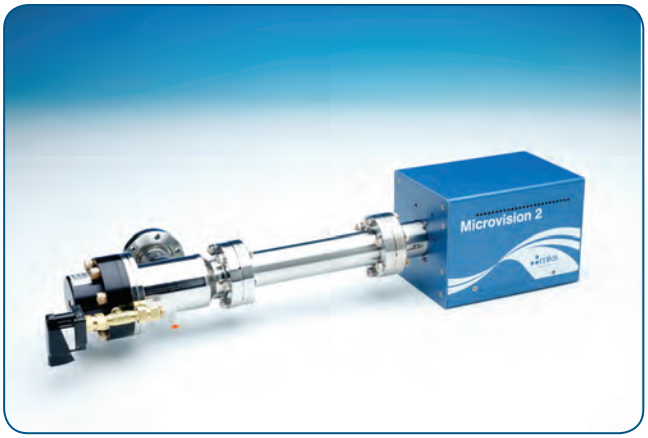


Mass Spectrometry Solutions

WWW.MKSINST.COM

Vision 2000-B™

VACUUM BASELINE MONITOR FOR PROCESS TOOLS

The Vision 2000-B™ is designed to track levels of potentially damaging residual gases that can negatively impact the quality of product – for example, aluminum deposition can be negatively impacted by the presence of O_2 and H_2O, which can lead to poor bulk film characteristics and surface roughness. The Vision 2000-B features the "smart head" technology from the Microvision 2. The electronics unit mounts directly onto the analyzer head, and connects to the system PC via an ethernet interface. The open ion source analyzer incorporates twin filaments, where the second "back-up" filament enables continued operation in the event of a filament failure. The user serviceable analyzer design allows the ion source to be easily removed and dismantled for cleaning. The standard system includes a double-filter analyzer for increased sensitivity of higher mass species, contamination resistance and enhanced long term stability. In addition, systems can be equipped with a heater jacket and pneumatic isolation valve. A 3-way pneumatic valve for manual control of isolation inlet valve is standard and optional pressure switch assemblies can be chosen to detect within milliseconds when a valve has opened or closed on the tool. This provides Vision 2000-B systems with the flexibility to fully satisfy the application requirements of any vacuum baseline RGA process.

Features & Benefits

- 100 amu standard mass range, 200 amu and 300 amu optional mass ranges
- Housings and heater jacket to meet needs of any process tool and vacuum baseline application
- Available with Process Eye™ Professional or optional TOOLweb® RGA software for
  - — Automated, recipe based operation
  - — User configurable, intelligent alarms
  - — High level tool integration
  - — Advanced data presentation (i.e. simultaneous bar chart/trend screen displays and display of valve movements)
- Simultaneous multiple-sensor operation capability
- Integration with tools for interdiction and alarms
- Alarm levels that dynamically change based on the slit valve positions (when used in conjunction with TOOLweb RGA)

Applications

The Vision 2000-B is an application specific instrument designed to monitor vacuum pumpdown, baseline, and leakback conditions on semiconductor and thin film process tools, and to alert of conditions that can negatively impact product yield. In addition, the Vision 2000-B provides the information required to optimize vacuum quality with

- Residual gas monitoring, including air and water
- Contaminant monitoring, including Hydrocarbons

Description

Process Eye™ Professional Control Platform

The Vision 2000-B analyzer uses Process Eye Professional, a highly flexible, modular application operating under 32bit or 64bit Windows XP, Vista, Server 2008 or Windows 7. Designed with a “client/server” structure, Process Eye Professional incorporates TCP/IP protocol for full network compatibility.

Process Eye Professional 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 the various phases of repetitive recipes.

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 Professional recipe eliminates the need for highly skilled, full time operators. The flexibility of Process Eye Professional allows recipes to be configured that will:

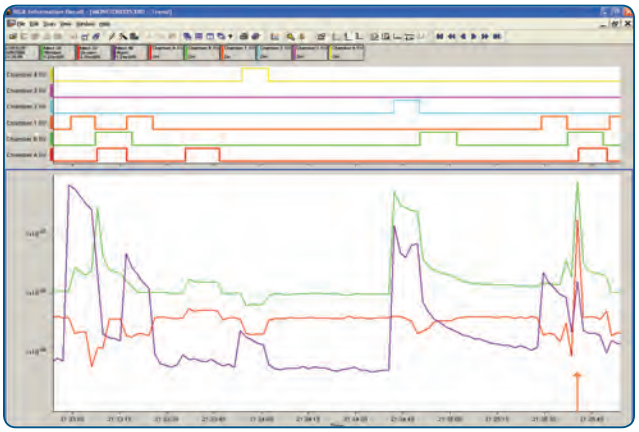
- Define data acquisition and data display parameters
- Display data in simultaneous “bar chart” and “data trend” formats, allowing the comprehensive and clear investigation of significant trend events
- Incorporate custom warnings and alarms, triggered or terminated when data highlights that process 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 Vision 2000-B analyzer through its flexible analog and digital I/O

