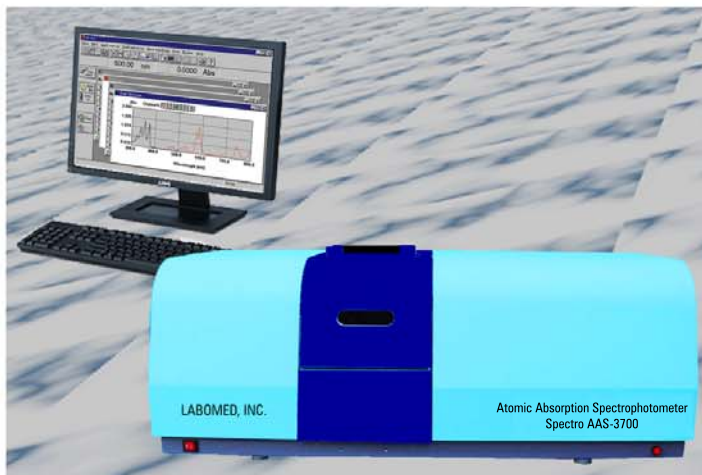




# Atomic Absorption Spectrophotometer

## Fully Automatic Flame System

**Model AAS-3700**



**Atomic Absorption Spectrophotometer AAS-3700** is a superior instrument for the research laboratory, and is an advanced and affordable system with high sensitivity that generates accurate and reproducible measurements. The AA-3700 spectrophotometer is accurate, reliable, and is an exceptional value. With its built-in, computer-controlled Air/Acetylene flame, titanium alloy burner and high-efficiency glass nebulizer design, the system provides optimal and reproducible results for micro and macro samples with high resolution.

Atomic Absorption Spectrophotometer AAS-3700 has a **powerful built-in software** which permits this instrument to be linked to a computer and a printer to display the photometric and spectral data on the PC monitor. **Atomic Absorption Spectrophotometer AAS-3700's** enhanced transmission and full reflection makes this atomic absorption spectrophotometer highly effective and reduces noise.

One of its advantages is its accurate wavelength, ease of operation, versatile software applications, and effortless optional accessory installation. This instrument is widely used for analyzing samples for **Agricultural, Food, Geological, Clinical, Metal, Petrochemical, Environmental, Mining and Pharmaceutical applications.**

It is easy to manipulate, and is fully automated, allowing for automatic adjustment of the lamp current and position, the burner head position, the negative voltage, and the gas flow. Safety is our primary concern, and the **Atomic Absorption Spectrophotometer AAS-3700** allows for constant monitoring of the burner head, the flame, the ignition, air pressure, and drain status, to ensure the optimum functioning of the instrument.

**Atomic Absorption Spectrophotometer AAS-3700** has a highly effective nebulizer, the sensitivity of the Cu  $2\mu\text{g/ml}$  is more than 0.28Abs.

Labomed, Inc. is certified by ISO-9001-2013, has CE Conformity and is FDA Licensed.

### Features

#### FEATURES AND FUNCTIONS:

*The instrument has a motorized 8 hollow cathode lamp turret which allows the automatic positioning and optimization of each hollow cathode lamp by the software. The control of the gas flows for the fuel gas ( $\text{C}_2\text{H}_2$ ) of the burner is also carried out directly from the software, thus allowing optimization of the instrument for the best analytical parameters for a selected analysis.*

*Two methods of background correction are available. The first utilizes a Deuterium Arc lamp and the second is the proven method of Self Reversal.*

*High precision minimal optics ensures maximum light throughput to the computer controlled Czerny-Turner Monochromator.*

*The location of the wavelength and peak selection is automatically controlled from the software.*

*The spectral bandwidth is automated and is available with a choice of five slit sizes.*

*The electronic parameters for the photomultiplier tube detector, the hollow cathode lamp current and the balancing of the absorbance and background energies are controlled from the software.*

*The ignition of the flame is computer controlled and the various safety interlocks offer a very safe operating system.*

#### SAFETY:

*The flame conditions are continuously monitored and should the flow rates change, an audible alarm sounds.*

*The pressure of the support gas (oxidant) is monitored constantly. If the pressure changes then the flow of the fuel gas will be stopped and the flame will be safely extinguished.*

