ESPECTROFOTÓMETRO 4211/50
4211/50 SPECTROPHOTOMETER
SPECTROPHOTOMÈTRE 4211/50

REF. / CODE / RÉF. HJD002

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.

LANGUAGE INDEX

TABLE OF CONTENTS

SAFETY

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 is in any way damaged or defective.
- Repairs may only be carried out by the authorized service technicians.
- 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	1PC
10mm Glass Cuvette	4PCS
10mm Quartz Cuvette	2PCS
Power Cord	1PC
User Manual	1PC
Dust Cover	1PC

UNPACKING

Open the package, according to carefully check the packaging packing list items, if found inside the packaging are missing or damaged items please contact us and authorized contractual partners.

INSTALLATION

1. Environment Required

To ensure the best performance, the following conditions are required:

- The best working temperature range is 16—35ºC and the humidity is 45—80%.
- Keep it as far as possible away from the strong magnetic or electrical fields or any electrical device that may generate high-frequency fields.
- Set the unit up in an area that is free of dust, corrosive gases and strong vibrations.

- Remove any obstructions or materials that could hinder the flow of air under and around the instrument.
- The power requirement is 110±11V/60±1Hz or 220±22V/50±1Hz.
- Use the appropriate power cord and plug into a grounded outlet.
- If the local voltage is not stable, a voltage regulator is required.
- Be away from direct sunlight.

2. Install Spectrophotometer

Placement
Place the instrument on the stable table carefully.
Install Printer (Printer is Optional Accessories)
Check to confirm instrument power switch is turned off. Connect the printer's data cable to the instrument's parallel port.
Connect the Power Cords
Check to confirm instrument power switch is turned off. Connect the power cables of the instrument and printer to two separate power outlets.

OVERVIEW

4211/50 spectrophotometer is an electrical measure instrument which is widely used in the laboratories.

- Use Frequency: Intermittence
- Excessive Voltage(Current): No
- Pollution Class: Class 1

SYMBOLS

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

	Caution, Danger!
	Caution, High Voltage!
	Caution, Hot!
	This equipment will be recycled at the end of its useful life.

MAIN SPECIFICATIONS

Optical System	Single beam
Wavelength Range	200-1000 nm
Wavelength Accuracy	±2 nm
Wavelength Repeatability	0,8 nm
Photometric Range	-0,3-3A, 0-200%T
Photometric Accuracy	±0.5%T
Photometric Repeatability	0.3%T
Spectral Bandwidth	4 nm
Stray Light	0,3%T@220nm&360nm
Stability	±0,002A/h@500nm
Work Mode	Photometry, Quantitation
Interface	USB, Parallel(printer)
Power Requirement	110 V CA/60 Hz o 220 V CA/50 Hz
Dimensions	490 x 360 x 210
Weight	14 kg

DESCRIPTION OF APPEARANCE AND KEYS

1. Appearance

Front View

Back View

1 LCD Display
2 Keypad
3 Lid of Sample Room
4 Rod
5 LCD Contrast Adjust
6 Printer port
7 USB port
8 Cover of Fan
9 Power Socket
10 Power Switch
11 Cover of Cooling Vents

2. Keypad

3. Description of Keys

SET	**SET Key:** Set Parameters
GOTOλ	**GOTO Key:** Set Wavelength
ZERO	**ZERO Key:** Blank
PRINT	**PRINT Key:** Print measuring result
——	**Function Key:** Functions according to the screen
△ ▽	**UP, DOWN Keys:** Scroll menu/data and set Y scale

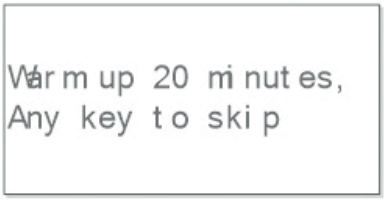
FUNCTIONS

Photometry
Display results as Abs, %T or Energy.
Quantitation
By using a Standard Sample to establish the Standard Curve.

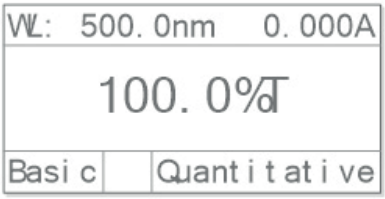
GETTING STARTED

The following chart describes the basic operation of the instrument.

