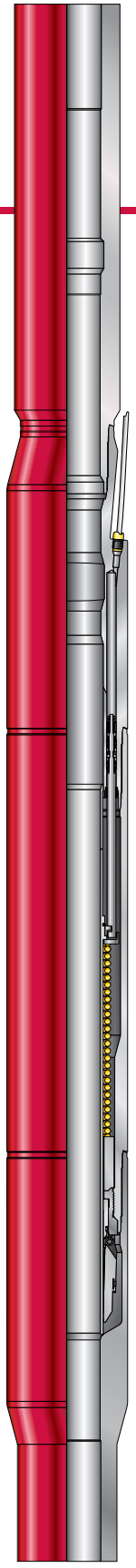
Weatherford®

Safety Systems

Optimax™ Series Tubing-Retrievable Surface-Controlled Subsurface Safety Valves

Model W(E)-5



Weatherford's *Optimax* Model W(E)-5 tubing-retrievable surface-controlled subsurface safety valve (TRSCSSV) is a rod-piston, flapper-type safety valve designed to shut in a well in the event of uncontrolled flow caused by equipment failure or damage. An integral part of the completion string, the W(E)-5 TRSCSSV is controlled by a single hydraulic control line. Application of control-line pressure keeps the valve in the open position; when pressure is bled off, the valve closes to protect property, personnel, and the environment. In the unlikely event the safety valve malfunctions, Weatherford's *Optimax* WLT lockout tool and *Optimax* WCT control-line communication tool can be deployed to adapt the valve to accept the Weatherford's WIT-10 wireline-insert safety valve, thus minimizing disruption to production operations.

The model W(E)-5 TRSCSSV, like all *Optimax* series TRSCSSVs, is designed to maximize simplicity and reliability of operation.

Applications

- Fluid and gas environments
- Production and injection applications

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Model W(E)-5

Features, Advantages and Benefits

- Design, material, manufacturing, assembly, and test documentation retention in accordance with API Q1 and API 14A quality programs ensure design and manufacturing integrity and conformance to industry standards.
- Several features of the model W(E)-5 valve maximize reliability:
  - The hydraulic control system has only two potential leak paths (the industry minimum).
  - Metal-to-metal premium housing connections are standard.
  - The non-elastomeric flapper soft seat reinforces the primary metal-to-metal seat for low-pressure seal integrity.
  - The simple design of this valve incorporates no sleeves, plugs, or other mechanisms that can be inadvertently actuated, causing premature control-line communication.
- The field-proven non-elastomeric dynamic seal system avoids fluid-compatibility and explosive-decompression issues, enhancing safety.
- Accessories can be deployed on slickline, avoiding complex operational requirements.
- The optimized safety valve design facilitates the use of control-line communication and lockout tools to insert a wireline-insert safety valve in the event of a malfunction, thus minimizing production disruption.

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Specifications

Size (in.)	2-3/8 *60.3*	2-7/8 *73.0*	3-1/2 *88.9*	4-1/2 *114.3*
Maximum OD (in./*mm*)	3.625 *92.075*	4.610 *117.094*	5.170 *131.318*	6.925 *175.895*
Overall length (in./*cm*)	64 *163*	62 *157*	68 *173*	72 *183*
Standard seal bore (minimum bore) (in./*mm*)	1.875 *47.625*	2.313 *58.750*	2.813 *71.450*	3.813 *96.850*
Housing threads (in.)[a]	3.300 and 2.400	4.250 and 2.875	4.687 and 3.500	6.250 and 4.500
Working pressure (psi/*MPa*)	5,000 *34.47*			
Test pressure (psi/*MPa*)	7,500 *52.72*			
Standard nipple profile	Petroline® QN profile[b]			
Control-line connection	Industry standard metal seal compression fitting for 1/4-in. control line			
Rated working temperature (°F/°*C*)	30° to 300° *–1° to 149°*			
Failsafe setting depth (ft/*m*)	1,000 *305*		2,000 *610*	
Operating pressure, full open (psi/*MPa*)[c]	1,500 *10.3*		2,000 *13.8*	
Operating pressure, full closed (psi/*MPa*)[c]	500 *3.4*		1,000 *6.9*	
Dynamic seal system	Proprietary design non-elastomeric rod-piston seal stack, verified in tests to 10,000-psi *(68.9-MPa)* gas differential pressure at 300°F *(149°C)*			
Flapper soft seal	Proprietary design of filled plastic material to provide a reliable low-pressure seal, verified in tests to 10,000-psi *(68.9-MPa)* gas differential pressure at 300°F (*149°C).*			

[a]Weatherford premium threads.
[b]Other manufacturers' profiles available on request.
[c]Values shown are estimates, subject to verification.

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Specifications (continued)

Standard metallic materials[a]	
Housing and internal components	9 chrome, 1 moly, or 13% chrome, 80,000-psi *(551.6-MPa)* minimum yield
Flapper and seat	INCONEL® 718
Power spring, piston rod, flapper pin, and torsion spring	MP 35 N
Tubing thread connection	As requested
Design and manufacturing compliance	API Q1 and API 14A
Class of service	API 14A 3S2

[a]All materials heat-treated in accordance with NACE MR 01 75.

Options

- An optional internal through-the-flapper self-equalizing feature simplifies safety valve operation while ensuring reliability.

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