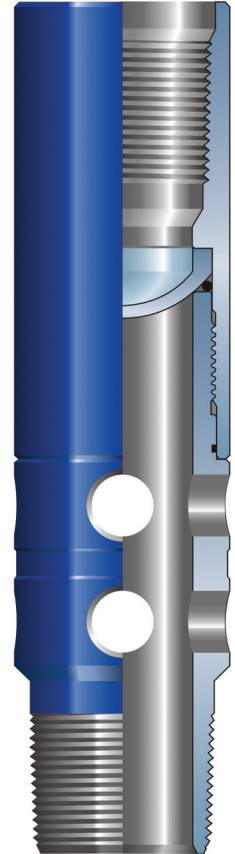


Purpose

The **Underbalancing Pressure Sub** - Ported version, is used in a perforating system to provide an economical method of achieving an underbalanced condition between the tubing and the wellbore formation. The tool incorporates a high strength ceramic dome which prevents communication between the tubing and annulus until a detonating bar is dropped from surface. The ported sub is normally run below a packer system, the ports are located below the ceramic dome to allow flow into the tubing.

Operation

The ported underbalancing pressure sub is installed in the tubing string normally below a packer system to create the desired underbalanced condition as well as replaces a fill-flow sub assembly. The ported section is located below the ceramic dome, this ported section area is always equal to or greater then the tubing i.d. cross sectional area which does not restrict or choke the wellbore flow into the tubing once the dome has been shattered from the drop bar passing through the tool.



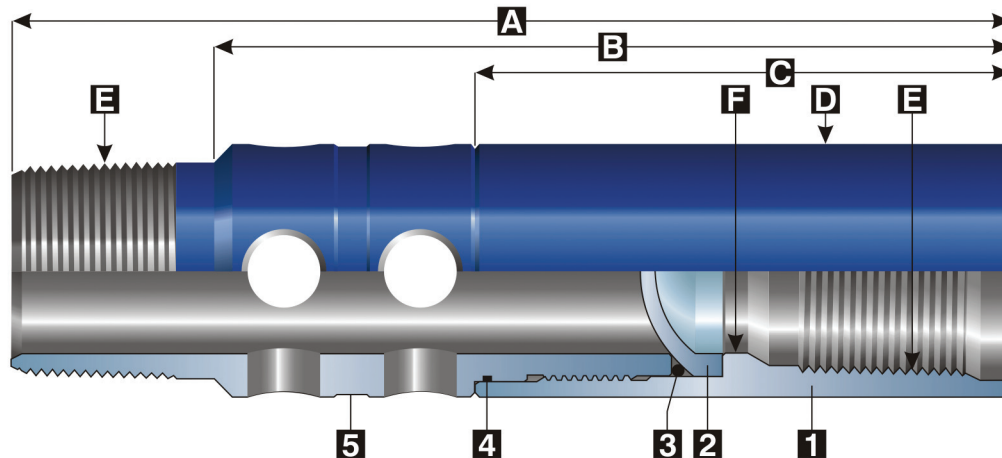
Specifications

Underbalancing Pressure Sub - Ported (Product N° 31-22)				
Thread Size and Type	2 3/8" EUE Pin (60.33 mm)	2 7/8" EUE Pin (73.0 mm)	3 1/2" EUE Pin (88.9 mm)	4 1/2" EUE Pin (114.3 mm)
Assembly Number	31-2206041-00	31-2207341-00	31-2208941-00	31-2211441-00
Pressure Rating	10,000 psi (69 mPa)	10,000 psi (69 mPa)	10,000 psi (69 mPa)	4,000 psi (27 mPa)
Tensile Strength	Manufactured from P-110 / L-80 for H2S applications / API Material			
Maximum Temperature	400°F (204°C) with 90 Durometer Viton O-rings			
Minimum ID	1.99" (50.54 mm)	2.44" (61.97 mm)	2.995" (76 mm)	4.00" (101.6 mm)
Maximum OD	3.04" (77.23 mm)	3.66" (92.96 mm)	4.50" (114.3 mm)	5.75" (146 mm)
Length	12.4" (314 mm)	12.9" (327 mm)	13" (330 mm)	54" (1371 mm)
Shipping Weight	14 lbs (6.35 kg)	21.2 lbs (9.63 kg)	32.3 lbs (14.68 kg)	65 lbs (29.5 kg)
Redress Kit Number	31-2206040-99	31-2207340-99	31-2208940-99	31-2211440-99

*NOTE: Standard EUE connections, premium thread connections available on request.

31-22 Underbalancing Pressure Sub - Ported, Dimentional Data

Dim	31-2206041-00		31-2207341-00		31-2208941-00		31-2211441-00	
	In	mm	In	mm	In	mm	In	mm
A	8.0	203.2	12.82	325.6	12.9	327.6	54	1371
B	9.89	251.2	10.18	258.5	10.11	256.7	49	1244.6
C	6.65	168.9	6.75	171.4	7.25	184.1	27	685.8
D	3.04	77.2	3.66	92.2	4.50	114.3	4.50	114.3
E	2 ³ / ₈ " EUE	60.33 EUE	2 ⁷ / ₈ " EUE	73.0 EUE	3 ¹ / ₂ " EUE	89.9 EUE	4 ¹ / ₂ " EUE	114.3 EUE
F	1.995	50.6	2.44	62.0	3.00	76.2	4.00	101.6



31-22 Underbalancing Pressure Sub - Ported, Parts List

Item	Description	31-2206041-00	31-2207341-00	31-2208941-00	31-2211441-00
		Part Number			
1	Top Sub	31-2106001-03	31-2107301-03	31-2108901-03	31-2111401-03
2	Ceramic Dome	31-2106000-01	31-2107300-01	31-2108900-01	31-2111400-01
3	O-Ring 90 Durometer Viton	81-0330000-04	81-0334000-04	81-0338000-04	81-0347000-04
4	O-Ring 90 Durometer Viton	81-0229000-04	81-0234000-04	81-0239000-04	81-0349000-04
5	Bottom Sub Ported	31-2206001-02	31-2207301-02	31-2208901-02	31-2211401-02