flange Type
- **S** - SAE J518 4-bolt flange standard series code 61 (available all sizes)
- **V** - SAE J518 4-bolt high pressure series code 62 (size 12 only)

### 5. Valve Size
- **06** - 3/4 inch
- **08** - 1 inch
- **10** - 1 1/4 inch
- **12** - 1 1/2 inch

### 6. Head 1 Pressure Range
- **A** - 10 - 50 bar (145 - 725 psi)
- **B** - 10 - 100 bar (145 - 1450 psi)
- **F** - 10 - 207 bar (145 - 3000 psi)
- **G** - 10 - 275 bar (145 - 4000 psi) 350 bar (5000 psi) (CPF*V-12 models only)

### 7. Head 2 Pressure Range
- **A** - 10 - 50 bar (145 - 725 psi)
- **B** - 10 - 100 bar (145 - 1450 psi)
- **F** - 10 - 207 bar (145 - 3000 psi)
- **G** - 10 - 275 bar (145 - 4000 psi) 350 bar (5000 psi) (CPF*V-12 models only)

### 8. Head 3 Pressure Range
- **A** - 10 - 50 bar (145 - 725 psi)
- **B** - 10 - 100 bar (145 - 1450 psi)
- **F** - 10 - 207 bar (145 - 3000 psi)
- **G** - 10 - 275 bar (145 - 4000 psi) 350 bar (5000 psi) (CPF*V-12 models only)

Note: Head 3 is the maximum pressure override adjustment. The pressure range selection should be at least 17 bar (250 psi) higher than those for Heads 1 and 2.

### 9. Control Type
- **W** - Screw adjust with locknut
- **H** - Handknob adjust without key
- **K** - Micrometer adjust with keylock

### 10. Thread Type
- **Remote Control/Vent Connection**
  - **Blank** - SAE-6 O-ring boss port (.5625-18 UNF-2B thd.)
  - **B** - BSP-G 1/4 (1/4" BSPF)

### 11. Remote Control
- **Blank** - No remote control
- **RC** - Remote Control

### 12. Pilot Drain
- **Blank** - Internal drain
- **1** - External drain

### 13. Vent Valve
- **3S** - Standard performance
- **3** - High performance

Uses 0C type spool/spring for CPF3 and 2C type spool/spring for CPF4; other features are optional. Refer to Vickers literature # GB-C-2015B Solenoid Operated Directional Control Valves catalog.

### 14. Manual Override Options

### 15. Solenoid Energization Identification

### 16. Electrical Options Flag

### 17. Spool Position Monitoring Switch

### 18. Solenoid Type/Electrical Connections

### 19. Indicator Lights

### 20. Coil Voltage Identification

### 21. Tank Rating Pressure
- **2** - 10 bar (145 psi) for spool position indicator models.
- **5** - 100 bar (1450 psi) for standard performance models, DG4V-3S, with AC or DC solenoids.
- **6** - 207 bar (3000 psi) for high performance models, DG4V-3, with AC solenoids.
- **7** - 207 bar (3000 psi) for high performance models, DG4V-3 with DC solenoids.

### 22. Design Number, 20 Series

Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.
Circuit Schematics

**CPF3S-06/08-*-20**

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) max. flow

**CPF4S-06/08-*-20**

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) max. flow

**CPF3S-10/12-*-20**

**CPF3V-12-*-20**

**CPF4S-10/12-*-20**

**CPF4V-12-*-20**

-10/-12 size 600 l/min (160 USgpm) max. flow
Pressure Curves

CPF3/4S-06

Typical Pressure Override
Internal Drain
External Drain

Flow l/min

Pressure Drop bar

Flow USgpm

CPF3/4S-08

Vented Δ P to T

Pressure Drop bar

Flow l/min

Flow USgpm

Pressure Drop psi

Flow USgpm

Pressure Drop psi

Typical Pressure Override
Internal Drain
External Drain

Typical Pressure Override
Internal Drain
External Drain
CPF3/4S-10

Typical Pressure Override
Internal Drain  
External Drain  

Vented Δ P to T
Internal Drain  
External Drain  

Flow USgpm

Pressure Drop bar

Flow l/min

CPF3/4S-12
CPF3/4V-12

Typical Pressure Override
Internal Drain  
External Drain  

Vented Δ P to T
Internal Drain  
External Drain  

Flow USgpm

Pressure Drop psi

Flow l/min
**Installation Dimensions**

**CPF3/4S-06 3/4\(^{\prime}\) Flange - Bi-Pressure With Safety & Tri-Pressure Relief Valve**

### Pressure Port (P port)
- 19.0 (.75) SAE Code 61 4-bolt flange connection
- \(\phi 19.0 \text{ (.75) SAE Code 61 4-bolt flange connection} \)
- Pressure adjusting lock screw (5/64\(^{\prime}\) hex key req’d. to lock/unlock set screw)

### Tank Port (T port)
- 19.0 (.75) SAE Code 61 4-bolt flange connection thru

### Gage Port or Remote Control Port
- .5625-18 UNF-2B thd. for 3/4” O.D. tubing
- G 1/4 BSP thd.

### For Key Removal
- 197.8 (7.79)
- “W” model (screw w/locknut max. extension)
- “K” model (micrometer w/keylock max. extension)

### Pressure Adjustment
- (clockwise rotation increases pressure)

### Head #1
- 186.7 (7.35)

### Head #2
- 133.0 (5.23)

### Head #3
- 126.6 (4.98)

### External Drain Port
- .4375-20 UNF-2B thd. for 1/4\(^{\prime}\) O.D. tubing
- G 1/8 BSP thd.

### Ref.
- 63.0 (2.48)
- 51.5 (2.03)
- 13.6 (.54) Ref.
CPF3/4S-08 1” Flange - Bi-Pressure With Safety & Tri-Pressure Relief Valve

mm (inch)

Pressure adjusting lock screw

(3/64” hex key req’d. to lock/unlock set screw)

Pressure adjustment
(clockwise rotation increases pressure)

Gage port or remote control port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

Tank port
(T port) - Ø 25.4 (1.00) SAE Code 61 4-bolt flange connection thru -

For key removal

“W” model
(screw w/locknut max. extension)

“K” model
(micrometer w/keylock max. extension)

“H” model (handknob) max. extension

Head #1

Head #2

Head #3

External drain port
(see model code)
- .4375-20 UNF-2B thd. for 1/4” O.D. tubing
- G 1/8 BSP thd.
CPF3/4S-10 1\(\frac{1}{4}\)” Flange - Bi-Pressure With Safety & Tri-Pressure Relief Valve

Pressure adjusting lock screw (5/64” hex key req’d. to lock/unlock set screw)

Pressure adjustment (clockwise rotation increases pressure)

Pressure port (P port) - ∅ 31.8 (1.25) SAE Code 61 4-bolt flange connection thru

Gage port or remote control port
- .5625-18 UNF-2B thd. for \(\frac{3}{8}\)” tubing
- G \(\frac{1}{4}\) BSP thd.

