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XLift

High-pressure gas lift system

APPLICATIONS

- High-pressure, high-flow-rate installations
- Deepwater, subsea, and high-asset-value wells
- Safety-critical installations

BENEFITS

- Improves production through increased gas injection rates and injection depths
- Increases life of well through increased reliability
- Reduces risk of workover through improved pressure integrity of entire wellbore environment

FEATURES

- Large 1¾-in-OD gas lift valve for robustness in high-pressure and high gas lift environments
- Barrier-qualified valve back-check that provides positive seal between tubing and casing annulus
- Optimized flow geometry through mandrel and valve system to facilitate high gas injection rates
- Edge-welded bellows design that provides flexible operation at surface gas injection pressures from 2,000 to 5,000 psi [13 to 34 MPa]
- Flow path incorporating venturi profile to stabilize gas throughput and production
- Suitability as the first valve below the mudline in deepwater applications
- Corrosion-resistant premium materials to suit diverse conditions and applications
- Mandrel design options, including dual flush-mount, full-length OD grooves for maximum clearance and cable or control line bypass protection
- Options for certification to ISO 17078-1 and 17078-2, monogrammed to API Spec. 19G1 and 19G2, along with industry pressure barrier qualifications
- Field-proven design and operation

The XLift* high-pressure gas lift system brings together carefully selected valves and mandrels into a complete system that enables reliable and accurate control of well production for maximum reserves recovery. By enabling gas lift wells to be operated with higher injection pressures and rates and at deeper injection points, the XLift system increases well performance. The higher operating pressure enables completion of wells with fewer valves and mandrels, which makes this system not only cost effective but also a reliable choice with the reduction of possible leak points.

Our gas lift system experts, highly trained and experienced, can help you choose the most appropriate valves and mandrels for your XLift system to enhance the reliability and longevity of your completion and maximize the productivity of your reservoir.

Gas lift valves

The XLift system uses a 1¾-in-OD gas lift valve specifically designed and tested to achieve reliable, robust operations in high-flow-rate conditions with minimum turbulence and pressure drop. To accommodate higher operating gas injection pressures, the 1¾-in valve incorporates a dual-seal edge-welded bellows system, which reduces the internal gas charge while increasing the operating injection pressure through a pressure intensifier. During offshore operations, this technology enables the operator to inject high-pressure gas below the mudline and significantly improve the depth of injection to maximize drawdown and increase production. The valves also feature a venturi flow configuration for more efficient and stable gas throughput.

Barrier-qualified valve back-check

The valves in the XLift system incorporate a positive-sealing barrier-qualified valve back-check to replace the velocity valve back-check systems used in traditional gas lift valves. The check ensures one-way flow through the tubing, closing and sealing if flow begins in the opposite direction. It forms a metal-to-metal barrier seal to reliably eliminate potential leak paths from tubing to casing, which improves tubing integrity.

Side pocket mandrels

The side pocket mandrels feature angled injection ports in the mandrel body and pocket to optimize the flow of injection gas into the gas lift valves. This reduces flow turbulence, reducing destructive erosion and minimizing pressure drops. The pocket also has no entry or exit restrictions to gas passage, a feature of the XLift system that ensures gas flow is regulated solely by the valve to ensure maximum use of the available surface gas injection pressure.

The mandrel design also accommodates two full-length, flush-mount grooves to accommodate cables or control lines. Unlike traditional side pocket mandrels that require guard systems that increase their outside geometry, the mandrels in the XLift system enable multiple cables or control lines to pass through without altering the original outside drift diameter of the mandrel body.

XLift system unique mandrel and valve design optimizes injection flow and improves performance.

XLift

The flush-mounted bypass system also offers maximum protection to the lines as they pass the mandrel body, which is critical for overall completion reliability in deep, highly deviated wells.

