



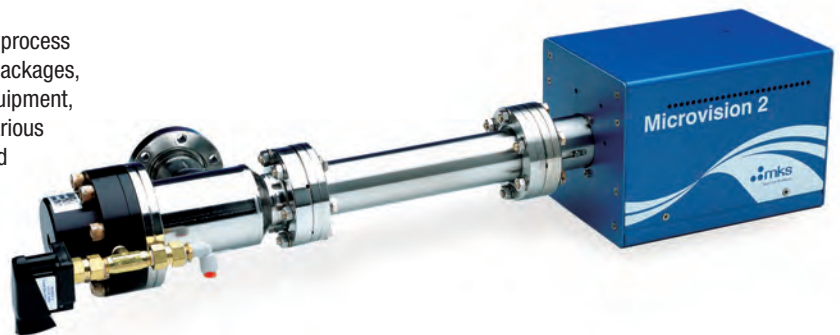
# Mass Spectrometry Solutions

**Residual Gas Analyzers (RGA)** — For general residual gas analysis, the performance of the MicroVision 2 RGA makes it the ideal choice for many applications, including ultra high vacuum (UHV) such as vacuum coatings, accelerators and high energy physics. The web-enabled e-Vision 2 RGA represents a significant advance in technology, opening up new possibilities for vacuum monitoring and e-diagnostics. With an unprecedented range of instrument control options, e-Vision 2 is designed to make vacuum troubleshooting and monitoring easy and straightforward.



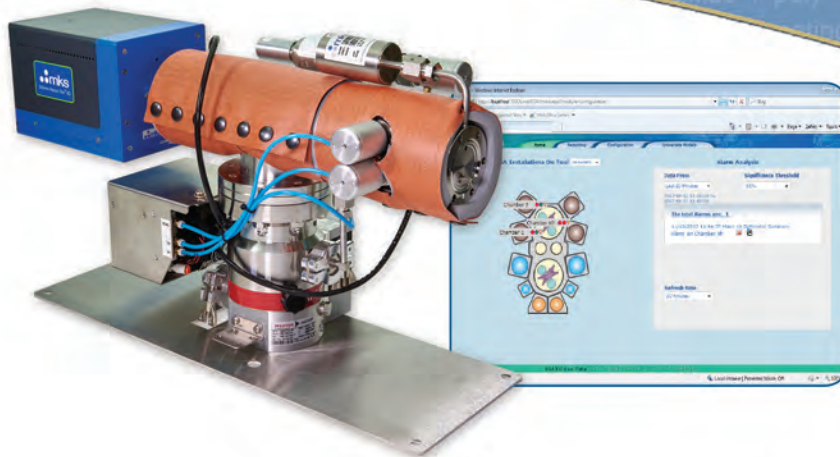
**High Pressure Residual Gas Analyzers** — The HPQ3 allows operation far beyond the  $1e-4$  mbar total pressure limit of other residual gas analyzers, without the need for differential pumping. Field-proven technology, coupled with the latest innovative electronics platform derived from the Microvision 2 family, give data quality not previously seen in this class of instrument. The HPQ3 has a variety of software control options to match the requirements of any application. For specific, higher pressure applications up to  $1e-2$  mbar, the HPQ3S makes real-time corrections using gauge pressure from the tool, or by using a variety of optional independent gauges fitted to custom F-Chamber designed for optimum performance.

**RGA Vacuum Process Monitor** — MKS Instruments' in-situ process monitoring instruments are fully integrated, application-specific packages, including component residual gas analyzers (RGAs), analytical equipment, and control software. Process mass spectrometers are used in various applications, including Chemical Vapor Deposition (CVD), Etch, and Physical Vapor Deposition (PVD) for process gas analysis. The Vision 2000-B™ tracks levels of potentially damaging residual gases that negatively impact quality. It features “smart head” technology from Microvision 2—the electronics unit mounts directly onto the analyzer head, and connects to the system PC via ethernet.



**RGA for ALD, CVD, Etch, and PVD Processes** — MKS Instruments incorporates patented V-lens™ technology, “smart head” RGA technology from Microvision 2 with a closed ion source and close-coupled inlet to deliver systems with a new level of sensitivity ( $<15$  ppb) and reliability, previously unachievable with conventional quadrupole mass spectrometry systems (QMS). These state-of-the-art RGAs are integrated with the Process Eye™ Professional control platform, a recipe-based, user-configurable software program.

