



Single Beam / Double Beam / Single&Double Beam

Excellence in Measurement

ISO9001:2008 CERTIFIED COMPANY



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**Headquarter**

**SPECTRUM INSTRUMENTS GMBH**  
Schreibersbildstrasse 14  
D-88662 Überlingen  
The Federal Republic of Germany  
Tel: +497551 970968  
Fax: +497551 970968  
Website: [www.spectrum-instruments.de](http://www.spectrum-instruments.de)  
Email: [info@spectrum-instruments.de](mailto:info@spectrum-instruments.de)

**Middle East Support Center**

**SPECTRUM INSTRUMENTS MIDDLE EAST.**  
**(MENA OFFICE)**  
1205 Al Thuraya Tower 1, Dubai Media City,  
United Arab Emirates  
Tel: +97 (1) 4 276 7560  
Fax: +97 (1) 4 551 5980  
Email: [info@spectrum-instruments.ae](mailto:info@spectrum-instruments.ae)

**International and Asia Pacific Support Center**

**SPECTRUM INSTRUMENTS (GROUP) CO., LTD.**  
18, 7th Fl. Sricharoenchai Bldg., Tiwanon Rd.,  
Talat Khwan, Mueang, Nonthaburi 11000, Thailand.  
Tel: +66 (2) 5265621-2  
Fax: +66 (2) 9689272  
Website: [www.spectrum-instruments.de](http://www.spectrum-instruments.de)  
Email: [info@spectrum-instruments.co.th](mailto:info@spectrum-instruments.co.th)

## SP-AA 2000 Atomic Absorption Spectrometer

Spectrum Instruments improve the optical precision, linear range and background correction effectively. SP-AA 2000 is an external computer controlled AAS equipped with 6-lamp positions, extinguish button, autozero button, start button, automatic gas control and automatic burner height setting.

### System Design

Optical system	Optics 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.
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	185-900 nm
Grating	Holographic diffraction grating with 1800 lines/mm
Wavelength repeatability	±0.1 nm
Wavelength accuracy	±0.3 nm
Sensitivity (Cu)	approx. 0.8A 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 6-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.
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 standard. SP-AA 2000 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.

### Option

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.

### Other information

Software	SPWinAA Software Package
Weight	90kg
Dimensions (W x D x H)	800 mm x 580 mm x 575 mm
Environmental Requirements	10 °C up to 35 °C Rel. humidity max. 85 %
Power Requirements	110 / 220V±10%, 50/60Hz, 10000W (Max.)

## SP-AA 3000 Atomic Absorption Spectrometer

The SP-AA 3000 from Spectrum Instruments is a fully automated computer controlled Flame AAS instrument featuring an 8-lamp turret, extinguish button, autozero button, start button, automatic gas box and automatic burner height setting. The instrument and all accessories are controlled by the SPWin-AA Software.

The majority of samples will run smoothly with this instrument, if the stored default methods are applied. In case of unique challenges our application experts will take personal responsibility for responding to the customers' needs.

### System Design

Optical system	High light throughput Single Beam
Modes of Operation	Atomic Absorption and Atomic Emission
Monochromator	Czerny-Turner type with 2 focal lengths at 355.8 and 345.6 mm, Automated wavelength and slit selection.
Wavelength range	185-900 nm
Grating	Holographic diffraction grating with 1800 lines
Wavelength repeatability	±0.1 nm
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. Two additional heating circuits for preheating lamps. Non-coded lamp and coded lamp can be used.
Background Correction	Deuterium (D <sub>2</sub> ) Background Correction and Self-absorption Background Correction.

### Flame System

Burner-Nebulizer-System	Titanium 100mm and 50mm burners heads: 100mm burner for air / acetylene operation, 50mm burner head for both air / acetylene and nitrous oxide / acetylene operation. Adjustable nebulizer using all Platinum / Iridium capillary, PEEK Nozzle and fixed ceramic impact bead are supplied as standard. Automated burner height setting for each element by software, using a motorized burner mount for vertical burner adjustment. The optimization of the operating flame condition is also fully automatic and software controlled.
Spray Chamber	The PPS (Polyphenylene Sulfide) spray chamber is used for both aqueous and organic solution.
Gas Controls	Software controlled gas box allows the 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. In case of pressure failure of fuel or oxidant gas, or power failure, safety interlocks will shut down the gases automatically in the right order.

### Option

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.

### Other information

Software	SPWinAA Software Package
Weight	90kg (main unit only)
Dimensions (W x D x H)	800 mm x 580 mm x 575 mm
Environmental Requirements	10 °C up to 35 °C Rel. humidity max. 85 %
Power Requirements	110 / 220V±10%, 50/60Hz, 1000W (Max.)

# SP-AA 4000

## Atomic Absorption Spectrometer

Spectrum Instruments improve the optical precision, linear range and background correction effectively. SP-AA 4000 is an external computer controlled AAS equipped with 8-lamp positions, extinguish button, autozero button, start button, automatic gas control and automatic burner height setting.

### 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.
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	185-900 nm
Grating	Holographic diffraction grating with 1800 lines/mm
Wavelength repeatability	±0.1 nm
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.
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 standard. SP-AA 4000 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.

### Option

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.

### Other information

Software	SPWinAA Software Package
Weight	90kg
Dimensions (W x D x H)	800 mm x 580 mm x 575 mm
Environmental Requirements	10 °C up to 35 °C Rel. humidity max. 85 %
Power Requirements	110 / 220V±10%, 50/60Hz, 10000W (Max.)