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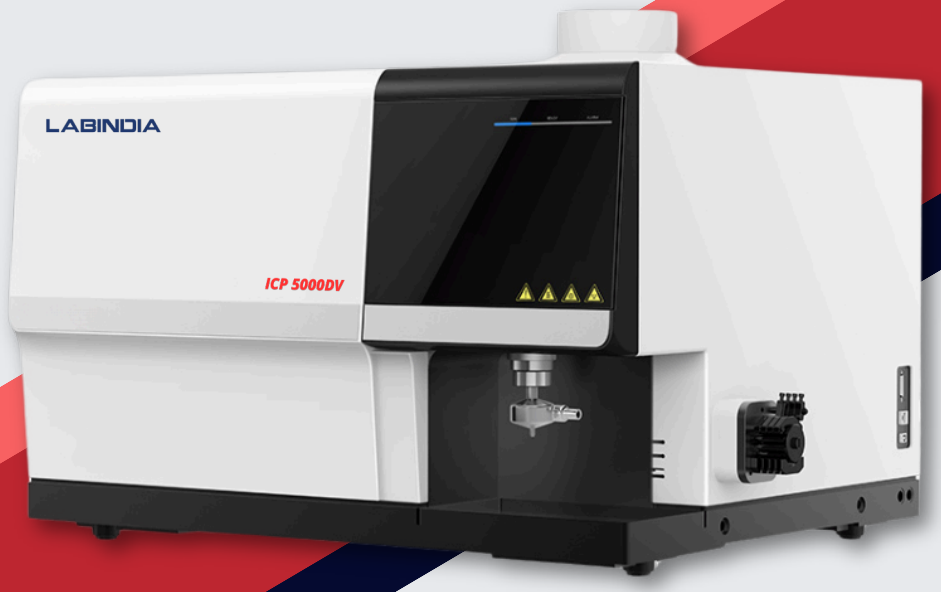
ICP-OES

5000 DV



ICP 5000 DV (Radial, Axial & Dual View) - Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)

The ICP 5000 DV is a polychromator based true simultaneous system having a state-of-the-art full-spectrum direct-reading capabilities that ensures superior anti-interference, analysis, and detection. This instrument meets high-end analysis demands in research, development, and quality control, offering accurate qualitative, semi-quantitative, and quantitative analysis of major, minor, and trace inorganic elements (% to ppb level of analysis).

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INNOVATIVE TECHNOLOGY

Dual Observation Vertical Torch Technology

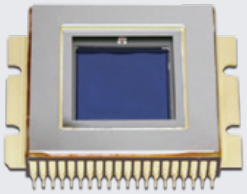
- The self exited all solid state Power supply ensures efficient and greatly reduces argon and torch consumption.
- The ICP 5000 DV features a next-generation vertical torch mount design with Axial, Radial and dual observation technology, fully software controlled, shear gas control, cool flame tail and optical purging by software.
- Suitable for measuring elements with substantial content differences in complex matrices.
- The vertical torch design prevents high salt deposition, while radial observation minimizes matrix interference, delivering enhanced sensitivity and repeatability for Refinery, petrochemical & Brine industry.
- Adjustable observation height optimizes positions for different elements.

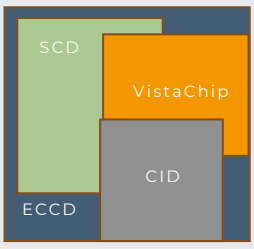
Large Area Array CCD Sensor

- Incorporates a large area array CCD sensor with excellent low noise and deep ultraviolet response.
- Anti-overflow design ensures superior detection limits.
- The large area array captures the full spectrum in a single scan.
- Enables rapid analysis of up to 72 elements.

