

POLLUTION

Fast on-line analysis, where you need it



GCX

MicroGC on-line

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Based on micro gaschromatographic technology, the GCX is a powerful GC solution that provides fast, accurate, reliable analysis of gas samples.

It is ideal for Process Analysis, Industrial Health&Safety and Environmental Monitoring. Its rugged construction ensures long-term, trouble-free operation.

EASY AND EFFICIENT

The innovative modular system can perform the analysis of complex environmental matrices with a single sample. Up to four analytic modules can be installed on the GCX, each of them containing a microinjector, a detector and a high-resolution capillary column.

The GCX is equipped with Laptop or rack PanelPC and MC² Software for the complete management of the instrument.

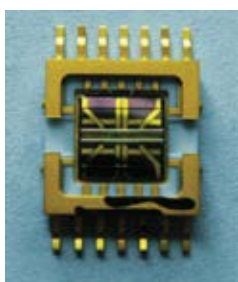
RUGGED AND RELIABLE

The GCX is a really tough instrument thanks to its zinc-coated welded steel chassis and to a careful study of its structure; it can perform complex analysis under the most demanding conditions; it is suitable for the most extreme applications typical of the online analysis with no human intervention.

FAST AND ACCURATE

The high-performance analytical modules of the GCX allow to perform an analysis even at low ppm concentrations. Thanks to the fast detection system it is possible to complete most of the analysis in few seconds.

The GCX is equipped with a high-sensitivity universal detector, based on the Micro Electro-Mechanical System (MEMS) technology, that makes it 10 times more sensitive than the conventional Thermo Conductivity Detectors, capable of measuring down into the low ppm range.



KEY FEATURES

- The modular design offers the maximum flexibility in the application and it reduces the method development leadtime
- The used TCD is up to 10 times more sensitive than the traditional high-conductivity detectors, allowing to detect the gas components at low ppm concentrations
- The analytical modules based on micro capillary column allow analysis in few seconds
- The rugged system for 19" rack installation allows its use in critical conditions
- The MC² software Suite is designed to allow non-expert users to drive the GCX and it permits instrument setup, schedule and control of monitoring activity, multi-stream analysis, advanced reports
- The full range of sampling equipment expands the possibilities in terms of sample handling and multi-stream plants
- The built-in LAN connectivity allows the user to control the instrument remotely

APPLICATIONS

- Composition and Calorific Power of Natural Gas, GPL, Biogas
- Odorants (THT, TBM etc.), Natural Gas
- Alternative Energy (Fuel-cell, Biogas)
- Hydrocarbons (Refineries, Methane, etc.)
- Chemical and Process Industries
- Fermentation Process
- Industrial Hygiene and Worker Safety
- Process Analysis
- Environmental and Air Monitoring
- Industrial Emissions
- Custom Solutions



CONTINUOUS ON-LINE MONITORING

The GCX is designed to work without any intervention of the operator after its installation and initial configuration.

The volatile compounds in the air or in a gas stream are analysed on-line, providing a continuous monitoring of different chemicals in a single analytic cycle.

Moreover, the GCX system allows to directly send via FTP the results of the analysis at the end of each cycle anywhere in the world. The user can access the system remotely to view the data or to activate an alternative analytical method.

The communication with the system can be managed via Ethernet and the results of the analysis are stored in the PC connected to the instrument.



Example of GCX rack installation with PanelPC, multi-stream sampler and pressure reducer for Carrier Gas.

The MC² software manages the whole system automatically.

ACCESSORIES

MPX and MPS multi-stream samplers

MPX is designed for distance sampling of low corrosive agents. It allows the managing of 8, 16, 24, 32 sampling points within 100 metres (basic version) or 300 metres (high-range version). It keeps monitored the status of the pump, the functioning of the electrovalves and the status of the filters.



MPS is designed to be easily re-located. It is equipped with an AISI316 rotating valve for aggressive samples.



MPS-H10 is completely heated at adjustable temperature to avoid the condensation of hot and humid samples. It is equipped with an AISI316 rotating valve with separate draining pipes.



Sample Conditioning

Specific accessories for sample conditioning are available. These systems extract the condensation, lower the temperature and regulate the pressure.

EDU3 is a thermal enricher/desorber, configured to be interfaced and automatically controlled by GCX. It allows to concentrate the sample up to 100 times (depending on the analyte). It includes sample and transfer line, swagelock 1/16 joint, setup interface, 3 Tenax concentration tubes.



