

HTHP Production Logging Tools (HADES)

HADES, the high pressure, high temperature (HPHT) production logging toolstring from Sondex, has six PL sensors (flow, temperature, fluid capacitance, pressure, gamma & CCL) packaged in a slim flask that is suitable for extreme well environments.

Description

The standard sensors of a production logging toolstring used in HADES have been upgraded to provide reliable and accurate measurements in extreme downhole conditions where high pressure and high temperature are a concern. A flask is used to house all the sensors, except the CTF, and act as a thermal and high pressure barrier, enabling the tool to operate efficiently in temperatures and pressures up to 500°F (260°C) and 20,000psi (138MPa) respectively. NACE approved materials are used to manufacture the flask.

The CTF - fluid capacitance probe, temperature probe and flowmeter - is positioned at the bottom of the string and fully exposed to well fluids ensuring an accurate measurement. Pressure is monitored using a 20,000psi quartz gauge housed inside the flask and connected to a pressure port via a by-pass line. All other sensors and electronics – gamma detector, CCL, memory/battery assembly or telemetry cartridge - are contained inside the flask together with additional heat sinks and thermal barriers.

Protection offered by the flask and other thermal barriers is time-dependant. Therefore the maximum bottom hole temperature and time the tools are in the well should be determined as part of the pre-job plan. The internal temperature of HADES is recorded with a separate temperature sensor and can be monitored by the logging engineer to ensure the tools are not over exposed.

The flowmeter mechanical section is interchangeable to optimise measurements for downhole flow conditions and well restrictions. HADES can also be run without the CTF and spinner if simple pressure temperature is required. Centralisers should be included in the toolstring at the top and bottom of the flasked section to assist with deployment in high deviation and horizontal wells.

Features

- High temperature/high pressure applications.
- Memory or surface read-out operation.
- Interchangeable spinner mechanical sections available.
- NACE MR0175 approved sensor housing materials.
- Multiple sensor measurements from a single toolstring.
- 572°F (300°C) tool option available.

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Specification

Temperature rating*	500°F (260°C)
Pressure rating	20,000psi (138MPa)
Tool OD	1.82in (46.2mm)
Tool length (with CFS)	12.3ft (3.73m)
Tool length (with 1 centraliser)	15.3ft (4.65m)
Tool weight (with 1 centraliser)	58.8lbs (26.6kg)
Supply voltage	+100VDC (Ultralink™) or 2x (3.6V) batteries (Memory)
Materials	Corrosion resistant throughout

*see duration chart on below

HADES spinner mechanical sections

Spinner model Type	Type	Shroud diameter	Shroud type
CFSM26	Continuous	1 ¹¹ / ₁₆ in (43mm)	Ported
CFSM27	Continuous	2 ¹ / ₈ in (54mm)	Ported
CFSM34	Continuous	1 ¹¹ / ₁₆ in (43mm)	Closed
CFSM35	Continuous	2 ¹ / ₈ in (54mm)	Closed
CFBM36	Full bore	For 4 ¹ / ₂ in casing	

Duration Chart

