

# OPTIZEN POP

UV-VIS SMART SPECTROPHOTOMETER





# BEYOND BETTER PERFORMANCE

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**We study the future of analytical instruments.**

The goal of K Lab Co., Ltd. is to create innovative products and produce value for our customers that has never existed in the world, leading to a better future.

We have developed spectrophotometers based on our best technology and have been providing opportunities to use them easily in laboratories and various fields.

We pursue innovation not only in product technology but also in customer satisfaction. We aim to improve the quality of our research by supplying products that meet customer needs.



## K LAB CO.,LTD.

### OPTIZEN POP

Based on our technical experience, K Lab Co., Ltd. has been leading the development and dissemination of a spectrophotometer having a monochromator applied with a high-precision scanning mechanism developed for the first time in Korea. We also consider the convenience and satisfaction of customers as our core value and we constantly challenge ourselves.



The K Lab's spectrophotometer product line, OPTIZEN™ POP has been produced based on high technology and strict quality control. It offers superior performance and design as well as convenience to customers, which cannot be compared to other products.

OPTIZEN POP can measure the transmittance or absorbance at each wavelength of a sample in ultraviolet and visible light bands to determine the quantitative characteristics such as concentration and purity. OPTIZEN POP, which can be used widely from general analytical experiments to professional research fields, guarantees accurate measurement and excellent reproducibility and provides reliable results in various fields such as the environment, biotechnology, and chemistry.

OPTIZEN POP provides four measurement modes (Photometric Mode, Quantitation Mode, Spectrum Mode and Kinetics Mode), and users can select a mode according to the purpose of the measurement. The embedded S/W built into the equipment, touch screen interface and applications make it very easy for users to use the equipment.

OPTIZEN POP provides an automatic multi-cell holder as standard, allowing users to easily measure multiple samples. The rotary type 8-cell holder realized by precise optical path design and micro stepping control technology enables precise, fast and convenient sample measurement.

## BUSINESS KEYWORDS

- **Innovative products**
- **World's best competitiveness**
- **Trusted brand**

K Lab Co., Ltd. ensures the world's best competitiveness through the development of innovative products in the field of analytical instruments and creates a brand trusted by customers through unwavering quality and services.

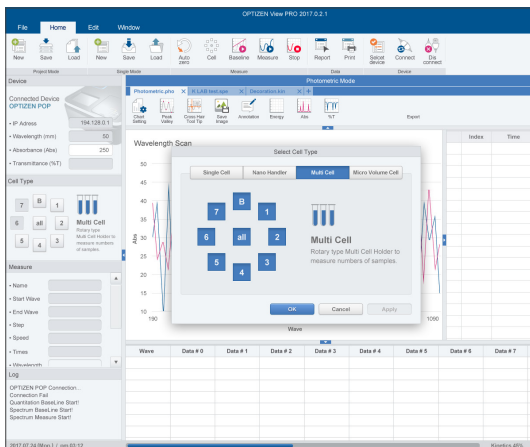
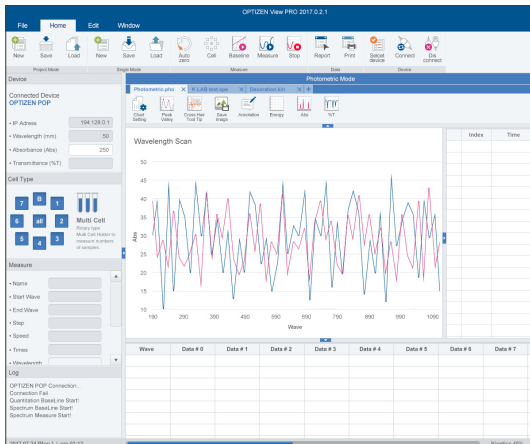




## THE SMART UV-VIS SPECTROPHOTOMETER

Experience faster and more convenient OPTIZEN POP.

### OPTIZEN VIEW (PC Software)



### One-touch Cell Holder Cover

One-type touch cell holder can easily be opened and closed.

### Mounting a measurement part with temperature sensor

Temperature measurement system is adopted as standard inside the sample box, allowing the temperature of the analysis to be checked and recorded instantaneously.

### Network Printer Support

Data can be printed out by connecting to the main unit without installing a printer driver.

### Remote Control

OPTIZEN VIEW can easily analyze data, using fast result value acquisition and post-processing functions.

