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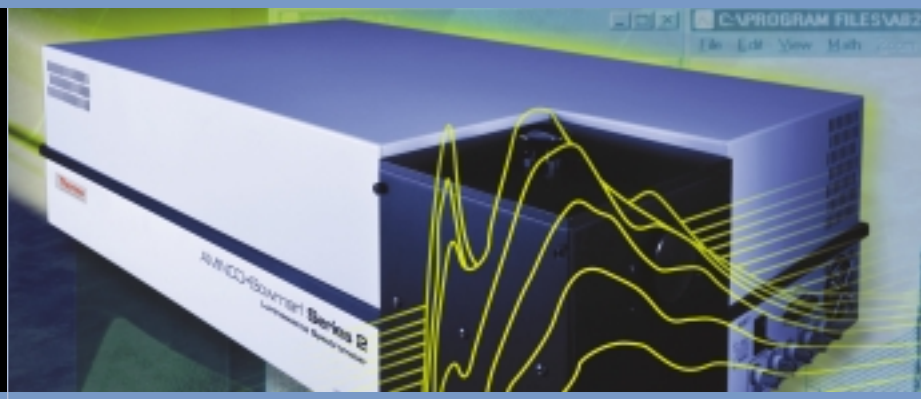
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AMINCO-Bowman Series 2



Luminescence Spectrometer

Analyze • Detect • Measure • Control™

Thermo ELECTRON CORPORATION

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AMINCO-Bowman Series 2

Luminescence Spectrometer

Performance Second to None

AMINCO-Bowman™ spectrofluorometers have been providing solid, reliable performance for almost fifty years. Thermo Electron Corporation has built on that history, combining an exclusive dual light-source design with a versatile sample compartment. As a result, the hardware of the AMINCO-Bowman Series 2 (AB2) provides capabilities that rank this instrument second to none in your laboratory.

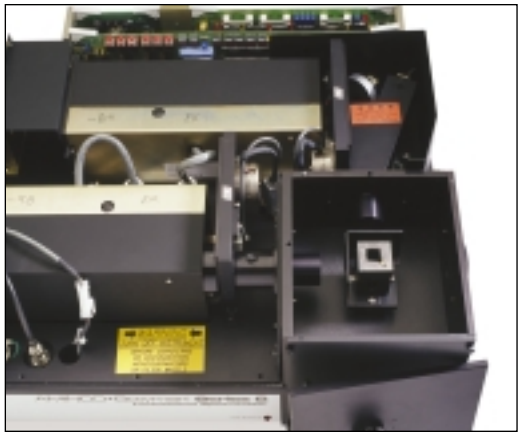


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Designed for Performance

With the AB2, there is more than meets the eye. Underneath the sturdy cover, we designed a powerful, high-performing instrument that provides the outstanding sensitivity and versatility needed in fluorescence applications. The illumination system, light path configuration, and horizontal beam geometry combine to produce superb accuracy and sensitivity in both large and small samples. The rapid slewing capability of the AB2 offers fast and reliable wavelength ratio measurements. Computer-controlled slits in the monochromators allow you to optimize your measurement for high-resolution or high light-throughput for better sensitivity. The interlocked shutters have a safety feature that protects your photomultiplier tube detector (PMT). A fast computer interface allows for high speed data transfer between the instrument and computer – a vital link for operations in which timing is a critical factor.

Versatile Sampling Capabilities



The open design of the AB2 sample compartment offers versatility for your sampling needs. Each accessory is designed to make use of the strong optical capabilities of the instrument. The T-Optics™ - configurable compartment makes the AB2 compatible with a number of important AMINCO-Bowman accessories to provide the widest range of application options. A choice of quartz-calcite polarizers or film polarizers offers a high degree of flexibility for experiments that require polarization measurements. The optional two- or four-position automated turrets allow the user to switch quickly among samples for rapid comparative measurements or for multiple sample measurements in other applications, such as polarization, time trace, and intracellular ion concentrations. Both turret accessories can be thermostatted and magnetically stirred. The Milliflow™ Stopped Flow Module features variable ratio mixing of two reactants in as little as two milliseconds dead time for the study of rapid kinetics.

