BIOBASE®

UV/VIS SPECTROPHOTOMETER
BK-S360
User Manual

BIOBASE GROUP

Version 2020.11

Content

Preface

1. Safety

This instruments are designed according to the following safety documents:《IEC 61010 — 1：2001》(Which is:《Measurement, Control and Laboratory Electric Equipments Safety Requirement》Part 1) and 《IEC 60601 — 1：1988》(Which is:《Electric Apparatus of Medical Treatment》 Part 1).

2. About the Instrument

Scanning Series UV/Vis Spectrophotometer is an electrical test instruments which is widely used in the laboratories.

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

3. Symbols

Caution, Danger!

Caution,High Voltage!

Caution,Hot!

Ground

Fuse

Recall, this instrument will be called back by the appointed Electrical Treatment Department or by the original Manufacturer when wasted.

I. Summary

Scanning Series UV/Vis Spectrophotometer have the characters of wide range of wavelength, high sensitivity, powerful function, easy to use, simple structure and pretty figure. Besides these, the large LCD, High Precise A/D and easy to store RAM makes the instrument much more superior than other originals. It is widely used in Chemistry, Pharmaceuticals, Biochemical, metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields. It is one of the most important instruments in Quality Control and an essential in normal laboratories.

1. Working Principle and Structure

Different matter has different but special absorbance wavelength point. Also, when at the fixed wavelength point, the absorbance has some relation to the substance's (Always transparent Solution) concentration and its thickness. The relation can be concluded as the following Formula which is called Lambert-Beer Law.

$$T= I/I_o$$
$$A=KCL= -\log I/I_o$$

A	Absorbance
C	Concentration of the Solution
K	Absorbance Coefficient of the Solution
L	The length of the Solution in the light path
I	The intensity of the light focused on the A/D after it permeate the solution to be measured.
Io	The intensity of the light focused on the A/D after it permeate the Solution.

Note: When test, the solvent is usually taken as the Reference Solution and its Transmittance is considered as 100%T. While the Transmittance of the sample to be tested is a relative value which is got comparing to that of the Reference.

2. Main Specifications

- Wavelength Range: 190-1100nm
- Stray Light: ≤0.05%T @ 220nm& 360nm
- Band Width: 1nm
- Photometric Range: 0-200%T,-0.3-3.0A
- Wavelength Accuracy: ±0.5nm
- WL. Repeatability: ≤0.2nm
- Photometric Accuracy: ±0.3%T
- Photometric Repeatability: ±0.2%T
- Stability: 0.001A/h @ 500nm
- Display: 480×272 Dots Matrix LCD
- Data Output: USB (2.0),USB (1.0)
- Dimension: 470×370×180
- Weight: 20kg

3. Main Functions

Scanning Series UV/Vis Spectrophotometer has functions below as main three parts.

- **Photometry**
  The photometric mode can be switched between Absorbance, Transmittance and Energy. You can use single-point method to measure the concentration.
- **Quantitative**
  Coefficient Method, Standard Curve Method and Input Method. The Regression Equation and the test result can be stored in the RAM and printed out.
- **Multiple Wavelength**
  Test the Abs. and Trans of the same sample under different wavelengths, can test the data from 8 wavelengths.
- **Kinetics**
  Test the sample changes in a period, get △A/t, display the spectrum curve.
- **Spectrum**
  Wavelength range 190-1100nm, set up the range, interval to test the max peak value curve of sample.
- **BIO**
  Built-in7 methods. Customers can also set the parameters. The data can be printed out.
- **Tools**
  Users can set the favorable items to keep the instrument work in best conditions.

II. Install Instrument

1. Environment Required

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

- The best working temperature range is 16-35℃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 220±22V@50±1Hz or 110±11V@60±1 Hz.
- Use the appropriate power cord and plug into a grounded outlet.
- If the local voltage is not stable enough, a manostat is required.
- Be away from direct sunlight.

2. Voltage Confirmation

Be sure to set the instrument's voltage switch at your local power supply, or severe damage may occur!

3. Installation

Step 1: Check the packing list

Unpack the contents, check the materials with the Packing List. Any damage or
Lost found, please contact us or the local dealer.

Step 2: Position

Place the instrument on the stable table carefully.

Step 3: Install printer (Optional)

Make sure the printer is power off.link the printer's data cable to the Instrument's parallel port.

Step 4: Link the power cord

Make sure the instrument's power switch is in the Off condition, link the power cord to the instrument and insert another end in the socket provided with a protective earth contact.

Step 5: Switch on the power

Check again. Make sure that all the links are right. Switch on the power. Then the instrument begins to self-test. After self-test and 15 minutes' pre-warm, it can work. The self-test includes the following steps:

Filter→Light Source Positioning→DarkCurrent→WLSelf-check→WEnergy→D Energy→ Room→ Battery Voltage(Fig.2-1)

After pre-warm, the instrument will ask the user to re-calibrate the system. (Fig. 2-2) Users can decide if they need to re-calibrate the system or not.

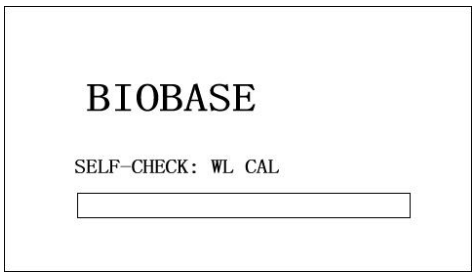

BIOBASE
SELF-CHECK: WL CAL

Fig. 2-1


MAIN MENU
2013-03-01 14:00
1. BASIC
2. QTY
3. KINS
4. MULTWL
6. SPEC
7. BIO
8. TOOLS

Fig. 2-2

III. Introduction of the Instrument

1. Introduction

Appearance of the instrument (Fig. 3-1)：

Fig. 3-1

1 — Lid of the room
2 —Operation Panel
3—Cell Holder
4— Rod
5— Fan
6— Fan Cover
7— Power Socket
8— Con-Tem Port
9— Power Switch
10—USB
11—Print Port
12 —USB Print Port

