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Phoenix xt150

High-temperature ESP monitoring system

APPLICATIONS

- ESP-lifted wells requiring performance monitoring
- Wells with potential startup or instability problems
- Wells requiring pressure maintenance

BENEFITS

- Improves ESP system run life
- Lowers ESP system operating costs
- Reduces ESP early failure rates

FEATURES

- Improved well-intervention planning
- Optimized pump and production performance
- Accurate, continuous monitoring of multiple key parameters
- Compatibility with supervisory control and data acquisition (SCADA) systems using Modbus® protocol
- Programmable trip and alarm relays for all parameters monitored
- Data logger with memory for storing historical data

The Phoenix xt150* high-temperature ESP monitoring system monitors downhole pressure, temperature, current leakage, and vibration, providing comprehensive data needed to protect ESP system integrity and optimize well performance.

This system incorporates state-of-the-art, high-temperature microelectronics and reliable digital telemetry. The system is manufactured to rigorous standards, and the units are qualified for use in high-temperature and harsh environments.

This system provides fast, reliable, accurate information for analysis of artificial lift performance. The electrical system has a tolerance for high phase imbalance and the capacity to handle voltage spikes.

Configuration options

Phoenix xt150 system gauges are available in two configurations—Type 0 and Type 1. The Type 0 configuration has a base gauge that fits to the ESP motor—either directly or through a simple motor-base crossover. The monitoring system measures intake pressure and temperature, motor oil or motor winding temperature, vibration, and current leakage.

The Type 1 configuration measures pump discharge pressure and provides all the measurements made by the Type 0 monitoring system. The pump discharge measurement is used in evaluating pump performance. With it, pressure across the pump can be calculated and the points on the pump curve can be plotted. These values help in diagnosing problems in the pump or elsewhere in the completion.

Alarms for all measured parameters

Alarms can be set for each measured parameter. This flexibility lets users select the level of monitoring appropriate for each ESP completion.

Phoenix xt150 system gauges communicate with the surface through the ESP cable. The same surface data acquisition equipment is used for all Phoenix* artificial lift downhole monitoring systems, enhancing compatibility.

Phoenix xt150 high-temperature ESP monitoring system.

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Monitoring and control compatibilities

The Phoenix xt150 monitoring system is fully compatible with other monitoring and control technologies. For example, the system can be used with the Instruct* all-in-one acquisition and control unit, a surface choke assembly, computer software for data retrieval, and a memory key for data retrieval to achieve an integrated monitoring and control system.

The Instruct unit can be connected to the Phoenix xt150 system to provide remote access and control from a single data acquisition and communication platform. Both units use data retrieval software to combine downhole and surface data. They provide plain language and multilingual prompts and have local and remote settings. Their capability of storing up to 500 events facilitates data logging and trending.

The downhole and surface data can be further integrated with the LiftWatcher* real-time surveillance service for round-the-clock surveillance of all monitored parameters via satellite. The service enables engineers to monitor and analyze data from multiple wells across several fields simultaneously in real time to prevent or resolve equipment downtime, misuse, and failure.

The system is SCADA ready and has a Modbus protocol terminal with RS232 and RS485 ports for continuous data output.

Phoenix xt150 System Specifications

Length, in [cm]	22.43 [57]
OD, in [cm]	4.5 [11.4]
Max. environmental pressure, psi [kPa]	6,500 [44,816]
Survivability temperature, degF [degC]	347 [175] in 24 h
Tested insulation rating, V DC	5,000
Material	13% chrome steel
Elastomers	As required
High-voltage coupling requirement	Surface choke
Surface data acquisition	Instruct unit

Phoenix xt150 System Gauge Parameters

Measurement	Range	Accuracy	Resolution	Drift	Rate
Intake pressure†, psi [kPa]	0–5,800 [0–39,000]	±5 [34]	0.1 [0.7]	5 [34]/year	4 s
Discharge pressure†, psi [kPa]	0–5,800 [0–39,000]	±5 [34]	0.1 [0.7]	5 [34]/year	4 s
Intake temperature, degF [degC]	0–302 [0–150]	1.33% at full scale	0.18 [0.1]	na‡	4 s (Type 0), 8 s (Type 1)
Motor winding or oil temperature, degF [degC]	0–768 [0–409]	1% at full scale	0.18 [0.1]	na	36 s
Vibration, *g*	0–30	3.33% at full scale	0.1	na	Variable
Current leakage, mA	0–25	0.20% at full scale	0.001	na	Variable

†Calibrated pressure range.
‡Not applicable.

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