In addition, Process Eye Professional provides “live history” for quick on-line review of data trend events.

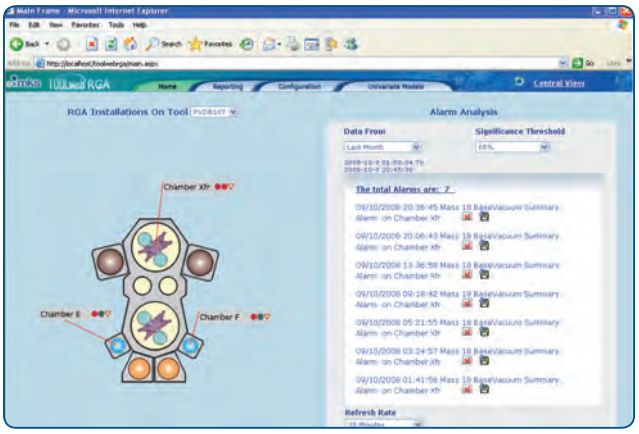
Recently captured bar chart spectra are stored in a data buffer and can be reviewed by moving a cursor over the associated trend plot.

TOOLweb® RGA

Using TOOLweb RGA sensor integration option for process tools, the Vision 2000-B can be used as a transfer, buffer or loader chamber sensor in a completely automated process environment. TOOLweb RGA maintains a constant monitor of tool activities with all sensor data being framed by wafer logistics before alarm models are applied. Full alarm and data reporting to the FAB host and FDC are available so real time monitoring of chamber conditions and flagging of any process excursions from ideal conditions is possible.



Data from a Vision 2000-B™ TOOLweb® RGA transfer module. The precise timing of slit valve pressure switch sensors compared to using SVIDS from the tool allows accurate diagnosis of which slit valve is causing an air leak on actuation.



TOOLweb® RGA Screen Home page for a tool with a Vision 2000-B transfer module. The dashboard view presents a complete status report and automated alarm analysis on one page.

Specifications

Performance

Mass Range Options	1-100 amu standard; 1-200 amu, 1-300 amu optional
Detector System	Dual (Faraday and secondary electron multiplier)
Maximum Operating Pressure	7.6e-5 Torr (1e-4 mbar)
Minimum Detectable Partial Pressure	
Faraday	2e-11 Torr (2.7e-11 mbar)
Secondary electron multiplier	5e-14 Torr (6.7e-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 the mass range

Analyzer & Housing

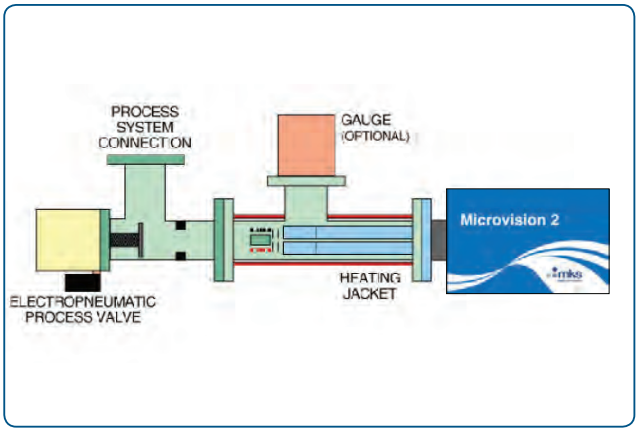
Bakeout Temperature & Bakeout Jacket	Optional for 200°C bakeout. 175w at 100-120Vac or 200-240 Vac.
Mounting Flange	DN35CF (70mm/2.75" OD) Conflat® flange
Ion Source	Open ion source
Filaments	Replaceable twin Tungsten or Thoria filaments
Vacuum Hardware	Analyzer housing plus pneumatic isolation valve. Optional independent total pressure gauge and/or valve and filament trip-box assemblies available for interlocked protection of the RGA.
Mass Filter	Double filter (1" RF only pre-filter with 4" main filter)
Pneumatics	60-80 psig CDA

