

## Thermo Scientific Lumina Fluorescence Spectrometer

Leading in resolution and sensitivity

**The Thermo Scientific Lumina fluorescence spectrometer delivers exceptional sensitivity for the most accurate measurements. Take your analysis to the next level of clarity with an industry leading 0.5 nm spectral bandwidth for both emission and excitation measurements. Accessories for temperature control, solid samples, and polarization give you sampling flexibility.**



Fluorescence measurements offer a spectroscopic window into molecular properties and behavior. The Thermo Scientific Lumina fluorescence spectrometer delivers sensitivity and high resolution for exceptional performance. Lumina™ meets the demands of both research and routine lab analysis for a wide range of applications. Build a complete system for your laboratory with our extensive line of accessories. Powerful Luminous software helps you move seamlessly from data acquisition to reporting results.

### Fluorescence for Everyone

From life science to materials, photophysics to quantitative analysis, the Lumina fluorescence spectrometer is designed to give you the research-quality data you demand. The resourceful Thermo Scientific Luminous software makes data acquisition, analysis and reporting straightforward. Our software helps you move from spectra to answers quickly and efficiently. Useful features of the system include:

- Make fluorescence, chemiluminescence or phosphorescence measurements with sophisticated instrument control options
- An excitation shutter helps protect precious, photosensitive samples
- Measure total fluorescence with zero-order options for both excitation and emission monochromators
- Qualification documentation is available to assist you with instrument qualification

### A Complete System

Your laboratory needs more than just an instrument and we deliver by supplying a complete fluorescence system. Our software and accessories can create a dedicated QA/QC analyzer or a flexible instrument for shared research laboratories. We offer accessories and software for:

- High resolution spectral analysis
- Thermal denaturation experiments with Peltier temperature control
- Rapid mixing accessories for microsecond kinetics measurements
- Solid sample measurements for optics, powders, and more
- Fluorescence polarization measurements
- Intracellular calcium measurements



## A Complete Fluorescence System

Designed and manufactured to the highest standards, the Lumina fluorescence spectrometer offers the highest quality optical and electrical components in a rugged and reliable system.

From the beam isolation tubes in the optical path to the individually configurable optical filters, the Lumina delivers performance and flexibility for research applications. Using pre-aligned, modular monochromators and the highest-quality optical components, the Lumina provides high resolution measurements with superior sensitivity. The quality does not end at the instrument, but extends to our software and accessories that offer a complete solution to your laboratory.

### High-Resolution Monochromators

Lumina uses 20 cm focal length monochromators to deliver a narrow, 0.5 nm spectral bandwidth for high resolution measurements. The high-performance monochromators in the Lumina are optimized with a concave grating for the highest throughput and 0.5 nm spectral bandwidth.

