



# TECHNICAL DATA SHEET QUANTITATIVE HYDROCARBON EVALUATION SYSTEM

No. SPECS-GAS-037

Rev. 4

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**TITLE: QUANTITATIVE HYDROCARBON EVALUATION SYSTEM**

**DEPARTMENT: TECHNICAL SUPPORT**

**DESCRIPTION:** FID gas equipment is used analyze gas samples, extracted from the possum belly and, where applicable the active mud system, applying the results to a Master Quantification Model that lags both gas samples by considering parameters such as hole size, penetration rate, flow rate, relative repeatability, extraction efficiency and others. If a Gas In (Suction Pit) system is used, the system maintains either a constant mud ratio or volume in a sealed extraction chamber by employing a progressive cavity pump. The Gas Out (Possum Belly) maintains a mud volume based on the flow rate with a variable speed progressive cavity pump controlled by the DLS software.

## QHE System Components

### Gas Out Extraction and Quantification

- Progressive Cavity Pump
- Mud intake to progressive cavity pump.
- The **Seepex®** cavity pump is an all-metal component pump which is specifically designed for highly abrasive and solids-laden drilling mud returning to surface – 7 mm solid particles are preserved, but the pump can handle cuttings up to 13 mm. The pump is powered by a 1 hp three-phase Class I Div 1 induction motor compatible with the DLS computer-control system, for precise pump capacity variable settings.
- 3/4" ID tubing connects pump and gas trap.
- QGM type gas trap.
- Explosion proof electric, or air motor for gas trap.



### Dedicated Constant Ratio/Volume Degasser & Gas Trap.

The screened mud entry probe is easily positioned below the surface of the mud and connects to a progressive cavity pump. The progressive cavity pump is driven by an explosion proof motor to maintain a constant volume of mud transfer from a flow line to a gas trap. The gas trap is driven at a constant rpm by an explosion proof electric or air motor. The gas trap is a modified QGM gas trap with the exception that the mud enters the side of the gas trap whilst the bottom of the gas



trap is sealed.

Two (2) independent gas lines, one active and one spare, with continuous purge capability are provided. Calcium Chloride desiccant and condensation collectors may be installed in each gas line. The gas lines are insulated (and heated if required) ¼" PVC tubing. The sample flow from the trap to the analyzers has a visual indicator located in the ML unit. Transit time through the gas-line is kept to a maximum of two (2) minutes depending on gas-line diameter & length. A T-valve is provided for vacutainer or iso-tube sampling.

## SPECIFICATIONS:

### Dedicated Total Gas Analyzer

- Total Hydrocarbon Gas continuous measurement (as equivalent methane in air).
- Values are stored in ppm in the database and displayed in percent on the detector front panel.
- Accuracy is +/- 5 % (see glossary).
- Resolution is 10 ppm (see glossary).
- Visual and audible alarms set on TG inside the unit (alarms threshold to be fixed according to company request).
- Systematic computation of Normalized Total Gas is applied through DLS.
- **Master calibration** using minimum of 3 points at different methane concentration (C1= 1,000, 10,000 and 100,000 ppm).
- **Calibration check** using 2 points at different methane concentration (C1= 1,000 and 100,000 ppm).



### Dedicated Chromatograph - CHR 1002 HS (See Technical Sheet SPECS-GAS-040)

- Chromatographic analysis from C1 to nC5.
- High speed gas chromatograph. 60 sec. elution time. Dual integration available.
- Measurement unit: ppm.
- Component values computed using peak areas.
- Accuracy: +/- 5%
- Resolution: 1 ppm
- Threshold of quantifiable value: 10 ppm
- Oven temperature, sample pressure and flow are displayed on the front panel.
- **Master calibration** - minimum 3 points using gas mixture (C1-nC5) at known components concentration (with C1= 100, 1,000, and 100,000 ppm).
- **Calibration check** at 1 point using gas mixture (C1-nC5) at known components concentration (with C1= 10 000 ppm).

### **OPTIONAL Gas In Extraction and Quantification**



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Same as gas out system, located in Active Fluid Pit/Tank. This system is only applicable in situations where the gas transit time through the gas lines to the logging unit can be maintained below two minutes. Note, this system is not applicable on tender assist rigs. This should be run as a constant ratio system.

**Software Features**

Gas In is lagged and used to correct the value of Gas Out for both Total Gas and Chromatograph values to account for re-circulated gas including; trip gas, connection gas, non-naturally occurring gases and retained hydrocarbons.

**Gas Line Management**

The Gas line is supplied with a back-up. Temperature is maintained constant through insulation. Condensate drop-out is provided. Line suction is also constant.

**Data Management**

Triple Master Calibrations are performed in a controlled environment. Multi-point calibrations are performed. Recorded data is stored in both Time and Depth based databases.

**INTERFACE:** HP Integrator, Chrom-Perfect Spirit Integration System, Charts and all Digital Monitors and DLS System

**APPROVAL:**

Dept. Supervisor : VICTOR SAET Date: 1<sup>st</sup> March 2005

Technical Committee : ALAN MORRISON Date: 1<sup>st</sup> March 2005