



 HiCube™ RGA

The all-in-one solution for gas analysis

For Europe only!

## The all-in-one solution for gas analysis

### All in one

The new HiCube RGA pumping station offers you a simple, straightforward solution for your gas analysis needs. It is suitable for mobile applications, and offers high resolution and sensitivity. The combination of the PrismaPlus mass spectrometer and a dry-sealing HiCube turbopumping station offers you a measurement and analysis unit for a wide range of applications that features optimally inter-coordinated high-tech components.

### Integrated safety

The integrated gas dosing/shut-off valve allows you to vary inlet pressure within a regulating range from atmospheric pressure to high vacuum. The additional employment of an ActiveLine full-range transmitter secures the mass spectrometer. This automatic pressure monitoring feature assures that the filament will always be de-energized sufficiently in advance should the pressure be exceeded. That makes our all-in-one system unsusceptible to improper operation, saving cash money over time.

### Numerous connection options

The HiCube RGA is designed for universal use. Thanks to its digital and analog inputs and outputs and the Quadera® software that comes with the unit, it is also possible to integrate external signals. This affords both system control as well as process monitoring. The software's user-friendly interface provides holistic display of both the measured values as well as the signals from external components.

### Advantages at a glance

- Can be used from atmospheric pressure to high vacuum
- Filament protected through pressure monitoring
- Gas inlet system with integrated shut-off
- High resolution and sensitivity
- Residual gas analysis and helium leak detection function



#### Wide variety of applications

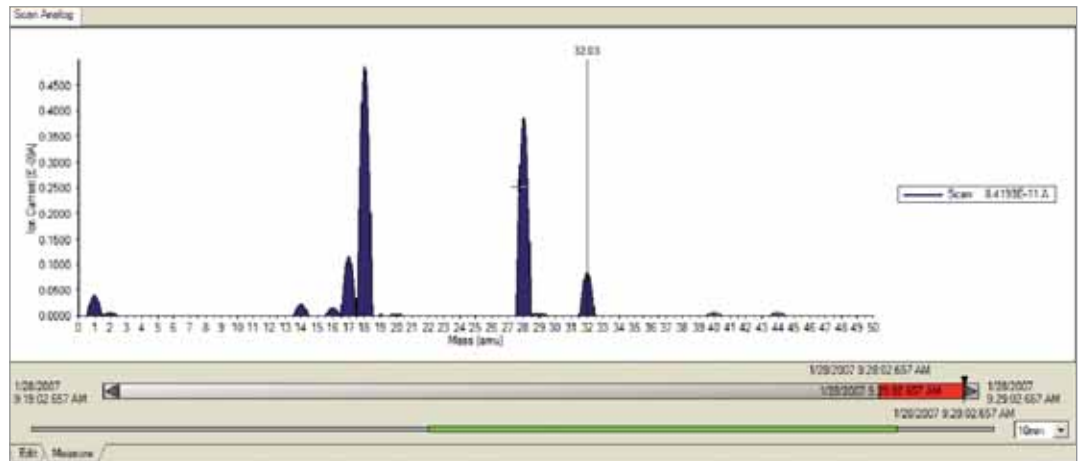
The new HiCube RGA offers virtually unsurpassed versatility. Whether you'd like to use it for residual gas analysis, process monitoring, leak detection or quality control in connection with vacuum processes – what you get with the HiCube RGA, is a complete, ready-to-run vacuum solution for research and development, the semiconductor and coating industries, as well as any number of further industrial applications.

