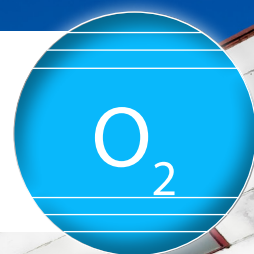


NOVASTREAM 6000

Oxygen & Trace Oxygen Gas Analyser



% and ppm O₂ analysis



The NovaSTREAM 6000-O₂ Analyser has different sensor variations to choose from to cover a wide range of applications pertaining to oxygen and trace oxygen analysis. The Paramagnetic Sensor performs percentage analysis and the Coulometric (Electrochemical) Sensor performs analysis from 50 ppb to either 100, 1000 or 10,000 ppm.

These versatile and robust sensors are specially engineered and refined for O₂ analysis and its industry-wide use ensures that it is both cost effective and reliable. High accuracy and sensitivity is achieved with a fast response time and this allows continuous monitoring of the gas stream.

The platform controlling these sensors; the industrious NovaSTREAM analyser, is straightforward to use and set-up with all functionality easily accessible and navigable with minimal training required. With the integration of Flow Sensors and 7 voltage free alarm relay contacts, including one for the sample flow, all critical monitoring is automated and provides peace of mind to the operator. Further verification is provided by voltage free contacts for switching in calibration gas inputs externally to support the auto-calibration routine. Both Calibration and Alarm records are maintained. Therefore, the NovaSTREAM 6000-O₂ provides peace of mind and an exceptional performance at all times.

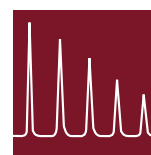
The precise results obtained from this analyser can be transmitted via an array of communication modules such as: Active or Passive 4-20mA (2 off), mV Signal, USB (2 off) and VGA outputs. Ethernet, Modbus over TCP/IP and Profibus outputs are also available as optional extras. This allows the analyser to be integrated seamlessly into all analytical infrastructures worldwide.

The modular design allows for easy access to the electronics for trouble-free maintenance and servicing. It is both cost effective and reliable with a low cost of ownership due to the low gas and power consumption. The AGC Engineering Team will custom design and test an analytical solution to meet your application and all systems are designed with volume optimised pipe work using only 1/8" Swagelok® fittings for external connections. Therefore, this robust system ensures an excellent stability, sensitivity and a long working life.

Features

- Paramagnetic & Coulometric Sensors
- % and ppm Trace Oxygen Analysis
- Wide Range of Applications
- Industry Proven Sensor Technologies
- 0-100% - Paramagnetic
- 50 ppb to 100/1,000/10,000 ppm - Coulometric
- Fast Detector Response
- Long Term Stability & Sensitivity
- 6.5" LCD Touch Screen
- Fully Automated use with intuitive GUI
- Integrated Configurable Alarms System with Alarm Record
- Added Sample Flow Alarm
- Integrated Diagnostics System
- Flow Sensors available
- Voltage free contacts for switching in calibration gas inputs externally
- Auto-Calibration Routine with Calibration Record
- Internal storage of results up to 24 months and data trending via PC
- External I/O Connections for internally pre-wired communication modules: 2 x 4-20mA, 1 x mV Signal, VGA & USB Outputs
- Ethernet, Modbus over TCP/IP & Profibus options
- Easy Access for maintenance and servicing
- Cost Effective and Reliable

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Gas Chromatography since 1965



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Principle Of Operation

Paramagnetic Measurement Principles

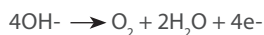
The Paramagnetic sensor utilises the paramagnetic susceptibility of oxygen, a physical property which distinguishes oxygen from most other common gases. The sensor incorporates two nitrogen-filled glass spheres mounted on a strong, noble metal taut-band suspension. This assembly, termed the "Suspension Assembly" is suspended in a symmetrical non-uniform magnetic field. When the surrounding gas contains paramagnetic oxygen, the glass spheres are pushed further away from the strongest part of the magnetic field. The strength of the torque acting on the suspension is proportional to the oxygen content of the surrounding gases. The measuring system is null-balanced. The zero position of the suspension assembly, as measured in nitrogen, is sensed by a differential photo-sensor assembly that receives light reflected from a mirror attached to the suspension assembly. The output from the photosensor is processed and then fed back to a coil wound around the suspension assembly to achieve a null-balanced position. This feedback achieves two objectives: When oxygen is introduced to the cell, the torque acting upon the suspension assembly is balanced by a restoring torque due to the feedback current in the coil. The feedback current is directly proportional to the volume magnetic susceptibility of the sample gas and hence, after calibration, to the partial pressure of oxygen in the sample. A voltage output is derived which is proportional to the feedback current. In addition, the electromagnetic feedback stabilises the suspension (heavily damping oscillations) thus making it resilient to shock and vibration.

