

ESP GUARDIAN SHIELD

The ESP Guardian Shield significantly improves the performance of ESP's in high GOR/GLR horizontal wells.

With OSI's DUAL-FLOW Completion System technology, the inadequacies of traditional "dip tube" type assemblies are eliminated while optimizing operational effectiveness. The Guardian Shield includes an encapsulating shroud around the ESP motor that prevents overheating due to gas interference.

Guardian Shield provides multi-stage separation of gas and solids while ensuring uncompromised flow area versus standard dip tube tools.

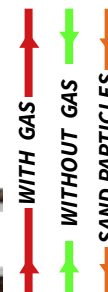
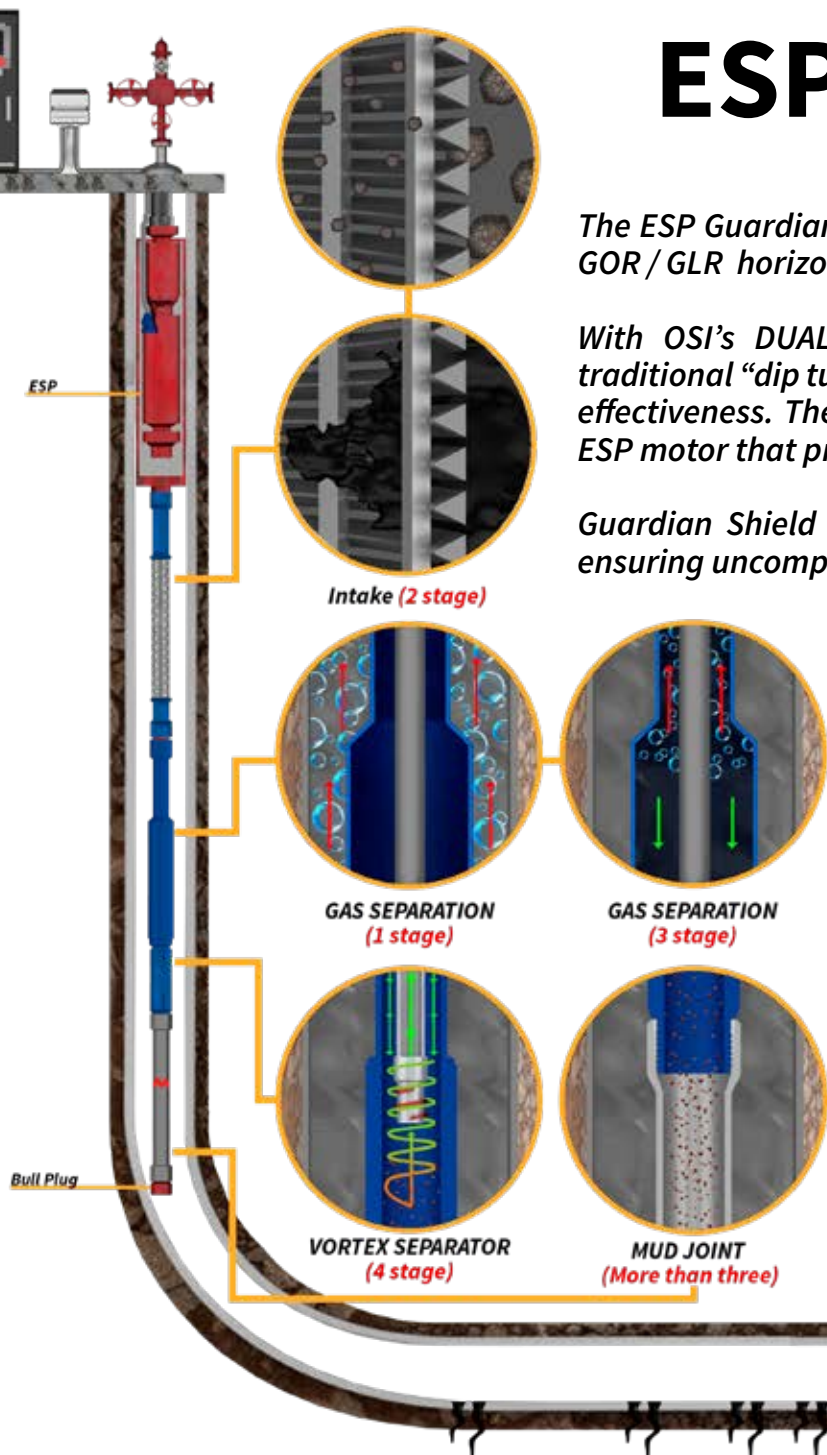
BENEFITS

- Mitigates gas slugs.
- Reduces or eliminates gas locking.
- Lowers ESP motor operating temperature.
- Prevents random shutdowns.

