

GR-54CCD

SLIT LAMP

# USER'S MANUAL



Thank you for purchasing our slit lamp microscope! The following is the description and specification of our product.

### General description

- 📁 This user manual elaborates on the relevant technical specification and operation notes of our slit lamp.
- 📁 Working principle: A beam of light attached to the slit lamp projects to the patients' eye, which forms an optical section of the living tissue of the eye, in this way the doctor can finish the observation and examination.
- 📁 Slit Lamp Microscopes are used to observe the disease of the anterior structures and tissue damage of eyes.

### The specification of this slit lamp microscope.

#### Microscope:


Type:	Galilean-Type
Magnification change:	Five Position revolving Drum
Eyepieces	12.5X
Angle between eyepieces:	13°
Total magnification Ratio:	6X, 10X, 16X, 25X, 40X
Pupillary adjustment:	52mm~78mm
Diopter adjustment:	±6D
Field of view:	40X (Ø5.5mm), 25X (Ø8.5mm), 16X (Ø13.5mm), 10X (Ø22mm), 6X (Ø34.7mm)

#### Slit Illumination:

Slit width:	Continuously variable from 0 to 14mm (at 14mm, slit becomes a circle)
Slit length:	Continuously variable from 1mm to 14mm
Aperture diameters:	Ø14mm, Ø10mm, Ø5mm, Ø3mm, Ø2mm, Ø1mm, Ø0.2mm
Slit angle:	0°-180° (Adjustable both vertical and horizontal)
Slit inclination	4 step: 5°, 10°, 15°, 20°
Filters:	Heat-absorbing filter, ND filter, Red-free, Cobalt Blue
Lamp:	H: 6V/20W Halogen Lamp L: 3V3W LED module
Luminance:	≥50klx

#### Electric-focus digital module specification:

Spec of image sensor:	5,000,000-pixel, 1/2.5-inch high-speed and high-definition image sensor
Resolution of image:	2592×1936

Format of image:	JPEG	
Resolution of video:	1920×1080 (Full HD) Compatible of 1296×960 & 1280×720	
Frame rate of video:	25-30fps	
Format of video:	AVI (MJPEG), MPEG4	
Mode of focus:	Auto-focus/Focus by moving the roller of the mouse	
Mode of exposure:	Auto-exposure, auto-gain	
Transmission interface:	compatible with 100M/1000M Ethernet, Standard RJ45 interface	
Base		
Longitudinal movement:	90mm	
Lateral movement:	100mm	
Fine Base movement:	15mm	
Vertical movement:	30mm	
Chin-Rest		
Vertical movement	80mm	
Power:		
Input voltage:	220V/110V~±10%	
Input frequency:	50Hz/60Hz	
Power Consumption:	H: 30VA (max) L: 20VA (max)	
Output voltage:	Light: 6V (continuously variable) Fixation: 3V Background illumination: 3V	
Dimension & Weight:		
Dimension	740mm × 450mm x 550mm	
Gross weight:	24Kg	
Net weight:	20Kg	
Working environment		
Temperature:	+5℃~+40℃	
Relative humidity:	≤80%	
Air pressure:	800hpa~1060hpa	
Storing environment		
Temperature:	-40℃~+55℃	
Relative humidity:	≤93%	
Air pressure:	700hpa~1060hpa	
Transporting environment		
Temperature:	-40℃~+55℃	
Relative humidity:	≤93%	
Air pressure:	700hpa~1060hpa	








## **General Requirements for Safety**

**Please read carefully the following precautions to avoid unexpected personal injury as well as the product being damaged and other possible dangers.**