### User Convenience

All functions of existing PC software are installed in OPTIZEN POP, making it faster and more convenient.

### Rapid Service

Quick services are available as OPTIZEN POP is made in Korea from design conception to manufacturing based on the unique technology of K LAB Co., Ltd.

### Compact Size

Compact OPTIZEN POP enhances the efficiency of the experimental space.

### Incredible Speed

Fast and flexible software delivers the best result with analytical speeds up to 1.5 times that of existing products.

### Extensive Scalability

OPTIZEN POP is designed for high-precision/high-resolution measurement in widebands from ultraviolet to visible light and can be used in various applications.

### Sensuous Design

Now, you can enjoy a greater level of pleasure with a sensuous design.





## A/S Support Policy

*K Lab Co., Ltd. provides systematic services based on professional technology to support the various requirements of customers.*

### Free Warranty Service

We provide repair and replacement services free of charge for products purchased within one year and lamp failures occurring within the warranty life. We are striving to provide stable performance based on systematic and continuous services and experiences.

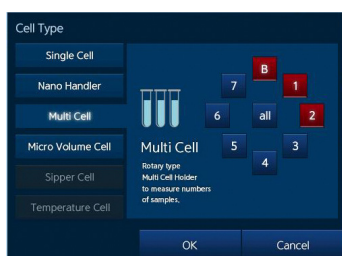
DEUTERIUM LAMP  
**1000 HOURS**



TUNGSTEN HALOGEN LAMP  
**2000 HOURS**

## THE BEST VISUAL AND FUNCTIONAL EXPERIENCE

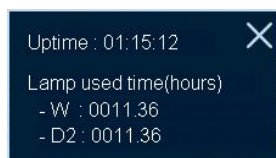
OPTIZEN POP has an intuitive interface that allows accurate data measurement and analysis with a single touch, focusing on user convenience. The measurement results are also easy to be edited and exported. The POP includes a variety of features optimized for laboratory equipment.



### Quick Cell Type Selection

Measurement monitoring is possible by selecting a cell type without entering the mode. The icon of the cell type in the quick menu changes according to the cell type status or position, so that the current status of the cell can be easily checked.

Mb, M7, M6, M5, M4, M3, M2, and M1: display of the cell position  
m,  $\mu$ , n, and s: display of the current cell type status



### Lamp Preheating Status Check Function

You can check the operating time of the equipment, the preheating status of the lamp and the cumulative operating time in real time and measure in the optimal status\*.

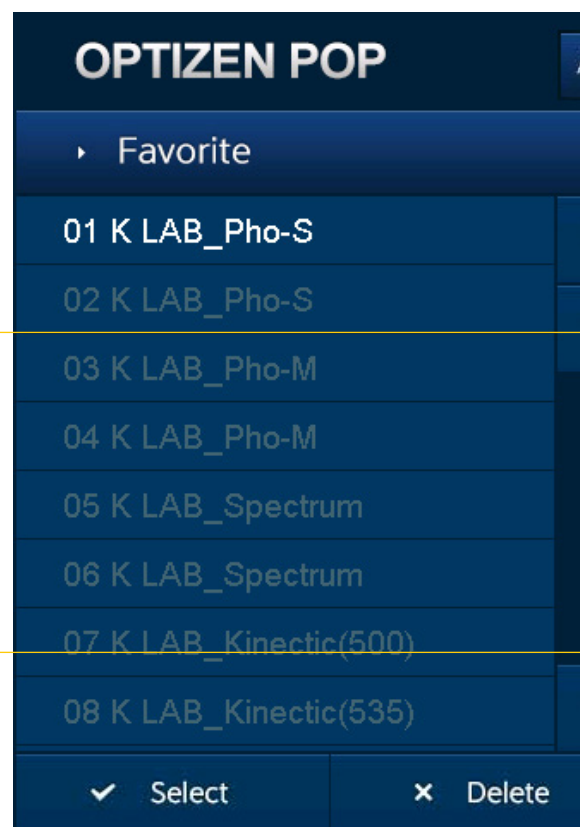
Before lamp preheating, the icon is displayed in yellow.  
After lamp preheating (1 hour), the icon is displayed in green.

(\* The equipment can be measured and operated immediately without preheating.

### Measured Value Monitoring Function

You can always check measured values in real time.

