

Analytical Instrumentation

iCE 3000 Series Atomic Absorption Spectrometers

The iCE 3000 Series Atomic Absorption Spectrometers are refreshingly different to any other atomic absorption instrument. They are compact, stylish and designed with ease of use as a priority.

Thermo Fisher Scientific is the leading provider of analytical instruments, equipment, reagents and consumables, software and services for research, analysis, discovery and diagnostics.

- 50 years of AA experience
- Award winning innovators in Atomic Absorption
- True dual atomisation
- World wide service and applications support
- Pioneers of the ground breaking iCAP ICP



Refreshingly different

- **Ergonomically designed**
Easily accessible lamp carousel, quick fit lamps and flame compartment tray, speed up simple instrument tasks
- **Unique integrated furnace vision system**
For effective and easy furnace method development
- **New improved burner design**
Even with the most difficult samples, operation is prolonged and trouble free

Flame Analysis

Optimisation of flame system

Optimisation routines can be included as part of your method so that the parameters are truly optimal.

Unbeatable flame performance

Superior detection limits and a fully inert sample system.

Safe and easy gas control

The gas control system is fully automatic thus ensuring repeatable flame conditions and safety.

Fully customisable auto-sampler

Configure the solutions to your personal preference.

Deuterium background correction for easy analysis

Deuterium background correction is provided by a unique Quadline D2 source which gives guaranteed background correction.

Optics designed for precision and ease-of-use

Self-calibrating monochromators and auto-aligning lamps ensure simple optical setup and optimum light throughput.

Refreshingly different

- **Enhanced software**
Renowned for its usability, extensive help functions and cookbook, the iCE SOLAAR software is now better than ever
- **New and extended wizards**
Enables effective system utilisation for quick, high productivity
- **Extensive auto optimization procedures**
Let the instrument optimise critical parameters, saving you time

Furnace Analysis

Integrated furnace vision tool

Enables vital information to be gained on sample injection and behaviour and is now a standard feature on selected instruments.

New furnace wizard

Guides you through the important steps required to achieve a fully optimised method with minimum effort.

Configurable furnace auto-sampler

Define where you would like samples, standards and modifiers to be positioned according to your requirements.

Optical feedback temperature control

The software will automatically control cuvette heating meaning that results will be drift free, accurate and repeatable.

Long life cuvettes

A wide range of cuvette types are available for all analysis needs, including Extended Lifetime Cuvettes (ELC).

Zeeman background correction option

Provides correction at the same wavelength as the analyte.

Gas flow

Two independently controlled gas streams are intelligently controlled via the software.



Analytical Instrumentation

iCE 3000 Series Atomic Absorption Spectrometers



iCE 3300

Single flame atomiser AAS with fully automatic gas box. Complete solution for laboratories with a main need to perform flame analysis but with occasional furnace samples.

- Simple flame system but with incredible versatility
- Six lamp auto-aligning carousel
- Double beam optics and self-calibrating Ebert monochromator.

iCE 3400

Single furnace atomiser AAS with Zeeman and D2 background correction. When challenging detection limits are critical.

- Six lamp auto-aligning carousel
- Furnace vision
- Echelle dual prism and and grating monochromator
- Vapour system and electrically heated cell can be utilised in this instrument



iCE 3500

Dual flame and furnace AAS with standard or Zeeman furnace option. Essential furnace vision tool included as standard. Ideal for high throughput environments with a requirement for quick and regular flame and furnace analysis.

- Software-controlled changeover from flame to furnace analysis without the operator even being in the room!
- Six lamp auto-aligning carousel for maximum light throughput
- D2 background correction for flame and furnace analysis
- Zeeman background correction option available for furnace work
- Double beam optics with a dual monochromator consisting of an echelle prism and a grating

A refreshingly different Atomic Absorption

The iCE 3000 Series AAS is the clear and safe choice of instrument to complete your elemental analysis needs.

	iCE 3300	iCE 3400	iCE 3500
Atomiser type	Flame / furnace option	Furnace	Flame and furnace
Simple software	Yes	Yes	Yes
Full set of Wizards	Yes	Yes	Yes
Ergonomic design	Yes	Yes	Yes
New improved flame atomiser	Yes	Not applicable	Yes

Analytical Instrumentation

iCE 3000 Series Atomic Absorption Spectrometers



The iCE SOLAAR Software

The iCE SOLAAR AA software package is intuitive and helpful. Extensive wizards guide you through various operational procedures making start-up exceptionally quick and simple. The help text and cookbook provide additional information on

the operational conditions for any elemental analysis. Application tips for sample preparation, matrix modifiers and many other important factors are available in the software. This support will give you the confidence to perform a successful analysis, no matter how difficult your samples seem.