### **Precautions**

1. In case there is any trouble, please first refer to the trouble-shooting guide. If it still can't work, please contact the authorized distributor or our Repair Department.
2. Do not use this instrument in the environment prone to fire and blast or where there is much dust and with high temperature. Use it in room and simultaneously be careful to keep it clean and dry.
3. Other medical equipment and devices that must be installed in the same place should follow the same electromagnetic compatibility principle. If the other device cannot apply to the same principle, please keep a distance of 3 meters at least between the two devices. And do not share the same power supply cable with the two devices.
4. Check that all the wires are correctly and firmly connected before using. Ensure that the instrument is well grounded.
5. Please pay attention to all the ratings of the electrical connecting terminal.
6. Turn off the main power first before replacing the main bulb, flash lamp and fuse.
7. When replacing the power cable, please use the power cable in accordance with the notes in the instruction manual.
8. Don't touch the surface of the lens and prism with hand or hard objects.
9. To prevent the instrument from falling down to floor, it should be placed on the floor where the inclination angle is less than 10°
10. Please deal with the waste disposal produced by the machine following relevant laws and regulations.
11. Read carefully the safety and other signals on this machine in order to use the product safely.

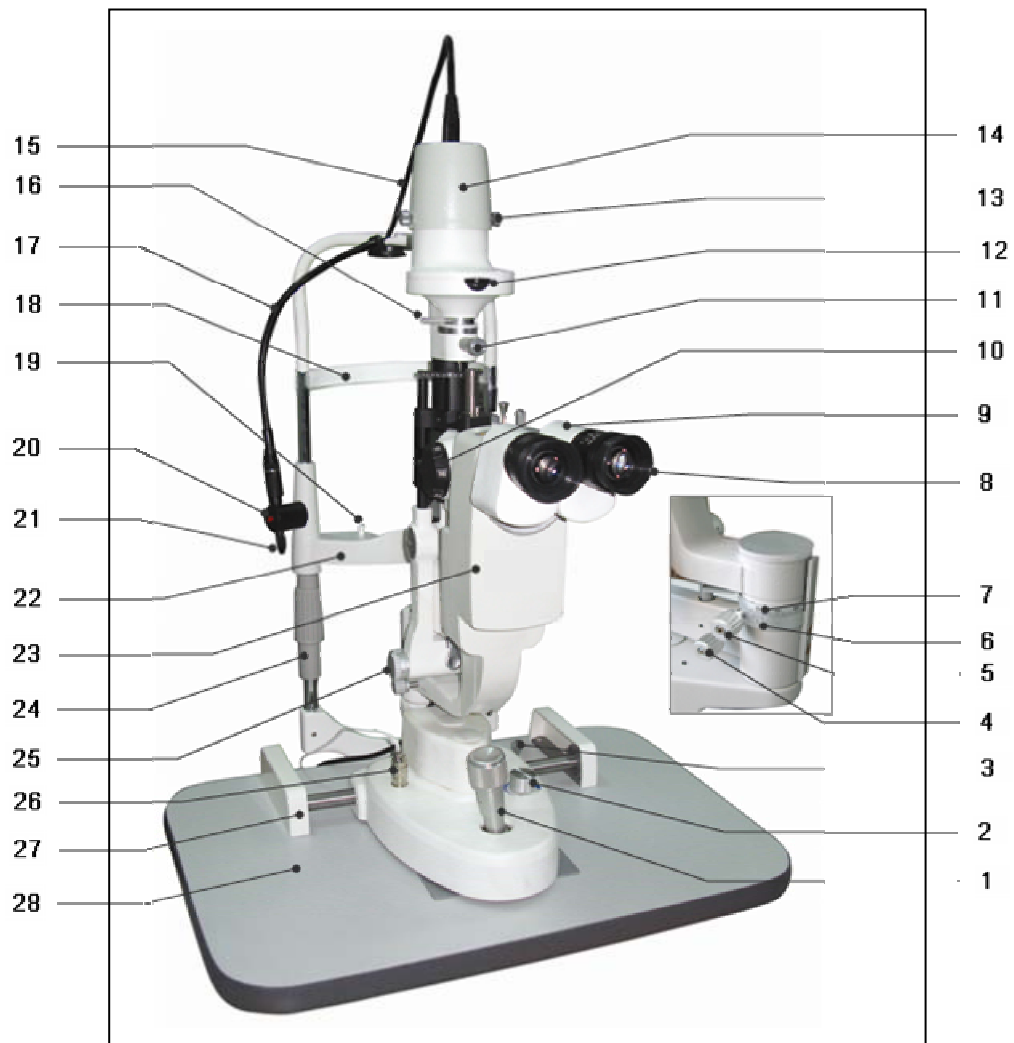
## THE SAFETY MARKS, PICTURES USED IN THIS INSTRUMENT