Turn On and Self-check
Switch on the power. Then the instrument begins to self-check and 20 minutes' warm up. Self-check includes the following steps: Turn on lamps - Check Sensor - Initialize AD - System position - Get Dark Current - Warm up.



After warm up, instrument displays Main Interface.



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.

GENERAL OPERATING

Select Application
Main interface, press the key [—] (left) to enter into.

Set Wavelength
Test interface, press key [GOTOλ] to set wavelength, [△] [▽] to modify wavelength value, then press key [—] (left) to go to wavelength and blank.

Set Parameters
Press [SET] enter into setup interface, [△] [▽] to select items or input parameters, [—] (left) to confirm.

Delete the test result and stored data
Test Interface, press the key [PRINT] , then press key [△] [▽] to select “Clear Data, not Print ”, [—] (left) to delete.

Blank
Put the Reference in the light path, press [ZERO] to do blank.

Measure Samples
Put the samples in the light path, press [—] (left) to measure.

Print the test results
Test Interface, press the key [PRINT] [△] [▽] select “Print, clear data”, press the key [—] (left) to print.

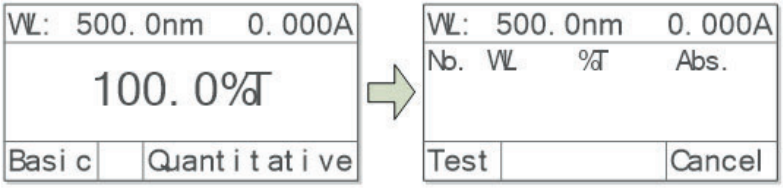
Store the Standard Curve
After got the Standard Curve, press [△] [▽] input the file name and press [—] (left) to save.

Load the Standard Curve
“Quantitative” interface, press [△] [▽] to select “Load Curve”, press [△] [▽] to choose the curve you want, press [—] (left) to open.

MEASURING

1. Photometry

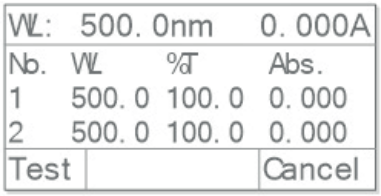
Step 1. Start Photometry
Main Interface, press key [—] (left) to choose “Basic”.



Step 2. Set Wavelength
Press [GOTOλ] to set wavelength, press [△] [▽] to input wavelength value, press [—] (left) to go to wavelength.

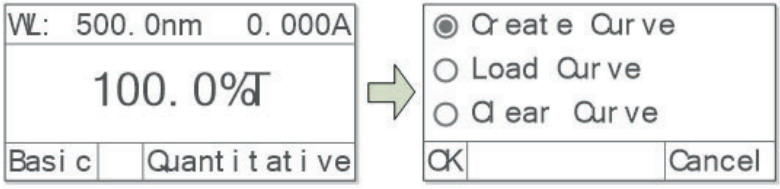
Step 3. Blank
Put the Reference in the light path and press [ZERO] to do blank.

Step 4. Measure samples
Put the sample in the light path, and then the result displays on the screen automatically, press [—] (left) to record.

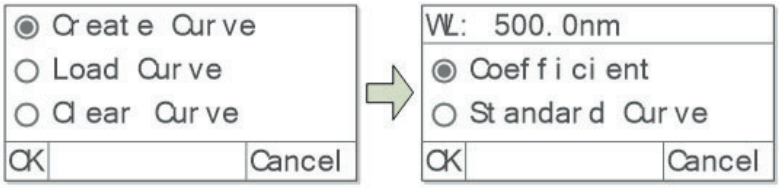


2. Quantitation

Step 1. Start Quantitation
Main Interface, press key [—] (right) to choose “Quantitative”.



