

Metris Evolve permanent PT gauge

Noise-immune gauges with advanced bidirectional telemetry



Pressure:

Rated up to 16,000 psi [110 MPa]



Temperature:

Rated up to 302 degF [150 degC]



Compatible with Agiliti*

modular digital completions

Where it is used

Metris Evolve* permanent PT gauges use proprietary enhanced silicon-on-insulator (eSOI) sensors for high-quality measurements in the tubing or annulus.

How it improves wells

The gauges enable real-time evaluation and prompt corrective actions by delivering continuous pressure and temperature (PT) measurements. Acquired data is used for

- long-term production, injection, and reservoir monitoring in real time
- production allocation and management
- production and injection optimization
- well productivity, pressure transient, and decline analysis
- workover and intervention planning
- improved field development via interwell connectivity identification and offset well placement and completion design optimization
- reservoir model improvement and validation
- artificial lift optimization
- hydraulic fracture monitoring.

The ability to multidrop these compact gauges on one monoconductor cable simplifies intelligent completion deployment.

How it works

The telemetry used by the gauge and surface acquisition unit is immune to external electrical noise and electromagnetic field interference (e.g., from ESP power cables or motor drives). Among other advantages, it enables multidropping up to eight dual-sensor gauges (i.e., 16 sensors) on a single monoconductor cable and eliminates limitations on the distance between gauges.

Gauges rated to 266 degF [130 degC] use Sealtite* downhole dry-mate connectors, whereas gauges rated to 302 degF are equipped with the electric dry-mate connectors EDMC-R or the new EDMC-S. Incorporating a retainer system and triple metal-to-metal seals, the EDMC-S is engineered for maximum reliability in aggressive downhole conditions. Additionally, these latest connectors reduce makeup time by a factor of nearly six, significantly enhancing efficiency.

Bidirectional telemetry

Unlike conventional permanent downhole systems, Metris Evolve gauges use advanced bidirectional telemetry. This not only transmits PT data but also enables users to actuate a wide range of downhole completion equipment with just one electric and two hydraulic lines.

What else I should know

These permanent gauges are engineered to deliver stable PT measurements at downhole conditions, a quality that is essential for long-term reservoir and production monitoring. Performance is validated in a controlled test cell, where drift stability is measured at simulated reservoir PT conditions. Every gauge is calibrated in-house at a Schlumberger manufacturing center to maximize performance.

The gauges are also 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 302 degF. Repeated shock and vibration testing at rigorous levels ensures that they 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.

The lower connection is V0-qualified per ISO 14998 and the gauge metallurgy is H₂S resistant per NACE MR0175/ISO 15156.

