

Phoenix xt175

High-temperature ESP monitoring system



Max. operating pressure:
6,500 psi [44.8 MPa]



Max. operating temperature:
347 degF [175 degC]

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 xt175* 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. It is manufactured to rigorous standards and is qualified for use in high-temperature and harsh environments.

Phoenix xt175 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

■ Intake measurement only (Type 0)

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.

■ Intake and discharge measurement (Type 1)

The Type 1 configuration measures pump discharge pressure in addition to 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. Discharge temperature measurement is available on request.

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 xt175 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.



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Monitoring and control compatibilities

The Phoenix xt175 monitoring system is fully compatible with other monitoring and control technologies. For example, the system can be used with the Instruct* 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 xt175 system to provide remote access and control from a single data acquisition and communication platform. The unit uses data retrieval software to combine downhole and surface data. It provides plain language and multilingual prompts and have local and remote settings. Its capability of storing up to 500 events facilitates data logging and trending.

The downhole and surface data can be integrated with the Lift IO* production life cycle management service for around-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 xt175 System Specifications

Length, cm [in]	57 [22.43]
OD, cm [in]	11.4 [4.5]
Max. operating pressure, [†] MPa [psi]	44.8 [6,500]
Max. operating temperature, degC [degF]	175 [347] for 24 h
Housing metallurgy	13Cr stainless steel
Sour service	Yes, [‡] with pH ₂ S <10 kPa [<1.5 psi] at 150 degC [302 degF]

[†] 69-MPa [10,000-psi] system is available on request.

[‡] For 13Cr housing, the maximum limit of 1.5 psi of H₂S at 150 degC is recommended. Contact us for information about specific corrosive environments

Phoenix xt175 System Gauge Parameters

Measurement	Range	Accuracy	Resolution	Drift	Rate
Intake pressure ^{†, ‡}	0–39,000 kPa [0–5,800 psi]	±34 kPa [±5 psi]	0.7 kPa [0.1 psi]	34 kPa/year [5 psi/year]	4 s
Discharge pressure ^{†, ‡}	0–39,000 kPa [0–5,800 psi]	±34 kPa [±5 psi]	0.7 kPa [0.1 psi]	34 kPa/year [5 psi/year]	4 s
Intake temperature	0–175 degC [0–347 degF]	±2 degC [±3.6 degF]	0.1 degC [0.18 degF]	na [§]	4 s (Type 0)
Discharge temperature ^{††}	0–175 degC [0–347 degF]	±2 degC [±3.6 degF]	0.1 degC [0.18 degF]	na	8 s (Type 1)
Motor winding or oil temperature	0–409 degC [0–768 degF]	±2 degC [±3.6 degF]	0.1 degC [0.18 degF]	na	36 s
Vibration	0–30 <i>g</i>	±1 <i>g</i>	0.1 <i>g</i>	na	Variable
Current leakage	0–30 mA	±0.05 mA	0.001 mA	na	Variable

[†] Calibrated pressure range.

[‡] 69-MPa [10,000-psi] system is available on request.

[§] Not applicable.

^{††} Discharge temperature available on request.

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