No.	mark	Description
1		TYPE B
2		DATE
3	<b>Class I</b>	The slit lamp is type I medical using equipment
4	<b>Type B</b>	English form of B type
5		<b>WEEE mark</b> Please deal with the waste disposal produced by the machine following relevant laws and regulations.
6		CE marking
7	PN:	Part Number
8	SN:	Serial Number
9		ON
10	○	OFF
11	Output	At the back of power supply box ,indicate outlet of the power
12	Input	At the back of power supply box ,indicate input of the power
13	Fuse F1AL250V	Rated value and current value
14	Power	At the front of power supply box, use with on and off
15	Voltage selector	Change input voltage to adjust the equipment to work under appropriate voltage
16		<p>The mark of light dimmer.</p> <p>Icon logo from the narrow to wide, said light source intensity from weak to strong</p>

## Contents

<b>1</b>	<b>NOMENCLATURE .....</b>	<b>7</b>
<b>2</b>	<b>ASSEMBLY .....</b>	<b>10</b>
2.1	CHECK LIST .....	10
2.2	ASSEMBLY PROCEDURE .....	11
2.3	CHECKING PROCEDURE AFTER ASSEMBLING .....	14
<b>3</b>	<b>OPERATION PROCEDURES .....</b>	<b>15</b>
3.1	DIOPTER COMPENSATION AND PUPIL DISTANCE ADJUSTMENT .....	15
3.2	PATIENT POSITION AND USE OF FIXATION TARGET .....	16
3.3	BASE OPERATION .....	16
3.4	OPERATION OF ILLUMINATION UNIT .....	17
3.5	OPERATION NOTES .....	18
<b>4</b>	<b>CLEANING AND DISINFECTION: .....</b>	<b>19</b>
4.1	CLEANING .....	19
4.1.1	<i>Cleaning way</i> .....	19
4.1.2	<i>Cleaning circle</i> .....	19
<b>5</b>	<b>PROTECTING AND MAINTAINING .....</b>	<b>19</b>
5.1	PROTECTING .....	19
5.2	MAINTAINING .....	20
5.3	REPLACING THE ILLUMINATION BULB .....	20
5.4	REPLACING THE FUSE .....	21
5.5	REPLACING THE CHIN-REST PAPER .....	22
5.6	CONSUMABLES .....	22
<b>5</b>	<b>TROUBLE SHOOTING GUIDE .....</b>	<b>23</b>
	<b>APPENDIX A .....</b>	<b>24</b>
	<b>APPENDIX B .....</b>	<b>24</b>

## 1 Nomenclature



1. Joystick

Incline joystick to move the instrument slightly on the horizontal surface and rotate it to adjust the elevation of the microscope.

2. Brightness Control Switch

The brightness can be adjusted continuously. Avoid working continuously at high setting, as the service life of the bulb will be shortened.

3. Base locking screw

Fasten the screw to lock the base of slit lamp.

4. Microscope Arm Locking Knob

Lock the rotational movement of the microscopes arm.

5. Illumination Arm Locking Knob

Lock the rotational movement of the illumination arm.

6. The indicate of relative angle between the microscope and illumination unit

Mark on the angle mark ring of the illumination arm, which relates to the long mark of the microscope arm, represent the two arms' angle when the "0" on the ring relates to the short mark at one side of the operator the right eyepiece may be blocked, and the side of the patient the left eyepiece.

