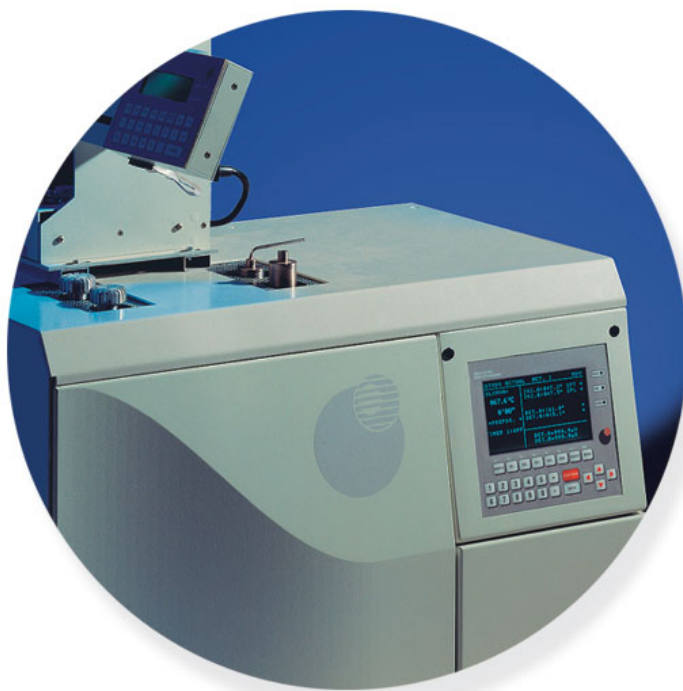


KONIK HRGC 4000

The result of 30 years of experience in
designing and manufacturing HRGCs



KONIK HRGC 4000® 1





The universe of molecules...
The world of KONIK

more than 25 YEARS of
CREATIVE INNOVATION

www.konik-group.com

**The power of sample
preparation, separation
and identification**

KONIK-Tech is an
ISO 9001 Certified Company

EUROPE +34 93 590 28 40
USA 305 557 22 12

KONIK HRGC 4000 B series



**Fast, Reliable,
Accurate & Productive**

Dual Standard and Fast Chromatography
Oven with $\pm 0.01^{\circ}\text{C}$ stability
Cold Septum, Purge-less Injector
Electronic Flow Controls



Evolution?... No! Revolution!

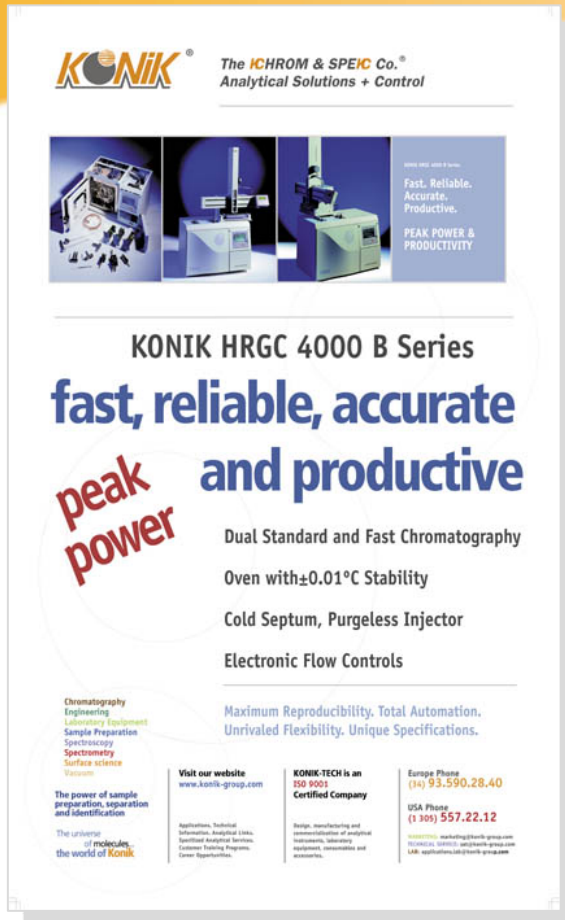
- Since 1978... Persistent specialization and commitment to an innovative design concept based in the integral modularity of: chassis, pneumatics, microprocessor, injectors, detectors, data systems,...



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KROM+MASS

Upgradable, retrofittable, expandable, versatile, ergonomic, powerful...



KONIK® The **ICHROM & SPEIC Co.**®
Analytical Solutions + Control

Fast. Reliable. Accurate. Productive.
PEAK POWER & PRODUCTIVITY

KONIK HRGC 4000 B Series
fast, reliable, accurate and productive
peak power

Dual Standard and Fast Chromatography
Oven with $\pm 0.01^\circ\text{C}$ Stability
Cold Septum, Purgeless Injector
Electronic Flow Controls

Chromatography
Engineering
Laboratory Equipment
Sample Preparation
Spectroscopy
Surface science
Vacuum

The power of sample preparation, separation and identification

The universe of molecules, the world of Konik

Maximum Reproducibility. Total Automation. Unrivaled Flexibility. Unique Specifications.

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KONIK-TECH is an ISO 9001 Certified Company

Design, manufacturing and commercialization of analytical instruments, laboratory equipment, accessories and consumables.

