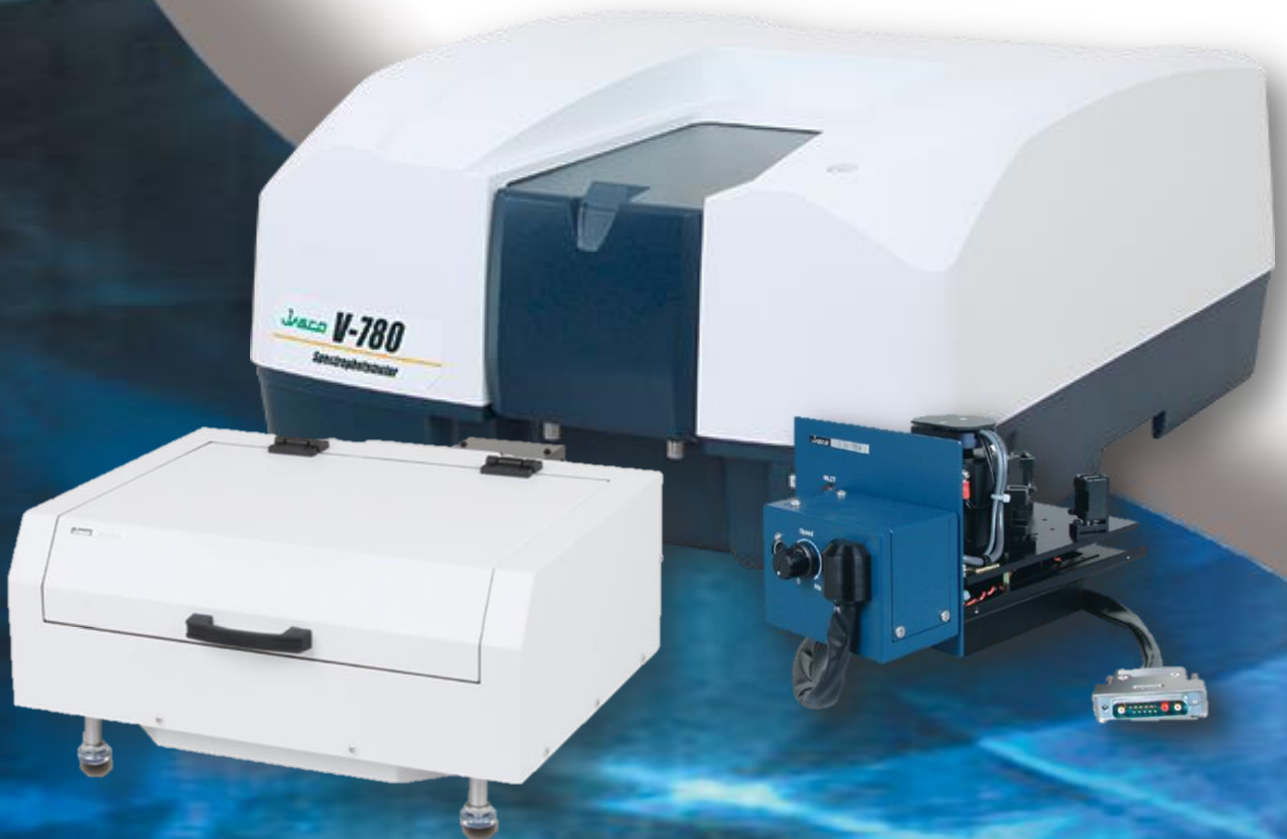


## **V-780-CFR**

***UV-Vis/NIR Double Beam Spectrophotometer***



**JASCO Corporation** - Japan was founded in 1958 to provide the scientific community with optical spectroscopy products.

In the mid-1950's a group of researchers in the Institute of Optics of what is now Tsukuba University needed an Infrared Spectrophotometer for their research.

Since a commercially available instrument was not yet existing at the time, they undertook the challenge to develop their own.

The result was quite a success - a reliable instrument with excellent optical performance. As a second result, other research groups asked them to replicate the instrument for use within their laboratories.



Over the years the JASCO product line has grown to cover instruments used, not only in research but also for routine analysis applications in areas such as quality control, environmental analysis, and process control. The current spectroscopy product line encompasses instrumentation for the following methods:

- **UV/Visible and NIR**
- **Microscope Spectrophotometers**
- **FT-IR, microscope FT-IR and FT-Raman**
- **Dispersive RAMAN**
- **Polarimeters**
- **Spectrofluorometers**
- **Portable Raman**
- **Portable FT-IR**
- **Fully Automated Dissolution Tester**

JASCO is also the world leader in the field of **Circular Dichroism Spectropolarimeters** and **Vibrational Circular Dichroism Spectrometers**.

*“serving the Science and Technology World by providing most advanced analytical instrumentation”*

With the introduction of HPLC in the mid-1970's JASCO's experience in highly sensitive and accurate optical systems led to the development of a series of chromatographic detection systems. Fixed and variable wavelength UV/Visible and Fluorescence detectors were introduced featuring excellent sensitivity and reliability in compact modules. In order to offer complete HPLC systems JASCO developed a variety of novel solvent delivery systems as well as other accessories such as column ovens, autosamplers, and PC based control and analysis software.

Today JASCO offers a wide variety of **HPLC modules**, accessories and analysis software. The new **JASCO LC-4000 Liquid Chromatography** series is designed to operate at pressures approaching 15,000 psi for either gradient or isocratic separations, providing researchers with a powerful tool when using the new generation of small particle columns. LC-4000 Series includes a versatile series of components offering unique flexibility to build systems for routine and specialized applications. LC-4000 features the widest choice of optical HPLC detector: UV, diode array, fluorescence, chemiluminescence, CD, chiral and refractive index detector.

Finally JASCO's modular **Supercritical Fluid Chromatography** and **Supercritical Fluid Extraction** platforms provide a low-cost, fast, green technology with reliable and worry-free performance for a wide variety of applications.



JASCO has a strong global presence, supplying customers in **over 45 different countries**.



**JASCO Europe** is responsible for marketing, sales, service and support for all Jasco products throughout **Europe, Middle East and Africa**.



## JASCO Europe S.r.l.

Via Cadorna, 1 - 23894 Cremella (LC)

Tel. +39-0399215811

Fax +39-0399215835

[jasco@jasco-europe.com](mailto:jasco@jasco-europe.com)

[www.jasco-europe.com](http://www.jasco-europe.com)

Follow us on:



## Make the most of your investment with **JASCO Service and Support**

JASCO Service and Support agreement plans are designed for those laboratories pursuing superior productivity through the highest level of professional services.

The use of automated instrumentation is the right approach to meet today's laboratories productivity requirements, reducing analysis run times, enhancing sample throughput, and increasing analytical accuracy and precision. In this view, preventive maintenance is very important to maximize laboratory uptime and avoid unexpected expenses.

In addition to the analytical goal, proper installation and maintenance are required to achieve optimal performance. JASCO provides flexible service and support management solutions focused on your laboratory real objectives.

With its service network, JASCO is ready to maintain the perfect reliability of customer's instrumentation and minimize the laboratory down time.

- Superior productivity
- Optimized analytical performance
- Lower cost of ownership
- Extended instrument life

If your laboratory has specific Service and Support requirements, JASCO can help you with customized contract agreements. In addition, a full set of Installation Qualification (IQ), Operational Qualification (OQ), and Performance Qualification (PQ) tests are available to verify the system proper installation, operation and performance, respectively.

## Get the most from your investment with **JASCO Training Courses**

JASCO Training Courses ensure maximum skill development for the best value of your laboratory. Our team of highly-experienced specialists can help your staff to get the most from your instrument reducing your analysis run time and improve performance.

Build your knowledge with JASCO Training Courses:

- Instrument and Software operation
- troubleshooting
- Maintenance
- Calibration
- Applications and Methods developments
- Operating Techniques

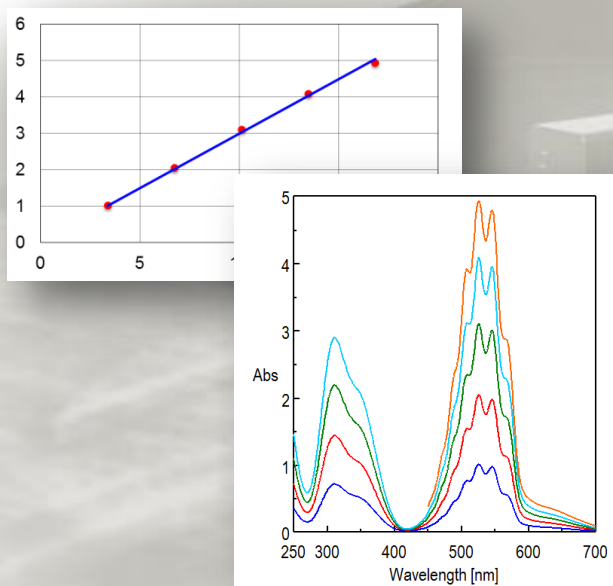


## UV-Vis/NIR Spectrophotometer V-780-CFR

JASCO V-780-CFR is a double beam spectrophotometer with a single monochromator and double detector system (PMT and InGaAs). V-780-CFR has been specifically design to achieve the highest sensitivity and resolution in NIR region **up to 1600 nm**. V-780-CFR supports various optional accessories for liquids and solids, providing sample measurements for a wide variety of sample shapes and volumes.

## JASCO V-780-CFR KEY FEATURES

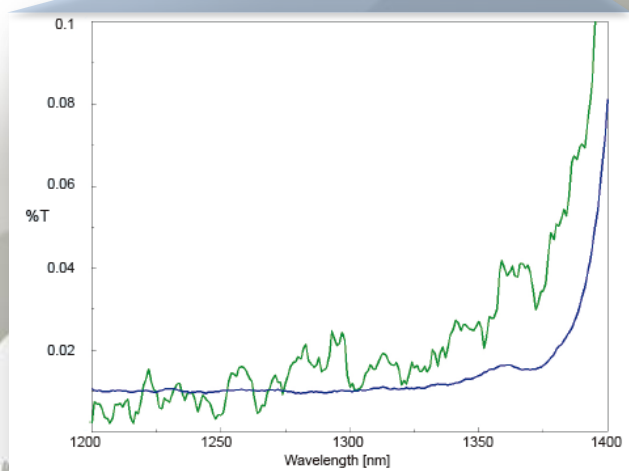
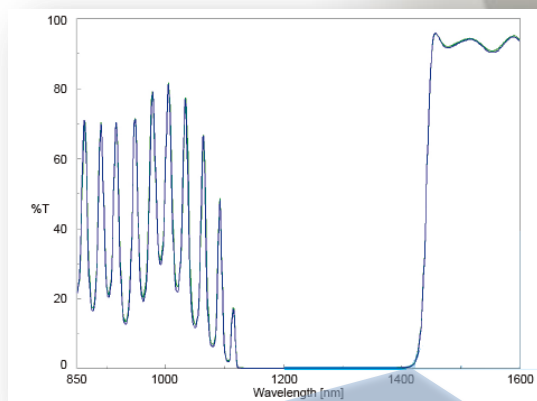
**High photometric linearity** - The photometric linearity range is up to 5 Abs in the visible region, up to 4 Abs in the UV-Visible region and up to 3 Abs in the NIR region. V-780-CFR offers measurement with a wide dynamic range and high-absorbance by employing optimized high-order cut-off filters, ultra high-resolution A/D converter and simplified signal processing prior to the A/D conversion.



Excellent linearity up to 5 absorbance using KMnO4 solution

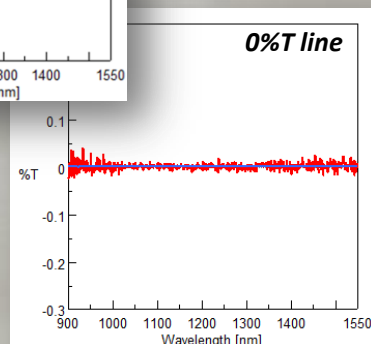
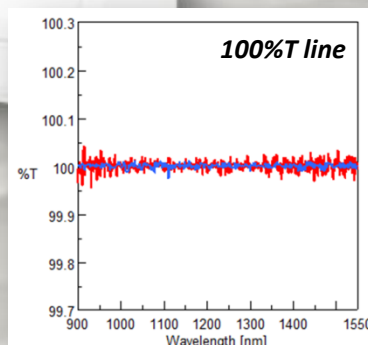
**High sensitivity in the NIR region** - The figures compare a 1.3  $\mu\text{m}$  band cut-off filter for optical communication measured using a spectrophotometer with a Peltier-cooled PbS photo-conductive detector and the JASCO V-780-CFR with a Peltier-cooled InGaAs Photodiode detector.

Transmittance Spectra of 1.3  $\mu\text{m}$  Cut-Off Filter



Zoomed View

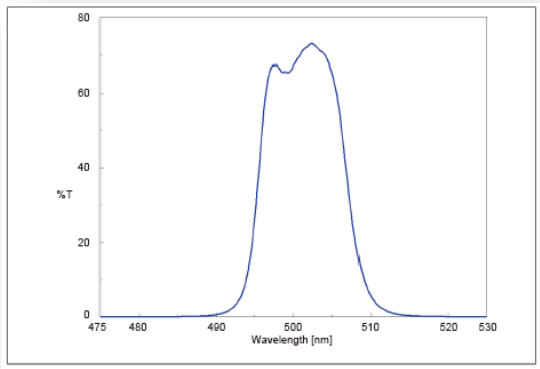
The InGaAs detector offers significant S/N enhancement over the PbS detector. Here below S/N ratio with 60 mm Integrating Sphere



InGaAs photodiode ( JASCO V-780-CFR )

PbS photocell

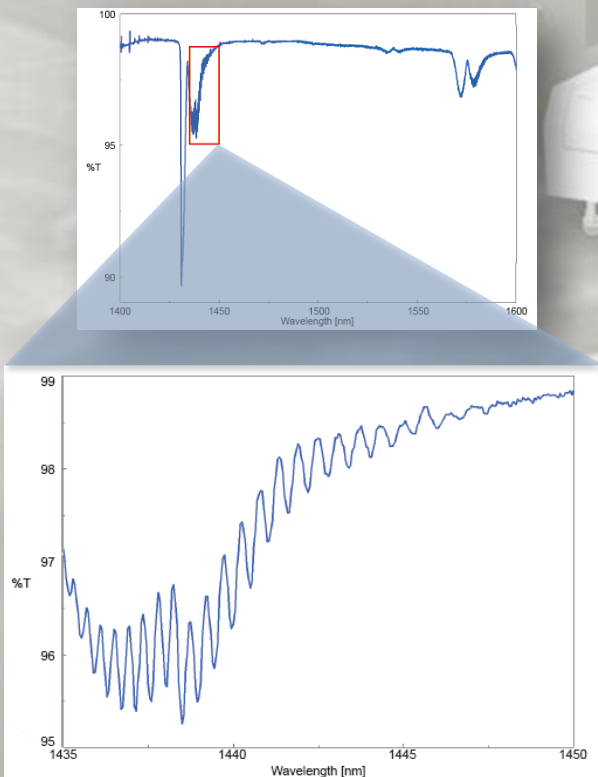
**Step-scan measurement** - Step-scan is a very useful tool for accurate measurement of samples such as bandpass filters for which the transmittance changes significantly over a narrow wavelength range.



