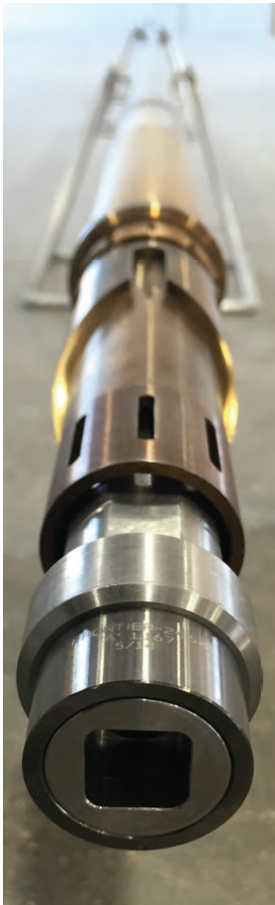




# TELEMETRY SYSTEMS



C&J Directional Services utilizes a fleet of highly advanced telemetry tools that provide guidance downhole in its directional operations. Each fully retrievable or collar-mounted positive pulse system module is designed to perform reliably even in high temperatures. These tools are manufactured by HPC and Tolteq, both industry leaders in downhole tool technology.

Engineered to reduce risk and minimize rig downtime, these tools are built on proven technology and optimized to meet the requirements of today’s extreme, fast-paced drilling environments. Supported by our regional in-house service centers, C&J is able to maintain the high level of service commitment to our customers that we are known for.

### MECHANICAL

Parameter	Minimum	Maximum
Outside diameter	—	1.875 in. 0.047 m
Operating temperature	32°C 0°F	175°C 347°F
Survival temperature	-40°C -40°F	185°C 365°F
Vibration, random	20 g RMS 10-200 Hz	
Shock	1000 g 0.5 mSec half-sine	

### INSTRUMENT ACCURACY SPECIFICATIONS

Parameter	Accuracy
Inclination: Absolute Spread	±0.1° ±0.1°
Azimuth (Magnetic dip angle at <70): at 5° inclination: Absolute at 5° inclination: Spread	±-1.2° ±-1.0°
at 10° inclination: Absolute at 10° inclination: Spread	±-1.0° ±-0.75°
at 90° inclination: Absolute at 90° inclination: Spread	±-0.5° ±-0.5°
Tool face accuracy, axial rotation, 10° through 90° inclination	± 1.0°
Total g field accuracy, absolute	± 5.0 mG
Total H field accuracy, absolute	3.0 mG
RPM measurement, 10-255 RPM	± 0.5% of value