Tank port (T port) - ∅ 31.8 (1.25) SAE Code 61 4-bolt flange connection thru

Gage port or remote control port
- .5625-18 UNF-2B thd. for \(\frac{3}{8}\)” tubing
- G \(\frac{1}{4}\) BSP thd.

External drain port
- 186.9 (7.36) G 1/8 BSP thd.

For key removal

“W” model (screw w/locknut max. extension)

“K” model (micrometer w/keylock max. extension)

“H” model (handknob) max. extension

Head #1
Head #2
Head #3

Ref. 61.0 (2.40) 58.1 (2.29) 30.0 (1.18)

67.0 (2.64) 136.1 (5.36) 188.5 (7.36)

1.9 (.08)

144.4 (5.69)

188.4 (7.46)

31
CPF3/4S-12 – Code 61
CPF3/4V-12 – Code 62
1\(\frac{1}{2}\)" Flange -
Bi-Pressure With Safety & Tri-Pressure Relief Valve

mm (inch)

Pressure adjusting lock screw (\(\frac{3}{32}\)" hex key req’d to lock/unlock set screw)

Pressure adjustment (clockwise rotation increases pressure)

For key removal

Gage port or remote control port
- .5625-18 UNF-2B thd. for \(\frac{3}{8}\)" O.D. tubing
- G \(\frac{1}{4}\) BSP thd.

Head #1
Head #3
Head #2

External drain port
(see model code)
- .4375-20 UNF-2B thd. for \(\frac{1}{4}\)" O.D. tubing
- G \(\frac{1}{8}\) BSP thd.
## Flange Sizes
- 06 - 3/4 inch flange
- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange

## Benefits
- Excellent repeatability and stable performance from cartridge design mainstage parts.
- Reduced installed costs and space requirements.
- Easier installation and servicing of components.
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.
- Direct mounting to pump flange reduces potential leak points for superior leak resistance.
- Multi-fluid capability without the need to change seals.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>UPF1S—06</th>
<th>UPF1S—08</th>
<th>UPF1S—10</th>
<th>UPF1S—12*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum flow:</td>
<td>100 l/min (26 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
</tr>
<tr>
<td>External drain</td>
<td>300 l/min (80 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal drain</td>
<td>151 l/min (40 USgpm)</td>
<td></td>
<td>151 l/min (40 USgpm)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum pressure:</th>
<th>P port</th>
<th>T port</th>
<th>P port</th>
<th>T port</th>
</tr>
</thead>
<tbody>
<tr>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)*</td>
</tr>
<tr>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
</tr>
</tbody>
</table>

* The UPF1V-12 (code 62 flange) has a max. P port pressure rating of 350 bar (5000 psi).

### General Description
This Vickers UPF1S unloading valve features flange mounting for increased design flexibility and reduced external piping. The valve is designed for direct mounting on the SAE flange outlet port of a pump. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

Unloading valves are used in accumulator charging circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the desired accumulator pressure is reached. These valves may also be used to unload the low pressure side of double pumps. The unloading valves also function as pressure relief valves when the remote pressure is lower than the plunger pressure setting.

In construction, an unloading valve contains a compound relief valve with a poppet-type main stage, an integral (when ordered per model code) check valve to prevent reverse flow from the accumulator, and a pressure operated plunger which vents the relief valve at the selected pressure.

The UPF1S valve has excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. UPF valves are of two-stage design with a fast-acting poppet type main stage for simple, long-lasting and effective operation. The many available control options make it possible to choose the optimum valve model for each application.
UPF1* Model Series

Model Code

**UPF1** - (**) - **06** - **F** - **B** - (P) - (1) - 20

1. **Valve Function**
   - U - Unloading valve

2. **Mounting Type**
   - PF - Pump flange mounting

3. **Unit type**
   - 1 - Single pressure without vent

4. **Flange Type**
   - S - SAE J518 4-bolt flange standard series code 61 (available in all sizes)
   - V - SAE J518 4-bolt high pressure series code 62 (size 12 only)

5. **Integral Check Valve**
   - Blank - Without check valve
   - C - With right angle check - Not available with UPF1V-12
   - CL - With In-line check

6. **Valve Size**
   - 06 - 3/4 inch
   - 08 - 1 inch
   - 10 - 1 1/4 inch
   - 12 - 1 1/2 inch

7. **Pressure Adjustment Range**
   - A - 9 - 70 bar (130 - 1000 psi)
   - B - 9 - 125 bar (130 - 1800 psi)
   - F - 9 - 245 bar (130 - 3600 psi)
   - G - 9 - 275 bar (130 - 4000 psi)
   - 350 bar (5000 psi) - (UPF1V-12 models only)

8. **Control Type**
   - W - Screw adjust with locknut
   - K - Micrometer adjust with keylock
   - M - Micrometer adjust w/o keylock

9. **Thread Type**
   - (remote control/vent connection)
   - Blank - SAE-6 O-ring boss port (.5625-18 UNF-2B thd.)
   - B - BSP-G 1/4" (1/4" BSPF)

10. **Accumulator Sense Port**
    - Blank - Internal sense port
    - P - External sense port (not available on models w/integral check)

11. **Pilot Drain**
    - Blank - Internal drain
    - 1 - External drain

12. **Design Number, 20 series**
    - Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.

* The integral check valve is not the same as the DCPFS right angle check valve.
**Circuit Schematics**

**UPF1S-C*-06/08-*-20 with check valve**

- 06 size 100 l/min (26 USgpm) max. flow
- 08 size 300 l/min (80 USgpm) external drain
- 150 l/min (40 USgpm) internal drain max. flow

**UPF1S-06/08-(P)-*-20 without check valve**

**UPF1S-C*-10/12-*-20 with check valve**

-10/-12 sizes 600 l/min (160 USgpm) max. flow

**UPF1S-10/12-(P)-*-20 without check valve**
Pressure Curves

**UPF1S-06**
Unload vs Recharge $\Delta P$ Pressure @100 l/min (26 USgpm) with integral check valve as supplied.
Internal Drain
External Drain

<table>
<thead>
<tr>
<th>Unload Pressure - psi</th>
<th>Recharge Pressure $\Delta P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6.8</td>
</tr>
<tr>
<td>34.5</td>
<td>13.8</td>
</tr>
<tr>
<td>69</td>
<td>20.6</td>
</tr>
<tr>
<td>138</td>
<td>27.5</td>
</tr>
<tr>
<td>207</td>
<td>34.5</td>
</tr>
<tr>
<td>276</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow - l/min</th>
<th>Pressure Drop - bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>60</td>
<td>4</td>
</tr>
<tr>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>100</td>
<td>5</td>
</tr>
</tbody>
</table>

Vented $\Delta P$ to T
Internal Drain
External Drain

<table>
<thead>
<tr>
<th>Flow - USgpm</th>
<th>Pressure Drop - psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>1.5</td>
</tr>
<tr>
<td>10.6</td>
<td>3.0</td>
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<td>15.9</td>
<td>4.5</td>
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<tr>
<td>21.1</td>
<td>5.5</td>
</tr>
<tr>
<td>26.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