Transmittance Spectrum of Bandpass Filter

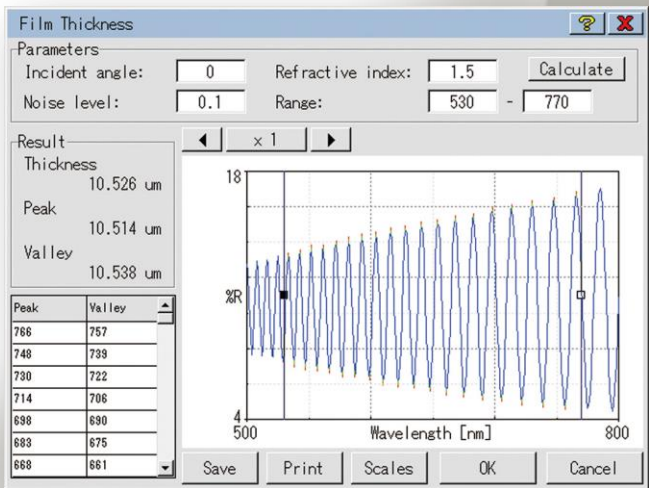
**High resolution in the NIR-** The figure below is the vibrational spectrum of CO<sub>2</sub> gas (path length: 100 mm) in the NIR, measured using the V-780-CFR. Overtones are seen near 1430 nm and also combination bands near 1770 nm. Zooming into the spectrum at around 1437 nm shows that the V-780-CFR offers sufficient resolution to see the rotational peaks in the vibrational spectra.

Transmittance Spectrum of CO<sub>2</sub> Gas Sample (long term accumulation)

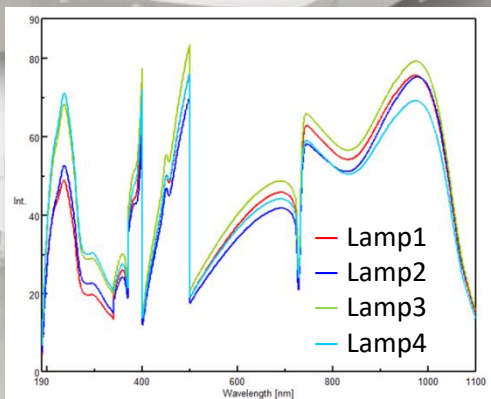


Zoomed View

**Film thickness measurement** - Film thickness measurements can be made using the SLM-907 specular reflectance accessory and integrated as standard Film Thickness measurement program. The film thickness of a food packaging film using the SLM-907 single reflection accessory is shown below.



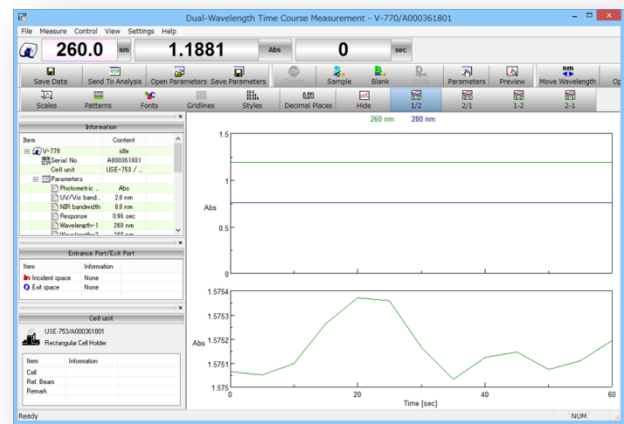
**Alignment-free lamp replacement** - The design of the socket deuterium lamp and socket tungsten halogen lamp facilitates light source over replacement, simplifies maintenance and reduces operation error. In the example below, single beam spectra and validation results of 4 different lamps mounted without any alignment tools.



|                      | Lamp 1 | Lamp 2 | Lamp 3 | Lamp 4 |
|----------------------|--------|--------|--------|--------|
| Wavelength Accuracy  | Pass   | Pass   | Pass   | Pass   |
| Photometric Accuracy | Pass   | Pass   | Pass   | Pass   |
| Noise Level          | Pass   | Pass   | Pass   | Pass   |
| Baseline Flatness    | Pass   | Pass   | Pass   | Pass   |



**Dual wavelength time course measurement** - kinetics measurement can be performed by simultaneous dual wavelength, and the difference between dual photometric value and the ratio of dual photometric value can be plotted.

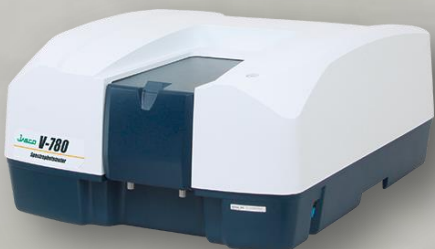


**Dark Correction** - A Dark Correction function is standard for all models of the V-700 Series, which provides photometrically accurate measurements of highly absorbing samples.

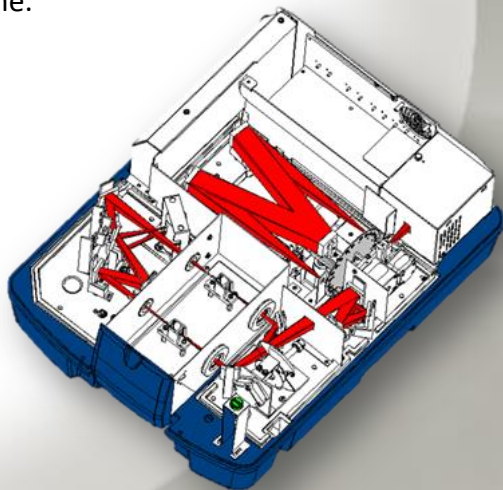
## Energy and space-saving system

- Green technology, best energy-saving in its class Switch off the light source from the measurement screen when not in use.
- Save energy and lamp life.
- All models have the most compact design requiring minimal bench space.

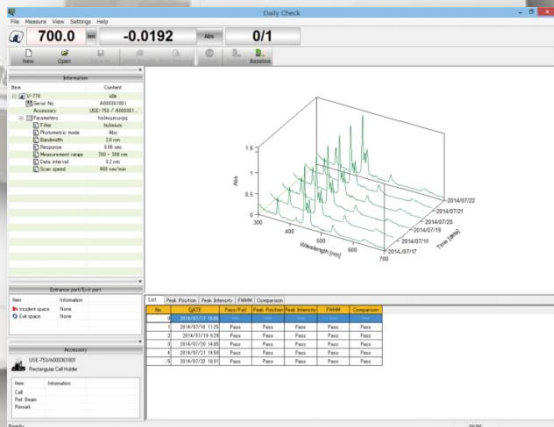
**Validation** - V-780-CFR provides a standard validation program. This program supports USP, EP and JP instrument qualification requirements. The program automatically performs an analysis of the instrument results based on defined acceptance criteria. Results of the validation tests can be printed or saved electronically for further review.



**True Double-Beam spectrophotometer** - All JASCO V-700 spectrophotometers are true double-beam systems, provide the best possible stability and allow reference to be measured and corrected in real time.



**Daily check program** - For users who requires a regular validation check; use a simple Holmium glass filter (or other standard) for daily measurement with automatic execution of procedures to easily record and track a comprehensive history of instrument performance.



**IQ accessory and IQ Start** - The IQ Accessory function automatically recognizes an accessory when it is inserted into the sample compartment. When the IQ Accessory system recognizes the registered accessory, the assigned program automatically starts by using the IQ Start function.

**Start Button** - All models have a Start Button for immediate initiation of sample measurement. After placing a sample in the sample compartment, simply press the Start Button on the instrument to begin measurement.



## JASCO V-780-CFR Unique Features

- **Standard working range (190 to 1600 nm)** and **variable spectral bandwidth from 0.1 nm** enough to satisfy any requirements.
- **Outstanding RMS noise (0.00003 Abs)** and **Dynamic Range (5 Abs)** provide capabilities from education and routine analysis to high-end research applications.
- **Double detector system (PMT and InGaAs)** able to achieve the highest sensitivity and resolution in NIR region.
- The **'L' Mode and 'M' mode spectral bandwidth** settings for measurement of highly absorbing samples or for accurate measurements of trace amounts of sample in a micro cell.
- **True Double-Beam** spectrophotometer provides the best possible stability and allows reference to be measured and correct on real time.
- **IQ Accessory function** for automatic recognition of any accessory inserted into the sample compartment.
- **Validation and Daily Check** programs help operator to keep the instrument always in perfect conditions assuring maximum accuracy of obtained results.
- The V-700 Series can be integrated with more than **70 accessories** and over **30 optional programs** to offer flexible configurations for a wide variety of analytical requirements.
- Cross-platform software package **Spectra Manager CFR** provides features to support laboratories for compliance with **21 CFR Part 11**.

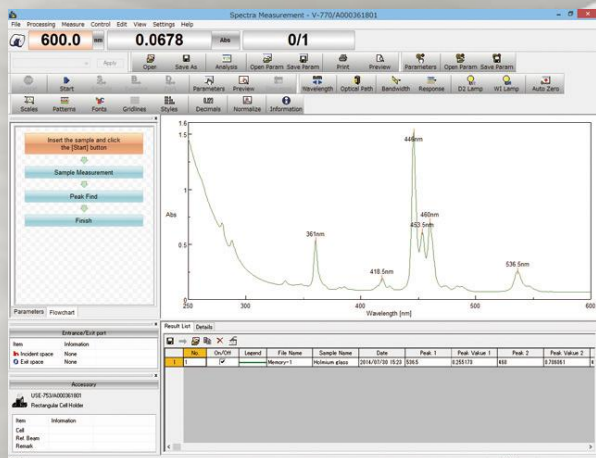
## Software JASCO SPECTRA MANAGER II

The SPECTRA MANAGER II program is a comprehensive package for capturing and processing data, eliminating the need to learn multiple software packages and offering the user a shallower learning curve. Several types of measurement data files can be viewed in a single window, and processed using a full range of data manipulation functions.

*The basic package includes:*

**QUICK START MEASUREMENT PROGRAM** - The Quick Start Measurement Program can automatically perform a series of operations as specified by a user, from measuring samples and processing data to saving and printing results, with a single click of the start button. The procedure is stored in memory for repeated use. The data processing functions include comparison of an obtained spectrum with spectra specified by a user.

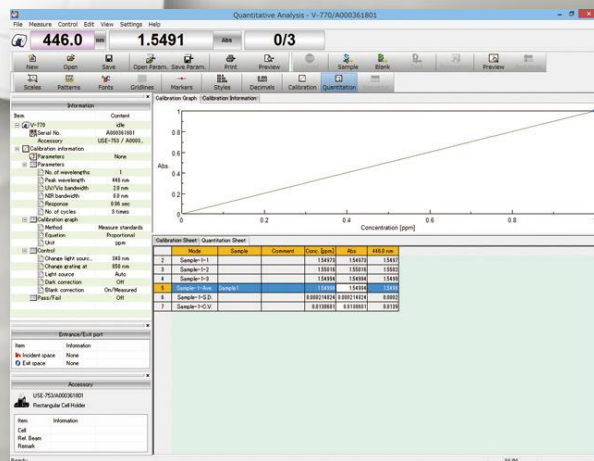
**SPECTRA MEASUREMENT PROGRAM** - The Spectra Measurement program measures photometric values of a sample in the selected wavelength range. Abs, %T or %R are available for the vertical axis while nm, cm<sup>-1</sup>, μm, and eV are available for the horizontal axis.



**CANVAS PROGRAM** - JASCO Canvas Program allows the user to prepare publication quality layouts of spectra, measurement parameters, text, images (BMP and WMF formats) to meet the user's own report requirements. The program also includes a set of drawing tools for professional documentation. Newly created documents can be stored as templates for routine data presentation.

**VALIDATION PROGRAM** - The Validation program offers assistance for verifying instrument performance to meet regulatory requirements set by GxP. The test methods are compliant with USP, EP and JP procedures. The program includes validation tests for wavelength accuracy, wavelength repeatability, photometric accuracy, photometric repeatability, resolution, resolution power, stray light, noise level, baseline stability and baseline flatness. Optional standards and tools are required for some validation tests.

**QUANTITATIVE ANALYSIS PROGRAM** - The quantitative measurement package consists of two programs; a calibration curve creation program and a quantitative measurement program. The program provides three types of baseline correction methods and eight types of calibration curves. A function for providing a pass/fail judgement for the obtained values is included.





## Software JASCO SPECTRA MANAGER II

**FIXED WAVELENGTH PROGRAM** - The Fixed Wavelength measurement program measures the photometric values of up to eight multiple wavelengths. A 'cycle number' and 'wait time' are selectable, and the mean, standard deviation and C.V. value for each wavelength are displayed after completion of each cycle of sample measurements.

**SPECTRUM PREVIEW FUNCTION** - The spectrum preview function allows a user to monitor changes to a spectrum by varying parameters in real-time. A spectrum can be rapidly obtained using the maximum scanning speed available. This function allows verification of the optimum set of instrument parameters and to check sample conditions before actual measurements.

