C101-E081J

SHIMADZU
Excellence in Science

IR 55th 2011
60th 2012 UV
ANNIVERSARY

UV-VIS Spectrophotometer

UVmini-1240

MEGA performance in a Mini space

MEGA capabilities at a Mini price

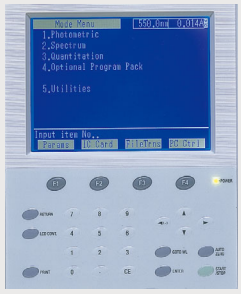
UV-VIS Spectrophotometer

UVmini-1240

The UVmini Spectrophotometer with Major Features

Minimal Training– –Easy to use

A large liquid-crystal display (LCD) has been incorporated with easy-to-follow prompts, large fonts, and graphics to help reduce the time needed to get your results. The description on the instrument's soft keypad quickly guides you through specific programs.



Mighty Performance with Quantitative Methods

Everything from simple concentration measurements up to sophisticated quantitative calibration curves. Some of the standard functions include:

- Factor method for input of simple constants.
- One-point calibration curve with one standard sample and a point through the origin.
- Multi-point calibration curve of the application requiring various standards.
  1st, 2nd, and 3rd-order polynomial fitting for the calibration come standard.
- Two or three wavelength quantitative analysis for measuring turbid samples or for measuring the effects of another distinguishable component.

Maximum Wavelength Scanning

The UVmini comes standard with a Spectrum mode that allows for full spectral data acquisition over the wavelength range of 190nm to 1100nm. Upon completion of the spectral scan, the peaks and valleys can be marked within a few seconds. The standard peak-pick function allows for clear and accurate detection of the most sensitive wavelengths.

Multiple Print Utilities

The UVmini provides flexible print options with the use of either a thermal screen copy printer or a variety of PC printers. The screen copy printer enables instant printing of tabulated data as well as copied information directly from the screen. The PC printers can be utilized for the same functions and for finer print resolution of spectral data.

Mega Data Archiving Capabilities

Methods, results, and raw data can be saved on either the standalone instrument, optional dedicated IC Data cards, or within a directory of an IBM Compatible PC with the help of the optional NEW UV DATA MANAGER software. This provides unlimited storage and expanded capabilities in archiving methods and managing essential results.

Mini Effort to Customize

With over 35 different types of attachments including multicell positioners, Sippers, and temperature-control devices, the UVmini can provide all the tools necessary to handle your specific application. The IC program cards quickly expand the functionality of the instrument.
By simply inserting the appropriate IC card into the slot on the front panel, dedicated applications such as DNA/Protein analysis can be performed.

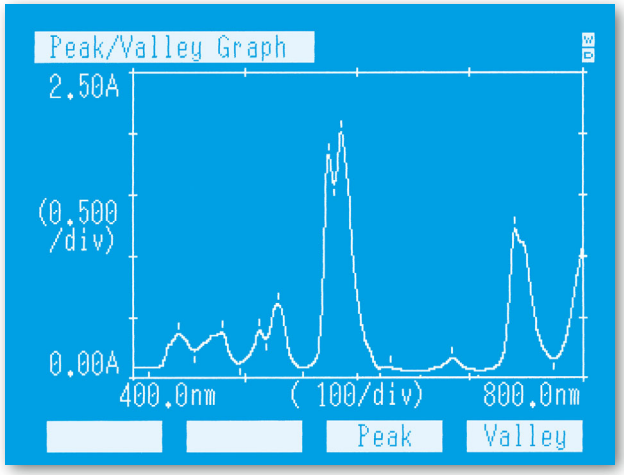
Contents

Standard Applications with Each UV Spectrophotometer!

Mode Menu

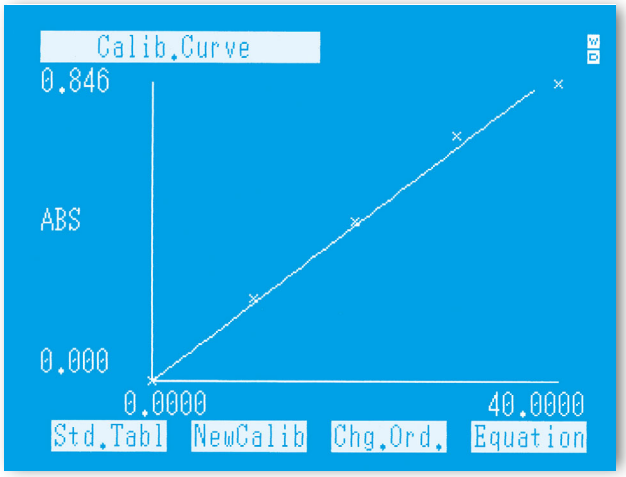
Photometric Mode for Fixed Wavelengths

With the photometric mode, you can measure the absorbance or transmittance at a fixed wavelength. Simple quantitative analysis using the K-factor method can also be performed. Results are automatically printed or sent to the RS-232C port. With the various optional cell positioners or sipper/autosampler configuration, continuous measurement of samples is also possible.



Spectrum Mode for Wavelength Scanning

With this standard mode, you can acquire a full UV-Visible spectrum of samples from 190nm to 1100nm. Repeat scan will allow you to measure any spectral change over the entire range automatically. Spectral data processing functions, such as scaling the graph and peak/valley detection, are also available as standard.

