

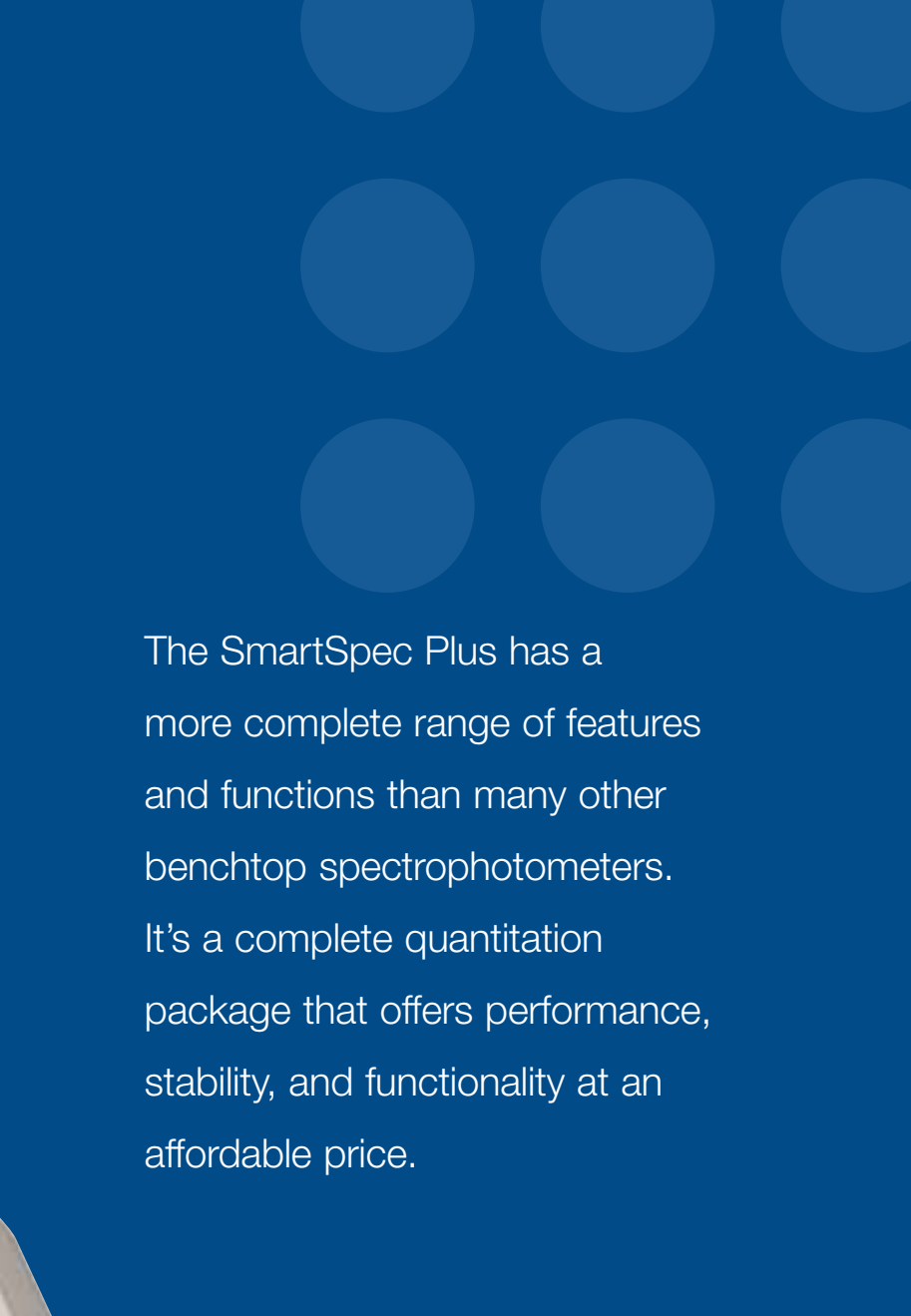


SmartSpec™ Plus spectrophotometer



Simply Brilliant.

