

Positive Pulse MWD System

The Positive Pulse MWD system is both reseatable and retrievable, minimizing rig downtime and the risk of LIH financial concerns. Compatible with a variety of collar diameters from 3½ to 9½ in.

Advantages of Positive Pulse MWD System

Features	Benefits
Retrievable and reseatable	MWD probe can be fished and this enables efficient probe upgrade and battery replacement if required
High temperature capability	System of choice for hot hole applications
Cost-efficient	Can be routinely serviced in less than one day enabling quick turnaround. Has extended battery life
Reliable	Manufactured and maintained to a uniform high standard
Modular	Modular design enables alternative sensor positions. Modules are inter-changeable between collar sizes for flexibility of use
Optimized telemetry	A downlink is used to select the optimum transmission sequence for each application
Configurable	Retrievable or non-retrievable configurations for the most appropriate choice for drilling conditions
User-friendly software	Surface system operations using Windows based qMWD software on a lap top computer. Easy decoding and simple tool programming interface.



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Positive Pulse MWD System Specifications

Technical Specifications					
Probe OD	1.875 in.				
Collar OD	3.5 in.	4.75 in.	6.75 in.	8.25 in.	9.5 in.
Tool Connections	2 3/8 in. IF	3 1/2 in. IF	4 1/2 in. API IF	6 5/8 in. API Reg	7 5/8 in. API Reg
Equivalent Collar Stiffness (OD & ID)	2.96 in. x 2.25 in.	4.75 in. x 2.81 in.	6.71 in. x 3.25 in.	7.93 in. x 4.00 in.	9.42 in. x 4.00 in.
Make-up Torque	3,500 lb-ft.	9,600 lb-ft.	30,000 lb-ft.	54,000 lb-ft.	62,000 lb-ft.
Flow Rate Range	75-165 usgpm	100-300 usgpm	150-800 usgpm	400-1200 usgpm	400-1200 usgpm
Max. Dogleg Rotating	50°/100 ft	15°/100 ft.	10°/100 ft.	8°/100 ft.	7°/100 ft.
Max. Dogleg Sliding	100°/100 ft.	30°/100 ft.	21°/100 ft.	14°/100 ft.	7°/100 ft.
Max. Temperature Operating	347°				
Max. Temperature Survival	347°				
Max. Pressure	20,000 psi				
Max. Sand Content	0.5°				
Max LCM Tolerance	40-50 lb/bbl evenly mixed, any size				

Sensor Specifications	
Memory Update Resolution	7.2 samples/ft at 50 ft/hr
Real Time Update Resolution	3.6 samples/ft at 50 ft/hr
Gamma Ray Resolution	1 API
Gamma Ray Sensitivity	2.5 counts/API with housing
Memory	4 MB (memory is in MWD Directional Module)
Max data sampling rate	Memory every 10 seconds, telemetry ever 20 seconds rotating, every 30 seconds sliding
Memory capacity	Up to 273 hrs (at 10 second sampling)

Surface System Specifications	
Surface System	SAI - Safe area Interface
Rig Floor Display	Certified Zone 1, Intrinsically safe
Pressure Transducer	4 - 20 mA, 0-5000 Psi, certified Zone 1, intrinsically safe
Hook Load Sensor	4-20 mA, 0-100 klb, Zone 1, intrinsically safe
Depth Encoder	Incremental, Two Channel in quadrature, Zone 1, intrinsically safe
Plotter	Printrex Thermal Plotter

Directional Sensor Package	Tri-axial fluxgate magnetometers and Q-Flex accelerometer package		
	Range	Resolution	Accuracy
Directional Measurement			
Inclination	0 -180°	0.1°	+/- 0.1°
Azimuth	0 - 360°	1.0°	+/- 0.25°
Toolface-Magnetic	0 - 360°	1.0°	+/- 0.5°
Toolface-Gravity	0 - 360°	1.0°	+/- 0.5°
TMF	0 - 100 µT	0.01 µT	+/- 0.075 µT
Dip	-90 - 90°	0.1°	+/- 0.15°
GT	0 - 1.000 g	0.0001 g	+/- 0.001 g
Temperature Measurement	-32 - 392°F	0.1°F	+/- 2°F
Temperature Sensor	Internal		



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