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AAS PLUS

ATOMIC ABSORPTION SPECTROPHOTOMETER

TRUE DOUBLE BEAM WITH BACKGROUND CORRECTION ULTRA FAST AAS-STANDALONE

WINDOWS BASED SOFTWARE

AAS Plus Atomic Absorption Spectrophotometer

MS AAS Plus is fully automated PC Controlled (optional with built-in PC standalone controller) atomic absorption spectrophotometer with flame & hydride system. The system comprises of automatic independent 8 lamp HCL turret and automatic variable spectral bandpass. The system uses state-of-art, ultra-fast lamp modulation up to 1024 Hertz coupled with Hamamatsu Photomultiplier tube, true double beam optics and Deuterium lamp background correction results into extreme stable and reproducible results.

General Specification

Features

- Operation using USB Connection
- Optional built in touch screen based Standalone controller with 32GB built in memory with Windows 10
- Real Time true double beam spectrophotometer with working wavelength range from 175.0 to 930.0 nm with reading from -0.3 to 3.5 ABS
- Ultra-fast modulation up to 1024 Hz
- Sensitivity > 0.980 ABS for 5.0 mg/L copper solution with RSD <0.5%

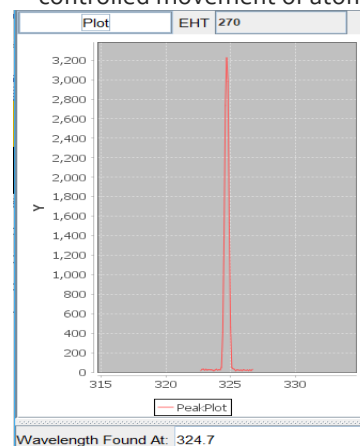
- Automatic EHT optimization & selection
- Optional Graphite Furnace accessory for simultaneously analysis

Monochromator

- Czerny Turner / Ebert*^(on custom order) design with precision motorized drive for wavelength selection
- Automatic calibration detection with correction
- Original 30.0x30.0x6.0 mm Holographic Diffraction blazed at 250.0 nm grating with ruling density of 1800 lines/mm
- RLD of 1.6 nm/mm, accuracy of 0.2nm
- Repeatability of 0.1nm with resolution of 0.2nm
- Front-surfaced, reflective optics with protective coating to ensures years of service with minimal loss of transmittance
- Wide focal length of 330.0 mm
- Continuously variable spectral bandwidth from 0.1 nm to 2.5 nm

Atomizer

- PTFE inert atomizer for both flame and VGA; accommodating titanium 100 mm Air-Acetylene burner & 50 mm Nitrous Oxide – Acetylene burner. Optional software controlled movement of atomizer.



Peak detection view

Powerful Windows® based software(CFR compliant) displays HCL spectral peak as easy to use graphical interface and allows user to change/select different peak by just a click of mouse!

Physical Dimensions:

865.0mm (L) x 525.0mm (W) x 520.0mm (H)
70KG (instrument only)*

Power Requirements:

AC 230 ± 10% with proper ground earth.

Environmental Requirements:

Temperature Range: 15C – 40C
Humidity: 0% - 80%

Output:

USB standard, WIFI, Bluetooth, Ethernet with standalone touch screen Windows based controller

HCL System

- Software controlled 4/8/10 lamp automatic HCL turret
- Inbuilt dedicated 8/10 channel HCL Lamp supply
- 3 dimensional optical path optimization system
- Multi active support to enable other lamps
- Supports coded and un-coded HCL Lamps
- Inbuilt lamp library with preconfigured wavelength, spectral bandwidth and oxidant user selectable
- User selectable preferred wavelength and spectral bandwidth selection

	Element Name	Current mA	A NM	Slit NM	Oxidant	Oxidant	Active 1	Active 2
					Air	Nitrous		
Lamp 1	Cu	4	324.7	0.5	0	0	0	0
Lamp 2	Fe	5	248.3	0.2	0	0	0	0
Lamp 3	Hg	10	253.7	0.5	0	0	0	0
Lamp 4	Select Lamp	0		0.2	0	0	0	0
Lamp 5	Select Lamp	0		0.2	0	0	0	0
Lamp 6	Select Lamp	0		0.2	0	0	0	0
Lamp 7	Select Lamp	0		0.2	0	0	0	0
Lamp 8	Select Lamp	0		0.2	0	0	0	0

