OMNISTEER

D-TECH ROTARY STEERABLE
AN SBO COMPANY

FREQUENTLY ASKED QUESTIONS

Is the OmniSteer RST compatible with any MWD/LWD system?

The OmniSteer™ RST is compatible with third-party real-time telemetry and MWD systems, giving customers freedom to assemble their preferred BHA.

What is the dogleg capability of the OmniSteer RST, and what is the maximum dogleg passthrough?

The OmniSteer RST typically achieves dogleg severities as follows:

- 5 7/8 to 8 3/4 in.: 8°/100 ft
- 9 7/8 to 13 1/2 in.: 6°/100 ft
- 16 to 18 1/4 in.: 3°/100 ft
- MX^3 tools: 20°/100 ft

The maximum dogleg capability of the OmniSteer RST depends on several factors, including formation characteristics, BHA and bit design, operating parameters, and the stabilizer gauge.

D-Tech works closely with each customer to define expected performance for the specific application and provides recommendations to optimize BHA configurations.

What mud motors can be run with the OmniSteer RST?

The D-Tech OmniSteer RST is compatible with any mud motor. D-Tech recommends the use of high-torque, even-wall motors to reduce the risk of micro stalls. These motors provide smooth torque and rotary speed delivery for maximized penetration rates.

What are the limitations on flow rate (min & max)?

Minimum and maximum flow rates are dependent on tool size. The RST can be configured for specific flow regimes and mud densities for optimized performance.

- 5 7/8- to 6 3/4-in.: 170 to 400 gpm
- 7 7/8 to 8 3/4 in.: 300 to 670 gpm
- 9 7/8 to 18 1/4 in.: 410 to 1,200 gpm
- MX^3 tools: 300 to 670 gpm

OMNISTEER ROTARY STEERABLE TOOL FAQ

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What are the differences between push-the-bit & point-the-bit solutions?

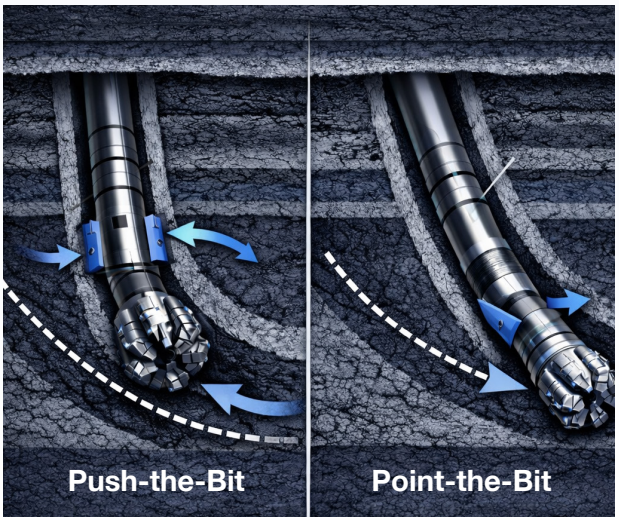
Both types of rotary steerable systems provide directional control while allowing continuous drillstring rotation from surface, eliminating the need to alternate between sliding and rotating as required with bent-housing motor assemblies. Continuous rotation improves drilling efficiency, hole quality, and overall performance.

Point-the-Bit Systems

In point-the-bit design, the drill bit axis is tilted relative to the drillstring axis, typically by deflecting an internal flexible shaft or using an offset mandrel with fixed or variable offset.

The primary challenge with point-the-bit systems is their mechanical and hydraulic complexity. These designs often require large volumes of hydraulic oil, universal joints, and fluid interface seals, which can lead to reduced reliability, higher repair costs, and longer maintenance turnaround times.

Some point-the-bit systems rely on non-rotating external housings to maintain toolface orientation. These designs can increase the risk of sticking because the stabilizer cannot effectively transmit torque during reaming, allows cuttings to settle, and may hang up on wellbore ledges. Systems using fully rotating offset mandrels also require significant electrical power, increasing heat generation and electrical stress that can reduce reliability in demanding environments.



