

# e-Vision 2

## Residual Gas Analyzer for General Purpose Vacuum Analysis



Residual Gas Analysis (RGA) is a routine workhorse tool for any vacuum engineer. The ability to quickly determine the individual gas partial pressures within a vacuum chamber provides a wealth of diagnostic information to help troubleshoot real and virtual leaks, identify components with abnormal out-gassing, identify contaminants and confirm when cryo-pumping and getter systems are close to needing regeneration. The e-Vision 2 RGA is one of a new range of products, from MKS, designed to meet all the traditional requirements for an RGA sensor but with data collection at speeds unachievable with previous generation technologies.

The e-Vision 2 RGA is designed to provide maximum value for money. The e-Vision 2 is designed to collect data at millisecond speeds per data point even when measuring data over the full dynamic range of the RGA. This capability has been achieved without sacrificing any of the necessary robustness, reliability and support which have served to make MKS the world leader in RGA products over the widest range of applications — from semiconductor tools or particle accelerators to general industrial applications.

### Product Features

- Maximum data acquisition speed of <3ms per point for analog scans
- Mass range of 100 or 200 amu
- Maximum operating pressure of  $1\text{e-}4$  Torr ( $1.3\text{e-}4$  mbar)



### Applications

The e-Vision 2 is suitable for a wide range of applications including:

- Leak detection of vacuum lines, welds and seals
- Vacuum diagnostics
- Pump down monitoring
- Chamber bakeout monitoring
- Leak checking of coolant lines within a vacuum chamber
- Chamber contaminant monitoring
- Monitor cryo-pump performance
- Monitor getter performance



*e-Vision 2 in use as a troubleshooting tool on vacuum-based surface analysis equipment.*

## Technology Leadership

MKS was the first company to offer an RGA compatible with modern Ethernet based web-enabled wide area network installations. The e-Vision 2 continues this development for the highest flexibility and connectivity through the use of industry standard communication hardware and software. The e-Vision 2 optimizes the roles required of a complex sensor by having two dedicated processors, one optimized, proprietary processor for data acquisition and one industry standard CE operating system processor for external communications through field proven TCP-IP technology. The advantages of this design approach are fast, accurate data from a robust RGA sensor using industry standard, flexible communication protocols, all at the best possible value for your investment.

## Hardware Performance

### Sensors

Field proven MKS quadrupole mass analyzers, with twin filaments as standard, ensure minimum downtime during critical diagnostic testing. The RGA is available with an optional dual detector including a faraday detector and microchannel plate electron multiplier for detection to  $e-14$  mbar.

### Electronics

Data acquisition occurs through all solid state, wide dynamic range, fast settling detector electronics. This technology prevents large peaks from causing false positive measurements on small peaks. Temperature stabilized critical components mean that signal stability and baseline drift are improved, allowing the unit to be used without frequent recalibration if the vacuum chamber is stable but ambient air temperature fluctuates.

## Software Flexibility

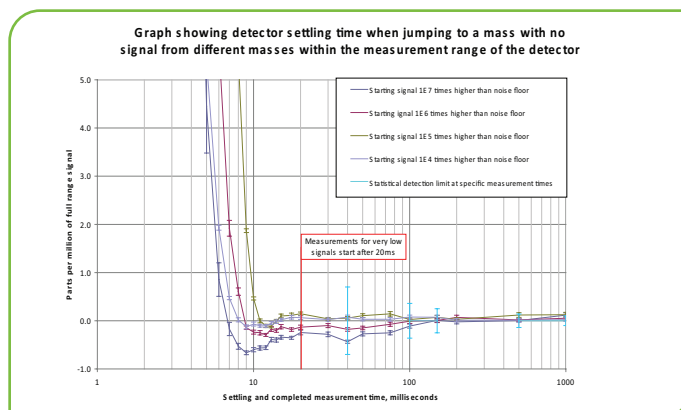
### Built-in Web Application

A web interface using industry standard technology allows control of the e-Vision 2 as well as calibration, operation and data export through a non platform-specific web browser from anywhere on a network. Using the ASCII protocol and TCP-IP communication, any third party software can send and receive commands and data from the e-Vision 2. In addition to the standard, built-in web applications, software control is also available through an optional Windows application, offering the best possible fit to any customer requirement.