7. The mark of microscope arm

Together with (6) to indicate the angle between the microscope and illumination unit

8. 12.5X Eyepieces

9. Prism Box

Separate the prism box to adjust the inter papillary distance until it fit for checking

10. Magnification Select Dial

Five different magnifications are provided

11. Slit Height Control Knob

Rotate this knob to adjust the spot and the slit height. Swing the knob horizontally to revolve the slit.

12. Aperture Slit Height and Display Window

It will display the diameter of the slit and the aperture.

13. The Fixation Knob of Lamp Cap

After fixing the knob, the lamp cap will not move.

14. Lamp Cap

With the function of protecting and insulating, its normal working temperature is around 51℃.

15. The plug of Lamp cap

It is connected with the power of the light unit.

16. Filter Selection Lever and display mark

The lever can choose different filters.

17. Tube for connecting the fixation target

This tube is used to connect the fixation target and background illumination module.

18. Forehead Belt



To fix the patient's head on an appropriate position

19. The Fixation Knob of Chin-rest Paper

It is used to fix the chin-rest paper.

20. Background illumination module

Provide auxiliary illumination when taking images.

21. Fixation target

Make the patient stare at it, it is convenient for checking

22. Chin-rest

23. Electric-focus digital module

Capture images and connect this module to PC to help the doctor to make diagnosis.

24. Chin-rest Elevation Adjustment Knob

Rotate the knob to adjust the elevation of the chin-rest

25. Slit Width Control Knob

The slit width is continuously adjustable within the range from 0 to 14mm. The marks on the left knob stands for the approximant value of the width.

26. Access line and plug of the brightness control

27. Rail Cover

Protect the rail surface

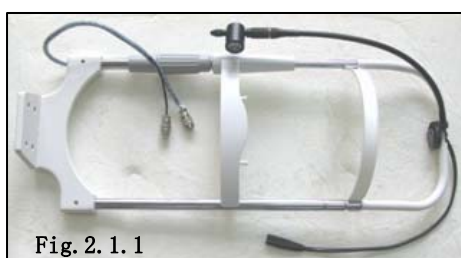
28. Work Table

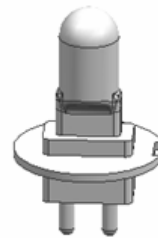
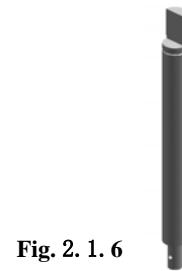
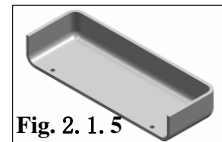
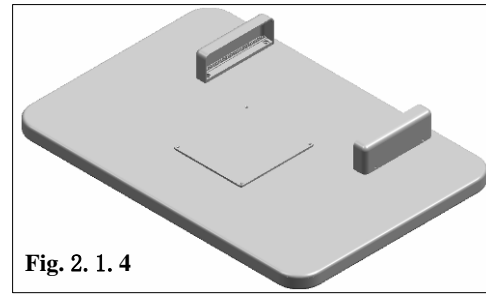
## 2 Assembly

This section of the manual describes how to assemble the slit lamp. All parts should be taken out with great care from the packing case before assembling.

### 2.1 Check List

NO.	MARK	NAME	QUANTITY	NOTE
1	A	Head-rest part	1	Fig.2.1.1
2	B	Microscope part	1	Fig.2.1.2
3	C	Illumination part	1	Fig.2.1.3
4	D	Electric digital module	1	Fig.2.1.3
5	E	Work table part	1	Fig.2.1.4
6	F	Rail cover	1	Fig.2.1.5
7	G	Power cable	2	
8	H	Focusing test rod	1	Fig.2.1.6
9	I	Protecting cap	1	
10	J	Chin-rest paper	1	
11	K	Screw driver	1	
12	L	Spare bulb (H)	1	Fig.2.1.7
13	M	User manual	1	
14	N	Packing list	1	
15	O	Power adapter	1	
16	P	Network cable (Rj45)	2	
17	Q	Mediview image process software disc	1	





