

Please Note:

These products are not currently available from MKS Instruments. The information here is provided as a resource for existing customers and may not be current.

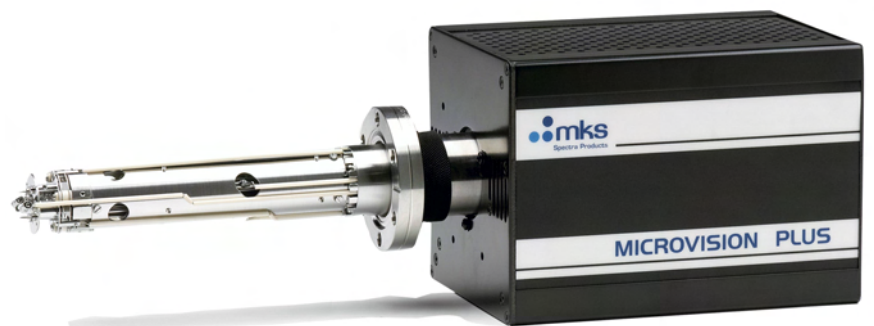
Gas

MicroVision Plus

SENSORS + SUPPORT = SOLUTIONS

Analysis

WWW.MKSINSTRUMENT.COM



Description

MicroVision Plus technology lies at the heart of every MKS, Spectra Products process RGA sensor and gas monitoring system. Harnessing the latest advances in RF electronics design and data acquisition electronics, the MicroVision Plus RGA delivers the levels of performance required in even the most demanding of applications. High stability operation and fast, wide dynamic range scanning allows process deviations and gas composition changes to be highlighted immediately.

The MicroVision Plus RGA offers state-of-the art electronics technology coupled with the latest in production-worthy residual gas analyzer instrumentation. The MicroVision Plus RGA features “smart head” technology — the electronics unit mounts directly onto the analyzer head, and connects directly to the system PC via an RS232C or RS422 interface. To meet specific applications requirements, open ion sources and UHV sources are available. The open ion source analyzer is

manufactured from stainless steel and high-purity alumina ceramics, and features independently replaceable twin filaments to provide built in back-up for longer operation without vacuum interruptions. In addition, the user-replaceable ion source can also be cleaned and rebuilt to maximize the lifetime of the analyzer. The UHV source is based on a low thermal inertia design for fast degassing and minimal out-gassing. Incorporating a platinum source cage, it reduces the occurrence of ESD (electron stimulated desorption) peaks.

The MicroVision Plus RGA incorporates a pre-filtered quadrupole analyzer as standard for contamination resistance and enhanced long term stability and high-mass sensitivity. A triple filter analyzer is also available for applications where enhanced resolution and maximum high mass performance is required.

Features & Benefits

- High stability RF and data acquisition electronics - minimum temperature related drift, fast warm-up
- Fast, wide dynamic range scanning - rapid highlighting of process deviations
- Pre-filtered analyzer as standard for improved resistance to contamination and enhanced high-mass sensitivity
- Flexible I/O capability for interaction with production tools and other sensors
- Operates with RGA for Microsoft® Windows® software program
 - Interactive, easy to use, comprehensive range of features
 - Included data review package
 - Optional simultaneous multiple-sensor operation capability
- Available with Process Eye 2000 software for:
 - Advanced process recipe creation and tracking
 - Decision making with alarm capabilities in recipes
 - Advanced screen displays with multiple, simultaneous chart presentation
- User-serviceable design

Applications

For general residual gas analysis, the performance of MicroVision Plus, coupled to the wide range of configurations available, make it the ideal choice for many different applications, including:

- High vacuum (UHV) applications, such as vacuum coatings, accelerators and high energy physics
- Harsh environments such as high temperature and ionizing radiation
- High performance
 - Research and development for high mass species studies
 - High resolution studies, including low molecular weight species studies and helium from deuterium studies



Applications

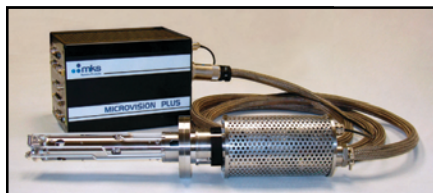
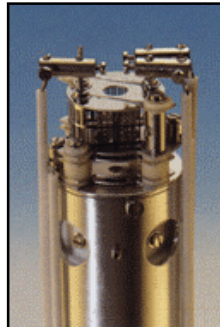
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High Performance RGA Configurations for Research and Industry

MKS, Spectra Products has been at the forefront of RGA technology for over a decade, including the first organization to launch commercial products for simultaneous multi-sensor operation and for operation in high radiation environments. MicroVision Plus RGAs are used by many of the most prestigious R&D and industrial facilities in the world - including a major synchrotron radiation research facility, which features the world's largest single installation of RGAs.

