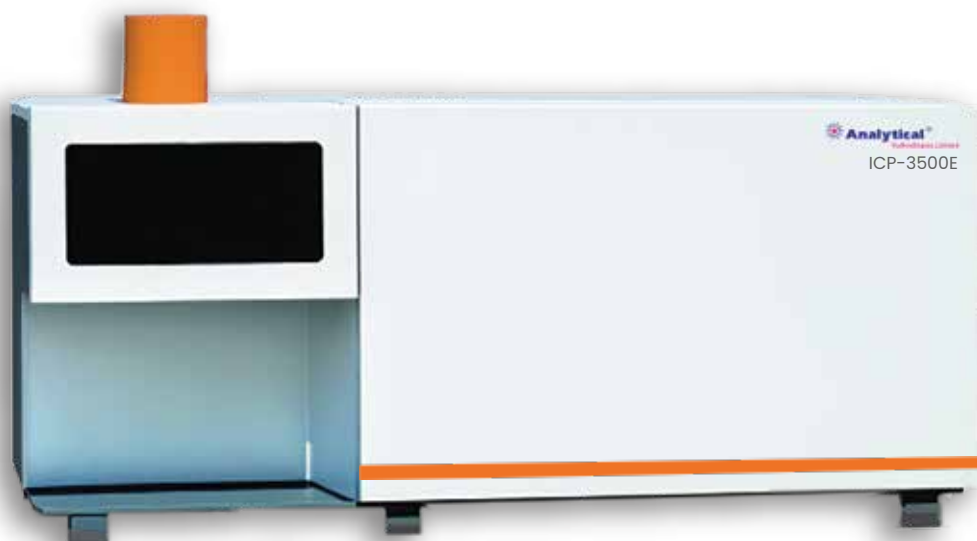


ICP-3500E

Inductively coupled plasma
emission spectrometer



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Analytical Technologies Limited

An ISO 9001 Certified Company

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Application range:

Instrument characteristics:

- Detection limit <1ppb:**

Detection limit 1-10ppb:

Detection limit 10-100ppb:

The elements those can be measured and their detection limits

Legend:

- 10ppb below
- 100-1000ppb
- 10-100ppb
- 1000ppb above

Technical specifications:

RF generator:

Circuit type	:	Solid state component, passive type
Working frequency	:	27.12MHz
Output Power	:	700W~1200W
Output power stability	:	<0.1%

Optical system:

Light path type	:	Czerny-Turner
Detector	:	CCD
Focal length	:	1000mm
Grating	:	Ion-etched holographic grating, 2400line/mm, Grating line area (80×110) mm ²
Exit, entrance slit	:	20μm

Photometric device:

Operating Voltage	:	-(200~1000) V
Current measurement range	:	10 ⁻⁴ ~10 ⁻⁹ A
Stability	:	<0.05%
Signal acquisition method	:	V/F conversion

Sample introduction device:

Torch working coil	:	Inner diameter φ22mm, 3T
Torch	:	Three concentric quartz torch, φ20mm
Nebulizer	:	Concentric Meinhard nebulizer, φ6mm
Spray chamber	:	Special high efficiency
Argon flowmeter	:	Double cylinder swirling compound chamber
a) Plasma gas	:	(0~20) L/min
b) Auxiliary gas	:	(0~2) L/min
c) Carrier gas	:	(0~2) L/min

Machine technical specifications:

Measuring wavelength range	:	(190~800) nm
Resolution	:	≤0.015nm
Measurement repeatability	:	RSD≤1.0%
Measurement stability	:	RSD≤2.0%
Representative element detection lower limit	:	ppb

Datasheet:

1. Complete machine requirements:

1.1 Automatic technology is adopted for plasma excitation and impedance matching, with small reflected power and standing wave ratio not greater than 1.25

1.2 The axial observation method is adopted. The lengthened torch tube is used to reduce the fluctuation of the tail flame. The cold cone is placed at the tail flame position to prevent the tail flame from entering the observation hole

1.3 Mass flowmeters are used for three plasma gas paths, and computer control is adjustable

1.4 The inner diameter of the working coil is small, the energy conversion efficiency is high, the power is 1000w, and the robustness is greater than 9 when the carrier gas is 0.7L/min

1.5 A wavelength scanning shall be carried out before the sample measurement to avoid the influence on the measurement accuracy due to the long time measurement wavelength shift.

