Applications

- Petrochemical
- Coal chemical process gas
- Natural gas composition and heating value
- Hydrogen energy gas composition
- Special industry component analysis

For years, we have been committed to providing customers with professional gas chromatography technology. The PGC30 online gas chromatography platform supports mainstream detectors, such as standard FID detectors, micro FID detectors, standard TCD, MEMS-based micro TCD, and more. Based on this, the analyzer can meet the analysis requirements for various compounds in hazardous areas.

The newly upgraded PGC30 flameproof online analyzer features a built-in high-temperature injection valve, chromatographic oven, chromatographic detector, industrial computer, and display screen. As a process analyzer with a high explosion-proof level, users do not need to worry about safety regulations and applicability issues; it can easily meet customers' analysis requirements.

To accommodate the special configuration requirements in various analyses, the analyzer can incorporate up to 3 Valco switching valves, 2 FID detectors, and a 15-channel EPC system. For the FID detector, a micro hydrocarbon removal module can be integrated inside the instrument to reduce the impact of on-site air quality on instrument performance. Its built-in aerospace-grade insulation cotton provides excellent thermal insulation to ensure the lowest internal temperature.

The system uses TCP/IP communication internally, with each module independently controlled and operated. The standard MODBUS data transmission software externally allows flexible configuration and operation by customers.

Features

- Intrinsically safe, flameproof system
- Ex d IIC T6 Gb, Zone 1 & 2
- Reliable UniLite embedded control system
- Multiple detectors: FID, TCD, micro TCD, FPD, etc.
- Full-path EPC control and monitoring
- Supports no less than 16 sample switching channels

- Internal temperature and pressure compensation
- Verified by mainstream users for 10+ years

Unlike laboratory chromatographs or online analyzers modified from laboratory chromatographs, this instrument uses a verified UniLite instrument control platform based on an industrial-grade Linux operating system, eliminating concerns about software stability and scalability.

Optional Injection Types

Gas / Liquid Injection Switching Valve / Diaphragm Valve

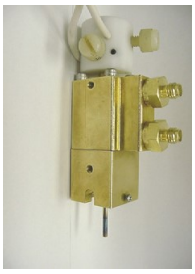
As a mature injection method, the analyzer provides various valve-based injection systems. Depending on application needs, the system can be configured with various types of valves, such as switching valves or diaphragm valves. To meet the needs of various applications, the instrument can integrate up to 4 switching valves or 6 diaphragm valves internally. For high-purity gas analysis, low-leakage or purged injection valves can be configured.

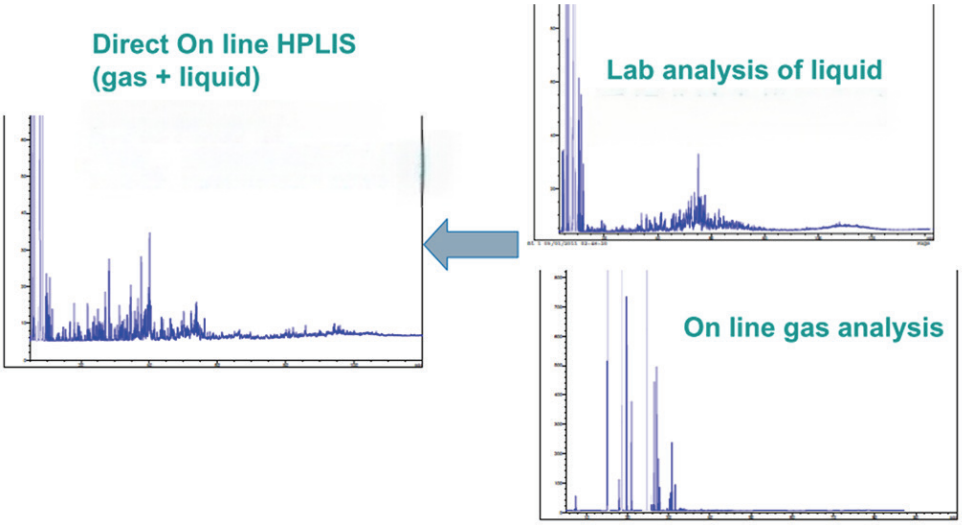
High-Pressure Liquid Injection Valve

For high-pressure liquid samples, especially those containing C1-C40 components, it is often necessary to separate the analysis of low-boiling and high-boiling components. During sample pretreatment, some components may crack, thus compromising the authenticity of the sample. The high-pressure liquid injection system enables in-situ injection of samples, allowing simultaneous analysis of low-boiling and high-boiling hydrocarbons. Specifically, it can be installed directly above the split/splitless inlet to achieve continuous analysis of liquid samples.

