

Extreme DST combination valve

Improve DST data accuracy and efficiency, reduce rig time

Applications

- HPHT wells
- DST operations
- Underbalanced perforating operations

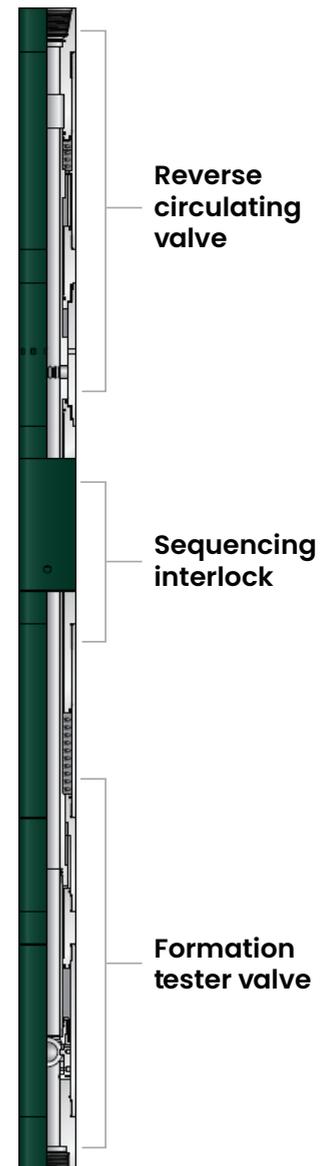
Benefits

- Sequencing interlock
 - Ensures selective actuation of the desired valve only (either the circulating or ball valve)
 - Enables ball or circulating valve cycling without having to repeat the entire actuation sequence for complete flexibility in operations
- Metal-to-metal seals
 - Designed to be debris tolerant
 - Extends functionality to HPHT environments
 - Provides high absolute, differential, and differential opening pressure capabilities
- Nitrogen chamber and annular reference trap system
 - Allows accurate operating pressures despite uncertainties in downhole conditions
 - Reduces surface nitrogen charge pressure even in high-pressure applications

The Baker Hughes **extreme drillstem test (DST) combination valve (xDCV)** contains both a ball valve and a circulating valve that are actuated using annulus pressure cycles. It is ideal for use in DST applications to establish the economic viability of a reservoir. It can also be run with tubing-conveyed perforating (TCP) systems to establish underbalance and improve reservoir communication.

The xDCV enables operators to gather accurate bottomhole pressure data, offers flexibility while flowing and killing the well, and reduces fluid loss and the resulting formation damage during operations. It is debris tolerant and stands up to extreme environments. Both the ball and circulating valves use metal-to-metal seals that open reliably under high differential pressures. A sequencing interlock allows selective actuation of each valve and mechanically prevents both valves from operating or being open at the same time.

The xDCV is run with a nitrogen chamber and annulus reference trap system, which act together to reduce the nitrogen pressure necessary to charge the valve at surface, reducing risks to personnel, particularly in high-pressure, high-temperature (HPHT) applications. By trapping a downhole reference, reliable operating pressures are maintained regardless of downhole conditions and uncertainties. A Baker Hughes resettable reference

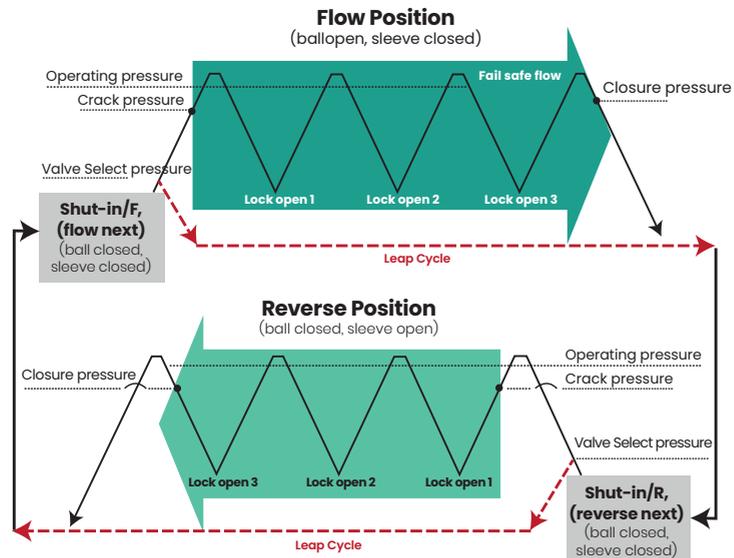


The xDCV combines the shut-in and circulating valves into one flexible tool.

trap system can account for changes in fluid weights.

When the test assembly is at depth and the packer is set, applied annulus pressure cycles open the ball valve, allowing fullbore passage through the inner diameter. Additional annulus pressure cycles close the ball valve and then open the circulating ports to establish communication between the annulus and workstring. Unlike some combination valves that must adhere to strict full-cycle patterns, the Baker Hughes xDCV uses a “leap cycle” to selectively actuate each valve. This allows the opening and re-opening of one valve without opening the other, resulting in complete flexibility to change the number of flow and shut-in periods and to adjust procedures on the fly.

Successfully tested to function with 40,000-psi internal pressure at over 400°F (204°C), the xDCV provides an effective system for either underbalanced shoot-and-pull TCP operations or full-blown well testing and data gathering in the most extreme environments. The rugged design and flexible operating system translate to effective control during surge and well kill operations, reducing risk and rig time, and preventing formation damage.



The sequencing interlock enables ball or circulation valve reset without having to repeat the entire valve sequence.

Typical properties

Outside diameter (OD)	5 in. (127 mm)
Inside diameter (ID)	2 ¼ in. (57.15 mm)
Length	25.33 ft (643.47 mm)
Maximum annular hydrostatic pressure	30,000 psi (206.84 MPa)
Differential pressure across ball	15,000 psi (103.42 MPa)
Maximum ball opening differential pressure	10,000 psi (68.95 MPa)
Maximum sleeve opening differential pressure	7,000 psi (48.26 MPa) annulus > tubing, 2,000 psi (13.79 MPa) tubing > annulus
Temperature rating	430°F (221°C)
Tensile rating	300,000 lb (136 078 Kg)
Torque rating	10,000 ft-lb (13 558 Nm)
Makeup torque	3,000–5,000 ft-lb (4067–6779 Nm)
Service	Above 175°F (80°C), the tool is suitable for H ₂ S, meets with NACE MR0175
Connections	To client specifications

