# ESPECTROFOTÓMETRO VISIBLE 4310/3,
# ESPECTROFOTÓMETRO UV/VIS 4320/3 - 4320/4
# 4310/3 VISIBLE SPECTROPHOTOMETER,
# 4320/3 - 4320/4 UV/VIS SPECTROPHOTOMETER
# SPECTROPHOTOMÈTRE VISIBLE 4310/3,
# SPECTROPHOTOMÈTRE UV/VIS 4320/3 - 4320/4

Este manual es parte inseparable del aparato por lo que debe estar disponible a todos los usuarios del equipo. Le recomendamos leer atentamente el presente manual y seguir rigurosamente los procedimientos de uso para obtener las máximas prestaciones y una mayor duración del mismo.

*This manual should be available for all users of these equipments. To get the best results and a higher duration of this equipment it is advisable to read carefully this manual and follow the processes of use.*

*Ce manuel est une partie indissociable de l'appareil et doit être mis à la disposition de tous les utilisateurs de l'équipement. Nous vous recommandons de lire attentivement ce manuel et de suivre scrupuleusement les procédures d'utilisation afin d'obtenir des performances maximales et une plus longue durée de vie de l'appareil.*

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## SAFETY INFORMATION

Please follow the guidelines below and read this manual in its entirety to ensure safe operation of the unit.

- Do not open the device.
- Disconnect the device from the mains supply before carrying out maintenance work or changing the fuses.
- The inside of the device is a high-voltage area Danger!
- Do not use the device if it is damaged, especially if the main power cable way is in any damaged or defective.
- Repairs may only be carried out by the service technicians from us and authorized contractual partners.
- The device must be connected to a power outlet that has a protective ground connection. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not allow any liquid to enter into the device.
- Do not operate the device in a hazardous location or potentially explosive environment.

## PACKAGE CONTENTS

| Description | Quantity |
|---|---|
| Spectrophotometer | 1 pc |
| Glass Cuvette | 4 pcs |
| Quartz Cuvette (UV/Vis models only) | 2 pcs |
| Power Cord | 1 pc |
| Instruction Manual | 1 pc |
| Dust Cover | 1 pc |

## UNPACKING

Open the package and carefully check the packing list items; if you found missing or damaged items please contact your distributor.

## INSTALLATION

■ **Placement**
Place the instrument on the stable table carefully.
■ **Install printer (Optional)**
Check to confirm instrument power switch is turned off; connect the printer's data cable to the Instrument's serial/USB port.

**Information: The spectrophotometer supports USB printers using the HP PCL3 GUI print description language.**

■ **Connect the power cord**
Check that instrument power switch is turned off; connect the power cord to the socket on the device; plug the other end of the power cord into a separate power outlet.

## SYMBOLS AND CONVENTIONS

The following chart is an illustrated glossary of the symbols that are used in this manual.

| | |
|---|---|
|  | **CAUTION** This symbol indicates a potential risk and alerts you to proceed with caution |
|  | **CAUTION** This symbol indicates the presence of high voltage and warns the user to proceed with caution |
|  | **CAUTION** This symbol indicates risks associated with hot surfaces |

## OVERVIEW

These models are used in Chemistry, Pharmaceuticals, Biochemical, Metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields for Quality Control laboratories.

## SPECIFICATIONS

| Model | 4310/3 | 4320/3 | 4320/4 |
|---|---|---|---|
| Reference | HJB007 | HJD010 | HJD011 |
| Optical system | Single beam, 1200 l/mm grating | | |
| Light source | Tungsten lamp | Tungsten lamp, Deuterium lamp | |
| Detector | Silicon photodiode | | |
| Spectral bandwidth | 4 nm | | 2 nm |
| Wavelength range | 320~1100 nm | 190~1100 nm | |
| Wavelength accuracy | ±0,5 nm | ±0,5 nm, 0,3 nm @656,1 nm | |
| Wavelength repeatability | ≤0,2 nm | | |
| Wavelength resolution | 0,1 nm | | |
| Wavelength swing speed | 10000 nm/min | | |
| Wavelength scanning speed | 20~4200 nm/min | | |
| Photometric range | -0,3~3 A, 0~200 %T, 0~9999,9 C | | |
| Photometric accuracy | ±0,002 A (0~0,5 A), ±0,004 A (0,5~1 A), ±0,3 %T(0~100 %T) | | |
| Photometric repeatability | ≤0,001 A (0~0,5 A), ≤0,002 A (0,5~1 A), ≤0,2 %T (0~100 %T) | | |
| Stray light | ≤0,05 %T (340 nm) | ≤0,05 %T (220 nm & 340 nm) | |
| Noise | ≤0,0005 A @ 0 A, 500 nm, ≤0,001 A @ 1 A, 500 nm, ≤0,002 A @ 2 A, 500 nm | | |
| Baseline flatness | ±0,002 A | | |
| Sample compartment | For 4 cuvettes of 10 mm, manual changer | | |
| Display | 5-inch TFT color touch screen | | |
| Storage | 236 KB (built-in), supports unlimited external expansion (USB memory) | | |
| Interface | RS232 serial port × 1 (printer), USB-A × 1 (USB memory/USB printer), USB-B × 1 (computer) | | |
| Power supply | 100~240 VAC, 50/60 Hz | | |
| Size | 450 (L)× 370 (A) × 187(H) mm | | |
| Weight | 10,5 kg | | |

## DESCRIPTION

**Front View**


**Right View**


**Rear View**

## GETTING STARTED

The following chart describes the basic operation of the instrument.

