Pressure Relief Valves

Remote Controls, Relief and Sequence Valves, and Single and Multiple Pressure Solenoid and Air Operated Relief Valves
Introduction

Remote Controls
Small, easily installed remote pressure control valves make it possible to control a balanced piston pressure relief valve from a more convenient location.

Relief and Sequence Valves
Pressure relief valves mount between the pump and valve system to protect against overloads. A suitable pilot valve may be used to "vent" the balanced piston relief valve when the system does not require power. This venting unloads the pump through the relief valve at low pressure, avoiding energy waste and reducing operating costs.

A sensitive adjustment mechanism allows the setting of the pressure in fine increments over a wide range — up to the maximum rating of the valve.

Stepped relief valves at the control console or other remote location, and elimination of separately mounted hydraulic remote controls and related connecting piping, result in lower installed cost. The valves are available with SAE straight threads, NPT threads, or interfaces for manifold or subplate mounting to provide no-leak connections.

Single and Multiple Pressure Solenoid and Air Operated Valves
These balanced piston type valves are used in applications needing an electrically or pneumatically controlled adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to the desired maximum.

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Series Model CGE-02/06/10
Remote/Electrically Modulated Controls

Model Code

<table>
<thead>
<tr>
<th>CGE - 02 - 1 (V) - 2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

Model Series

CGE - Relief valve, manifold or subplate mounted, remote electrically modulated

Valve Size

02 - NFPA-DO 3 (ISO-4401-03) interface
06 - 60 series (3/4" nominal size)
10 - 100 series (1-1/4" nominal size)

Pressure Rating

1 - 70 bar (1000 psi)
3 - 210 bar (3000 psi)

High Vent Spring

(For CGE-06 & -10 3000 psi pressure models only). Omit if not required.

Design Number

Subject to change. Installation dimensions remain as shown for design numbers 20 through 29

General Information

The CGE-02 valve provides the capability to modulate system pressure when connected to a relief or reducing valve or regulating the pressure setting of a pressure compensator variable displacement pump.

The CGE-06/10 provides the capability to modulate system pressure using a remote electrical controller. The pressure setting of the valve is approximately proportional to input current; increasing current provides increasing pressure.

Manual Operation

A manual override adjustment of the CGE-06/10 operates over the full pressure range and should be set just above the maximum pressure to be controlled electrically. For example, the override should be set at 2200 psi when maximum electrically controlled pressure is 2000 psi.

The override adjustment can also be used for complete manual operation of the valve during set up and troubleshooting by isolating the pilot head section from the manual override section. This is done by removing an access plug and reversing a button in the pilot section (see fig. 1).

Electrical Power Supply

Vickers power supply EMCS-*-30 is recommended for controlling this valve. Figure 2 shows the basic diagram (amplifier switch should be in position 1).

Tank Connection

The tank connection should be piped directly to tank through a surge free line to minimize back pressure. If tank line back pressure exceeds system pressure by 7 bar (100 psi) a malfunction may occur. Any pressure in the tank line is an additive when the valve is controlled by the manually adjusted (non-electrical) head.

Pilot Drain Connection

Drain line must be full size unrestricted and connected directly to reservoir so that it terminates below reservoir fluid level. No other lines are to be connected to this drain line. Pressure in this line (taken at the valve) not to exceed 1 bar (15 psi).

Graphical Symbol

Minimum Pressure Specifications (Zero Current)

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow</th>
<th>Minimum Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L/min</td>
<td>bar</td>
</tr>
<tr>
<td>CGE-06-1-2*</td>
<td>76</td>
<td>5.2</td>
</tr>
<tr>
<td>CGE-06-3*-2*</td>
<td>189</td>
<td>5.2</td>
</tr>
<tr>
<td>CGE-06-3V-2*</td>
<td>189</td>
<td>10.4</td>
</tr>
<tr>
<td>CGE-10-1-2*</td>
<td>189</td>
<td>5.2</td>
</tr>
<tr>
<td>CGE-10-3-2*</td>
<td>189</td>
<td>10.4</td>
</tr>
<tr>
<td>CGE-10-3V-2*</td>
<td>189</td>
<td>20.7</td>
</tr>
</tbody>
</table>
Installation Data

Filter Screen

The CGE-02 valve contains a filter screen in the pressure port of the valve head (fig. 3) which may require periodic cleaning, depending on system cleanliness.

The CGE-06/10 valves contain a filter screen in the pressure port of the valve head (fig. 3) and an additional screen in the valve body (fig. 4). Both require periodic cleaning depending on system cleanliness.

WARNING

Before breaking a circuit connection, make certain that power is off and system pressure has been released. Lower all vertical cylinders, discharge accumulators and block any load whose movement could generate pressure. Plug all removed units and cap all lines to prevent the entry of dirt into the system.

To remove the filter screen from the valve head (fig. 3), first shut down the machine and remove the access plug, button, spool and screen. Clean screen and reassemble.

To remove the filter screen from the valve body (fig. 4), first shut down the machine and remove the relief valve from the pump. Remove the snap ring and screen. Clean the snap ring and screen. Clean screen and reassemble.

Ratings

The CGE Series are rated for a maximum pressure of 210 bar (3000 psi). The table on page 3 lists minimum pressures attainable when the CGE is used with three sizes of system relief valves at various system flows.

Pressure and Flow (see tables on right)

Pressure change due to temperature:

The maximum pressure deviation between 26.7°C (80°F) and 65.6°C (150°F) is 4.8 bar (70 psi).

Hysteresis:

5% of maximum current (without dither—see curves on pages 5–7)

3% of maximum current (with dither)

Recommended dither:

10 mA (RMS) at 60 Hz

Power required (maximum): 5.75 watts

Nominal coil resistance: 18 ohms

Current required:

0-500 mA DC (not polarity sensitive)

Response Time

For response time, see tables below. Note that response time will increase with increasing flows. Also response time is dependent on the amount of all volume in the pressure side of the circuit; less oil volume under pressure will result in faster response times.

Step input currents of less magnitude will decrease response time proportionally. Decreasing pressure response will be approximately 1/4 of response time values.

Note

Response times shown are typical of those experienced with an average volume of oil under compression. For small volumes of oil under compression (20-40 cubic inches), response times are 60-80 ms.

Pressure & Flow Ratings

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Pressure bar (psi)</th>
<th>Maximum Flow L/min (USgpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGE-02-1</td>
<td>70 (1000)</td>
<td>1.9 (0.5)</td>
</tr>
<tr>
<td>CGE-02-3</td>
<td>210 (3000)</td>
<td>170 (45)</td>
</tr>
<tr>
<td>CGE-06-1-2*</td>
<td>70 (1000)</td>
<td>380 (100)</td>
</tr>
<tr>
<td>CGE-06-3*-2*</td>
<td>210 (3000)</td>
<td>210 (3000)</td>
</tr>
<tr>
<td>CGE-10-1-2*</td>
<td>70 (1000)</td>
<td>210 (3000)</td>
</tr>
<tr>
<td>CGE-10-3*-2*</td>
<td>210 (3000)</td>
<td>210 (3000)</td>
</tr>
</tbody>
</table>

Minimum Controllable Flows

<table>
<thead>
<tr>
<th>Model</th>
<th>L/min</th>
<th>USgpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGE-06-*2</td>
<td>7.6</td>
<td>2</td>
</tr>
<tr>
<td>CGE-10-*2</td>
<td>11.4</td>
<td>3</td>
</tr>
</tbody>
</table>

Response Time, typical

<table>
<thead>
<tr>
<th>Model</th>
<th>Step input mA</th>
<th>Flow L/min USgpm</th>
<th>Pressure Increase bar PSI</th>
<th>Response Time-ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGE-06-1-2*</td>
<td>0-500</td>
<td>76</td>
<td>5-70</td>
<td>75-1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10-210</td>
<td>150-3000</td>
</tr>
<tr>
<td>CGE-10-1-2*</td>
<td>189</td>
<td>50</td>
<td>5-70</td>
<td>75-1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10-210</td>
<td>150-3000</td>
</tr>
</tbody>
</table>
Performance Curves

CGE-02-3-20

CGE-06-3-2*

Flow – 76 L/min (20 USgpm)

Pressure vs Current

Pressure vs System Flow

Minimum Pressure vs System Flow

CGE-06V-2*

Flow – USgpm

Pressure vs Current

Pressure vs System Flow

Minimum Pressure vs System Flow
Performance Curves

CGE-06-1-2*  
Flow – 76 L/min (20 USgpm)

Pressure vs Current

CGE-10-3-2*  
Flow – 189 L/min (50 USgpm)

Pressure vs System Flow

Minimum Pressure vs System Flow
Series Model CGE Remote/Electrically Modulated Controls

Installation Dimensions

**CGE-02**
mm (inch)

- **A**: 17.6 (0.69)
- **B**: 6.4 (0.25)
- **C**: 42.5 (1.67)
- **D**: 151.0 (5.94)
- **E**: 37.4 (1.47)
- **F**: 65.1 (2.56)
- **G**: 89.0 (3.50)

**CGE-06/10-**-

**-2***

mm (inch)

- **A**: 19.8 (0.78)
- **B**: 29.3 (1.15)
- **C**: 63.5 (2.50)
- **D**: 66.8 (2.63)
- **E**: 133.4 (5.25)
- **F**: 109.5 (4.31)
- **G**: 231.7 (9.12)
- **H**: 255.5 (10.06)
- **J**: 170.5 (6.71)
- **K**: 42.9 (1.69)
- **L**: 164.1 (6.46)
- **M**: 138.2 (5.44)
- **N**: 85.9 (3.38)

<table>
<thead>
<tr>
<th>Model</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
<th>G (mm)</th>
<th>H (mm)</th>
<th>J (mm)</th>
<th>K (mm)</th>
<th>L (mm)</th>
<th>M (mm)</th>
<th>N (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGE-06</td>
<td>16.6 (0.65)</td>
<td>24.6 (0.96)</td>
<td>47.8 (1.88)</td>
<td>53.4 (2.10)</td>
<td>106.4 (4.19)</td>
<td>103.1 (4.06)</td>
<td>220.5 (8.68)</td>
<td>244.4 (9.62)</td>
<td>165.0 (6.50)</td>
<td>38.9 (1.53)</td>
<td>158.6 (6.25)</td>
<td>127.0 (5.00)</td>
<td>71.4 (2.81)</td>
</tr>
<tr>
<td>CGE-10</td>
<td>19.8 (0.78)</td>
<td>29.3 (1.15)</td>
<td>63.5 (2.50)</td>
<td>66.8 (2.63)</td>
<td>133.4 (5.25)</td>
<td>109.5 (4.31)</td>
<td>231.7 (9.12)</td>
<td>255.5 (10.06)</td>
<td>170.5 (6.71)</td>
<td>42.9 (1.69)</td>
<td>164.1 (6.46)</td>
<td>138.2 (5.44)</td>
<td>85.9 (3.38)</td>
</tr>
</tbody>
</table>

**Weight**

<table>
<thead>
<tr>
<th><strong>P</strong> (kg)</th>
<th><strong>Q</strong> (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.1 (1.38)</td>
<td>54.1 (2.13)</td>
</tr>
<tr>
<td>46.0 (1.81)</td>
<td>59.6 (2.65)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>P</strong></th>
<th><strong>Q</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>13</td>
<td>29</td>
</tr>
</tbody>
</table>
Series CGR-02 Remote Controls

Model Code

<table>
<thead>
<tr>
<th>Model Code</th>
<th>(F3) - CGR - 02 - C - (K) - 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seals</td>
</tr>
<tr>
<td>F3</td>
<td>For mineral oil and fire resistant fluids</td>
</tr>
<tr>
<td>Blank</td>
<td>Omit if not required</td>
</tr>
<tr>
<td>2</td>
<td>Valve Size</td>
</tr>
<tr>
<td>02</td>
<td>6.35 mm (1/4 in) nominal size</td>
</tr>
<tr>
<td>3</td>
<td>Maximum Adjustable Pressure</td>
</tr>
<tr>
<td>B</td>
<td>70 bar (1000 psi)</td>
</tr>
<tr>
<td>C</td>
<td>140 bar (2000 psi)</td>
</tr>
<tr>
<td>F</td>
<td>210 bar (3000 psi)</td>
</tr>
<tr>
<td>4</td>
<td>Adjusting Knob</td>
</tr>
<tr>
<td>K</td>
<td>Optional adjusting knob installed</td>
</tr>
<tr>
<td>Blank</td>
<td>Omit if not required</td>
</tr>
<tr>
<td>5</td>
<td>Design Number</td>
</tr>
<tr>
<td></td>
<td>Subject to change. Installation dimensions same for designs 30 through 39.</td>
</tr>
</tbody>
</table>

General Information

Typical application is as a remote control device for balanced piston type relief valves. The CGR-02 is not intended for use as a relief valve by itself. The valve is normally used to provide adjustment of system pressure from a convenient or remote location.

