

# Thermo Scientific GENESYS 10S Series UV-Visible Spectrophotometers



## *Powerful Performance, Affordable Price*



Accurate



Reliable



Easy-to-Use

## Accurate, Reliable, and Easy-to-use

Built on the foundation of over 17,000 Thermo Scientific GENESYS 10 series instruments sold worldwide and 60 years of experience in spectroscopy, the new GENESYS™ 10S series of spectrophotometers provides exceptional performance at an attractive price. Whether your application is research or routine analysis, educational or industrial, you can count on the GENESYS 10S for accurate and reliable results.

### Affordable to Purchase, Inexpensive to Own

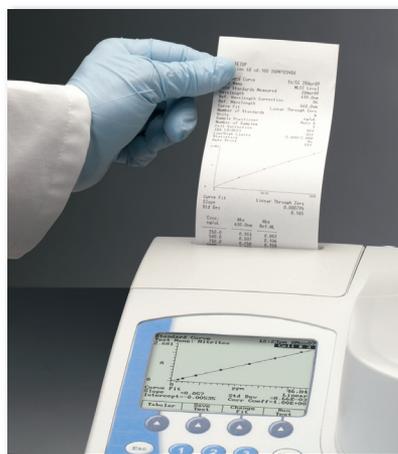
The GENESYS 10S series of instruments offer an excellent value providing robust operation, ease of use, and low cost of ownership. The efficient optical configuration delivers high performance with a minimum number of optical surfaces in a true monochromator design. A xenon lamp provides instant-on UV-Visible measurements and is guaranteed for 3 years of continuous use. The GENESYS 10S Vis uses a tungsten lamp and single detector to support routine measurements in the visible range.

With only three moving parts, the GENESYS 10S series is designed for maximum reliability. You can count on these instruments to perform for your most demanding applications.

Feature-rich and easy-to-use embedded software has advanced functionality for more demanding samples, yet it is simple and straightforward for routine analysis. The GENESYS 10S series instruments are the right choice for any application, analysis, or SOP.

### Big Performance, Small Size

A patented\* out-of-plane monochromator design enables the GENESYS 10S series instruments to deliver exceptional performance in a very compact footprint. With stray light and noise specifications comparable to instruments two or three times the size and price, our instruments save valuable bench space in your laboratory leaving room for additional equipment. For added flexibility, the optional built-in printer delivers high-quality, hard copy reports of data and graphics.

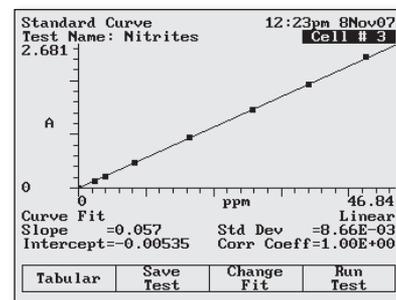


### Intuitive and Powerful Software

The intuitive software is driven from an integrated, chemical-resistant keypad. The GENESYS 10S features easy-to-learn software applications for stand-alone operation. Context-sensitive SoftKeys™ ensure that routine measurements require only a few keystrokes.

Setting up customized methods allows for more advanced analysis without a computer. Customized methods can be saved for later use. Pre-programmed and configurable methods allow:

- Fast wavelength scanning at up to 4,200 nm/minute
- Absorbance Ratio and Absorbance Difference measurements for quick comparisons and quality control
- Quantitative analysis with up to 15 standards and five calibration curve fits
- Multiple fixed measurements at up to 31 different wavelengths
- 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 up to 10 pre-programmed measurement units, or create your own.