**Turn On and Self-check**

Switch on the power. Self-check includes the following steps: Turn On Lamp - Locating Filter Disc - Locating Automatic Sample Holder (If Installed) - Get Dark Current - Locating Wavelength - Check Energy - Check System baseline.

## GENERAL OPERATING INSTRUCTIONS

**■Touch Screen Using Tips**

The entire screen can be started with a touch. To make a choice, use your nails, fingertips, pencil, or stylus to press the screen. Don't press the screen with sharp objects (such as ball point).

**■Select Application**

**Main** Interface, press the icon to select application.


| | |
|---|---|
| | **Photometry** Measure the absorbance or transmittance of the sample. |
| | **Quantitation** Establish the standard curve and measure the concentration of the sample. |
| | **Spectrum** Scan the sample in a wavelength range. |
| | **File** Manage files stored in the instrument or USB disk. |
| | **System** System calibration and setup. |
| | **Performance verification** Verify the performance of the instrument. |

## ■Basic Operation

| | |
|---|---|
|  | **Home** Back to main interface. |
|  | **Return** Back to the previous interface. |
|  | **Page Up/Down** Go to previous/next page. |

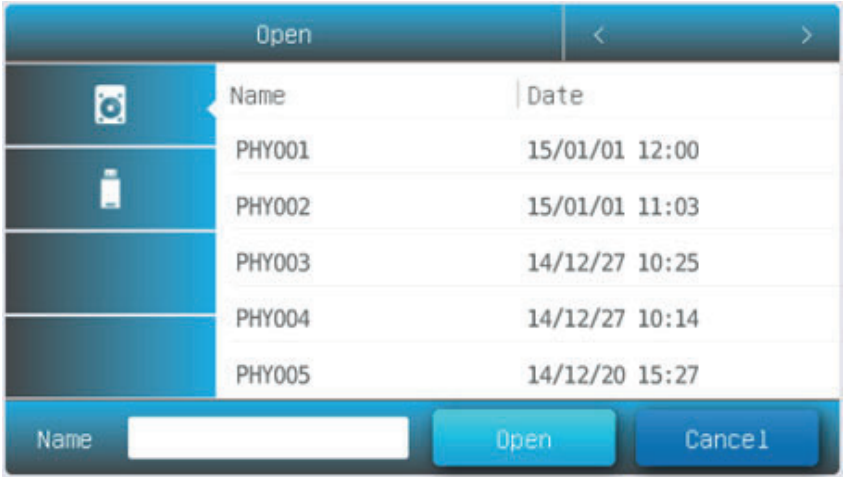
## ■Measurement Results Operation

| | |
|---|---|
|  | **Open** Open result(s) from internal/USB memory. |
|  | **Save** Save result(s) to internal/USB memory. |
|  | **Print** Print result(s). |
|  | **Delete** Delete selected result(s). |

**Rename, Print and Delete Results**


**Rename a Sample: List** interface, press the area **Name**, key in the sample name (up to 8 characters).
**Print the Measurement Report: List** interface, press the icon  .
**Delete sample(s): List** interface, press the **Check Box,** and press the icon  .

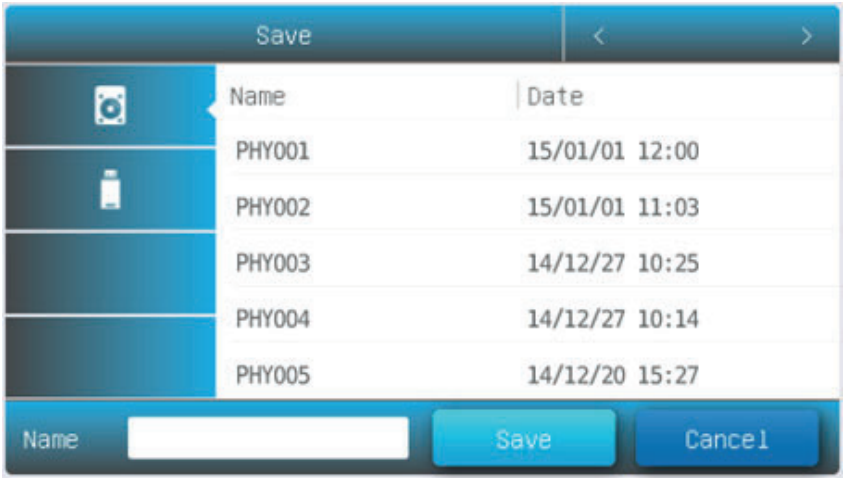
**Open Results**




**Open:**

1. **List** interface, press the icon .
2. Press the icon **internal memory/USB memory** to select the memory which the file saved.
3. Press file lists to select, press the button **Open**.

