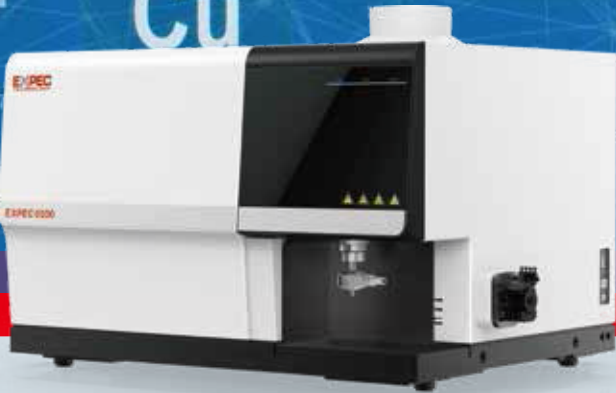


EXPEC Product Series



Fully automatic heavy metal analysis system



EXPEC 6500  
ICP-OES

Exert our thoughts to specialty

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# EXPEC 6500

## A new generation of full spectrum ICP-OES

Inductively coupled plasma optical emission spectrometer has been developed for nearly half a century. The early commercial ICP-OES products mainly use separately excited RF power source to generate plasma flame, and use photomultiplier tube as detector to collect spectra. After years of technical accumulation and research and development, FPI has created a new generation of EXPEC 6500 ICP-OES, which has made new leaps in core technologies such as RF power supply, large area array detector application, and plasma torch flame observation methods. It supports the full spectrum rare earth analysis required by high resolution and Cl/Br element analysis in deep ultraviolet band. At the same time, expanding a variety of easy-to-use functions and intelligent auxiliary equipment to form an intelligent analysis system can help operators improve efficiency, free themselves from repetitive work, and create value more effectively.



EXPEC-6500



EXPEC 6000



ICP-5000

## Thought what you thought

EXPEC 6500 Inductively Coupled Plasma Optical Emission Spectrometer adopts a newly designed vertical torch dual observation technology, which can simultaneously measure elements with large differences in high and low content under complex matrices. The patented self-excited all-solid-state RF power supply ensures that the system has excellent sample adaptability, and has a low-power standby mode, which greatly reduces the consumption of argon. The unique large-area high-sensitivity ECCD sensor brings stronger performance to the product. Combined with FPI's many years of experience in the development of spectroscopic instruments, the 8-hour stability RSD of EXPEC 6500 ICP-OES products is <1%, and the precision of the internal standard method is RSD<0.1%, bringing you stable and reliable analysis results.

### Main features

#### A new generation of vertical torch dual observation technology

The EXPEC 6500 product adopts a newly developed vertical torch dual observation technology, which greatly reduces argon consumption and torch consumption, and can be used to measure elements of relatively large differences in content in a complex matrix. The vertical torch prevents high salt deposition, and the radial observation avoids matrix interference, with which better sensitivity and repeatability can be achieved. The innovative vertical observation technology with adjustable height can optimize the observation position for different elements.

#### Patented self-excited all-solid-state RF power supply

The product integrates the self-excited all-solid-state RF power supply with EXPEC's third-generation patented technology to ensure that the equipment has better sample adaptability and stability. There won't be any flameout even if organic samples or air is directly injected, thus eliminating the need for pre-treatment and preparation processes for organic samples such as oil. The power range of the power supply is (500-1600) W, and its power adjustment range is better than that of most mainstream products. In the 500W low-power standby mode, the argon consumption is 5L/min, which adequately saves the cost of argon consumables for the user, and eliminates the waiting time required between the repeated turning on and off of the stable RF power supply.

#### Large area array ECCD sensor

As for the proprietary large area array ECCD sensor, its excellent low noise and deep ultraviolet response combined with anti-overflow design, provide the EXPEC 6500 with good detection limits. The large area array design ensures that the instrument can truly acquire the full spectrum in one take, and finish analyzing 72 elements in 10 s.