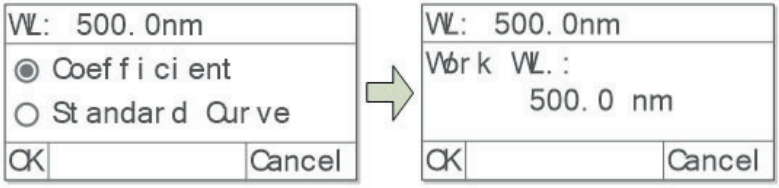
Step 2. Establish or call Standard Curve



2 methods to establish Standard Curve:

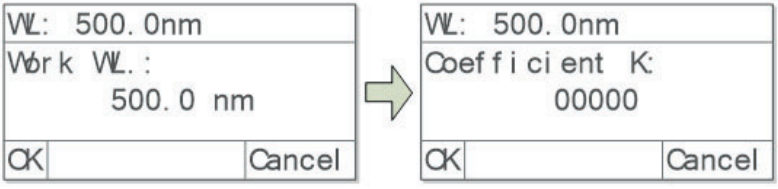
Method 1: Establish Standard Curve by inputting coefficients

1) Establish. Press [△] [▽] , to select "Coefficient", then press [—] (left) to confirm.



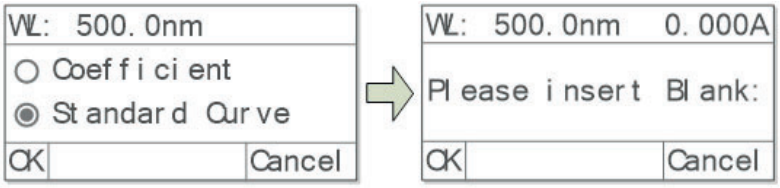
2) Set wavelength. Press [△] [▽] to input wavelength value, press [—] (left) to confirm.

3) Set coefficients K and B. Press [△] [▽] to input coefficient K, press [—] (left), same way set B.



Method 2: Establish Standard Curve by using Standard Samples

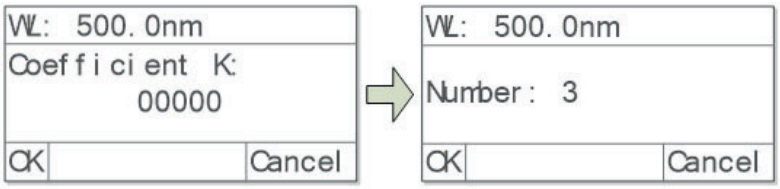
1) Establish. Pulse [△] [▽] para seleccionar "Standard Curve" y, a continuación, [—] (izqu.).



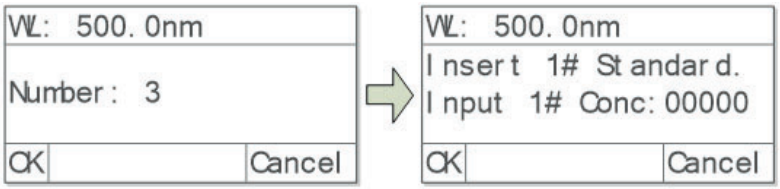
2) Set Wavelength. Press [GOTO] to set wavelength, press [△] [▽] to input wavelength value, press [—] (left) to go the setting value.

3) Blank. Put the Reference in the light path, press [—] (left) to do blank.

4) Setup number of Standard Samples. Press [△] [▽] , to input the quantity of standard samples(no more than 9), press [—] (left) to confirm.

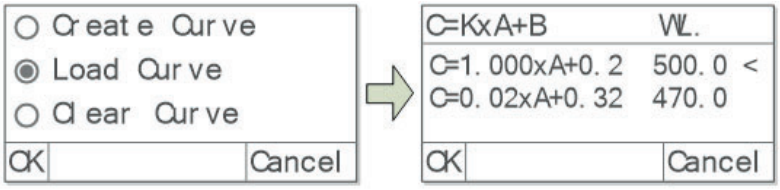


5) Calibrate Standard Samples. Put the corresponding standard samples in the light path as the screen indicates, press [△] [▽] , to input the concentration, press [—] (left) to confirm, complete finish all the standard samples.



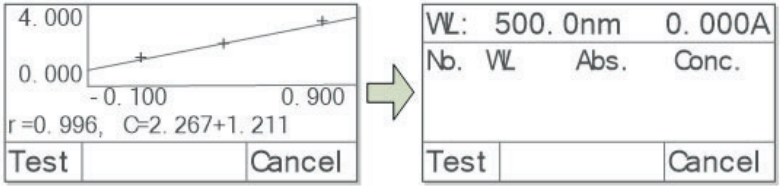
Load the Stored Curve

Press [△] [▽] to choose "Load Curve", press [△] [▽] to choose the curve, press [—] (left) to confirm.