## 2.2 Assembly procedure

1. Open the carton, take out the tools like screw driver and spanner.
2. Check the setting on the voltage selector located on the bottom of the power box. If it doesn't match with the input voltage, slide it to the proper position with watch screw driver. Take out the table unit check whether the power switch is in the proper position, if not use the screw driver to correct it. (caution)

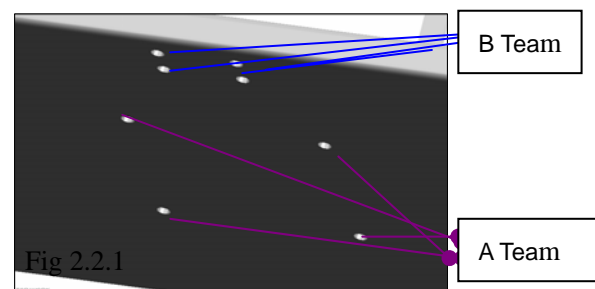
Open the fuse holder with screw driver and take out the fuse. It has been set to 220V, 1A before leaving factory.



**Attention: Set the input voltage and frequency of the instrument according to that of the mains.**

3. Before attaching the worktable

(Fig.2.1.4) on to the power table, please screw off four M6x20mm bolts with the spanner. (Fig.2.2.1 A Team) .

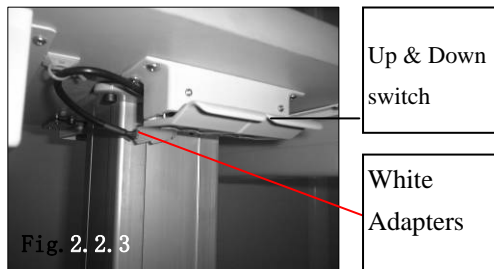


4. Lift the worktable to aim its screw hole at the assembly hole of the instrument table. (Fig.2.2.2)
5. Put down the worktable, with the power panel facing the operator, refasten the bolt securely with the spanner (Fig.2.2.2) .

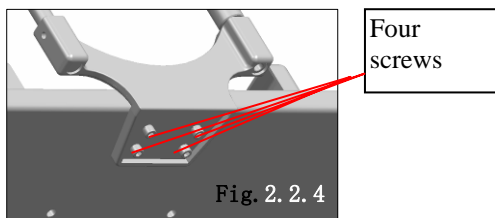


The screw to connect with the electrical table

6. Connect two white adapters under table board, Turn on and press Up & Down switch to check whether the power table is normal. (Fig.2.2.3) .



7. Remove the four screws of B Team with the screw drive (Fig.2.1.4), take out the head-rest from carton (Fig.2.1.1), ensure the four hole on head rest aim the screw hole of B team (Fig.2.2.1 B team), retighten the previously removed screw make head-rest connect with work table .(Fig. 2.2.4)



8. Take out the slit lamp part (Fig.2.1.3), put it on the rails of the table board, check whether the wheels can be rolled steadily on the rails. (Fig.2.2.5), place the rail cover to the rail, remove four screws attached to the rail with the screw drive,

retighten the previously removed screws. (Fig.2.2.5 and 2.2.6) .