1.6 Upgrade spectral line database, with up to 50000 pieces of data information

1.7 Automatic screening function of interference spectrum

1.8 Automatic serial communication

1.9 Analysis speed: scanning more than 5 elements in one minute

1.10 Scanning range: 190~800nm

1.11 Scanning mode: turbine vortex rod, driven by computer controlled stepping motor, with the minimum scanning step of 0.0006nm

1.12 Wavelength indication error: $\leq 0.005\text{nm}$

1.13 Repeatability: $\leq 0.005\text{nm}$

1.14 Correlation coefficient: ≥ 0.9995

1.15 Precision: $\text{RSD} \leq 1.0\%$

1.16 Stability: $\text{RSD} \leq 2.0\%$

1.17 Measurement range: ultramicro to constant

1.18 Detection limit:

Zn $\leq 0.003\text{mg/L}$

Ni $\leq 0.010\text{mg/L}$

Mn $\leq 0.002\text{mg/L}$

Cr $\leq 0.007\text{mg/L}$

Cu $\leq 0.007\text{mg/L}$

Ba $\leq 0.001\text{mg/L}$

1.19 Measurement method: single and multi element sequential measurement

1.20 Power: 2.5KW (maximum power consumption)

2, Detailed parameters of instrument components

1. RF generator

1.1 Circuit type: all solid state RF generator

1.2 Operating frequency 27.12MHz

1.3 Frequency stability: 0.01%

1.4 Output power: 700W~1200W, step 50W

1.5 Output power stability: 0.1%

1.6 Electromagnetic field leakage radiation intensity:<2V/m

2. Injection device

2.1 Output working coil: inner diameter 22mm, 3 turns

2.2 Rectangular tube: three concentric quartz rectangular tube

2.3 Coaxial spray: concentric atomizer

2.4 Fog chamber: double cylinder and swirling compound fog chamber to further remove heavy fog droplets and improve aerosol atomization efficiency

2.5 Observation position: axial observation

2.6 Argon flow

2.6.1 Plasma gas: mass flowmeter 0-20L/min, accuracy ± 0.4 L/min, stability ± 0.2 L/min

2.6.2 Auxiliary gas: 0-2 L/min Accuracy ± 0.04 L/min, stability ± 0.02 L/min

2.6.3 Carrier gas: 0-2 L/min Accuracy ± 0.04 L/min, stability ± 0.02 L/min

3. Beam splitter

3.1 Optical path: Czerny Turner

3.2 Focal length: 1000mm

3.3 Grating specification: ion etching holographic grating; Marking density: 2400 lines/mm, marking area: 80 × 110mm

3.4 Reciprocal linear dispersion rate: 0.37nm/mm

3.5 Resolution: ≤ 0.015 nm

3.6 Scanning wavelength range: 190nm~800nm

3.7 Minimum step distance of stepping motor drive: 0.0006mm

3.8 Exit and entrance slit: 20 μ m

3.9 Spec. of reflector: 78 × one hundred and five × 16mm³

3.10 Lens: Φ 30mm 1:1 imaging

3.11 Spectrometer thermostatic device: 30-38°C adjustable

4. Light metering device

- 4.1 Photomultiplier tube specification: R955
- 4.2 Negative high voltage of photomultiplier tube: 200V~1000V, stability < 0.05%
- 4.3 Photomultiplier tube current measurement range: 10-4-10-9A
- 4.4 Signal acquisition mode: V/F conversion

5. Instrument configuration

- 5.1 One ICP-7700 host
- 5.2 A set of software installation CD and user manual
- 5.3 A set of host power cable, serial port cable and USB data cable
- 5.4 One computer
- 5.5 One black and white laser printer
- 5.6 One EW-2H cooling water circulating device

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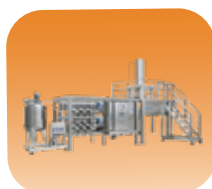
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