**TIME COURSE PROGRAM** - The Time Course measurement program measures the changes of a sample's photometric value over time at a fixed wavelength and with a defined interval. For the time course measurement, the V-780-CFR can obtain data at a minimum interval of 0.05 sec. Parallel time course measurements while controlling the cell positions of a cell changer are also possible.

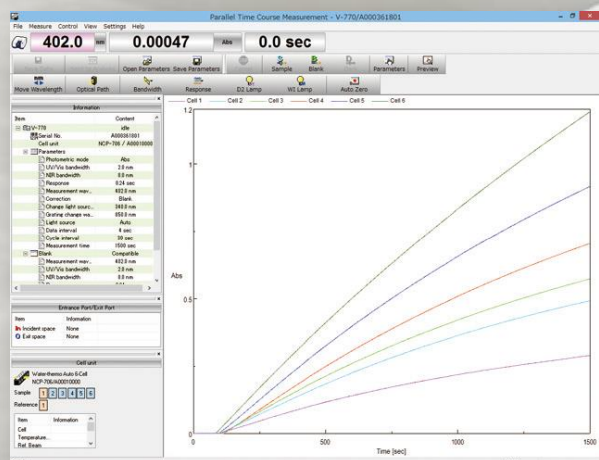
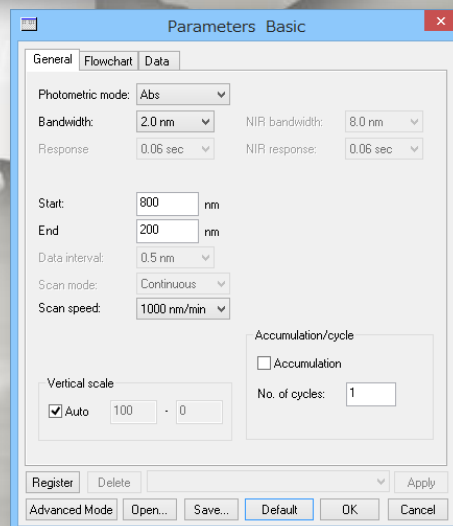
**SPECTRA ANALYSIS PROGRAM** - The spectra analysis program includes all typical data analysis and data manipulation functions.

Furthermore, the film thickness measurement, color analysis, and the enzyme activity calculation programs are provided as standard.

### Data manipulation functions

- *Spectral manipulations (zoom in, zoom out, rescale)*
- *Overlay*
- *Arithmetic operations*
- *Spectral Subtraction*
- *Derivatives*
- *Peak detection and processing - Find, Height, Area, FWHH*
- *Smoothing*
- *FFT Filter*
- *Deconvolution*
- *Baseline correction*
- *Unit conversion*

**AUTOMATIC SETUP** - The response time is automatically determined depending on the selected bandwidth and scan speed so that the spectrum profile does not become broad. The data interval is also automatically determined depending on the selected bandwidth.

## Software JASCO SPECTRA MANAGER II - CFR

Spectra Manager CFR provides features to support laboratories for compliance with **21 CFR Part 11**. A choice of complete pull-down task menus, user-friendly icons, and easily accessible pop-up menus enables new users to manage security information, control user access, and record audit trails.

*The package includes:*

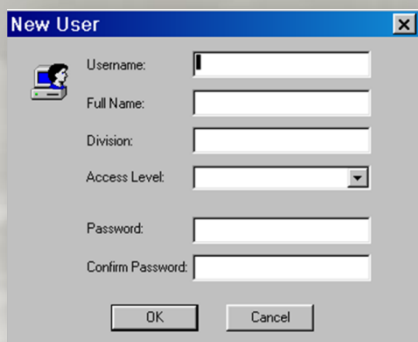
- Access control for secure systems by user ID and password
- Audit trail function with time-stamp for records tracking
- Three levels of electronic signatures for record integrity

### Easy-to-use

Startup window lists available resources, such as instruments, measurement and application programs.

### User registration

All users who use Spectra Manager CFR must be registered. When registered, the user must be assigned specific access levels for administrative rights and access to control and analysis programs.



**New User**

Username:

Full Name:

Division:

Access Level:

Password:

Confirm Password:

OK Cancel

### System policy

Password expiration, the minimum number of characters and timeout for password entry can be set by authorized managers.

### Access rights control

User access to the Spectra Manager CFR requires a Username and Password.

### Security management

All of the security management functions of Spectra Manager CFR are accessed through the Administrative Tools interface.

### Workgroup registration

Users who perform measurements and analyses must be registered in a workgroup. Within a workgroup, users are granted access as either a “Manager”, “Analyst”, or “Operator”, with authorities to modify instrument and analysis settings. Individual users are only able to execute procedures that are allowed by their assigned access level.



**Properties of Jasco QA**

General Workgroup Folder

Registered Users Registered Instruments and Applications

| Username                                          | Full Name          | Workgroup Rights |
|---------------------------------------------------|--------------------|------------------|
| <input checked="" type="checkbox"/> Administrator | Administrator      |                  |
| <input type="checkbox"/> Ben                      | Ben Landas         |                  |
| <input type="checkbox"/> Chuck                    | Chuck Higgins      |                  |
| <input type="checkbox"/> Dave                     | David Empli        |                  |
| <input checked="" type="checkbox"/> Richard       | Richard A. Larsen  | Managers         |
| <input checked="" type="checkbox"/> Trish         | Patricia A. Larsen | Operators        |

OK Cancel Apply



**Properties of Jasco QA**

General Workgroup Folder

Registered Users Registered Instruments and Applications

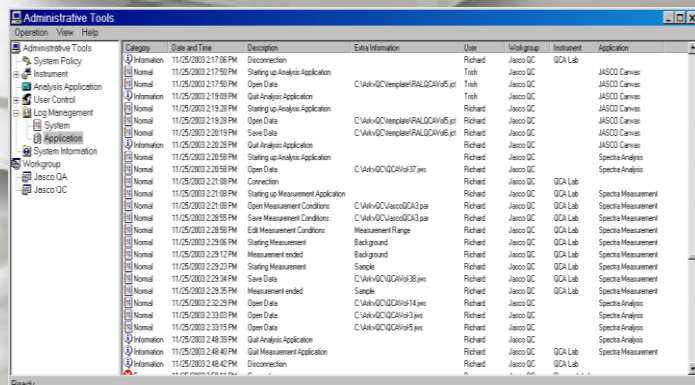
☒ Instrument

- ☒ QC Lab
- ☒ Jasco 610
- ☒ QCA Lab
- ☒ Jasco QC Lab
- ☒ Research Lab
- ☒ QA Lab
- ☒ FT/IR-460
- ☒ Analysis Application
- ☒ JASCO Canvas
- ☒ Spectra Analysis

OK Cancel Apply

### Audit trails

The system and application history are automatically recorded. Audit trails are assigned to every data file, recording data manipulations on the spectral data. Audit trails are also applied to instrument parameters, Canvas templates or documents and analysis methods.



| Category             | Date and Time         | Description                         | Extra Information              | User    | Workgroup | Instrument          | Application |
|----------------------|-----------------------|-------------------------------------|--------------------------------|---------|-----------|---------------------|-------------|
| Administrative Tools | 11/05/2003 2:17:05 PM | Disconnection                       |                                | Richard | Jasco QC  | QCA Lab             |             |
| System Policy        | 11/05/2003 2:17:50 PM | Starting up Analysis Application    |                                | Trish   | Jasco QC  | JASCO Canvas        |             |
| Instrument           | 11/05/2003 2:17:50 PM | Open Data                           | C:\Vai\QC\template\RALDGH\65.p | Trish   | Jasco QC  | JASCO Canvas        |             |
| Analysis Application | 11/05/2003 2:19:09 PM | Qual Analysis Application           |                                | Trish   | Jasco QC  | JASCO Canvas        |             |
| User Control         | 11/05/2003 2:19:29 PM | Starting up Analysis Application    |                                | Richard | Jasco QC  | JASCO Canvas        |             |
| Log Management       | 11/05/2003 2:19:29 PM | Open Data                           | C:\Vai\QC\template\RALDGH\65.p | Richard | Jasco QC  | JASCO Canvas        |             |
| System               | 11/05/2003 2:20:19 PM | Save Data                           | C:\Vai\QC\template\RALDGH\65.p | Richard | Jasco QC  | JASCO Canvas        |             |
| Application          | 11/05/2003 2:20:59 PM | Qual Analysis Application           |                                | Richard | Jasco QC  | Spectra Analysis    |             |
| System Information   | 11/05/2003 2:20:59 PM | Starting up Analysis Application    |                                | Richard | Jasco QC  | Spectra Analysis    |             |
| Workgroup            | 11/05/2003 2:21:09 PM | Open Data                           | C:\Vai\QC\QCA\637.p            | Richard | Jasco QC  | QCA Lab             |             |
| Jasco QA             | 11/05/2003 2:21:09 PM | Connection                          |                                | Richard | Jasco QC  | QCA Lab             |             |
| Jasco QC             | 11/05/2003 2:21:09 PM | Starting up Measurement Application |                                | Richard | Jasco QC  | Spectra Measurement |             |
|                      | 11/05/2003 2:21:09 PM | Open Measurement Conditions         | C:\Vai\QC\Jasco\QCA3.p         | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:55 PM | Save Measurement Conditions         |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:59 PM | Edit Measurement Conditions         |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:59 PM | Starting Measurement                |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:59 PM | Background                          |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:12 PM | Measurement ended                   |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:23 PM | Starting Measurement                |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:34 PM | Save Data                           | C:\Vai\QC\QCA\638.p            | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:35 PM | Measurement ended                   |                                | Richard | Jasco QC  | QCA Lab             |             |
|                      | 11/05/2003 2:28:39 PM | Qual Analysis Application           |                                | Richard | Jasco QC  | Spectra Analysis    |             |
|                      | 11/05/2003 2:28:40 PM | Qual Measurement Application        |                                | Richard | Jasco QC  | Spectra Analysis    |             |
|                      | 11/05/2003 2:48:42 PM | Disconnection                       |                                | Richard | Jasco QC  | QCA Lab             |             |

### Electronic signatures

Three levels of electronic signatures, “Creation”, “Review” and “Approval” are available. Electronic signatures are applied to spectral data files, Canvas templates or documents, instrument parameters and analysis methods.

|                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Optical System                                                | <ul style="list-style-type: none"> <li>• Czerny-Turner mount</li> <li>• Single Monochromator</li> <li>• True Double-Beam (Sample &amp; Reference)</li> </ul>                                                                                                                                                                                                                                                                                            |
| Light Source                                                  | Deuterium & Halogen lamps with automatic switching                                                                                                                                                                                                                                                                                                                                                                                                      |
| Detector                                                      | Photomultiplier tube and Peltier cooled InGaAs photodiode                                                                                                                                                                                                                                                                                                                                                                                               |
| Wavelength Range                                              | 190 – 1600 nm                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Wavelength Accuracy                                           | $\pm 0.3$ nm at 656.1 nm<br>$\pm 1.0$ nm at 1.312.2 nm                                                                                                                                                                                                                                                                                                                                                                                                  |
| Wavelength Repeatability                                      | $\pm 0.05$ nm (UV-Vis)<br>$\pm 0.1$ nm (NIR)                                                                                                                                                                                                                                                                                                                                                                                                            |
| Scanning Speed                                                | 10 to 4,000 nm/min (up to 8,000 in preview mode)                                                                                                                                                                                                                                                                                                                                                                                                        |
| Slew Speed                                                    | 12,000 nm/min (UV-Vis)<br>24,000 nm/min (NIR)                                                                                                                                                                                                                                                                                                                                                                                                           |
| Spectral bandwidth                                            | <i>UV-Vis</i><br>0.1, 0.2, 0.5, 1, 2, 5, 10 nm - L2, L5, L10 nm - M1, M2 nm<br><i>NIR</i><br>0.2, 0.4, 1, 2, 4, 8, 20 nm – L4, L10, L20 nm – M2, M4 nm                                                                                                                                                                                                                                                                                                  |
| Photometric Range<br>(guaranteed on the whole spectral range) | -4 + 4 Abs (UV-Vis)<br>-3 + 3 Abs (NIR)                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Maximum Photometric Range                                     | -5 + 5 Abs (KMnO <sub>4</sub> aqueous solution)                                                                                                                                                                                                                                                                                                                                                                                                         |
| Photometric Accuracy                                          | $\pm 0.0015$ Abs (0 to 0.5 Abs)<br>$\pm 0.0025$ Abs (0.5 to 1 Abs)<br>$\pm 0.3$ %T<br>Tested with NIST SRM 930                                                                                                                                                                                                                                                                                                                                          |
| Stray Light                                                   | 1 % (198 nm KCl 12 g/L)<br>0.005 % (220 nm NaI 10 g/L)<br>0.005 % (340 nm and 370 nm NaNO <sub>2</sub> 50 g/L)<br>0.04 % (1420 nm H <sub>2</sub> O)                                                                                                                                                                                                                                                                                                     |
| Baseline stability                                            | $\pm 0.0003$ Abs/hour                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Baseline flatness                                             | $\pm 0.0002$ Abs                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| RMS noise                                                     | 0.00003 Abs (0 Abs, 500 nm, 60 sec)                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Communication                                                 | USB                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Automatic Accessories Recognition                             | YES                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Software                                                      | Spectra Manager II including the following programs: <ul style="list-style-type: none"> <li>• Spectra Measurement</li> <li>• Quantitative analysis</li> <li>• Fixed Wavelength</li> <li>• Dual Wavelength Time Course Measurement</li> <li>• Quick Start Measurement</li> <li>• Canvas</li> <li>• Validation &amp; Daily Check</li> <li>• Spectrum Preview</li> <li>• Film Thickness</li> <li>• Color</li> <li>• Enzyme Activity Calculation</li> </ul> |
| Dimensions and weight                                         | 460(W)x602(D)x268(H) mm – 29 kg                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power requirements                                            | 150VA                                                                                                                                                                                                                                                                                                                                                                                                                                                   |



# **Software & Sampling Accessories**

**V-780-CFR UV-Vis Spectrophotometer**



**JASCO**

**Spectra Manager Ver. 2**



## Sampling Accessories

V-700 Series can be integrated with a complement of more than 70 accessories to offer flexible configurations for a wide variety of analytical requirements.

