arcVISION312

Slimhole **formation evaluation** while drilling
arcVISION 312

ACCURATE MEASUREMENTS FOR PRODUCTIVE DRILLING

- Slimhole drilling operations in 4¼- to 5¼-in wellbores: standard reentry, through-tubing reentry, coiled tubing, short-radius wells, unplanned contingency operations

- 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

LESS TIME TO TD

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


ACCURATE MEASUREMENTS
FOR PRODUCTIVE DRILLING

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

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* 3¾-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 4¾ to 5⅞ in.

**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.
# 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 [6.0656 m³/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 ⅜ 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**:
  - Sliding: 100°/100 ft [100°/30 m]
  - Rotating: 30°/100 ft [30°/30 m]
- **Maximum surface rotation**: 200 rpm
- **Maximum downhole rotation**: 30 min at ±100% amplitude of average surface rotation
- **Maximum shock**: 30 min at shock level 3 (50 gₙ) threshold with 4 severity levels and 1-s min. update
- **Average moment of inertia**: 2.25 in⁴

## Measurement Performance

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma ray</td>
<td>0–250 gAPI</td>
<td>±7%</td>
<td>6 in with ±2.5 gAPI statistical repeatability</td>
</tr>
<tr>
<td>Annular pressure</td>
<td>0–25,000 psi</td>
<td>±1 psi</td>
<td>1 psi</td>
</tr>
<tr>
<td>Continuous inclination</td>
<td>0–180°</td>
<td>0.07° at 90° inclination</td>
<td>0.040° at 90° inclination</td>
</tr>
<tr>
<td>Shock sensor</td>
<td>&gt;50 gₙ</td>
<td>threshold with 4 severity levels and 1-s min. update</td>
<td></td>
</tr>
</tbody>
</table>

## Resistivity Range and Accuracy

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Range</th>
<th>Accuracy</th>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-MHz phase shift</td>
<td>0.2–60 ohm.m</td>
<td>±2%</td>
<td>60–3,000 ohm.m</td>
<td>±0.3 mS/m</td>
</tr>
<tr>
<td>400-kHz phase shift</td>
<td>0.1–10 ohm.m</td>
<td>±2%</td>
<td>10–100 ohm.m</td>
<td>±2 mS/m</td>
</tr>
<tr>
<td>2-MHz attenuation</td>
<td>0.2–25 ohm.m</td>
<td>±3%</td>
<td>25–50 ohm.m</td>
<td>±1.5 mS/m</td>
</tr>
<tr>
<td>400-kHz attenuation</td>
<td>0.1–3 ohm.m</td>
<td>±3%</td>
<td>3–10 ohm.m</td>
<td>±10 mS/m</td>
</tr>
</tbody>
</table>

## Resistivity Depth of Investigation² and Vertical Resolution

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Spacing (in)</th>
<th>Vertical resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>R = 1.0 ohm.m (depth of investigation in radii and in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-MHz phase shift</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>400-kHz phase shift</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>2-MHz attenuation</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>400-kHz attenuation</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>R = 10.0 ohm.m (depth of investigation in radii and in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-MHz phase shift</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>2-MHz attenuation</td>
<td>27</td>
<td>31</td>
</tr>
</tbody>
</table>

1. Maximum collar dogleg refers to maximum collar curvature, not hole curvature.
2. Resistivity depth of investigation is the radius at which integrated geometrical factor reaches 0.5 in the specified formation resistivity.

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