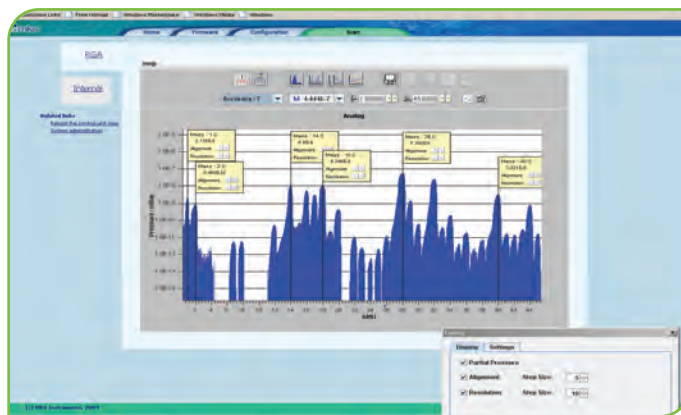
## EasyView

The field proven software provides basic RGA controls but with more functionality than the built-in web application.

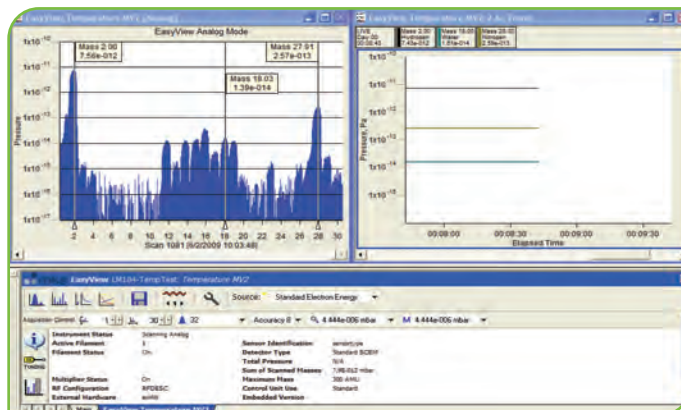
- Store RGA data and recall it back into the Recall viewer
- Annotate graphs with notes
- Run several RGAs from one software package



Signals close to the noise floor can still be reliably measured, even immediately after measuring very large signals.



Built-in web application for e-Vision 2 control and data acquisition.



EasyView software for more sophisticated data management and control of multiple RGAs.

