

Array Spinner Flowmeter Sub (ASFS)

OVERVIEW

The Array Spinner Flowmeter Sub (ASFS) has been developed for oil/gas/water identification in a highly deviated and horizontal well. The tool is mainly composed of six small impeller sensors mounted on the bow spring arms. Six turbine spinner sensors are evenly distributed in the spring cage. The impellers are mounted to the spring arm by jewel bearings, and it effectively reduces the mechanical friction of the impeller to improve the sensitivity. It can directly measure the flow rate and direction of each phase or mixed phases. During logging, fluid can be rotated through an impeller by a dynamic flow or up-down passes. The flowmeter has 2 magnets, and 6 Hall-effect switches spaced 72° apart. When the impeller rotates, the magnet at the impeller passes through the Hall effect sensor and causing the circuit to generate 0V-5V pulses. One full rotation of the impeller generates 10 pulses. The rate and direction of impeller rotation can be calculated by recording the pulse rate and the pulse sequence.



BENEFITS

- ❑ Good adaptation to well conditions by combining spring bow and rigid arms
- ❑ Mounting micro-optic and resistivity probes for simultaneous fluid flow rate and flow direction measurement
- ❑ Continuously adjustable arms for measurement
- ❑ SRO/Memory logging
- ❑ Compatible with other WellRay tools for comprehensive logging

SPECIFICATIONS

Parameters	Description
Max Working Temperature	175°C
Max Working Pressure	103MPa (15,000psi)
OD	43mm (sectional 45mm)
Casing Size	3" to 7"
Communication	WRTbus
Number of Impeller	6
Impeller Diameter	φ0.4"
Relative Bearing Measuring Accuracy	5°
Relative Bearing Deviation	5° to 175°