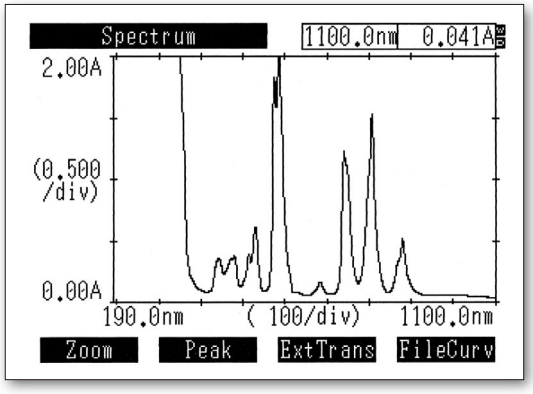


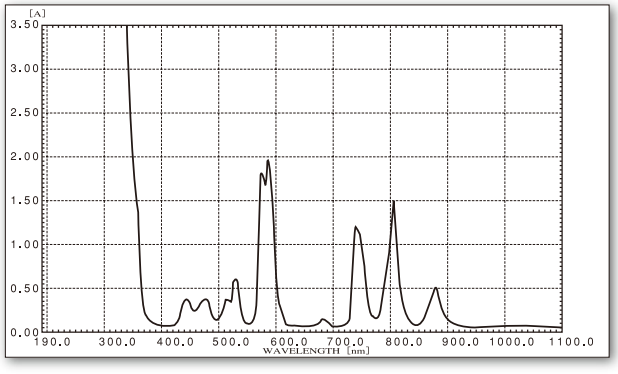
Quantitation Mode for Single Component Analysis

This mode allows you to set up a calibration curve for easy determination of unknown sample concentrations. One, two or three-wavelength modes are available. Selectable quantitative methods include K-factor, one point or multi-point calibration curves. 1st, 2nd, or 3rd-order fits are also selectable.

Print out

The measured spectrum can be printed out as a screen copy for quick display (left) or plotted for the best-printing resolution (right).

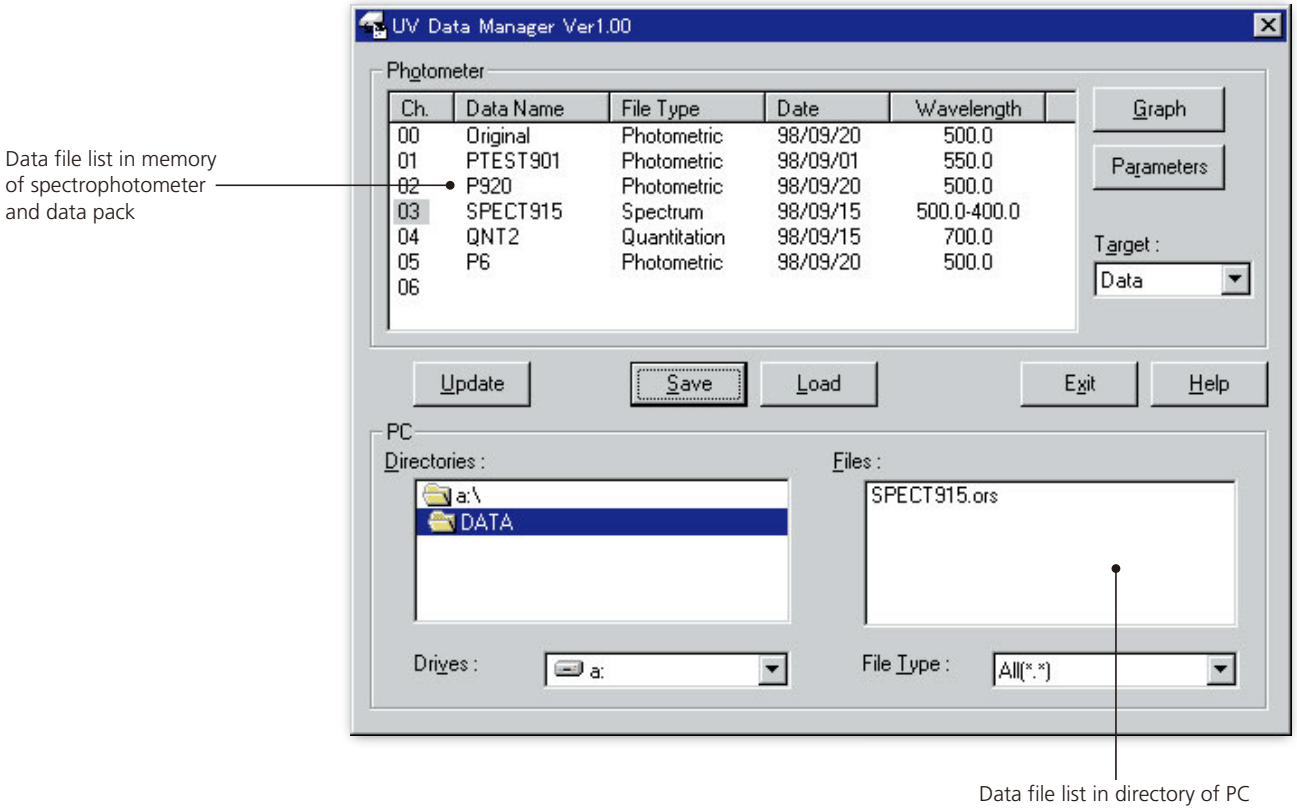




Optional Software

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

With the UVmini connected to a PC via the standard RS-232C port, the UV Data Manager is the software designed to help organize and store data files in memory for a computer, the spectrophotometer or the data packs.



Some of the software features include:

- Management of data and parameter files.
- Data translation from the spectrophotometer to the PC and 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.

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

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

DNA/Protein Program Pack (P/N 206-89765-92)

Concentrations of DNA and protein are 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.

The concentration calculating formula is selectable between the two types shown below.