- Pressure resistance: Up to 1200 psi
- Sample loop: 0.06, 0.25, 0.5 (standard), 1.0, or 12.0 µL
- Sample vaporization chamber material: 316 stainless steel / Hastelloy, sulfur passivation available

- Installation: Located above the SSL inlet





A single injection can simultaneously analyze both light and heavy components

High-Temperature Sample Injection System

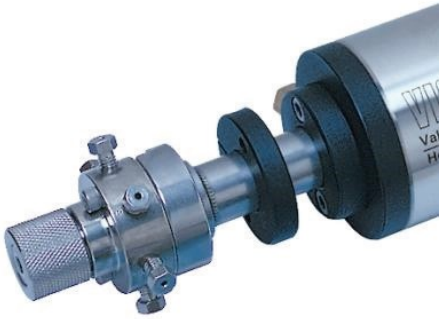
The valve box inside the PGC30 supports temperatures up to 330°C, ensuring undistorted analysis for high-temperature or high-boiling point samples. Patented penetration insulation joints enable lossless sample transfer.

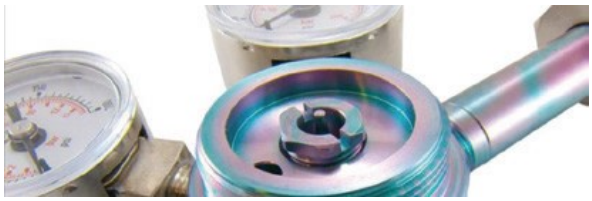
At the same time, all internal heating components are powered by 24V DC, ensuring system safety and reliability; combined with special aerospace-grade insulation cotton, the valves and pipelines inside the valve box operate within a uniform temperature zone.

- Maximum temperature: 330°C
- Valve body material: 316L stainless steel / Hastelloy or other custom materials

Special Inert Sampling System

For highly corrosive or easily adsorbed samples, full inertization is provided; whether it is various sizes of fittings, sample lines, sample loops, inlets, ball valves, or injection valves, appropriate components can be configured into the sampling system to handle trace analysis at ppb and ppt levels.





Optional Detectors

- FID - Flame Ionization Detector
- TCD - Thermal Conductivity Detector
- MEMS TCD - Micro Thermal Conductivity Detector based on MEMS technology
- FPD - Flame Photometric Detector
- PDHID - Pulsed Discharge Helium Ionization Detector
- PID - Photoionization Detector
- ECD - Electron Capture Detector
- EPD - Enhanced Plasma Discharge

FID Detector

To achieve system modularity and high stability, the FID uses a fully modular structure. One module includes the detector body, signal amplification, and transmission circuit. All connections are made via a 4-pin connector. This greatly enhances continuous operation stability and facilitates replacement. For situations with unstable on-site zero air, the system can be configured with an independent hydrocarbon removal module to ensure detector performance.

- Linearity ≥ 10^7
- Sensitivity ≤ 2.9×10^{-12} g/s (n-hexadecane)
- Carrier gas: Ar, N_2, Air, or H_2
- Air (auxiliary gas): ~350 ml/min
- Combustion gas: ~35 ml/min

TCD Detector

As an important detector, TCD is a powerful tool for analyzing permanent gases and ppb-level components. The single-filament thermal conductivity used significantly improves the sensitivity of traditional detectors to 5-10 ppm. For lower concentration analysis

requirements, a MEMS-based TCD detector is provided, with sensitivity as low as 1 ppm (methane).

- Single-filament TCD: Linearity ≥ 10^5, Minimum detection limit ≥ 400 pg propane/ml (He carrier)
- MEMS micro TCD: Linearity ≥ 10^6, Minimum detection limit < 1 ppm (methane, He carrier)
- Carrier gas: He, Ar, N_2, or H_2

PDHID Detector

For ppb-level component analysis, a mature and stable non-radioactive pulsed discharge ionization detector can be used. This detector is a non-destructive, highly sensitive detector with good response to all gases except neon, with sensitivity as low as 10 ppb.

- Linearity: ≥ 10^4
- Sensitivity: < 10 ppb methane
- Carrier gas: He

FPD Detector

The FPD detector is a flame photometric detector specifically used to selectively detect sulfur and phosphorus compounds in chromatographic effluents, with high selectivity and sensitivity. The filter inside the detector removes interfering light, eliminating hydrocarbon interference with sulfur and phosphorus compound samples.

- Linearity: ≥ 10^3
- Sensitivity: Sulfur: 2.0×10^{-11} g/s
- Carrier gas: H_2, N_2, He

PID Detector

The PID uses an ultraviolet (UV) lamp to ionize organic compounds into positive and negative ions detectable by the detector. The detector measures the charge of the ionized gas and converts it into a current signal. After detection, the ions recombine into the original gas and vapor. PID is a non-destructive detector with good sensitivity for carbon-containing organic compounds.

- Linearity ≥ 10^4
- Minimum detection limit < 10 ppb methane
- Carrier gas: None

EPD Detector

The principle of EPD is to apply a high-frequency, high-intensity electromagnetic field around the quartz cell of the detector. Under the influence of the electromagnetic field, the carrier gas and impurity gases are ionized into plasma, which has high energy. When the sample enters the quartz cell, it is ionized by the plasma and emits light of different wavelengths, which is converted into electrical signals via corresponding filters and photodiodes. For ppb-level permanent gases in high-purity gases, it provides high detection performance.

