



# PRISMAPRO®

The latest generation of compact mass spectrometers.  
Modular design. Powerful software. Low detection limit.

## The latest generation of compact mass spectrometers.

The combination of high sensitivity, maximum stability and intelligent operation make the PrismaPro the perfect solution for mass spectrometry.

### Versatility

Its modular design offers you a variety of application options in industrial and analytical environments, in research & development, in semiconductor production and in coating technology.

The PrismaPro is the ideal solution for applications ranging from quality assurance, leak detection and residual gas analysis right through to complex, quantitative tasks.

### New generation of software

The newly developed PV MassSpec software is a further plus. In addition to being especially easy to operate, it also serves as an easy-to-read platform for transferring all measured data.

### Open programming interface

Alternatively to the PV MassSpec, the disclosed JSON programming interface of the PrismaPro can also be accessed directly. Together with a wide selection of interfaces, such as digital and analog inputs and outputs or Ethernet, integration into your system is easily achieved.

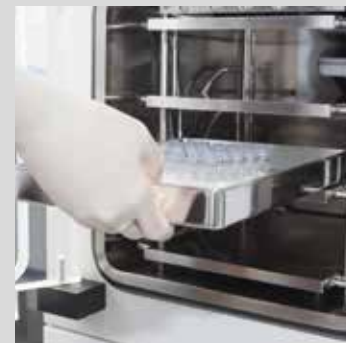
Our product and service professionals around the world stand ready to provide you with application assistance on the implementation of the PrismaPro. Many decades of customer and application-specific experiences make Pfeiffer Vacuum your ideal partner.



Accelerator



Coating



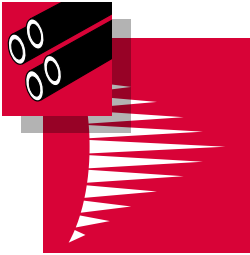
Industrial applications,  
f.e. freeze drying



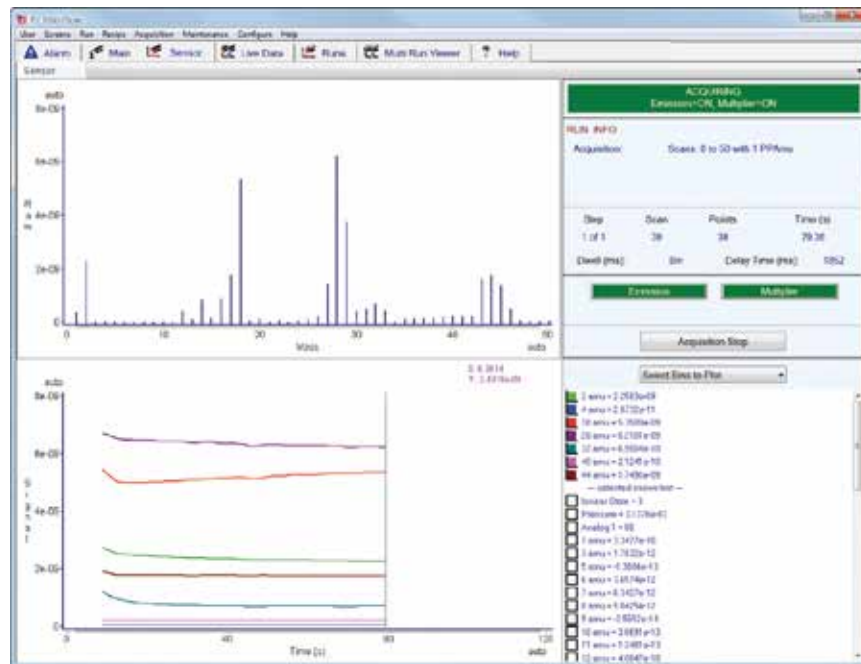
#### Customer values

- Optimum adaptability due to modular design
- High performance in spite of compact size
- A variety of interfaces make for simple systems integration
- Networkable through Ethernet
- High measurement speed, stability and high resolution
- Flexible operation thanks to interchangeable analyzers and electronics
- Two filaments mean maximum up-time
- Lowest detectable partial pressure  $3 \cdot 10^{-15}$  hPa (mbar)
- Easy total pressure measurement due to directly connectable gauges
- Saving of time through intuitive operation of the PV MassSpec software
- World-class support and worldwide on-site service
- Easy integration thanks to disclosed JSON programming interface

## PV MassSpec – new Software for PrismaPro®



The PV MassSpec software has been specifically developed for the PrismaPro and offers an easy-to-read, user-friendly platform for capturing and visualizing measured data and parameter records. Complete measurement procedures can be programmed.