The SOLAAR Security

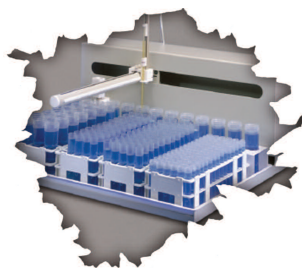
SOLAAR Security is able to secure your data for compliance purposes or just for good practice. Provides all the tools you need to comply with the FDA 21 CFR part 11 ruling by adding e-signatures, event logs, audit trails and access controls.

There are many wizards available to walk you through various operations to achieve complete instrument and method set up.

Wizards get you productive fast by:

- Providing step by step guides to routine activities
- Allowing more advanced facilities to be explored as experience grows
- Demonstrating the correct sequence of operations to achieve a specific objective
- Giving users an opportunity to learn

Software and Accessories

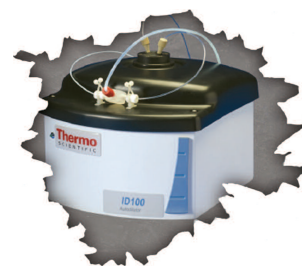


Flame Auto-Sampler

iCE 3000 Series instruments support a range of auto-samplers made by CETAC to fulfill your more demanding volume workloads.

Flame Dilution - ID100

This accessory can make standards from a master solution quickly and accurately. High-speed intelligent dilution will bring out of range samples into the calibration range.

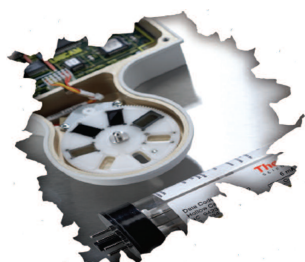


Vapour Generation - VP100

This fully software controlled system is a simple and cost effective way to reach lower detection limits for the Arsenic group elements. The optional EC90 electrically heated cell can offer improved performance and safety.

Validator Packages

A comprehensive log book with pre-printed forms, detailed SOP's and integrated software. Providing all you need from specification, design and installation qualification to operational and performance qualification.



Intelligent Spectrometer Qualification (iSQ)

A calibrated module is used to test various performance criteria of your instrument and provides the user with a simple and convenient pass and fail report.

The iCE 3300 AA Spectrometer

A high performance, versatile, double beam Atomic Absorption Spectrometer

The CE 3300 AA Spectrometer provides the complete elemental analysis package with stunning simplicity, innovative design and superior performance.

The ground-breaking iCE 3300 AA Spectrometer makes even the most complicated analyses simple. Superior, double beam optics provide unrivalled performance, while the innovative hardware and software design ensures that running samples, developing methods and maintaining the instrument is easy.



Features

- Improved, efficient design minimises the footprint of the instrument and ensures that day-to-day analysis and maintenance is simple
- Enhanced, user-friendly software and comprehensive Wizard-driven interface to guide you through every aspect of an analysis
- High precision, double beam optics produce unparalleled detection limits and exceptional optical stability
- New universal titanium burner with improved solids capability increases the efficiency and accuracy of your flame analysis
- Unique Quadline background correction with guaranteed performance
- Safety comes as standard with integrated software, hardware safety features and automatic gas control
- Simple installation and operation of the pre-aligned furnace and auto-sampler module
- Unique furnace vision system improves efficiency of furnace analysis and method development (optional upgrade)
- Security software and validation packages allow complete 21 CFR part 11, GLP and GALP compliance (optional upgrades)

Specifications

The iCE 3300 offers unrivalled flame sensitivity which is achieved by high efficiency nebulisation through a fully inert impact bead, spoiler and spray chamber. The new finned universal titanium burner ensures exceptional atomisation, even with the most difficult samples. The fully automatic gas box uses binary flow control for safe, reliable and repeatable analysis with all flame types.

All critical parameters can be optimised automatically if required – burner height, gas flows, even optical instrument parameters.

The iCE 3300 accepts the GFS33 Integrated Graphite Furnace and Auto-sampler Module which offers the best in detection limits with minimum interferences. Dynamic optical temperature feedback ensures accurate heating rates up to 3000 °C per second regardless of cuvette age. Add to that the optional unique furnace vision system then you have the ultimate in effective and easy furnace method development.