## Additional Flexibility with Application Software

*A range of software application programs are available for the GENESYS 10S series instruments.*

### 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 GENESYS 10S spectrophotometer and the appropriate accessories.*

\* Patent number: US 6,414,753 B1

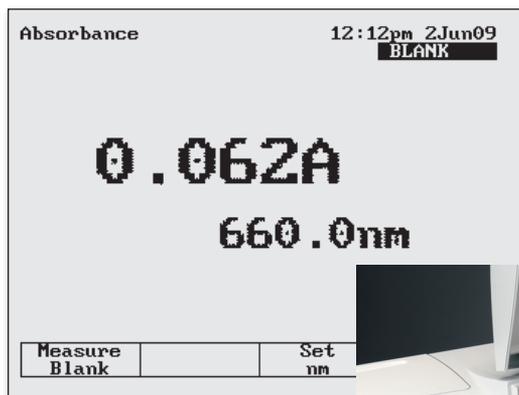
## USB Connectivity

The GENESYS 10S 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 GENESYS 10S 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 GENESYS 10S series instruments support ink jet and laser printers with HP® PCL control.



## Walk-up Simplicity

Not all UV-Visible measurements are complex – sometimes only a quick absorbance or percent transmission reading is necessary. A simple walk-up screen displays the real-time measurement and the wavelength for fast and easy readings. The xenon lamp of the GENESYS 10S UV-Vis does not require warm-up time and is ready to provide accurate data instantly.



## Research Quality Measurements with Routine Simplicity

A high-intensity xenon lamp and dual-beam optical geometry empower the **GENESYS 10S UV-Vis spectrophotometer** 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.

The GENESYS 10S UV-Vis uses dual-beam optics to make accurate measurements. Because the light from the xenon lamp is very intense, a beam splitter can be used to extract and measure a small portion of light to an internal reference detector without a loss of performance in sample measurement. This allows simultaneous measurement of the sample with real-time reference beam correction for each flash of the lamp.

The dual beam optical configuration has performance advantages over single-beam and array detector instruments and 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

### Flexible 1.8 nm Bandwidth

The GENESYS 10S UV-Vis balances regulatory compliance with sensitivity. A 1.8 nm spectral bandwidth allows the system to meet Pharmacopeia requirements for resolution. The 1.8 nm bandwidth permits more light energy to reach the sample resulting in lower detection limits and superior signal-to-noise performance.

#### 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

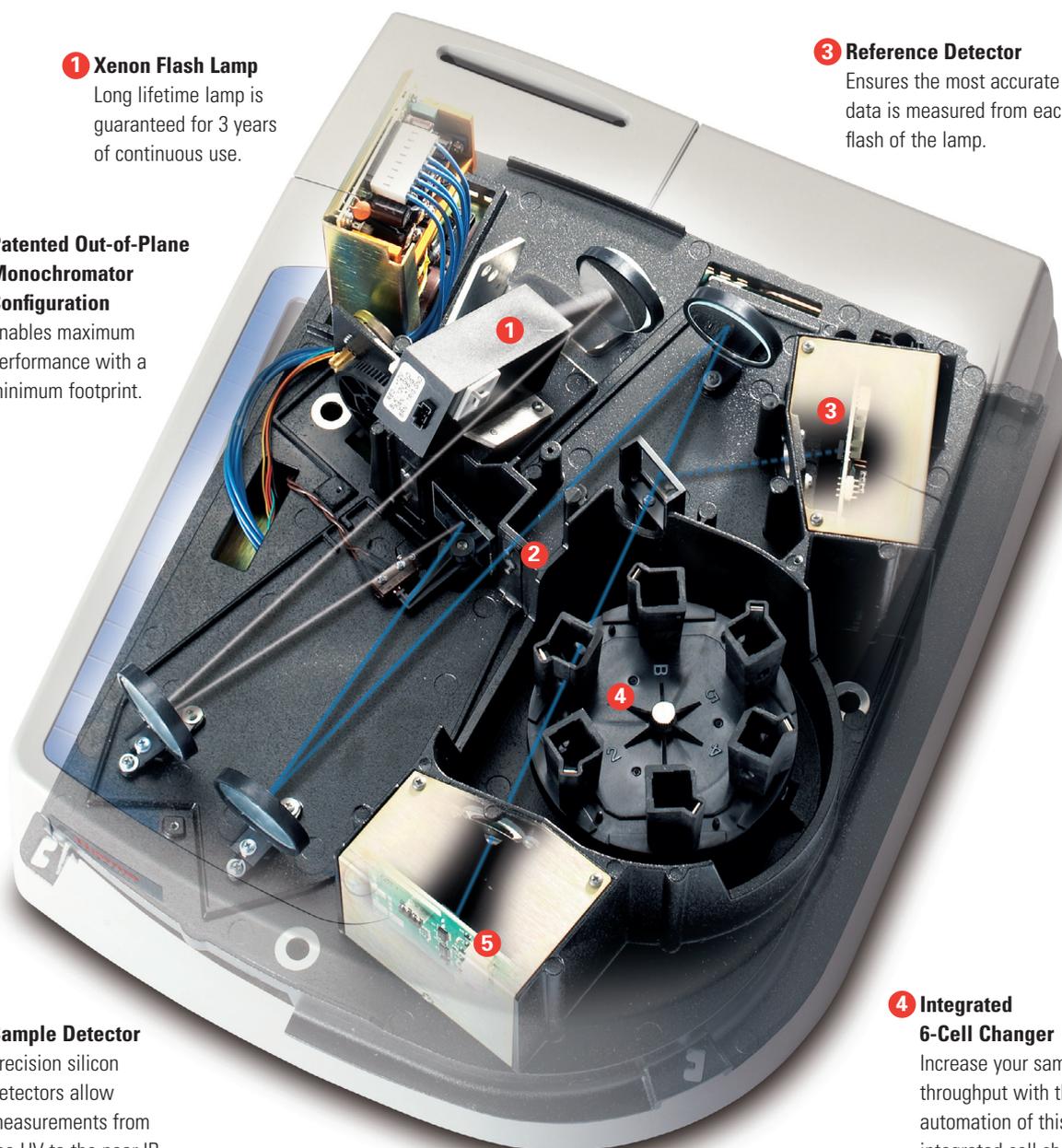
Ensures the most accurate data is measured from each flash of the lamp.