The Choice for UHV

The MicroVision Plus with an open ion source analyzer is suitable for many high vacuum RGA applications. For UHV pressures, a high performance UHV source option is available. This source incorporates a platinum source cage to reduce ESD. For fast degassing and minimal out-gassing, the UHV source is based on a low thermal inertia design.



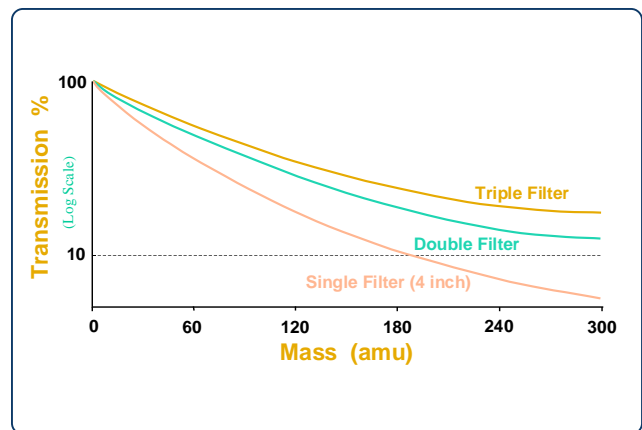
The Choice for Operation in Harsh Environments

Certain applications require the RGA

to operate in an environment that could damage the electronics in traditional close-coupled configurations. MicroVision Plus assemblies can be supplied with special extenders that allow the analyzer to be operated in harsh environments (e.g. high temperature/ionizing radiation) with the control electronics located in a safe/shielded position. Two extenders are available (3 meters and 15 meters), each incorporating radiation resistant cable and a high temperature analyzer interface, allowing analyzers to be operated at temperatures of up to 200°C (Faraday detection mode only).

The Choice for High Mass Performance

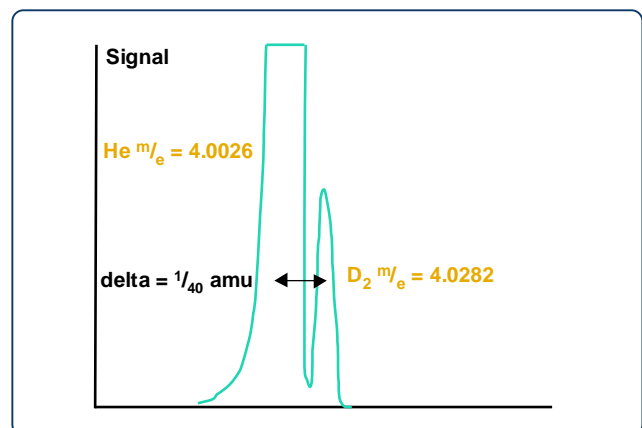
MicroVision Plus systems incorporate a pre-filtered analyzer as standard. While protecting the main filter from a gradual build-up in contamination, the "RF only" pre-filter also strongly focuses ions leaving the ion source, thereby improving both resolution and transmission (a measure of ions successfully traveling between the ion source and the detector). The optional "triple filter" analyzer has both pre- and post-filters for further improvements in the transmission of higher mass species.



Improvement in performance with double and triple filters

The Choice for High Resolution Performance

Two special models of MicroVision Plus are available for applications requiring enhanced peak resolution and sensitivity performance. Incorporating high frequency RF electronics, these units have mass ranges of 1-100 amu and 1-6 amu. The 1-100 amu version delivers excellent performance for low molecular weight species (including low levels of hydrogen). The 1-6 amu model, used in conjunction with a triple filter analyzer, is able to resolve helium and deuterium at mass 4.

