Universal Gas Analyzers

UGA systems — 100 amu, 200 amu, and 300 amu

- Atmospheric pressure to UHV
- 100, 200 and 300 amu systems
- Fast response time (<0.2 s)
- Electron multiplier std. on all systems
- Stand-alone leak detection
- Built-in heaters for bakeout to 120 °C (UGA series)
- Windows software (RS-232 or Ethernet)
- Multi-capillary inlet (opt., UGA series)
- Measure up to 100 % H_2 with UGA-Hydrogen (UGA w/ Opt. 03)
- Low cost solutions (ULT Series)

Universal Gas Analyzers

The UGA and UGA *LT* Series Universal Gas Analyzers are state-of-the-art bench top mass spectrometers that operate from above atmospheric pressure to UHV. They are ideal for on-line monitoring and analysis of gas mixtures. Whether you're measuring trace-level contaminants, solvents, hydrocarbons, refrigerants or corrosive gases, your UGA analyzer is up to the task.

UGA applications include semiconductor exhaust gas monitoring, glove box analysis, fuel cell studies, Freon detection, pollution monitoring, fermentation studies and general R&D vacuum analysis.

These analyzers are also simple to operate and maintain. The chassis design allows the instrument to be operated vertically or horizontally, and both front-panel and computer operation are supported. The UGA *LT* series is a simplified design for less demanding applications.

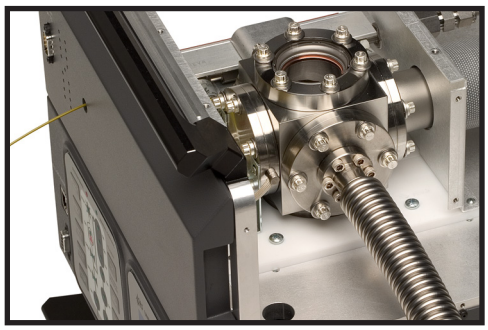
Principle of Operation

The UGA system uses a two-stage pressure reducing inlet to sample gases at atmospheric pressure. After the pressure is reduced to around 10^{-6} Torr, the gas stream is sent to a mass spectrometer (residual gas analyzer — RGA) which measures the concentration of each mass of interest.

The UGA Windows software provides a graphical user interface for complex graphing and data analysis. The software also allows remote control of the system's valves, heaters and pumps.

For gas sampling in the range of 10^{-1} to 10^{-4} Torr, the vacuum inlet assembly is used. Simply attach a 2.75" CF to 1/4" tube adapter to one of the CF ports, and adjust the length of the tube for the inlet pressure.

Direct access to the RGA is provided for UHV applications ($<10^{-4}$ Torr). Any of the 2.75" CF ports of the vacuum inlet assembly can be used to connect to your vacuum chamber.



Direct connection for UHV applications

Multi-Capillary Inlet (UGA series only)

An optional multi-port sampling inlet consists of 16 manifold-mounted valves that can be used with a variety of capillaries.

Heated Chamber (UGA series only)

The UGA system is equipped with individual heaters for the vacuum chamber (including RGA), the turbo pump connector, and the vacuum inlet assembly. During bakeout, the system can be heated to 120 °C.

Dual-Diaphragm Pumps (UGA series only)

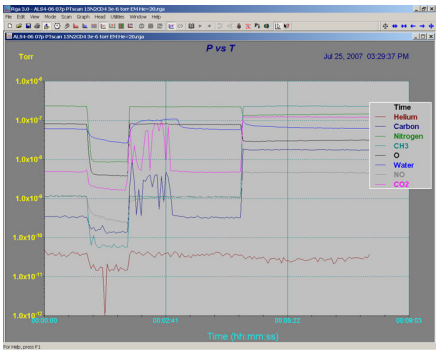
Separate diaphragm pumps are used to handle the bypass flow and backing of the turbo pump. This architecture allows corrosive gases (chlorine, fluorine, etc.) to be analyzed without damaging the RGA and turbo pump, and virtually eliminates the problem of back streaming. Measuring high concentrations of low mass gases (hydrogen, helium, etc.) is no longer a problem.

Turbo Pump Venting (UGA series & UGA LT series)

An optional valve and inlet to the turbo pump's exhaust is available for users who wish to vent with dry nitrogen (or other inert gases). This keeps the pump free from water and other contaminants present in air.