Pressure Range

The available pressure ranges for this valve are from 4.5 to 70 bar (65 to 1000 psi), from 4.5 to 140 bar (65 to 2000 psi), and from 4.5 to 210 bar (65 to 3000 psi). Therefore, the main system relief valve being controlled by the CGR-02 should be selected according to the maximum pressure required in the system. Check the model code for the main system relief valve.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw or optional adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure. The maximum pressure that can be attained by turning the adjusting screw is set at the factory to the value specified in the model code.

Graphical Symbol

![Graphical Symbol]

Ratings

The CGR-02 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists minimum pressures attainable when the CGR-02 is used with five sizes of system relief valves at various system flows.

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow l/min (USgpm)</th>
<th>Through Main System Relief Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19 (5)</td>
<td>38 (10)</td>
</tr>
<tr>
<td></td>
<td>78 (20)</td>
<td>170 (45)</td>
</tr>
<tr>
<td></td>
<td>284 (75)</td>
<td>379 (100)</td>
</tr>
<tr>
<td></td>
<td>568 (150)</td>
<td>758 (200)</td>
</tr>
<tr>
<td></td>
<td>947 (250)</td>
<td></td>
</tr>
<tr>
<td>C**-06-*V-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,7 (68)</td>
<td>5,0 (73)</td>
<td>5,9 (86)</td>
</tr>
<tr>
<td>C**-10-*B-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,1 (146)</td>
<td>10,7 (155)</td>
<td>11,9 (172)</td>
</tr>
<tr>
<td>C-16-*V-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,6 (52)</td>
<td>3,9 (56)</td>
<td>4,3 (62)</td>
</tr>
<tr>
<td>C-24-*V-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51,7 (750)</td>
<td>56,6 (820)</td>
<td>59,3 (860)</td>
</tr>
</tbody>
</table>

Minimum Pressure

<table>
<thead>
<tr>
<th>Model</th>
<th>Minimum Pressure bar (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS*-03-*V-50</td>
<td>4,7 (68)</td>
</tr>
<tr>
<td>CS*-03-*V-50</td>
<td>7,4 (108)</td>
</tr>
<tr>
<td>C**-06-*V-50</td>
<td>4,7 (68)</td>
</tr>
<tr>
<td>C**-06-*V-50</td>
<td>7,4 (108)</td>
</tr>
<tr>
<td>C**-10-*B-30</td>
<td>4,8 (69)</td>
</tr>
<tr>
<td>C**-10-*B-30</td>
<td>10,1 (146)</td>
</tr>
<tr>
<td>CF-16-*V-10</td>
<td>3,6 (52)</td>
</tr>
<tr>
<td>CF-16-*V-10</td>
<td>13,2 (192)</td>
</tr>
<tr>
<td>CF-24-*V-10</td>
<td>15,5 (225)</td>
</tr>
<tr>
<td>CF-24-*V-10</td>
<td>51,7 (750)</td>
</tr>
</tbody>
</table>
Series CGR-02 Remote Controls

Installation Dimensions

mm (inch)

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.7 (1.88)</td>
<td>Outlet port**</td>
</tr>
<tr>
<td>23.9 (0.94)</td>
<td>Pressure adjustment screw</td>
</tr>
<tr>
<td>23.1 (0.91)</td>
<td>Inlet port</td>
</tr>
<tr>
<td>71.4 (2.81)</td>
<td>Mounting surface (O-rings provided)</td>
</tr>
<tr>
<td>47.7 (1.88)</td>
<td>Outlet port**</td>
</tr>
<tr>
<td>155.2 (6.11)</td>
<td>Fully extended</td>
</tr>
<tr>
<td>123.9 (4.88)</td>
<td>Fully extended</td>
</tr>
<tr>
<td>93.7 (3.69)</td>
<td></td>
</tr>
<tr>
<td>6.3 (0.25)</td>
<td>Clearance for turning knob</td>
</tr>
</tbody>
</table>

* Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

** Connect outlet port directly to tank. Any pressure at this port must be added to relief valve pressure setting.

Mounting Pad

mm (inch)

The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 µm (63 microinch). Mounting bolt torque (3/8–16 screws) is 3.4 Nm (30 lb. ft.). Mounting bolts should be SAE grade 7 or better.

Inlet and outlet connections
Series C-175 Remote Control/Relief Valves

Model Code

C - 175 - C - 20

<table>
<thead>
<tr>
<th>1</th>
<th>Model Series</th>
<th>2</th>
<th>Size</th>
<th>3</th>
<th>Pressure Range</th>
<th>4</th>
<th>Design Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Relief valve</td>
<td>175</td>
<td>44,45 mm (1.75 in) diameter body</td>
<td>B</td>
<td>5 to 70 bar (75 to 1000 psi)</td>
<td>20</td>
<td>Subject to change. Installation dimensions same for designs 20 through 29.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>35 to 140 bar (500 to 2000 psi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>100 to 210 bar (1500 to 3000 psi)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General Information
The C-175 is suitable for applications requiring an adjustable, small capacity, direct action, spring-loaded type pressure relief valve or pressure regulating valve. It can also be applied as a remote control valve for pilot operation of balanced piston type relief valves. The C-175 is designed to be panel mounted.

Pressure Adjustment
Pressure can be adjusted by loosening a jam nut and turning the pressure adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Ratings
The C-175 remote control for relief valves is rated for a maximum pressure of 210 bar (3000 psi) and a maximum flow capacity of 11.3 l/min (3 USgpm).

Graphical Symbol

---

Drawing of the valve symbol.
Series C-175 Remote Control/Relief Valves

Installation Dimensions
mm (inch)

- Pressure adjustment knob
- Jam nut
- Tank connection: \( \frac{1}{4} \) NPTF thd.
- Pressure inlet connection: \( \frac{1}{4} \) NPTF thd.

Dimensions:
- \( \varnothing 7.1 \) (0.28) thru \( \varnothing 10.4 \) (0.41) counterbore 6.4 (0.25) deep
- 12.7 (0.50)
- 87.6 (3.45) Fully extended
- 117.3 (4.62)
- 44.4 (1.75)
- 77.7 (3.06)
- 1.5 (0.06)
Series CG-03 Relief Valves

Model Code

(F3) - CG - 03 - C (V) - 10 - (S81)

**F3** - For mineral oil and fire resistant fluids
**Blank** - Omit if not required

**Model Series**

**C** - Relief valve
**G** - Subplate mounted

**Valve Size**

03 - 9,525 mm (3/8 in) nominal size

**Seals**

- **F3** - For mineral oil and fire resistant fluids
- **Blank** - Omit if not required

**Pressure Range**

- **B** - 5 to 70 bar (75 to 1000 psi)
- **C** - 35 to 140 bar (500 to 2000 psi)
- **F** - 100 to 210 bar (1500 to 3000 psi)

**High Vent Spring**

- **V** - Optional high vent spring installed
- **Blank** - Omit if not required

**Design Number**

Subject to change. Installation dimensions same for designs 10 through 19.

**Special Feature Suffix**

- **S81** - Optional handwheel control installed

**General Information**

Series CG-03 valves utilize balanced piston type construction. They are designed for applications requiring an adjustable pressure relief valve to limit system pressure to a desired maximum.

**Pressure Range**

The available pressure ranges for this valve are from 5 to 70 bar (75 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select an appropriate pressure range that will prevent excessively high working pressures from being imposed on the pump and other equipment.

**Pressure Adjustment**

Pressure is adjusted by loosening a jam nut and turning an adjustment screw or optional handwheel. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

**Tank Connection**

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Pressure in the tank line is additive to the pressure setting. Contact your Vickers representative for alternatives.

**Graphical Symbols**

- **Vent**

**Ratings**

The CG-03 is rated for a maximum pressure of 210 bar (3000 psi). Rated capacity is 0 to 30 l/min (0 to 8 US gpm). The following table lists approximate minimum venting pressures for the three available pressure ranges of the CG-03 with and without high vent springs.

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Range</th>
<th>Percentage of Maximum Rated Capacity</th>
<th>Minimum Venting Pressure bar (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-03-B-10</td>
<td>5 to 70 bar (75 to 1000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
<tr>
<td>CG-03-BV-10</td>
<td>35 to 140 bar (500 to 2000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
<tr>
<td>CG-03-C-10</td>
<td>100 to 210 bar (1500 to 3000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
<tr>
<td>CG-03-CV-10</td>
<td>100 to 210 bar (1500 to 3000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
<tr>
<td>CG-03-F-10</td>
<td>100 to 210 bar (1500 to 3000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
<tr>
<td>CG-03-FV-10</td>
<td>100 to 210 bar (1500 to 3000)</td>
<td>25% 27% 28% 32%</td>
<td></td>
</tr>
</tbody>
</table>
Series CG-03 Relief Valves

Installation Dimensions

Note

* Use vent connection only when circuit indicates a connection for venting relief valve.

** Not to exceed 7 bar (100 psi).
Mounting Subplates
mm (inch)

When a subplate is not used, a machined pad (shaded area) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch).

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.

Subplates and Bolt Kits
Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-03-B-10 valve
(1) CGM-10S-03-10 subplate
(1) BKCG03602 bolt kit (assembly number 255602, consisting of four bolts, 1/2-13 x 2.00")

CGM-10S-03-10
(Straight thread connections)

CGMT-03-10
(Pipe thread connections.* All other dimensions same as CGM-10S-03-10.)

*Not recommended
Series C*-03/06/10 Relief/Sequence Valves

Model Code

<table>
<thead>
<tr>
<th>C</th>
<th>S</th>
<th>(H)</th>
<th>06</th>
<th>C</th>
<th>(V)</th>
<th>(V)</th>
<th>50</th>
</tr>
</thead>
</table>

1. **Valve Type**
   - C – Relief valve

2. **Connections**
   - S – SAE straight thread
   - T – NPTF thread* (not available in 03 size valve)
   
   *Not recommended

3. **High-flow Designation**
   - H – High-flow valve (available in CS models only)
   - Blank – Omit if not required

4. **Valve Size**
   - 03 – .8750-14 UNF-2B straight thread (0.625 tubing)
   - 06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4" pipe
   - 10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4" pipe

5. **Pressure Range**
   - B – 8.5 to 70 bar (125 to 1000 psi)
   - C – 35 to 140 bar (500 to 2000 psi)
   - F – 100 to 210 bar (1500 to 3000 psi)

6. **High Vent Spring**
   - V – Optional high vent spring installed (required in high-flow models)
   - Blank – Omit if not required

7. **Sequence Valve Designation**
   - Y – Configured as sequence valve (not available in 03 size valve)
   - Blank – Omit for relief valve

8. **Design Number**
   - 5* – For 03 and 06 size valves
   - 3* – For 10 size valve
   
   Subject to change. Installation dimensions same for designs 30 through 39 and for designs 50 through 59.

General Information

The series C*-03/06/10 valve can be ordered as either a pressure relief valve or a sequence valve.

Inlet and outlet pressure connections can be used interchangeably when the valve is mounted in the pressure line. The valve may also be teed off the pressure line with one of the inlet pressure connections plugged.

Minimum venting pressure (see curves on page 18) designates the pressure at which the valve operates (regardless of adjustment) when the vent connection is open to tank. This action is sometimes required during a part of a cycle. Use only when indicated by circuit.
Relief Valve Configuration
The C*-03/06/10 is designed for use in applications requiring an adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to a desired maximum.

In addition to conventional relief valve operation, two other functional modes can be used: 1) system pressure can be limited to the valve’s relatively low venting pressure by directing flow from the vent connection to tank; 2) system pressure can be remotely controlled by directing flow from the vent connection to a remote control pressure relief valve such as the C-175 or CGR-02.

The pressure setting of the relief valve selected should be approximately 10 to 14 bar (150 to 200 psi) above actual system working pressure. A higher setting could waste power and put unnecessary loads on the pump and other system components.

High-Flow Designation
A high vent spring must be included in high-flow models of the C*-06 and C*-10. The high-flow option is not available for the CS-03.

Tank Connection
Flow from the T port should be piped directly to the tank to minimize back pressure. Any pressure in the tank line is additive to the pressure setting.

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Contact your Vickers representative for alternatives.

Sequence Valve Configuration
Type “Y” (pressure sequence) versions of the C*-03/06/10 valve are designed for applications that require an adjustable pressure operated valve to control the sequence of flow to another branch of a circuit.

Sequence Operation
When pressure at the inlet port exceeds the valve setting, flow from the pressure inlet is directed to the secondary outlet port. The secondary outlet receives full pressure, and the valve acts as a tee in the line. Reverse free flow connections (secondary outlet to primary inlet) are not provided in this design.

Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

These sequence valves perform the same hydraulic circuit function as RS-06 and RS-10 sequence valves. The C*-03/06/10 models, however, are capable of functioning at higher flows and faster sequencing with less pressure overshoot.

Pressure Range
The available pressure ranges for this valve are from 8,5 to 70 bar (125 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select the appropriate pressure range that will prevent excessively high working pressures from being imposed on the pump and other equipment.

Pressure Adjustment
Pressure can be adjusted by loosening a jam nut and turning an adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Ratings
The C*-03/06/10 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists pressure ranges and rated flows for the CS-03, C*-06, and C*-10 standard and high-flow models.