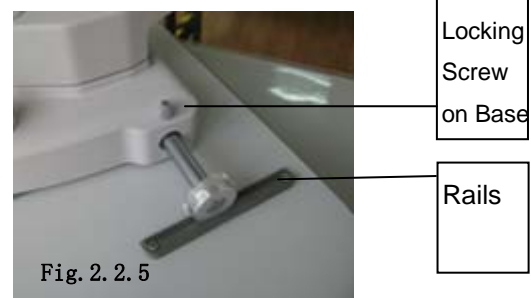
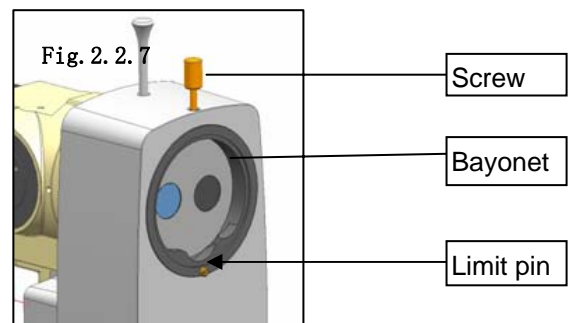
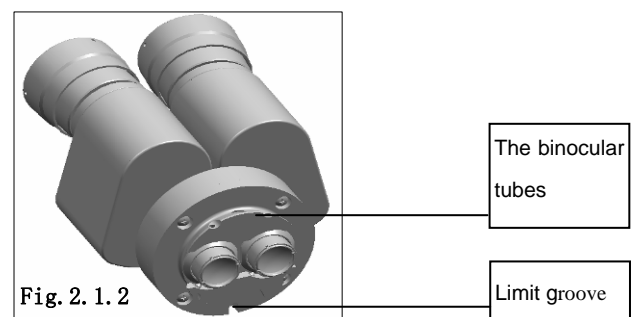
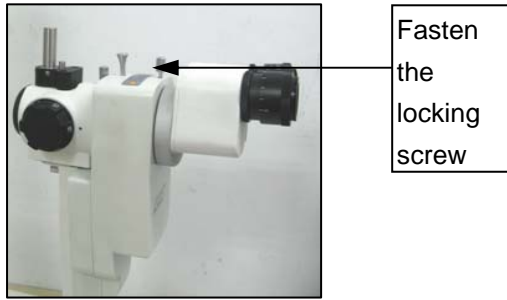


Fig. 2. 2. 6

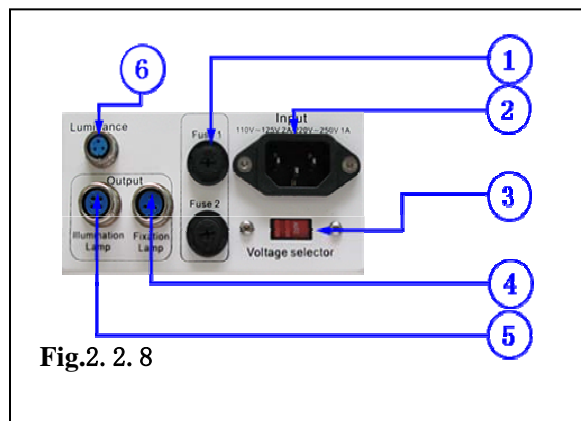
9. Take out the binocular tubes of microscope part (Fig.2.1.2), match the groove on the binocular tubes with the pin on the microscope body. Fasten the fixing screw on the body to the microscope.

**ATTENTION :**  
**Don't touch the objective and eyepiece when assembling.**

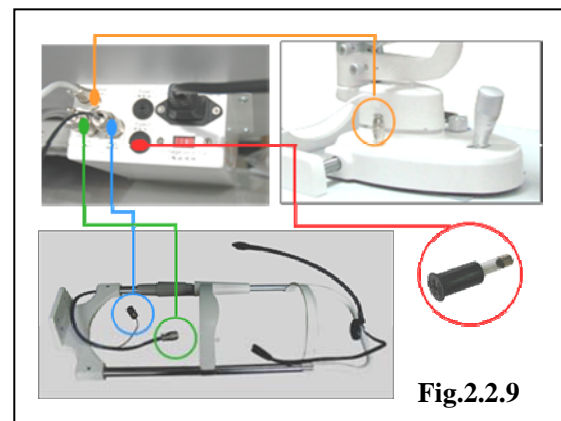




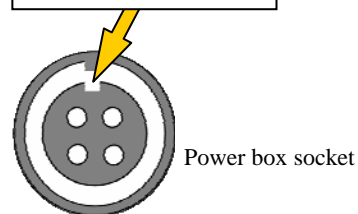
10. Please make sure the power cord of slit lamp is not connected with main power. Connect the link wire of brightness control knob on the base to the corresponding socket on the power box (Fig.2.2.9). And then insert the plug of chin-rest bracket in the correct socket, and fasten it