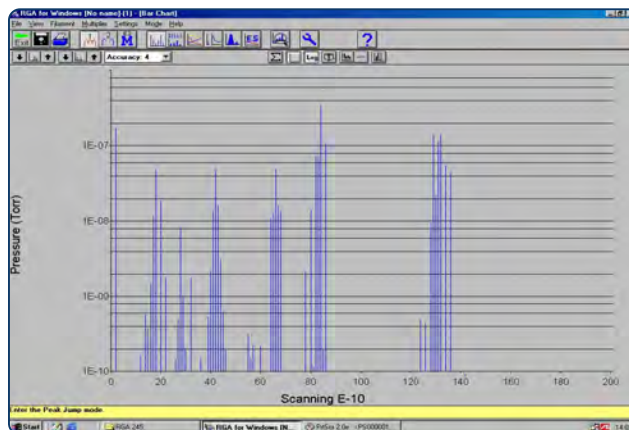


The delta M from the center of the He peak to the center of the D₂ peak is 1/40 amu

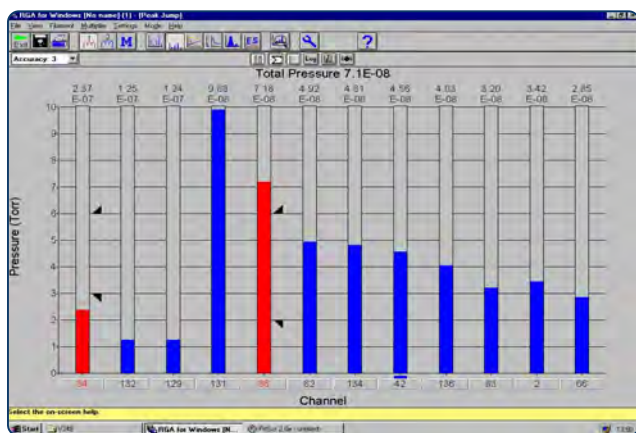


RGA for Windows® Control Platform

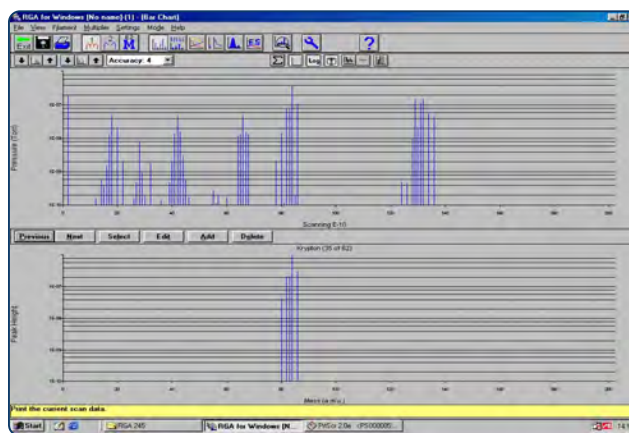
The MicroVision Plus RGA can be operated using RGA for Windows, an intuitive package that is widely acclaimed for its ease of use. RGA for Windows offers a number of data acquisition and display routines including Bar Chart (with library comparison), Peak Jump, Trend Analysis and Leak Check plus a high-speed multi-peak trend routine called Fast Scan. RGA for Windows includes DDE (dynamic data exchange) links for the exchange of data and control commands with other Windows based programs. A macro facility is also included for automated operation, along with a separate Recall package that can be used either off-line or simultaneously with RGA for Windows so that previously stored data can be directly compared with live data. Additionally, a multi-sensor version of RGA for Windows is available for the simultaneous operation of multiple MicroVision Plus units.



