

490-GC Micro-GC Solution



When the composition of gas mixtures is critical, Varian's 490-GC Micro-GC delivers the information you need, time after time. Our 5th generation micro-gas chromatograph generates more data in less time for faster and better business decisions.

Key Benefits

- ▶ **The Speed You Need.** Precise gas analysis in seconds rather than minutes brings improved product quality and more exact product valuation to industries such as oil and gas exploration, refining, natural gas production and distribution, fuel cell development, and specialty gas production.
- ▶ **Full Flexibility.** The 490-GC Micro-GC is a rugged, compact analyzer for gas quality analysis in the laboratory, on-line and at-line. With advanced micro-machining and computing technologies, the 490-GC offers between one and four analytical GC channels. Each channel is a separate GC with pneumatics, injector, column, and detector. User exchangeable GC channels or modules provide quick and easy reconfiguration for any application.
- ▶ **Increase Monitoring Frequency.** Micro-electronic gas control with time-programmable backflush lets you inject samples while eliminating components that could foul the column and reduce lifetime. Extremely fast analysis for continuous process monitoring and control using the 490-GC ensures faster and better decisions that can lead to higher quality end-products.
- ▶ **Easy Start-Up.** On arrival, the 490-GC provides the results and ruggedness you demand in the laboratory and in the field for the analysis of gaseous and vapor streams. Start-up is easy, quick and seamless with electronic data sheets (EDS), which store operational history and the last used method for each GC channel. The 490-GC can be controlled from virtually anywhere in the world through a PC and the internet, using industry standard protocols such as TCP/IP.



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Specifications

Configuration

One to four analytical GC channels

Control

- Independent control of each analytical channel
- Injector, column, and detector settings
- Pneumatics, including time-based column pressure programming

Injector

- Micro-machined injector with no moving parts
- Injection volume 1 μ L to 10 μ L, software selectable
- Optional heated injector, up to 110 °C, including heated sample transfer line
- Optional backflush capability

Column Oven

Temperature range, up to 180 °C, isothermal

Detector

- Micro-machined Thermal Conductivity Detector (TCD)
- Dual-channel (sample and reference flow)
- Internal volume 200 nL per channel
- Filaments, 4

Detection Limits, TCD

- WCOT (wall coated open tubular) columns, 1 ppm
- Micro-packed/PLOT columns, 10 ppm

Operating Range, TCD

- Concentration, 1 ppm to 100% level
- Linear dynamic range, 10^6

Repeatability

< 0.5% RSD for propane at 1 mol % level for WCOT columns at constant temperature and pressure

Optional DMD (Differential Mobility Detector) occupies one channel position

- Detection limit, 100 ppb for MES
- Dynamic range, 10^3
- RSD < 2% at 10 times the LDL
- Gas requirements, 400 mL/min 'Zero' Air or N₂
- Source, 63Ni, 5 mCi (185 MBq)

Carrier Gas

- He, H₂, N₂, or Ar, 550 \pm 10 kPa (80 \pm 1.5 psi) input
- Up to two different types of carrier gases can be used in one instrument
- Inlet connection, 3.2 mm (1/8 in.) stainless steel compression fitting (Swagelok®)

Sampling

- Sample inlet, 1.6 mm (1/16 in.) stainless steel Valco® fitting with replaceable 5 μ m stainless steel filter
- Sample conditions, non-condensing gas of 0 °C to 110 °C
- Maximum sample inlet pressure, 100 kPa (14.5 psi)
- Software selectable sample pump or continuous flow
- Optional separate sample inlet can be installed in front or back

Communication

- Analog input, 6 signals (0-10 V)
- LAN (TCP/IP)
- Serial (RS232) for control of a stream selection valve
- Webserver, display instrument status on standard Internet browser



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Control/Data Handling Software

- Standard package, Galaxie™ Chromatography Software from Varian
- Additional calculation and reporting packages
 - Natural gas calculations, such as calorific value and relative density, meet ISO 6976, GPA 2171, and ASTM D 3588 standards
 - Custom calculations and reporting
 - I/O control, for control of analog output signals (4-20mA) and relays
 - PCI1000Com, for transferring results from Galaxie Chromatography Software from Varian, over Modbus TCP/IP to a DCS

19 in. housing for a dual channel Micro-GC configurable with a wide range of accessories

- Stream selection valves
- Micro-Gasifier
- Genie® Membrane Filters
- Sample pressure sensors

Options

- Micro-Gasifier, heated pressure-reducing
 - Controlled evaporation of LPG or LNG samples
 - Controlled reduction of high pressure gas samples
 - Operating temperature 100-150 °C, default set at 100 °C
 - Sample inlet pressure, 1000 psi/7000 kPa maximum
 - Sample carry-over, <1% RSD, as measured for hexane
 - Sample outlet pressure 7.5 psi +/- 2.5 psi
- Genie Membrane Filter
 - Fully inert membrane technology
 - Compliant for BTU calorific value applications
 - Removes particles from gas samples
 - Removes liquids from gas samples
- Stream Selection Valve, up to 16 sample streams for multi-stream analysis. Two main valve types are used with the 490-GC
 - SD (dead-ended) valves select one of 4 to 16 dead-ended streams
 - SF (flow-through) valves select a stream and send it to the outlet
- On-board universal accessory bracket (occupies one channel position in the Micro-GC)
 - Stream selection valves

- Micro-Gasifier
- Genie Membrane Filters
- Pressure regulator
- Sample pressure sensors
- Sample relief valves
- Gas injection by syringe
 - Front sample inlet
 - Septum cap or Luer-lock connection
 - Selection valve for syringe or standard pump injection
- Optional Field/Portable Case
 - Refillable gas containers, one or two 300 mL gas containers with maximum pressure of 12,000 kPa (1740 psi). Easy re-fill with certified adapter, safety relief valve to avoid over-pressurization, and pressure read-out per gas container
 - Up to two different type of carrier gases can be used. Choice of carrier gases:
 - Helium
 - Argon
 - Nitrogen
 - Rechargeable battery packs, with an optional second battery pack for up to 8 hours continuous operation
 - Two-channel system, 37 cm (h) x 29 cm (w) x 41 cm (d)
 - Four-channel system, 37 cm (h) x 29 cm (w) x 72 cm (d)
 - Weight with 490-GC, minimum of 10 kg (configuration dependent)



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Environmental Requirements

- Humidity (relative), 0% to 95% non-condensing
- Temperature, 0 °C to 50 °C
- Certified up to 2000 m altitude

Dimensions and Weight

- Two-channel system, 28 cm (h) x 15 cm (w) x 30 cm (d)
- Four-channel system, 28 cm (h) x 15 cm (w) x 55 cm (d)
- Weight, minimum of 5.2 kg (configuration dependent)

Power Requirements

- Main power, 90-130 Vac or 180-260 Vac, 50-60 Hz
Output, 12 VDC, maximum 130 W



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