1. Fuse box
2. Power socket
3. 110V/220V voltage selector
4. Fixation lamp socket
5. Illumination lamp socket
6. Brightness control knob socket



There is a limit groove on the socket. Please align the plug with the groove.

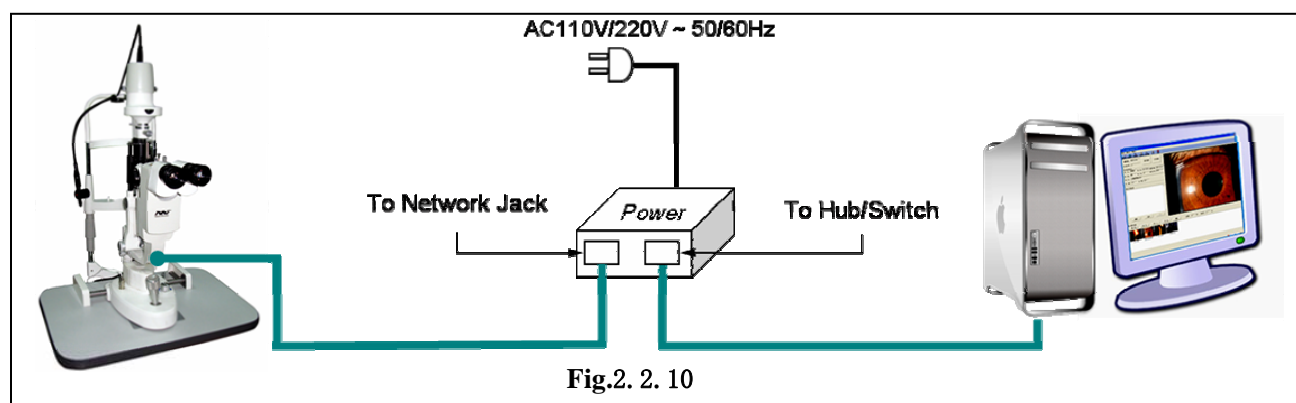


12. Check the voltage selector, this power box support working under the voltage of 110V and 220V. Please select the right voltage according to the voltage in your country.

**⚠Caution:** Wrong power selection may lead to damage of the instruments.

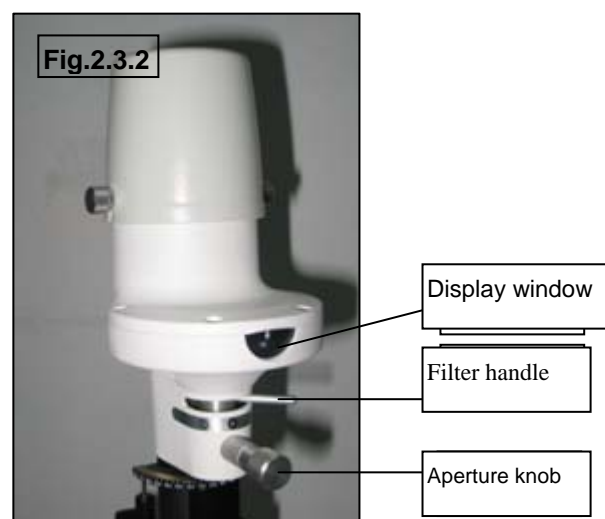
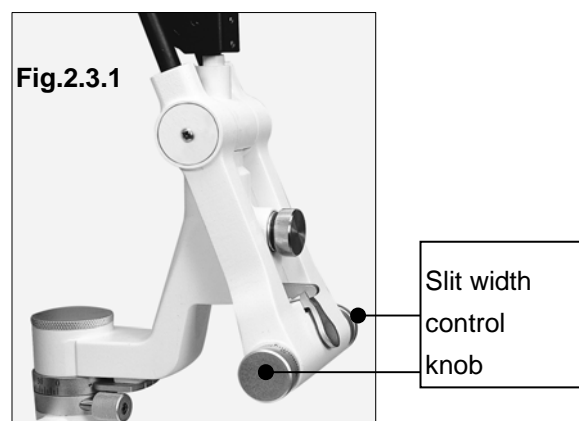
13. Please connect the digital module to the power adaptor (interface: "To Network Jack") with one of the RJ45 network cable. And use the other one to link the power adaptor (interface: "To Hub/Switch") to PC.
14. Connect the adapter to main power supply and press down the pole on the digital module. As the installation of mediview software please refer to the other manual attached.
15. Open the fuse box and make sure there is a fuse assembled  
Specification of the fuse is 1A/250V

