

## Spectronic BioMate 3 and Spectronic BioMate 5 UV-Visible Spectrophotometers



### Versatile, accurate UV-Vis for life science applications

Thermo Electron Corporation, with over 60 years of experience in UV-Vis spectrophotometry, has designed the BioMate™ Series – the instruments you can count on to meet the demands of your laboratory.

#### Rapid, Reliable Nucleic Acid and Protein Analysis Results

The Spectronic BioMate 3 and Spectronic BioMate 5 put leading-edge technology into a compact, convenient design. You get all the versatility and flexibility you need to obtain accurate, reliable measurements for your biotech research. Both models feature a user-friendly interface, powerful optics, rugged design, versatile software capabilities, optional built-in printer and much more.

The time-saving software makes your job easier. Just put your sample in and obtain accurate results in seconds. Pre-programmed procedures enable even first-time users to perform:

- DNA ratio and concentration with and without scanning
- Protein standard curves using Bradford, Lowry, BCA, and Biuret reagents
- Direct UV concentrations of dsDNA, ssDNA, RNA and oligonucleotides
- Cell growth
- Oligo calculations

#### Plus, All the Capabilities of a Standard Lab Spectrophotometer

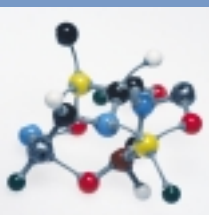
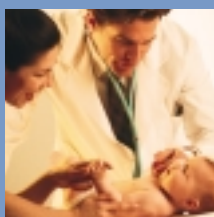
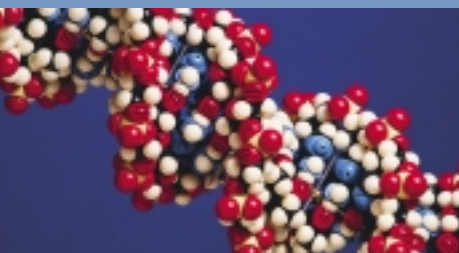
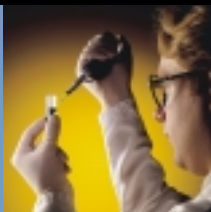
The Spectronic BioMate 3 system is not just dedicated to DNA and protein analyses. It is an ideal general-purpose spectrophotometer for such life science applications as multi-wavelength and simple kinetic-reaction measurements.

Looking for even greater flexibility and performance? The Spectronic BioMate 5 system can handle applications such as calculating enzyme-rate reactions or substrate concentrations.

Both models are monochromator-based, offering you a full wavelength range and superb accuracy.

#### Everything a Life Sciences Lab Needs and More...

- Customize your instrument for your specific applications. Use the unique SmartStart™ feature to easily create a power-up menu that displays only the tests your lab uses. This saves time and reduces error.
- Save time by using the built-in Oligo calculator to determine the molecular weight and the theoretical T<sub>m</sub> (used to determine the PCR annealing temperature) of your oligonucleotides
- Save time and reduce setup error by saving your programmed methods, and protect your saved methods with passwords
- Easily ensure that your instrument is performing to specification, and prove it with logs and documented evidence using built-in and/or accessory traceable instrument performance standards



### Hardware

- Optical specifications comparable to instruments twice their size
- High-resolution graphics display
- Small footprint saves bench space
- Easy-to-use keyboard to set up tests, print results, and move cell changer

### Additional Features and Accessories

- Test tube holders
- Affordable sipper accessories
- Multi-cell holders measure multiple samples with the push of a button
- Micro-cells for small volumes
- Built-in printers show all parameters, date, time, test name, data, final results, and statistics

### For Busy Lab Operators, It Is the Smart Choice

These spectrophotometers feature the unique SmartStart screen that lets you select only the tests you require. Simply pre-program one, two, or more of your frequently used methods. When you turn the instrument on, the boot-up screen immediately shows the selected tests – without additional scrolling. After your data is acquired, you can print all instrument parameters, date, time, sample number, and data on an optional printer.

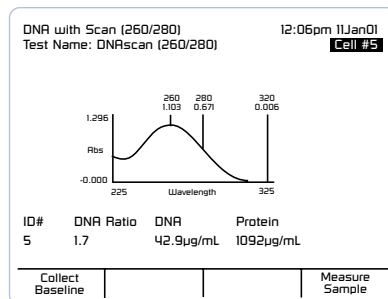
### DNA/Protein Concentration and DNA Purity

- Test results are shown on the screen in seconds.
- Parameters for determining DNA purity, DNA concentration, and protein concentration are pre-selected; use default parameters or customize them to specific needs.
- Choose whether or not to display protein concentration on the results screen.
- An optional reference wavelength corrects for the effect of turbidity.
- Built-in dilution-factor calculator delivers direct concentration results.