\* [AUTO ZERO] Quick button provided.



### Favorite

By registering the information that is being measured or analyzed, or has been completed, you can easily and quickly call up the information to perform tasks.

### Provision of Data Security

Measured data are saved in the extended memory by default to prevent data loss due to equipment damage. They can also be saved in an external device by using the backup function.

### Touch Graph Zoom-In/Out

By providing a drag-select method, it is possible to set a magnification range, and the user can easily enlarge the desired section. The auto-scale function is implemented.

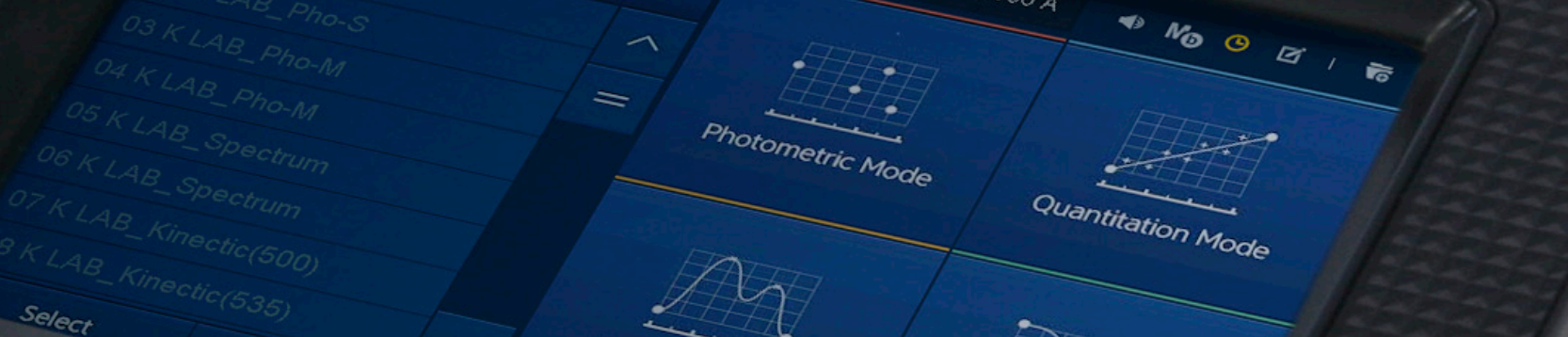
### Provision of Useful Control Mode

OPTIZEN POP can be directly measured from the instrument or remotely from a PC. In a network environment, analysis results can be viewed on a PC without a limit of work space.

### Convenient Data Management

By storing data in the extended memory and USB, the user can perform various tasks such as switching data, applying special conversion expressions and exporting to Excel in PC.





