

# WellWatcher Quartz

Premium high-temperature, high-resolution PT gauge



**Rated up to 30,000 psi**  
[206,843 kPa]



**Rated to 177 degC [350 degF]**  
for 14 years operating life

**APPLICATIONS**

- Long-term production and reservoir monitoring
- Injection monitoring
- Single- or multiple-zone monitoring
- Intelligent completions

**BENEFITS**

- Continuous pressure and temperature measurements allow
  - real-time evaluation
  - immediate corrective actions
- Real-time data minimize the need for costly interventions

**FEATURES**

- Multidrop capability of up to eight gauges on a monoconductor cable at 1-s sampling
- Long-term measurement accuracy with excellent sensor and electronics stability
- High system reliability confirmed by rigorous testing
- Compact gauge design for optimal well integration
- Advanced cable connector technology
- Compatible with the WellWatcher Neon\* DTS, DAS, and PT gauge system
- Hermetically sealed gauge housing, fully welded, with inert gas filling
- Vendor-specific and Intelligent Well Interface Standardization (IWIS)—compliant subsea card available
- Flow rate and fluid density measurements in multidrop configurations

WellWatcher Quartz\* premium high-temperature, high-resolution PT gauges are part of the family of WellWatcher\* permanent monitoring systems. WellWatcher systems help operators optimize well productivity and improve hydrocarbon recovery throughout the producing life of a well or field by providing real-time evaluation through accurate downhole measurements.

WellWatcher Quartz gauges evolved from the proven N series quartz gauges and incorporate the most recent innovations in quartz transducers, advanced electronic components, and cable head connector sealing technology. Increased reliability and multidrop capabilities result from

- high-temperature multichip module ceramic electronics and quartz sensors
- proprietary advanced connector technology
- cable head with fully welded assemblies
- corrosion-resistant alloys.

**Connector options for enhanced sealing**

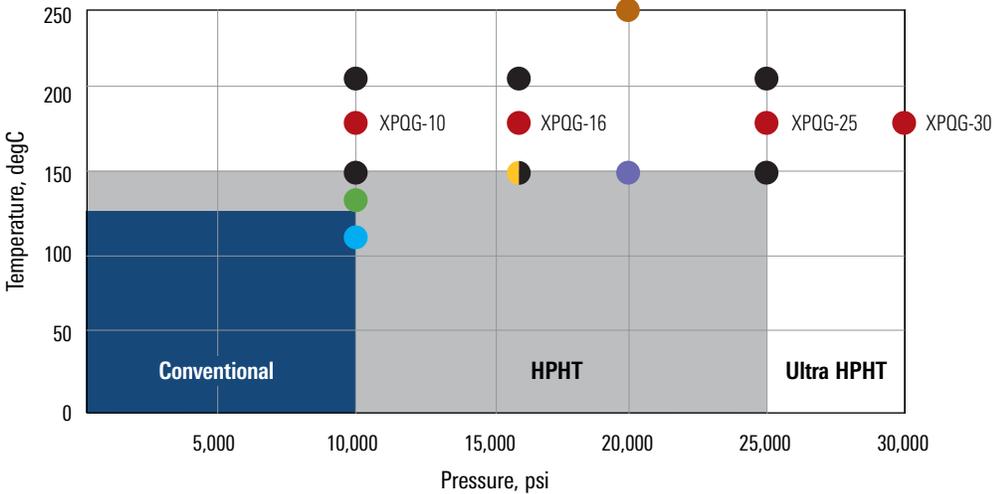
WellWatcher Quartz gauges feature the innovative and fully field-proven Intellitite\* downhole dual-seal dry-mate connector in the cable head. Welded and redundant options are available.

The welded cable head can be terminated even in hazardous areas classified Zone 1 and provides the highest system protection available against corrosive liquids, shock, vibration, and tensile load. The redundant option features three independent seals, including two fully redundant metal-to-metal seals, which can be independently pressure tested using a microleak detection system. Both cable head options—significantly more reliable than industry-standard connectors—have an unmatched track record.

**Stable measurements at reservoir conditions**

WellWatcher Quartz gauges are engineered to deliver highly accurate and stable pressure and temperature measurements, which are critical for long-term reservoir and production monitoring. Gauge performance is validated in controlled test cells where drift stability is measured at simulated reservoir pressures and temperatures.