2. Operation Panel

Operation panel of Scanning UV/Vis Spectrophotometer(Fig.3-2)：

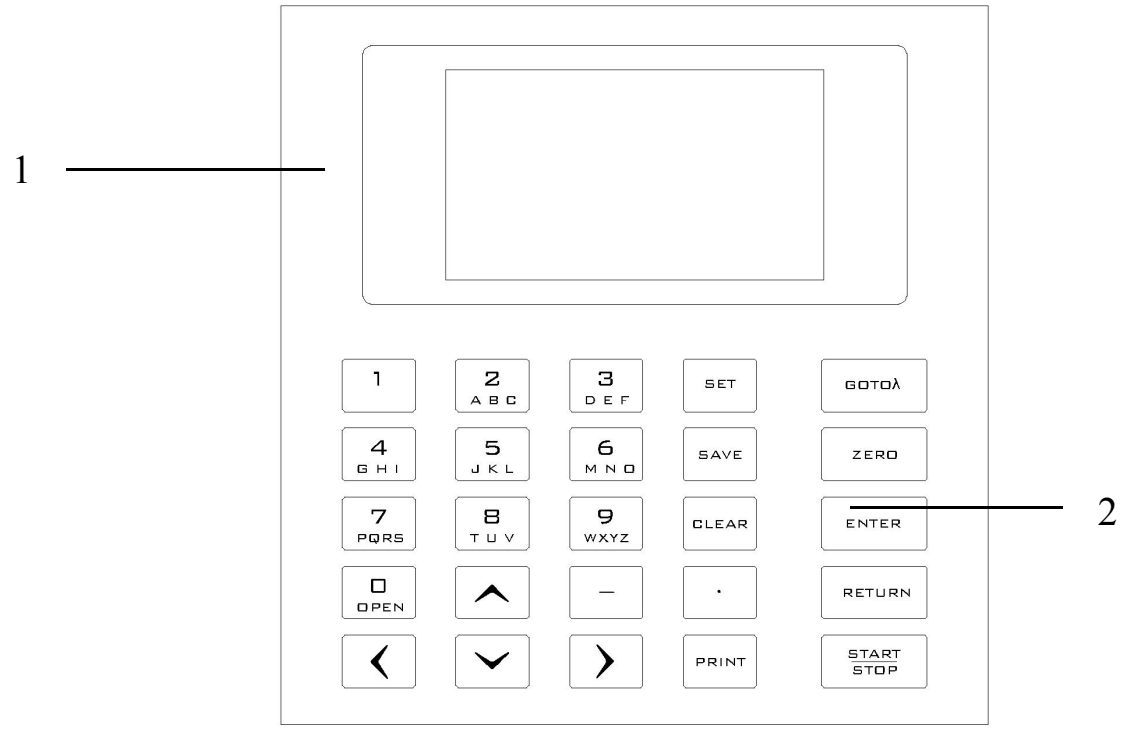
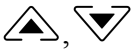


Fig. 3-2

1 —LCD Displayer
2 —Keypad

3. Keypad Description

0 OPEN … 9 WXYZ	Input Parameters, Wavelength and set 8 cell auto cell holder.
CLEAR	Delete the input value or stored data.
RETURN	Cancel operation or return to former menu
ZERO	Calibrate 100%T/0Abs
0 OPEN	Load the files saved in the RAM
SAVE	Save the test results.
START/STOP	Start/Cancel Test

GOTO λ	Set Wavelength
PRINT	Print Test Result
ENTER	Confirm the input value or setting
	Scroll the menu or data
	Seek wavelength peak or set coordinate.

IV. Instrument Operation

1. Software System

Software System of Instrument (Fig. 4-1)

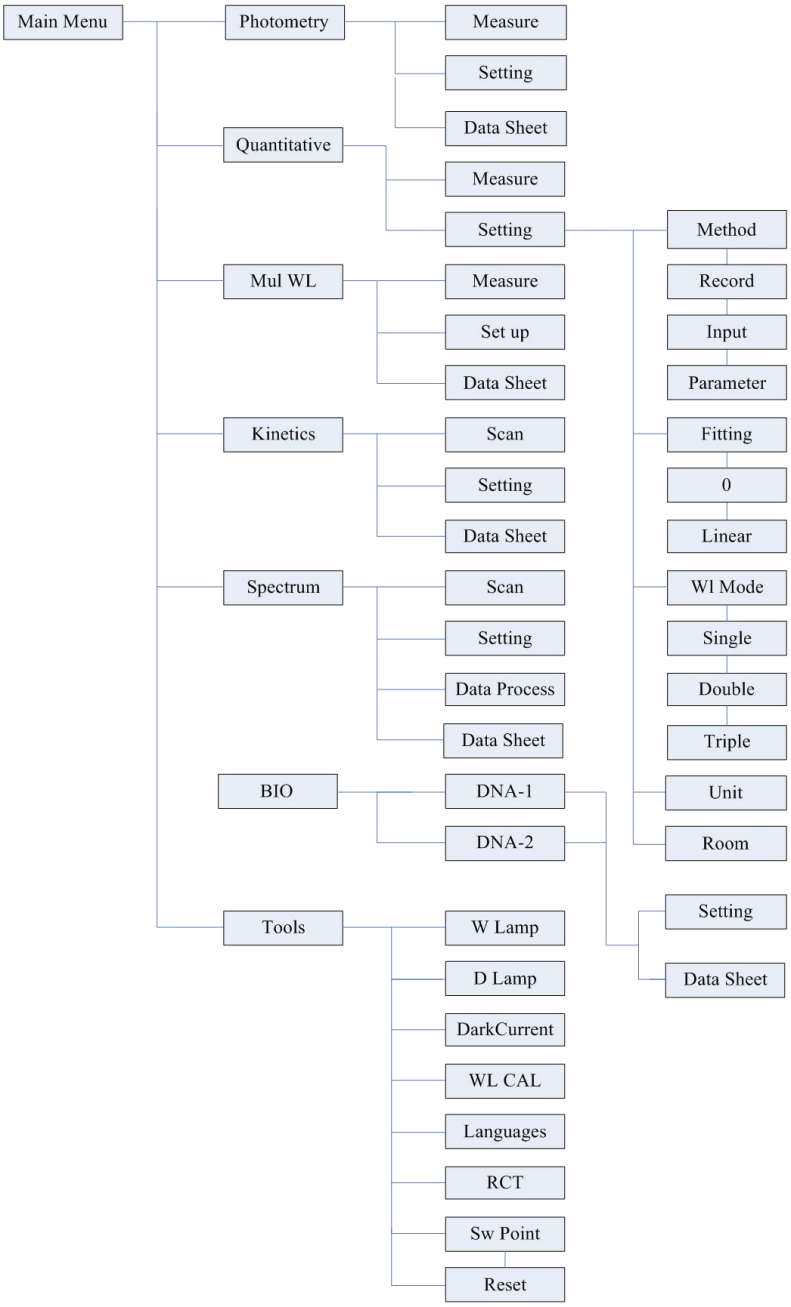


Fig. 4-1

2. Basic Operation

(1) Select Test Method

In the main menu, press numeric key [1] —— [9 WXYZ] to enter this mode directly.

(2) Set Wavelength

Press [GOTO λ] to set wavelength,use numeric key to input the value and press [ENTER] to confirm. When the wavelength changed to the point you set, the system calibrates 100%T/0Abs automatically.

(3) Set Parameters

In different menus, press [SET] to go into different parameter setting interface, input the values by numeric keys,press [ENTER] to confirm,press [RETURN] to return. Press [START/STOP] to go into test interface and save settings.

(4) Set auto-cell holder(Optional Accessory)

Go into the auto-cell holder (In the setting menu) to make corresponding cell position at the light path. Then read the test data.

(5) Delete the Input Value

When input value, press [CLEAR] to delete all the characters.

(6) Delete the test result and stored data

Press [▲]、[▼] to select in the test interface, press [CLEAR] to delete the test result or stored data.

Press [CLEAR] to delete all data if nothing selected.

(7) Calibrate 100%T/0Abs

Put the Reference in the light path, press [ZERO] to calibrate 100%T/0Abs.

(8) Measure Samples

In the test interface, put the samples to be tested in the light path, press [START/STOP] to measure.

