

Thermo Scientific Evolution 60S UV-Visible Spectrophotometer



Research Performance, Routine Ready



Precise



Dependable



Economical



Intuitive

Maximum Performance in a Compact Design

Built on the foundation of 60 years of experience in spectroscopy, the Thermo Scientific Evolution 60S UV-Visible spectrophotometer provides exceptional performance at an affordable price. Use the power of 1.0 nm resolution to take your measurements to the next level of clarity. Whether your application is research or routine analysis, you can count on the Evolution™ 60S for accurate and reliable data.

High Performance, Exceptional Value

The efficient optical design of the Evolution 60S features a minimum number of optical surfaces for maximum energy throughput and increased resolution with a 1.0 nm spectral bandwidth. The xenon lamp provides instant-on, UV-Visible measurements and is guaranteed for 3 years of continuous use.

Feature-rich and easy-to-use embedded software has advanced functionality, yet is simple and straightforward for routine analysis. Whether your methods require quantitative analysis, wavelength scanning, nucleic acid quantification, kinetics or other more advanced assays, Evolution 60S is the right choice.

1.0 nm Resolution for Performance, Compact Size

The Evolution 60S has a 1.0 nm spectral bandwidth providing increased resolution for your most demanding samples. A patented* out-of-plane monochromator design enables the Evolution 60S to deliver exceptional performance in a compact footprint. With

stray light and noise specifications comparable to instruments two or three times the size and price, the Evolution 60S delivers the power you need for your measurements and saves valuable bench space. Embedded software is easy to read on the large, LED-backlit display.



For added flexibility, the optional built-in printer delivers high-quality, hardcopy reports of data and graphics without increasing the instrument's space requirements.

Ingeniously Simple Software

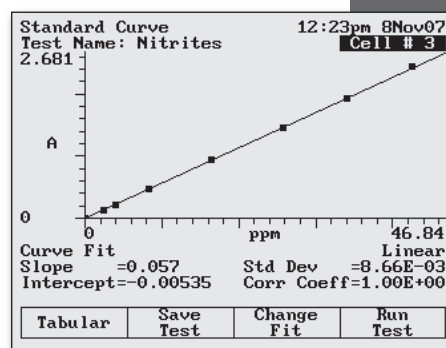
The intuitive and powerful embedded software is driven from an integrated, chemical-resistant keypad. The Evolution 60S features easy-to-learn software applications for stand-alone operation. Context sensitive SoftKeys™ ensure that routine measurements require only a few keystrokes.

For more advanced analysis, the embedded software makes method setup easy. Customized methods can be saved to internal memory or a USB device for later use.

Pre-programmed and configurable embedded software includes:

- Fast wavelength scanning up to 4,200 nm per minute
- Nucleic acid and protein concentration assays
- Quantitative analysis with up to 15 standards and five calibration curve fits
- Absorbance Ratio and Absorbance Difference measurements for quick comparisons and quality control
- Performance Verification for GLP/GMP and regulatory compliance

The Standard Curve screen provides easy set up of concentration methods. Select up to 5 curve fit options, up to 15 standards and select up to 10 pre-programmed measurement units, or create your own.



More Flexibility with Application Software

A range of software application programs are available for the Evolution 60S

Thermo Scientific VISION/ite and VISION/ite SE

Standard instrument control software with dedicated applications for scanning, fixed wavelength analysis, quantitative analysis and multi-cell kinetics. Makes data collection, storage, export and reporting fast and simple. VISION/ite™ SE enables 21 CFR Part 11 compliance in your laboratory. This simple to install and configure software gives user access and audit trail capabilities for up to 40 unique users.

EnzLab

A dedicated analyzer software package for automated enzymatic food and beverage analysis with methods for over 70 different test kits.

Thermo Scientific VISION/ite ColorCalc

Color determination software for simple or complex transmission color measurements, including liquid color. Basic and Advanced packages cover routine to specific color analysis.