BIO-RAD



The SmartSpec Plus has a more complete range of features and functions than many other benchtop spectrophotometers. It's a complete quantitation package that offers performance, stability, and functionality at an affordable price.



Simplified Sample Quantitation That's Perfect for Life Science Applications

The SmartSpec Plus is a scanning tabletop UV/visible spectrophotometer that is versatile and easy to use.

A perfect tool for routine quantitation of nucleic acid and protein samples, the SmartSpec Plus provides life science researchers with an instrument for:

- Spectral scanning, with maximum and minimum absorbance detection
- Sample assays within a working wavelength range of 200–800 nm
 - Quantitation of DNA, RNA, and oligonucleotides
 - Quantitation of proteins using UV, Bradford, Lowry, and BCA assay methods
- Monitoring of cell culture growth
- Simple kinetic assays

The SmartSpec Plus spectrophotometer has been designed with the user in mind. A simple menu-driven interface simplifies assays and provides common sample computations at the touch of a button. Conversion factors may be stored and modified as needs change.

The SmartSpec Plus is capable of providing results and performing calculations such as:

- A_{260}/A_{280} ratio for nucleic acid purity
- Quantitation that takes dilution factors into account
- Sample concentration in mg/ml, $\mu\text{g/ml}$, and pmol/ μl
- Molar extinction coefficient and molecular weight of oligonucleotides

smart features

- Compact, space-saving design
- Built-in printer that records results immediately
- Easy-to-use, menu-driven operation
- Xenon flash lamp that extends lamp life and reduces maintenance costs
- Capable of spectral scans from 200 to 800 nm
- Multilanguage interface — English, French, German, Italian, Spanish, and Japanese display

SmartSpec Plus

spectrophotometer

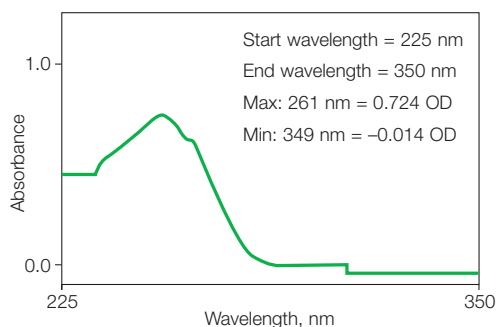


Nucleic Acid Quantitation

The SmartSpec Plus offers a complete solution for quantitation of PCR products, nucleic acid preps, or samples prior to cell transfection experiments. Common calculations, such as concentration in $\mu\text{g/ml}$, A_{260}/A_{280} purity ratio, and corrections for dilutions, are performed automatically. At the end of the assay, a date-stamped report may be printed that shows the user name and the results of analysis.

DNA and RNA

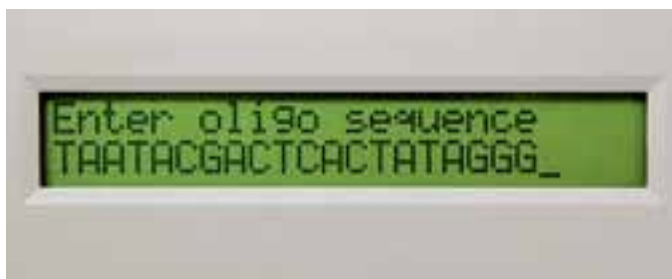
Choose to quantitate dsDNA, ssDNA, or RNA, and either select from the preprogrammed conversion factors or enter a value that is best for the sample being assayed. The SmartSpec Plus will provide absorbance values, concentration, and purity results at the touch of a button. The SmartSpec Plus will also automatically account for user-defined dilution factors.



Wavelength scan of a DNA sample from 225 to 350 nm. The absorption maximum is at 261 nm. The instrument can be programmed to automatically subtract the background absorbance.

Oligonucleotides

The SmartSpec Plus simplifies the quantitation of DNA and RNA oligonucleotides. When you enter the sequence, length, or composition, the SmartSpec Plus will display sample concentration in $\mu\text{g/ml}$ and $\text{pmol}/\mu\text{l}$ and will automatically perform calculations of molar extinction coefficients and molecular weights.