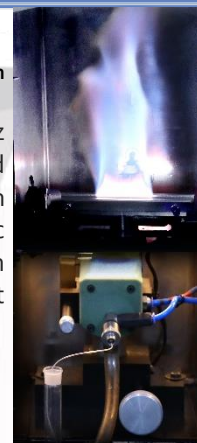
Gas Box System – Automatic

- Independent display to program gas box and to show real-time flow rate, parameters and errors
- Recall feature loads previous program on start
- Fully software controlled with oxidant and fuel monitoring
- Inbuilt safety interlocks such as correct burner, oxidant and fuel pressure, liquid level in drain, flame detection
- Safe shutdown from all operating modes even in case of sudden power failure



Background Correction System

Deuterium arc lamp with 1024 Hz modulation performs background correction from 185.0 to 425.0 nm
 With Inbuilt Deuterium arc lamp current optimization control unit



Nitrous Oxide flame in Action

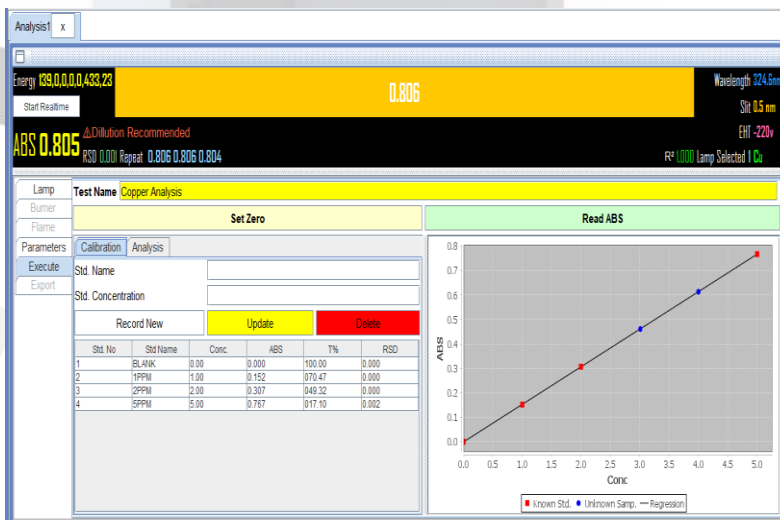
Gas Box System – Manual

- Manual gas box with safe, sturdy and independent roto flow meters with oxidant and fuel monitoring
- Manual actuated ignition system with air-acetylene
- Minimum acetylene flow is boosted prior to the oxidant change when switching from Nitrous oxide – Acetylene operation



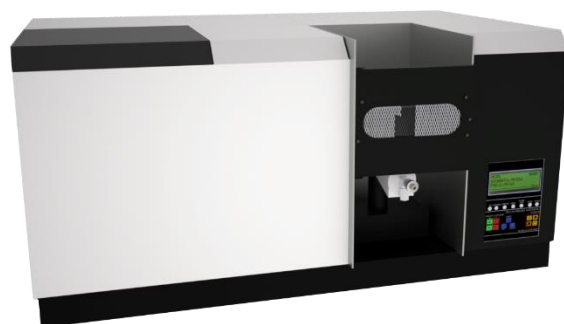
Powerful Windows Based standalone

- Automatic initialization and self-diagnostics on startup
- Large LCD type display shows all critical information simultaneously
- CFR21 part 11 compliant software with database support to capture all events and results generated by the software
- Provision to digitally sign pdf document using secured token
- Automatic Lamp, EHT and spectral bandwidth selection based on analysis
- Organization setup with users and roles
- Built in modules to operate Lamp system, Burner position & Flame characteristics
- Powerful analysis setup with adjustment of replicates, integration time and read delay



Configuration Selector

Configuration Code	Configuration Consists
1121111	<ul style="list-style-type: none"> • AAS Double Beam • Fully Automatic Gas box • Background Correction • Motorized Burner • With Standalone built in Windows 10 controller
1121110	<ul style="list-style-type: none"> • AAS Double Beam • Fully Automatic Gas box • Background Correction • Motorized Burner
1121100	<ul style="list-style-type: none"> • AAS Double Beam • Fully Automatic Gas box • Background Correction
1121000	<ul style="list-style-type: none"> • AAS Double Beam • Fully Automatic Gas box
1120100	<ul style="list-style-type: none"> • AAS Double Beam • Manual Gas box • Background Correction
1110100	<ul style="list-style-type: none"> • AAS System • Manual Gas box • Background Correction
1110000	<ul style="list-style-type: none"> • AAS System • Manual Gas box
1110000-4PD	<ul style="list-style-type: none"> • AAS System with Solid State Photodiode Detector • 4 Lamp Turret • Automatic/ Optional - Manual Gas box



