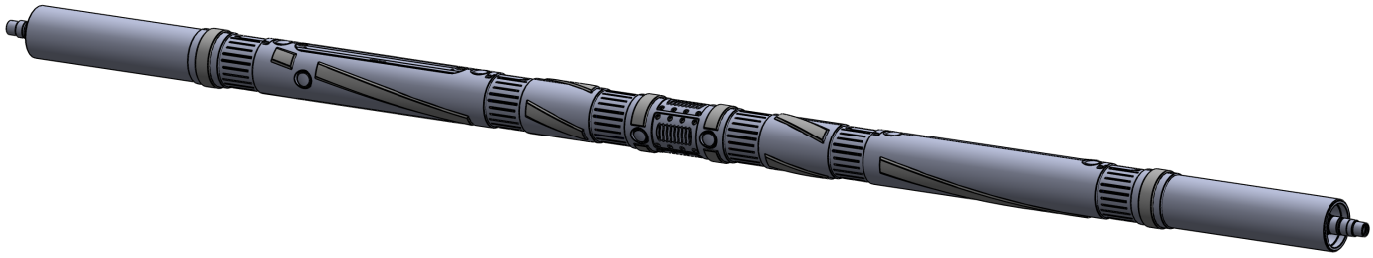
Well Resolutions Technology

BoundaryTracker™

Beam-steering Deep Azimuthal Resistivity Tool



Hit the most productive zone and maintain desired distances from bed or fluid boundaries with the next-gen boundary mapping technology.

Navigate your reservoirs continuously in any drilling mode (rotating or sliding) and with any type of BHA.

Both standard version (150°C and 20,000 psi) and HTHP version (175°C, 25,000 psi) are available.

NEXT-GENERATION AZIMUTHAL RESISTIVITY TOOL DESIGNED TO WORK WITH BOTH RSS AND MOTOR

FEATURES & BENEFITS

- Tracks bed boundaries with electronically steerable electromagnetic waves
- Measures 256, 16-sector fully compensated azimuthal resistivities
- Measures up to 12 fully compensated propagation resistivities at 3 frequencies (400 kHz, 2 MHz, and 4 MHz)
- Maps approaching bed boundaries up to 20 feet apart
- Expands resistivity measurement range up to 4,000 ohmm
- Works with any type of BHA (RSS or motor) in any drilling mode (rotating or sliding)
- Short sub (11.3 ft. or 3.5m) to shorten the BHA
- Modular electronics design improves shop or rig-site tool serviceability
- Compatible with virtually any type of drilling fluids

APPLICATIONS

- Navigate reservoirs and make timely adjustments to well trajectory
- Track and maintain desired distances from reservoir boundaries
- Monitor water zones and avoid contact
- Eliminate relogging of sliding sections
- Refine the earth model with the high-definition azimuthal & propagation resistivity measurements

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BoundaryTracker tracks reservoir tops and/or bottoms and places the wellbore in the sweetest spots to maximize production.

BoundaryTracker offers ultra deep depth of investigation which, when interpreted jointly with the approaching angle of the reservoir boundary, provides early warning of exit.

BoundaryTracker interfaces with top- or bottom-mounted pulsers thru the specially designed datalinks.

BoundaryTracker is designed to be run above RSS or mud motor and capable of boundary tracking in sliding mode.

TOOL FEATURE HIGHLIGHTS

- Compatible with virtually all types of mud, making it a suitable choice to run in complex hole conditions
- Extra large memory allows days of runs
- High measurement accuracy expands the applicability range
- Modular electronics design improves tool serviceability
- H2S-resistance upgrades available
- Available in 3-1/2 in., 4-3/4 in., 6-3/4 in., and 8-1/4 in. collar sizes