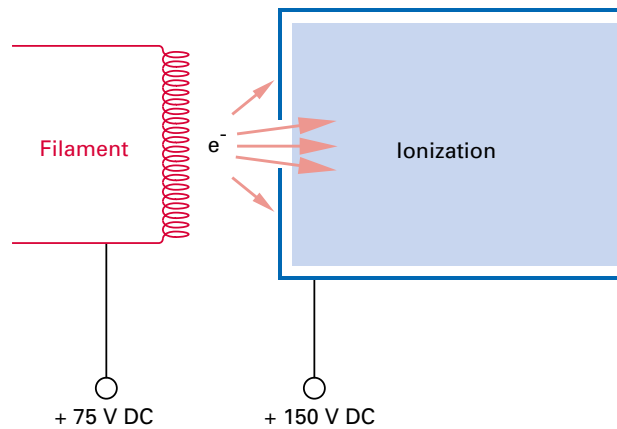
PV MassSpec measurement routine

- User-friendly, intuitive operation
- Automated measurement routines via included sequencer
- Leak detection and vacuum diagnosis with just one click
- Automatic calibration and tuning
- Simple definition of measurement recipes
- Mass spectrometer data can be linked with external signals
- Compatible with PrismaPlus

## Overview of technologies

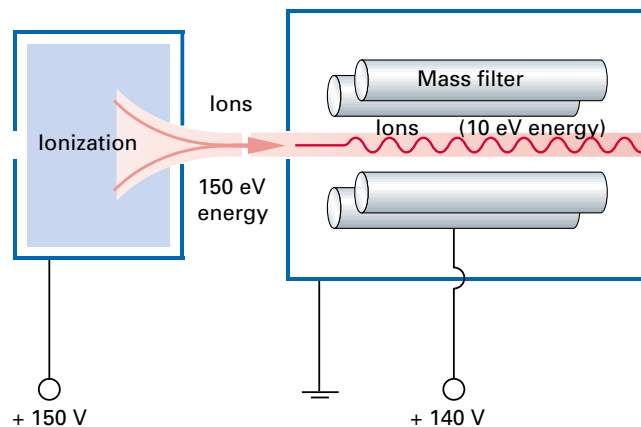
### Biased ionization chamber

Biasing the ionization chamber results in an extremely low background signal. The electron-emitting filament is positively biased relative to ground. This design prevents desorption of gas particles from the chamber walls, and thus the generation of an undesired background signals by electron stimulated desorption.



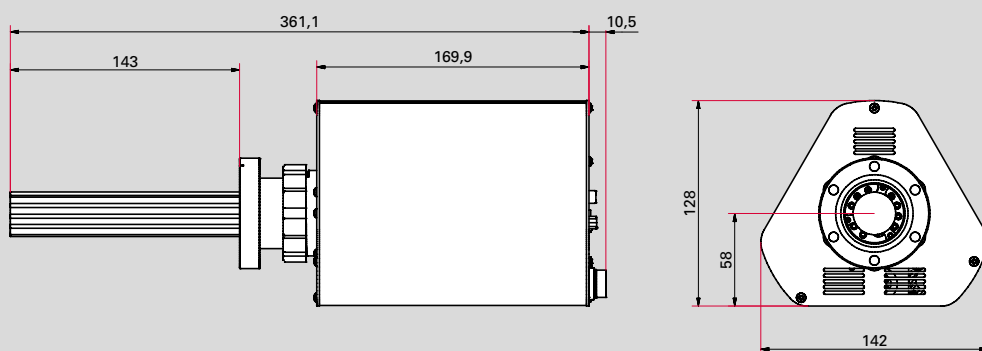
### Field-axis technology

One of the most important factors in the performance of a mass spectrometer is the transmission of the ions from the ion source into the mass filter. With the aid of field-axis technology, the ions are able to cross the peripheral fields of the separating system without any noteworthy interaction. This enables a high level of sensitivity (A/hPa) to be achieved without the need for pre and post filters.

