LABINDIA
ANALYTICAL
WHERE COMMITMENT IS CULTURE

ICP-MS

5500

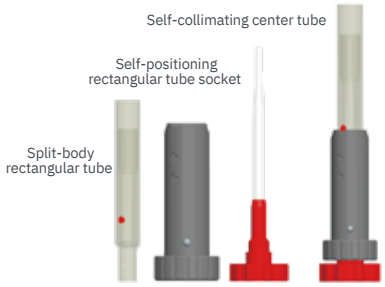
ICP-MS 5500 - Third-Generation Inductively Coupled Plasma Mass Spectrometer (ICP-MS)

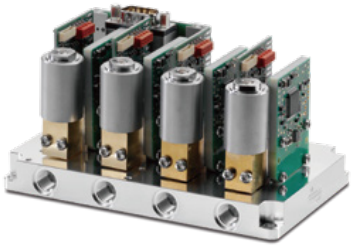
The Labindia ICP-MS 5500 represents a revolutionary leap in the field of inductively coupled plasma mass spectrometry (ICP-MS), integrating cutting-edge technology, advanced engineering, and continuous innovation. Designed to address the most complex and demanding analytical challenges, the ICP-MS 5500 offers exceptional sensitivity, reliability, and versatility, making it the ideal choice for a wide range of applications in environmental analysis, industrial quality control, and high-purity materials testing.

www.labindia-analytical.com

HIGH-EFFICIENCY INJECTION SYSTEM

Split-Body Torch Design
The ICP MS 5500 features a split-body torch with a self-positioning rectangular tube socket, ensuring simplified installation and maintenance. This design reduces operational costs by allowing easy switching of the central tube to accommodate different sample injection requirements, such as high sensitivity, organic solvents, or high-salt matrices. The full split-body design also enhances the stability of the system, offering improved performance even in demanding analytical conditions.





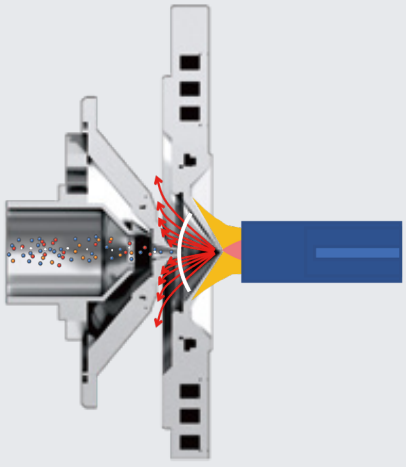
Optimized Full MFC Gas Control System
Our fully integrated, high-precision digital MFC gas controller ensures excellent control with accuracy better than 0.5%. With the capability to deploy up to seven MFC channels, it allows flexible configuration for atomizing, auxiliary, and cooling gases, as well as additional dilution and collision gases for complex analyses.

- **Innovative Online Argon Dilution System (AGOD)**

Designed for high-salt matrix sample analysis, the AGOD system enables effective sample dilution before entering the plasma, ensuring high precision without the need for additional reagents or dilution solutions. This system allows direct injection of samples with minimal gas consumption, while maintaining stable plasma conditions.

EFFICIENT ION INTERFACE DESIGN

The improved double taper ion interface in the ICP MS 5500 enables superior ion extraction with minimal matrix interference. This design facilitates smooth transitions from atmospheric pressure to high vacuum, improving sensitivity and reducing sample loss. The high-performance ion optics ensure minimal ion dispersion and exceptional transmission efficiency.



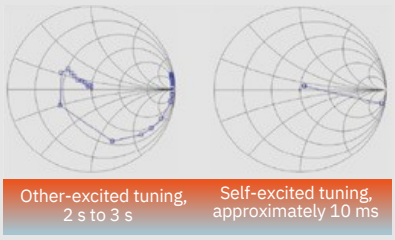
TEC Refrigerated Injection System

The ICP MS 5500 comes equipped with a TEC (Thermoelectric Cooler) refrigerated injection system as part of the standard configuration. This advanced refrigeration module enhances the system's ability to maintain stable, continuous operation while effectively reducing oxide formation. It also improves the analysis of organic solvents, ensuring precise results for a wide range of sample types.

12-rotor high-precision peristaltic pump

The ICP MS 5500 integrates an advanced 12-rotor high-precision peristaltic pump for reliable and accurate sample injection. This standard feature supports various pump tubes, including PVC, Solva, Tygon, and Viton, to cater to diverse sample matrices, from conventional to organic solutions. The pump's design reduces usage complexity and enhances the longevity of the system, making it ideal for varied analytical needs.