(9) Print the Test Result

In the test interface, press [PRINT] to print the test result.

(10) Store the Test Result

In the test interface, press [SAVE] to remind the store position, press [SAVE] again to input the file name and press [ENTER] to confirm.

(11) Load the Stored File

In the test interface, press [0 OPEN] to go into file selecting interface, press ▲、▼ to choose the file you want, press [ENTER] to open.

In different menu, users can only load the files with the corresponding postfix. List is the corresponding postfixes:

- Quantitative: *.qua
- Standard Curve: *.fit
- Wavelength Scan: *.wav
- Kinetics: *.kin
- DNA/Protein test: *.dna
- Multi-wavelength: *.mul

3. Before Measurement

(1) Self-check

Remove all the blocks in the light path and close the lid of the compartment. Switch on the power supply to begin the self-test.

(2) Pre-warming

After self-test, the instrument goes into pre-warm state. For accurate test, at least 30 minutes of warm up is required.

(3) Check the Cuvettes

The cuvettes must be clear and there's no remains of the samples on the surface of it. Only Silicon (Quartz) cuvettes are permitted to be used in the range of less 300nm.

4. Measurement

(1) Basic Mode

Step 1, Go into test interface of Basic mode

In the main menu,press the key of [1] to choose "BASIC"followed with [GOTO λ] pressed to set up wavelength.

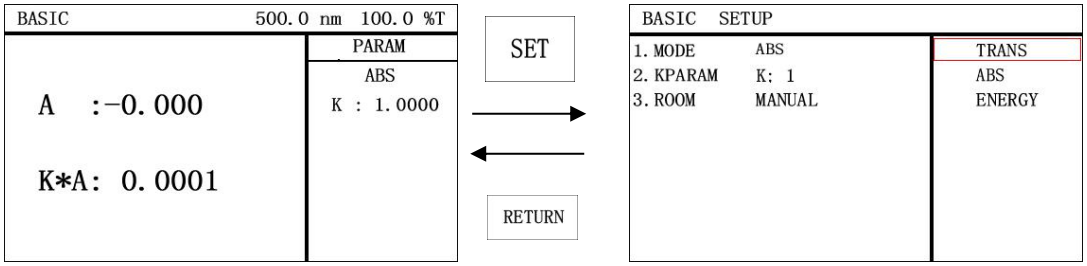


Fig. 4-2

Step 2, Set Test Mode

Press SET to set up (Fig. 4-2). Press 1 to go into selecting mode, Press ▲、▼ to choose "TRANS","ABS" or "ENERGY" mode, and press ENTER to confirm. Press 2 ABC to set coefficient K (-9999.9-9999.9) ENTER to confirm. Press START/STOP to confirm all settings.

Step 3, Set Wavelength

Press GOTO λ to set wavelength, input the value by the numeric keypad followed with ENTER pressed to confirm. Press START/STOP to go into photometry data sheet.

Step 4, Calibrate 100%T/0Abs

Put the Reference in the light path and press ZERO to calibrate 100%T/0Abs.

Step 5, Sample Measurement

Put the sample to be measured in the light path, the result will be displayed on the screen automatically. Press START/STOP to go into photometry data sheet. Repeat Step 4, 5, press START/STOP to calculate the data into the data sheet, test all samples.

Step 6, Save/Open/Print Data

Press SAVE to save the result.Press ▲, ▼ to choose store position, press SAVE to input file name, ENTER to confirm and save. Save photometry parameter and tested data. Fig. 4-3

Press 0 OPEN, ▲, ▼ to choose stored data, press ENTER to open and test directly.

Press PRINT to print data in data sheet.

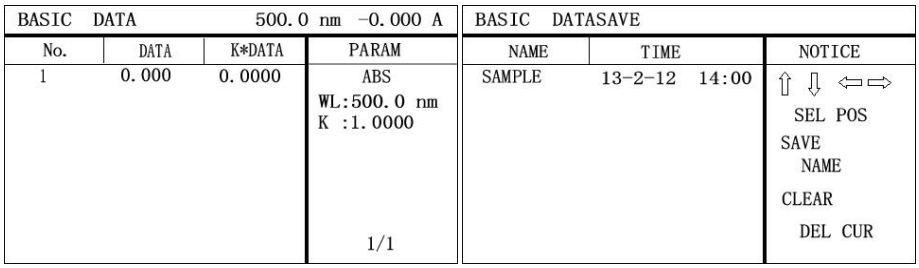


Fig. 4-3

(2) Quantitative

Step 1, Go into Quantitative Test Interface

In the main menu, press 2 ABC tochoose"QTY".The instrument display the last tested parameter.

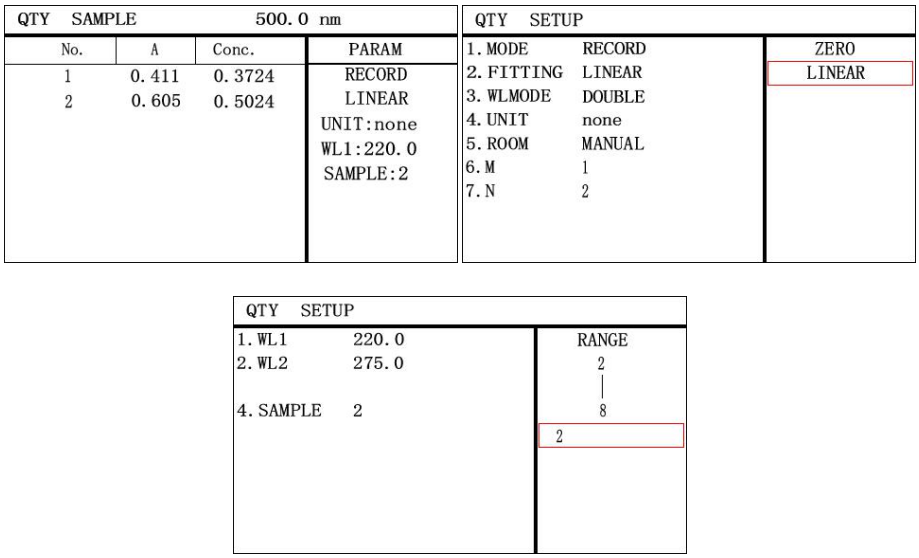


Fig. 4-4

Step 2, Set Parameters

Press SET to enter the quantitative setting interface (Fig. 4-4). Press numeric key to select. Press ENTER to confirm. Press START/STOP to enter standard sample test, input the standard sample concentration, press ENTER to confirm. After finished setting, press START/STOP to test successively or press ENTER to input standard sample Abs. value.

P.S.: Coefficient method without displaying curve.

Step 3, Set up Standard Curve

Press START/STOP to go into QTY Curveinterfaceto establish or select standard curve (Fig. 4-5), 3 methods are under your choice.