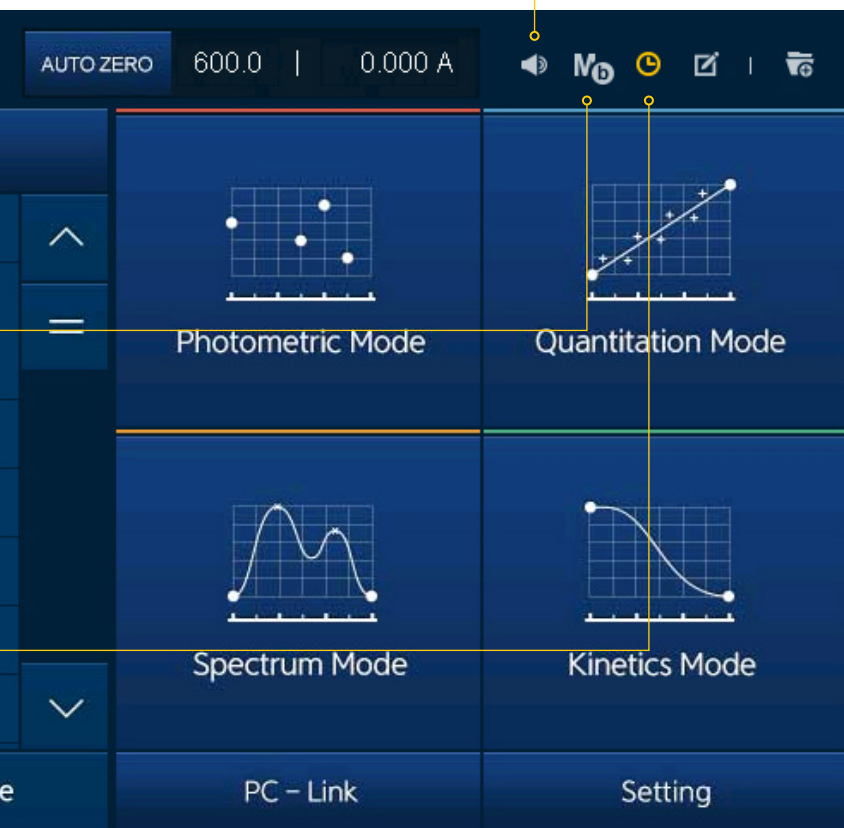
### Volume Control Function

The volume of the instrument (16 levels) can be adjusted to suit the laboratory environment.



### Help

You can check the explanations and precautions for using the functions (features) of the program.



### PC-Link

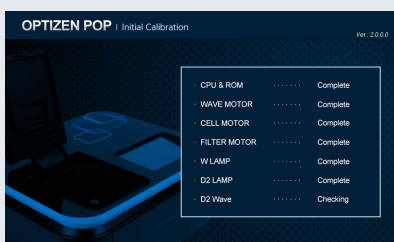
By changing the mode of the equipment to the remote mode, you can use it by direct link to a PC through OPTIZEN VIEW.

### Setting

You can change the basic information, network, event, and system settings of the equipment as well as calibrate the equipment.

## Modes for Measurement

- Photometric Mode**  
*Absorption information measurement mode*  
 This mode allows you to measure the absorbance and concentration of a sample at a specific wavelength.
- Quantitation Mode**  
*Quantitative analysis mode*  
 This mode allows you to quantitatively analyze a sample using the calibration curve.
- Spectrum Mode**  
*Absorption spectrum acquisition mode*  
 This mode allows you to acquire the absorption or transmission spectrum in the desired wavelength band.
- Kinetics Mode**  
*Temporal absorption information change confirmation mode*  
 This mode allows you to measure the absorbance or transmittance of a sample over time.



### Provision of Built-In-Test (BIT)

When the power is turned on, a self-test is performed to determine if there are any problems within the device. During the initial self-test, the CPU & ROM, drive of each motor, lamp and calibration status are checked to determine if there are any problems within the device. Each item is checked, and the result is displayed to maintain the best condition at all times.

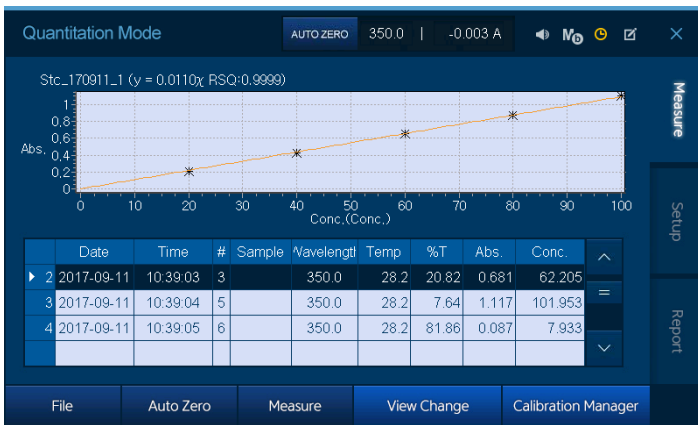
### Self-test Items

CPU ROM  
 WAVE MOTOR  
 CELL MOTOR  
 FILTER MOTOR  
 W LAMP  
 D2 LAMP  
 D2 Wave



### Photometric Mode

- In this mode, the absorbance (Abs) (or transmittance (%T)) at a specific wavelength can be easily measured.
- The factor (K) value can be set to allow a simple quantitative test ( $C = K \times A$ ) on a sample to be performed making it possible for absorbance (Abs) measurement.
- Up to 8 wavelengths can be set, and the absorbance at each wavelength is measured automatically.
- Automatic analysis for up to 7 samples is possible using the multi-cell holder.



### Quantitation Mode

- It is a mode that can measure and manage the calibration curve by utilizing the multi-cell holder.
- Quantitative analysis for a sample of interest can be performed using a calibration curve made by up to 7 concentrations of the sample.
- Four types of calibration curves including linear (zero-crossing), linear, quadratic, and cubic types are provided.
- Accurate calibration curve can be created with the values measured repeatedly for a maximum of 5 times.