$\Delta P$ P to P
With 0.34 bar (5 psi) Check Valve

**UPF1S-08**
Unload vs Recharge $\Delta P$ Pressure with integral check valve as supplied.
Internal Drain @150 l/min (40 USgpm)
External Drain @300 l/min (80 USgpm)

<table>
<thead>
<tr>
<th>Unload Pressure - psi</th>
<th>Recharge Pressure $\Delta P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6.8</td>
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<tr>
<td>34.5</td>
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<tr>
<td>276</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow - l/min</th>
<th>Pressure Drop - bar</th>
</tr>
</thead>
<tbody>
<tr>
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Vented $\Delta P$ P to T
Internal Drain
External Drain

<table>
<thead>
<tr>
<th>Flow - USgpm</th>
<th>Pressure Drop - psi</th>
</tr>
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<tbody>
<tr>
<td>13.2</td>
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<td>79.3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

$\Delta P$ P to P
With 0.34 bar (5 psi) Check Valve
**Pressure Curves**

**UPF1S-10**

Unload vs Recharge $\Delta P$ Pressure with integral check valve as supplied.

- **Internal Drain** @600 l/min (160 USgpm)
- **External Drain** @600 l/min (160 USgpm)

**UPF1S(V)-12**

Unload vs Recharge $\Delta P$ Pressure with integral check valve as supplied.

- **Internal Drain** @600 l/min (160 USgpm)
- **External Drain** @600 l/min (160 USgpm)

**Pressure Drop - bar**

- 0 5 10 15 20 25 30 35 40

**Unload Pressure - psi**

- 0 5 10 15 20 25 30 35 40

**Flow - l/min**

- 0 100 200 300 400 500 600

**Flow - USgpm**

- 26.4 52.8 79.3 105.6 132 158.4 290

**Vented $\Delta P P$ to T**

- **Internal Drain** @600 l/min (160 USgpm)
- **External Drain** @600 l/min (160 USgpm)

**With 0.34 bar (5 psi) Check Valve**

- **Flow - USgpm**

- 26.4 52.8 79.3 105.6 132 158.4 290

- **Pressure Drop - psi**

- 0 5 10 15 20 25 30 35 40

- **CL** in-line check

- **C** right angle check

**Recharge Pressure $\Delta P$**

- 0 5 10 15 20 25 30 35 40

- **Unload Pressure - psi**

- 0 5 10 15 20 25 30 35 40

- **Pressure Drop - bar**

- 0 5 10 15 20 25 30 35 40

- **Flow - l/min**

- 0 100 200 300 400 500 600

- **Flow - USgpm**

- 26.4 52.8 79.3 105.6 132 158.4 290

- **Pressure Drop - psi**

- 0 5 10 15 20 25 30 35 40

- **CL** in-line check

- **C** right angle check

**C** right angle check

**CL** in-line check
Installation Dimensions

UPF1S-06 3/4” Flange - Unloading Valve without Vent or Check

mm (inch)

- P port (inlet) 140.3 (5.53)
- P port (outlet) 39.6 (1.56)
- T port Ø 19.0 (.75) SAE Code 61 4-bolt flange connection 32.5 (1.28)
- 63.4 (2.50)
- Accumulator pressure gage port or external pilot port (models w/o check valve)
  - .5625-18 UNF-2B thd. for 3/8” O.D. tubing
  - G 1/4 BSP thd.
- External drain port
  - .5625-18 UNF-2B thd. for 3/8” O.D. tubing
  - G 1/4 BSP thd.
- For key removal
  - “M” model (with micrometer adjust max. extension)
  - “K” model (key lock with micrometer adjust max. extension)
- For cap removal
  - “W” model (screw w/locknut max. extension)
Installation Dimensions

UPF1S-C*-06 3/4” Flange - Unloading Valve with Check without Vent

mm (inch)

"C" Models
Right Angle Check

Accumulator pressure age port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

"CL" Models
In-line Check

For key removal

For cap removal

"W" model (screw w/locknut max. extension)

"M" model (with micrometer adjust max. extension)

"K" model (key lock with micrometer adjust max. extension)
UPF1S-08 1” Flange - Unloading Valve without Vent or Check

mm (inch)

P port (inlet)  
T port Ø 25.4 (1.00) SAE Code 61 4-bolt flange connection

P port (outlet)  
Accumulator pressure gage port or external pilot port (models w/o check valve)  
- .5625-18 UNF-2B thd. for $\frac{3}{16}$” O.D. tubing  
- G $\frac{1}{4}$ BSP thd.

For key removal

“M” model (with micrometer adjust max. extension)

“K” model (key lock with micrometer adjust max. extension)

External drain port  
- .5625-18 UNF-2B thd. for $\frac{3}{16}$” O.D. tubing  
- G $\frac{1}{4}$ BSP thd.

For cap removal

“W” model (screw w/locknut max. extension)
UPF1S-C*-08 1” Flange -
Unloading Valve with Check without Vent

mm (inch)

"C" Models
Right Angle Check

Accumulator pressure gage port
or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

"W" model
(screw w/locknut max. extension)

"M" model (with micrometer adjust max. extension)

"K" model (key lock with micrometer adjust max. extension)

For key removal

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

"CL" Models
In-line Check

For cap removal

For key removal

Gage port .5625-18 UNF-2B thd. for 3/8” tubing
G 1/4 BSP thd.
UPF1S-10 1¼” Flange - Unloading Valve Without Vent or Check

mm (inch)

P port (inlet)
T port Ø 31.8 (1.25) SAE Code 61 4-bolt flange connection

P port (outlet)

 Accumulator pressure gage port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

“M” model (with micrometer adjust max. extension)
“K” model (key lock with micrometer adjust max. extension)

For cap removal

For key removal
UPF1S-C*-10 1 1/4” Flange - Unloading Valve with Check without Vent

**“C” Models**
Right Angle Check

- P port (inlet)
  - T port \(\odot 31.8\) (1.25) SAE Code 61 4-bolt flange connection
- Gage port .5625-18 UNF-2B thd. for \(\frac{3}{8}\)" tubing
- G \(\frac{3}{4}\) BSP thd.
- P port (outlet)

**“CL” Models**
In-line Check

- P port (inlet)
  - T port \(\odot 31.8\) (1.25) SAE Code 61 4-bolt flange connection
- Gage port .5625-18 UNF-2B thd. for \(\frac{3}{8}\)" tubing
- G \(\frac{3}{4}\) BSP thd.
- For cap removal
- For key removal

Accumulator pressure gage port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for \(\frac{3}{8}\)" O.D. tubing
- \(\frac{1}{4}\) BSP thd.

External drain port
- .5625-18 UNF-2B thd. for \(\frac{3}{8}\)" O.D. tubing
- \(\frac{1}{4}\) BSP thd.

