High-Pressure Surge Valve

ENABLES HIGHER DIFFERENTIAL PRESSURES TO BE CREATED FOR SURGING OR UNDERBALANCED PERFORATING REQUIREMENTS

OVERVIEW

The high-pressure surge valve is a full-opening, annulus pressure-operated valve designed for use in a cased hole. It can be run as a surge valve or a back pressure valve. Top high-pressure surge valves can be run with bottom high-pressure surge valves, bottom pressure-responsive (PR) multi-service valves, or 5-in. lower surge/circulating valves to form a surge chamber. This surge helps clean debris from the perforation before a stimulation treatment, sand-control treatment, flow test, or before running the FasTest™ system. If run in conjunction with the FasTest system, this valve is often referred to as the upper surge valve.

Potential for a sudden pressure surge is provided when two surge valves are spaced apart in the tubing string to form an atmospheric air chamber. When used as a surge tool, the bottom valve is opened, and fluids from the perforations are swept into the air chamber by the fluid surge. When used in conjunction with the FasTest system, the valve is used to open up the chamber and enable the collection of bulk fluid after the main chamber has been filled.

FEATURES AND BENEFITS

» Operates without requiring pipe manipulation
» Achieves more effective surge because the ball opens instantly
» Creates the required air-chamber volume by spacing the valves
» Enables circulation or spotting of well fluid after surging is complete
» Enables through-tubing operations because of full-open inside diameter (ID)
» Suitable for sour-gas service at temperatures above 175°F (79°C) when used in accordance with Paragraph 11.7 of NACE MR-0175
» Applicable at temperatures up to 450°F (232°C) when dressed with a 600 series
» O-rings and VICTREX® PEEK backup seals

OPERATION

The high-pressure surge valve is run into the well with the ball valve in the closed position. When the valve reaches the desired depth, it is triggered by the application of a predetermined annulus pressure, opening the ball valve and locking it in the open position. The valve can be equipped with or without a rupture disc (RD), depending on functionality required of the tool. If run with an RD, the valve will operate at a predetermined annulus pressure, or if run without an RD, the valve will react to a predetermined differential pressure.
## High-Pressure Surge Valve Technical Specifications

<table>
<thead>
<tr>
<th>Nominal Tool Size in.</th>
<th>OD in. (cm)</th>
<th>ID in. (cm)</th>
<th>End Connections</th>
<th>Service Temperature* °F (°C)</th>
<th>Length in. (cm)</th>
<th>Tensile Rating** lb (kg)</th>
<th>Burst Rating** psi (bar)</th>
<th>Collapse Rating** psi (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 7/8</td>
<td>3.90 (9.91)</td>
<td>1.80 (4.57)</td>
<td>2 7/8 CAS</td>
<td>450 (232)</td>
<td>51.64 (131.17)</td>
<td>229,600 (104 147)</td>
<td>8,500 (586)</td>
<td>7,900 (545)</td>
</tr>
<tr>
<td>5</td>
<td>12.78 (3.17)</td>
<td>2.25 (5.72)</td>
<td>3 7/8 CAS</td>
<td>450 (232)</td>
<td>71.26 (181.00)</td>
<td>405,000 (184 000)</td>
<td>15,000 (1034)</td>
<td>15,000 (1034)</td>
</tr>
</tbody>
</table>

Notes:
* Service temperature up to 450°F (232°C) (dressed with 600 series O-rings and VICTREX® PEEK backup seals)
** The values of tensile, burst, and collapse strength are calculated with new tool conditions, Lame's formulas with von Mises' Distortion Energy Theory for burst and collapse strength, and stress area calculations for tensile strength.
» Pressure rating is defined as the differential pressure at the tool. (Differential pressure is the difference in pressure between the casing annulus and the tool ID.)
» Meets NACE-0175 requirements (>175°F (>79°C)).
» These ratings are guidelines only. For more information, consult your local Halliburton representative.
» VICTREX® is a registered trademark of Victrex Manufacturing Limited.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com