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USA Phone (1 305) 557.22.12

marketing@konik-group.com
KONIK-TECH@konik-group.com
LAB_applications@konik-group.com

- Modules are easily retrofitted from one model to another
- Low maintenance
- Low obsolescence
- High residual and permanent value
- Ecological (modules are always re-used)

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Microprocessor Module



KONIK HRGC 4000® 5

- Large LCD menu-driven display
- Interactive
- User friendly
- Flexible customized options
- Available in most roman alphabets



Microprocessor Module **CRASH THROUGHS**

- Large graphical and interactive LCD screen
- Temperature program and output chromatograms displayed in real time
- 10 methods storage and method linking. Unlimited number of methods in PC hard disk
- 3 password levels
- Power fail memory protection
- Control of temperatures of 8 isolated blocks
- Overheating protection
- Autodiagnosics and self-testing.
- Autoswitch on/off.
- 4 extra timers control

KONIK HRGC 4000® 6



Oven



KONIK HRGC 4000® 7

- Fastest heating and cooling oven
- PID temperature control
- $\pm 0.1^{\circ}\text{C}$ accuracy displayed
- Maximum reproducibility and minimum down time
- Overheating protection



Oven **CRASH THROUGHS**

- High performance and low thermal inertia oven design with expanded temperature range (from -90°C with cryo option to 490°C in 0.1°C steps)
- Optimized control of two oven flaps for near ambient.
- Up to 15 ramps upon request (5 ramps standard) from 0.1°C/min to 40.0°C/min in 0.1°C/min steps (up to 100.0°C/min optional)
- Temperature resolution: $\pm 0.01^\circ\text{C}$ and accuracy: $\pm 0.1^\circ\text{C}$ PID controlled
- RAC[®] (Ready Active Control)
- Allows ensambling up to 5 automatic valves for multidimensional chromatography and MS and FT-IR interfaces

KONIK HRGC 4000[®] 8



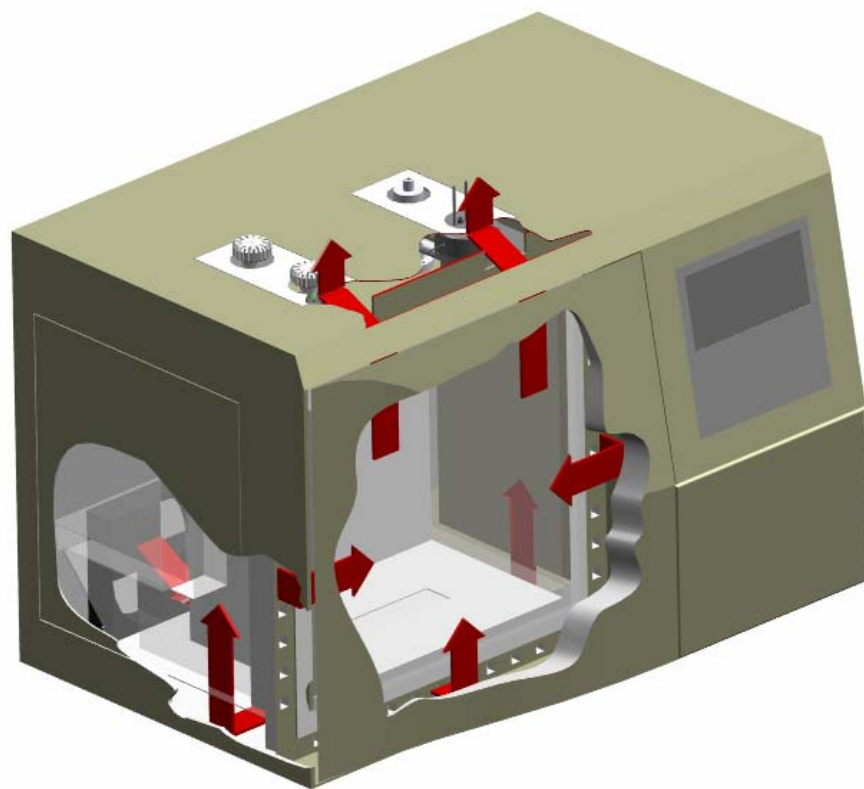
Forced Air Flow

- Two ovens: one inside another guarantees maximum accuracy. Maximum stability: $\pm 0.01^{\circ}\text{C}$. Displayed: $\pm 0.1^{\circ}\text{C}$
- Fast forced air cooling from the bottom to the lateral flap
- Minimum cooling time between runs: from 250°C to 50°C in less than 5'

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Forced Air Flow Diagram



KONIK HRGC 4000® 10

PID flaps control:
maximum stability even at
temperatures close to
room temperature

