

Surface-controlled subsurface safety valves

General service, self-equalizing, premium rod-piston flapper valves with working pressures up to 10,000 psi [69 MPa]

Temperature

Oil and gas wells:

40 to 300 degF [4 to 149 degC]

CCS wells:

Operating temperature

–31 to 176 degF [–35 to 80 degC]

Survival temperature

Down to –109.3 degF [–78.5 degC]

Setting depth

Up to 6,000 ft [1,829 m]

Applications

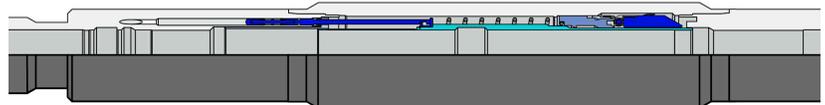
- Sweet to severely corrosive environments
- Oil and gas wells, CCS wells

Benefits

- Minimizes risk with fewer potential leak paths
- Increases reliability by protecting the hydraulic piston bore
- Enables flapper pressure equalization without compromising reliability
- Minimizes solids and scale deposition
- Lowers workover costs by enabling use of simple slickline interventions for lockout and hydraulic communication
- Extends service life by reducing operating friction and resisting corrosive chemicals

Features

- Validation to API Spec 14A V1-R
- Field-proven INCONEL[®] 718 flapper and seat with secondary soft seat
- Flapper-mounted, dart-based equalizing system
- Static, metal-to-metal or metal-to-PEEK hydraulic end seals in open and closed positions
- Metal-to-metal premium connection body seals
- Rod-piston actuator with nonelastomeric dynamic seals
- Hydraulic system rated 15,000 psi [103 MPa]
- Sliding components with optimal geometry and clearance



TRMAXX surface-controlled subsurface safety valve.

How they improve performance

TRMAXX[™] surface-controlled subsurface safety valves are hydraulically actuated from surface by using a control line to transmit hydraulic signals to the valve. These tubing-pressure sensitive, standard spring valves have been rigorously tested and qualified per the requirements of API Spec 14A. They are suitable for a range of subsurface environments, including both production and injection wells and various wellbore fluids—oil, gas, and water.

The robust design of TRMAXX valves is optimized for reliability and longevity. The premium dynamic seals of the hydraulic actuator enable seamless operation. Nonelastomeric rod-piston seals and static end stops ensure the pressure integrity of the hydraulic system whether the valve is in the open or closed position. A field-proven metal-to-metal flapper closure mechanism is used to isolate the wellbore, controlling flow to surface when closed.

How are the valves qualified?

The valves are validated to API Spec 14A V1-R, but their performance exceeds the certification requirements.

Flapper leakage: API Spec 14A allows leakage up to 5 ft³/min. The acceptance criterion for TRMAXX safety valve flapper systems is 150 times more stringent.

Hydraulic actuator integrity: API Spec 14A allows up to 5% drop in applied hydraulic pressure; for 10,000-psi hydraulic pressure, the acceptable leakage is 500 psi. TRMAXX safety valve actuators allow <1% drop, as confirmed by rigorous tests.

Slam closure: The valve's flapper system has been successfully slam tested at high flow rates that exceed the Annex K requirements of API Spec 14A.

TRMAXX Specifications

Specifications	2 3/8-in TRMAXX 5E Valve	2 3/8-in TRMAXX 10E Valve	2 7/8-in TRMAXX 5E Valve
Nominal tubing size	2.375 in [60.3 mm]	2.375 in [60.3 mm]	2.875 in [73 mm]
Max. OD	3.64 in [92.5 mm]	4.124 in [104.7 mm]	4.609 in [117.1 mm]
Nipple bore	1.875 in [47.6 mm]	1.812 in [46 mm]	2.312 in [58.7 mm]
Pressure rating	5000 psi [34.5 MPa]	10000 psi [69 MPa]	5000 psi [34.5 MPa]
Valve type	Tubing mounted	Tubing mounted	Tubing mounted

TRMAXX Specifications

Specifications	2 7/8-in TRMAXX 10E Valve	3 1/2-in TRMAXX 5E Valve	3 1/2-in TRMAXX 10E Valve
Nominal tubing size	2.875 in [73 mm]	3.5 in [88.9 mm]	3.5 in [88.9 mm]
Max. OD	5.166 in [131.2 mm]	5.176 in [131.5 mm]	5.916 in [150.3 mm]
Nipple bore	2.312 in [58.7 mm]	2.812 in [71.4 mm]	2.812 in [71.4 mm]
Pressure rating	10000 psi [69 MPa]	5000 psi [34.5 MPa]	10000 psi [69 MPa]
Valve type	Tubing mounted	Tubing mounted	Tubing mounted

TRMAXX Specifications

Specifications	4 1/2-in TRMAXX 5E Valve	4 1/2-in TRMAXX 10E Valve	5 1/2-in TRMAXX 5E Valve
Nominal tubing size	4.5 in [114.3 mm]	4.5 in [114.3 mm]	5.5 in [139.7 mm]
Max. OD	6.923 in [175.8 mm]	7.5 in [190.5 mm]	8.226 in [208.9 mm]
Nipple bore	3.812 in [96.9 mm]	3.812 in [96.9 mm]	4.562 in [115.9 mm]
Pressure rating	5000 psi [34.5 MPa]	10000 psi [69 MPa]	5000 psi [34.5 MPa]
Valve type	Tubing mounted	Tubing mounted	Tubing mounted

TRMAXX Specifications

Specifications	5 1/2-in TRMAXX 10E Valve
Nominal tubing size	5.5 in [139.7 mm]
Max. OD	9.415 in [239.1 mm]
Nipple bore	4.562 in [115.9 mm]
Pressure rating	10000 psi [69 MPa]
Valve type	Tubing mounted

All specifications are subject to change without notice.

The engineering data provided illustrate the scope of this product offering but are not all-inclusive. Additional sizes and pressure ratings are available on request.