**Save Results**




**Save:**

1. **List** interface, press the icon **Save**.
2. Press the icon / to select the Internal/USB memory which the file to save.
3. Type in the file name, press the button **Save**.

## ■Files Operation

| | |
|---|---|
|  | **Internal Memory** Internal memory of the spectrophotometer. |
|  | **USB Memory** USB extended mass memory. |
|  | **Copy** Copy the selected file(s) from internal /USB memory to USB/internal memory. |
|  | **Export csv** Export file(s) to *.csv format |
|  | **Export txt** Export file(s) to *.txt format |
|  | **Delete** Delete the selected file(s). |

**Rename, Import, Export and Delete Files**


**Rename a File: File management** interface, press the area **Name**, key in the file name (up to 8 characters).

**Copy File(s) From/To Internal Memory/USB Memory: File management** interface, press the **Check Box**, press the button  (need USB disk)

**Export File(s) To *.csv Format: File management** interface, press the **Check Box**, press the button  (need USB disk).

**Export File(s) To *.txt Format: File management** interface, press the **Check Box**, press the button  (need USB disk).

**Delete File(s): File management** interface, press the **Check Box**, and press the icon  .

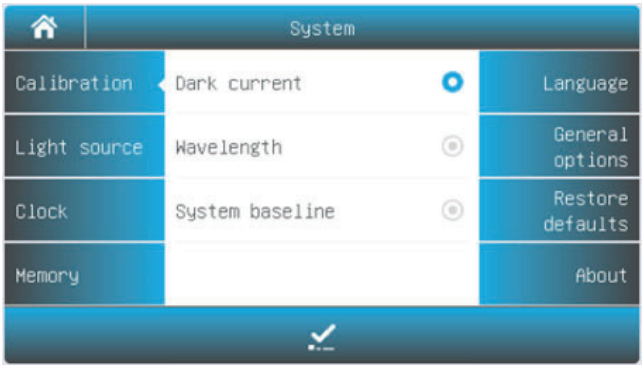
## CALIBRATION AND SYSTEM SETTINGS

Select the icon  in the main interface. Display options to calibrate the system and configure the basic instrument settings.

### ■ Calibration

**Calibrate** Start to do calibration.

Select Tab **Calibration** in the **System** interface. Remove something in the measurement channel, close the sample chamber cover, select the item **Dark current, Wavelength or System baseline,** press the icon  to do calibration.




### ■ Settings of Light Source

**Tungsten lamp reset** Reset the Tungsten lamp usage time.

**Deuterium lamp reset** Reset the Deuterium lamp usage time.

Select Tab **Light source** in the **System** interface. The light source information is displayed on the screen.


Visible model


UV/Vis models

**On/Off lamp:** Press the icon  to turn on/off the Tungsten lamp/ Deuterium lamp.

**Change the lamp switching point:** Press the value of lamp switching point. Input the new value.

**Reset the lamp usage:** Press the icon / to reset the Tungsten lamp/Deuterium lamp usage time.

**Important information:** *1. If only one of the light sources is used in for a long period of time, please turn off another light source to save energy. 2. If the lamp switching point is changed, the system baseline must be recalibrated.*

**■Edit Clock**

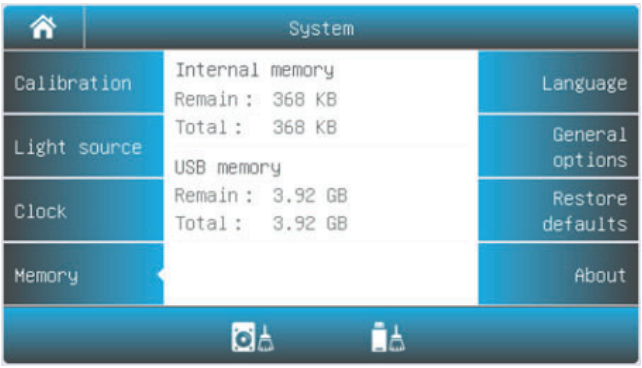
| | |
|---|---|
| | **Accept** Accept the new value. |

Select Tab **Clock** in the **System** interface. Press the value of year, month, date, hour, minute or second to change. Press the icon to accept new value.


**■Memory management**

| | |
|---|---|
| | **Format Internal Memory** Format the internal memory of the spectrophotometer. |
| | **Format USB Memory** Format the USB mass storage. |

Select Tab **Memory** in the **System** interface. The use of the internal and USB memory (if inserted) is shown. Press the icon / to format internal memory/USB memory.