Press [—] (left) to enter the test mode after building or loading standard curve.

Step 3. Enter into Measuring Interface. Press [—] (left) to enter into the Quantitation Measuring Interface.



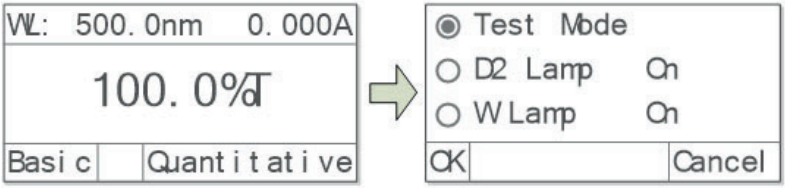
Step 4. Blank. Put the Reference in the light path, press [ZERO] to do blank.

Step 5. Measure Samples. Put the sample to be tested in the light path, press [—] (left) to measure. Then the test result will display in the data sheet. Repeat this step to finish measuring all the samples.

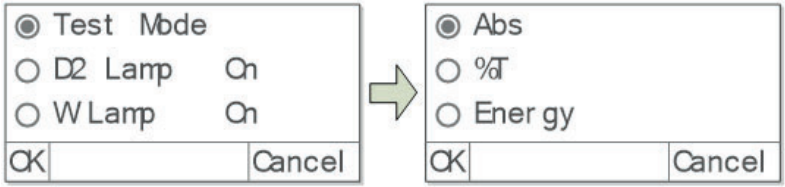
500. 0nm			0. 000A
No.	WL	Abs	Conc.
1	500. 0	0. 039	0. 078
2	500. 0	0. 042	0. 084
3	500. 0	0. 041	0. 082

3. Utility

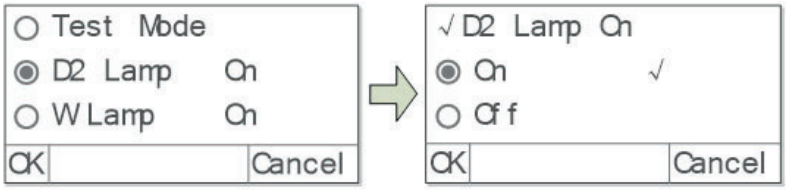
Main Interface, press [SET] to go into utility setting.



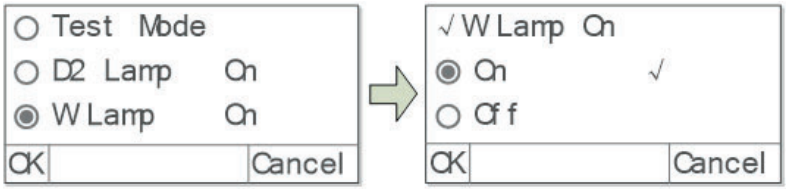
Test Mode Press [△] [▽] to choose “Test Mode”, press [—] (left) to enter, press [△] [▽] to choose “Abs”, “%T”, “Energy”, press [—] (left) to confirm.



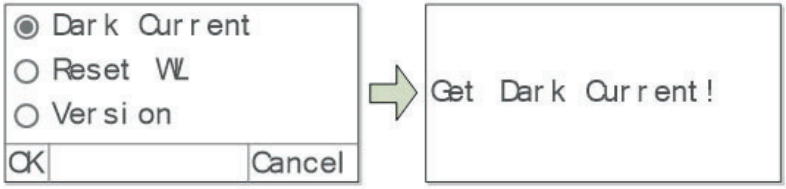
Turn On/Off D2 Lamp Press [△] [▽] to choose “D2 Lamp”, then press [—] (left) to enter. Press [△] [▽] to choose “On” or “Off”, press [—] (left) to turn on/off.