### Calibration Manager

The calibration manager allows the user to use the standard curve to select, create, modify, delete, import and export external quantitation mode files from the external storage, etc.





### Spectrum Mode

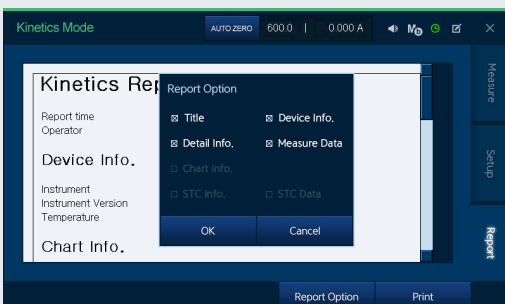
- This mode allows the user to check the spectrum of the desired wavelength band.
- Absorbance (Abs) and transmittance (%T) data can be switched using a shortcut key.
- Automatic spectrum analysis for up to 7 samples (excluding the reference sample) is possible.
- This mode includes the functions to zoom in the section and to find the Peak/Valley location of the spectrum.



### Kinetics Mode

- This mode allows the user to check the change in absorbance (or transmittance) over time at a specific wavelength.
- This mode is measured at regular intervals, and the minimum interval that can be set is for 1 second.
- This mode's progress during the measurement is displayed, and 24-hour measurement is possible.
- The changes in the absorbance of 7 samples can be obtained automatically.

\* The minimum measurement interval is adjusted according to the measurement range and conditions.



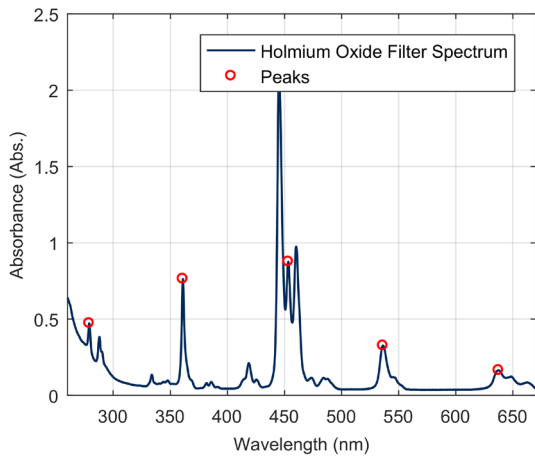
### Report & Print

You can check the data measured at each mode in a report format or print them out. Moreover, you can select the items to be included through the Report Option and print out only the necessary information.



# THE UNCOMPROMISING PERFORMANCE

OPTIZEN POP is equipped with an 8-position rotary multi-cell holder as standard which minimizes the impact of light source drift by measuring the blank automatically of each sample measurement.



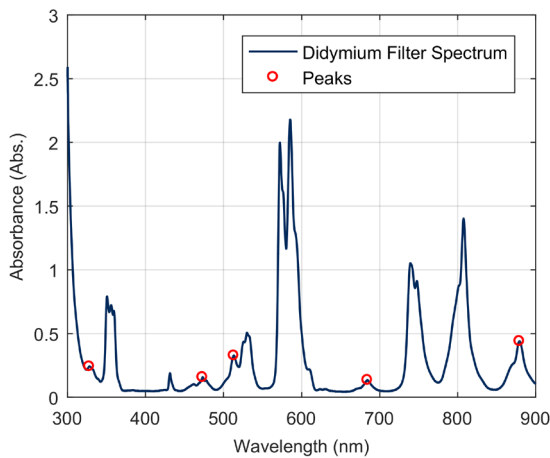
## Wavelength accuracy & repeatability

OPTIZEN POP employed the company's own high resolution wavelength measurement mechanism. This mechanism guarantees a wavelength reproducibility of less than 0.1 nm in all bands. The wavelength accuracy verified through the Holmium Oxide filter ( $MU^* = \pm 0.2$  nm) and Didymium Filter ( $MU^* = \pm 0.2$  nm) is  $\pm 0.5$  nm or less.