The GFS33 offers unrivalled graphite furnace automation. Huge capacity and infinite solution preparation facilities cater for all needs. With automated ash/atomise temperature optimisation, auto-sampler loading guides and the Thermo Fisher Scientific unique guaranteed background correction system, furnace analysis has never been easier. The auto-sampler remains permanently in alignment with the furnace completely eliminating the need to re-align the probe every time the furnace is fitted.

We are the only supplier offering Extended Lifetime Cuvettes (ELC) with up to 10 x more lifetime than alternatives. Couple this with features such as pre-heated cuvette injection, cooling water temperature compensation and fast furnace operation - making it the safest choice.

Technical Specification

Optics	Double Beam
Monochromator	0.27 m Ebert type
Lamp Carousel	6 Lamp Coded, Auto-aligning
Photomultiplier	Choice of standard or wide range types
Flame Atomiser	Universal system (uses 50 mm Ti burner)
Furnace Atomiser Option	GFS33 combined module
Furnace Vision	System Optional
Background Correction	Guaranteed Quadline deuterium system
Gas Management	Automatic binary control
PC Software	Included as standard
Validation Package	Optional

The iCE 3400 AA Spectrometer

High performance, dedicated graphite furnace Atomic Absorption Spectrometer

The iCE 3400 AA Spectrometer offers a dedicated furnace atomiser system with outstanding performance and productivity.

The refreshingly different iCE 3400 AA Spectrometer is a combination of performance and simplicity. Superior optics, innovative design and flexible background correction options ensure unrivalled analytical performance. User-friendly, Wizard-driven software ensures that complicated analyses are made simple. The iCE 3400 provides the complete solution for furnace atomiser analysis in an innovative and easy package.



Features

- Unique combination of both Zeeman and deuterium background correction provides the ultimate in flexible, interference free furnace analysis
- The combination of high precision, double beam optics and superbly accurate temperature control produce stunningly low detection limits and incredible analytical stability
- Unique furnace vision system included as standard improves efficiency and simplifies method development by providing a high-definition, real-time video of sample analysis
- Improved, efficient design minimises the footprint of the instrument and ensures that day-to-day analysis and maintenance is simple
- Enhanced, user-friendly software and comprehensive Wizard-driven interface to guide you through every aspect of an analysis
- Safety comes as standard with integrated software and hardware safety features
- Simple installation and operation of the pre-aligned furnace and autosampler module
- Unique, state-of-the-art extended lifetime cuvettes (ELCs) provide vastly extended lifetimes compared to the alternatives, improving efficiency and saving you money
- Security software and validation packages allow complete 21 CFR part 11, GLP and GALP compliance (optional upgrades)

Specifications

The iCE 3400 has a six-lamp carousel with automatic lamp switching, ensuring that multi-element analyses are performed easily and efficiently. Our unique optics supply unparalleled sensitivity and accuracy. The optical system is entirely sealed from the environment, which minimises maintenance and maximizes productivity.

The unique combination of deuterium and Zeeman background correction in a single instrument gives you the flexibility to tackle the toughest samples.

The GFS35(Z) furnace module includes a furnace auto-sampler with a huge capacity as standard. This equipment is fully configurable by the user, allowing you to control exactly where you place each of your standards and samples. The furnace employs dynamic optical temperature control, which allows superbly accurate regulation of heating rates up to 3000 °C per second, giving you the highest analytical sensitivity.

Technical Specification

Optics	Dual beam
Monochromator	Echelle type
Lampcarousel	6 lamp coded, auto-aligning
Photomultiplier	Wide range (180 nm - 900 nm)
Furnace Atomizer	GFS35(Z) combined module
Furnace Vision System	As standard
Background Correction	Guaranteed Quadline and AC, Zeeman systems
Gas Management	Automatic binary control
PC Software	Included as standard
Security Package	Optional
Validation Package	Optional

Safety comes as standard with the iCE 3400. The instrument automatically detects the presence of a cuvette, furnace coolant and inert gas flow and will not allow an analysis to continue if any of these is compromised.

The enhanced software makes even the most complex analyses simple, while the new Wizards guide both new and experienced users through the most important tasks. Automated optimisation Wizards ensure that you get the best performance from your instrument, while actually saving you time and effort.

Furnace vision is a standard feature on the iCE 3400 and is fully integrated into the software. This allows valuable information to be obtained during the sample injection and analysis phase. The iCE 3400 is easy to upgrade with various accessories so your instrument can adapt to your future needs.

