RGA – Analyseur de gaz résiduel Stanford Research

100, 200 and 300 amu systems
Better than 1 amu resolution 6 orders of magnitude dynamic range in a single scan
5 x 10^{-14} Torr detection limit
RGA Windows and LabVIEW software
Field-replaceable electron multiplier and filament
RS-232 interface

The 100, 200 and 300 amu residual gas analyzers from SRS offer exceptional performance and value. These RGA's provide detailed gas analysis of vacuum systems at about half the price of competitive models. Each RGA system comes complete with a quadrupole probe, electronics control unit (ECU), and a real-time Windows software package that is used for data acquisition and analysis, as well as probe control.

Rugged Probe Design

The probe consists of an ionizer, quadrupole mass filter and a detector. The simple design has a small number of parts which minimizes outgassing and reduces the chances of introducing impurities into your vacuum system. The probe assembly is rugged and mounts onto a standard 2 ¾ inch CF flange. It is covered with a stainless steel tube with the exception of the ionizer which requires just 2 ½ inches of clearance in your vacuum system—about that of a standard ion gauge. The probe is designed using self-aligning parts so it can easily be reassembled after cleaning.

Compact Electronics Control Unit

The densely packed ECU contains all the necessary electronics for controlling the RGA head. It is powered by either an external +24 VDC (2.5 A) power supply or an optional, built-in power module which plugs into an AC outlet. LED indicators provide instant feedback on the status of the electron multiplier, filament, electronics system and the probe. The ECU can easily be removed from the probe for high temperature bakeouts.

Dual ThO_2/Ir Filament

Unique Filament Design

A long-life, dual thoriated-iridium (ThO_2/Ir) filament is used for electron emission. Dual ThO_2/Ir filaments last much longer than single filaments, maximizing the time between filament replacement. Unlike other designs, SRS filaments can be replaced by the user in a matter of minutes.

Electron Multiplier

Continuous Dynode Electron Multiplier

A Faraday cup detector is standard with SRS RGA systems which allows partial pressure measurements from 10^{-5} to 5 × 10^{-11} Torr. For increased sensitivity and faster scan rates, an optional electron multiplier is offered that detects partial pressures down to 5 × 10^{-14} Torr. This state-of-the-art macro multi-channel continuous-dynode electron multiplier (CDEM) offers increased longevity and stability and can also be replaced by the user—a first for RGAs!

Useful Features

RGA Heater Jacket

All RGAs have a built-in degassing feature. Using electron impact desorption, the ion source is thoroughly cleaned, greatly reducing the ionizer's contribution to background noise.

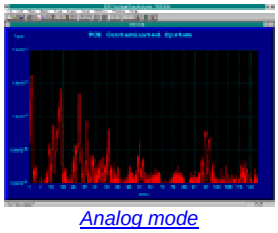
A firmware driven filament protection feature constantly monitors (675 Hz) for over pressure. If over pressure is detected, the filament is immediately shut off, preserving its life.

A unique temperature-compensated, logarithmic electrometer detects ion current from 10^{-7} to 10^{-15} Amps in a single scan with better than 2 % precision. This huge dynamic range means you can make measurements of small and large gas concentrations simultaneously.

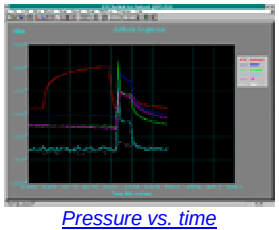
Complete Programmability

Communication with computers is made via the RS-232 interface. Analog and histogram (bar) scans, leak detection and probe parameters are all controlled and monitored through a high-level command set. This allows easy integration into existing programs.

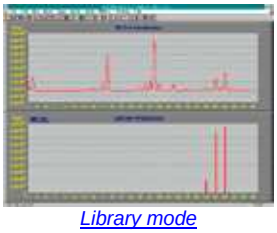
RGA Windows Software



Analog mode



Pressure vs. time



Library mode

The RGA systems are supported with a real-time Windows software package that runs on PCs. The intuitive graphical user interface allows measurements to be made quickly and easily. The program is fully interactive, giving the user complete control of the graphical display. Screens can be split for dual-mode operation, scales can be set to linear or log format, and data can be scaled manually or automatically. Data is captured and displayed in real-time or scheduled for acquisition at a given time interval for long-term data logging. Features include user-selectable units (Torr, mbar, Pa and A), programmable audio and visual alarms, and comprehensive on-line help.