‘W’ model (screw w/locknut max. extension)

‘M’ model (with micrometer adjust max. extension)

‘K’ model (key lock with micrometer adjust max. extension)
UPF1S-12 – Code 61
UPF1V-12 – Code 62
1 1/2” Flange -
Unloading Valve without Vent or Check

mm (inch)

P port (inlet)

“V” series
40.0
(1.57)

79.6
(3.13)

80.0 “V” series
(3.15)

Tank port (T port)
∅ 38.1 (1.50) SAE Code 61
4-bolt flange
(For UPF1V-12, Code 62 4-bolt flange) connection thru

Code 62 flange

P port (outlet)

190.2
(7.49)

3.3
(.13)

3.7 “V” series
(.14)

“M” model (with micrometer adjust max. extension)
“K” model (key lock with micrometer adjust max. extension)

Pressure port (P port) -
∅ 38.1 (1.50) SAE Code 61
4-bolt flange
(For UPF1V-12, Code 62 4-bolt flange) connection thru

Accumulator pressure gage port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

For key removal

For cap removal

“W” model (screw w/locknut max. extension)
Tank port (T port) - ∅ 38.1 (1.50) SAE Code 61 4-bolt flange thru

UPF1S-C'-12 Code 61
UPF1V-CL-12 Code 62
1½” Flange - Unloading Valve without Vent with Check

mm (inch)

“C” Model Code 61
Right Angle Check

P port (inlet) 190.2 (7.49)
P port (outlet)

80.8 (3.18)

79.6 (3.13)
39.6 (1.56)

225.6 (8.88)
132.5 (5.22)

Pressure port (P port) - ∅ 38.1 (1.50) SAE Code 61 4-bolt flange connection

132.5 (5.22)

78.5 (3.09)
39.0 (1.54) Ref.

48.5 (1.91)

97.0 (3.82)
63.1 (2.49)

152.8 (6.02)

Accumulator pressure gage port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/16” O.D. tubing
- G 1/4 BSP thd.

“CL” Model Code 61
In-line Check

P port (inlet) 190.2 (7.49)
P port (outlet)

79.6 (3.13)
39.6 (1.56)

155.8 (6.13)

196.9 (7.75)
190.2 (7.49)

41.0 (1.61)
3.7 (0.14)

External drain port (screw w/locknut max. extension)

108.7 (4.29)

152.2 (5.99)

171.7 (6.76)

“M” model (with micrometer adjust max. extension)

For cap removal

155.7 (6.13)

“W” model (with micrometer adjust max. extension)

128.7 (5.07)

For key removal

“K” model (key lock with micrometer adjust max. extension)
Unloading Valves - With Vent

Flange Sizes
- 06 - 3/4 inch flange
- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange

Benefits
- Excellent repeatability and stable performance from cartridge design mainstage parts.
- Reduced installed costs and space requirements.
- Easier installation and servicing of components.
- Pilot design minimizes response time and cracking flow which allows for high pressure stability thus increasing system productivity.
- Direct mounting to pump flange reduces potential leak points for superior leak resistance.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>UPF2S—06</th>
<th>UPF2S—08</th>
<th>UPF2S—10</th>
<th>UPF2S—12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum flow</td>
<td>100 l/min (26 USgpm)</td>
<td>300 l/min (80 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
<td>600 l/min (160 USgpm)</td>
</tr>
<tr>
<td>P port</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)*</td>
</tr>
<tr>
<td>T port</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
<td>207 bar (3000 psi)</td>
</tr>
</tbody>
</table>

* The CPF2V-12 (code 62 flange) has a max. P port pressure rating of 350 bar (5000 psi).

Pilot Valve Max. T Port Pressure Rating
100 bar (1450 psi) for DG4V-3S valve
207 bar (3000 psi) for DG4V-3 valve AC
207 bar (3000 psi) for DG4V-3 valve DC

Electrical Response
Electrical response is defined as the time from initiation of power to the solenoid, to the initiation of pressure rise, with 1.5 liters .4 USgpm) of oil under compression:

06 size –
@100 l/min (26 USgpm) = DC - 200 ms
AC - 160 ms

08 size –
@300 l/min (80 USgpm) = DC - 210 ms
AC - 175 ms

10/12 size -
@300 l/min (80 USgpm) = DC - 180 ms
AC - 160 ms

Hydraulic Response
06 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 3450 bar (50000 psi) /second. Maximum overshoot < 8%.

08 Size: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2900 bar (42000 psi) /second. Maximum overshoot < 10%.

10/12 Sizes: Rate of pressure rise with 2.5 liters (.7 USgpm) of oil under compression = 2600 bar (37500 psi) /second. Maximum overshoot < 10%.

General Description
This Vickers UPF2S relief valve features flange mounting for increased design flexibility and reduced external piping. The valve is designed for direct mounting on the SAE flange outlet port of a pump. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

Unloading valves are used in accumulator charging circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the desired accumulator pressure is reached. These valves may also be used to unload the low pressure side of double pumps. The unloading valves also function as pressure relief valves when the remote pressure is lower than the plunger pressure setting. The UPF2S valve has excellent dynamic and steady state operating characteristics including stability, fast response and low pressure override. UPF valves are of two-stage design with a fast-acting poppet type main stage for simple, long-lasting and effective operation. The many available control options make it possible to choose the optimum valve model for each application.

In construction, an unloading valve contains a compound relief valve with a poppet-type main stage, a check valve to prevent reverse flow from the accumulator, and a pressure operated plunger, which vents the relief valve at the selected pressure.
## UPF2* Model Series

### Model Code

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em><em>U P F 2 * - () - ** - * - * - (B) - (P) - (1) - 3(S) (X) (V) M - (S</em>) - *** (L) - * - * - 20</em>*</td>
<td></td>
</tr>
</tbody>
</table>

### Valve Function

- U - Unloading valve

### Mounting Type

- PF - Pump flange mounting

### Unit Type

- 2 - Single pressure with vent

### Flange Type

- S - SAE J518 4-bolt flange standard series code 61 (available all sizes)
- V - SAE J518 4-bolt high pressure series code 62 (size 12 only)

### Integral Check Valve*

- Blank - Without right angle check
- C - With right angle check - Not available with UPF2V-12
- CL - In-line check

### Valve Size

- 06 - 3/4 inch
- 08 - 1 inch
- 10 - 1 1/4 inch
- 12 - 1 1/2 inch

### Pressure Adjustment Range

- A - 9 - 70 bar (130 - 1000 psi)
- B - 9 - 125 bar (130 - 1800 psi)
- F - 9 - 245 bar (130 - 3600 psi)
- G - 9 - 275 bar (130 - 4000 psi)
  - 350 bar (5000 psi) - (UPF2V-12 models only)

### Control Type

- W - Screw adjust with locknut
- K - Micrometer adjust with keylock
- M - Micrometer adjust w/o keylock

### Thread Type

- Blank - SAE-6 O-ring boss port (.5625-18 UNF-2B thd.)
- B - BSP-G 1/4 (1/4" BSPF)

### Accumulator Sense Port

- Blank - Internal sense port
- P - External sense port (not available w/check models)

### Pilot Drain

- Blank - Internal drain
- 1 - External drain

### Vent Valve

- 3S - Standard performance
- 3 - High performance

Uses 22A type spool/spring; other features are optional. Refer to Vickers literature # GB-C-2015B Solenoid Operated Directional Control Valves catalog.

