PERMANENT QUARTZ GAUGES

APPLICATION

The Permanent Quartz Gauges is a downhole pressure and temperature measurement sensors designed for permanent installation. To achieve very high measurement stability and long life, the sensor incorporates hermetically sealed quartz resonator crystals, TSS electronics and mechanical sealing technology.

Pressure and temperature are measured using very precise, stable quartz crystal resonators. The measurements are directly digitized downhole, avoiding analog cable signals, and then sent digitally up the cable to maintain high precision and noise immunity. This eliminates the drift, noise sensitivity and additional cost inherent in gauges that send analog signals to the surface to be filtered and digitized.
Each gauge automatically sends its serial number and quality status with every measurement, ensuring quality results.
The sensor is hermetically sealed (welded), eliminating the need for elastomeric O-ring primary seals. The cable head and pressure connections use only metal-to-metal seals. Every seal can be pressure tested during installation. Up to nine sensors may be connected to the same cable, electrically in parallel. If one tool sensor or circuit fails, the other continue to operate.
Alternatively, tubing and annulus pressures can be measured, as required. The sensor is tested under shock and vibration conditions.

TECHNICAL DATASHEET

PRESSURE MEASUREMENTS	VALUE	
Pressure Range1 (psia | bar)	0 to 10,000 0 to 690	0 to 10,000 0 to 690
Available Calibration Temperature Ranges (°C)	25-150	25-150
Accuracy (% FS) 25-150 °C	0.02	0.02
Typical Accuracy (% FS) 25-150 °C	0.012	0.015
Resolution (psi * sec)	less than 0.006	less than 0.008
Frequency Output Range (kHz)	10 to 70	10 to 80
Response Time	less than 1 sec	less than 1 sec
Acceleration Sensitivity (psi / g - any axis)	less than 0.02	less than 0.02
Drift at max pressure and temp. (% FS / year)	0.02	0.02

TEMPERATURE MEASUREMENTS	VALUE
Temperature Range (°C / °F)	25-150
Accuracy (°C)	0.5
Typical Accuracy (°C)	0.15
Achievable Resolution3 (°C / sec)	less than 0.005
Average Sensitivity (Hz / °C)	180
Frequency Output Range (kHz)	10 to 100
Drift at 177 °C (°C / year)	less than 0.1