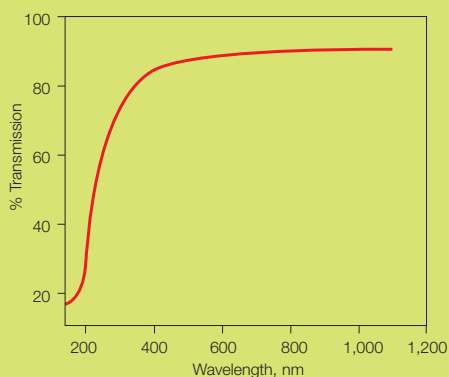


Nucleic Acid Quantitation Accessories

Quartz Cuvettes

Bio-Rad provides a selection of quartz cuvettes for your nucleic acid assay needs. All quartz cuvettes are heat fused and annealed to relieve strain. Bio-Rad quartz cuvettes will resist most solvents and mild acidic and basic solutions.

Choose from among four cuvette sizes.



Transmission profile of a water-filled trUView cuvette.

trUView™ Cuvettes

Bio-Rad offers low-volume (50 μl) disposable plastic cuvettes suitable for assays measured between 220 and 1,100 nm.

A single-use alternative to quartz cuvettes, trUView cuvettes are designed for the quantitation of small-volume nucleic acid samples. trUView cuvettes are provided in packs of 50 or 100 individually wrapped cuvettes.

Cuvette Selection Guide

Min. Volume	Max. Volume	Cuvette Type	Pathlength	Catalog #
1,000 μl	3,500 μl	Standard cuvette, quartz	10 mm	170-2502
500 μl	1,400 μl	Semimicrovolume cuvette, quartz	10 mm	170-2503
200 μl	700 μl	Microvolume cuvette, quartz	10 mm	170-2504
80 μl	100 μl	Submicrovolume cuvette, quartz	10 mm	170-2505
50 μl	1,500 μl	trUView plastic cuvettes, 50	10 mm	170-2510
50 μl	1,500 μl	trUView plastic cuvettes, 100	10 mm	170-2511

Protein Quantitation

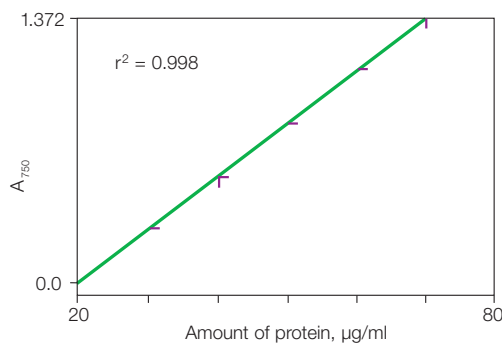
The SmartSpec Plus provides everything needed for the quantitation of proteins. Features built into each assay option speed data collection and present a complete analysis of assay methods and results.

Why pay a high price for protein quantitation when the SmartSpec Plus can do it for less?

Bradford, Lowry, and BCA Protein Assays

The SmartSpec Plus has preprogrammed methods for the quantitation of proteins by the Bradford, Lowry, and BCA methods. The easy-to-follow menu guides the user through the entire assay, ensuring that all standards and replicates are read to give complete results.

- Standards can be analyzed in groups of up to 9 replicates
- Up to 10 standard curves can be stored under user-assigned names
- Mean and standard deviation values are automatically calculated for each replicate group
- Printable final report includes a standard curve and calculated r^2 value



Standard curve generated on the SmartSpec Plus spectrophotometer using the Lowry protein assay.

UV Protein Assay (280 nm)

The SmartSpec Plus also allows quick estimations of protein concentrations in nucleic acid backgrounds and provides absorbance data at 260 nm, 280 nm, and 320 nm. This nondestructive quantitation method preserves small-volume protein samples so that they can be further characterized by other methods.