### Variable Spectral Bandwidth

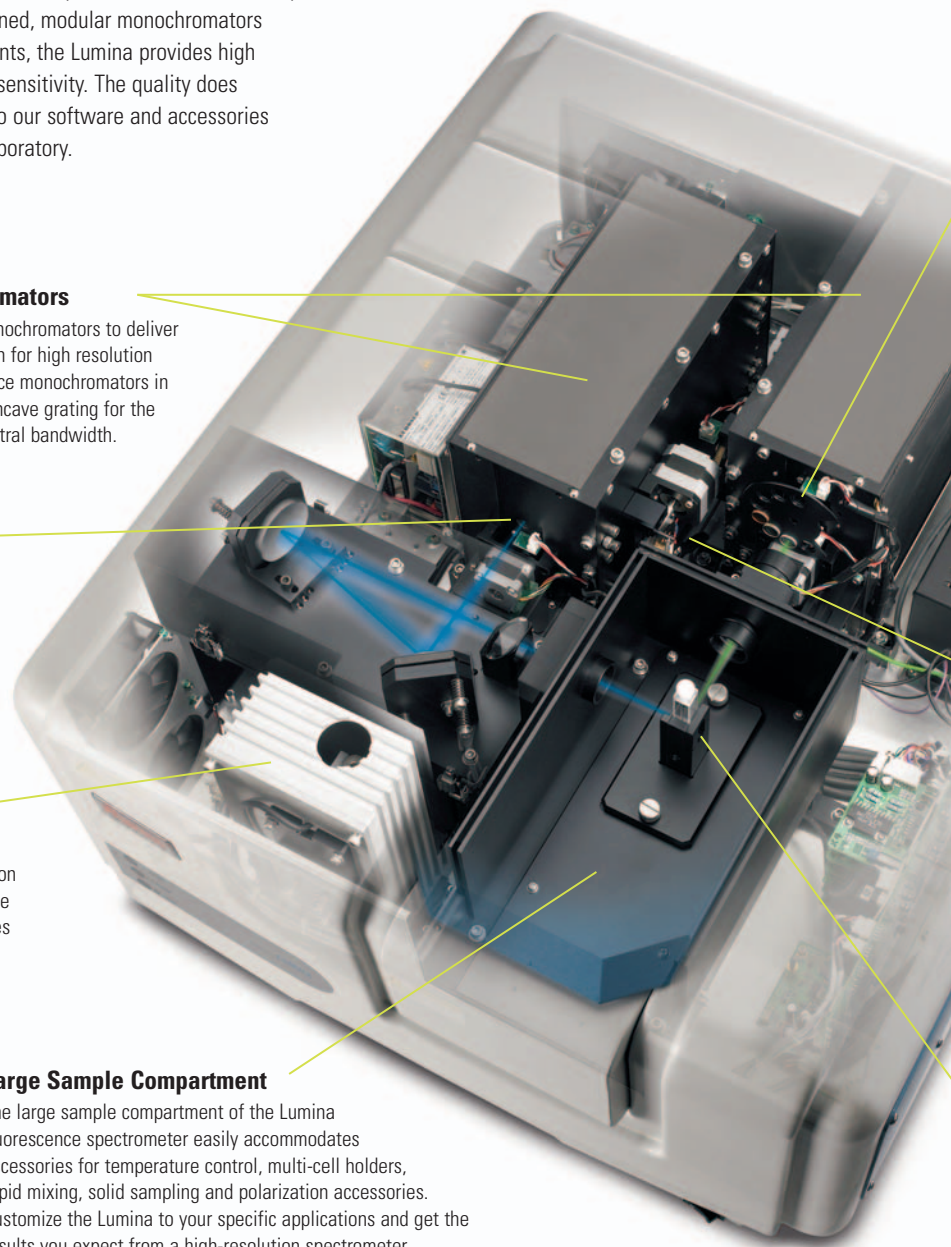
Precisely match the resolution you need with the compound you are analyzing by selecting the appropriate spectral bandwidth for your measurement. Choose from 0.5, 1.0, 2.5, 5.0, 10, 20 nm spectral bandwidths for both excitation and emission monochromators.

### 150 W Xenon Lamp

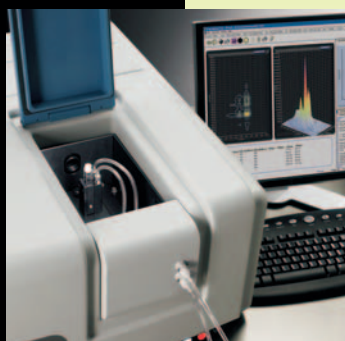
An ozone-free, 150 W xenon lamp provides extremely stable illumination throughout the full wavelength range of the Lumina. Avoid the noisy spikes and intense lines associated with xenon flash lamps and get reliable, consistent and intense illumination from the UV to the near-IR.

### Large Sample Compartment

The large sample compartment of the Lumina fluorescence spectrometer easily accommodates accessories for temperature control, multi-cell holders, rapid mixing, solid sampling and polarization accessories. Customize the Lumina to your specific applications and get the results you expect from a high-resolution spectrometer.



## Accessories that Deliver Performance and Reliability



Fluorescence is an extremely sensitive technique that requires precise control of samples during analysis. The Lumina fluorescence spectrometer has a variety of accessories to help make the most accurate and reliable fluorescence measurements. Have a demanding or specialized application? Let us help you find the right sampling accessories, optical components, and filters for your laboratory.

The **Peltier 4-Position Fluorescence Cell Holder** delivers the power of Peltier temperature control for extreme temperature accuracy and reproducibility. Temperature probe accessories allow you to monitor the temperature in two cuvettes during measurement.



Choose either the **4-Position Fluorescence Cell Holder** or the **Thermostatted 4-Position Fluorescence Cell Holder** for higher throughput fluorescence measurements for scanning, quantitative analysis, and kinetics. Recirculating water provides temperature control and optional stirring is available.



### Customizable Filters

Three longpass filters ensure the highest spectral purity by blocking excitation and scattered light. Filters for 320, 435, and 530 nm are included as standard. An open position allows for white-light excitation and total fluorescence measurements. Customize your measurements by adding up to four additional 12.5 mm round filters.