Thermo Scientific VISION/ite MaterialsCalc

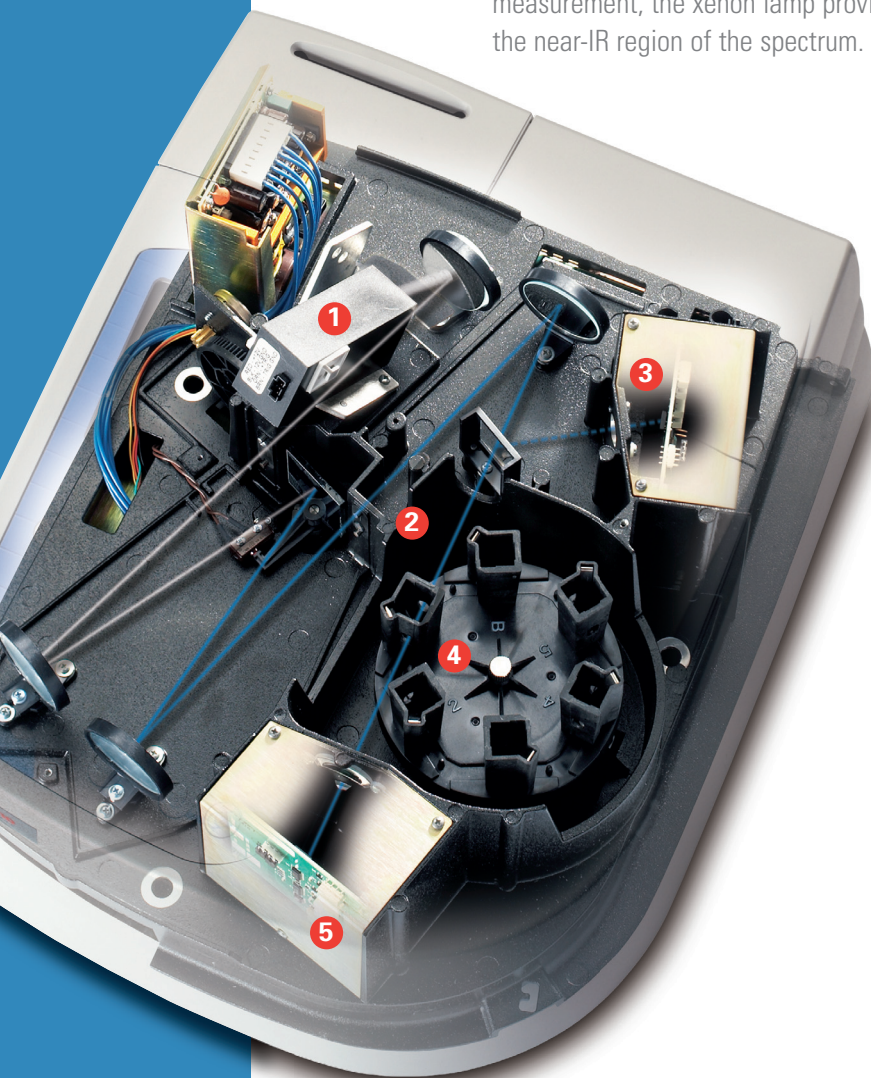
Transmission analysis of optical materials including sunglasses and plastics with built-in methods for the most common industrial standards.

Each of these application software packages completely controls the Evolution 60S spectrophotometer and the appropriate accessories.

* Patent number: US 6,414,753 B1

A Solution for Every Assay

A high-intensity xenon lamp and dual-beam optical geometry empower the Evolution 60S to deliver unsurpassed data quality throughout the entire UV-Visible range. Firing pulses of light only when the instrument is taking a measurement, the xenon lamp provides strong illumination from the UV to the near-IR region of the spectrum.



Because the light from the xenon lamp is very intense, a beam splitter can be used to extract a small portion of light to an internal reference detector without a loss of performance. This allows simultaneous measurement of the sample with real-time reference beam correction for each flash of the lamp.