*A sensor monitors the level of liquid in the drain and will prevent ignition if too slow. The flame will also be extinguished if the level of liquid in the drain changes significantly.*

*A flame sensor monitors the flame and safely turns off the gas flow to the burner if the flame suddenly extinguishes.*

*The burner is identified by a switch making it impossible to light without the burner being fitted.*

*An emergency flame off button is installed in case a problem is observed. The flame can be extinguished safely.*



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### Specifications of AAS-3700

#### Optic System

Wavelength Range:	190nm - 900nm
Monochromator:	Czerny-Turner configuration
Spectral Bandwidth:	0.1nm, 0.2nm, 0.4nm, 1.0nm, 2.0nm (5 steps. with automatic changeover)
Wavelength Accuracy:	± 0.25nm
Wavelength Repeatability:	0.15nm
Baseline Stability:	0.005A/30 min

#### Flame analysis

Sensitivity (Cu):	0.03 µg/ml/1%
Burner Head:	Titanium alloy burner
Nebulizer:	High efficiency glass nebulizer, Acid proof available as an option
Atomization Chamber:	Corrosion-resistant material
Position Adjustment:	Automatic setting of optimum height for flame burner
Safety:	Automatic ignition and of mixing air-acetylene gas with safety control

#### Background correction

Deuterium Lamp Background Correction:	Deuterium Lamp Background Correction: >40 times (1Abs) and Self-Reversal Background Correction: >60 times (1Abs)
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#### Data processing

Analytical method:	flame and hydride
Determination method:	calibration curves using 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> order of fit, standard addition method
Repetitions:	1-20 with calculations of average, SD and RSD
Result Printout:	output of parameters, data, spectra and calibration curves

#### Mainframe

Light Source:	8 hollow cathode lamp turrets with 2 lamps simultaneously lit (one lamp pre-heated)
Power Supply:	110V/60Hz or 220V/50Hz 200W (mainframe)
Dimensions:	mainframe 110 cm x 50cm x 45cm

NOTE:

The sensitivity of the Cu 2µg/ml is more than 0.28Abs..



# Atomic Absorption Spectrophotometer

## Fully Automatic Flame System

### Specifications of AA-3700

<b>Spectrophotometer:</b>	External PC-controlled Flame Atomic Absorption Spectrophotometer, with two analytical modes, Flame and Hydride.
<b>Software:</b>	AAWin 2.0 PC software, compatible with Windows XP, 7 and 8, allows for proper testing of a wide range of elements, using the AAS Analytical Testing Manual.
<b>Lamp Turret:</b>	Fully automated 8-lamp turret, with automatic lamp selection, automatic (programmable) gas and flame controls, with D2 background correction.
<b>Optical System:</b>	Highest Resolution, single beam optics, 2 measurement modes of atomic absorption and emission. All optics are coated with a protective seal and double sealed with a special lightproof cover for enhanced stray light rejection and reduced dust contamination.
<b>Safety System:</b>	Compatibility with cathode lamps. Built in various safeties interlocks gas flow pressure burner heads, nebulae spray chamber release drain, drain full, etc.
<b>Monochromator:</b>	Optimized Czerny-Turner-Design automated wavelength selection, peaking and slit selection.
<b>Wavelength range:</b>	190 – 900 nm.
<b>Grating:</b>	Grating with 1800 lines/mm.
<b>Slits:</b>	Automated slit selection 0.1, 0.2, 0.4, 1.0 and 2.0 nm, within 5 steps.
<b>Optical Bench:</b>	Optical parts are mounted on a strong and compact structural steel basic plate for strength and stability with a cover to prevent dust, vapor and humidity ingress.
<b>Detector:</b>	Standard wide range UV-sensitive photomultiplier.
<b>Lamps:</b>	Automated 8-lamp turret with independent lamp power supply to each lamp, each with two heating circuits for lamp preheating operation.
<b>Lamp Support:</b>	All lamps are electronically modulated or better sensitivity and extended life time. Coded lamps for automatic lamp recognition without adapters. Multi-element coded lamps for increased element capacity & automatic selection of next element. High intensity boosted discharge lamps for low noise and best detection limits. Warranty on hollow cathode lamps are 5000 mA hours or 24 month.
<b>Background Correction:</b>	Background correction Self-reversal.
<b>Flame System:</b>	All-titanium alloy burner. Acetylene flame is available and each is coded for automatic recognition.
<b>Flame Gas:</b>	Fully automated gas box with automatic (Programmable) control oxidant selection with automatic gas sequencing.
<b>Flame Performance:</b>	Sensitivity: Copper 0.03 $\mu\text{g/ml}$ /1%.
<b>Burner System:</b>	The burner chamber should be made of high strength composite material.
<b>Nebulizer-System:</b>	High efficiency glass nebulizer.
<b>Spray Chamber:</b>	Spray Chamber made by PPS.
<b>Gas Controls:</b>	Fully computer controlled Total Flow Gas box with dual fuel and oxidant monitoring for constant and stable control of the fuel/oxidant ratio. Computer controlled automated flame ignition with automatic input of additional gases for organic solvents.