DNA (260/280)			
Test Name: DNA (260/280)			
ID#	Abs 260nm	Abs 280nm	Abs 320nm
1	0.725	0.410	0.010
	DNA Ratio =	1.79	
	DNA Conc =	30.57 µg/mL	
	Protein Conc =	79.33 µg/mL	
2	0.294	0.162	0.005
	DNA Ratio =	1.84	
	DNA Conc =	12.53 µg/mL	
	Protein Conc =	24.80 µg/mL	

### DNA/Protein Concentration and DNA Purity with Scan

- Easy, one-step operation.
- Displays scan of DNA sample and results.
- Offers the option to add reference wavelength and dilution factor.



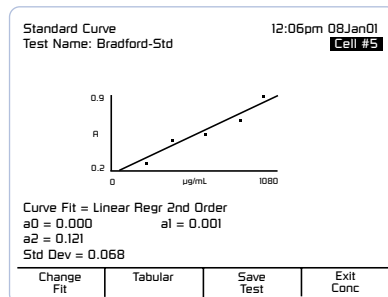
### Direct UV/DNA Measurements

- Measures direct ssDNA, dsDNA, RNA, and oligo concentrations using absorbance at 260 nm.
- Measures oligo concentration using base sequence calculator.
- Enables operators to select pre-set units or create new ones.

ID#	Abs 260nm	Oligos µg/mL	Oligos pmol/µL
1	0.736	21.79	1.342
2	0.309	9.146	0.562
3	0.452	13.38	0.824

### Protein Concentration

- Offers seven standard curve methods for measuring protein – Bradford, Lowry, BCA (all with standard and micro) plus Biuret.
- Use pre-set or user-defined wavelength, units of measure, and curve fit.
- Provides three UV methods – direct 280 nm, direct 205 nm, and Warburg-Christian calculation.
- Offers print-outs that show standard curve and results.



Std#	µg/mL	Abs 595nm
1	200	0.221
2	400	0.464
3	600	0.521
4	800	0.650
5	1000	0.883

Curve Fit = Linear Regr 2nd Order  
a0 = 0.00 a1 = 0.001  
a2 = 0.121  
Std Dev = 0.068

### Cell Growth

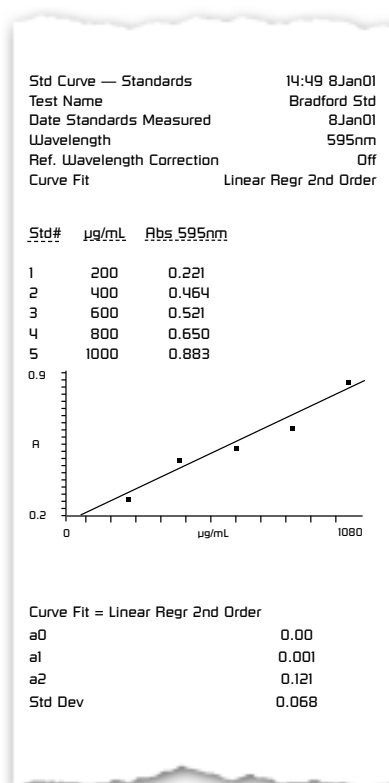
- Monitors cell growth by measuring absorbance at 600 nm.
- Determines when to harvest cells.

### Oligo Calculator

- Enter in a base sequence and the instrument calculates molecular weight, theoretical Tm, and oligo concentration factor.
- Choose from one of four Tm calculation methods.

Base Sequence	Tm Calc
ATCGTCGATTGAGCATCAGCATGACTAGATCAGATCGCG	

Number of bases = 40  
%GC = 47.56  
DNA Mol. Wt. = 12388  
DNA & (260) = 441550  
Conversion Factor = 28.06



Typical printout showing standard curve data and plot.

## Built to Perform. Built to Last

As a researcher, you need quick answers from your tests. Or perhaps you need data to support theories of molecular-reaction mechanisms. Whatever your need or application, there is a Spectronic BioMate instrument that can meet it.

Both systems feature high-quality optics for accurate and precise measurements. The Spectronic BioMate 3's long-life xenon lamp delivers an outstanding signal-to-noise ratio, negligible drift and no warm-up time for accurate, precise measurements over the 190 – 1100 nm wavelength range. It also provides calibrated wavelength peaks that are used as built-in wavelength standards for performance verification.

For even higher-level optics, our Spectronic BioMate 5 system features double-beam optics for long-term stability. It is just what you need when running kinetic-reaction tests with a changing reference.

