SHIMADZU
Excellence in Science

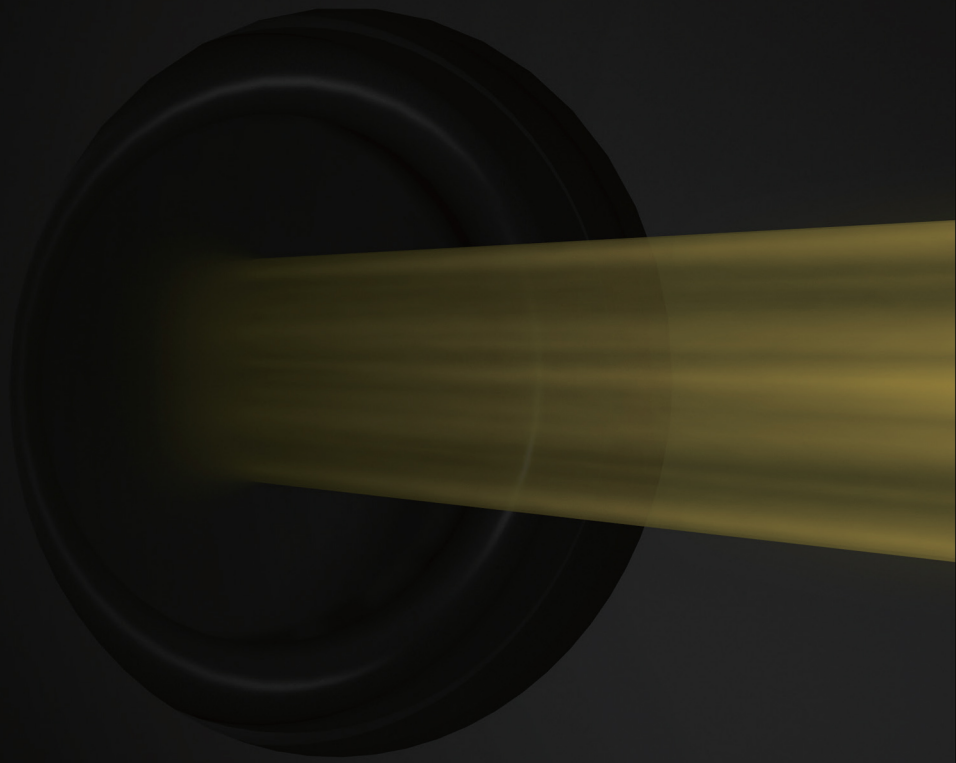
C101-E158

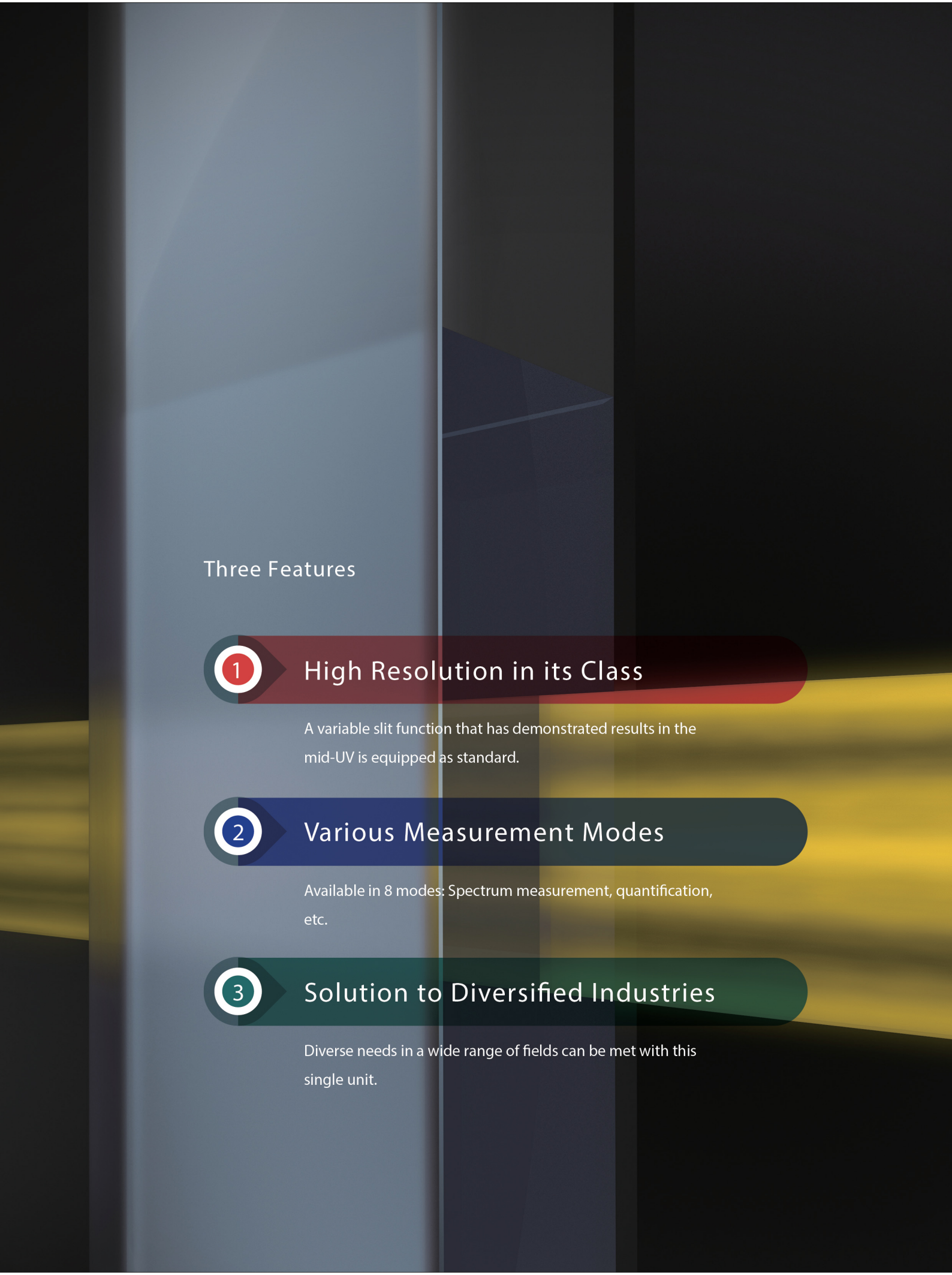
UV-VIS Spectrophotometer

UV-1780

UV-VIS Spectrophotometer Enhancing Your Productivity

A compact, double-beam UV-VIS spectrophotometer wrapped in a sleek form. The UV-1780 uses the Czerny-Turner mounting for its monochromator and boasts the high resolution up to 0.5 nm with 5 spectral bandwidths. Available as either a stand-alone instrument or a PC-controlled instrument, the UV-1780 is USB flash drive ready, which enables users to save data, perform data analysis and print using a PC.





Three Features

1 High Resolution in its Class

A variable slit function that has demonstrated results in the mid-UV is equipped as standard.

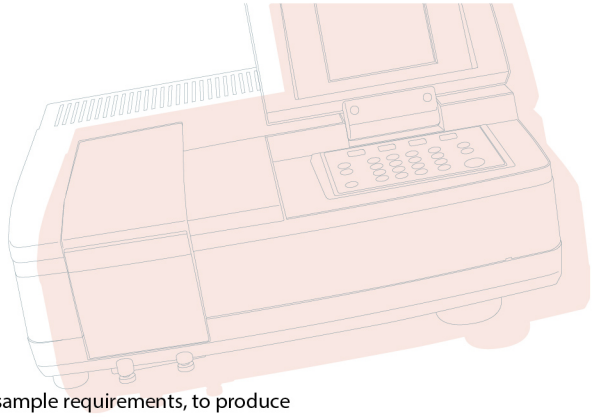
2 Various Measurement Modes

Available in 8 modes: Spectrum measurement, quantification, etc.