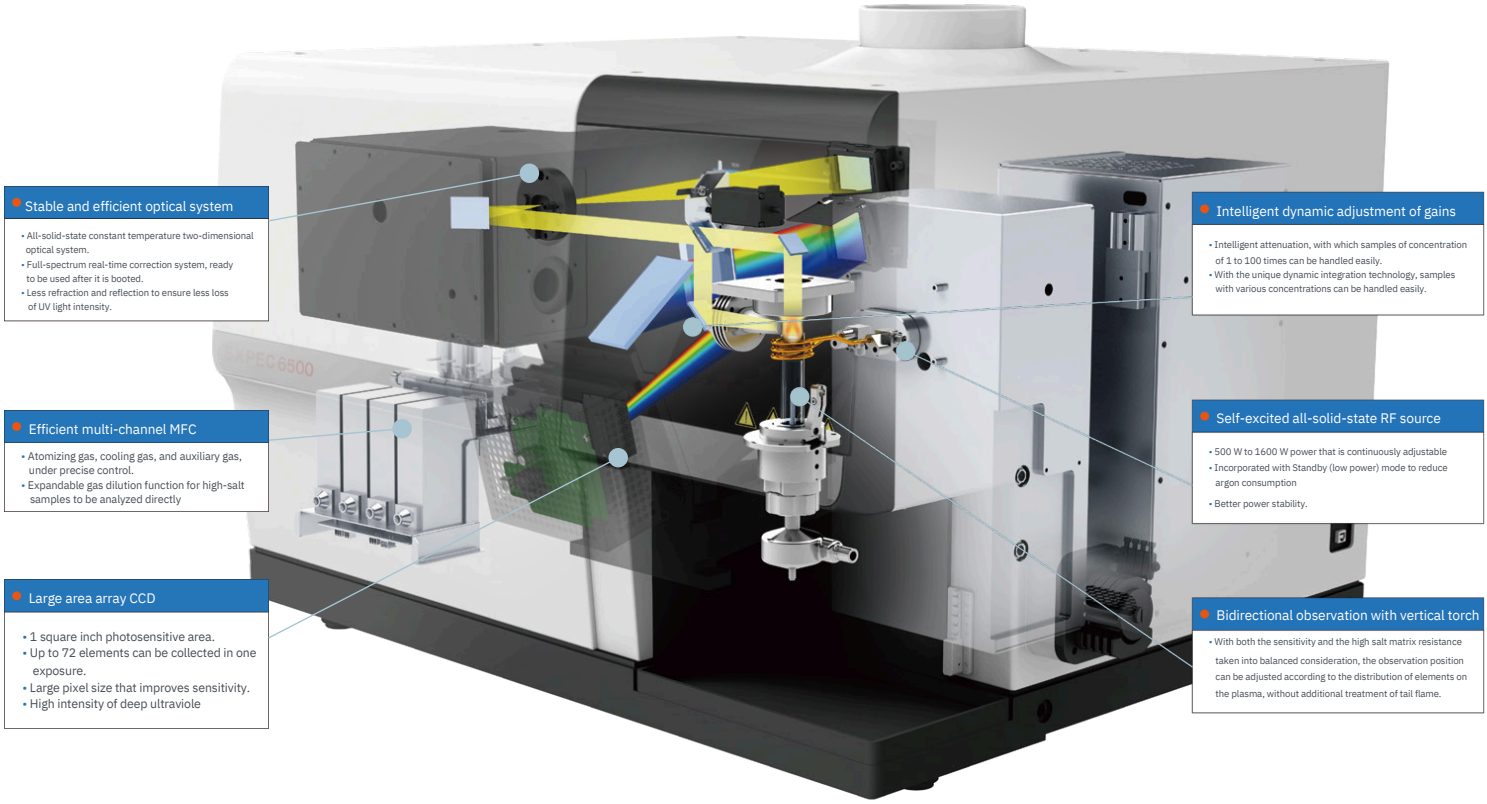
HIGH-PERFORMANCE LARGE AREA ARRAY CCD

- **Large Area, High Sensitivity**: Square-inch array with 24 µm x 24 µm large pixel size for wider spectral range (165–900 nm) and high resolution.
- **Rapid Detection**: Rapid analysis of 72 elements
- **Enhanced UV Performance**: Superior deep ultraviolet sensitivity.
- **Anti-Saturation Design**: Prevents spectral interference.
- **Efficient Cooling**: Thermo Electrically Cooled refrigeration minimizes thermal noise.
- **Integrated Reliability**: Compact, efficient, and robust for precise results.





ICP 5000 DV DESIGNED FOR HIGH PERFORMANCE & RELIABILITY



Stable and efficient optical system

- All-solid-state constant temperature two-dimensional optical system.
- Full-spectrum real-time correction system, ready to be used after it is booted.
- Less refraction and reflection to ensure less loss of UV light intensity.

