



Stable Isotope Ratio Mass Spectrometer

The IsoPrime100 is the next generation of the world's renowned IsoPrime gas source stable isotope ratio mass spectrometer. Building on a legacy of almost 40 years, the IsoPrime100 is the most compact, high performance IRMS on the market. At the heart of the new IsoPrime100 is a completely redesigned 100V head amplifier which offers unrivalled dynamic range as well as automatic gain-switching. Enhancements to the ionisation source have resulted in higher instrument performance with exceptional sensitivity, precision and accuracy as well as an impressively low H_3^+ correction factor of $\leq 8.0\text{ppm/nA}$.

Largest dynamic range of any IRMS

With twice the head amplification power (100V) compared to any other system, the IsoPrime100 delivers more control over linearity, H_3^+ factor and reference gas precision. The next generation IsoPrime100 with its new 100V head amplifier, provides more dynamic range for applications where it is needed most. The optional automatic gain switching provides ease of analysis for enriched samples. This large amplification range is a perfect fit to Elementar's vario series EA – sample inlets with unmatched elemental concentration ranges.

Advanced vacuum system:

Efficient and reliable vacuum pumps are integral to IsoPrime's fully interlocking system, providing base pressures in the 10^{-8} mbar range. Pirani and Penning gauges measure vacuum performance and the entire system has built-in fail-safe protection. In combination with its fully stainless steel housing, the IsoPrime100 exhibits the ultimate in background performance without the necessity of differential pumping, thereby optimising maintenance intervals.

Patented collector system

The IsoPrime100 offers standard analysis of $\delta^{13}C$, $\delta^{15}N$, $\delta^{34}S$ and $\delta^{18}O$ using the unique IsoPrime Universal Triple Collector (UTC) featuring patented high performance Faraday buckets, with a proven performance lifetime in excess of 10-years. The addition of a state-of-the-art Electrostatic Filter (ESF), provides unparalleled continuous flow δD capability. With capacity for detecting and measuring up to 10 ion beams simultaneously, the IsoPrime100 can be used for special "multi-collector" applications such as analysis of chlorine and bromine isotopes, N_2O isotopomers, SO_2 – SO fractions and CO_2 clumped isotopes as well as other bespoke configurations.

IsoPrime100

High class software

IonVantage® provides a major leap forward in IRMS software development. The reliable IonVantage® Windows-based GUI platform is capable of simultaneous MS & Inlet Management, with built-in intelligence enabling sample list modifications whilst sample analysis is still running. IonVantage also has the flexibility for editing methods, direct control of the GC parameters, easy integration with LIMS and creating customised inlets and scripting. Full integration with Elementar's digital EA control makes it a leading IRMS software suite – IonVantage®.

Easy to use and maintain

The IsoPrime100 is universally praised for its ease of service and the longevity of its design. Years of experience in IRMS has accumulated in an easy to service

instrument with long life-time parts.

Large range of Inlet systems for all applications

Whatever your IRMS needs, the IsoPrime100 has been developed to meet the needs of the world's best scientists and technologists. The IsoPrime100 meets the demands for the most advanced, efficient and practical solutions, for IRMS applications, together with the Elementar & Agilent range of EA and GC inlets – or specialist Multiflow, TraceGas, Dual Inlet, Liquid Chromatography or Multiprep devices. The IsoPrime100 is the IRMS of choice for experts in the fields of geological sciences, environmental studies, medical sciences and food authentication. Even operators with little or no IRMS training become proficient in the operation of the IsoPrime100 due to its ease of use and robust operation.

A class leading dynamic range of 100V

System description:	Gas source stable isotope ratio mass spectrometer for δD , $\delta^{13}C$, $\delta^{18}O$, $\delta^{15}N$ and $\delta^{34}S$			
Sensitivity:	850 molecules/ion in dual inlet and 1200 molecules/ion in continuous flow sample consumption for 5nA signal at mass 44: 0,04 nmol/s in DI; 0,06 nmol/s in CF			
Analyser characteristics:	Mass range:	1–70 amu at 3kV, upto mass 96 possible		
	Resolution:	100 m/ Δm (10% valley definition)		
	Focal plane length:	108 mm		
IRMS Specifications:	H ₃ ⁺ correction factor:	< 8.0 ppm/nA		
	H ₃ ⁺ factor stability:	< 0.03 ppm/nA/h		
Continuous flow:	Gas	Isotope	Internal Precision (1s ‰)	Linearity (‰/nA)
	CO ₂	$\delta^{13}C$	≤ 0.06	≤ 0.02
		$\delta^{18}O$	≤ 0.06	≤ 0.04
	N ₂	$\delta^{15}N$	≤ 0.06	≤ 0.02
	H ₂	δD	≤ 0.20	
Dual Inlet:	Gas	Isotope	Sample Size (Bar μL)	Internal Precision (2s ‰)
	CO ₂	$\delta^{13}C$	100	≤ 0.010
		$\delta^{18}O$		≤ 0.016
	CO ₂	$\delta^{13}C$	1 (using cold finger)	≤ 0.020
		$\delta^{18}O$		≤ 0.030
	N ₂	$\delta^{15}N$	100	≤ 0.010
	O ₂	$\delta^{18}O$	100	≤ 0.010
	H ₂	δD	200	≤ 0.1
	SO ₂	$\delta^{34}S$	100	≤ 0.010

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