



Optical Pressure-Temperature Gauge

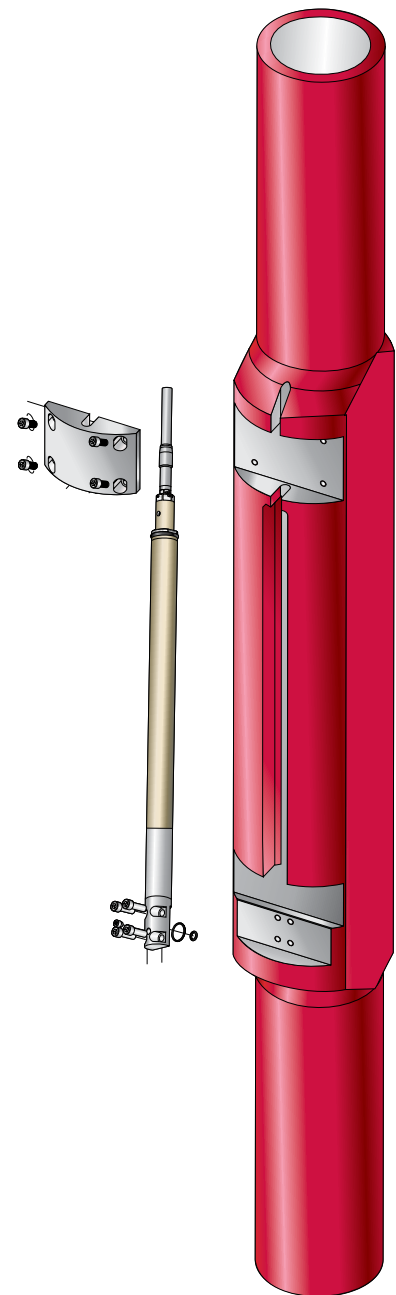
Weatherford's optical pressure-temperature (P/T) gauge provides permanent reservoir monitoring, enabling superior reservoir management decision-making.

Operating reliably in high-temperature/high-pressure (HTHP) applications, the optical P/T gauge delivers stable, high-resolution reservoir pressure and temperature measurements with no measurable drift. Its unique operating capabilities offer a performance margin for high-value wells.

Applications

The gauge is designed to provide life-of-field, reliable service and can be used in the following applications:

- In-well flowing pressure measurement
- Reservoir pressure determination during shut-ins
- Data gathering for pressure transient analyses (skin, permeability, and reservoir boundary determination)
- Management and control of well ramp-up
- Interference testing and reservoir connectivity determination
- Seamless integration with other Weatherford optical sensors
- Intelligent wells
- Subsea wells

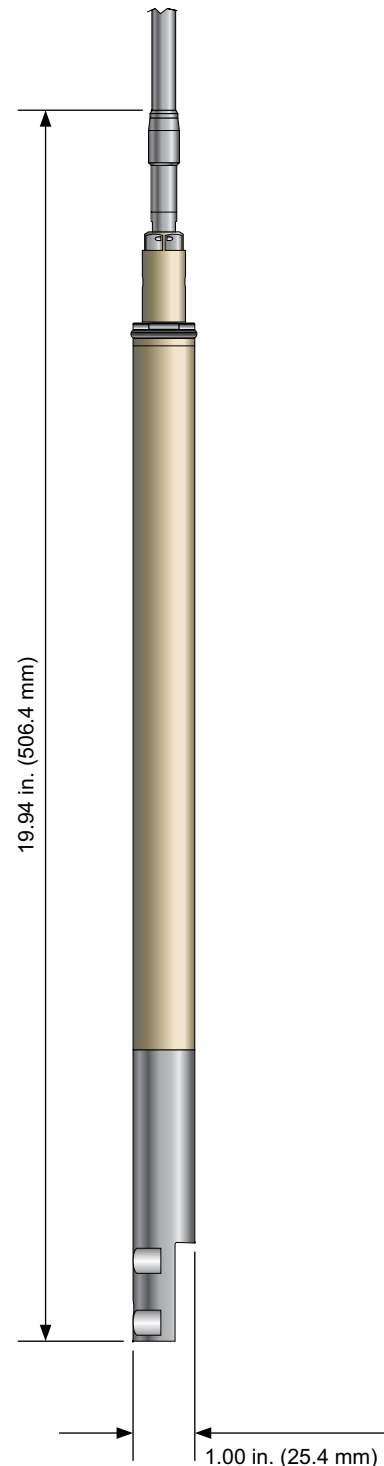




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Features, Advantages and Benefits

- Optical technology platform enables gauge design with a minimal number of component parts and no moving parts to ensure reliable operations over the life of the well.
- Gauge is designed to deliver stable measurements with no measurable drift, eliminating concerns about absolute pressure and temperature measurement over the life of the field.
- Gauge has the industry's highest mechanical shock and vibration survivability, enabling it to withstand impact, vibration, and significant pressure surges.
- Immunity to electromagnetic interference means functionality will not be disrupted by other electrical completion components.
- Complex interrogation components are located at the surface, making the gauge system easy to service.
- Gauge is chemically inert, minimizing corrosion compatibility concerns.
- On-demand availability of reservoir pressure data reduces well interventions and production shut-ins.
- Gauge is electronically passive, with no electronics downhole, increasing system reliability and stability.
- Gauge features a standard footprint and gauge mandrel interface and requires no more than industry-standard handling and installation procedures, for minimal effect on the completion architecture.





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Specifications

Operational Performance		
Calibrated pressure range (psi/bar)	Atmosphere to 10,000 (690)	Atmosphere to 20,000 (1,379)
Overpressure (psi/bar)	25,000 at 302°F (1,724 at 150°C)	
Collapse pressure (psi/bar)	> 25,000 (1,724)	
Burst pressure (psi/bar)	> 35,000 (2,413) at RT	
Calibrated temperature range (°F/°C)	77° to 302° (25° to 150°)	
Maximum temperature (°F/°C)	347° (175°)	
Minimum storage temperature (°F/°C)	-58° (-50°)	
Update Rate	1 sec, no limit	
Pressure Metrology		
Pressure accuracy (psi/bar)	± 2 (0.14)	
Long-term stability (psi/bar)	< 0.5 (0.03)/yr	
Pressure resolution (psi/bar)	≤ 0.03 (0.002)*	
Temperature Metrology		
Temperature accuracy (°F/°C)	± 0.18 (0.1)	
Long-term temperature stability (°F/°C)	< 0.18 (0.1)/yr	
Temperature resolution (°F/°C)	≤ 0.036 (0.02)*	
Shock and Vibration Data		
Vibration	15 Grms, random [10 to 2,000 Hz (Nav Mat)]	
Shock	100 g, 9 ms half sine	
Drop	500 g, 1 ms half sine	
Thermal shock	53.6°F (12°C)/min	

*Depends on update rate