

OPTIMUM +
ALARM SET POINTS

WELLHEAD
PRESSURE

REAL TIME PUMP CURVE
LIVE OPERATING POINT

WATER CUT
BOTTOM HOLE
FLOWING PRESSURE
PRESSURES
TEMPERATURES
VIBRATION
CURRENT LEAKAGE

TOTAL LIQUID FLOW RATE

E7+™

Intelligent ESP monitoring
Advanced real-time monitoring and protection for ESPs

GE Oil & Gas Zenith E7+™ Intelligent ESP Monitoring

A new-technology monitoring system unlocking enhanced oil recovery capabilities and prolonged ESP runlife

GE's Zenith E7+ system is a smart-technology addition to the Zenith E-Series ESP monitoring range. The intelligent system uses the very latest technology to automate ESP protection and enable optimisation for enhanced oil recovery.

Additional parameters = increased knowledge

Combining the latest E7 gauge technology with ZSP+ (Zenith Surface Panel Plus), the intelligent E7+ system provides a reliable source of valuable real time data for well and pump analysis, diagnosis and optimisation.

Automating pump and well protection

E7+ calculates appropriate alarm set points for the ESP, ensuring maximum runlife and protecting the reservoir regardless of changing ESP operation or well conditions. Alarm levels automatically compensate for frequency or well fluid changes. Smart alarms can be set on

- intake pressure
- discharge pressure
- bottom hole flowing pressure
- wellhead pressure
- motor temperature
- pump flow
- pump head

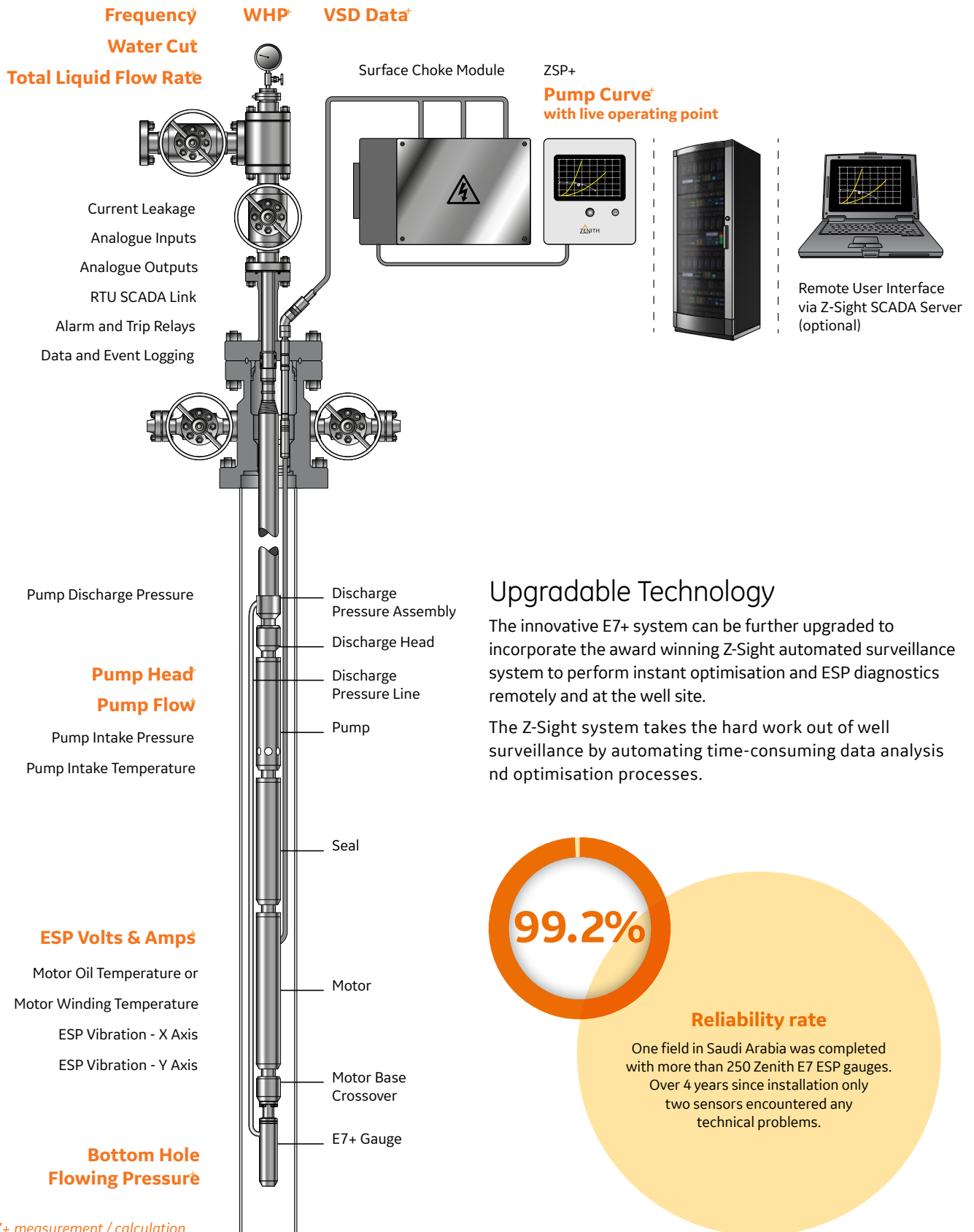
Proven Reliability

As an industry leader in monitoring systems, Zenith gauges provide reliable measurements surrounding the ESP giving the operator confidence in pushing that system to its optimum performance – with the knowledge that the pump is running within its specified limits.

Zenith E7+ system parameters

	E7	E7+	Benefit
Pump intake pressure	●	●	Monitors draw down on the well and protects against pump off
Pump discharge pressure	●	●	Protects from pumping against closed valves
Intake temperature	●	●	Monitors ESP performance when used with frequency and flow
Motor oil or motor winding temperatures	●	●	Protects against motor burn
Vibration X axis	●	●	Monitors vibration caused by sand, gas, pump wear and bend
Vibration Y axis	●	●	Monitors vibration caused by sand, gas, pump wear and bend
Current leakage	●	●	Monitors ESP system electrical integrity over time
Wellhead pressure		●	Enables analysis of tubing gradient (outflow) when used with Pd Improved view of operation when logged with ESP/gauge data
frequency		●	Tracks electrical ESP performance. Improved view of ESP performance when logged with gauge data
ESP volts and amps		●	Tracks electrical ESP performance. Improved view of ESP performance when logged with gauge data
total liquid flow rate		●	Reduces requirement for well testing and provides real time trend
water cut		●	Reduces requirement for well testing and provides real time trend
bottom hole flowing pressure		●	Pressure at the perforations protects from excessive draw down and enables tracking of well inflow performance
real time pump curve & live operating point		●	Enables full ESP pump performance diagnostics to ensure pump is running within its designed range

● Parameter included



Upgradable Technology

The innovative E7+ system can be further upgraded to incorporate the award winning Z-Sight automated surveillance system to perform instant optimisation and ESP diagnostics remotely and at the well site.

The Z-Sight system takes the hard work out of well surveillance by automating time-consuming data analysis and optimisation processes.

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.

* E7+ measurement / calculation



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