C101-E070I

Access to your success
SHIMADZU

UV-VIS Series Accessories

Shimadzu
UV-VIS Spectrophotometers

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Liquid Samples

1. Basic Measurement

Accessories that are used with all Shimadzu spectrophotometers.

Cells

Samples are placed in cells for measurement. The figure below shows the ten sample cell shapes. Generally, the rectangular cell with an optical path length of 10 mm is used. In cases when absorption is low, a cell with a longer optical path length is used, whereas when absorption is high, a cell with a shorter optical path length is used. The relationship between absorption strength (absorbance) and cell length is described below. By utilizing this formula, an appropriate optical path length can be determined.

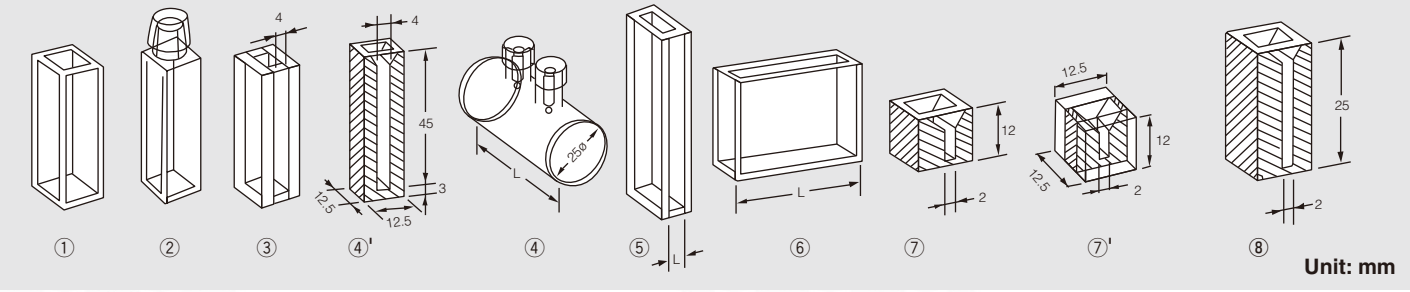
Absorbance (A) = E • C • L

E : Absorption coefficient (a constant for given samples)
C : Concentration of sample
L : Cell length

A square cell with a stopper is generally used to measure volatile liquid samples, and a microcell is used to measure a sample with small volume.
Sample cells are made of one of the three materials listed below. The wavelength range for each type of material has been established as follows:

Fused silica (S cells) : 190 - 2500 nm
Glass (G cells) : 320 - 2500 nm
Fused silica (IR cells) : 220 - 3200 nm

Description	Optical path (L)	Required Sample Volume	Type	Fused silica (S)	Glass (G)	Fused silica (IR)
Square cell	10mm	2.51 to 4.0mL	①	200-34442	200-34565	200-66579-01
	20mm	5.0 to 8.0mL	⑥	200-34446	200-34446-01	200-66579-02
	50mm	12.5 to 20.0mL		200-34944	200-34944-01	200-66579-03
	100mm	25.0 to 40.0mL		200-34676	200-34676-01	200-66579-04
Square cell with stopper	10mm	2.5 to 4.0mL	②	200-34444	200-34444-01	200-66579-21
Semi-micro cell	10mm	1.0 to 1.6mL	③	200-66501	200-66501-01	200-66579-11
Semi-micro black cell	10mm	1.0 to 1.6mL	③'	200-66551	–	200-66579-12
Super micro black cell	5mm	25 to 100µL*1	⑦'	208-92116	–	–
	10mm	50 to 200µL*2	⑦	200-66578-11	–	–
Micro black cell	10mm	50 to 400µL	⑧	200-66578-12	–	–
Cylindrical cell	10mm	3.8mL	④	200-34448 (silica window)	200-34448-01 (glass window)	200-66579-31 (IR silica window)
	20mm	7.6mL		200-34472 (silica window)	200-34472-01 (glass window)	200-66579-32 (IR silica window)
	50mm	19.0mL		200-34473-01 (silica window)	200-34473-03 (glass window)	200-66579-33 (IR silica window)
	100mm	38.0mL		200-34473-02 (silica window)	200-34473-04 (glass window)	200-66579-34 (IR silica window)
Short path cell	1mm	0.3 to 0.4mL	⑤	200-34660-01	200-34662-01	200-66579-05
	2mm	0.5 to 0.8mL		200-34655	200-34662-11	200-66579-06
	5mm	1.3 to 2.0mL		200-34449	200-34449-01	200-66579-07



Micro cell for nucleic acid quantitation (5µL,10µL), Black micro cell (70µL)

*1 50 ~ 100µL with UVmini
*2 100 ~ 200µL with UVmini

- The optimal micro cell for quantitation of nucleic acids.
  Micro cell for nucleic acid quantitation (5µL, optical path 5mm) (P/N 046-25302-12)
  Micro cell for nucleic acid quantitation (10µL, optical path 10mm) (P/N 046-25302-02)
- Micro cell for protein quantitation.
  Black micro cell (70µL, optical path 10mm) (P/N 046-25302-11)

*Use with the standard cell holder provided. It cannot be used together with the multicell holder, the sample compartment unit, the thermoelectrically temperature-controlled cell holder TCC-240A, or the 6-cell type thermoelectrically temperature-controlled cell positioner CPS-240A.
*We recommend that these micro cells be used within the absorbance range of 0.2 to 1.0.
*As the quantity of light passing will be reduced when using the micro cell, the optical specifications of the system may not be met.
*Insert a cell containing the buffer before measuring samples, and carry out baseline correction.

5µL cell　10µL cell　70µL cell

Liquid Samples

1. Basic Measurement

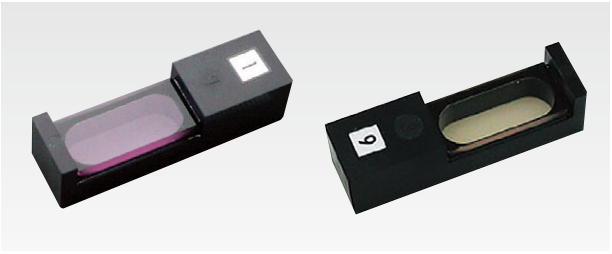
Film Holder (P/N 204-58909)

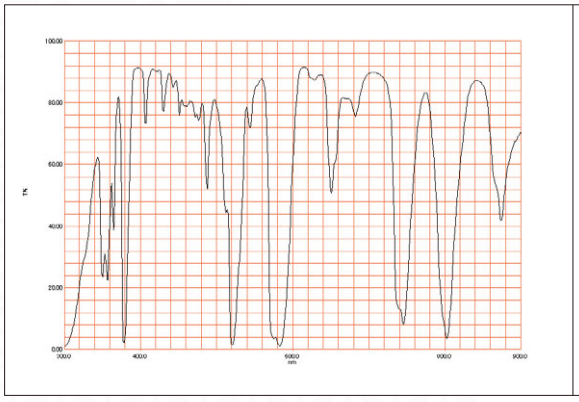
Holds thin samples, such as films and filters.

Note: 1. The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini-1240/1240V, MultiSpec-1500.
2. Direct Detection Unit (See page 22) is necessary for the SolidSpec-3700/3700DUV.

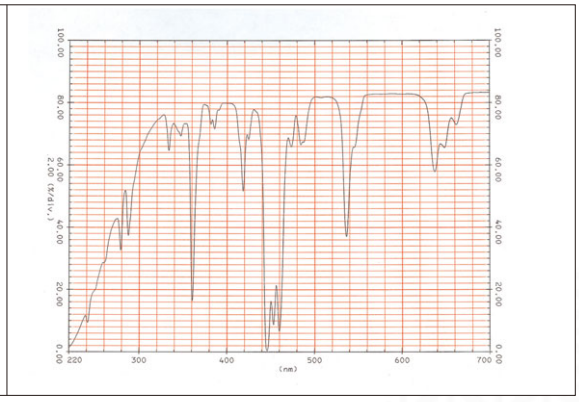
Didymium Filter (P/N 202-30242-09)
Holmium Filter (P/N 202-30242-05)

These filters are used to check the instrument.





Spectrum using a didymium filter

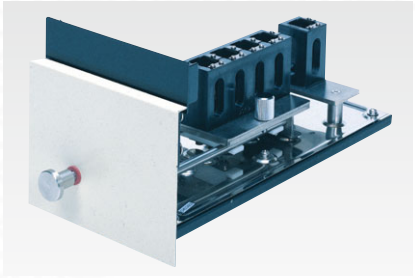


Spectrum using a holmium filter

Four-Cell Sample Compartment Unit with Holder (P/N 206-23670-91)

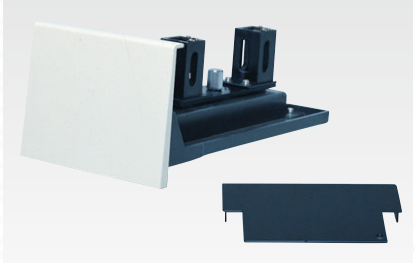
Holds four 10 mm path cells, which are manually selected by sliding the mount.

Note: Not applicable to SolidSpec-3700/3700DUV.



Alternate Sample Compartment (P/N 206-60184-07)
(UVmini Series, MultiSpec-1500 only)

Holds such sampling accessories as the super microcell holder, micro flow-thru cell, long-path rectangular cell holder, cylindrical cell holder, film holder, and the constant-temperature cell holder.



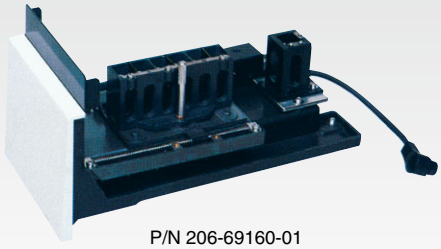
Multicell Sample Compartment (6 Cell)

Holds up to six 10 mm square cells. No temperature control capability.

- Number of cells : 6 on the sample side and 1 on the reference side. Reference side is not used on the UVmini-1240.

Cells are not included.

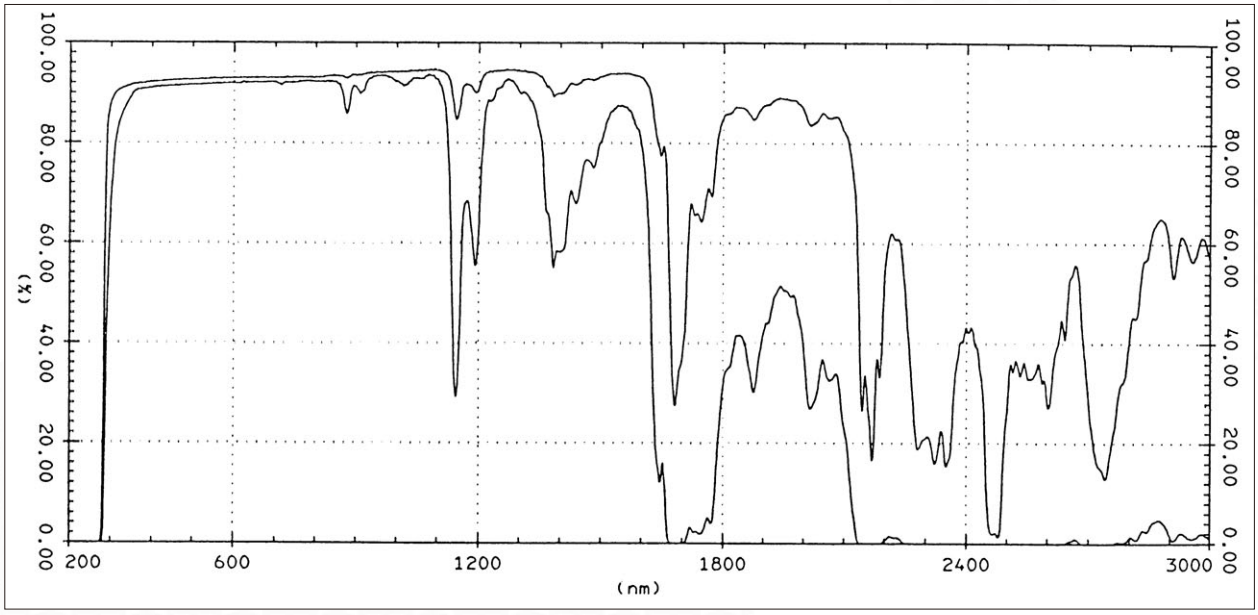
P/N	UVmini series	1600/1700/1800 series	2400/2500 series	3600 series	MultiSpec-1500
206-60605-02	Yes	No	No	No	Yes
206-69160-01	No	Yes	Yes	Yes	No



P/N 206-69160-01

2. Short Optical Path Measurement

Used to measure samples with absorbance too high to be measured with a standard 10 mm square cell.