3 Solution to Diversified Industries

Diverse needs in a wide range of fields can be met with this single unit.

High Resolution in its Class



Variable spectral bandwidth up to 0.5 nm

Variable spectral bandwidth at 0.5 nm, 1 nm, 2 nm, 4 nm, or 5 nm can be selected, based on sample requirements, to produce high-quality spectrum.

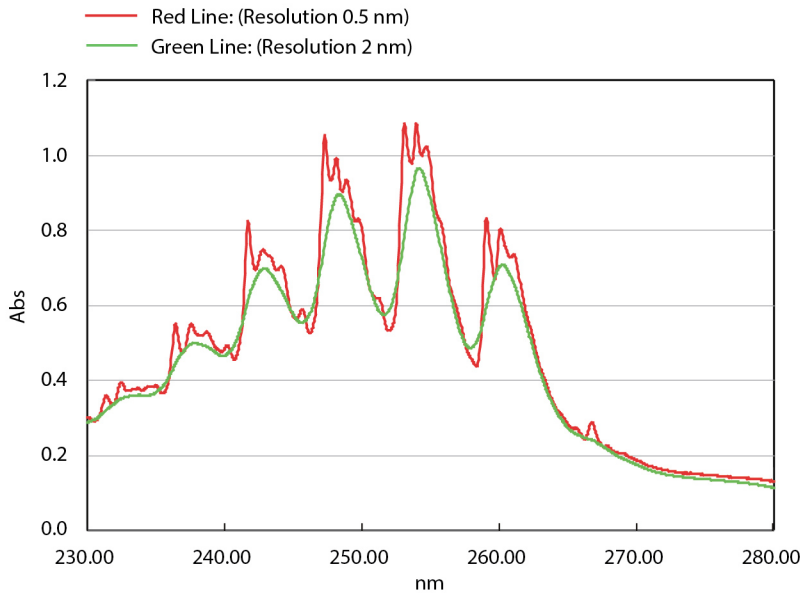
The Czerny–Turner monochromator enhances high throughput in optical system to higher resolution of 0.5 nm.

Provide more spectral information with high resolution

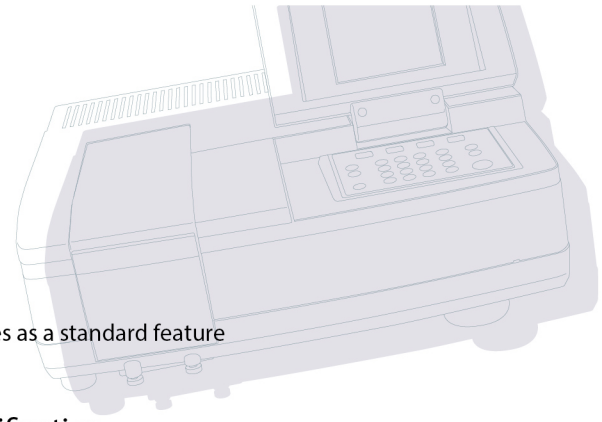
Materials containing a benzene ring exhibit very sharp peaks in the wavelength range of 230 nm to 280 nm.

The below spectrum (benzene vapor) wa s obtained using spectral bandwidths of 0.5 nm and 2 nm with 10 mm optical path length.Enabling detailed analysis of each peak in a sample with bandwidth of 0.5 nm, all the five peaks are observed around 250 nm. The difference in peak resolution, up to 60% between 0.5 nm and 2 nm, can be observed.

Spectral bandwidth of 0.5 nm is requi red for high resolution measurement of sample, if necessary.