## The all-in-one solution for gas analysis

### Typical applications

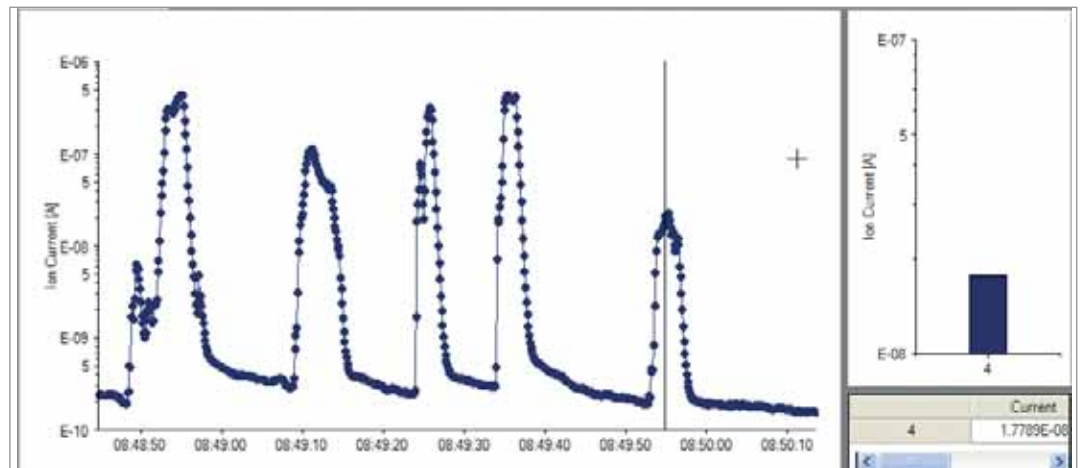
#### Residual gas analysis

Analysis of the residual gas in a recipient provides insight into the composition of the remaining substances upon reaching the desired ultimate pressure or conditioning requirements. This enables conclusions to be drawn about the surface properties, desorption behavior, purity and leak-tightness of the recipient, as well as the composition of the process gas. That provides the user with important information about the condition of his vacuum chamber and/or the vacuum components.



#### Leak detection

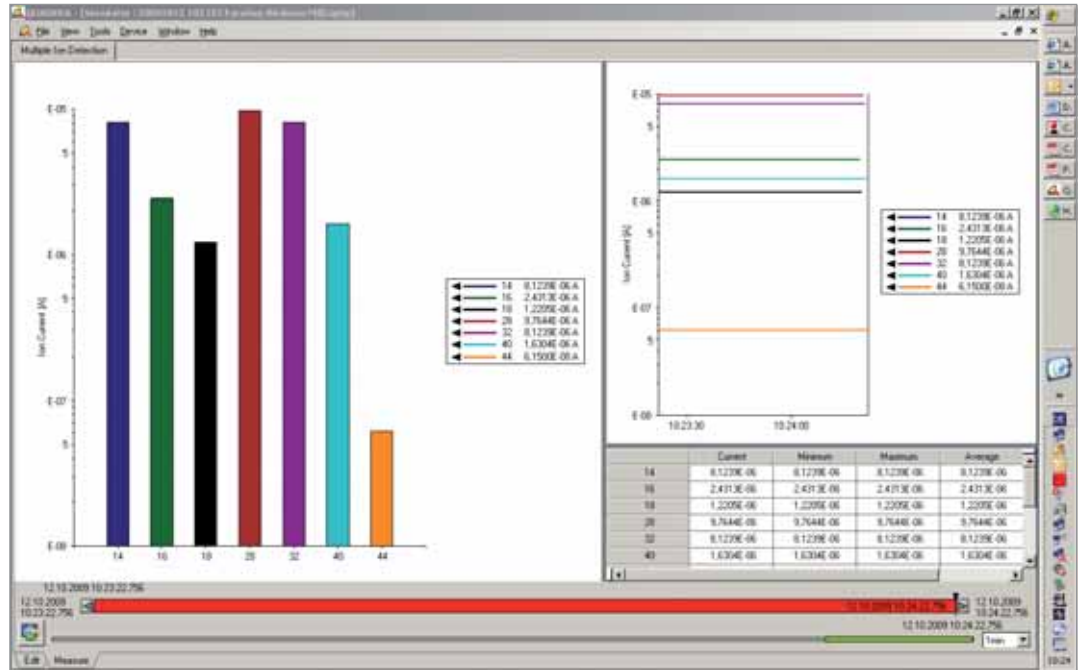
The HiCube RGA features a helium leak detection mode that can be activated under software control. This functionality makes it easier for the user to find any leaks in the vacuum system.