System Highlights

- Two identical stepper motor controlled monochromators with ion-etched concave holographic gratings.
- Optional T-Optics configuration.
- 900:1 signal-to-noise ratio (peak-to-peak) and 2000:1 (RMS).
- Spectral bandwidth adjustable from 1 nm to 16 nm.
- Cleanable, load-bearing surface capable of holding a computer with monitor, to save bench space.
- Flexible sample compartment architecture accommodating: standard cuvettes, microcuvettes, MilliFlow stopped-flow accessory, autopolarizer, front surface and sample holders.
- Dual light sources can be mounted simultaneously. 150-watt continuous wave xenon lamp provides high intensity illumination for the most sensitive fluorescence measurements. An optional flash lamp can be used for phosphorescence studies.
- Two auxiliary data input channels are available for input of data from external sources, such as a temperature probe or pH meter.
- Fast data acquisition with settable rates up to one data point per 300 microseconds.

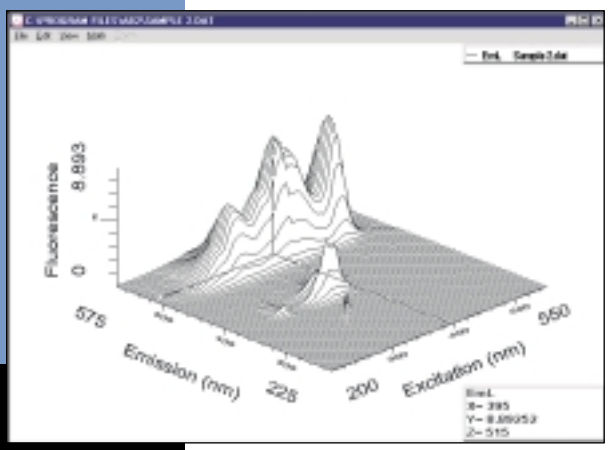


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Comprehensive Software

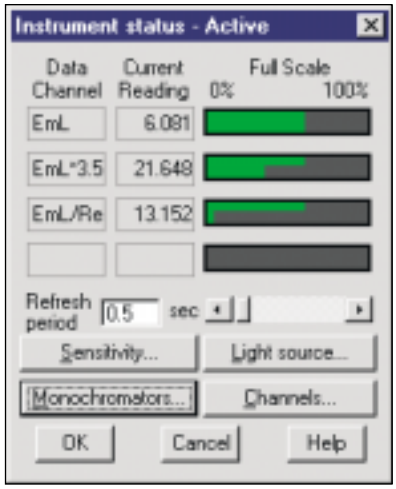
In addition to the solid optical design and versatile sample handling features of the instrument, the AB2 software offers numerous applications and simplified data processing. Users can create and store personalized test or method setups, using the comprehensive and flexible Windows®-based software. An extensive list of application programs makes the AB2 the ideal choice for a wide range of uses; excitation and emission wavelength scans, synchronous scanning, 3D excitation/emission matrices, time traces, intracellular probe measurements, and quantitative analyses can be set up and performed easily.

The software provides a number of places where you can enter notes and comments allowing documentation of your work in "real time". In addition, an array of features designed to enhance the analysis and presentation of data is available. Graphics capabilities include 3D representation with "point-of-view" perspective options, complete control of axes, customized legends, and a variety of lines, markers and display colors. Processing and analysis capabilities include basic math, smoothing, blank subtraction, normalization, curve fitting, and a host of other mathematical operations for processing your data. All applications programs can be externally triggered for coordination with external devices.



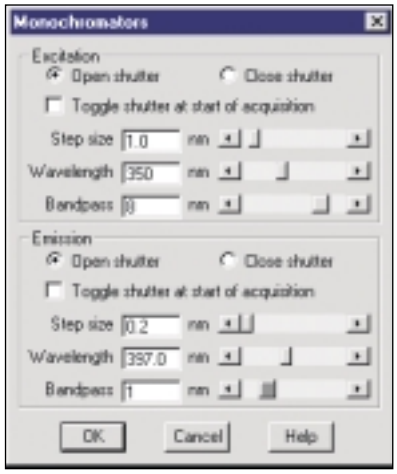
Data Display Window

- Tabular and graphic data displays, both updated in real time
- Graphic data window has its own menu bar for image manipulation or data post processing
- 2D with overlays and 3D graphs are available, including Excitation-Emission Matrix (EEM), or fluorescent "fingerprint" graphical display
- Tabular display becomes a data report