SELF-EXCITED ALL-SOLID-STATE ICP ION SOURCE



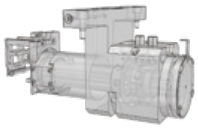
RF power supply

The ICP MS 5500 employs a self-excited, all-solid-state ICP ion source that enhances stability and performance. This feature eliminates the need for a matching box and allows for millisecond-level frequency adjustments, improving matrix resistance and accommodating volatile organic solvents. The ion source's water-cooling system ensures continuous, long-term operation.

INNOVATIVE TECHNOLOGY

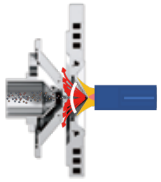
Simplify Routine Analysis

- **Wide Mass Range:** Analyze elements with atomic masses ranging from 2–260 amu.
- **Flexible Resolution:** Switch between high and standard resolution (0.3–2.0 amu) during a single method run for expanded application versatility.
- **Dynamic Range:** Achieve precise results with a linear dynamic range exceeding nine orders of magnitude.
- **Detection Limits:** Ultra-low detection limits for trace elements, including Li (<2 ppt), In (<0.1 ppt), and U (<0.1 ppt).



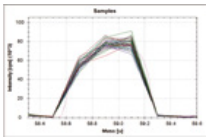
Enhance Workflow Efficiency

- **TEC Refrigerated Injection:** Standard configuration improves stability and reduces oxide ion interference.
- **Online Argon Dilution:** Directly analyze high-salt samples without manual dilution, enhancing throughput.
- **12-Rotor High-Precision Peristaltic Pump:** Ensures accurate sample delivery across diverse matrices.



Maximize Analytical Performance

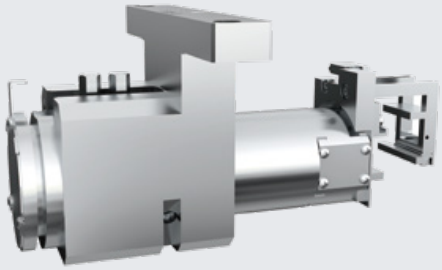
- **Stability:** Short-term RSD <2% over 20 minutes; long-term RSD <3% over 2 hours.
- **Sensitivity:** Lithium >20 Mcps/ppm; Indium >180 Mcps/ppm; Uranium >200 Mcps/ppm.
- **Interference Elimination:** Patented collision/reaction cell technology minimizes matrix and polyatomic interferences.



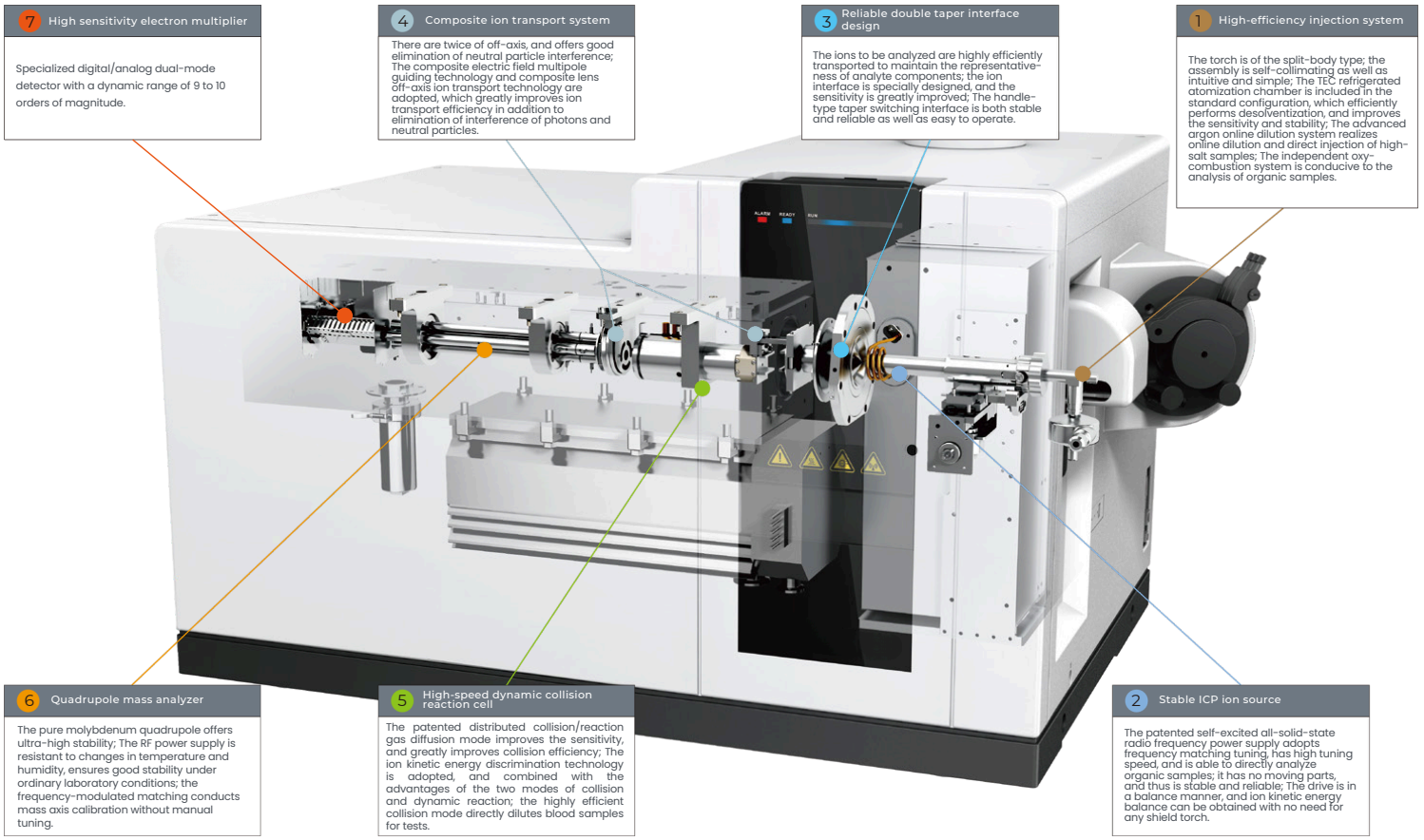
HIGH-SPEED DYNAMIC COLLISION REACTION CELL

