TUBING RETRIEVABLE/CONVENTIONAL GAS LIFT VALVE (INJECTION PRESSURE OPERATED)

ES 06 is a conventional (tubing retrievable) injection pressure operated gas lift valve that ES manufactures in 1.0″ and 1-1/2″ O.D. This valve is basically controlled by injection gas pressure (casing pressure). The valve is installed on a conventional mandrel. The valve has a bellows assembly that contains a nitrogen charge over damping fluid. The dome charge provides the closing force of the valve. When injection gas pressure exceeds the closing force, the bellows compress, lifting the valve stem off of the seat, allowing gas to be injected through the valve and into the tubing.

Features

Body material in stainless steel SS304/SS 316L, 17-4PH and Monel.

Three-ply Monel bellows.

Mechanical stop prevents bellows over stoke.

Viscous fluid shear dampening prevents bellow fatigue and stem Chattering.

Tungsten carbide ball and ball stem assembly.

Replaceable floating Monel seat (also available in tungsten carbide material)

Silver brazed bellows connections

Valve Type &	Effective Bellov $_2$	Port Size	Port Area 2	Ap/Ab	1-Ap/Ab	*Rtef-(Ap/Ab)/
IPO;1.0"	0.31	3/16	0.029	0.094	0.906	0.103
		1/4	0.051	0.165	0.835	0.197
		5/16	0.079	0.255	0.745	0.342
IPO;1.5"	0.77	3/16	0.029	0.038	0.962	0.039
		1/4	0.051	0.066	0.934	0.071
		5/16	0.079	0.103	0.897	0.114

*- Tubing Effective Factor

Conventional

Check Valve

Artificial Lift System

(SPRING LOADED)

ES 62 is a conventional check Valve that ES manufactures in 1.0" and 1-1/2" O.D. The check valve is installed externally on conventional mandrels. Check dart prevent gas and fluid flow from the tubing back into the casing annulus.

An elastomer check pad is contacted first by the check dart and as differential pressure increases a metal-to-metal contact acts as a secondary seal.

The check valve is manufactured of premium material for corrosion resistance in wells with high concentrations of H2S and/or CO2.

Features

Body material in stainless steel SS304/SS 316L, 17-4PH and Monel.

Check valve back pressure rating 5,000 PSI.

Spring material Inconel X 750.

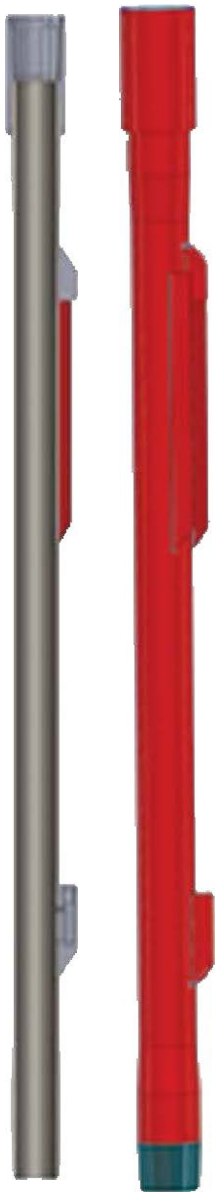
Compatible with other industry standard conventional (tubing retrievable) mandrels

Available Elastomer material Viton, Aflas and MFT.

Check valve Type & Size	Check Valve OD	Effective Port Diameter(IN)	Top & Bottom Connection	Flow Direction
Spring Loaded; 1.0"	1.0"	5/16	1/2" NPT	Annulus to Tubing
Spring Loaded; 1.5"	1.5"	1/2	1/2" NPT	

CONVENTIONAL GAS LIFT MANDREL

ES 03 is a conventional mandrel. It is designed to receive 1.0″ and 1-1/2″ conventional gas lift valves and conventional check valve. These valves are mounted externally on the mandrel . Our conventional mandrels feature external side guards to protect the gas lift valve and check. Mandrels are available in standard sizes 2-3/8″ and 2-7/8″ in J-55, N-80, L-80 and P110 materials. We can also accommodate 3-1/2″ and 4- 1/2″ sizes along with 13-CR material by special order.



