

XplorAA

Atomic Absorption Spectrometer



AAS





ISO 9001
Quality Accreditation

GBC has always placed a strong emphasis on quality in all aspects of our operation, from design and manufacture to the provision of service and support to our customers, and we are fully committed to continuous evaluation and improvement in all areas.

The GBC Quality Management System has been accredited to the ISO 9001 quality standard by Lloyd's Register Quality Assurance Limited. This certification is your assurance that the procedures and processes used to produce the goods and services which GBC provides comply with the relevant International Standard, and demonstrates commitment to meeting the needs and expectations of our customers.

Since 1978 GBC has been at the forefront of scientific technological development, manufacturing and marketing a wide range of award winning, quality scientific instruments.

GBC's Product Lines



Visionary Technology

GBC Scientific Equipment will advance people's knowledge and their capacity to enhance the quality of life for all humankind.



XplorAA – The efficient choice for a cost-effective AAS



The XplorAA atomic absorption spectrometer is GBC's answer for an economical workhorse in today's laboratories. Whether you are analysing one element or many, you can choose from different XplorAA configurations to match your analysis needs and price point. The XplorAA also comes in a No Flame version without a gasbox allowing a furnace or hydride dedicated analyzer with no flame system needed. Powerful XplorAA software allows unprecedented instrument control and data manipulation whilst following all the regulatory QC protocols and features that will assist to achieve US FDA 21 CFR Part 11 compliance. All XplorAAs have USB communications.

XplorAA

- World-class sensitivity and precision.
- Double beam optics for long term stability or single beam optics for increased sensitivity.
- Asymmetric modulation which allows more analysis time in sample beam compared to reference beam for low noise. The analytical signal baseline is not influenced by the optical chopper as occurs on competitor's instruments.
- Hyper-Pulse background correction to ensure accurate results.
- Two-lamp manual turret or six-lamp motorized turret, both with auto alignment for accurate lamp optimization.
- Automatic wavelength and choice of 20 slit widths between 0.1 and 2.0 nm in 0.1 nm increments in both normal and reduced height for ease of operation.
- Programmable gasbox (computer controlled), automatic gasbox (electronically controlled, no computer communication), manual gasbox, or no gasbox. Each gas box system contains comprehensive safety locks.
- D₂ lamp life over 10 times that of competitors.
- Optional coded lamp recognition for both normal hollow cathode lamps and Super Lamps.
- Optional 10 Volt one lamp Super Lamp capability. Ensures highest sensitivity with low power consumption and low heat output.
- Optional air purge for instrument electronics. This greatly increases the XplorAA's longevity in harsh, acidic environments.
- Optional accessories: System 5000 graphite furnace, HG3000 hydride generator, MC3000 mercury concentrator, EHG4000 electrically heated hydride cell, SDS3000/SDS3000D high speed auto sampler and auto dilutor.



Best Flame Performance

The XplorAA allows greater than 0.9 absorbance and less than 0.5% RSD using 5 ppm copper – on the same measurement.

Safety and Simplicity

Safety and simplicity with fully programmable flame control

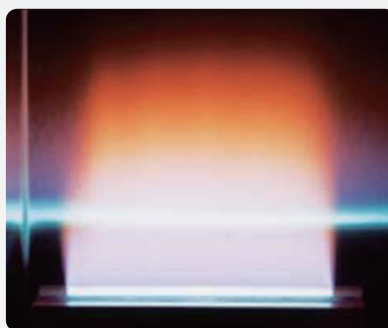
Add a programmable gas box to improve accuracy and ensure optimum gas flows for every element every time you open a method.

The programmable flame control on a XplorAA's programmable gasbox offers significant productivity improvements compared to manual or auto gasbox configurations. The added safety features are of real benefit for nitrous oxide-acetylene analyses, or when inexperienced operators are using the instrument.

Gas flow settings are stored along with many other instrument parameters with each method. This ensures that gas flow settings are accurately reproduced every time the method is used resulting in greater analytical accuracy, trouble free operation and time savings.

Gas flow settings may also be optimized for every individual element in a multi-element analysis. These flows are automatically adjusted and flame types can also be changed automatically without any operator intervention. This is particularly important for analyses close to the detection limit.

Flame stability is enhanced because gas flow adjustment is smoothly and continuously variable across the entire operating range. This is achieved by continuously-variable needle valves controlled by micro-stepper motors, eliminating the flame pulsations which will occur in solenoid-operating systems.