### Manual Override Options

- Blank - Internal drain
- 1 - External drain

### Solenoid Energization Identification

### Electrical Options Flag

### Spool Position Monitoring Switch

### Solenoid Type/Electrical Connections

### Indicator Lights

### Coil Voltage Identification

### Tank Rating Pressure

- 2 - 10 bar (145 psi) for spool position indicator models.
- 5 - 100 bar (1450 psi) for standard performance models, DG4V-3S, with AC or DC solenoids.
- 6 - 207 bar (3000 psi) for high performance models, DG4V-3, with AC solenoids.
- 7 - 207 bar (3000 psi) for high performance models, DG4V-3, with DC solenoids.

### Design Number, 20 Series

Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.

* The integral check valve is not the same as the DCPFS right angle check valve.
UPF2S-C*-06/08-*-20 with check valve and vent

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) external drain
150 l/min (40 USgpm) internal drain max. flow

UPF2S-06/08-(P)-*-20 with vent and without check valve

-06 size 100 l/min (26 USgpm) max. flow
-08 size 300 l/min (80 USgpm) external drain
150 l/min (40 USgpm) internal drain max. flow

UPF2S-C*-10/12-*-20 with check valve and vent

-10/-12 sizes 600 l/min (160 USgpm) max. flow

UPF2S-10/12-(P)-*-20 with vent and without check valve
Pressure Curves

**UPF2S-06**
Unload vs Recharge $\Delta P$ Pressure @100 l/min (26 USgpm) with integral check valve as supplied.
- Internal Drain
- External Drain

**UPF2S-08**
Unload vs Recharge $\Delta P$ Pressure with integral check valve as supplied.
- Internal Drain @150 l/min (40 USgpm)
- External Drain @300 l/min (80 USgpm)

**Vented $\Delta P$ P to T**
- Internal Drain
- External Drain

---

**Flow - l/min**

<table>
<thead>
<tr>
<th>Flow - l/min</th>
<th>Pressure Drop - bar</th>
<th>Pressure Drop - psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>14.5</td>
</tr>
<tr>
<td>100</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>34.5</td>
</tr>
<tr>
<td>200</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>250</td>
<td>5</td>
<td>58</td>
</tr>
</tbody>
</table>

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**Flow - USgpm**

<table>
<thead>
<tr>
<th>Flow - USgpm</th>
<th>Pressure Drop - bar</th>
<th>Pressure Drop - psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>1</td>
<td>14.5</td>
</tr>
<tr>
<td>10.6</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>15.9</td>
<td>3</td>
<td>34.5</td>
</tr>
<tr>
<td>21.1</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>26.4</td>
<td>5</td>
<td>58</td>
</tr>
</tbody>
</table>

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**Flow USgpm**

<table>
<thead>
<tr>
<th>Flow USgpm</th>
<th>Pressure Drop - bar</th>
<th>Pressure Drop - psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.2</td>
<td>1</td>
<td>14.5</td>
</tr>
<tr>
<td>26.4</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>39.6</td>
<td>3</td>
<td>34.5</td>
</tr>
<tr>
<td>52.8</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>66</td>
<td>5</td>
<td>58</td>
</tr>
<tr>
<td>79.3</td>
<td>6</td>
<td>73</td>
</tr>
</tbody>
</table>

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**UPF2S-06**
Unload Pressure - bar
500 1000 1500 2000 2500 3000 3500 4000
Unload Pressure - psi
500 1000 1500 2000 2500 3000 3500 4000

**UPF2S-08**
Unload Pressure - bar
500 1000 1500 2000 2500 3000 3500 4000
Unload Pressure - psi
500 1000 1500 2000 2500 3000 3500 4000

---

**Flow l/min**

<table>
<thead>
<tr>
<th>Flow l/min</th>
<th>Pressure Drop - bar</th>
<th>Pressure Drop - psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>14.5</td>
</tr>
<tr>
<td>100</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>34.5</td>
</tr>
<tr>
<td>200</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>250</td>
<td>5</td>
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</tbody>
</table>

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**Flow USgpm**

<table>
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<th>Flow USgpm</th>
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<td>52.8</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>66</td>
<td>5</td>
<td>58</td>
</tr>
<tr>
<td>79.3</td>
<td>6</td>
<td>73</td>
</tr>
</tbody>
</table>
UPF2S-10
Unload vs Recharge Δ P Pressure with integral check valve as supplied.
Internal Drain — @600 l/min (160 USgpm)
External Drain — @600 l/min (160 USgpm)

UPF2S(V)-12
Unload vs Recharge Δ P Pressure with integral check valve as supplied.
Internal Drain — @600 l/min (160 USgpm)
External Drain — @600 l/min (160 USgpm)
Installation Dimensions

UPF2S-06

3/4” Flange - Unloading with Vent without Check

mm (inch)

P port (inlet)

Pressure port T port: Ø 19.0 (.75) SAE Code 61 4-bolt flange connection

P port (outlet)

Pressure port P port: Ø 19.0 (.75) SAE Code 61 4-bolt flange connection thru

Accumulator pressure gage port or external pilot port models w/o check valve
- 5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

For key removal

"M" model (with micrometer adjust max. extension)

"K" model (key lock with micrometer adjust max. extension)

External drain port
- 5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.
UPF2S-C*-06

3/4" Flange - Unloading with Vent & Check

mm (inch)

**“C” Models**
Right Angle Check

- Tank port (T port) - ø 19.0 (.75) SAE Code 61 4-bolt flange connection
- G 1/4 BSP thd.

**“CL” Models**
In-line Check

- P port (inlet) - ø 19.0 (.75) SAE Code 61 4-bolt flange connection thru
- G 1/4 BSP thd.

Gage port (accumulator) port .5625-18 UNF-2B thd. for 3/8" tubing
G 1/4 BSP thd.

Pressure port (P port) - ø 19.0 (.75) SAE Code 61 4-bolt flange connection

Accumulator pressure gage port or external pilot port
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.