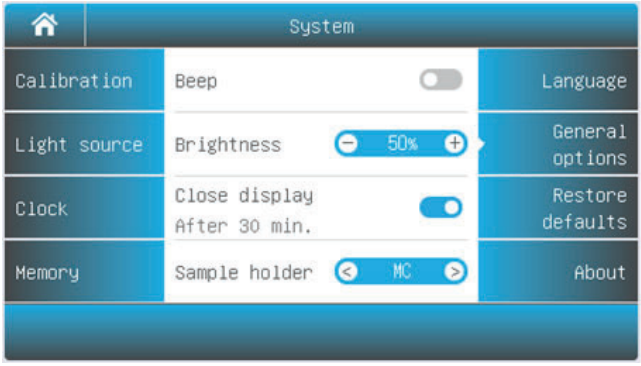
## ■Language Selection

**Accept** Accept the new language.

Select Tab **Language** in the **System** interface. Select a language, press the icon to change.


## ■General Options

Select Tab **General Options** in the **System** interface.




**Beep:** Press the icon to turn on/off the beep.

**Brightness:** Press the icon 50% to decrease/increase the brightness of the LCD display.

**Close display:** Press the icon to turn on/off. If turned on, the display will close automatically if no operation for 30 minutes.

**Select sample holder:** If the instrument is equipped with an automatic sample cell holder, you need to press MC before the first use to set the type of automatic sample cell holder provided (automatic five-cell holder AC-5 or automatic eight-cell holder AC-8).

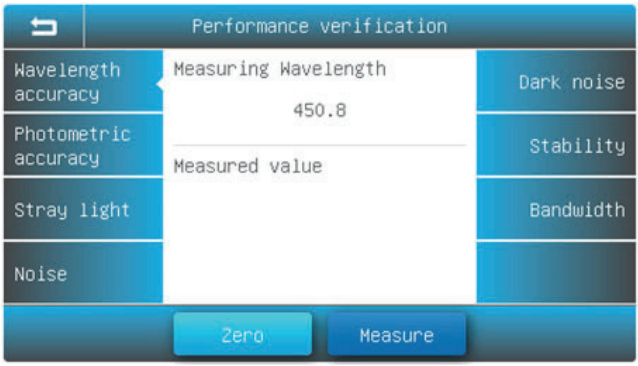
### ■Restore Defaults

**Restore** Restore the parameters to factory settings.

Select Tab **Restore defaults** in the **System** interface. Select an item, press the icon  to restore.


## PERFORMANCE VERIFICATION

Select the icon  in the main interface. Display options to verify the performance of the instrument.




**Important information** *Before verifying the performance, the instrument needs to be preheated for 30 minutes, and then re-measure dark current.*

### ■Verifying Wavelength Accuracy and Wavelength Repeatability

Select Tab **Wavelength accuracy** in the **Performance verification** interface.

**Standard Sample:** Holmium oxide solution or equivalent filter
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength of measurement, press the button **Zero**.
2. Put the **Standard Sample** in the measurement channel, press the button **Measure**.
3. Repeat step 2 to do measurement three times. The difference between the average of the three measurements and the standard value is the single-point wavelength tolerance. The difference between the maximum and minimum values of the three measurements is single point wavelength repeatability.
4. Repeat step 1-3 to do measurement single-point wavelength tolerance one by one. The maximum value in the single-point wavelength tolerance is wavelength accuracy. The maximum value in the single-point wavelength reproducibility is wavelength repeatability.

### ■Verifying Photometric Accuracy and Photometric Repeatability

Select Tab **Photometric accuracy** in the **Performance verification** interface.

**Standard Sample:** NIST 930D or equivalent filter
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength of measurement, press the button **Zero**.
2. Put the **standard sample** in the measurement channel, press the button **Measure**.
3. Repeat step 2 to do measurement three times. The difference between the average of the three measurements and the standard value is the single-point photometric tolerance. The difference between the maximum and minimum values of the three measurements is single point photometric repeatability.
4. Repeat step 1-3 to do measurement single-point photometric tolerance one by one. The maximum value in the single-point photometric tolerance is photometric accuracy. The maximum value in the single-point photometric reproducibility is photometric repeatability.

### ■Verifying Stray Light

Select Tab **Stray light** in the **Performance verification** interface.

**Standard Sample:** 10g/L NaI solution or equivalent filter (220nm, **UV/Vis models only),**
50g/L $NaNO_2$ solution or equivalent filter (340 or 360nm)
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength of measurement.
2. Put the **reference** in the measurement channel, press the button **Zero**.
3. Put the **Standard Sample** in the measurement channel, press the button **Measure**, the result is the stray light of this wavelength.

### ■ Verifying Noise

Select Tab **Noise (0A)** in the **Performance verification** interface.

**Standard Sample:** None
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength of measurement, press the button **Zero**.
2. Press the button **Measure**, the result is the noise of this wavelength.

### ■ Verifying Dark Noise

Select Tab **Noise (0%T)** in the **Performance verification** interface.

**Standard Sample:** Block
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength of measurement, press the button **Zero**.
2. Put the **Block** in the measurement channel, press the button **Measure**, the result is the dark noise of this wavelength.

### ■ Verifying Stability

Select Tab **Stability** in the **Performance verification** interface.