Control Unit/PC

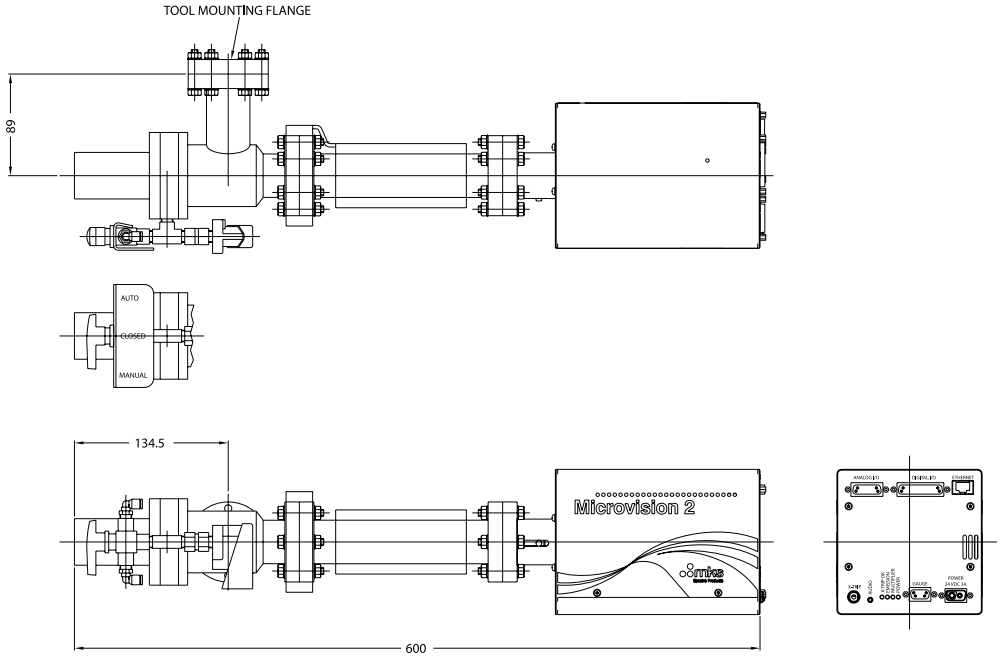
Control Module Weight	1.7 kg
Power	24 VDC, 3.4A, external supply (included), 100-120V/200-240V, 2.1 Amp, 47-63 Hz
Maximum Operating Conditions	Electronics: 10-40°C, 80% RH (non-condensing)
LED Status Indication	Interlock status, emission OK, SEM, power and communications
I/O Capability	4 analog inputs (-11 to +11v, 22 bit), 2 analog outputs (0-10V, 12 bit), 16 digital TTL I/O, 1 opto-isolated filament control input, one dedicated gauge port
Optional PC based	Generic I/O support for PCI slots, USB and Ethernet I/O devices. Modbus/GEM SECS support for some product configurations.
Other Facilities	Leak check headset socket, external filament trip and instrument reset
Software	Process Eye Professional fully network compatible control platform generating under Microsoft® Windows® 2000, XP* or Vista* (*recommended)
Communications	Ethernet CAT-5e
Minimum PC Specification Required	Required Intel® Pentium IV® or AMD Athlon XP 1.2GHz, 1024 MB RAM, 120 GB disk free space drive. Multi-sensor installation may require higher specifications.
Simultaneous Multi-Sensor	Multi-Sensor Process Eye Professional client/server configuration offers flexible multi-sensor operation
Total Shipping Weight	25 lbs (11.4 Kg)
Compliance	CE

Ordering Information

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



Vision 2000-B™ High Performance Process Monitor System Integration



Dimensional Drawing —

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

MKS Instruments, Inc.
Global Headquarters

2 Tech Drive, Suite 201
Andover, MA 01810

Tel: 978.645.5500
Tel: 800.227.8766 (in USA)
Web: www.mksinst.com

MKS Instruments, Inc.
Mass Spectrometry Solutions

3635 Peterson Way
Santa Clara, CA 95054

Tel: 408.750.0300

MKS Instruments, Inc.
Mass Spectrometry Solutions

Cowley Way
Crewe, Cheshire CW1 6AG

Tel: +44.1270.250150

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