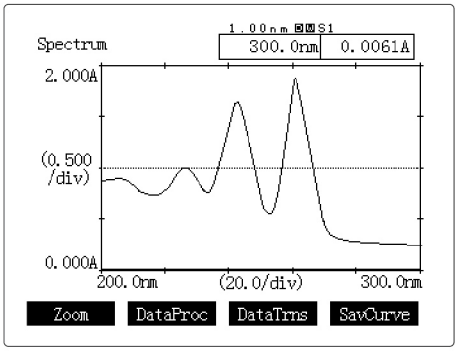
Various Measurement Modes



From photometric to bio method: Equipped with a variety of measurement modes as a standard feature

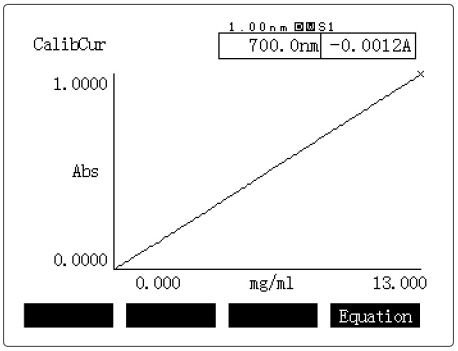
Spectrum

A sample spectrum is recorded using wavelength scanning. Zoom in on the finished spectrum for a better view and perform a wide variety of data processing functions, for example, peak/valley pick function.



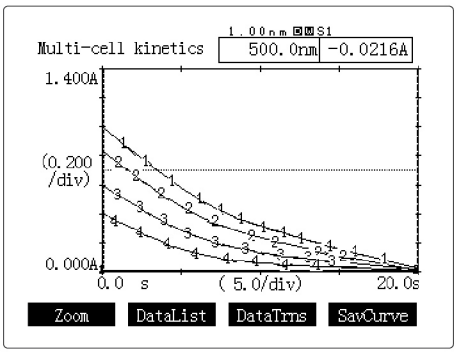
Quantification

Generates a calibration curve from the measurement of standards, and calculates the concentrations of unknowns. Allows various combinations of wavelengths (1 to 3 wavelengths and derivatives) and calibration curves (K-factor and first-to-third order).



Kinetics

Measures absorbance changes as a function of time, and obtains the enzymatic activity values. The kinetics measurement method or the rate measurement method can be selected. When using the 6 Cells Multi-Cell Holder or the CPS-100A Cell Positioner, multiple samples can be measured.



Photometric

Measures the absorbance or transmittance at a single wavelength.

Time Course

Measures the change in absorbance or transmittance as a function of time. When using the 6 Cells Multi-Cell Holder or the CPS-100A Cell Positioner, multiple samples can be measured.

Multi-Component Quantitation

Quantitates up to eight components mixed in a single sample. The calibration equation is determined using pure or mixed components with known values.

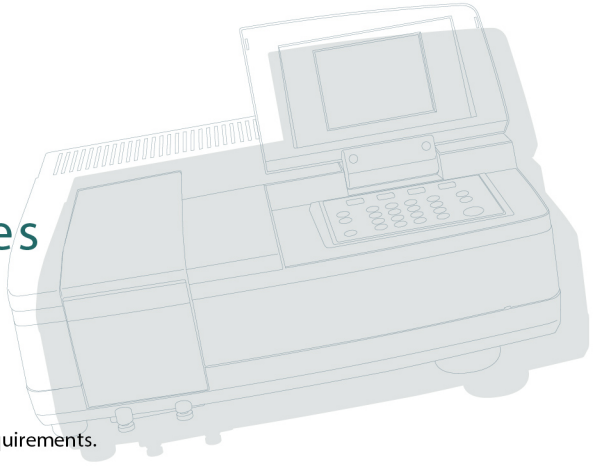
Multiple wavelengths

Measurement and calculation can be performed up to four wavelengths, including the calculation of the difference between, or ratio of, the measurements obtained for two wavelengths.