Mandrel Tubing Mandrel	PPF	Valve	Connection	Mandrel OD	Mandrel ID	Drift ID	Length
2-3/8	4.7	1.0"	API EU*	3.783"	1.995"	1.901"	4 feet
		1.5"		4.283"			
2-7/8	6.5	1.0"		4.335"	2.441"	2.347"	
		1.5		4.835"			

*- Premium connection is also available upon request.

Wireline Retrievable

Gas Lift Valve

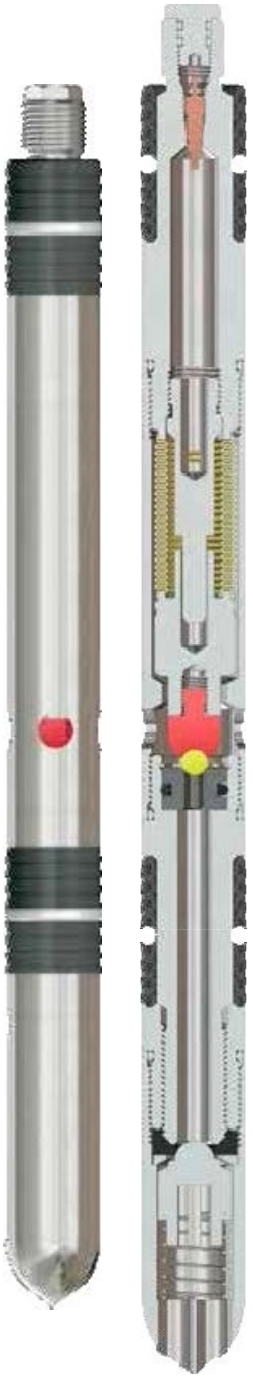
Artificial Lift System

WIRELINE RETRIEVABLE GAS LIFT VALVE (INJECTION PRESSURE OPERATED)

ES 05 IPO is a wirline retrievable injection pressure opeated gas lift valvethatmanufacturesin 1.0”or 1-1/2” O.D. This valve is basically controlled by injection gas pressure (casing pres- sure). The valve is installed in side pocket mandrels with the help of wireline tools.

The valve has a bellows assembly that contains a nitrogen charge over damping fluid. The dome charge provides the closing force of the valve. When injection gas pressure exceeds the closing force, the bellows compress, lifting the valve stem off of the seat, allowing gas to be injected through the valve and into the tubing.

The valve has an integral back check device which prevent gas and fluid flow from the tubing back into the casing annulus.



Features

Body material in stainless steel SS304/SS 316L, 17-4PH and Monel. Standard packing material Neoprene others are also available.
Three-ply Monel bellows.
Mechanical stop prevents bellows over stoke.
Viscous fluid shear dampening prevents bellow fatigue and stem Chattering.
Tungsten carbide ball and ball stem assembly.
Replaceable floating Monel seat
(also available in tungsten carbide material) Silver brazed bellows connections
Compatible with ES as well as other manufacturer’s side pocket mandrels

Valve Type & (Ap/Ab)/	(AP/AB)	Effective Latch Bellow	Port Area	Port Size (IN)	Area (IN2)	Ap/Ab Ab	*Rtef-1-Ap/
IPO; 1.0”	BK-2	0.31	3/16	0.029	0.094	0.906	0.103
			1/4	0.051	0.165	0.835	0.197
			5/16	0.079	0.255	0.745	0.342
IPO; 1.5”	RK	0.77	3/16	0.029	0.038	0.962	0.039
			1/4	0.051	0.066	0.934	0.071
			5/16	0.079	0.103	0.897	0.114

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Wireline Retrievable Dummy Valve

WIRELINE RETRIEVABLE DUMMY VALVE

ES 11 1.5" and 1.0" Wireline Dunmy Valves are Wireline Retriev- able non-equalizing isolationtools designed to install in a side pocket mandrel.

The ES Dummy is a multi-purpose tool used to blank off the pocket of side pocket mandrels. This allows production operations to be carried out prior to the need for gas lift valves, allow pressurizing of the tubing or casing for setting packers, testing and treatment procedures.

The simple design of the dummy valve allows for easy replacement of the valve packing and for rapid low-cost repair of valve components. The rugged, solid construction and premium materials assure a long service life.

Features

Body material in stainless steel SS304/SS 316L, 17-4PH and Monel.

Standard packing material Neoprene others are also available.

Compatible with standard 1.0"(BK-2) and 1.5"(RK) latches.