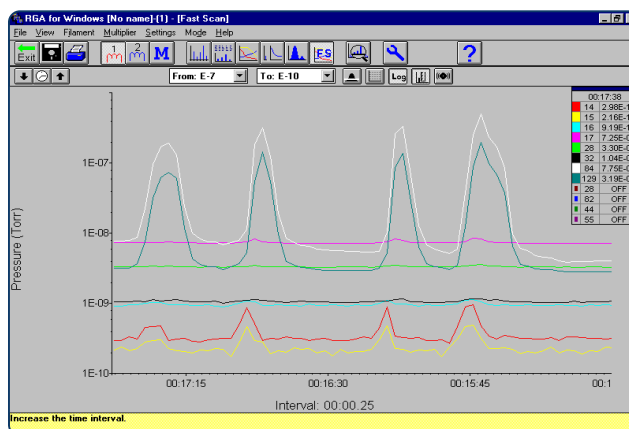
Standard bar chart mode with log pressure axis



Peak jump mode showing adjustable high/low alarm settings and alarms that have been triggered



Split screen library/bar chart comparison



Fast scanning multi-channel trend analysis mode



Process Eye 2000 Control Platform

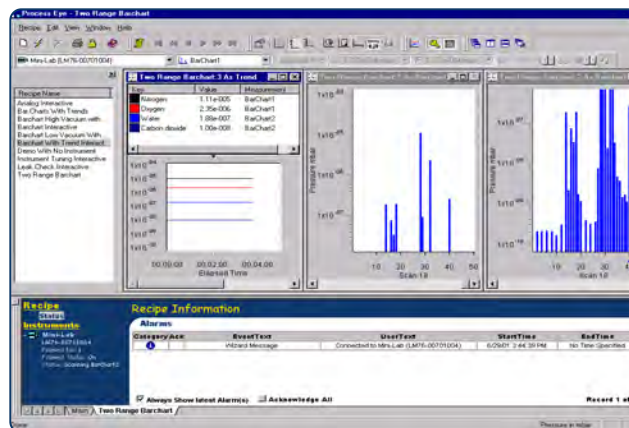
The MicroVision Plus RGA can also be operated with Process Eye 2000, a highly flexible, 32-bit modular application operating under Windows NT® 4.0, 95, 98, Millennium or 2000. Designed with a client/server structure, Process Eye 2000 incorporates TCP/IP protocol for full network compatibility.

Process Eye 2000 uses recipes to specify the way in which the instrument scans, displays data, and responds to the data acquired. Recipes are user configurable using the Recipe Wizard and are ideal for monitoring repetitive processes and analyses. In addition, Process Eye 2000 provides live history for quick on-line review of data trend events. Associated bar chart spectra and recently captured spectra are stored in a data buffer for easy review. The recipes can be linked together to address different monitoring conditions or to facilitate automatic calibration (using pre-defined calibration recipes). The single button push (or external signal) initiation of a Process Eye 2000 recipe eliminates the need for highly skilled, full time operators. The flexibility of Process Eye 2000 allows recipes to be configured that will:

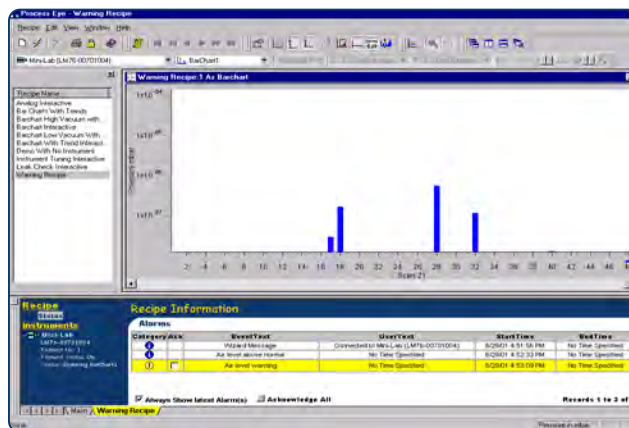
- Define data acquisition and display parameters, along with any on-line data processing required to convert data into relevant units and information
- Display data in multiple, simultaneous “bar chart” and “data trend” formats, allowing the comprehensive and clear investigation of significant trend events
- Incorporate custom warnings and alarms, triggered or terminated, when data highlights that process conditions have deviated from normal conditions or when specific events occur (e.g. valves opening/closing)
- Monitor and display other parameters as trends, in relevant units (temperature, gas flow rate, power, pressure, etc.) which are linked into the MicroVision Plus through its flexible analog and digital I/O

In addition, the Process Eye 2000 software platform allows MicroVision Plus systems to