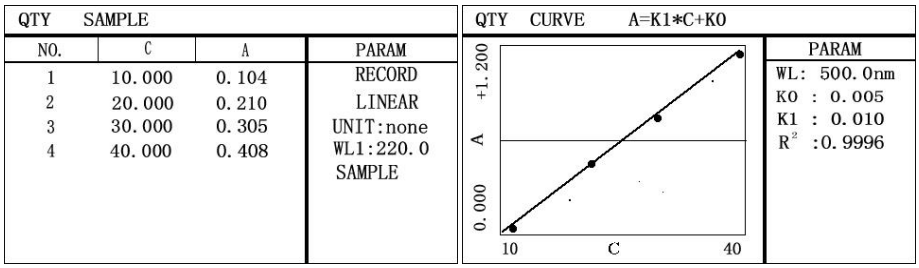


Fig. 4-5

Set up Standard Curve (In the setup menu):

Method 1: Standard Sample read (RECORD)

1) Quantitative Method. Press [1], [▲], [▼] to choose standard sample read (RECORD). [ENTER] to confirm.

2) Set Parameter. According to the menu options, press numeric key to set up fitting method, wavelength method, units and room, press [ENTER] to confirm, then press [START/STOP] to enter wavelength, sample no., [ENTER] to confirm.

3) Sample Test. Press [START/STOP] to go into quantitative standard sample sheet.

4) Set Standard Sample. According to the notice, input the standard sample concentration (Fig. 4-7), [ENTER] to confirm, press [▲], [▼] to select the value. After finishing inputting concentration, press [START/STOP] to enter Abs. test.

5) Calibrate 100%T/0Abs. Put the Reference Sample in the light path and press [ZERO] to calibrate 100%T/0Abs.

6) Mark Standard Sample. Put the sample corresponding with the concentration in the light path, press [ENTER] to read. Abs. The value will be displayed on the data sheet, according to notice to test successively.

7) Sample Test. Press [START/STOP] to enter curve, press again to enter quantitative data sheet. Put the reference in the light path, then press [ZERO]. Put the sample in the light path, then press [START/STOP] to read value.

Method 2：Use Standard Samples (INPUT)

1) Quantitative Method. Press [1], [▲], [▼] to choose Standard Sample Input (INPUT),then press [ENTER] to confirm.

2) Set Parameter. According to the menu options, press numeric key to set up fitting method, wavelength method, units and room, press [ENTER] to confirm, then press [START/STOP] to enter wavelength, sample no., [ENTER] to confirm.

3) Sample Test. Press [START/STOP] to enter quantitative standard sample sheet.

4) Set Standard Sample. According to the notice, input the standard sample concentration (Fig. 4-7), ENTER to confirm, press ▲, ▼ to select the value. After finishing inputting concentration, press START/STOP to enter Abs. INPUT, the method is same as inputting concentration. Then press START/STOP to enter curve picture, press START/STOP again to enter quantitative data sheet to start test.

5) Calibrate 100%T/0Abs. Put the Reference Sample in the light path and press ZERO to calibrate 100%T/0Abs.

6) Test Sample. Put the test sample in the light path, press START/STOP to read value.

Method 3：Coefficient method (Input Regression Equation)

1) Quantitative Method. Press 1, ▲, ▼ to select coefficient method (PARAM). ENTER toconfirm.

2) Set Parameter. According to the menu options, press numeric key to set up fitting method, wavelength method, units and room, press ENTER to confirm, then press START/STOP to enter, input wavelength, photometry coefficient K1 and intercept K0 (Linear Fit) ENTER to confirm.

3) Sample Test. Press START/STOP to enter quantitative data sheet. Fig. 4-6

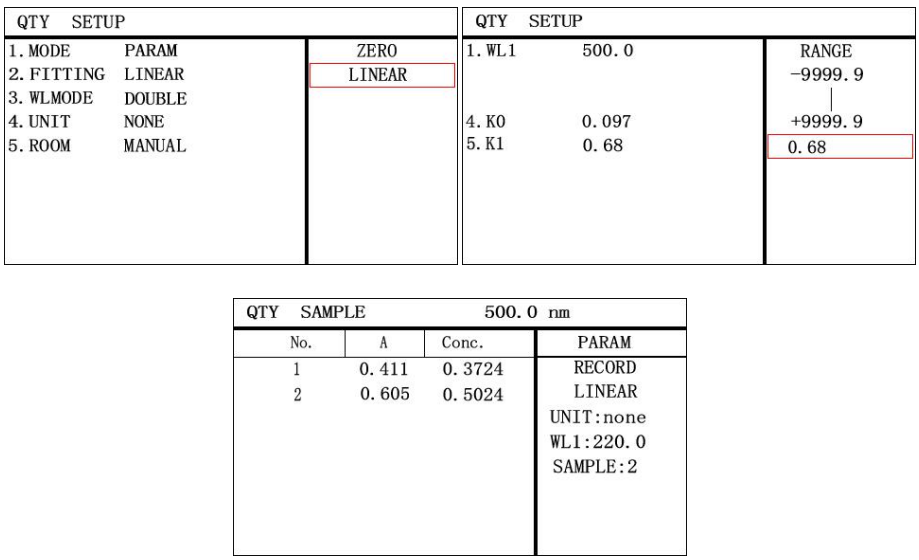


Fig. 4-6

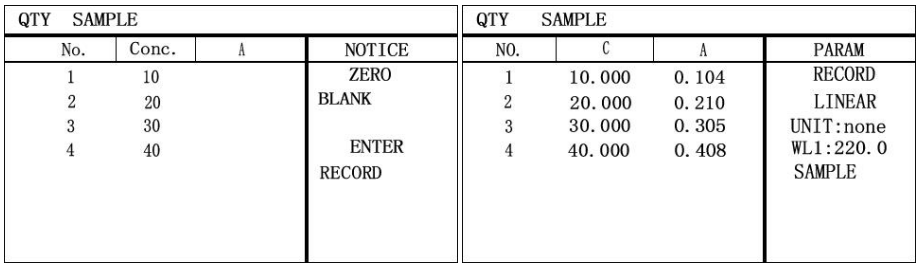


Fig. 4-7

Load the Stored Curves：

In the “Quantitative” interface,press 0 OPEN to go into files selection interface.Use ▲, ▼ to select the curve you need and press ENTER to load.

Users can press START/STOP to check the curve.(Fig.4-5),press RETURN to return.

Step 4,Go into the sample measurement interface

In the “Quantitative Curve” interface, Press START/STOP to go into the Quantitative Test interface(Fig. 4-8).

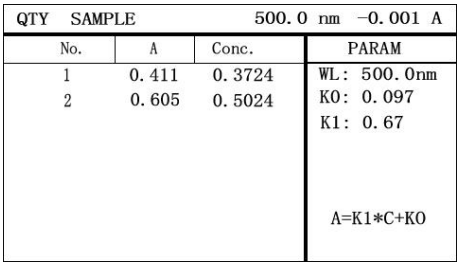


Fig. 4-8

Step 5, Calibrate 100%T/0Abs.

Put the Reference Sample in the light path, press ZERO to calibrate 100%T/0Abs.