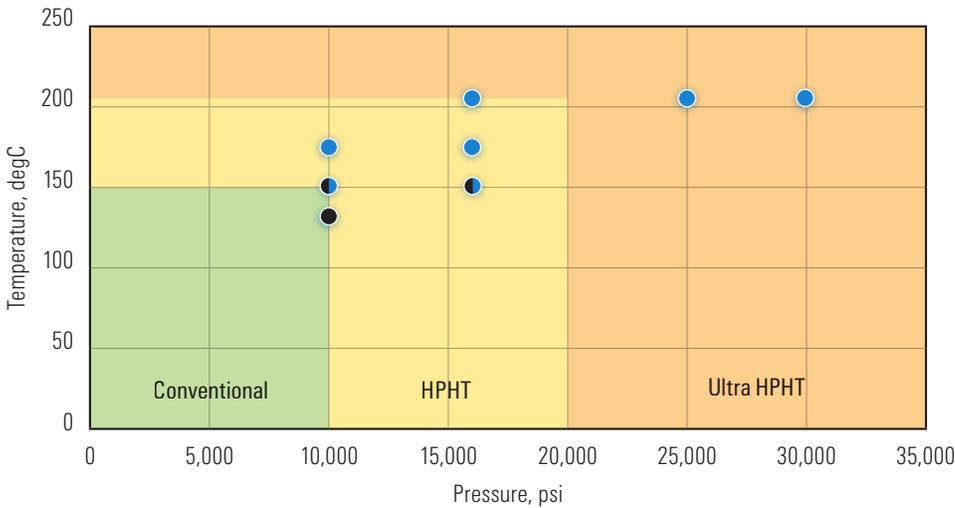
Part of an integrated system

Metris Evolve gauges belong to the family of Metris* permanent monitoring systems. When used together with WellWatcher Advisor* real-time intelligent completion software, the gauge becomes 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 Evolve gauges are available in different configurations (e.g., single- or dual-sensor gauges with or without feedthrough connector) to suit any completion design.

Metris Evolve



- Metris Evolve permanent PT gauge
- Metris Extreme* HPHT permanent PT gauge

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

Metris Evolve Permanent PT Gauge Specifications

Maximum pressure, psi [MPa]	10,000 [69]	10,000 [69]	16,000 [110]
Maximum temperature, degF [degC]	266 [130]	302 [150]	302 [150]
Cablehead connector	Sealtite connector	EDMC-S or EDMC-R	EDMC-S or EDMC-R
Feedthrough connector (for multidropped gauges)	Sealtite connector	EDMC-S or EDMC-R	EDMC-S or EDMC-R
Shock and vibration	AWES standard or beyond	AWES standard or beyond	AWES standard or beyond
H ₂ S resistance	NACE MR0175	NACE MR0175	NACE MR0175
Scanning rate	One dataset (pressure and temperature) per sensor per second	One dataset (pressure and temperature) per sensor per second	One dataset (pressure and temperature) per sensor per second
Tool power	Voltage: 9 V–70 V Current: 14 mA	Voltage: 9 V–70 V Current: 14 mA	Voltage: 9 V–70 V Current: 14 mA

Metrology

Standard pressure calibration range, [†] psi [MPa]	1,000 to 10,000 [6.9 to 69]	1,000 to 10,000 [6.9 to 69]	1,000 to 16,000 [6.9 to 110]
Standard temperature calibration range, [†] degF [degC]	77–302 [25–150]	77–302 [25–150]	77–302 [25–150]
Initial pressure accuracy, psi [kPa]	±1.5 [±10.3]	±1.5 [±10.3]	±2.0 [±13.8]
Typical pressure accuracy, psi [kPa]	<±1.0 [<±6.9]	<±1.0 [<±6.9]	<±1.5 [<±10.3]
Pressure resolution, 1-s gate time, psi [kPa]	0.035 [0.24]	0.035 [0.24]	0.055 [0.38]
Pressure drift over full range, psi/year [kPa/year]	±1.5 [±10.3]	±1.5 [±10.3]	±3.2 [±22.1]
Temperature accuracy, degF [degC]	±0.27 [±0.15]	±0.27 [±0.15]	±0.27 [±0.15]
Temperature resolution, 1-s gate time, degF [degC]	0.009 [0.005]	0.009 [0.005]	0.009 [0.005]
Temperature drift at 302 degF, degF/year [150 degC, degC/year]	±0.18 [±0.1]	±0.18 [±0.1]	±0.18 [±0.1]

Dimensions

Outer diameter, in [mm]	0.75 [19.1]	0.75 [19.1]	0.75 [19.1]
Single-sensor length, in [mm]	17 [431.8]	18.1 [459.7]	26.7 [678.2]
Single-sensor length with feedthrough, in [mm]	21 [533.4]	22.9 [581.7]	29 [736.6]
Dual-sensor length, in [mm]	19.3 [490.2]	22.0 [558.8]	28.97 [735.8]
Dual-sensor length with feedthrough, in [mm]	20.9 [530.9]	22.9 [581.7]	40.06 [1,017.5]

[†] Custom calibration ranges are available if required.

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