Efficient multi-channel MFC

- Atomizing gas, cooling gas, and auxiliary gas, under precise control.
- Expandable gas dilution function for high-salt samples to be analyzed directly

Large area array CCD

- 1 square inch photosensitive area.
- Up to 72 elements can be collected in one exposure.
- Large pixel size that improves sensitivity.
- High intensity of deep ultraviole

Intelligent dynamic adjustment of gains

- Intelligent attenuation, with which samples of concentration of 1 to 100 times can be handled easily.
- With the unique dynamic integration technology, samples with various concentrations can be handled easily.

Self-excited all-solid-state RF source

- 500 W to 1600 W power that is continuously adjustable
- Incorporated with Standby (low power) mode to reduce argon consumption
- Better power stability.

Bidirectional observation with vertical torch

- With both the sensitivity and the high salt matrix resistance taken into balanced consideration, the observation position can be adjusted according to the distribution of elements on the plasma, without additional treatment of tail flame.

BACK-VENTED ANTI-OVERFLOW AND ANTI-BLOOMING DESIGN

• Even in the 800 nm to 900 nm waveband where the argon line overflow is strong, the spectrum of effective elements can still be clearly distinguished.

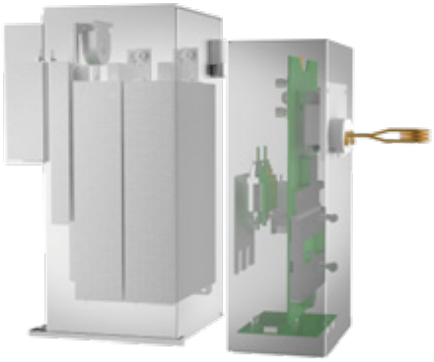
EXCEPTIONAL UV RESPONSE

• The intensity of spectral lines around 165 nm is prominent.

• The ultraviolet waveband hierarchy is clearly visible.

ALL-DIGITAL SELF-EXCITED ALL-SOLID-STATE RF POWER SUPPLY WITH STANDBY MODE

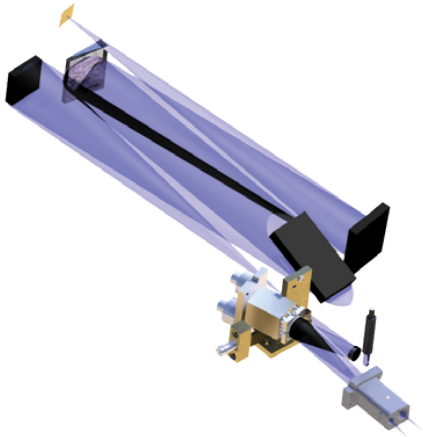
- **Fully digital power supply control:** The RF power supply based on dual power supply technology is continuously adjustable over the wide power range of 500 W to 1600 W, with better sample adaptability.
- **Self-excited RF power supply:** The matching is quick, thus offering adaption to complex sample analysis and switching; there are no moving parts, which makes the instrument more reliable.
- **Standby mode**: The mode enables the ultra-low power standby function, and reduces argon consumption by more than 50%.
- The water-cooled design enables rapid heat dissipation, and the power stability is within 0.1%, thus guaranteeing the reliability.



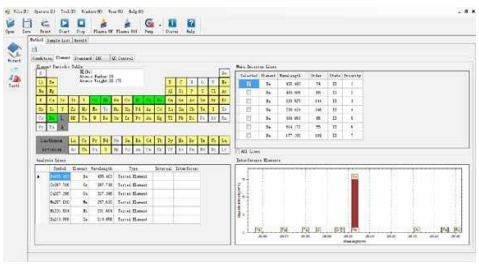
All-digital self-excited all-solid-state radio frequency power supply