Push-the-Bit Systems

In push-the-bit systems, directional control is achieved by applying a controlled side force against the borehole wall to steer the well along the desired trajectory. This force is generated hydraulically using drilling fluid pressure.

Push-the-bit systems are widely valued for their mechanical simplicity, continuous rotation capability, and reliable directional control across a range of drilling conditions.

The D-Tech OmniSteer RST builds on these advantages with a design focused on reliability, efficiency, and serviceability. In the OmniSteer system, side force is generated using the pressure drop across the bit nozzles, diverting only a small portion of mud flow to power hydraulic pistons. This approach reduces power demand and minimizes internal wear.

Key advantages of the D-Tech push-the-bit design include:

- Lower electrical power requirements, reducing heat buildup and improving reliability
- Reduced internal wear, supporting longer tool life
- Scalable control electronics across multiple tool sizes
- Faster turnaround between runs, improving asset availability and operational efficiency

Unlike some competing systems, the OmniSteer design does not require mounting holes in the collar housing to support control electronics, a common source of fatigue cracking in high stick-slip or high-frequency torque environments, improving structural integrity and long-term durability.

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What are the LCM tolerances for the system (size & quantities)?

An innovative filter design allows the D-Tech OmniSteer RST to provide industry-leading LCM handling capabilities.

- The specified maximum LCM concentrations are as follows (medium-sized nut plug): 63 lbm/bbl

For other types of LCM, the maximum concentration is subject to material type.

What are the threaded connections on the OmniSteer RST?

In its standard configuration, the OmniSteer RST uses the following drill bit (lower) connections X upper connections:

- OS475 / OS500: 3 1/2 IF (NC38) or XT39
- OS650 / OS675 / MX^3 tools: 4 1/2 IF (NC50)
- OS800 / OS900: 6 5/8-in. Reg
- OS1100: 7 5/8-in. Reg

Our strong connection with SBO enables us to offer custom connection collars for a variety of thread types upon request.

How is surface testing conducted prior to running the OmniSteer RST in hole?

The ease with which the D-Tech tool can be picked up, programmed, and controlled is essential to delivering customer value.

The tool is fully programmed prior to deployment. This enables a pick-up-and-go process at the rig site without the need for a high-side or scribing procedure. In normal operating conditions, an OmniSteer tool BHA can be picked up quicker than a conventional motor BHA.

The system is controlled through an intuitive, easy-to-use software application available for iOS and Android platforms, eliminating the need for expensive surface equipment.

What is the maximum RPM for running the OmniSteer RST?

The maximum continuous operating rotational speed to achieve maximum steering performance is 330 RPM for the OmniSteer tool and 400 for the MX^3 tool. Contact your D-Tech representative for more information.

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Describe the downlink process for communicating with the OmniSteer RST.

The D-Tech OmniSteer RST uses a simple but robust communication system.

Commands are sent by rig pump flow modulation through 15 to 25% variation in flow. Downlinking is best performed while drilling, saving time. The intuitive D-Tech downlink software can be installed on any laptop, iPhone, or Android device.

What downlink verifications are received at the surface?

Downlink verification is done on surface through a WITS interface module that runs the same detection software used in the tool and verifies that the correct downlink command was sent.

What is the pressure drop through the system?

A large, open-flow path through the D-Tech OmniSteer RST results in a minimal overall pressure drop through the system.

How far are directional sensors from the bit when running the OmniSteer RST?

D-Tech OmniSteer rotary steerable tools facilitate pinpoint accuracy using a six-axis accelerometer package coupled with a roll gyro located four feet from the drill bit to continually record inclination.

What is your current fleet utilization for the OmniSteer RST?

The scalable design of the OmniSteer tool uses a single-sized electronics control assembly for every tool size.

Fast tool turnaround time of less than one day provides the D-Tech RST with outstanding asset efficiency and fleet utilization, which minimizes downtime and maximizes productivity for customers.