The iCE 3500 AA Spectrometer

High performance, dual atomiser, double beam AA Spectrometer

The iCE 3500 Atomic Absorption Spectrometer is a unique, dual atomiser instrument that provides unrivalled levels of performance in an innovative, user-friendly package.

The refreshingly different iCE 3500 Atomic Absorption Spectrometer provides unrivalled performance, flexibility and simplicity. A new, innovative burner design improves solids capacity and accuracy during flame analysis. Superior optics, innovative design and guaranteed background correction ensures unrivalled analytical performance. The unique dual atomiser design allows automatic, efficient and safe switching between flame and furnace analysis with no user intervention. The user friendly, Wizard driven SOLAAR Software guides new users through every aspect of an analysis and adds extra functionality for experienced users.



Features

- Unique dual atomiser design enables safe, software-controlled switching between flame and furnace analysis with a single mirror movement
- High precision, double beam optics, combined with an Echelle monochromator produce stunningly low detection limits and incredible analytical stability
- New universal 50 mm titanium burner with improved solids capability increases the efficiency and accuracy of your flame analysis
- Unique Quadline deuterium background correction with guaranteed performance as standard
- Superior furnace vision system included as standard improves efficiency and simplifies method development by providing a high definition, real time video of the inside of the cuvette
- Improved efficient design minimises the footprint of the instrument and ensures that day-to-day analysis and maintenance is simple

Features

- Enhanced, user-friendly software and comprehensive Wizard driven interface guides you through every aspect of an analysis
- Safety comes as standard with integrated software and hardware safety features and automatic gas control
- Simple installation and operation of the pre-aligned furnace and autosampler module
- Choose a deuterium only furnace, or a Zeeman AND deuterium background correction furnace, for the ultimate in flexible, interference free analysis
- Unique, state-of-the-art extended lifetime cuvettes (ELCs) provide vastly extended lifetimes, improving efficiency and saving you money
- Security software and validation packages allow complete 21 CFR part 11, GLP and GALP compliance (optional upgrades)

The iCE 3500 AA Spectrometer

Specifications

Unrivalled flame sensitivity is achieved by high efficiency nebulization into a fully inert spray chamber with impact bead and spoiler. The new finned 50 mm universal titanium burner ensures exceptional atomisation even with the most difficult samples. The fully automatic gas box uses binary flow control for safe, reliable and repeatable flame conditions.

All critical parameters can be automatically optimised if required – burner height, gas flows and even optical instrument parameters.

The iCE 3500 Atomic Absorption Spectrometer accepts the GFS35 and the GFS35Z Integrated Graphite Furnace and Auto-sampler Module. Offer the ultimate in detection limits with minimum interferences. The GFS35Z provides a choice of Zeeman or Deuterium background correction for guaranteed performance. Dynamic optical temperature feedback ensures accurate heating rates of up to 3000 °C per second, regardless of cuvette age. The unique GFTV furnace vision system is provided as standard, giving you the ultimate in effective and easy furnace method development.

The GFS35/GFS35Z offers unrivalled graphite furnace automation. Huge capacity and multiple solution preparation facilities cater for all needs.

With automated ash/atomise temperature optimisation, autosampler loading guides and the background correction options, furnace analysis has never been easier. The autosampler remains permanently in alignment with the furnace completely eliminating the need to re-align the probe and furnace head.

Thermo Fisher Scientific are the only supplier offering Extended Lifetime Cuvettes (ELC) with up to 10 x more lifetime than alternatives. Couple this with features such as pre-heated cuvette injection, cooling water temperature compensation and fast furnace operation, then you know you are making a safe choice.

The SOLAAR Software package is both intuitive and easy to use. Extensive wizards are able to guide the user through various operational procedures making start-up a simple and quick process.

Additional information on the operational conditions for any elemental analysis is available in the help text and cookbook. Application tips for sample preparation, matrix modifiers and many other important factors are also available within the Thermo Scientific SOLAAR software.



In addition, a full range of accessories are available to permit flame auto-sampling, intelligent dilution, vapour analysis and validation.

Technical Specification

Optics	Double beam
Monochromator	Echelle type
Lamp Carousel	6 Lamp Coded, auto-aligning
Photomultiplier	Wide range (180 nm to 900 nm)
Flame Atomiser	Universal system (uses 50 mm Finned Ti burner)
Furnace Atomiser Options	GFS35 or GFS35(Z) combined module
Furnace Vision System	As standard
Background Correction	Guaranteed Quadline deuterium or AC Zeeman systems
Gas Management	Automatic binary control
PC Software	Included as standard
Security Package	Optional
Validation Package	Optional