## Process monitoring

The HiCube RGA enables 128 selected mass intensities to be observed over time within a measurement range of up to 300 amu\*. Cycling thresholds can be assigned to selected masses. If they are higher or lower than the desired limits, signals are advanced to a higher-level control system via digital outputs. This allows the HiCube RGA to provide realtime process observation and control.

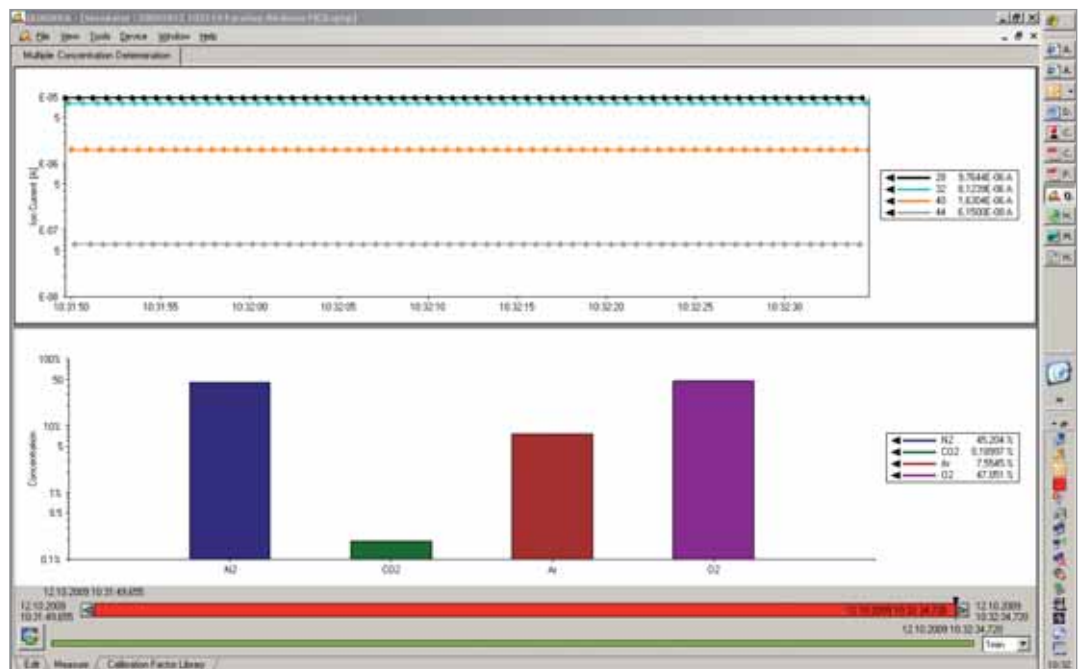
The EVN 116 gas dosing valve additionally allows the pressure in the vacuum system to be adapted to suit the needs of the process in question, and an additionally integrated shut-off valve provides excellent reproducibility of the gas inlet.



## Quality assurance and process optimization

The ability to provide quantitative determination of the gas composition and to determine the purity of process gases, as well as to monitor the gas composition in connection with vacuum coating processes, for example, is considered to be an important instrument in process documentation and quality assurance.

All measured values are stored even while the measurement is being performed, and can be tracked without having to stop the measurement. The measurement results can be exported for further analysis even while a measurement is still being performed.



\* Depending upon the mass spectrometer in question

## Technical data

<b>Turbopumping Station</b>	<b>HiCube™ Eco</b>
Power consumption	230 VA
Voltage (range)	110 V, 50/60 Hz; 230 V, 50/60 Hz
Pumping speed for N <sub>2</sub>	67 l/s
Pumping speed of backing pump at 50 Hz	0.9 m <sup>3</sup> /h
Ultimate pressure	< 1 · 10 <sup>-7</sup> mbar

<b>Transmitter</b>	<b>PKR 251 active Pirani/cold cathode transmitter</b>
Measurement range	from 5 · 10 <sup>-9</sup> to 1 · 10 <sup>3</sup> mbar

<b>Valve<sup>1)</sup></b>	<b>EVN 116 gas dosing/shut-off valve</b>
Gas flow	regelbar von 5 · 10 <sup>-6</sup> bis 3 · 10 <sup>3</sup> mbar l/s
Connection	DN 16 ISO-KF

