

# Logging Sondes

## Slimhole Density Sonde

The digital Slimhole Density Sonde can be used on its own or in combination with other sondes. It is suitable for qualitative density measurements in reduced diameter holes.

### **Specifications:**

Weight:	5.0 kg	Length:	1.8 m	Diameter:	38 mm
Detectors (NaI)	x 2 NaI crystals with 48 and 24 cm spacing				
Source requirement	Typically 10mCi <sup>137</sup> Cs				
Max. Temperature	80°C	Max. Pressure:	20 MPa		

## Formation Sidewall Density Sonde

This combinable sonde is suitable for quantitative formation density measurements in uncased holes. It uses a gamma ray source and a set of two detectors at different spacing to detect the gamma rays scattered by the formation. The amount of scattered gamma rays is a function of the electron density of the formation material and hence, a function of its bulk density. This relationship is used to calibrate the density sonde and then use it to log the bulk density of the formations crossed by the borehole.

In order to optimise performance, the sonde is designed with three main features:

1. A side-walling calliper to ensure that the detector measures only the radiation scattered by the formation
2. A detector mandrel diameter that is large enough to minimise the sonde and borehole curvature mismatch and improve sonde to formation contact to minimise the effect of the borehole fluid
3. An efficient detector shield to prevent gamma rays from travelling up, inside the sonde body.

### **Specifications:**

Weight:	28 kg	Length:	1.89 m	Diameter:	66 mm
Detectors (NaI)	x 2 NaI crystals with 38 and 16cm spacing				
Source requirement	Typically 100mCi <sup>137</sup> Cs				
Density Range:	1-3 g/cc				
Max. Temperature	80°C	Max. Pressure:	20 MPa		

