

# NOVA CHROM

## Gas Chromatograph

Following on from the success of the AGC Series 100 GC range, AGC Instruments introduces the new NovaCHROM GC. The NovaCHROM GC is a culmination of years of experience in high sensitivity Gas Chromatography specific for the Analysis of impurities in a wide range of gas applications. It utilises the latest advanced technologies to provide our customers with the precise results they require with the ease of use and support features they expect.

The NovaCHROM uses industry driven and proven methods of analysis for the quality control of gases using different detector technologies adapted to the required applications. Minimal training is necessary as the large colour interactive touch screen provides an easy-to-use user interface for guided functionality. It offers excellent control of the many features which enable the precise monitoring of applications. This allows the operator to perform chosen applications with ease and ensures that the NovaCHROM GC provides a top class service to you at all times.

Each NovaCHROM GC is equipped with specific chromatography components depending on the application. In order to guarantee a contamination free, precision or UHP quality chromatographic separation, "high purity" rotary valves in a purged box (for ADD and DID detectors) are used to prevent leakages. 1/8" Stainless Steel columns are fitted either with Swagelok® or VCR compression fittings and combined with 1/16" stainless steel tubing and plumbing accessories throughout (electropolished if required). Other materials such as Teflon or Hastelloy may be used, as required, to eliminate interference from the matrix gas or to mitigate the effects of corrosive elements. Moreover, the packed columns with their multiple column ovens and individual temperature controllers also maintain exceptional stability, sensitivity, accuracy and repeatability.

With a quick start up time, fast detector response and superior attributes such as the Electronic Pressure Control (EPC) System for the carrier gas, operation of the NovaCHROM is swift, precise and straightforward. The optimised consumption of carrier and supply gases by the NovaCHROM provides an economical platform with a low cost of ownership and long life span. Servicing and maintenance is trouble-free with a drop-down front panel for easy access to the electronic components and the unique column infrastructure, which can be regenerated in-situ, provides the user with seamless operations.

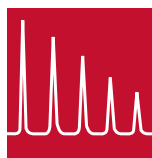
The Integrated Diagnostics and Configurable Alarms Systems pinpoint any areas which require attention to allow swift identification and resolution of any process issues. With these features, the NovaCHROM can operate unattended for long periods of time. This makes this GC Platform very versatile and robust to meet the exacting needs of the operation.

Online Gas Analysis at %, ppm and ppb levels



## Features

- Detection to 1 ppb (application dependent)
- Large Colour 6.5" LCD Touch Screen
- Compact 19" Rack Design
- Fully Automated Use
- Integrated Configurable Alarms System
- Electronic Pressure Control of Carrier Gas
- Multi-Column Ovens with individual Temperature Control using different column switching technologies such as Backflush, Heartcut and Precut.
- Integrated Diagnostics System
- Data Handling Control by TrendVision PLUS Software of both the GC and its ancillary components e.g. as a sample multiplexer
- Increased Connectivity via RS-232, RS-485 and Field BUS communications
- Drop Down Front Panel for easy access to electronics
- Customised Chromatography Solutions
- Suited for space saving installations as single modules or mini systems
- Designed with industrial interfaces for rack integration as new cabinets or as replacement units
- Designed for both batch-type analysis and continuous monitoring.
- Ideal for Process environments with Status Signal, Alarm contacts, remote operation requirements