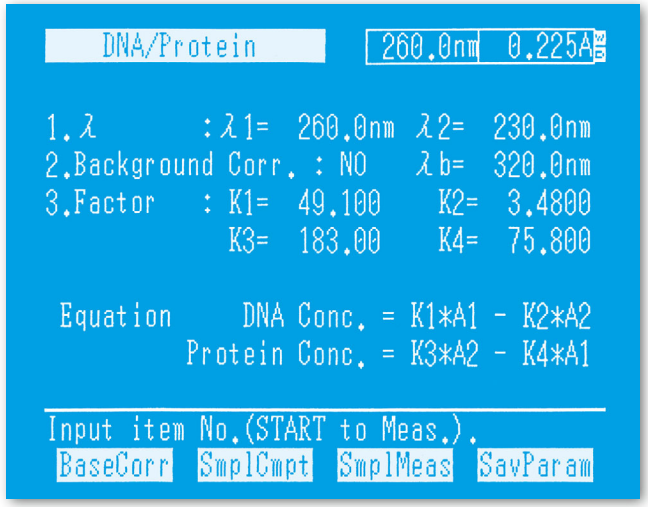
1. A1 = Absorbance at 260 nm A2 = Aborbance at 230 nm
   Ratio = A1/A2
   DNA concentration = 49.1 × A1 – 3.48 × A2
   Protein concentration = 183.0 × A2 – 75.8 × A1

2. A1 = Absorbance at 260 nm A2 = Aborbance at 280 nm
   Ratio = A1/A2
   DNA concentration = 62.9 × A1 – 36.0 × A2
   Protein concentration = 1552.0 × A2 – 757.3 × A1

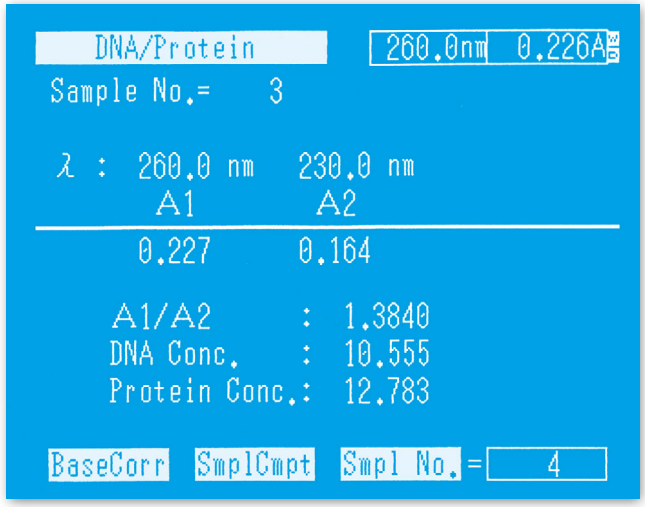
Selectable background correction for the absorbance at 320 nm is available.

Reference:
1. Warburg and Christian, (1942) *Biochem. Z.* 310, 384–421.
2. Kalb and Bernlohr, (1977) *Anal. Biochem.* 82, 362–371.

Parameter setting display



Measurement display



Optional Software

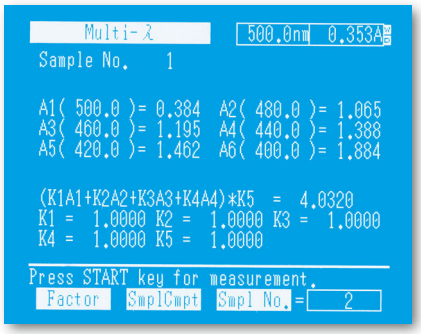
Multiwavelength Measurement Program Pack
(P/N 206-89755-92)

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 a three-wavelength calculation. It permits linked operation with the optional CPS cell positioner to allow up to 6 samples to be measured concurrently.

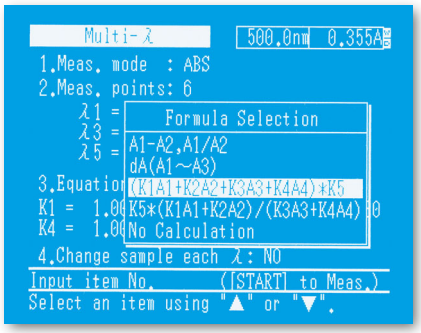
- The wavelength program can be set for up to six wavelengths.
- Measuring data can be selected from two modes: absorbances or transmittances.
- Photometric values can be used for producing calculations.
  1. Ratio and difference of photometric values for two wavelengths
  2. Three-wavelength computation
  3. Four data formula computation: (K1x 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 Multiwave ength Measurement Pack



Calculation Formula Setting Screen for Multiwavelength Measurement Pack

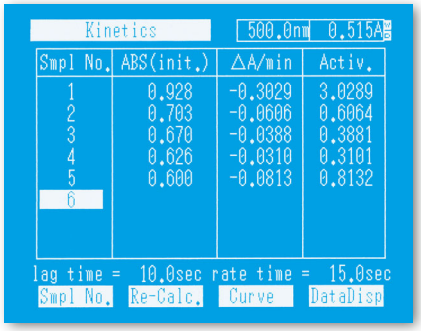


Kinetics Program Pack **(P/N 206-89756-92)**

This software is used for measuring the 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 are 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.
- Measuring of two wavelengths is possible. The 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.