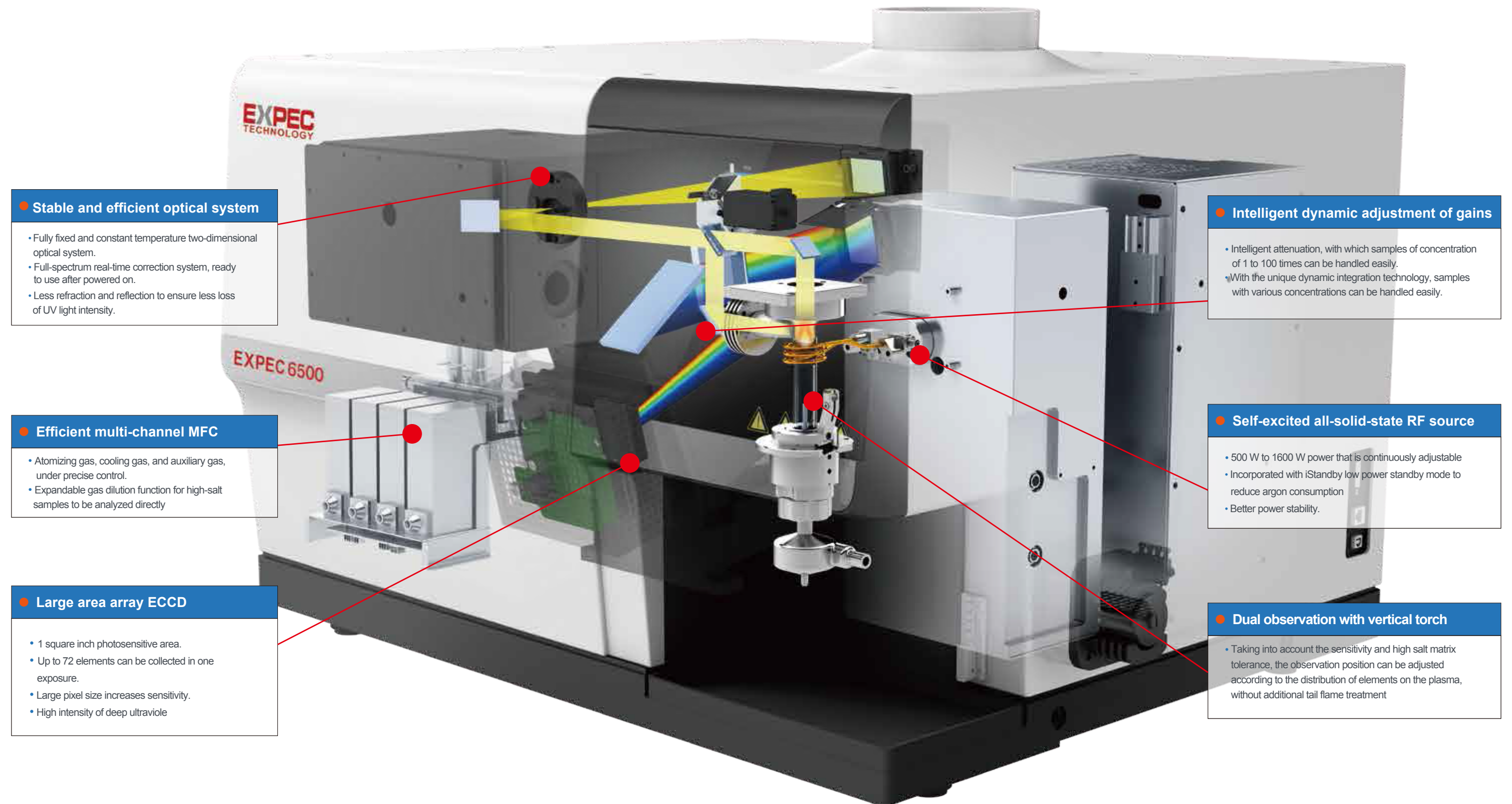
#### 8-hour stability RSD < 1%

Through high-precision temperature gradient field simulation, and air duct fluid dynamics simulation, in combination with repeated practical verification, the internal structure design has been optimized, which gives the structure greater resistance to environmental temperatures. Since the stability design of many key components such as RF power supply and injection system is incorporated into the instrument, the high stability of 8 hours RSD is below 1%, which has reached the leading level internationally.



# EXPEC 6500

Exert our thoughts to specialty



# EXPEC 6500

## Refinement in the details

### All-digital self-excited all-solid-state RF power supply with iStandby 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.

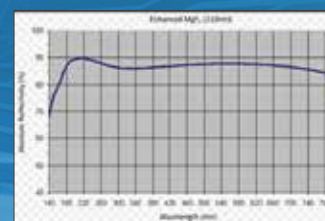
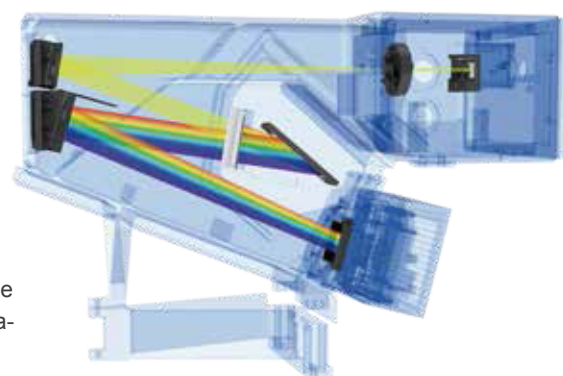
- Self-excited RF power supply: The matching is quick, thus offering adaption to complex sample analysis and switching; there are no moving parts, which makes the instrument more reliable.
- iStandby mode: The mode enables the ultra-low power standby function, and reduces argon consumption by more than 50%.
- The water-cooled design enables rapid heat dissipation, and the power stability is within 0.1%, thus guaranteeing the reliability.