Comprehensive flame control interlocks provide a safer instrument.

Safety without sacrificing any performance is what the XplorAA is all about.

A full range of interlocks ensures trouble free operation even with inexperienced operators.

Safety interlocks include:

- Ignition of flame is prevented if no burner is installed, or is not installed correctly.
- The flame will not change-over to a nitrous oxide-acetylene flame if the correct burner is not installed.
- Pressure sensors on the air, acetylene and nitrous oxide gas supplies continually monitor the pressure so that the flame will not ignite if the pressure is too low, or the flame will be shut down if the pressure drops while it is burning.
- The oxidant flow (air or nitrous oxide) is continuously monitored to ensure that the flame can be ignited or shut down in the correct manner if the flow is insufficient. Insufficient oxidant flow can result in a flashback. GBC is the only company to offer this important safety feature.
- A flame sensor shuts off the gases if the flame is extinguished for any reason. This prevents the laboratory from filling up with gas.
- An integral liquid trap with built-in liquid level sensor prevents ignition or shuts down the flame if there is insufficient liquid in the trap.
- A mains power sensor shuts down the flame in the correct sequence if the power supplied to the instrument is interrupted.

Sensitive and Efficient Unmatched Optical Performance

Optics

The optical design is the heart of any spectrometer, and at GBC we have a long history of quality optical systems.

The large, self-calibrating 333 mm (focal length) monochromator has been specifically designed to provide the high light throughput and stability needed for atomic absorption.

Spectral bandwidth is continuously adjustable between 0.1 and 2 nm (in 0.1 nm increments) and, for furnace work, reduced slit height is available with all slit widths. A wide-range photomultiplier tube covers the full wavelength range (175–900 nm).

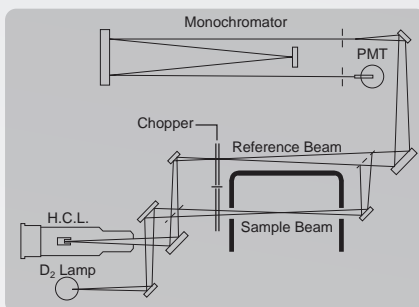
The XplorAA provides unmatched optical performance by:

- The use of the most efficient all-reflective optics (not inferior lenses).
- The use of minimal optical components (to ensure maximum light throughput).
- The monochromator is designed for maximum efficiency for all wavelengths.
- The unique Asymmetric Modulation to improve signal to noise ratio.

Conventional double beam instruments measure the light in both the sample and reference beams for equal duration, Asymmetric Modulation allows the light in the sample compartment to be measured for twice the duration of the sample beam measurement. As the sample compartment is the area in which all the noise is generated in any AAS, Asymmetric Modulation improves the signal-to-noise ratio by as much as 40%. This results in unmatched performance in both sensitivity and detection limit.

Hyper-Pulse background correction

The Hyper-Pulse background corrector, available on the XplorAA – one of the fastest systems available, has been further improved by pulse interpolation. This allows for more accurate interpolation of “Transient Signals” such as GF signals.



High intensity deuterium arc lamp provides 175–425 nm correction range. With all background correction systems, there is a small time delay between the measurement of background and total absorbance. When the background is changing very rapidly, as is often the case with graphite furnace work, this delay can lead to an error in the background corrected reading. Systems with slower sampling rates and longer delay times show greater errors.

Most background correctors measure the background absorbance 50 or 60 times per second and the delay between the measurement of background and total absorbance can be as much as 10 milliseconds.



A motorized six-lamp turret is one option for XplorAA. The user simply selects the required element, the rest is automated – wavelength, lamp selection, lamp current, lamp alignment, slit width, slit height and lamp warm-up sequence.

Located behind the Hollow Cathode Lamps, the D₂ lamp is easily accessible by the user. This lamp is auto aligned which makes it quick and easy for the user to change their own D₂ lamps accurately each time.

The GBC Hyper-Pulse system takes 200 (50 Hz) or 240 (60 Hz) sample measurements per second and the delay between the measurement of background and total absorbance is about 1 millisecond. This produces a dramatic reduction in background correction errors. Accuracy is further improved by interpolating between background measurements to calculate the background when the atomic signal is measured.

This system also allows correction for higher background levels than most systems – up to 2.5 total absorbance.

