

## Atomic Absorption Spectrophotometer / AAS 21



CE



- High sensitivity
- simple and safe operation
- Low analytical cost

### Features

#### Innovated rich oxygen air- acetylene flame analysis technique:

The patented flame analysis technique adopting rich oxygen air- acetylene flame as the substitution for nitrous oxide-acetylene flame for high temperature element analyses, such as Ca, Al, Ba, W, Mo, Ti, V, etc. Flame temperature is continuously adjustable between 2300- 2950 with makes it possible to choose the best atomization temperature for different elements. It features easy operation, low analysis cost and wide flame AAS analytical range. Rich oxygen flame will not pollute the environment and is not harmful to human bodies. It's break-through in flame AAS analysis

#### Integrated flame/ graphite furnace atomization system, changeable with flame emission burner

- Automatically controlled changeover of the integrated flame and graphite furnace atomizer featuring easy operation and time saving eliminates human labor.
- A flame emission burner head can be installed to perform flame emission analysis to alkali metals as K, Na etc.



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#### Accurate fully automated control system

- Automatic 6-lamp turret, automatic adjustment of lamp current and optimization of light beam position
- Automatic wavelength scanning and peak picking
- Automatic spectral bandwidth changing
- Automatic changeover between flame and graphite furnace operation, automatic optimization of position parameters, automatic ignition and automatic gas flow setting

#### Reliable fully automatic graphite furnace analysis

- Adopting FUZZY-PID and dual curve mode light-controlled temperature control technique, temperature auto-correction technique, ensures fast heating, good temperature reproducibility and high analytical sensitivity. The temperature control accuracy is less than 1%
- Graphite furnace with pneumatic control and pressure lock ensures constant pressure and reliable contact
- Multi-function auto-sampler features automatic standard sample preparation, automatic correction of sampling probe depth, automatic tracing and correction of liquid surface height in the sample vessel, with the sampling accuracy of 1% and reproducibility of 0.3%, realizing fully automation of graphite furnace analysis

#### Perfect safety protection measures

- Alarm and automatic protection to fuel gas leakage, abnormal flow, insufficient air pressure and abnormal flame extinction in flame system
- Alarm and protection function to insufficient carrier gas and protective gas pressure, insufficient cooling water supply and over-heating in graphite furnace system

#### Advance and reliable electronic design

Adopting large-scale programmable logic array and Inter I2C bus technology European type sockets and AMP adapters with high reliability to ensure long term reliability of the whole electronic system

#### Easy and practical analysis software

- Easy-to-use AAS analysis software is made under Windows operating system, realizing fast parameter setting and optimization
- Automatic sample dilution, automatic curve fitting, automatic sensitivity correction
- Automatic calculation of sample concentration (content), mean value, standard deviation and relative standard deviation calculation
- Multi-elements determination in sequence to the same sample  
Measured data and final results can be printed out and edited in Excel format

### Main Specification

Wavelength range	190-900nm
Wavelength accuracy	Better than $\pm 0.25\text{nm}$
Resolution be separated	Two spectral lines of Mn at 279.5nm and 279.8nm can be separated with the spectral bandwidth of 0.2nm and valley-peak energy ratio less than 30%.
Baseline stability	0.004A/30min
Background correction	The D2 lamp background correction capability at 1A is better than 30 times The S-H background correction capability at 1.8A is better than 30 times.

### Light Source System

Lamp turret	Motorized 6-lamp turret ( Two high performance HCLs can be mounted on the turret to increase the sensitivity in flame analysis.)
Lamp current adjustment	Wide pulse current: 0~25mA, Narrow pulse current: 0~10mA
Lamp power supply mode	400Hz square wave pulse; 100Hz narrow square wave pulse+400Hz wide square wave pulse

### Optical System

Monochromator monochromator	Single beam, Czerny-Turner design grating
Grating	1800 l/mm
Focal length	277mm
Blazed Wavelength	250nm
Spectral Bandwidth	0.1nm, 0.2nm, 0.4nm, 1.2nm, auto-switch over

### Flame Atomizer

Burner	10cm single slot all-titanium burner
Spray chamber	Corrosion resistant all-plastic spray chamber
Nebulizer	High efficiency glass nebulizer with metal sleeve, sucking up rate:6-7ml/min
Emission burner provided	

### Graphite Furnace

Temperature range	Room temperature~3000°C
Heating rate	2000□/s
Graphite tube dimensions	28mm(L)×8mm(OD)
Characteristic mass	Cd $\leq 0.5 \times 10^{-12}\text{g}$ , Cu $\leq 5 \times 10^{-12}\text{g}$ , Mo $\leq 1 \times 10^{-11}\text{g}$
Precision	Cd $\leq 3\%$ , Cu $\leq 3\%$ , Mo $\leq 4\%$