Step 6, Measure Samples

Place the sample to be tested in the light path, press START/STOP to measure. Then the test result will display in the data sheet. Repeat this step to finish measuring all the samples.(Fig. 4-9)

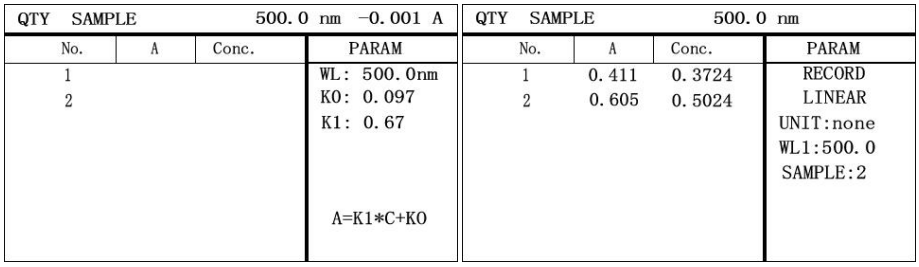


Fig. 4-9

Step 7, Print Data

Press PRINT to print the result.

Step 8, Delete Data

Press ▲, ▼ to move the cursor to select the value you don't need, then press CLEAR to delete the value.

Step 9, Store the data

After measurement, press SAVE to store the data. Input the file name by the numeric keypad and press SAVE to store.

Double Wavelength：△A=M*A1-N*A2

Triple Wavelength：△A=A2-A4

$$A4=\frac{(\lambda 1-\lambda 2)A3+(\lambda 2-\lambda 3)A1}{\lambda 1-\lambda 3}$$

(3) Kinetics

Step 1, Go into Kinetics Test Interface

In the main menu, press 3 DEF to select "KINS" (Fig. 4-12).

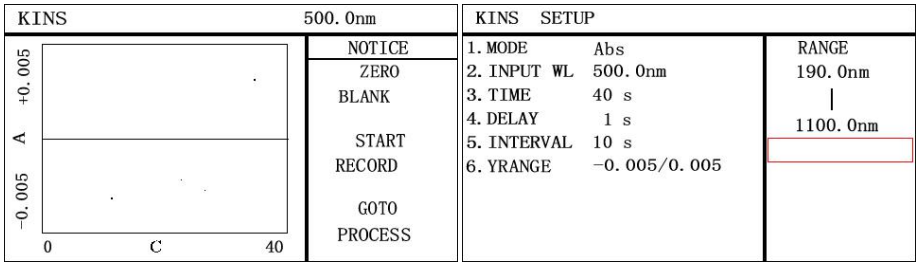


Fig. 4-12

Step 2, Setup Parameters

Press function key SET to set up parameters, input wavelength, test time, delay, interval, record range and room. ENTER to confirm.

Press numeric key 1 to choose test mode Abs. or Trans.

Press numeric key 2 ABC to input test wavelength, range 190nm-1100nm.

Press numeric key 3 DEF to input test time, the unit is second.

Press numeric key 4 GHI to input delay time, the delay time cannot be calculated to data sheet.

Press numeric key [5 JKL] to input interval, the data in the data sheet read according to the interval.

Press numeric key [6 MNO] to input the sample Abs. range, which is -4-4.

Press numeric key [7 PQRS] to choose room, standard is manual, default is auto.

After finished, press [START/STOP] to enter spectrum interface.

Step 3, Calibrate 100%T/0Abs

Put the Reference Sample in the light path, press [ZERO] to calibrate 100%T/0Abs.

Step 4, Measure the sample

Put the sample to be tested in the light path and press [START/STOP] to begin the test.

Step5, Data Process

After test, press [GOTO λ] to enter data process interface. (Fig.4-13)

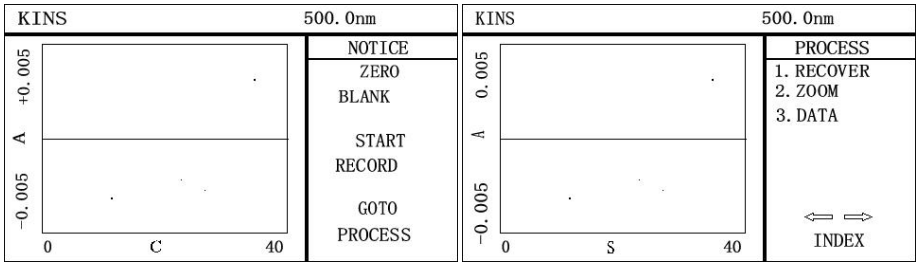


Fig. 4-13

Press [1] to recover original data.

Press [2 ABC] to change coordinate, test time and range.

Press [3 DEF] to enter data sheet, display test data A and dA/dt. Fig. 4-14

Press ◀, ▶ to display the point value successively.

KINS DATA

TIME	A	dA/dt	NOTICE
0	0.000		
10	0.000	0.0000	
20	0.000	0.0000	
30	-0.000	-0.0000	
40	0.000	0.0000	
			1/1

Fig. 4-14

Step 6,Print curve

Press PRINT to print curve and data sheet.

Step 7, Save and Open

After scan, press SAVE to save curve, parameters and data sheet, press numeric key to input file name, ENTER to save. 0 OPEN to open stored file. ▲, ▼ to choose file, ENTER to open.

(4) Multi-Wavelength Test

Step 1, Go into multi-wavelength test interface

In the main menu, press numeric key 4 GHI to choose "MULTWL". (Fig. 4-10)

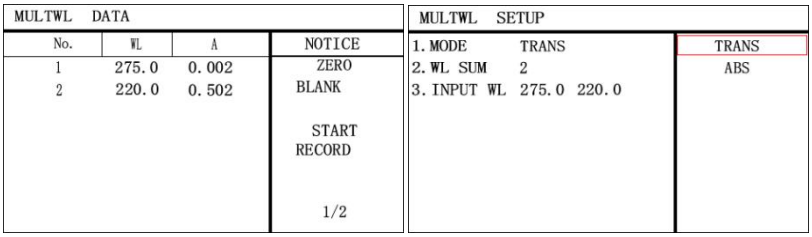


Fig. 4-10

Step 2, Setup

Press SET, 1 to set up test mode, press ▲, ▼ to choose Trans. and Abs., ENTER to confirm.

Press numeric key 2 ABC to set up no. of wavelength, can set up 8 wavelengths at most, choose the wavelength no. under your choice.

Press numeric key 3 DEF to set up wavelength, then ENTER key to confirm.

After finished, press START/STOP to start testing.

Step 3,Calibrate 100%T/0Abs

Press the sample in the light path, according to notice, press ZERO to calibrate 100%T/0Abs.

Step 4, Data Test

Place the Reference Sample in the light path,press START/STOP to test sample, results will be displayed in the data sheet. (Fig. 4-11)

Step 5, Save Data

Press SAVE to save data, press ▲, ▼ to choose store data, press SAVE again to input file name, ENTER to confirm.Press 0 OPEN, ▲, ▼ to choose stored file, ENTER to open and test directly. PRINT to print the tested data.

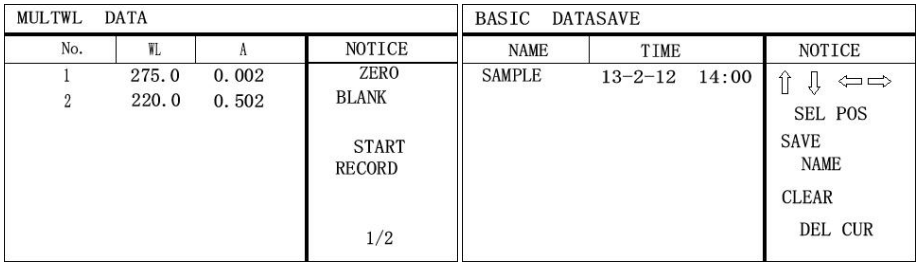


Fig. 4-11

Step 6, Delete

Press CLEAR to delete the current data.