Coulometric Measurement Principle

The Coulometric sensor uses an ambient temperature, non-depleting oxygen reaction, generating a current flow that is determined by the number of oxygen molecules that are reduced at the cathode. The sensor reaction is driven by 1.3 Volts applied across the electrodes. The resulting electron flow is measured as a current that is precisely proportional to the oxygen concentration in the sample gas. The cathode reaction uses 4 electrons from the 1.3 volt circuit, 2 water molecules from the electrolyte, and 1 oxygen molecule from the sample gas to generate 4 hydroxyl ions which migrate across the reaction chamber to the anode:



The anode reaction consumes the 4 hydroxyl ions and delivers 4 electrons to the circuit, 2 water molecules back to the electrolyte, and vents one oxygen molecule.



There is no net change to the electrolyte and no depletion of the sensor or electrodes.

Typical Industries

- Air Separation Units
- Hydrogen Plants
- Chemical Plants
- Iron and Steel Industry
- Gas Blending Equipment
- Industrial Gas Production Units

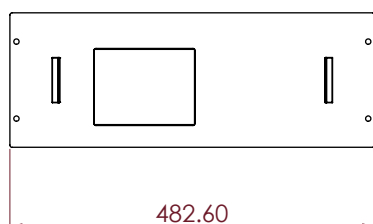
Typical Applications

- Monitoring Nitrogen (N_2), Argon (Ar), Helium (He), Hydrogen (H_2) and Carbon Dioxide (CO_2) for low concentrations of oxygen.
- Measuring concentrations of explosive or toxic gases in fuel handling areas.
- Measuring by-product gases from various chemical processes and converters.
- Checking bulk and blended gases in gas manufacturing facilities.

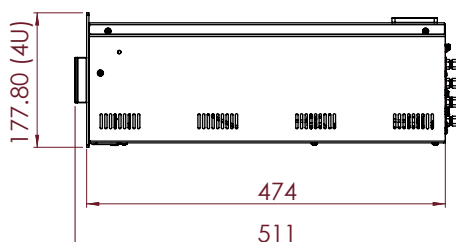


Specification	Paramagnetic	Electrochemical
Detectors	Paramagnetic Sensor	Coulometric Sensor
Typical Ranges	0.01 - 100%	50ppb to 100/1,000/10,000 ppm
Accuracy (Intrinsic Error)	$<\pm 0.1\% \text{ O}_2$	$<\pm 3\%$ of reading or $<0.05\%$ of range
Zero Stability	$<\pm 0.1\% \text{ O}_2$ during first 24 hours operating	$<\pm 0.05 \text{ ppm O}_2$ - 24 hours
Linearity / Signal Noise	Linearity: $\pm 0.05\% \text{ O}_2$	Signal Noise at baseline: $<10\text{ppb}$
Response Time	$<2.5 \text{ secs @} 200\text{mL/min } (T_{10} \text{ to } T_{90})$	T_{90} : $<30 \text{ secs}$
Temperature Coefficient	Zero: $<\pm 0.03\% / \text{O}_2^\circ\text{Celsius}$ Span: $<\pm 0.05\%$ of O_2 reading/ $^\circ\text{Celsius}$	Zero: $<\pm 50\text{ppb}$
Sample Pressure Range	$\pm 5 \text{ psig}$	$\pm 5 \text{ psig}$
Sample Flow Range	50 to 200 mL/min	250 to 750 mL/min
Operating Temperature	0° to 65° Celsius	5° to 45° Celsius
Start-Up & Stabilisation Time	30 minutes	
Interface	6.5" Industrial Grade Colour Touch Screen Control	
Outputs / Communication Modules	<ul style="list-style-type: none"> • 2 x Isolated 4-20mA outputs (Active or Passive) [configurable for high & low resolution readings] • 1 x mV Signal output • 1 x RS-232 • 2 x USB • VGA • Modbus over TCP/IP* • Profibus* • Ethernet* 	
Alarms	7 x Voltage Free Alarm Relay Contacts (including one for sample flow) Alarm Record	
Calibration	Auto-Calibration Routine (with internal validation) [Dependent on Model] Voltage Free contacts for switching in the calibration gas inputs externally Calibration/Validation Record	
Data / Results	Data Trending via PC connection and 24 months internal storage	
Gas Connections	1/8" Swagelok® fittings	
Power Supply	100 - 120 VAC or 220 - 240 VAC, 50/60 Hz	
Dimensions	482 (W) x 511 (D) x 177 (H) mm	
Certifications	CE , ISO 9001:2015 , ATEX & IECEx certified	

FRONT VIEW



SIDE VIEW



* Optional Extras
- Subject to system design/configuration

Company Profile

AGC Instruments Ltd.

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 50 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.

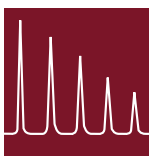


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Aftersales Care

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.

NovaSTREAM Applications

Total Hydrocarbons Analysis

% Ar in O₂ Analysis

Trace N₂ in Ar/He Analysis

% O₂ Analysis

ppm O₂ Analysis

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