Experimental capabilities range from simple educational applications and routine daily use, to specific applications for advanced biochemical and semiconductor research.

The range of accessories include various types of cell holders for liquid samples and options for a wide variety of solid samples.

### LSE-701 - Long path cell holder



#### Specifications

|                           |                                                                                                                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>        | Rectangular cell pathlength 10, 20, 50 or 100 mm                                                                                                                                                           |
| <b>Reference Cell</b>     | Rectangular cell pathlength 10, 20, 50 or 100 mm                                                                                                                                                           |
| <b>Capacity</b>           | 1 sample and 1 reference cell                                                                                                                                                                              |
| <b>Temperature</b>        | Ambient                                                                                                                                                                                                    |
| <b>Suggested Software</b> | <ul style="list-style-type: none"> <li>VWAC-796 - ASTM Color analysis program</li> <li>VWSC-797 - Saybolt color analysis program</li> <li>VWWQ-953 - Chromaticity/Turbidity measurement program</li> </ul> |

### FSE-702 - 4-position manual long path cell changer



#### Specifications

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| <b>Sample Cell</b>    | Rectangular cell pathlength 10, 20, 50 or 100 mm |
| <b>Reference Cell</b> | Rectangular cell pathlength 10, 20, 50 or 100 mm |
| <b>Capacity</b>       | 4 sample and 1 reference cell                    |
| <b>Temperature</b>    | Ambient                                          |

### SSE-704 - 6-position manual cell changer



#### Specifications

|                       |                                   |
|-----------------------|-----------------------------------|
| <b>Sample Cell</b>    | Rectangular cell pathlength 10 mm |
| <b>Reference Cell</b> | Rectangular cell pathlength 10 mm |
| <b>Capacity</b>       | 6 sample and 1 reference cell     |
| <b>Temperature</b>    | Ambient                           |

### NCP-705 - 6-position automatic cell changer



#### Specifications

|                           |                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>        | Rectangular cell pathlength 10 mm                                                                                                                                |
| <b>Reference Cell</b>     | Rectangular cell pathlength 10 mm                                                                                                                                |
| <b>Capacity</b>           | 6 sample and 1 reference cell                                                                                                                                    |
| <b>Temperature</b>        | Ambient                                                                                                                                                          |
| <b>Cell Switching</b>     | Software Controlled                                                                                                                                              |
| <b>Suggested Software</b> | <ul style="list-style-type: none"> <li>VWIS-957 - Interval scan measurement program</li> <li>VWIS-958 - Temperature interval scan measurement program</li> </ul> |

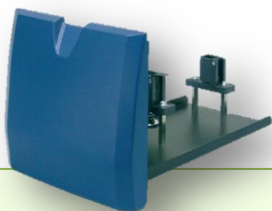
### CYH-708 - Cylindrical cell holder



#### Specifications

|                       |                                                  |
|-----------------------|--------------------------------------------------|
| <b>Sample Cell</b>    | Cylindrical cell pathlength 10, 20, 50 or 100 mm |
| <b>Reference Cell</b> | Cylindrical cell pathlength 10, 20, 50 or 100 mm |
| <b>Capacity</b>       | 1 sample and 1 reference cell                    |
| <b>Temperature</b>    | Ambient                                          |

## UCB-710 – Bio rectangular cell holder



### Specifications

A cell height adjustment function provides the ability to use a 100  $\mu$ L micro cell. A mask for a 100  $\mu$ L micro cell is standard, 50  $\mu$ L can be supplied as option.

|                                |                                      |
|--------------------------------|--------------------------------------|
| <b>Sample Cell</b>             | Rectangular cell<br>pathlength 10 mm |
| <b>Reference Cell</b>          | Rectangular cell<br>pathlength 10 mm |
| <b>Capacity</b>                | 1 sample and 1 reference cell        |
| <b>Temperature</b>             | Ambient                              |
| <b>Minimum<br/>Cell Volume</b> | 50 $\mu$ L                           |

## EMC-709 – Micro cell holder



### Specifications

The EMC-709 is a cell holder for a 50  $\mu$ L micro cell. A 5  $\mu$ L micro cell can be used with an optional spacer.

|                                |                                      |
|--------------------------------|--------------------------------------|
| <b>Sample Cell</b>             | Rectangular cell<br>pathlength 10 mm |
| <b>Reference Cell</b>          | Rectangular cell<br>pathlength 10 mm |
| <b>Capacity</b>                | 1 sample and 1 reference cell        |
| <b>Temperature</b>             | Ambient                              |
| <b>Minimum<br/>Cell Volume</b> | 5 $\mu$ L                            |

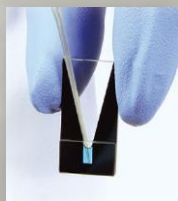
## EMC-759 – Ultra-micro cell holder



### Specifications

The EMC-759 is a cell holder for a 5  $\mu$ L micro cell

|                                |                                      |
|--------------------------------|--------------------------------------|
| <b>Sample Cell</b>             | Rectangular cell<br>pathlength 10 mm |
| <b>Reference Cell</b>          | Rectangular cell<br>pathlength 10 mm |
| <b>Capacity</b>                | 1 sample and 1 reference cell        |
| <b>Temperature</b>             | Ambient                              |
| <b>Minimum<br/>Cell Volume</b> | 5 $\mu$ L                            |



5  $\mu$ L micro cell



50  $\mu$ L micro cell



5  $\mu$ L micro cell and  
spacer

## TCH-703 – 8-position Micro turret cell holder

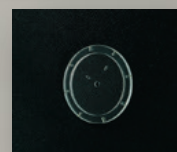


### Specifications

Cell holder for an optional 8-position turret micro cell, containing eight cells with a volume of approximately 4  $\mu$ L arranged in a circle.

|                    |                 |
|--------------------|-----------------|
| <b>Sample Cell</b> | pathlength 1 mm |
| <b>Capacity</b>    | 8 sample cells  |
| <b>Temperature</b> | Ambient         |
| <b>Cell Volume</b> | 4 $\mu$ L       |

8-position micro turret cell  
P/N: 6916-4822A





The following cell holder accessories can be used with water circulators for maintaining samples at a uniform temperature. The circulators available separately.

## STR-773

### Water thermostatted cell holder with stirrer



#### Specifications

|                              |                                                                                                         |
|------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>           | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                          |
| <b>Reference Cell</b>        | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                          |
| <b>Capacity</b>              | 1 sample and 1 reference cell                                                                           |
| <b>Temperature Control</b>   | Thermostatted water circulation for sample and reference                                                |
| <b>Operating Temperature</b> | 10 to 90 degC                                                                                           |
| <b>Stirrer</b>               | Integrated variable speed magnetic stirrer - 2 mm path width micro cell cannot be used with the stirrer |

## HMC-711

### Water thermostatted micro cell holder



#### Specifications

|                                                                                                   |                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Minimum sample volume is 50 µL by using a rectangular cell, 5 mm path length and 2 mm path width. |                                                                                                                                                                            |
| <b>Sample Cell</b>                                                                                | Rectangular cell<br>10 x 10 or 5, 2 or 4 x 10, 2 x 5 mm                                                                                                                    |
| <b>Reference Cell</b>                                                                             | Rectangular cell<br>10 x 10 or 5, 2 or 4 x 10, 2 x 5 mm                                                                                                                    |
| <b>Capacity</b>                                                                                   | 1 sample and 1 reference cell                                                                                                                                              |
| <b>Temperature Control</b>                                                                        | Thermostatted water circulation for sample and reference                                                                                                                   |
| <b>Operating Temperature</b>                                                                      | 10 to 90 degC                                                                                                                                                              |
| <b>Cell masks (standard)</b>                                                                      | <ul style="list-style-type: none"> <li>Mask for 100 µL cell (2 pcs.) for micro cell, 2 x 10 mm</li> <li>Mask for 200 µL cell (2 pcs.) for micro cell, 4 x 10 mm</li> </ul> |

## NCP-706

### Water thermostatted 6-position automatic cell changer



#### Specifications

|                              |                                                          |
|------------------------------|----------------------------------------------------------|
| <b>Sample Cell</b>           | Rectangular cell<br>10 x 10 or 5, 2 or 4 x 10, 2 x 5 mm  |
| <b>Reference Cell</b>        | Rectangular cell<br>10 x 10 or 5, 2 or 4 x 10, 2 x 5 mm  |
| <b>Capacity</b>              | 6 sample and 1 reference cell                            |
| <b>Temperature Control</b>   | Thermostatted water circulation for sample and reference |
| <b>Operating Temperature</b> | 10 to 90 degC                                            |
| <b>Cell Switching</b>        | Software Controlled                                      |

## MHT-745

### Manual 4-position water thermostatted turret cell holder



#### Specifications

|                              |                                                          |
|------------------------------|----------------------------------------------------------|
| <b>Sample Cell</b>           | Rectangular cell<br>10 x 10, 4 x 10 mm                   |
| <b>Reference Cell</b>        | Rectangular cell<br>10 x 10, 4 x 10 mm                   |
| <b>Capacity</b>              | 4 sample and 1 reference cell                            |
| <b>Temperature Control</b>   | Thermostatted water circulation for sample and reference |
| <b>Operating Temperature</b> | 10 to 90 degC                                            |
| <b>Cell Switching</b>        | Manual                                                   |

## EHCS-760

**Peltier thermostatted single cell holder  
(Air cooled)**

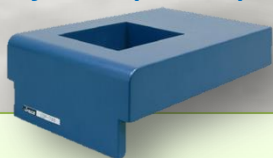


### Specifications

|                                     |                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>                  | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Reference Cell</b>               | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Capacity</b>                     | 1 sample and 1 reference cell                                                                                                                                                                    |
| <b>Temperature Control</b>          | <b>Sample only</b> - Heating/cooling system using <b>air cooled Peltier</b> effect                                                                                                               |
| <b>Operating Temperature</b>        | 10 to 60 degC (at 25 degC)                                                                                                                                                                       |
| <b>Temperature control accuracy</b> | ±0.1 degC (cell holder sensor)                                                                                                                                                                   |
| <b>Temperature Accuracy</b>         | With cell holder sensor<br>±0.5 degC (20 to 40 degC)<br>±1 degC (other temp. range)<br><br>With optional temperature sensor<br>±0.2 degC                                                         |
| <b>Stirrer</b>                      | Integrated variable speed magnetic stirrer - 2 mm path width micro cell cannot be used with the stirrer                                                                                          |
| <b>Suggested Software</b>           | <ul style="list-style-type: none"> <li>VWIS-958 - Temperature interval scan measurement program</li> <li>VWTP-959 - Temperature Gradient measurement and DNA melting analysis program</li> </ul> |

## CSP-909

**Lid for sample compartment with syringe port**



### Specifications

When monitoring a substrate-enzyme reaction, this accessory allows addition of an enzyme solution without opening the sample chamber lid. Can only be used with a 10 x 10 mm rectangular cell. Required needle length for the syringe is 50 mm

|                               |                                                                           |
|-------------------------------|---------------------------------------------------------------------------|
| <b>Compatible Cell Holder</b> | STR-733<br>EHCS-760 - ETCS-761 - ETCR-762                                 |
| <b>Syringe</b>                | P/N 0507-0220 – Micro syringe 10µL<br>P/N 0507-0223 – Micro syringe 100µL |

## ETCS-761 & ETCR-762

**Peltier thermostatted single cell holder  
(Water cooled)**



|                                     |                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>                  | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Reference Cell</b>               | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Capacity</b>                     | 1 sample and 1 reference cell                                                                                                                                                                    |
| <b>Temperature Control ETCS-761</b> | <b>Sample only</b><br>Heating/cooling system using <b>Water cooled Peltier</b> effect                                                                                                            |
| <b>Temperature Control ETCR-762</b> | <b>Sample &amp; Reference</b><br>Heating/cooling system using <b>Water cooled Peltier</b> effect                                                                                                 |
| <b>Operating Temperature</b>        | 0 to 100 degC<br>for cooling water temperature at 25 degC                                                                                                                                        |
| <b>Temperature control accuracy</b> | ±0.1 degC (cell holder sensor)                                                                                                                                                                   |
| <b>Temperature Accuracy</b>         | With cell holder sensor<br>±0.5 degC (20 to 40 degC)<br>±1 degC (other temp. range)<br><br>With optional temperature sensor<br>±0.2 degC                                                         |
| <b>Stirrer</b>                      | Integrated variable speed magnetic stirrer - 2 mm path width micro cell cannot be used with the stirrer                                                                                          |
| <b>Suggested Software</b>           | <ul style="list-style-type: none"> <li>VWIS-958 - Temperature interval scan measurement program</li> <li>VWTP-959 - Temperature Gradient measurement and DNA melting analysis program</li> </ul> |

### Options

**Cell Mask kit** - includes sample masks and a cell-height adjustment stand to raise the cell height. Using the cell-height adjustment stand, a 2 mm path width micro cell can be used to measure sample with a minimum 100 µL volume.

**OPS-515** - In-cell sensor with holder (factory option) - This is an optional sensor which can be used to monitor the temperature inside of the sample cell.

**Cell Spacers** - Spacers for cells with an optical path length of 1, 2 and 5 mm are available.

**Capillary adapter** - The capillary adapter is used for a capillary cell (minimum sample volume of 3 µL). The optional sensor (OPS-515) in the cell adapter is required for temperature monitoring.