Activity Value Display Screen for Kinetics Program Pack

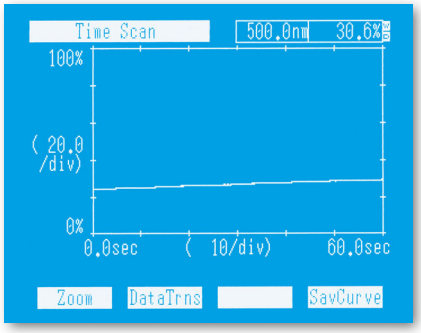


Time Scan Program Pack **(P/N 206-89757-92)**

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, transmittancerate and energy.
- The setting range for measuring is from 1 to 6550 seconds.
- 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

Measuring Screen for Time Scan Program Pack

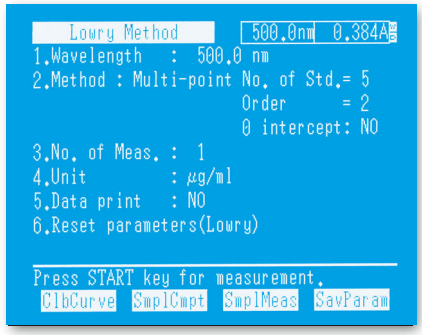


Protein Analysis Program Pack (P/N 206-89758-92)

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

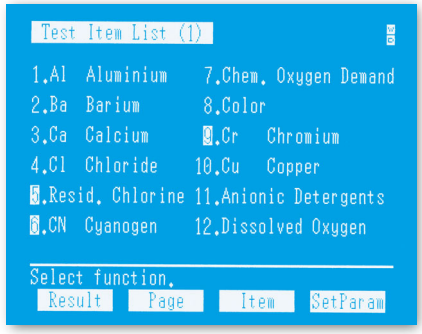


Water Analysis Program Pack (P/N 206-89751-92)

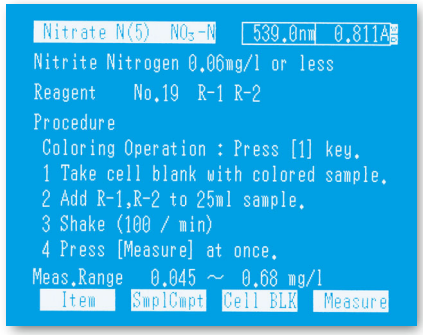
Easy and accurate water analysis can be conducted in combination with simplified reagents.

- There are 48 analysis 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 the conditions 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 a specified time. The 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 complete.

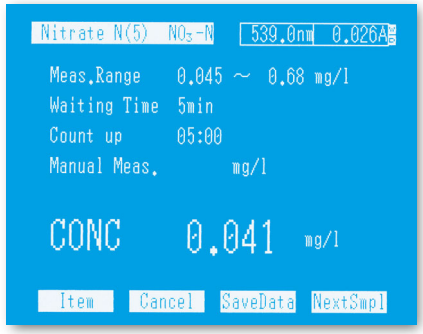
Item Selection Screen for Water Analysis Program Pack



Operation Screen for Water Analysis Program Pack



Measuring Screen for Water Analysis Program Pack



List of Measurable Items

Chemical Symbol	Measureble item	Chemical Symbol	Measureble item
Al	Aluminum	Ni	Nickel
Ba	Barium	NO_2	Nitrite
Ca	Calcium		Nitrite-nitrogen
Cl	Chloride	NO_3	Nitrite: Nitrate free
ClO	Residual chlorine: DPD method		Nitrite: Nitrate in 0.2 mg/l max.
CN	Cyanogen: Total cyanogen		Nitrite: Nitrate in 0.2 mg/l min.
COD	Chemical oxygen demand		Nitrite-nitrogen: Nitrite-nitrogen free
Color	Color		Nitrite-nitrogen: Nitrite-nitrogen in 0.06 mg/l max
Cr	Chromium: Hexavalent chromium		Nitrite-nitrogen: Nitrite-nitrogen in 0.06 mg/l min.
	Chromium: Total chromium	Pb	Lead: Not including other metals
Cu	Copper		Lead: Including other metals (KCN used)
DO	Dissolved oxygen	pH	BCG
F	Fluorine		CPR
Fe	Iron (Ferrum): Divalent iron		BTB
	Iron (Ferrum): Divalent iron at low concentration		CRb
	Iron (Ferrum): Total iron (reducing method)	Phenol	Phenol
	Iron (Ferrum): Total iron at low concentration	PO_4	Phosphate
FOR	Formaldehyde	Sio_2	Silica: High concentration
K	Postassium		Silica: Low concentration
Mg	Magnesium	SO_3	Sulfite
Mn	Manganese	SO_4	Sulfate
NH_4	Ammonium	TH	Total hardness
	Ammonium nitrogen	Turbid.	Turbidity
		Zn	Zinc: Not including other metals
			Zinc: Including other metals (KCN used)

Specifications

Hardware Specifications

Optical Design	Wavelength range	190.0 to 1100.0 nm
	Display wavelength	0.1nm step
	Selectable wavelength	0.1nm step (1nm step in spectrum mode)
	Scan speed	Wavelength change: approximately 3800 nm/min. Scan: approximately 24 to 1400 nm/min
	Light source change	Selectable from following 3 types; ● Auto change with wavelength Selectable wavelength 295nm to 364nm: 1nm interval Recommended wavelength: 340nm ● Halogen lamp only ● Deuterium (D_2) lamp only
	Measurement method	Single beam measurement
	Light source	Auto correction with the computer memory 20W Halogen lamp (long-life 2000 hours) Deuterium lamp (socket type) Auto adjustment for maximum sensitivity
	Monochromator	Incorporates aberration-correcting concave blazed holographic grating
	Detector	Silicon photodiode