Compatible with ES as well as other manufacturer's side pocket mandrels.

Valve Type & Size	Latch Type
Dummy; 1.0"	BK-2
Dummy; 1.5"	RK

Wireline Retrievable

Orifice Valve

Artificial Lift System

WIRELINE RETRIEVABLE ORIFICE VALVE

ES 12 1.5" and 1.0" Wireline Retrievable Orifice Valve is used to control the flow of gas from the casing annulus into the tubing. The valve is installed in side pocket mandrels.

The valve is designed with a square edged orifice which, when properly sized, allows volume control when the casing and tubing pressures are known. An integral reverse flow check prevents gas and or fluid from flowing from the tubing back into the casing annulus. The ES valve consists of a flow barrel, seat housing and floatingsquareedgedorifice,lower packing retainer, and check nose with a reverse flow check drop.

In operation, gas and/or fluids that are injected into the casing annulus enter through the ports in the side pocket mandrel. This gas and/or fluid then enter through the ports in the valve that is located in the flow barrel between the two sets of packing. The gas and/or fluid then flows through the seat housing and square edged orifice, past the reverse flow check drop, through the check nose and into the tubing.

Features

Replaceable square edged orifice (Tungsten Carbide available) Flow capacity determined by orifice sizing.

Integral reverse flow check valve.

Compatible with standard 1.0"(BK-2) and 1.5"(RK) latches. Compatible with other manufacturers' side pocket mandrels. Standard packing material Neoprene others are also available.

Valve Type & Size	Latch Type	Port Size (IN)
Orifice; 1.0"	BK-2	3/16
		1/4
		5/16
Orifice; 1.5"	RK	3/16
		1/4
		5/16

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WIRELINE RETRIEVABLE LATCHES

ES 07 Wireline RetrievablLatches are designed to secure Retrievable Gas Lift Valves and any other flow control devices, such as chemical injection valves and water flood valves, into the appropriate side pocket mandrels equipped with 1" or 1-1/2" outside diameter receiver pockets. All the running post and bodies for the BK-2 and RK model latches are drilled and pinned.

RK

Features

Available in SS316/SS316L, SS304 and Monel.

Latch design allows valves to be pulled and serviced or replaced without pulling the whole tubing, reducing the pulling and servicing costs.

1 1/2-in. OD latch type include two O-rings that provide a barrier against fine sands and debris, protecting the latch from becoming stuck and hindering retrieval.

Compatible with pulling tools, gas lift devices and side pocket mandrels.

Springs are available with Inconel Alloy to prevent scale buildup and enhance erosion resistance.

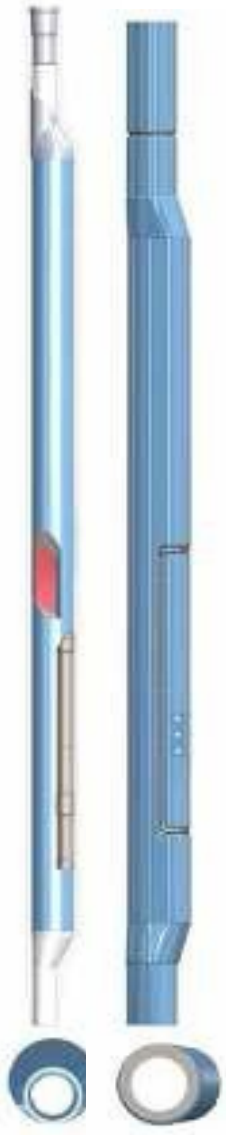
Pocket Size	Lug Profile	Model	Locking Profile	Port Size	Running Neck OD(IN)	Running Tool	Pulling Tool
1.0"	180°	BK-2	Ring Type	0.875	0.750	JK	1-1/4" JDC
1.5"	180°	RK	Ring Type	1.185	0.937	RK-1	1-5/8" JDS

SIDE POCKET MANDREL

The ES26 1.5″ and 1.0″ Wireline Retrievable Orifice Valve is used to control the flow of gas from the casing annulus into the tubing. The valve is installed in side pocket mandrels.

The valve is designed with a square edged orifice which, when properly sized, ES26 Side Pocket mandrel is used to house gas-lift valves and similar devices that require communication with the annu-lus. The design of a side-pocket mandrel is such that the installed components do not obstruct the production flow path, enabling access to the wellbore and completion components below.