## PSC-763

**Automatic 6-position Peltier cell changer  
(Air cooled)**



### Specifications

|                                     |                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>                  | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Reference Cell</b>               | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Capacity</b>                     | 6 sample and 1 reference cell                                                                                                                                                                    |
| <b>Temperature Control</b>          | <b>Sample only</b> - Heating/cooling system utilizing <b>air cooled Peltier</b> effect                                                                                                           |
| <b>Operating Temperature</b>        | 10 to 70 degC (at 20 degC)                                                                                                                                                                       |
| <b>Temperature control accuracy</b> | ±0.1 degC (cell holder sensor)                                                                                                                                                                   |
| <b>Temperature Accuracy</b>         | With cell holder sensor<br>±0.5 degC (20 to 40 degC)<br>±1 degC (other temp. range)<br><br>With optional temperature sensor<br>±0.2 degC                                                         |
| <b>Stirrer</b>                      | Integrated variable speed magnetic stirrer - 2 mm path width micro cell cannot be used with the stirrer                                                                                          |
| <b>Suggested Software</b>           | <ul style="list-style-type: none"> <li>VWIS-958 - Temperature interval scan measurement program</li> <li>VWTP-959 - Temperature Gradient measurement and DNA melting analysis program</li> </ul> |

### Options

**OPS-513** - In-cell sensor with holder (factory option) - This is an optional sensor which can be used to monitor the temperature inside of the sample cell.

## PAC-743 & PAC-743R

**Automatic 6/8-position Peltier cell changer  
(Water cooled)**



### Specifications

|                                     |                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sample Cell</b>                  | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Reference Cell</b>               | Rectangular cell<br>10 x 10, 4 x 10, 2 x 10 mm                                                                                                                                                   |
| <b>Capacity</b>                     | 6/8 sample and 1 reference cell                                                                                                                                                                  |
| <b>Temperature Control PAC-743</b>  | <b>Sample only</b><br>Heating/cooling system utilizing <b>Water cooled Peltier</b> effect                                                                                                        |
| <b>Temperature Control PAC-743R</b> | <b>Sample &amp; Reference</b><br>Heating/cooling system utilizing <b>Water cooled Peltier</b> effect                                                                                             |
| <b>Operating Temperature</b>        | 0 to 100 degC (at 20 degC)                                                                                                                                                                       |
| <b>Temperature control accuracy</b> | ±0.1 degC (cell holder sensor)                                                                                                                                                                   |
| <b>Temperature Accuracy</b>         | With cell holder sensor<br>±0.5 degC (20 to 40 degC)<br>±1 degC (other temp. range)                                                                                                              |
| <b>Stirrer</b>                      | Integrated variable speed magnetic stirrer - 2 mm path width micro cell cannot be used with the stirrer                                                                                          |
| <b>Suggested Software</b>           | <ul style="list-style-type: none"> <li>VWIS-958 - Temperature interval scan measurement program</li> <li>VWTP-959 - Temperature Gradient measurement and DNA melting analysis program</li> </ul> |

## MCB-100

**Mini Water Circulation Bath**



### Specifications

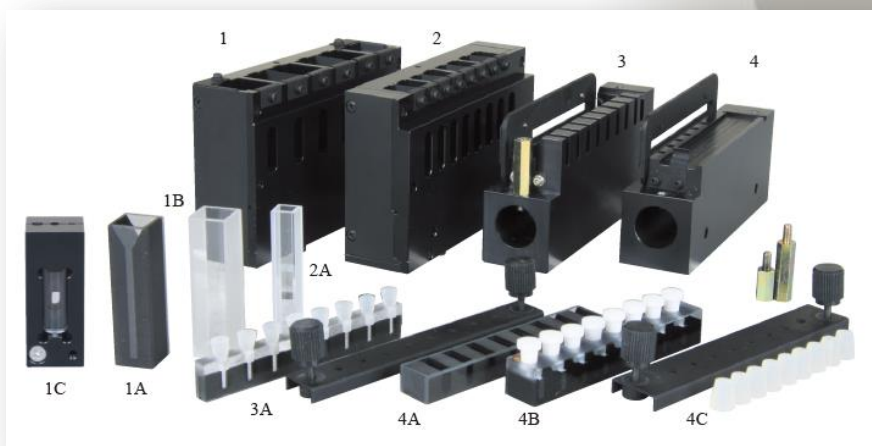
|                                    |                                                                     |
|------------------------------------|---------------------------------------------------------------------|
| <b>Temperature control range</b>   | 10 degC below ambient temperature to 40 degC (IN and OUT connected) |
| <b>Bath capacity</b>               | Approx. 200 mL                                                      |
| <b>Temperature sensor accuracy</b> | ±0.2 degC (at 20 degC)                                              |
| <b>Cooling/heating capacity</b>    | 52W                                                                 |
| <b>Dimensions</b>                  | 160 (W) \x 278 (H) x 225 (D) mm                                     |
| <b>Suggested accessories</b>       | ETCS-761 – ETCR-762 – PAC-743                                       |



## PAC-743 & PAC-743R

PAC-743 & PAC-743R allow measurements of the transmittance & absorbance of multiple samples by using dedicated cell blocks with temperature control.

The PAC-743R provides temperature control of the reference cell in addition to temperature control of the sample cells.



### How to configure it

| Cell block<br>(Cell and temp. sensor are optional)                                                                                                                                   | # | Compatible Cell                                                                                                                                                                                       | #  | In-cell sensor<br>(factory option)                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------|
| <b>6916-H243A</b> - 6-position cell block<br>(with variable speed magnetic stirrer)<br>for rectangular cell, 10 x 10 mm                                                              | 1 | Rectangular quartz cell,<br>2 x 10 mm, max. 6pcs.                                                                                                                                                     | 1A | <b>6916-H516A</b> Sensor in cell, 1 pc.<br><b>6916-H517A</b> Sensor in cell, 6 pcs/set                               |
|                                                                                                                                                                                      |   | Rectangular quartz cell,<br>4 x 10 mm, max. 6pcs.                                                                                                                                                     |    |                                                                                                                      |
|                                                                                                                                                                                      |   | Rectangular quartz cell,<br>10 x 10 mm, max. 6pcs.                                                                                                                                                    | 1B |                                                                                                                      |
|                                                                                                                                                                                      |   | <b>6916-H360A</b> - Capillary cell adaptor and Capillary cell,<br>max. 6 pcs.<br>(A sealing compound is required for using capillary cells.)                                                          | 1C |                                                                                                                      |
| <b>6916-H343A</b> - 8-position cell block<br>(with variable speed magnetic stirrer)<br>for rectangular cell, 5 x 5 mm                                                                | 2 | Rectangular quartz cell, 5 x 5 mm, max 8 pcs.                                                                                                                                                         | 2A | <b>6916-H516A</b> Sensor in cell, 1 pc.<br><b>6916-H518A</b> Sensor in cell, 8 pcs/set                               |
| <b>6916-H643A</b> - 1 mm 8-position micro<br>cell block<br>(Including Silicon cap x 8,<br>Silicon cap with sensor hole x1,<br>and cap fixture)<br>*Stirrer function is not available | 3 | <b>1103-1171A</b> - 8-position 1 mm micro cell<br>1 mm path length, 10 µL for each position                                                                                                           | 3A | <b>6916-H516A</b> Sensor in cell, 1 pc.<br>*The 8th cell position is used only to<br>monitor cell block temperature. |
| <b>6916-H743A</b> - 10 mm 8-position<br>micro cell block<br>*Stirrer function is not available                                                                                       | 4 | <b>1103-0202A</b> - 8-position 10 mm micro cell<br>10 mm path length, 100 µL for each position<br>without capability for well caps                                                                    | 4A | N/A                                                                                                                  |
|                                                                                                                                                                                      |   | <b>1103-1168</b> - 8-position 10 mm micro cell with Teflon caps<br>10 mm path length, 100 µL for each position                                                                                        | 4B | <b>6916-H516A</b> Sensor in cell, 1 pc.<br>*The 8th cell position is used only to<br>monitor cell block temperature. |
|                                                                                                                                                                                      |   | <b>6916-H543A</b> - Silicon cap kit for 1103-1168, to prevent<br>volatilization of samples at high temperatures consisting<br>of silicon cap x8 , Silicon cap with sensor hole x1, and cap<br>fixture | 4C |                                                                                                                      |

## SAH-769 One drop accessory



### Specifications

The SAH-769 One Drop accessory is a dedicated accessory for the V-700 Series to measure micro volume samples of protein and nucleic acid. The 1mm and 0.2 mm cells are included as standard with accessory.

|                  | Minimum Sample Volume |
|------------------|-----------------------|
| 1mm pathlength   | 5 µL                  |
| 0.2mm pathlength | 0.6 µL                |

### Precision of Quantitative Analysis

Solutions of Calf Thymus DNA (KH<sub>2</sub>PO<sub>4</sub> / NaOH buffer at pH7) at several concentrations were measured by using cells with 1-mm. The spectrum has shown at Figure 1 and LDL has shown at Table 1.

Table 1 Sample Conc. and Abs [OP: 1mm]

| Legend | Conc. [ng/µL] | Abs    |
|--------|---------------|--------|
| —      | 0             | 0.0005 |
| —      | 13            | 0.0228 |
| —      | 26            | 0.0417 |
| —      | 52            | 0.0838 |
| —      | 260           | 0.4500 |
| —      | 520           | 0.8970 |
| —      | 780           | 1.3443 |
| —      | 1040          | 1.8137 |

Table 1

Sample Concentration and Abs  
[optical path: 1 mm]

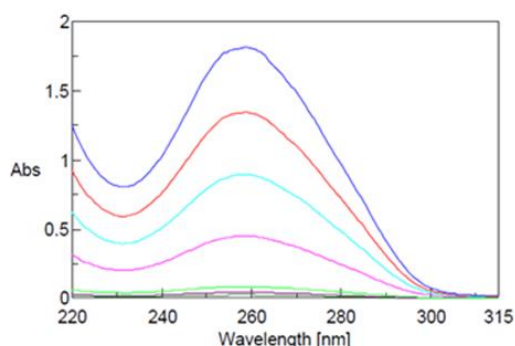


Figure 1

Absorbance spectra of DNA solution  
[optical path: 1 mm]

## Measurement Procedure



1) Drop sample on the cell



2) Close the cover glass and the lid of sample compartment



3) Start sample measurement



4) Cleaning the cell

less than  
20 seconds

### Measurement Parameters

Data interval: 0.5 nm  
Measurement range: 220 to 315 nm  
Band width: 1.5 nm  
Response: Medium  
Scan Speed: 200 nm/min

ASU-800 autosampler, combined with a syringe pump and a flow cell or a variety of sippers, automatically measures multiple liquid samples using spectrophotometer V-700 series. Tubes or tube racks according to the sample volume and the amount of samples, or dedicated racks for microplates can be purchased separately. PC control software is included as standard.

**ASU-800** can be coupled with the following accessories:

- **NQF-781** - Vacuum sipper
- **NQF-783** - Vacuum sipper with long-path flow cell
- **NPF-721** - Peristaltic sipper
- **ASP-849** - Syringe pump
- **SFC-712** - Flow cell holder
- **MFC-714** - Micro flow cell holder
- **FIC-715** - Micro flow cell holder
- **AWU-828** Washing unit
- **Dust Cover**

## ASU-800 - Autosampler unit



| Rack                                                                       | Tube/Microplate/Vials                                                                      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 6989-J111A – <b>SRA-811</b><br>15 mm O.D. test tube rack - 100 samples     | <b>6774-H110A</b><br>15 mm O.D. test tube, 15 mm (O.D.) x 105 mm (H) - 10 mL - 100 pcs/set |
| 6989-J112A – <b>SRA-812</b><br>13 mm O.D. test tube rack – 100 samples     | <b>6774-H109A</b><br>13 mm O.D. test tube, 13 mm (O.D.) x 100 mm (H) - 7 mL - 100 pcs/set  |
| 6989-J113A – <b>SRA-813</b><br>12 mm O.D. test tube rack – 150 samples     | <b>6905-H146A</b><br>12 mm O.D. test tube, 12 mm (O.D.) x 105 mm (H) - 5 mL - 100 pcs/set  |
| 6989-J114A – <b>SRA-814</b><br>10 mm O.D. test tube rack – 150 samples     | <b>6774-H111A</b><br>10 mm O.D. test tube, 10 mm (O.D.) x 90 mm (H) - 3 mL - 100 pcs/set   |
| 6989-J116A - <b>SRA-816</b><br>Microplate Rack – 192 samples               | Commercially available 1ml 96-well microplates                                             |
| 6989-J117A - <b>SRA-817</b><br>Thermostatted Microplate Rack – 192 samples | Commercially available 1ml 96-well microplates                                             |
| 6989-J118A – <b>SRA-818</b><br>Vial Rack                                   | <b>0410-0102</b><br>Screw top vial – 1.5 mL - 500 pcs./set                                 |

## Specifications

|                      |                                                                                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nozzle</b>        | SUS-316 - 1.5 mm (O.D.) x 1.1 mm (I.D.)                                                                                                                             |
| <b>Tubeing</b>       | Teflon – 2.0 mm (O.D.) x 1.0 mm (I.D.)                                                                                                                              |
| <b>Software</b>      | Fully controlled by Personal Computer - Included as standard: Spectra Measurement, Quantitative Calibration, Quantitative Analysis and Fixed Wavelength Measurement |
| <b>Communication</b> | USB                                                                                                                                                                 |



### AWU-828 Washing Unit

Washing unit specifically design for the sippers NQF-781, NQF-783 and NPF-782.

The AWU-828 can automatically wash the ASU-800 autosampler system.