The dual beam optical configuration ensures:

- each measurement is as accurate as possible – reference beam correction on each data point
- superior photometric accuracy over long measurements – no drift
- peaks do not shift as the scan speed changes

1 Xenon Flash Lamp

Long lifetime lamp is guaranteed for 3 years of continuous use.

2 Patented Out-of-Plane Monochromator Configuration

Enables maximum performance with a minimum footprint.

3 Reference Detector

Ensures the most accurate data is measured from each flash of the lamp.

4 Integrated 6-Cell Changer

Increase your sample throughput with the automation of this integrated cell changer.

5 Sample Detector

Precision silicon detectors allow measurements from the UV to the near-IR.

Accessories for Every Sample

From cell holders to temperature control, the Evolution 60S offers a wide variety of accessories to meet the sampling needs of your laboratory. Whether your needs include Peltier temperature control or remote sampling with a fiber optic probe, the Evolution 60S goes beyond the instrument to provide you with a complete laboratory solution.

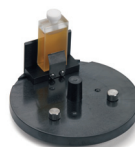
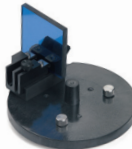


Liquid Thermo-statted Single Cell Holder



nanoCell

Solid Sample Holder



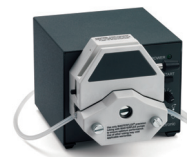
Single-Cell Peltier

Long Pathlength 50 mm Rectangular Cell Holder



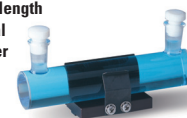
Long Pathlength 100 mm Rectangular Cell Holder

VERSA Fiber Optic Probe



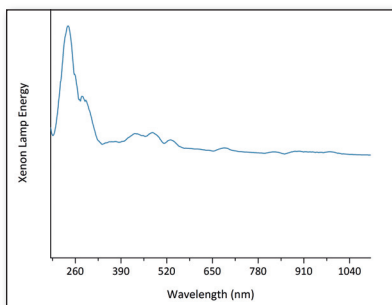
Sipper Accessory

Long Pathlength Cylindrical Cell Holder



Instant-On and Maintenance-Free

The xenon lamp in the Evolution 60S UV-Vis spectrophotometer provides excellent performance over the entire wavelength range of 190 – 1100 nm. The lamp also provides intense light in the UV region of the spectrum adding sensitivity for life science, environmental, and organic chemistry applications. Guaranteed for 3 years of continuous use, a xenon lamp typically provides 5 to 7 years of maintenance-free performance. The lamp may not need replacing over the entire lifetime of the instrument, as it is only on when taking measurements.



Other benefits of the xenon lamp include:

- no warm-up – instant measurements
- long life – rarely replaced over the life of the instrument
- will not damage sensitive samples – does not continuously expose sample to intense UV light
- temperature stability – does not change sample compartment temperature

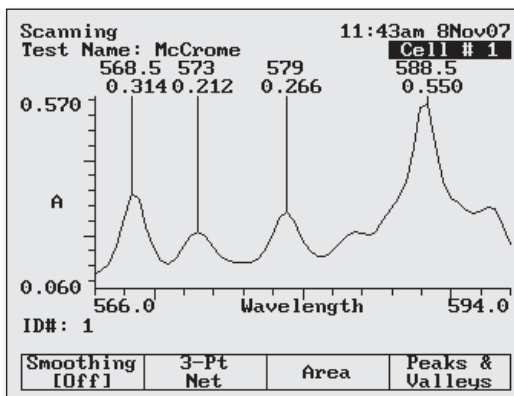
Cost of Lamp Replacement

Instrument	Instrument Purchase	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Cost of Ownership
Traditional Lamp Instrument		\$ 881	\$ 881	\$ 881	\$ 881	\$ 881	\$ 4,405
Evolution 60S	SAME	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

Savings with Xenon Lamp: \$ 4,405

Fast Wavelength Scanning

Wavelength scanning is one key aspect of UV-Visible spectrophotometric analysis. Peaks in the spectrum help identify and quantify samples. Enhanced scanning technology in the Evolution 60S acquires high-quality spectral data quickly. The Evolution 60S accelerates through wavelength scans at speeds over 4,200 nm/minute. Measuring small absorption changes in the presence of highly absorbing solutions like organic solvents is possible because of the exceptionally large photometric range.



