

Pfeiffer/Balzers Omnistar GSD 300 O2 RGA (Residual Gas Analyzer)

An RGA is in many ways the multimeter of the vacuum world, capable of extremely sensitive, mass selective detection of gasses down to partial pressures sometimes reaching below $1e-14$ mBar. Basically, it is able to detect and identify any gasses present in the vacuum system it is installed in and can be used for highly sensitive detection of leaks, contaminants of all types and process gasses. If for example there is a major air leak, strong nitrogen ($m/z=28$) and oxygen ($m/z=32$) lines will be present. To find the leak usually either helium ($m/z=4$) or Isopropanol ($m/z=60.01$ plus smaller fragments) may be sprayed around suspect connections, and whenever the leak is struck these mass/charge lines will see a sharp rise. RGA software often has built in modes for auditory signalling to aid in leak detection.

Most RGA's are designed to be permanently mounted to their chamber and operate as *in-situ* diagnostic tools. They are usually Quadrupole Mass analyzers with an electron multiplier detector, and most of the time they rely on the chamber's pumps to reach high enough vacuums to begin operations, usually around $1e-4$ mBar or better. Some are however more standalone units, separately pumped with their own turbopumps, allowing for much higher initial operating pressures, as is the case for the beauty we have here at OV, it can function at or even above ambient pressure and is as such a universal gas analysis system.

Some key specs for the Omnistar GSD 300 O2:

- Model Number BKM26253
- Power Supply 230V AC
- Omnistar Standard Gas Inlet
- 2m Capillary Heater
- Possibly fast Prisma Yttriated Iridium Filament on RGA
- 1-300 amu mass range
- Tungsten Channeltron Detector
- RS232C / ArcNet LAN / Separate Control Interfaces for communicating with the unit.

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Worth Asking for:

- Pfeiffer BG 805 203 BD; The Communications Manual for the QMS 200
- Pfeiffer Talkstar V1 or greater; the software used for controlling the RGA

Further reading:

- https://en.wikipedia.org/wiki/Residual_gas_analyzer
- https://en.wikipedia.org/wiki/Quadrupole_mass_analyzer
- <https://www.americaninstrument.com/pdf/2647-GC.pdf> Pfeiffer Omnistar GSD 301 T Manual
- <http://nanotraps.mbi-berlin.de/public/Bedienungsanleitungen-Manuals/massenspektrometer/0bg5201bd.pdf> Pfeiffer Prisma QMS 200 (in German Unfortunately)
- https://www.idealvac.com/files/brochures/Pfeiffer_PKR_251_Pirani_ColdCathode.pdf Pfeiffer PKR 251
- <https://manualzz.com/doc/30114534/quadstar-32-bit> Manual for the Analysis and control software for the unit