### Dust cover

This is a dust case that covers the rack part of ASU-800



## NQF-781 – Vacuum sipper



### Specifications

NQF-781 can be used in conjunction with the autosampler ASU-800.  
A 10 mm rectangular cell holder is integrated in addition to the 10 mm flow cell, and can be easily switched.

|                                                |                                                                            |
|------------------------------------------------|----------------------------------------------------------------------------|
| <b>Optical Pathlength</b>                      | 10 mm                                                                      |
| <b>Cell Capacity</b>                           | about 50 µL                                                                |
| <b>Cell Material</b>                           | Quartz                                                                     |
| <b>Carryover</b>                               | Less than 1%                                                               |
| <b>Minimum sample requirement</b>              | 0.7 mL<br>for low-viscosity samples                                        |
| <b>Material in contact with sample/solvent</b> | Teflon, Fluoroelastomer, Aflon                                             |
| <b>Maximum Processing Capacity</b>             | 450 samples/hour                                                           |
| <b>Wavelength Range</b>                        | 220 - 900 nm (V-750/760)<br>220 - 2200 nm (V-770)<br>220 - 1600 nm (V-780) |

## NQF-783

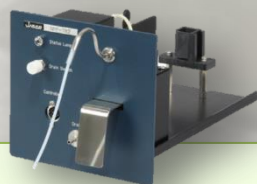
### Vacuum sipper with long-path flow cell



### Specifications

NQF-783 can be used in conjunction with the autosampler ASU-800.  
A 50 mm rectangular cell holder is integrated in addition to the 50 mm flow cell, and can be easily switched.

|                                                |                                                                            |
|------------------------------------------------|----------------------------------------------------------------------------|
| <b>Optical Pathlength</b>                      | 50 mm                                                                      |
| <b>Cell Capacity</b>                           | about 1400 µL                                                              |
| <b>Cell Material</b>                           | Quartz                                                                     |
| <b>Carryover</b>                               | Less than 1%                                                               |
| <b>Minimum sample requirement</b>              | 2.4 mL<br>for low-viscosity samples                                        |
| <b>Material in contact with sample/solvent</b> | Teflon, Fluoroelastomer, Aflon                                             |
| <b>Maximum Processing Capacity</b>             | 450 samples/hour                                                           |
| <b>Wavelength Range</b>                        | 220 - 900 nm (V-750/760)<br>220 - 2200 nm (V-770)<br>220 - 1600 nm (V-780) |



## NPF-782 – Peristaltic sipper

### Specifications

NPF-782 can be used in conjunction with the autosampler ASU-800.  
A 10 mm rectangular cell holder is integrated in addition to the 10 mm flow cell, and can be easily switched.  
The sample can be recovered by reversing the 'drain' direction.

|                                                |                                                                            |
|------------------------------------------------|----------------------------------------------------------------------------|
| <b>Optical Pathlength</b>                      | 10 mm                                                                      |
| <b>Cell Capacity</b>                           | about 50 µL                                                                |
| <b>Cell Material</b>                           | Quartz                                                                     |
| <b>Carryover</b>                               | Less than 1%                                                               |
| <b>Minimum sample requirement</b>              | 0.7 mL for low-viscosity samples                                           |
| <b>Material in contact with sample/solvent</b> | Teflon, Fluoroelastomer, Aflon                                             |
| <b>Maximum Processing Capacity</b>             | 360 samples/hour                                                           |
| <b>Wavelength Range</b>                        | 220 - 900 nm (V-750/760)<br>220 - 2200 nm (V-770)<br>220 - 1600 nm (V-780) |

## ASP-849 – Syringe Pump



### Specifications

The ASP-849 can be used in conjunction with the ASU-800 and SFC-712/MFC-714/FIC-715 flow cell holders. The syringe pump is suitable for drawing small quantities of sample.

|                                                |                                 |
|------------------------------------------------|---------------------------------|
| <b>Reproducibility of volume delivery</b>      | Within $\pm 1\%$                |
| <b>Syringe volume</b>                          | 2.5 mL (included as standard)   |
| <b>Optional syringes</b>                       | 1 mL – 5 mL – 10 mL             |
| <b>Material in contact with sample/solvent</b> | Teflon, Fluoroelastomer, Quartz |
| <b>Compatible Flow Cell Holders</b>            | SFC-712<br>MFC-714<br>FIC-715   |

## SFC-712 – Flow cell holder



### Specifications

|                                                |                                                                                 |
|------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Flow Cell compatibility</b>                 | <b>6156-H607A</b><br>5 mm path length flow cell<br>(50 $\mu$ L cell capacity)   |
|                                                | <b>6156-H608A</b><br>10 mm path length flow cell<br>(100 $\mu$ L cell capacity) |
| <b>Flow Cell</b>                               | Rectangular Quartz                                                              |
| <b>Material in contact with sample/solvent</b> | Teflon, Fluoroelastomer, Quartz                                                 |
| <b>Wavelength Range</b>                        | 220 - 900 nm (V-750/760)<br>220 - 2200 nm (V-770)<br>220 - 1600 nm (V-780)      |

## MFC-714– Micro Flow cell holder FIC-715 – Micro Flow cell holder



### Specifications

|                           |                                 |
|---------------------------|---------------------------------|
| <b>Cell Material</b>      | MFC-714: SUS<br>FIC-715: Teflon |
| <b>Optical Pathlength</b> | 10 mm                           |
| <b>Cell Capacity</b>      | 20 $\mu$ L                      |

## LFC-713 – Long path flow cell holder



### Specifications

|                                |                                                                                    |
|--------------------------------|------------------------------------------------------------------------------------|
| <b>Flow Cell compatibility</b> | <b>6522-J343A</b><br>30 mm path length flow cell<br>(approx. 0.6 mL cell capacity) |
|                                | <b>6522-J333A</b><br>50 mm path length flow cell<br>(approx. 1 mL cell capacity)   |
|                                | <b>6522-J243A</b><br>100 mm path length flow cell<br>(approx. 2 mL cell capacity)  |
| <b>Flow Cell</b>               | Synthetic Fused Silica                                                             |
| <b>Wavelength Range</b>        | 220 - 900 nm (V-750/760)<br>220 - 2200 nm (V-770)<br>220 - 1600 nm (V-780)         |



**FLH-740 – Film holder**

## Specifications

FLH-740 accessory are used to measure the transmittance of solid, transparent samples such as films, plate glass, and filters.

**Minimum Sample size** 15 mm (H) x 15 mm (W)

**Maximum Sample size** 80 mm (H) x 100 mm (W)

**Sample Thickness** 0.5 to 10 mm

**Insert Mode** Leaf Spring type



**FLH-741 – Film holder**

## Specifications

FLH-741 accessory are used to measure the transmittance of solid, transparent samples such as films, plate glass, and filters.

**Minimum Sample size** 5 mm (H) x 5 mm (W)

**Maximum Sample size** 80 mm (H) x 100 mm (W)

**Sample Thickness** 0.5 to 25 mm

**Insert Mode** Holding Plate type



**RSH-744 – Rotary sample holder**

## Specifications

RSH-744 accessory can be used to measure a film type sample and rotating the sample manually. The sample can be rotated 360° around the optical axis and the inclination (tilt) of the sample versus the source beam can be varied within a range of  $\pm 50^\circ$ .

**Minimum Sample size** 10 mm (H) x 30 mm (W)

**Maximum Sample size** 18 mm (H) x 38 mm (W)

**Sample Thickness** 1 to 2 mm

**Rotation Angle** Optical axis: 360°  
Perpendicular to the optical axis:  $\pm 50^\circ$



**VTA-752 – Film holder (variable incident angle)**

## Specifications

VTA-752 is a film holder to measure transmittance of a film type sample, changing the incident angle of the light beam. The incident angle of the source light beam can be set in  $1^\circ$  increments.

**Minimum Sample size** 15 mm (H) x 35 mm (W)

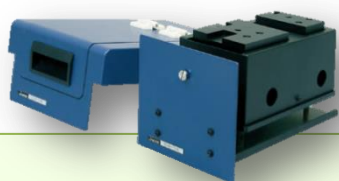
**Maximum Sample size** 80 mm (H) x 70 mm (W)

**Sample Thickness** 1 to 2 mm

**Rotation Angle**  $\pm 90^\circ$



## SLM-907 – Specular Reflectance accessory



### Specifications

SLM-907 accessory is designed to measure the relative reflectance of a sample using the reflected light from an aluminum-deposited plane mirror as a reference.

This accessory allows measurement of the reflectance of metal-deposited films and/or metal Plating, as well as measurement of film thickness using a film thickness analysis program.

|                             |                                                                            |
|-----------------------------|----------------------------------------------------------------------------|
| <b>Incident angle</b>       | Approx. 5°                                                                 |
| <b>Minimum Sample size</b>  | 10 x 10 mm                                                                 |
| <b>Maximum Sample size</b>  | 100 x 120 mm                                                               |
| <b>Beam Port</b>            | 7 mm diam.<br>(1 mm, 2 mm diam. Options)                                   |
| <b>Reflection Reference</b> | Aluminum-deposited plane mirror (Standard)                                 |
| <b>Wavelength range</b>     | 200 - 870 nm (V-750/760)<br>200 - 2500 nm (V-770)<br>200 - 1600 nm (V-780) |
| <b>Sample chamber lid</b>   | Included as standard                                                       |

### Options

|                               | MSK-001                                   | MSK-002    |
|-------------------------------|-------------------------------------------|------------|
| <b>Sample stage with mask</b> | 2 mm diam.                                | 4 mm diam. |
| <b>Minimum Sample Size</b>    | 3 x 3 mm                                  | 5 x 5 mm   |
| <b>Maximum Sample Size</b>    | 50 x 50 mm                                | 50 x 50 mm |
| <b>Suggested Software</b>     | VWRR-769 - Reflectance correction program |            |

## VWRR-769

### Reflectance correction program

VWRR-769 program can convert a relative reflectance spectrum, obtained by using a specular reflectance accessory, to an absolute reflectance spectrum by multiplying the absolute reflectance spectrum of the reflectance standard with a relative reflectance spectrum of the sample.

VWRR-769 software includes typical absolute reflectance data of an evaporated aluminum mirror for conversion.

|                             |                 |
|-----------------------------|-----------------|
| <b>Required Accessories</b> | SLM-907-SLM-908 |
|-----------------------------|-----------------|

## SLM-908

### Specular Reflectance accessory



### Specifications

SLM-908 accessory is designed to measure the relative reflectance of a sample using the reflected light from an aluminum-deposited plane mirror as a reference. This accessory allows measurement of the reflectance of metal-deposited films and/or metal Plating, as well as measurement of film thickness using a film thickness analysis program. SLM-908 accessory can measure larger samples such as 6 inch silicon wafers.

|                             |                                                                            |
|-----------------------------|----------------------------------------------------------------------------|
| <b>Incident angle</b>       | Approx. 5°                                                                 |
| <b>Sample size</b>          | 150 mm diam.                                                               |
| <b>Beam Port</b>            | 7 x 7 mm                                                                   |
| <b>Reflection Reference</b> | Aluminum-deposited plane mirror (Standard)                                 |
| <b>Wavelength range</b>     | 200 - 870 nm (V-750/760)<br>200 - 2500 nm (V-770)<br>200 - 1600 nm (V-780) |
| <b>Sample chamber lid</b>   | Included as standard                                                       |

### Options

|                               | MSK-001                                   | MSK-002    |
|-------------------------------|-------------------------------------------|------------|
| <b>Sample stage with mask</b> | 2 mm diam.                                | 4 mm diam. |
| <b>Minimum Sample Size</b>    | 3 x 3 mm                                  | 5 x 5 mm   |
| <b>Maximum Sample Size</b>    | 50 x 50 mm                                | 50 x 50 mm |
| <b>Suggested Software</b>     | VWRR-769 - Reflectance correction program |            |

## DPL-515 – Depolarization Plate



### Specifications

DPL-515 depolarizer converts incident light to non-polarized light. Non-polarized light is obtained when the rotation angle is set to 45°. The applicable spectral range is from 350 to 2,500 nm.

## GPH-506 – Polarizer



### Specifications

GPH-506 polarizer converts the source light from the instrument monochromator into linearly polarized light. The plane of polarization can be set at 0° (vertical linearly polarized light) and 90° (horizontal linearly polarized light). The applicable spectral range is from 215 to 2,300 nm.

## ISN-901i - Integrating Sphere, 60 mm



### Specifications

ISN-901i integrating sphere are provided with a light trap so that the reflectance of samples can be measured with or without the specular reflectance component. The rectangular cell holder for diffuse transmittance of a turbid liquid sample and holders for diffuse reflectance of solid samples are standard. A range of sample holders, a fluorescence cut filter and polarizer are available as options.

|                                              |                                                                                    |
|----------------------------------------------|------------------------------------------------------------------------------------|
| <b>Inside diameter of integrating sphere</b> | 60 mm                                                                              |
| <b>Minimum sample size (Reflectance)</b>     | 20 (H) x 20 (W) x 0.5 (t) mm                                                       |
| <b>Maximum sample size (Reflectance)</b>     | 65 (H) x 50 (W) x 25 (t) mm                                                        |
| <b>Sample cell (Transmittance)</b>           | Rectangular cell<br>5, 10, 20, 30, 50 mm path length                               |
| <b>Reference cell (Transmittance)</b>        | Rectangular cell<br>5, 10, 20 mm path length<br>(Reference cell block is optional) |
| <b>Wavelength range</b>                      | 200 – 1600 nm                                                                      |
| <b>On-board Detector</b>                     | PMT & InGaAs                                                                       |
| <b>Incident angle to reflection surface</b>  | 0°, approx. 5°                                                                     |

### Options

**PSH-002 Powder sample holder** - For diffuse reflectance measurements of powder samples - Size of sample area: 16 mm diameter - Thickness: 0.5 - 6 mm

**PSH-003 Powder sample holder** - For diffuse reflectance measurements of small amount of powder samples - Size of sample area: 5 mm diameter - Thickness: 0.5 - 4 mm - (\*) The lens and mask kit is required

#### SSH-506 Solid Sample Holder

For diffuse transmittance measurements of a solid sample  
Min. sample size: 20 (H) x 20 (W) x 0.5 (t) mm  
Max. sample size: 70 (H) x 40 (W) x 35 (t) mm

#### RLH-603 Reference Side rectangular cell holder

This cell holder is used for the reference side when performing diffuse transmittance measurements of turbid liquid samples. Cell to be used: 5, 10 or 20 mm optical pathlength rectangular cell

#### (\*) 6916-H123A Lens and mask kit

This accessory kit consists of a lens to focus the light beam onto a small amount of a powder sample and three types of masks (1, 2, 3 mm diam.). The lens focuses the beam down to a 1 mm diameter by using the 1 mm diam. mask for diffuse reflectance measurements of a very small area of the sample.

