PRODUCT SPEC SHEET

QUEST™ GWD

powered by SPEAR™

Solid-State Gyro While Drilling System with Retrievable Mud Pulser

MECHANICAL SPECS

Probe Length	20.98 - 26.51 ft	6.39 - 8.08 m
Probe OD (Standard probe)	1.875 in	47.6 mm

COLLAR SIZES VS. FLOW RATES

Collar Sizes	Flow Rate	Dogleg Severity
(inches)	(gallons/minute)	sliding/rotating
4 ¾	100 - 400	30° / 15°
6 ½	200 - 700	20° / 10°
6 ¾	200 - 700	21° / 10°
8 ¼	400 - 800	14° / 8°

ENVIRONMENTAL SPECS

Maximum Pressure	20,000 psi	138,000 kPa
Temperature Maximum Operating	302° F	150° C
Lost Circulation Material	Fine..... 15 lbs/bbl Medium..... 10 lbs/bbl Coarse..... 8 lbs/bbl	
Maximum Vibration Maximum Shock	20 g_{RMS} (5-1,000 Hz) 250g ½ sine ½ msec	
Operating Time	Up to 300 hrs utilizing 2 lithium batteries	

SENSOR SPECS

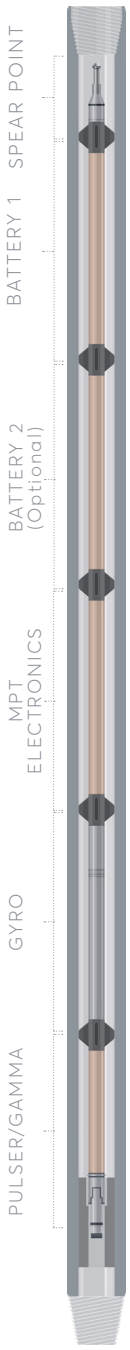
Sensor Type	3-axis coriolis vibratory rate gyro 3-axis accelerometer 3-axis magnetometer (optional)
Telemetry	Mud Pulse
Frequency Range	0.33 - 1.30 Hz Field Programmable
Data Rates	0.5 - 1.1 bps (downlink adjustable)

INSTRUMENT ACCURACY*

Measurement	Range	Accuracy
Gyro Inclination	0 - 180°	±0.05°
Gyro Azimuth	0 - 360°	±0.1°
Gyro Tool Face	0 - 360°	±1.0°
Gravity Tool Face	-180 - 180°	±1.0°
Magnetic Inclination#	0 - 180°	±0.1°
Magnetic Azimuth#	0 - 360°	±1.0°
Magnetic Tool Face#	0 - 360°	±1.0°
Gamma (cps)#	0 - 255.5°	5%

*ISCWSA / SPE WTS compliant error ellipse reports are available upon request for specific well profiles.

#Optional



Gyrodata's gyro while drilling service, Quest™ GWD provides all-attitude, high-accuracy, high-performance coriolis vibratory rate-gyroscopic surveys in real-time as drilling progresses. A three-axis digital magnetometer and gamma ray are optional add ons. This gyro while drilling tool includes Gyrodata's retrievable pulser technology, and provides steering and survey data in vertical to horizontal applications.

DESIGN + PERFORMANCE

- High-performance coriolis vibratory gyro assures precise wellbore guidance for collision avoidance and trajectory placement
- Provides continuous inclination and tool face from vertical while sliding, and full surveys on demand
- Surveys are not affected by magnetic interference
- Surveys during the connections - no additional wait time
- Eliminates the need to use wireline gyros to orient or steer the drilling assembly, which saves considerable rig time and provides for safer operations
- Memory gyro multishot capability as the bottomhole assembly (BHA) is tripped out of hole
- Option for both live inclination and magnetic azimuth
- Robust, no mass unbalance or calibration shift
- Retrievable in the event of stuck pipe
- Fully transparent gyro quality control; gravity, full earth rate and latitude. Third parties can QC the data
- No East/West cautionary zones

MARKET + APPLICATIONS

- Vertical, Directional & Horizontal Drilling
- Multi-Well Pad Drilling
- Offshore & Riserless Drilling
- Onshore Drilling
- Batch Well Drilling
- High Latitude Drilling
- Gross Error Detection
- Definitive Wellbore Placement
- Ellipse of Uncertainty Reduction
- Areas of Magnetic Interference
- Collision Avoidance
- Side-Tracking
- Relief/Intervention Well
- IFR & MWD Validation

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