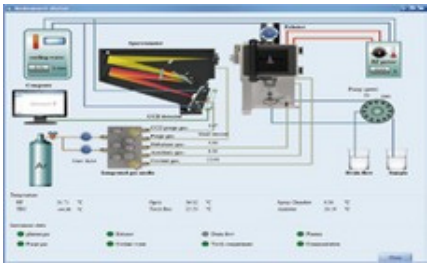
STABLE AND EFFICIENT THREE-DIMENSIONAL OPTICAL SYSTEM WITH ECHELLE GRATING

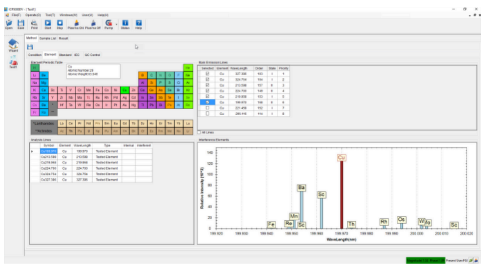
- High-performance three-dimensional spectroscopic system with reduced reflection times and minimal light energy loss.
- Heat-balanced control light chamber at constant temperature of 36°C, as cornerstone of stable instrument.
- The distributed purge, designed using fluid mechanics simulations, quickly creates a high-purity argon atmosphere in the optical system, enabling efficient ultraviolet analysis while saving both time and argon.
- The thermal isolation design of the host and optical system ensures balanced heat exchange, enhancing the optical system's resistance to external environmental changes.

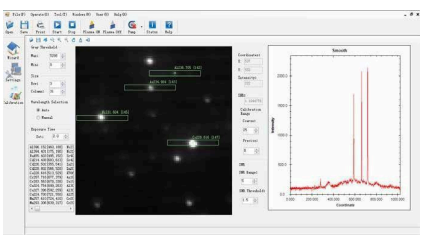


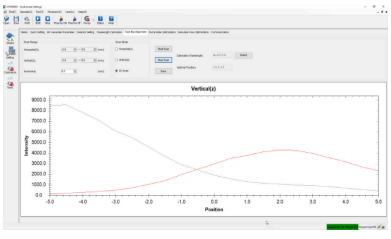
Analysis Software for easy operations







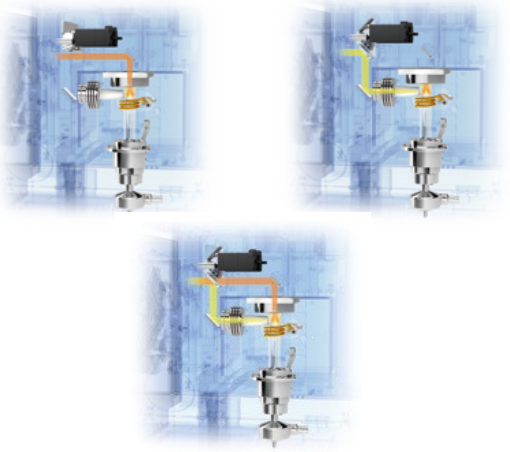




INTRODUCING A NEW GENERATION OF DUAL OBSERVATION ICP-OES TECHNOLOGY WITH VERTICAL TORCH MOUNT

Vertical Torch Mount Design:

- **Enhanced Efficiency:** Reduced argon consumption and minimized salt deposition.
- **Extended Torch Lifespan:** Prolonged torch service life and reduced consumables usage.
- **Plasma Monitor:** Built in high resolution digital camera offers live monitoring of the plasma torch.

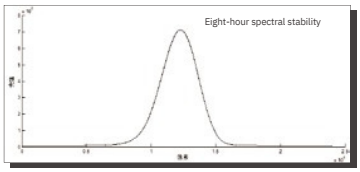


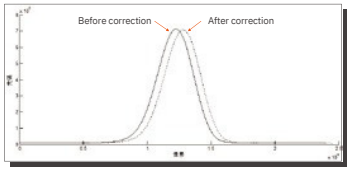
Advanced Dual Observation:

- **Axial Observation:** Delivers high sensitivity for precise elemental analysis.
- **Radial Observation:** Minimizes matrix interference, enabling flexible plasma positioning for optimized element acquisition based on sample characteristics.
- **Bidirectional Observation:** Combines the strengths of axial and radial modes, surpassing the performance of either individually.

Real-Time Spectral Correction:

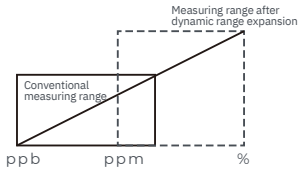
- **Enhanced Startup:** Efficient fast startup and ignition, enabling automatic spectrum correction without the need for dedicated sample injections.
- **Enhanced Accuracy:** Full-Spectrum Real-Time Correction (FSC) technology to dynamically correct subtle spectral deviations, ensuring superior spectral integration and long-term stability. Low integration time





Intelligent Dynamic Gain Adjustment:

- **Precision Control:** Enables easy control over any concentration gradient, ensuring accurate analysis across a wide range of sample concentrations.
- **Intelligent Attenuation:** Effortlessly handles samples with concentration variations of 1 to 100 times, eliminating the need for repeated dilutions and simplifying sample preparation.



