Data Sheet

Agilent
Trusted Answers

Cary 3500 UV-Vis Spectrophotometer Specifications

Introduction

The Agilent Cary 3500 UV-Vis spectrophotometer features an innovative and versatile architecture that revolutionizes UV-Vis analysis. Designed from the ground-up, it will streamline your experimental processes and, by uniquely allowing simultaneous measurement of standards, samples and controls, give confidence in results.

The Cary 3500 is a fully interchangeable modular system. The engine module contains a long-life, super fast xenon lamp, and a research-grade, double out-of-plane Littrow monochromator. The engine is common to all Cary 3500 Uv-Vis configurations and makes accurate, high-absorbance measurements possible. Measurement modules are designed for specific measurement types—from single cuvettes through to eight cuvettes at multiple temperatures—and can be upgraded as analytical needs evolve. The measurement modules do not contain any moving parts and all have permanent optical alignment.

The instrument's optical design produces a tightly-controlled beam geometry that measures less than 1.5 mm at the sample interface. This enables robust measurements from small aperture cuvettes and microvolume samples.

A high-speed (up to 250 data points/second) data collection rate, high photometric range, and optimized detector position ensure that accurate data is collected from all measurement types. This includes sub-second kinetic reactions, highly turbid solutions or a wide range of sample concentrations.

With the ability to collect data from up to eight channels at once, at up to 150,000 nm/min, multiple broad wavelength range spectra can be collected and displayed on the screen in less than a second.

Spectral bandwidth can be varied from 0.1 to 5.0 nm in 0.01 nm intervals to give excellent spectral resolution. This exceeds the requirements of international pharmacopoeias and ensures that all analytical needs, both now and in the future, can be easily met.

The accompanying Cary UV Workstation software is comprised of easy-to-use, application-specific modules for: time-based kinetics, concentration measurements, wavelength scanning, and temperature-based measurements.

Agilent Cary spectrophotometers are manufactured according to a Quality system that is certified to ISO-9001.

Instrument model overview

Parameter	Cary 3500 Compact UV-Vis	Cary 3500 Multicell UV-Vis	Cary 3500 Compact Peltier UV-Vis	Cary 3500 Multicell Peltier UV-Vis	Cary 3500 Multizone UV-Vis
Long-life xenon flashlamp source	●	●	●	●	●
Permanently aligned beam	●	●	●	●	●
Tightly-controlled beam geometry (< 1.5 mm at sample interface)	●	●	●	●	●
190–1100 nm wavelength range	●	●	●	●	●
150,000 nm/min maximum scan rate	●	●	●	●	●
250 data points/second measurement rate	●	●	●	●	●
Number of cuvette positions that can be measured simultaneously	2	8	2	8	8
	Ambient measurements only		**Temperature control**		
Temperature control system	None		Self-contained, integrated, air-cooled, waterless Peltier-controlled		
Water-free temperature cycling from 0 to 110 °C	–	–	●	●	●
Number of independently-controlled temperature zones	–	–	1	1	1, 2 or 4
Temperature monitoring/control points	–	–	2	2	8
			Temperature accuracy		
Peltier Block Probe (°C)	–	–	±0.5		
Sample Probe* (°C)	–	–	±0.25		
Cell to cell variation (°C)	–	–	< ±0.15		
			Temperature ramping		
Max ramp rate (°C/min)	–	–	40.0		
Min ramp rate (°C/min)	–	–	0.1		
			Options		
Purge option	–	–	●	●	●

**Probe accuracy between the range of 25–60 °C*

Performance Specifications

Parameter	Specification
Photometric system	Double beam with rear beam access
Monochromator	Double out-of-plane Littrow monochromator
Source	Full-spectrum xenon flash lamp with typical lifetime of 10 years (guaranteed 3 years)
Source flash rate	250 Hz
Wavelength range	190 – 1100 nm
Detectors	Silicon photodiode detectors for simultaneous measurement of all channels
Beam dimensions at sample interface	< 1.5 mm
Limiting resolution	0.1 nm
Stray light (%T) At 198 nm (12 g/L KCl, BP/EP method) At 220 nm (10 g/L NaI, ASTM method) At 300 nm (Acetone) At 370 nm (50 mg/L $NaNO_2$)	 < 1.0 % < 0.003 < 0.005 < 0.003
Wavelength accuracy (nm)	± 0.2
Wavelength reproducibility (nm)	< 0.025
Photometric accuracy (Abs) NIST 930E filter at 1 Abs	± 0.005
Photometric range (Abs)	4.0
Photometric reproducibility (Abs)	0.005
Photometric stability (Abs/hour)	0.0003
Photometric noise (Abs/RMS) At 500 nm, 0 Abs At 500 nm, 0 Abs (using ultra-micro cuvette: 50 µL, 2 x 2.5 mm, 10 mm pathlength) At 500 nm, 1Abs	 < 0.0001 Abs < 0.0001 Abs < 0.0002 Abs
Operational	
z-height	15 mm
Spectral bandwidth	0.1 to 5 nm at 0.01 nm
Maximum scan rate	150,000 nm/min
Data collection rate	250 data points per second
Data interval	0.01 to 10 nm

Installation Requirements

System Installation

For details of installation requirements refer to the Agilent Cary 3500 UV-Vis Site Preparation Guide, partnumber G9864-90001.

Dimensions

Instrument	Weight		Height		Depth		Width	
	kg	lbs	cm	in	cm	in	cm	in
Cary 3500 Compact UV-Vis	21.7	47.8	28	11	43.5	17.1	44.5	17.5
Cary 3500 Multicell UV-Vis	23.9	52.7	28	11	43.5	17.1	44.5	17.5
Cary 3500 Compact Peltier UV-Vis	27.0	59.5	28	11	70	27.6	44.5	17.5
Cary 3500 Multicell Peltier UV-Vis	34.2	75.4	28	11	70	27.6	44.5	17.5
Cary 3500 Multizone UV-Vis	34.2	75.4	28	11	70	27.6	44.5	17.5

Recommended Environmental Conditions

Parameter	Specification
Instrument conditions[1,2]	15 – 35 °C at 15-80% relative humidity, non-condensing, altitude 0 – 3100 m
Electrical requirements	Mains supply of 100—240 volts AC and Frequency 50-60 Hz. Maximum power consumption for Engine is 100 VA, CTM is 130 VA and MCM is 480 VA.

1. Optimum temperature performance of Peltier-controlled systems is achieved when the ambient temperature of the laboratory is between 20 and 25 ºC and be held constant to within ± 2 ºC throughout the day.
2. Optimum analytical performance is achieved if operational temperature is within ± 5 ºC of the temperature at which the instrument auto calibration routine was last run.

Customer support policies

Agilent is renowned for providing expert applications and service support. Agilent has a global network of factory-trained specialists ready to provide support for hardware, software, or applications wherever you are located. Services include:

- Full 12-month warranty support
- Seven (7) year hardware support period from date of last unit manufacture. After this time, parts and supplies will be provided if available.
- Preventive maintenance to deliver consistent operation and minimize downtime
- Troubleshooting, maintenance and repair
- Software support services
- Comprehensive warranty extension and service contracts, including peripherals
- Classroom training and onsite training delivered by experts

Further details

For further information please consult your Agilent office or supplier, or our website at www.agilent.com.

www.agilent.com/chem/cary3500uv-vis

Printed in the USA, December 17, 2018
5994-0446EN

Agilent
Trusted Answers