

PR 2100 gas chromatograph



PERICHROM

INSTRUMENTATION
SCIENTIFIQUE

Generalities

Compact dual channel GC, with an ergonomic keyboard for an easy set up and control.

The PR 2100 offers improved performance in a modular environment easily implemented with a large selection of injectors, detectors and auto-samplers to increase the productivity.



Oven

Front opening and spacious oven provides easy access to columns.

A double door ensures an excellent isolation of the oven contributing to a quiet and safe operation.

A propeller located on the rear wall offers an efficient mixing of the oven atmosphere and provides high temperature homogeneity and stability.

Modern electronic regulation combined with proven technology ensures precise heating rates.

A trap door driven by a stepper motor microprocessor controlled allows admission of air for fast cooling.



keyboard

The waterproof membrane, touch-tone keypad with VFD vacuum fluorescent display, simplifies parameters entry and system control.

Keys are grouped logically. Real time data are displayed in 4 lines of 20 characters.

In addition, 8 LED's lets you know at-a-glance the GC status including the oven ramp tracking.

The keypad provides:

Sequence programming:
up to 6 complete methods can be stored and edited including

- Oven programming.
- Injectors and detectors settings.
- Flow and pressure programming with settings and real time values displayed.
- Events time settings.

Electronic pneumatics control

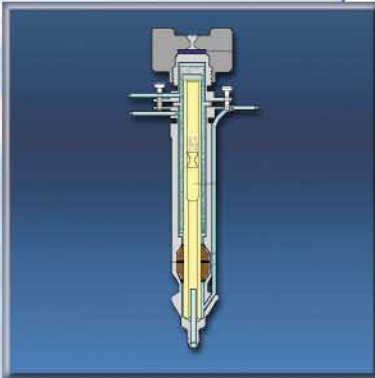
Full electronic pneumatics control offering up to 10 regulations according to the needs.

Offers levels of performance not achievable with mechanical pneumatic system.

Variability in instrument set-up is reduced; it saves time and increase analysis reproducibility.

Flows and pressure are stored in the method offering better regulatory compliance.

Injectors



Split-splitless injector is designed for both split and splitless modes in constant or programmable pressure. Glass insert is specially designed for minimising discrimination and optimising vaporisation. It includes septum purge.

For use with capillary column and widebore column with an adapter.

Packed column injector with wide bore column adapter

PTV injector is an injector combining large volume injection and fast linear temperature programming.

This flexible injector offers the possibility of direct thermal desorption into the capillary column.

On-column injector is designed to provide cool on-column injection specially recommended as a non-discriminating method of high molecular weight components.

Ideal for the quantitative analysis of samples with high boiling points compounds and for the analysis of thermally labile compounds.

Its unique design with head cooling system allows the injector to remain at low temperature allowing quick stabilisation before the next injection.

The injector is cooled down by an air-cooling system provided with the GC.

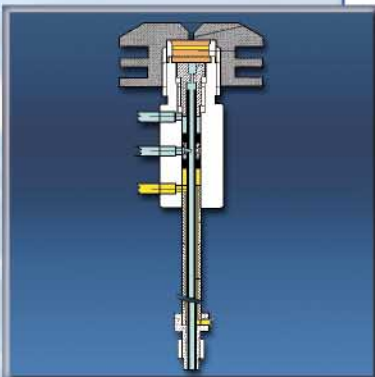
For use with capillary and widebore column with easily interchangeable inserts.

Manual or automatic valves are used for gas and liquid samples.

This injection system is composed of a valve with an internal or external sample loop. The valve can be manually activated or operated automatically. Valves can be either heated or not.

The GC accommodates virtually any configuration for optimum separation.

PERICHROM's application department can design custom configurations. Some standard custom packages are available.



Detectors

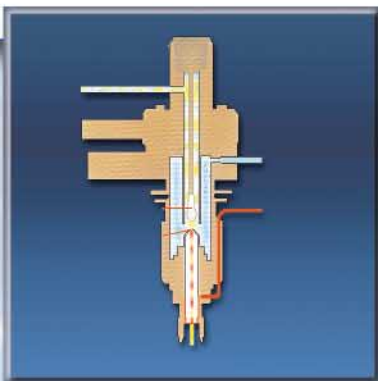
Compounds detection after their chromatographic separation requires the most selective and sensitive detection

PR 2100 gas chromatograph offers a complete range of detectors:
TCD, FID, ECD, NPD and FPD.