Sample Lines

Complete equipment for sampling installation: fluxbox, terminals with sinterized filters for particulate, sampling lines in inert material (steel, PEEK or PTFE) heated at controlled adjustable or fixed temperature. Available in different length, temperature range and connections.



ANALYTICAL MODULES

The GCX can analyse simultaneously a wide range of compounds since it can contain up to four MicroGC modules. Each of the modules can use its own carrier gas (H_2 , He, Ar, N_2) and sample inlet.



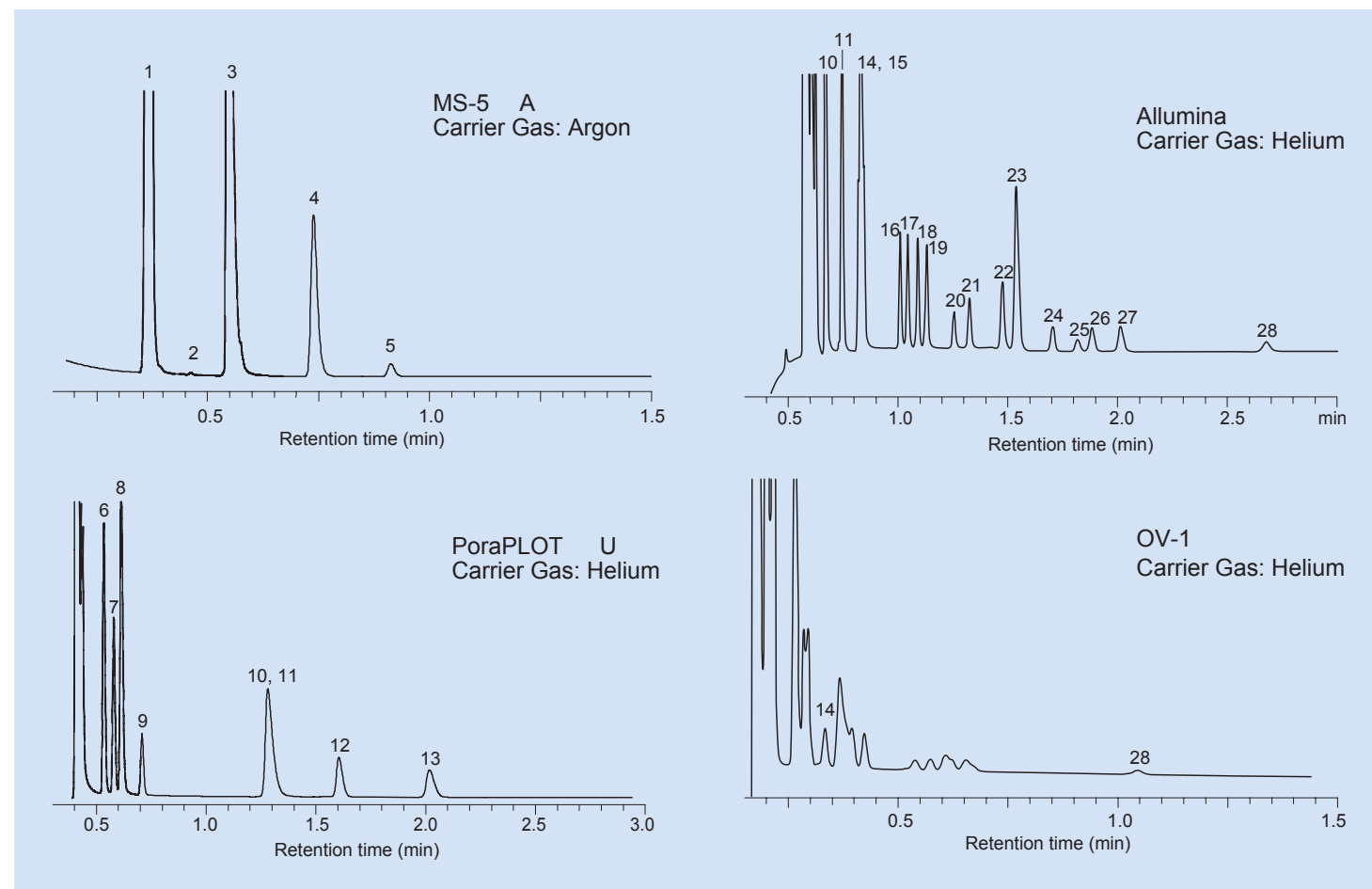
Each module is an autonomous MicroGC that integrates a microinjector, a high-resolution capillary column and the TCD detector based on MEMS technology. Choosing the analytical modules means to identify the appropriate injector and the chromatographic column.