(5) Spectrum

Step 1, Go into spectrum scan

In the main menu, press numeric key 5 JKL to choose "SPEC". (Fig. 4-15)

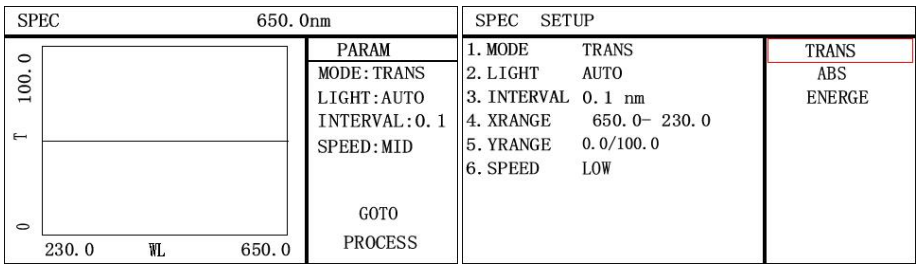


Fig. 4-15

Step 2, Set up scan parameters

Function key SET to set up parameters, according to notice, set up Mode, Source Light, Interval, Scan Range, Record Range and Scan Speed, ENTER to confirm, after set up, press START/STOP to enter spectrum test interface.

Press numeric key 1, mode: Trans., Abs., Energy, press ▲, ▼ key to choose test mode. Press ENTER to confirm.

Press numeric key [2 ABC], source light: Auto, W lamp, D lamp, press ▲, ▼ to choose test source light. Press [ENTER] to confirm.

Press numeric key [3 DEF], set interval:0.1, 0.2, 0.5, 1, 2, 5nm, press ▲, ▼ to choose scan interval. Press [ENTER] to confirm.

Press [4 GHI], input scan range: 190-1100nm, input the range under the practical meet. Press [ENTER] to confirm.

Press [5 JKL], input record range: Abs., A value is -4-4; Trans., T value is 0-200%; Energy, E value is 0-100%. Press [ENTER] to confirm.

Press [6 MNO], set scan speed: Fast, Middle, Slow, press ▲, ▼ to choose scan speed, press [ENTER] to confirm.

After finishing settings, press [START/STOP] to enter spectrum test interface.

Step 3, Scan baseline

Put the reference in the light path, [ZERO] to scan baseline, [START/STOP] to cancel scan.

Step 4, Scan Sample

Put the sample in the light path, [START/STOP] to scan sample (Fig. 4-16a), [START/STOP] to cancel scan.

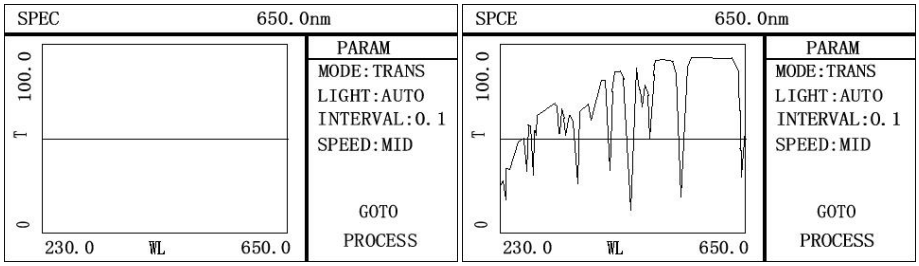


Fig. 4-16a

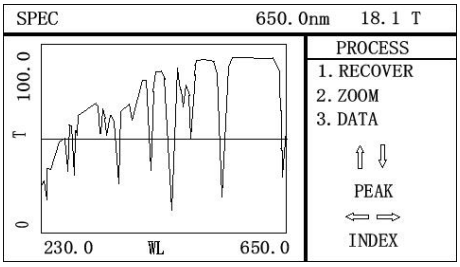


Fig. 4-16b

Step 5, Data Process

After scan, press GOTO λ to enter data process (Fig. 4-16b). Press numeric key 1, recover original spectrum; Press numeric key 2 ABC to change X,Y coordinate. Press numeric key 3 DEF to enter data sheet.

Step 6, Print Curve and Peak Value

Press PRINT to print curve and data sheet.

Step 7, Save Data

Press SAVE to choose store position, press SAVE again to save, input curve name and press ENTER to confirm.

Step 8, Open and Delete Curve

Press 0 OPEN, ▲, ▼ to choose the curve you want and ENTER to open, press CLEAR to delete stored curve.

(6) BIO

Step 1, Go into DNA/Protein Test

In the Main menu,press 6 MNO to choose "BIO".(Fig. 4-17)

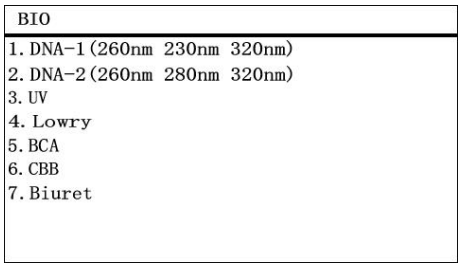


Fig. 4-17

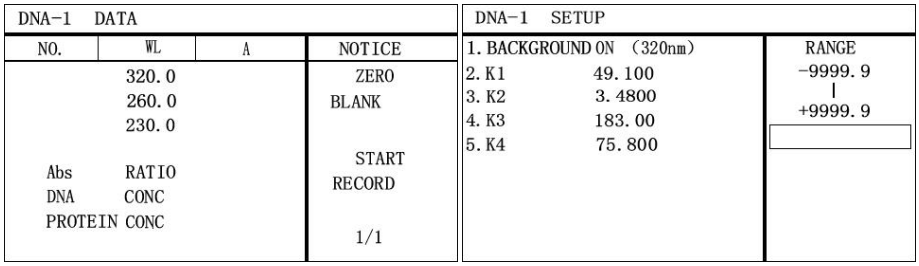


Fig. 4-18

Step 2, Choose Method

Press numeric key 1 to choose DAN-1, Fig. 4-18

Step 3, Setup

Press SET to set coefficients, input all the values of 1-5 by numeric keypad according the indication and press ENTER to confirm. Press START/STOP to enter test interface.

Step 4, Calibrate 100%T/0Abs

Place the Reference Sample in the light path, press ZERO to calibrate 100%T/0Abs.

Step 5, Sample Measure

Place the sample to be test in the light path, press START/STOP to measure. The result will display in the data sheet.(Fig. 4-18).

Step 6, Delete Data

Press clear to delete the data.

Step 7, Store the Data

After measurement, press SAVE to store the result. Input the file name by the numeric keypad, press SAVE to confirm.

