

sFrac™ Valve

Selectively Control High-Rate Stimulation and Production of Multiple Intervals in a Single Well

Halliburton WellDynamics sFrac™ valve is a remotely operated downhole hydraulic valve that offers a cost-effective multi-stage fracturing capability to operators working in areas with tight gas or difficult-to-produce reserves. Available in both 3-1/2-in. and 4-1/2-in. sizes, the sFrac valve can be cemented in place along with the casing string, and can be used later in the life of the well for selective shut-off of unwanted water or gas.

Benefits

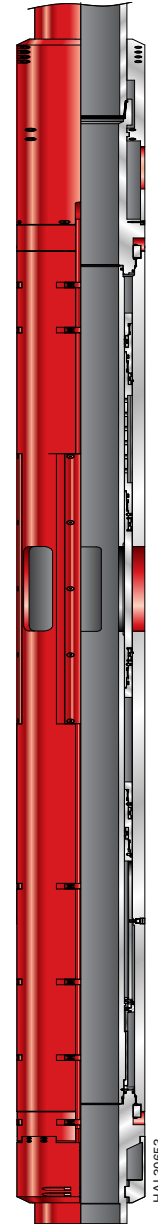
- Save rig time and operational expense by selectively controlling high-rate stimulation in a single well without mechanical intervention
- Produce from a zone without the threat of fracturing proppant flowing back to plug the wellbore
- Shut off water production later in the life of the well

Features

- 10,000 psi rating
- One million pounds of sand per interval
- Remotely operated
- Two versions available (screen and on-off)
- Two sizes available (3 1/2-in. and 4 1/2-in.)

The sFrac valve enables operators to economically complete multiple intervals in a horizontal wellbore in low-permeability sandstones, carbonates, gas shale and coalbeds. It allows selective, high-rate and precise placement of hydraulic fractures in a multi-zone well without the need for mechanical intervention.

The sFrac valve can be casing-conveyed and cemented in place, or deployed via production tubing. Feed-through mechanical packers or Swellpacker® isolation systems are used to isolate cased or open-hole intervals as required.



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WellDynamics' reliable Direct Hydraulics downhole control system uses hydraulic lines connected directly from the surface to remotely actuate the sFrac valve. Each of the two control lines required to operate the valve is connected to the open or closed side of the valve, respectively. If multiple valves are present, the closed side is networked to a common close line, and the open side of each valve has a dedicated open line.

Alternatively, a simple multi-drop electro-hydraulic control system is also available. This system uses two hydraulic lines and

one electrical control line connected directly from the surface to actuate multiple sFrac valves in a single wellbore. This system uses a passive multiplexing switching method to control each valve independently, though they are connected (multi-dropped) to the same control lines.

Once stimulation has been completed, the sFrac valve operates as a production device, allowing full wellbore access. Zones can also be selectively shut-off in case of water breakthrough during the later life of the well.

| Specifications | | |
|-------------------------------------|---|---|
| 4 1/2-in. sFrac™ Valve | Screen | On/Off |
| Tubing Size | 4.5-in. | 4.5-in. |
| Maximum OD | 6.250-in. | 6.000-in. |
| Minimum ID | 3.688-in. | 3.688-in. |
| Length | 170-in. | 105.14-in. |
| Top and Bottom Connection | 4-1/2 in 8 RD 13.5 lb API LTC Box X Pin | 4-1/2 in 8 RD 13.5 lb API LTC Box X Pin |
| Service | Std/H ₂ S/CO ₂ | Std/H ₂ S/CO ₂ |
| Max Working Temperature | 275° F / 135° C | 275° F / 135° C |
| Working Pressure Internal | 10,000 psi | 10,000 psi |
| Working Pressure External | 10,000 psi | 10,000 psi |
| Test Pressure Internal | 10,000 psi | 7,500 psi |
| Test Pressure External | 10,000 psi | 7,500 psi |
| Max Hydraulic Pressure | 10,000 psi | 10,000 psi |
| Base Metallurgy | A002 (4140) | A002 (4140) |
| Fastener Metallurgy | Stainless Steel | Stainless Steel |
| Piston Area | 5.730 sq in. | 5.730 sq in. |
| Tensile Rating (based on 13.5#) | 338,000 lbf | 335,000 lbf |
| Compressive Rating (based on 13.5#) | 200,000 lbf | 200,000 lbf |
| Minimum Internal Flow Area | 10.68 sq in. | 10.68 sq in. |
| Max Diff Unloading Pressure | 3,000 psi | 3,000 psi |
| Control Line Bypass | 8 x .25 lines | 8 x .25 lines |

In addition to the simple on-off version of the sFrac valve, WellDynamics offers a screen version that allows production to occur without the threat of fracturing proppant plugging the wellbore. The sFrac valve is a new ICV designed specifically for cased-hole applications. This valve differs from other WellDynamics ICVs,

in that it can be placed in a casing string and cemented in a production liner and will still function effectively. The primary application for this tool is in staged stimulation operations where various zones can be selectively stimulated through the valve via the production liner and tieback string.

| Specifications | |
|-------------------------------------|---|
| 3 1/2-in. sFrac™ Valve | On/Off |
| Tubing Size | 4.5-in. |
| Maximum OD | 5.425-in. |
| Minimum ID | 2.750-in. |
| Length | 87-in. |
| Top and Bottom Connection | 3-1/2 in 8 RD 13.5 lb API LTC Box X Pin |
| Service | Std/H ₂ S/CO ₂ |
| Max Working Temperature | 275° F / 135° C |
| Working Pressure Internal | 10,000 psi |
| Working Pressure External | 10,000 psi |
| Test Pressure Internal | 7,500 psi |
| Test Pressure External | 7,500 psi |
| Max Hydraulic Pressure | 10,000 psi |
| Base Metallurgy | A002 (4140) |
| Fastener Metallurgy | Stainless Steel |
| Piston Area | 5.18 sq in. |
| Tensile Rating (based on 13.5#) | 200,000 lbf |
| Compressive Rating (based on 13.5#) | 200,000 lbf |
| Minimum Internal Flow Area | 5.94 sq in. |
| Max Diff Unloading Pressure | 1,500 psi |
| Control Line Bypass | 8 x .25 lines |

For more information on any of the details featured here, please email us at welldynamics@halliburton.com.

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