

# ProMass<sup>D</sup>

## Quadrupole Mass Spectrometer Analyser System for low volume, quick responding gas measuring with large dynamic range

Protea's ProMass<sup>D</sup> analyser is a compact, robustly designed desktop Quadrupole Mass Spectrometer (QMS) instrument incorporating all the latest mass spectrometer and vacuum pumping technology. ProMass<sup>D</sup> is supplied in a case for horizontal or vertical orientation and is ideal for laboratory experimental measurements. QMS is a useful mechanism for gas analysis, being able to detect and measure almost all gases with low detection limits and fast response.

A mass spectrometer measures the mass-to-charge ratio of the molecules in a sample by collecting and analysing the mass spectrum we can identify and quantify which molecules are present. The QMS within ProMass<sup>D</sup> contains a mass filter that is made up of 4 parallel circular rods, hence the name quadrupole. ProMass<sup>D</sup> is available with mass ranges of 0-100amu, 0-200amu and 0-300amu (triple quadrupole version).

- \* Very quick (millisecond) response time
- \* Detects almost any gas
- \* Low maintenance costs, with corrosion resistance inlets
- \* Advanced chemometrics for multi-gas quantification



Detects almost any gas

Advanced vacuum pumping and ion stabilisation for quick start-up time

Application of Protea's advanced chemometric routines to aid quantification

Compatible with our sampling system control systems for turn-key solutions

Specific Applications for ProMass<sup>D</sup>:

- Hydrogen (H<sub>2</sub>) analysis
- TGA-MS
- Environmental analysis
- Fermentation
- Catalysis

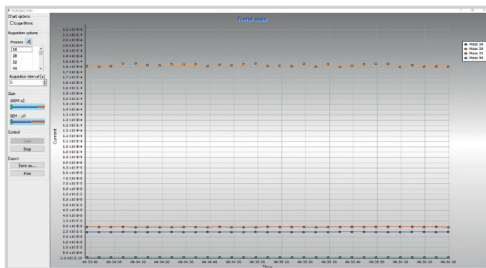


## QMS Software

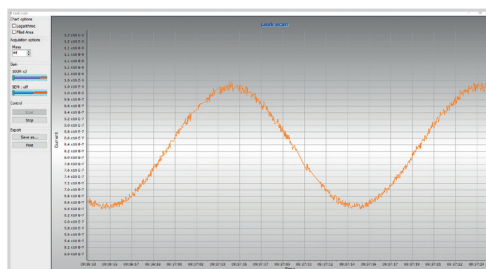
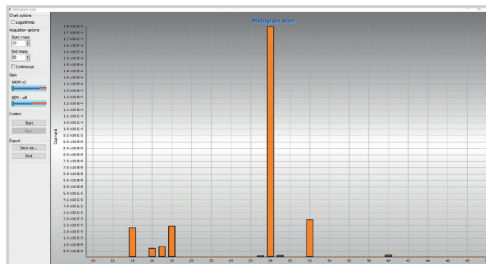
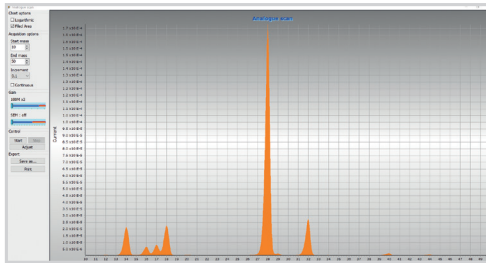
### PAS-Scan software included

ProMass is supplied with free PAS-Scan software for QMS peak analysis. This simple to use software allows for Analogue, Histogram, Trend and Leak scans to be taken quickly and simply. Scans can be carried out a single mass (leak detection), specific masses (mass jumping) or as a full analogue scan over the mass range of the QMS. The mass spectra can be plotted on linear or logarithmic scales.

Individual QMS settings can be saved to the electronics of the QMS or can be saved to an .xml file. This allows a single network PC to connect to multiple QMS with different settings.



*PAS-Scan software allows quick and simple recording of Analogue, Mass Trend, Histogram and Leak Scans*



### PAS Analytical software

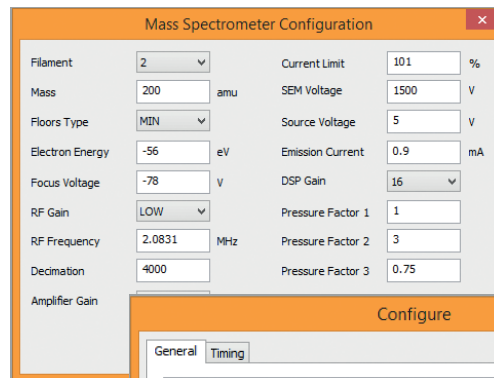
For analytical applications requiring quantified concentration measurements, the more comprehensive PAS software can be provided. PAS allows for single or multiple mass measurements. Dynamic analysis can be applied, as a minimum just using a simple univariate peak height analysis of specific masses.

This will provide an online trend in raw units or partial pressure, ion current or as a concentration measurement in ppb, ppm, mg/m<sup>3</sup> or %Vol.

