

TO BE A WORLD-LEADING ANALYTICAL TESTING SOLUTIONS PROVIDER!



### Atomic Absorption Spectrometer(AAS) Series

- Highly Automatic
- Multiple Safety Protection
- Humanized Design
- Perfect Service System



- AAS 9000 Integrated AAS
- AAS 8000 Graphite Furnace AAS
- AAS 6000 Flame AAS

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- Our corporation specializes in R&D, manufacturing, sales and services of analytical and measuring instruments in Spectroscopy, Chromatography and Mass Spectrometry fields.
- Full product range, provide solutions for environmental protection and safety, industrial testing and analysis, and other fields.
- Our biggest strength is providing tailor-made solutions according to customer's needs.
- We have above 148 distributors and after-service stations throughout the world.
- Skyray Instrument announced its initial public offering in Growth Enterprise Market, Shenzhen Stock Exchange on January 25th, 2011. (Stock code: 300165)

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# Atomic Absorption Spectrometer Series

- Highly Automatic
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Unique configuration and high-end performance make testing more accurate!

## Overview

AAS series atomic absorption spectrometer is researched, developed, manufactured and sold by Skyray Instrument Co., Ltd. based on its years' R&D experience on spectrometer. With high performance and reliability, AAS series provides various atomization modes like flame, graphite furnace and hydride generation.

AAS series is PC-controlled through USB2.0 interface, with data can be automatically processed; it has multiple protective measures to ensure safe and reliable operation; simple and convenient structure design combined with user-friendly software interface simplify operation.



AAS 6000 Flame AAS

## AAS Series

### AAS 6000 Flame Atomic Absorption Spectrometer

Flame atomic absorption is applied to micro and trace metallic elements test, covering over 30 elements. The instrument has simple structure, provides fast test, with good repeatability and less interference, especially suitable for testing Cu, Zn, K, Na, Au, Ag, etc.

### AAS8000 Graphite Furnace Atomic Absorption Spectrometer

Graphite furnace atomic absorption is suitable for trace and ultra-trace metallic elements test, covering over 60 elements. It is highly sensitive, with low limit of detection and less sample volume, especially suitable for testing Cd, Cr, Pb, Al, Mo, etc.

AAS 8000 (with graphite furnace auto sampler) and AAS 8000-M (without graphite furnace auto sampler) are of low detection limit, highly sensitive and easy to operate.



AAS8000 Graphite Furnace AAS

### AAS 9000 Integrated Atomic Absorption Spectrometer

It has flame and graphite atomizers, incorporating their features. Users can switch atomizer quickly based on test needs to ensure best test effect.

AAS 9000 (with graphite furnace auto sampler) and AAS 9000-M (without graphite furnace auto sampler) adopt flame and graphite atomizers, with better universality. In serial light path design, it realizes automatic switch between two atomizers, and delivers stable and reliable test.



AAS 9000 Integrated AAS

Wide Application | Good Compatibility | Easy Operation | Stable and Reliable

## Features

### Host Machine

#### Total reflection achromatic optical system

Using concave mirror instead of convex lens, effectively solved the chromatic aberration problem of different focuses of different elements, and increased the efficiency of optical system.

#### C-T Monochromator

1800 lines/mm, blaze wavelength of 230nm beam-splitting system.

#### 8-element lamp turret

8 independent lamp power supplies, 7 lamps heating simultaneously at most while one is working, saving lamp changing and preheating time, the operation is more convenient as a result.

#### Full automatic design

The instrument is totally monitored and controlled by computer, except for mainframe power switch.

#### USB 2.0 communication interface

Update the old RS232 mode into the latest USB2.0 mode, increasing the communication speed, and compatible with the new operation system.

#### Background correction system

Deuterium lamp background correction and self-reversal background correction, be able to correct over 30 times of background when background signal is 1A.

#### Streamline sheet metal process design, modern stylish, elegant and beautiful

#### Proprietary intellectual property rights and powerful software

Humanized operation interface makes your operation easier; the interface of the software can be switched between English and Chinese. Full automatic qualitative and quantitative analysis can calculate element contents and generate report automatically.

## Humanized design facilitates detection!



Scientific R&D



8-element lamp turret



Auto-sampler



Flame System



Scientific R&D



USB 2.0



Analysis software interface



Graphite Furnace System

# Atomic Absorption Spectrometer Series

- Highly Automatic
- Multiple Safety Protection
- Humanized Design
- Perfect Service System



Multiple safety protection measures, ensuring the reliability of the sample analysis!