#### 5 Sample Detector

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

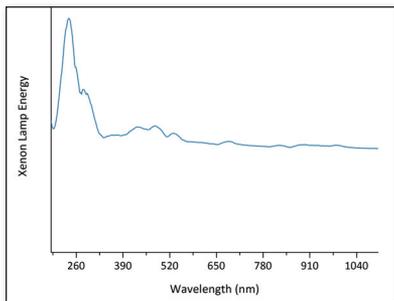
#### 4 Integrated 6-Cell Changer

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



## Instant-On and Maintenance-Free Xenon Lamp

The xenon lamp in the GENESYS 10S UV-Vis spectrophotometer provides excellent performance over the entire wavelength range of 190-1100 nm. It also provides intense light in the UV region of the spectrum adding sensitivity for life science, environ-



mental, and organic chemistry applications. Guaranteed for 3 years of continuous use, the 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. The 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	<b>SAME</b>	\$ 881	\$ 881	\$ 881	\$ 881	\$ 881	\$ 4,405
GENESYS 10S UV-Vis		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

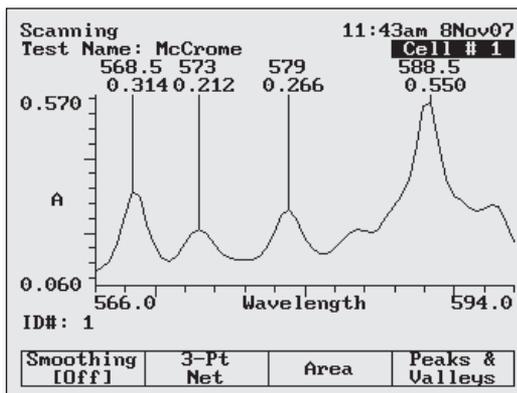
**Savings with Xenon Lamp: \$ 4,405**

## Fast Wavelength Scanning

Wavelength scanning is one key aspect of UV-Visible spectrophotometric analysis. Enhanced scanning technology in the GENESYS 10S series acquires high-quality spectral data quickly. The GENESYS 10S series instruments accelerate through wavelength scans at speeds up to 4,200 nm/minute. The exceptionally large photometric range allows you to accurately measure small absorbance changes even when using highly absorbing blank samples. 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



## Options for Life Science

Every life science lab is unique and often measures a variety of samples. Having a full-featured, monochromator-based spectrophotometer in your laboratory provides flexibility for routine and advanced assays. 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 assays.

