Pilot-Operated Gas Lift Valves
Slickline-retrievable valves for intermittent tubing flow production

APPLICATIONS
- Intermittent tubing flow production

BENEFITS
- Increases efficiency
- Enables uniform bellows operation

FEATURES
- Small spread between the opening and closing casing pressures
- Large flow-area for high-volume gas injection applications
- Premium materials suitable for various environments
- Floating seats for versatile application and economical replacement
- Field-proven Camco® gas lift and subsurface safety systems bellows in the pilot section
- Reverse-flow check valves to prevent backflow into the tubing annulus

Each Camco systems pilot-operated gas lift valve consists of a pilot section and a power section. A specially manufactured, nitrogen-charged, multi-ply MONEL® bellows provides the force necessary to maintain the pilot section in the normally closed position, while the power section uses an INCONEL® spring for the purpose. 1-in [25.4-mm] OD PK-1 valves and 1½-in [38.1-mm] OD RP-6 valves are available. The valves feature integral reverse-flow check valves and floating seats.

Flow areas
The power section of the PK-1 valve has a flow area equivalent to a ⅛-in [9.5-mm] port. Port sizes for the pilot section are available in ¼-in [1.6-mm] increments from ⅛ to ⅛ in [3.2 to 7.9 mm].

The power section of the RP-6 valve has a flow area equivalent to a ⅝-in [14.3-mm] port. Port sizes for the pilot section are available in ⅛-in increments from ¼ to ½ in [6.4 to 12.7 mm].

Operation
The power section of the valve is either fully open or fully closed, as determined by the pilot section. Injection gas enters the pilot section of the valve and acts on the effective bellows area. As injection pressure overcomes the precharged nitrogen pressure in the bellows, the bellows is compressed and lifts the stem tip off the seat.

Injection gas then flows down past the seat and eventually overcomes the preset spring force of the power section. As the power section opens, a high volume of injection gas flows through the valve, past the reverse-flow check valve into the production tubing.

Engineering Data for Pilot-Operated Valves

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Nominal OD, in [mm]</th>
<th>Latch</th>
<th>Running Tool</th>
<th>Pulling Tool</th>
<th>Mandrel Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>PK-1</td>
<td>1.000 [25.4]</td>
<td>GA-2</td>
<td>JDC†</td>
<td>KBM, KBMM, KBMG, KBG</td>
<td></td>
</tr>
<tr>
<td>RP-6</td>
<td>1.500 [38.1]</td>
<td>RA</td>
<td>JDC</td>
<td>MMA</td>
<td></td>
</tr>
<tr>
<td>RP-6 1½</td>
<td>1.500 [38.1]</td>
<td>RK</td>
<td>JDS</td>
<td>MMM, MMG, MMRG</td>
<td></td>
</tr>
</tbody>
</table>

†Use core extension with this pulling tool for integral bottom latch valves.