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UV/Vis Spectroscopy

# Quality UV/Visible Spectrometers

## The Lambda Series



The Lambda Series of UV/Visible spectrometers, based on the proven technology and industry leading performance of the established Lambda platform are quality systems providing you dependable results. You can select the instrument suitable for your application getting the best value for your money, while being confident that The Lambda Series will deliver proven robustness and reliability. With the range of application specific software and pre-defined user methods, coupled with the widest range of proven accessories, the Lambda Series gives you the instrument of your choice.

There are three instruments that make up the Lambda Series of instruments – the Lambda 25, the Lambda 35 and the Lambda 45. The instruments differ in optical resolution and in the stray radiation specification. The Lambda 25 has fixed 1 nm slits while the Lambda 35 and Lambda 45 have 0.5, 1, 2 and 4 nm variable slits. Unlike the others, the Lambda 45 has a pre-monochromator, which lowers the stray radiation for enhanced absorbance range.

### Key Features

- ▶ Quality systems for dependable results
- ▶ Range of Instruments to suit your needs
- ▶ Lower cost of ownership
- ▶ Software and accessories to fit your application
- ▶ Proven optical system
- ▶ Double beam stability

## Quality optical system for dependable results

Signal stability is very important in UV/Visible spectroscopy, especially with time based experiments or when running a large number of samples, the Lambda Series instruments all use double beam optics. Double beam systems not only compensate for instrument drift but can also compensate for sample matrix drift when a blank is placed in the reference beam. Table I shows the impact of instrument drift on an analytical reading after a 4-hour period. The % error becomes more significant at lower absorbance values.

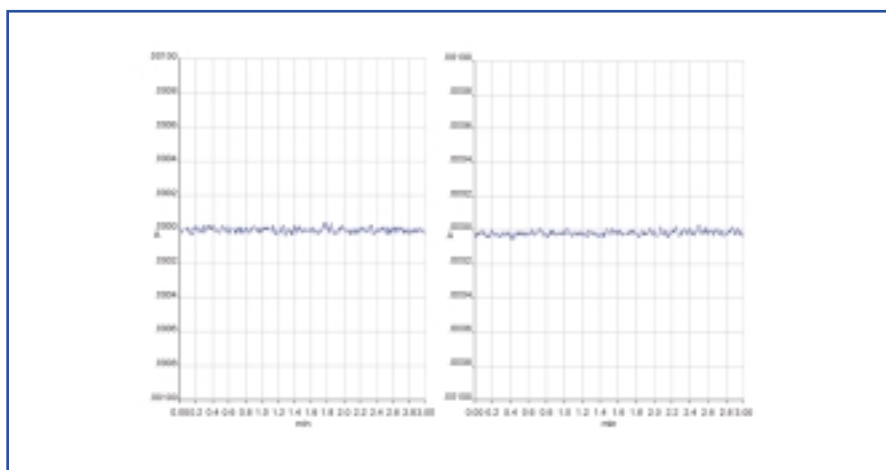
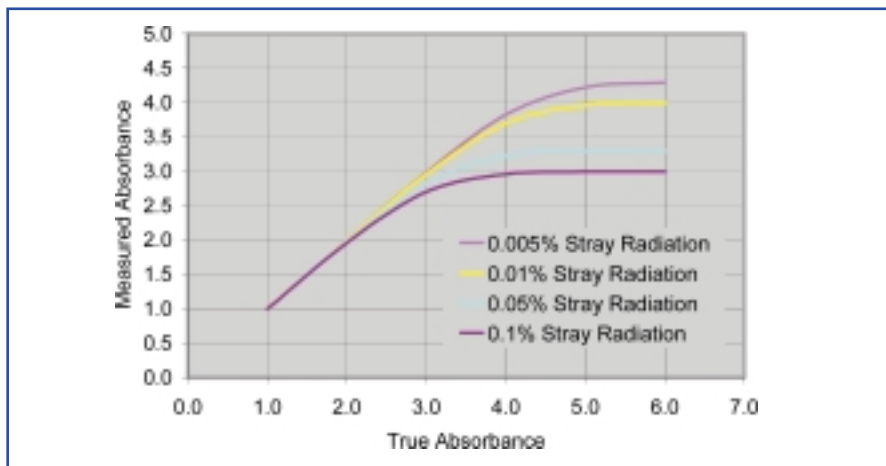
The Lambda Series incorporates concave holographic gratings along with a proven optical design to minimize stray radiation. With the impressive stray radiation specification of the Lambda Series, you can measure to 3A and be assured that your results will be accurate. Systems with more stray light limit the absorbance range where quality results can be obtained.