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### Specifications of AA-3700

<b>Safety Functions:</b>	Sensor controls insure the correct use of the burner head, check the siphon system, monitor the liquid level in the waste vessel, ensure correct operating gas pressures are maintained. In case of over pressurization of spray chamber, flame not detected or system power failure, the safety interlocks shut down the gases automatically.
<b>Safety Measures:</b>	Automatic gas leak check. Automatic air – C <sub>2</sub> H <sub>2</sub> flow rate increasing. Flame monitor, prevention of wrong burner head use. Automatic flame extinction via flame vibration sensor. Safety interlock, Burner type , Burner installation, Liquid trap, Pressure relief stopper. Flame operation, Flame shield, and Oxidant pressure upper and main power. Separate upper and lower flame shields to operator from heat and UV radiation. Allows external adjustment of all burner controls.
<b>Flow-Injection Technique:</b>	Continuous rinse function for analysis of small sample volumes and best operation conditions for samples with a high salt or matrix content.
<b>Hydride &amp; Hg Generation:</b>	The Hydride and Hg systems for the determination of As at the µg/L range Continuous flow (continuous) mode.
<b>Software:</b>	AAWin2.0 Software Package, Integrated 32-bit software for AA control, calibration, installation kit method development method. Data storage with GLP (Good Laboratory Practice). All elements determine sample by sample. Providing multi-tasking access to 3rd party software, such as spreadsheets, word processing, etc. Standard; QC spike; duplicates, precision, correlation coefficient and duplicates, limit tests. Each test provides a choice of user-selected error action options including stop, flag and continue retry, recalibrate and switch to next method. All data is automatically date and time stamped.
<b>Dimensions (L x W x H):</b>	1100mm x 500 mm x 450 mm.
<b>Environmental Requirements:</b>	Relative Humidity maximum ≤70%, Non condensing.
<b>Technical Standards:</b>	Compliant with legal and ISO requirements for laboratory instrumentation.
<b>Burner Head:</b>	AZ, 100mm, for operation with higher sensitivity in the acetylene/air flame.
<b>Compressed-Air Compressor:</b>	(Purchase locally) Ultra-quiet pressure air compressor to supply AAS with water and oil free air. Nearly vibration free, Minimum service, simple operation, anti corrosion treated, 230V, 50 Hz, including compressed-air tubing.
<b>UPS (for compressor):</b>	3KVA true on-line UPS with 30 minutes back-up.
<b>Ducting System:</b>	Including blower, pipe and connectors (for compressor).
<b>HCL:</b>	As, Cd , Pb, Cr, Mg, Mn , Fe, Zn, Cu (for compressor).
<b>Standards:</b>	CE marked.
<b>Standard Solution:</b>	100 ml standard solution with certificate for lamps, Acetylene Gas cylinder with regulator and gas. Argon gas cylinder with regulator and gas. (Must be obtained locally, not provided by Labomed).
<b>Minimum PC requirements:</b>	Intel Pentium core i3, min 1GB, HDD 300 GB, RS 232 serial external, USB, 48x CD-ROM, keyboard, mouse, 17" monitor, laser printer, XP Pro w/ SP2 or higher. (Purchase locally.)