Nitrogen Phosphorous detector (NPD)

Selective detector for nitrogen and phosphorous containing compounds. Based on an alkaline bead incorporating an electronically controlled heater, it offers a quick stabilisation and a constant response during an extended lifetime.

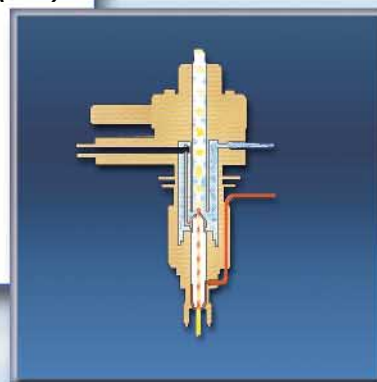
Another unique advantage is that it operates without flame providing a higher sensitivity.



Flame ionisation detector (FID)

Widely used for organic compounds, its unique design permits to achieve unmatched limits of detection.

Operates in capillary mode without make-up gas.



Flame photometric detector (FPD)

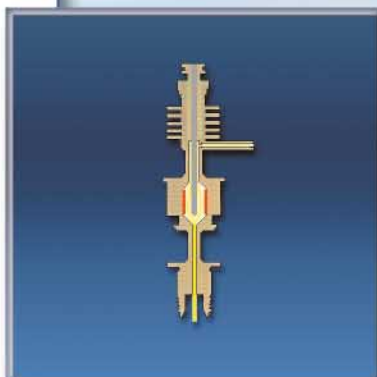
Dual flame FPD for selective detection and trace amount analysis of sulphur and phosphorus compounds.

Dual-flame design overcomes limitations such as quenching effects due to hydrocarbons.

Electron capture detector (ECD)

Selective detector for halogenated compounds. Mainly used for chlorinated pesticides analysis.

Signal linearisation is made by means of a modulated frequency offering a superior linear dynamic range.



Thermal conductivity detector (TCD)

Non destructive detector based on a flow through cell offering a wide choice of filaments according to sample corrosiveness.

Electronic pressure control offers gas security to prevent filaments and easy flow adjustment for single column configuration.

Autosamplers

Headspace autosampler HSS 32

"Valve and loop" generation. Unlike other design it uses no syringe and no transfer line. This unique design prevents sample loss or contamination and offer excellent reproducibility.

Vials are magnetically transported into the incubator oven for constant times with optimised procedure so that a sample is always ready when previous run is completed.



ALS 104 liquid autosampler

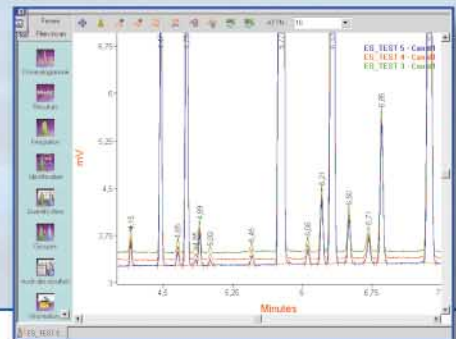
The ALS 104 is an affordable autosampler offering uncompromised performance.

The external position of the tray provides the double advantage of free access to the injectors and of avoiding temperature rise by conduction, what would be prejudicial to thermally labile samples.

The ALS 104 offers a widened range of syringes contributing to a higher precision.

Stepper motors ensure precise settings allowing operation with the lowest sample volume.

Ability to inject into 4 injectors.



Chromatography workstation Winilab III

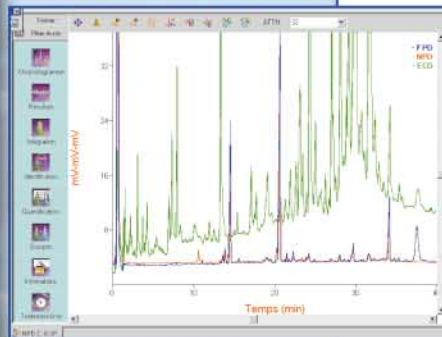
Optimised for use with Windows NT4.0, Winilab III is also compatible with any Windows platform starting from Windows 98.

It can acquire and process up to 4 signals simultaneously whatever the separation technique used (HPLC, GC,...).

The set-up of a new instrument, including those from other manufacturers, is as

simple as installing a new printer on your PC.