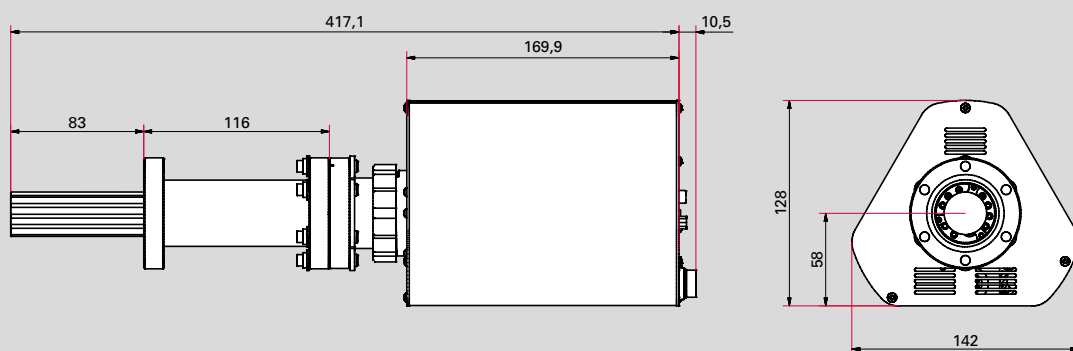


## Dimensions

**QMG 250 F 0°  
(Faraday)**



**QMG 250 M 0°  
(C-SEM/Faraday)**



## Connection options

### Standard



#### Standard I/O connection (D-Sub 15-pin connector):

- 1 Analog input
- 2 Digital inputs
- 1 Relay

#### Ethernet

#### Power supply:

External power supply SP 250  
90–260 V AC; 50/60 Hz

### Extended



#### Extended I/O connection (D-Sub 62-pin connector):

- 8 Analog outputs
- 8 Analog inputs
- 10 Digital outputs
- 5 Digital inputs

#### Connections

**total pressure transmitter**  
ActiveLine or DigiLine with  
Analog Relay option (AR) f.e. to  
protect the mass spectrometer  
against an accidental increase of  
pressure

I/O option	Analog outputs	Analog inputs	Digital outputs	Digital inputs
Number	8	8	10	5
Specification	0–10 V	-10 – +10 V	$V_{out} = 24 V$	$V_{in} = 24 V$
Resolution	16 bit	16 bit	–	–
Application examples	<ul style="list-style-type: none"> <li>• Measured values, e.g. ion currents</li> <li>• Ratios (concentrations)</li> <li>• Data transfer to higher-level systems</li> </ul>	Reading in external values, e.g. pressure, temperature, gas flow	<ul style="list-style-type: none"> <li>• Free assignment of switchpoints</li> <li>• Valve actuation</li> </ul>	Starting or stopping measurement tasks by means of external signal

## Technical data and accessories

### Technical data

PrismaPro	QMG 250 F1	QMG 250 F2	QMG 250 F3	QMG 250 M1	QMG 250 M2	QMG 250 M3
Detector	Faraday (F)			C-SEM/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 / 125 mm					
Min. detection limit, Faraday <sup>1)2)</sup>	$4 \cdot 10^{-13}$ hPa	$5 \cdot 10^{-13}$ hPa	$7 \cdot 10^{-13}$ hPa			
Min. detection limit, C-SEM <sup>1)2)</sup>	–	–	–	$3 \cdot 10^{-15}$ hPa	$4 \cdot 10^{-15}$ hPa	$5 \cdot 10^{-15}$ hPa
Ar sensitivity, Faraday <sup>3)</sup>	$5 \cdot 10^{-4}$ A/hPa	$4 \cdot 10^{-4}$ A/hPa	$3 \cdot 10^{-4}$ A/hPa	$5 \cdot 10^{-4}$ A/hPa	$4 \cdot 10^{-4}$ A/hPa	$3 \cdot 10^{-4}$ A/hPa
Max. operating pressure, Faraday operation	$5 \cdot 10^{-4}$ hPa					
Max. operating pressure, C-SEM operation	–	–	–	$5 \cdot 10^{-5}$ hPa	$5 \cdot 10^{-5}$ hPa	$5 \cdot 10^{-5}$ hPa
Contribution to adjacent mass (40/41) <sup>1)</sup>	< 10 ppm	< 20 ppm	< 50 ppm	< 10 ppm	< 20 ppm	< 50 ppm
Operating temperature, analyzer	200 °C (max. 150 °C when operating with SEM)					
Operating temperature, electronics	5 – 50 °C					
Bakeout temperature, analyzer	300 °C					
Connection flange	DN 40 CF-F					
Resolution at 10 % peak height	0.5 – 2.5 amu					
Dwell time	1 ms – 16 s/amu					
Reproducibility of peak ratio	± 0.5 %					
Interface	Ethernet					
Supply voltage	100–240 V AC, 50/60 Hz					
Weight	2.5 kg			3.2 kg		