Selection of three injectors:

- Variable volume: it allows greater analysis flexibility, even at low ppm concentration
- Fixed volume: it allows to obtain the maximum repeatability
- Backflush: it preserves the separation column from undesired contaminants

Main chromatographic columns with their respective applications:

OV-1	Hydrocarbons C4-C9, aromatics, solvents, halogenated anesthetics. BTEX, CFC, mercaptans, acroleine, oxygenates, etc.
OV-1701	Natural gas odorants (THT), hydrocarbons C6-C10
CpSil13CB	Natural gas odorants (TBM), hydrocarbons C3-C9, sulfurate, amines and halogenated compounds
MolSieve 5A	Permanent gases: CH_4 , CO , H_2 , N_2 , O_2 , He, Ar, Ne, etc.
PPQ / PPU	Hydrocarbons C1-C3, volatile solvents, N_2 , N_2O , CO_2 , CH_4 , NH_3 , H_2S , SO_2 , acetylene, halogenates, free fatty acids, etc.
Stabilwax	High boiling point solvents. Alcohols, aldehydes, ketones, nitro compounds, etc.
Alumina	Hydrocarbons C3-C6, olefins and isomers

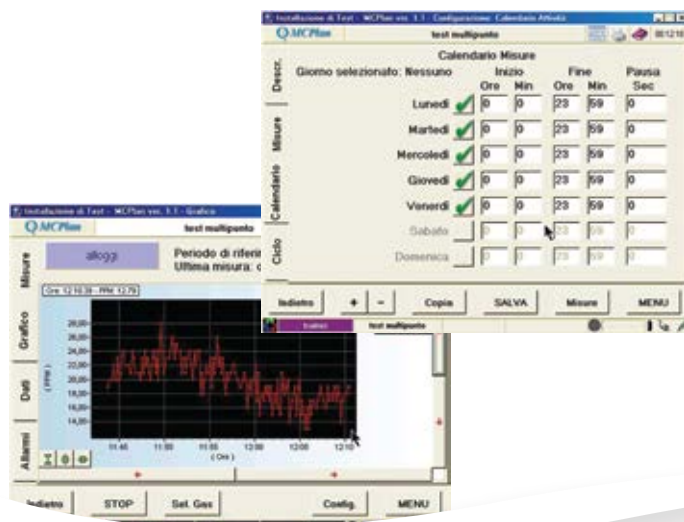


Peaks Indication

- | | | | |
|--------------------|--------------------|---------------------|-----------------------|
| 1. Hydrogen | 8. Ethane | 15. n-Butane | 22. 1,3-Butadiene |
| 2. Oxygen | 9. Acetylene | 16. trans -2-Butene | 23. Metilacetilene |
| 3. Notrogen | 10. Propane | 17. 1-Butene | 24. 3-Methyl-2-butene |
| 4. Methane | 11. Propylene | 18. iso-Butene | 25. trans-2-Pentene |
| 5. Carbon monoxide | 12. 1,2-Propadiene | 19. cis-2-Butene | 26. 1-Pentene |
| 6. Carbon dioxide | 13. Propyne | 20. iso-Pentane | 27. cis-2-Pentene |
| 7. Ethylene | 14. iso-Butane | 21. n-Pentane | 28. n-Hexane |

MC²

MicroGC Software



Smart, user-friendly, efficient

MC-TUNE

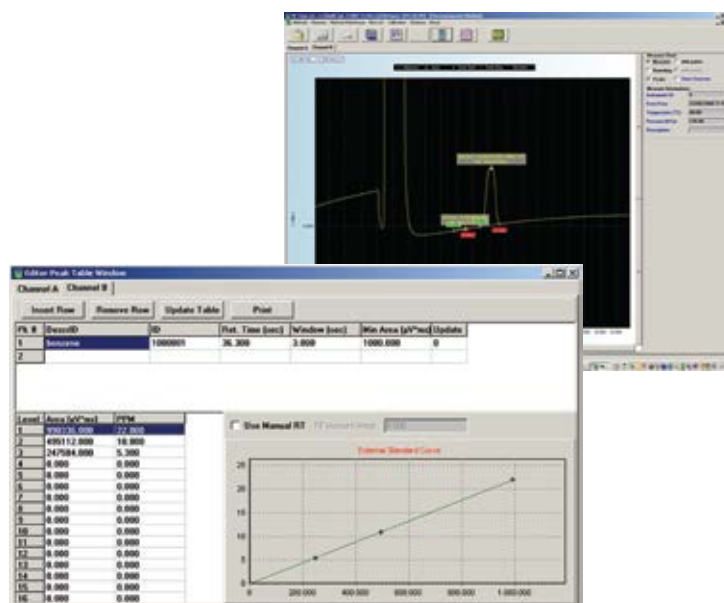
Chromatographic analysis

The analysis software **MC-Tune**, designed to maximise the efficiency of the microgaschromatographic technique, allows to:

- set the instrumental operating parameters
- drive the optional sample pre-concentration system
- perform the qualitative and quantitative calibration
- indicate to the instrument how to process the output signal

Through MC-Tune it is possible to perform an analysis and look over the chromatogram.