Extended lamp life

In addition, the design of the high intensity D₂ lamp and associated power supplies ensures unequalled lamp lifetime. The GBC lamp will operate for 1000 hours even at full current. Compare this to some alternative brand instruments where the D₂ lamp is guaranteed to last only 90 hours of operation, and add up the savings! GBC lamps have low lamp current requirement with a high duty cycle design.

Flame atomization system delivers reliability and performance

All materials in contact with the sample have been selected for maximum corrosion resistance. On the XplorAA, the spray chamber is made from inert polypropylene. The burner is made entirely of titanium. The nebulizer has a platinum-iridium capillary and an inert venturi.

The nebulizer also has an adjustable sample uptake rate, essential for optimum performance with refractory elements or organic solvents. The whole flame atomization system is easily removed for cleaning or for change-over to graphite furnace.

System 5000 delivers sub ppb detection limits

XplorAA Accessories

System 5000

Fully automated high performance System 5000 Graphite Furnace

For analyses where parts per billion detection limit is required, the System 5000 offers the automation, the reproducibility and the accuracy required.

The System 5000 graphite furnace is a complete graphite furnace system which includes the PAL Auto Sampler for rapid and accurate analysis and the power supply unit and workhead. The entire system is controlled by the XplorAA software.

Approximately 50 elements can be determined, most at sub-parts-per billion concentrations.



Features and benefits

- Variable injection volume of 1 μL to 100 μL in 1 μL increments allows the user to setup optimum method.
- Temperature program up to 3,000°C for even the most complex sample.
- High performance furnace tubes with raised sections contain the sample within a small area of the tube to eliminate temperature gradients.
- Programmable gas selection allows different gases to be used allowing for diverse ashing techniques to be used in one method.
- Chemical modifiers are dispensed automatically. Two modifiers are available eliminating almost all manual sample pre-treatment.
- Variable injection speed is a useful feature which is needed with viscous samples such as oils, or when using hot injection.
- Hot injection allows faster analyses and thus greater laboratory productivity.
- Unique setup and storage of PAL probe co-ordinates (horizontal position and vertical position) in the software.
- Multiple injections allow automatic pre-concentration. For low concentration analyses the PAL auto sampler will deposit the sample and the furnace will dry then ash before the cycle is repeated as many as fifty times, totally eliminating messy and time consuming extraction or pre-concentration techniques.

The PAL Programmable Auto Sampler provides automatic calibration with up to 10 standards and automatic analysis of up to 40 samples. Sample volumes between 1 and 100 μL may be selected.

HG3000 and EHG4000 Hydride Accessories

Hydride Accessories

HG3000

Continuous flow HG3000 for best results

The HG3000 is an automatic continuous flow hydride generator for the analysis of the hydride forming elements such as arsenic, selenium, antimony, bismuth, tellurium, tin, germanium and lead at parts per billion concentration level.

The same system can be used to measure mercury at parts per billion concentration utilising the cold vapour technique.

As the system is a continuous flow system, signals can be integrated, thus filtering noise and improving the detection limits when compared to hydride generation systems that produce transient signals. To achieve the same sensitivity with flow injection systems, much larger sample volumes are required, meaning longer set up and analysis times.

The continuous flow process also means faster analysis when following good analytical procedures and measuring more than one replicate. Typical sample throughput is 60 samples per hour, measuring three replicates on each sample. Other systems only allow 30 to 40 samples to be measured each hour when measuring three replicates on each sample. The HG3000 will increase the productivity of your laboratory.



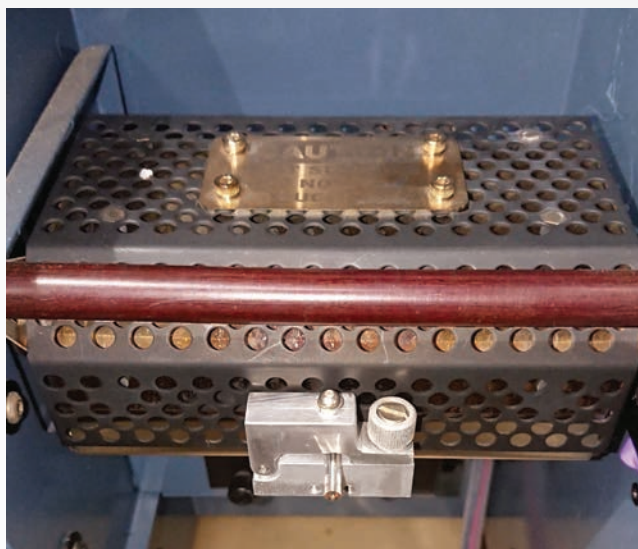
EHG4000

Improve hydride results with the EHG4000 Electrically Heated Hydride Cell

The EHG4000 is used to electrically heat the quartz cell used in hydride generation analysis, as an alternative to flame-heating of the cell. The advantages of using an electrically heated cell include: more accurate temperature control, more stable temperatures, less noise as the flame is not present, and improved detection limits for most elements.

