PowerDrive Orbit

Rotary steerable system

**APPLICATIONS**
- High-performance drilling
- Complex fluid systems
- Extended-reach drilling

**BENEFITS**
- Improved drilling efficiency
- Enhanced trajectory control
- Precise kickoff from vertical
- Increased operating parameter window

**FEATURES**
- Performance-focused design
- Up to 350 revolutions per minute
- Metal-to-metal sealing on pad
- QuikDownlink* continuous-circulation downlink service
- Eight-sector near-bit azimuthal gamma ray
- Six-axis continuous survey
- Inclination and azimuth closed loops to provide advanced automated tangent controls
- Optional hybrid configuration

PowerDrive Orbit* 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.

**Toughness and versatility to take on any environment**
The PowerDrive Orbit RSS is highly versatile, tough, and reliable in any global operational environment. It cuts drilling time and increases efficiency with its ability to steer at high surface rpm. An innovative pad design features metal-to-metal sealing to handle aggressive drilling fluids and severe downhole conditions. With dual downlink options, including the QuikDownlink* continuous-circulation downlink service, it fulfills all commands from surface in any rig type, enables real-time decision making, and provides excellent trajectory control.

The PowerDrive Orbit RSS has enhanced durability for severe downhole conditions. It can drill from shoe to TD in a single run, reducing operating days. It provides extra reliability in complex operations where stick/slip, severe shock and torque, and complex hydraulic systems are significant risks.

**Performance drilling with enhanced trajectory control**
Supporting up to 350 rpm, the PowerDrive Orbit RSS delivers higher ROP and helps to minimize stick/slip. It provides six-axis continuous survey measurements that, together with automated downhole closed loops that include hold inclination and azimuth mode, optimize outcomes for well placement, trajectory control, and smoother boreholes. PowerDrive Orbit RSS minimizes dogleg severity in laterals, enables automated control, and drives consistency in drilling operations with minimal surface intervention. Early identification of zones of interest are provided by its extended gamma ray measurement.
# PowerDrive Orbit

## Specifications

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<td>475 RSS</td>
<td>675 RSS</td>
<td>825 RSS</td>
<td>900 RSS</td>
<td>1100 RSS</td>
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### Mechanical

- **Nominal OD, in [mm]**
  - 43/4 [120.7]
  - 63/4 [171.5]
  - 81/4 [209.6]
  - 9 [228.6]
  - 11 [279.4]

- **Overall length, ft [m]**
  - 13.50 [4.11]
  - 13.53 [4.12]
  - 13.84 [4.21]
  - 14.05 [4.28]
  - 15.22 [4.63]

- **Dogleg severity (DLS) capability, °/100 ft [°/30 m]**
  - 10 [10]
  - 8 [8]

- **Hole sizes, in [mm]**
  - 53/4–63/4 [146.1–171.5]
  - 81/2–83/4 [215.9–222.3]
  - 105/8 [269.86]
  - 121/4–181/8 [311.2–460.4]
  - 26 [660.4]

- **Bit speed, rpm**
  - 0–350

- **Maximum weight on bit, lbf [N]**
  - 31,000 [137,894]

- **Maximum torque on bit, ft.lbf [N.m]**
  - 9,000 [12,202]

- **Maximum overpull, lbf [N]**
  - 340,000 [1,512,395]

- **Passthrough (DLS sliding), °**
  - 30

### Hydraulics

- **Flow range, galUS/min [L/min]**
  - 120–355 [454–1,343]

- **Maximum mud density, lbm/galUS [kg/L]**
  - 24 [2.88]

- **Lost circulation material (LCM), lbm/bbl [kg/L]**
  - 35 [0.13]

- **Acidity level, pH**
  - 9.5–12

- **Oxygen, ppm**
  - 1

### Pressure and temperature

- **Maximum temperature, degF [degC]**
  - 302 [150]

- **Maximum pressure, psi [MPa]**
  - 20,000 [137.9]

### Measurements

- **Inclination offset to tool bottom, ft [m]**
  - 6.93 [2.11]

- **Azimuth offset to tool bottom, ft [m]**
  - 9.03 [2.75]

- **Average gamma ray**
  - API calibrated

### Specifics

- **Automated loop**

### Downlinking method

- **Flow and rpm**

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1. Value dependent on application—bit, BHA, parameters, formation type, etc.
2. Maximum at 0-ft.lbf torque on bit; bit recommendations should be considered.
3. Maximum at 0-lbf weight on bit.
4. **Dependent on mud density.**
5. **Maximum flow of 320 galUS/min for 53/4 and 57/8 BU.**
6. **Dependent on mud density.**
7. **High pressure configuration available up to 35,000 psi.**

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