Performance Specifications	Spectrum bandwidth	5 nm
	Wavelength accuracy	± 1.0 nm
	Wavelength repeatability	± 0.3 nm
	Stray light	less than 0.05% (220.0 nm NaI, 340.0 nm $NaNO_2$ & UV39)
	Photometric range	Absorbance: –0.3 to 3.0 Abs Transmittance: 0.0 to 200%
	Recording range	Absorbance: –3.99 to 3.99 Abs Transmittance: –399 to 399%
	Photometric accuracy	± 0.005 Abs (at 1.0 Abs) ± 0.003 Abs (at 0.5 Abs)
	Photometric repeatability	± 0.002 Abs (at 1.0 Abs)
	Drift	less than ± 0.001 Abs/h (after 2 hr warm-up)
	Baseline flatness	± 0.010 Abs (after 1 hr warm-up, at 1100 to 200 nm)
	Noise	less than 0.002 Abs, Peak to Peak less than 0.0005 Abs, RMS

Site Requirements	Sample compartment	Interior dimensions W110.0 × D230.0 × H105.0 mm (partial depth: 155.0 mm) 2 screw port for option accessory installation
	Display	6 inch LCD (320 × 240 dot) with CFD lighting with contrast adjustment
	Power supply	100~120 V 50/60 Hz 160 VA 220~240 V 50/60 Hz 160 VA
	Dimensions	W416 × D379 × H274mm
	Weight	11 kg
	Ambient temperature	15 to 35°C
	Ambient humidity	45 to 80%, less than 70% if over 30°C

Software Specifications

Photometric	Fixed wavelength measurement; T%, ABS Quantitation with K-factor method Save/Load of the result data table Auto printout of measured data, Auto transfer via serial port Optional cell positioners for continuous measurement of samples

Spectrum	Spectrum measurement ● Measuring mode: ABS, T%, E ● Scan Speed: Very fast, Fast, Medium, Slow, Very slow ● Scan times: 1 to 99 ● Spectrum display: Selectable overlay or sequential Data processing of spectrum data ● Detection of peak and valley (both up to 20) ● Zoom in and zoom out (only vertical axis can zoom out) ● Data read out with cursor keys ● Data save/load (Standard: 6, Data pack: 21) Spectrum data transfer via serial port Spectrum printout (A5 size, with ESC/P type printer)

Quantitation	1 wavelength, 2 or 3 wavelength quantitation Calibration curve K factor method with auto concentration calculation One point calibration curve with auto concentration calculation Multi-point calibration curve ● Number of standards (2 to 10) ● Calibration curve: 1 to 3 order calibration curve ● Selection to pass or not pass on original point Repeat measurement of standards (1 to 10 times) and creation of the calibration curve with the mean values of measurement data Display of the calibration curve Display of the correlation factor of the calibration curve Quantitation measurement Repetition (1 to 10 times) and the quantitation with the mean value Save/load of the measured data table Auto printout of the measured data, Auto transfer via serial port Optional cell positioners for continuous measurement of samples

Optional Accessories

Film Holder **(P/N 204-58909)**

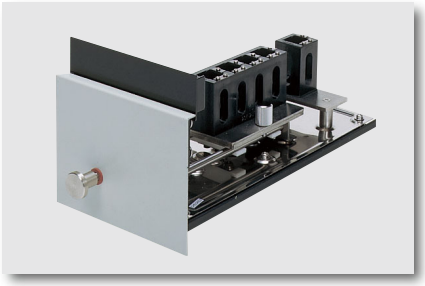
For measurement of thin samples such as films and filters.
Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.

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

These filters are used to check the instrument.

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

Provides manual sample changer with 4 holders for 10 mm square cells. Cells are on a sliding mount which moves by manual changing. Requires Alternate Sample Compartment. This option accepts other four-cell holders.

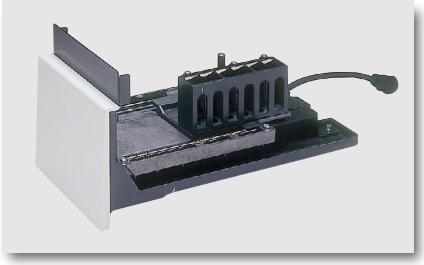


Alternate Sample Compartment **(P/N 206-60184-07)**

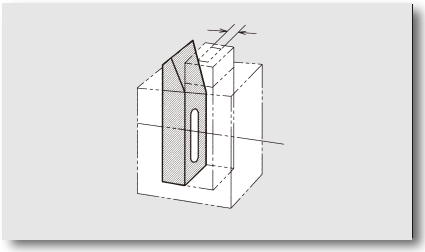
It provides for additional sampling accessories such as the micro flow-thru cell, the long-path rectangular cell, the cylindrical cell, the film cell holder, and the constant-temperature cell.

Multicell Sample Compartment **(P/N 206-60605-02)**

Holds up to six 10mm square cells. No temperature control capability.
Number of cells: 6 on the sample side.
Note: Cells are not included in the standard contents.



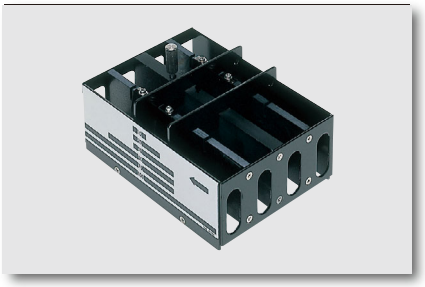
Spacer for Short-Path Cell (P/N 204-21473-**)



Samples too dense to be measured with a standard 10 mm square cell can be measured reliably without dilution by means of a short-path cell.
The spacers are available for three types of cells corresponding to a path-length of 1, 2, or 5 mm. As shown in the figure, the spacer is sandwiched between the cell and the inner wall of the square cell holder.

