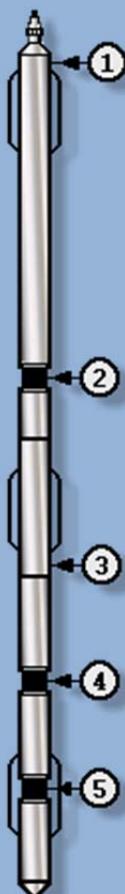


CENTURY GEOPHYSICAL LLC. PRODUCT DESCRIPTION

9320 Full Wave Sonic Tool



Background Information

The Full Wave Sonic tool contains a single transmitter and dual receiver to record formation travel times. The full wave form data is also recorded simultaneously, along with near and far travel times, borehole-compensated delta time, calculated sonic porosity, receiver gains, near/far amplitudes and natural gamma. The sonic or acoustic log uses the basic principle of sound waves traveling through a media. The Century sonic system uses a single transmitter and dual receiver system for recording the travel times of the formation. The receivers are spaced approximately 2 and 3 feet, from the transmitter. Therefore, a 0.3 m (1 ft.) calculation can be made to measure this interval transit time. Additionally, the 9320 can be upgraded for cement bond logging, by adding a casing collar locator (see below for link).

Features

Properties Measured (see diagram)		Tool Specifications
1. Natural Gamma: Mechanical Centralizer 2.5 x 10.2 cm (1.0 x 4.0 in.) NaI Scintillation Offset: 22.9 cm (9 in.)	3. Acoustic Isolator: Thermoplastic polyester Offset: N/A 4. Near Receiver: (2 ft.) spacing Offset: 231.1 cm (91 in.) 5. Far Receiver: (3 ft.) spacing Offset: 266.7 cm (105 in.)	Length: 283.2 cm (111.5 in.) Temperature: 85 C (185 F) Diameter: 50.8 mm (2.0 in.) Pressure: 175 kg/cm ² (2500 PSI) Weight: 22.7 kg (50 lb.) Logging Speed: 9 m/min. @0.06 SI (30 ft./min. @ 0.2 ft. SI) Tool Voltage Required: 85 VDC

Sensor Response Ranges

Sensor	Response Limits	Accuracy
Near Receiver (NR)	40 to 4096 usec	+/-0.5 usec
Far Receiver (FR)	40 to 4096 usec	+/-0.5 usec
Delta Time	40 to 250 usec@ft	+/- 1msec
Sonic Porosity	-10 to 100	+/-2%
Amplitude (minimum)	+/- 10 mv @ 256 gain	+/-5%
Amplitude (maximum)	+/-1.5 volts @ 4 gain	+/-5%
Gains	4 to 256	+/-5%
Natural Gamma (NG)	0 to 10,000 api	+/-5%

Tool Information

Item	Model #	Part #
Full Wave Sonic without NG	8320	339000A
Full Wave Sonic with NG	9320	339000B
Full Wave Sonic with NG and CCL	9321	339500A