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Range bar (psi)</th>
<th>Rated Flow l/min (USgpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>CS-03-B*-50</td>
<td>8,5 to 70 (125 to 1000)</td>
<td>175 (45)</td>
</tr>
<tr>
<td>CS-03-C*-50</td>
<td>35 to 140 (500 to 2000)</td>
<td>227 (60)</td>
</tr>
<tr>
<td>CS-03-F*-50</td>
<td>10 to 210 (1500 to 3000)</td>
<td>454 (120)</td>
</tr>
<tr>
<td>CS/T-06-B*-50</td>
<td>8,5 to 70 (125 to 1000)</td>
<td></td>
</tr>
<tr>
<td>CS/T-06-C*-50</td>
<td>35 to 140 (500 to 2000)</td>
<td></td>
</tr>
<tr>
<td>CS/T-06-F*-50</td>
<td>100 to 210 (1500 to 3000)</td>
<td></td>
</tr>
<tr>
<td>CS/T-10-B*-30</td>
<td>8,5 to 70 (125 to 1000)</td>
<td></td>
</tr>
<tr>
<td>CS/T-10-C*-30</td>
<td>35 to 140 (500 to 2000)</td>
<td></td>
</tr>
<tr>
<td>CS/T-10-F*-30</td>
<td>100 to 210 (1500 to 3000)</td>
<td></td>
</tr>
</tbody>
</table>

Graphical Symbols

Relief Valves
Using Vent Connection

Sequence Valves
Using Vent Connection
Series C*-03/06/10 Relief/Sequence Valves

Performance Curves

Nominal Override Characteristics

- C*-03/06-**-50
- C*-10-**-30

Vent Pressure Versus Flow

- C*-03/06-**-50
- C*-10-**-30
**Installation Dimensions**

mm (inch)

![Diagram showing installation dimensions](image)

### Notes

* Drain connection on Y models only. Not available in 03 size valve. Connect directly to tank. Pressure at drain port is additive to pressure setting.

** Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

† Knob can be backed out beyond minimum pressure stop. Reposition knob (if desired) to any 90° increment by reinstalling cover.

†† Per SAE Standard J-514.

---

### L – System Connections

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-03</td>
<td>143,3 (5.64)</td>
<td>95,5 (3.76)</td>
<td>47,8 (1.88)</td>
<td>39,9 (1.57)</td>
<td>55,6 (2.19)</td>
<td>65,6 (2.58)</td>
<td>32,8 (1.29)</td>
<td>62,0 (2.45)</td>
<td>45,7 (1.80)</td>
<td>53,9 (2.12)</td>
</tr>
<tr>
<td>CS-06</td>
<td>147,8 (5.84)</td>
<td>100,0 (3.94)</td>
<td>48,8 (1.92)</td>
<td>39,9 (1.57)</td>
<td>55,6 (2.19)</td>
<td>65,6 (2.58)</td>
<td>32,8 (1.29)</td>
<td>62,0 (2.45)</td>
<td>45,7 (1.80)</td>
<td>53,9 (2.12)</td>
</tr>
<tr>
<td>CT-06</td>
<td>154,9 (6.10)</td>
<td>109,4 (4.30)</td>
<td>48,8 (1.92)</td>
<td>39,9 (1.57)</td>
<td>55,6 (2.19)</td>
<td>65,6 (2.58)</td>
<td>32,8 (1.29)</td>
<td>62,0 (2.45)</td>
<td>45,7 (1.80)</td>
<td>53,9 (2.12)</td>
</tr>
<tr>
<td>CS-10</td>
<td>157,2 (6.18)</td>
<td>124,0 (4.88)</td>
<td>61,9 (2.44)</td>
<td>41,2 (1.62)</td>
<td>61,9 (2.44)</td>
<td>83,3 (3.28)</td>
<td>41,7 (1.64)</td>
<td>66,5 (2.62)</td>
<td>61,9 (2.44)</td>
<td>69,9 (2.75)</td>
</tr>
<tr>
<td>CT-10</td>
<td>160,3 (6.31)</td>
<td>138,1 (5.43)</td>
<td>61,9 (2.44)</td>
<td>41,2 (1.62)</td>
<td>61,9 (2.44)</td>
<td>83,3 (3.28)</td>
<td>41,7 (1.64)</td>
<td>66,5 (2.62)</td>
<td>61,9 (2.44)</td>
<td>69,9 (2.75)</td>
</tr>
</tbody>
</table>

†† Not recommended

---

**CS Models**

- .875-14 UNF-2B thd.
- (0.625 O.D. tubing)
- Not available in 03 size valve

**CT Models††**

- 1.0625-12 UNF-2B thd.
- (0.750 O.D. tubing)
- 3/4 NPTF thd.††

- 1.6250-12 UNF-2B thd.
- (1.250 O.D. tubing)
- 11/4 NPTF thd.††
Series CG-06/10 Relief/Sequence Valves

Model Code

(F3) CG - (H) 06 - C (V) (Y) - 50

1 Seals
F3 – For mineral oil and fire resistant fluids
Blank – Omit if not required

2 Model Series
C – Relief valve
G – Subplate mounted

3 High-flow Designation
H – High-flow valve (available in relief valves only)
Blank – Omit if not required (and for sequence valves)

4 Valve Size
06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4” pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 11/4” pipe

5 Pressure Range
B – 8.5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

6 High Vent Spring
V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

7 Sequence Valve Designation
Y – Configured as sequence valve
Blank – Omit for relief valve

8 Design Number
50 – For 06 size valve
30 – For 10 size valve

Subject to change. Installation dimensions same for designs 30 through 39 and for designs 50 through 59.

General Information
The series CG-06/10 valve is designed for manifold or subplate mounting and can be ordered as either a pressure relief valve or a sequence valve.

Minimum venting pressure (see curves on page 22) designates the pressure at which the valve operates (regardless of adjustment) when the vent connection is open to tank. This action is sometimes required during a part of a cycle. Use only when indicated by circuit.

Relief Valve Configuration
The CG-06/10 is designed for use in applications requiring an adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to a desired maximum.

In addition to conventional relief valve operation, two other functional modes can be used: 1) system pressure can be limited to the valve's relatively low venting pressure by directing flow from the vent connection to tank; 2) system pressure can be remotely controlled by directing flow from the vent connection to a remote control pressure relief valve such as the C-175 or CGR-02.

The pressure setting of the relief valve selected should be approximately 10 to 14 bar (150 to 200 psi) above actual system working pressure. A higher setting could waste power and put unnecessary loads on the pump and other system components.

High-Flow Designation
A high vent spring must be included in high-flow models of the CG-06 and CG-10.

Tank Connection
Flow from the T port should be piped directly to the tank to minimize back pressure. Any pressure in the tank line is additive to the pressure setting.

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Contact your Vickers representative for alternatives.

Sequence Valve Configuration
Type “Y” (pressure sequence) versions of the CG-06/10 valve are designed for applications that require an adjustable pressure operated valve to control the sequence of flow to another branch of a circuit.

Sequence Operation
When pressure at the inlet port exceeds the valve setting, flow from the pressure inlet is directed to the secondary outlet port. The secondary outlet receives full pressure. Reverse free flow connections (secondary outlet to primary inlet) are not provided in this design.

Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

These sequence valves perform the same hydraulic circuit function as RG-06 and RG-10 sequence valves. The CG-06/10 models, however, are capable of functioning at higher flows and faster sequencing with less pressure overshoot.
Drain Connection
The drain connection should be piped directly to the tank to minimize back pressure. Any pressure in the drain line is additive to the pressure setting.

Pressure Range
The available pressure ranges for this valve are from 8.5 to 70 bar (125 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

Pressure Adjustment
Pressure can be adjusted by loosening a jam nut and turning an adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Mounting Adapter Plates
Two relief valve mounting adapter plates (see page 26) are available to adapt current design relief valves to the -10 design mounting. The CGAM-06-20 adapts a CG-(H)06-*H(V)-5* valve to a CG-06-*V-10 mounting. The CGAM-10-20 adapts a CG-(H)10-*V)-3* valve to a CG-06-*V-10 mounting.

The following bolt kits are used with mounting adapter plates to mount CG-06/10 valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Bolt Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-(H)06-<em>H(V)-5</em></td>
<td>BKCGAM06608</td>
</tr>
<tr>
<td>CG-(H)10-<em>V)-3</em></td>
<td>BKCGAM10609†</td>
</tr>
</tbody>
</table>

† Holds only adapter plate to mounting pad or subplate. Separate bolt kit needed to mount relief valve to adapter plate.

Ratings
The CG-06/10 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists pressure ranges and rated flows for the CG-06 and CG-10 standard and high-flow models.

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Range</th>
<th>Rated Flow</th>
<th>Standard</th>
<th>High-Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bar (psi)</td>
<td>l/min (USgpm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG-06-B*-50</td>
<td>8,5 to 70 (125 to 1000)</td>
<td>227 (60)</td>
<td>340 (90)</td>
<td></td>
</tr>
<tr>
<td>CG-06-C*-50</td>
<td>35 to 140 (500 to 2000)</td>
<td>454 (120)</td>
<td>680 (180)</td>
<td></td>
</tr>
<tr>
<td>CG-06-F*-50</td>
<td>100 to 210 (1500 to 3000)</td>
<td>227 (60)</td>
<td>340 (90)</td>
<td></td>
</tr>
<tr>
<td>CG-10-B*-30</td>
<td>8,5 to 70 (125 to 1000)</td>
<td>454 (120)</td>
<td>680 (180)</td>
<td></td>
</tr>
<tr>
<td>CG-10-C*-30</td>
<td>35 to 140 (500 to 2000)</td>
<td>454 (120)</td>
<td>680 (180)</td>
<td></td>
</tr>
<tr>
<td>CG-10-F*-30</td>
<td>100 to 210 (1500 to 3000)</td>
<td>454 (120)</td>
<td>680 (180)</td>
<td></td>
</tr>
</tbody>
</table>

Graphical Symbols

Relief Valves Using Vent Connection

Sequence Valves Using Vent Connection
Series CG-06/10 Relief/Sequence Valves

Performance Curves

Nominal Override Characteristics

- CG-06-**-50
- CG-10-**-30

![Graph of Nominal Override Characteristics]

Vent Pressure Versus Flow

- CG-06-**-50
- CG-10-**-30

![Graph of Vent Pressure Versus Flow]
Installation Dimensions

Discharge to tank† (secondary outlet connection on Y models)

Drain connection**†

∅O thru 4 places†

Pressure inlet connection†

∅P counterbore 4 places†

Vent connection**†

Note

* Drain connection on Y models only. Connect directly to tank. Pressure at drain port is additive to pressure setting.

** Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

† See dimensions of applicable subplate (page 24) for location.

†† Knob can be backed out beyond minimum pressure stop. Reposition knob (if desired) 90° up or down from position shown by reinstalling cover (except on Y models).

### Model Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-06</td>
<td>71.4 (2.81)</td>
<td>7.9 (0.31)</td>
<td>62.0 (2.44)</td>
<td>53.3 (2.10)</td>
<td>106.4 (4.19)</td>
<td>47.8 (1.88)</td>
<td>107.2 (4.22)</td>
<td>47.8 (1.88)</td>
<td>60.5 (2.38)</td>
<td>42.9 (1.69)</td>
<td>131.1 (5.16)</td>
<td>156.5 (6.16)</td>
<td>100.8 (3.97)</td>
<td>159.5 (6.28)</td>
</tr>
<tr>
<td>CG-10</td>
<td>85.9 (2.81)</td>
<td>2.3 (0.31)</td>
<td>81.0 (2.44)</td>
<td>66.8 (2.63)</td>
<td>133.4 (5.25)</td>
<td>55.6 (2.19)</td>
<td>116.1 (4.57)</td>
<td>63.5 (2.50)</td>
<td>N/A</td>
<td>50.8 (2.00)</td>
<td>141.5 (5.57)</td>
<td>164.6 (6.48)</td>
<td>104.7 (4.12)</td>
<td>163.6 (6.44)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>O (in)</th>
<th>P (in)</th>
<th>Q (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-06</td>
<td>16.6 (0.65)</td>
<td>24.5 (0.96)</td>
<td>35.1 (1.38)</td>
</tr>
<tr>
<td>CG-10</td>
<td>19.8 (0.78)</td>
<td>29.3 (1.15)</td>
<td>46.0 (1.81)</td>
</tr>
</tbody>
</table>
Series CG-06/10 Relief/Sequence Valves

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-06-B-50 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, 5/8-11 x 2.75")

When a subplate is not used, a machined pad (shaded area) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch).

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.

The following bolt kits are used to mount CG-06/10 valves:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Bolt Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-(H)06-<em>-(V)-5</em></td>
<td>BKCG06604</td>
</tr>
<tr>
<td>CG-06-<em>-(V)Y-5</em></td>
<td>BKCG06605</td>
</tr>
<tr>
<td>CG-(H)10-<em>-(V)-3</em></td>
<td>BKCG10616</td>
</tr>
<tr>
<td>CG-10-<em>-(V)Y-3</em></td>
<td>BKCG10616</td>
</tr>
</tbody>
</table>

Mounting Subplates

mm (inch)

CGM-06S-20 (for 3/4” O.D. tubing)

Note

* Drain connection required for sequence (Y) models only. Must be machined by user.