From simple nucleic acid concentration measurements to protein concentration and kinetics assays, the embedded software in our life science analyzers 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 quickly. 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 Protein assays
- Cell growth (with scaling factor)

Add software control to measure multi-cell kinetics and to acquire data for sophisticated analysis. Ask your sales representative for more information about our dedicated life science analyzers.

### Protein Tests

15:22 30Jul09

**Protein Conc. (280)**  
 Coomassie/Bradford Std  
 Coomassie/Bradford Micro  
 Pierce 660nm Protein  
 Lowry-Standard  
 Pierce Modified Lowry  
 BCA-Standard  
 Pierce Micro BCA (tm)  
 Biuret  
**Protein Conc. (205)**  
 Warburg-Christian

Press ↑ or ↓ to select

		Stored Tests	Basic ATC

### DNA/RNA (260/280)

2:39pm 12Mar08

Test Name: DNA/RNA (260/280) Cell # 4			
ID#	Abs 260nm	Abs 280nm	Abs Ref.WL
1	0.227	0.123	0.036
	<b>Ratio</b>	<b>Conc.</b>	
<b>Result</b>	2.195	9.550	

Page 1 of 4, Sample 1

Press ↑ or ↓ to view data

			Measure Samples

## Cost-Effective Visible Only Measurements for Teaching and Routine Quality Control

The **GENESYS 10S Vis spectrophotometer** offers the same powerful and agile performance as the UV-Visible configuration in a visible-only version. Leverage the power of a traditional, grating-based spectrophotometer to teach your students the basics of spectroscopy. The straightforward embedded software interface is easy to teach and use. Many important experiments can be performed using the visible region of the spectrum including simple enzymatic assays, color determination, and concentration measurements.

The 5.0 nm spectral bandwidth is ideal for most routine quality control measurements. When high resolution is not required to resolve closely spaced peaks, the added energy throughput of the GENESYS 10S Vis extends the sensitivity of your analysis and increases the signal-to-noise ratio for dilute samples. Precision electronics and a simple, single-beam optical geometry provide accurate results.

### Power and Performance With or Without a PC

The GENESYS 10S series instruments are optimized for the classroom or teaching lab – offering great value and many features for their small footprint. These lightweight instruments are easy to transport and store. Offering the ergonomic choice of a simple, but powerful embedded software interface or optional computer control with application software tailors the spectrophotometer to your needs. Use the embedded software to acquire scanning, fixed wavelength, kinetics, or concentration data and easily save the experimental data in a spreadsheet-compatible, CSV format.

Students can:

- acquire the data in the lab
- save it to a memory device
- use a separate computer for analyzing data and writing lab reports

Application software with computer control of the instrument further extends the types of experiments that can be performed in the laboratory and allows more sophisticated analysis. *VISION/lite* instrument control software offers an intuitive interface for wavelength scanning, fixed wavelength analysis, single and multi-cell kinetics, and quantitative analysis. This easy-to-use and easy-to-teach interface makes acquiring, analyzing and exporting data straightforward – allowing you to focus on the experiment, not the software.



## Automation for Routine Analysis

With a small footprint and easy-to-use embedded software, the GENESYS 10S series is ideal for routine sample analysis. For simple, multi-sample experiments, automate your analysis with the built-in 6-Cell Changer. With one position reserved for a blank, the cell changer allows the automated analysis of up to five samples. The 6-Cell Changer can be removed easily and replaced with other cell holders including long pathlength cell holders, Peltier and recirculating water temperature control cell holders, and flow cells for sipper systems.

For high throughput liquid sample analysis, a versatile peristaltic pump sipper system is available. Installation is fast and simple – slide on the sipper spout, attach



tubing and you are ready to take data. A variety of flow cells is available, with pathlengths from 1 to 100 mm and volumes as low as 8 microliters.

