

## arcVISION312

Slimhole **formation evaluation**  
while drilling



## arcVISION312

### ACCURATE MEASUREMENTS FOR PRODUCTIVE DRILLING

- Slimhole drilling operations in 4¼- to 5⅞-in wellbores: standard reentry, through-tubing reentry, coiled tubing, short-radius wells, unplanned contingency operations
- Real-time quantitative formation evaluation and geosteering

### LESS TIME TO TD

- Unmatched reliability of real-time data transmission from SlimPulse\* slim MWD tool
- Dogleg capability up to 100°/100 ft with precise trajectory control
- Smooth wellbore that minimizes well construction risk and maximizes well performance
- Maximum power transfer with high flow rates, increasing rate of penetration
- Multiple depths of investigation to detect invasion, even in high-resistivity formations
- Same measurements as larger tools, facilitating well-to-well correlation
- Downhole pressure control, better hole cleaning, and kick and losses detection to improve drilling efficiency

**Multiple real-time measurements**  
enable drillers to geosteer wellbores to the best place



# Borehole-compensated arcVISION312 measurements take the guesswork out of interpretation, leading to **better decisions** and **improved well performance**.

The arcVISION312\* 3/8-in drill collar resistivity tool provides while-drilling resistivity, gamma ray, inclination, and annular pressure measurements to help produce and evaluate reservoirs. It is the smallest of five arcVISION\* compensated resistivity tools and extends the formation-evaluation-while-drilling and geosteering capabilities of the larger tools to slim holes with diameters from 4 1/4 to 5 7/8 in.

## REDUCED SLIMHOLE DRILLING RISK

The arcVISION312 tool can withstand harsh drilling conditions, including high sand content in the drilling fluid. A flow rate of up to 160 galUS/min at 1% sand content allows maximum power transfer to the PowerPak\* steerable motor.

High-torque connections substantially reduce the backoff risk inherent in slimhole drilling, and speed of rotation is not limited. The tool's maximum weight on bit of 22,000 lbf allows the weight transfer needed for fast drilling, and its maximum dogleg severity of 100°/100 ft makes it ideal for short-radius applications.

## PRECISE WELL TRAJECTORY CONTROL

Trajectory control is critical in slimhole drilling because the dogleg required can reach 1°/ft and the targets are often small. The arcVISION312 tool's measurements of annular pressure and of resistivity at multiple depths of investigation are transmitted to the surface simultaneously in real time, along with near-bit inclination measurements. These measurements enable directional drillers to reach the target and keep the wellbore in the pay zone.

They also help in keeping the wellbore smooth and avoiding undulations. That reduces well construction risk by providing better clearance for tubing and perforation equipment—and increases production.

## MULTIPLE DEPTHS OF INVESTIGATION

The arcVISION312 tool makes the same well-known and fully characterized measurements as other arcVISION\* tools. Five 2-MHz borehole-compensated phase-shift measurements provide quantitative resistivity values that enable the tool to detect invasion

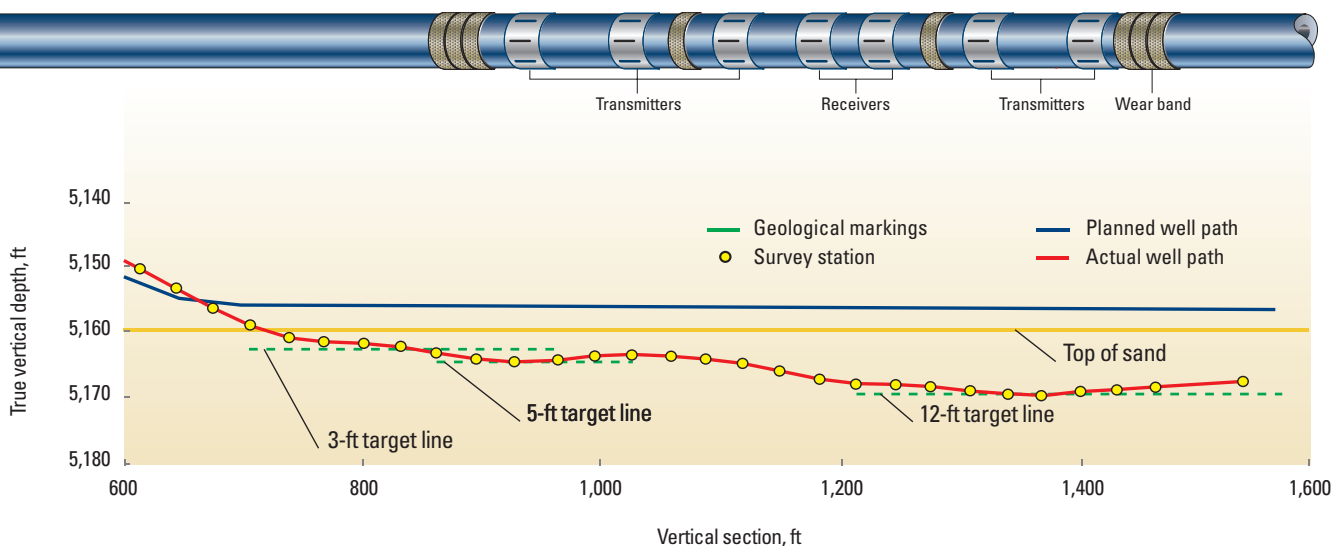
profiles and any other adverse borehole or formation effects, even in formations with high resistivities.