** Ref. SAE Standard J-514.
CGM-10S-20 (for 1\(\frac{1}{4}\)" O.D. tubing)  
mm (inch)

- 13.49 (0.531) thru 19.83 (0.781) spotface 4 pcs.
- .7500-10 UNC-2B thd. 47.8 (1.88) deep 4 holes for mounting valve
- 6,35 (0.250) thru 10.56 (0.415) thru 13.49 (0.531) thru 19.83 (0.781) spotface 4 pcs.

Note:
* Drain connection required for sequence (Y) models only. Must be machined by user.
** Ref. SAE Standard J-514.
Series CGAM-06/10 Adapter Mounting Plates

Model Code

![Model Code Diagram]

Model Series
- C – Relief valve
- G – Subplate mounted
- A – Adapter
- M – Mounting plate

Compatible Valve Size
- 06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4” pipe
- 10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4” pipe

Design Number
Subject to change. Installation dimensions same for designs 20 through 29.

General Information
CGAM-06/10 adapter mounting plates are designed for adapting new, improved valves to the subplate or machined mounting pad used by a superseded valve.

<table>
<thead>
<tr>
<th>Adapter Mounting Plate</th>
<th>Superseded Valve</th>
<th>New Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGAM-06-20</td>
<td>CG-06-**-10</td>
<td>CG-06-**-20 and up</td>
</tr>
<tr>
<td></td>
<td>CG5-06**-**-20</td>
<td>CG5-06**-**-30 and up</td>
</tr>
<tr>
<td>CGAM-10-20</td>
<td>CG-10-**-10</td>
<td>CG-10-**-20 and up</td>
</tr>
<tr>
<td></td>
<td>CG5-10**-**-20</td>
<td>CG5-10**-**-30 and up</td>
</tr>
</tbody>
</table>

Mounting Bolts
Mounting bolts are not included with adapter plates and must be ordered separately.

Examples:
(1) CGAM-06-20 mounting adapter plate
(1) BKCGAM06608 bolt kit (consisting of four bolts, 5/8-11 × 3.50”)

(1) CGAM-10-20 mounting adapter plate
(1) BKCGAM10609 bolt kit (consisting of four bolts, 3/4-10 × 2.50”)

Mounting bolts for the CGAM-06-20 hold both the relief valve and the adapter plate to a mounting pad or subplate. Mounting bolts for the CGAM-10-20 hold only the adapter plate to a mounting pad or subplate. A separate bolt kit is needed to mount the relief valve to the adapter plate.

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.
Installation Dimensions

mm (inch)

CGAM-06-20

- 15.9 (0.62) rad (4 places)
- 66.5 (2.62)
- 69.8 (2.75)
- 34.9 (1.38)
- 49.3 (1.94)
- 76.2 (3.00)
- 7.14 (0.281)
- 6.4 (0.25) Rest pin
- Tank port

Vent port
Inlet port

Interface holes match subplates or mounting pads for superseded valves (seals furnished)

CGAM-10-20

- 17.5 (0.69) rad (4 places)
- 88.9 (3.50)
- 66.5 (2.62)
- 91.9 (3.62)
- 46.0 (1.81)
- 41.1 (1.62)
- 103.1 (4.06)
- 133.4 (5.25)
- 66.5 (2.62)
- 58.7 (2.31)
- 19.83 (0.781) thru 29.36 (1.156) counterbore
- Tank port

- .750-10 UNC-2B thd.
- 4 holes for mounting valve

- 162.1 (6.38)
- 31.0 (1.22)
- 7.9 (0.31)
- 6.4 (0.25) Rest pin

Interface holes match subplates or mounting pads for superseded valves (seals furnished)

Interface holes match CG-06-**-20/40 and CG5-06-**-**-30/40 valves

Interface holes match CG-10-**-20 and CG5-10-**-**-30 valves

Vent port
Inlet port

.750-10 UNC-2B thd.
4 holes for mounting valve

.750-10 UNC-2B thd.
4 holes for mounting valve

Tank port

Vent port
Inlet port

Vent port
Inlet port

Tank port

Tank port

Tank port

Tank port

Tank port

Tank port
### Model Code

| Model Code | (F3) | C | S | 5 | (H) | 06 | 2 | A | (P) | C | (V) | - | M | (S1) | (PA5) | - | W | (L) | - | B | (9) | - | P08 | - | 100 |
| ^1 | ^2 | ^3 | ^4 | ^5 | ^6 | ^7 | ^8 | ^9 | ^10 | ^11 | ^12 | ^13 | ^14 | ^15 | ^16 | ^17 | ^18 | ^19 | ^20 | ^21 | ^22 | ^23 | ^24 |

#### Seals
- **F3** – For CG5 all internal seals are F3. Interface seals are Buna-N. Add prefix F3 to model for use with synthetic fluids.
- **Blank** – Omit for CS5 and CT5 (all seals are F3 as standard)

#### Valve Type
- **C** – Relief valve

#### Connections
- **G** – Manifold or subplate mounting (not available in 03 size valve)
- **S** – SAE straight thread
- **T** – NPTF thread* (not available in 03 size valve)

*Not recommended

#### Control Type
- **5** – Solenoid controlled (pilot operated)

#### High-flow Designation
- **H** – High-flow valve (not available in CT models)
- **Blank** – Omit if not required

#### Valve Size
- **03** – .8750-14 UNF-2B straight thread (0.625 tubing)
- **06** – 1.0625-12 UN-2B straight thread (0.750 tubing) or \( \frac{3}{4} \)" pipe
- **10** – 1.6250-12 UN-2B straight thread (1.250 tubing) or \( \frac{1}{2} \)" pipe

#### Pilot Spool Function
- **0, 1, or 2** – Indicates venting condition. See Graphical Symbols on page 31.

#### Pilot Spool Spring Arrangement
- **A** – Spring offset
- **C** – Spring centered
- **F** – Energize to center

#### Manual Override
- **P** – Plain override in end cap (single solenoid models only)
- **Blank** – Omit if not required

#### Pressure Range
- **B** – 8.5 to 70 bar (125 to 1000 psi)
- **C** – 35 to 140 bar (500 to 2000 psi)
- **F** – 100 to 210 bar (1500 to 3000 psi)

#### High Vent Spring
- **V** – Optional high vent spring installed (required in high-flow models)
- **Blank** – Omit if not required

#### Flag Symbol
- **M** – Electrical options and features

#### Spool Indicator Switch
- For spring offset (A) models only. Not available in manual override models.
- **S** – Switch unwired
- **S1** – Switch wired normally open
- **S2** – Switch wired normally closed

#### Electrical Connections
- **PA3** – 3-pin receptacle (single solenoid models only)
- **PA5** – 5-pin receptacle
- **PB** – “Insta-P lug” with male and female connectors
- **Blank** – Omit if not required

#### Housing
- **U** – ISO 4400 (DIN 43650) connector (For use with indicator lights, contact your Vickers representative.)
- **W** – \( \frac{1}{2} \)" NPT thread wiring housing
- **WL** – \( \frac{1}{2} \)" NPT thread wiring housing with coil indicator lights

#### Coil Voltage Rating
- **B** – 115/120V AC 60 Hz and 110V AC 50 Hz
- **D** – 230V AC 60 Hz and 220/230V AC 50 Hz
- **F** – 6V DC
- **G** – 12V DC
- **H** – 24V DC

#### Coil Wattage
- **9** – Low wattage coil (B coil only)
- **Blank** – Omit if not required

#### Pilot Valve Port Orifices
- **00** – Solid plug
- **03** – 0.30 (0.012)
- **06** – 0.60 (0.024)
- **08** – 0.80 (0.030)
- **10** – 1.00 (0.040)
- **13** – 1.30 (0.050)
- **15** – 1.50 (0.060)
- **20** – 2.00 (0.080)
- **23** – 2.30 (0.090)
- **Blank** – Omit if not required

* = P, T, A, or B as required

#### Design Number
- **100** – For CS5 and CT5 models (using DG4V-3S pilot valve)
- **110** – For CG5 models (using DG4V-3 high performance pilot valve)

Subject to change. Installation dimensions same for designs 100 through 109 and for designs 110 through 119.
General Data
All valves are of the patented Vickers balanced piston type construction.
These valves are generally used for applications requiring an electrically
controlled adjustable pressure relief or regulating valve to limit the pressure in
an oil circuit to the desired maximum.

Pressure Adjustment
Select pressure range so that excessively high working pressures will not be
imposed upon pump or other equipment.

Adjustment of pressure is accomplished by loosening jam nut and turning
adjusting screw. Clockwise rotation increases pressure; counterclockwise
rotation decreases pressure.

Application Guidance
High Flow Valve ("H" Model)
"H" series valves require use of a high vent spring (C*5-(H)06/10**-*
V-**-*-1**).

Typical Spool Shift Time
Note
Any sliding spool valve, if held
shifted under pressure for long
periods of time, may stick and not
spring return due to fluid residue
formation and, therefore, should be
cycled periodically to prevent this
from happening.

Following is typical spool shift time* for
spring offset and spring centered
models (rated flow and pressure):

<table>
<thead>
<tr>
<th>Solenoid Energized</th>
<th>AC</th>
<th>12 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td></td>
<td>30 ms</td>
</tr>
</tbody>
</table>

Spring Return
AC (all spools except 2)  | 22 ms
AC (type 2) and
DC (all models)         | 45 ms

Offset to Offset on
Spring Centered Models
AC  | 25 ms
DC  | 60 ms

Maximum Cycling Rate
(all spool positions
actuated once/cycle)
AC  | 4 Hz
DC  | 3 Hz

* Shift times apply to solenoid pilot valve only.

Installation Data
Tank Connection
The tank connection should be piped
directly to tank to minimize back
pressure. Any back pressure in the tank
line is additive to the valve pressure
setting. If tank line back pressure
exceeds system pressure by 7.0 bar
(100 psi), a malfunction may occur.
Transient pressure peaks in the tank line
must not exceed 155 bar (2250 psi).

Note
Surges of oil in a common tank line
serving these and other valves can
be of sufficient magnitude to cause
inadvertent shifting of the pilot spool
of the valves. Separate tank lines or
a vented manifold with a continuous
downward path to tank is necessary.

Mounting
Mounting orientation is unrestricted.

Electrical Information
AC solenoids furnished with this valve
are dual frequency types (as shown in
the table on page 30). They also resist
burn-out, which allows time to find and
correct problems before solenoid
burn-out occurs.

Solenoids
Solenoids are identified by a letter in the
model number. Example:
CG5-062C-B-M-W-B-110.

Note
Solenoids are designed to function
continuously at ±10% of rated voltage.

Note
On all models, when solenoid “A” is
energized, flow is always P→A.
When solenoid “B” is energized, flow
is always P→B. This is in
accordance with ANSI-B93.9
standard. Solenoid “A” and “B” are
identified on diagram on top of valve.
This orientation is reversed for left
hand “L” models.

Ratings

<table>
<thead>
<tr>
<th>Rated Pressure (Maximum)</th>
<th>210 bar (3000 psi)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Rated Capacity (Maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS5-03 &amp; C*5-06</td>
</tr>
<tr>
<td>C*5-H06</td>
</tr>
<tr>
<td>C*5-10</td>
</tr>
<tr>
<td>C*5-H10</td>
</tr>
</tbody>
</table>
Series C*5-03/06/10 Pilot Operated Relief Valves

**Solenoid Energizing**
Spring centered and spring offset types will be spring positioned unless solenoid is energized continuously.

The conduit connection readily adapts to connector receptacle assemblies on the market.

**Electrical Connection Note**
1/2 NPT thread for C*5(H)****-M-W*-90 models is provided on both ends of the wiring box. The wiring box is a NEMA type 4 enclosure.

**Solenoid Indicator Lights**
Light is “on” when there is current at the coil. Lights are available for most AC and DC voltages.

**Wiring**
The electrical connections to the valve are made in the electrical wiring housing. Two lead wires for each solenoid, approximately 153,0mm (6.00 in.) long, with M3 (No. 6) size terminals are provided for customer connection. A ground terminal is also provided.

**Seals**
**Threaded Valves:**
All seals used in the threaded valves are fluorocarbon as standard and are suitable for use with phosphate ester type fluids or its blends, water glycol, water-in-oil emulsions, and petroleum oil.