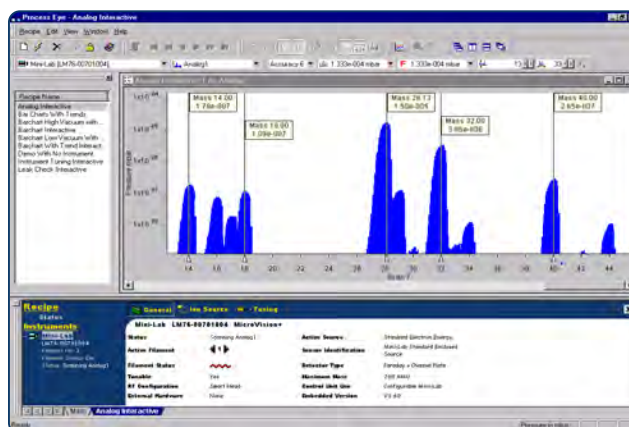
- Monitor gas composition trends as well as other critical parameters (temperature, flow rate, etc.)
- Alert the operator to deviations from normal conditions using custom messages



Bar chart scans covering different dynamic ranges with line trend display accessing data from both spectra



Logarithmic bar chart spectrum highlighting process deviation and displaying a warning screen



Interactive analog mode



Specifications

HARDWARE

Mass Range Options	1-100, 1-200 & 1-300 amu standard 1-6, & 1-100 amu high performance optional
Maximum Operating Pressure*	7.6x10 ⁻⁵ Torr (1x10 ⁻⁴ mbar)
Minimum Detectable Partial Pressure*	Faraday: 1.5x10 ⁻¹¹ Torr (2x10 ⁻¹¹ mbar) Channelplate SEM: 3.8x10 ⁻¹⁴ Torr (5x10 ⁻¹⁴ mbar) Single channel SEM: 7.6x10 ⁻¹⁵ Torr (1x10 ⁻¹⁴ mbar)
Mass Stability	Better than ±0.1 amu over 8 hours at stable ambient temperature
Resolution	Better than 10% valley between peaks of equal height, throughout mass range

ANALYZER

Bakeout Temperature	250°C (electronics dismantled)
Maximum Operating Temperature	200°C (Faraday mode only, electronics in horizontal orientation)
Mounting Flange	DN40CF (70 mm/2.75" OD) Conflat® Flange
Ion Source Options	Open, UHV, Closed and Cross-Beam
Ion Source Sensitivity	2x10 ⁻⁴ A/mbar
Ion Source Parameter Variables	Electron energy: 20-100eV. Emission current: 0-5 mA. Ion energy: 0-10V. Ion extraction potential: 0 - minus 130 V (adjustable from PC).
UHV Analyzer Outgassing Spec	Less than 1x10 ⁻⁹ mbar-l/s
Filaments	Twinned tungsten (optional ThO ₂ /Ir or Y ₂ O ₃ /Ir)

CONTROL UNIT/PC

MicroVision Plus Electronics Module Weight	2.1 kg
Power	24 VDC, 3.4 A external supply (included)
Maximum Ambient Operating Temperature	35°C, 80% RH (non condensing)
LED Status Indication	Filament 1, filament 2, SEM, power & communications
MicroVision Plus I/O Capability	RGA for Windows: 4 analog inputs (1 for external gauge reading), 12 TTL output signals; Process Eye 2000: 4 analog inputs (0-10V, 16 bit), 1 analog output (0-10V, 16 bit), 16 digital TTL I/O, 1 opto-isolated filament control input
I/O Capability (optional PC based)	Process Eye 2000: Generic I/O card support for ISA slots, DTS300 I/O card support for PCI slots, Modbus/GEM SECS support for some product configurations
Other Facilities	Leak-check audio headset socket with volume adjustment, external filament-protect speaker and socket, instrument reset
Software	Software: RGA for Windows: Windows 3.1, 3.11, 95/98*, NT 4.0*, Millennium* and 2000* compatible; Process Eye 2000: fully network compatible control platform generating under Microsoft® Windows NT 4.0, 98, Me, 2000* or XP* (recommended) *Contact MKS for degree of functionality
MicroVision Plus Communications (baud rate & max. distance)	RGA for Windows: RS232C, 9600 baud, 15 m (50ft) maximum; Process Eye 2000: RS232C, 9600 baud, 15 m (50ft) RS422, 115000 baud, 1.2 Km (4000ft)
Recommended PC Spec	Pentium III 233 MHz, 64MB RAM, 6 GB disk drive. Multi-sensor installations may require higher specifications.