# Detectors Available

## Discharge Ionisation Detector (DID)

### NovaCHROM 1000

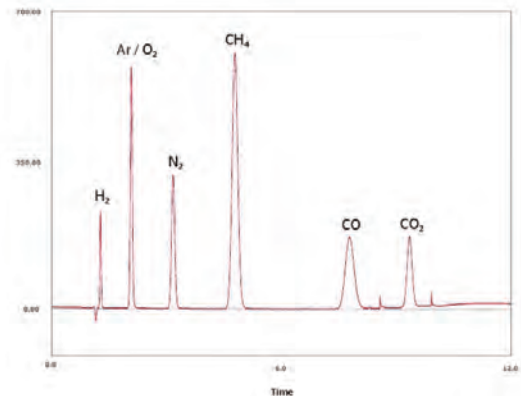
The AGC NovaCHROM 1000 Gas Chromatograph equipped with the Discharge Ionisation Detector (DID) has long-term stability and outstanding analytical performance, providing detection limits down to low ppb measurements for a wide range of gases. Based on using a non radioactive, universal and concentration dependent design, this detector generates high energy photons through an electrical discharge in High Purity Helium. The metastable Helium then ionises all components except Helium. The GC design is totally application dependent comprising of a unique number of gas sampling and column switching valves typically linked to two or more column oven modules. If required, specialised gas matrix scrubbers are fitted into the chromatography path e.g. Hydrogen Removal Module or De-Ox Trap.

Linearity	$>10^6$
Sensitivity	$<1$ ppb of $\text{CH}_4$ (Application Dependent)
Response time	$<0.5$ seconds

#### Gases Required:

Detector Supply Gas	Ultra Pure He N6.0 (as the Carrier/ Purge/Discharge Gas)
Actuator Gas	Clean Dry Air @ 3 bar (for Valve Switching and Actuation)

- Typical Applications:**
- Impurities in Pure/High Purity Gases  $\geq \text{N5}$
  - Customised Solutions for  $\text{O}_2$  Analysis (N4 - N6)
  - Single GC solutions for multiple N5 Matrices (e.g. He/ $\text{H}_2$ /Ar/ $\text{N}_2$ )
  - Corrosive & Electronic Gas Applications



## Argon Discharge Detector (ADD)

### NovaCHROM 2000

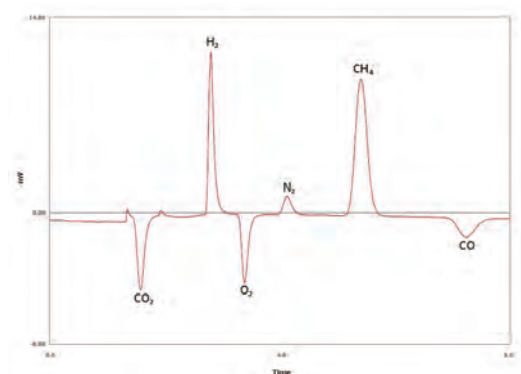
The AGC NovaCHROM 2000 Gas Chromatograph uses an Argon Discharge Detector for the continuous analysis of impurities in an Argon Matrix Gas to ppb levels. A high energy electromagnetic field, through which the carrier gas passes, produces an ionising effect. This process transforms the gas to a plasma state and a by-product of this is the emission of photons of light. As the sample component elutes from the column, the light intensity is altered and this light emission can be monitored by a sensitive, tuned photo-diode. The output from the photo diode is converted to a millivolt signal which can be measured on a data capture system, such as the AGC TrendVision PLUS software. The typical GC design comprises of either a single or dual-column chromatography and the NovaCHROM 2000 can specifically detect  $\text{O}_2$  traces in Argon in parallel with other impurities without using an additional  $\text{O}_2$  meter. Since Argon has an unlimited supply at reasonable costs, the NovaCHROM 2000 is an economic trace analyser for a number of popular industrial applications. Furthermore, precise quantitative results are supported by the linearisation function provided by TrendVision PLUS.

Linearity	$>10^3$
Sensitivity	$<1$ ppb (Application Dependent)
Response time	$<0.5$ seconds (90%)

#### Gases Required:

Detector Supply Gas	Ultra Pure Ar N6.0 (as the Carrier & Purge Gases)
Actuator Gas	Clean Dry Air @ 4 bar (for Valve Switching and Actuation)

- Typical Applications:**
- Impurities in Pure/High Purity Ar
  - Customised Solutions for  $\text{CO}_2$  Analysis (Soft Drinks application)