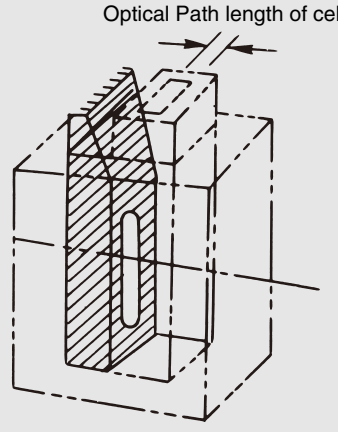


Absorption spectra of toluene ($C_6H_5CH_3$) measured using a cell with either a 1 or 10 mm optical path length

Spacer for Short-Path Cell

Three types of spacers are available to provide path lengths of 1, 2, and 5 mm.
The spacer is to be sandwiched between the cell and the inner wall of the square cell holder. (See the figure.)

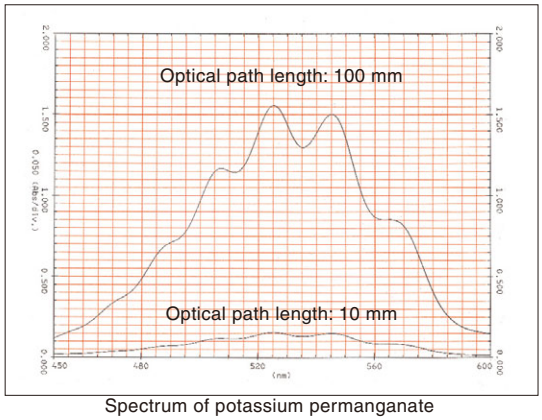
P/N (Spacer)	Path length of cell
204-21473-03	1 mm
204-21473-01	2 mm
204-21473-02	5 mm



Liquid Samples

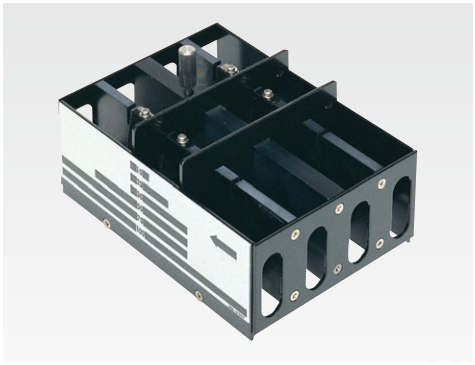
3. Long Optical Path Measurement

When the concentration of a sample is too low to be measured using a standard 10 mm optical path length cell, a cell with a longer optical path length is used for measurement at the optimal absorption sensitivity. As shown in the figure on the right, the absorption spectrum of potassium permanganate becomes clearer when a 100 mm cell is used instead of a 10 mm cell.



Spectrum of potassium permanganate

Universal Rectangular Cell Holder, Four-Cell Type
(P/N 204-27208)



Holds four rectangular cells: 10, 20, 30, 50, 70 and 100 mm in path length.

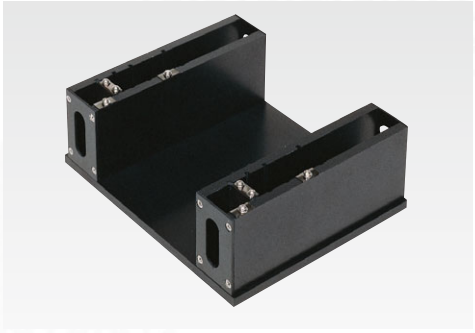
Note: 1. The Four-Cell Sample Compartment (P/N 206-23670-91) is necessary.
2. If the measurement requires a long rectangular cell at the reference side, a Reference Long Rectangular Cell Holder (P/N 204-28720) is necessary. 70mm and 100mm cells can not be used for the UVmini Series.
3. Not applicable to SolidSpec-3700/3700DUV.

Reference Side Rectangular Long Pass Absorption Cell Holder
(P/N 204-28720)

If using a four-cell rectangular long pass absorption cell holder, only use a reference side cell holder if necessary.

Note: Not applicable to SolidSpec-3700/3700DUV.

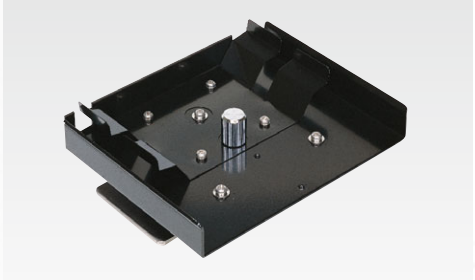
Long-Path Rectangular Cell Holder
(P/N 204-23118-01)



Holds two rectangular cells: 10, 20, 30, 50, 70 and 100 mm in path length.

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500. 70mm and 100mm cells can not be used for the UVmini Series.

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



Holds two cylindrical cells: 10, 20, 50 and 100 mm in path length.

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500.

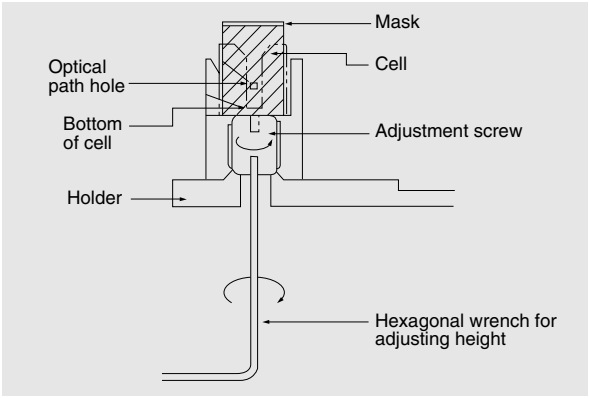
4. Micro-volume Measurement

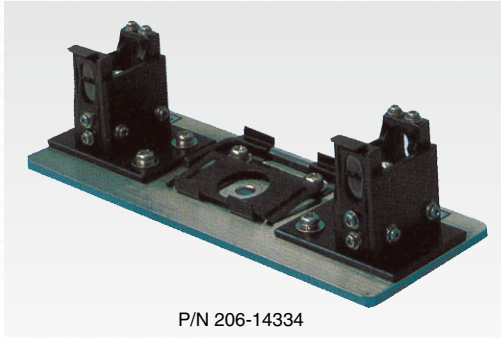
The following accessories are used to measure micro-volume samples. This technique allows a sample size as small as 50µL to be measured using a super micro cell. Thus, this technique can be used for biochemical analysis in which minute samples are measured.

Super Micro Cell Holder

Holds micro or super micro cells for measurement of extremely small volume samples such as DNA and proteins. The minimum volume required for both cell types is 50µL when the path length is 2 mm. The maximum sample volume is 400µL for the micro cell and 120µL for the super micro cell.

- Applicable cell : micro or super micro cell. Cells are not included.
  Mask : Choice of 1.5W x 1H mm and 1.5W x 3H mm





P/N 206-14334

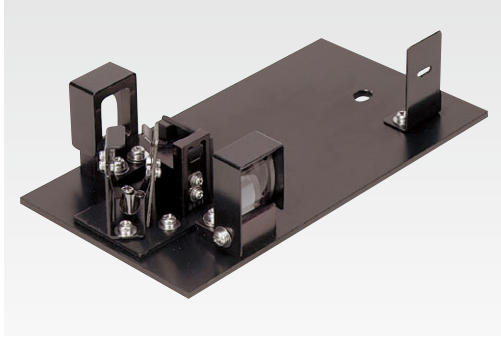
P/N	UVmini series	1600/1800 series	2400/2500 series	3600	MultiSpec -1500	Solid Spec
206-14334	No	Yes	Yes	Yes	Yes	Yes
206-14334-01	Yes	No	No	No	No	No

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500.

Supermicro Cell Holder (P/N 206-55050-91) (UV-1700 only)

Holds supermicro cells for measurement of extremely small volume samples. Samples of 25 to 200 µL can be measured, depending on the type of black cell used.

- Applicable cells: ⑦,⑦', and ⑧ in the cell list (page 3)



Micro Cell Holder with Mask (P/N 204-06896)

For semi-micro cells and micro cells with a maximum path length of 3mm. Mask width can be adjusted.

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500. Only a cell of 4mm in path width is used for the UVmini Series.

Liquid Samples

4. Micro-volume Measurement

3µL Capillary Cell Kit for Ultramicro Volume Measurement

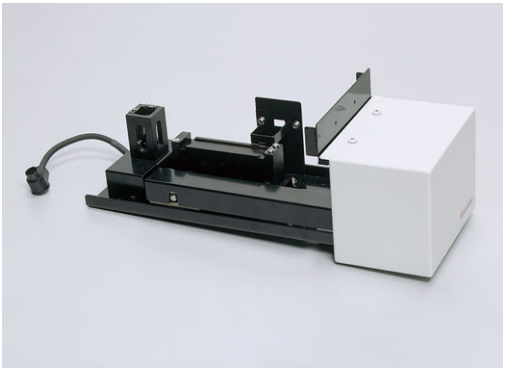
(P/N 206-69746)
(UV-1600/1700/1800 series, 2400/2500 series, 3600, SolidSpec only)

- Recommended for small volume and precious samples, such as in biological applications. The minimum sample volume required is 3µL when the tube closure is used (theoretical value).
- Solution sample is aspirated into the capillary cell and the cell is directly subjected to measurement.
- The holder is the same size as a 10 mm square cell and can be mounted to the standard cell holder.
- Supplied with 100 capillaries (made of quartz) and a tube closure.

Note: Effective optical path length is typically about 1/20 of 10mm square cell.

8/16 Series Micro Multi-Cell Holders and Cells

(UV-1600/1700/1800 series, 2400/2500 series, 3600 only)



Cell Holders

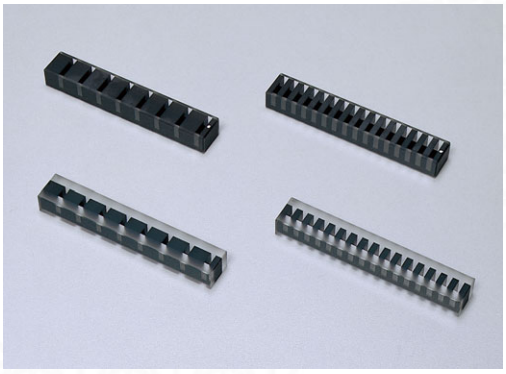
Model	P/N
8/16 Series Micro Multi-cell Holder MMC-1600	206-23680-91
8/16 Series Constant Temperature Micro Multi-cell Holder MMC-1600C	206-23690-91

This cell holder holds one micro multi-cell, either 8 or 16 cell, for micro-volume measurement.Two types of micro multi-cell holders are available, the standard type (MMC-1600) and the constant temperature water circulation type (MMC-1600C).

- Applicable temperature range : 10-60°C (C type)
- Temperature deviation between circular water and cell : max. 3°C (C type)
- Temperature stabilizing time : 15min or less (C type)

Micro Multi-cells

Standard sample volume	P/N
8 Series Micro Multi-cell; optical path length 10mm, cell volume 100µL	208-92089
16 Series Micro Multi-cell; optical path length 10mm, cell volume 100µL	208-92088
8 Series Micro Multi-cell; optical path length 5mm, cell volume 50µL	208-92086
16 Series Micro Multi-cell; optical path length 5mm, cell volume 50µL	208-92085



There are two types of micro multi-cells available in both the 8 Series and the 16 Series models, a 50µL type and a 100µL type. The cell intervals of the 8 Series Micro Multi-cell are applicable for use with 8 x 12 well microplates and 8-channel pipettes. Microplate samples aspirated into multi-channel pipettes can be injected directly into the cells for measurement.