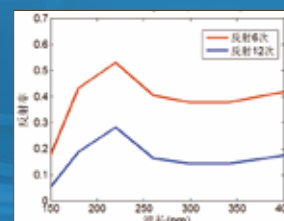
All-digital self-excited all-solid-state RF power supply

### Stable and efficient two-dimensional optical system with echelle grating

- Efficient two-dimensional spectroscopic system, with less reflection times and less light energy loss.
- Heat-balanced control light chamber at constant temperature of 36 degrees, is the cornerstone of instrument stability.
- Based on fluid mechanics simulation, the designed distributed purge enables the optical system to quickly establish a high-purity argon atmosphere to achieve UV analysis, saving time and argon.
- The thermal isolation design of the host and the optical system balances the heat exchange, makes the optical system better better resistant to the influence of changes in the external environment.
- Applications on vehicles are supported in a stable and reliable way.



Lens reflection efficiency chart



Comparison chart of efficiency of multiple reflections

### Proprietary high-performance large area array ECCD

#### • 1 square inch large area array CCD detector

The large pixel size brings high-sensitivity response, and the overall area is large, which can obtain a wider spectral range at the same time of high resolution.

#### • 1024\*1024 pixels, one-time exposure

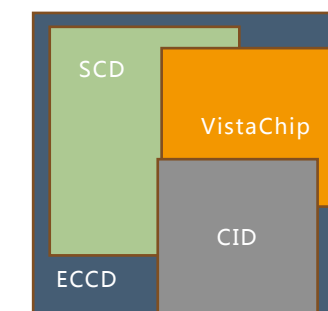
Realize the detection of 72 elements in the full spectrum range, and get the result in 10s

#### • Obvious order in the deep ultraviolet region, high sensitivity

#### • Back-vented anti-overflow design, with no need for worries about the influence of spectral line saturation on adjacent spectral lines

#### • TEC cooling packaged inside the sensor acts directly on the pixel

Integrated, high efficiency, high reliability, more conducive to eliminating the influence of thermal noise



#### • Back-vented anti-overflow 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.

#### • Good UV response

- The intensity of C and Al spectral lines around 160 nm is good.
- The ultraviolet waveband hierarchy is clearly visible.

# EXPEC 6500

## Refinement in the details

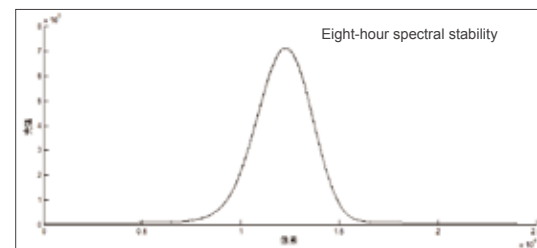
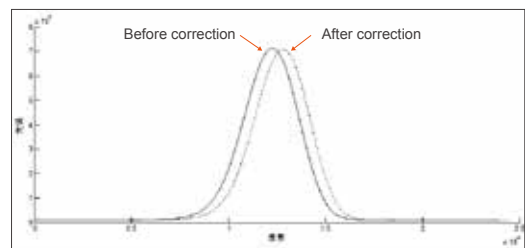
### New generation of dual observation technology with vertical torch

- The vertical torch reduces argon consumption, and prevents high salt deposition.
- The vertical torch prolongs the service life of the torch, and reduces the consumption of torch consumables.
- Axial observation: High sensitivity.
- Radial observation: The interference by matrix is prevented. The position of plasma light can be adjusted. And the element acquisition can be optimized according to different positions of the plasma.
- Dual observation: Having the advantages of both (axial and radial).



### Patented real-time drift correction technology for spectral position correction.

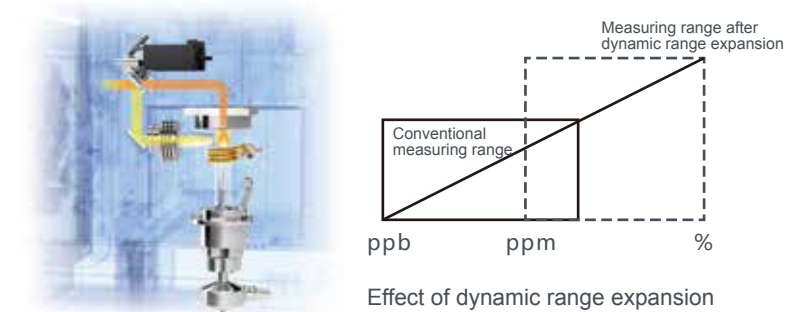
- Only C, N, and Ar spectral lines are used for start-up and ignition, and the spectrum correction is automatically completed without specific sample injection.
- The patented full-spectrum real-time correction (FSC) technology uses the characteristic line of the non-interfering neon to correct the subtle deviations of the spectrum in real time, so that better spectral integration can be achieved to ensure good long-term stability.



