### STANDARD, 4000 PSI MAXIMUM SETTING

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Typical Cartridge Model Code</th>
<th>Cracking Pressure</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 15 GPM</td>
<td>CBCA – LHN</td>
<td>30 psi Check Spring</td>
<td>Buna-N</td>
</tr>
<tr>
<td>E 30 GPM</td>
<td>CBEE – LHN</td>
<td>1000 - 4000 psi</td>
<td>Viton</td>
</tr>
<tr>
<td>G 60 GPM</td>
<td>CBGA – LHN</td>
<td>1000 - 2500 psi</td>
<td></td>
</tr>
<tr>
<td>I 120 GPM</td>
<td>CBIA – LHN</td>
<td>1200 GPM</td>
<td></td>
</tr>
</tbody>
</table>

#### OPTION ORDERING INFORMATION

**Nominal Capacity**
- **C** 15 GPM
- **E** 30 GPM
- **G** 60 GPM
- **I** 120 GPM

**Control**
- **L** Standard Screw
- **C** Tamper Resistant
- **H** 3:1 Pilot Ratio
- **B** 5:1 Pilot Ratio (with sealed pilot)
- **Y** 2:1 Pilot Ratio (with bleed through pilot)

**Version**
- **J** 4.5:1 Pilot Ratio
- **H** 10:1 Pilot Ratio
- **L** 2.3:1 Pilot Ratio (with sealed pilot)

**Installation Torque**
- **J** 30 psi Check Spring: 30/35 lb-ft
- **H** 2000 - 5000 psi: 45/50 lb-ft
- **L** 1200 GPM: 150/160 lb-ft

#### Cartridge Dimensions

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Typical Cartridge Model Code</th>
<th>Cavity</th>
<th>Installation Torque (lb. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 GPM</td>
<td>CBCA – LHN</td>
<td>T - 11A</td>
<td>30/35</td>
</tr>
<tr>
<td>30 GPM</td>
<td>CBEE – LHN</td>
<td>T - 2A</td>
<td>45/50</td>
</tr>
<tr>
<td>60 GPM</td>
<td>CBGA – LHN</td>
<td>T - 17A</td>
<td>150/160</td>
</tr>
<tr>
<td>120 GPM</td>
<td>CBIA – LHN</td>
<td>T - 19A</td>
<td>350/375</td>
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**Turn screw clockwise to reduce setting and release load. Complete Adjustment 3 Turns.**

### STANDARD, 5000 PSI MAXIMUM SETTING

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<td>30 psi Check Spring</td>
<td>Buna-N</td>
</tr>
<tr>
<td>E 30 GPM</td>
<td>CBEG – LJN</td>
<td>2000 - 5000 psi</td>
<td>Viton</td>
</tr>
<tr>
<td>G 60 GPM</td>
<td>CBGG – LJN</td>
<td>1000 - 2500 psi</td>
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#### OPTION ORDERING INFORMATION

**Nominal Capacity**
- **C** 15 GPM
- **E** 30 GPM
- **G** 60 GPM
- **I** 120 GPM

**Control**
- **L** Standard Screw
- **C** Tamper Resistant
- **G** 4.5:1 Pilot Ratio
- **H** 10:1 Pilot Ratio
- **L** 2.3:1 Pilot Ratio (with sealed pilot)

**Version**
- **J** 30 psi Check Spring: 30/35 lb-ft
- **K** 1000 - 2500 psi: 45/50 lb-ft
- **L** 1200 GPM: 150/160 lb-ft

**Installation Torque**
- **J** 30 psi Check Spring: 30/35 lb-ft
- **K** 2000 - 5000 psi: 45/50 lb-ft
- **L** 1200 GPM: 350/375 lb-ft

#### Cartridge Dimensions

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**Turn screw clockwise to reduce setting and release load. Complete Adjustment 3 Turns.**

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**Counterbalance Valves**

#### Cartridge Dimensions

- **Nominal Capacity**
  - **C** 15 GPM
  - **E** 30 GPM
  - **G** 60 GPM
  - **I** 120 GPM

- **Control**
  - **L** Standard Screw
  - **C** Tamper Resistant
  - **H** 3:1 Pilot Ratio
  - **B** 5:1 Pilot Ratio (with sealed pilot)
  - **Y** 2:1 Pilot Ratio (with bleed through pilot)

- **Installation Torque**
  - **J** 30 psi Check Spring: 30/35 lb-ft
  - **K** 1000 - 2500 psi: 45/50 lb-ft
  - **L** 1200 GPM: 350/375 lb-ft

---

**Option Ordering Information**

- **Turn screw clockwise to reduce setting and release load. Complete Adjustment 3 Turns.**

- **Adjustment Range Options:**
  - **C, E, G, I** are standard set at 3000 psi.
  - **H, K** are standard set at 2000 psi.
  - Customer may specify setting.

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**Cartridge Dimensions**

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Counterbalance Valves, 3:1, 1.5:1 and 2:1 Pilot Ratio, External Pilot, Non-vented

Applications
The Sun three port counterbalance cartridges (with pilot to open assist) are modulating devices that allow free flow from port 2 (inlet) to port 1 (load) and then block reverse flow until a pilot pressure inversely proportional to the load pressure is sensed at port 3 (pilot) or load pressure exceeds relief setting. These valves improve the motion control of most control valve systems by ensuring that the actuator always sees a positive load pressure, even under overrunning load situations.

Design Concepts and Features
- Recommended minimum setting should be 1.3 times maximum load induced pressure.
- 3:1, 1.5:1, 2:1 pilot ratio, load holding to 3000 psi (with 4000 psi setting).
- Load reactive pilot assist for overcenter load control applications.
- 5 drops/min. maximum leakage at reseat.
- Reseat exceeds 85% of set pressure at standard setting.
- Back pressure at Port 2 may adversely affect operation of valve. For circuits with back pressure Sun recommends vented counterbalance valves CW** (vented valves).

Counterbalance Valves, 4.5:1, 10:1 and 2.3:1 Pilot Ratio, External Pilot, Non-vented

Applications
The Sun three port counterbalance cartridges (with pilot to open assist) are modulating devices that allow free flow from port 2 (inlet) to port 1 (load) and then block reverse flow until a pilot pressure inversely proportional to the load pressure is sensed at port 3 (pilot) or load pressure exceeds relief setting. These valves improve the motion control of most control valve systems by ensuring that the actuator always sees a positive load pressure, even under overrunning load situations.

Design Concepts and Features
- Recommended minimum setting should be 1.3 times maximum load induced pressure.
- 4.5:1 10:1, 2.3:1 pilot ratio, load holding to 3760 psi (with 5000 psi setting).
- Load reactive pilot assist for overcenter load control applications.
- 5 drops/min. maximum leakage at reseat.
- Reseat exceeds 85% of set pressure at standard setting.
- Back pressure at Port 2 may adversely affect operation of valve. For circuits with back pressure Sun recommends vented counterbalance valves CW** (vented valves).

General Application Requirements
- Operating Temperature Range: Buna-N seals -50°F to 200°F, Viton seals 0°F to 250°F.
- Viscosity Range: 60-3000 SUS.
- Fluid Contamination Level: ISO 4406 18/15 or better; Recommend βp≥75 to achieve ISO 18/15 or better in most systems.
- Factory Pressure Setting for cartridge is established at cracking flow 35 cc/min.