Standard Supply and Optional Supply

Standard Supply	<ul style="list-style-type: none"> • PC interface using USB interface • 8 Lamp fully automatic turret • Software controlled Automatic Variable Slit from 0.0 to 2.5nm • Air – Acetylene Burner • AAS Software • 3 meters gas pipe for each required gases • Necessary Fittings • Dust Cover
Optional Supply	<ul style="list-style-type: none"> • PC • Printer • N₂O burner • HCL Lamps • Acetylene Cylinder & regulator • Nitrous Oxide Cylinder & regulator • Heated regulator • Vent assembly • Vapor Generator • Graphite Furnace • Auto-sampler



Specifications

<i>System</i>	The system is PC based AAS operating in the 175 – 930 nm wavelength range and giving a sensitivity of > 0.980 abs for 5 micro- gram/ ml aqueous copper standard solution with air-acetylene flame. It has a visible display of the detector's energy gain in digital energy form convenient to the operator, simultaneous background correction (Deuterium) with attenuator, provision for automatic calibration using more up to 20 standards and recalibration with single standard, and operate on 220+/-10 Volts, 50 Hz AC Single power supply 600VA. AAS software driven.
<i>Data Processing</i>	PC Data processing / auto control system & Printer
<i>Photometric System:</i>	Double Beam & Single beam real time shared optics, long term stability to withstand thermal and mechanical variations, blazed at 250 nm Monochromator of 330 mm focal length and 1800 lines/mm, RLD 1.6 nm/mm, accuracy of 0.2 nm, repeatability of 0.1 nm, spectral band pass appropriate for effective measurements of all environmentally relevant metals, and reduced height available for all the slit widths. Wavelength 175 to 930 nm.
<i>Chopper Technology</i>	Real Time Chopper Positioning System –RTCPS®
<i>Band width</i>	0.0 to 2.5 nm (automatic)
<i>Grating</i>	Monochromator with blazed at 250 nm holographic grating 1800 lines / mm sourced from Richardson U.S.A.
<i>Detector</i>	High performance Photo Multiplier Tube sourced from Hamamatsu Japan [Model R928/R955] or CMOS Photodiode
<i>Lamp turret</i>	8 lamps turret automatic controlled through software Optional 4/10 lamps automatic turret through software Optical axis adjustment Automatic for all lamp positions
<i>Background correction</i>	Background correction D2 arc lamp 190-425 nm modulation up to 1024 Hz
<i>Sensitivity</i>	>0.980 Absorbance for 5.0 mg/L Copper standard solution
<i>Operation Modes</i>	Absorption, Emission, Molecular Absorption, UV Scanning Spectrophotometer with background correction
<i>Burner head Titanium</i>	High temperature burner head N ₂ O 50 MM Burner Head
<i>Integration Time</i>	0.0 seconds to 150seconds
<i>Accuracy</i>	+ -0.008 ABS at 1.0 ABS
<i>Burner / Flame Atomizer</i>	(Air-Acetylene and Nitrous Oxide-Acetylene system): PTEF spray chamber, Titanium burner with impact bead and flow spoiler, and remain unaffected from attacks by acid solutions and organic solvents (e.g. Methyl isobutyl Kenton, i.e., MIBK). The burner head adjustment in vertical and horizontal direction computer controlled and the position of the burner head also get stores with a defined and particular method. The nebulizer is able to provide manually adjustable uptake rates, and the material of the nebulizer is inert to acid solutions and organic solvents, such as MIBK.
<i>Nebulizer</i>	Outer Shell SS , Capillary made of corrosion resistance inert material with Platinum[10%] and Iridium [10%] Sample feed range : 0.0 – 12.0 ml/min
<i>Automatic Flame Control System & Interlocks</i>	Independent display to program gas box and show real time digital flow rate, parameters and errors. Recall feature auto load previous program on start. Fully software controlled with oxidant and fuel monitoring. Inbuilt safety interlocks such as Correct burner, Oxidant and fuel pressure, Drain liquid level, Flame detection, Nebulizer sensor. Automatic ignition and extinguish Safe shutdown from all operating modes in case of sudden power failure. Computer controlled oxidant selection with automatic gas sequencing and oxidant and fuel monitoring Essential safety interlocks: mains voltage, burner type as well as its presence in position, air selector, flame sensor, liquid trap level, flash back, gas supply pressure, air supply and gas leak anywhere in the network of gas tubing's in the system. Provision for safe and automatic shutdown in case of power failure.
<i>Data processing</i>	Automatic control system through AA Software