## Flame Ionisation Detector (FID)

### NovaCHROM 3000

The AGC NovaCHROM 3000, using the Flame Ionisation Detector (FID), is used to measure concentrations of hydrocarbons within a sampled gas. The presence of hydrocarbons is detectable by burning the sampled gas in an air-hydrogen flame. Burning just pure hydrogen with air produces only small amounts of ionisation. The presence of hydrocarbons in the sampled gas, when burnt with an air-hydrogen mix causes increased levels of ionisation. The ionisation occurs as a result of the carbon atoms present in the sampled gas. The level of ionisation is proportional to the number of carbon atoms within the sample. The typical GC design comprises of one or dual-column (packed or wide-bore) chromatography with backflush or heartcut switching technology. AGC Instruments also produces its own methaniser module technology which is fitted upstream to the detector for  $\text{CO}$  and  $\text{CO}_2$  detection.

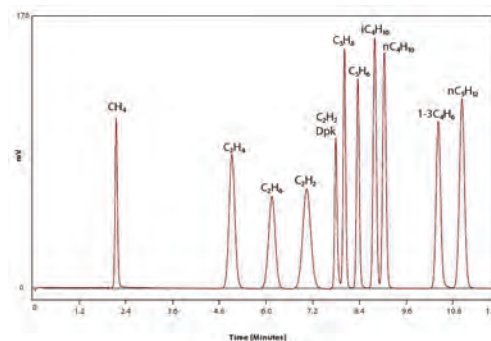
Linearity  $>10^6$   
 Sensitivity  $<10\text{ppb of CH}_4$   
 Response time  $<0.5\text{ seconds}$

#### Gases Required:

Carrier Gas Application dependent:  $\text{N}_2$ , He,  $\text{H}_2$  or Ar  
 Detector Supply Gas 1  $\text{H}_2$  N5.0 or N6.0 (Application dependent)  
 Detector Supply Gas 2 Synthetic Air or Purified Air ("THC free")  
 Actuator Gas Clean Dry Air @ 3 bar (for Valve Actuation)

#### Typical Applications:

- C1-C6 hydrocarbons at ppm or ppb levels
- Customised Solutions for  $\text{O}_2$  Analysis
- Methane/Total Non-Methane analysis
- Analysis of trace level CO and  $\text{CO}_2$  using a methaniser
- Pharmacopeia Applications



## Thermal Conductivity Detector (TCD)

### NovaCHROM 4000

The AGC NovaCHROM 4000, using the Thermal Conductivity Detector (TCD), is typically used to measure permanent gases or gas mixture components at percentage and ppm levels. The TCD has four sensing elements which are connected to form an electrical Wheatstone bridge circuit. These elements are typically miniature rhodium-tungsten filaments, which are mounted in a metallic cell block. A flow through type thermal conductivity cell is normally used in this analyser. This cell contains a sample and reference gas flow geometry and two elements are installed in each flow system. An electrical current from a regulated power source heats the elements. Changes in thermal conductivity of the sample gas result in an output voltage change which can be measured on a data capture system, such as the AGC TrendVision PLUS Chromatography Software.

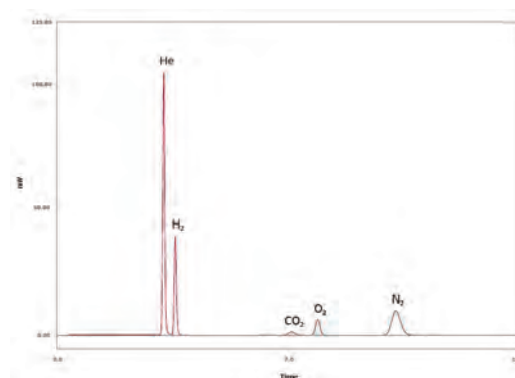
Linearity  $>10^4$   
 Sensitivity  $<5\text{ppm}$   
 Response time  $<1\text{ second}$

#### Gases Required:

Detector Supply Gas He, Ar,  $\text{N}_2$  or  $\text{H}_2$   
 (as the Carrier & Reference Gases:  
 Purity is application dependent)  
 Actuator Gas Clean Dry Air @ 3 bar  
 (for Valve Switching and Actuation)