For key removal

“M” model (with micrometer adjust max. extension)
“K” model (key lock with micrometer adjust max. extension)

For cap removal

“W” model (screw w/locknut max. extension)

External drain port
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.
1” Flange - Unloading with Vent without Check

P port (inlet)
Tank port (T port) - ∅ 25,4 (1.00) SAE Code 61 4-bolt flange connection

Pressure port (P port) - ∅ 25,4 (1.00) SAE Code 61 4-bolt flange connection thru

Accumulator pressure gage port or external pilot port models w/o check valve
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

For key removal
“M” model (with micrometer adjust max. extension)
“K” model (key lock with micrometer adjust max. extension)

For cap removal
“W” model (screw w/locknut max. extension)
**UPF2S-C*-08**

1” Flange - Unloading with Vent & Check

mm (inch)

### “C” Models

**Right Angle Check**

- Tank port (T port) - \( \varnothing 25.4 \) (1.00) SAE Code 61 4-bolt flange connection
- Pressure port (P port) - 65.0 (2.58)
- 90.4 (3.56)
- 166.5 (6.55)
- P port (inlet)

### “CL” Models

**In-line Check**

- Pressure port (P port) - \( \varnothing 25.4 \) (1.00) SAE Code 61 4-bolt flange connection
- 62.7 (2.47)
- 135.4 (5.33)
- Accumulator pressure gage port or external pilot port
  - .5625-18 UNF-2B thd. for \( \frac{3}{16} \)” O.D. tubing
  - G \( \frac{1}{4} \) BSP thd.

- Gage port (accumulator) port - .5625-18 UNF-2B thd. for \( \frac{3}{16} \)” tubing
  - G \( \frac{1}{4} \) BSP thd.

- T port \( \varnothing 25.4 \) (1.00) SAE Code 61 4-bolt flange connection thru
- 63.4 (2.50)
- 32.5 (1.28)
- 154.3 (6.07)

- For key removal
  - “M” model (with micrometer adjust max. extension)
  - “K” model (key lock with micrometer adjust max. extension)

- For cap removal
  - “W” model (screw w/locknut max. extension)

- External drain port
  - .5625-18 UNF-2B thd. for \( \frac{3}{16} \)” O.D. tubing
  - G \( \frac{1}{4} \) BSP thd.
UPF2S-10

1¼” Flange - Unloading with Vent without Check

mm (inch)

For key removal

“M” model (with micrometer adjust max. extension)

“K” model (key lock with micrometer adjust max. extension)

Accumulator pressure gage port or external pilot port (models w/o check valve)
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G 1/4 BSP thd.
UPF2S-C*-10
1¼” Flange - Unloading with Vent & Check

mm (inch)

“C” Models
Right Angle Check

P port (inlet)

T port Ø 31.8
(1.25) SAE
Code 61 4-bolt flange connection

76.9
(3.03)
75.8
(2.98)
38.3
(1.51)

221.7
(8.73)
132.5
(5.22)

Gage port (accumulator)
.5625-18 UNF-2B thd. for 3/8” tubing
G ¼ BSP thd.

P port (outlet)

“CL” Models
In-line Check

P port (inlet)

T port Ø 31.8
(1.25) SAE
Code 61 4-bolt flange connection

196.9
(7.36)
136.1
(5.36)
1.9
(0.08)

167.0
(6.57)
145.8
(5.74)

196.9
(7.36)
136.1
(5.36)
1.9
(0.08)

Accumulator pressure gage port
or external pilot port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G ¼ BSP thd.

For cap removal

“W” model
(screw w/locknut max. extension)

“K” model
(key lock with micrometer adjust max. extension)

For key removal

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G ¼ BSP thd.
UPF2S-12 – Code 61
UPF2V-12 – Code 62
1\(\frac{1}{2}\)” Flange -
Unloading with Vent without Check

mm (inch)

T port ∅ 38.1 (1.50)
SAE Code 61 4-bolt flange. (For UPF2V-12,
Code 62 4-bolt flange)
connection

“V” series 80.0 (3.15)

“V” series 39.6 (1.56)

P port (inlet)

190.2 (7.49)

139.4 (5.49)

80.0 (3.15)

3.3 (.13)

3.7 “V” series (.14)

P port (outlet)
Code 62 flange

Pressure port P port - ∅ 38.1
(1.50) SAE Code 61 4-bolt flange
(For UPF2V-12, Code 62 4-bolt
flange) P port
connection thru

Accumulator pressure gage port or external
pilot port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G \(\frac{1}{4}\) BSP thd.

“M” model (with micrometer adjust max. extension)

“K” model (key lock with micrometer adjust max. extension)

For key removal

171.7 (6.76)

155.7 (6.13)

128.7 (5.07)

For cap removal

156.7 (6.17)

152.2 (5.99)

108.7 (4.28)

“W” model (screw w/locknut max. extension)

External drain port
- .5625-18 UNF-2B thd. for 3/8” O.D. tubing
- G \(\frac{1}{4}\) BSP thd.
UPF2S-C*-12 Code 61
UPF2V-CL-12 Code 62
1½" Flange -
Unloading with Vent & Check

mm (inch)

"C" Model Code 61
Right Angle Check

P port (inlet)
T port
∅ 38.1 (1.50) SAE Code 61 4-bolt flange connection

Gage port (accumulator) port
.5625-18 UNF-2B thd. for 3/8" tubing
G 1/4 BSP thd.

"CL" Model Code 61
In-line Check

P port (inlet)
T port
∅ 38.1 (1.50) SAE Code 61 4-bolt flange connection

"CL" Model Code 62
In-line Check

P port (inlet)
T port
∅ 38.1 (1.50) SAE Code 62 4-bolt flange connection

Pressure Port (P port)
∅ 38.1 (1.50) SAE Code 61 4-bolt flange connection

Accumulator pressure gage port or external pilot port
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.

"W" model (screw w/locknut max. extension)
External drain port
- .5625-18 UNF-2B thd. for 3/8" O.D. tubing
- G 1/4 BSP thd.

"M" model (with micrometer adjust max. extension)
"K" model (key lock with micrometer adjust max. extension)
DCPFS-08/10/12-**-20

Right Angle Check Valves

Flange Sizes

- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange (Not available with Code 62 flanges.)

Benefits

- Fast opening and closing and stable performance.
- Rugged, shock resistant, offset poppet design ensures long service life.
- Easier installation and servicing of components.
- Superior leak resistance due to SAE flange mounting and reduced piping.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>DCPFS-08</th>
<th>DCPFS-10</th>
<th>DCPFS-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum flow</td>
<td>114 l/min (30 USgpm)</td>
<td>227 l/min (60 USgpm)</td>
<td>378 l/min (100 USgpm)</td>
</tr>
<tr>
<td>Maximum pressure</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
<td>275 bar (4000 psi)</td>
</tr>
</tbody>
</table>

General Description

This Vickers DCPFS check valve is flange mounted to increase design flexibility and reduce external piping. Fewer leak points and SAE flange connections lead to installations with superior leak resistance.

The DCPFS check valve is designed for direct mounting on a pump flange, or may be stacked with the CPF series relief valves to provide a pump unloading function. The DCPF is not intended to be used with the UPFS unloading valve.

Poppet design lifts easily to permit flow and reseats quickly to form a leakproof check to block flow in the opposite direction. The DCPFS check valves can be mounted in any position.

The DCPFS check valve has excellent operating characteristics with sizes that make it possible to choose the optimum model for each application.