- Micro-volume samples can be measured
- Support for commercial microplates and micro pipettes (with 8 Series micro cells)
- Up to 16 samples can be measured at a time (with 16 Series micro cell)

Micro Cell Mask for Standard Six-Cell Holder

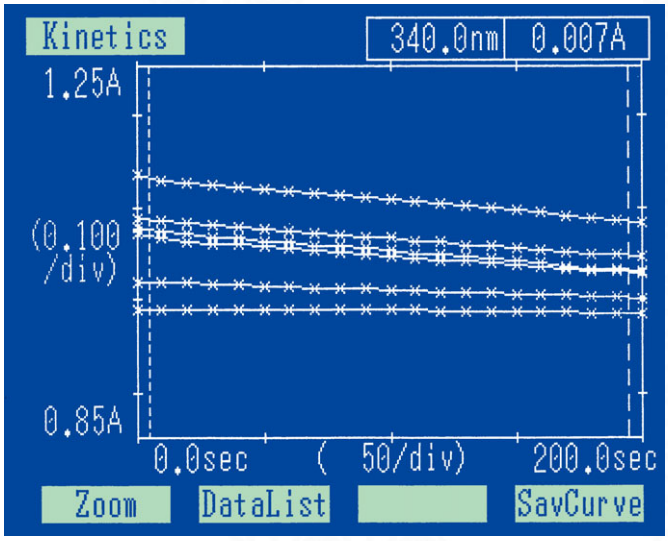
(P/N 206-66828)
(UVmini Series, MultiSpec-1500 only)

Stops down the measuring light beam for measurement with 4mm-wide path micro cells installed in the standard six-cell holder.

Applicable Cell: 10mm Semi-micro cell (quartz) (P/N 200-66501)
10mm Semi-micro cell (glass) (P/N 200-66501-01)
10mm Semi-micro black cell (quartz) (P/N 200-66551)

5. Accessories for Constant-Temperature Measurement

The following accessories are used for biological component measurement, enzymatic activity measurement and reaction rate analysis for which the sample temperature must be kept constant. The figure shows an example in which enzymatic activities are measured by combining the UV-1700 and the 6-cell thermoelectrical temperature-controlled cell positioner CPS-240A.



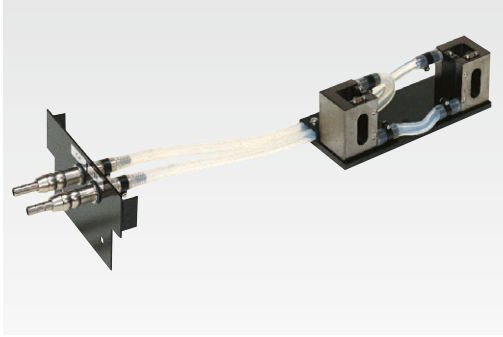
Using a cell positioner, reactions in the six cells could be measured in parallel.
- Sample: serum cholinesterase activity of solution was measured.
- Measurement time: 200 seconds.

Constant-Temperature Cell Holder (P/N 202-30858-04)

Maintain a sample cell and reference cell at a desired, uniform temperature by circulating constant-temperature water.

- Temperature range : 5 to 90°C (depends on the performance of the constant-temperature water circulator)
- Accepts a pair of 10 mm square cells
- Connection joint outer diameter : 6mm and 9mm

Note: 1. The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500.
2. Not applicable to SolidSpec-3700/3700DUV.



Constant-Temperature Four-Cell Holder (P/N 204-27206-02)

Maintain four sample cells and a reference cell at a desired, uniform temperature by circulating constant-temperature water.

- Temperature range : 5 to 90°C (depends on the performance of the constant-temperature water circulator)
- Accepts four 10 mm square cells plus a reference cell
- Connection joint outer diameter : 9mm

Note: 1. The Four-Cell Sample Compartment (P/N 206-23670-91) is necessary.
2. Not applicable to SolidSpec-3700/3700DUV.

Liquid Samples

5. Constant-Temperature Measurement

CPS-240A Cell Positioner, Thermoelectrically Temperature Controlled (P/N 206-23760-∗∗)

1) Supports time-course monitoring of up to 6 samples
The multicell holder and the single cell holder do not have temperature control capability. This option permits measurement of up to six samples under constant-temperature conditions.
2) Supports enzyme activity assay
Combination with the appropriate Kinetics Program Pack or software permits measurement of enzyme kinetics for up to six samples under constant-temperature conditions.

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

Note: 1. Square cells are not included in the standard contents.
2. A USB adaptor CPS (P/N 206-25234-91) is required for UV-1800.
3. Not applicable to SolidSpec-3700/3700DUV.

TCC-240A Thermoelectrically Temperature-Controlled Cell Holder (P/N 206-23780-∗∗)

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 range : 7 to 60°C
- Temperature display accuracy (difference from the true value): ±0.5°C
- Temperature control precision (variation of temperature): ±0.1°C

Note: 1. Square cells are not included in the standard contents.
2. Not applicable to SolidSpec-3700/3700DUV.

NTT-2200P Constant-Temperature Water Circulator (P/N 208-97263)

Circulates temperature-controlled water to a constant-temperature cell holder.

- Temperature range: Ambient +5°C to +80°C
- Temperature control precision: ±0.05°C~
- Max. pumping rate: 27/31 L/min, 9.5/13 m (50/60 Hz)
- External circulation nozzle: 10.5 mm OD (both outlet and return)
- Tank capacity: About 10 L (9 L during use)
- Safety features: Detection of over-temperature of Upper or Lower limits, Detection of heater wire malfunction, Protection of heating too little circulating water, Detection of sensor malfunction, Independent over treat protection, Over current circuit protector
- Standard accessories: Lid with handles, Rubber hose (4m), Hose clamps (4pc.), Instruction manual
- Dimensions: 270W x 560H x 400D (mm)
- Power requirements: 100 VAC, 1250 VA, with 1.7 m power cord and grounded plug

S-1700 Thermoelectric Single Cell Holder

(P/N 200V:206-23900-38, 100V:206-23900-91)
(UV-1600/1700/1800 series, 2400/2500 series, 3600, MultiSpec-1500 only)

This cell holder permits setting of a temperature program to increase and decrease the sample cell temperature.

- The thermoelectric system allows prompt control of sample temperature between 0°C and 110°C.
- Temperature increase/decrease speed can be changed using 12 settings, which means the holder can be used in analysis of melting curves for nucleic acids, etc. that occur during quick as well as slow heating (or cooling).
- A stirrer is also provided to ensure uniform temperature distribution throughout the cell.
- Cooling water circulation is required for Peltier element cooling. And though tap water can be used, it is recommended that a commercially available constant-temperature water circulator be used, as the following conditions must be fulfilled to exact maximum performance from the S-1700.
  - · Cooling water specification: 20 ±2°C
  - · Water flow: 4.8L / min or more
- Temperature is not controlled at the reference side.
- Cells are not supplied. Please use 10mm square tight-sealing cells (a Hellma product).

Type	Optical Path	Minimum Sample Volume Required
110-QS-10	10mm	3.5mL
115B-QS-10	10mm	400µL

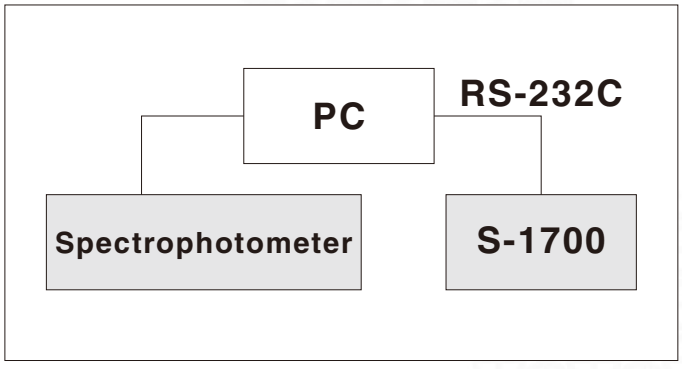
- Temperature accuracy in cell (when room temperature is 25°C)
  Within ±0.25°C (0 to 25°C)
  Within ±1%°C of set value (25 to 75°C)
  Within ±2%°C of set value (75 to 110°C)

Tm Analysis Software (P/N 206-57476-91)

(UV-1600/1700/1800 series, 2400/2500 series, 3600 + S-1700 only)

- This software works with the S-1700 and accumulates temperature-versus-absorbance curve data at the PC to analyze the Tm (melting temperature) of nucleic acids such as DNA and RNA. The figure below is a typical setup for this software.
- RS-232C cable (P/N 200-86408) is needed to connect the PC to the S-1700.

Note: 1. USB cable (P/N 088-52848-32) is required for UV-1800 to connect the PC to the UV-1800.
2. RS-232C cable (P/N 200-86408) is required for UV-1700 to connect the PC to the UV-1700.



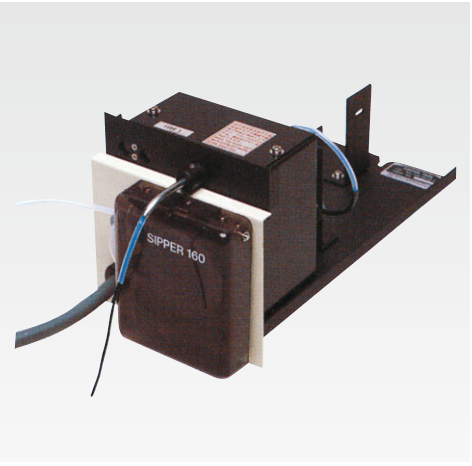
Liquid Samples

6. Automatic Analysis

The following accessories are used to continuously send samples to a sample compartment for measurement. The sipper unit automatically supplies sample solutions in cells using a step motor-driven peristaltic pump. When this unit and the auto-sample changer are used simultaneously, up to 100 samples can be measured automatically in approximately 20 minutes. The micro flow cell can also be used for continuous measurement of the column effluent.

Sipper Units

4 types of sipper units with different cell types are available.The stepping motor-driven peristaltic pump ensures reliable and smooth aspiration of sample solution.



Sipper L

Single pass, 10 mm light path, and 2 mL standard sample volume required (minimum 1 mL).

Sipper T

Triple pass, 10 mm light path, and 1.5 mL standard sample volume required (minimum 0.8 mL).

Sipper C

Provided with a constant-temperature jacket, 10 mm light path, and 2.5 mL standard sample volume required (minimum 1 mL).

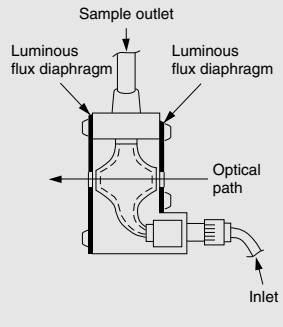
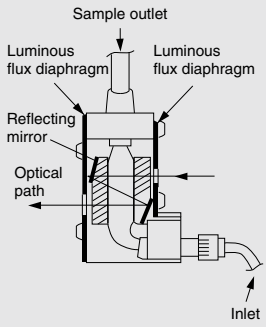
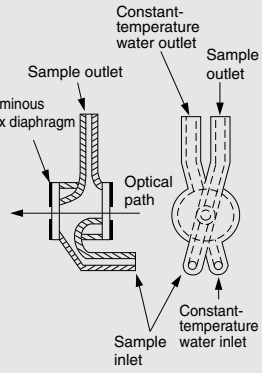
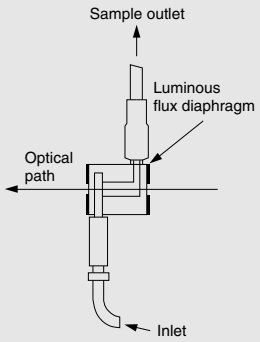
Sipper U

Supermicro type, single pass, 10 mm light path, and 0.5 mL standard sample volume required (minimum 0.3 mL).

- Suction, drain and stabilizing times are digitally set so that these parameters can be optimized for different sample viscosity.

Note: The use of a Solenoid Valve (P/N 204-06599-01) and the SWA-2 Sample Waste Unit (P/N 206-23820-91) are recommended when strong acids, strong alkalis, or organic solvents are to be measured.

Type and configuration of flow cells

160L (P/N 206-23790-91)	160T (P/N 206-23790-92)	160C (P/N 206-23790-93)	160U (P/N 206-23790-94)
			
(Required Sample Volume : 2.0mL) Cross-section of a L-type flow cell Standard type	(Required Sample Volume : 1.5mL) Cross-section of a T-type flow cell Triple-pass type	(Required Sample Volume : 25mL) Cross-section of a C-type flow cell Constant-temperature type	(Required Sample Volume : 0.5mL) Cross-section of a U-type flow cell Supermicro type

- L type : Standard flow cell
- T type : Triple-pass flow cell
  The light beam passes through the flow route 3 times and the total optical path is 10mm. Air bubble and sample removal operations are smooth since the cell shape is vertically elongated.
- C type : Constant-temperature flow cell
  The flow cell has a double structure and isothermal water is circulated around the internal structure to maintain temperature.
- U type : Supermicro flow cell
  This model is used when the volume of sample is very small. Noise is somewhat high compared to the L model since the light beam furher cut.

