



# Zenith E-Series ESP Monitoring Systems

For enhanced oil recovery and prolonged ESP run life

# GE Oil & Gas Zenith E-Series ESP monitoring systems

Reliable downhole monitoring systems delivering valuable data to enable assessment of well and ESP system performance

GE's Zenith E-Series ESP monitoring systems prolong electrical submersible pump (ESP) run life and unlock enhanced oil recovery through reliable well and pump surveillance using key parameters surrounding the motor and pump.

Accurate, real-time measurements empower confidence in pushing the ESP to its optimum performance, enabling maximum production with the knowledge that the pump is safely running within its specified limits.

## Flexible system selection

Easily installed and maintained systems are compatible with all ESP manufacturer equipment. Multiple specification options allow a system to be deployed to suit the economic and technical requirements of the application — measuring data that is valuable to the operation.

### For low production wells with small economic impact

GE Oil & Gas recommends measuring intake pressure and temperature to prevent pump-off and provide well pressure surveillance. Our Zenith Surface Panel (ZSP) provides the interface for communication with the downhole gauge.

### For more prolific wells or wells with difficult operating conditions

The addition of discharge pressure, motor winding temperature and vibration enable full well analysis to assess performance and optimize production.

### For advanced monitoring and protection

The GE E7+ option is Zenith's smart-technology solution. The intelligent system uses pioneering technology, combining the E7 gauge with ZSP+ (Zenith Surface Panel Plus) to provide valuable data for well analysis including advanced parameters.

Zenith E-Series system parameters

	E4	E6	E7	E7+
Pump intake pressure	●	●	●	●
Pump discharge pressure			●	●
Intake temperature	●	●	●	●
Motor oil or motor winding temperatures	●	●	●	●
Vibration X axis		●	●	●
Vibration Y axis		●	●	●
Current leakage	●	●	●	●
Wellhead pressure				●
Total liquid flow rate				●
Water cut				●
Bottom hole flowing pressure				●
Real time pump curve & live operating point				●

● Parameter included

2,500+

### Days run life to date

Zenith E-Series gauges are achieving run lives well over 2,500 days in the field, and continuing to perform.

As the preferred technology in some locations, Zenith E-Series gauges regularly outlive the pumps. In fields where downhole data is crucial to producing the reservoir effectively, Zenith E-Series gauges have been installed and providing valuable data for seven years.

## Advanced technology options

### Ground fault immunity

A cutting-edge development of the Zenith E-Series range, the Zenith Ground Fault Immune (GFI) ESP Gauge is a robust alternative which cannot be disturbed by cable ground faults. The industry-first system maintains continuous delivery of reliable well data ensuring sustained optimization of production levels despite fault conditions.

### Upgradeability

Zenith E-Series ESP monitoring systems can be upgraded to incorporate the award winning Z-Sight automated surveillance system to perform instant optimization and ESP diagnostics remotely and at the well site.

## Field-proven reliability

97%

### Reliability rate

Built on the legacy of Zenith, GE Oil & Gas has installed over 1,300 E-Series systems across the Gulf region of the Middle East with 97% still delivering accurate downhole data — an exemplary track record for reliability.

Maintaining an exemplary survivability record is of primary importance. GE Oil & Gas focuses on ensuring customers receive the best service and equipment in the industry.

Comprehensive and fit-for-purpose design provides continuous data even in high temperature and difficult operating environments. Advanced technology transducers, high tolerance to ESP ground faults and robust makeup ensure system survival in harsh well conditions.

Gauges are designed to operate reliably up to 150°C, 175°C or 260°C, and are fully tested to survive higher temperatures that occasionally occur during ESP operation.

## Maximize run life while reducing cost

Alarm/trip safeguards ESP and well, protecting against

- Unnecessary workover and expenditure
- Excessive well draw-down
- High or low flow rates (pump upthrust or downthrust)
- Dead heading or shut in
- Resonant vibration frequencies

## Optimize production

- Dual pressure gauge enables full validation and analysis of well and ESP operating conditions
- Feedback intake pressure level to VSD frequency setting to provide automated control of draw-down
- Fast sampling and accurate gauges enable analysis of draw-down and build-up pressure transients

## Autonomous source of data for analysis

- Identification of pump wear issues
- Validation of inflow/outflow data

99.2%

### Reliability rate

One field in Saudi Arabia was completed with more than 250 Zenith E7 ESP gauges. Over 4 years since installation only two sensors encountered any technical problems.



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