## ILN-902i - Integrating Sphere, 150 mm



### Specifications

ILN-902i integrating sphere are provided with a light trap so that the reflectance of samples can be measured with or without the specular reflectance component. The rectangular cell holder for diffuse transmittance of a turbid liquid sample and holders for diffuse reflectance of solid samples are standard. A range of sample holders, a fluorescence cut filter and polarizer are available as options.

|                                              |                                                     |
|----------------------------------------------|-----------------------------------------------------|
| <b>Inside diameter of integrating sphere</b> | 150 mm                                              |
| <b>Minimum sample size (Reflectance)</b>     | 20 (H) x 20 (W) x 0.5 (t) mm                        |
| <b>Maximum sample size (Reflectance)</b>     | 100 (H) x 50 (W) x 30 (t) mm                        |
| <b>Sample cell (Transmittance)</b>           | Rectangular cell<br>5, 10, 20 30, 50 mm path length |
| <b>Reference cell (Transmittance)</b>        | Rectangular cell<br>5, 10, 20 30, 50 mm path length |
| <b>Wavelength range</b>                      | 200 – 1600 nm                                       |
| <b>On-board Detector</b>                     | PMT & InGaAs                                        |
| <b>Incident angle to reflection surface</b>  | approx. 5°                                          |

### Options

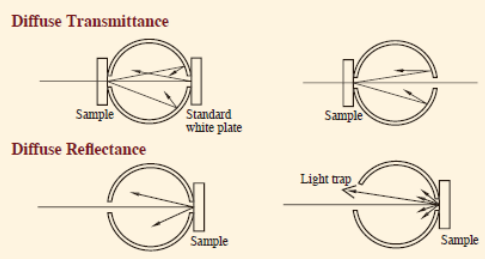
#### PSH-002 Powder sample holder

For diffuse reflectance measurements of powder samples  
Size of sample area: 16 mm diameter  
Thickness: 0.5 - 6 mm

#### SSH-507 Solid sample holder

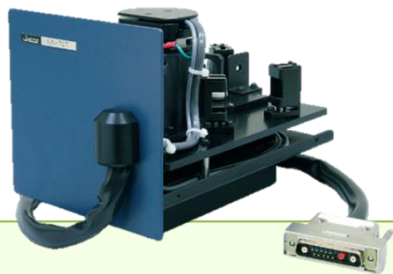
For diffuse transmittance measurements of a solid sample  
Min. sample size: 20 (H) x 20 (W) x 0.5 (t) mm  
Max. sample size: 70 (H) x 30 (W) x 40 (t) mm

Integrating spheres are designed to measure either the diffuse transmittance or diffuse reflectance of a sample. Usually, the UV-Vis/NIR spectrophotometers measure the transmittance of a homogeneous, transparent liquid or solid sample. However, when a turbid liquid sample or opaque solid sample is measured, the light incident upon the sample is diffusely transmitted or reflected and only a small portion of the light reaches the detector. The integrating sphere accessory acquires the light diffuse-transmitted or diffuse-reflected from the sample into the integrating sphere and introduces it to the detector.



## IJN-904i

### Dedicated Gemstone integrating sphere



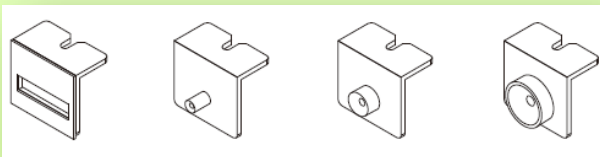
#### Specifications

IJN-904i is specially designed to measure the diffuse transmittance and diffuse reflectance of small and irregularly shaped samples such as gemstones. Various sample holders are included as standard for measurements of precious stones mounted on rings and necklaces. Use with the GHP-506 polarizer (option) is recommended.

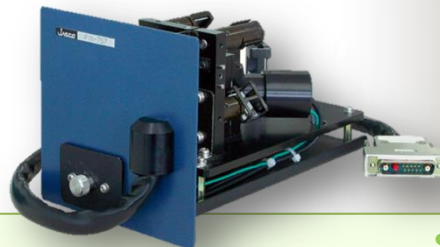
|                                                        |                |
|--------------------------------------------------------|----------------|
| <b>Inside diameter of integrating sphere</b>           | 60 mm          |
| <b>Minimum sample size (Transmittance/Reflectance)</b> | 2 mm diameter  |
| <b>Maximum sample size (Transmittance)</b>             | 10 mm diameter |
| <b>Maximum sample size (Reflectance)</b>               | 30 mm diameter |
| <b>Wavelength range</b>                                | 250 – 1600 nm  |
| <b>On-board Detector</b>                               | PMT & InGaAs   |

#### Options

**Sample holders for rings, pearls, gemstones (included as standard)**



## PIN-903i - Horizontal integrating sphere



#### Specifications

PIN-903i can mount samples horizontally and allows the simple measurement of small and powder samples with little to no sample preparation.

|                                              |                                         |
|----------------------------------------------|-----------------------------------------|
| <b>Inside diameter of integrating sphere</b> | 60 mm                                   |
| <b>Minimum sample size (Transmittance)</b>   | 3 mm diam.x 0.5 (T) mm                  |
| <b>Maximum sample size (Transmittance)</b>   | 50 (H) x 50 (W) x 2 (T) mm              |
| <b>Maximum sample size (Reflectance)</b>     | 30 x 30 x 10 (T) mm                     |
| <b>Reflectance measurement adaptor</b>       | 20 mm diam. x 2 mm (no window required) |
| <b>Wavelength range</b>                      | 250 – 1600 nm                           |
| <b>On-board Detector</b>                     | PMT & InGaAs                            |

#### Options

**6916-J156A - Lens and mask for reflectance measurement - (mask size: 1, 2 and 3 mm diam.)**

**6916-J256A - Lens and mask for transmittance measurement - (mask size: 1, 2 and 3 mm diam.)**

These lens and mask kits are used to focus the light beam for measurement of a small area. When the 1 mm diameter mask is used, the beam diameter of the incident light upon the sample is decreased to a minimum of 2 mm in diameter.

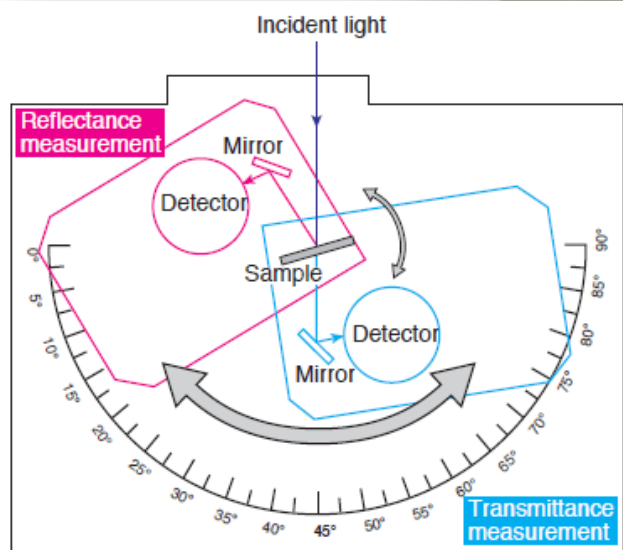


## ARMN-921i Automated Absolute Reflectance measurement accessory



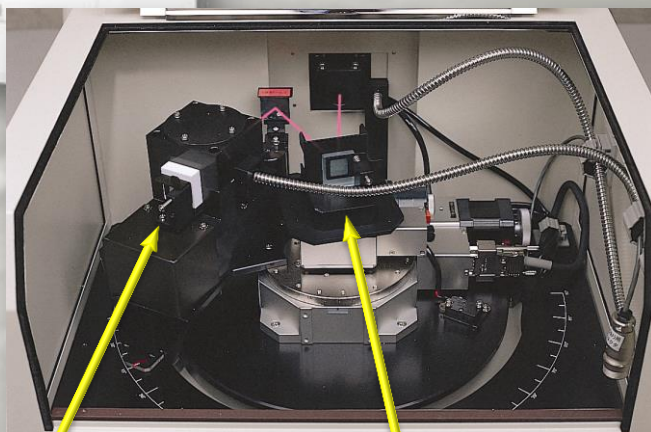
### Specifications

|                                                   |                                                                                                                                                           |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Wavelength range</b>                           | 250 – 1600 nm                                                                                                                                             |
| <b>Movement of sample stage and detector</b>      | Asynchronous                                                                                                                                              |
| <b>Control of sample stage and detector</b>       | Automated                                                                                                                                                 |
| <b>Measurement mode</b>                           | Absolute reflectance<br>Relative reflectance                                                                                                              |
| <b>Integrating sphere</b>                         | 60 mm                                                                                                                                                     |
| <b>Incidence angle</b>                            | <i>Absolute reflectance mode</i><br>5° to 60°<br><br><i>Relative reflectance mode</i><br>Vertical incidence<br><br><i>Transmittance mode</i><br>5° to 60° |
| <b>Angle setting</b>                              | Sample stage: 0.1° step (manual)<br>Detector stage: 1° step (manual)                                                                                      |
| <b>Minimum sample size (Absolute Reflectance)</b> | 20 (H) x 20 (W) x 1 (t) mm                                                                                                                                |
| <b>Maximum sample size (Absolute Reflectance)</b> | 70 (H) x 100 (W) x 10 (t) mm                                                                                                                              |
| <b>Minimum sample size (Relative Reflectance)</b> | 20(H) x 20(W) x 0.5(T) mm                                                                                                                                 |
| <b>Maximum sample size (Relative Reflectance)</b> | 70(H) x 100(W) x 10(T) mm                                                                                                                                 |
| <b>Accuracy</b>                                   | ±1.5% at incidence angle of 6°                                                                                                                            |
| <b>100% line flatness</b>                         | Within ±1%                                                                                                                                                |
| <b>Polarizer</b>                                  | Included as standard                                                                                                                                      |
| <b>Software included</b>                          | <ul style="list-style-type: none"> <li>Absolute reflectance spectral measurement</li> <li>Interval analysis</li> </ul>                                    |



The ARMN-921i automates the absolute reflectance measurements of specularly reflecting samples such as metal or glass samples. The detector is equipped with an integrating sphere and thus it also permits measurement of the relative reflectance of a diffusely reflecting sample. Since the angles of the sample stage and the detector can be changed independently, the absolute reflectance and transmittance of a sample can be measured with varied angles of incidence. A software controlled polarizer is provided as standard for the examination of the polarization properties of a sample. In addition to S and P polarized lights, N polarized light that obtains the same measurement results as non-polarized light is available.

The interval data analysis program which is standard for the ARMN-920 can display the measurement results in three dimensions of the wavelength, photometric value and angle.



Integrating sphere

Sample Stage

## ARN-915i

### Absolute Reflectance measurement accessory (Synchronous type)



#### Specifications

The ARN-915i accessory provides absolute reflectance measurements of samples by the manual, synchronous movement of the sample stage and detector. Changing the incident angle of the sample by manually moving the detector position, the absolute reflectance of the sample can be measured at varied incident angles. Using the optional ARG-476 or GPH-506 polarizers, the polarization properties of the sample can also be examined.

|                                                   |                                                                                                             |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Wavelength range</b>                           | 250 – 1600 nm                                                                                               |
| <b>Movement of sample stage and detector</b>      | Synchronous                                                                                                 |
| <b>Control of sample stage and detector</b>       | Manual                                                                                                      |
| <b>Measurement mode</b>                           | Absolute reflectance<br>Relative reflectance                                                                |
| <b>Integrating sphere</b>                         | 60 mm                                                                                                       |
| <b>Incidence angle</b>                            | <i>Absolute reflectance mode</i><br>5° to 60°<br><br><i>Relative reflectance mode</i><br>Vertical incidence |
| <b>Angle setting</b>                              | 2.5° step (manual)                                                                                          |
| <b>Minimum sample size (Absolute Reflectance)</b> | 20 (H) x 20 (W) x 1 (t) mm                                                                                  |
| <b>Maximum sample size (Absolute Reflectance)</b> | 70 (H) x 100 (W) x 10 (t) mm                                                                                |
| <b>Minimum sample size (Relative Reflectance)</b> | 20(H) x 20(W) x 0.5(T) mm                                                                                   |
| <b>Maximum sample size (Relative Reflectance)</b> | 70(H) x 100(W) x 10(T) mm                                                                                   |
| <b>Accuracy</b>                                   | ±1.5% at incidence angle of 6 °                                                                             |
| <b>100% line flatness</b>                         | Within ±1%                                                                                                  |
| <b>Polarizer</b>                                  | Optional (ARG-476 or GPH-506 )                                                                              |

## ARSN-918i

### Absolute Reflectance measurement accessory (Asynchronous type)



#### Specifications

The ARSN-918i accessory provides absolute reflectance measurements of samples by the manual, asynchronous movement of the sample stage and detector, thus, the positions of the sample stage and detector can be independently varied to obtain the absolute reflectance and transmittance spectra of the sample at varied incident and detection angles. Using the optional ARG-476 or GPH-506 polarizers, the polarization properties of the sample can also be examined.

|                                                   |                                                                                                                                                           |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Wavelength range</b>                           | 250 – 1600 nm                                                                                                                                             |
| <b>Movement of sample stage and detector</b>      | Asynchronous                                                                                                                                              |
| <b>Control of sample stage and detector</b>       | Manual                                                                                                                                                    |
| <b>Measurement mode</b>                           | Absolute reflectance<br>Relative reflectance                                                                                                              |
| <b>Integrating sphere</b>                         | 60 mm                                                                                                                                                     |
| <b>Incidence angle</b>                            | <i>Absolute reflectance mode</i><br>5° to 60°<br><br><i>Relative reflectance mode</i><br>Vertical incidence<br><br><i>Transmittance mode</i><br>5° to 60° |
| <b>Angle setting</b>                              | Sample stage: 0.1° step (manual)<br>Detector stage: 1° step (manual)                                                                                      |
| <b>Minimum sample size (Absolute Reflectance)</b> | 20 (H) x 20 (W) x 1 (t) mm                                                                                                                                |
| <b>Maximum sample size (Absolute Reflectance)</b> | 70 (H) x 100 (W) x 10 (t) mm                                                                                                                              |
| <b>Minimum sample size (Relative Reflectance)</b> | 20(H) x 20(W) x 0.5(T) mm                                                                                                                                 |
| <b>Maximum sample size (Relative Reflectance)</b> | 70(H) x 100(W) x 10(T) mm                                                                                                                                 |
| <b>Accuracy</b>                                   | ±1.5% at incidence angle of 6 °                                                                                                                           |
| <b>100% line flatness</b>                         | Within ±1%                                                                                                                                                |
| <b>Polarizer</b>                                  | Optional (ARG-476 or GPH-506 )                                                                                                                            |

## Absolute Reflectance accessories

### Options

#### SSH-508 Solid sample holder

The SSH-508 is set on the entrance to the detector for diffuse transmittance measurements of scattering samples at a vertical (0°) incidence.