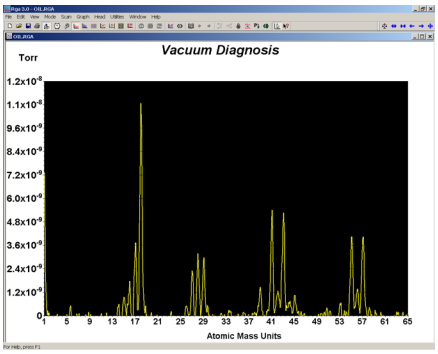
Using Your Universal Gas Analyzer

The UGA system can be controlled from the front-panel or from a computer. A choice of manual or auto-control of all system components is provided.



UGA Windows software — P vs. T mode

Data is measured and displayed using the UGA software. The intuitive user interface allows measurements to be made quickly and easily. Data is captured and displayed in real-time, or scheduled for acquisition at a specified time. Features include analog and histogram scan modes, pressure vs. time



UGA Windows software — Analog mode

plots, leak detection, gas library, and on-line help. RGA parameters can also be controlled and monitored through a high-level ASCII command set. Standard RS-232 and Ethernet interfaces are used as the data link to your PC.

Best Value

The UGA Analyzers offer the best value of any system currently available. They provide more performance, better features, and are priced well below the competition.

Inlet* (UGA series)

Type	Stainless Steel & PEEK capillaries, two extra 2.75" CF ports.
Flow rate	1 to 10 milliliters per minute (at atmospheric pressure)
Pressure	About 10^{-4} mbar to several bar (depending on connecting ports and capillary)

Mass Spectrometer

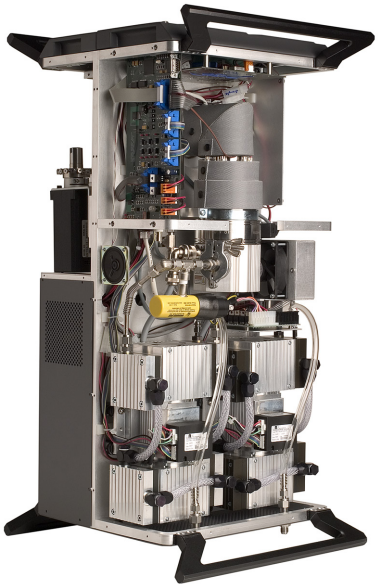
Type	Quadrupole (RGA)
Detector	Faraday cup & electron multiplier
Mass range	100, 200 or 300 amu
Resolution	Better than 0.5 amu (at 10 % of peak height)
Detection limit	Less than 1 ppm
Operating pressure	5×10^{-6} Torr

Connections* (UGA series)

Sample inlet	
1 mbar to 1 bar	⅛" Ultra-Torr® fitting
10^{-1} to 10^{-4} Torr	2.75" CF port
$<10^{-4}$ Torr	2.75" CF port
Computer interface	RS-232, Ethernet

UGA Software

Software	Windows application. Controls UGA system including RGA.



Opened UGA

System

High-vacuum pump	Hybrid turbo-molecular
Diaphragm pump	Advanced low pressure

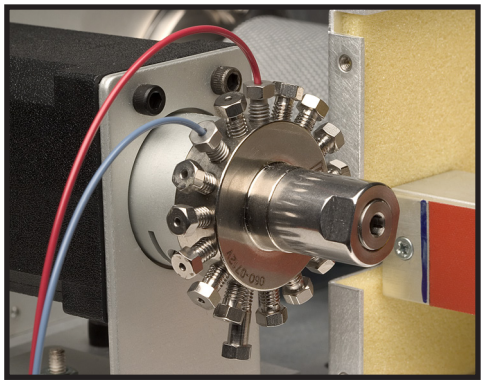
Materials

Construction	SS304 and SS316
Insulators	Alumina, ceramic
Seals	Viton®, buna-N, nitrile butyl rubber, copper gasket
Misc.	Aluminum, Tygon®

General

Startup time	Eight minutes from full stop
Max. ambient temp.	35 °C
Bake out temp.	120 °C (regulated heaters, UGA only)
Power	85 to 264 VAC or 120 to 370 VDC, 47 to 63 Hz or DC, 720 W
Dimensions	12" × 11" × 27" (WHL)
Weight	85 lbs. UGA, 75 lbs. ULT
Warranty	One years parts and labor on defects in material and workmanship. Pump seals and diaphragm warranted for 90 days.

** ULT series has different specifications. Please refer to the online comparison sheet*



Multi-capillary inlet port

Ordering Information

UGA100	100 amu sampling system
UGA200	200 amu sampling system
UGA300	300 amu sampling system
Option 01	Multi-port sample inlet (16-ch.)
Option 02	Turbo pump venting port
Option 03	H_2 turbo pump upgrade
O100HC	Heated capillary
ULT100	100 amu sampling system
ULT200	200 amu sampling system
ULT300	300 amu sampling system
Option 01	Ion Gauge
Option 02	Turbo pump venting port