Winilab workstation offers full control of the PR 2100 gas chromatograph.



Technical Specifications

PR 2100 Basic oven

- Multiple-level temperature program with six ramps settable from 0.1°C to 120°C/minute and seven isothermal levels.
- Minimum oven temperature: Ambient + 4°C
- Cryogenic system optionally available for temperature between -100°C and ambient.
- Maximum oven temperature: 450°C.
- Rapid cool down from 450°C to 50°C in less than 7 min.
- Four independent heated zones (up to 450°C) for individual control of injectors and detectors plus auxiliary zones.
- Six programs memorisable through keyboard
- Keyboard with fluorescent display (4 x 20 characters, 32 keys)
- Modern electronic architecture based on Motorola® microcontrollers
- External communication with one RS 232, 4 external events control, 2 logic inputs and 2 logic outputs.
- Column oven size : 29 x 28 x 17 cm (13.8 litres) allows for simple side by side installation of columns
- Consumption: 2700 VA max.
- Overall dimensions: 45 x 51.5 x 48 cm
- Weight: 30 kg

Optionals:

- Cryogenic option for sub-ambient temperature operation: as low as -40°C with carbon dioxide and -100°C with nitrogen.
- Programmable optional heated zone
- Additional board for 2 extra heated zones

Pneumatic unit

- One or two modules with 5 Electronic Pressure Regulations each allowing complete electronic pressure regulation for carrier gas, split adjustment, combustion gases (air and Hydrogen for flame detectors)
- Specification of each module:
- Numerical PID regulation with 5 independent pressure regulations.
- Choice of 2 pressure ranges: 0-400, or 0-100 kPa.
- Adjustment in increments of 1 kPa
- Direct flow adjustment on the split line
- Gas saver capabilities.

Injectors

Selection of one or two injectors among:

- Packed and widebore capillary column injector
- Split-splitless injector with constant or programmable pressure
- On-column injector
- PTV injector with programmed control of temperature and pressure and large volume capabilities.
- Gas or liquid sampling valve

The manufacturer reserves the right to change any specification without notice.

Detectors

Choice of one or two detectors among 5 different detectors:

- **FID Flame Ionisation detector**
Vertical assembly. Gas tight system.
Operating temperature from ambient to 450 °C
Polarisation: 250V negative or positive
Sensitivity range selectable from 10⁻⁹ to 10⁻¹² A/mV
Detectability: 10⁻¹² g/s
Dynamic linearity better than 10⁸
Make-up gas not required due to zero dead volume design
- **TCD Thermal conductivity detector**
Cell volume 600 µl or 140 µl
Four WX filaments (options: W2X, AuW, Ni, Pt-Ir)
Operating temperature up to 360°C
Detectability: 10⁻¹⁰ g/ml of nC10
- **FPD Flame photometric detector**
Double flame technique for selective detection of sulfur and phosphorous compounds
High voltage unit for photomultiplier and supply for the ignitor
Sensitivity range selectable from 10⁻⁹ to 10⁻¹² A/mV
Dynamic range 10⁷ phosphorus
Logarithmic program for sulfur calibration
- **ECD Electron Capture detector**
Nickel 63 source mounted in a sealed cylindrical chamber
Central electrode
Linearised by frequency modulated supply
Dynamic linearity: 5.10⁴
Detectability: better than 4.10⁻¹⁵ g/s of lindane
- **NPD Nitrogen Phosphorus Detector**
Head adaptable on FID body
Alkaline ceramic source with temperature regulation
Operating temperature : 600-700°C
Linearity: better than 10⁶ for Nitrogen
Detectability: 10⁻¹³ g/s nitrogen, 5.10⁻¹⁴ g/s phosphorus

Peripherals

- **ALS Automatic Liquid Sampler**
105 position interchangeable tray with 2 ml vials
Simple syringe set-up
Injection volume from 0.1µl to 10µl in 0.1µl steps
Stepper motors for precise settings
Free access to the injector for manual operation
Two 10 ml vials for wash and waste
XYZ technology allowing injection in 4 different injectors
Stored up to 9 operating methods
- **HSS Headspace Autosampler**
Calibrated sample loop directly connected to a needle
Incubation oven with shaking capabilities
Constant incubation times with optimised procedure
32 position interchangeable tray
Free access to the injector for manual operation
Stepper motors for precise settings
Stored up to 9 operating methods

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