Right Angle Check Model Code

(F3) DC PF S - ** - ** - 20

1 Special Seals
   F3 - For mineral oil & fire resistant fluids. (Omit if not required)

2 Valve Function
   DC - Check valve

3 Mounting Type
   PF - Pump flange mounting

4 Flange Type
   S - SAE J518 4-bolt flange standard, series code 61

5 Valve Size
   08 - 1" flange
   10 - 1 1/4" flange
   12 - 1 1/2" flange

6 Spring Cracking Pressure
   5 - 0,3 bar (5 psi)
   50 - 3,4 bar (50 psi)
   75 - 5,2 bar (75 psi)

7 Design Number, 20 Series
   Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.
DICPFS-06/08/10/12-**-10

In-Line Check Valves

Flange Sizes
- 06 - 3/4 inch flange
- 08 - 1 inch flange
- 10 - 1 1/4 inch flange
- 12 - 1 1/2 inch flange (Available with Code 62 high pressure.)

<table>
<thead>
<tr>
<th>Maximum flow</th>
<th>DICPFS—06</th>
<th>DICPFS—08</th>
<th>DICPFS—10</th>
<th>DICPFS—12*</th>
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</thead>
<tbody>
<tr>
<td>l/min (USgpm)</td>
<td>120</td>
<td>300</td>
<td>600</td>
<td>750</td>
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</table>

<table>
<thead>
<tr>
<th>Maximum pressure</th>
<th>DICPFS—06</th>
<th>DICPFS—08</th>
<th>DICPFS—10</th>
<th>DICPFS—12*</th>
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</thead>
<tbody>
<tr>
<td>bar (psi)</td>
<td>350</td>
<td>350</td>
<td>280</td>
<td>207</td>
</tr>
</tbody>
</table>

* DICPFV-12 Code 62 high pressure flange is rated at 750 l/min (200 USgpm) at 350 bar (5000 psi)

Features
- Direct mounting to SAE flange.
- Compact, robust design.
- Low pressure drop design.
- Wide flow/pressure range.

General Description
Vickers flange mounted in-line check valves can be used with the existing line of flange mounted pressure controls. The DICPF in-line check valves come in four sizes, 06 (.75”), 08 (1”), 10 (1.25”) and 12 (1.50”).

These are direct, flange mounted, in-line check valves with SAE 4-bolt mounting. They may be mounted directly on an SAE pump flange, actuator, manifold or may be stacked with a Vickers CPF relief valve to provide a pump unloading function.

This mounting style results in a much smaller space requirement and eliminates plumbing and potential leak points that result from installation of conventional line mounted check valves.

These check valves are not to be used with the UPF flange mounted unloading relief valves.

In-Line Check Model Code

<table>
<thead>
<tr>
<th>DICPFS - ** - ** - 10</th>
</tr>
</thead>
</table>

1. **Valve Function**
   DIC – Direct inline check

2. **Mounting Type**
   PF – Pump flange mounting

3. **Flange Type**
   S – SAE J518 4-bolt flange, std. pressure series, code 61
   V – SAE J518 4-bolt flange, high pressure series, code 62 (1.50 in. models only)

4. **Valve Size**
   06 – 0.75 in. flange, SAE-12
   08 – 1.00 in. flange, SAE-16
   10 – 1.25 in. flange, SAE-20
   12 – 1.50 in. flange, SAE-24

5. **Cracking Pressure**
   05 – 0.3 bar (5 psi)
   25 – 1.7 bar (25 psi)

6. **Design Number**
Pressure Drop Data

Right Angle Check Valves
DCPFS—08
Pressure drop chart 0.3 bar (5 psi) and 3.4 bar (50 psi) cracking pressure model

DCPFS—10/12
Pressure drop chart 0.3 bar (5 psi) cracking pressure model

In-Line Check Valves

Flow - USgpm
Flow - l/min
Flow - l/min
Flow - l/min

Pressure Drop Data
Installation Dimensions

DCPFS - 08/10/12
Right Angle Check Valve

mm (inch)

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td>DCPFS-08</td>
<td>102.9 (4.05)</td>
<td>91.9 (3.62)</td>
<td>59.9 (2.36)</td>
<td>64.8 (2.55)</td>
<td>57.2 (2.25)</td>
<td>28.4 (1.12)</td>
<td>135.1 (5.32)</td>
<td>106.7 (4.20)</td>
<td>52.3 (2.06)</td>
<td>26.2 (1.03)</td>
<td>25.4 (1.00) Dia.</td>
<td>26.2 (1.03)</td>
<td>13.2 (.52)</td>
<td>10.3 (.406) Dia.</td>
<td>85.3 (3.36)</td>
<td>41.1 (1.62)</td>
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<tr>
<td>DCPFS-10</td>
<td>146.0 (5.75)</td>
<td>133.6 (5.26)</td>
<td>76.2 (3.00)</td>
<td>80.8 (3.16)</td>
<td>68.3 (2.69)</td>
<td>34.0 (1.34)</td>
<td>152.9 (6.02)</td>
<td>118.6 (4.67)</td>
<td>58.7 (2.31)</td>
<td>29.5 (1.16)</td>
<td>31.7 (1.25) Dia.</td>
<td>30.2 (1.19)</td>
<td>15.0 (.59)</td>
<td>11.9 (.469) Dia.</td>
<td>99.8 (3.93)</td>
<td>48.5 (1.91)</td>
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<tr>
<td>DCPFS-12</td>
<td>146.0 (5.75)</td>
<td>133.6 (5.26)</td>
<td>76.2 (3.00)</td>
<td>80.8 (3.16)</td>
<td>68.3 (2.69)</td>
<td>34.0 (1.34)</td>
<td>152.9 (6.02)</td>
<td>118.6 (4.67)</td>
<td>69.8 (2.75)</td>
<td>35.1 (1.38)</td>
<td>38.1 (1.50) Dia.</td>
<td>35.8 (1.41)</td>
<td>17.8 (.70)</td>
<td>13.5 (.531) Dia.</td>
<td>99.8 (3.93)</td>
<td>48.5 (1.91)</td>
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</table>

DCPF* -06/ 08/10/12
In-Line Check Valve

Standard Pressure Series (Code 61) mm (inch)