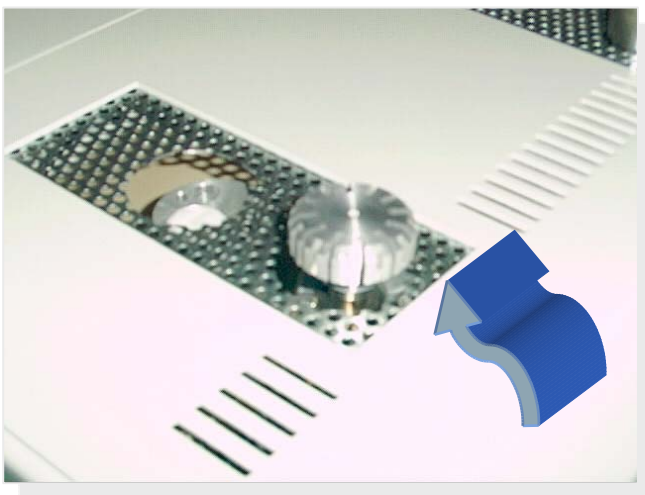
Minimal thermal inertia



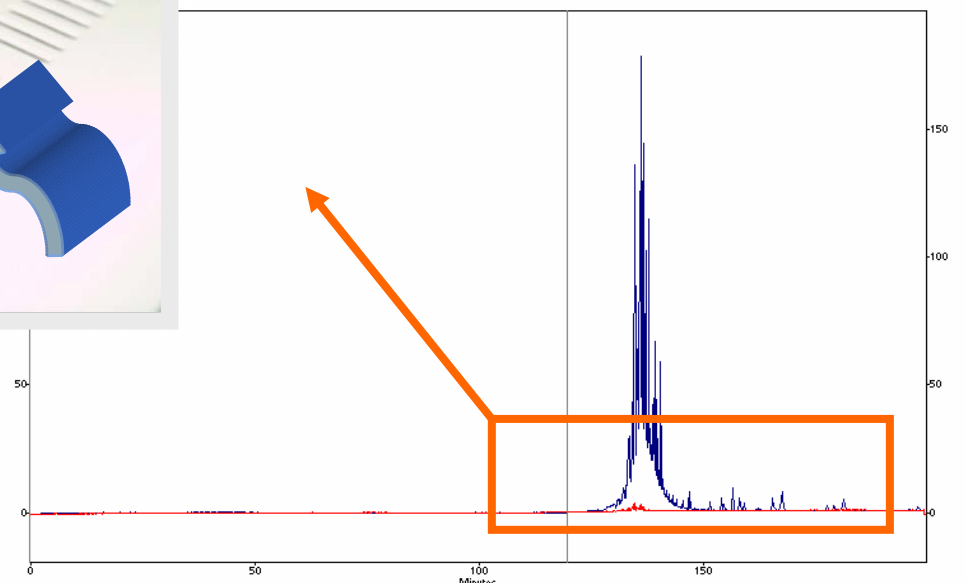
Injection Systems

- Cold septum, purge-less multimode and universal injector. The guarantee for sample integrity from low boilers to high boilers and gas savings
- All injection options available for any type of column: capillary, megabore, packed, PTV, ...
- Temperature: 25 to 490°C in 0.1°C increments (450°C advisable)
- Accuracy: 0.1°C PID controlled
- Overheating protection
- Purge-less capillary injector with 5 operational modes
- Programmable splitless time and ratio
- Control RAC[®] sets on/off “ready” signals

Cold Septum Purge Less Tight Injector



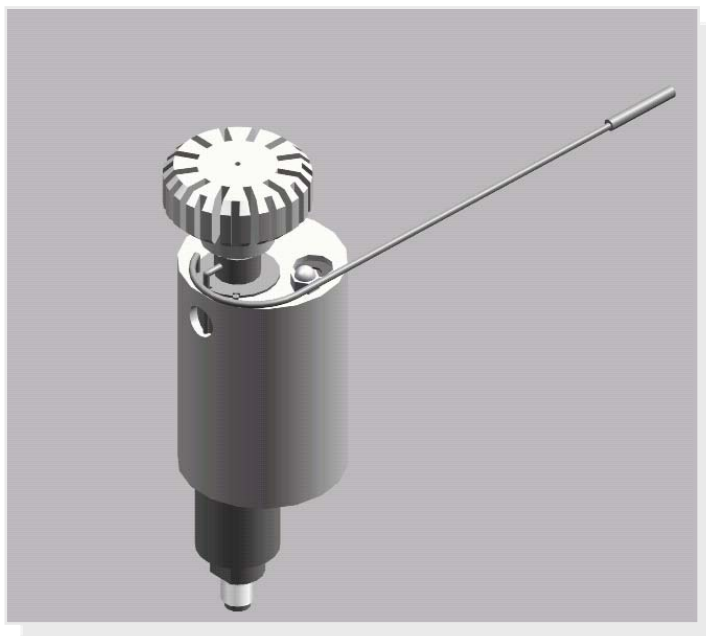
— With forced air
— Without forced air



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Injection Systems: **Conventional and On-Column**