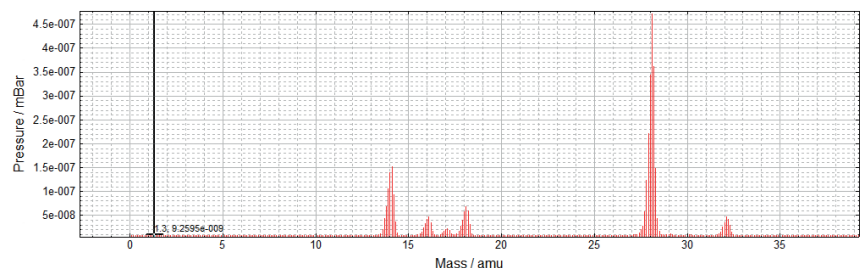
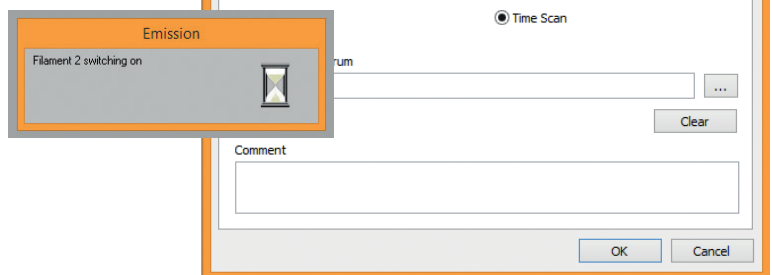
Normalisation of mass spectra for base peak normalisation or sum to unity normalisation can be applied, as well as baseline and background subtraction.

A full quantification analysis can be carried out using a number of methods: univariate peak height compensation, multivariate CLS and multivariate PLS analysis.

There is **no limit** to the number of masses or gases that PAS can analyse for.



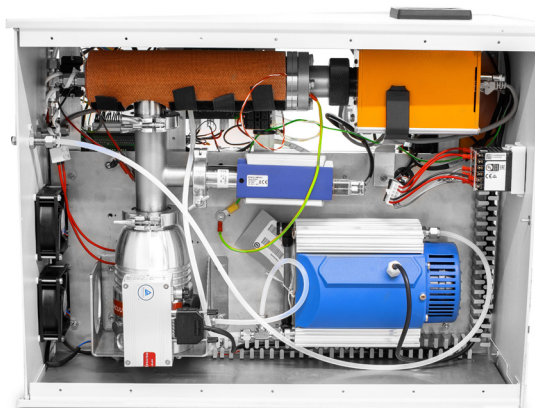
*PAS software allows for detailed parameter tuning and quantitative analysis of mass spectrum data*



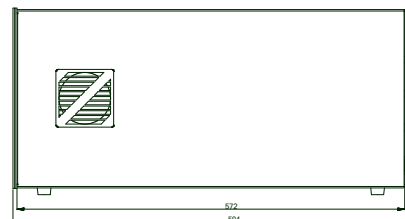
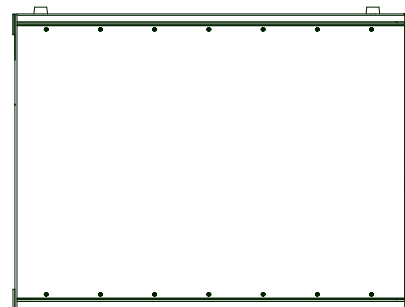
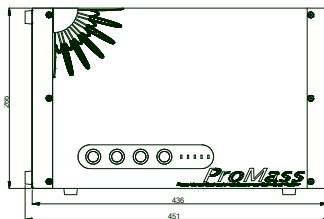
### Hardware Specifications

Vacuum System	80 l/sec Turbo Molecular Drag pump (TMP) Internal diaphragm backing pump Automated vacuum system control for vacuum integrity and protection Pirani total pressure gauge PID controlled temperature bake-out of vacuum chamber
Ion Source	Open or closed electron ionization source with adjustable electron energy Filaments: Yttrium oxide coated Iridium Source energy controlled and ramped for long-life and stability Soft ionization (option)
Vacuum Inlet	Fast Capillary: 2m heated sample line, purge time <100ms, Swagelok 6mm fittings, with in-built PID control Membrane barrier: For liquid sampling Calibrated leak: Heatable Sintered Stainless Steel, Hastelloy, Tungsten for corrosive gases
QMS	Detector: Faraday and C-SEM Maximum Operating Pressure: 1x10 <sup>-5</sup> mbar (C-SEM) Range: upto 300amu Resolution: 0.7-2.0 amu adjustable Reproducibility: ≤ ± 1% Speed: 1amu/sec (standard), >200amu/sec (option)
Analysis	Minimum Sample Time: 10ms Detection limit: Typically 100ppb Units: ppb, ppm, %Vol
Operating Temperature	0 - 40°C
Dimensions	436 x 572 x 266
Power	Mains input voltage: 90- 250vac. 50/60 Hz. Power consumption <3A

Heated Capillary controlled from analyser. Other inlet types are available



ProMass<sup>D</sup> has complete internal vacuum system, inc. pressure gauge and backing pump. External rotary backing pump can also be used



This Datasheet is a guide to the product and Protea Ltd reserve the right to modify the product without notification.