ELSA-EA lubricator/retainer valve

The Lubricator/Retainer Valve is a tubing retrievable valve. The placement of the valve in the subsea well-testing string determines whether the tool functions as a Lubricator or Retainer Valve. The valve can function as either a normally open or normally closed/ fail-safe ball valve. It is operated from the surface by control lines.

When used as a Lubricator Valve, it is installed at a predetermined depth beneath the drill floor. The valve and the workstring above it serve as a lubricator for wireline tools. This installation replaces the need for surface-mounted lubricators.

In the lubricator position, the valve can also be used to prove the integrity of the lubricator section by pressure testing from above.

When used as Retainer Valve, it is installed directly above the Subsea Test Tree (SSTT) near the ocean floor. Its primary function is to capture well fluids that would be trapped in the handling string during an unlatch of the SSTT.

Additionally, the valve can be used to prove the integrity of the handling string before the well is brought on line.

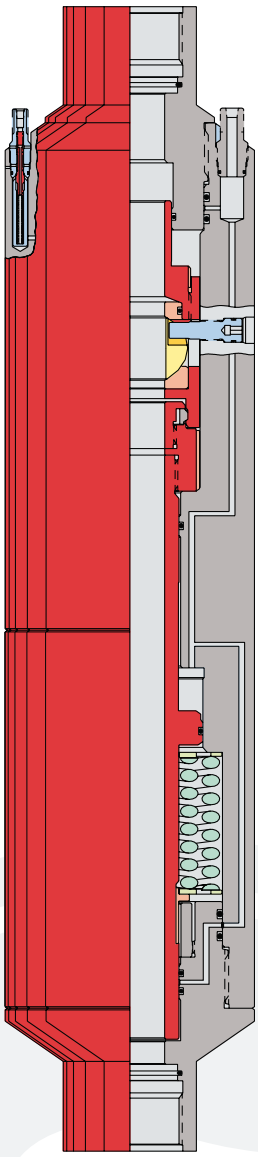
Operation (Normally Open Mode)

The three hydraulic ports in the valve are control line, balance line (lock line), and SSTT-latch line (vent line).

With no pressure on the control line or balance line, the ball is forced open by springs. When hydraulic pressure is applied to the control line, it helps the springs keep the valve open during flow. When pressure on control line is released and pressure is applied to the balance line, the operating piston is forced upward, compressing the springs and rotating the ball to the closed position.

Differential pressure directly affects the operation of the valve. Differential pressure from below causes the valve to seal without continued pressure to the balance line. If a differential pressure from above the ball is applied, the balance-line pressure must be at least 60% of the pressure above the ball for the valve to hold and seal. Otherwise, the ball rotates open.

When the valve is used as Retainer Valve, the third hydraulic line is attached to the SSTT latch line and to a bleed-off valve installed in the Retainer Valve. If the latch line is pressured to unlatch the SSTT, the bleed-off valve vents the pressure trapped between the closed Retainer Valve and the SSTT. This venting action facilitates unlatching by relieving the pressure-induced load on the SSTT latch.



Lubricator / Retainer Valve normally open

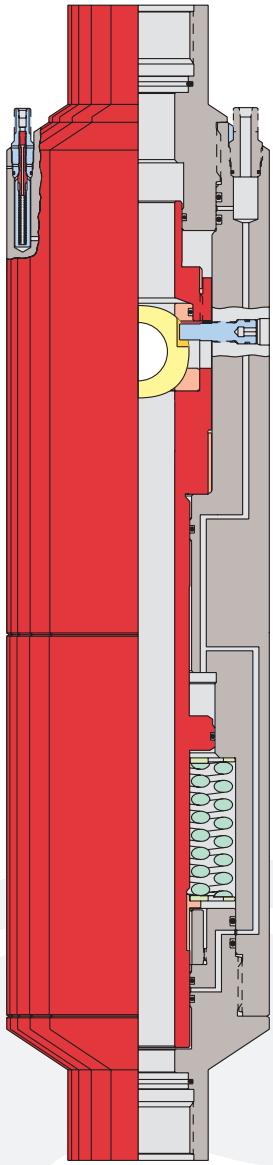
Features & Benefits:

- Retainer dual mode capabilities: normally open or normally closed/fail-safe
- Can be used as a Lubricator Valve for wireline tools
- Can be used as a Retainer Valve to capture well fluids from the handling string
- Normally open holds pressure from below and selectively seals from above

ELSA-EA lubricator/retainer valve

The Lubricator/Retainer Valve seals are arranged so that well pressure from a leaking seal is routed to the control chamber of the valve to open the ball. This routing bleeds the pressure in the handling string from the surface all the way to the SSTT.
If one of these seals develops a leak when the valve is closed, the operating piston uncouples from the ball mechanism at the snap ring. The ball remains closed for safety purposes. The snap ring can be re-snapped when balance line pressure is applied.

Operation (Normally Closed Mode)
The three hydraulic ports in the valve are the ball-control line, the ball-balance line (lock line), and the SSTT-latch line (vent line). With no pressure on the ball-control line or balance line, the ball is forced closed by springs. When hydraulic pressure is applied to the ball-control line, it compresses the springs and keeps the valve open during flow. When pressure to the ball-control line is released, the operating piston is forced downward, releasing the springs and rotating the ball to the closed position.
Differential pressure directly affects the operation of the valve. Differential pressure from above causes the valve to seal
without continued pressure to the ball-balance line.
The third hydraulic line is attached to the SSTT latch line and to a bleed-off valve installed in the retainer valve. If the latch line is pressured to unlatch the SSTT, the bleed-off valve vents the pressure trapped between the closed retainer valve and the SSTT. This venting action facilitates unlatching by relieving the pressure-induced load on the SSTT latch.
The Retainer Valve seals are arranged so that well pressure from a leaking seal is routed to the balance chamber of the valve to close the ball.



Lubricator / Retainer Valve normally closed

Technical Specifications:

P/N	617.20100	617.20300
OD in. (cm)	10.75 (27.31)	10.75 (27.31)
ID in. (cm)	3.00 (7.62)	2.75 (6.99)
End Connections	4 1/2 - 4 ACME	5 - 4 ACME
Length in. (cm)	71.44 (181.46)	74.64 (198.59)
Tensile Rating* lb (kg)	400,000 (181,000)	400,000 (181,000)
Working Pressure** psi (kPa)	10,000 (69,000)	15,000 (103,421)
Service	H_2S	H_2S
Temperature Range °F (°C)	0 to 350 (-18 to 177)	0 to 350 (-18 to 177)

* The tensile strength value is calculated with new tool conditions. Stress area calculations are used to calculate tensile strength.

* * Pressure rating is defined as the differential pressure at the tool. (Differential pressure is the difference in pressure between the casing annulus and the tool ID.)

ELSA-EALubricator/RetainerValve 131107_v1