5. Tools

In the main menu,press 8 TUV to select “Tools”.(Fig. 4-19)

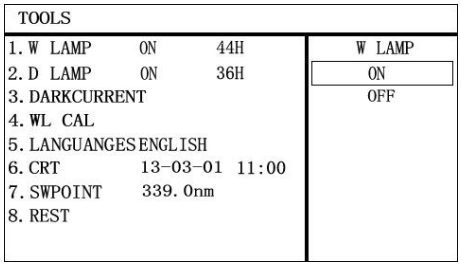


Fig. 4-19

1. W Lamp

Press 1 anduse ▲, ▼ to choose “W Lampon or off” and press ENTER to confirm.

Users can switch Off the W Lamp when test in the wavelength range of 190-339nm, so as to prolong the life time of W lamp.

2. D2 Lamp

Press 2 ABC anduse ▲, ▼ to choose “D Lamp on or off” then press ENTER to confirm.

Users can switch Off the D2 Lamp when test in the wavelength range of 340-1100nm, so as to prolong the life time of D2 lamp.

After some period of usage(About 1000h), the energy would drop off to a low level,and the test data in the UV range would get instable and deviate a lot from the experiential value. Then the D2 lamp should be replaced to a new one.After replacement, users shoud calibrate the wavelength again.

3. Dark Current

Press 3 DEF to choose “DARKCURRENT” and press ENTER to confirm. Then the system begins to refresh Dark Current.

Note: During the course, opening the lid of the compartment is prohibited.

4. Wavelength Calibration

Press 4 GHI to re-search D lamp energy curve 656.1nm. The instrument will self-calibrate when switch on.

Note: During the course, opening the lid of the compartment is prohibited.

5. Languages Selection

Press 5 JKL anduse ▲, ▼ to choose “Languages” and press ENTER to confirm.

6. Clock Setup

Press 6 MNO to choose “Clock Setup”, then press function key 1,2,3,4,5 to set up data (Fig. 4-20).

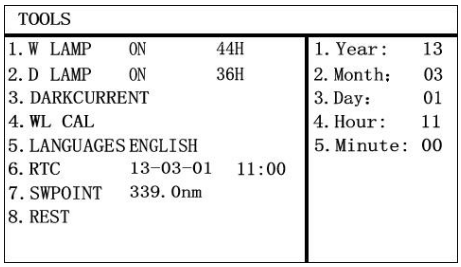


Fig. 4-20

7. Change Switch Point

Press numeric key 7 PQRS to choose “SWPOINT”. The default value is 339nm.

8. RESET

Press numeric key 8 TUV to initial files, empty all ROM files. **NOTICE: Be Cautious to use this function.**

9. BASELINE

Press numeric key 9 WXYZ to choose “BASELINE”. This function is for re-establish Baseline.

V. Instrument Maintenance

To keep the instrument work in good condition, constant maintain is needed.

1. Daily Maintain

(1) Check the Room

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.

(2) Surface Clean

The cover of the instrument is with paint. Please use wet towel to wipe off the drips on the surface immediately. Organic solution is forbidden to be used to cleanthe cover. Please wipe off the dirt on the cover timely.

(3) Clean 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. Troubleshooting

(1) Dark Current Error when Self-check

Possible Cause	Solution
· Open the lid of the compartment during the course of self-test.	Close the lid of the compartment and switch on the power again.

(2) No Response After Power On

Possible Cause	Solution
· Bad contact in power supply	Improve the contact
· Fuse melt	Replace a new fuse

(3) Printer Not Work, Printer Error

Possible Cause	Solution
· No power supply	Switch on the power supply
· Bad contact in power supply	Improve the contact
· Bad contact of the data cable	Improve the contact

(4) No Stable Reading

Possible Cause	Solution
· No enough pre-warm	Increase the pre-warm time
· Glass cuvettes used in UV Range	Use Silicon Cuvettes.
· No stable Sample	Improve the sample
· Much higher sample concentration	Dilute the sample
· Low voltage or unstable power supply	Improve the power condition
· Lights defect	Replace a new lamp
· Light used up	Replace a new lamp

(5) Worse Repeatability

Possible Reason	Solution
· Unstable sample	Improve the sample

· Cuvettes polluted	Clean the cuvettes

(6) Incorrect Reading

Possible Reason	Solution
· Dark Current Error	Re-get the dark current
· Worse matching of the cuvettes	Improve the matching of the cuvettes

3. Spare parts replacement

(1) Replace the Fuse

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, 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(Fig.5-1).

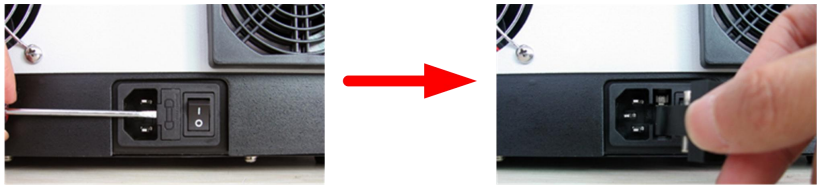


Fig. 5-1

Step 4, Replace a New Fuse
Pick out the spare fuse and replace it to the working position(Fig.5-2).

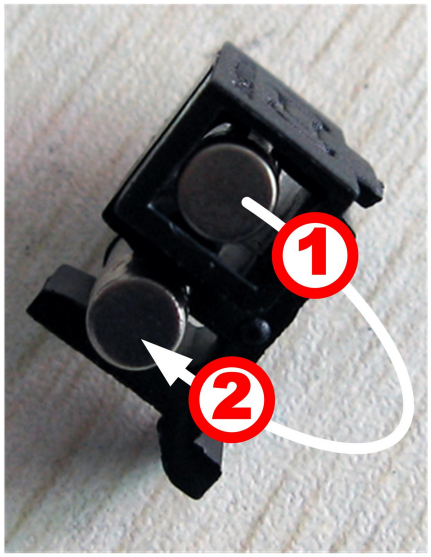


Fig. 5-2

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.

(2) Replace Lamps

High temperature ! 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 in Fig.5-3(Each side with 2 screws)and remove the cover.

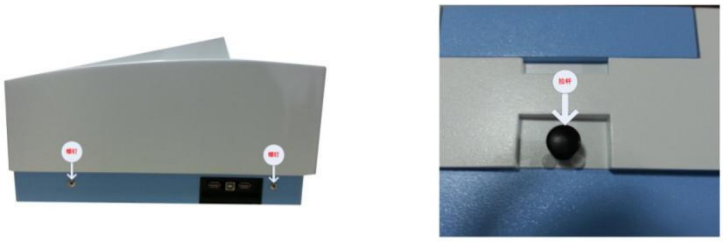


Fig. 5-3

Step 4, Open the Cover of the Light Chamber

Unscrew the 2 screws on the light chamber cover and remove it(Fig.5-4).

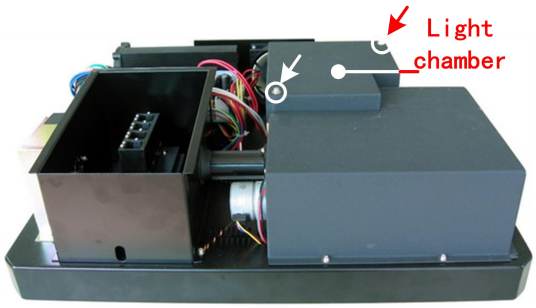


Fig. 5-4

Step 5, Replace the D2 Lamp

Unscrew the 2 screws on the D2 Flange (No.1 in Fig. 5-5), unplug the connector in the power board(No. 2)and remove the D2 lamp. Draw on the cotton glove and replace a new lamp. Fix the 2 screws and plug the connector again.

