The Thermo Scientific GFS35/GFS35Z graphite furnace and auto-sampler module is the ideal combination of furnace technology and automation functionality, providing unparalleled instrument sensitivity and productivity.

The Thermo Scientific GFS35/GFS35Z Combined Graphite Furnace and Auto-Sampler Module

A high performance graphite furnace system

The Thermo Scientific GFS35/GFS35Z modules are designed to give you optimum performance. The modules comprise a pre-aligned graphite furnace and intelligent auto-sampler to simply and effectively achieve your analysis requirements.

The Thermo Scientific GFS35/GFS35Z furnace design achieves accurate temperature control and fast temperature rise times. It utilizes an optical control system based on a photodiode detector. A fibre optic link means the photodiode is not placed close to the furnace head, thereby avoiding temperature effects and pick-up from the furnace power leads. The net result is temperature risetimes approaching 3000 °C/sec., ensuring the best sensitivity possible for all elements, and precise temperatures, for the best measurement precision.

Another major requirement is a range of well-designed cuvettes. Our unique cuvette option, called the Extended Lifetime Cuvette (ELC), with a thick coating of dense pyrolytic graphite ensures long lifetimes and provides impressive performance with the more refractory elements. Ridged cuvettes are designed to contain organics or samples which tend to spread out when injected (thus reducing the efficiency of atomization). Omega Integrated Platform cuvettes utilize ELC technology and help overcome interference effects by ensuring isothermal conditions are maintained in the cuvette when the sample is atomized.

The cuvette is surrounded by an all graphite enclosure, flushed with inert gas. A continuous flow around the outside of the cuvette prevents air oxidation (maximizing lifetime) and an additional, variable flow inside the cuvette flushes out drying and ashing vapours to reduce background effects.

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Standard graphite furnace systems utilize the QuadLine deuterium background correction built into all our spectrometers. The GFS35Z is the Zeeman background correction version of the graphite furnace, which corrects over a wider wavelength range and can correct for some spectral overlap situations. Deuterium background correction can also be utilized with the GFS35Z.

Optical Temperature Control

Optical temperature control provides accurate control for even the fastest heating rates (> 3000 ˚C/sec) to ensure maximum sensitivity for all elements. Optical temperature control guarantees reproducible temperatures, irrespective of changes in cuvette mass and electrical resistance. The Thermo Scientific SOLAAR Software allows up to 20 constant plus 20 ramped temperatures to be programmed in any analysis for the best analytical flexibility. This control also compensates for variable cooling water temperatures, enhancing cuvette temperature stability.

All-Graphite Containment

The furnace head incorporates graphite cuvettes, sheath and end-loaded contact cones to provide an all graphite, closed environment resulting in an essentially metal contamination and corrosion free analysis zone. Cuvettes and cones may be easily replaced using a single lever system to open and close the furnace head.

High Atomization Efficiency

Binary control of both internal and external gas flows ensures reproducible results. Continuous external flow results in minimum air oxidation of graphite components for longer cuvette lifetimes, while variable (including gas stop) internal flows allow optimisation of atomization efficiency. An alternate internal gas may be used, for example air, to assist in the ashing of organic samples.

COMPATIBILITY	
Instrument	**Furnace Module**
Thermo Scientific iCE 3300 AAS	GFS33
Thermo Scientific iCE 3400 AAS	GFS35Z
Thermo Scientific iCE 3500 AAS	GFS35 or GFS35Z

Range of Graphite Cuvettes

Different types are available to suit any analysis. Extended Lifetime Cuvettes (ELCs) have outstanding lifetimes, providing reproducible performance over several thousand firings. Ridged cuvettes (in pyrolytically coated and uncoated form) help contain difficult samples in the optimum cuvette temperature zone for efficient atomization. Omega Cuvettes with integral platforms provide the most interference free conditions (often in combination with matrix modification) for samples with complex matrices.

Zeeman Furnace

The GFS35Z Zeeman background correction system is capable of correcting for certain types of structured background that cannot be corrected acurately for by the Quadline deuterium system.

A pre-aligned tilt mount allows the furnace head to be tilted forward out of the sample compartment to allow easier access for maintenance and to allow other accessories to be used without furnace removal.

Automated Ash-Atomize parameter optimization

Besides controlling the complete furnace program, The Thermo Scientific SOLAAR Software has a number of user aids, such as automatic sequencing and an automated Wizard for selection of the optimum temperatures for the Ash and Atomize phases.

Furnace Autosampler

Manual injection of samples into a furnace cuvette can be inaccurate and time consuming. For this reason the furnace autosampler is included as part of the GFS35/GFS35Z module.

The autosampler is more than just a sample deposition device, it is also a preparation station capable of performing numerous functions. Actions like matrix modification, standard additions, standards preparation and intelligent dilution are just some of the functions available. Intelligent operation improves productivity and performance. Truly intelligent dilution reduces the possibility of errors. The Autosampler Loading Guide suggests optimum carousel solution placement but can be adjusted via "drag and drop placement" to meet your individual requirements.

On-board wash and waste containers eliminiate inconveniently positioned containers. One litre capacity ensure maximum productivity and long overnight analysis.

GFTV

The GFTV 'furnace vision' system is now a standard feature on the iCE 3400 AAS and iCE 3500 AAS instruments and allows the user to see events happening within the furnace cuvette in real time.This is a valuable aid for Method Development and furnace optimization. Images may be stored for future reference.

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