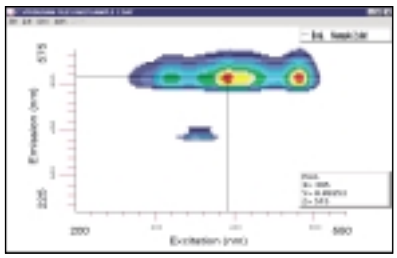
Instrument Status Window

- Continuously active display of standard PMT output and any opened data channel
- Used for optimizing the instrument setup prior to running a test sample

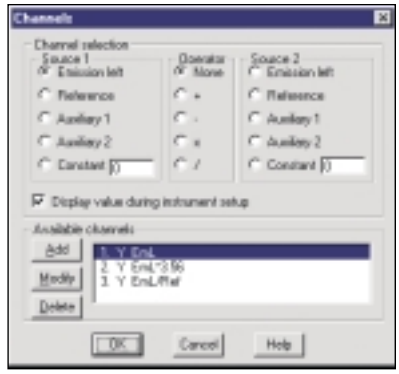


Monochromator Window

- Allows for manual setting of wavelength, bandpass and step size for both excitation and emission monochromators
- Allows for manual toggle of the excitation and emission shutters

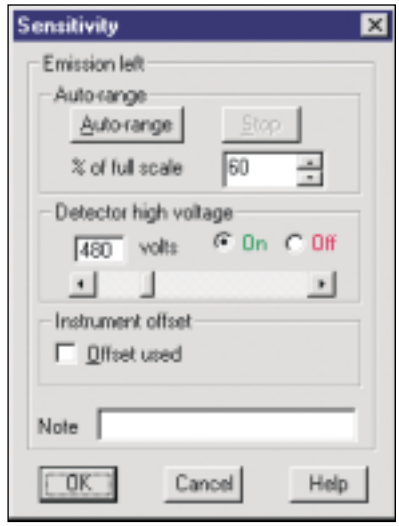


Excitation–Emission Matrix



Channels

- Data channels can be set up to collect data from various sensors and ports, and to save all channels of data together in one data file, if desired
- As many as 16 data channels can be set up, including mathematical operations with a constant
- Four channels can be selected to be displayed in real time in the Status window as an active display



Sensitivity Window

- With highest concentration standard in place, one click on Auto-range sets the PMT detector sensitivity to put the sample signal on scale
- Provides visual assistance for manual sensitivity setting

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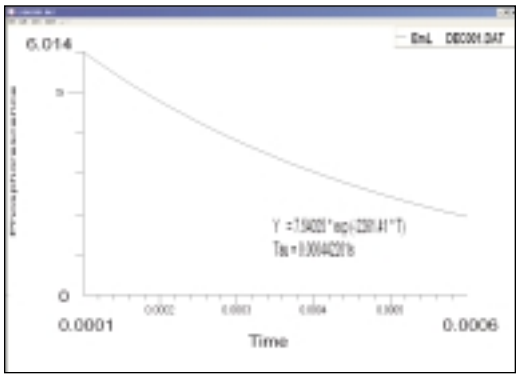
Wide-Ranging Applications

Life Sciences

The large sample compartment and comprehensive Windows®-based software of the AB2 provide accurate and reliable measurements for busy life science laboratories. The beam geometry allows for measurements with microcuvettes (minimum volume of 125 microliters). Glan type prism polarizers provide polarization/anisotropy measurements in the UV range. Polarization measurements are made easy with the L-format and/or the optional T-format. These features allow researchers to study protein folding, DNA-protein binding, hybridization, protein-ligand binding, as well as enzyme assays and intracellular ion concentrations.

Analytical

The AB2 is the preferred lab partner because it delivers maximum sensitivity, excellent spectral resolution, superb data acquisition speed and versatile sampling accessories. With spectral bandwidths set at 1 nm the analytical chemist can get high-resolution spectra for qualitative analysis. With the spectral bandwidths set to 8 or even 16 nm, the analytical chemist can attain extremely low detection limits. The AB2 gives analytical chemists the sensitivity they need for analytical assays as diverse as clinical analyses using fluorescence immunoassays, environmental fluorescent tracer studies, and the use of ATP to measure microbial contamination of foods. A solid sample holder, high-performance liquid chromatography (HPLC) flow cell, automated sipper/sampler, polarizers (for vertical, horizontal, and magic angle measurements), the MilliFlow™ stopped-flow reactor (for millisecond kinetics), and a variety of other sampling accessories allow measurements on many different types of samples without alterations. Whatever your quantitative or qualitative challenge, the AB2 is the lab partner of choice.