### Intelligent dynamic gain adjustment, easy to control any concentration gradient

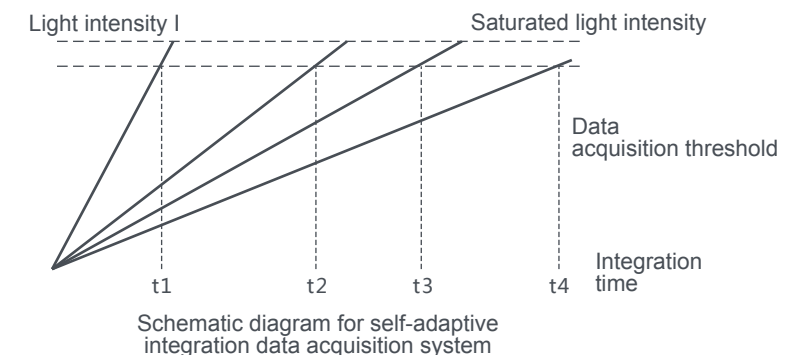
#### Intelligent attenuation, easy to control samples with 1~100 times concentration

According to the high and low concentrations of elements, the attenuation factor is automatically increased, and the analysis of samples with large gradients of high and low elements can be completed at one time without repeated dilution, reducing the difficulty of sample pretreatment.



#### Intelligent integration

Patented intelligent integration design: synchronous acquisition of signal background, exposure time depends on the light intensity of the spectral line, automatic calculation of the optimal exposure time of the spectral line, normalized calculation of light intensity, combined calculation of the working curve, and an integration time accurate to microseconds control, extended dynamic range, avoid repeated sample dilution.



#### 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.



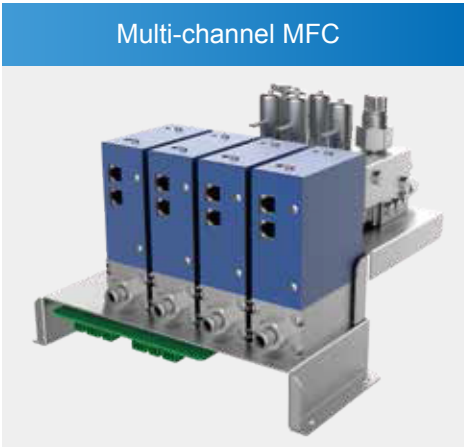
Schematic diagram for argon dilution input

Various expansion takes you into another experimental world with ease.

Friendly and easy to use software interface

Stable injection system

- Multi-channel digital mass flow controller, providing precise control over each channel of argon, with the control accuracy at 0.01 L/min, to ensure the stability of the data measured.
- The high-precision 12-roller 4-channel peristaltic pump ensures stable sample injection, and can add internal standard solution and standard addition solution according to the needs, which is conducive to complex sample analysis.
- Fully split-body torch, the installation of which is self-collimating; for different applications, only the center tube needs to be replaced, which greatly reduces costs.



Real-time display of status information



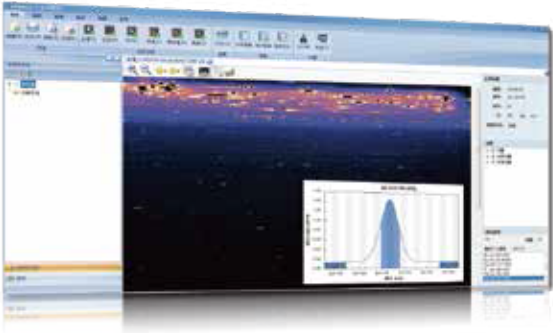
Windows-style all-English operation interface



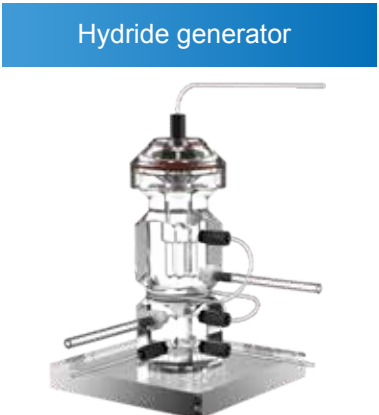
Method backup and import



Full spectrum and sub-array controls



Supporting expansion with a variety of accessories



| Model             | Features                                      | Application field                                                                                                       |
|-------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| EXPEC 6500 Type D | Bidirectional observation with vertical torch | Applicable to areas with high sensitivity requirements, and providing a relatively wide range of versatility.           |
| EXPEC 6500 Type R | Bidirectional observation with vertical torch | Suitable for applications with complex matrices, such as metals, oil products, geological and mineral samples, and etc. |