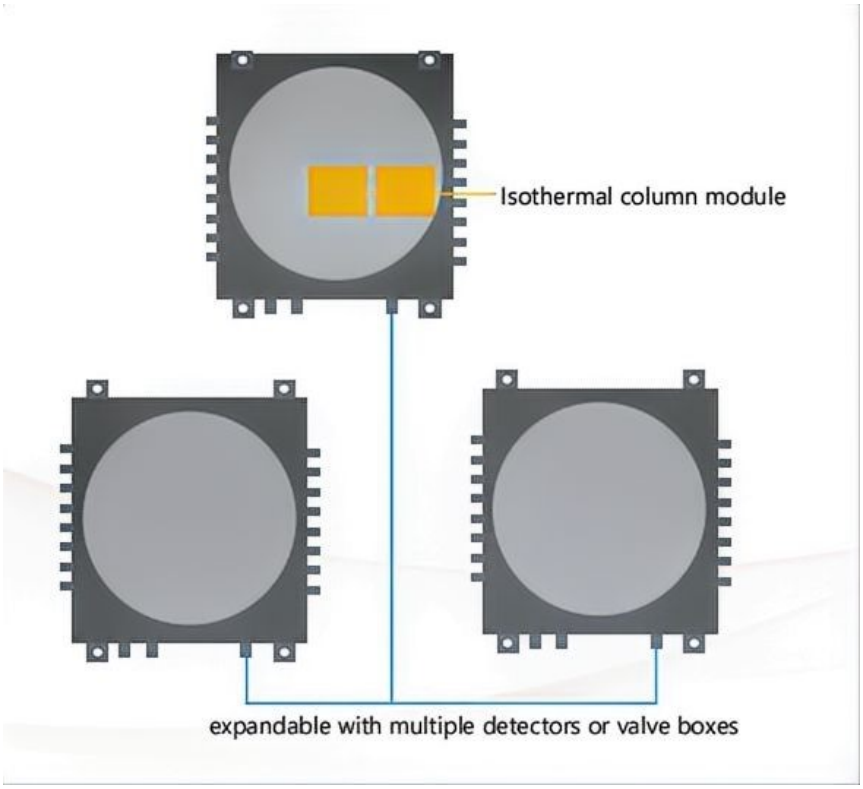
- Linearity ≥ 10^3
- Sensitivity < 1 ppb H_2
- Carrier gas: He

Column Heating

- A single instrument can have 2 built-in isothermal column ovens
- Optional rapid heating column
- Multiple instruments can be connected in parallel to expand the number of detectors

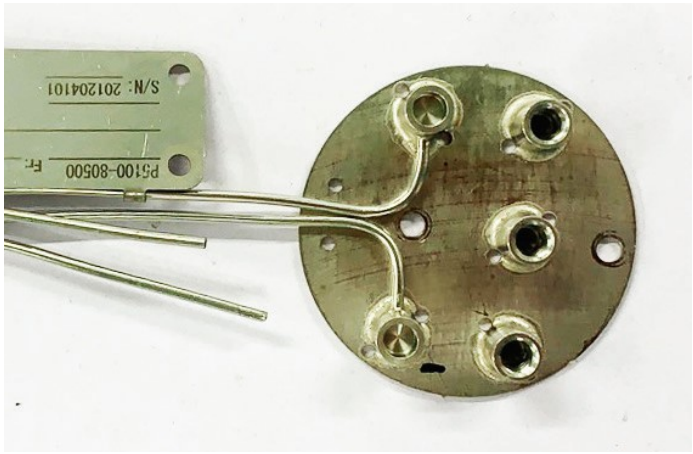
Column Oven

The instrument can be configured with 2 independent valve boxes and 2 chromatographic column ovens to meet various on-site application needs. The built-in column oven can reach temperatures over 330°C, accommodating no less than 2-4 packed columns or 2 capillary columns. For complex applications requiring multiple detectors, heated valve boxes, and injection valves, the instrument supports direct expansion of the entire system's functionality via TCP/IP, enabling parallel control and data analysis of multiple instruments (modules).



On-Column Heating Column Module

The PGC30 supports the installation of low thermal mass columns, enabling rapid heating and cooling of the column. The maximum heating rate can exceed 500°C/min. Compared to traditional air bath column oven technology, the analysis cycle of this column is significantly shortened. Combined with Deanswitch microfluidic control technology, it offers new features such as heart-cutting, multi-dimensional GC, and comprehensive two-dimensional GC.



UniLite Industrial Chromatography Control Software

- Industrial real-time operating system, reliable process chromatography
- Built-in fully automatic data processing module
- Wizard-based calibration, worry-free operation