## EASY CORRELATION FOR GEOSTEERING

Offset-well or landing-phase data are crucial for optimizing drainhole position because they are the reference for geosteering. The arcVISION312 tool facilitates correlations and steering decisions in laterals by making the same measurements as larger tools. In addition, it offers attenuation and 400-kHz measurements for deeper readings.

## COMPENSATED MEASUREMENTS

The arcVISION312 measurements are compensated to remove the rugosity effects and electronics drift that can cause misinterpretation and lead to erroneous decisions. More accurate measurements lead to better decisions and improved well performance.



## Real-time quantitative formation evaluation

### arcVISION312 Specifications

#### General and Environmental

Maximum operating temperature	300 degF [150 degC]
Maximum operating pressure	20,000 psi [137.9 MPa]
Maximum flow rate at 1% sand content	160 galUS/min [0.6056 m <sup>3</sup> /min]
Length	25.18 ft [7.67 m] (with SlimPulse tool real-time link)
Weight in air	475 lbm [215.46 kg]
Real-time crossover top connection	VO55 2.812-6 pin
Top/bottom collar top connection	2 3/8 Slimline H-90 box
Top collar nominal OD	3.125 in

#### Mechanical Operation

Maximum rotary torque	2,400 ft.lbf [3,253.92 N.m]
Maximum weight on bit	22,000 lbf [97.9 N]
Maximum load	45,000 lbf [200.25 N] tensile, 80,000 lbf [356.0 N] jarring
Maximum dogleg severity <sup>†</sup>	100°/100 ft [100°/30 m] sliding, 30°/100 ft [30°/30 m] rotating
Maximum surface rotation	200 rpm
Maximum downhole rotation (stick/slip amplitude)	30 min at ±100% amplitude of average surface rotation
Maximum shock	30 min at shock level 3 (50 $g_n$ ), 200,000 cumulative shocks above 50 $g_n$
Average moment of inertia	2.25 in <sup>4</sup>

Measurement Performance	Range	Accuracy	Resolution
Gamma ray	0–250 gAPI	±7%	6 in with ±2.5-gAPI statistical repeatability
Annular pressure	0–25,000 psi	±1 psi	1 psi
Continuous inclination	0–180°	0.07° at 90° inclination 0.1° at 45° inclination	0.040° at 90° inclination 0.057° at 45° inclination
Shock sensor	>50 $g_n$ threshold with 4 severity levels and 1-s min. update		

Resistivity Range and Accuracy	Range	Accuracy	Range	Accuracy
2-MHz phase shift	0.2–60 ohm.m	±2%	60–3,000 ohm.m	±0.3 mS/m
400-kHz phase shift	0.1–10 ohm.m	±2%	10–100 ohm.m	±2 mS/m
2-MHz attenuation	0.2–25 ohm.m	±3%	25–50 ohm.m	±1.5 mS/m
400-kHz attenuation	0.1–3 ohm.m	±3%	3–10 ohm.m	±10 mS/m

#### Resistivity Depth of Investigation<sup>‡</sup> and Vertical Resolution

Measurement	Spacing (in)					Vertical resolution
	10	16	22	28	34	
<i>R</i> = 1.0 ohm.m (depth of investigation in radii and in)						
2-MHz phase shift	12	13	14	15	17	0.7 ft [0.21 m] for all 5 spacings
400-kHz phase shift	15	17	19	22	25	1.0 ft [0.30 m] for all 5 spacings
2-MHz attenuation	16	19	22	24	26	1.8 ft [0.55 m] for all 5 spacings
400-kHz attenuation	24	27	30	33	36	4.0 ft [1.22 m] for all 5 spacings
<i>R</i> = 10.0 ohm.m (depth of investigation in radii and in)						
2-MHz phase shift	14	18	22	25	28	1.0 ft [0.30 m] for all 5 spacings
2-MHz attenuation	27	31	34	36	38	4.0 ft [1.22 m] for all 5 spacings

<sup>†</sup> Maximum collar dogleg refers to maximum collar curvature, not hole curvature.

<sup>‡</sup> Resistivity depth of investigation is the radius at which integrated geometrical factor reaches 0.5 in the specified formation resistivity.

### SLIMHOLE GEOSTEERING FOR PRODUCTIVE DRILLING

- Combinable with the SlimPulse tool for real-time data transmission
- High-torque connections and no rotation-speed limitations to improve safety
- 2-MHz and 400-kHz attenuation and phase-shift borehole-compensated measurements with up to 20 depths of investigation
- Continuous near-bit inclination measurement for precise well placement
- Simultaneous annular pressure and formation evaluation measurements in real time
- Up to 15 days of data recording with 48-MB memory

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