Data Sheet

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# 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)**<br>**At 198 nm**<br>**(12 g/L KCl, BP/EP method)**<br>**At 220 nm**<br>**(10 g/L NaI, ASTM method)**<br>**At 300 nm**<br>**(Acetone)**<br>**At 370 nm**<br>**(50 mg/L $NaNO_2$)** | <br>**< 1.0 %**<br><br>**< 0.003**<br><br>**< 0.005**<br><br>**< 0.003** |
| **Wavelength accuracy (nm)** | **± 0.2** |
| **Wavelength reproducibility (nm)** | **< 0.025** |
| **Photometric accuracy (Abs)**<br>**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)**<br>**At 500 nm, 0 Abs**<br>**At 500 nm, 0 Abs**<br>**(using ultra-micro cuvette: 50 µL, 2 x 2.5 mm, 10 mm pathlength)**<br>**At 500 nm, 1Abs** | <br>**< 0.0001 Abs**<br>**< 0.0001 Abs**<br><br><br>**< 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 Compact Peltier UV-Vis** | **23.9** | **52.7** | **28** | **11** | **43.5** | **17.1** | **44.5** | **17.5** |
| **Cary 3500 Multicell 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**

**This information is subject to change without notice.**


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