Biomethod

Determine DNA and protein concentrations using the bioscience/life science program included as standard. Quantitates DNA or protein using the absorbance at 260/230 nm or 260/280 nm with simple operation.

Solution to Diversified Industries



Widely applied to many industries

With a build-in validation functions, the instrument is compliance with GLP and ISO-9000 requirements.

The UV-1780 Multipurpose UV-Visible Spectrophotometer offers wavelength scanning from 190-1100 nm. This lower-cost, high-quality instrument is ideal for applications ranging from routine environmental and food quality testing to life science analyses. In addition, 5 spectral bandwidths are available to be selected.

Analysis Compatibility Table

Academia

- Identification of organic compounds
- DNA/protein quantitation
- Chemical reaction tracking
- Enzyme reaction measurement

Foods

- Food dye measurements
- Quantitation of vitamins, food additives, and minerals

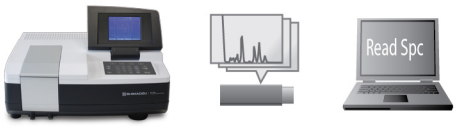
Chemicals

- Transmittance measurements for films
- Thickness measurements for thin films and other films

Envi ronmental

- Turbidity measurements
- Quantitation of total phosphorus and total nitrogen in river water, and lakes and marshes
- Measurements of plating liquids (hexavalent chromium, aluminum, nickel, etc.)
- Quantitation of iron, copper, arsenic, and ammonia in water

Various systems supported by USB connection

Stand Alone	UV-1780 + USB drive + PC + Read Spc 	Special software (Read Spc*) is required to read and display data. You can transfer the data to Microsoft Excel.
	UV-1780 + Printer (commercially available)	You can print out the transferred data directly.
PC Control	UV-1780 + PC + UV Probe (Option)	UV Prove (Option) can be used to control the instrument. (See page 8)

Note: This software can be provided free of charge. Contact your local office for availability.

Instrument Validation and Maintenance/ Inspection Functions have been Enhanced

Instrument validation function

Fully-automatic

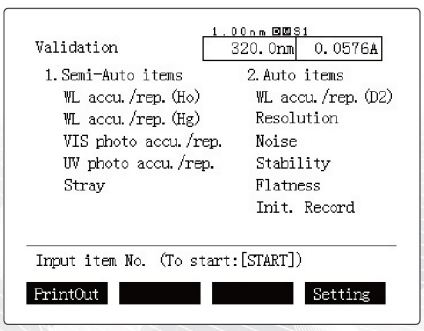
Wavelength accuracy/repeatability (deuterium lamp), spectral bandwidth, noise level, baseline drift, and baseline flatness. Default to save the initialization results.

Instrument Maintenance and Inspections

The usage times of the deuterium (D2) lamp and the halogen (WI) lamp can be recorded and displayed, which enables users to ascertain the expected replacement period of the lamps when performing periodic inspections.

Semi-automatic

Wavelength accuracy/repeatability (holmium solution and mercury lamp methods), stray light, visible range accuracy/repeatability, UV range accuracy/repeatability.



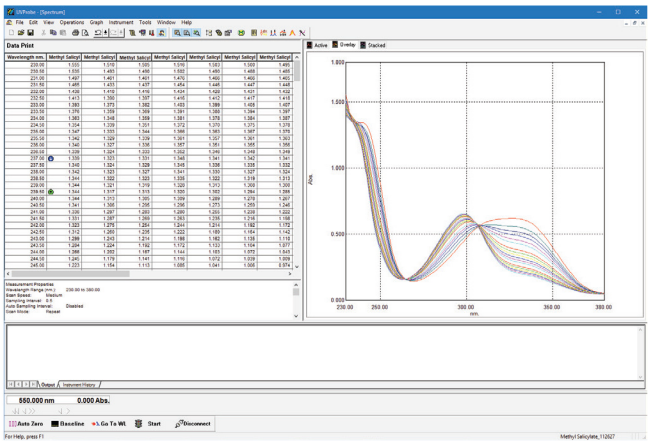
Control with UVProbe Software (Option)

