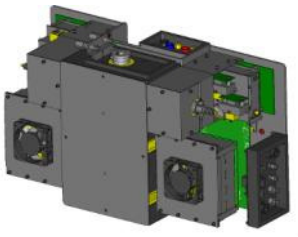
CALIDUS™ the Modular micro Gas Chromatograph

- **Sample Processing Unit**
- **Plug & Play Programmed Temperature Column Modules**
- **Plug & Play Detector Modules**
  - **Flame Ionization**
  - **Thermal Conductivity**



A CALIDUS micro gas chromatograph features fully-independent Programmed Temperature Column Modules (PTCM) that can be operated isothermally and interfaced to a Sample Processing Unit (SPU). Detector Modules (DM) are also fully-independent and can be mixed and matched within the CALIDUS Sample Processing Unit environment.

- **SPU -** standard with a split/splitless injection port (1:1 up to 1:200) suitable for gas or liquid samples via a syringe through the septum injection, optional automated sampling valves for gas or liquids or an optional auto-sampler capable of liquid or heated headspace gas samples. The inlet includes septum purge to prevent bleed components from entering the system.
- **PTCM -** resistively heated steel capillary chromatography column with necessary hardware, software and electronic control for temperature programming from 0.1°C to 10°C per second from 5°C above ambient to 400°C depending on the model and maximum temperature capability of the column material selected.
- **DM -** incorporates micro Flame Ionization Detector (FID) or micro Thermal Conductivity Detector (TCD) with the necessary hardware, software and electronic control to provide detector temperature control and digital output signal.
  - **FID -** 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. Control is provided for the fuel supply pressure and auto-ignition. The data rate is 100 Hz.
  - **TCD -** fully digital, universal detector consisting of a constant temperature filament sensing the change in power required to hold the filament temperature constant due to chromatographic component elution. The data rate is 50 Hz.

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

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SIGNIFICANCE AND USE

The CALIDUS micro gas chromatograph provides a simple ultra-fast analysis (10-50 times faster than conventional lab or process GC's) of fixed gases and hydrocarbons up to C_{50}. CALIDUS is available for laboratory, at-line, transportable or online use in the hydrocarbon processing industry, environmental labs, pharmaceuticals, food and beverage industry, military, medical industry, and educational markets.

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

Faster, Smaller, Smarter, Easier, Greener

CALIDUS™ micro Gas Chromatograph

- **Model 101**
- **Model 101 HT**
- **Model 201**
- **Model 301**
- **Model CS**

5 CALIDUS Models combine various standard modules to provide general or specific applications and expanded measurement capabilities. Each of these models can be installed as a plug and play module within the Calidus process analyzer enclosure.

CALIDUS Model 101 - 3 modules, a Sample Processing Unit, a Programmed Temperature Column Module and a Detector Module interfaced with the ChromPerfect chromatography data system and fully integrated with LineUp running on a Windows PC. The user may select either a micro FID or TCD and one of the available different PTCMs to separate and measure fixed gases and hydrocarbons up to C_{44}.

CALIDUS Model 101 HT - a 101 with a PTCM using High Temperature MXT-1HT Sim Dist column and a micro FID module specifically for determination of boiling range distribution of petroleum products and biodiesel formulations up to C_{50} in boiling point. The analyzer is interfaced with the ChromPerfect chromatography data system, SimDis 2000 software, and fully integrated with LineUp running on a Windows PC. An ASTM method for Ultra Fast Micro GC 2887 is currently under development based on the CALIDUS Model 101 HT.

CALIDUS Model 201 - 4 modules, 2 PTCMs in series with one Sample Processing Unit and one Detector Module interfaced with ChromPerfect chromatography data system and fully integrated with LineUp running on a Windows PC. There are two major advantages for having two PTCMs in series. First is the ability to leverage selectivity of different stationary phases. And second, is virtually doubling the column length for even greater separation power up to C_{44}.

CALIDUS Model 301- 5 modules, a Sample Processing Unit with a single injector connected to a splitter dividing the sample between two PTCMs in parallel, each with a single micro FID or TCD Detector Module. The Model 301 handles hydrocarbon samples with a wide range of boiling points and a wide range of concentrations (% to ppm) with better separation and faster analysis all without complicated valve schemes and resultant additional hardware.

CALIDUS Model CS (Column Switching) - 5 modules, a Sample Processing Unit with a single injector connected to a 6-port diaphragm/plunger column valve, two PTCMs in parallel, and two detector Modules. This model can be plumbed to perform heartcutting from one PTCM with its own FID or TCD Detector Module to a second PTCM with its own FID or TCD Detector Module. Backflushing configurations are available too. This model is used for analysis where a specified discrete hydrocarbon (s) must be separated and measured from a defined stream or sample composition typically within a required time frame with optimum selectivity (up to C_{12}).

CALIDUS
micro GAS CHROMATOGRAPH


TCD


PTCM


FID

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