Syringe Sipper N (Normal-temperature-type)
(P/N 206-23890-91)

Syringe Sipper CN (Constant-temperature, water-circulating type)
(P/N 206-23890-92)
(UVmini series, UV-1600/1700/1800 series, 2400/2500 series, 3600 only)

Two types of syringe sippers are available, the normal-temperature type (N) and the constant-temperature, water-circulating type (CN). The sipper unit employs a syringe pump system. The liquid contact surfaces are composed of Teflon, glass, or quartz, imparting excellent chemical resistance and ease of maintenance, and allowing measurement of almost any sample type. Further, the extremely high repeatability of sipping volume (repeat precision: ±0.03mL) makes it ideal when performance validation is required.

Flow cell available separately. Choose from the recommended flow cells listed below.

- Circulation water temperature range : ambient to 60°C (CN type)

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series.
Square cell (Ultra-micro) can not be used for the UVmini Series.

Cell Type	P/N	Optical Path Length	Dimensions of Aperture	Standard Required Sample Volume
Square (Ultra-micro)	208-92114	10mm	ø2mm	0.9mL
Square (Micro)	208-92113	10mm	ø3mm	1.0mL
Square (Semi-micro)	208-92005	10mm	H11 x W3.5mm	5.0mL

- The flow cell can be changed independently for excellent ease of maintenance.
- Excellent chemical resistance allows measurement of almost any sample.
- Excellent repeat sipping of fixed volumes.

ASC-5 Auto Sample Changer **(P/N 206-23810-**)**

Combine with a Sipper 160 to build an automated multisample spectrophotometry system.

- The aspirating nozzle is programmed to move in the X, Y, and Z (vertical) directions.
- Up to 8 sets of operational parameters, including the size of racks and the number of test tubes, may be memorized in the battery back-up protected files.
- Up to 100 test tubes may be set together on the rack.

Note: 1. A commercially available test tube stand, with a footprint smaller than 220 x 220mm, is applicable.
2. Not applicable to MultiSpec-1500 and SolidSpec-3700/3700DUV.
3. An ASC USB adaptor (P/N 206-25235-91) is required for UV-1800.

SWA-2 Sample Waste Unit
(P/N 206-23820-91)

The SWA-2 is a universal aspirator having a built-in vacuum pump. Recommended for use with sippers and Solenoid valve (Fluoropolymer) for acids,
bases, and organic solvents.

Note: 1. Where tap water pressure fluctuates, it is better to use the SWA-2 in place of an ordinary aspirator.
2. Not applicable to SolidSpec-3700/3700DUV.

Liquid Samples

6. Automatic Analysis

Solenoid Valve (Fluoropolymer)
(P/N 204-06599-01)

This accessory is required because strong acid, strong alkali and ester solutions cannot be measured due to a lack of chemical resistance in the sipper unit and the pump for the thermoelectrical temperature-controlled sipper unit. This accessory requires the use of the sample waste unit SWA-2 (P/N 206-23820-91).

Note: Not applicable to SolidSpec-3700/3700DUV.

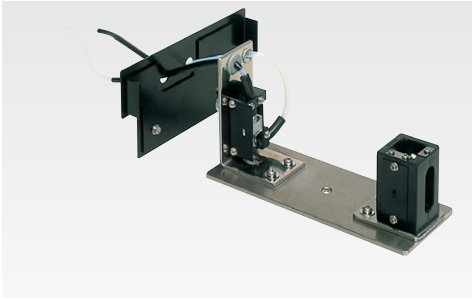
10 mm Micro Flow-Thru Cell with Holder
(P/N 204-06222)

10 mm path length and 0.3 mL inner volume.

5 mm Micro Flow-Thru Cell with Holder
(P/N 204-06222-01)

5 mm path length and 0.15 mR inner volume.

Note: 1. The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500.
2. Not applicable to SolidSpec-3700/3700DUV.



Front Panel with Holes (P/N 204-27588-03)
(UVmini series, UV-1600/1700/1800 series, 2400/2500 series, MultiSpec-1500 only)

Allows the tubes of a flow-thru cell, for example, to be connected through the front panel of the instrument.

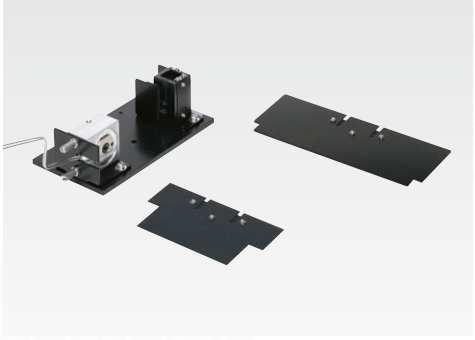
Note: 1. The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini Series, and MultiSpec-1500.
2. Not applicable to SolidSpec-3700/3700DUV.

Flow Cell for Liquid Chromatography (P/N 206-12852)
(UV-1600/1700/1800 series, 2400/2500 series, 3600 only)

This flow cell allows UV-VIS detection for high performance liquid chromatography at variable wavelengths.

- Inner diameter: 1 mmf, optical path length: 10 mm, volume: 8µL
- Sample side: flow cell, reference side: cell holder with mask

Note: 1. Not applicable to UVmini Series, MultiSpec-1500, SolidSpec-3700/3700DUV.
2. UV-1600/1700 series: when connecting an integrator, an analog signal output interface (P/N 204-04757) is required.
3. UV-1800: when connecting an integrator, an analog signal output interface (P/N 206-25233-91) is required.
4. UV-1601PC/1650PC/2401PC/2501PC/2450/2550 cannot send analog signals.



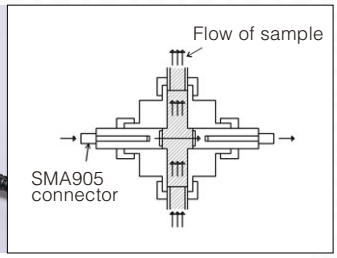
7. Onsite Measurement (Optical Fiber Application Measurement)

- Single 600μm dia. fiber achieves high throughput.
- The general-purpose SM905 fiber connector allows operation with other SM905-compatible probes.

Crossflow Cell for Process Monitor System

(P/N 206-53570-13)
(UV-2400/2500 series, 3600 only)

Optical path length is continuously variable from 1 mm to 15mm to allow monitoring of samples of any concentration.



- Measuring wavelength range: 230~800nm (For 2m fiber length)
- Optical path length: 1~15mm (variable)
- Sample temperature: < 130°C
- Pressure resistance: <1.72 MPa (17.6kg/cm^2)
- Material: 316SS
- Pipe connectors: < 1/2 inch
- Optical material: <synthetic quartz

Optical Fiber Coupler

UV-2401/2450/2501/2550, 3600 only
(P/N 206-54175-91)

Optical fiber application system is connected to a UV-VIS spectrometer using a high-precision optical fiber coupler. This optical fiber coupler has been designed for the UV-2400/2450/2500/2550, and 3600 to guarantee high throughput and stability.

Configurations

○:Required

Description	P/N	Process monitor system
UV-2450	206-24300-**	choose among these
UV-2550	206-24400-**	
UV-3600	206-23000-**	
Optical fiber coupler*1 (0.5mm optical fibers, 2 pcs.)	206-54175-91	○
Crossflow cell	206-53570-13	○
2m optical fibers (2 pcs. a set)*2	206-53875-92	choose among these
5m optical fibers (2 pcs. a set)*2	206-53875-93	
10m optical fibers (2 pcs. a set)*2	206-53875-94	
20m optical fibers (2 pcs. a set)*2	206-53875-95	

Note: If fibers are connected, the MultiSpec basic specifications for measuring accuracy, stray light, etc. are out of guarantee.
*1Crossflow cell is designed to have maximum throughput at room temperature.
*2Light intensity available for transmission decreases according to the fiber length by approximately the following ratios.

Fiber length	Decrease in UV range (100% at 0.5 m)	Decrease in visible range (100% at 0.5 m)
2m	80%	95%
5m	60%	92%
10m	36%	90%
20m	13%	80%

Suspension and Opaque Samples

8. Suspension and Opaque Sample Measurement

Measurement of suspension samples is difficult due to the scattering of reflected light by fine particles in the solution. Integrating sphere are used in this type of analysis. The glass method involves the placement of a scattering board behind the sample, resulting in the equalization of scattering coeffcients of the reference side and sample side. As shown in Figure 1, the integrating sphere method involves a barium sulfate-coated sphere that draws the scattered light, allowing all of the light to reach the detector. Since light cannot penetrate opaque samples, it is reflected on the surface of the samples. Figure 2 shows one case in which incoming light is reflected symmetrically with respect to the normal line (forward reaction), and another case in which the incoming light is scattered in different directions. The former is referred to as specular reflection and the latter is referred to as diffuse reflection.

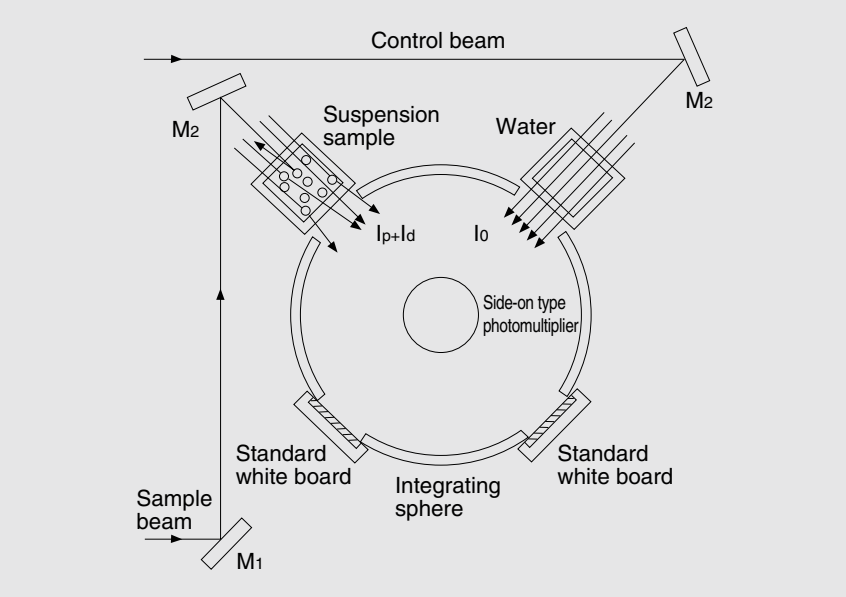


Figure 1. Semi-transparent sample measurement using the integrating sphere method

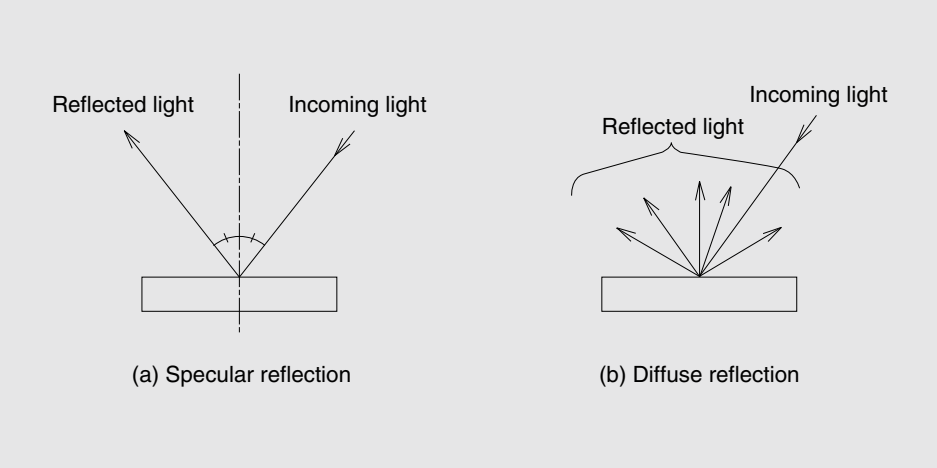


Figure 2. Specular reflection and diffuse reflection

(solid)

8. Suspension and Opaque Sample Measurement

Integrating Sphere

With this instrument, a turbid sample is placed in front of the incoming light window as shown in Figure 1, and the reflectance of an opaque sample is measured by placing it as shown in Figure 3. In this case, when light is directed at the sample at 0 degrees, diffuse reflectance is measured, and when light is directed at 8 degrees, total reflectance (specular and diffuse reflectance) can be measured.

