



## CALIDUS™ 101 micro Gas Chromatograph

GC analysis for virtually any fixed gas and hydrocarbons up to C<sub>44</sub> for laboratory, at-line, transportable or online use

- Upstream (E&P)
- Petrochemical/Chemical
- Food & Beverage
- Military
- Refining
- Pharmaceutical
- Medical
- Educational



**CALIDUS Model 101** - comprised of 3 modules

A single Sample Processing Unit with a standard split/splitless injection port (1:1 up to 1:200) suitable for gas and liquid samples via either syringe through the septum injections, optional gas, liquid or headspace auto-sampler, or automated sampling valves. The inlet includes septum purge to prevent bleed components from entering the system.

A single Programmed Temperature Column Module containing the resistively heated steel capillary chromatography column with necessary hardware, software and electronic control to enable temperature programming from 0.1°C to 10°C per second from 5°C above ambient to 350°C depending on the maximum temperature capability of the column material selected.

A single Detector Module incorporating either a micro Flame Ionization Detector (FID) or micro Thermal Conductivity Detector (TCD) with the necessary hardware, software and electronic control to provide detector temperature control, digital output signal and additionally for proper FID fuel supply pressure and auto-ignition.

The micro FID is a fully digital carbon/hydrogen bond detector using the hydrogen flame to burn the sample components. It uses an electrometer to sense the current changes in the flame cell due to chromatographic component elution. The data rate is 100 Hz.

The micro TCD is a fully digital, universal detector. The TCD consists of a constant temperature filament that senses change in power required to hold the filament temperature constant when chromatographic components elute. The power measurement is used to determine the amount of the component eluting from the column. The data rate is 50 Hz.

CALIDUS is controlled with ChromPerfect chromatography data system fully integrated with LineUp running on a Windows PC.



100 AEI Drive  
Fairlea, WV 24901  
P.O. Box 518  
Ronceverte, WV 24971  
  
Phone: 304-647-5860  
Fax: 304-645-4006  
E-mail: [info@falconfast.net](mailto:info@falconfast.net)

### SIGNIFICANCE AND USE

The Model 101 is the simplest configuration of the CALIDUS micro GC systems. It provides ultra-fast analysis (10 to 50 times faster than conventional lab or process GC's) of fixed gases and hydrocarbons to C<sub>44</sub>. It is ideal for sample scouting, methods development and transportable uses. Simplicity doesn't negate the powerful capability of this model.

The analyses are used for product specifications testing, product safety, environmental measurements, process control, catalyst protection, educational tools, spot checks of fuels and many more.

**Faster, Smaller, Smarter, Easier, Greener**



# CALIDUS™ 101 Specifications (global patents pending)

December 1, 2010

## Ambient Environment

Operating Temperature Range: 0°C to 35°C  
Storage Temperature Range: -20°C to 60°C  
Relative Humidity Range: 0 to 100% (non-condensing)

## Power Requirements

Less than 300 watts peak power at startup, practical use < 200 Watts for gas or liquid analyses  
24 VDC supplied from external power supply, 100-240VAC using 50/60Hz AC

## Safety

General purpose, light industrial (lab instrument environment)  
CE Mark and Nationally Recognized Testing Laboratory (NRTL) certified pending (TUV Rheinland)

## Gas Supplies

50 PSIG, 99.995% H<sub>2</sub> or He at up to 250 ml/min, 50 PSIG zero air for FID operation

## Sample Requirements (via split/splitless injector with septum purge)

Air or gaseous samples at 0 to 50 PSIG at ambient temperature  
Membrane, SPME and static and dynamic headspace extracts  
Direct liquid injections neat or dilute organic solvents (DCM, hexane, MEK, toluene, methanol, CS<sub>2</sub> etc.)

## Dimensions

17" wide by 8.5" deep by 11" high, ~ 20 lbs  
Uninterrupted power supply and data acquisition computer external to the base unit

## Controls/Outputs

All functions and parameters via ethernet or RS-232 using ChromPerfect™ software  
Start analysis from keyboard or GC  
Set method from external computer using ChromPerfect software  
50-100Hz digitization (detector dependent) on each column, 24 bit resolution, auto zero on each run  
Trigger in and ready out signals plus an array of others via ChromPerfect

## Front Panel Displays

Temperature and pressure readings, function on/off, other  
Power on/off  
Status of analysis columns (isothermal, programming, cool down, ready, cycles run, other)

## Standard Equipment

One capillary column, 2m long, 100µm to 320µm ID, temperature programmable from 0.1 to 10°C per second from 5°C above ambient to 350°C (maximum temperature software limited to be no greater than the limit for the columns installed, isothermal operation is available). Column modules are 2 meter columns in Mxt-1, Mxt-5, Mxt-1701, Mxt-Wax, Mxt-MoleSieve, Mxt-Alumina, < 320µm & various film thicknesses with others coming soon.  
Flame ionization or thermal conductivity (filament) detection  
Gas and liquid inlet for syringe injection of samples or automated gas and liquid sample valves available

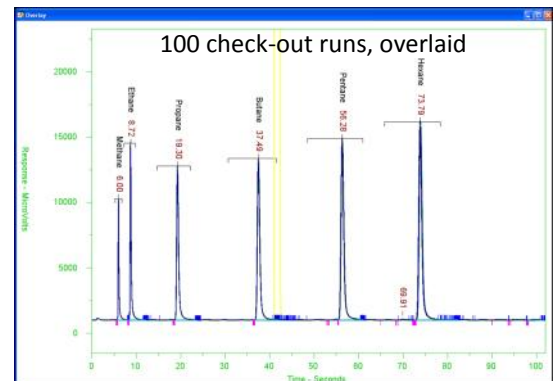
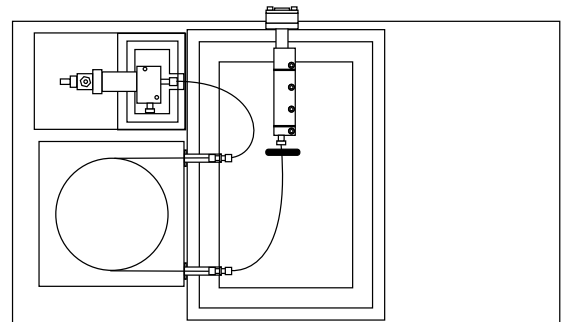
## Performance (application dependent)

Repeatability of ± 1% RSD or better (area) and of ± 0.1% RSD or better (retention times)  
Analysis times for VOCs: can be <20 seconds and for SVOCs: can be <60 seconds  
Dynamic range: depends on detector used and application (FID typically 10<sup>5</sup>)

## Data Processing and Instrument Control

Note: computer system is integral and necessary component of the analysis system and includes the following requirements:

- RS-232 or USB to RS-232 adapter, ethernet
- Windows XP or newer operating environment
- ChromPerfect software for dual column data acquisition via RS-232 serial or ethernet ports



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**HROM**alytic +61(0)3 9762 2034  
ECHnology Pty Ltd

Australian Distributors  
Importers & Manufacturers  
www.chromtech.net.au

12/13

Website NEW : www.chromalytic.com.au E-mail : info@chromtech.net.au Tel: 03 9762 2034 . . . in AUSTRALIA