



# Zenith C-Series Artificial Lift Monitoring Systems

Economic monitoring and protection of artificial lift wells

# GE Oil & Gas Zenith C-Series artificial lift monitoring systems

Permanent monitoring systems delivering detailed and accurate information about the well, reservoir and pumping system

Designed for non-ESP environments, GE's Zenith C-Series monitoring systems economically advance the level of information traditionally used to operate lifting systems such as progressive cavity pumps (PCP), beam pumps, gas lift and jet pumps, protecting the pumping system while enabling increased well production.

The Zenith C-Series gauge is installed on a carrier sub in the tubing string above or below the pump and uses an electric instrument line to communicate signals to surface.

## Valuable data

Pressure data is of primary importance in understanding the performance of a reservoir, well and pumping system.

A permanent reading of annulus pressure from the Zenith C-Series system allows improved control of well drawdown, maximizing production whilst keeping pressure, hence fluid level, above critical pump off conditions.

## Flexible system selection

Multiple specification options allow a system to be deployed to suit the economic and technical requirements of the application.



### Zenith C-Series system parameters

	C2	C5	C6	C9 for PCP
Annulus pressure	○	○	●	●
Tubing pressure	○	○	●	●
Annulus temperature	○	●	●	●
Tubing temperature	○	●	●	●
Vibration X axis		●	●	●
Vibration Y axis		●	●	●
Total rod twist				●
Total rod cycles				●
Surface & downhole rpm				●
Rotor position relative to stator (installation & operation)				●

● Parameter included ○ Optional

### For PCP wells

PCP systems are emerging as a competitor to ESPs, particularly in heavy oil fields. Monitoring a PCP well with the Zenith C-Series system improves both run life and production.

### For gas lift wells

Data acquired from the Zenith C-Series monitoring system on a gas lift completion can lead to increased production and a decreased requirement for injected gas, improving overall efficiency.

### For beam pump wells

Although typically low producing wells, it has been demonstrated that data from the Zenith C-Series monitoring system on a beam pump completion can assist in enhancing production and aid in reservoir management as reservoir access below the pump is restricted.

2,450+

### Days run life to date

Zenith C-Series gauges are achieving run lives well over 2,450 days in the field, and continuing to perform.

As the preferred technology in some locations, Zenith C-Series gauges regularly outlive the pumps.

In fields where downhole data is crucial to producing the reservoir effectively, Zenith C-Series gauges have been installed and providing valuable data for over 6½ years.

95%

### Reliability rate

With a high percentage of Zenith C-Series sensors installed across South America, Africa and the Middle East, 95% of systems throughout these regions continue to deliver accurate downhole data.

## Advanced technology options

### Enhanced PCP protection

The patented PCP Protection System (C9) intelligently analyzes mechanical issues that decrease PCP run life such as rod breakage, and rotor and elastomer damage. Monitoring and protecting against common PCP problems such as incorrect rotor position, pump off, deadheading, wear and over-temperature avoids related decreased or lost oil production.

### Upgradeability

Zenith C-Series systems for PCPs can be upgraded to incorporate the award winning Z-Sight automated surveillance system to perform instant optimization and PCP diagnostics remotely and at the well site.

## Field-proven 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.

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

Zenith C-Series systems offer two options for data acquisition:

- **Zenith Interface Unit (ZIU)**  
Interfaces the gauge signal to RS232 or RS485 Modbus output for use on a drive or SCADA Remote Terminal Unit.
- **Zenith Surface Panel (ZSP)**  
Provides on-screen data charting, alarms and trips, analogue and data (Modbus) communication signals.

Gauges are designed to operate reliably up to 125°C or 150°C, and are fully tested to survive higher temperatures that occasionally occur during operations.

## Maximize run life while reducing cost

Alarm/trip safeguards pump and well, protecting against

- Pump off
- Pump overheating
- Excessive well draw-down
- High or low flow rates
- Dead heading or shut in
- Resonant vibration frequencies

## Optimize production

- Dual pressure option enables full validation and analysis of well and pump 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 to aid in reservoir management using the real time data

## Autonomous source of data for analysis

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



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