The mandrels for the XLift system are considered part of our premium round mandrel product line. Schlumberger personnel perform all critical manufacturing processes in-house to ensure complete process control. Schlumberger is the only gas lift mandrel manufacturer that can perform all critical processes—machining, welding, heat treatment, and inspection—in-house.

Side Pocket Mandrel Specifications				
Tubing size, in OD; lbm/ft [kg/m]	4½; 12.6 [19]	5½; 17 [25]	5½; 20 [30]	5½; 23 [34]
Min. ID, in [mm]	3.933 [100]	4.834 [123]	4.695 [119]	4.587 [117]
Internal drift, in [mm]	3.833 [97]	4.767 [121]	4.653 [118]	4.545 [115]
Max. OD, in [mm]	7.515 [191]	8.473 [215]	8.296 [211]	8.346 [212]
External drift, in [mm]	7.625 [194]	8.525 [217]	8.379 [213]	8.525 [217]
Recommended casing, in OD; lbm/ft [kg/m]	8⅝; 38 [57]	9.625; 47 [70]	9.625; 53.5 [80]	9⅝; 47 [70]
Length, in [mm]	117.557 [2,986]	125 [3,175]	134 [3,404]	132.000 [3,353]
Pocket size, in [mm]	1.75 [44]	1.75 [44]	1.75 [44]	1.75 [44]
Cable bypass envelope, in	See footnote†	1.046 × 0.614 (both sides)	1.000 × 0.482 and 0.640 × 0.600	1.500 × 0.500
Material†	410SS/13Cr	410SS/13Cr	INCONEL® alloy 718	410SS/13Cr
Internal test pressure at ambient temperature, psi† [MPa]	8,745 [60]	7,740 [53]	12,000 [83]	7,500 [52]
External test pressure at ambient temperature, psi† [MPa]	8,570 [59]	6,290 [43]	11,000 [76]	8,000 [55]
Tensile strength at ambient temperature, lbf [N]	288,000 [1,281,088]	397,000 [1,765,944]	641,000 [2,851,310]	466,000 [2,072,871]
Thread weight†, lbm/ft	12.6	17	20	23.0
Thread type†	New VAM®	Tenaris®-3-SB	VAM Top Hc	KS Bear®
Thread configuration†	Box × pin	Box	Box	Box × pin
Thread recuts	See footnote†	0	2	2
Secondary Accessories				
Kickover tool	XL-175 Kickover tool			
Running tool	XL 1.75			
Pulling tool	2-in JD Series® type			

†Alternative specifications, materials, sizes, and pressure ratings available on request.

Gas Lift Valve Specifications			
Valve type	**XLO-B**	**XLOR-B**	**XLI-B**
Description	**Orifice**	**Orifice rupture disc**	**IPO unloading**
OD (not incluting latch), in	1¾	1¾	1¾
Length with latch, in [mm]	33 [838]	37 [940]	34 [864]
Valve back-check	Barrier	Barrier	Barrier
Validated max. operating pressure, psi [MPa]	10,000 [69]	10,000 [69]	10,000 [69]
Function test pressure†, psi [MPa]	5,000 or 10,000 [34 or 69]	5,000 or 10,000 [34 or 69]	5,000 or 10,000 [34 or 69]
Max. surface gas injection pressure, psi [MPa]	N/A	N/A	5000 [34]
Max. temperature, degF [degC]	350 [177]	350 [177]	350 [177]
Min. temperature, degF [degC]	32 [0]	32 [0]	32 [0]
Venturi orifice size range†, in	8/64 to 32/64	8/64 to 32/64	8/64 to 32/64
Differential activation mechanism†	N/A	Rupture disc	N/A
Materials			
Body parts	INCONEL 925, MONEL®	INCONEL 925, MONEL	INCONEL 925, MONEL
Venturi orifice	Tungsten carbide	Tungsten carbide	Tungsten carbide
O-rings	Viton®	Viton	Viton
External seals	Modified Campac carbon	Modified Campac carbon	Modified Campac carbon

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