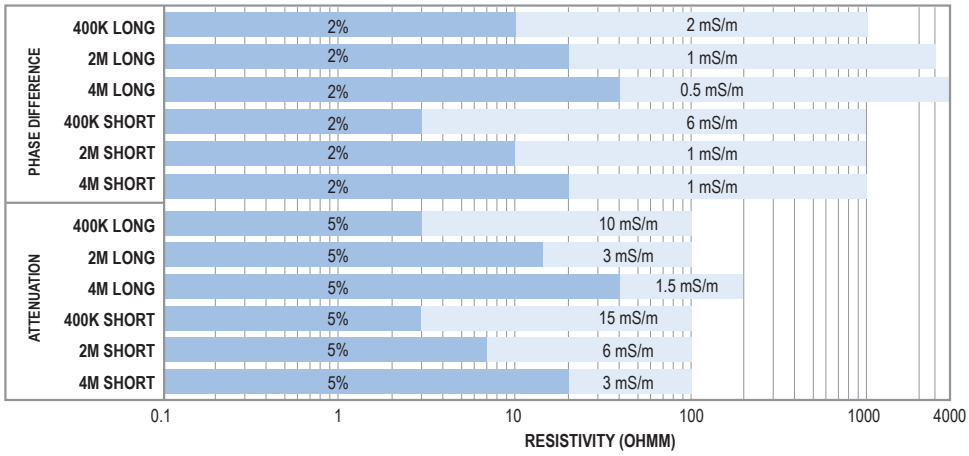
SPECIFICATIONS

Tool Size		3-1/2 in.	4-3/4 in.	6-3/4 in.	8-1/4 in.
Hole Size Range		4-1/4 to 5-1/2 in.	5-7/8 to 6-3/4 in.	8-3/8 to 10-5/8 in.	11 to 12-1/4 in.
Nominal OD/MAX OD		3.-1/2 / 3-3/4 in.	5 / 5-1/4 in.	6-3/4 / 7 in.	8-1/4 in./ 8-1/2 in.
Nominal Length		136 in. (3.45m)			
Top/Bottom Conx		Customer's Choice			
Connection Makeup Torque		2,500 lbf-ft.	10,000 lbf-ft.	30,000 lbf-ft.	46,000 lbf-ft.
Max DLS	Rotating	20˚/100 ft.	15˚/100 ft.	8˚/100 ft.	6˚/100 ft.
	Sliding	40˚/100 ft.	30˚/100 ft.	16˚/100 ft.	12˚/100 ft.
Max RPM		200			
Max WOB		20,000 lbf*	50,000 lbf*	100,000 lbf*	150,000 lbf*
Max Sand Content		<1%			
Power		External			
Max Flow Rate		150 gpm	350 gpm	750 gpm	1000 gpm
H2S-resistant upgrade		Optional			

MEASUREMENTS

Operating Frequencies		400 kHz & 2 MHz (4 MHz optional)			
Coil Spacings		18 in. & 46 in.			
Resistivity Range		0.1 – 3,000 ohmm (4,000 ohmm with 4 MHz)			
Vertical Resolution		1.25 ft. at 1 ohmm			
Depth of Investig. - Propag. Resistivity		Up to 14 ft.			
Depth of Detection – Azimuthal Resistivity		Up to 20 ft.			
Azimuthal Gamma Option		No	Yes	Yes	No
PWD Option		No	Yes	Yes	Yes
Power Consumption		Configurable			

ACCURACY



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STANDARD DIRECTIONAL

BoundaryTracker™

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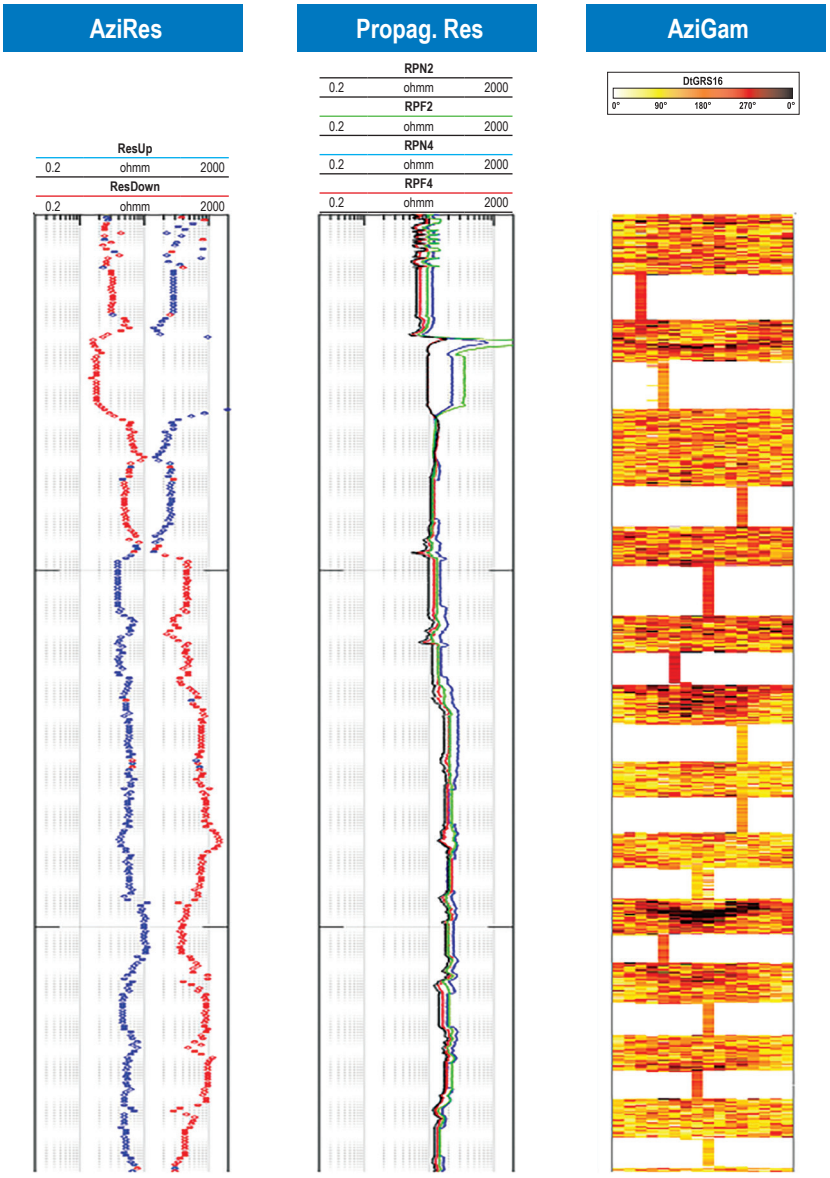
CONTINUOUS RESISTIVITY MAPPING WITHOUT SLIDING GAPS

WELL LOCATION: CANADA

- SAGD injection well
- The BoundaryTracker™ tool above a motor



BOUNDARYTRACKER™ AS A BOUNDARY MAPPING TOOL –

THE COMPETITIVE ADVANTAGES

	Max distance of boundary detection	Max temperature rating	Max pressure rating	Best for RSS?	Best for motors?	Interfacing with TMP	Interfacing with BMP
WRT (BoundaryTracker)	20ft	175˚C	25,000 psi	Yes	Yes	Yes	Yes