

Optimax™ Model WDB Wireline-Retrievable Subsurface Safety Valve

Restores safety-valve functionality in wells with damaged safety-valve landing nipples or hone bores

Applications

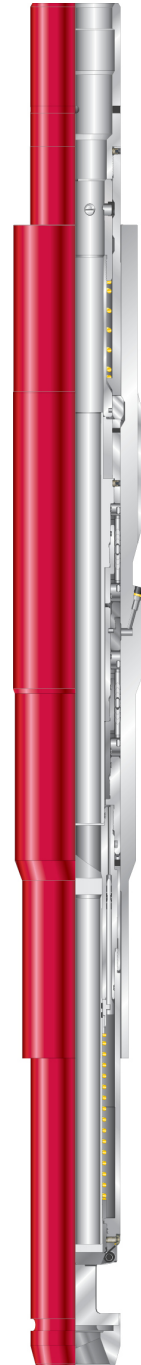
- Wells with groove- or gouge-damaged safety-valve landing nipples
- Wells with groove- or gouge-damaged hone bores in tubing-retrievable subsurface safety valves (TRSSV)
- Wells in which hone-bore debris or corrosion prevents conventional wireline-retrievable or insert-valve sealing
- Sour- and critical-well applications

Features and Benefits

- Restores safety-valve functionality without a major workover, which saves operational time and costs
- Enables optimal production with a larger through-bore and flow area and does not reduce ID or restrict flow when installed
- Seals hone bores with damage of up to 0.039 in. (1 mm) in accordance with American Petroleum Institute (API) standards
- Installs without additional accessory tools or special procedures, and packing stacks do not energize until they are seated in the nipple
- Provides metal-to-metal, through-the-flapper equalizing technology that effectively seals the wellbore
- Available with either a Safe-Set Anchor or Locking System option; the anchor system is used in the case of damage to the safety valve profile, whereas the locking system is set in the existing profile, and can be retrofitted to any industry standard profile.
- Includes a dynamic seal system with a rod piston, proprietary Viton® elastomeric T-seal, and moly-filled Teflon® bearing backup rings
- Provides a reliable low-pressure seal with the Viton flapper soft seal

Tool Description

The Weatherford Optimax Model WDB wireline-retrievable subsurface safety valve (WRSSV) restores safety valve functionality in wells with damaged safety valve systems, including those with damaged landing nipples or hone bores, without a major workover. Hone-bore damage (including grooves, gouges, debris, and corrosion) can prevent conventional wireline and insert valves from functioning properly. This can result in loss of well control, intermittent service, or damage to completion insert equipment.



The Optimax Model WDB WRSSV enables standard installation and retrieval without additional tools. The valve optimizes production through a larger through-bore and flow area without reducing ID or restricting flow when installed.



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Tool Description (continued)

The tool features a standard valve-and-lock assembly and a patented packing mandrel, which provides effective sealing in damaged landing nipples. Force applied to the packing stacks significantly improves the sealing capabilities. Floating pistons energize the packing stacks and are activated by tubing pressure from one side and control-line pressure from the other.

The Model WDB exceeds API 14A requirements and operates up to 10,000-psi (68.9-MPa) gas-differential pressure at 300°F (149°C).

Specifications

Lock System Measurement

Size	2-7/8 × 2.313 in. (73.0 × 58.75 mm)	3-1/2 × 2.813 in. (89.9 × 71.45 mm)	4-1/2 × 3.437 in. (114.3 × 87.30 mm)	4-1/2 × 3.813 in. (114.3 × 96.85 mm)			5-1/2 × 4.562 in. (139.7 × 115.90 mm)
Nipple profile	X	B	DB-6	B	RRQ	DB-6	RRQ
Maximum lock OD	2.281 in. (57.94 mm)	2.868 in. (72.85 mm)	3.488 in. (88.60 mm)	3.860 in. (98.04 mm)	3.858 in. (97.00 mm)	3.860 in. (98.04 mm)	4.620 in. (117.35 mm)
Minimum flowing ID	1.180 in. (29.97 mm)	1.433 in. (36.40 mm)	1.630 in. (41.40 mm)	2.165 in. (55.00 mm)			2.465 in. (62.61 mm)
Overall length	47.50 in. (120.6 mm)	57.70 in. (146.6 mm)	55.35 in. (140.5 mm)	59.05 in. (150.0 mm)	64.00 in. (162.6 mm)	59.05 in. (150.0 mm)	62.50 in. (158.7 mm)
Test pressure	9,750 psi (67.2 MPa)	9,000 psi (62.1 MPa)	9,750 psi (67.2 MPa)			7,500 psi (51.7 MPa)	

Safe-Set System Measurement

Size	2-7/8 in. (73.0 mm)	3-1/2 in. (89.9 mm)	4-1/2 in. (114.3mm)	5-1/2 in. (139.7mm)	7 in. (177.8mm)
Maximum tubing weight	8.6 lb (3.9 kg)	12.7 lb (5.8 kg)	18.8 lb (8.5 kg)	29 lb (13.2 kg)	32 lb (14.5 kg)
Minimum tubing weight	6.4 lb (2.9 kg)	9.2 lb (4.2 kg)	12.6 lb (5.7 kg)	17 lb (7.7 kg)	17 lb (7.7 kg)
Minimum flowing ID	1.180 in. (29.97 mm)	1.433 in. (36.40 mm)	1.630 in. (41.40 mm)	2.465 in. (62.61 mm)	3.648 in. (92.70 mm)
Overall length	60 in (1.524 MM)				
Test pressure	10,000 psi (68.9MPa)				



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Specifications (continued)

Operating Limits – Both Systems

Working pressure	10,000 psi (68.9 MPa)
Operating pressure (full open)	2,000 psi (13.8 MPa)
Operating pressure (full closed)	1,000 psi (6.9 MPa)
Working temperature	30° to 300°F (-1° to 149°C)
Fail-safe setting depth	2,000 ft (610 m)

Material

Actuation system	Rod piston, Viton® elastomeric T-seal, and moly-filled Teflon® bearing backup rings verified to 10,000 psi (68.9 MPa) gas differential pressure at 300°F (149°C).*
Flapper soft material	Viton seal
Lock and majority of safety-valve components	Minimum 13Cr, 80,000 psi (551.6 MPa) MYS, heat treated
Rod piston, flapper, seat	INCOLOY® 925, heat treated*
Power spring, flapper pin, torsion spring	MP35N, heat treated
Design compliance	API 14A
Manufacturing compliance	API Q1 and API 14A
Class of service	3S2

Options

The WDB(E) model includes a through-the-flapper self-equalizing feature.

* Viton and Teflon are registered trademarks of The Chemours Company. INCOLOY is a registered trademark of Huntington Alloys Corporation.