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Conventional Injector

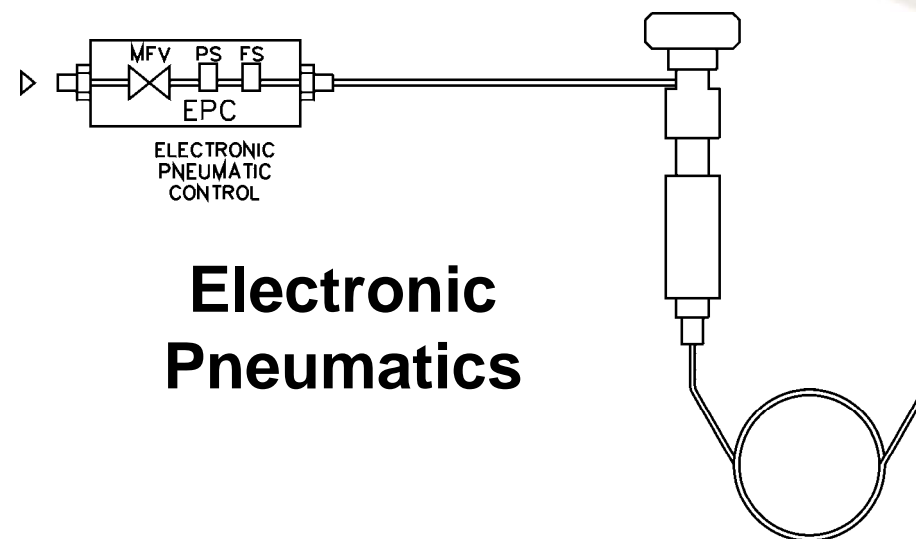
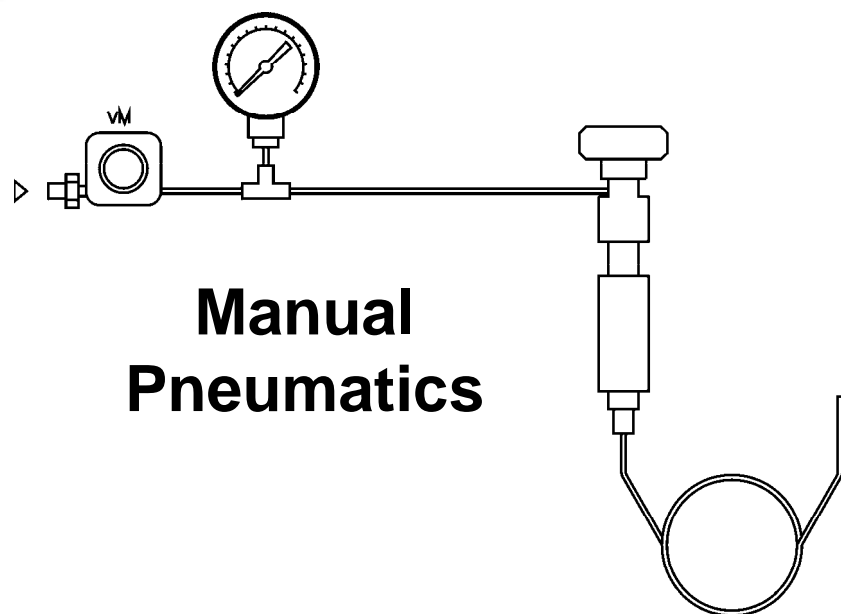
- Packed and Megabore Columns.
- Flow / Pressure ramping.

On-column Injector

- Liquid Sample directly to the column through the proper syringe
- Packed, mega-bore and capillary columns.



Injection Systems: **Conventional and On-column**



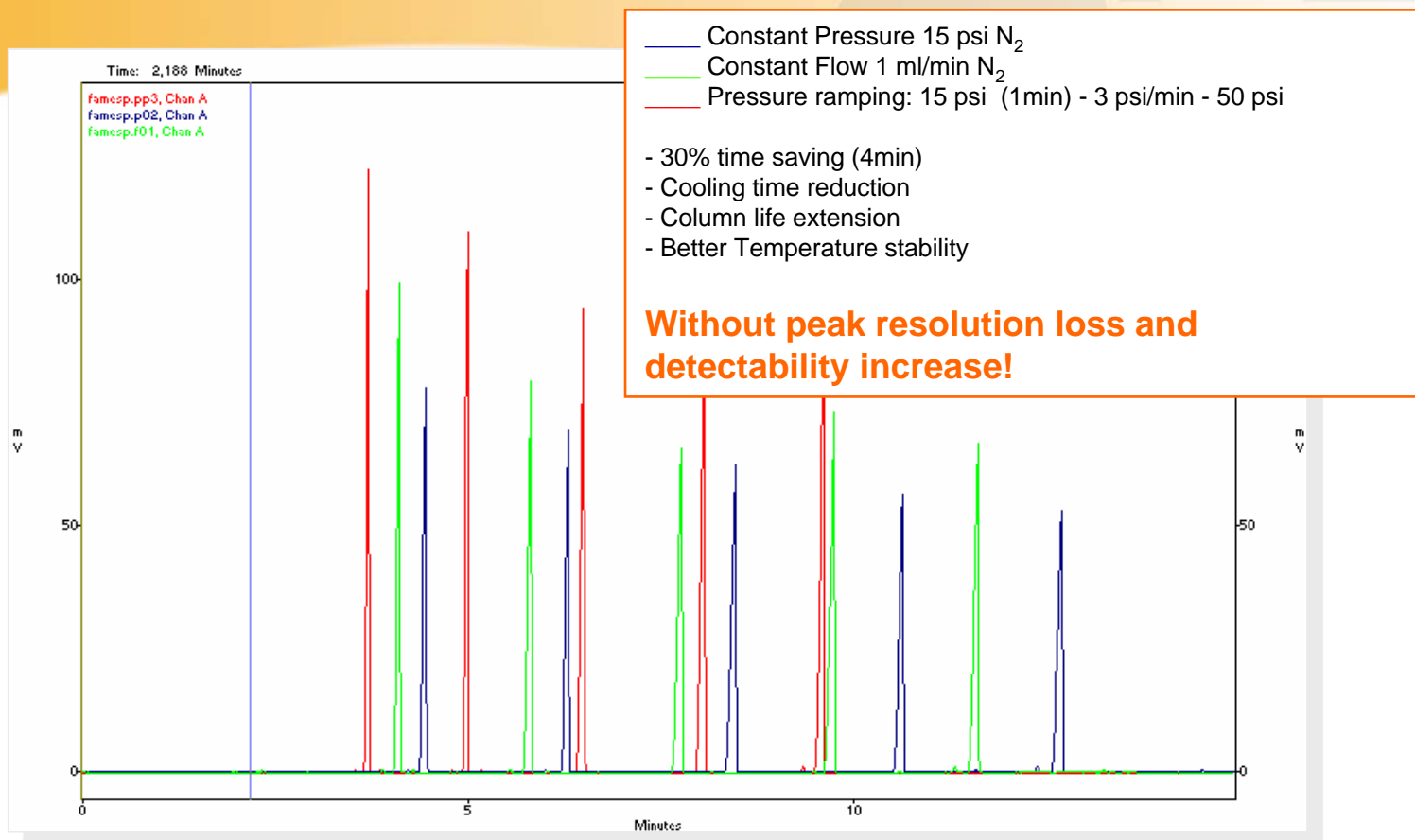
With **Electronic Pneumatics** you get better reproducibility and positive and/or negative pressure and flow programming.