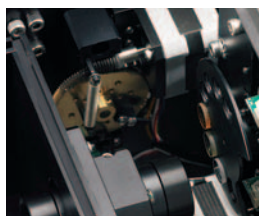


### Sensitive Detector

A high-performance R-928 PMT detector provides unparalleled sensitivity from 190–900 nm. Use this extended measurement range for the analysis of near-IR dyes, chlorophyll, or phthalocyanine compounds.

### Fast Scanning Drive

Acquire data at speeds up to 6,000 nm/min with the precision wavelength drive of the Lumina fluorescence spectrometer. A 20,000 nm/min slew speed accelerates scanning measurements and minimizes the exposure time of the sample to excitation light. Streamline synchronous and 3D experiments and maximize your sample throughput.



### Horizontal Beam Geometry

A horizontal beam geometry provides optimum excitation to deliver the maximum fluorescence signal. It also allows accurate measurements with only 500  $\mu$ L of sample.

## Powerful Software for Complete Analysis

The Luminous software provides full control of the Lumina fluorescence spectrometer and accessories. Data acquisition and processing, post-run spectral analysis, system validation and diagnostic testing are all integrated into a single platform for convenience. Take complete control of your measurements with intuitive method settings. Use a full suite of tools to process your data and then customize the information you report.

### Wave Scan Module

- Measure emission and excitation spectra using serial or synchronous scanning
- Analyze spectral data with a full suite of tools
- Use precise spectral data for examining photophysical properties of molecules, conformational changes, fluorescence anisotropy, or determining quantum yields
- Measure phosphorescence and luminescence

### Time Scan Module

- Use the Time Scan module for acquiring kinetics data with 20 microsecond resolution
- Use precise Peltier temperature control for Temperature-Based Kinetic Scan
- Calculation methods for determining reaction rate, reaction mechanism and enzyme activity
- Measure Phosphorescence lifetimes

### 3D Scan Module

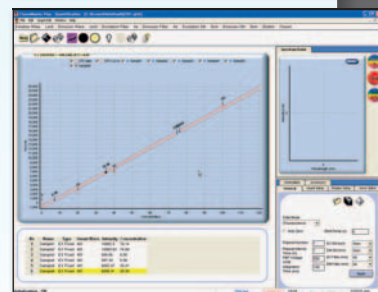
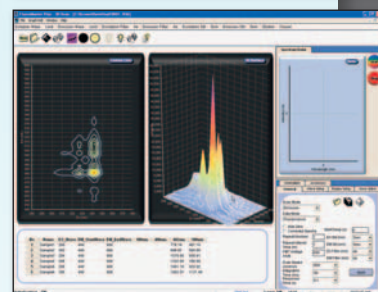
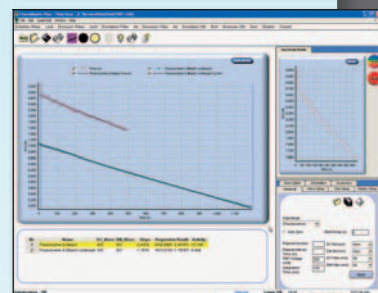
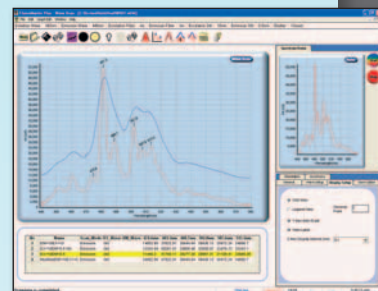
- Powerful 3D graphics module for simultaneous analysis of excitation and emission spectra
- Use contour plots and data analysis tools for demanding compound identification applications

### Quantification Modules

- Easy-to-use module for measuring fluorescence standards
- Fit calibration data with linear, 2nd or 3rd order polynomials
- Automatic calculation of sample concentrations

### Data Processing and Convenience Features

- Dedicated module for denaturation experiments like DNA melting and protein folding experiments
- Equation and quantum yield calculations
- 1st–3rd Derivative Fluorescence Spectrometry
- Graphical Peak & Valley Detection with powerful Baseline Correction
- Comprehensive Baseline Correction methods
- Easy Data Export



For the best possible accuracy and long-term stability use the **Peltier Fluorescence Single Cell Holder** with a temperature range from 10–110 °C. Useful for kinetics analysis and applications where temperature control is essential to accurate measurements. The **Thermostatted Fluorescence Single Cell Holder** allows recirculating liquid to control the temperature of a single cuvette.