Use your device by scanning the QR code



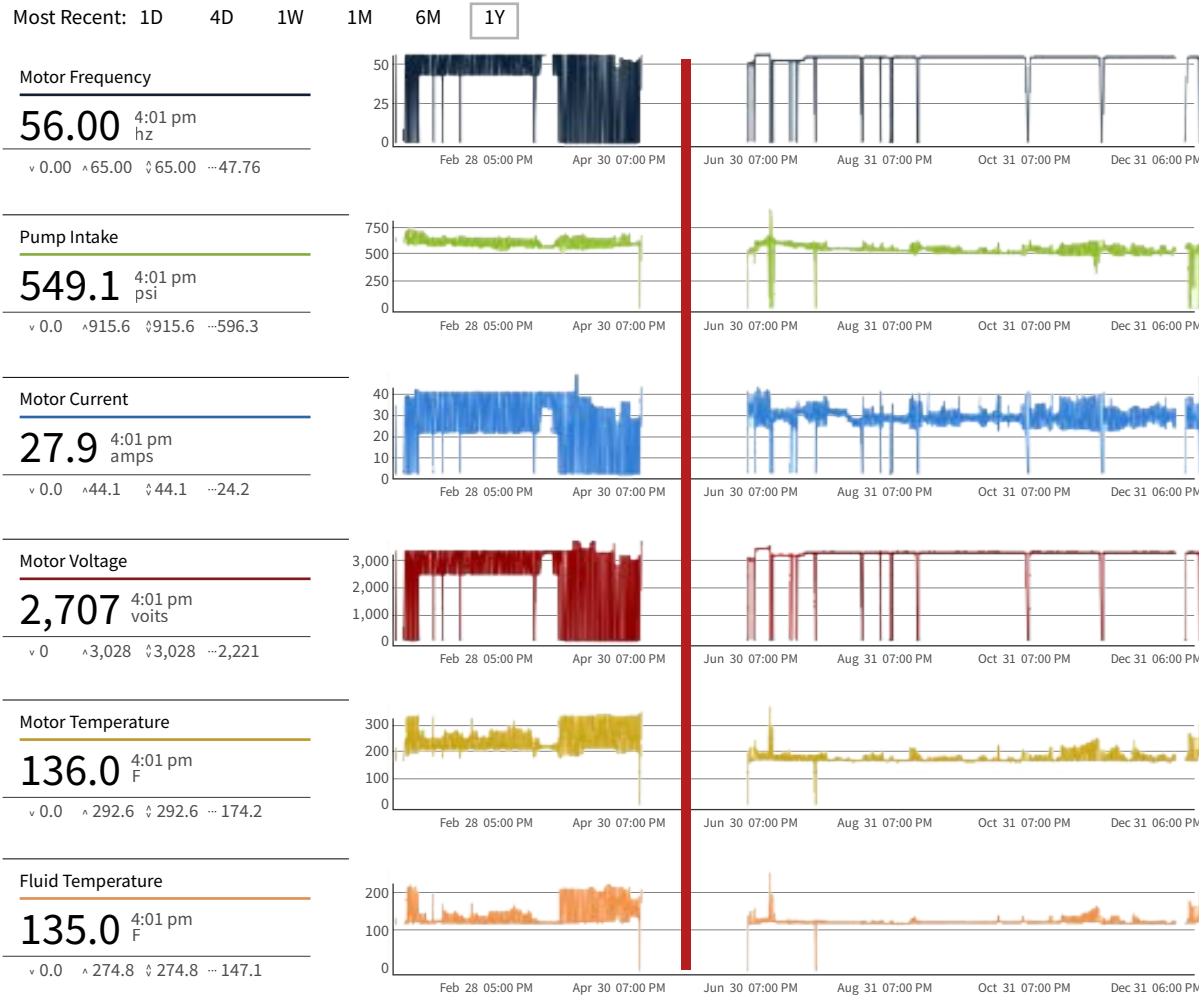
HOW IT WORKS





"Your source for fluid conditioning systems"