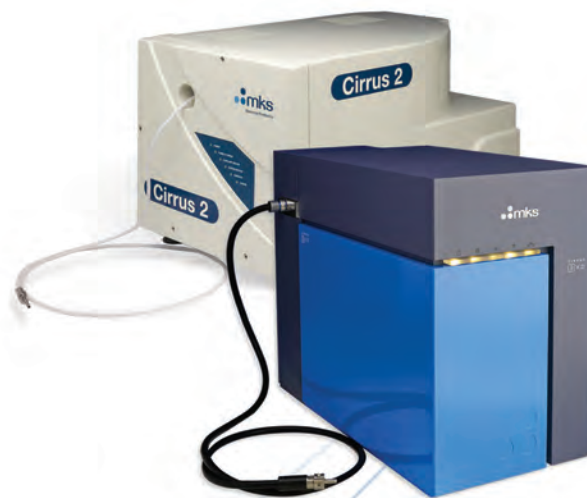
The Vision 2000-C™ XD and Vision 2000-E™ XD systems allow seamless monitoring of the complete ALD, CVD or Etch process cycle, from base vacuum to process pressures of up to 700 Torr. The Vision 2000-P™ XD provides simple and effective PVD process monitoring of contamination levels within semiconductor and thin film PVD process tools. With V-lens technology, process engineers can identify and prevent issues faster and easier than ever before while maximizing manufacturing yield.



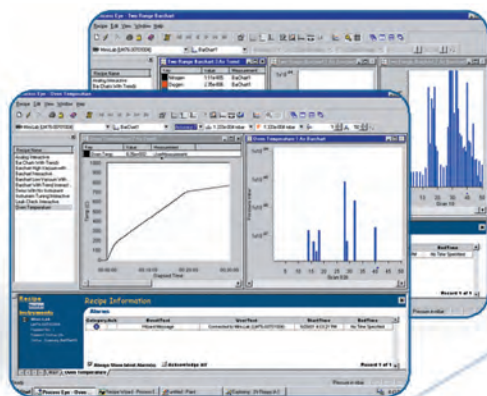
**Photoresist Detection Monitor RGA** — It is often difficult to know when a photoresist problem is affecting the productivity of a 300mm PVD system. Even small amounts of residual resist, when introduced over a prolonged period, can reduce yields, cause particle contamination or slowly contaminate process chambers. Early identification is therefore critical.

The 300mm Resist-Torr® XD system consists of an optimum combination of V-lens technology, a closed ion source quadrupole mass analyzer with fast response capillary inlet, and advanced proprietary algorithms developed exclusively for the degas chambers on industry leading 300mm PVD cluster tools. This provides a new level of sensitivity (<15ppb), selectivity, and confidence in degas applications not achievable with conventional quadrupole mass spectrometry-based residual gas analyzers.

When utilized with the powerful features of Process Eye™ and TOOLweb® RGA sensor control software, the result is a completely automated operation providing highly sensitive and highly reliable early photoresist detection. Unscheduled downtimes are reduced and device yields are improved.



**Atmospheric Pressure RGA** — Cirrus™ 3-XD is designed to more easily detect and monitor trace gases, delivering a unique analytical advantage for “eXtreme Detection” capability. The Cirrus 3-XD system provides a new level in performance and robustness in compact benchtop and rack-mounted designs. Cirrus 2 quadrupole mass spectrometer offers the versatility of state-of-the-art quadrupole mass spectrometry in a convenient benchtop configuration. Cirrus quadrupole mass spectrometer systems are regularly used for the identification and analysis of gases and gas mixtures in a wide variety of applications.



**RGA Process Monitoring Software** — Process Eye Professional and EasyView are the latest in RGA software from MKS Instruments. They are 32-bit, network compatible applications that capitalize on the features and functions of the latest Microsoft® operating systems. They are designed for process monitoring applications where flexible control is required to achieve automation and full integration with a process tool. Process Eye Professional uses recipes to define the way in which the RGA scans, displays data, and responds to the data acquired. EasyView is an interactive, ICON-driven package with many advanced data display and data storage capabilities.