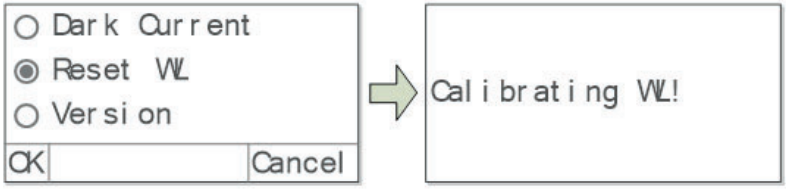
Turn On/Off W Lamp Press [△] [▽] to choose “W Lamp”, then press [—] (left) to enter. Press [△] [▽] to choose “On” or “Off”, press [—] (left) to turn on/off.



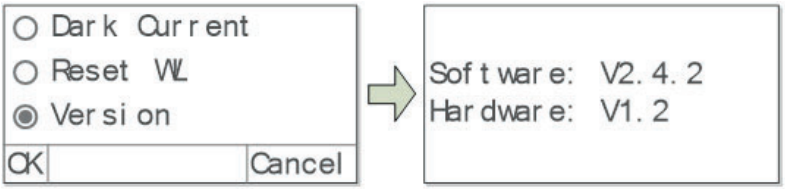
Get Dark Current Keep the light path without anything blocking, press [△] [▽] to choose “Dark Current”, then press [—] (left) to resample Dark Current.
Note: During the course, open the lid of the compartment is prohibited.



Reset Wavelength Keep the light path without anything blocking, press [△] [▽] to choose “Reset WL”, then press [—] (left) to reset wavelength.



About Version Press [△] [▽] to choose "Version", press [—] (left) to view version information, press any key to return.



TROUBLESHOOTING

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

Problem	Cause	Solution
Power on, no response	1. Power cord connection is not reliable 2. Fuse burning	1. Improve connection 2. Replace fuse
Measurement uncertainty	1. Warm up is not enough 2. Sample is not Stable 3. The concentration of sample is too high 4. Power Supply Voltage Low or not Stable 5. Lamp damage or lamp life maturity	1. Warm up more time 2. Improve the sample 3. Dilute the sample 4. Improve the Power Supply 5. Replace lamp
Dark Current Error when self-check	1. The lid of the compartment is open during self-check	1. Close the lid, restart
System Calibrate Failed	1. Something block the Light path	1. Remove it, calibrate again
Power on, back light is OK, but nothing display on the screen or display is not clear	1. Display Contrast problem	1. Adjust the contrast potentiometer
Measurements inaccurate	1. Cuvettes were contaminated 2. Samples were contaminated 3. Bad matching of the cuvettes 4. Dark current error	1. Clean the cuvettes 2. Improve the samples 3. Improve the matching of the cuvettes 4. Resample dark current

REPAIR AND MAINTENANCE

1. 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 wiped off immediately.

Surface Cleaning
If paint drops fall on the instrument cover, wipe them off immediately with a damp towel. Organic solution is forbidden to be used to clean the cover. Please wipe off the dirt on the cover timely.

Cleaning 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.

2. Spare Parts Replacement

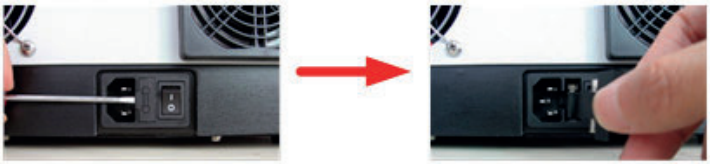
Fuse replacement

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

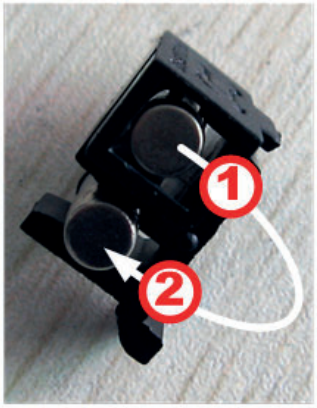
Step 1. Tools preparation
Prepare a 3×75 Flat Blade screwdriver.

Step 2. Switch Off the power supply
Switch off the power supply, and unplug the socket.

Step 3. Take out the Fuse Seat
Take out the fuse seat by the screwdriver.



Step 4. Put the new fuse
Pick out the spare fuse (3.15A/250V) and replace it to the working position.