Phosphorescence decay curve showing results of the automated exponential curve fit and phosphorescence lifetime (tau) calculation for Europium-doped block.

Environmental

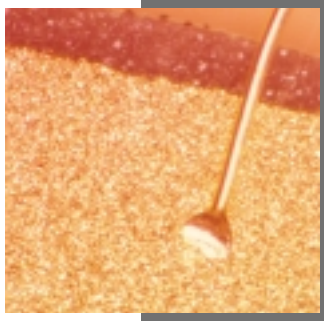
The AB2's high performance capabilities along with optional sampling accessories provide flexibility for many environmental and petrochemical applications. The environmental chemist can perform source characterization, fingerprinting to identify sources of spills and quality characterization on crude and processed oil and coal-based products that often contain fluorescent components. Fluorescent tracer studies, such as the measurement of effluent discharge rates or localization of sewer infiltration are also popular applications.

Pharmacology/Biotechnology

In the pharmaceutical industry, the AB2 spectrometer is essential in drug development. With its superb sensitivity, the AB2 helps to optimize trace levels of antibiotics, determines nucleic acid structures and is essential in qualitative analysis. Thermo Electron is committed to providing application solutions to this vital industry.

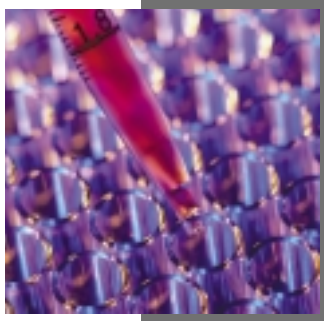
Education

Affordability and ease of use make the AB2 the perfect teaching instrument. With the AB2, students can learn all the analyses listed in the above application areas, and more. Students spend their time on science, not on the intricacies of instrument operation. The versatility of the AB2 means it can be used in a wide range of teaching environments.









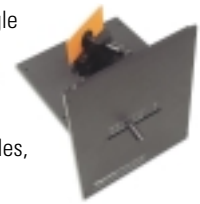


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Versatile Sampling Accessories for your Application Needs

The accessories for the AB2 spring from our nearly fifty years of experience with fluorescence instrumentation and sample handling. From the thermostatted and auto-stirred two- and four-cell turrets to the Millflow stopped-flow accessory, we know what you need. Each accessory is optimized to work with the high-performance optical design of the AB2, and slides in and out easily to set up your next experiment. The GPIB interface allows easy communication between the accessories, the instrument, and the updated package to give you complete control over your measurements. We handle solid samples, cuvettes, low-temperatures, and stirring, even in our coverslip holder for measurement of mono-layer cell growth. Our X-Optics™ (FP-012) accessory, when combined with the External PMT accessory, allows you to perform %Transmittance measurements in your AB2.

Variable Angle Front-Surface Sample Holder



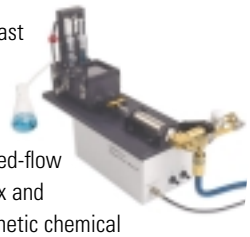
Fixed and variable angle front surface accessories simplify studies of highly absorbing liquid samples, thin films, papers, and coated surfaces.

Two- or Four-Position Cell Turret



An optional two- or four-position automated sample holder, which can be thermostatted and magnetically stirred, gives you the ability to switch quickly among samples for rapid comparative measurements or other applications.

MilliFlow



The extremely fast data acquisition rate of the AB2 allows the MilliFlow stopped-flow accessory to mix and measure fast kinetic chemical reactions with dead times of less than two milliseconds.

AutoPolarizer



The AutoPolarizer uses quartz calcite prisms for polarization measurements in the UV as well as the visible spectrum. Low cost filter wheel polarizers are available for use in the visible spectrum only.