WELL PERFORMANCE BEFORE & AFTER OSI'S BHA INSTALLATION



- Average motor temperature and Fluid temperature almost dropped by 100° F. Average motor temperature dropped from 182.3° F to 139.3° F after OSI's tool installation.

- The difference between motor temperature and fluid temperature is 2° F indicating high gas separation efficiency with negligible free gas presence.

- Along with that, the fluctuations in the temperature has reduced and become constant which hadn't been observed before.

- Motor frequency remained stable which prevented ESP shutdowns, increasing the pump efficiency.

ESP GUARDIAN SHIELD™

Better ESP performance in high GOR wells!

Features

- Highly efficient gas separator design.
- Dual Flow System technology (Simulates diffusor and impeller).
- Separates free gas to the annulus.
- New Vortex Separator design.

Casing Size	Tubing Size	Max Body Size (OD)
5-1/2"	2-7/8"	3-1/2"
7"	3-1/2"	5-1/2"

DUAL-FLOW SYSTEM™

OSI developed the Dual-Flow Completion System, to the deficiencies of traditional dip tube based BHA's while improving functionality and operational effectiveness.

Dual-Flow Systems are delivered to the location pre-assembled and "make-up" like standard oilfield tubing. Because no special lift subs or landing plates are required, personnel exposure to injury is greatly reduced. Furthermore, make-up of long assemblies takes just minutes rather than hours.

Fluids enter the Dual-Flow through the intake section which, depending on the application, can be a screen, a perforated sub or a gas separator. Flow proceeds down the annulus of the intake / inner string and through the Dual-Flow nipple.

The heart of the system, the Dual-Flow nipple provides a continuous flow path between joints and into the inner string intake. From the intake, the fluid flows up the inner string to the pump intake

The Dual-Flow nipple provides advantages versus standard dip tube tools. It does not compromise flow area and, the slotted design is resistant to plugging should solids enter the assembly through the intake screen.

HOW IT WORKS

To improve the performance of the ESP, The Guardian Shield provides gas separation in multiple stages. Prior to the fluid entering the system, the outside geometry of the gas separator begins to break gas out of solution. The fluid passes through the screened intake which prevents some of the free gas from entering the system while simultaneously combining gas particles to produce larger, faster moving bubbles.

The fluid flows down through the housing of the gas separator section where gravity driven gas separation occurs. Utilizing the Venturi effect, the design of the GAS BODY removes gas through multiple stages.

The VORTEX GAS SHIELD imparts centrifugal force to the fluid, to agitate and further separate as much gas as possible. The fluid then enters the end of the helix and travels up the inner dip tube, through the entrance of the shroud, and into the pump.



Cross sectional view

Tbg Size	Inner String	Flow Area (In ²)	
		Dip Tube	Dual Flow Nipple
2-3/8	1	0.865	0.865
2-7/8	1-1/4	1.496	1.496
3-1/2	1-1/4	2.036	2.036

VORTEX FLOW CHART

FLOW CHART		HELIX SIZES		
ESP		EUE TUBING SIZE		
MIN	MAX	2-3/8"	2-7/8"	3-1/2"
96	192	HE1.1	HE2.1	HE3.1
132	252	HE1.2	HE2.2	HE3.2
216	440	HE1.3	HE2.3	HE3.3
330	610	HE1.4	HE2.4	HE3.4
410	850	HE1.5	HE2.5	HE3.5
780	1480	HE1.6	HE2.6	HE3.6
1150	1910	HE1.7	HE2.7	HE3.7
1480	2800	HE1.8	HE2.8	HE3.8
2100	3900	HE1.9	HE2.9	HE3.9