**Standard Sample:** None
**Measurement:**

1. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength 500, press the button **Zero**.
2. Press the button **Measure**, the result is the noise at 500nm.

### ■ Verifying Bandwidth

Select Tab **Bandwidth** in the **Performance verification** interface.

**Standard Sample:** Low-pressure quartz mercury lamp
**Measurement:**

1. Open the lamp cover, put the low pressure quartz mercury lamp into the lamp seat, and turn it on.
2. Remove something in the measurement channel, close the sample chamber cover, press the wavelength value, type in the wavelength 546.1.
3. Press the button **Measure**, the result is the bandwidth.

## MEASUREMENT

■ **Important Guidelines**

- Reagents and dilution buffers can cause cauterization and other damage to health.
- Samples (nucleic acids, proteins, bacteria cultures) can be infectious and cause serious damage to health.
- During sample preparation, measuring procedures and maintenance and cleaning work, observe all local laboratory safety precautions (e.g. wear protective clothing and gloves, use of disinfectant) regarding the handling of sample material.
- Dispose of measuring solutions and cleaning and disinfectant materials in accordance with the relevant local laboratory regulations.

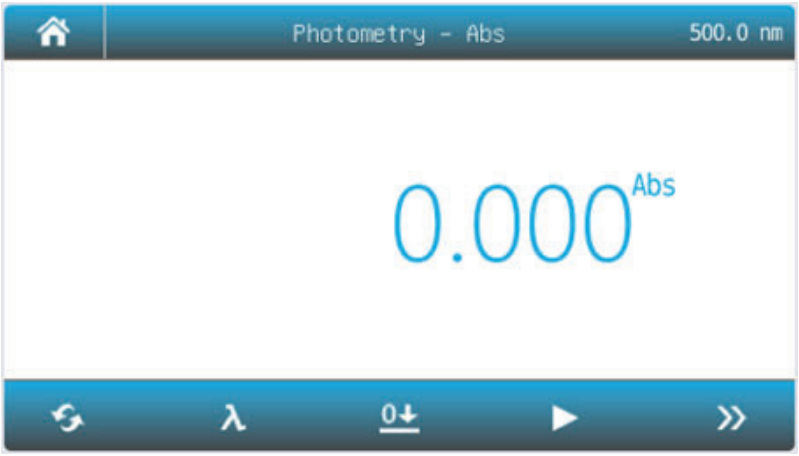
**Check the cuvettes**

■ The cuvettes must be clear and there's no remains of the samples on the surface of it. **Only Quartz cuvettes are permitted to be used in the range of UV region.**

■ **Photometry**

Photometry mode is used to measure the absorbance or transmissivity of the sample.

1. **Main** interface, press the icon  to start a **Photometry** application.




| | |
|---|---|
|  | **Mode** Switch measurement mode to %T, Abs or Energy. |
|  | **Wavelength** Set measurement wavelength. |
|  | **Zero** Do 0Abs/100%T. |
|  | **Read** Measure sample and record the result. |
|  | **List** View the result(s) list. |
|  | **Increase/Decrease** Increase/Decrease the gain of signal. Only for **Energy** mode. |

2. Press the icon  to switch to the measurement mode.

| | |
|---|---|
| **Abs** | Measure absorbance value of the sample(s). |
| **%T** | Measure transmittance value of the sample(s). |
| **E** | Measure energy value of the sample(s). |

3. Press the icon  to set wavelength, key in the measurement wavelength.

4. Put the reference in the measurement channel, press the icon  to do zero.

5. Put the sample in the measurement channel, press the icon  to measure and record the result.

6. Press the icon  to browse the result(s).

■ **Quantitation**

Quantitation mode is used to measure the concentration of the sample(s).

1. **Main** interface, press the icon to start a **Quantitation** application.


2. Establish Method

2.1 **Quantitation** interface, press the button **Establish method.**

| | |
|---|---|
| **Measurement** | **A=A1:** Absorbance is equal to the measured absorbance value of the measured wavelength 1.<br>**A=A1-m*A2:** Absorbance is equal to the difference between the absorbance value of the measured absorbance at the wavelength 1 and the wavelength 2, m is the coefficient.<br>**A=A1/A2:** Absorbance is equal to the ratio of the measured absorbance value of the measured wavelength 1 and 2. |
| **Wavelength 1** | Measurement wavelength 1 |
| **Wavelength 2** | Measurement wavelength 2 |
| **Fitting** | **LIN-0:** Linear to zero<br>**LIN:** Linear<br>**QUA:** Quadratic |
| **Unit** | - (No Unit), %, ppm, ppb, g/L, mg/L, µg/L, ng/L, g/dL, mg/dL, µg/dL, mg/mL, µg/mL, ng/mL, µg/µL, ng/µL, mol/L, mmol/L, IU, Custom (user input, up to 8 characters). |
| **Calibration** | **Coe K:** Input equation coefficient<br>**Std M:** Measure standard samples<br>**Std I:** Input standard samples |
| **Standard quantity** | Standard sample number (up to 10) |

2.2 Press the item to set measurement parameters.

2.3 After all the parameters are set up, press the button **Next** to start establishing the stan dard curve. If the item **Calibration** is set to the parameter Coe K, Std M or Std I, please refer to 2.3.1, 2.3.2 or 2.3.3, respectively.