AB2 Technical Specifications

Light Source	Xenon flash lamp and/or 150 W continuous wave lamp (depending upon configuration – both are mountable)
Wavelength Range	220 – 850 nm
Sensitivity	CW lamp min. 2000:1 rms* Flash lamp min. 1000:1 rms**
Scan rate	3 – 6000 nm/min
Slew rate	12000 nm/min
Monochromator step size	0.2 nm minimum
Wavelength accuracy	+/- 0.5 nm
Wavelength repeatability	+/- 0.25 nm
Optical Bandpass	computer control from 1 – 16 nm
Gratings	ion-etched concave holographic
Footprint	17.25" D x 31" W x 9" H (43.8 x 78.7 x 22.9 cm)
Weight (instrument only)	112 lbs (50.9 kg)
Wavelength emission and excitation correction range	200 – 600 nm
Output signals	Buffered PMT for external monitoring
PMT security	Sample Lid interlock
Instrument housing	Load-bearing top surface for spacesaving computer placement
Instrument interface	IEEE-488 (GPIB)
System compatibility	Windows 2000, NT, XP

** Signal-to-noise ratio on Raman band of water with excitation at 350 nm, emission at 397 nm and 4 nm excitation and emission slits. The emission monochromator step size is 0.2 nm and the scan rate is 0.2 nm/second. Corresponds to a minimum p-p SNR of 900:1.*

*** Signal-to-noise ratio on Raman band of water with excitation at 350 nm, emission at 397 nm and 8 nm excitation and emission slits. The emission monochromator step size is 1.0 nm and the scan rate is 0.2 nm/second. Corresponds to a minimum p-p SNR of 500:1.*

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AB2 Ordering Information

The AMINCO-Bowman Series 2 spectrofluorometer includes a thermostattable single cuvette holder, T-Optics-configurable sample compartment, a PMT for detection, and Windows-based operating software for instrument and accessory control and data processing. Versions of the AB2 are available for 100, 120, 220 or 240 VAC, 50/60 Hz. A pre-configured and tested personal computer, monitor, and printer are recommended to complete your system.

Instruments	
FA-355	AMINCO-Bowman Series 2 with Windows software, flash lamp and PCI GPIB Card. Pre-tested computer configuration recommended
FA-356	AMINCO-Bowman Series 2 with Windows software, CW lamp and PCI GPIB Card. Pre-tested computer configuration recommended
FA-357	AMINCO-Bowman Series 2 with Windows software, CW lamp, flash lamp and PCI GPIB Card. Pre-tested computer configuration recommended

Accessories	
FP-120	MilliFlow Stopped-Flow Reactor
FP-049	Low Temperature Luminescence Accessory
FP-360	Circulating Water Bath
FP-361	Circulating Water Bath (heating and cooling) 25° C to 150° C
FP-012	Actinic Light Port and X-Optics Path Front Plate
FA-261	Beam Condensing Lens
FP-286	Cuvette risers for measuring low volume samples < 500 µL
FA-272	External PMT housing (Requires external PMT FA-277)
FA-277	External PMT

Cuvettes	
FP-070	Quartz cuvettes (1 cm x 1 cm) with teflon stopper
FP-113	Triangular quartz reference cuvette
FA-084	125 µL volume quartz microcell (set of 2) (Requires beam condensing lens and cuvette risers)
FP-293	100 µL Flow Cell Kit (includes cell)
FP-292	25 µL Flow Cell Kit (includes cell)
FP-294	8 µL Flow Cell Kit (includes cell and fittings for use with HPLC)
FP-291	8 µL Flow Cell Kit (includes cell), pressure up to 50 psi

Intracellular Accessories	
FP-295	Variable Angle Coverslip Holder
FP-296	Sample Compartment Adapter to perform perfusion experiments
FP-297	Replacement Coverslips
FP-172	Injection Port - For single, two or four cuvette sample holders (syringe type)
FP-193	Injection Port - For single, two, or four cuvette sample holders (pipette type)

Polarization Accessories	
FA-286	Auto Polarizer
FA-271	Right channel polarization adaptor – includes lens, polarizer mount and manual shutter (vertical, horizontal, or magic angle measurements)
FP-107	Film polarizer for right channel polarization (T-format)
FP-033	Glan-Thompson polarizer for right channel polarization (T-format), UV-Vis range, good light collection
FP-037	Glan-Taylor polarizer for right channel polarization
FA-263	Film polarizer/filter wheel set for polarization/anisotropy measurements

Computers and peripherals	
912A0501	Advanced Workstation personal computer
912A0502	Basic Minitower Workstation personal computer
912A0503	Value Minitower Workstation personal computer

When ordered with an AB2, each quality Dell® personal computer will have the GPIB PCI card and Windows software installed and tested as a system prior to shipment. A full selection of CRT monitors, LCD Flat-panel monitors, and printers are also available.

Availability subject to change. Please contact your sales representative for specific system configurations and additional details.

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