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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>3/4” S - 06</td>
<td>19.1 (.75)</td>
<td>50.8 (2.0)</td>
<td>52.0 (2.05)</td>
<td>65.0 (2.56)</td>
<td>66.5 (2.61)</td>
<td>47.6 (1.88)</td>
<td>23.8 (.906)</td>
<td>22.2 (.875)</td>
<td>11.1 (.437)</td>
<td>10.4 (.407)</td>
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<tr>
<td>1” S - 08</td>
<td>25.4 (1.00)</td>
<td>60.0 (2.36)</td>
<td>58.5 (2.30)</td>
<td>70.0 (2.76)</td>
<td>71.5 (2.81)</td>
<td>52.4 (2.06)</td>
<td>26.2 (1.03)</td>
<td>26.2 (1.03)</td>
<td>13.1 (.516)</td>
<td>10.4 (.407)</td>
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<tr>
<td>1 1/4” S - 10</td>
<td>31.6 (1.25)</td>
<td>70.0 (2.76)</td>
<td>73.0 (2.88)</td>
<td>79.0 (3.11)</td>
<td>80.5 (3.16)</td>
<td>58.7 (2.31)</td>
<td>29.4 (1.16)</td>
<td>30.2 (1.19)</td>
<td>15.1 (.594)</td>
<td>12.0 (.470)</td>
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<tr>
<td>1 1/2” S - 12</td>
<td>38.1 (1.50)</td>
<td>76.2 (3.00)</td>
<td>82.5 (3.25)</td>
<td>93.5 (3.68)</td>
<td>95.0 (3.74)</td>
<td>69.9 (2.75)</td>
<td>34.9 (1.38)</td>
<td>35.7 (.141)</td>
<td>17.9 (.703)</td>
<td>13.5 (.532)</td>
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High Pressure Series (Code 62) mm (inch)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1 1/2” V - 12</td>
<td>38.1 (1.50)</td>
<td>76.2 (3.00)</td>
<td>95.0 (3.74)</td>
<td>112.5 (4.43)</td>
<td>114.0 (4.48)</td>
<td>79.4 (3.13)</td>
<td>39.7 (.156)</td>
<td>35.7 (.144)</td>
<td>18.3 (.720)</td>
<td>16.7 (.657)</td>
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</table>
Application Data

Service Information
Refer to the following service drawings for parts breakdown:
CPF1S-06/08/10/12    I-3777-S
CPF2S-06/08/10/12    I-3778-S
CPF3/4S-06/08/10/12  I-3779-S
UPF1S-06/08/10/12    I-3768-S
UPF2S-06/08/10/12    I-3769-S
DCPFS-06/08/10/12   I-3435-S
Pilot valve service drawing:
DG4V–3(S)–**–60    I-3886-S

Weights
<table>
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<tr>
<th>Model</th>
<th>Assembly</th>
<th>A SAE Straight Thread</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>L</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>CPF1S</td>
<td>06</td>
<td>1.0625–12 (7/8” tube)</td>
<td>52,3 (2.06)</td>
<td>65,0 (2.56)</td>
<td>23,6 (.93)</td>
<td>47,8 (1.88)</td>
<td>10,9 (.43)</td>
<td>22,2 (.875)</td>
<td>19,1 (.750)</td>
<td>13,5 (.53)</td>
<td>31,8 (1.25)</td>
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<tr>
<td>CPF2S</td>
<td>06</td>
<td>1.3125–12 (1.0” tube)</td>
<td>58,7 (2.31)</td>
<td>70 (2.75)</td>
<td>26,2 (1.03)</td>
<td>52,4 (2.06)</td>
<td>13,2 (0.52)</td>
<td>26,2 (1.03)</td>
<td>25,4 (1.00)</td>
<td>16,8 (0.66)</td>
<td>35,1 (1.38)</td>
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<tr>
<td>CPF3/4S</td>
<td>08</td>
<td>1.625–12 (1 1/4” tube)</td>
<td>73,2 (2.88)</td>
<td>79,2 (3.12)</td>
<td>29,5 (1.16)</td>
<td>58,7 (2.31)</td>
<td>15 (0.99)</td>
<td>30,2 (1.19)</td>
<td>31,8 (1.25)</td>
<td>21,3 (0.84)</td>
<td>38,1 (1.50)</td>
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<tr>
<td>UPF1S</td>
<td>06 w/check</td>
<td>1.875–12 (1 1/2” tube)</td>
<td>82,6 (3.25)</td>
<td>93,7 (3.69)</td>
<td>35,1 (1.38)</td>
<td>69,9 (2.75)</td>
<td>17,8 (0.70)</td>
<td>35,8 (1.41)</td>
<td>38,1 (1.50)</td>
<td>18,5 (0.73)</td>
<td>41,1 (1.62)</td>
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<tr>
<td>UPF2S</td>
<td>06 w/check</td>
<td>1.0625–12 (7/8” tube)</td>
<td>52,3 (2.06)</td>
<td>65,0 (2.56)</td>
<td>23,6 (.93)</td>
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<td>UPF3S</td>
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<td>1.3125–12 (1.0” tube)</td>
<td>58,7 (2.31)</td>
<td>70 (2.75)</td>
<td>26,2 (1.03)</td>
<td>52,4 (2.06)</td>
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<td>26,2 (1.03)</td>
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<td>UPF4S</td>
<td>08 w/check</td>
<td>1.625–12 (1 1/4” tube)</td>
<td>73,2 (2.88)</td>
<td>79,2 (3.12)</td>
<td>29,5 (1.16)</td>
<td>58,7 (2.31)</td>
<td>15 (0.99)</td>
<td>30,2 (1.19)</td>
<td>31,8 (1.25)</td>
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<td>UPF5S</td>
<td>08 w/check</td>
<td>1.875–12 (1 1/2” tube)</td>
<td>82,6 (3.25)</td>
<td>93,7 (3.69)</td>
<td>35,1 (1.38)</td>
<td>69,9 (2.75)</td>
<td>17,8 (0.70)</td>
<td>35,8 (1.41)</td>
<td>38,1 (1.50)</td>
<td>18,5 (0.73)</td>
<td>41,1 (1.62)</td>
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</tbody>
</table>

Ordering Procedure
When ordering a unit please specify the complete model code, as detailed in the model code sections, which is applicable to your requirements.

4—Bolt SAE Code 61 Flanges* (Maximum operating pressure 207 bar (3000 psi)

mm (inches)

*A Thread SAE straight

“C” Screw thread

Flange mounting surface must be flat and smooth.

* For additional information on SAE 4-bolt flanges see Vickers Catalog 700 or GB-C-2005A
**Fluid Cleanliness**

**Hydraulic Fluid Information**


Recommendations on filtration and the selection of products to control fluid condition are included in Vickers publication 561.

Recommended cleanliness levels using petroleum oil under common conditions is based on the highest fluid pressure levels in the system:

In referencing the table below, the shaded area highlights the recommended cleanliness level for flange mounted valves.

Fluids other than petroleum, severe service cycles or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.

<table>
<thead>
<tr>
<th>SYSTEM PRESSURE LEVEL</th>
<th>PRODUCT</th>
<th>69 bar (1000 psi)</th>
<th>138 bar (2000 psi)</th>
<th>207+ bar (3000+ psi)</th>
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<tbody>
<tr>
<td>Vane Pumps – Fixed</td>
<td></td>
<td>20/18/15</td>
<td>19/17/14</td>
<td>18/16/13</td>
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<tr>
<td>Vane Pumps – Variable</td>
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<td>18/16/14</td>
<td>17/15/13</td>
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<tr>
<td>Piston Pumps – Fixed</td>
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<td>19/17/15</td>
<td>18/16/14</td>
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<td>Piston Pumps – Variable</td>
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<td>19/17/14</td>
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