Not only can you initiate a scan from the embedded local control software, you can also:

- analyze scan data to determine peak and valley wavelengths
- perform peak height and 3-point net calculations for a sloping baseline
- save scan data to a USB memory device
- print graphical scan data with the internal printer

Performance Verification

Performance verification tests included in the embedded software of every Evolution 60S provide pre-programmed methods for verifying instrument performance. In accordance with GLP and GMP, each verification report gives the time, date, and instrument serial number. The built-in wavelength accuracy test is compatible with either the internal lamp or external calibrated standards. Additional built-in tests allow you to monitor instrument performance to ensure reliable results.

The xenon lamp of the Evolution 60S provides an internal standard for wavelength accuracy verification. To validate the instrument performance further, built-in test methods for stray light, noise, and resolution are available.



USB Connectivity

The Evolution 60S series spectrophotometers feature USB connections which allow you to:

- Connect to a computer for software control, data analysis and storage
- Use a USB memory device to store methods and data in CSV format
- Print hard copy data reports directly to an external printer

Connecting to a desktop workstation or laptop computer has never been easier. Built-in software drivers immediately recognize the Evolution 60S series instruments and allow easy connection to



application software. Use the entire capacity of your USB memory device to store method and data files – makes file transfer quick and easy. The Evolution 60S series instruments support ink jet and laser printers with HP® PCL control.

Assays for Life Science

Every life science lab is unique and often measures a variety of samples. The Evolution 60S allows you to have a full-featured, monochromator-based spectrophotometer in your laboratory – providing flexibility for routine measurements with 1.0 nm resolution clarity. Whether you need the nanoCell accessory for occasional small-volume measurements or constant and precise Peltier temperature control, we offer a variety of accessories for your life science application needs.

DNA/RNA (260/280)		2:39pm 12Mar08	
Test Name: DNA/RNA (260/280) Cell # 4			
ID#	Abs 260nm	Abs 280nm	Abs Ref. μ L
1	0.227	0.123	0.036
	Ratio	Conc. μ g/mL	
Result	2.195	9.550	

Page 1 of 4, Sample 1
Press **F** or **I** to view data

			Measure Samples
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From simple nucleic acid concentration measurements to protein concentration and kinetics assays, embedded software on the Evolution 60S delivers the power you need in a convenient and easy-to-use interface. Pre-configured methods can be edited and then stored to personalize assay methods. Example pre-configured methods include:

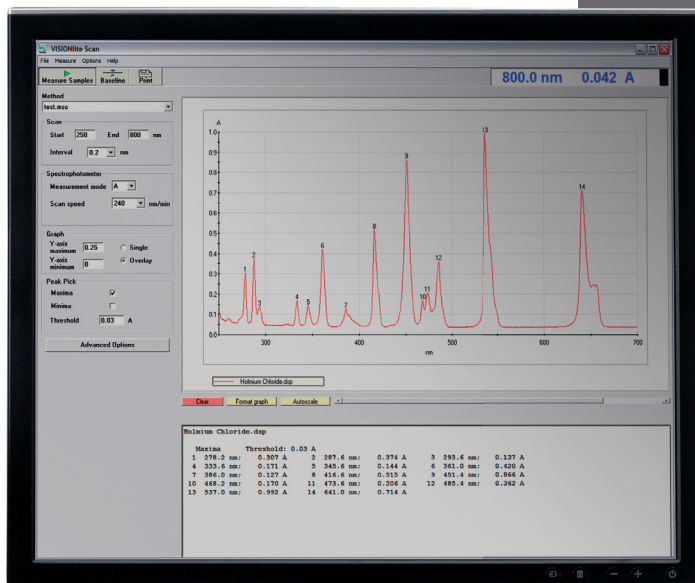
- Nucleic acid ratio and concentration (260/280 and 260/230)
- Direct protein at 280 nm and 205 nm
- Coomassie/Bradford (Standard and Micro)
- Lowry (Standard)
- BCA (Standard)
- Thermo Scientific Pierce Micro-BCA, modified Lowry, and 660 nm Protein assays
- Cell growth (with scaling factor)

Add VISION/ite software control to measure multi-cell kinetics and to acquire data for sophisticated analysis.