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Temperature/Flow Programming (+/+)

ULTRA-FAST CHROMATOGRAPHY



KONIK HRGC 4000® 15

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Injection Systems: **Capillary Injector**

- Universal Multimode Injector with cold septum purge less. The guarantee for sample integrity. Gas saver.
- 5 operative modes: split, splitless, split-splitless, splitless with Autosampler and conventional injector.
- Any options for any column type: capillary, megabore, packet (SS or glass)...
- Flow / pressure programming.

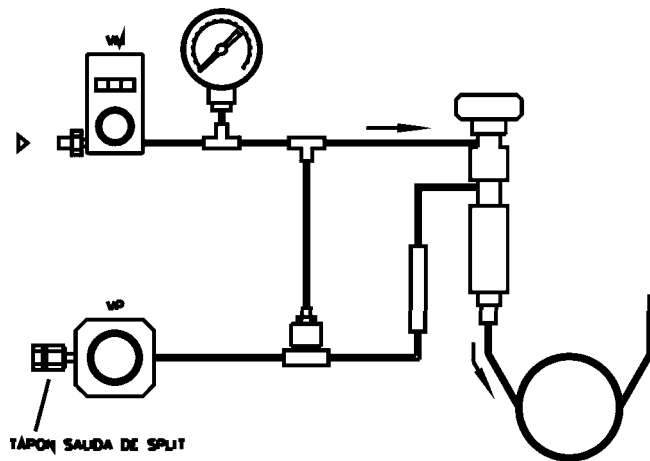


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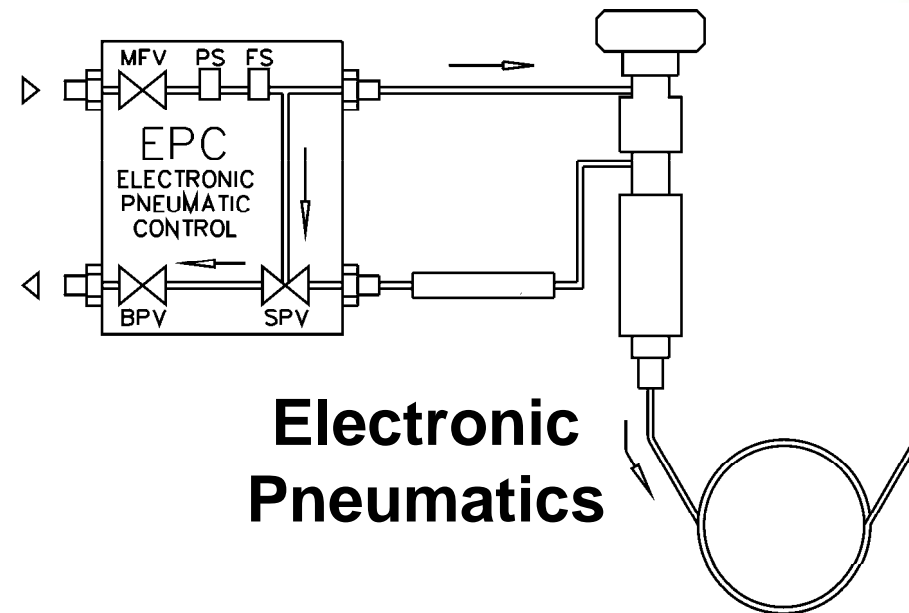


Injection Systems: **Capillary Injector**

Manual Pneumatics



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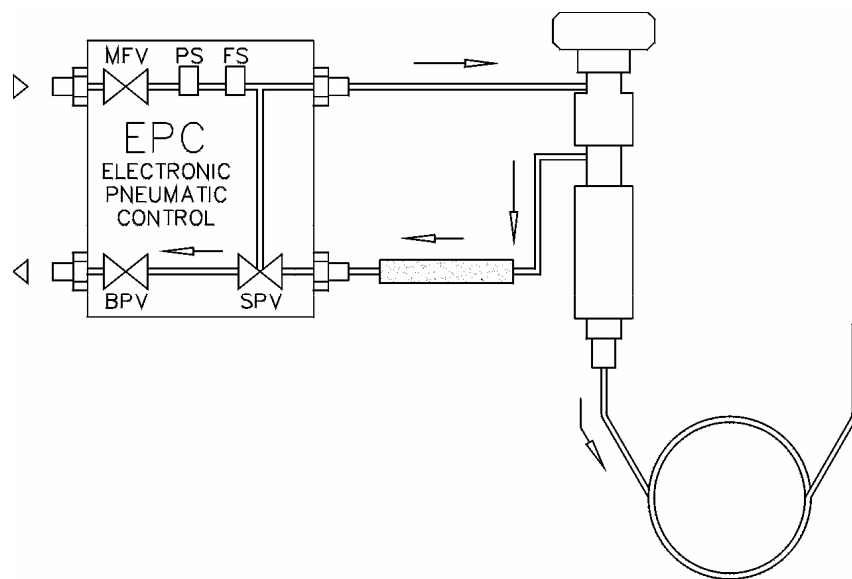