Effect of dynamic range expansion

Schematic diagram for argon dilution input

ARGON ONLINE DILUTION

Effective dilution of high salt samples of more than 10% is achieved by adding a channel of argon gas for dilution which is controlled by MFC before the aerosol in the atomization chamber enters the torch, and the difficulty of sample pretreatment is thus reduced.

KEY FEATURES:

Thermally Stable Optical System

- Thermostatic 3D optical system with minimal reflections and low energy loss.
- Constant temperature optical chamber maintained at 36°C ± 0.1°C.
- Full-spectrum coverage from 165 nm to 900 nm.
- Focal Length: 380 mm, Echelle Grating: 87 L/mm

Robust Sample Introduction System

- Self-aligning demountable torch.
- Cyclonic glass spray chamber and quartz concentric nebulizer.
- Four-channel 12-roller peristaltic pump for reliable sample delivery.

High-Performance RF Generator

- Solid-state design with low maintenance.
- RF frequency: 27.12 MHz, adjustable delivery output power range from 500-1600 W in dual view.
- Power adjustment precision: 10 W steps, with automatic control.
- RF Stability: 0.01%

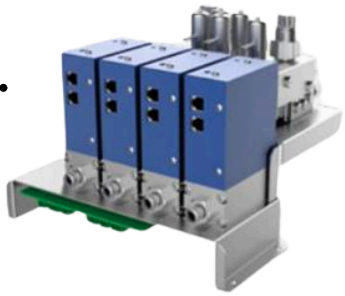
Superior Detection System

- Large Array CCD with TEC pixel-level refrigeration for enhanced stability.
- Spectral range: 165-900 nm.
- Anti-blooming protection with 1 sq. inch photosensitive area.
- Optical resolution: ≤ 0.007 nm @ 200 nm.
- Full-spectrum, real-time calibration technique (FSC).

Flexible Optical View

- Radial, axial & dual observation with adjustable optical height via software.

Comprehensive Gas Flow Control



- Computer-controlled precise mass flow controllers for all gas flows.
- Plasma gas: 8-20 L/min (default: 12 L/min).
- Auxiliary, nebulizer, and make-up gas flows fully adjustable.

Accessories (Optional)

- Automatic continuous flow hydride generation system
- Auto-sampler capable of handling up to 240 samples with PC control.

ALL TYPES OF SAMPLE INTRODUCTION SYSTEM:

- Aqueous
- HF
- High TDS
- Organic

SOFTWARE CAPABILITIES

User-Friendly Operation

- Intuitive multi-window, multi-method analysis interface. Semi-Quant modes ensures scanning of all elements irrespective of selection of metals in analytical method, it also helps for the scanning of probable range of all elements in unknown samples.
- Real-time system monitoring of RF power, gas flows, cooling water pressure, and plasma stability.

Comprehensive Element Library

- Over 50,000 spectral lines with inter-element and background correction.
- Semi-quantitative analysis for unknown samples.

Enhanced Data Handling

- Automatic and manual wavelength calibration.
- Automatic Background correction for optimal accuracy. Simultaneous reading of background & emission data spectrum line.
- Data export, calibration curve editing, and customizable test methods.

Regulatory Compliance

- Designed in full compliance with **21 CFR Part 11** for electronic signature and audit trailing.
- Three-level administrative authority and detailed service diagnostics.

TECHNICAL SPECIFICATIONS

PARAMETERS	SPECIFICATIONS
Wavelength Range	165 nm - 900 nm
Resolution	≤ 0.007 nm
RF Frequency	27.12 MHz
Output Power Range	500-1600 W
Pixel Size	24 µm x 24 µm
Startup Time	< 5 minutes from standby
Dimensions (W x L x H)	106 x 67 x 75 cm
Weight	180 kg

APPLICATIONS

The ICP 5000 DV is ideal for:

- Environmental monitoring and compliance.
- Pharmaceutical quality control.
- Food and beverage safety analysis.
- Material science and metallurgy.
- Academic and industrial research.

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