

Thunder subsurface safety valve

Ensure reliable operation in any completion with field-proven design features

Baker Hughes's **Thunder™ subsurface safety valve** completes our portfolio of reliable tubing-retrievable safety valves (TRSVs). Leveraging more than 30 years of experience, supplying over 50,000 valves to operators throughout the world, the Thunder valve offers fail-safe operation in a broad range of applications.

The Thunder safety valve reliably withstands temperatures as high as 350°F, accommodates working pressures up to 10,000 psi, and maintains fail-safe operation at depths of up to 10,000 ft. The Thunder valve is available in three configurations – standard, slimline, and ThunderT. The standard and slimline configurations feature metal-to-metal containment of wellbore fluids in the closed position. The slimline design is useful in applications requiring a reduced valve diameter. The ThunderT is our standard 5,000psi rated solution for applications where a slightly larger valve diameter will suffice.

All of our Thunder safety valve models use our patented puncture communication system, which provides an uninterrupted fluid path to the piston, eliminating the possibility of accidental activation or inadvertent communication. Integration of

this field-proven communication system into the Thunder valve design minimizes intervention costs while enhancing reliability. The Thunder also incorporates a non-elastomeric dynamic seal assembly to avoid rapid gas decompression and thermal degradation associated with some elastomeric seal designs. Every Thunder and ThunderT safety valve utilizes Baker Hughes's proprietary RBT metal-to-metal sealing thread technology for high tensile ratings and gas-tight sealing. Each thread is analyzed for combined stress and completes a combined load test as part of our standard prototype test program.

The patented through-the-flapper self-equalizing system provides high-integrity sealing, is resilient to debris and erosion and has been proven to reduce operating costs for operators. During wireline operations, a flapper can be inadvertently damaged if it is not held in the fully open position. The Thunder valve's flapper design recesses the sealing surface away from the edge of the flapper, protecting it from damage when wireline cable drags across the edge. High-flow-rate wells also generate tremendous energy that can cause damage to a flapper during an uncontrolled slam closure. The

Applications

- Shallow to deep setting depths
- Onshore and offshore completions

Benefits

- Provides high-integrity sealing and simple intervention operations without conventional failure modes associated with sliding sleeve type communication features
- Resists high impact loads even in extreme high-flow-rate applications through robust flapper closure mechanism
- Maximizes the internal diameter of the valve while providing gas-tight sealing and high tensile ratings through a slimline design
- Minimizes the risk of thermal degradation and rapid gas decompression with non-elastomeric dynamic seals

Thunder flapper design is also proven through high-flow-rate gas testing to ensure reliable sealing, even after slam closure. Finite element analysis, rigorous testing, and decades of experience have produced a valve that offers an ultra-strong flapper closure mechanism that will ensure reliable, long-term operation in a broad range of completions. In addition to industry-leading technology, Baker Hughes professionally trained safety valve experts are there to ensure that your well completion offers predictable, repeatable performance, every time.

Contact a Baker Hughes representative to learn more about how our Thunder TRSVs can ensure reliable, long-term operation in your well.

Thunder TRSV specifications					
Size (in.)	Working pressure (psi)	Maximum OD	Maximum seal bore	Maximum temperature (°F)	Validation rating
2.375	10,000	3.625	1.875	300	V2
2.875		5.135	2.312		
3.500	5,000	5.000	2.812	300	V2
	8,000	5.200			
		5.400			
		5.650			
4.500	5,000	6.600	3.812	350	V1
	8,000	6.850			
		7.048			
	10,000	7.030			
7.403					
5.500	5,000	7.730	4.562	350	V1
	8,000	7.730			
		8.000			
	10,000	7.760			
8.080					
7.000	5,000	9.200	6.000	300	V2
	7,500				

ThunderT TRSV specifications					
Size (in.)	Working pressure (psi)	Maximum OD	Maximum seal bore	Maximum temperature (°F)	Validation rating
2.375	5,000	3.625	1.875	300	V2
2.875	5,000	4.625	2.312		
3.500	5,000	5.380	2.812		
4.500	5,000	7.125	3.812		
5.500	5,000	8.375	4.578		

This is an overview of our standard products. Baker Hughes has a large catalog of safety valve products, and not all variations are shown.