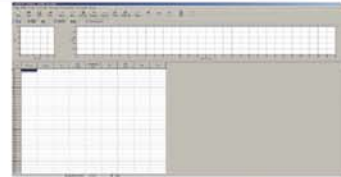
# Atomic Absorption Spectrophotometer

## Fully Automatic Flame System

**Model AAS-3700**

### Software Specifications

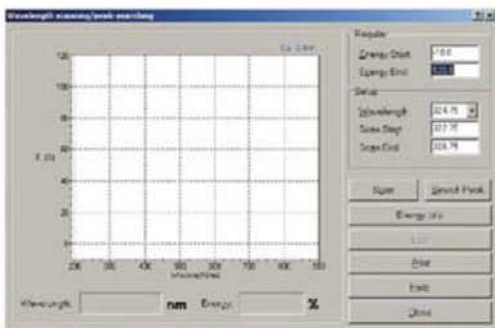
AA-Win Pro Software is a powerful and intuitive software product designed to allow control and data acquisition from the Spectro AAS-3700 Atomic Absorption Spectrophotometer. The AA-Win Pro software allows the Analyst to control all aspects of their analytical method whilst providing an extensive range of tools for data collection, storage and interpretation.



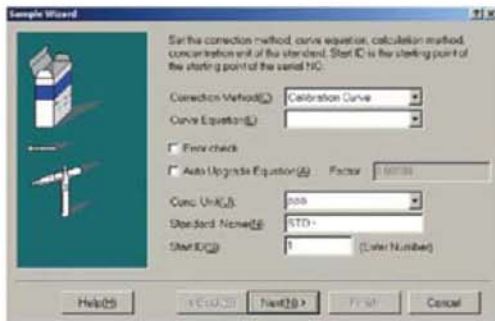
Lamp turret setup, operating and warm-up currents, along with the desired analytical wavelengths are easily selected in this configuration.

No.	Method	Sample	Wavelength	Conc. Unit	Std. Dev.	Blank	Time
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
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21							
22							
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25							
26							
27							
28							
29							
30							

Use the sample table to perform quick measurements of both Standards and Samples. Easily append the sample table to add new samples or even revise calibration curves either by manual introduction or using an Autosampler.



Ensure optimal peak position at the chosen analytical line by scanning the emissions spectra.



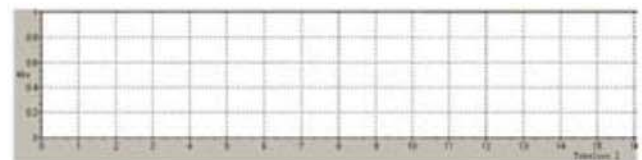
Each stage of analysis setup is made quick and simple by means of the Sample Wizard.



View up-to-date calibration curves in 1st, 2nd, or 3rd order using a standard calibration or standard addition. Perform retrospective curve fits to ensure optimum correlation.



Obtain reliable and accurate results by using the Energy control feature to manually optimize atomiser position and setup. Use the Auto-balance feature to ensure energy level, and optical alignments are optimized when using background correction.



View real-time signal acquisition for flame and hydride generation analysis.



# Atomic Absorption Spectrophotometer

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Innovative Design

Model AAS-3700

Periodic table of chemical elements | Details

1A	2A	3B	4B	5B	6B	7B	8	9	10	11	12	13A	14A	15A	16A	17A	18
H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

Legend:

- Flame: [White box]
- Furnace: [Blue box]
- Hydride: [Purple box]

Legend elements:

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Elements that can be analyzed with the AAS-3700

### Software

- The user friendly software requires a Windows platform and operates within Win95, Win98, Win NT, Win 2000 and WinXP. The system uses a number of software wizards to guide the operator through setting up procedures.
- The software controls the automatic switch over for the Hollow Cathode Lamps and automatically optimises working parameters for the system. The software also allows manual input of data to ensure that the operator always stays in control. The software will automatically complete the configuration of the system for analysis.
- The user has the choice of two methods of background correction namely the self reversal system OR the traditional deuterium lamp background correction system.
- During the analysis cycle of the flame, the software shows the entire measurement process. This includes measured values, temperature steps, time etc. all signal and temperature data is stored for future re-call and printout.
- Detailed reporting and QC control software is included within AAWin allows printout of spectra, standard calibration curves, analysis and signal data. Full printout of operating parameters is also available for user references.
- The following methods of analysis can be carried out using the AAS-3700 system Absorption, emission, hydride and cold vapour analysis.

