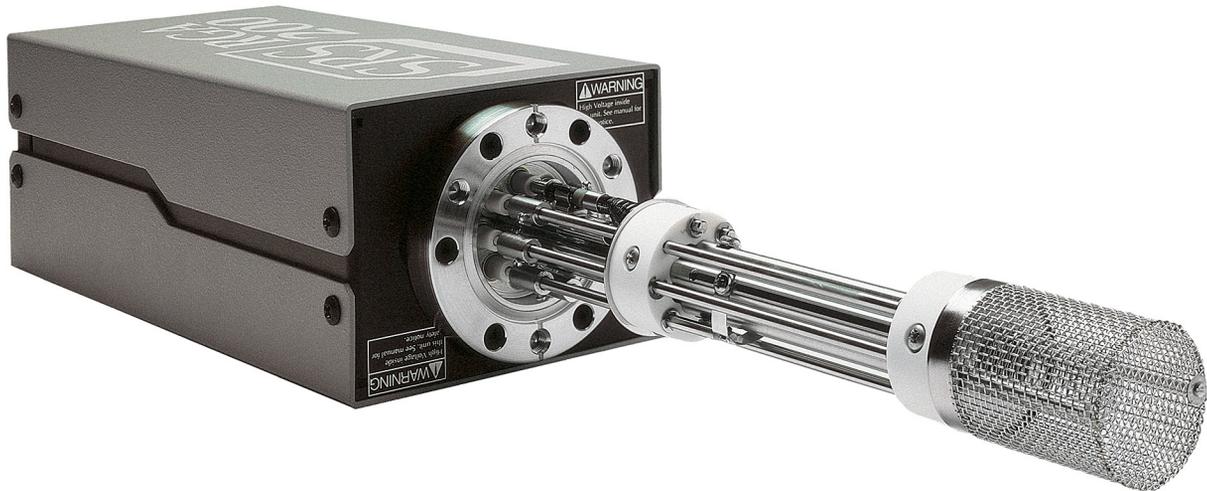


# Residual Gas Analyzers

RGAs — 100 amu, 200 amu and 300 amu systems



## Residual Gas Analyzers

- 100, 200 and 300 amu systems
- Better than 1 amu resolution
- 6 decades of dynamic range
- $5 \times 10^{-14}$  Torr detection limit
- RGA Windows & LabVIEW software
- Field-replaceable electron multiplier and filament
- RS-232 and Ethernet interfaces

The 100, 200 and 300 amu residual gas analyzers from SRS offer exceptional performance and value. These RGAs 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 2.75" Conflat® flange. It is enclosed within a stainless steel tube, with the exception of the ionizer which requires just 2.5" 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.

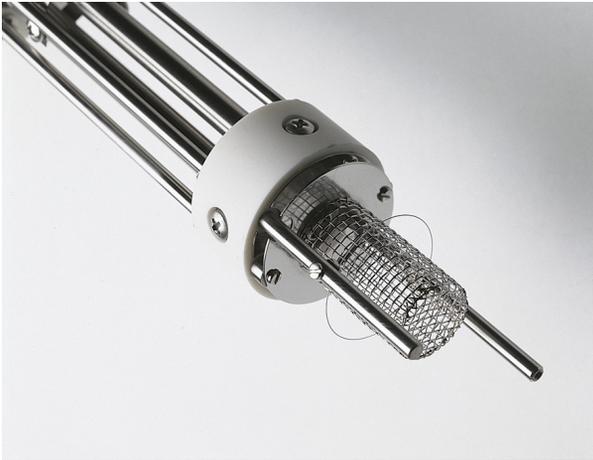
### Compact Electronics Control Unit

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.

### Unique Filament Design

A long-life, dual thoriated-iridium ( $\text{ThO}_2/\text{Ir}$ ) filament is used for electron emission. Dual  $\text{ThO}_2/\text{Ir}$  filaments last much longer than single filaments, maximizing the time between

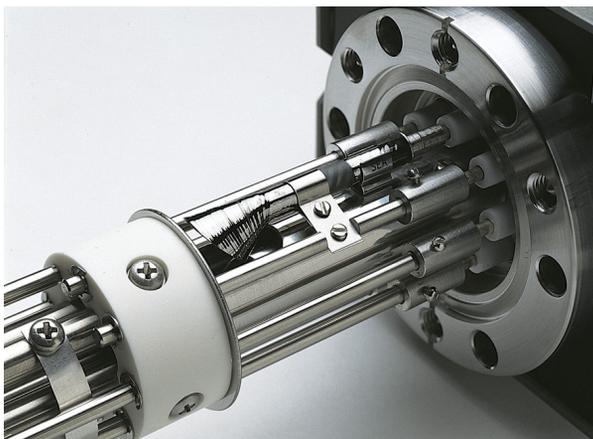


*Dual  $\text{ThO}_2/\text{Ir}$  filament*

filament replacement. Unlike other designs, SRS filaments can be replaced by the user in a matter of minutes.

