

Ultra-HP™ Wireline-Retrievable Injection-Pressure-Operated Gas-Lift Valve

Enhances flow performance in high-pressure wells to maximize the production rate and reduce nonproductive time

Applications

- Wells requiring wireline-retrievable equipment
- Wells needing high injection pressures that require gas-lift valve dome pressures up to 5,000 psi (345 bar) and differential submergence pressures up to 10,000 psi (689 bar)
- Wells requiring high injection rates to maximize production rates
- High-profile wells with high intervention costs

Features and Benefits

- The complete assembly—including the aerodynamic check dart—was designed using computational flow dynamics and physically tested to provide maximum gas passage and erosion resistance, which increases the overall production rate.
- To meet the demands of extreme gas-lift environments, the valve meets American Petroleum Institute (API) 19G2 V-1 certification standards, which is currently the highest standard in the industry.
- The reverse-flow check-valve system has been qualified for installation in the North Sea per guiding document TR2385 by passing stringent flow-erosion testing and meeting sealing criteria for maximum well-containment capabilities.
- An internal bellows-protection system prevents bellows overtravel, and a noncompressible silicon fluid provides support for bellows when high differential pressures are applied to the valve. This reduces operational failures, nonproductive time (NPT), and operating costs.
- Edge-welded-bellows construction features an internal support member that enables higher pressure ratings for extreme applications and an average cycle life that exceeds 100,000 cycles per API 19G2 testing procedure guidelines.
- Viscous dampening fluid prevents bellows fatigue and reduces associated well NPT by decreasing stem pounding/chatter.
- Lapped and matched tungsten-carbide seats provide a robust and resilient seal, which reduces chances of seal damage during the unloading phase, while a tight seal provides upper unloading valves a positive seal for more efficient well operation.
- The integral reverse-flow check valve provides a barrier to tubing-to-casing communication for well containment.



Cutaway of the Ultra-HP™ gas-lift valve



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- Depending on operator preference, the assembly can be equipped with a combination modified-PTFE and metal-to-metal seal or with the strictly metal-to-metal seal. This enables optimal performance, customized for specific well conditions.
- The Ultra-HP™ valve is compatible with all manufacturers' gas-lift mandrels that meet API 19G1 standards.
- The valve can be manufactured from various materials and customized to fit well conditions.
- The large dome area improves flow characteristics of the valve and enables optimum production from the well.

Tool Description

The Weatherford Ultra-HP™ gas-lift valve is specifically designed for deepwater or other high-profile well applications. It has a 1 1/2-in. nominal outside diameter (OD) and is wireline retrievable. The high dome-charge capability of 5,000 psi (345 bar) and differential-submergence-pressure rating of 10,000 psi (689 bar) make this valve applicable in high-pressure injection systems to achieve deep points of injection and to maximize production. This valve features internal bellows supports to prevent deformation when exposed to high differential pressures. Depending on operator preference and specific well conditions, the assembly can be equipped with the Weatherford QS-type reverse-flow check valve, which has a combination modified-PTFE and metal-to-metal seal, or with the Q-type reverse-flow check valve, which has a strictly metal-to-metal seal. These check valves were designed by applying computational flow-dynamics analysis and physical testing to maximize gas-passage capability and erosion resistance.

Specifications

Valve Model	Valve Model Number	Valve OD	Effective Bellows Area (Ab)	Port Size ID	Port Size Area
Ultra-HP™ (RH-2XHP)	0228-XXX	1.50 in. (38.10 mm)	0.77 in. ² (496.8 mm ²)	3/16 in. (4.75 mm)	0.029 in. ² (18.71 mm ²)
				1/4 in. (6.35 mm)	0.052 in. ² (33.55 mm ²)
				5/16 in. (7.94 mm)	0.080 in. ² (51.61 mm ²)
				3/8 in. (9.53 mm)	0.114 in. ² (73.55 mm ²)
				7/16 in. (11.11 mm)	0.154 in. ² (99.35 mm ²)
				1/2 in. (12.70 mm)	0.200 in. ² (122.58 mm ²)

