

TRFC-LT

Hydraulic flow control valve



Rated to 5,000 psi
[34 MPa]



Rated to 257 degF
[125 degC]

APPLICATIONS

- Multizone intelligent completions
- Commingled-flow completions
- Compartmentalized horizontal wells
- High-water-cut wells

BENEFITS

- Enables cost-effective optimization of well performance by reducing unwanted water and gas production
- Enhances dynamic reservoir characterization through periodic zonal tests without need for interventions
- Improves production or injection sweep through zonal control
- Eliminates costs and risks of well interventions by using surface-controlled chokes
- Enables accurate production allocation in conjunction with PT gauges via precise, repeatable flow choke characterization

FEATURES

- Unrestricted setting depth enabled by balanced piston design
- On-off or four-position configurations
- Various choke sizes available in four-position configuration
- Optional multidrop module for fewer hydraulic lines when installing multiple TRFC-LT valves
- Choice of materials and thread types
- Bypass slot for electrical, fiber-optic, or hydraulic line(s)

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



Four-position (left) and on-off (right) versions of TRFC-LT flow control valve.

- 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.

TRFC-LT Valve Specifications

Size, in [mm]	2 $\frac{7}{8}$ [73]
Type	On-off or four position
Working differential pressure, psi [kPa]	5,000 [34,474]
Working temperature, degF [degC]	257 [125]
OD, in [mm]	5.5 [140]
ID, in [mm]	2.3 [58]
Max. equalization differential pressure, psi [kPa]	1,000 [6,894]
Max. flow rate, bbl/d [m ³ /d]	10,000 [1,590]
Choke seal material	Nonelastomeric