The ICP MS 5500 is equipped with a high-speed dynamic collision reaction cell featuring a compound electric field, providing high ion transfer efficiency and reduced cell volume. Patented gas diffusion technology ensures optimal gas distribution, improving collision efficiency and sensitivity.

With **Kinetic Energy Discrimination (KED)**, it effectively eliminates interferences, allowing for accurate analysis of complex samples. Additionally, direct dilution injection of blood and serum samples is supported, offering enhanced interference resistance.



REVOLUTIONIZING INORGANIC MASS SPECTROMETRY

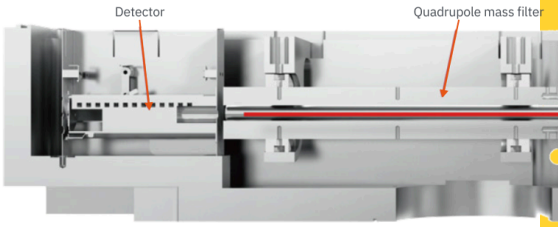


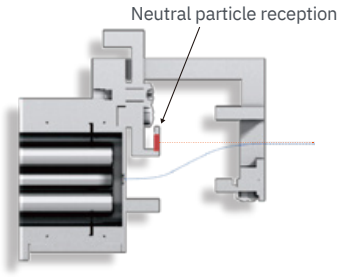
HIGH-PRECISION QUADRUPOLE MASS ANALYZER

The ICP MS 5500 features a high-precision quadrupole mass analyzer made from pure molybdenum, ensuring superior thermal stability and reliable performance. It delivers high resolution and excellent mass accuracy, providing precise elemental analysis across a wide range of samples.

ADVANCED ION OPTICS AND MASS ANALYZER

The Labindia ICP MS 5500 boasts a cutting-edge, high-efficiency ion optical system featuring a unique double taper interface. This ensures optimal ion transport while minimizing the impact of neutral particles. The system also incorporates a patented collision reaction cell and a molybdenum quadrupole mass analyzer, ensuring stable and high-resolution analysis across various sample types.





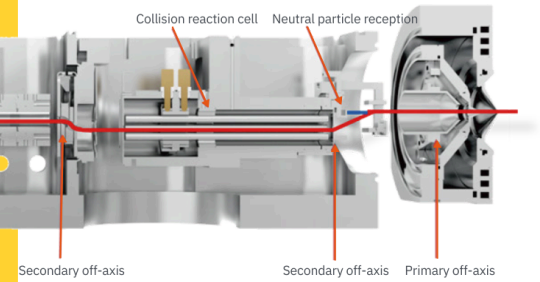
Composite Ion Transport System
The ICP MS 5500 incorporates a Composite Ion Transport System with advanced features, including neutral particle reception. This system enhances ion flow, improving sensitivity and ensuring accurate results even in challenging sample matrices. The quadrupole mass filter and collision reaction cell further contribute to effective interference reduction.