As the EHG4000 does not require a flame, hydride analyses can be carried out unattended or even overnight, saving the laboratory time and money.

The electrical heating blanket can also be used with XplorAA No Flame, which does not have a gasbox, enhancing its analytical capability.



MC3000 and SDS3000 Accessories

Mercury analysis at ppt levels

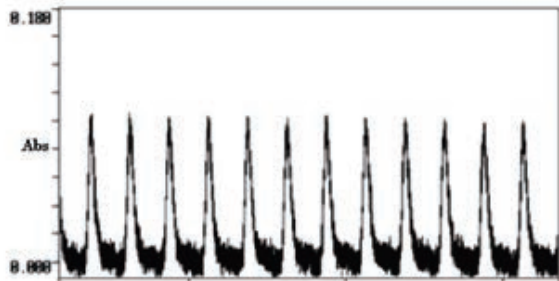
MC3000

Measure mercury at less than 10 ppt with the MC3000 Mercury Concentrator

Regulations for mercury analysis are pushing the required detection limits continually lower, so that they are well below the level achievable using the standard cold vapour technique. The MC3000 mercury concentrator accessory for the HG3000 addresses this problem. By concentrating the mercury vapour on a gold foil, then heating by a patented Radio Frequency, detection limits of five parts per trillion can be readily achieved. The very quick and centralised heating results in the unsurpassed sensitivity and reproducibility. The MC3000 accessory is fully controlled by the XplorAA software and the analysis can be carried out unattended when used in conjunction with the SDS3000 auto sampler.



The RF coil surrounds the mercury concentration cell shown in front of the absorption cell located in the light path.



Mercury trace at 20 ppt

SAMPLE	CERTIFIED VALUE	MEASURED VALUE
Water 9645-9647	1.74 ppb	1.76 ppb
Sewage Sludge	3.23 ppb	3.65 ppb

SDS3000

Fast, sturdy and reliable auto sampler

The SDS3000 is a precision engineered X-Y-Z auto sampler. Designed and fabricated by GBC Scientific Equipment, this affordable auto sampler provides accurate and fast analysis due to its durable, reliable and sturdy design. Supplied with four sample racks to hold 240 sample vials each of approximately 14 mL and a standards rack to hold 10 standard vials plus a blank each with a volume of approximately 50 mL. PTFE and PEEK material is used to provide a metal free liquid flow path. Variable continuous flow sample probe rinse station with peristaltic pump minimizes sample contamination and carryover. Software controls include rinse time, delay time, number of replicates, rescale rate, recalibration rate, measurement time and analysis order. Full random access capability is standard. Up to 360 samples can be loaded using 7 mL tubes.

SDS3000D

The SDS3000D is the SDS3000 auto sampler with inbuilt dilutor. This new self-contained auto sampler/dilutor means no more messy tubing in your laboratory required by two separate units.

The SDS3000D can be used in two ways. Firstly, it can prepare your multi-element working standards from bulk standards automatically and accurately and secondly it can dilute any over range samples automatically and accurately.



Powerful Windows® AAS Software

Rapid method development

The method module of the software allows the operator to setup and store all parameters associated with an elemental analysis including instrument, quality control, calibration, flame and graphite furnace, sampling and measurement parameters. As all the parameters are within one module it is a simple task to develop a method. Once an element is selected from the periodic table and the appropriate wavelength determined, recommended conditions are recalled. Methods can be password protected to ensure that unauthorized changes or erasure cannot take place.

Flexible sample handling

The samples module is used to identify the samples and to determine in which order they will be analysed, when and how often spike recoveries, check samples, re-calibrations and re-slopes will be carried out.

Once a sample file has been created it can be saved for later use or modification. Also included with the sample identification are sample weights and dilutions which can be used to calculate the element concentration in the original sample. The weights can be read in directly from an electronic balance with a USB port or the information can be imported from other software packages.