OPTIONS AND PLUG-IN MODULES

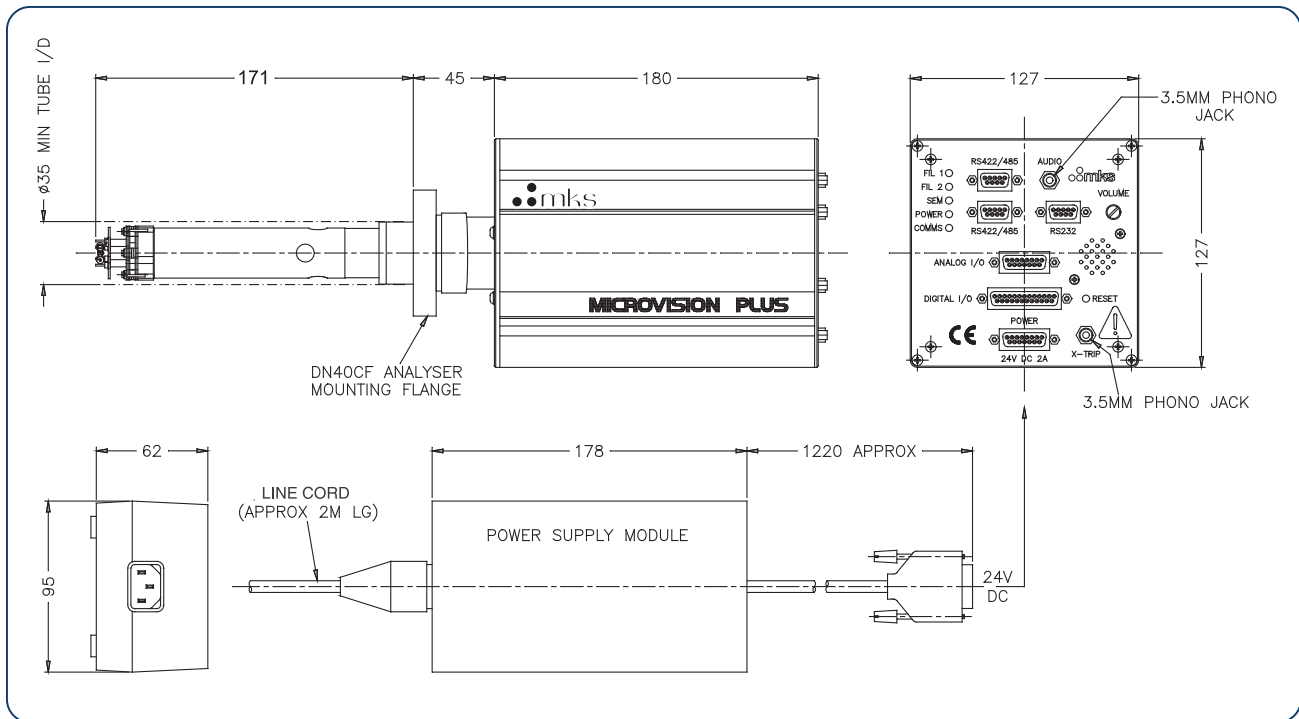
Radiation Resistant Extenders for Remote Location of Electronics	Two optional extender lengths available: 3 meters & 15 meters
Remote Vacuum Controller (RVC)	Provides interlocked PC-based control of differentially pumped vacuum system
Valve Actuator	Converts TTL logic signals to multiple 24 volt output signals
Valve Controller	Provides automated PC-based control of multi-way valve manifold

SHIPPING INFORMATION

Complete Instrument Shipping Weight	10 kg
MicroVision Plus Packaging Dimensions	430 mm x 390 mm x 330 mm



Dimensional Drawing



Note: Unless otherwise specified, dimensions are nominal values in millimeters.



Ordering Information

Please contact your local MKS office for price and availability information.



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