Unique Ion Channel
The ICP MS 5500 offers a flexible ion channel that can be deployed in either high sensitivity mode for precise, high-throughput analysis or salt-resistant mode for stable performance in long-term high-salt sample analysis. The use of nickel or platinum taper materials ensures durability and optimal performance across both modes.

SPECIALIZED FOR COMPLEX APPLICATIONS

The Labindia ICP-MS 5500 is engineered for versatility across a wide range of challenging applications:

- **Environmental Monitoring:** Heavy metals in surface water, soil, and atmospheric particles.
- **Industrial Quality Control:** Impurity metals in high-purity reagents for semiconductors.
- **Advanced Speciation Analysis:** LC-ICPMS integration for heavy metal species detection.
- **Refractory Solid Samples:** Solid direct injection for efficient sample analysis.
- Hazardous Locations: Radionuclide detection in critical environments.



MINIMAL MAINTENANCE DESIGN

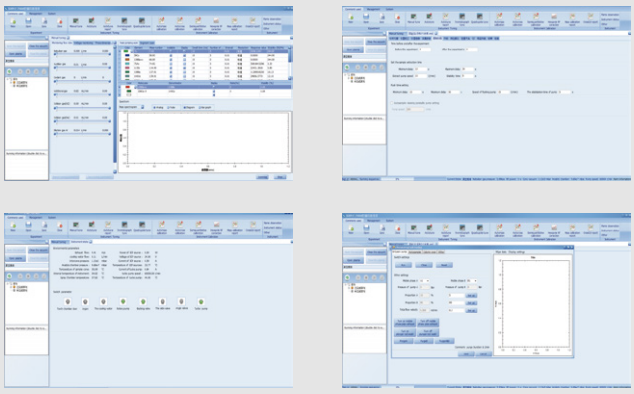
The innovative handle-type taper switching system and full split-body torch design make routine maintenance simple and cost-effective. With self-positioning features and easy-to-replace components, the ICP MS 5500 ensures minimal downtime and lower operational costs.

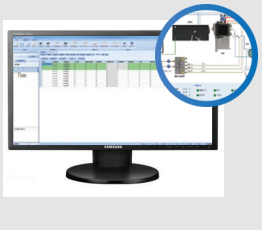
SPECIFICATION	DETAILS
Ion Source	• Optimized ICP ion source with self-excited all-solid-state RF power supply • Stable plasma conditions for high-efficiency ionization
Mass Analyzer	• High-precision quadrupole mass analyzer (pure molybdenum) • Resolution: High-resolution mode for accurate elemental analysis • Dynamic range: Up to 10 orders of magnitude
Collision Reaction Cell	• High-speed dynamic collision reaction cell with compound electric field • Patented distributed collision/reaction gas diffusion for improved sensitivity • Kinetic Energy Discrimination (KED) for excellent interference elimination
Ion Transport System	• Composite ion transport system with off-axis ion deflectors and patented gas reception • Enhanced ion flow for high accuracy in complex samples
Injection System	• 12-rotor high-precision peristaltic pump with adjustable materials for various sample types • TEC refrigerated injection module included for enhanced stability and organic solvent analysis
Sample Introduction	• Split-body torch with self-positioning rectangular tube for easy maintenance • High salt and high sensitivity mode for versatile sample analysis

SPECIFICATION	DETAILS
Detection Limit	• Sub-ppt (parts per trillion) sensitivity • Low background noise and excellent signal-to-noise ratio
Software & Control	• Windows-based software with graphical interface for intuitive operation • Real-time display of key parameters and customizable reporting
Environmental Tolerance	• Operates in environments with temperature variations (15°C to 35°C) and humidity levels (20% to 80% R.H.) • Resistant to sudden temperature and humidity changes
Power Requirements	• 220V ±10% • Power consumption: Typically low, optimized for energy efficiency
Dimensions & Weight	• Compact footprint for laboratory convenience • Weight: Approx. 40 kg
Optional Features	• Online argon dilution system (AGOD) for high-salt sample analysis • Automatic dilution systems for direct analysis of blood/serum samples

USER-FRIENDLY SOFTWARE INTERFACE

The ICP MS 5500 is equipped with intuitive, Windows-based software that simplifies operation and data analysis. The software features real-time display of key parameters, automatic peak finding, and integration, along with customizable report outputs. The interlock protection system ensures safe operation, while the methodology library facilitates quick setup and instrument reverse control.





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