Automated multi-element analysis

The analysis module is used to bring together the method and sample details for the measurements that are to be taken. These may be linked to provide fully automated multi-element analysis. This information can be saved as individual files, and multi-element analysis can be initiated with just three mouse clicks.

Result integrity is assured

The results section of the software is used to collect, display and process data collected by the instrument. As all the raw

data is collected for each standard and sample it is possible to re-calculate results post-run, based on different criteria. For example, results that were collected in peak area mode can be calculated in peak height mode. This can be invaluable for method development, particularly in furnace work.

The calibration routine can also be changed post-run to get the best possible fit of the calibration. Even weight and dilution data can be added after the analysis and results recalculated. Of course, erroneous results can be deleted, meaning that samples or calibrations need not be repeated. The entire results section can be password protected to ensure the integrity of the data.

Electronic records and signatures

The Electronic Records and Electronic Signatures Rule (21 CFR Part 11) was established by the USA FDA to define the requirements for submitting documentation in electronic form and the criteria for approved electronic signatures. This rule defines the standards by which an organization can use electronic records to meet its record keeping requirements. The XplorAA software includes features that will assist to achieve 21 CFR Part 11 compliance.

Security settings allow for the application of an "Audit Trail File". This creates a log of every action carried out by the software and by which user.



Turn key solutions

This feature allows a shortcut to the XplorAA software from the windows

desktop. This shortcut can be modified so that a specific method, sample, result, or any other files can be opened automatically when the icon is clicked.

User password

Selected users may be restricted to a minimal amount of access within the software and prevent the accidental deletion of important files by other users.



Intelligent lamp warm up

The XplorAA software calculates the exact time when the next element lamp should start to be warmed. This feature saves you money by not having a lamp in warm up mode longer than it needs to be; which can occur during long furnace programs and/or if you have many samples.

Lamp life log

The XplorAA software package automatically records lamp life, in mHours, as a text file named "lamplife.log" in the XplorAA program folder. Whenever you change a lamp all you need to do is to reset the log and it will automatically keep track of the number of mHours the lamp has done. Additionally you may set up a status panel whereby you can view the lamps mHour usage any time during the course of the day.

XplorAA Specifications

Optics

Double beam or single beam with background correction and flame emission capability. Asymmetric modulation with 2:1 sample-to-reference ratio for noise reduction. All-reflective system with quartz overcoating on mirrors. Sealed against dust and vapour.

Monochromator

Ebert-Fastie design with 333 mm focal length and 175–900 nm wavelength range. 1800 line/mm holographic grating with dual-blazed profile and 1.6 linear reciprocal dispersion. Automatic wavelength selection and peaking. Continuously adjustable slits with 0.1 to 2 nm spectral bandwidth (0.1 nm increments). Reduced height for furnace operation available with all slit widths. Automatic setting of slit width and height. Automatic scanning. Selected wide range multi-alkali photomultiplier tube.

Lamp Turret

Two-lamp turret with manual lamp selection or six-lamp turret with automatic lamp selection. Automatic optimization in two planes for maximum light throughput. Six-lamp turret features automatic multi-element operation, with the next lamp in the sequence automatically warmed up. Compatible with standard hollow cathode lamps. Optional one lamp Super Lamp power supply on XplorAA.

Background Correction

Hyper-Pulse background corrector on the XplorAA takes 200 (50 Hz) or 240 (60 Hz) sample readings per second for correction of fast background peaks.

With approximately 1 ms between pulses and interpolation between measurements, the best possible accuracy is assured. High intensity deuterium arc lamp provides 175–425 nm correction range. Corrects to 2.5 total absorbance.

Flame Control

The XplorAA is available with programmable gasbox, automatic gasbox, manual gasbox or no gasbox.

Programmable Flame Control: Automatic setting of flame type and gas flows from stored conditions. Programmed ignition and shutdown sequences. Automatic change of flame conditions during automatic multi-element operation. May be programmed to automatically extinguish the flame at the end of an analysis. Interlocks monitor air, acetylene and nitrous oxide pressure, burner presence, burner type, liquid trap level, presence of nebulizer and pressure relief bung, oxidant flow, flame condition and mains power. Ignition is prevented or flame is shutdown if a fault is detected. Screen display of interlock status.