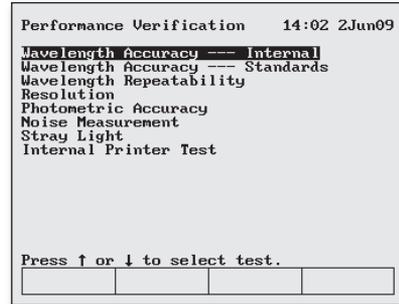
## Performance Verification

Performance verification tests included in the embedded software of every GENESYS 10S series instrument 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 data collection.

The xenon lamp of the GENESYS 10S UV-Vis 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.



A cost-effective Green Dye standard is available to verify both photometric accuracy and wavelength accuracy of the GENESYS 10S series instruments. With certified values at 260, 430, and 630 nm, this standard provides a check of wavelength and photometric accuracy from the UV to the near-IR.



## Accessories for Every Sample

From cell holders to temperature control, the GENESYS 10S series of spectrophotometers 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 GENESYS 10S series goes beyond the instrument to provide you with a complete laboratory solution.

**Aluminum Baseplate Cell Holder**



**Single-Cell Peltier**



**Liquid Thermostatted Single Cell Holder**



**Long Pathlength Cylindrical Cell Holder**



**Long Pathlength 100 mm Rectangular Cell Holder**



**nanoCell**



**Adjustable Filter Holder**



**VERSA Fiber Optic Probe**



**Long Pathlength 50 mm Rectangular Cell Holder**



**Sipper Accessory**

# GENESYS 10S Series Specifications

	GENESYS 10S UV-Vis	GENESYS 10S Vis
Optical Design	Dual Beam – Internal Reference Detector	Single Beam
Spectral Bandwidth	1.8 nm	5.0 nm
Light Source (Typical Lifetime)	Xenon Flash Lamp (5 years; 3 years guaranteed)	Tungsten-Halogen Lamp (1000 hrs.)
Detector	Dual Silicon Photodiodes	Silicon Photodiode
Wavelength: Range	190 – 1100 nm	325 – 1100 nm
Accuracy	± 1.0 nm	
Repeatability	± 0.5 nm	
Slew Speed	11,000 nm/min	
Scanning Speed	10 – 4,200 nm/min	
Data Interval	0.2, 0.5, 1.0, 2.0, 3.0, 5.0 nm	1.0, 2.0, 3.0, 5.0 nm
Photometric: Linear Range	Up to 3.5 A at 260 nm	Up to 3.0 A at 340 nm
Display	-0.5 – 5.0 A; -1.5 – 125%T; ± 9999 C	-0.1 – 3.0 A; -0.3 – 125%T; ± 9999 C
Accuracy	± 0.005 A at 1.0 A 0.010 A K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	0.5% or ± 0.005 A, whichever is greater up to 2 A
Noise	< 0.00025 at 0.0 A < 0.00050 at 1.0 A < 0.00080 at 2.0 A RMS at 260 nm	< 0.001 A at 0.0 A < 0.002 A at 2.0 A Peak-to peak at 340 nm
Drift	< 0.0005 A/hr	0.002 A/hr after warm-up
Stray Light	< 0.08%T at 220, 340nm (NaI, NaNO <sub>2</sub> ) < 1.0%T 198 nm (KCl)	< 0.1%T at 340, and 400 nm
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 or 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

- GENESYS 10S Series spectrophotometer
- 6-position cell changer
- Single cell holder
- 100 – 240 V automatic power supply
- AC power cord
- Spare fuses
- Protective plastic cover
- USB memory device
- USB cable

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

## Ordering Information

GENESYS 10S UV-Vis Instruments	Part Number
GENESYS 10S UV-Vis, US line cord	840-208100
GENESYS 10S UV-Vis, with internal printer, US line cord	840-208200
GENESYS 10S UV-Vis, Europlug & UK line cords	840-209700
GENESYS 10S UV-Vis, with internal printer, Europlug & UK line cords	840-209800
GENESYS 10S Vis Instruments	Part Number
GENESYS 10S Vis, US line cord	840-207900
GENESYS 10S Vis, with internal printer, US line cord	840-208000
GENESYS 10S Vis, Europlug & UK line cords	840-209500
GENESYS 10S Vis, with internal printer, Europlug & UK line cords	840-209600

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