

## ELSA®-DB (Dual Bore)

The Subsea Test Tree (SSTT) forms an integral part of the subsea landing string for well test or intervention operations, and mimics the functionality of the BOP stack. It provides an operable primary safety system to control tubing pressure with dual barrier isolation in the event of an undesired situation or emergency.

The lower ball within the SSTT is capable of cutting wireline and/or coil tubing. The SSTT has a debris tolerant, high tensile latch arrangement which is capable of multiple unlatch/latch operations. The latch assembly also isolates the hydraulics after disconnection and facilitates communication upon reconnection. Should all hydraulic pressure be lost downhole then a secondary disconnect can be performed with the application of pressure below the closed annular element. To open either valve, hydraulic pressure is applied to the open side of the actuation piston which compresses the spring pack, and an offset camming pin arrangement rotates the ball to the open position. To close either valve the open hydraulic pressure is vented to allow the spring pack to push the piston, which in turn closes the ball. Inherent to the valve is an interlock that ensures the well is isolated prior to disconnection.

The production bore is tapered to suit the production bore offset on the tubing hanger running tool (THRT).

Functional redundancy can be provided via a secondary system that is activated independently from the primary hydraulic circuit; pressure manipulation from surface through the choke / kill lines below the BOP pipe rams will access a pre-arranged sequential set of shuttles that direct the pressure to the desired function.

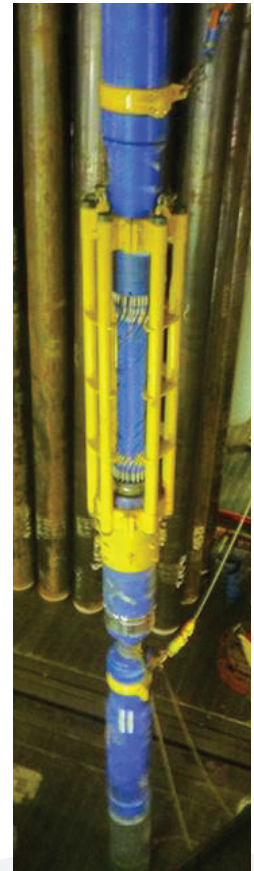
The ELSA®-DB is designed to be run with the ELSA®-HD retainer valve & lubricator valve.

### Applications:

Completion installation, workover and intervention operations on vertical subsea xmas trees from mobile offshore drilling units in water depths up to 10,000 ft (3048m)

Drill stem testing, well clean up and extended appraisal operations requiring a large flow bore

Specifically designed to operate in batch completion campaigns where minimal redress operations between runs are critical



### Benefits:

Provides a dual primary subsea barrier between the well and surface during subsea operations

Allows subsea well operations to be conducted under controlled conditions without having to function the BOP

Disconnect function allows mobile offshore drilling unit (MODU) to unlatch and re-latch safely should environmental conditions dictate

Independent ball closure allows a single cutting device to be selected

System reliability and maintenance requirements virtually eliminating rig down time

Electrical feed through and wet connectors to facilitate surface read out

Can be run with either EXPRESS subsea control systems or direct hydraulic

Pump through capability for well equalisation or bull heading

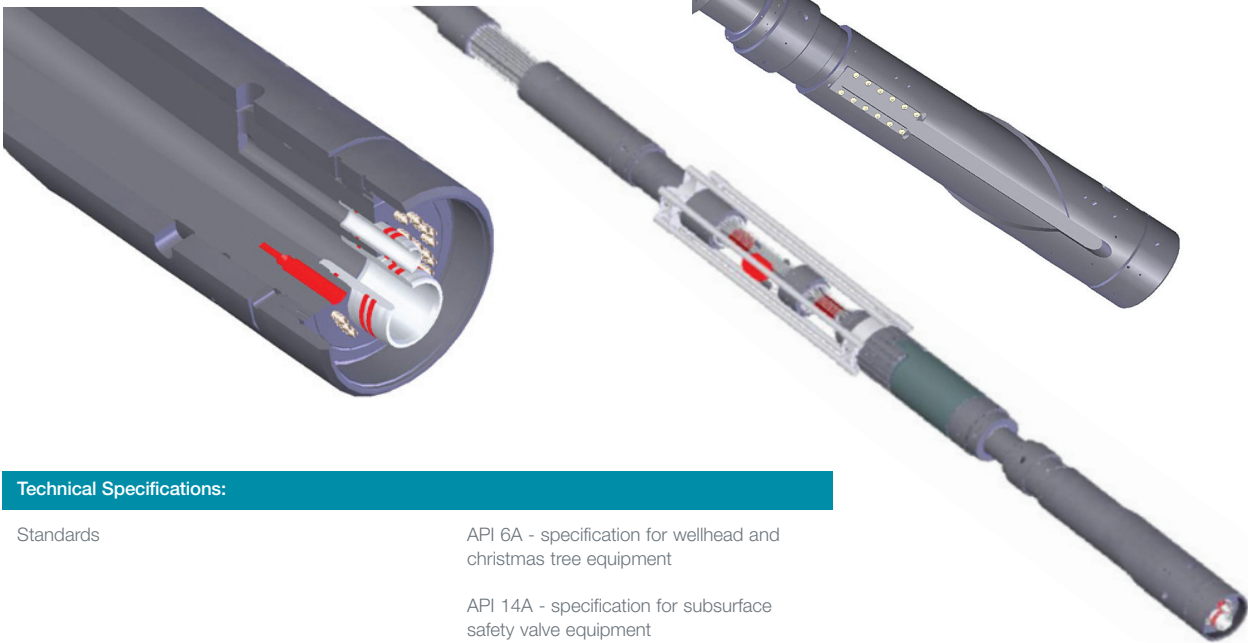
Allows monobore landing string to be utilised, while still providing functionality for vertical xmas trees

To allow chemicals to be injected directly into the well stream through a dual sealing/backflow valve arrangement, with injection point between the balls

Latch retrieval tool profile



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### Technical Specifications:

Standards	API 6A - specification for wellhead and christmas tree equipment  API 14A - specification for subsurface safety valve equipment
Service	NACE MR0175 / ISO 15156 - materials for use in H <sub>2</sub> S - containing environments in oil and gas production
Maximum Working Pressure	10,000 psi (690 bar)
Test Pressure	15,000 psi (1034 bar)
Design Temperature	-18 °C to 121 °C (0°F to +250°F)
Maximum Tensile Loading @ MWP	Up to 400,000 lbs (1,779,288 N)
Maximum Tensile Loading @ 0 psi / Bar	1,000,000 lbs (4,448,220 N)
Torsion Capacity	30,000 ft lbs (40,675 Nm)
Pump Through' Capability	Yes
Coiled Tubing Cutting Capability of Lower valve	2.00" OD x 0.188" Wall (90,000psi Yield) c/w 7/16" braided Wire
Differential pressure from above (Max)	10,000psi (690 bar)
Differential Pressure from below (Max)	10,000psi (690 bar)
Overall length	Up to 181"
Outside Diameter (Max)	Up to 18.625" (473 mm)
Internal Diameter (Min)	Up to 6.115" (155 mm)
Hydraulic Control Working Pressure	10,000 psi (690 bar)
Hydraulic Control Fluid Cleanliness	Up to AS 4059 Class 6B through to F
Number of Through Lines	Up to 19
Weight (Max)	up to 9626 lbs (4336 kgs)