**Pressure and Temperature Ratings for WellWatcher\* Permanent Monitoring Systems Downhole Gauges**



WellWatcher Quartz premium high-temperature, high-resolution PT gauges are available for pressures as high as 30,000 psi.

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## Rigorous qualification testing

The gauges undergo accelerated life cycle tests at various high temperatures, and the results are used for a calculated gauge life at the rated temperature. In addition, thermal shock cycle testing and power on-off cycles simulate the most demanding operating conditions. The complete gauge assemblies also undergo repeated shock and vibration testing at rigorous levels to qualify them for real-life operational conditions in production and injection wells.

## Track record of 45 years

Having installed permanent gauges since 1972, Schlumberger is the recognized industry leader in permanent downhole monitoring, with an established program for continuous performance improvement. All engineering, manufacturing, calibration, and qualification of WellWatcher systems is performed at an in-house facility in France, where Schlumberger has been developing downhole electronics since 1959.

### WellWatcher Quartz Gauge Specifications

	XPQG-10 Gauge	XPQG-16 Gauge	XPQG-25 Gauge	XPQG-30 Gauge
<b>Gauge performance</b>				
Sensor type	Quartz	Quartz	Quartz	Quartz
Working pressure range, <sup>†</sup> psi [kPa]	Atmospheric to 10,000 [68,947]	Atmospheric to 16,000 [110,320]	Atmospheric to 25,000 [172,375]	Atmospheric to 30,000 [206,843]
Working temperature range, <sup>†</sup> degC [degF]	25 to 177 [77 to 350]	25 to 177 [77 to 350]	25 to 177 [77 to 350]	25 to 177 [77 to 350]
Pressure accuracy	±0.012% full scale	±0.015% full scale	±0.015% full scale	±0.02% full scale
Pressure resolution at 1-s sample rate, psi [kPa]	<0.006 [<0.04]	<0.008 [<0.06]	<0.010 [<0.07]	<0.010 [<0.07]
Pressure drift at maximum pressure and temperature	±0.02% full scale per year	±0.02% full scale per year	±0.02% full scale per year	±0.025% full scale per year
Temperature accuracy (typical), degC [degF]	±0.15 [±0.27]	±0.15 [±0.27]	±0.15 [±0.27]	±0.15 [±0.27]
Temperature resolution at 1-s sample rate, degC [degF]	<0.005 [<0.009]	<0.005 [<0.009]	<0.005 [<0.009]	<0.005 [<0.009]
Temperature drift, degC [degF]	<±0.1 [±0.18] per year at 177 degC [350 degF]	<±0.1 [±0.18] per year at 177 degC [350 degF]	<±0.1 [±0.18] per year at 177 degC [350 degF]	<±0.1 [±0.18] per year at 177 degC [350 degF]
Max. overtemperature, degC [degF]	200 [392]	200 [392]	200 [392]	200 [392]
<b>Physical characteristics</b>				
Max. housing diameter, in [mm]	0.75 [19]	0.75 [19]	0.75 [19]	0.75 [19]
Intellitite connector	All gauge versions are integrated with electrical Intellitite dry-mate connectors; either welded (W) or redundant (R) options are available.			
Multigauge connection options	As part of the single system, all these gauges can be configured in different variants. For each variant, the gauge is fully welded at the manufacturing plant to a Y, T, W, or T3 connector block assembly.			
Gauge pressure port reading option	Various combinations of measurement are available for each gauge, including tubing, annulus, flowmeter application, and remote pressure measurement through a snorkel line using a hydraulic dry-mate connector (HDMC).			
Service	All gauge versions are suitable for sour service (NACE compliance).			
Storage and shipping temperature, degC [degF]	-40 to 75 [-40 to 167]	-40 to 75 [-40 to 167]	-40 to 75 [-40 to 167]	-40 to 75 [-40 to 167]
Cold storage temperature, degC [degF]	-55 [131]	-55 [131]	-55 [131]	-55 [131]
<b>Well integration</b>				
Max. number of gauges per cable at 1-s sampling rate	8	8	8	8
<b>Qualification test data</b>				
Survivability	Qualified for a 14-year life at 177 degC [350 degF]			
Vibration screening	4.046 g, 30 Hz to 1,400 Hz			
Shock test	12,000 at 250 g, 2 ms (transverse) and 20 at 100 g, 5 ms (axial)			

<sup>†</sup> Customized calibration ranges are available if required.

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