

## Multi-Sensor Array Tools

The Multi-Sensor Array Tools are designed to take measurements in a single plane across the diameter of the wellbore to overcome the problem of phase segregation that occurs in many wells.

The suite of tools consists of;

### Capacitance Array Tool (CAT)

This has 12 miniature sensors mounted on the inside of a set of collapsible bowsprings and measure the capacitance of the surrounding fluid close to the well casing. In taking measurements in a single plane across the diameter of the well-bore rather than along it, results in an accurate cross-sectional plot of fluid phases.

### Resistance Array Tool (RAT)

This has 12 micro resistance sensors mounted on the inside of a set of collapsible bowsprings and determines the water hold-up profile across the whole wellbore. The tool differentiates between conductive water and hydrocarbons which are non-conductive, and will detect very small, fast moving bubbles.

### Spinner Array Tool (SAT)

This has 6 miniature turbines deployed on bowspring arms. The spinner is mounted between 2 low friction jewelled bearings to reduce the mechanical threshold of the spinner and improve sensitivity to fluid flow. These turbines enable discreet local fluid velocities to be measured around the wellbore.



# Production Logging Sensors

Capable of being deployed in memory or surface read out mode, each tool incorporates a relative bearing measurement to indicate the high side of the hole.

The combination of the CAT and RAT tool enables the cross-sectional water hold-up profiling of the phases in wellbores of any deviation from vertical to horizontal and in any flow regime.

The SAT tool enables the cross-sectional velocity profiling of the phase velocities in segregated fluid streams in deviated and horizontal wells.

The combination of the Array tools enables quantitative estimations of volumetric flow rate for each phase with a much greater degree of certainty and thus provides more precise information for reservoir management.



Technical Specifications:			
	CAT	RAT	SAT
Temperature Rating	350 °F	350 °F	350 °F
Pressure Rating	15000 psi	15000 psi	15000 psi
Tool OD	1 11/16"	1 11/16"	1.85 ins
Length	51.4 ins	51.4 ins	45.5 ins
Weight	17.3 lbs	18 lbs	17.2 lbs
Casing Size Range	3 to 7 ins	3.5 to 7 ins	3 to 7 ins
Number of Sensors	12	12	6
Scan Time	255 µsecs	4.8 msec	
Spinner Diameter			0.4 or 0.6 ins
Spinner Pitch			2 ins
Spinner Resolution			3 pulses/rev