#### Typical Applications:

- Purity of Gases
- Precise analysis of the components in binary or multiple gas mixtures: %, ppm
- Customised Solutions for Corrosive Gas Analysis
- Pharmacopeia Applications (Medical, Food, Diving, Laser, Excimer)
- Natural Gas Analysis



## Flame Photometric Detector (FPD)

### NovaCHROM 5000

The AGC NovaCHROM 5000 Gas Chromatograph uses a double Flame Photometric Detector (FPD) which is designed to give a selective response to sulphur or phosphorous compounds. When an excitation energy is applied to the atoms of an element, a photometric emission spectrum is obtained whose wavelength is characteristic of the element. The intensity of the emitted light is proportional to the number of atoms excited. Within the flame photometric detector, the excitation energy is derived from the dual-heat zone combustion of the sample in a hydrogen-rich flame. This double flame technology eliminates the well-known cross-interference caused by the matrix gas. Furthermore, precise quantitative results are supported by the linearisation function provided by TrendVision PLUS.

Linearity  $10^3$  (Sulphur Mode)  
 Sensitivity 20pg S/sec for Thiophene (Sulphur Mode)

#### Gases Required:

Carrier Gas  $\text{N}_2$  N5.0 or N6.0 (Others available upon request)  
 Detector Supply Gas 1  $\text{H}_2$  N5.0 or N6.0 (Application dependent)  
 Detector Supply Gas 2 Synthetic Air or Purified Air ("THC free")  
 Actuator Gas Clean Dry Air @ 3 bar (for Valve Switching and Actuation)

#### Typical Applications:

- Analysis of volatile sulphur species in pure gases or ambient air
- Natural Gas Analysis ( $\text{H}_2\text{S}$ , COS, Mercaptans and Sulphides)
- Customised Solutions for  $\text{CO}_2$  Analysis (Soft Drinks application)
- Customised Applications for Sulphur in Light Hydrocarbons



## TrendVision PLUS Software

TrendVision PLUS is the most recent release of the well recognised Chromatography Data Capture Software from AGC Instruments. Specifically designed for this market, it has been developed following careful consultation with our customers so that it is easy to use and set up.

Rugged industrial level modular and scalable hardware is used with an Embedded Windows Operating System. Once your system is installed, usage in the daily environment is very easy with minimal training required. It encompasses all the important functions required in this demanding gas analysis environment, enabling many standard features to be easily applied with the end products of excellent chromatography results and straightforward reporting. Furthermore, the ability to integrate outputs from third party gas analysers is a strong feature and offers a lot of flexibility for reporting.

TrendVision PLUS provides a unified chromatography method whereby all settings are contained in a single method, including event tables, calibration tables and integration settings. In addition, this software enables the GC systems to run in a fully unattended mode. It can also take control of the GC systems and automatically perform the required analysis using the pre-programmed methods. This is coupled with the ability to send results back to a DCS or control room using fieldbus protocols or traditional 4-20 mA signalling. If On-Line operation is not required then the software runs equally well in its Stand-Alone mode with the same functionality and ease of use.

Please consult with our specific brochure for this Software.



## Company Profile

### AGC Instruments

AGC Instruments is a leading manufacturer of Gas Analysis Solutions to all users requiring a Quality Control or identification of their gas stream. We have over 48 years experience in providing our customers with their "Total Gas Analysis Solutions". We work closely with all customers to ensure they obtain the analytical solution that meets their needs and a system that is easy to use and understand. All AGC distributors are extremely experienced and factory trained to the highest standards, offering you a complete after sales support service.

The wide range of Detectors available can be customised to measure unique gas streams and we place an emphasis on the continuous development of our analytical solutions. Our worldwide reach with strategic partners ensures that you have peace of mind and after sales care that are important to your operations.

## Aftersales Care

AGC Instruments are committed to providing and maintaining quality systems from customer liaison to technical knowledge through to System Design and Delivery. We believe that our After Sales Support to the customer is one of the most important services we can offer. Each Distributor has been carefully selected and trained to ensure our customers receive the best possible service. Furthermore, online customer support and direct support are available to deliver a comprehensive support package.

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