

# GAS CHROMATOGRAPHY SYSTEM



## Performance parameters of GC 2000

GC 2000 is a special-purpose detection and analysis instrument for laboratories based on the basic principle of gas chromatography. It adopts the advanced electronic flow pressure control system, microfluidic plate control technology, high-precision independent temperature control system, and high-sensitivity detector, which, in combination with the flexible and friendly user interface, high-speed sampling frequency and signal processing speed, and networked data and control platform, meet the user's requirements for the capability, reliability, stability and advanced nature of instrument analysis.

### Chromatographic performance

- Retention time repeatability < 0.008%
- Peak area repeatability < 0.5%

### System performance

- Supporting simultaneous installation:
  - Two injection ports
  - Four detectors
  - Three detector signals
- Electronic digitized data output of the advanced detector, enabling quantitative analysis of peaks over the full range of the detector in a single injection
- Electronic flow control for all injection ports, detectors, and auxiliary gas flow circuits
- Possible for up to 6 electronic flow control modules to be installed, to provide control over up to 18 gas circuits.
- Accuracy of pressure setpoint and control approaching 0.001 psi, providing more accurate retention time for low pressure analyses.
- Electronic flow controller for capillary columns with five column flow control modes: Constant pressure, pulse, and programmed pressure rise and flow increase to the fourth order; possible to calculate the average linear velocity of the column.
- Standardized pressure and temperature compensation to keep test results remain unchanged even when the laboratory environment changes.
- Possible for users to automate leak checks before each run, or run the check function at any time during maintenance or diagnostics. Users are alerted when a leak is detected so that immediate action can be taken to correct and reduce system downtime.

### Color touch screen interface

- 8-inch high-resolution full-color capacitive touch screen, with the resolution at 1280 (RGB) \*720, color depth at 16.7M, and pixel pitch (mm) at 0.138\*0.138.
- Customized host control software based on the Android system, with the graphical interface, full touch for operation, the UI also graphical, in combination with intelligent functions such as self-diagnosis reminder, self-leakage detection, etc., reducing the difficulty of use and maintenance, and for easily grasping of the status of the instrument.



### Column oven

- Specification: 28x31x16 cm, possible to hold up to 3 capillary columns.
- Temperature range applicable to all columns and their separation requirements. Room temperature+4°C to 450°C
- Temperature setting accuracy:  $\leq 0.1^\circ\text{C}$ .
- Maximum heating rate:  $\Omega 120^\circ\text{C}/\text{min}$ .
- Supporting 32 oven heating gradients, 33 constant temperature platforms, and possible to realize programmed temperature rise and programmed temperature rise.
- Maximum running time: 999.99 min.
- Oven cooling rate: 6 minutes from 450°C to 50°C, at a room temperature of 20°C.
- Ambient temperature sensitivity: 1°C change in ambient temperature, change in column oven average temperature < 0.01°C.

### Electronic gas circuit control

- Standardized pressure and temperature compensation functions.
- Electronic pressure control with ruby damping, with pressure control accuracy at  $\pm 0.001$  psi.
- Pressure units are available in psi, kPa, bar.
- Programed pressure rise/flow rise: Up to fourth order.
- Supported carrier and makeup gas types: Ar, N<sub>2</sub>, He, H<sub>2</sub>.
- Stability of carrier gas flow rate: Less than 1%/10 min.

### Injection port

- Supports installation of up to two injection ports.
- Fully electronic gas circuit control, supporting pressure compensation and temperature compensation.
- Injection port type:
  - Ultra- deactivated split/splitless injection port.
- Compatible with all capillary columns (inner diameter: 0.1 mm–0.53 mm).

- Split ratio up to 12500:1 to avoid column overload.
- Supporting, split, splitless, pulse split, pulse splitless injection and other injection modes.
- Maximum operating temperature: 450°C.
- Temperature setting accuracy:  $\pm 0.1^\circ\text{C}$ .
- Carrier gas saving mode, making it possible to reduce gas consumption without compromising chromatographic separation effects.
- Electronic septum purge flow control to effectively eliminate chromatographic ghost peaks.
- Flow control range 0–500 mL/min ( $\text{N}_2$ ), 0–1250 mL/min ( $\text{H}_2$  or He).
- Injection port supporting ultra-deactivated processing, eliminating active sites on surface and improving detection sensitivity, peak shape and reproducibility of active substances.

## Detector

- Supporting installation of up to four detectors.
- All detectors supporting electronic gas circuit control and electronic switch control, as well as pressure compensation and temperature compensation.

## Flame Ionization Detector (FID)

- Minimum detection limit:  $<1.2 \times 10^{-12}$  g C/s.
- Linear dynamic range:  $10^7$ .
- Baseline noise:  $<1 \times 10^{-13}$  A.
- Baseline drift:  $<1 \times 10^{-12}$  A within 30 min.
- Signal acquisition frequency: 10 Hz, 20 Hz, 50 Hz, 100 Hz, and 200 Hz available.
- Auto ignition and flameout protection.
- Hydrogen leak protection function.
- Maximum operating temperature: 450°C.

## Electron Capture Detector (ECD)

- Minimum detection limit:  $<4.2 \times 10^{-15}$  g/mL.
- Linear range:  $10^4$ .
- Baseline noise:  $<0.02$  mV.
- Baseline drift:  $<0.05$  mV within 30 min.
- Data acquisition rate: 10Hz, 20Hz, 50Hz, 100Hz, and 200Hz available. Radioactive source:  $\beta$  ray from  $^{63}\text{Ni}$  ( $\leq 10$  mCi).
- Maximum operating temperature: 350°C.

## Flame Photometric Detector (FPD)

- Single wavelength flame photometric detector, with high selectivity and sensitivity for sulfur or phosphorous compounds.
- Minimum detection limit:  $<9 \times 10^{-14}$  g/s (P);  $<5 \times 10^{-12}$  g/s (S)
- Linear range:  $\Omega_B f(P)$ ;  $\Omega_B f(S)$
- Baseline noise:  $<2 \times 10^{-12}$  A.
- Baseline drift:  $10^{-10}$  A within 30 min.
- Maximum operating temperature: 350°C.

## Auxiliary electronic flow circuit control

- Two positions on the rear of the GC of the GC 2000 for the auxiliary electronic flow circuit control modules.

## Environmental conditions

- Operating ambient temperature:  $5^\circ\text{C}$ – $35^\circ\text{C}$ .
- Operating ambient humidity: 5%–95%.
- Limit temperatures for storage:  $-40^\circ\text{C}$  to  $70^\circ\text{C}$ .
- Power supply requirements: Voltage: AC 220 ( $\pm 10\%$ ) V; Frequency: 50 ( $\pm 10\%$ ) Hz.

## Safety and Regulatory certifications

- GB 4793.1–2007 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements.
- GB/T 15479–1995 Technical requirements and test methods of insulation resistance and insulating strength for use in industrial process measurement and control instruments.


## Other specifications

- Height: 486 mm.
- Width: 556.4 mm.
- Thickness: 558 mm.
- Weight: 38.1 kg.
- Supporting up to 6 valves.
- Independent heating zone, 8 heating zones in total with the column oven excluded.


### For more Info:


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