Step 5. Reset the fuse seat
Replace the fuse seat in the power socket.

Step 6. Switch on the power
Plug the socket and switch on the power.

Lamps replacement

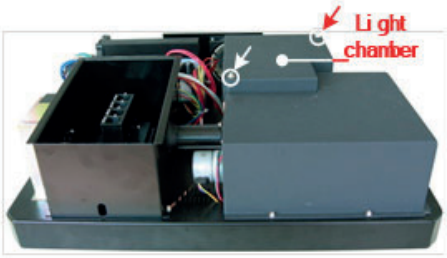
Hot! Wait 20 minutes before open the lamp chamber after power off to avoid scald!

Step 1. Tools preparation
Prepare a 6×150mm Cross Blade screwdriver and a pair of glove.

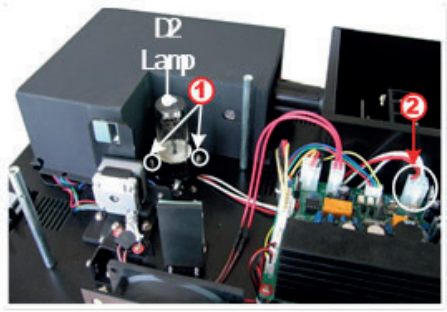
Step 2. Power Off
Switch off the power supply and unplug the socket.

Step 3. Open the cover
Unscrew the 4 screws indicated (each side with 2 screws) and remove the cover.

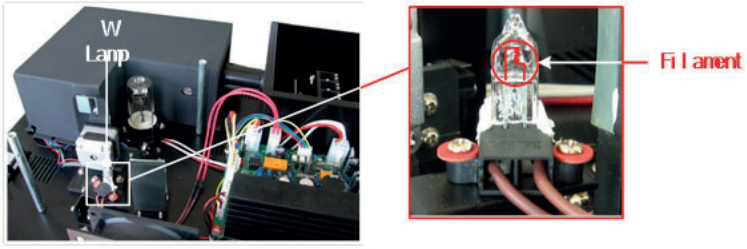
Step 4. Open the cover of the light chamber
Unscrew the 2 screws on the light chamber cover and remove it.



Step 5. D2 lamp replacement
Unscrew the 2 screws on the D2 Flange (No.1), unplug the connector in the Power Board (No. 2) and remove the D2 lamp. Draw on the cotton gloves and replace a new lamp. Fix the 2 screws and plug the connector again.

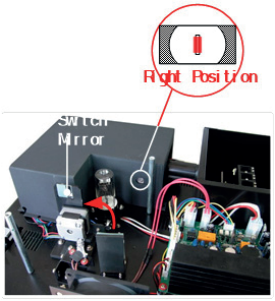


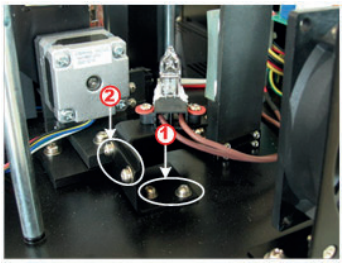
Step 6. W lamp replacement
Pull out the defected W lamp and draw on the cotton gloves. Insert the new W lamp as deep as possible on the lamp seat. Be sure to keep the filament in the same direction as the old one face.



Adjust the position of the W lamp

Switch on the power(the Switch Mirror should be placed to the position as indicates). Observe the light spot, it should in the center of the entrance hole. If the light spot deviates to Left or Right, then loosen the No.1 screws and move the lamp seat to Left or Right until it focus on the center of the slot. Then fix the screws. If the light spot deviates to Up and Down, then loosen the No.2 screws and move the lamp seat Up and Down until the light spot focus on the center of the slot. Then fix the No. 2 screws again.





Step 7. Finish

Reset the cover of the light chamber and fix the screws. Reset the cover of the instrument and fix the screws. Install the rod of the sample compartment, then the work is finished.

WARRANTY AND EQUIPMENT DISPOSAL

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 purchase except the lamps. Lamps have a warranty of 1000 hours usage time or 6 months max. If a defect is present, we will, at its option, repair, replace, or refund the purchase price of this product at no charge to you, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear.

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 equipment 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!