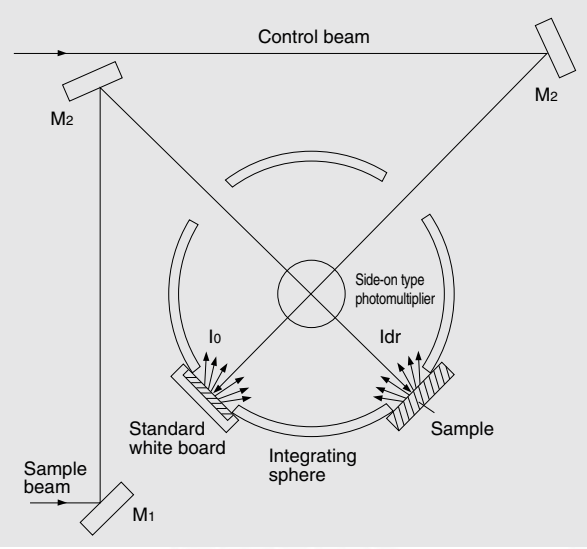
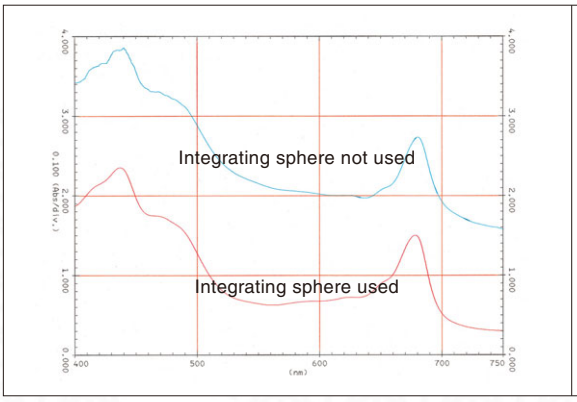
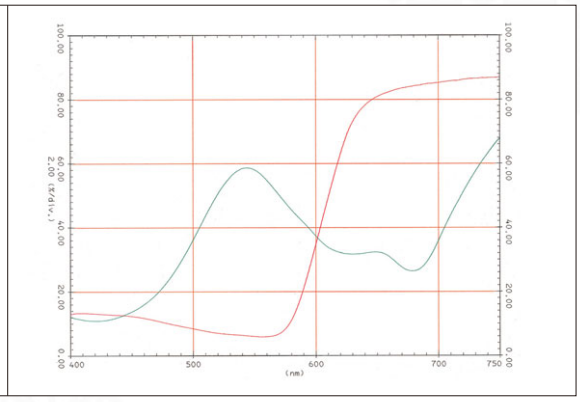


Figure 3. Opaque sample measurement using the integrating sphere method



Spectrum of a chlorophyll suspension solution



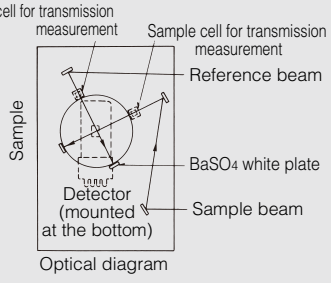
Reflectance spectrum of paint

ISR-240A Integrating Sphere Attachment, 60mm dia.

(P/N 206-23860-91)
(UV-2400/2500 series, 3600 only)

This attachment is used for measurement of diffuse, and total and reflectance and measurement of transmittance of liquids and solids.

- Wavelength range: 240-800nm.
- Integrating sphere: 60mm inner diameter, equipped with a photomultiplier.
- Maximum size of reflection sample: 40~70mm wide, 10mm thick or 70~70mm wide, 5mm thick.
- Two $BaSO_4$ white plates, two sample holders and $BaSO_4$ powder (500g) are included.
- Incident angle: 0 deg.



Optical diagram

Suspension and Opaque Samples

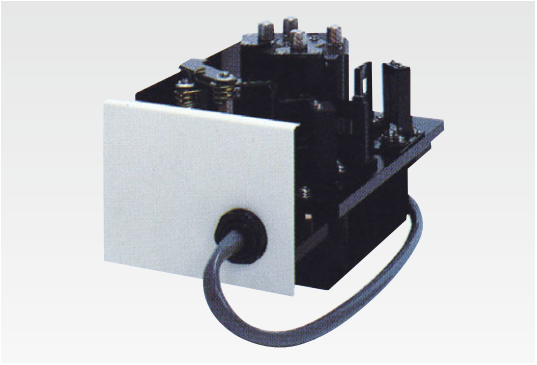
8. Suspension and Opaque Sample Measurement

ISR-2200 Integrating Sphere Attachment, 60mm dia.

(P/N 206-23850-91)
(UV-2400/2500 series only)

This attachment is used for measurement of diffuse, total, and specular reflectance and measurement of transmittance of liquids and solids. The accessory has a wide wavelength range from 220 nm to 850 nm, and the following features :

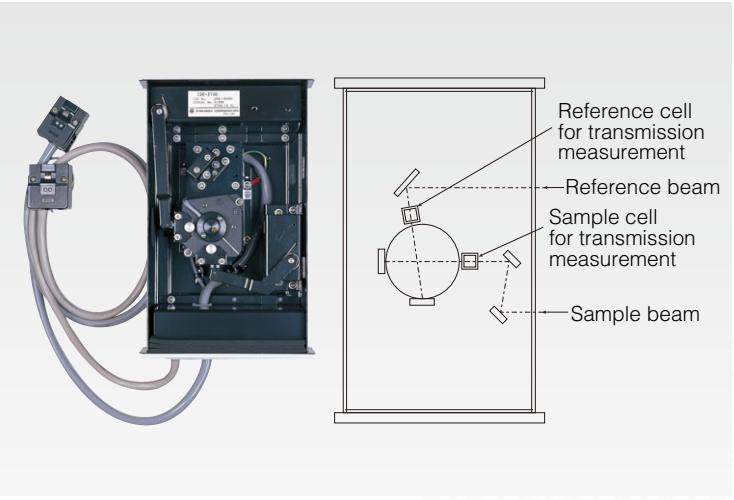
- Integrating sphere : 60 mm in inner diameter, equipped with a photomultiplier.
- Maximum size of reflection sample : About 70 mm dia, and 12 mm thick.
- Two $BaSO_4$ white plates, two sample holders and $BaSO_4$ powder (500g) are included. Cells are not included.



ISR-3100 Integrating Sphere Attachment, 60 mm dia.

(P/N 206-23851-91)
(UV-3600 only)

- Wavelength range: 220 ~ 2600 nm.
- Integrating sphere: 60 mm in inner diameter, equipped with a photomultiplier and a PbS cell.
- Maximum size of reflection sample: About 100 mm dia.x15 mm thick.
- Incident angle: 0 deg. / 8 deg.
- Two $BaSO_4$ white plates, two sample holders and $BaSO_4$ powder (500g) are included. Cells are not included.

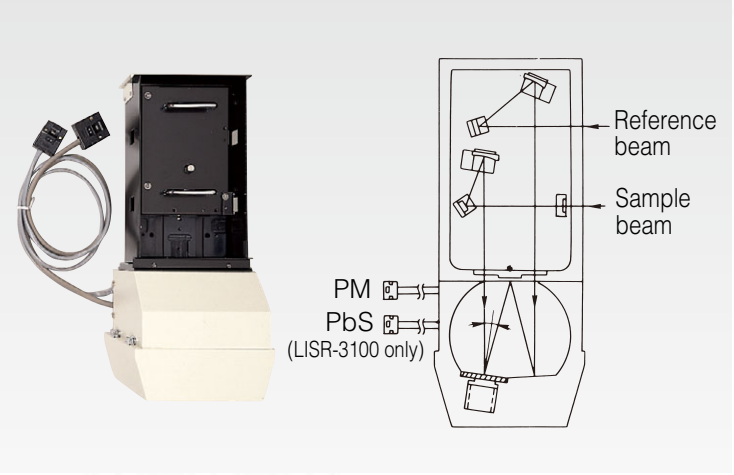


150mm dia. Integrating Sphere Attachment

LISR-2100 (P/N 206-23862-91)
LISR-3100 (P/N 206-23862-92)
(UV-3600 only)

This attachment is used to measure the reflectance spectrum of solid samples, such as powder, paper or cloth.
The integrating sphere attachment is used primarily to measure the transmittance of solid or liquid samples. It is also suitable for color analysis because stable measurement can be performed regardless of the surface configuration of the samples.

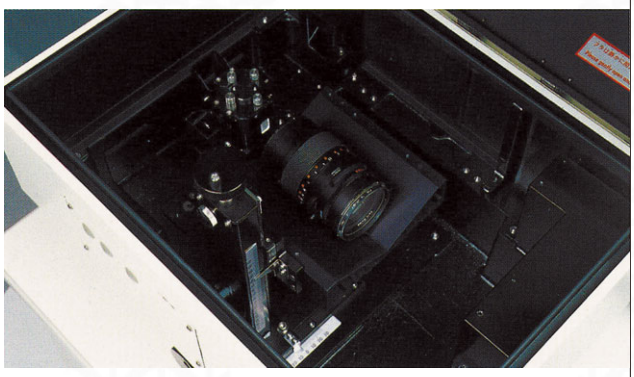
- Measurement wavelength range: 240~840nm (LISR-2100)
  240~2400nm (LISR-3100)
- Integrating sphere: inner diameter 150 mm
- Reflectance sample installation space: about 150 (W) x 170 (H) x 30 (t) mm
- Transmittance measurement accessory (P/N 206-17270) is required.



(solid)

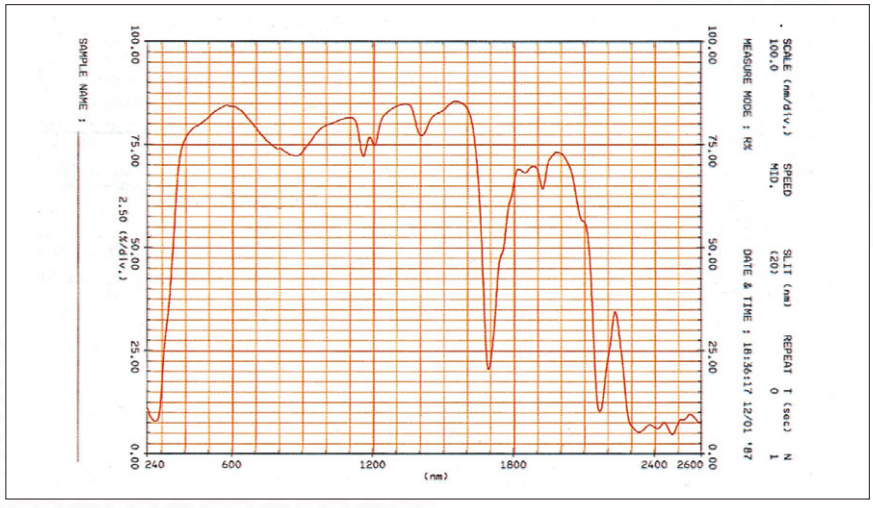
Multipurpose Large-Sample Compartments

MPC-2200 (P/N 206-23830-91)
(UV-2400/2500 series only)
MPC-3100 (P/N 206-23831-91)
(UV-3600 only)

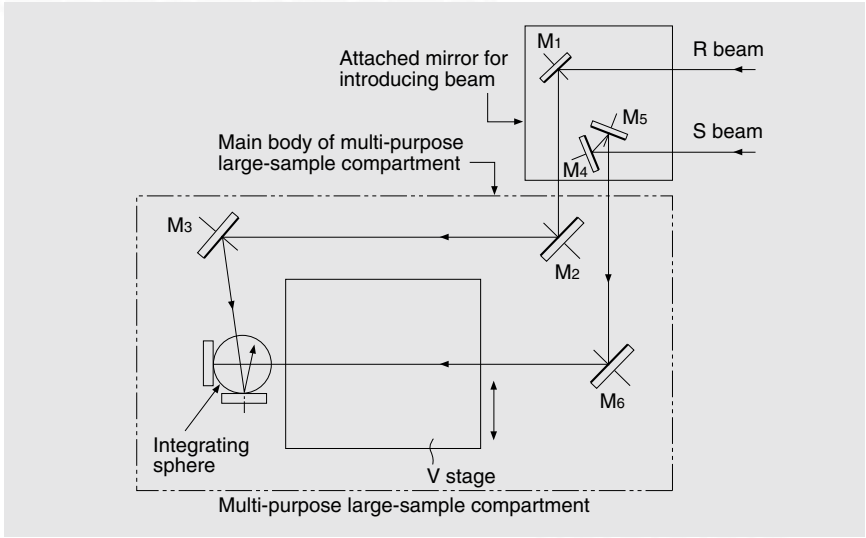


Reflection / transmission spectra of various solids such as a large disk, silicon wafer, lens, plastics, and glass are easily obtainable.