Customized Operational Flexibility

The Evolution 60S offers the flexibility to choose a configuration suited to your needs: Local Control, computer software control, or Local Control with computer software control. Each of these configurations offers a customized fit to your individual laboratory environment:

- **The Local Control configuration** offers complete instrument control, comprehensive method and data file manipulation, and saves valuable bench space.
- **The Computer Control configuration** uses a diverse suite of application software to control the Evolution 60S. Software control allows you to collect, store, recall, and analyze your data, using one convenient program.
- **The combination of both Local Control and Computer Control** gives you the freedom to completely customize the configuration that matches your experimental needs. For example, use Local Control to make a quick absorption measurement to determine the purity of a DNA sample. You do not need to wait for the computer to boot and the software to load. Later, to run a kinetics experiment based on a method stored on a network drive, simply open software, and switch the instrument to computer control. In multi-user environments, Local Control with computer control gives you the ultimate flexibility.



Evolution 60S Specifications

Optical Design	Dual Beam – Internal Reference Detector
Spectral Bandwidth	1.0 nm
Light Source (Typical Lifetime)	Xenon Flash Lamp (5 years; 3 years guaranteed)
Detectors	Dual Silicon Photodiodes
Wavelength	
Range	190 – 1100 nm
Accuracy	± 0.8 nm
Repeatability	± 0.5 nm
Slew Speed	11,000 nm/min
Scan Speed	10 – 4200 nm/min
Data Interval for Scanning	0.1, 0.2, 0.5, 1.0, 2.0, 3.0, 5.0 nm
Photometric	
Linear Range	> 3.5 A
Display	-0.5 – 5.0 A; -1.5 – 125% T; ± 9999 C
Accuracy	± 0.005 A at 1.0 A 0.010 A K ₂ Cr ₂ O ₇
Noise	< 0.00025 at 0.0 A, < 0.00050 at 1.0 A, < 0.00080 at 2.0 A, RMS at 260 nm
Drift	< 0.0005 A/hr
Stray Light	< 0.08%T at 220, 340nm (NaI, NaNO ₂) < 1.0%T 198 – 200 nm (KCl)
Resolution (Toluene in Hexane)	> 1.5
Display	Graphical with LCD backlight 9.7 x 7.1 cm (3.8 x 2.8 in.)
Keypad	Sealed Membrane with tactile response keys
Printer (optional)	40 column Internal (text and graphics) External USB printer (HP PCL 3.0 and greater)
Connectivity	USB Type A port for USB memory device (front panel) USB Type B port for optional computer connectivity (rear panel) USB Type A port for external printer (rear panel)
Dimensions	30 W x 40 D x 25 H cm (11.8 x 15.7 x 9.8 in)
Weight	8.6 kg (19 lb.)
Power Requirements	Selected Automatically 100 – 240 V; 50 – 60 Hz

Supplied as Standard

- Evolution 60S spectrophotometer
- 6-position cell changer
- Aluminum baseplate single cell holder
- AC power cord
- 100–240 V automatic power supply
- Protective plastic cover
- USB memory device
- USB cable

Note: Software is not included with the instrument and must be ordered separately.

Ordering Information

Description	Part Number
Evolution 60S UV-Vis, Local Control, US line cord	840-208500
Evolution 60S UV-Vis, Local Control with internal printer, US line cord	840-208600
Evolution 60S UV-Vis, Local Control, Euro & UK line cords	840-210100
Evolution 60S UV-Vis, Local Control with internal printer, Euro & UK line cords	840-210200
Evolution 60S UV-Vis, Computer Control, US line cord	840-208700
Evolution 60S UV-Vis, Computer Control, Euro & UK line cords	840-210300

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