<sup>1)</sup> For open ion source

<sup>2)</sup> at a dwell time of 4 s

<sup>3)</sup> considerably higher sensitivity by operation with C-SEM

### Accessories<sup>2)</sup>

	Order numbers
ActiveLine, PKR 360, $1 \cdot 10^{-9}$ – 1,000 hPa	PT T02 350 010
ActiveLine, PKR 361, $1 \cdot 10^{-9}$ – 1,000 hPa	PT T03 350 010
ActiveLine, PBR 260, $5 \cdot 10^{-10}$ – 1,000 hPa	PT R27 000
ActiveLine, TPR 280, $5 \cdot 10^{-4}$ – 1,000 hPa	PT R26 950
Connection cable, ActiveLine gauge–QMG 250, 0.6 m	PT 448 249 -T
DigiLine, PPT 200 AR, $1 \cdot 10^{-4}$ – 1,000 hPa	PT R38 131
DigiLine, HPT 200 AR, $5 \cdot 10^{-10}$ – 1,000 hPa	PT R39 351
DigiLine, MPT 200 AR, $5 \cdot 10^{-9}$ – 1,000 hPa	PT R40 351
Connection cable, DigiLine gauge–QMG 220, 3 m	PT 348 250 -T

<sup>2)</sup> Can be used only in conjunction with extended I/O connection

### Miscellaneous

	Order numbers
Chambers and gas inlet systems	on request



<b>Detector version</b>	<b>a</b>
<b>Faraday</b> <sup>1)</sup> only for leak detection and high-vacuum residual gas analysis	<b>5</b>
<b>C-SEM/Faraday;</b> C-SEM = Continuous Secondary Electron Multiplier for fast, sensitive UHV residual gas analysis, analytical applications and leak detection	<b>6</b>
<b>Mass range</b>	<b>b</b>
<b>1–100 amu</b>	<b>1</b>
<b>1–200 amu</b>	<b>2</b>
<b>1–300 amu</b>	<b>3</b>
<b>Ion source</b>	<b>c</b>
<b>Open ion source</b> for high-vacuum residual gas analysis; high sensitivity and good linearity	<b>1</b>
<b>Crossbeam ion source</b> for direct gas beam inlet, without interaction with the walls of the ion source; electron energy adjustable from 0 to 100 eV	<b>3</b>
<b>Grid ion source</b> <sup>2)</sup> for UHV residual gas analysis; minimum outgassing and desorption rate	<b>4</b>
<b>Filament</b>	<b>d</b>
<b>Tungsten;</b> for UHV applications	<b>1</b>
<b>Yttriated iridium;</b> low filament temperatures, high resistance to air inrushes	<b>2</b>
<b>I/O connection</b> <sup>3)</sup>	<b>g</b>
<b>Standard</b>	<b>0</b>
<b>Extended</b> for control and signal interchange via analog and digital inputs/outputs and connection to a total pressure gauge	<b>1</b>

<sup>1)</sup> With open ion source only

<sup>2)</sup> Ion sources with tungsten filament only

<sup>3)</sup> See page 7

## **VACUUM SOLUTIONS FROM A SINGLE SOURCE**

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

## **COMPLETE RANGE OF PRODUCTS**

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We are the only supplier of vacuum technology that provides a complete product portfolio.

## **COMPETENCE IN THEORY AND PRACTICE**

Benefit from our know-how and our portfolio of training opportunities!

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