



**Double Beam Flame / Graphite Furnace**



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## SP-AA 5000 Atomic Absorption Spectrometer



The SP-AA 5000 from Spectrum Instruments is a fully automated computer controlled Flame and Graphite Furnace AAS instrument featuring an 8-lamp turret, extinguish button, autozero button, start button, automatic gas box and automatic burner height setting, graphite furnace, autosampler for flame and furnace, Hydride System and cooling system. The furnace power supply is integrated in the instrument. Instrument and all accessories are controlled by the SPWin-AA Software. It is also included the integrated furnace color camera for observation of sample injection and sample drying in the graphite tube.

### System Design

Optical system	Dual Optics combined for single beam and double beam mode. True Double Beam developed optical noise reduction technology, which combined optical component UV enhancement technology. It improved instrument's optical performance, linear range and enhanced background correction. Measurement modes of atomic absorption and atomic emission are available.
Monochromator	Czerny-Turner type with 2 focal lengths at 355.8 and 345.6 mm, automated wavelength selection and slit selection. The monochromator provides a true double beam operation.
Wavelength range	180-900 nm
Grating	Holographic diffraction with 1800 lines/mm
Wavelength accuracy	±0.3 nm
Sensitivity (Cu)	approx. 0.9A at 5 ppm, RSD≤0.5%
Slits	Automated slit selection 0.1; 0.2; 0.4; 0.7; 1.4; 2.0 nm
Detector	Wide range UV sensitive photomultiplier tube
Lamp	Automated 8-lamp turret with independent lamp power supply for each lamp and two heating circuits for preheating lamp operation. Non-coded lamp and coded lamp can be used for analysis.
Background Correction	Deuterium (D2) Background Correction and Self-absorption Background Correction.

### Flame System

Burner-Nebulizer-System	All-titanium 100mm and 50mm burners are available:-100mm burner for air / acetylene operation, 50mm burner for both air / acetylene and nitrous oxide /acetylene operation. Adjustable nebulizer with internal Platinum / Iridium capillary, PEEK Nozzle and fixed ceramic impact bead are supplied as optional. SP-AA 5000 features automated setting of burner height for each elements.
Spray Chamber	The PPS (Polyphenylene Sulfide) spray chamber is used for both aqueous and organic solution.
Gas Controls	Programmable gas control features software-controlled gas flows with automatic setting of gas flows for each element.
Safety Functions	Interlocked safety system prevents selection of the nitrous oxide flame if the nitrous oxide burner is not fitted. Sensor controls for protection to use the incorrect burner head and check the siphon system. To ensure correct operating fuel gas and oxidant pressures are maintained also to check the flow rate. In case of the system power failure, safety interlocks will shut down the gases automatically.
Hydride System	The Hydride system is a continuous flow technique for the determination of As, Se,Sb, Sn, Te, Bi and Hg at low microgram per liter (ppb) concentration with electrothermal heating unit (600-950°C) to heat the quartz cell. The Hg will be determined with the cold vapour technique. The system has the gas flow control including two peristaltic pumps for supply the reagent, acid and samples solution.
Autosampler for Flame	Corrosion resistant sample tray is consist of 85 positions. Integral peristaltic pump with speed control provides on-demand rinsing of the probe, eliminating carryover.

# SPECIFICATIONS

## SP-AA 5000 Atomic Absorption Spectrometer

### Graphite furnace System

Heating System	Integrated computer-controlled Longitudinal Heated Graphite Furnace.
Function	Analytical furnace programs up to 9 steps can be set up.
Temperature	Programmable temperature up to 3000 °C in 1 °C increment. Maximum linear heating rate is 2000 °C/s under software control.
Gas Flow	Choice of two inert gases with computer-controlled flows. Separate control of inert gas stream is Argon for internal and external gas flow. The external gas flow is 1 L/min and internal gas flow in the graphite tube can be adjusted up to 250mL/min
Cooling System	A closed circuit optimized to save time, water and provide stable condition. Water temperature during operation is approx. 25 °C.
Autosampler for Graphite	Injection volumes from 1 to 50 µL in increments of 1 µL are user selectable. Automatic dilutions and additions of three different modifiers are available. Corrosion resistant sample tray holds 87 positions.
Safety Functions	Warning will function when cooling water flow failure, gas pressure over, Furnace temperature too high, Graphite tube broken.
Camera for Graphite tube	This camera provides a full-color image monitoring for observation of the sample injection by autosampler or manual injection. It is also able to observe the sample drying in Graphite tube.

### Other information

Software	SPWinAA Software Package
Weight	150kg
Dimensions (W x D x H)	800 mm x 800 mm x 575 mm
Environmental Requirements	10 °C up to 35 °C Rel. humidity max. 85 %
Power Requirements	110 / 220V±10%, 50/60Hz