**Subplate Mounted Valves:**
Standard models are furnished with Buna-N seals for the mounting surface and may be used with water glycol, water-in-oil emulsions, and petroleum oil. Internal seals are fluorocarbon. The use of phosphate ester or its blends requires an F3 model. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

**Subplates and Bolt Kits**
Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG5-062C-F-M-W-* -110 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, 5/16-11 x 2.75”)

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

**Solenoid Voltage Rating**

<table>
<thead>
<tr>
<th>Solenoid Voltage Rating</th>
<th>Identification Letter</th>
<th>Inrush amps (R.M.S.)*</th>
<th>Holding amps</th>
<th>Holding watts</th>
<th>Resistance ohms @20°C</th>
<th>Inductance mH</th>
</tr>
</thead>
<tbody>
<tr>
<td>115/120V AC 60 Hz</td>
<td>B</td>
<td>2.0</td>
<td>0.54</td>
<td>31</td>
<td>33.5</td>
<td>185</td>
</tr>
<tr>
<td>110V AC 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>230/240V AC 60 Hz</td>
<td>D</td>
<td>1.0</td>
<td>0.27</td>
<td>31</td>
<td>140</td>
<td>731</td>
</tr>
<tr>
<td>220V AC 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24V AC 60 Hz</td>
<td>N</td>
<td>7.8</td>
<td>2.45</td>
<td>27</td>
<td>1.60</td>
<td>57</td>
</tr>
<tr>
<td>24V AC 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115/120V AC 60 Hz</td>
<td>B9 Low Watt</td>
<td>1.5</td>
<td>0.31</td>
<td>17</td>
<td>55.0</td>
<td>285</td>
</tr>
<tr>
<td>110V AC 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110V AC 60 Hz</td>
<td>T</td>
<td>1.9</td>
<td>0.66</td>
<td>27</td>
<td>23.1</td>
<td>150</td>
</tr>
<tr>
<td>110V AC 50 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6V DC</td>
<td>F</td>
<td>—</td>
<td>6.8</td>
<td>41</td>
<td>0.88</td>
<td>4.07</td>
</tr>
<tr>
<td>12V DC</td>
<td>G</td>
<td>—</td>
<td>3.5</td>
<td>41</td>
<td>3.45</td>
<td>16.3</td>
</tr>
<tr>
<td>24V DC</td>
<td>H</td>
<td>—</td>
<td>1.7</td>
<td>41</td>
<td>13.9</td>
<td>64.6</td>
</tr>
<tr>
<td>32V DC</td>
<td>DK</td>
<td>—</td>
<td>1.3</td>
<td>41</td>
<td>24.7</td>
<td>114</td>
</tr>
<tr>
<td>48V DC</td>
<td>J</td>
<td>—</td>
<td>0.87</td>
<td>41</td>
<td>55.3</td>
<td>258</td>
</tr>
</tbody>
</table>

* Maximum peak inrush amps approximately 1.4 x R.M.S value shown
Graphical Symbols

Model C*5-(H)**0C (DG4V-3-0C Pilot)

When solenoid “A” is energized, control is at connection “A”. When solenoid “B” is energized, control is at connection “B”. When both solenoids are de-energized, valve is vented.

Model C*5-(H)**2C (DG4V-3-2C Pilot)

When solenoid “A” is energized, control is at connection “A”. When solenoid “B” is energized, control is at connection “B”. When both solenoids are de-energized, control is by integral adjustment.

Model C*5-(H)**0A (DG4V-3-0BL Pilot)

When solenoid “A” is energized, control is by integral adjustment. When solenoid “A” is de-energized, valve is vented.

Model C*5-(H)**1A (DG4V-3-2AL Pilot)

When solenoid “A” is energized, control is at connection “A”. When solenoid “A” is de-energized, control is at connection “B”.

Model C*5-(H)**2A (DG4V-3-2BL Pilot)

When solenoid “A” is energized, control is at connection “A”. When solenoid “A” is de-energized, control is by integral adjustment.

Model C*5-(H)**0F (DG4V-3-0FL Pilot)

When solenoid “A” is energized, valve is vented. When solenoid “A” is de-energized, control is by integral adjustment.
Series C*5-03/06/10 Pilot Operated Relief Valves

Performance Curves

Subplate or Manifold Mounted Models

Nominal Override Characteristics

- CG5-06
- CG5-10

Vent Pressure Versus Flow*

- CG5-06
- CG5-10

* Valves supplied with external pilot connections (model designation “0C”, “2C”, “1A”, and “2A”) have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1.7 bar (25 psi) higher than shown.
Threaded Port Models

Nominal Override Characteristics

- **C•5-03/06**
- **C•5-10**

Vent Pressure Versus Flow*

- **C•5-03/06**
- **C•5-10**

* Valves supplied with external pilot connections (model designation “0C”, “2C”, “1A”, and “2A”) have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1.7 bar (25 psi) higher than shown.
Series C*5-03/06/10 Pilot Operated Relief Valves

Installation Dimensions
mm (inch)

Subplate or Manifold Mounted Models

Double Solenoid Spring Centered Type
CG5-(H) ** C. ** - M. - * - 110 Series

Note
See page 35 for tabulated dimensions.

* See mounting subplates for locating dimensions.

** Use 7.92 (0.312) hex key.

† Clearance for removal of solenoid coil.

†† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.
Single Solenoid Spring Offset Type
CG5-(H) *** A- **-M- **-110 Series
(See page 34 for other details and dimensions)

Solenoid valve with cover assembly can be rotated to 3 positions 90° apart

<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>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG5-06</td>
<td>71.4</td>
<td>7.9</td>
<td>62.0</td>
<td>53.3</td>
<td>106.4</td>
<td>47.8</td>
<td>107.2</td>
<td>47.8</td>
<td>42.9</td>
<td>131.1</td>
<td>156.5</td>
<td>106.7</td>
<td>134.9</td>
<td>16.6</td>
</tr>
<tr>
<td></td>
<td>(2.81)</td>
<td>(0.31)</td>
<td>(2.44)</td>
<td>(2.10)</td>
<td>(4.19)</td>
<td>(1.88)</td>
<td>(4.22)</td>
<td>(1.88)</td>
<td>(1.69)</td>
<td>(5.10)</td>
<td>(6.16)</td>
<td>(4.20)</td>
<td>(5.31)</td>
<td>(0.65)</td>
</tr>
<tr>
<td>CG5-(H)10</td>
<td>85.9</td>
<td>2.3</td>
<td>81.0</td>
<td>66.8</td>
<td>133.4</td>
<td>55.6</td>
<td>116.1</td>
<td>63.5</td>
<td>50.8</td>
<td>141.5</td>
<td>168.4</td>
<td>110.7</td>
<td>138.9</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td>(3.38)</td>
<td>(0.09)</td>
<td>(3.19)</td>
<td>(2.63)</td>
<td>(5.25)</td>
<td>(2.19)</td>
<td>(4.57)</td>
<td>(2.50)</td>
<td>(2.00)</td>
<td>(5.57)</td>
<td>(6.63)</td>
<td>(4.36)</td>
<td>(5.47)</td>
<td>(0.78)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
<th>Y (AC)</th>
<th>Y (DC)</th>
<th>Z (AC)</th>
<th>Z (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG5-06</td>
<td>24.5</td>
<td>35.1</td>
<td>4.0</td>
<td>46.0</td>
<td>143.8</td>
<td>181.4</td>
<td>207.3</td>
<td>225.3</td>
<td>247.1</td>
<td>89.0</td>
<td>98.8</td>
<td>206.4</td>
<td>234.4</td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td>(1.38)</td>
<td>(0.16)</td>
<td>(1.81)</td>
<td>(5.66)</td>
<td>(7.14)</td>
<td>(8.16)</td>
<td>(8.87)</td>
<td>(9.73)</td>
<td>(3.50)</td>
<td>(3.89)</td>
<td>(8.12)</td>
<td>(9.22)</td>
</tr>
<tr>
<td>CG5-(H)10</td>
<td>29.3</td>
<td>46.0</td>
<td>5.6</td>
<td>48.5</td>
<td>155.7</td>
<td>193.3</td>
<td>219.2</td>
<td>237.2</td>
<td>259.1</td>
<td>85.0</td>
<td>94.8</td>
<td>54.6</td>
<td>68.5</td>
</tr>
<tr>
<td></td>
<td>(1.15)</td>
<td>(1.81)</td>
<td>(0.22)</td>
<td>(1.91)</td>
<td>(6.13)</td>
<td>(7.61)</td>
<td>(8.63)</td>
<td>(9.34)</td>
<td>(10.2)</td>
<td>(3.34)</td>
<td>(3.73)</td>
<td>(2.14)</td>
<td>(2.69)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>AA</th>
<th>BB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG5-06</td>
<td>11.4</td>
<td>84.8</td>
</tr>
<tr>
<td></td>
<td>(0.45)</td>
<td>(3.34)</td>
</tr>
<tr>
<td>CG5-(H)10</td>
<td>17.0</td>
<td>91.2</td>
</tr>
<tr>
<td></td>
<td>(0.67)</td>
<td>(3.59)</td>
</tr>
</tbody>
</table>
Series C*5-03/06/10 Pilot Operated Relief Valves

Threaded Port Models

mm (inch)

Double Solenoid Spring Centered Type

CS/T5-(H) *** C- **-M- * - - - - 100 Series

Note

See page 37 for tabulated dimensions.
* Use 7.92 (0.312) hex key.
** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.
† Clearance for removal of solenoid coil.
†† .7500-16 UNF-2B thread for 0.500 O.D. tubing.

Remote control or vent connection†† (Use only when circuit indicates.)
### Single Solenoid Spring Offset Type

**CS/T5-(H) *** A- *** M- *** -100 Series**

(See page 36 for other details and dimensions)

---

![Solenoid valve with cover assembly can be rotated to 4 positions 90° apart](image)

---

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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* Not recommended
Series C*19-06/10 Air Operated Relief Valves

Model Code

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<th>C</th>
<th>(P)</th>
<th>F</th>
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</table>

1. **Seals**
   - F3 — For CG19 all internal seals are F3. Interface seals are Buna-N. Add prefix F3 to model for use with mineral oil and fire resistant fluids.
   - Blank — Omit for CS5 and CT5 (all seals are F3 as standard)

2. **Valve Type**
   - C — Relief valve

3. **Connections**
   - G — Manifold or subplate mounting (not available in 03 size valve)
   - T — NPTF thread*  
     *Not recommended

4. **Control Type**
   - 19 — Air controlled (pilot operated)

5. **High-flow Designation**
   - H — High-flow valve (not available in CT models)
   - Blank — Omit if not required

6. **Valve Size**
   - 06 — 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4" pipe
   - 10 — 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4" pipe

7. **Pilot Spool Function**
   - 0, 1, or 2 — Indicates venting condition. See Graphical Symbols on page 46.

8. **Pilot Spool Spring Arrangement**
   - A — Spring offset
   - C — Spring centered
   - F — Pressurize to center

9. **Manual Override**
   - P — Plain override in end cap (single operator models only)
   - Blank — Omit if not required

10. **High Vent Spring**
    - V — Optional high vent spring installed (required in high-flow models)
    - Blank — Omit if not required

11. **Pilot Valve Port Orifices**
    - *00 — Solid plug
    - *03 — 0.30 (0.012)
    - *06 — 0.60 (0.024)
    - *08 — 0.80 (0.030)
    - *10 — 1.00 (0.040)
    - *13 — 1.30 (0.050)
    - *15 — 1.50 (0.060)
    - *20 — 2.00 (0.080)
    - *23 — 2.30 (0.090)
    - Blank — Omit if not required

    * = P, T, A, or B as required

12. **Design Number**
    Subject to change. Installation dimensions same for designs 100 through 109 (using -60 design DG18V-3 pilot valve).

General Data

C*19-06/10 valves are of balanced piston type construction. These valves are generally used for applications requiring an air controlled adjustable pressure relief or regulating valve to limit the pressure in an oil circuit to the desired maximum.

Pressure Adjustment

Select a pressure range such that excessively high working pressures will not be imposed upon the pump or other equipment.

Adjustment of pressure is accomplished by loosening jam nut and turning adjusting screw. Clockwise rotation increases pressure; counterclockwise rotation decreases pressure.

Application Guidance

High Flow Valve (“H” Model)

The “H” series valves require the use of a high vent spring (C*19-(H)06/10**-**-V**-**-1**-**).
Installation Data

Tank Connection
The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Transient pressure peaks in the tank line must not exceed 155 bar (2250 psi).

Note
Surges of oil in a common tank line serving these and other valves can be of sufficient magnitude to cause inadvertent shifting of the pilot spool of the valves. Separate tank lines or a vented manifold with a continuous downward path to tank is necessary.

Mounting
Mounting orientation is unrestricted.

Seals

Threaded Valves:
All seals used in the threaded valves are fluorocarbon as standard and are suitable for use with phosphate ester type fluids or its blends, water glycol, water-in-oil emulsions, and petroleum oil.

Subplate Mounted Valves:
Standard models are furnished with Buna-N seals for the mounting surface and may be used with water glycol, water-in-oil emulsions, and petroleum oil. Internal seals are fluorocarbon; the use of phosphate ester or its blends requires an F3 model. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

Subplates and Bolt Kits
Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG19-062C-F-10* valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, 5/8-11 x 2.75"

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Graphical Symbols
See page 46 for C*19-06/10 graphical symbols.