Wide Application | Good Compatibility | Easy Operation | Stable and Reliable

## Flame System

### Pure Ti atomizing chamber and burner

Prevent acid gas corrosion effectively and maximize service life

### Efficient glass nebulizer

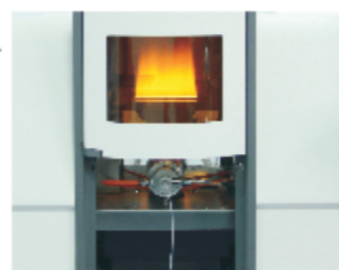
Efficient glass nebulizer with higher nebulization efficiency, easy to maintain and replace

### Mass flow controller makes the flow of C<sub>2</sub>H<sub>2</sub> controllable

Control C<sub>2</sub>H<sub>2</sub> flow adjustable, monitoring the flow dynamically, ensuring it to be convenient and safe.

### Multiple safety protection measures, ensuring the reliability of the sample analysis

- (1) C<sub>2</sub>H<sub>2</sub> leaking preventive measure
- (2) C<sub>2</sub>H<sub>2</sub> pressure monitoring
- (3) Air pressure monitoring
- (4) Burner monitoring
- (5) Flaming burning monitoring
- (6) Water seal monitoring



Flame System

## Graphite Furnace System

### Internal power supply

The power supply of graphite furnace and host machine are incorporated in one instrument, which makes it more compact, shortens cable length, reduces the electromagnetic interference of graphite furnace power supply and improves heating efficiency of graphite tube.

### High temperature control precision, quick temperature rise

Large power transformer, micro resistance cable and light control heating mode are used, combined with software and hardware temperature calibration systems, ensuring ±1% control precision under high temperature



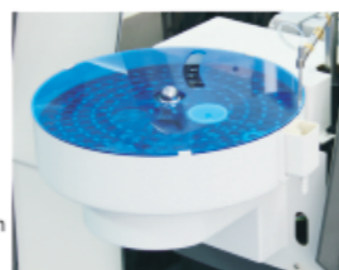
Graphite Furnace System

### Multiple safety protection measures, ensuring the reliability of the sample analysis

- (1) Cooling water flow monitoring
- (2) Carrier gas pressure monitoring
- (3) Graphite tube temperature monitoring
- (4) Graphite furnace temperature monitoring

### Carrier gas flow auto-control

The internal and external gas of graphite furnace are automatically controlled by computer based on software heating procedures.



Auto-sampler

## Auto-sampler

### Disc type universal auto-sample with 150 cup positions

Polar coordinates disc type auto-sampler, with high positioning accuracy, stable operation and easy maintenance (manual sampling for AAS8000-M and AAS9000-M, no auto-sampler supplied)

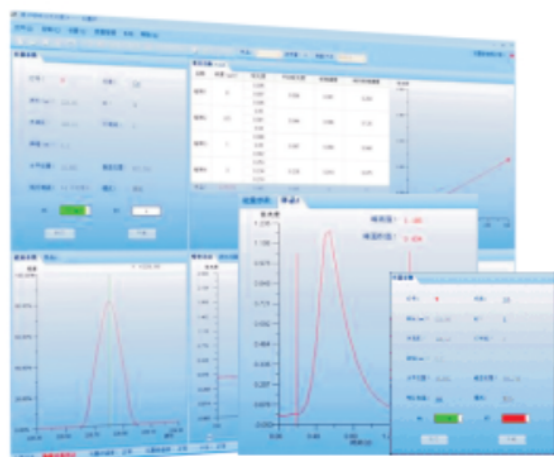
## Technical Parameters

Host machine	Monochromator	Czerny-Turner
	Wavelength coverage	190nm ~ 900nm
	Wavelength accuracy	±0.25nm
	Wavelength repeatability	< 0.10nm
	Slits	auto-switch among 0.1/0.2/0.4/0.7/1.4 nm
Flame system	RSD(Cu)	< 1%
	Detection limit (Cu)	< 0.006µg/mL
	Characteristic concentration (Cu)	< 0.025µg/mL/1%
	Static stability	0.003 Abs
	Dynamic stability	0.005 Abs
Graphite furnace system	Temperature control range	room temp. - 3000°C
	Heating rate	3000°C/s
	RSD (Cd)	≤ 2% (for auto sampling)
	RSD (Cd)	≤ 5% (for manual sampling)
	Detection limit (Cd)	≤ 1pg

## Device

Optional configuration	Low noise oil-less air compressor
	Auto water cooling system
	Hydride generator
	Advanced PC
	Advanced printer
	Light source for elements to be analyzed

## Humanized software interface, automatic test, accurate result!



- AAS Series software is applicable to Windows systems.
- Interface in Windows style, more in line with user's habits, simplified operation
- Main interface basically covers all functions, like parameter setting, instrument control, data processing, spectrum display, curve fitting, user management, instrument status monitoring.
- Automatic sample test, record previous test parameters automatically, save project, export test report, convert to EXCEL etc.