The software also allows complete RGA head control with easy mass scale tuning, sensitivity calibration, ionizer setup, and electron multiplier gain adjustment. For further analysis, data files can be saved in ASCII format for easy transfer into spreadsheets. Graphic images can be saved as META files or copied to the clipboard for importing directly into other Windows programs. The software also provides password protection for locking out head parameters so that casual users can´t alter important settings. A LabVIEW dirver is also available on the SRS website.

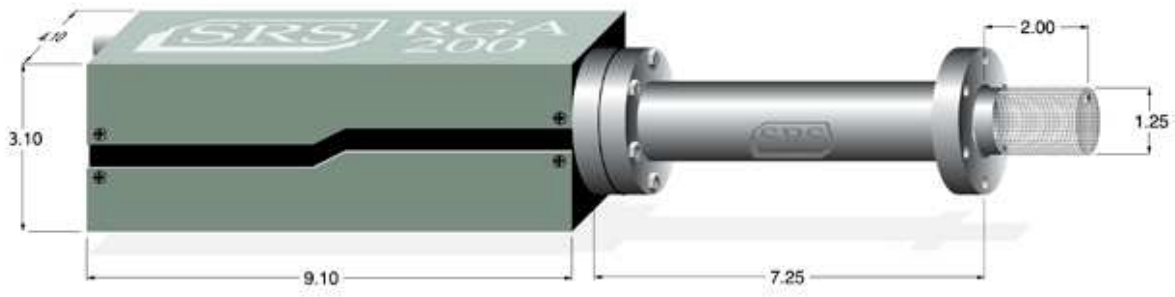
An optional stand-alone monitor (PPM100) can be used to control the RGA without a host computer.

Multi-Head Operation

The software supports multiple head operation when more than one RGA is needed. Up to eight ECUs can be monitored from the software.

Performance and Value

The SRS family of RGAs is ideal for applications involving gas analysis, leak detection, and vacuum processing. We offer 100, 200 and 300 amu systems with supporting Windows software and options that include an electron multiplier and a built-in power module for AC line operation.



Specifications

Operational

Mass range	
RGA100	1 to 100 amu
RGA200	1 to 200 amu
RGA300	1 to 300 amu
Mass filter type	Quadrupole
Detector type	Faraday cup (FC)—standard, electron multiplier (EM)—optional
Resolution	Better than 0.5 amu @ 10 % peak height (per AVS std. 2.3). Adjustable to constant peak width throughout the mass range.
Sensitivity (A/Torr)	2×10^{-4} (FC), <200 (EM). User adjustable throughout high voltage range. Measured with N_2 @ 28 amu with 1 amu full peak width, 10 % height, 70 eV electron energy, 12 eV ion energy, and 1 mA electron emission current.
Minimum detectable partial pressure	5×10^{-11} Torr (FC). 5×10^{-14} Torr (EM). Measured with N_2 @ 28 amu with 1 amu full peak width, 10 % height, 70 eV electron energy , 12 eV ion energy, and 1 mA electron emission current.
Operating pressure	10^{-4} Torr to UHV (FC) 10^{-6} Torr to UHV (EM)
Max. operating temp.	70 ℃
Bakeout temperature	300 ℃ (without ECU)

Ionizer

Design	Open ion source, cylindrical symmetry, electron impact ionization.
Material	SS304 construction
Filament	Thoriated-iridium (dual) with firmware protection. Built-in 1 to 10 W degas ramp-up. Field replaceable.
Electron energy	25 to 105 V, programmable
Ion energy	8 or 12 V, programmable
Focus voltage	0 to 150 V, programmable
Electron emission current	0 to 3.5 mA, programmable

General

Probe dimension	8.75" from flange face to top of ionizer
Probe insertion	2.0"
Probe mounting flange	2.75" CF
Minimum tube I.D.	1.375"
ECU dimensions	9.1" ×4.1" × 3.1" (WHL) Easily separated from the probe for bakeout.
LED indicators	Power ON/OFF, filament ON/OFF, degas ON/OFF, electron multiplier ON/OFF, RS-232 Busy, Error, Overpressure, Burnt Filament.
Warm-up time	Mass stability ±0.1 amu after 30 minutes
Computer interface	RS-232C, 28,800 baud with high-level command set
Software	Windows based application
Power requirement	24 VDC @ 2.5 amps. Male DB9 connector. Optional 110/120/220/240 VAC adapter.
Weight	6 lbs.
Warranty	One year parts and labor on defects in materials and workmanship