(\*)  $MU$  : Measurement Uncertainty

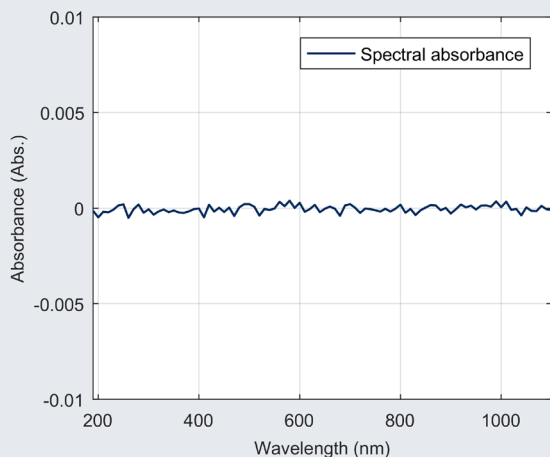
Holmium Spectrum

Reference	279.35 nm	360.85 nm	453.60 nm	536.40 nm	637.65 nm
Measured	279.00 nm	361.00 nm	453.30 nm	536.20 nm	637.40 nm
Judge	PASS	PASS	PASS	PASS	PASS



Didymium Spectrum

Wavelength	328.15 nm	473.35 nm	513.55 nm	684.50 nm	879.40 nm
Error	328.00 nm	473.00 nm	513.10 nm	684.40 nm	879.10 nm
Judge	PASS	PASS	PASS	PASS	PASS



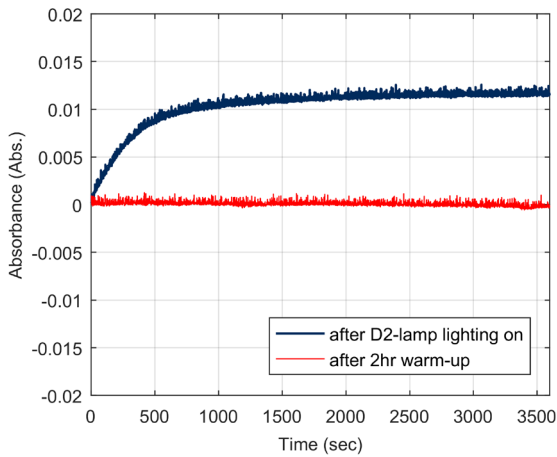
## Baseline Flatness

OPTIZEN POP automatically adjusts the baseline at each measurement, providing a constant baseline flatness without additional baseline correction.

### Baseline Flatness

Limits :  $\pm 0.002$  ABS (240 ~ 1050)

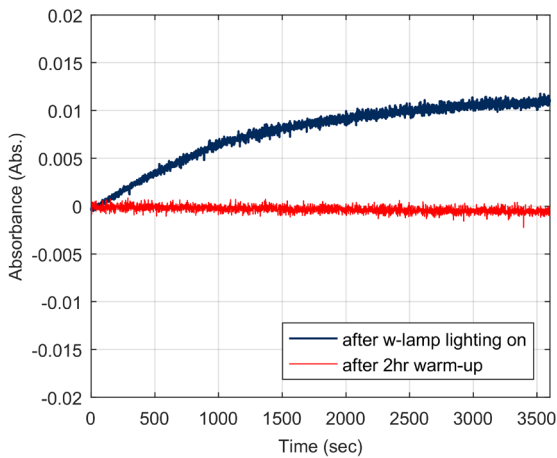




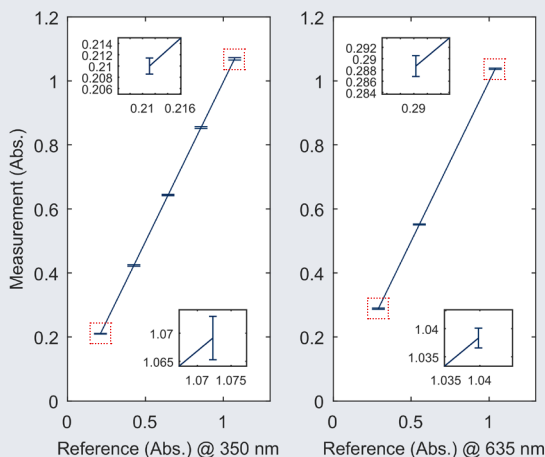
### Baseline stability

Since OPTIZEN POP uses a single-beam monochromator, fluctuations in the measured values may occur due to the drift phenomenon of the light source immediately after turning on the equipment. This phenomenon is gradually stabilized through a preheating process of the light source. Therefore, it is recommended to preheat for more than one hour for high-precision measurement, and in this case, the stability within 0.001 Abs is guaranteed.