Electronic Pneumatics

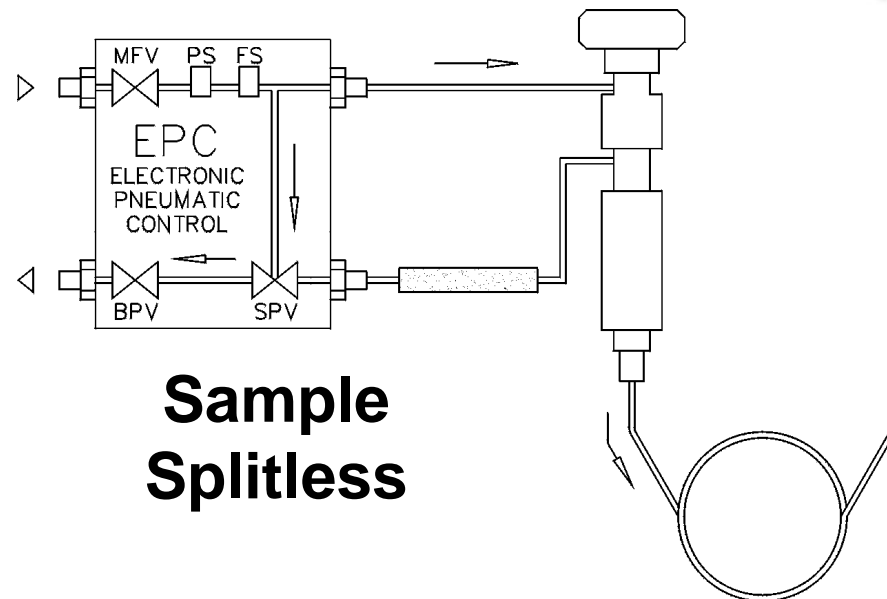
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Injection Systems: **Capillary Injector**

Sample Split Mode



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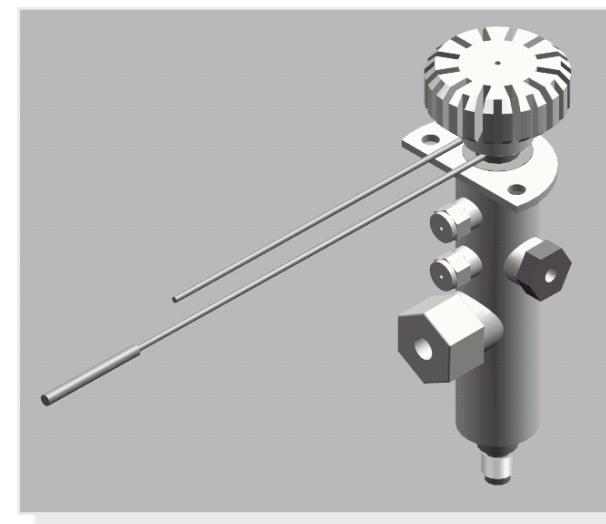


Sample Splitless

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Injection Systems: PTV

- Cool sample injection. Sample vaporization by means of temperature programming.
- Injector cooling: Air, CO₂ or LN₂.
- Large Volume Injection (1 ml).
- 5 operative modes: split, splitless, split-splitless, split-splitless with Autosampler and conventional injector.
- Special Liners with adsorbent traps.

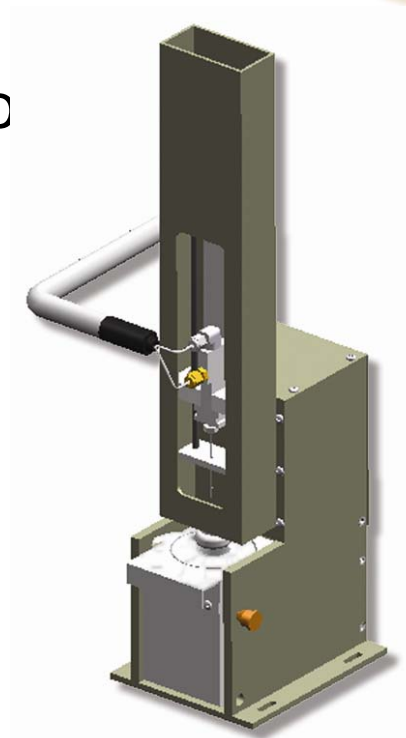


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Injection Systems: **HS Monovial**

- Sample preparation method for complex matrices.
- Analysis of volatile compounds in vapor phase in equilibrium with liquid/solid phases.
- 6, 10 or 20 ml vials.
- Different injection volumes: programmable injection time.
- EPC Control of Carrier and Pressurization Gas.

