

## Acoustic Scanner.

### Measurement Principle

The acoustic scanner is an ultrasonic (high frequency) imaging probe, which creates an orientated image of the borehole wall. The probe achieves the 360 degree image by using a rotating, angled mirror below the transducer. Orientation of the image is achieved by using the 3 axis magnetometers and accelerometers inside the probe.

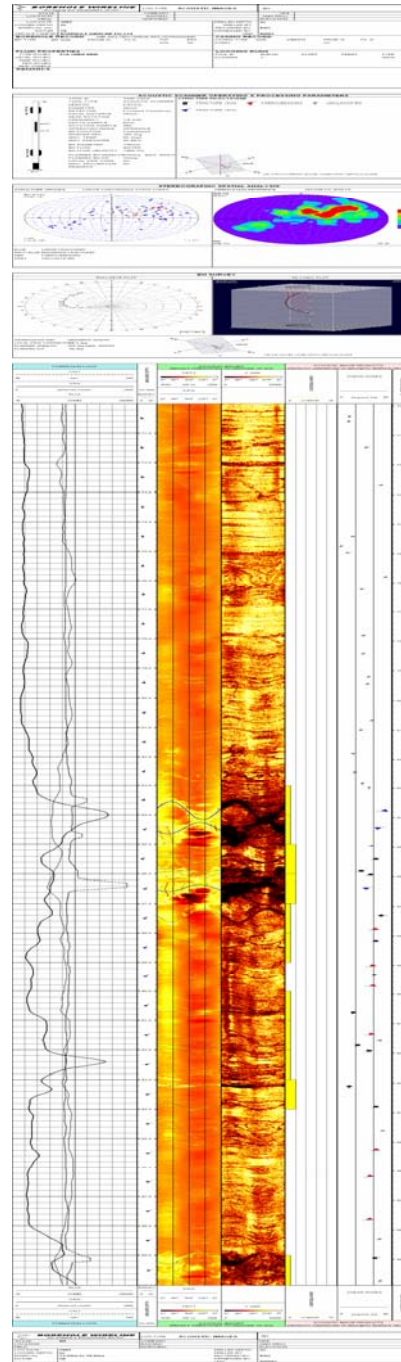
The transducer in the probe acts as a transmitter and receiver of ultrasonic pulses through the rotating mirror. Image Resolution is governed by the logging speed (the lower the speed, the higher the vertical resolution) and the rotational sample rate (90, 120, 180 or 360 samples per revolution) together with the rotational speed of a step motor – more samples equates to a lower step motor speed.

A simple analogy for the acoustic scanner is the false colour image represents multiple “knocks” of a geological hammer on the rock. The harder the rock, the “knock” is more likely to be similar to a ringing noise – hence a bright colour on the amplitude image. Softer rock is associated with a dull thud of the geological hammer – hence a dark colour on the amplitude image.

The images created are false colour and reflect:

**Two Way Travel Time:** The time taken for an acoustic pulse to travel from the transducer in the probe through the borehole fluid, reflected from the borehole wall and back to the transducer in the probe.

**Amplitude:** The intensity of the reflected pulse which is based upon the hardness of the rock, the smoothness of the borehole wall, the type of fluid in the borehole.



Single Run

### PHYSICAL SPECIFICATIONS

WEIGHT	10.0 kg
LENGTH	2.07m
DIAMETER	42mm
CONSTRUCTION	Titanium
BH DIAMETER RANGE	50mm – 380mm
RADIAL RASOLUTION	90, 120, 180, 360
TRANSDUCER	Focused Peizocomposite
FREQUENCY	1.5 MHz
BEAM ANGLE	3 degrees conical
ORIENTATION	3 axis magnetometer & 3 axis accelerometer
MAX. TEMP/PRESSURE	80°C/20 MPa