- Built-in 60 mm dia, integrating sphere permits measurement of a non-flat surface sample (such as lens) or thick glass.
- Wide wavelength range : 240 ~ 800 nm (MPC-2200)
  240 ~ 2600 nm (MPC-3100)
- Maximum sample size : Transmission : 305 mm dia. x 50 mm thick or
  204 mm dia. x 300 mm long
  Reflection : 305 mm dia. x 50 mm thick
- Height-adjustable V stage is built-in.



Reflectance spectrum of a CD measured in a multi-purpose large-sample compartment



Multi-purpose large-sample compartment

Suspension and Opaque Samples

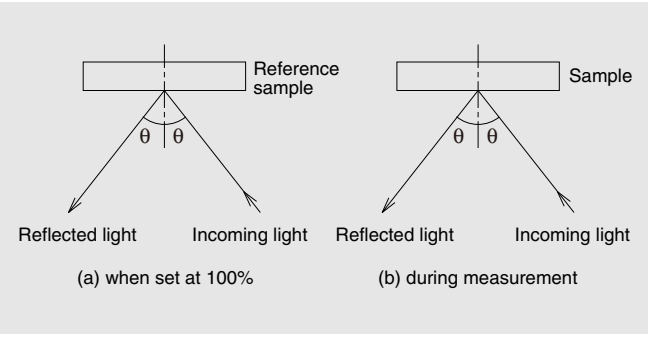
8. Suspension and Opaque Sample Measurement

Specular Reflectance Attachment
5° incident angle (P/N 206-14046)

The technique of specular reflectance is often applied to the examination of semiconductors, optical materials, multiple layers, etc. The 5Å Kincident angle minimizes the influence of polarized light. Thus, no polarizer is necessary.

- Samples as large as 100W x 160D x 15Th mm can be readily measured with the UVmini Series, UV-1600/1700/1800, Solidspec-3700, and Multi-Spec-1500.
- Samples as large as 140W x 160D x 10Th mm can be readily measured with the UV-2400/2500 series, UV-2450PC/2500PC, and UV-3600.
- Sample placement is easy -- just set it on the holder with the measuring surface down.
- Installed in the standard sample compartment.

Note: 1. The Alternate Sample Compartment (P/N 206-60184-07) is necessary for the UVmini-1240/1240V, and MultiSpec-1500.
2. Direct Detection Unit (See page 22) is necessary for the SolidSpec-3700/3700DUV.

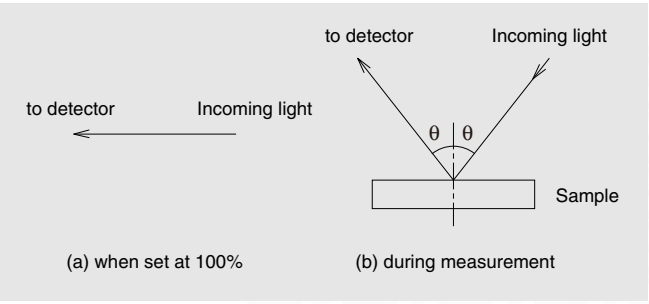


Relative specular reflectance measurement

Absolute Specular Reflectance Attachment
(UV-2400/2500 series, 3600, SolidSpec only)

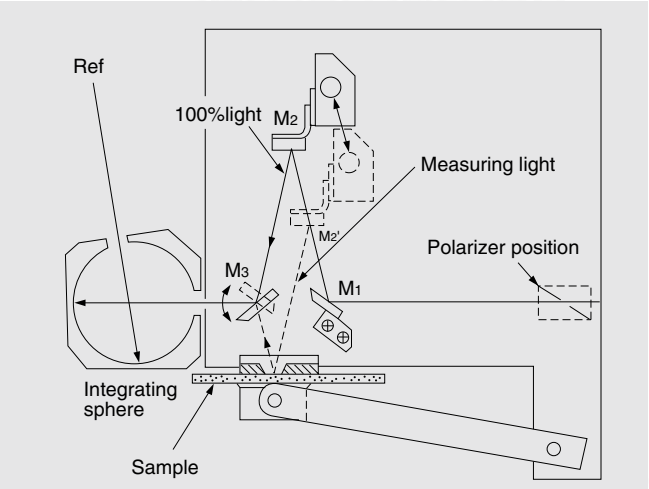
These accessories are intended for use with the MPC-2200 / 3100 or Solid Spec-3700 sampling compartment and require a Sample Base Plate Integrating Sphere Set (See page 21). At angles of incidence greater than 30 degrees, a polarizer is also required.

- V-N method : Optical path is easily switched between 100% level setting and sample measurement.
- Approximate sample size : 25 to 200 mm dia, or 20 to 150 mm square, up to 30 mm thick.



Absolute specular reflectance measurement

ASR Attachment	P/N	Incidence Angle	λ Range
ASR 3105	206-16817	5°	300 ~ 800nm (MPC-2200) 300 ~ 2400nm (MPC-3100)
ASR 3112	206-16100	12°	300 ~ 800nm (MPC-2200) 300 ~ 2500nm (MPC-3100)
ASR 3130	206-15001	30°	300 ~ 800nm (MPC-2200) 300 ~ 2300nm (MPC-3100)
ASR 3145	206-15002	45°	300 ~ 800nm (MPC-2200) 300 ~ 2300nm (MPC-3100)

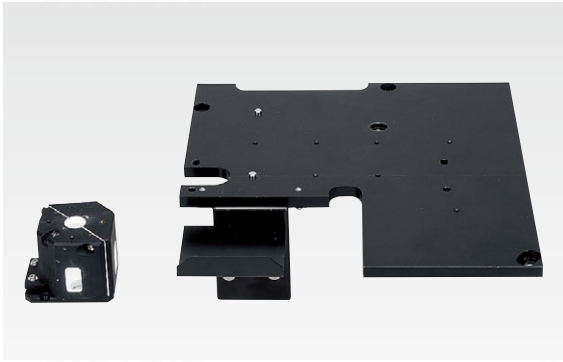


Configuration of absolute specular reflectance instrument

(solid)

Sample Base Plate Integrating Sphere Set
(UV-2400/2500 series, 3600, Solidspec only)

This is used to install an absolute specular reflectance attachment to the UV main unit.



	P/N	2400/2500 Series	3600	SolidSpec -3700	SolidSpec -3700DUV	λ Range
BIS-3100	206-17059	Yes	Yes	No	No	240 ~ 2600 nm
BIS-3700	206-20880-91	No	No	Yes	No	240 ~ 2600 nm
BIS-3700 DUV	206-20880-92	No	No	No	Yes	175 ~ 2600 nm

Large Polarizer Set (P/N 206-15694)
Polarizer Type Ⅰ (P/N 206-13236-01)
Polarizer Type Ⅱ (P/N 206-13236-02)
Polarizer Type Ⅲ (P/N 206-13163)
Polarizer Adaptor Set (P/N 206-15693)
(UV-2400/2500 series, 3600, Solid Spec only)

This attachment is used to obtain accurate reflectance measurements at high angles of incidence.
A polarizer adaptor set (P/N 206-15693) is a mounting accessory for polarizers.

Note: This polarizer can only be used in multipurpose large-scale sample compartments and absolute specular reflectance attachments.

	P/N	Effective Diameter	λ Range
Large Polarizer Set	206-15694	20 mm	250~2500 nm
BPolarizer Type Ⅰ	206-13236-01	18 mm	400~800 nm
BPolarizer Type Ⅱ	206-13236-02	17 mm	260~700 nm
BPolarizer Type Ⅲ	206-13163	10 mm	260~2500 nm

Suspension and Opaque Samples

9. Special Accessories for SolidSpec-3700/3700DUV

Automatic X-Y Stage (P/N 206-20810-39)

The Automatic X-Y Stage enables automatic measurements for the points specified in advance and is a powerful accessory for high-throughput measurements.

- Maximum sample size : 310mm diameter or 310 x 310mm, 40mm thickness

Direct Detection Unit DDU
(P/N 206-20264-91)

Direct Detection Unit DDU-DUV
(P/N 206-20264-92)

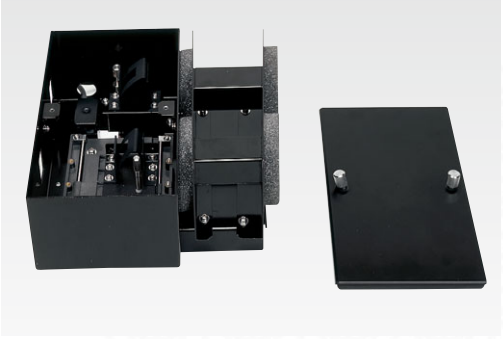
The same sample compartment as a conventional UV-VIS spectrophotometer can be added to the SolidSpec-3700/3700DUV by mounting the Direct Detection Unit DDU or DDU-DUV.

- Measurement wavelength range :
  DDU 190 ~ 3300nm (when mounted in SolidSpec-3700)
  DDU-DUV 165 ~ 3300nm (when mounted in SolidSpec-3700DUV)

Purge Box (P/N 206-21788-91)

The Purge Box is used with the Direct Detection Unit DDU-DUV, allowing the inside to be purged. The Purge Box has a film holder and a six-cell holder and allows the cell positions to be moved without opening the cover of the SolidSpec-3700/3700DUV.

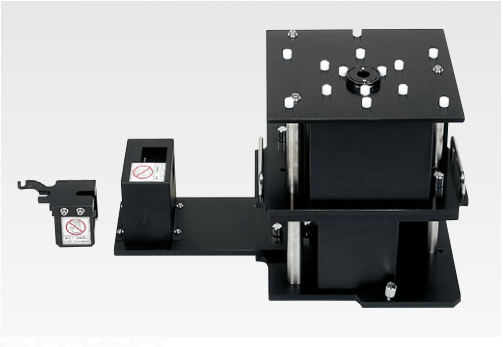
- Maximum sample size :
  60 x 60mm, 20mm thickness



Large Specular Reflectance Attachment (5° incident angle)
(P/N 206-20570-91)

The Large Specular Reflectance Attachment is needed for relative specular reflectance measurements. This accessory is mounted in the main body of SolidSpec-3700/3700DUV and enables reflectance measurements keeping the samples horizontal. The Direct Detection Unit DDU or DDU-DUV is not required for this accessory.

- Applicable sample size: maximum 470W x 560D x 40H (mm)



Square Cell Holder for Integrating Sphere
(P/N 206-22339-92)

10mm square cell holder for integrating sphere built into SolidSpec-3700/3700DUV systems.

(solid)

10. Printer

DPU-414 Screen Copy Printer
(P/N 206-55215-) (UVmini-1240, UV-1700 only)**
(P/N 206-55210-) (UV-1601 only)**

MPU Screen Copy Printer
(P/N 206-26007-) (UV1800 only)**

Prints hard copies of screens, including numeric data. A printout is made after each measurement.
Spectra, kinetics reaction data, and quantitation calibration curves displayed on the screen are output in the screen print. A hard copy can be printed at any time, making it simple to record measurement parameters.

The printer cable is included.
- Thermal paper (10 rolls) : (P/N 088-58907-04)

DPU-414 Dimensions: 160W x 170D x 66.5H (mm)

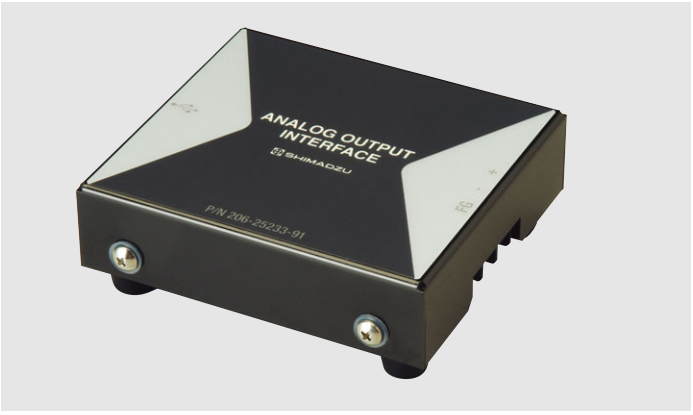
MPU Dimensions: 170W x 155D x 88H (mm)

Suspension and Opaque Samples (solid)

11. Interfaces, Cable

Analog Signal Output Interface
(P/N 206-25233-91)(UV-1800 only)

- Used to record output of the UV-1800 on an analog recorder.
- Analog output full scale : 100 mV/2 Abs. or 100 mV/100%T



Interface cable (Centronics standard)
(UVmini series, UV-1600/1700 only)

Used to print with a commercial printer (ESC/P only).
Note: Even with a color printer, output is only in monochrome.

