

# Zenith GFI ESP gauge

## Ensure delivery of downhole data despite ground fault

### Applications

- Wells lifted by ESP
- Offshore ESP installations
- Oil fields where ESPs are prone to cable failure

### Features and benefits

- Maintains real-time data transmission despite cable ground fault
- Provides high quality data at higher sampling rate
  - Enables increased production, improved equipment runlife and effective reservoir management
- Delivers downhole electrical system measurements
- Assists in predicting ESP failure
- Assists in establishing root cause of ESP failure
- Provides real-time condition monitoring of cable health
  - Enables proactive maintenance
- Indicates fault depth and severity
  - Enables faster workover and improved inventory management
- Dual redundant gauge design

Downhole gauges for electrical submersible pump (ESP) systems typically use the pumping system’s power cable for communicating pump and well data to the surface. This type of gauge technology, known as “comms on power,” has been used for many years, providing operators with the information required to enable optimized production and protect downhole equipment. This standard technology is susceptible to problems when the insulation on the cable is damaged or ages. When a ground fault occurs on the cable, the gauge signal is lost, even if the ESP motor continues to drive the pump and the gauge itself is undamaged.

Cautionary adjustments applied to safeguard operations while running pumps blind can lead to a loss of up to 25% fluid output as compared to pumps optimized using live data.

The **Zenith™ GFI ESP gauge** runs a unique power and communication system that continues to deliver reliable pump and well condition data despite ground fault conditions, enabling better decision-making, optimized production, and efficient well operations.

The GFI gauge’s hybrid design incorporates both GFI and Zenith E-Series E7 monitoring systems in a single housing, resulting in a fully dual redundant ESP gauge.

The gauge is connected electrically to the wye point of the ESP motor. A motor base crossover may be required for some ESP manufacturer motors.

The gauge is calibrated during manufacture and retains its calibration on board. No dedicated calibration key required at surface.

Construction	
Material	13-chrome metalwork as standard
Seals	AFLAS
Maximum working pressure	5,800 psia (400 bar)
Temperature rating	302°F (150°C)
Make up length	4.68 ft (1.43 m)
Outside diameter	4.5 in. (11.43 cm)



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Measurement	Units	Range	Resolution
<b>Downhole gauge</b>			
Pump intake pressure	psia/bar	0 to 5,800 psia	0.1 psia (0.007 bar)
Pump discharge pressure	psia/bar	0 to 5,800 psia	0.1 psia (0.007 bar)
Intake temperature	°C/°F	0 to 302°F (0 to 150°C)	0.18°F (0.1°C)
Motor winding temperature	°C/°F	0 to 410°F (0 to 210°C)	0.18°F (0.1°C)
Vibration – x axis	G	0 to 5 g	0.003 g
Vibration – z axis	G	0 to 10 g	0.003 g
Tool head voltage	V	0 to 500 V	0.1 V
<b>Surface</b>			
Current leakage	mA	0 to 20 mA	0.001 mA
Phase 1, 2, 3 voltage and imbalance	Vrms	0 to 5 Kv	10 V
<b>Calculated output</b>			
Cable fault severity	%	0 to 100%	1%
Cable fault depth	ft	0 to 99,999 ft	1 ft
Cable fault resistance	Gohms	0 to 999	10