### Continuous Dynode Electron Multiplier

A Faraday cup detector is standard with all SRS RGAs, allowing partial pressure measurements from  $10^{-5}$  Torr to  $5 \times 10^{-11}$  Torr. For increased sensitivity and faster scan rates,



*Continuous dynode electron multiplier*

an optional electron multiplier is offered that detects partial pressures down to  $5 \times 10^{-14}$  Torr. This state-of-the-art, multi-

channel, continuous-dynode electron multiplier (EM) offers increased longevity and stability, and can also be replaced by the user — a first for RGAs.

### Useful Features

SRS 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

The RGA systems are supported with a real-time software package that runs on Windows OS computers. The intuitive graphical user interface allows measurements to be made quickly and easily. Data is captured and displayed in real-time or scheduled for acquisition at a given time interval for long-term data logging. Multiple spectral data and individual measurements can be collected together in one sequence. Versatile docking windows and widgets give the user various ways to organize the display. Data can be scaled manually or automatically, in linear or log format on plots. Units are selectable among Torr, Bar, Pascal and Amp. Features include common gas labels, programmable audio and visual alarms, expandable library, composition analysis, and comprehensive on-line help.

The software also allows complete RGA control with easy mass scale tuning, sensitivity calibration, ionizer setup, and electron multiplier gain adjustment. For further analysis, data files can be saved in CSV text format for easy transfer into spreadsheets. Graphic images can be saved in common formats (PNG, BMP, TIFF, JPG, SVG, PDF) or copied to the clipboard for importing directly into other programs. 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. With a software instance independently control an RGA, multiple RGAs can be controlled and run

## Residual Gas Analyzers

concurrently with multiple software instances. The number of RGAs is only limited by the system resources.

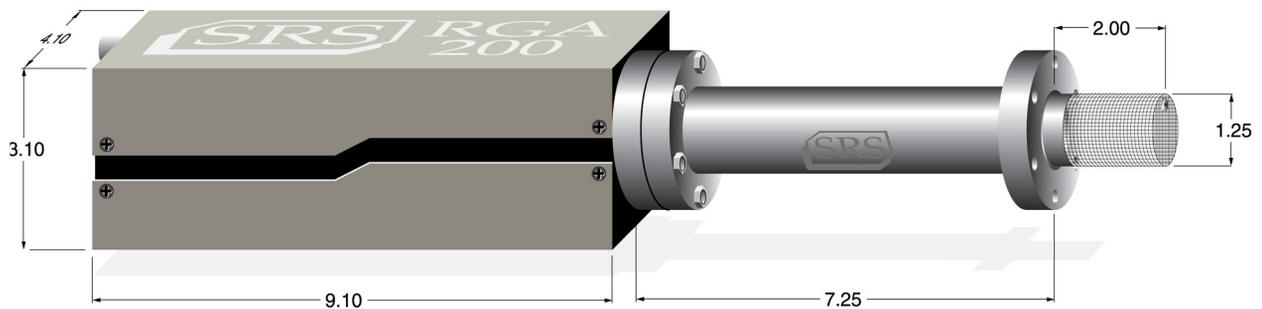
### Performance and Value

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. The RGA Windows software is available on the web at [www.thinkSRS.com](http://www.thinkSRS.com).



*RGA rear panel  
(without AC power module)*

*RGA rear panel  
(with AC power module)*



*RGA dimensional drawing (inches)*

## 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 (per AVS std. 2.3)	Better than 0.5 amu @ 10% peak height. Adjustable to constant peak width throughout the mass range.
Sensitivity (A/Torr)	$2 \times 10^{-4}$ (FC), <200 (EM). User adjustable throughout high voltage range. Measured with N <sub>2</sub> @ 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	$5 \times 10^{-11}$ Torr (FC), $5 \times 10^{-14}$ Torr (EM) Measured with N <sub>2</sub> @ 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 range	10 <sup>-4</sup> Torr to UHV (FC) 10 <sup>-6</sup> Torr to UHV (EM)
Operating temperature	70 °C (max.)
Bakeout temperature	300 °C (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	3.1" × 4.1" × 9.1" (WHD). 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 min.
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 built-in power module for AC line operation
Weight	6 lbs.
Warranty	One year parts and labor on defects in materials and workmanship

## Ordering Information

RGA100	100 amu RGA w/ RS-232
RGA200	200 amu RGA w/ RS-232
RGA300	300 amu RGA w/ RS-232
Option 01	Electron multiplier
Option 02	AC power module
Option 03	Ion counting output
O100HJRW	Heater jacket
O100MAX	Max. insertion nipple (4.5" CF)
O100REA	Ethernet adapter for RGA
PPM100	Optional stand-alone monitor



Maximum insertion nipple (O100MAX)