Measurement noise is another important specification to consider when purchasing an instrument. Noise has its greatest impact on detection limits. The lowest absorbance value that can be used for an analytical measurement is 10 times the instrument noise. The Lambda Series has a noise specification of 0.0003A peak to peak, which means that 0.003A is the lowest useable absorbance reading. Assume that you have a sample of dsDNA with a concentration of 50 µg/mL and it has a absorbance reading of 1A. Therefore, 0.15 µg/mL of sample would give a reading of 0.003A and would be the detection limit. Table II shows the impact of noise on the method detection limits.

The optical performance of the Lambda Series ensures that you will get dependable results at high and low absorbance values and that the Lambda Series will consistently give you quality data.

Table I.

| Drift specification | Measurement error after 4 hours | % error on 0.5A | % error on 2A |
|---------------------|---------------------------------|-----------------|---------------|
| 0.01A/hr            | ± 0.04A                         | ± 8%            | ± 2%          |
| 0.001A/hr           | ± 0.004A                        | ± 0.8%          | ± 0.2%        |
| 0.0004A/hr          | ± 0.0012A                       | ± 0.24%         | ± 0.06%       |
| 0.00015A/hr         | ± 0.0006A                       | ± 0.12%         | ± 0.03%       |



Noise measurement on Lambda 35 at 500 and 200 nm.

Table II. Instrument noise specification (peak to peak) and the impact on analytical detection limits

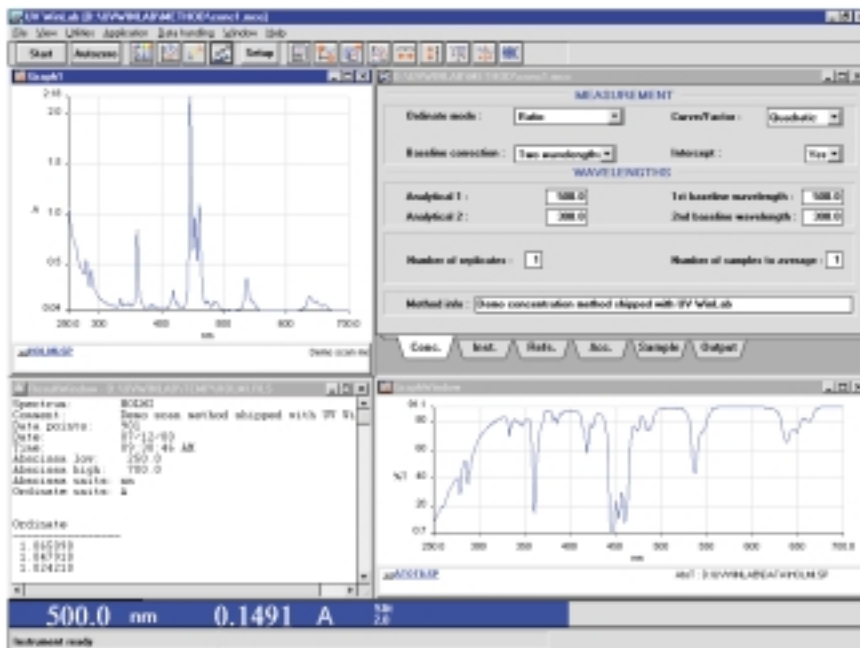
| Noise specification | Detection limit for dsDNA |
|---------------------|---------------------------|
| 0.0003A             | 0.15 µg/mL                |
| 0.0006A             | 0.3 µg/mL                 |
| 0.0015A             | 0.75 µg/mL                |

## Powerful yet easy-to-use Software

The Lambda Series of instruments are PC Controlled by UV WinLab™ software. This powerful software package takes full advantage of the Microsoft® Windows® graphical user interface. By utilizing stored methods, UV WinLab makes it extremely easy to perform routine analytical procedures. Simply recall a method and click on the start button in the UV WinLab specific tool bar. UV WinLab includes modules for data acquisition, report generation, spectral analysis and kinetics. Data acquisition includes spectral scanning, time-based measurements, multiple wavelength reading and quantitative measurements.

## Accessories

While the instrument is the heart of the UV/visible system, accessories give the system the analytical utility needed in the modern laboratory. The Lambda series has a wide range of sampling accessories to meet your every need. Cell Changers to multiplex measurements, Sippers to increase sample throughput, cell holders for a wide range of sample types and sampling conditions and solid sampling devices make up the range of accessories available to you.