Automatic Flame Control: Separate fuel and oxidant flow meters. Push-button gas selection, ignition and extinction. Programmed ignition and shutdown sequences. Automatic fuel enrichment with nitrous oxide-acetylene flame. Interlocks monitor air, acetylene and nitrous oxide pressure, burner type, nebulizer bung, pressure relief bung, liquid trap level, flame conditions and mains power. Ignition is prevented or flame is shut down if a fault is detected.

Manual Flame Control: Manual setting of flame type and gas flows. Separate fuel and oxidant flow meters. Push-button ignition. Interlocks monitor burner type, nebulizer bung, pressure relief bung, liquid trap level. Ignition is prevented if a fault is detected. Interlocks prevent ignition of nitrous-oxide flame or changeover to nitrous-oxide flame with air-acetylene burner.

Flame Atomization System

Pre-mix design with solid inert polymer mixing chamber. All-titanium burner construction. The optional nitrous oxide burner is designed to reduce carbon build up. Nebulizer has platinum-iridium capillary and inert venturi for resistance to acid attack. Adjustable sample uptake rate with locking mechanism. Inert impact bead. Interlocked nebulizer bung and pressure relief bung. Integral liquid trap with liquid level interlock. XplorAA has quick-change mounting to enable easy change-over to graphite furnace.

Performance Guarantee

Greater than 0.9 abs for 5 mg/L copper solution with an RSD of less than 0.5% on the same measurement.

Dimensions

820 x 520 x 480 mm (W x D x H)

Weight

Unpacked 67 kg, Packed 100 kg

Electrical Requirements

100–240V AC, 50/60 Hz, 600 VA

Software

Microsoft Windows® operating system for true multitasking. Controls XplorAA and all its accessories: SDS3000 auto sampler, auto dilutor, GF5000 graphite furnace and PAL furnace auto sampler and MC3000 mercury concentrator.

Data Processing

Provides analysis by atomic absorption or emission. Absorbance range to 3.0 Abs. Measurement by integration, running mean, peak height or peak area. Mean and RSD of up to 50 replicate readings. Calibration using up to 10 standards. Linear least squares curve correction, linear least squares through zero curve correction, exact fit curve correction, concentration least squares (polynomial) curve correction, standard additions or bracketing standards. Programmable reslope using a single standard or complete re-calibration, rate settable by either time or frequency of samples. Password protected result editing to remove unwanted readings on either samples or standards. Weight and dilution correction. All editing available either during the run or post run.

Graphics

High resolution colour display of atomic absorbance, background signals, furnace temperature programs, calibration curves, peaking meters and wavelength scans. Graphics can be displayed in a number of different modes including overlaying non-successive peaks. Selectable absorbance scale for traces. Graphics cursor can be used to obtain numerical information from graphics traces. Zoom function allows graphics traces to be expanded.

Data Storage

Storage is provided for all data including the linking of the graphics trace to the result. Also stored are the methods, sample labels, sample sequences, method sequences, weights and dilutions, report headers and footers, calibrations and the results.

Report Generation

Reports may be printed from all stored results in either single element or multi-element format with results being combined from different runs and different measurement techniques. All operating parameters, calibration graphs, headers, footers, method notes, sample labels, results statistics and weight and dilution factors may be printed. Software supports a full range of printers.

Quality Control Protocols

Complete range of quality control functions available including check samples, spike recovery, upper and lower QC limits, calibration correctness. Checks can be carried out at pre-determined intervals based on time or number of samples analysed. Alternately checks can be carried out randomly. All checks have operator settable failure limits and failure actions. Flagging for all failed tests.

XplorAA Accessories

System 5000 Graphite Furnace

Automated graphite furnace system. Comprises GF5000 graphite furnace power supply and workhead plus PAL programmable furnace auto sampler. Controlled by GBC XplorAA software.

GF5000 Furnace Assembly

Furnace assembly includes graphite tube (and platform if required) mounted in enclosure with quartz windows. Permanently connected to power supply by umbilical cord carrying gas, cooling water and electrical supplies. Two independent gas supplies. Temperature range ambient to 3000°C. Computer controlled maximum heating rate of 2000°C/sec.

Unlimited number of steps, each with ramp and hold, gas selection, graphics display option and read option.

Temperature controller monitors current and voltage and uses power feedback to provide accurate control over the full temperature range during both ramp and hold stages. Interlocked to inert gas and cooling water pressures. Corrects for changes in cooling water temperature.

