TRFC-LT flow control valves expand the economic feasibility of intelligent completions to lower-productivity wells. They enable operators to optimize well performance via downhole control of zonal production. The valves can be part of an integrated intelligent approach or installed as stand-alone tools.

**Surface-actuated downhole control**
TRFC-LT valves are actuated from surface by applying differential hydraulic pressure across a balanced piston. The balanced piston design eliminates the need to counteract control line hydrostatic head during operation, extending the valve setting depth.

**Flexible flow control**
Two versions of this annular-type valve are available: on-off or four position. For the multiposition valve, various choke bean sizes are available. When the valve is fully open, there is no restriction to fullbore flow. TRFC-LT is a direct-position valve and can shift directly from any position to any other position.

**Reduced installation complexity**
A single-zone well requires two hydraulic control lines. For multizone wells with multiple TRFC-LT valves and no multidrop module, each valve has a dedicated “open” line while the single “close” line is shared by all (i.e., \(n + 1\) lines for \(n\) zones).

The optional hydraulic multidrop module enables selective control of more TRFC-LT valves with fewer hydraulic lines. The number of lines is determined by WellBuilder® completion system design software and depends on the configuration of on-off and multiposition valves used. The module directs the required pressure to the appropriate side of the valve piston to actuate the valve of interest.

**WellWatcher Advisor software**
Through real-time workflows that integrate data from multiple zones or wells, WellWatcher Advisor® real-time intelligent completion software provides solutions and the ability to

- determine the real-time liquid rate for each zone via mechanistic choke models
- improve the accuracy of rate calculations by using PVT data
to correct fluid properties to downhole conditions
- compute the real-time pseudosteady-state productivity index and
average reservoir pressure
- identify underperforming zones and wells
- improve the wellbore cleanup process
- optimize flow control valve positions to accelerate production and
maximize recovery
- perform zonal back allocation of reserves using cumulatives.

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**TRFC-LT Valve Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size, in [mm]</td>
<td>2½ [73]</td>
</tr>
<tr>
<td>Type</td>
<td>On-off or four position</td>
</tr>
<tr>
<td>Working differential pressure, psi [kPa]</td>
<td>5,000 [34,474]</td>
</tr>
<tr>
<td>Working temperature, degF [degC]</td>
<td>257 [125]</td>
</tr>
<tr>
<td>OD, in [mm]</td>
<td>5.5 [140]</td>
</tr>
<tr>
<td>ID, in [mm]</td>
<td>2.3 [58]</td>
</tr>
<tr>
<td>Max. equalization differential pressure, psi [kPa]</td>
<td>1,000 [6,894]</td>
</tr>
<tr>
<td>Max. flow rate, bbl/d [m³/d]</td>
<td>10,000 [1,590]</td>
</tr>
<tr>
<td>Choke seal material</td>
<td>Nonelastomeric</td>
</tr>
</tbody>
</table>

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