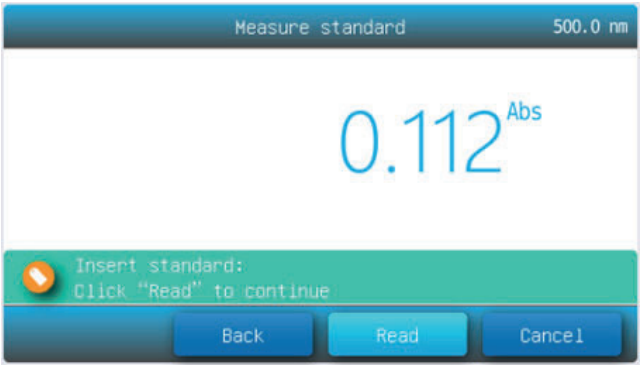
■ **Input equation coefficient to establish the standard curve**

1- Input equation coefficient (K0 ~ K3). Press button **Next**.

■ **Measure standard sample to establish the standard curve**

1- Put the reference in the measurement channel, press the button **Zero** to do zero.


2- Put the 1# standard sample in the measurement channel, press the button **Read** to measure.



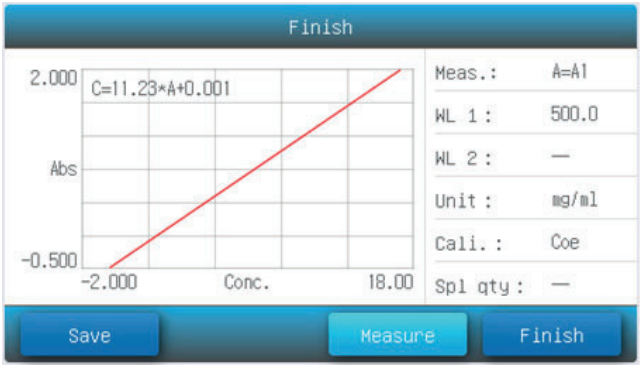

3- Repeat step 2 to measure other standard samples.

4- Press the item **Conc** to input concentration of standard samples, press the button **Next**.

■ **Input standard sample values to establish the standard curve**

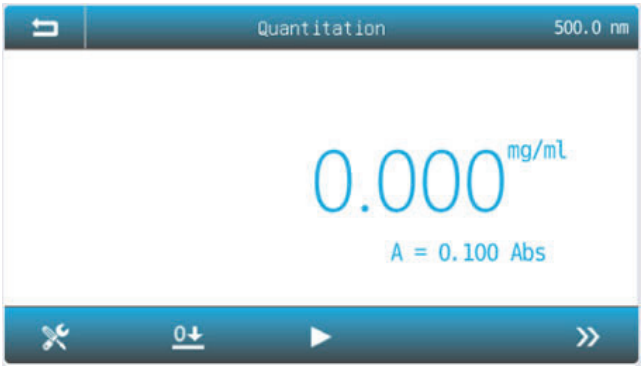
1- Press the item **Abs** and **Conc** to input absorbance and concentration of standard samples, press the button **Next**.

2.4 **Establish method** finished. Press the button **Save** to save the method, press the button **Measure** to accept the new method and go to the **measurement interface**, press the button **Finish** to exit.



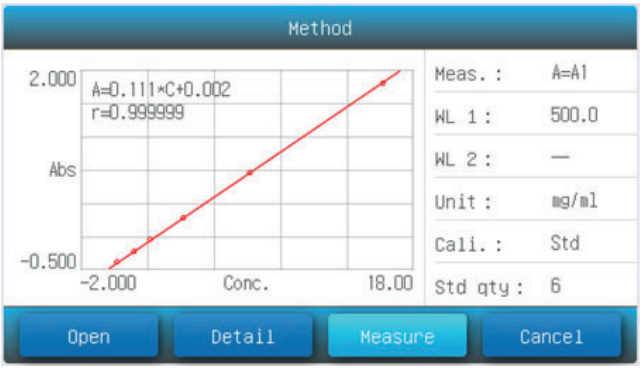

3 Measure sample

3.1 **Quantitation** interface, press the button **Measure sample.**




| | |
|---|---|
| | **Method** Select measurement method |
| | **Zero** Do 0Abs/100%T |
| | **Read** Measure the sample and record the result |
| | **List** View the result(s) list |