<b>Mass spectrometers<sup>4)</sup></b>	<b>PrismaPlus™</b>					
	<b>QMG 220 F1</b>	<b>QMG 220 F2</b>	<b>QMG 220 F3</b>	<b>QMG 220 M1</b>	<b>QMG 220 M2</b>	<b>QMG 220 M3</b>
Detector		Faraday (F)			C-SEM <sup>3)</sup> /Faraday (M)	
Mass range	1-100 amu	1-200 amu	1-300 amu	1-100 amu	1-200 amu	1-300 amu
Rod system, diameter/length	6 mm/100 mm					
Min. detection limit, Faraday	1 · 10 <sup>-12</sup> mbar	2 · 10 <sup>-12</sup> mbar	4 · 10 <sup>-12</sup> mbar	5 · 10 <sup>-12</sup> mbar	1 · 10 <sup>-11</sup> mbar	2 · 10 <sup>-11</sup> mbar
Min. detection limit, C-SEM	–	–	–	1 · 10 <sup>-14</sup> mbar	< 2 · 10 <sup>-14</sup> mbar	< 4 · 10 <sup>-14</sup> mbar
Sensitivity to Ar, Faraday	1 · 10 <sup>-3</sup> A/mbar	6 · 10 <sup>-4</sup> A/mbar	3 · 10 <sup>-4</sup> A/mbar	5 · 10 <sup>-4</sup> A/mbar	3 · 10 <sup>-4</sup> A/mbar	1.5 · 10 <sup>-4</sup> A/mbar
Sensitivity to Ar, C-SEM	–	–	–	200 A/mbar	200 A/mbar	100 A/mbar
Max. operating pressure <sup>2)</sup> , Faraday operation	1 · 10 <sup>-4</sup> mbar					
Max. operating pressure, C-SEM operation –	–	–	–	1 · 10 <sup>-5</sup> mbar	1 · 10 <sup>-5</sup> mbar	1 · 10 <sup>-5</sup> mbar
Contribution to adjacent mass (40/41)	< 10 ppm	< 20 ppm	< 50 ppm	< 10 ppm	< 20 ppm	< 50 ppm
Operating temperature, analyzer	150 °C					
Operating temperature, electronics	0 - 40 °C					
Bake-out temperature, analyzer	200 °C					
Connection flange	DN 40 CF-F					
Resolution at 10 % peak	0.5 - 2.5 amu					
Measurement speed, analog/bar graph scan	20 ms - 60 s/amu					
Measurement speed, stair	2 ms - 60 s/amu					
Measurement speed, MID	2 ms - 60 s/amu					
Number of measurement channels in MID	128					
Reproducibility of peak ratio	± 0,5 %					
Interface	Ethernet					
Digital input	External protection					
Supply voltage	90 - 260 V AC, 50/60 Hz					

<b>Total weight<sup>5)</sup></b>	<b>HiCube™ RGA</b>
HiCube RGA (complete system)	25.4 - 26.8 kg

<sup>1)</sup> Including digital position indication and integrated shut-off valve