PAL Furnace Auto Sampler

Accommodates 40 samples and 10 premixed standards and one stock solution for automatic mixing of up to 10 standards. Container volumes are 2 mL for samples and standards, 5 mL for automix standard, 10 µL for blank and primary modifier. Auxiliary modifier can be placed in any position on the auto sampler. Dispensed volume is 1–100 µL, programmable in 1 mL increments. All-PTFE capillary. 1 L rinse container. Probe set-up controlled by computer with co-ordinates stored in memory. Program options include automatic mixing of standards, automatic injection of chemical modifier(s), multiple injection, heated injection, automatic re-slope or complete re-calibration, check sample, and spike recovery.

Inert Gas Requirements

Argon or nitrogen at a pressure of 70–200 kPa (10–30 psi)

Cooling Water Requirements

1–2 L/min at 100–200 kPa (15–30 psi)

Dimensions

GF5000: 410 x 370 x 329 mm (W x D x H)
PAL: 220 x 209 x 140 mm (W x D x H)

Weight

GF5000: Unpacked 40 kg, Packed 50 kg
PAL: Unpacked 7 kg, Packed 10 kg

Electrical Requirements

208–240 V AC, 50/60 Hz,
Rated current 15 A, surge current 40 A

SDS3000 Auto Sampler

The SDS3000 is a precision engineered X-Y-Z auto sampler. Designed and fabricated by GBC Scientific Equipment, this affordable auto sampler provides accurate and fast analysis due to its durable, reliable and sturdy design. Supplied with four sample racks to hold 240 sample vials each of approximately 14 mL and a standards rack to hold 10 standard vials plus a blank each with a volume of approximately 50 mL. PTFE and PEEK material is used to provide a metal free liquid flow path. Variable continuous flow sample probe rinse station with peristaltic pump minimizes sample contamination and carryover. Software controls include rinse time, delay time, number of replicates, rescale rate, recalibration rate, measurement time and analysis order. Full random access capability is standard. Up to 360 samples can be loaded using 7 mL tubes.

Dimensions

670 x 335 x 520 mm (W x H x D)

Weight

SDS3000: Unpacked 19 kg, Packed 41 kg

Electrical Requirements

100–240 V AC, 50/60 Hz

SDS3000D Auto Sampler with Dilutor

The SDS3000D is the SDS3000 with inbuilt dilutor. This new self-contained auto sampler/dilutor means no more messy tubing in your laboratory required by two separate units.

The SDS3000D can be used in two ways. Firstly, it can prepare your multi-element working standards from bulk standards automatically and accurately and secondly it can dilute any over range samples automatically and accurately.

Dimensions

670 x 335 x 520 mm (W x H x D)

Weight

SDS3000D: Unpacked 21 kg, Packed 43 kg

Electrical Requirements

100–240 V AC, 50/60 Hz

HG3000 Hydride Generator

The HG3000 is an automatic continuous flow hydride generator for the analysis of the hydride forming elements such as arsenic, selenium, antimony, bismuth, tellurium, tin, germanium and lead at parts per billion concentration level.

The same system can be used to measure mercury at parts per billion concentration utilizing the cold vapour technique.

Dimensions

300 x 200 x 260 mm (W x H x D)

Weight

HG3000: Unpacked 7 kg, Packed 12 kg

Gas Requirements

High purity argon or nitrogen at 30 mL/min (+120 mL/min for SnCl₂ operation) and an inlet pressure of 150 kPa

Electrical Requirements

100–240 V AC, 50/60 Hz, 120 VA

MC3000 Mercury Concentrator

Gold amalgamation mercury trapping accessory for use with the HG3000 to enable ppt analysis of mercury. Consists of a power supply and workhead with built-in gold foil trap and quartz absorption cell. Controlled by the XplorAA software. Programmable load time, number of replicates, flush time and clean.

Dimensions

260 x 160 x 290 mm (W x H x D)

Weight

MC3000: Unpacked 11 kg, Packed 15 kg

Gas Requirements

High purity argon or nitrogen gas purge, flow rate 30 mL/min and inlet pressure of 150 kPa.

Electrical Requirements

100–240 V AC, 50/60 Hz

EHG4000 Electrically Heated Cell for HG3000

Temperature controlled electric heating blanket for heating the quartz cell used in hydride generation AAS. Includes power supply with temperature controller and workhead.