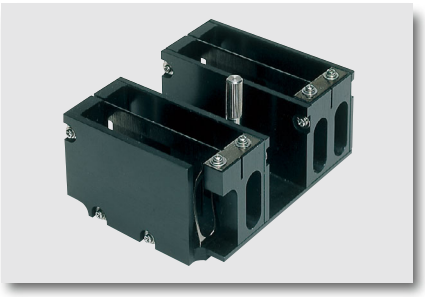
P/N	Opt. path
204-21473-03	1 mm
204-21473-01	2 mm
204-21473-02	5 mm

Universal Rectangular Cell Holder, four-cell type (P/N 204-27208)



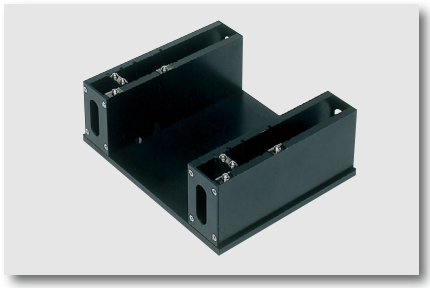
Provides a manual changer for rectangular cells having an optical path of 10, 20, 30, or 50 mm.
Note: The Four-Cell Sample Compartment Unit (P/N 206-23670-91) is necessary.

50mm Path Square Cell Holder, four cell type (P/N 206-65898)



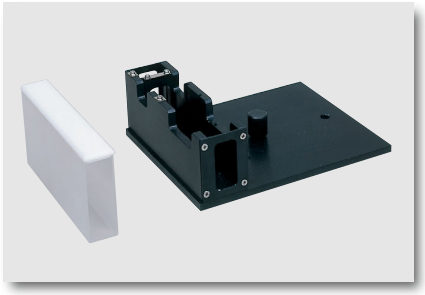
Installed in place of the six-cell holder to accept four 50mm path-length square cells. The cells are automatically changed over in synchronization with measurement, in the same way as the standard six-cell holder.
Applicable cell: 50mm Square cell (P/N 200-34944)

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



For rectangular cells having an optical path of 10, 20, 30, or 50 mm.
Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.

Wide-Width Long-Path Rectangular Cell Holder (P/N 206-69421)



For rectangular cells having an optical path of up to 50 mm because of the width of the light beam.

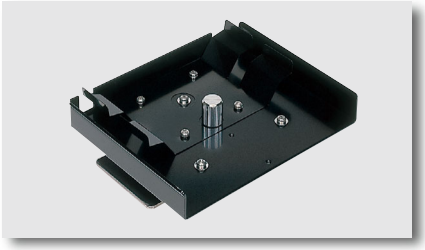
Wide-Width Long-Path Rectangular Cell

These are rectangular cells having a width of 15 mm. Dedicated lids are provided to prevent sample spilling.

Optical path length	P/N	P/N of lid
10 mm	200-66599-01	200-66600-01
33 mm	200-66599-02	200-66600-02
50 mm	200-66599-03	200-66600-03

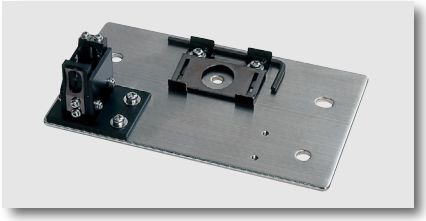
Cylindrical Cell Holder **(P/N 204-06216-02)**

For a cylindrical cell having an optical path of 10, 20, 50, or 100 mm.
Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.



Supermicro Cell Holder **(P/N 206-14334-01)**

Measure a sample as small as 100 microliters with the supermicro cell holder.
The holder facilitates the use of the masked microcell (P/N 200-66578-11) for 100 to 120 µL and supermicro cell (P/N 200-66578-12) for quantities of 100 to 400 µL. Requires use of the Alternate Sample Compartment (P/N 206-60184-07).



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

Holds a cell, 10 mm in pathlength and 3 mm in pathwidth (masked).
Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.

Micro Cell Mask for standard six-cell holder **(P/N 206-66828)**

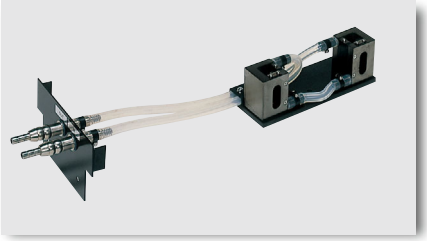
Stops down the measuring light beam for measurement with 4mm-wide path micro cells installed in the standard six-cell holder.
Applicable cell: 10mm Semi-micro cell (quartz) (P/N 200-66501)
10mm Semi-micro cell (glass) (P/N 200-66501-01)
10mm Semi-micro black cell (quartz) (P/N 200-66551)

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

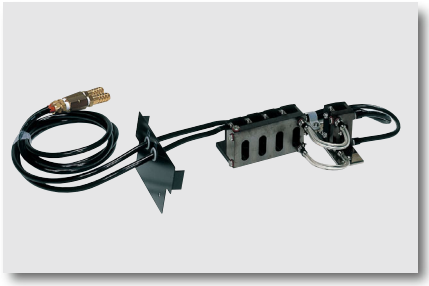
Maintains a sample cell at a desired, uniform temperature by circulating constant-temperature water.

- Temperature range: 5 to 90°C (depends on the perfomance of the constant temperature water circulator)
- Cell holder: Accepts a 10 mm square cell

Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.



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



Maintains four sample cells at a desired, uniform temperature by circulating constant-temperature water.