Absorbance change of Deuterium before and after warm-up



Absorbance change of tungsten halogen lamp before and after warm-up



### Photometric accuracy & repeatability

OPTIZEN POP ensures photometric accuracy within  $\pm 5$  mAbs and photometric reproducibility within  $\pm 3$  mAbs through very excellent noise characteristics.

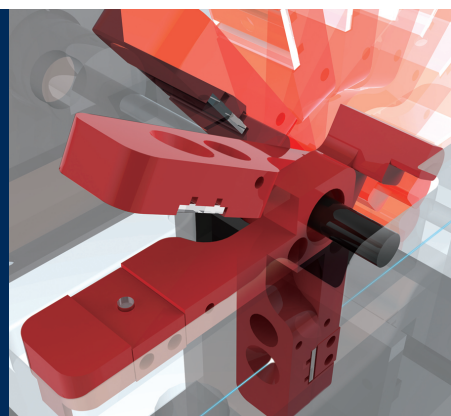
	350 nm (@ 1 Abs) (using Potassium Dichromate)	635 nm (@ 1 Abs) (using Neutral Density Filter)
Photometric Accuracy	3.3 mAbs	1.5 mAbs
Photometric Reproducibility	1.6 mAbs (P-P) 0.5 mAbs ( $\sigma$ )	9.7 mAbs (P-P) 0.3 mAbs ( $\sigma$ )

## OPTIZEN POP ACCESSORIES

OPTIZEN POP is compatible with a wide range of accessories from a micro-volume cell holder to a temperature control system, providing a complete solution for laboratories and research environments in each field.

Nanohandler is a product designed to overcome the limitations of general-purpose spectrometers and will present new possibilities as your research partner.

The nanohandler is designed to operate at a time by swing arm rotation from sample fixation to positioning at the measurement site, thereby making it very convenient to measure micro-volume samples. There are two types of nanohandlers: manual (207M) and automatic (207A), which can be simply detached and attached and easily managed and washed.



### Nanohandler Applications

OPTIZEN POP Bio is a product combining the nanohandler with a bio-specific application. It is a device for the quantitative analysis of micro-volume samples such as DNA, RNA, and proteins. As various analysis methods such as Bradford, Lowry, and Bicinchoninic Acid (BCA) are built-in, you can check the result value obtained automatically by an analysis method without troublesome calculation after measurement.

- Nucleic Acid Analysis (dsDNA, ssDNA, OligoDNA, RNA quantity/purity check)
- Warburg (Christian – Warburg-Christian)
- Kalb-Bernlohr
- Protein Analysis (Bradford, Lowry, BCA, Biuret, Direct UV)
- Cell Density
- Kinetic Tests for Enzyme Activity

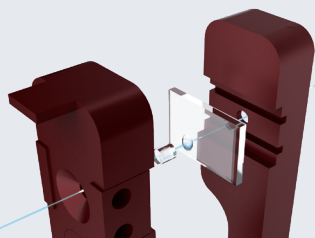


Nanohandler 207M



Nanohandler 207A

	207 A	207 M
Path Length	0.2 mm and 0.5 mm	
Sample Size	0.5 ~ 3 $\mu\text{L}$ [ ds DNA ]	
Concentration Range	1 ~ 7500 ng/ $\mu\text{L}$ [ ds DNA ]	
Lower Limit Concentration	5 $\mu\text{L}$ or 10 $\mu\text{L}$ [ ds DNA ]	
Maximum Concentration	2000 ~ 5000 ng/ $\mu\text{L}$ [ ds DNA ]	
DNA Reproducibility	<math>\pm 1.0\%</math> [ dsDNA, at 1000 ng/ $\mu\text{L}</math> ]$	
Operating System	Auto / Manual	



Since the nanohandler directs the light directly into the measurement part, it has less optical loss than an optical fiber, ensuring high accuracy and reproducibility. In addition, it is a transmission type with a shorter optical path length passing through a sample, compared to a reflection type, making it possible to measure high concentrations.

\* Registered Patent No. 10-1309129 (Please be cautious of similar products.)





### Sipper System

Useful apparatus for experiments in which a large amount of sample is transferred by flow-through cells to continuously supply the sample.

