

PowerDrive Archer

High build rate rotary steerable system

APPLICATIONS

- High-curvature 3D wells
- Sidetrack and dogleg severity (DLS) assurance

BENEFITS

- High build rates from any inclination
- Well trajectory previously only possible with positive displacement motors
- Improved wellbore placement in reservoir's sweet spot
- Smooth wellbore to ease completion

FEATURES

- Unique hybrid steering unit for maximum DLS
- Near-bit continuous inclination and azimuth measurement
- Near-bit azimuthal gamma ray measurement

PowerDrive Archer* high build rate RSS is part of the PowerDrive* RSS family of fully rotating steerable systems that minimize the risk of sticking. The entire family has a complete direction and inclination sensor package close to the bit for precise well placement and independently generates power for 3D steering and control.

In any drilling environment, the PowerDrive RSS family delivers the power required to place wells accurately with superior borehole quality while ensuring maximum drilling efficiency.

Unique hybrid design for greater precision and ROP

The PowerDrive Archer RSS delivers complex 3D well profiles while maintaining high ROP and wellbore quality. It minimizes well profile restriction and optimizes attack angle in troublesome formations. The system enables operators to maximize reservoir exposure, increasing hydrocarbon production potential. Increased DLS capability gives control in challenging formations.

Flat time elimination for drilling on plan

Additional advantages of the PowerDrive Archer RSS include the ability to drill complex curves and trajectories and perform openhole sidetracks at any point without requiring a trip out of the hole. It can kick off deeper and land early in the reservoir, maximizing ROP for optimal performance in the vertical section and reducing risk of mechanical sticking while improving wellbore quality. Fast, reliable directional openhole sidetracks can be completed to reduce time spent drilling multilateral wells and enable wells to be placed exactly where required.

Wellbore quality assurance for ease of completion

The PowerDrive Archer RSS produces smooth, high-quality wellbores, reducing torque and drag as well as making it easier to run casing and wireline logs for trouble-free well completions. Its moving components are internal; its internal pads push against an articulated sleeve pivoted on a universal joint to offset the steering unit from the tools' axis. This creates a hybrid effect that drives the bit, delivering well profiles previously only possible with motors.



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Specifications		PowerDrive Archer 475 RSS	PowerDrive Archer 675 RSS
Mechanical	Nominal OD, in [mm]	4¾ [120.7]	6¾ [171.5]
	Overall length, ft [m]	14.98 [4.56]	16.15 [4.92]
	Dogleg severity (DLS) capability, °/100 ft [°/30 m] [†]	18 [18]	15 [15]
	Hole sizes, in [mm]	5⅞–6¾ [149.2–171.5]	8⅞–9⅞ [212.7–244.5]
	Bit speed, rpm	0–350	0–350
	Maximum weight on bit, lbf [N] [‡]	35,000 [155,688]	55,000 [244,652]
	Maximum torque on bit, ft.lbf [N.m] [§]	9,000 [12,202]	16,000 [21,693]
	Maximum overpull, lbf [N]	272,000 ^{††} [1,209,916]	400,000 ^{††} [1,779,289]
	Passthrough (DLS sliding), °	30	16
Bit connection (box)	3½ Reg	4½ Reg	
Hydraulics ^{§§}	Flow range, galUS/min [L/min] ^{††}	130–355 [492–1,343]	220–650 [832–2,464]
	Maximum mud density, lbm/galUS [kg/L]	18 [2.16]	18 [2.16]
	Maximum sand content, %	1	1
	Lost circulation material (LCM), lbm/bbl [kg/L] ^{†††}	35 [0.13]	50 [0.19]
	Acidity level, pH	9.5–12	9.5–12
	Oxygen, ppm	1	1
Pressure and temperature	Maximum temperature, degF [degC]	302 [150]	302 [150]
	Maximum pressure, psi [MPa]	20,000 [137.9]	20,000 [137.9]
Measurements	Inclination offset to tool bottom, ft [m]	8.41 [2.56]	9.81 [2.99]
	Azimuth offset to tool bottom, ft [m]	10.51 [3.20]	12.01 [3.66]
	Azimuthal gamma ray	Eight bin	Eight bin
	Average gamma ray	API calibrated	API calibrated
	Gamma ray offset to tool bottom, ft [m]	7.51 [2.29]	9.01 [2.75]
	Vibration range (axial), g _n	0–35	0–35
	Vibration range (radial), g _n	0–75	0–75
	Shock range, g _n	625	625
	Shock and vibration axis	Triaxial	Triaxial
Magnetic field cone of exclusion	None	None	
Specifics	Automated loop	Inclination and azimuth	Inclination and azimuth
	Downlinking method	Flow and rpm	Flow and rpm

- [†] Value dependent on application—bit, BHA, parameters, formation type, etc.
[‡] Maximum at 0-ft.lbf torque on bit; bit recommendations should be considered.
[§] Maximum at 0-lbf weight on bit.
^{††} Universal joint will require rebuild beyond 50,000 lbf overpull at the joint.
^{†††} Dependent on mud density.
^{§§} Special configuration available for silicate muds.

Refer to the Schlumberger Shock and Vibration references for details regarding axial, lateral, and torsional limits of tools.

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