SlimPulse

Schlumberger

Retrievable MWD service

The SlimPulse* retrievable MWD service provides cost-effective solutions in high-efficiency drilling environments. It was designed for reliability and efficiency in real-time directional performance. SlimPulse components use the same reliable and proven technology developed for the existing PowerPulse* MWD telemetry system and ImPulse* integrated MWD platform.

Using servo technology for mud pulse telemetry, the SlimPulse service provides direction, inclination, toolface, and gamma ray measurements in real time. Servo technology benefits include a fast data rate, strong signal, and superior antijamming capabilities for reliable data transmission in difficult drilling conditions. Continuous direction and inclination measurements are made while drilling to facilitate trajec-tory control and reduce stationary survey measurements. Telemetry data automatically switches between a “sliding frame” and a “rotating frame” to optimize update rates for improved trajectory control.

The tool is operable in a wide variety environments and fits in collar sizes from 2½ to 9½ in. Flow rate operating range varies from 35 to 1,200 galUS/min. The entire tool is fully retrievable and replaceable, which saves rig time by eliminating pipe trips for directional equipment.

SlimPulse service can be upgraded to operate in temperatures as great as 350 degF [177 degC]; the designers capitalized on experience gained on previous-generation tools operating 15,000 h in temperatures above 300 degF [149 degC].

The system can be combined with the ARC475 4¾-in drill collar resistivity tool, the AIM at-bit inclination measurement service, the APWD annular pressure while drilling service, and PowerDrive* rotary steerable systems. Combining SlimPulse and AIM services provides precision trajectory control in holes as small as 5⅞ in and inclination data within 1 ft of the bit while maintaining retrievability. This information is transmitted via electromagnetic telemetry to an integrated receiver sub positioned above the downhole motor. The integrated receiver sub contains an optional pressure sensor to monitor equivalent circulating densities to enhance the drilling process.

Applications

- Continuous surveys while rotating

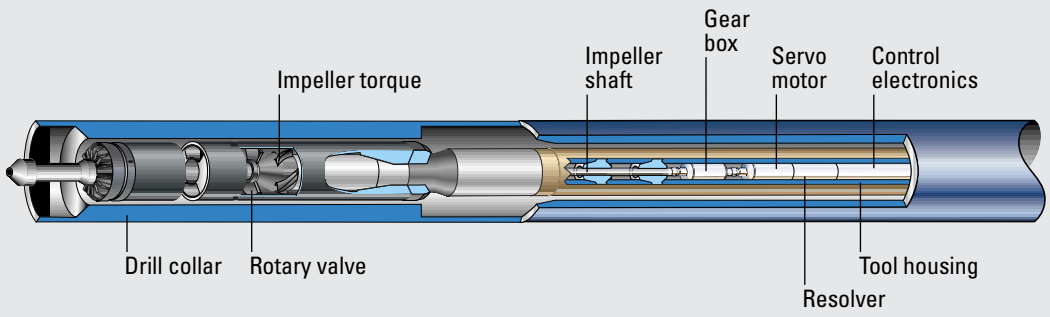
Benefits

- Retrievable and replaceable for reduced lost-in-hole expo-sure and improved operating efficiency
- Automatic rotation detection to maximize update rates

Features

- High-temperature option—350 degF [177 degC]
- Simple operation under a wide range of flow rates from 35 to 1,200 galUS/min
- Operation in lost circulation material concentrations of 50 lbm/bbl (medium nut plug)
- Servo technology for faster data rates, stronger signal, and superior antijamming capabilities for reliable data transmission in difficult drilling conditions

SlimPulse service.



SlimPulse Measurement Performance Specifications		
	Stationary	**Continuous**
Direction and inclination survey		
Inclination		
Range	0 to 180°	(above 20°)
Accuracy	±0.1° at 1 sigma	±0.2° at 1 sigma
Resolution	0.03°	0.10°
Azimuth		
Range	0 to 360°	30 to 330°
Accuracy	(above 5°) ±1° at 1 sigma	±2° at 1 sigma
Resolution	0.03°	0.5°
Toolface		
Update period	14 to 50 s (mode dependent)	
Range	0 to 360°	
Accuracy	±3° at 1 sigma	
Resolution	6°	
Magnetic to gravity toolface switching	3.5° or 8°	
Formation evaluation		
Gamma ray		
Range	0 to 250 API	
Accuracy	±6%	
Statistical resolution	0.5 cps	
Distance from bottom of tool	18.0 ft or 8.5 ft	
MWD temperature		
Range	Up to 350 degF [177 degC]	
Accuracy	±1.5 degF [0.8 degC]	
Resolution	3 degF [1.7 degC]	
General specifications		
Temperature rating	350 degF [177 degC]	
Pressure rating	20,000 psi	
Flow range	35 to 1,200 galUS/min	
Collar size	2½ to 9½ in	
Curvature	50°/100 ft (145°/100 ft in the short-radius version)	
LCM	50 lbf/bbl (medium nut plug)	
Mud type	No restrictions	
Sand content	2.5%	
Length	26.5 ft	
Weight	150 lbm	
Tool OD	1¾ in	
Telemetry type	Continuous mud siren	
Miscellaneous measurements		
Threshold shock measurement		
Downlink options		
Real-time diagnostics		

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