

Scientific Drilling's Vulcan™ FLS (Flow Logging System) 1.75^G & 2.25^G are extended duration, flasked system production logging tools for high-temperature geothermal wells.

This high-temperature system offers the following sensors:

- + Casing collar locator (CCL)
- + Gamma ray
- + Pressure
- + Temperature
- + Spinner flowmeter
- + Optional: Nuclear Fluid Density

For more information on Scientific Drilling's range of cased hole services, contact your Scientific Drilling sales representative or visit:

<http://scientificdrilling.com/cased-hole-services>

GENERAL SPECIFICATIONS

MAXIMUM TEMPERATURE**	650°F (343°C)	
MAXIMUM PRESSURE***	16,000 psi (110,316 kPa)	
MEMORY	Non-volatile, 48 MB	
TEMPERATURE SENSOR ACCURACY/RESOLUTION	High-accuracy platinum resistance ±1.8°F (1°C) / 0.02°F (0.01°C)	
PRESSURE SENSOR ACCURACY/RESOLUTION	High-accuracy quartz ±3.0 psi / 0.01 psi	
CONTINUOUS SPINNER RESOLUTION & OD RANGE	Minimum 0.1 rps with direction 1.75 - 3.5 in	
GAMMA RAY CRYSTAL DETECTOR	Sodium iodide (NaI) scintillation	
CASING COLLAR LOCATOR TYPE & MEASUREMENT FREQUENCY	Magnetic flux 50 samples per second	
CENTRALIZERS	Over-body	
HOUSING DIAMETER	Medium: 1.75 in (44.4 mm)	Large: 2.25 in (57.1 mm)

NUCLEAR FLUID DENSITY

ACCURACY	0.02 g/cc	
RESOLUTION	± 0.01 g/cc	
SOURCE	Cs ¹³⁷ 10 mCi / 20 mCi	
TEMPERATURE RATING	600°F (315°C)	

*Specifications are subject to change without notice **Max. temperature rating dependent on run duration
***Max. pressure rating dependent on temperature

APPLICATIONS

- + Steam entry flow profiling
- + Memory and real-time data acquisition
- + Thermal EOR steam injection flow profiling
- + Heat-up tests (feed zone identification)
- + Completion tests (injection surveys)
- + Quantitative flow evaluation
- + Re-injector water acceptance capacity evaluation

BENEFITS

- + High-endurance in hot wells
- + Slickline conveyance simplifies pressure control for safer operations
- + Highly robust and reliable system
- + Includes gamma-ray sensor for accurate depth correlation
- + Nuclear fluid density provides steam quality evaluation capability
- + Over-body centralizers optimize tool centralization

