Optimax™ WZ Series Tubing-Retrievable Surface-Controlled Subsurface Safety Valve

Incorporates essential features of the Optimax series in a highly reliable, cost-efficient design

Applications

- Fluid and gas environments
- Production and injection applications

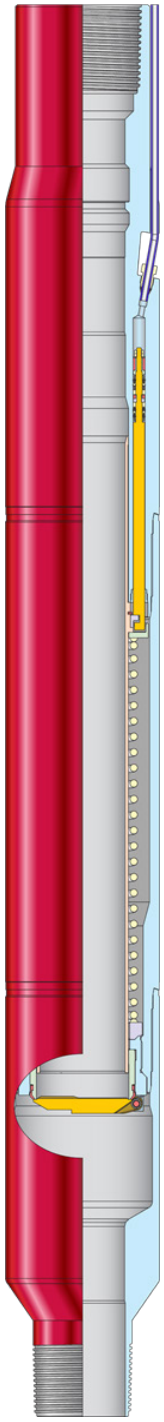
Features and Benefits

- The field-proven nonelastomeric, dynamic seal system avoids fluid-compatibility and explosive decompression issues for enhanced safety.
- Key features of the Optimax WZ series valve enhance reliability:
  - The hydraulic control systems have only two potential leak paths.
  - Metal-to-metal premium-thread housing connections are standard.
  - A nonelastomeric, soft flapper seat reinforces the primary metal-to-metal seal for low-pressure seal integrity.
- Design, material, manufacturing, assembly, and test documentation retention comply with API Q1 and exceed V1 standards established in API 14A, 12th edition.
- The optimized safety-valve design facilitates use of control-line communication and lockout tools to install a wireline-insert safety valve in the event of a malfunction, thus minimizing production disruptions.
- Accessories can be deployed on slickline, which simplifies operations.

Tool Description

The Weatherford Optimax WZ series tubing-retrievable surface-controlled subsurface safety valve (TRSCSSV) shuts in a well in the event of uncontrolled flow caused by equipment failure or damage. This rod-piston, flapper-type TRSCSSV is part of the Optimax series of safety valves.

As an integral part of the completion string, the Optimax WZ series valve is controlled by a single hydraulic control line. Applying control-line pressure keeps the valve in the open position; when pressure is bled off, the valve closes to protect personnel, property, and the environment. In the unlikely event of a malfunction, a full range of accessory tools are available, including wireline-insert safety valves.



The Optimax WZ series valve incorporates a simplified design that lowers cost without compromising reliability.

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Optimax™ WZ Series Tubing-Retrievable Surface-Controlled Subsurface Safety Valve

The Optimax WZ series valve not only retains essential features that drive reliability in the Optimax series, but also includes optimized design features that improve cost effectiveness. Notably, the number of internal premium connections is reduced and the overall length is shortened. Like all TRSCSSVs in the Optimax series, this valve maximizes operational simplicity and reliability.

Options

An optional through-the-flapper self-equalizing feature simplifies valve operation and enhances reliability.

Specifications

WZ(E)

Tubing size	2-7/8 in. (73.025 mm)	3-1/2 in. (88.96 mm)
Rated working pressure	5,000 psi (34.5 MPa)	
Test pressure	7,500 psi (51.7 MPa)	
Maximum control chamber pressure	15,000 psi (103.4 MPa)	
Maximum valve outside diameter (OD)	4.610 in. (117.09 mm)	5.170 in. (131.31 mm)
Standard sealbore	2.313 in. (58.75 mm)	2.813 in. (71.45 mm)
Overall length[a]	50.0 in. (127 cm)	
Standard nipple profile[b]	WX	
Control-line connection	Industry standard metal-seal compression fitting for 1/4-in. (6.35-mm) control line	
Rated working temperature	30 to 300°F (-1 to 149°C)	
Failsafe setting depth	2,000 ft (610 m)	
Operating pressure, full open[c]	2,000 psi (13.8 MPa)	
Operating pressure, full closed[c]	1,000 psi (6.9 MPa)	
Dynamic seal system	Weatherford proprietary design, nonelastomeric, rod-piston seal stack verified in tests to 10,000 psi (68.9 MPa) gas differential pressure at 300°F (149°C)	
Standard metallic materials	All materials are heat-treated in accordance with NACE MR 01 75	
Housing and internal components	9 chrome, 1 moly or 13% minimum chrome 80,000 psi (551.6 MPa) minimum yield	
Flapper, seat, and rod piston	INCOLOY® 925	
Power spring, flapper pin, torsion spring	MP35N	
Tubing thread connection	As requested	
Design and manufacturing compliance	API Q1 and API 14A	

[a] Approximate length, depending on nipple profile and thread connection.
[b] Other manufacturers' profiles available upon request.
[c] Values shown are estimates, subject to verification. Other manufacturers' profiles available upon request.

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Options

An optional through-the-flapper self-equalizing feature simplifies valve operation and enhances reliability.

Specifications (continued)

WZP(E)

Tubing size	2-7/8 in. (73.025 mm)		3-1/2 in. (88.96 mm)	
Rated working pressure	5,000 psi (34.5 MPa)	10,000 psi (68.9 MPa)	5,000 psi (34.5 MPa)	10,000 psi (68.9 MPa)
Test pressure	7,500 psi (51.7 MPa)	15,000 psi (103.4 MPa)	7,500 psi (51.7 MPa)	15,000 psi (103.4 MPa)
Maximum control chamber pressure	15,000 psi (103.4 MPa)			
Maximum valve outside diameter (OD)	4.610 in. (117.09 mm)	5.110 in. (129.79 mm)	5.170 in. (131.31 mm)	5.810 in. (147.57 mm)
Standard sealbore	2.313 in. (58.75 mm)		2.813 in. (71.45 mm)	
Overall length[a]	50.0 in. (127 cm)			
Standard nipple profile[b]	WX			
Control-line connection	Industry standard metal-seal compression fitting for 1/4-in. (6.35-mm) control line			
Rated working temperature	30 to 300°F (-1 to 149°C)			
Failsafe setting depth	2,000 ft (610 m)			
Operating pressure, full open[c]	2,000 psi (13.8 MPa)			
Operating pressure, full closed[c]	1,000 psi (6.9 MPa)			
Dynamic seal system[d]	Weatherford proprietary design, nonelastomeric, rod-piston seal stack verified in tests to 10,000 psi (68.9 MPa) gas differential pressure at 300°F (149°C)[c]			
Standard metallic materials	All materials are heat-treated in accordance with NACE MR 01 75			
Housing and internal components	9 chrome, 1 moly or 13% minimum chrome 80,000 psi (551.6 MPa) minimum yield			
Flapper, seat, and rod piston	INCOLOY® 925 / INCONEL® 718			
Power spring, flapper pin, torsion spring	MP35N			
Tubing thread connection	As requested			
Design and manufacturing compliance	API Q1 and API 14A			

[a] Approximate length, dependent on profile and thread connection.
[b] Other manufacturers' profiles available upon request.
[c] Values shown are estimates, subject to verification. Other manufacturers' profiles available upon request.
[d] P feature safety valves also contains a non-elastic piston-stop seal, which isolates the dynamic seals at the full-open and full-closed positions.

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