3.2 Press the icon to select method.




3.3 Press the button **Open** to load measurement method stored in the internal memory/USB disk.

3.4 Press the button **Measure** to accept the new measurement method and back to **measurement interface.**

3.5 Put the reference in the measurement channel, press the icon to do zero.

3.6 Put the sample in the measurement channel, press the icon to measure and record the result.

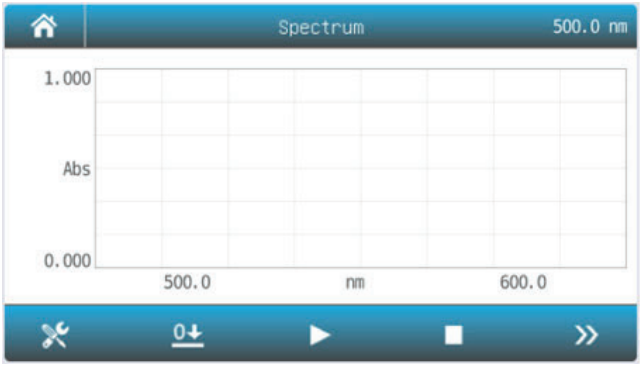
3.7 Press the icon to browse the result(s).


| Name | Abs | Result | Date |
|---|---|---|---|
| Spl - 1 | 0.002 | 0.012 | 14/04/01 12:00:03 |
| Spl - 2 | 0.003 | 0.018 | 14/04/01 12:01:12 |
| Spl - 3 | 0.010 | 0.060 | 14/04/01 12:01:58 |
| Spl - 4 | 0.353 | 0.706 | 14/04/01 12:02:07 |
| Spl - 5 | 0.357 | 0.714 | 14/04/01 12:02:49 |

■ **Spectrum**

Spectrum mode is used to scan the absorbance or transmissivity of the sample in a wavelength range.

1. **Main** interface, press the icon to start a **Spectrum** application.




| | |
|---|---|
| | **Method** Set the measurement parameters |
| | **Zero** Scan baseline |
| | **Read** Scan the sample and draw curve |
| | **Stop** Stop scanning |
| | **List** View the results list |

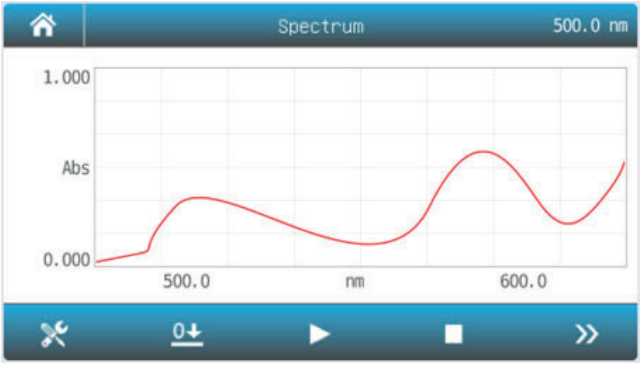
2. Press the icon to setup the measurement parameters.

| | |
|---|---|
| **Start wavelength** | Scan start wavelength |
| **End wavelength** | Scan end wavelength |
| **Step** | Scan interval: 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10.0 nm |
| **Speed** | **HS:** High speed, **MS:** Medium speed, **LS:** Low speed |
| **Photometry mode** | **Abs:** absorbance**, %T:** transmissivity |
| **Y minimum** | Minimum ordinate |
| **Y maximum** | Maximum ordinate |

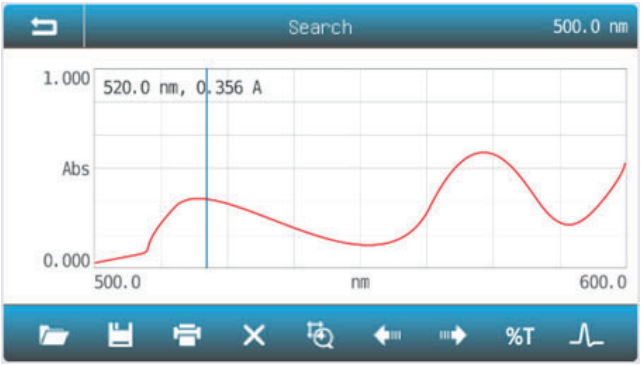
3. Press the item to select or key in the parameters, press the button **Measure** to accept the new parameters and back to **measurement** interface.

4. Put the reference in the measurement channel, press the icon  to scan baseline.

5. Put the sample in the measurement channel, press the icon  to scan and record the result.




6. Press the icon  to browse the curve and results.



| | |
|---|---|
|  | **Scale** Set the coordinate value |
|  | **Left** Moves the cursor to the left point (peak) to point (peak) |
|  | **Right** Moves the cursor to the right point (peak) to point (peak) |
|  | **Mode %T** Change the mode to %T |
|  | **Mode Abs** Change the mode to Abs |
|  | **Point/Peak** Change the search mode point/peak |

## TROUBLESHOOTING

Review the information in the table below to troubleshoot operating problems.

| Problem | Cause | Solution |
|---|---|---|
| Power on, no response | Power cord connection is not reliable | Improve connection |
| | Fuse burning | Replace fuse |
| Measurement uncertainty | Sample is not stable | Improve the sample |
| | Glass cuvettes used in UV region | Use quartz cuvettes |
| | The sample concentration is too high | Dilute the sample |
| | Power supply voltage low or not stable | Improve the power supply |
| | Lamp damage or lamp life maturity | Replace lamp |
| Dark current error when self-check | The lid of the compartment is open during self-check | Close the lid, restart |
| System calibration failed | Something blocks the light path | Remove it, calibrate again |
| Inaccurate measurements | Cuvettes were contaminated | Clean the cuvettes |
| | Samples were contaminated | Improve the samples |
| | Bad matching of the cuvettes | Improve the matching of the cuvettes |
| | Dark current error | Resample dark current |