- Temperature range: 5 to 90°C
- Accepts four 10 mm sample cells

Note: The Four-Cell Sample Compartment Unit (P/N 206-23670-91) is necessary.

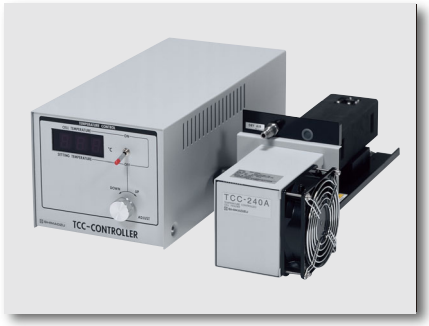
CPS-240A Cell Positioner, thermoelectrically temperature controlled (P/N 206-23760-**)

Supports time course monitoring of up to 6 samples.
The CPS-240A permits measurement of up to six sample cells under constant-temperature conditions.
Provides a printout of absorbance changes of up to six samples during the set length of time at the selected constant temperature.

- Number of sample cells: 6
- Temperature control 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: Sample cells (P/N 200-34442) are not included in the standard content of the CPS-240A.

TCC-240A Theremoelectrically Temperature-Controlled Cell Holder (P/N 206-23780-**)



Use the Peltier effect for controllng the sample temperature, so no thermostatic bath or cooling water is required.

- Number of cells: One each on the sample and reference sides.
  (The reference side is not used in the UVmini-1240.)
- 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: Cells (P/N 200-34442) are not included in the standard content.

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

Circulates temperrature 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, 9.5/13m (50/60 Hz)
- External circulation nozzle: 10.5 mm OD (both outlet and return)
- Tank capacity: About 10 L (9 L duting use)
- Safety feature: Detection of over-temperature of Upper or Lower limits, Detection of heater wire malfunction, Protection of heating too few circulating water, Detection of sensor malfunction, Independent over teat protection, Over current circuit protetor
- Standard accessories: Lid with handles, Rubber hose (4 m), Hose clamps (4 pc.), Instreulion manual
- Dimensions: W270 × D400 × H560 mm
- Power requirements: 100 VAC, 1250 VA, with 1.7 m power cord and grouded plug

Sipper 160L (P/N 206-23790-91)

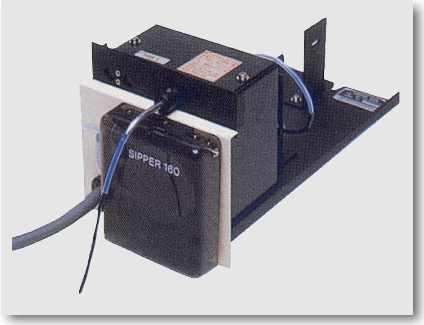
Single pass, 10 mm light path, and 2 mL volume.

Sipper 160T (P/N 206-23790-92)

Triple pass, 10 mm light path, and 1.5 mL volume.

Sipper 160C (P/N 206-23790-93)

Provided with a constant-temperature jacket, 10 mm light path, and 2.5 mL volume.



Sipper 160U (P/N 206-23790-94)

Supermicro type, single pass, 10 mm light path, and 0.5 mL volume.

- The stepping motor-driven peristaltic pump ensures reliable and smooth aspiration of sample solution. (No interface required.)

Note: Use of a Teflon valve unit (P/N 204-06599-01) is recommended when strong acids, strong alkalis, or organic solvents are to be measured. (The Sample Waste Unit (P/N 206-23820-91) is necessary.)

Standard sample volume	
Sipper L	2.0mL
Sipper T	1.5mL
Sipper C	2.5mL
Sipper U	0.5mL

Syringe Sipper

Model	P/N
Syringe Sipper N (Normal temperature type)	206-23890-91
Syringe Sipper CN (Constant temperature, water circulator type)	206-23890-92

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

Recommended Flow Cells				
Cell Type	P/N	Optical Path Length	Dimensions of Aperture	Standard Required Sample Volume
Square (micro)	208-92113	10 mm	ø3 mm	1.0 mL
Square (semi-micro)	208-92005	10 mm	11 (H) × 3.5 (W) mm	5.0 mL

The sipper unit employs a syringe-pump system. The liquid-contact surfaces are composed of Fluoropolymer, 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: ± 0.03 mL) makes it ideal when performance validation is required.

- The type of flow cell can be selected in accordance with the application.
- The flow cell can be changed independently for excellent ease of maintenance.
- Circulated-water temperature range: ambient to 60°C (CN type)

Note: 1. A commercially available test tube stand, with a footprint smaller than 220 × 220 mm, 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.

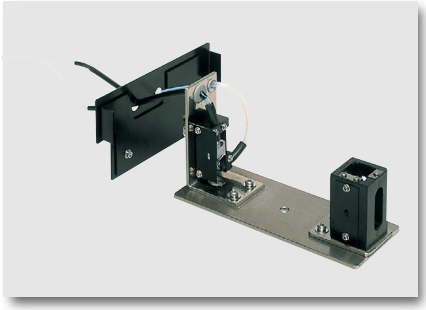
ASC-5 Auto Sample Changer (P/N 206-23810-**)

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 memoraized in the battery back-up protected files.
- An RS-232C interface (P/N 204-09079) is optionally available for a computer to control the ASC-5 directly.
- Up to 100 test tubes may be set together on the rack.

Note: A commercially available test tube stand, with a footprint smaller than 220 × 220 mm, is applicable.
Requires a sipper.