Ratings

<table>
<thead>
<tr>
<th>Spec</th>
<th>CG/T19-06</th>
<th>CG/T19-H06</th>
<th>CG/T19-10</th>
<th>CG/T19-H10</th>
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<tr>
<td>Rated Pressure (Maximum)</td>
<td>210 bar (3000 psi)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated Capacity (Maximum)</td>
<td>227 l/min (60 USgpm)</td>
<td>340 l/min (90 USgpm)</td>
<td>454 l/min. (120 USgpm)</td>
<td>680 l/min (180 USgpm)</td>
</tr>
<tr>
<td>Maximum Air Pilot Pressure</td>
<td>10 bar (150 psi)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Minimum Air Pilot Pressure</td>
<td>1,0 bar (15.0 psi)</td>
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</table>
Series C*19-06/10 Air Operated Relief Valves

Performance Curves

Subplate or Manifold Mounted Models

Nominal Override Characteristics

- **CG19-06**
- **CG19-10**

Vent Pressure Versus Flow*

- **CG19-06**
- **CG19-10**

* Valves supplied with external pilot connections (model designation “0C”, “2C”, “1A”, and “2A”) have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1.7 bar (25 psi) higher than shown.
Threaded Port Models

Nominal Override Characteristics

- CT19-06
- CT19-10

Vent Pressure Versus Flow*

- CT19-06
- CT19-10

* Valves supplied with external pilot connections (model designation “0C”, “2C”, “1A”, and “2A”) have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1.7 bar (25 psi) higher than shown.
Series C*19-06/10 Air Operated Relief Valves

Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models

Double Operator Spring Centered Type
CG19-(H) *** C - ** - * - 100 Series

Air pilot connection for P models
1/8 NPTF thread

Air pilot connection for B models
1/8 BSP thread

Remote relief connections
A (right) and B (left) for all models except OA†

Pressure adjustment control**

Remote control or vent connection, Use only when circuit indicates*

Pressure inlet connection*

Spring centered only fully extended

Note
See page 43 for tabulated dimensions.
* See mounting subplates for locating dimensions.
** Use 7.92 (0.312) hex key.
† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.
Single Operator Spring Offset Type
CG19-(H) *** A- ** - * - 100 Series
(See page 42 for other details and dimensions)

Air operated pilot valve with cover assembly can be rotated to 3 positions 90° apart

Manual Override Actuator
(for single operator models)
Typical Model CG19-062AP * - 100
Manual actuator applicable if pilot is rotated 90° from standard position.

<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>L</th>
<th>M</th>
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<td>62.0(2.44)</td>
<td>53.3(2.10)</td>
<td>106.4(4.19)</td>
<td>47.8(1.88)</td>
<td>107.2(4.22)</td>
<td>63.5(2.50)</td>
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<td>129.5(5.10)</td>
<td>156.5(6.16)</td>
<td>100.8</td>
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<td>CG19-(H)10</td>
<td>85.9(3.38)</td>
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<td>81.0(3.19)</td>
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<td>46.0(1.81)</td>
<td>143.8(5.66)</td>
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**Threaded Port Models**

**mm (inch)**

**Double Operator Spring Centered Type**

CT19-**C-**-**M-**-** - 100 Series

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<th>Note</th>
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</table>

See page 45 for tabulated dimensions.

* Use 7,92 (0.312) hex key.

** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

† .7500-16 UNF-2B thread for 0.500 O.D. tubing.

Air pilot connection for P models 1/8 NPTF thread

Air pilot connection for B models 1/8 BSP thread

Air pilot connections may be rotated 90° each side of center

Manual actuator (both ends)

Pressure adjustment control

Pilot or pressure gauge connection

Remote relief connections A (right) and B (left) for all models except OA

Remote control or vent connection† (Use only when circuit indicates.)

Wrench flats 3 places

H (system connections) 3 places

Fully extended

Manual actuator (both ends)

Pressure adjustment control

Pilot or pressure gauge connection

Remote relief connections A (right) and B (left) for all models except OA

Remote control or vent connection† (Use only when circuit indicates.)

Wrench flats 3 places

H (system connections) 3 places

Fully extended
Single Operator Spring Offset Type
CT19-***A-**M-**-**-100 Series
(See page 44 for other details and dimensions)

Air operated pilot valve with cover assembly can be rotated to 3 positions 90° apart

<table>
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<tr>
<th>Model</th>
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<th>C</th>
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</table>

■ Not recommended
Series C*19-06/10 Air Operated Relief Valves

Graphical Symbols

Model C*19-(H)**QC (DG18V-3-0C Pilot)

When operator “A” is pressurized, control is at connection “A”. When operator “B” is pressurized, control is at connection “B”. When both operators are de-pressurized, valve is vented.

Model C*19-(H)**2C (DG18V-3-2C Pilot)

When operator “A” is pressurized, control is at connection “A”. When operator “B” is pressurized, control is at connection “B”. When both operators are de-pressurized, control is by integral adjustment.

Model C*19-(H)**0A (DG18V-3-0BL Pilot)

When operator “A” is pressurized, control is by integral adjustment. When operator “A” is de-pressurized, valve is vented.

Model C*19-(H)**1A (DG18V-3-2AL Pilot)

When operator “A” is pressurized, control is at connection “A”. When operator “A” is de-pressurized, control is at connection “B”.

Model C*19-(H)**2A (DG18V-3-2BL Pilot)

When operator “A” is pressurized, control is at connection “A”. When operator “A” is de-pressurized, control is by integral adjustment.

Model C*19-(H)**0F (DG18V-3-0FL Pilot)

When operator “A” is pressurized, valve is vented. When operator “A” is de-pressurized, control is by integral adjustment.
### Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

#### Model Code

<table>
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<th>C</th>
<th>G</th>
<th>(H)</th>
<th>10</th>
<th>C</th>
<th>(E)</th>
<th>F</th>
<th>(V)</th>
<th>(PA3)</th>
<th>DG</th>
<th>(L)</th>
<th>(W)</th>
<th>8C</th>
<th>(230AC)</th>
<th>20</th>
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</thead>
</table>

**1** **Seals**
- F3 – For mineral oil and fire resistant fluids. Mounting face seals of CG model relief and all pilot valves have standard Buna-N seals unless specified as F3.
- Blank – Omit for standard models

**2** **Valve Type**
- C – Relief valve

**3** **Connections**
- G – Manifold or subplate mounting
- S – SAE straight thread
- T – NPTF thread*  
*Not recommended

**4** **High-flow Designation**
- H – High-flow valve (not available in CT models)
- Blank – Omit if not required

**5** **Valve Size**
- 06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4" pipe
- 10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4" pipe (not available in CS or CT models)

**6** **Head No. 1 Pressure Range**
- B – 8.5 to 70 bar (125 to 1000 psi)
- C – 35 to 140 bar (500 to 2000 psi)
- F – 100 to 210 bar (1500 to 3000 psi)
- E – Vent (tri-pressure models only)

**7** **Head No. 2 Pressure Range**
- B – 8.5 to 70 bar (125 to 1000 psi)
- C – 35 to 140 bar (500 to 2000 psi)
- F – 100 to 210 bar (1500 to 3000 psi)
- E – Vent (tri-pressure models only)

**8** **Head No. 3 Pressure Range**
- B – 8.5 to 70 bar (125 to 1000 psi)
- C – 35 to 140 bar (500 to 2000 psi)
- F – 100 to 210 bar (1500 to 3000 psi)
- E – Vent (tri-pressure models only)

**9** **High Vent Spring**
- V – Optional high vent spring installed (required in high-flow models)
- Blank – Omit if not required

**10** **Electrical Connections**
- PA3 – 3-pin receptacle (single solenoid models only)
- PA5 – 5-pin receptacle
- PB – “Insta-Plug” with male and female connectors
- S – Spool indicator switch (bi-pressure models only). Also available with PA3 and PA5 models.
- Blank – Omit if not required

**11** **Pilot Valve (DG4S4-01)**
- DG – Solenoid operated, sliding spool, four-way directional valve

**12** **Solenoid Indicator Light(s)**
- L – Lights available for use with 100V AC through 125V AC solenoids only
- Blank – Omit if not required

**13** **Housing**
- W – 1/2" NPT thread wiring housing (required for PA3 and PA5 models)
- Blank – Omit if not required

**14** **Pilot Spool Function and Spring Arrangement**
- 0A – Spring offset open center spool (bi-pressure models only)
- 8C – Spring centered tandem center spool with open center crossover (tri-pressure models only)

**WARNING**
Tandem center spool (8) must be used only with spring centered pilot valve (C). Open center spool (0) must be used only with spring offset pilot valve (A). Use of any other spools could be hazardous.

**15** **Solenoid Coil Voltage Rating**
- 230AC – 230V AC 60 Hz coils
- 460AC – 460V AC 60 Hz coils
- 115AC-50/60 – 115V AC 50/60 Hz coils
- 6DC – 6V DC coils
- 12DC – 12V DC coils
- 24DC – 24V DC coils
- Blank – Omit for standard 115V AC 60 Hz coils

**16** **Design Number**
Subject to change. Installation dimensions same for designs 20 through 29 (using -50 design DG4S4-01 pilot valve).
Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

General Data
The 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. The bi-pressure relief valve can be used to electrically select either of two preset pressures, or one pressure and vent.

The main stage is a balanced piston type relief valve, and the intermediate stages are of the poppet spring type. The pilot stage uses a standard DG4S4-01 (NFPA-D05) valve (see Vickers publication 671 for more details).

Pressure Adjustment
Any head in the intermediate stage can contain a B, C, or F spring. The pressure ranges of these springs are shown in the following table.

<table>
<thead>
<tr>
<th>Spring</th>
<th>Pressure Range (bar)</th>
<th>Pressure Range (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>8.5 to 70 (125 to 1000)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>35 to 140 (500 to 2000)</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>100 to 210 (1500 to 3000)</td>
<td></td>
</tr>
</tbody>
</table>

The minimum pressure as indicated for the “B” spring is a function of flow and is shown on the corresponding Nominal Override Characteristics curves.

If there is an “E” in the model code, the corresponding control head contains no spring. When that head is put into operation, the system is vented. The vent pressure is shown on the Vent Pressure vs. Flow curves.

Pressure for each head can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Application Guidance
High Flow Valve (“H” Model)
“H” series valves require the use of a high vent spring (CS-H06-BCV-DG or CG-H10-FCBV-DG).

Installation Data
Tank Connection
The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur.

Mounting
Inlet and outlet pressure connections (on straight or NPTF thread models) may be used interchangeably when the valve is mounted in the pressure line, or the valve may be teed off the pressure line with one of the pressure connections plugged. The tank connection should be piped directly to tank to maintain a desired action.

Electrical Information
Solenoids
Solenoids on models listed are for 115V AC 60 Hz service. Solenoids for other voltages and frequencies are available. Specify in the model code if service other than 115V AC 60 Hz is desired.

Note
Solenoids are designed to function continuously at ±10% rated voltage.

All solenoid coil wire insulation is Class “F”. Standard solenoid coil lead wire has Class “A” insulation. “F3” solenoid coil lead wire is Class “F”.

Solenoids “a” and “b” are identified on the unit by a diagram plate on the side of the pilot valve.

Solenoid Energizing
On tri-pressure models (C*-06/10-***, **DG*-NC*-1*-2*), energizing solenoid “a” causes pilot head No. 3 to control the pressure. Energizing solenoid “b” causes pilot head No. 1 to control the pressure. With both solenoids de-energized, pilot head No. 2 will control the pressure.

Solenoids must be kept energized to maintain a desired action.

On bi-pressure models (C*-06/10-***- **DG*-NC*-1*-2*), de-energizing the solenoid causes pilot head No. 1 to control the pressure. Energizing the solenoid causes pilot head No. 3 to control the pressure. The solenoid must be kept energized to maintain the desired action.

WARNING
DG pilot valve must conform to relief valve type being used. If relief valve is tri-pressure, pilot stage must be DG4S4-01BC*-5*. This valve contains type “8” tandem center open center crossover spool. If relief valve is bi-pressure, pilot stage must be DG4S4-010A*-5*. This valve contains type “0” open center spool. Use of incorrect spools could be hazardous.

Note
Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation. The valve should be cycled periodically to prevent this.

Spring centered and spring offset pilot valves are spring positioned unless the solenoid is energized continuously.
**Additional Information**

Eaton publication 671 contains additional information and dimensions on the pilot portion of the C*-06/10-DG, including solenoids and connections, insta-plug connections, and NFPA electrical connectors.

**Subplates and Bolt Kits**

Valves, subplates, and mounting bolts must be ordered separately.