## Powerful function makes instrument application wider!

### AAS Atomic Absorption Spectrometer is widely applied in:

- Geology and mining, analysis in metallurgy and steel industry, nonferrous metal analysis
- Environment analysis, air condition monitoring, water quality analysis, analysis of soil and solid wastes
- Analysis of petrochemicals and light industrial products, analysis of crude oil and its products, analysis of chemical and light industrial products
- Food analysis, biochemical and health products analysis
- Building materials analysis (glass, ceramics and paint, etc.)



## Technical Specifications

Project	AAS 6000	AAS 8000	AAS 9000
Description	Only flame method, automatic	Only graphite furnace method, automatic	Flame and graphite furnace integrate, automatic
<b>Host machine</b>			
Optical system	No lens, concave lens, total reflection, achromatic optical system		
monochromator	Czerny-Turner		
Grating groove	1800lines/mm		
Slit	auto-switch among 0.1, 0.2, 0.4, 0.7, 1.4nm		
Detector	photomultiplier		
Light source	8-element lamp turret, 8 independent lamp power, 7 lamps heating simultaneously at most while one is working; search the optimal lamp place automatically.		
<b>Flame system</b>			
Safety protection	(1)C <sub>2</sub> H <sub>2</sub> leaking preventive measure (2)C <sub>2</sub> H <sub>2</sub> pressure monitoring (3)Air pressure monitoring (4)Burner monitoring (5)Flaming burning monitoring if unusual, shut down automatically, with pop-up window displayed		(1)C <sub>2</sub> H <sub>2</sub> leaking preventive measure (2)C <sub>2</sub> H <sub>2</sub> pressure monitoring (3)Air pressure monitoring (4)Burner monitoring (5)Flaming burning monitoring (6)Water seal monitoring If unusual, shut down automatically, with pop-up window displayed
Combustion system	Universal atomizer, easy to replace, pure Ti atomizing chamber and burner, high temperature and corrosion resistance		Universal atomizer, easy to replace, pure Ti atomizing chamber and burner, high temperature and corrosion resistance
Waste discharge system	Manual water seal, easy to observe		Automatic water seal and monitoring system
Positioning of flame atomizer	Vertical and horizontal adjustment controlled by software		Vertical and horizontal adjustment controlled by software
C <sub>2</sub> H <sub>2</sub> flow control	Precise mass flow controller adjust C <sub>2</sub> H <sub>2</sub> flow, ensuring stable flow, safe and reliable		Precise mass flow controller adjust C <sub>2</sub> H <sub>2</sub> flow, ensuring stable flow, safe and reliable
<b>Graphite furnace system</b>			
Positioning of graphite atomizer		Vertical and horizontal adjustment controlled by software	Vertical and horizontal adjustment controlled by software
Graphite furnace safety control		(1)Cooling water flow monitoring (2)Carrier gas pressure monitoring (3)Graphite tube temperature monitoring (4)Graphite furnace temperature monitoring if unusual, shut down automatically, with pop-up window displayed	
Graphite furnace gas circuit		The internal and external gas of graphite furnace are PC-controlled. External gas protects graphite pipe from air oxidation, to maximize service life; internal gas carries matrix composition of drying and ashing process out of graphite tube.	
Replace of graphite tube		Pneumatic control, easy to replace	
Power supply		Built-in integrated design, compact structure, less electromagnetic interference, better power efficiency	
Furnace temperature control		Ramped heating mode, high power heating mode and light control heating mode used in combination to stabilize temperature control.	
Auto-sampler		Host machine providing control and power, it is of several sampling modes, with the functions of sampling needle cleaning, adding improver, automatically cleaning if concentration is too high.	
<b>Data processing</b>			
Data processing system	Flame method data processing system, humanized windows style interface, compatible with the latest operation system	Graphite furnace method data processing system, humanized windows style interface, compatible with the latest operation system	Integrated data processing system, humanized windows style interface, compatible with the latest operation system
<b>Others</b>			
Size (L×W×H)	870mm×565mm×595mm	1250mm×525mm×537mm	1296mm×565mm×532mm
Weight	100Kg	155Kg	165Kg
Power supply	Host machine: 220V±22V 50HZ±1HZ Power 2KW	Host machine: 220V±22V 50HZ±1HZ Power 2KW Graphite furnace: 220V±22V 50HZ±1HZ Power 5KW	
Environment	Temperature 5℃ ~35℃, relative humidity <80%, no-condensing.		