Protein Quantitation Accessories

Plastic Cuvettes

Bio-Rad maintains an inexpensive line of disposable cuvettes for protein assays. Both the 3.5 ml and 1.5 ml cuvettes are supplied in packages of 100 and are compatible with the SmartSpec Plus. They adsorb less Coomassie Blue dye than glass or quartz cuvettes, and assays may be mixed directly in the cuvettes.

Colorimetric Protein Assays

Bio-Rad offers three colorimetric assays for protein quantitation: the Bio-Rad protein assay for general use, the *DC*[™] protein assay for samples solubilized in detergent, and the *RC DC*[™] protein assay for samples in the presence of both reducing agents and detergents. The linear range for each protein assay is 0.2–1.5 mg/ml.





Specifications

Light source	Xenon lamp
Detector	Photodiode array
Display	2 x 24 alphanumeric backlit LCD
Printer	Built-in alphanumeric/graphic printer
Interface	RS-232 serial port
Wavelength range	200–800 nm
Wavelength accuracy (at 18–27°C)	<±1.0 nm from 200 to 250, 300 to 800 nm <±0.5 nm from 250 to 300 nm
Spectral bandwidth	<5 nm
Absorption accuracy	±0.01 at 0.5 AU; ±0.02 at 1.0 AU
Absorption repeatability	±0.005 at 0.5 AU
Stray light	<0.2% at 230 nm using NaI standard
Operating temperature	15–35°C
Dimensions (W x D x H)	33 x 26 x 14 cm
Weight	~3.8 kg
Power requirement	90–260 VAC, 47–63 Hz
Regulatory	CE, TÜV

Performance Validation Package

The SmartSpec Plus may be purchased with an optional performance validation package that allows routine checks of critical performance specifications. This package includes a NIST-traceable reference cuvette for checking wavelength and photometric accuracy, and a certificate of analysis. Built-in software test routines will guide you through setup, automatically perform tests, and provide a test report.

The performance validation package may be purchased bundled with the SmartSpec Plus, or as an accessory.

Ordering Information

Catalog #	Description
170-2525	SmartSpec Plus Spectrophotometer
170-2520	SmartSpec Plus Spectrophotometer, includes performance validation package

Accessories

170-2509	Performance Validation Package, includes NIST-traceable cuvette, certificate of analysis
170-2502	Standard Cuvette, 1–3.5 ml, quartz
170-2503	Semimicrovolume Cuvette, 0.5–1.4 ml, quartz
170-2504	Microvolume Cuvette, 200–700 µl, quartz
170-2505	Submicrovolume Cuvette, 80–100 µl, quartz
223-9950	Standard Disposable Polystyrene Cuvettes, 3.5 ml, 100
223-9955	Semimicrovolume Disposable Polystyrene Cuvettes, 1.5 ml, 100
170-2510	trUView Cuvettes, pack of 50
170-2511	trUView Cuvettes, pack of 100
170-2506	Printer Paper, 5 pack
170-2507	Spring, cuvette holder

Protein Assay Kits

500-0001	Bio-Rad Protein Assay Kit I, bovine γ -globulin standard; based on method of Bradford
500-0002	Bio-Rad Protein Assay Kit II, bovine serum albumin standard; based on method of Bradford
500-0111	DC Protein Assay Kit I, bovine γ -globulin standard
500-0112	DC Protein Assay Kit II, bovine serum albumin standard
500-0121	RC DC Protein Assay Kit I, includes RC reagents package, DC protein assay reagents package, bovine γ -globulin standard; 500 standard assays
500-0122	RC DC Protein Assay Kit II, includes RC reagents package, DC protein assay reagents package, bovine serum albumin standard; 500 standard assays

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India (91-124)-2398112/3/4, 5018111, 6450092/93 Israel 03 951 4127 Italy 39 02 216091 Japan 03-5811-6270 Korea 82-2-3473-4460
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Spain 34 91 590 52 00 Sweden 08 555 12700 Switzerland 061 717 95 55 Taiwan (886 2) 2578 7189/2578 7241 United Kingdom 020 8328 2000