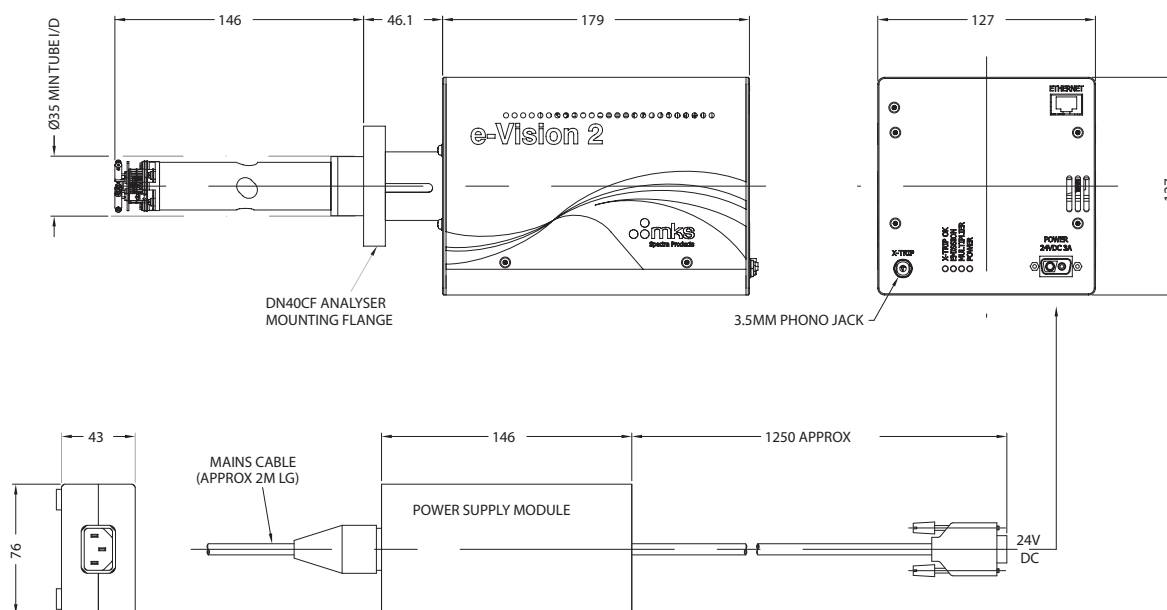
## e-Vision 2 Electronics

Mounted Weight on Flange	1.7kg
Power	24V DC, 2A external universal voltage supply (included)
Maximum Operating Conditions	10-40°C, 80% RH (non condensing)
Communication	10/100 Base-T Ethernet, static or automatically assigned IP addresses
Data Acquisition Method	Dedicated realtime acquisition processor
Data Collection Methods	<ul style="list-style-type: none"> <li>Analog scanning, full mass range 8, 16 or 32 points/amu</li> <li>Barchart scanning</li> <li>Peak-jump collection of up to 15 peaks per scan</li> </ul>
Maximum Data Acquisition Speed	<3ms per point for analog scans
Settling Time from Full Range to Baseline Signal	<20ms
Control Method	CE operating system processor with web-server interface
Command Structure	Documented ASCII command protocols
Electron Energy	40 or 70eV fixed (set in web configuration)
Emission Current	1 mA
Filament Protection	Opto-isolated input for filament protect or control with auto detection of presence of the jack plug as failsafe
Software	<ul style="list-style-type: none"> <li>Built-in web applications allowing RGA control and data acquisition without installed software using web browser on any PC</li> <li>Optional EasyView for Windows 2000, XP or Vista</li> </ul>

## e-Vision 2 Analyzers

Mass Range	100 or 200 amu
Filter Length	4" (100 mm)
Detector	Faraday or Dual Faraday Microchannel Plate Electron Multiplier
Filaments	Tungsten or Thoria Coated Iridium
Maximum Operating Pressure	1e-4 Torr (1.3e-4 mbar)
Ion Source Sensitivity	5e-5 A/mbar
Minimum Detectable Partial Pressure (3 $\sigma$ baseline noise at 300ms integration)	<ul style="list-style-type: none"> <li>7.5e-11 Torr (1e-10 mbar) Faraday</li> <li>2e-13 Torr (2.5e-13 mbar) Multiplier</li> </ul>
Mass Stability	$\pm 0.1$ amu over 8 hours at stable ambient
Resolution	Better than 10% valley for peaks of equal height across mass range
Bakeout Temperature	250°C with electronics removed
Operating Temperature	<ul style="list-style-type: none"> <li>200°C Faraday only with electronics 10-40°C</li> <li>150°C Multiplier with electronics 10-40°C and pressure &lt;1e-8 mbar</li> <li>90°C Multiplier with electronics 10-40°C and pressure &lt;1e-5 mbar</li> </ul>
Compliance	CE

Ordering Code: EVX-YZ0-00A (Example: EV2-120-000)	Code	Configuration
<b>Model</b>		
e-Vision 2	EV	EV
<b>Software Option (X)</b>		
Web Application Only	2	2
EasyView	E	
<b>Mass Range (Y)</b>		
100 amu	1	1
200 amu	2	
<b>Detector Type (Z)</b>		
Faraday Only	1	2
Multichannel Plate Dual	2	
<b>Reserved Digits 6, 7, and 8 (0-00)</b>		
TBD	0-00	0-00
<b>Filament Choice (A)</b>		
Tungsten Filaments	0	0
Thora Coated Iridium	1	



Dimensional Drawing - Unless otherwise specified, dimensions are nominal values in millimeters.