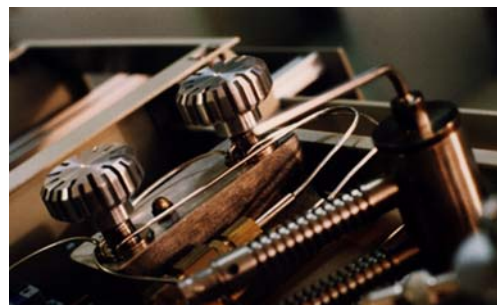


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Detection Systems

- Full range of digital detectors: FID, TCD, ECD, NPD, FPD, FPD/FID, PID, DID, HECD, OLFACTORY, PDHID/PDECD, MASS
- Modular and interchangeable with digital electrometers / amplifiers for any type of column
- Independent temperature programming from ambient to 490°C in 0.1°C steps
- Overheating protection
- RAC[®] sets on/off “ready” signals
- Automatic autozero
- Highest detectability

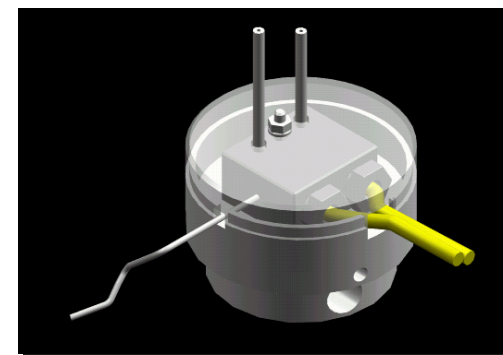
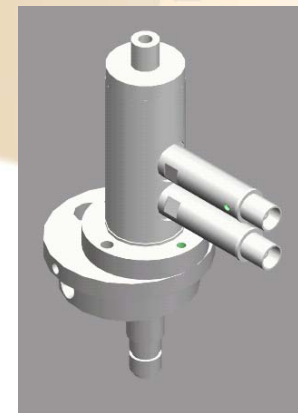


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Detectors: FID and TCD

- **Flame Ionisation Detector - FID**
 - Extremely sensitive. Exhibits a very wide linear dynamic range.
 - Universal detector: used for analysis of organic compounds (C-H groups).
- **Thermal Conductivity Detector - TCD**
 - Great universality and linearity.
 - Analysis of permanent gases and organic/inorganic compounds (CO_2 , CS_2 , H_2O , H_2 , N_2 , light hydrocarbons ...).
 - Rhenium/Tungsten; Gold/Tungsten filaments.
 - Non destructive detector. Possibility of coupling with other detector.



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Detectors: ECD, NPD and FPD (FID/FPD Dual)



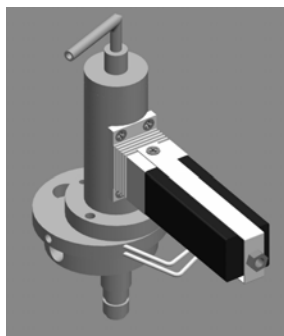
- **Electron Capture Detector - ECD**

- Extremely sensitive and highly specific.
- Ideal choice for analyzing halogenated compounds: chlorinated pesticides, (PCB), trihalomethanes,...



- **Nitrogen Phosphorous Detector - NPD**

- Very sensitive and specific to Nitrogen/Phosphorous containing compounds.
- Alkaline bead thermostatically controlled.

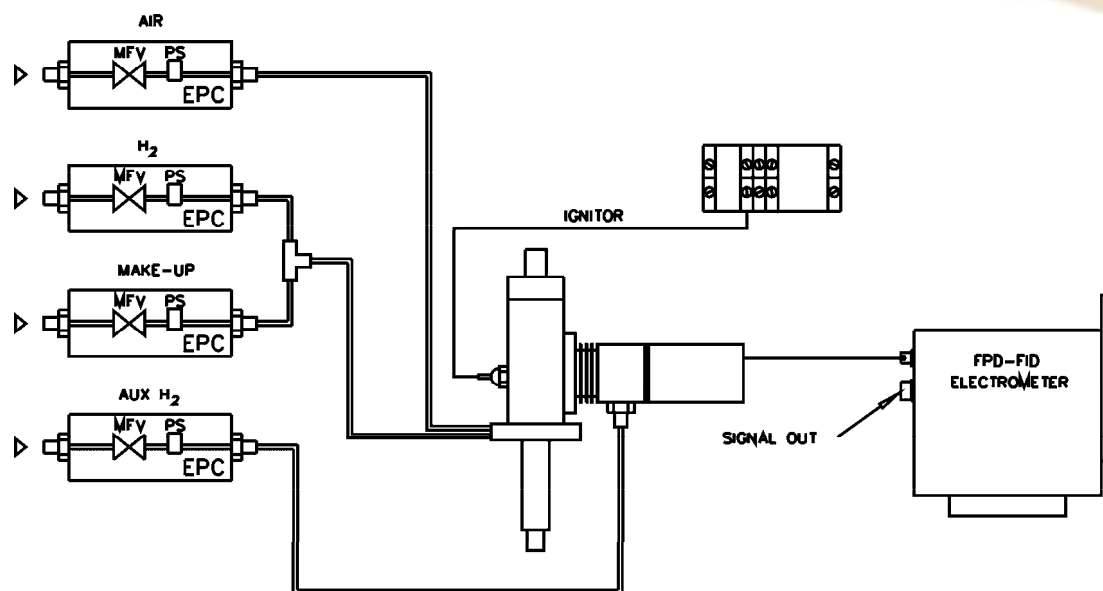


- **Flame Photometric Detector (FID/FPD Dual)**

- Photometric detector.
- Great sensitivity and selectivity to Sulphur and Phosphorous containing compounds.
- 393nm (S), 525nm (P) filters
- Dual FID/FPD.



Diagram of the Detection System



With **Electronic Pneumatics**: Digital setting and control of make-up gas and digital control of all detector gases

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Versatile and Innovative

- **All the injectors:** No septum purge required
- **EPC:** EPC of carrier, make up and detectors gases controlled and regulated through microprocessor and software. Independent pressure and flow programming
- **Complete range of detectors:** Maximum sensitivity and linearity

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Technical Document
Reference: HRGC4000B.rus.k / KNE-419-000 / REV. 4

Konik TechDoc

Konik HRGC 4000 B Series Peak Power

TECHNICAL SPECIFICATIONS DOCUMENT

Brief Description of the Instrument
The KONIK HRGC 4000 B Series Peak Power Gas Chromatograph is a High Resolution modular system integrated in one structural unit. Its unique design allows for constant upgrading and equipment modernization to any future analytical requirement, without modifying its external appearance or basic structure.