Example:
1. CG-06-BCF-DG-8C-2* valve
2. CGM-06S-20 subplate
3. BKCG06604 bolt kit (consisting of four bolts, 5/8-11 x 2.75")

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

<table>
<thead>
<tr>
<th>Solenoid Voltage Rating</th>
<th>Inrush amps (R.M.S.)</th>
<th>Holding amps</th>
<th>Holding watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>115V AC 60 Hz</td>
<td>5.1</td>
<td>0.61</td>
<td>—</td>
</tr>
<tr>
<td>230V AC 60 Hz</td>
<td>2.55</td>
<td>0.32</td>
<td>—</td>
</tr>
<tr>
<td>460V AC 60 Hz</td>
<td>1.27</td>
<td>0.16</td>
<td>—</td>
</tr>
<tr>
<td>115V AC 50/60 Hz</td>
<td>50 Hz: 3.25</td>
<td>50 Hz: 0.56</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>60 Hz: 4.97</td>
<td>60 Hz: 0.59</td>
<td>—</td>
</tr>
<tr>
<td>6V DC</td>
<td>—</td>
<td>4.0</td>
<td>24</td>
</tr>
<tr>
<td>12V DC</td>
<td>—</td>
<td>2.0</td>
<td>24</td>
</tr>
<tr>
<td>24V DC</td>
<td>—</td>
<td>1.0</td>
<td>24</td>
</tr>
</tbody>
</table>

**Ratings**

<table>
<thead>
<tr>
<th>Rated Pressure (Maximum)</th>
<th>210 bar (3000 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Capacity (Maximum)</td>
<td></td>
</tr>
<tr>
<td>C*-06 and CG/S-H06</td>
<td>227 l/min (60 USgpm)</td>
</tr>
<tr>
<td></td>
<td>340 l/min (90 USgpm)</td>
</tr>
<tr>
<td>CG-10 and CG-H10</td>
<td>454 l/min (120 USgpm)</td>
</tr>
<tr>
<td></td>
<td>680 l/min (180 USgpm)</td>
</tr>
</tbody>
</table>

**Graphical Symbols**

**Tri-pressure Spring Centered Valve, 3-position**

C*-**.-***.DG-8C-2*

**Bi-pressure Spring Offset Valve, 2-position**

C*-**.-**.DG-0A-2*
Internal Vent Tri-pressure Models

On internal vent models, one control head is open and is identified by the letter “E” in the model code. Venting can be set so as to be selected by solenoid “a” or solenoid “b”. When control head No. 2 is open, venting takes place when both solenoids are de-energized.

Note

Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).
Performance Curves

Nominal Override Characteristics

- C*-06
- C*-10

Vent Pressure Versus Flow

- C*-06
- C*-10

System Pressure – psi

1000
2000
3000
4000
5000

System Pressure – bar

50
100
150
200
250
300

Flow – USgpm

1000
2000
3000
4000
5000
6000

Flow – l/min

50
100
150
200
250
300
350
400
450
500

Min. Adj. Pressure

High vent 06

High vent 10

Low vent 06

Low vent 10

Typical Vent Pressure – psi

0
20
40
60
80
100
120
140
160
180
200

Typical Vent Pressure – bar

0
50
100
150
200
250
300
350

High vent 06

H06

H10

Low vent 06

Low vent 10

High vent 10

Low vent 06

Low vent 10

Min. Adj. Pressure

Flow – l/min

50
100
150
200
250
300
350
400
450
500
600
684

Flow – USgpm

10
20
30
40
50
60
70
80
90
100
180

Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

Installation Dimensions
mm (inch)

Subplate or Manifold Mounted Models

Bi-pressure
CG-(H)*.*-*-DG*-0A-*-2*
and Tri-pressure
CG-(H)*.*-*-DG*-8C-*-2*

** See mounting subplates for locating dimensions.
** Use 7.92 (0.312) hex key.
† Clearance for removal of solenoid coil.
†† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

<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>L</th>
<th>M</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-(H)06-DG</td>
<td>71.4</td>
<td>7.9</td>
<td>62.0</td>
<td>53.3</td>
<td>106.4</td>
<td>47.8</td>
<td>107.2</td>
<td>47.8</td>
<td>42.9</td>
<td>134.1</td>
<td>155.7</td>
<td>96.8</td>
<td>159.5</td>
</tr>
<tr>
<td></td>
<td>(2.81)</td>
<td>(0.31)</td>
<td>(2.44)</td>
<td>(2.10)</td>
<td>(4.19)</td>
<td>(1.88)</td>
<td>(4.22)</td>
<td>(1.88)</td>
<td>(1.69)</td>
<td>(5.28)</td>
<td>(6.13)</td>
<td>(3.81)</td>
<td>(6.28)</td>
</tr>
<tr>
<td>CG-(H)10-DG</td>
<td>85.9</td>
<td>2.3</td>
<td>81.0</td>
<td>66.8</td>
<td>133.4</td>
<td>55.6</td>
<td>116.1</td>
<td>63.5</td>
<td>50.8</td>
<td>145.5</td>
<td>166.9</td>
<td>103.1</td>
<td>133.9</td>
</tr>
<tr>
<td></td>
<td>(2.81)</td>
<td>(0.31)</td>
<td>(2.44)</td>
<td>(2.63)</td>
<td>(5.25)</td>
<td>(2.19)</td>
<td>(4.57)</td>
<td>(2.50)</td>
<td>(2.00)</td>
<td>(5.73)</td>
<td>(6.57)</td>
<td>(4.06)</td>
<td>(5.27)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-(H)06-DG</td>
<td>16.6</td>
<td>24.5</td>
<td>35.1</td>
<td>35.9</td>
<td>55.6</td>
<td>111.3</td>
<td>191.8</td>
<td>225.6</td>
<td>242.8</td>
<td>48.5</td>
</tr>
<tr>
<td></td>
<td>(0.65)</td>
<td>(0.96)</td>
<td>(1.38)</td>
<td>(1.53)</td>
<td>(2.19)</td>
<td>(4.38)</td>
<td>(7.55)</td>
<td>(8.88)</td>
<td>(9.56)</td>
<td>(1.91)</td>
</tr>
<tr>
<td>CG-(H)10-DG</td>
<td>19.8</td>
<td>29.3</td>
<td>46.0</td>
<td>42.9</td>
<td>62.7</td>
<td>125.5</td>
<td>202.9</td>
<td>236.7</td>
<td>254.0</td>
<td>60.5</td>
</tr>
<tr>
<td></td>
<td>(0.78)</td>
<td>(1.15)</td>
<td>(1.81)</td>
<td>(1.69)</td>
<td>(2.47)</td>
<td>(4.94)</td>
<td>(7.99)</td>
<td>(9.32)</td>
<td>(10.00)</td>
<td>(2.38)</td>
</tr>
</tbody>
</table>
Threaded Port Models

**Bi-pressure**
CS/T-(H)06-***DG*-0A.-*2*  
and Tri-pressure  
CS/T-(H)06-***DG*-8C.-*2*

---

**Note**

* .7500-16 UNF-2B thread for 0.500 O.D. tubing.  
** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.  
† Use 7.92 (0.312) hex key.  
†† Clearance for removal of solenoid coil.

---

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS/H06-DG</td>
<td>1.0625-12 UN-2B thd. for 0.750 O.D. tubing</td>
</tr>
<tr>
<td>CT/H06-DG</td>
<td>3/4&quot; NPTF thd.</td>
</tr>
</tbody>
</table>

- Not recommended
Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

**DC Solenoid Models**

**mm (inch)**

**Double Solenoid Spring Centered Tri-pressure**

C *-(H)06 - *** - *** DG-8C-24DC-20

**Single Solenoid Spring Offset Bi-pressure**

C *-(H)06 - *** - *** DG-0A-24DC-20

---

**Monitor Switch Models**

**mm (inch)**

**Single Solenoid Spring Offset Bi-pressure (only) with Monitor Switch C *-10- **-5DG-0A-20**

When the solenoid is de-energized, the spool is returned to the offset position.

**Internal Monitor Switch**

This switch permits electrical interlocking of various hydraulic controlled motions without resorting to external mechanical contrivances. The switch monitors valve spool position and may be wired into the control circuit.

The monitor switch is a plunger type with panel mounting and uses a single pole, double throw contact arrangement. “A” is normally closed, and “B” is normally open.

The housing of the monitor switch does not provide for manual override operation.

---

**Electrical Ratings**

<table>
<thead>
<tr>
<th>Volts</th>
<th>AC amps</th>
<th>DC amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>125</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>250</td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>480</td>
<td>20</td>
<td>–</td>
</tr>
<tr>
<td>600</td>
<td>5</td>
<td>–</td>
</tr>
</tbody>
</table>
## Model Code

<table>
<thead>
<tr>
<th>(F3)</th>
<th>C</th>
<th>G</th>
<th>(H)</th>
<th>10</th>
<th>F</th>
<th>(E)</th>
<th>C</th>
<th>(V)</th>
<th>DG</th>
<th>8C</th>
<th>(P)</th>
<th>M</th>
<th>(S1)</th>
<th>(PA5)</th>
<th>M</th>
<th>WL</th>
<th>B(9)</th>
<th>P08</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Seals
- **F3**: For mineral oil and fire resistant fluids. Mounting face seals of CG model relief and all pilot valves have standard Buna-N seals unless specified as F3.
- **Blank**: Omit for standard models

### Valve Type
- **C**: Relief valve

### Connections
- **G**: Manifold or subplate mounting
- **S**: SAE straight thread
- **T**: NPTF thread*
  *Not recommended

### High-flow Designation
- **H**: High-flow valve (not available in CT models)
- **Blank**: Omit if not required

### Valve Size
- **06**: 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4” pipe
- **10**: 1.6250-12 UN-2B straight thread (1.250 tubing) or 11/4” pipe (not available in CS or CT models)

### Head No. 1 Pressure Range
- **B**: 8.5 to 70 bar (125 to 1000 psi)
- **C**: 35 to 140 bar (500 to 2000 psi)
- **F**: 100 to 210 bar (1500 to 3000 psi)
- **E**: Vent (tri-pressure models only)

### Head No. 2 Pressure Range
- **B**: 8.5 to 70 bar (125 to 1000 psi)
- **C**: 35 to 140 bar (500 to 2000 psi)
- **F**: 100 to 210 bar (1500 to 3000 psi)
- **E**: Vent (tri-pressure models only)

### Head No. 3 Pressure Range
- **B**: 8.5 to 70 bar (125 to 1000 psi)
- **C**: 35 to 140 bar (500 to 2000 psi)
- **F**: 100 to 210 bar (1500 to 3000 psi)
- **E**: Vent (tri-pressure models only)

### High Vent Spring
- **V**: Optional high vent spring installed (required in high-flow models)
- **Blank**: Omit if not required

### Pilot Valve (DG4V-3 or DG4V-3S)
- **DG**: Solenoid operated, sliding spool, four-way directional valve

### Pilot Spool Function and Spring Arrangement
- **0A**: Spring offset open center spool (bi-pressure models only)
- **8C**: Spring centered tandem center spool with open center crossover (tri-pressure models only)

### Manual Override
- **P**: Plain override in both ends of single solenoid (bi-pressure models only)
- **Blank**: Omit if not required

### Flag Symbol
- **M**: Electrical options and features

### Spool Indicator Switch
- **S**: Switch unwired
- **S1**: Switch wired normally open
- **S2**: Switch wired normally closed
- **Blank**: Omit if not required

### Electrical Connections
- **PA3**: 3-pin receptacle (single solenoid models only)
- **PA5**: 5-pin receptacle
- **PB**: "Insta-Plug" with male and female connectors
- **Blank**: Omit if not required

### Pilot and Adapter
- **M**: DG4V-3(S) pilot valve with adapter plate*
  *Refer to catalog GB-C-2015 for pilot and adapter plate mounting information.

### Housing or Coil Type
- **U**: ISO 4400 (DIN 43650) connector
- **W**: 1/2” NPT thread wiring housing
- **WL**: 1/2” NPT thread wiring housing with coil indicator lights

### Solenoid Coil Voltage Rating
- **A**: 110V AC 50 Hz
- **B**: 110V AC 50 Hz/120V AC 60 Hz
- **C**: 220V AC 50 Hz
- **D**: 220V AC 50 Hz/240V AC 60 Hz
- **G**: 12V DC
- **H**: 24V DC

### Coil Wattage
- **9**: Low wattage coil*
- **Blank**: Omit if not required
  * Available only with B, G, and H voltage coils and only on -40 design models.

### Pilot Valve Port Orifices
- **0**: Solid plug
- **03**: 0.30 (0.012)
- **06**: 0.60 (0.024)
- **08**: 0.80 (0.030)
- **10**: 1.00 (0.040)
- **13**: 1.30 (0.050)
- **15**: 1.50 (0.060)
- **20**: 2.00 (0.080)
- **23**: 2.30 (0.090)
- **Blank**: Omit if not required
  * = P, T, A, or B as required

### Design Number
- **40**: Model with DG4V-3S standard performance pilot valve
- **50**: Model with DG4V-3 high performance pilot valve

Subject to change. Installation dimensions same for designs 40 through 49 and for designs 50 through 59.
Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

General Data
The -40 and -50 design multi-pressure solenoid operated relief valves are the same as the -20 design shown in the previous section, except for the pilot valve. The DG4S4-10 (NFPA-D05) pilot valve used in the -20 design is replaced by a smaller DG4V3 (NFPA-D03) valve. The -40 design uses a DG4V-3S (standard performance) pilot valve, and the -50 design uses a DG4V-3 (high performance) pilot valve.