<i>Software</i>	Program capable of communicating with MS Window latest versions. Software for flame AA (air acetylene and nitrous oxide acetylene). Calibration curve and standard addition methods, Built-in Cook book, Interference warning, Necessary modules to set run and monitor all the accessories attached to the main unit. Built in diagnostics for performance verification, IQ, PO, OQ validation protocols.
<i>Connectivity</i>	Standard USB
<i>Electrical Parameters</i>	220 V +/- 10 V Basic unit 600VA.
<i>Dimension</i>	868x525x520 mm (LXWXH)
<i>Weight</i>	70KG basic unit PC 5 KG and other accessories weight extra as per order
<i>Accessories</i>	Select as per requirement of analysis.
<i>HCL</i>	67 Elements single element & Multi-elements hollow cathode lamps AAS accepts coded and non-coded HCL
<i>Vapor Hydride Generator VGA 1200ET</i>	Variable Flow controlled by stepper motor Dual pump Peristaltic pump, Electro thermal controlled heating, Fine inert gas controller flow meter, Hydride 110 mm quartz cell, 110 mm Cold vapor Mercury closed cell. Ideal for ppb level analysis of vapor generation accessory offers an extremely sensitive procedure for analysis of metallic ion of As, Bi, Sb, Se, Te, Sn, Pb, Ge & HG controlled through AAS software. Dual peristaltic pump: variable flow 0.3 to 5 ml/min. Precision Gas flow controller: 0.1 ml to 15 ml/min. Reagent mixture: PTFE corrosion resistant. Controlled Heating: Electrical heating 200 to 1200 degree C. Require Argon/Nitrogen gas cylinder and regulator.
<i>Graphite Furnace GTA 450</i>	MS AAS PLUS Graphite Atomizer Very fast & Precisely controlled atomization Superior signal to noise ratio. Minimal running cost. Gas consumption due to Special cavity design Auto sample dispenser with user friendly programmable method development. The temperature range of ambient to 3000° C is computer controlled with a maximum ramp rate of 2000°C/sec. It is an automated graphite furnace system used with MOTRAS AAS PLUS atomic absorption spectrophotometer. The Unit is stand-alone configuration consists of Atomic absorption spectrophotometer, Graphite tube power supply atomizer head, sample dispenser and software. Sample dispenser is an essential component of system, dispenses up to 80 µL in increment of 1 µL. It accommodates 32 sample and 10 standards.
<i>Auto sampler AS100</i>	Ideal for low to medium sample application. Auto sampler provide fully automated feature of a proven Technology controlled through AAS software. Sample tray capacity 100 sample cups and 10 reagent cups. Material: Polypropylene Volume: 20ml for sample cup, 20ml for reagent cup.
<i>Installation Accessory</i>	As per site need
<i>Oil free Compressor</i>	Oil free compressor with 20 L reservoir tank, auto on/off capable to deliver 25 l/min at 80 PSI pressure. 1 HP motor single phase 220 V operation, 15A line.
<i>Air Purifier</i>	Moisture trap filter with regulator
<i>Acetylene gas cylinder</i>	41 L capacity 99.0% purity, with explosive test certificate.
<i>Acetylene gas Regulator</i>	Double stage/ Single stage dual gauge
<i>Nitrous oxide gas cylinder</i>	47 L capacity, 99.0% purity with explosive test certificate.
<i>Nitrous gas heated Regulator</i>	Nitrous gas heated Regulator Double stage/ Single stage dual gauge
<i>Exhaust Hood and Vent Assembly</i>	KIT consists –SS hood, Inert centrifugal blower, two L bands, and four meter SS pipe 15 cm diameter suitable for AAS with necessary fixtures.
<i>Other accessory</i>	Voltage stabilizer/UPS as per local need to be provided by purchaser.

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