The most common upgrades, as well as the necessary modifications for specific applications were considered while designing the HRGC-4000 B Peak Power. The optimal configuration for any specific application is obtained by selecting the basic version and customizing the unit by adding the required options for the analysis desired: injector options, detector options, valve switching devices, backflushing devices, autosampler, head space, control software, data processing, etc.

Operational Performances
The system is capable to operate with capillary columns as well as with 530 micron megabore, 1/8" OD Stainless Steel packed columns and 1/4" OD glass Columns. It allows up to 4 independent injection devices: Capillary Universal Multimode Split/Splitless Injector, Standard Packed Injector 1/8", On-Column Glass Injector 1/4", On-Column Capillary Injector, PTV, Static Head Space, and Gas Sampling Valves.

Up to 3 different detector can be fitted: FID, TCD, ECD, NPD, FPD, HHD, HECD, PID, DID, Ofactory, MSD, Nitrosamines, etc.

The microprocessor control unit includes a LCD graphical retro-illuminated 240 x 180 points display (12 x 6.5cm) which provides visualisation of the different monitor, assessment and programmed, as well as gas temperature chromatogram.

It also provides and computer Systems and tional RS-232C.

Other features include: heating protection, heated flow protection, heating block and compressor.

The temperature Derivative microprocessor temperature block according programmed.

Size: 640 x 400 x 530 mm
Weight: 50 kilograms
Voltage: 110V/210A, 2

Main Injection Systems
Capillary Universal Multimode Split/Splitless Injector

- Microprocessor controlled.
- It can be used with any type and all sizes of capillary columns, 530 micron megabore, 1/8" SS packed columns and 1/4" Glass Packed Columns.

KONIK® HRGC 4000 B series Gas Chromatograph

KONIK GROUP
Chromatography • Spectrometry
Analytical Solutions • Control

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Agents and Representatives worldwide

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- **User friendly:** Easy menus via LCD graphic display
- **Configured at will:** Optimizable for any application
- **Complete range of peripherals:** Data Systems, Autosamplers, Head Space, Pyrolyzers,...
- **Total automation and control:** RS232 & RS485



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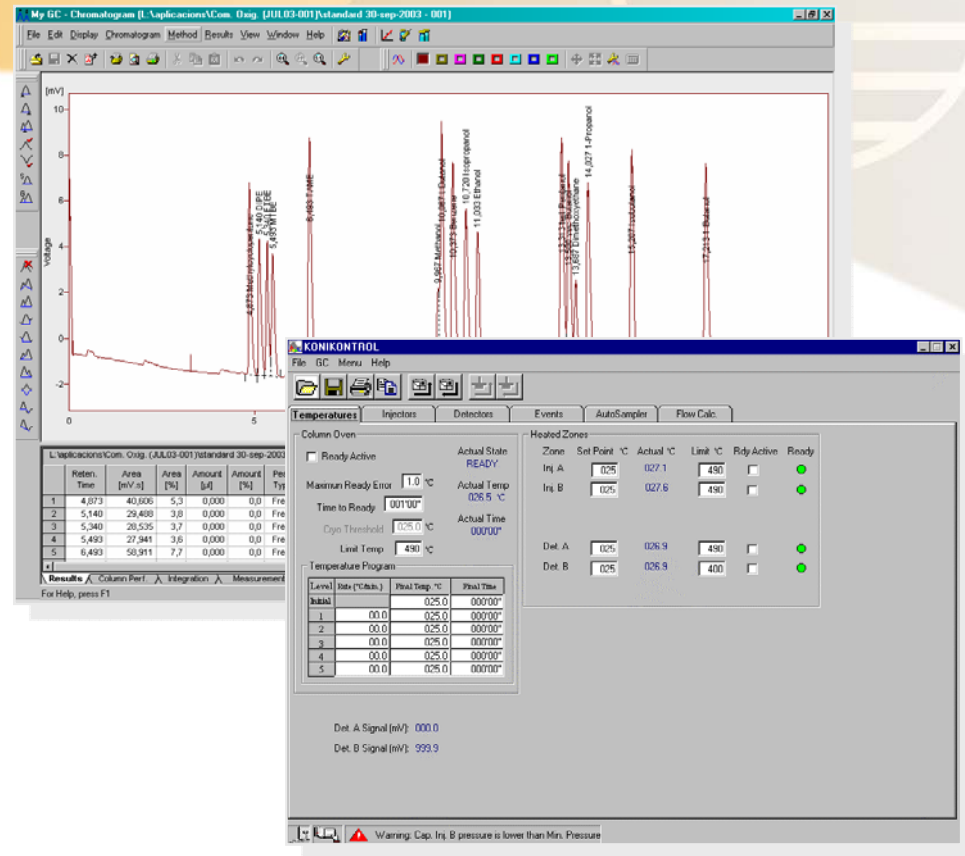
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Total Automation

In **Sample Preparation**
 Static and Dynamic
 Head Space, SP μ E,
 Thermal Desorption,
 Multi-vial instrument

In **Autosamplers** both
 for HRGC and HPLC

In **Integration and
 Control Software**
 Konikrom Plus[®]



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