<sup>2)</sup> With emission current reduced to 0.2 mA: 1 · 10<sup>3</sup> mbar

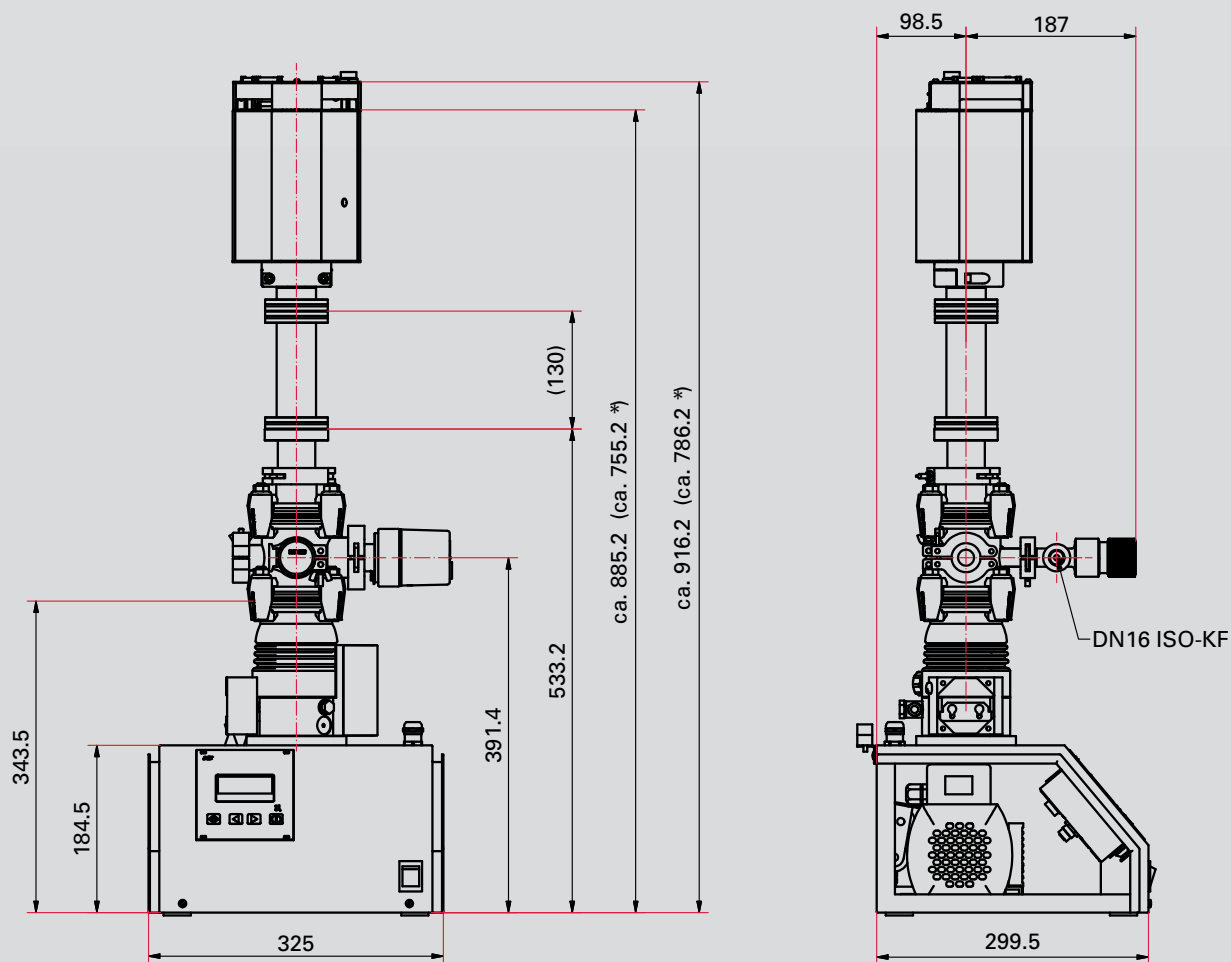
<sup>3)</sup> C-SEM = Continuous Secondary Electron Multiplier

<sup>4)</sup> Incl. I/O module, open ion source, connection for electronics and analyzer on one axis (o°), yttriated iridium filament

<sup>5)</sup> Depending upon mass spectrometer

The HiCube RGA is optionally available with display unit (laptop)

## Dimensional drawing and order numbers



*\*) The dimensional drawing shows the complete HiCube RGA system with QMG 220 M1/M2/M3. The values in parentheses apply to the HiCube RGA with QMG 220 F1/F2/F3.*

Dimensions in mm

### Order numbers

HiCube RGA with PrismaPlus	QMG 220 F1 <sup>*)</sup>	QMG 220 F2 <sup>*)</sup>	QMG 220 F3 <sup>*)</sup>	QMG 220 M1	QMG 220 M2	QMG 220 M3
<b>Order numbers</b>	PP S15 001	PP S15 002	PP S15 003	PP S15 004	PP S15 005	PP S15 006

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