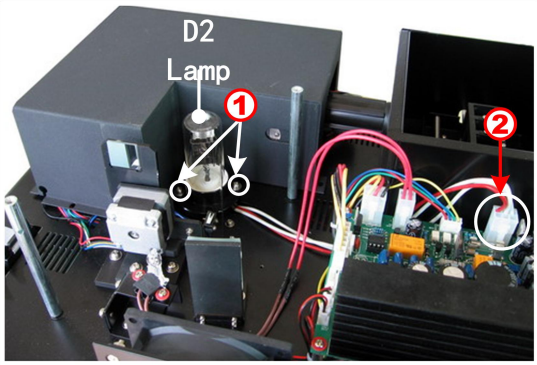


Fig. 5-5

Step 6, Replace W Lamp

Remember the direction of the filament before pull out the W lamp. Be sure that the new lamp's filament is in the same direction as before.

Pull out the defected W lamp and draw on the cotton glove. 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.

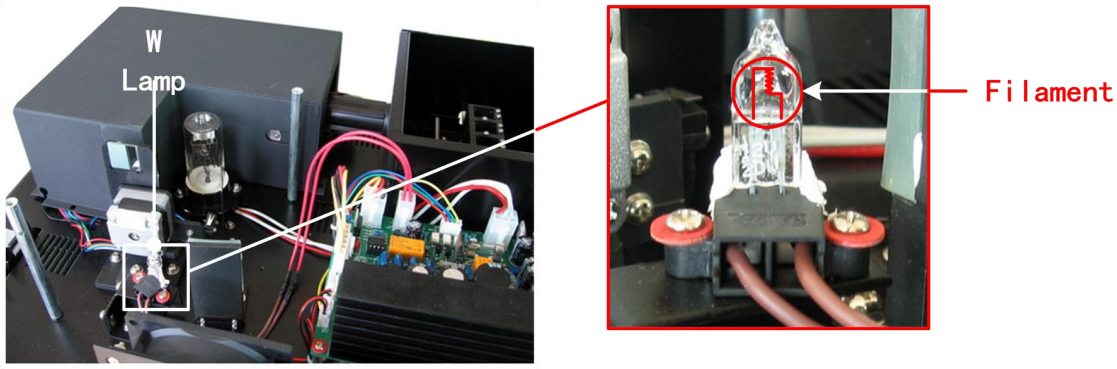


Fig. 5-6

Step 7, Adjust the Position of the W Lamp

Switch on the power,(the Switch Mirror should be placed to the position as Fig. 5-7 indicates). Observe the entrance facula,and it should in the center of the entrance hole(Fig.5-7). If the facula deviate to Left or Right, then loosen the No.1 screws in Fig. 5-8 and move the lamp seat to Left or Right until it focus on the center of the slot. Then fix the screws. If the facula deviate to Up and Down, then loosen the No.2 screws in Fig. 5-8 andmove the lamp seat Up and Down until the facula focus on the center of the slot. Then fix the No. 2 screws again.

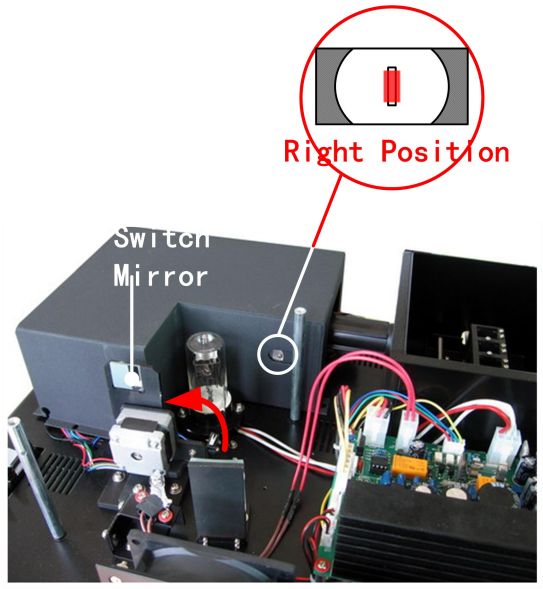


Fig. 5-7

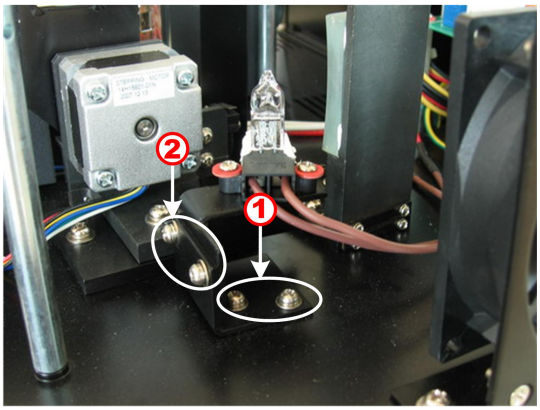


Fig. 5-8

Step 8, Finish

Reset the cover of the light chamber and fix the screws. Reset the cover of theinstrument and fix the screws. Recover the Pole in the compartment, then the course finished.

(3) Replace the Battery

Be sure to switch off the power supply and unplug the socket before open the Bottom Cover !

Step 1, Prepare the Tools

Prepare a 6×150mm Cross Blade Screwdriver.

Step 2, Switch Off the Power Supply

Switch off the power supply and unplug the socket.

Step 3, Open the Bottom Cover Plate

Unscrew the 13 screws indicated in Fig.5-9 then remove the bottom plate.

Fig. 5-9

Step 4, Replace the Battery

Pick out the old battery and replace a new one(Fig. 5-10).

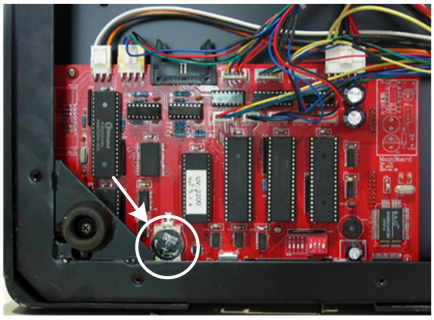


Fig. 5-10

Step 5, Finish

Recover the bottom plate and fix the 13 screws, then the course finishes.

Appendix 1: Consumable Sheet

Deuterium Lamp
Tungsten Lamp
10mm Cuvette Glass (4PCS/BOX)
10mm Cuvette Quartz (4PCS/BOX)

BIOBASE GROUP
2# building, No.9 Gangxing Road, High-tech Zone, Jinan City, Shandong Province, China
Tel: +86-531-81219803/01
Fax: +86-531-81219804
Inquiry: export@biobase.com
Complaints: customer_support@biobase.cc
After-sales service: service_sd@biobase.cc; service_ivd@biobase.cc
Web: www.biobase.cc/www.meihuatrade.com / www.biobase.com