UVProbe software contains the following four functions, each of which can be performed easily with its own screen:

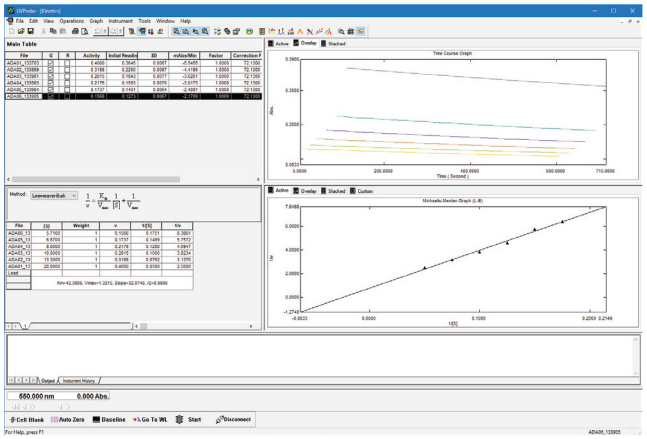
- Spectrum Module
- Photometric Module (Quantitation)
- Kinetics Module (Time Course Measurement)
- Report Generator

In addition to peak detection, area calculation and other data processing functions, UVProbe is equipped with various functions including: security functions that limit each user limited to specific functions, a data history log function, and an instrument audit trail function.

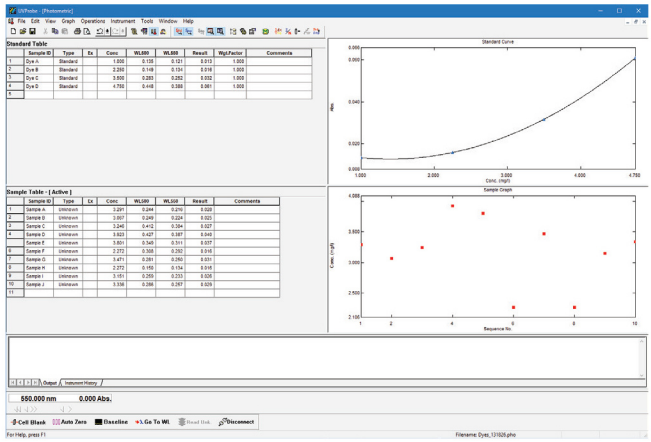
Spectrum Module



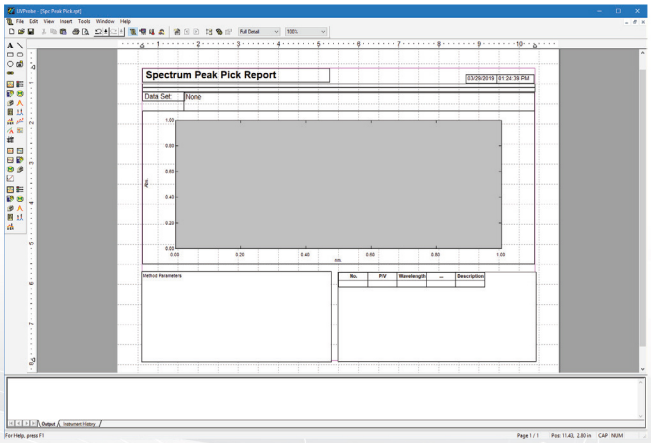
Kinetics Module



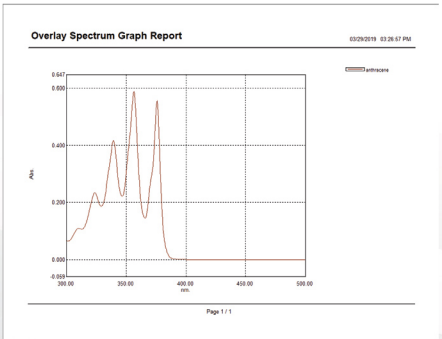
Photometric Module



Report Generator



The report generator gives you the freedom to arrange graphs, tables, etc. to suit your needs. You can now specify the thickness and color of graph lines, as well as font size.
Pasting labels on graphs and editing text is easy, allowing you to effectively print comments along with the analysis results.