For fluorescence polarization experiments, rely on the **2-Channel Fluorescence Polarization Accessory** for accurate measurements of anisotropy and polarized emission. Choose from a selection of film and Glan-Thompson polarizers.

The **Fluorescence Solid Sampling Accessory** makes measuring fluorescence from solid materials easy. The specialized sample holder accommodates a wide range of samples from thin films to substrates several centimeters thick. Use the **Quartz Powder Cell** for measuring powder and granular samples.

The **Rapid Mixing Accessory** allows you to measure reaction kinetics up to 1,000 times faster than manual mixing. Exploit the 20 microsecond data acquisition time of the Lumina and get the most accurate kinetics data.

The **Fluorescence Microcell Holder** allows you to accurately position small volume fluorescence cells in the Lumina. Get the maximum fluorescence possible with this precision accessory.



## Supplied as Standard

- Lumina fluorescence spectrometer
- Luminous software
- Single cell holder
- 100–240 V automatic power supply
- AC power cord
- 10 mm fluorescence cuvette

## Specifications

|                                               |                                                                                                          |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Optical Design                                | Czerny-Turner monochromators, concave gratings<br>20 cm focal length<br>Magnesium Fluoride coated optics |
| Beam Geometry                                 | Horizontal, 5.0 mm wide                                                                                  |
| Minimum Sample Volume                         | 0.5 mL (standard 10 mm cuvette)                                                                          |
| Excitation Grating                            | 1200 lines/mm, 250 nm blazed                                                                             |
| Emission Grating                              | 1200 lines/nm, 400 nm blazed                                                                             |
| Excitation and Emission Spectral Bandwidths   | 0.5, 1.0, 2.5, 5.0, 10, & 20 nm (fixed, selectable)                                                      |
| Light Source                                  | 150 W Ozone Free Xenon Lamp                                                                              |
| Sensitivity (Raman band of water)             | > 4000:1 RMS<br>> 1000:1 Peak-to-peak                                                                    |
| Detector                                      | R-928 Photomultiplier tube<br>Silicon photodiode for reference                                           |
| Zero Order Selection                          | Excitation and Emission                                                                                  |
| Long-pass filters for excitation and emission | 320, 435, 530 nm<br>open for zero order, 4 optional, user-determined                                     |
| Wavelength                                    |                                                                                                          |
| Range                                         | 190–900 nm                                                                                               |
| Accuracy                                      | ±0.5 nm                                                                                                  |
| Repeatability                                 | ±0.2 nm                                                                                                  |
| Slew Speed                                    | 20,000 nm/min                                                                                            |
| Scan Speed                                    | 1–6,000 nm/min                                                                                           |
| Minimum Data Interval                         | 0.1 nm                                                                                                   |
| Connectivity                                  | RS-232                                                                                                   |
| Dimensions                                    | 60 W × 65 D × 30 H cm (23.6 x 25.6 x 11.8 in)                                                            |
| Weight                                        | 45 kg (99.2 lb.)                                                                                         |
| Power Requirements                            | 100–240 V; 50–60 Hz; selected automatically                                                              |

## Ordering Information

| Product Name                                       | Part Number |
|----------------------------------------------------|-------------|
| Thermo Scientific Lumina Fluorescence Spectrometer | 222-263000  |

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|-------------------------------------|---------------------------------------|--------------------------------------|-------------------------------------|
| <b>Africa-Other</b> +27 11 570 1840 | <b>Denmark</b> +45 70 23 62 60        | <b>India</b> +91 22 6742 9434        | <b>South Africa</b> +27 11 570 1840 |
| <b>Australia</b> +61 2 8844 9500    | <b>Europe-Other</b> +43 1 333 50 34 0 | <b>Italy</b> +39 02 950 591          | <b>Spain</b> +34 914 845 965        |
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| <b>China</b> +86 10 8419 3588       | <b>Germany</b> +49 6103 408 1014      | <b>Netherlands</b> +31 76 579 55 55  | <b>www.thermo.com</b>               |

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**JH BIO**  
INNOVATIONS FOR EXCELLENCE  
JH BIO Innovations Pvt.Ltd.,  
# 68, 15th Cross, 1st Block, R.T.Nagar, Bangalore -32. INDIA.  
Ph : 080-23548433, 23434493, 23434495 Fax: 23548981  
E-mail : info@jhindia.com Web: www.jhindia.com

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