ES 's Oval/Round Body Mandrel configuration is designed to provide a full opening tubing drift while receiving any manufactures 1.0″ or 1-1/2″ O.D. ES or other manufacturer's Gas Lift Valves. These mandrel feature an orienting sleeve and deflector above the pocket. The orienting sleeve allows you an option to use a positive orienting kick over tool to run or retrieve valves. Deflector sare in place to deflect and protect the valve latch.



Features

Offset design eliminates the need to pull or rerun the tubing string to install or replace gas-lift valves.

Pocket is offset from tubing ID, Which allows the maximum flow from tubing.

Orienting sleeve having mule profile which allows precise installation and retrieval of gas-lift equipment in straight and deviated wellbores.

Deflectors protects gas-lift equipment from damage.

Mandrel is available in 4140/4130 and 13CR material.

Mandrel can be furnished in either API threads or Premium connection.

Round body design is available for high pressure applications.

Tubing size	Mandrel type [2]	Pocket	Pocket type	Pocket latch Configuration	Orientation Sleeve	Major O.D.	Major I.D	Drift
2-7/8"	Oval	1.0"	Forged	180°	Yes	4.75"	4.00"	2.347″
		1.5"	Machined			5.40"	4.62"	
2-7/8"	Round	1.0"	Forged	180°	Yes	5.00"	-	
		1.5"	Machined			5.44"	-	
3-1/2"	Oval	1.0"	Forged	180°	Yes	5.31"	4.12"	2.867″
		1.5"	Machined			5.96"	5.00"	
3-1/2"	Round	1.0"	Forged	180°	Yes	5.75"	-	
		1.5"	Machined			6.00"	-	

CONVENTIONAL CHEMICAL INJECTION VALVE

The ES50 1.0" Conventional Chemical Injection Valve is used for injection of corrosion inhibitors and chemical to treat corrosion in the tubing or around the downhole tools.
ES50 is a spring loaded valve is installed on a conventional mandrel. Injection rate of the valve is adjusted by the port size and tension of the power spring. The preset power spring keeps the valve in closed position.

Features

INCONEL power spring and check-valve spring withstand corrosive and high temperature conditions.

Spring Loaded integral reverse-flow check valve prevents tubing-to-casing annulus communication during operation.

Simple design increases the flow efficiency.

Tungsten-carbide ball and insert seat (standard) offer the highest abrasion and impact resistance available, providing a robust and stable injection system.

Valve is available in SS316 and Monel material. Inconel is also available upon request.

Valve Type & Size	Top Connection	Port Size (IN)
Chemical Injection 1.0"	1/4" NPT	3/16
		1/4
		5/16

Artificial Lift System

RUNNING TOOL

ES running tools are wireline application tools used to run and install 1.0". and 1.5" outside diameter (OD) devices inside pocket mandrels.

These running tools consist of a fishing neck, a pin thread connection on the top end, and a skirt on the lower end, which attaches to the gas lift device with shear pins.

Running Tool Type	Top Connection	Fishing Neck	Maximum OD	Device Size
JK Running Tool	Ø15/16-10	1.187"	1.25"	1.0"
RK-1 Running Tool	UNS2A	1.187"	1.45"	1.5"

JD PULLING TOOL

ES08 JD pulling tools are wireline application tools designed to pullout the retrievable devices from a well with outside fishing necks. These tools are available with three different core lengths, which enable the tools to retrieve subsurface devices with fishing necks of different lengths of reach.

The JD series pulling tools use the D sub, which is made up to the core of the tool. The dogs, which are mount- ed on the skirt, are inserted into the vertical openings in the skirt. The dogs are spring-loaded and have pawls located in the windows on the skirt.

The pulling tool can be released in the event that the subsurface device cannot be freed by continuous downward jarring.

Three types of JD series tools are used and differ only by their core length, which is selected according to the reach required:

JDC long core/short reach

JDS intermediate core/intermediate reach

JDL short core/long reach

All other parts of each tool are identical and entirely interchangeable.

Pulling Tool Size	Top Connection	Pulling Tool Fishing Neck	Maximum OD	To Pull Finish Neck OD	Core Connection
1-1/4"	Ø15/1 6-10	1.187"	1.30"	0.875"	Ø1/4-20
1-5/8"	UNS2A	1.187"	1.625"	1.187"	Ø1/2-13