**Minimum sample size** 30(H) x 30(W) x 0.5(T) mm

**Maximum sample size** 70(H) x 80(W) x 10(T) mm

#### Wide incident angle sample holder

This sample holder is attached to the sample stage to allow an angle of incidence up to a maximum of 85°.

- 6708-H163A for ARV and ARSV
- 6708-H460A for ARMV

**ARV**  
**Minimum sample size** 30(H) x 60(W) x 1(T) mm

**ARSV - ARMV**  
**Minimum sample size** 30(H) x 30(W) x 1(T) mm

**Maximum sample size** 70(H) x 100(W) x 10(T) mm

**Incidence angle** 0° - 85°

#### PDU-755 Phase difference measurement unit

PDU-755 option provides the measurement of the reflectance phase difference and the transmittance phase difference. It consists of an angle selective analyzer and the VWAP-794 phase difference measurement program (included)

**Wavelength range** 250 – 2000 nm

**Polarization rotation angle** 0° - 90°

#### ARG-476 Polarizer

The ARG-476 is a Glan-Taylor polarizer and is recommended for absolute reflectance measurements using incident angles of 30° or greater. By setting the polarizer at 45°, the same result can be obtained as for measurements with non-polarized light.

**Wavelength range** 250 – 2000 nm

**Polarization rotation angle** 0° - 90°

## Absolute Reflectance accessories

### Softwares

#### VWAP-794

##### Phase difference measurement program

VWAP-794 software is included in the PDU-755 phase difference measurement accessory as standard.

VWAP-794 program measures transmittance and reflectance phase difference spectra with multiple incident angles by using a polarizer and analyzer.





## FAN-751 - Optical fiber unit



### Specifications

FAN-751 accessory consisting of an optical fiber unit and external detector, enables the measurement of bulky samples that cannot be set in the sample compartment and/or samples that are in special environments. The light from the main instrument is introduced to the optical fiber. The light from a sample is introduced to the external detector via the optical fiber.

**External detector** Photomultiplier tube

**Wavelength range** 250 – 1600 nm

### Options

**6916-J254A**  
Fiber connection port, Bundle type for FAN-751

**6916-J250A**  
Fiber connection port, FC connector type for FAN-751

**6916-J251A**  
Fiber connection port, SMA connector type for FAN-751

## FAP-754 - Optical fiber unit



### Specifications

FAP-754 accessory can be used for sample measurement using the internal detector of the spectrophotometer. The light from the main instrument is introduced to an optical fiber. The light from a sample is introduced to the detector of the spectrophotometer via a return optical fiber.

### Options

**6916-J154A**  
Fiber connection port, Bundle type for FAP-754

**6916-J150A**  
Fiber connection port, FC connector type for FAP-754

**6916-J151A**  
Fiber connection port, SMA connector type for FAP-754

## ELM-912 - External light source interface



### Specifications

This interface is for introducing light from an external light source into the spectrophotometer, and measuring the spectrum of the external source. It can be used for the spectral/intensity evaluation of external light sources.

\* For correction of the measured spectrum, a secondary reference source is also required.

### Options

**1120-0109** - Optical fiber (bundle type), 1m

**1120-0110** - Optical fiber (bundle type), 1.5m



## Biochemical Softwares

### VWKN-772

#### Kinetics analysis program

VWKN-772 Kinetics Analysis program performs time course measurements of multiple samples, plots the graphs and calculates the maximum reaction velocity ( $V_{max}$ ), Michaelis-Menten constant ( $K_m$ ) and the Hill constant ( $n$ ).

The program also supports calculation of inhibitor constant and determination of inhibitor type by comparing data obtained with and without an inhibitor. An automated cell changer can be utilized, enabling batch analysis of multiple data.

#### Five types of plots

- Michaelis-Menten
- Lineweaver-Burk
- Hofstee
- Eadie
- Hill

#### Calculation items

- Maximum reaction velocity ( $V_{max}$ )
- Michaelis-Menten constant ( $K_m$ )
- Hill constant ( $n$ )
- determination of inhibitor type
- inhibitor constant

|                      |     |
|----------------------|-----|
| <b>CFR compliant</b> | YES |
|----------------------|-----|

### VWPN-952

#### Protein nucleic acid quantitation program

VWPN-952 program measures the absorbance of protein and nucleic acid solutions at specified wavelengths and calculates the concentration of the protein and nucleic acids based on a calculation method selected from five different types listed below. It is possible to select the wavelength for baseline correction and to choose whether baseline correction is to be performed. Generally, correction is performed for turbid solutions at a wavelength of 320 nm. Dilution rate correction is also possible for the user-defined concentration calculation method.

#### Available calculation methods

- Absorbance ratio of 280/260 nm
- Absorbance ratio of 230/260 nm
- Warburg-Christian method
- User-defined absorbance ratio
- User-defined concentration calculation

|                      |     |
|----------------------|-----|
| <b>CFR compliant</b> | YES |
|----------------------|-----|

### VWTP-959

#### Temperature Gradient measurement and DNA melting analysis program

VWTP-959 temperature programming software offers DNA or protein melting analysis.

Controlling the temperature of a Peltier accessory (single or multi-cell), the VWTP-959 provides measurement of the absorbance at a specific wavelength during temperature changes, then calculates the melting temperature ( $T_m$ ) from the results of the measurement.

|                              |                                                      |
|------------------------------|------------------------------------------------------|
| <b>Suggested Accessories</b> | EHCS -760 - ETCS-761 – ETCR-762<br>PSC-763 - PAC-743 |
|------------------------------|------------------------------------------------------|

|                      |     |
|----------------------|-----|
| <b>CFR compliant</b> | YES |
|----------------------|-----|

### VWIS-957

#### Interval scan measurement program

VWIS-957 program measures spectra of samples automatically with a user-defined time interval between scans. The final data array can be displayed as a 2-D spectral display; a 3-D spectral display; contour, color-image or cross-section images; or 2-D displays of the peak height/ratio, peak area/ratio, FWHM or peak shift calculations. Data plots similar to the VWIS-957 software can be obtained using the VWTS-958 data array.

VWIS-957 can be used with an automated cell changer accessory for spectral data collection of multiple samples.

|                              |         |
|------------------------------|---------|
| <b>Suggested Accessories</b> | NCP-705 |
|------------------------------|---------|

|                      |     |
|----------------------|-----|
| <b>CFR compliant</b> | YES |
|----------------------|-----|

### VWIS-958

#### Temperature interval scan measurement program

VWTS-958 program measures spectra of samples automatically with a user-defined temperature interval between scans, providing a data array similar to the VWIS-957 program, but related to sample temperature. VWTS-958 can be used with an automated cell changer and/or with Thermostatted Single or Multiple holders for spectral data collection of multiple samples.

|                              |                                                                 |
|------------------------------|-----------------------------------------------------------------|
| <b>Suggested Accessories</b> | NCP-705<br>EHCS -760 - ETCS-761 – ETCR-762<br>PSC-763 - PAC-743 |
|------------------------------|-----------------------------------------------------------------|

|                      |     |
|----------------------|-----|
| <b>CFR compliant</b> | YES |
|----------------------|-----|

## Biochemical Package

### VWKN-772

#### Kinetics analysis program

VWKN-772 Kinetics Analysis program performs time course measurements of multiple samples, plots the graphs and calculates the maximum reaction velocity ( $V_{max}$ ), Michaelis Menten constant ( $K_m$ ) and the Hill constant ( $n$ ).

The program also supports calculation of inhibitor constant and determination of inhibitor type by comparing data obtained with and without an inhibitor. An automated cell changer can be utilized, enabling batch analysis of multiple data.

#### Five types of plots

- Michaelis-Menten
- Lineweaver-Burk
- Hofstee
- Eadie
- Hill

#### Calculation items

- Maximum reaction velocity ( $V_{max}$ )
- Michaelis-Menten constant ( $K_m$ )
- Hill constant ( $n$ )
- determination of inhibitor type
- inhibitor constant

**CFR compliant** YES

### VWTP-959

#### Temperature Gradient measurement and DNA melting analysis program

VWTP-959 temperature programming software offers DNA or protein melting analysis.

Controlling the temperature of a Peltier accessory (single or multi-cell), the VWTP-959 provides measurement of the absorbance at a specific wavelength during temperature changes, then calculates the melting temperature ( $T_m$ ) from the results of the measurement.

**Suggested Accessories** EHCS -760 - ETCS-761 – ETCR-762  
PSC-763 - PAC-743

**CFR compliant** YES

### VWPN-952

#### Protein nucleic acid quantitation program

VWPN-952 program measures the absorbance of protein and nucleic acid solutions at specified wavelengths and calculates the concentration of the protein and nucleic acids based on a calculation method selected from five different types listed below. It is possible to select the wavelength for baseline correction and to choose whether baseline correction is to be performed. Generally, correction is performed for turbid solutions at a wavelength of 320 nm. Dilution rate correction is also possible for the user-defined concentration calculation method.

#### Available calculation methods

- Absorbance ratio of 280/260 nm
- Absorbance ratio of 230/260 nm
- Warburg-Christian method
- User-defined absorbance ratio
- User-defined concentration calculation

**CFR compliant** YES

### UCB-710 – Bio rectangular cell holder



#### Specifications

A cell height adjustment function provides the ability to use a 100  $\mu$ L micro cell. A mask for a 100  $\mu$ L micro cell is standard, 50  $\mu$ L can be supplied as option.

|                            |                                      |
|----------------------------|--------------------------------------|
| <b>Sample Cell</b>         | Rectangular cell<br>pathlength 10 mm |
| <b>Reference Cell</b>      | Rectangular cell<br>pathlength 10 mm |
| <b>Capacity</b>            | 1 sample and 1 reference cell        |
| <b>Temperature</b>         | Ambient                              |
| <b>Minimum Cell Volume</b> | 50 $\mu$ L                           |

### 6916-J310A – Bio-Package for V-700 series

| Part Number | Model    | Description                                                                                   |
|-------------|----------|-----------------------------------------------------------------------------------------------|
| 6916-H110A  |          | Bio cell holder block (sample side cell block of UCB-710) including Mask for 100uL micro cell |
| 4880-7472A  | VWKN-772 | Advanced kinetics analysis program                                                            |
| 4880-6522A  | VWTP-959 | Temperature gradient measurement and DNA melting analysis program                             |
| 4880-6515A  | VWPN-952 | Protein nucleic acid quantitation program                                                     |

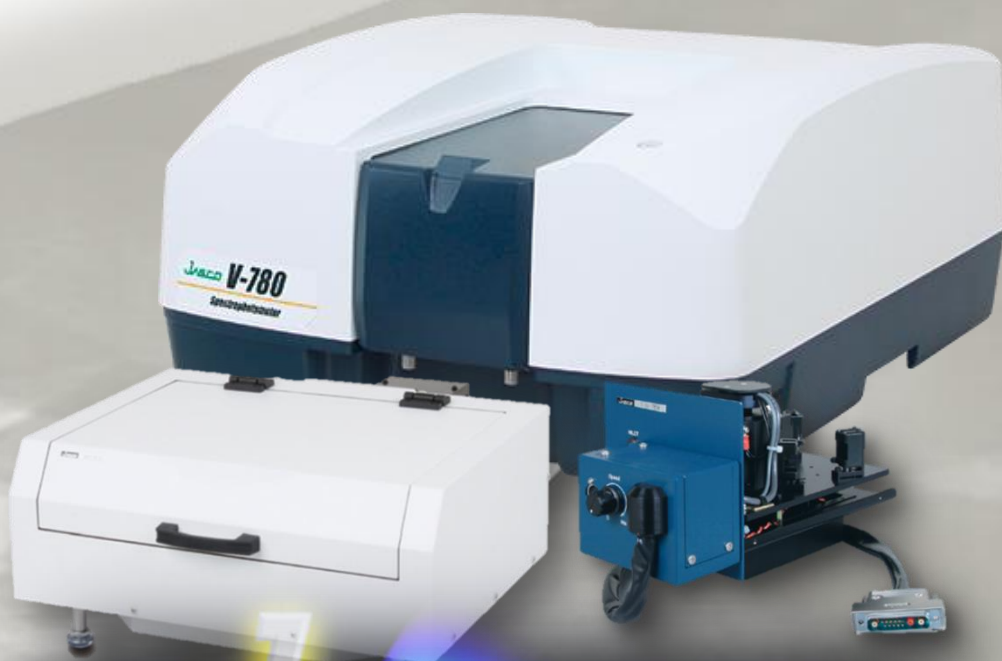


## Materials Analysis Softwares

### VWQM-978

#### *Spectrum quantitative measurement program*

VWSQ-978 package provides the quantitative analysis for a maximum of ten peaks by applying the Beer-Lambert law to each selected sample peak. Simultaneous determination of multiple components of a sample is possible if the absorption peaks of each component do not overlap. Two calculation methods are available, using either the peak height or peak area of the selected absorption peaks.




Spectra Manager Ver.2  
Spectra Manager Ver.2



**JASCO Europe S.r.l.**

*Via Cadorna, 1 - 23894 Cremella (LC)*

[jasco@jasco-europe.com](mailto:jasco@jasco-europe.com)

[www.jasco-europe.com](http://www.jasco-europe.com)

*Follow us on:*



**DISCLAIMER**

The contents of this publication are for reference and illustrative purposes only. Information, descriptions, and specifications in this document are subject to change without notice and cannot be used from third parts for data comparison and/or performance comparison. JASCO assumes no responsibility and will not be liable for any errors or omissions contained herein or for incidental, consequential damages or losses in connection with the furnishing, performance or use of this material.