Micro Flow-Thru Cell with a holder—10 mm (P/N 204-06222)



Provides a 10 mm pathlength flow-thru cell and holder with an inner volume of 0.3 mL.
Note: Requires the Alternate Sample Compartment (P/N 206-60184-07).

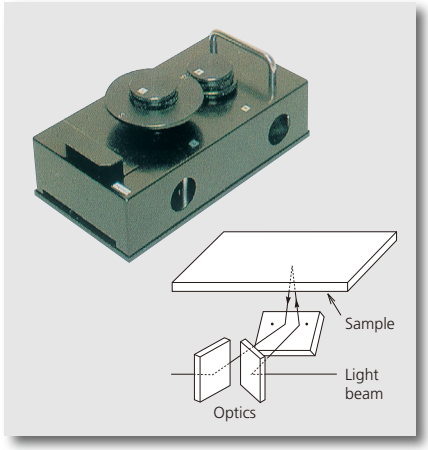
Micro Flow-Thru Cell with a holder—5 mm (P/N 204-06222-01)

Provides a 5 mm pathlength flow-thru cell and holder with an inner volume of 0.15 mL.
Note: Requires the Alternate Sample Compartment (P/N 206-60184-07).

Front Panel with holes (P/N 204-27588-03)

This panel allows the tubes of a flow-thru cell, for example, to be connected through the panel.
Note: The Alternate Sample Compartment (P/N 206-60184-07) is necessary.

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



The technique of specular reflectance measurement is often utilized for evaluation of semiconductors and optical materials. The 5° incident angle minimizes the influence of polarized light. Since a polarizer is not required for measurement, the operation is quite simple.

- Samples as large as W100 × D160 × T15 mm can be readily measured, the minimum measuring area being 7 mm in diameter.
- Sample placement is quite easy - just set it on the holder with the measuring face down.
- The Spectrum Program Pack is necessary for recording reflection spectra.

Note: Requires the Alternate Sample Compartment (P/N 206-60184-07).

DPU-414 Screen Copy Printer (P/N 206-55215-**)

Prints hard copies 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 recoad measurement parameters.

- Dimensions: W160 × D170 × H66.5mm
  Tharmal paper (10 rolls) : (P/N 088-58907-04)
  The printer cable is included with DPU-414.

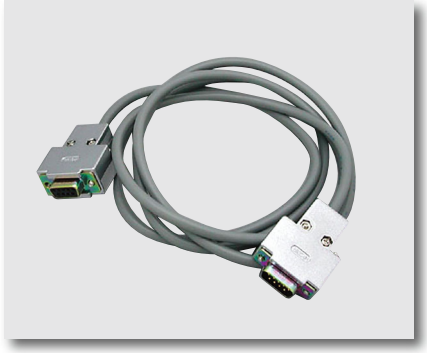
Centronics Interface Cable (P/N 088-50904-20)

This option is necessary to connect a spectrophotometer to a commercially available printer. Almost any printer attached to a personal computer is capable of printing out digital data, but only some types of printers have the capability to hard-copy graphic images. The recommendable printers useful for this purpose is Seiko-Epson MJ 930C, LP-1800, or LX-800 compatible.

RS-232C Cable (Type 2) (P/N 200-86408)

This cable is used to connect a spectrophotometer to an IBM-PC personal computer or compatible. The connection is made in the manner shown to the right.

- 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 input/output and one for grounding.
- The pins of the control lines on the PC side are connected so that signal input/output is always ready to be made from the PC side.



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

If using a 4-cell-type universal rectangular cell holder, use this as a reference-side cell holder if necessary.

Hexavalent Chrome Analysis System (P/N 206-24360-**)

Easy Quantitative Analysis of Hexavalent Chrome
by a Diphenylcarbazide Colorimetric Method Complying with JIS H 8625

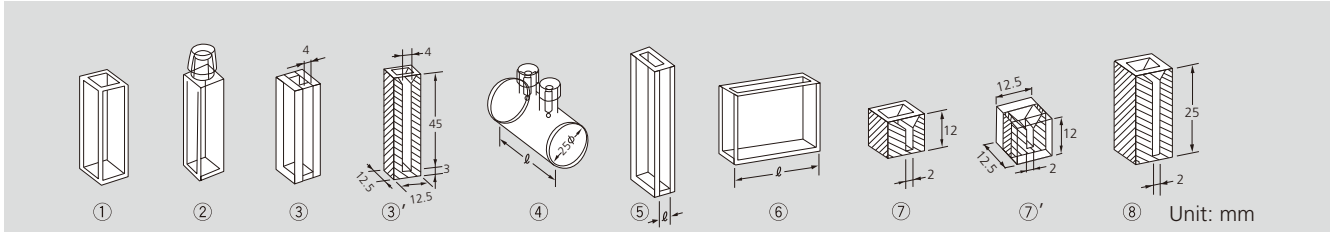
- Shimadzu UVmini-1240 Spectrophotometer
- Water Analysis Program Pack (P/N 206-89751-92)
- Equipment
  Modular dry bath (with modular block)
  100mL measuring cylinder, 300mL beaker
  18mm dia. × 180mm test tubes with scale markings (pack of 50), Z-shaped test-tube rack, 3mL measuring pipette, timer
- Hexavalent chrome reagent pack manufactured by Kyoritsu Chemical-Check Lab., Corp. (contents for 50 analyses) (Reagent No.31, Cr^{6+})

Modular dry bath (with modular block)

Timer

Cells

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



Note:

1) Micro Cell Holder with Mask (P/N 204-06896) or Micro Cell Mask for standard six-cell holder (P/N 206-66828) is necessary.

2) Supermicro Cell Holder (P/N 206-14334-01) is necessary.

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