DeepShield Deepwater Subsurface Safety Valve

Get fail-safe protection in critical deepwater completions

The DeepShield™ deepwater subsurface safety valve delivers fail-safe performance in completions that require low operating pressures due to control system limitations. With a patented operating system, the DeepShield valve provides simple and reliable operation in the most critical applications.

The DeepShield safety valve is the industry’s first V1-validated valve as defined in API SPEC 14A Specification for Subsurface Safety Valve Equipment, Twelfth Edition. Per this specification, subsurface safety valves must now undergo more stringent prototype testing than was previously required. With only minor modifications, the subsurface safety valve prototype test program at Baker Hughes, a GE company (BHGE) enabled testing to the new V1 validation specifications, and continues to exceed the requirements set forth by API.

The DeepShield safety valve uses an integrated nitrogen-charged system that opposes the hydrostatic pressure acting on top of the piston. Balancing the hydrostatic pressures ensures low operating pressures, even in deepwater applications. The dynamic seal configuration used for the operating piston represents a significant engineering achievement that uses reliable, field-proven sealing technology designed for nitrogen-charged safety valves. The valve features a patented operating system capable of closing in all applications, even if primary nitrogen chamber pressure is lost.

To ensure long-term nitrogen containment, the DeepShield valve features the following enhancements:

- Field-adjustable primary nitrogen chamber
  - Enables last-minute adjustments to match changing well conditions
- Two independent, patented operating systems
  - Offer redundancy to maintain dependable valve operation
  - Ensure fail-safe operation in critical applications
- Same moving parts as a conventional tubing-retrievable subsurface safety valve
  - Simplifies operation
  - Increases certainty
- Piston wear bearing and scraper ring
  - Minimizes ingress of debris
  - Maintains functionality in harsh, debris-laden environments
- Low operating pressure at any setting depth
  - Reduces operating system cost
- BHGE RBT metal-to-metal thread technology
  - Provides gas-tight sealing in harsh environments
  - Enables high tensile rating
- Optional integral control line filter
  - Helps ensure trouble-free operation

Applications
- Completions requiring low operating pressures due to control system limitations
- Remote subsea wells
- Deepset wells in dry-tree applications
- Completions requiring a V1-validated safety valve

Features and benefits
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Enhanced dynamic seal configuration
Upgraded dynamic seal materials
Increased volume in the secondary chamber
Internal alignment modifications
Redundant seals in the fail-safe piston
Reduced leak paths in the primary nitrogen coils
Upgraded materials for low-pressure sealing performance of the check seats in fill ports

An energized scraper ring minimizes ingress of debris in harsh environments, and a stronger power spring is also available for higher closing force in heavy debris applications.

The DeepShield valve has two independent operating systems and an integral control line filter, delivering the redundancy and operational assurance you need in remote subsea wells. When it comes to your critical applications, the innovative design and simple operation of the valve makes it a smart choice for protecting people, the environment, and your investment.

Contact your local BHGE representative today to learn how the DeepShield safety valve can provide fail-safe operation in critical deepwater applications.

### Specification Guide

<table>
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<tr>
<th>Size</th>
<th>Maximum OD</th>
<th>Maximum Seal Bore</th>
<th>Piston Displacement</th>
<th>Working Pressure</th>
<th>Product Family Number</th>
<th>Setting Depth</th>
<th>Maximum Temperature</th>
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*Available upon request

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