Pressure relief performance of the -40 and -50 design valves is the same as for the -20 design valve, but pilot pressures as high as 350 bar (5075 psi) are possible with the -40 and -50 designs. The -50 design provide greater pilot flow capability.

The 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. The bi-pressure relief valve can be used to electrically select either of two preset pressures, or one pressure and vent.

The main stage is a Vickers balanced piston type relief valve, and the intermediate stages are of the poppet spring type. As explained above, the pilot stage uses either a standard DG4V3S or high performance DG4V3 valve (see Vickers publication DG4V-3(S)-B2). If relief valve is tri-pressure, pilot stage must be DG4V-3(S)-0A, or DG4V-3(S)-0A-40. This valve contains type “0” open center spool. Use of incorrect spools could be hazardous.

Pressure for each head can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Electrical Information
Solenoids
Solenoids “a” and “b” are identified on the unit by a diagram plate on the side of the pilot valve.

Solenoid Energizing
On tri-pressure models (C*-06/10-****. **DG*-0A-M-M-**-40/50), de-energizing the solenoid causes pilot head No. 3 to control the pressure. Energizing the solenoid causes pilot head No. 1 to control the pressure. With both solenoids de-energized, pilot head No. 2 will control the pressure. Solenoids must be kept energized to maintain a desired action.

On bi-pressure models (C*-06/10-***. **DG*-0A-M-M-**-40/50), de-energizing the solenoid causes pilot head No. 3 to control the pressure. Energizing the solenoid causes pilot head No. 3 to control the pressure. The solenoid must be kept energized to maintain the desired action.

WARNING
DG pilot valve must conform to relief valve type being used. If relief valve is tri-pressure, pilot stage must be DG4V-3(S)-0C. This valve contains type “8” tandem center open center crossover spool. If relief valve is bi-pressure, pilot stage must be DG4V-3(S)-0A. This valve contains type “0” open center spool. Use of incorrect spools could be hazardous.

Note
Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation. The valve should be cycled periodically to prevent this.

Spring centered and spring offset pilot valves are spring positioned unless the solenoid is energized continuously.

Application Guidance
High Flow Valve (“H” Model)
“H” series valves require the use of a high vent spring (CS-H06-BCV-DG or CG-H10-FCBV-DG).

Installation Data
Tank Connection
The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur.

Mounting
Inlet and outlet pressure connections (on straight or NPTF thread models) may be used interchangeably when the valve is mounted in the pressure line, or the valve may be teed off the pressure line with one of the pressure connections plugged. The tank connection should be piped directly to tank to minimize back pressure.

Subplates and Bolt Kits
Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CGM-06-BCF-DG-8C-M-M-**-40 valve
(1) CGM-065-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, 5/16 x 2.75”)

CGM-065-20 and CGM-105-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 µm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Ratings

<table>
<thead>
<tr>
<th>Rated Pressure (Maximum)</th>
<th>210 bar (3000 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Pressure (Maximum)</td>
<td>Standard “H”</td>
</tr>
<tr>
<td>C*-06 and CG/S-H06</td>
<td>227 L/min (60 USgpm)</td>
</tr>
<tr>
<td>CG-10 and CG-H10</td>
<td>454 L/min (120 USgpm)</td>
</tr>
</tbody>
</table>
Internal Vent Tri-pressure Models

On internal vent models, one control head is open and is identified by the letter “E” in the model code. Venting can be set so as to be selected by solenoid “a” or solenoid “b”. When control head No. 2 is open, venting takes place when both solenoids are de-energized.

Note

Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).

Graphical Symbols

Tri-pressure Spring Centered Valve, 3-position
C**-DG-8C-M-M-**-40/50

Bi-pressure Spring Offset Valve, 2-position
C**-DG-0A-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**E-DG-8C-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Note

Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).

Graphical Symbols

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Bi-pressure Spring Offset Valve, 2-position
C**-DG-0A-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Tri-pressure Spring Centered Valve, 3-position
C**-**E-DG-8C-M-M-**-40/50

Note

Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).
Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

Performance Curves

Nominal Override Characteristics

- **C*-06**
- **C*-10

**Vent Pressure Versus Flow**

- **C*-06**
- **C*-10
Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models
Bi-pressure CG-(H)**.**DG-0A-M-M-**-40/50 and Tri-pressure CG-(H)**.**DG-8C-M-M-**-40/50

Note
* See mounting subplates (page 24) for locating dimensions.
** Use 7.92 (0.312) hex key.
† Clearance for removal of solenoid coil.
†† 4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

<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>L</th>
<th>M</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>CG-(H)06-DG</td>
<td>71.4</td>
<td>7.9</td>
<td>62.0</td>
<td>53.3</td>
<td>106.4</td>
<td>47.8</td>
<td>107.2</td>
<td>47.8</td>
<td>42.9</td>
<td>131.1</td>
<td>156.5</td>
<td>100.8</td>
<td>159.5</td>
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<td></td>
<td>(2.81)</td>
<td>(0.31)</td>
<td>(2.44)</td>
<td>(2.10)</td>
<td>(4.19)</td>
<td>(1.88)</td>
<td>(4.22)</td>
<td>(1.88)</td>
<td>(1.69)</td>
<td>(5.16)</td>
<td>(6.16)</td>
<td>(3.97)</td>
<td>(6.28)</td>
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<tr>
<td>CG-(H)10-DG</td>
<td>85.9</td>
<td>2.3</td>
<td>81.0</td>
<td>66.8</td>
<td>133.4</td>
<td>55.6</td>
<td>116.1</td>
<td>63.5</td>
<td>50.8</td>
<td>141.5</td>
<td>164.6</td>
<td>104.7</td>
<td>163.6</td>
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<tr>
<td></td>
<td>(3.38)</td>
<td>(0.31)</td>
<td>(2.44)</td>
<td>(2.63)</td>
<td>(5.25)</td>
<td>(2.19)</td>
<td>(4.57)</td>
<td>(2.50)</td>
<td>(2.00)</td>
<td>(5.57)</td>
<td>(6.48)</td>
<td>(4.12)</td>
<td>(6.44)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>O</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>AA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-(H)06-DG</td>
<td>16.6</td>
<td>24.5</td>
<td>35.1</td>
<td>35.9</td>
<td>55.6</td>
<td>111.3</td>
<td>184.9</td>
<td>209.8</td>
<td>235.7</td>
<td>253.5</td>
<td>275.6</td>
<td>48.5</td>
<td>39.6</td>
</tr>
<tr>
<td></td>
<td>(1.38)</td>
<td>(0.96)</td>
<td>(1.38)</td>
<td>(1.53)</td>
<td>(2.19)</td>
<td>(4.38)</td>
<td>(7.28)</td>
<td>(8.26)</td>
<td>(9.28)</td>
<td>(10.85)</td>
<td>(1.91)</td>
<td>(1.56)</td>
<td></td>
</tr>
<tr>
<td>CG-(H)10-DG</td>
<td>19.8</td>
<td>29.3</td>
<td>46.0</td>
<td>42.9</td>
<td>62.7</td>
<td>125.5</td>
<td>196.1</td>
<td>221.0</td>
<td>246.9</td>
<td>264.4</td>
<td>286.8</td>
<td>60.5</td>
<td>46.7</td>
</tr>
<tr>
<td></td>
<td>(0.78)</td>
<td>(1.15)</td>
<td>(1.81)</td>
<td>(1.69)</td>
<td>(2.47)</td>
<td>(4.94)</td>
<td>(7.72)</td>
<td>(8.70)</td>
<td>(9.72)</td>
<td>(10.41)</td>
<td>(2.38)</td>
<td>(1.84)</td>
<td></td>
</tr>
</tbody>
</table>
Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

Threaded Port Models

mm (inch)

Bi-pressure
CS/T(H)06-DG-0A-M-M-**-*-40/50

and Tri-pressure
CS/T(H)06-DG-8C-M-M-**-*-40/50

Note

* .7500-16 UNF-2B thread for 0.500 O.D. tubing.

** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

† Use 7.92 (0.312) hex key.

†† Clearance for removal of solenoid coil.

Model | A
--- | ---
CS-(H)06-DG | 1.0625-12 UN-2B thd. for 0.750 O.D. tubing
CT-(H)06-DG | 3/4" NPTF thd.

Not recommended
**Application Data**

### Weights

The following table lists the approximate weight of each valve in the catalog:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Weight kg (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGR-02</td>
<td>1.4 (3)</td>
</tr>
<tr>
<td>C-175</td>
<td>1.8 (4)</td>
</tr>
<tr>
<td>CG-03</td>
<td>3.2 (7)</td>
</tr>
<tr>
<td>CS/T-03/06</td>
<td>2.7 (6)</td>
</tr>
<tr>
<td>CG-06</td>
<td>5.0 (11)</td>
</tr>
<tr>
<td>CG-10</td>
<td>8.6 (19)</td>
</tr>
<tr>
<td>CG5-06</td>
<td>8.4 (18.5)</td>
</tr>
<tr>
<td>CG5-10</td>
<td>11.1 (24.5)</td>
</tr>
<tr>
<td>CS/T-03/06</td>
<td>6.1 (13.5)</td>
</tr>
<tr>
<td>CS/T-10</td>
<td>8.6 (19)</td>
</tr>
<tr>
<td>CG19-(H)06</td>
<td>7.8 (17.2)</td>
</tr>
<tr>
<td>CG19-(H)10</td>
<td>10.5 (23.2)</td>
</tr>
<tr>
<td>CT19-06</td>
<td>4.8 (12.9)</td>
</tr>
<tr>
<td>CT19-10</td>
<td>7.3 (18.4)</td>
</tr>
<tr>
<td>CG-(H)06-DG</td>
<td>11.8 (26)</td>
</tr>
<tr>
<td>CG-(H)10-DG</td>
<td>18.1 (40)</td>
</tr>
<tr>
<td>CS/T-(H)06-DG</td>
<td>10.0 (22)</td>
</tr>
<tr>
<td>CG-(H)06-DG-M-M</td>
<td>11.3 (25)</td>
</tr>
<tr>
<td>CG-(H)10-DG-M-M</td>
<td>17.7 (39)</td>
</tr>
<tr>
<td>CS/T-(H)06-DG-M-M</td>
<td>10.0 (22)</td>
</tr>
</tbody>
</table>

The following table lists the approximate weight of each subplate in the catalog:

<table>
<thead>
<tr>
<th>Subplate</th>
<th>Weight kg (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM-10S-03-10</td>
<td>1.6 (3.5)</td>
</tr>
<tr>
<td>CM GMT-03-10</td>
<td>1.6 (3.5)</td>
</tr>
<tr>
<td>CM-06S-20</td>
<td>3.4 (7.5)</td>
</tr>
<tr>
<td>CGM-10S-20</td>
<td>6.8 (15.0)</td>
</tr>
</tbody>
</table>

### Fluids and Seals

For best results, oil viscosity should range between 32 cSt and 49 cSt (150 SUS and 225 SUS) at 38°C (100°F). Maximum operating temperature is 66°C (150°F) for the CGR-02 and 68°C (155°F) for all other models. Water glycol, water-in-oil emulsions, and petroleum oil may be used with non-F3 models, which are furnished with Buna-N seals for the mounting surface and fluorocarbon seals internally. Add F3 prefix when phosphate ester type fluids or blends are to be used. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

**Subplates and Bolt Kits**

Valves, subplates, and mounting bolts must be ordered separately.

Example:

(1) CG5-062C-F-M-W-*-110 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, 5/8–11 x 2.75”)

The following table lists the appropriate bolt kit for each subplate mounted valve in the catalog:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Bolt Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG-03-B-10</td>
<td>BKCG03602</td>
</tr>
<tr>
<td>CG-(H)06-(V)-50</td>
<td>BKCG06604</td>
</tr>
<tr>
<td>CG-06-(V)Y-50</td>
<td>BKCG06605</td>
</tr>
<tr>
<td>CG-(H)10-(V)-30</td>
<td>BKCG10616</td>
</tr>
<tr>
<td>CG-10-(V)Y-30</td>
<td>BKCG10616</td>
</tr>
<tr>
<td>CG5-06*(110</td>
<td>BKCG06604</td>
</tr>
<tr>
<td>CG5-10*(110</td>
<td>BKCG10616</td>
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<td>CG19-06*(100</td>
<td>BKCG06604</td>
</tr>
<tr>
<td>CG19-10*(100</td>
<td>BKCG10616</td>
</tr>
<tr>
<td>CG-(H)06-DG*-20/40/50</td>
<td>BKCG06604</td>
</tr>
<tr>
<td>CG-(H)10-DG*-20/40/50</td>
<td>BKCG10616</td>
</tr>
</tbody>
</table>

When a subplate is not used, a machined pad (as indicated by shaded area on subplate installation dimensions pages) must be provided for mounting. The pad must be flat within 0.013 mm (0.0005 in) and smooth within 1.6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

### Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 “Vickers Guide to Systemic Contamination Control” available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

The recommended fluid cleanliness level is: 19/17/14