

WRFC-H

Wireline-retrievable flow control valve for gas lift applications



Rated up to 7,500 psi
[52 MPa]



Rated up to 250 degF
[121 degC]

APPLICATIONS

- Auto gas lift intelligent completions
- Conventional gas lift completions

BENEFITS

- Maximize production
- Incrementally adjust variable window choke from surface without need for costly intervention
- Eliminate production loss to thief zones and cross-contamination of reservoirs
- Economically repair or replace parts exposed to turbulent flow

FEATURES

- Installation and retrieval by standard slickline, wireline, or coiled tubing
- Reverse-flow check valves to prevent crossflow
- Customizable, four choking positions plus fully closed and fully open positions
- Dependable mechanical closure spring
- Compatibility with oil- and water-based control line fluids
- Gas qualification

The WRFC-H wireline-retrievable flow control valve provides zonal production control in gas lift applications. It is remotely actuated from surface by applying hydraulic pressure to a control line that connects the surface system to the valve's operating section.

The WRFC-H valve is housed in the eccentric pocket of a Schlumberger side pocket mandrel located adjacent to the tubing bore. It has a customizable maximum flow area and controls up to 10,000 bbl/d [1,590 m³/d] of solids-free liquid or 30 MMcf/d [849,505 m³/d] of dry gas. The valve mandrel is available in a range of sizes and materials.

Operation

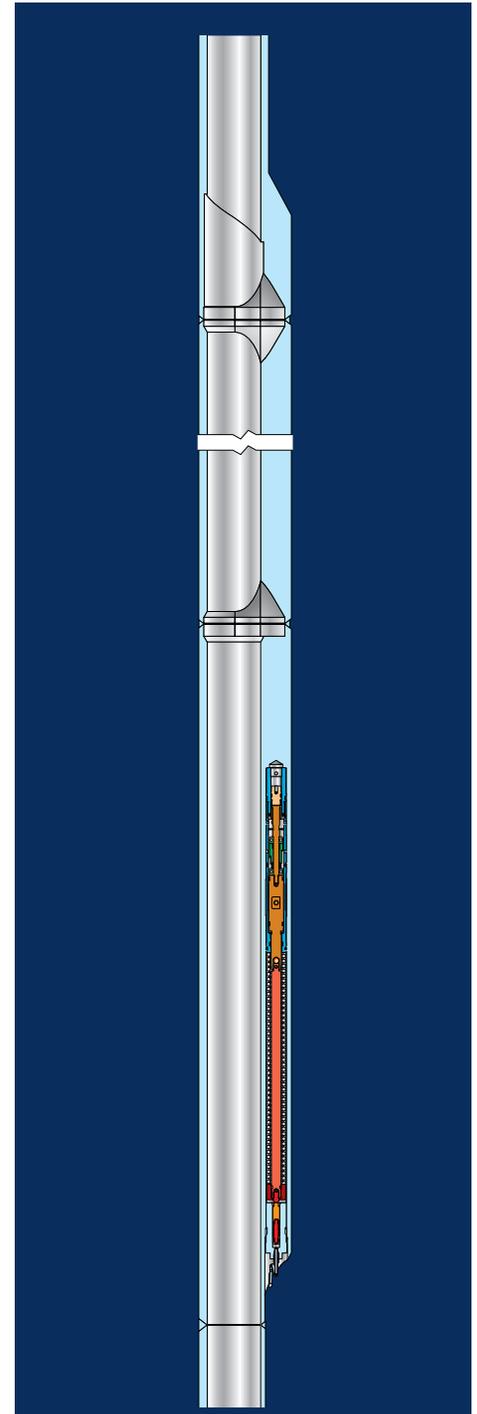
A proven surface-controlled hydraulic system is used to adjust the valve orifice so that lift-gas flow is optimized without necessitating costly well intervention.

The actuation module adjusts the WRFC-H variable-window control valve, which can be configured with up to six positions, including fully open and fully closed. Fluid flow is controlled in 20% increments. Adjusting the flow rate of injected gas provides control of zonal production. Valve opening size can be customized to suit the application. Reverse-flow check valves prevent crossflow between reservoirs and unwanted annular flow to the surface.

Installation and retrieval

To facilitate installation and retrieval of the WRFC-H, the side pocket mandrel incorporates several unique features. Below the threads in the mandrel's upper swage, a special orienting guide sleeve positively aligns a kickover tool for installation or retrieval of the WRFC-H and provides the stop necessary for actuating the kickover tool.

A finger on the kickover tool fits into a vertical slot in the orienting sleeve and positions the tool so that the flow control valve is aligned with the pocket, regardless of the degree of well deviation. A tool discriminator above the mandrel pocket guides the WRFC-H into the pocket and automatically deflects tools with larger diameters into the tubing bore.



WRFC-H wireline-retrievable flow control valve.

A coiled tubing adapter and kickover tool can be used for valve replacement in highly deviated or horizontal wells.

The side pocket mandrel is manufactured for the expected downhole environment. Metallurgical properties are closely controlled through stringent specifications and quality assurance programs.

In the event of a contingency, conventional orifice or dummy valves can be installed in the mandrel pocket. These devices do not change the mandrel ID.

WRFC-H Flow Control Valve Specifications

Size, in	3½	5½	7
Max. OD, in [mm]	5.889 [149.581]	8.260 [209.804]	9.390 [238.506]
Min. ID, in [mm]	2.740 [69.596]	4.670 [118.618]	5.900 [149.860]
Drift ID, in [mm]	2.625 [66.675]	4.545 [115.443]	5.750 [146.050]
Eccentricity, in [mm]	0.977 [24.816]	1.075 [27.305]	0.914 [23.216]
Overall length, in [mm]	142 [3,607]	142 [3,607]	150 [3,810]
Max. gas flow rate, MMcf/d [m ³ /d]	30 [849,505]	30 [849,505]	30 [849,505]
Max. liquid flow rate, bbl/d [m ³ /d]	10,000 [1,590]	10,000 [1,590]	10,000 [1,590]
Max. working pressure, psi [kPa]	5,000 [34,474]	7,500 [51,711]	5,400 [37,232]
Operating temperature range, degF [degC]	75–250 [23–121]	75–200 [23–93]	75–200 [23–93]
Control line bypasses	Five control lines	Five control lines	One control line
Max. number of tool positions	Six (open, closed, and four choking positions)		
Max. flow area, in ² [mm ²]	0.75 [484] (customizable)		
Material specification	NACE MR0175		
Hydraulic control lines	Single or dual hydraulic lines to surface		
Control line fitting	Inverted dual ferrule connector		
Control line fluid compatibility	Oil- or water-based fluids		