## Spectronic BioMate 5 – Additional Benefits

- 2 nm bandwidth to resolve sharp peaks
- Fast, full-range scanning and 1st – 4th derivative capabilities
- Superb stray-light rejection for exceptional linearity
- Automatic rate measurements on up to seven samples (in parallel) – run times up to 40 hours
- Advanced spectral manipulation and rate/enzyme kinetics applications
- High-performance electronics that distinguish between small absorbance changes
- Ability to save methods and data to non-volatile memory or to floppy-disk drive
- Optional built-in spread sheet for simple or complex calculations

## VISION Software – Complete Suite of Software Options

Optional software packages are available for the Spectronic BioMate 5 series that allow you to perform a wide range of analyses.

### VISION<sup>pro</sup>™ Software

- A comprehensive package with scanning, single wavelength, multiple wavelength, quantification, and multi-component analysis supplied as standard functions.
- Advanced data manipulation features allow you to get your results in the form you need
- Custom report flexibility including methods, graphs, data, Microsoft® Word files, Excel spreadsheets, and graphics

### VISION<sup>security</sup>™ Software

- Complete software package with advanced security options and VISION<sup>pro</sup> functionality.
- Meets security requirements of regulated and quality control laboratories
- Provides tools required to achieve 21 CFR Part 11 compliance
- Electronic Signatures for data and method traceability

### VISION<sup>life</sup>™ Software

- Life science module for VISION<sup>pro</sup> and VISION<sup>security</sup>
- Kinetics for intensity change with time studies
- Parallel rate measurements for advanced enzyme system measurements
- Comprehensive manipulation and rate calculation options
- Enzyme kinetics and equation modeling



## Versatile Accessories Maximize Productivity



### MiniSipper

- Measure 300 samples/hour
- Glass or quartz flowcells



### CVC (Calibration Validation Carousel)

- Automatic validation testing
- Wavelength and absorbance accuracy
- Saves data to disk



### Test-tube/cuvette Cell Holder

- Holds test-tube up to 18 mm diameter
- Holds 10 mm square cuvette

	Spectronic BioMate 3 UV-Vis Part Number 335904 Series Part Number 335905 Series	Spectronic BioMate 5 UV-Vis Part Number 9423BI01002E Part Number 9423BI01202E
Spectral Bandwidth	5 nm	2 nm
Optical System	Split-beam, grating-based, dual detectors	Double-beam, quartz-coated optics
Lamp Source: Typical Lifetime	Xenon: 5 years	Deuterium: 1000 hrs, Tungsten: 2000 hrs
Wavelength:		
Range	190 – 1100 nm	190 – 1100 nm
Accuracy	± 1.0 nm	± 1.0 nm
Repeatability	± 0.5 nm	± 0.2 nm
Graphic Display	320 x 240 pixel LCD, 3.8" x 2.8"	VGA-Quality Graphics LCD, 4.5" x 3.3"
Photometric:		
Range	0.3 – 125%T; -0.1 – 3.0A; 0 – 9999 C	-0.1 – 200%T; -0.3 – 3.0A; 0 – 9999 C
Readout	Absorbance, Transmittance, Concentration	Absorbance, Transmittance, Concentration
Accuracy	0.5% of reading or 5 mA, whichever is greater, up to 2A	+5 mA at 1A
Noise	< 1 mA at 0A; < 2 mA at 2A, peak-to-peak at 340 nm	< 0.1 mA
Drift	< 1 mA/hour after warm-up	< 1 mA/hour after warm-up
Stray Light	< 0.1%T at 220 and 340nm	< 0.05%T at 220 and 340 nm
Standard Interface	Bi-directional RS-232C	Bi-directional RS-232C Parallel port Sipper and accessories
Standard Cell Holder	1-position or 6-position automatic cell holder	7-position automatic cell holder, thermostatable
Keypad	Membrane keypad	Membrane keypad
Software	DNA ratio/concentration and protein concentration with or without scanning Direct oligo concentration at 260 nm Direct protein at 280 nm and 205 nm Protein standard curves Cell growth Oligo calculator: absorptivity, molecular weight, factor and theoretical Tm Absorbance, %T, Concentration Standard curve Absorbance ratio Absorbance difference Multiwavelength Kinetics	
	Survey Scan	Full Scan
	Performance Validation	Performance Validation Multi-component Analysis (MCA) VISION <sup>pro</sup> software (optional) VISION <sup>security</sup> software (optional) VISION <sup>life</sup> software (optional)
Test Storage	Up to 40 sets of test parameters	Unlimited; 30 in memory plus 1.44 Mb floppy disk drive
Languages	Software, printout and Operator's Manual: English, French, German, Spanish, Italian (user-selectable)	
Printer (optional)	40-column internal graphical	50-column internal graphical or external printers
Power Requirements	Selected automatically; 100 – 240 volts	Selected automatically; 100 – 240 volts
Dimensions	330 W x 410 D x 235 H mm; (13" x 16" x 9")	455 W x 395 D x 215 H mm; (18" x 15.5" x 8.5")
Weight	8.6 Kg (19 lb.)	10 Kg (22.1 lb.)
Warranty	1 year	

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