## REPAIR AND MAINTENANCE

### ■ Daily Maintain

**Check the compartment:** After measurement, the cuvettes with sample solutions should be taken out of the compartment in time. Or the volatilization of the solution would make the mirror go moldy. Users must pay more attention to the corrosive sample and liquid easy to volatilize. Any solution remains in the compartment should be wipe off immediately.
**Cleaning of the instrument surface:** If paint drops fall on the surface of the instrument, wipe them off immediately with a damp towel. Organic solution is forbidden to be used to clean the surface. Please wipe off the dirt on the surface timely.
**Cleaning of the cuvettes:** After every test or after a solution change, the cuvettes should be cleaned carefully, or the remains on the surface would cause measuring error.

### ■ Spare Parts Replacement

**Fuse replacement**

**Danger! Be sure to switch off the power and unplug the socket before replacement!**

**Tools preparation:** Prepare a 3×75 flat blade screwdriver.
**Switch off the power supply:** Switch off the power supply and unplug the socket.
**Take out the fuse seat:** Push the fuse case by using the screwdriver, and turn it counterclockwise, the fuse seat will pop out when released.


**Replace the fuse:** Place the new fuse (3.15A/250V).

**Reset the fuse seat:** Replace the fuse seat in the power socket. Push the fuse case by using the screw-driver, and turn it clockwise, the fuse seat will be locked when released.

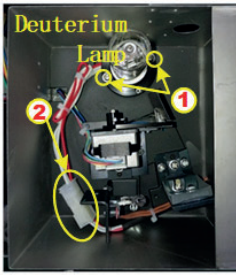

**Switch on the power:** Plug the socket and switch on the power.

## Lamp replacement

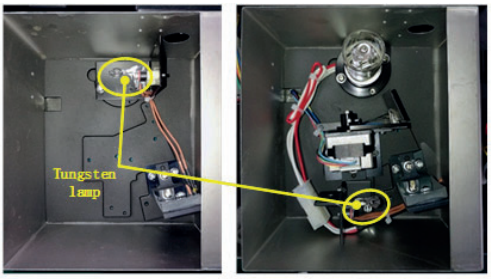
**Hot! Wait 20 minutes before opening the lamp chamber after power off to avoid scald!**

**Tools preparation:** Prepare a 6×150mm flat blade screwdriver and a pair of gloves.
**Power off:** Switch off the power supply and unplug the socket.
**Open the cover:** Loosen the indicated two screws and remove the lamp cover.

**4. D2 lamp replacement: If your spectrophotometer is visible model, please skip to step 5.** Unplug the connector (No. 2). Unscrew the 2 screws on the D2 flange (No.1) and remove the D2 lamp. Draw on the cotton gloves and place the new lamp. Fix the 2 screws and plug the connector again.

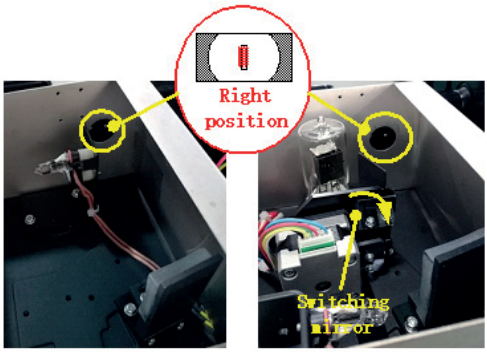


**W lamp replacement:** *The Tungsten lamp is equipped with a blue-grey silicon coating by manufacturer. This coating is only a transport safety device. It can be removed with the first exchange of lamp.* Pull out the defected W lamp and draw on the cotton gloves. Insert the new W lamp as deep as possible on the lamp seat. Be sure to keep the filament in the same direction as the old one face.




Visible models UV/Visible models

**Adjust the position of the W lamp:** Switch on the power (the switching mirror should be placed to the position as indicates). Observe the entrance facular; it should be in the center of the entrance hole. If the facular deviates to left or right, then loosen the two screws and move the lamp seat to left or right until it focuses on the center of the slot. Then fix the screws.




Visible models UV / Visible models

**Finish:** Reset the cover of the light chamber and fix the screws. Reset the cover of the lamp room and fix the screws.

## WARRANTY

AUXILAB S.L. warrant that this product will be free from defects in material and workmanship for a period of 2 years from date of delivery except the lamps. Lamps have a warranty of 1000 hours usage time or 6 months max. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

**Compliance with local laws and regulations**
The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to use the product in its local environment. We will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

## EQUIPMENT DISPOSAL

This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.
It's your responsibility to correctly dispose of your device at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.
For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.
By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.
Thank you!