Dimensions

Controller: 280 x 140 x 250 mm (W x H x D)
Workhead: 160 x 110 x 170 mm (W x D x H)

Weight

EHG4000: Unpacked 5 kg, Packed 8 kg

Electrical Requirements

100–240 V AC, 50/60 Hz

Ordering Information

XplorAA Atomic Absorption Spectrometers

99-0710-00 XplorAA double beam, two lamp turret, programmable gas control
99-0569-00 XplorAA double beam, two lamp turret, automatic gas control
99-0568-00 XplorAA double beam, two lamp turret, manual gas control
99-0575-00 XplorAA single beam, two lamp turret, manual gas control

99-0710-06 XplorAA double beam, six lamp turret, programmable gas control
99-0569-06 XplorAA double beam, six lamp turret, automatic gas control
99-0568-06 XplorAA double beam, six lamp turret, manual gas control
99-0575-06 XplorAA single beam, six lamp turret, manual gas control

Each XplorAA is supplied with air-acetylene burner, spray chamber, adjustable inert nebulizer, gas hoses, operation manual, flame methods manual and XplorAA software for the operation of the instrument and all accessories.

XplorAA No Flame Atomic Absorption Spectrometers

99-0571-00 XplorAA double beam, two lamp turret, No Flame control
99-0570-00 XplorAA single beam, two lamp turret, No Flame control
99-0571-06 XplorAA double beam, six lamp turret, No Flame control
99-0570-06 XplorAA single beam, six lamp turret, No Flame control

Each XplorAA No Flame is supplied with operation manual and AAS software for the operation of the instrument and all accessories.

Accessories

99-0075-00 Nitrous oxide-acetylene burner for XplorAA
95-0693-00 Recommended spares and consumables for XplorAA
99-0012-00 Fume extraction system (complete) 220/240 V, 50 Hz
99-0012-01 Fume extraction system (complete) 110 V, 60 Hz
99-0400-00 Fume extraction system (complete) 220 V, 60 Hz
75-0054-00 Air compressor 220/240 V, 50Hz
75-0055-00 Air compressor 110 V, 60Hz
75-0056-00 Air compressor 220 V, 60Hz
99-0050-02 Nitrous oxide cylinder regulator with heater 220/240 V
99-0050-03 Nitrous oxide cylinder regulator with heater 110 V
99-0099-00 Air cylinder regulator
99-0100-00 Acetylene cylinder regulator
99-0284-00 Balston gas purifier
95-9912-00 Gas purifier maintenance kit

Flame Auto Sampler

99-0697-00 SDS3000 Auto Sampler
99-0698-00 SDS3000D Auto Sampler with Dilutor
SDS3000 and SDS3000D supplied complete with test tubes, inert probes, cables, tubing, inbuilt wash pump, fixed wash reservoir and four 60-position sample racks.

Hydride

99-0276-00 HG3000 Automatic Hydride Generator
95-0016-00 Recommended spares and consumables for HG3000
99-0723-00 EHG4000 Electric Heater for hydride cell
99-0245-11 MC3000 Mercury Concentrator Unit for HG3000

Graphite Furnace

99-5005-00 System 5000 Automated Graphite Furnace System (complete)
Comprises GF5000 power supply and workhead plus PAL automatic sampler. Supplied complete with 10 pyrolytically coated graphite tubes, 5 platforms, 500 sample vials, furnace methods manual, beakers, hoses, cables and tubing
99-0059-00 Graphite furnace tubes, pyrolytically coated (pack of 10)
99-0060-00 Pyrolytic graphite platforms (pack of 10)
99-0342-00 Pyrolytically coated, integrated platform graphite furnace tubes (pack of 10)
99-0061-00 Pair of electrodes
99-0022-00 Sample vials for PAL (pack of 500)
95-0015-00 Recommended spares and consumables for System 5000
96-0104-00 Refrigerated cooling system 220 V, 50Hz
96-0104-01 Refrigerated cooling system 115 V, 60 Hz

Designed and manufactured by GBC Scientific Equipment Pty Ltd
A.C.N. 005 472 686
GBC reserves the right to change specifications without prior notice
GBC publication number
01-5013-00 September 2024

GBC SCIENTIFIC EQUIPMENT
World-class scientific instruments and accessories
— AAS, ICP-OES, ICP-TOFMS, UV-Vis, XRD, GC and GC-MS

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