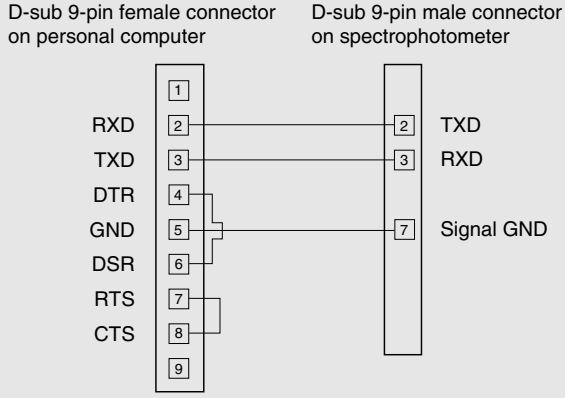
USB Interface Cable (P/N 088-52848-32)
(UV-1800 only)

Used to connect the UV-1800 to the PC.

RS-232C Cable (Type 2) (P/N 200-86408)
(UVmini Series, UV-1601, UV-1700 only)

Used to connect a UVmini Series, UV-1601, or UV-1700 to an IBM compatible PC. The connection is made as shown to the figure below.

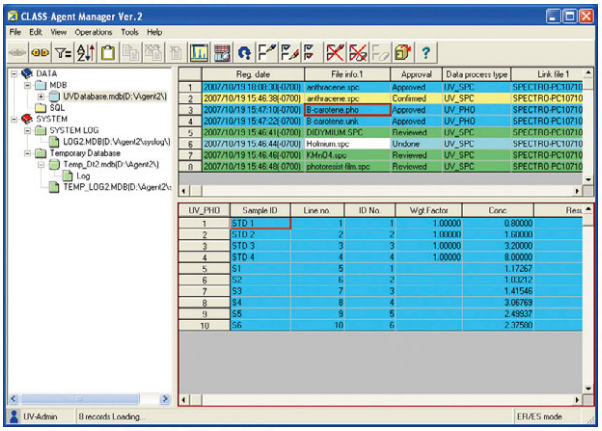
- The cable has a 9-pin female connector on the PC side, and a 9-pin male connector on the spectrophotometer side.
- Only three lines are used for communication: two lines for signal output and input and one for grounding.
- The pins of the control lines on the PC side are connected so that signal input and output are always ready to be made from the PC side.



Software

12. Software

UVProbe Agent software (P/N 206-21550-92)
(UV-1650PC/1800/2450/2550/3600/SolidSpec only)



The UVProbe Agent is a unique tool to manage various types of data acquired by the UVProbe for quick and easy data retrieval for further study, approval, browsing, back-up and disposal thereafter.

- The CLASS-Agent supports FDA 21 CFR Part 11 (Electronic Records and Electronic Signatures) and data security management and electronic signature functions are incorporated for data stored in the database.
- Data acquired by the UVProbe are automatically transferred and stored in the database, which can be easily queried.
- Spectra and peak detection tables included in the data stored in the database can be directly browsed.
- The UVProbe Agent is network-compatible. By installing an Agent software for corresponding analytical instruments, such as HPLC or FTIR spectrophotometer, data from all analytical instruments can be integrally managed at a server PC and those data can be browsed at client PCs.
- OS: WindowsXP/Professional SP2/Vista Business.

Note:
- UVProbe software Ver. 2.00 or higher is required.
- Data acquired/processed by Kinetics module is not compatible.

Performance Validation Software (P/N 206-84836-91)
(UV-1650PC/2450/2550 only)

Routine checking, calibration, and quality recording of your instrument performance are quite important for maintaining the reliability of data given by the instrument.
The Shimadzu Performance Validation Software carries out all these jobs with minimized labor and with minimal operator errors.

Features

- Test results are printed out automatically together with the time and date.
- Automate the number and sequence of up to 11 test validation methods. This batch of methods becomes your Standard Operating Procedure.
- The results, conditions, and history of checking may be automatically filed.
- This software runs on Windows XP/2000.

Specifications

Checking is made on the following 11 items, and the results are printed out in a semi-automated sequence. (The installation and removal of standard samples and/or tools for checking are made manually.)

- Instrument status after initialization
- Wavelength accuracy
- Wavelength repeatability
- Wavelength resolution
- Stray light
- Photometric accuracy
- Photometric (measurement) repeatability
- Baseline stability (amount of drift)
- Noise level
- 0% T line flatness

Software

12. Software

Film Thickness Measurement Software
(P/N 206-66877)
(UV-1601PC/2401PC/3101PC/3600/SolidSpec only)

This software provides calculation of film thickness from the peak positions of the interference pattern.

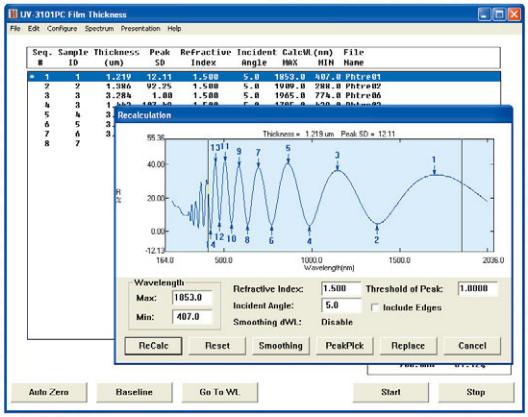
- Measurable thickness range is expressed by the next equation, though it somewhat differs with the types of samples.

$$\frac{\lambda e}{n} < d < \frac{50\lambda s}{n}$$

λe: Shortest measured wavelength
λs: Longest measured wavelength
n: Refractive index of sample

- Automatically detects valleys and peaks of interference spectrum.
- Calculates film thickness from the wavelengths of all the peaks and valleys within the specified wavelength range.
- Wavelength range may be selected watching the interference pattern.
- This software runs on Windows XP/Professional SP2/Vista Business.

Note: This software does not include a RS-232C connection cable. For use with the UV-1601, either UVPC software (206-60570-04) or a RS-232C cable (200-86408:IBM PC compatible) should be used.

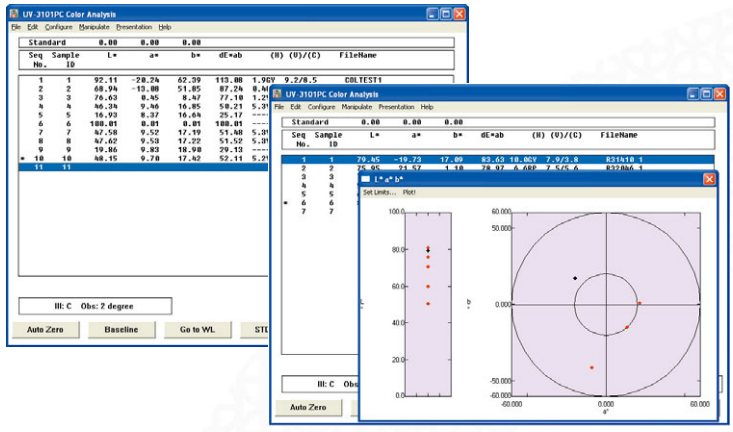


Color Measurement Software
(P/N 206-67449)
(UV-1601PC/2401PC/3101PC/3600/SolidSpec only)

This software calculates color indices from the spectra given by the spectrophotometer.

- Presents indices of XYZ, Lab (Hunter), L*a*b*, L*u*v*, Munsell, whiteness, yellowness, metamerism, and many others.
- Recalculates any results with different parameters and conditions. Chromaticity diagram and magnified color difference diagram may be graphically displayed.
- Permits computation using user-defined illuminants, besides the standard ones. The user-defined illuminants may be stored as files to be recalled at any time.
- Correction using the standard white plate ensures high accuracy in color computation. The set standard values may be stored as files to be recalled at any time.
- Calculates color differences using the arbitrarily selected standard samples.
- Available convenient functions include thickness correction, smoothing, averaging, and standard deviation calculation.
- Up to 100 data may be displayed together.
- This software runs on Windows XP/Professional SP2/Vista Business.

Note: This software does not include a RS-232C connection cable. For use with the UV-1601, either UVPC software (206-60570-04) or a RS-232C cable (200-86408:IBM PC compatible) should be used.



DLT-UVPC Solar Transmittance Measurement Software
(P/N 206-23130-92)
(UV-3150/3600, SolidSpec-3700/3700DUV only)

This software calculates the solar transmittance, solar reflectance, visible radiation transmittance, and visible light reflectance for sheet glass and films.

- Users can create their own table of weighting factors and can save weighting coefficient tables as a file.
- Results can be recalculated using a different reference sample.
- Users can create their own light illumination for color calculations. Users can save the light illumination they create as a file.
- Highly precise calculation results can be obtained using white tile correction. Reflectance data from the white tile can be saved as a file.
- Chromaticity coordinates can be graphed.
- Compatible Operating Systems: Windows XP/Professional SP2/Vista Business.

Note: Using UV-PC to operate a UV-3100PC system in Windows 3.1/95/98 requires upgrading to Windows XP/2000 and UVProbe software (P/N 206-21440-91).

Optional Software for UVmini-1240/1240V

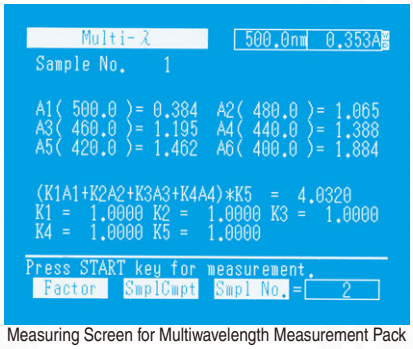
Multiwavelength Measurement Program Pack
(P/N 206-89755-92)

This multiwavelength measurement program pack can measure up to six wavelengths. It can also simultaneously display the difference and ratio for two wavelengths in response to measured absorbances or transmittance rates as well as calculation results for three-wavelength calculation. It permits linked operation with the optional CPS cell positioner to allow up to 6 samples to be measured concurrently.

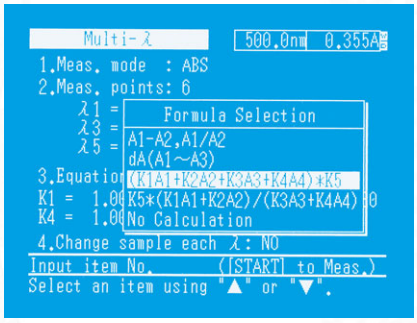
- The wavelength program can be set for up to six wavelengths.
- Measuring data can be selected from two modes: absorbances or transmittances.
- Photometric values can be used for producing calculations.

1) Ratio and difference of photometric values for two wavelengths
2) Three-wavelength computation
3) Four data formula computation:
   (K1 x A1+K2 x A2+K3 x A3+K4 x A4) x K5
4) Four data formula computation:
   K5 x (K1 x A1+K2 x A2) / (K3 x A3+K4 x A4)
   An (n = 1 to 4) is the absorbance at measuring wavelength ln (n = 1 to 4).
   The same settings are possible for transmittance rates.

- Measurement results are printed out for each measurement.
- Sample exchange for each wavelength:
  When one measurement is made, the sample can be exchanged for each wavelength so that the measurement can be taken.



Measuring Screen for Multiwavelength Measurement Pack



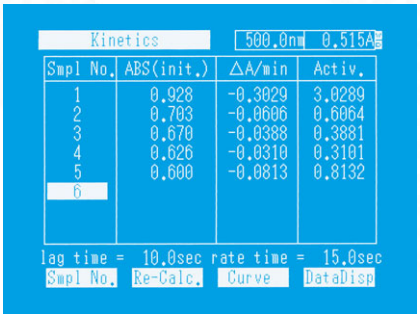
Calculation Formula Setting Screen for Multiwavelength Measurement Pack

Kinetics Program Pack
(P/N 206-89756-92)

This software is used for measuring time change in absorbance at a constant wavelength and calculating enzyme activity values or other types of values.

- Calculation and recalculation of the activity value is possible through linear regression using the least-squares method.
- The coefficients used in the activity value calculation can be set to a maximum of four types.
- The setting range for measuring is from 1 to 6550 seconds or minutes.
- Measuring of two wavelengths is possible. Absorbance time change can be recorded while absorbance at the background wavelength is being extracted from absorbance at the measured wavelength.
- Data processing function for reaction curves:
  Expansion and compression (Note that compression is possible only in the vertical axis.)
  Data readout with the cursor key, Reaction curve storing and recall
- Measurement results (chart data) can be stored and recalled.