Intake Volume: max. 70  $\mu$ l  
RS-232C Communication Control



### Film Cell Holder – Wide Type

Single cell holder to measure solid samples, such as an optical film or slide glass, which can transmit light.

Sample Size: max. 100 mm(H) x 70 mm(W)  
Sample Thickness: max. 5 mm



### Film Cell Holder – Small Type

Wide type Cell holder for measuring solid samples of a smaller size. It can be mounted on a multi-cell holder for simultaneous analysis of multiple samples.

Sample Size: max. 100 mm(H) x 30 mm(W)  
Sample Thickness: max. 2 mm



### Micro Volume Cell Holder

Single cell holder used when a sample volume is 500  $\mu$ l or less.

Optical Path Length: 10 mm  
Center Height: 15 mm



### Round Cell Holder

Single cell holder used for analysis using a test tube.

Test Tube Diameter: 16 mm / 25 mm  
Test Tube Height: max. 100 mm



### Long Path Cell Holder

Single cell holder used for measurement by increasing the optical path length to analyze low concentration samples.

Optical Path Length: 50 ~ 100 mm



### Temperature Cell Holder (Water/Oil circulator Type)

Apparatus that controls the temperature of the cell holder by using the water/oil circulator.



### Peltier Control System (including Temperature Cell Holder)

Apparatus that precisely controls the temperature of the cell holder using the Peltier effect.

Temperature Control Range: 5 ~ 85  $^{\circ}$ C  
Temperature Accuracy:  $\pm$ 0.5  $^{\circ}$ C  
Temperature Control Precision:  $\pm$ 0.1  $^{\circ}$ C

Meet  
users' needs  
in a variety of  
applications



Chemistry



Biotechnology and pharmaceuticals



Environment and materials



Food

## OPTIZEN POP APPLICATIONS

OPTIZEN POP offers measurement modes that can be used in many applications, such as measurement of absorbance information, quantitative analysis of samples, acquisition of absorption spectrum, and measurement of absorbance change over time.

### Applications by industry

#### · Biotechnology and pharmaceuticals

Nucleic acid (RNA/DNA) and protein analysis  
Drug analysis, Enzyme reaction  
Analysis of homogenous suspension of biological samples  
Intercellular ion measurement  
Concentration measurement, etc.

#### · Chemistry

Chemical process QA/QC  
Chemical identification  
Analytical chemistry  
Ion measurement  
Purity measurement  
Paint color measurement, etc.

#### · Environment and materials

Water quality measurement  
Soil measurement  
Residual pesticide measurement  
Thin film analysis  
Nanocomposite analysis  
Optical device photometric analysis, etc.

#### · Food

Food manufacturing QA/QC  
Food stability test  
Measurement of nutrients in food and agricultural products  
Purity and browning index of food  
Carbohydrate enzyme crystals, etc.

## OPTIZEN POP SPECIFICATIONS



Photometrics System	Single Beam Type
Light Source	Tungsten Halogen Lamp & Deuterium Lamp (Built-in light source auto interchanging motor)
Detector	Silicon photodiode
Monochromator	Czerny–Turner type with 1200 lines/mm blazed grating
Lamp interchange wavelength	Set freely in the range of 340~410 nm (Default: 370 nm)
Spectral Bandwidth	< 1.8 nm
Wavelength	
Range	190 ~ 1100 nm
Accuracy	<± 0.5 nm (at D2 peak 656.1, 486.0 nm)
Repeatability	<± 0.1 nm
Setting	≥ 0.1 nm
Slew Rate	About 7,800 nm/min
Scanning Speed	Max 4,000 nm/min
Photometric	
Range	- 3.0 ~ 3.0 Abs (Enable to Set up)
Accuracy	<± 0.005 Abs (at 1.0 Abs)
Repeatability	<± 0.001 Abs
Stray light	< 0.1 %T (220, 340 nm)
Baseline Stability	<± 0.001 Abs/h (at 700 nm)
Baseline Flatness	<± 0.001 Abs (200~1100 nm)
Standard Cell Holder	Rotary type 8 position Multi Cell Holder
Operation	Embedded S/W (Window CE6.0)
Display	7" LCD with touch screen
Interface	4 USB ports/Ethernet
Data Capacity	8 Giga byte
Printer	Supporting network printer
Power Requirement	Free Voltage (50/60 Hz)
Dimensions	433(W) x 381(D) x 180(H) mm
Weight	8 kg



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