Accessories

Film Holder (P/N 204-58909)

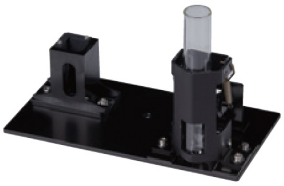
Used in transmittance measurement of thin samples such as films and filters. Holds thin samples, such as films and filters, for analysis.

Test Tube Holder (P/N 207-23510-41)

Holds test tube instead of sample compartment.

Outside diameter: φ15 to 18 mm
Height: 84 to 115 mm

Note: Test tube is not included.



Long-Path Rectangular Cell Holder (P/N 204-23118-01)

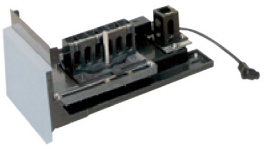
Holds two rectangular cells with an optical path length of 10, 20, 30, 50, 70, or 100 mm.

Multi-Cell Sample Compartment (P/N 206-69160-41)

Holds up to six 10-mm square cells on the sample side. No temperature control capability.

Number of cells:
6 on the sample side
1 on the reference side

Note: Square cells are not included, please purchase separately.



CPS-100 Cell Positioner, Thermoelectrically Temperature Controlled (P/N 206-29500-**)

This attachment permits measurement of up to six sample cells under constant-temperature conditions. Combination of this attachment and the Kinetics mode provides measurement of temperature-sensitive enzyme kinetics of one to six samples.

Number of cells:
6 on the sample side (temperature-controlled)
1 on the reference side (temperature not controlled)
Temperature control range: 16°C to 60°C
Temperature display accuracy:
± 0.5°C (difference from the true value)
Temperature control precision:
± 0.1°C (variation of temperature)
Ambient temperature: 15°C to 35°C

Note: Square cells (P/N 200-34442) are not included, please purchase separately. A USB adapter CPS (P/N 206-25234-91) is required.

TCC-100 Thermoelectrically Temperature Controlled Cell Holder (P/N 206-29510-**)

Uses Peltier effect for controlling the sample and reference temperature, so no thermostated bath or cooling water is required.

Number of cells:
One each on the sample and reference sides (temperature-controlled)
Temperature control range: 7°C to 60°C
Temperature display accuracy:
± 0.5°C (difference from the true value)
Temperature control precision:
± 0.1°C (variation of temperature)

Note: Square cells (P/N 200-34442) are not included, please purchase separately.

Cylindrical Cell Holder (P/N 204-06216-02)

Holds two cylindrical cells with an optical path length of 10, 20, 50, or 100 mm.

Note: The sample compartment unit (P/N 206-60184-07) is required.

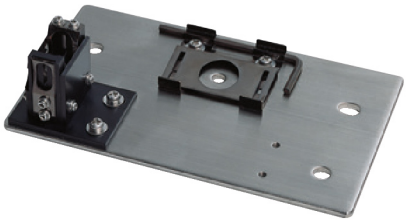
Super Micro Cell Holder (P/N 206-14334-01)

Holds super micro cells for measurement of extremely small volume samples. The cell height is adjustable, and the required sample volume can be adjusted in the range of 100 to 200 µL, depending on the type of black cell used.

Applicable cells: (7), (7)', and (8)
Mask: Choice of 1.5 (W) × 1 (H) mm or 1.5 (W) × 3 (H) mm

When using a 5-mm super micro black cell, the measurement with 50 µL sample is available.