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#### Detection and Data Processing System

Detector	R928 Photomultiplier with high sensitivity and wide spectral range.
Software	Under Windows operating system
Analytical method	Working curve auto-fitting; standard addition method; automatic sensitivity correction, automatic calculation of concentration and content.
Repeat times	1-99 times, automatic calculation of mean value, standard deviation and relative standard deviation.
Multi-task Functions	Sequential measurement for multi-element determination to the same sample
Condition reading	With model function
Result printing	Measurement data and final analytical report printout, editing with Excel
Standard RS-232 serial port communication	

#### Graphite Furnace Autosample

Sample tray capacity	55 sample vessels and 5 reagent vessels
Vessel materia	Polypropylene
Vessel volume	3ml for sample vessel, 20ml for reagent vessel
Minimum sampling volume	1 $\mu$ l
Repeatable sampling times	1 -99 times
Sampling system	Accurate dual pump system, with 100 $\mu$ l and 1 ml injectors

#### Characteristic Concentration and Detection Limit

Normal Air-C <sub>2</sub> H <sub>2</sub> flame	Cu: Characteristic concentration $\leq 0.025\text{mg/L}$ , Detection limit $\leq 0.006\text{mg/L}$
Oxygen-rich Air-C <sub>2</sub> H <sub>2</sub> flame	Ba: Characteristic concentration $\leq 0.22\text{mg/L}$ Al: Characteristic concentration $\leq 0.4\text{mg/L}$

#### Function Expansion

Hydride vapor generator can be connected for hydride analysis

#### Dimensions and weight

Main unit	107 $\times$ 49 $\times$ 58cm, 140kg
Graphite furnace	42 $\times$ 42 $\times$ 46cm, 65kg
Autosampler	40 $\times$ 29 $\times$ 29cm, 15kg

### Order Information's

0.100.017	AAS-21 Package	<ul style="list-style-type: none"> <li>• Atomic Absorption, Fully automatic flame and furnace type</li> <li>• 6-lamp turret, D2 &amp; S-H background correction, automatic flow control,</li> <li>• Air-C<sub>2</sub>H<sub>2</sub> flame and patented air-C<sub>2</sub>H<sub>2</sub>-O<sub>2</sub> flame (Substitution for N<sub>2</sub>O-C<sub>2</sub>H<sub>2</sub> flame) with graphite furnace automatic changing, furnace auto-sampler</li> <li>• Complete with graphite furnace system, graphite furnace auto-sampler, software and Cu, Mn, Hg, Cd, Ba Lamps</li> </ul>
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### Options

0.100.130	Al / Aluminium	0.100.160	Mn / Manganese
0.100.131	Sb / Antimony	0.100.161	Hg / Mercury
0.100.132	As / Arsenic	0.100.162	Mo / Molybdenum
0.100.133	Ba / Barium	0.100.163	Nd / Neodymium
0.100.134	Be / Beryllium	0.100.164	Ni / Nickel
0.100.135	Bi / Bismuth	0.100.165	Nb / Niobium
0.100.136	B / Boron	0.100.166	Os / *Osmium
0.100.137	Cd / Cadmium	0.100.167	Pd / Palladium
0.100.138	Cs / *Cesium	0.100.168	Pt / Platinum
0.100.139	Ca / Calcium	0.100.169	K / Potassium
0.100.140	Ce / Cerium	0.100.170	Re / Rhenium
0.100.141	Cr / Chromium	0.100.171	Rh / Rhodium
0.100.142	Co / Cobalt	0.100.172	Rb / *Rubidium
0.100.143	Cu / Copper	0.100.173	Sm / Samarium
0.100.144	Er / *Erbium	0.100.174	Sc / *Scandium
0.100.145	Eu / *Europium	0.100.175	Se / Selenium
0.100.146	Gd / Gadolinium	0.100.176	Si / Silicon
0.100.147	Ga / Gallium	0.100.177	Ag / Silver
0.100.148	Ge / Germanium	0.100.178	Na / Sodium
0.100.149	Au / Gold	0.100.179	Sr / Strontium
0.100.150	Hf / *Hafnium	0.100.180	Ta / Tantalum
0.100.151	Ho / *Holmium	0.100.181	Tb / *Terbium
0.100.152	In / Indium	0.100.182	Te / Tellurium
0.100.153	Ir / Iridium	0.100.183	Tl / Thallium
0.100.154	Fe / Iron	0.100.184	Sn / Tin
0.100.155	La / Lanthanum	0.100.185	Ti / Titanium
0.100.156	Pb / Lead	0.100.186	W / Tungsten
0.100.157	Li / Lithium	0.100.187	V / Vanadium
0.100.158	Lu / *Lutecium	0.100.188	Zn / Zinc
0.100.159	Mg / Magnesium	0.100.189	Zr / Zirconium

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