Note: Synchronized measurement with multiple cells such as CPS-240A is not possible.

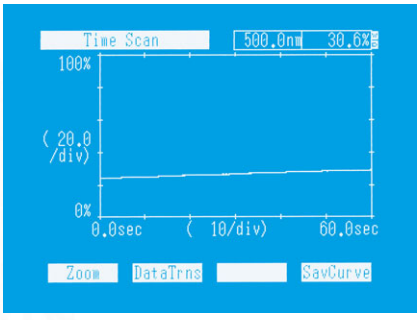


Activity Value Display Screen for Kinetics Program Pack

Time Scan Program Pack
(P/N 206-89757-92)

The time scan program pack can record the time change for photometric values (transmittance rates, absorbances and energy) at a constant wavelength. The state of change is displayed on screen as a time scan curve.

- Measuring data can be selected from three modes:
  absorbance, transmittance rate and energy.
- The setting range for measuring is from 1 to 6550 seconds or minutes.
- Data processing function for reaction curves:
  Expansion and compression (Note that compression is possible only in the vertical axis.)
  Data readout with the cursor key, Reaction curve storing and recall

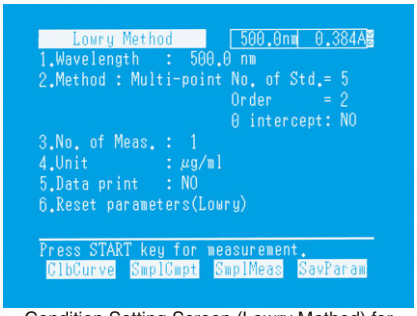


Calculation Formula Setting Screen for Multiwavelength Measurement Pack

Protein Analysis Program Pack
(P/N 206-89758-92)

The protein analysis program pack is a single package that combines four quantitative methods for measuring protein concentrations using coloring reagents and a quantitative method for direct measurement of concentrations calculated from measured absorbances and absorption constants that have been set in advance.

- Quantitation Methods
  Lowry method, BCA method (method using Bicinchoninic Acid)
  CBB method (method using Coomassie Brilliant Blue G-250)
  Biuret method, UV absorption method (280 nm)
- The calibration curve function is the same as the standard quantitation mode. (function using calorimetric method)
- Quantitation is possible from repeated measuring (1 to 10 measurements) together with those mean values.
- Measurement results (chart data) can be stored and recalled.

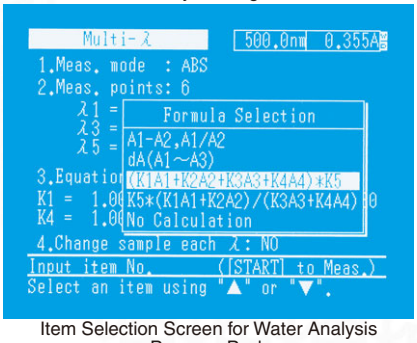


Condition Setting Screen (Lowry Method) for Protein Analysis Program Pack

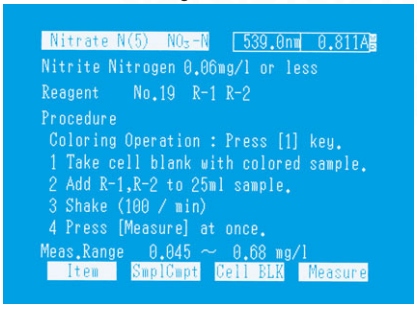
Water Analysis Program Pack
(P/N 206-89751-92)

Easy and accurate water analysis can be conducted in combination with simplified reagents.

- The number of analysis items are 48 items in 31 types, and all the analysis conditions are installed. Just select an item (including measurement of wavelength, calibration curve, measuring time, and measurement concentration range for each individual item) and it will be set automatically.
- Results can be acquired even without analytical knowledge through operation in accordance with screen instructions. The pack comes with an analysis guide which displays the number of the reagent to be used and the operation procedure, so there is no need to refer to the manual.
- If the optional multicell holder (6-cells) is used, up to six cells can be measured consecutively in one analysis.
- Automatic analysis commences after specified time. Elapsed time is displayed on screen, concentration values are displayed automatically after the specified time has elapsed, and a buzzer sounds to state that analysis is completed.



Item Selection Screen for Water Analysis Program Pack



Operation Screen for Water Analysis Program Pack

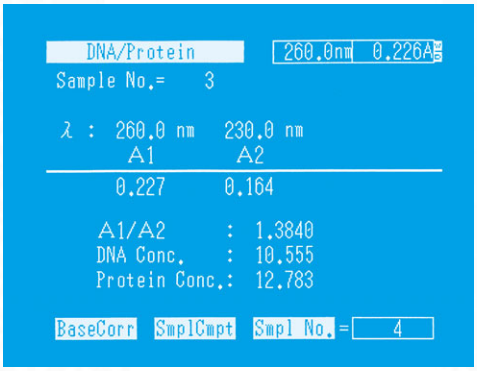
List of Measurable Items

Chemical symbo	Measurable item	Chemical symbo	Measurable item
Al	Aluminum	NO_2	Nitrite
Ba	Barium		Nitrite-nitrogen
Ca	Calcium	NO_3	Nitrate: Nitrate free
Cl	Chloride		Nitrate: Nitrate in 0.2 mg/l max.
ClO	Residual chlorine: DPD method		Nitrate: Nitrate in 0.2 mg/l min.
CN	Cyanogen: Total cyanogen		Nitrate-nitrogen: Nitrite-nitrogen free
COD	Chemical oxygen demand		Nitrate-nitrogen: Nitrite-nitrogen in 0.06 mg/l max.
Color	Color		Nitrate-nitrogen: Nitrite-nitrogen in 0.06 mg/l min.
Cr	Chromium: Hexavalent chromium	Pb	Lead: Not including other metals
	Chromium: Total chromium		Lead: Including other metals (KCN used)
Cu	Copper	pH	BCG
DO	Dissolved oxygen		CPR
F	Fluorine		BTB
Fe	Iron(Ferrum): Divalent iron		CRb
	Iron(Ferrum): Divalent iron at low concentration	Phenol	Phenol
	Iron(Ferrum): Total iron (reducing method)	PO4	Phosphate
	Iron(Ferrum): Total iron at low concentration	SiO2	Silica: High concentration
FOR	For maldehyde		Silica: Low concentration
K	Potassium	SO_3	Sulfite
Mg	Magnesium	SO_4	Sulfate
Mn	Manganese	maldehyde	TH Total hardness
NH_4	Ammonium	Turbid.	Turbidity
	Ammonium nitrogen	Zn	Zinc: Not including other metals
Ni	Nickel		Zinc: Including other metals (KCN used)

Software

DNA/Protein Program Pack
(P/N 206-89750-92)

The concentration of DNA and protein is quickly calculated by using an optional program pack. The measurement wavelengths and the calculation are preprogrammed. Quantitative results are easily measured by simply setting the sample into the spectrophotometer and pressing START. Absorbance ratios and DNA/Protein calculations are readily available in the standard menu and the measurement wavelengths and factors can be modified to match your specific requirements.



Measurement display for DNA/Protein Program Pack

- Concentration calculating formula is selectable between two types as below.

1) A1 = Absorbance at 260nm A2 = Absorbance at 230nm
   Ratio = A1/A2
   DNA concentration = 49.1 x A1 - 3.48 x A2
   Protein concentration = 183.0 x A2 - 75.8 x A1
2) A1 = Absorbance at 260nm A2 = Absorbance at 280nm
   Ratio = A1/A2
   DNA concentration = 62.9 x A1 - 36.0 x A2
   Protein concentration = 1552.0 x A2 - 757.3 x A1
   Selectable background correction for the absorbance at 320nm is available.

Note: Not applicable to UVmini-1240V.

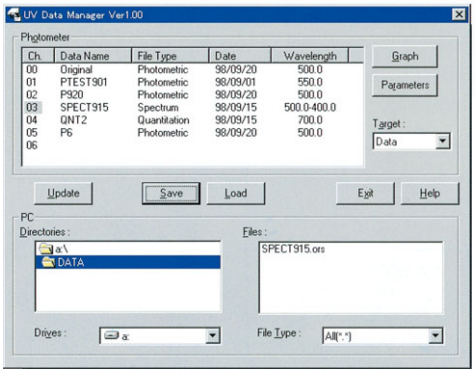
UV Data Manager Software
(P/N 206-89765-92)

With the UV Mini connected to a PC via the standard RS-232C port, the UV Data Manager helps organize and store data files in memory of a computer, the spectrophotometer or the data packs.

Some of the features of the software include:

- Management of data and parameter files.
- Concentration calculating formula is selectable between two types of formula.
- Data translation from the spectrophotometer to the PC into a text file for easy pasting into a spreadsheet software package.
- Download previously saved data from the PC to the spectrophotometer for expanded storage and backup capabilities. Data can also be uploaded onto the IC data pack cards for multiple instrument users.
- Convenient sorting and searching possibilities for files in the data list box of the spectrophotometer, helping to maintain order of your essential information.
- Spectral data can be graphically displayed in the UV Data Manager for quick and easy data interpretation.

Note: UV Data Manager is to be operated under MS-Windows 95/98/NT/2000/XP.
Use IBM-PC compatible personal computer.
Use Shimadzu RS-232C interface cable. The part number is 200-86408.



Measurement display for DNA/Protein Program Pack

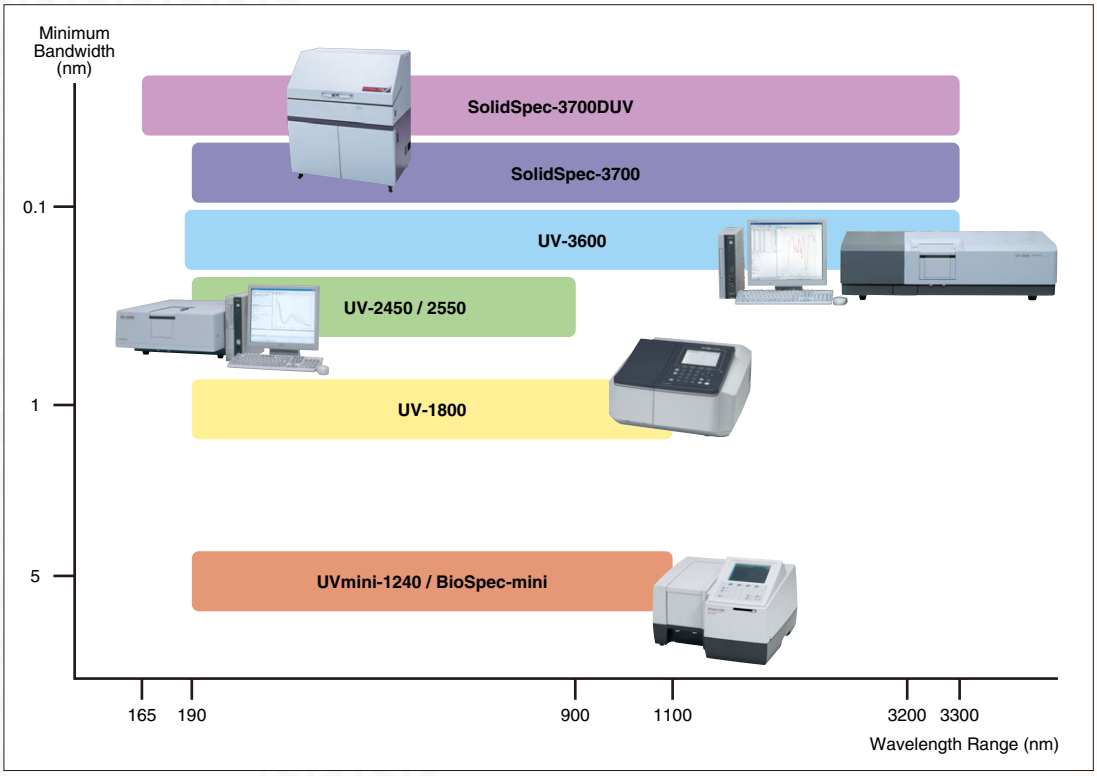
- Support files:
  Photometric files
  Spectrum files
  Quantitation files
  *Optional program pack files are not available.

Data Pack
(P/N 206-80700)

Stores 46 files of experimental parameters, or 21 files of time-course and/or spectral curves.

Note: This Data Pack is identical to the UVmini-1240 Series Data Pack but the files are not compatible.
The Data Pack must be initialized for use with the UV-1700.

Shimadzu UV-VIS spectrophotometers



JQA-0376

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SHIMADZU

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