Liquid sample cell holders for the Lambda Series



Solid sample accessories for the Lambda Series

## Customer support from a global partner

The support you need when and where you need it. UV/Vis spectroscopy is a routine tool used for a multitude of applications in many industries. The Lambda Series gives you the instrument of choice backed by the PerkinElmer global support organization. You can be confident that you are buying from a market leader who can give you the support you want, when and where you need it, particular to your industry needs: validated installation, IQ/OQ, instrument performance verification, routine maintenance.

| Specifications and Technical Detail                        |   |   |  |
|--|---|---|--|
|  | Lambda 25   | Lambda 35   | Lambda 45  |
| <b>Principle Scanning</b>                                  | UV/Vis spectrometer with microcomputer electronics, PC control                              | UV/Vis spectrometer with microcomputer electronics, PC control                              | UV/Vis spectrometer with microcomputer electronics, PC control                                     |
| <b>Optics</b>  | Double beam spectrometer with concave holographic grating with 1053 lines/mm                | Double beam spectrometer with concave holographic grating with 1053 lines/mm                | Double beam spectrometer with concave holographic grating with 1053 lines/mm and pre-monochromator |
| <b>Sources</b>   | Prealigned deuterium and tungsten-halogen lamps with automatic source change                | Prealigned deuterium and tungsten-halogen lamps with automatic source change                | Prealigned deuterium and tungsten-halogen lamps with automatic source change                       |
| <b>Wavelength Range</b>                                    | 190-1100 nm   | 190-1100 nm   | 190-1100 nm  |
| <b>Stray Radiation</b>                                     | 0.01%T at 220, 340, 370 nm (ASTM)   | 0.01%T at 220, 340, 370 nm (ASTM)   | 0.0%T at 220, 340, 370 nm (ASTM)   |
| <b>Stray Radiation according to pharmacopoeia with KCL</b> | >2A at 200 nm   | >2A at 200 nm   | >2A at 200 nm  |
| <b>Wavelength Accuracy</b>                                 | ±0.1 nm at D2 peak, 656.1 nm  | ±0.1 nm at D2 peak, 656.1 nm  | ±0.1 nm at D2 peak, 656.1 nm   |
| <b>Wavelength Repeatability</b>                            | ±0.05 nm at D2 peak, 656.1 nm   | ±0.05 nm at D2 peak, 656.1 nm   | ±0.05 nm at D2 peak, 656.1 nm  |
| <b>Bandpass</b>  | 1 nm fixed  | 0.5, 1,2 and 4 nm variable  | 0.5, 1,2 and 4 nm variable   |
| <b>Photometric Accuracy</b>                                | ±0.003A at 1A, measured with NIST 930 filters   | ±0.003A at 1A, measured with NIST 930 filters   | ±0.003A at 1A, measured with NIST 930 filters  |
| <b>Photometric Accuracy according to pharmacopoeia</b>     | ±0.010A measured with potassium dichromate  | ±0.010A measured with potassium dichromate  | ±0.010A measured with potassium dichromate   |
| <b>Photometric Repeatability</b>                           | ±0.001A at 1A   | ±0.001A at 1A   | ±0.001A at 1A  |
| <b>Stability</b>   | 0.00015A/h (at 500 nm, 2 s response)  | 0.00015A/h (at 500 nm, 2 s response)  | 0.00015A/h (at 500 nm, 2 s response)   |
| <b>Baseline flatness</b>                                   | 0.001A, 1 nm slit (200 – 1100 nm at 0A, smooth 2, 240 nm/min)                               | 0.001A, 1 nm slit (200 – 1100 nm at 0A, smooth 2, 240 nm/min)                               | 0.001A, 1 nm slit (200 – 1100 nm at 0A, smooth 2, 240 nm/min)                                      |
| <b>Noise level</b>   | 0.00008A RMS, 0.0003A Peak to peak, (0A, 500 nm, 2 s response)                              | 0.00008A RMS, 0.0003A Peak to peak, (0A, 500 nm, 2 s response)                              | 0.00008A RMS, 0.0003A Peak to peak, (0A, 500 nm, 2 s response)                                     |
| <b>Outputs</b>   | RS232C/V24 interface, Parallel interface and accessory control. Second RS232C/V24 optional. | RS232C/V24 interface, Parallel interface and accessory control. Second RS232C/V24 optional. | RS232C/V24 interface, Parallel interface and accessory control. Second RS232C/V24 optional.        |
| <b>Power Requirements</b>                                  | 100 to 250 VAC, 50/60 Hz, 259 VA  | 100 to 250 VAC, 50/60 Hz, 259 VA  | 100 to 250 VAC, 50/60 Hz, 259 VA   |
| <b>Operating Conditions</b>                                | + 15 °C to + 35 °C, <75% humidity non-condensing  | + 15 °C to + 35 °C, <75% humidity non-condensing  | + 15 °C to + 35 °C, <75% humidity non-condensing   |
| <b>Size</b>  | 650 mm wide, 233 mm high, 560 mm deep   | 650 mm wide, 233 mm high, 560 mm deep   | 650 mm wide, 233 mm high, 560 mm deep  |
| <b>Weight Approx.</b>                                      | 26 kg   | 26 kg   | 26 kg  |

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