If the instrument has previously been calibrated, it will provide name and concentration of the compounds.



MC-PLAN

Automatic management of the activity

The **MC-Plan** software combines an easy and intuitive interface with an extreme flexibility, allowing to:

- work on different user levels protected by password
- select different preconfigured analytical methods
- start an analysis and read immediately the qualitative and quantitative results
- select days, hours and recurrence of the measurements for a continuous automatic monitoring
- export the data (on USB flash drive) and generate printable reports
- read on a synoptic chart the instantaneous concentration of every gas in every sampling point, with alarms for alert thresholds
- view on tables and charts the temporal trends of the concentrations
- send a visual, acoustic or remote alert (e-mail or sms) when the chosen limits are exceeded
- set the gases to be measured in each sampling point
- customise the timing of measurements and their sequence in case of multi-stream monitoring activity

MC-PLAN plug-in

MC-PLAN-MP "Multi-stream"

Allows to drive the multistream sampler of the series MPX, MPS and MPS-H10.

MC-PLAN-MP "Particles"

Allows to manage in an integrated mode a complete system of indoor fixed particle counters for cleanrooms.

MC-PLAN-R "Advanced Report"

Allows to build up advanced reports with average values, trends, etc. and to print them out on an external printer.

MC-PLAN-R-CP "Report Calorific Power"

Allows to determine the values of calorific power (including Wobbe index and relative density) and to extract the complete report.

KEY FEATURES											
Size	132.5mm x 483mm x 437mm - 3U Rack 19"										
Weight	From 10.6 Kg to 13 Kg depending on the installed modules										
Power supply	100 - 240 VAC										
Operating temperature	0°C - 50°C										
Sampling conditions	Indoor and Outdoor with appropriate protection from atmospheric agents										
Carrier Gas	Helium, Hydrogen, Nitrogen, Argon. Work pressure 500 kPa										
Column temperature	Isothermal operation: 30-180 °C, 15°C above environmental temperature										
Sample conditions	Temperature 0 - 120°C, pressure 0 - 210 kPa										
Detector	TCD based on the Micro Electro-Mechanical System (MEMS) technology										
Detection limits	Low ppm										
Dynamic range	10 ⁶ ± 10%										
Repeatability	RSD at constant temperature and pressure (for C1 to C6 components at % level): <table border="0"> <thead> <tr> <th><i>Injector type</i></th> <th><i>Area repeatability</i></th> </tr> </thead> <tbody> <tr> <td>Variable volume</td> <td>≤ 1% RSD</td> </tr> <tr> <td>Backflush, timed mode</td> <td>≤ 1% RSD</td> </tr> <tr> <td>Fixed volume</td> <td>≤ 0,2% RSD</td> </tr> <tr> <td>Backflush, fixed mode</td> <td>≤ 0,5% RSD</td> </tr> </tbody> </table>	<i>Injector type</i>	<i>Area repeatability</i>	Variable volume	≤ 1% RSD	Backflush, timed mode	≤ 1% RSD	Fixed volume	≤ 0,2% RSD	Backflush, fixed mode	≤ 0,5% RSD
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Fixed volume	≤ 0,2% RSD										
Backflush, fixed mode	≤ 0,5% RSD										
Communication	TCP/IP; RS-232; Remote Digital I/O; opt.Modbus										

Pollution, a Team of People

POLLUTION is an experienced designer and manufacturer of analytical instruments for the on-site chemical analysis of volatile compounds.

Since 1991 POLLUTION has been a leader in microGC and emissions FID technologies.

Markets served: Environmental, Energy&Process (natural gas, petrochemical), Health&Safety.

POLLUTION's young and highly motivated team, on top of providing continuous innovation, works projected towards customer needs and satisfaction.

In its modern internal R&D Center, located in its Italian facility, chemists and engineers work together to develop innovative technologies and advanced instrumentation.

POLLUTION is driving successful partnerships with universities and industrial research centers in Italy and worldwide.

POLLUTION is ISO9001:2008 and ISO13485:2004 certified.



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