

# PRODUCTION LOGGING TOOLS

## Fluid Density Radioactive (FDR)

The FDR uses low energy gamma rays to determine the downhole fluid density during a production log. It provides a safe and reliable measurement that is unaffected by well deviation and flow rates.

### DESCRIPTION

Gamma rays are emitted from an Americium-241 source at one end of a measuring cell and are detected at the opposite end by a scintillation detector and photomultiplier. Well fluid flows through the cell and attenuates the received count rate in an inverse logarithmic function of the average fluid density. The detector is temperature stabilized and matched to the gamma energy of the source.

The tool can be calibrated in air and fresh water using Sondex supplied multipliers to derive calibration values applicable to oil and saltwater densities.

### FEATURES

- Americium 241 gamma ray source.
- Shielded detector highly resistant to radioactive scale interference. Multi-phase production profiling.
- Fluid identification.
- Used in all well deviations.
- Density measurements in a range of fluid flow rates.
- Protective radiation shield (type A rated) can be locked on the tool so that the source can be left in place between jobs.
- Fully combinable with all UltrawireT<sup>™</sup> Production Logging Tools.
- Surface read out or memory operation.



**SPECIFICATIONS**

<b>Model</b>	<b>FDR019</b>	<b>FDR020</b>
<b>Temperature Rating</b>	350 °F (177 °C)	
<b>Pressure Rating</b>	15,000 psi (103.4 MPa)	
<b>Tool Diameter</b>	1-3/8" (35 mm)	1-11/16" (43 mm)
<b>Tool Length</b>	22.9" (581 mm)	23.0" (585 mm)
<b>Tool Weight</b>	6 lbs (2.7 Kg)	9.6 lbs (4.4 Kg)
<b>Toolbus</b>	Ultrawire™	
<b>Current Consumption</b>	35mA (typ.)	
<b>Protective Shield Weight</b>	11.1 lbs (5.0 Kg)	12.0 lbs (5.4 Kg)
<b>Measurement Range</b>	0 to 1.25 g/cc	
<b>Accuracy</b>	±0.03 g/cc	
<b>Resolution</b>	0.01 g/cc	
<b>Sensor Measure Point</b>	4.3" (110 mm)	
<b>Materials</b>	Corrosion Resistant Throughout	