Metris Extreme
HPHT permanent PT gauge

 Rated up to 30,000 psi [207 MPa]
 Rated up to 400 degF [204 degC]
 Compatible with Agiliti* modular digital completions

APPLICATIONS
- Long-term production and reservoir monitoring in real time
- Measurement of downhole fluid density and flow rate in real time
- Artificial lift performance enhancement
- Injection monitoring and optimization
- Pressure buildup surveys and transient well testing
- Hydraulic fracture monitoring

BENEFITS
- Simplifies deployment of intelligent completions with compact gauges and monoconductor cable
- Enables real-time evaluation and prompt corrective actions by delivering continuous pressure and temperature (PT) measurements
- Helps improve production through evaluation of artificial lift system
- Improves field development by enabling optimal offset well placement and completion design

FEATURES
- Immunity to electrical noise and electromagnetic field interference
- Extended system reliability confirmed by rigorous testing
- Long-term measurement accuracy with quartz sensor and advanced electronics
- Up to 16 sensors on monoconductor cable
- In-house calibration at a Schlumberger manufacturing center
- Grade VO lower connection system per ISO 14998
- H₂S-resistant gauges per NACE MR0175/ISO 15156

Metris Extreme HPHT permanent PT gauges have advanced quartz sensors for high-quality measurements. Robust electronic technology and stringent qualification procedures ensure an extended lifetime and flawless performance. Downhole data acquired by these gauges is used for real-time surveillance, production analysis, and pressure transient analysis, which are important for well productivity and reservoir depletion evaluation as well as for production optimization.

Downhole data unaffected by electrical noise and intergauge distance
The telemetry used by Metris Extreme gauges and the surface acquisition units is immune to external electrical noise, such as that induced by ESP power cables or motor drives. Among other advantages, it enables multidropping up to eight dual-sensor gauges on a single cable and eliminates limitations on the distance between gauges.

Stable measurements at reservoir conditions
These permanent gauges are engineered to deliver stable pressure and temperature measurements, which are essential in long-term reservoir and production monitoring applications. Performance is validated in a controlled test cell, where drift stability is measured at simulated reservoir pressure and temperature conditions.

Enhanced sealing for extended reliability
For extra reliability, these gauges are equipped with Intellitite* downhole dual-seal dry-mate connectors. Incorporating a retainer system and two fully redundant metal-to-metal seals, this premium connector is fully pressure testable using a microleak detection system.

Rigorous qualification testing
Metris Extreme gauges are subjected to power on-off cycles and temperature cycling to simulate the most demanding operating conditions. They are qualified for a lifetime in excess of 20 years at maximum pressure and up to 400 degF [204 degC]. Repeated shock and vibration testing at rigorous levels ensures that the gauges meet the environmental qualifications for production and injection wells. Qualifications meet or exceed the Advanced Well Equipment Standards (AWES) recommended practice for the qualification of downhole instrumentation and sensors.

Part of an integrated system
Metris Extreme gauges belong to the family of Metris* permanent monitoring systems. When used in conjunction with WellWatcher Advisor* real-time intelligent completion software, the gauges become part of a monitoring solution that includes downhole surveillance, data analysis, and reservoir interpretation. These technologies are supported and deployed by a specialized group of scientists, engineers, and technicians who are highly trained and experienced in permanent monitoring systems and intelligent completion technology. This specific central support for project preparation and operations contributes to the delivery of best-in-class service quality worldwide.
### Metris Extreme HPHT Permanent PT Gauge Specifications

<table>
<thead>
<tr>
<th></th>
<th>10,000 [69]</th>
<th>16,000 [110]</th>
<th>25,000 [172]</th>
<th>30,000 [207]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum pressure, psi [MPa]</strong></td>
<td>302 or 350 [150 or 177]</td>
<td>302, 350, or 400 [150,177, or 204]</td>
<td>400 [204]</td>
<td>400 [204]</td>
</tr>
</tbody>
</table>

**Shock and vibration**
- AWES standard or beyond

**H₂S resistance**
- NACE MR0175

**Scanning rate**
- One dataset (pressure and temperature) per gauge per second

**Tool current**
- 20 mA for gauge + 15 mA for telemetry

### Metrology

<table>
<thead>
<tr>
<th></th>
<th>1,000 to 10,000 [6.9 to 69]</th>
<th>1,000 to 16,000 [6.9 to 110]</th>
<th>1,000 to 25,000 [6.9 to 172]</th>
<th>1,000 to 30,000 [6.9 to 207]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard temperature calibration range,</strong> † degF [degC]</td>
<td>0.006 [0.041]</td>
<td>0.008 [0.055]</td>
<td>0.010 [0.069]</td>
<td>0.010 [0.069]</td>
</tr>
<tr>
<td><strong>Pressure accuracy, % full scale</strong></td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td><strong>Pressure resolution, 1-s gate time, psi [kPa]</strong></td>
<td>±0.015</td>
<td>±0.02</td>
<td>±0.02</td>
<td>±0.02</td>
</tr>
<tr>
<td><strong>Pressure repeatability, % full scale</strong></td>
<td>±0.02</td>
<td>±0.02</td>
<td>±0.02</td>
<td>±0.02</td>
</tr>
<tr>
<td><strong>Temperature accuracy, degF [degC]</strong></td>
<td>±0.9 [±0.5]</td>
<td>±0.9 [±0.5]</td>
<td>±0.9 [±0.5]</td>
<td>±0.9 [±0.5]</td>
</tr>
<tr>
<td><strong>Temperature resolution, 1-s gate time, degF [degC]</strong></td>
<td>0.009 [0.005]</td>
<td>0.009 [0.005]</td>
<td>0.009 [0.005]</td>
<td>0.009 [0.005]</td>
</tr>
<tr>
<td><strong>Temperature repeatability, degF [degC]</strong></td>
<td>&lt;0.02 [±0.01]</td>
<td>&lt;0.02 [±0.01]</td>
<td>&lt;0.02 [±0.01]</td>
<td>&lt;0.02 [±0.01]</td>
</tr>
<tr>
<td><strong>Temperature drift at 350 degF, degF/year</strong></td>
<td>±0.18 [±0.1]</td>
<td>±0.18 [±0.1]</td>
<td>±0.18 [±0.1]</td>
<td>±0.18 [±0.1]</td>
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</table>

### Dimensions

<table>
<thead>
<tr>
<th></th>
<th>0.75 [19]</th>
<th>0.75 [19]</th>
<th>0.75 [19]</th>
<th>0.84 [21]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outer diameter, in [mm]</strong></td>
<td>22.8 [580]</td>
<td>22.8 [580]</td>
<td>22.8 [580]</td>
<td>22.8 [580]</td>
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<tr>
<td><strong>Single-sensor length, in [mm]</strong></td>
<td>25.8 [655]</td>
<td>25.8 [655]</td>
<td>25.8 [655]</td>
<td>25.8 [655]</td>
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<tr>
<td><strong>Single-sensor length with feedthrough, in [mm]</strong></td>
<td>20.9 [530]</td>
<td>20.9 [530]</td>
<td>20.9 [530]</td>
<td>20.9 [530]</td>
</tr>
<tr>
<td><strong>Dual-sensor length, in [mm]</strong></td>
<td>31.5 [800]</td>
<td>31.5 [800]</td>
<td>31.5 [800]</td>
<td>31.5 [800]</td>
</tr>
</tbody>
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† Custom calibration ranges are available if required.

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Metris Extreme and Metris Evolve gauges are available with various pressure and temperature ratings to suit the application.