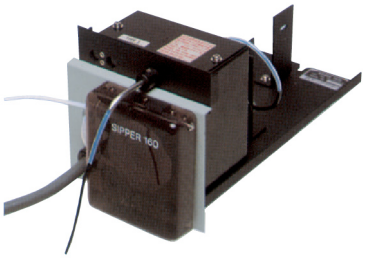
Note: The sample compartment unit (P/N 206-60184-07) is required. The quantity of light passing through the cell is reduced, so it may not be possible to satisfy the optical specifications of the instrument.



Sipper Unit 160T: Triple-Pass Sipper (P/N 206-23790-52)
Sipper Unit 160C : Constant-Temperature Sipper (P/N 206-23790-53)

Two sipper units with different flow cell types are available. The stepping motor-driven peristaltic pump ensures reliable and smooth aspiration of sample solution. (Direct driving is possible from the UV-1280 so no interface is required.)

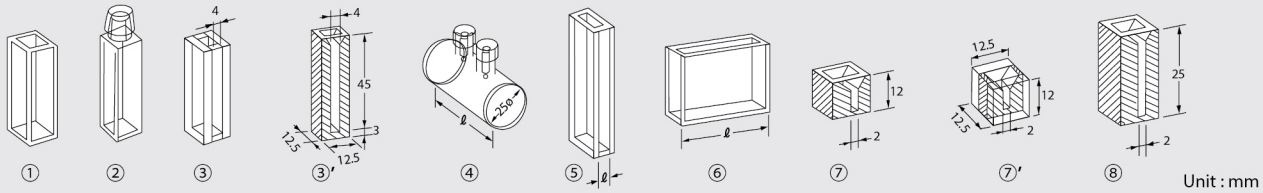
Note: The use of a solenoid valve (fluoropolymer) (P/N 204-06599-01) and the SWA-2 sample waste unit (P/N 206-23820-58) are recommended when strong acids, strong alkalis, or organic solvents are to be measured. The quantity of light passing through the cell is reduced, so it may not be possible to satisfy the optical specifications of the instrument.



Standard Sample Volume	
160T	1.5mL
160C	2.5mL

Cells

Description	Optical Path (L)	Required Sample Volume	Type	Fused Silica (S)	Glass (G)
Rectangular cell	10mm	2.5 to 4.0mL	①	200-34442	208-92296
	20mm	5.0 to 8.0mL	⑥	200-34446	200-34446-01
	50mm	12.5 to 20.0mL		200-34944	200-34944-01
Rectangular cell with stopper	10mm	2.5 to 4.0mL	②	200-34444	200-34444-01
Semi-micro cell	10mm	1.0 to 1.6mL	③ *1	200-66501	200-66501-01
Semi-micro black cell	10mm	1.0 to 1.6mL	③′ *1	200-66551	—
Super Micro black cell	5mm	50 to 100µL	⑦′ *2	208-92116	—
	10mm	100 to 200µL	⑦ *2	200-66578-11	—
Micro black cell	10mm	100 to 400µL	⑧ *2*3	200-66578-12	—
Cylindrical cell	10mm	3.8mL	④	200-34448(silica window)	200-34448-01 (glass window)
	20mm	7.6mL		200-34472(silica window)	200-34472-01 (glass window)
	50mm	19.0mL		200-34473-01 (silica window)	200-34473-03 (glass window)
	100mm	38.0mL		200-34473-02 (silica window)	200-34473-04 (glass window)
Short-path cell	1mm	0.3 to 0.4mL	⑤	200-34660-01	200-34662-01
	2mm	0.5 to 0.8mL		200-34655	200-34662-11
	5mm	1.3 to 2.0mL		200-34449	200-34449-01



Note : *1 The micro cell mask for six-cell holder (206-66828) is required when Multi-Cell Sample Compartment is used.
*2 The super Micro cell holder (206-14334-01) is required.
*3 A 1.5 × 3 mm mask is applicable.

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