

# WRDP-1 Series Safety Valves

General service, self-equalizing, rod piston, flapper valves with working pressures to 10,000 psi [68,950 kPa]

## APPLICATION

- Sweet to moderately corrosive applications from 40 degF to 300 degF [4 degC to 149 degC]

## BENEFITS

- Provides versatile and reliable operation.
- Design is cost effective and easy to run.
- Allows fewer potential leak paths.
- Reduces problems associated with solids and scale deposition.
- Applies to a wide range of subsurface environments

## FEATURES

- Internal equalization and adjustable closing pressures
- Designed in accordance with API and ISO criteria
- Rod piston with a premium sealing system
- Compact design
- Minimum number of seals
- Field-proven Inconel® 718 flapper and seat with metal-to-metal sealing
- Optimal geometry and clearance between sliding components
- Engineered for setting depths to approximately 2,500 ft [762m]
- Safety valve provided complete with integral lock mandrel through 3½-in size

The Camco\* WRDP-1 slickline retrievable subsurface safety valves are engineered to provide industry-leading reliability. The WRDP-1 series features rod-piston operation with the rugged Camco flapper and seat design and an internal equalizing system that can be disabled by plugging the equalization ports prior to installation. This design maximizes long-term performance and reduces potential leak paths.

The WRDP-1 series safety valves are available in a range of sizes and are normally supplied with a fit-for-purpose lock for convenient use as a primary valve in applications where a value-engineered slickline valve is desired.

The WRDP-1 series is operated by a rod-piston, premium sealing system. The premium flapper mechanism also has full, metal-to-metal sealing plus a secondary soft seat, and it meets a leakage-acceptance criterion that is substantially more stringent than API and ISO specifications.

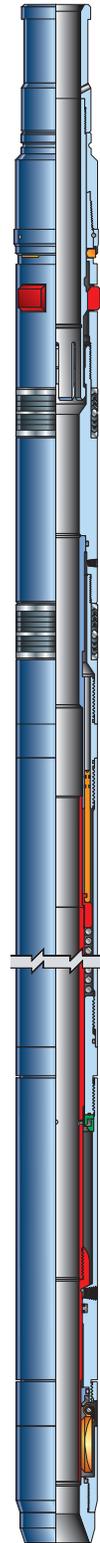
The WRDP-1 series safety valves are suitable for setting depths of approximately 2,500 ft [762 m] and are applicable to a wide range of wells, with working pressures to 10,000 psi [68,950 kPa].

## VALVE VARIATIONS

Some models of the WRDP-1 series safety valves are designed to be spring spacer adjustable (SSA). SSA valves permit closing pressures to be varied during valve assembly by substituting spacers of different lengths instead of changing the power spring. WRDP-1 safety valves with the multiple lock-out feature, or valve sizes larger than 3½ in, are not supplied with an integral lock.

## VALVE INSTALLATION

To install a WRDP-1 series safety valve, the valve is lowered and locked into the hydraulic landing nipple using the appropriate D series running tool and prong. To retrieve the valves after equalization, the appropriate JDC pulling tool and prong are used.



WRDP-1 safety valve.

# WRDP-1 Series Safety Valves

## VALVE OPERATION

The WRDP-1 series safety valves are normally closed. They are opened by applying hydraulic pressure through a control line that extends from the hydraulic landing nipple, through the wellhead, to the control panel. Hydraulic pressure applied from the surface control panel pushes the rod pistons and the flow tube down. This downward force compresses the power spring, moves the flapper off seat, and continues until the valve is in the fully open position. When the hydraulic control line pressure is released, the power spring lifts the flow tube and the rod piston. This upward movement permits the torsion spring on the hinged flapper to move the flapper into the flow stream, close against the flapper seat, and shut in flow from the well.

## EQUALIZING OPERATION

To open the WRDP-1 series safety valve with pressure below the flapper; the application of increased wellbore pressure above the flapper is preferred until the pressure across the flapper is minimal; then hydraulic pressure is applied to the actuating piston. When the tubing pressure is equalized, the flow tube moves down to the fully open position and shields the closure mechanism.

If equalization is not possible by increasing wellbore pressure, then the safety valve may be completely equalized through the internal equalizing system.

To equalize the valve with the equalizing feature disabled, pressure is applied to the tubing above the valve until the pressure equalizes across the flapper.

### Engineering Data for WRDP-1 Series Safety Valves

Tubing OD <sup>‡</sup> (in [mm])	Valve Type	Valve Packing OD (in [mm])	Min. ID (in [mm])	Working Pressure (psi [kPa])
2.375 [60.3]	WRDP-1 <sup>†</sup>	1.875 [47.6]	0.734 [18.6]	6,000 [41,570]
2.875 [73.0]		2.312 [58.7]	1.125 [28.6]	
3.500 [88.9]		2.812 [71.4]	1.562 [39.7]	
4.500 [114.3]	WRDP-1AH-SSA-NS	3.812 [96.8]	1.875 [47.6]	10,000 [68,950]
5.500 [139.7]		4.437 [112.7]	2.000 [50.8]	
7.000 [177.8]	WRDP-1A-NS	6.000 [152.4]	3.625 [90.1]	5,000 [34,475]

<sup>†</sup> The engineering data provided illustrate the scope of this product offering and are not all inclusive.

Additional sizes and pressure ratings are available upon request.

<sup>‡</sup> Lock is included in the valve assembly.

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