16. Clear up all the tools and accessories and then put them into the draw under table top.



### 2.3 Checking procedure after assembling

17. This instrument supplies a 3-wire cable. Please select a proper power socket as matched. Ensure that the instrument is grounded well.
18. When the main power switch of the power box is placed at 'I', it turns on, and 'O' for turn off. The main power switch should be set at the 'O' position before connecting the input cable with the power socket.
19. Turn on the main power switch, and the pilot lamp will be lighted. Open the light control knob to examine the brightness. The power supply signal will turn bright when power is connected (Fig.3.1.3).
20. Put on focus test rod (Fig.2.1.7),
21. Adjust the slit width control knob and there should be facula on the black flat surface of focus test rod, and the brightness should change.
22. Check the fixation target device to confirm it is lighted. Ensure it can be normally lighted (Fig.3.2.1)
23. Check whether all the moveable parts such as aperture and slit height control knob (Fig.2.3.2) filter selection lever, joy stick (Fig.2.3.4) and magnification changer lever (Fig.2.3.3) etc. could be operated freely.





Magnification dial

Joystick



Fig. 2. 3. 4

24. Rotate the brightness control switch (Fig.3.1.2), the light should be from dark to bright.
25. As the operation guide for digital module and the software please refer to the other user manual attached.
26. After examination, turn off the main power and cover the instrument with the dust-proof cover.

### 3 Operation procedures

#### 3.1 Diopter compensation and Pupil Distance adjustment

##### ①Use of the focusing test rod

The rod is supplied as one of standard accessories for confirming the microscope's accurate adjustment. Insert it into the main shaft hole with the black flat surface facing the objective lens i.e. the direction of the operator (Fig.3.1.1).

**⚠ATTENTION:** The picture of the test rod is for reference only; please see the object as standard. Take out the rod after

the adjustment.

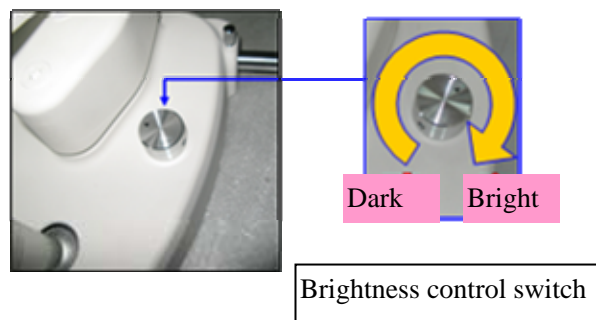
Insert the test rod into the hole



Fig.3.1.1

##### ②Brightness adjustment

Switch on the main power switch and set the brightness control switch (Fig.3.1.3) at central part. Turn the slit width control knob (Fig.2.3.1) to make the slit width to be 2~3mm.



Brightness control switch

Fig.3.1.2

##### ③Adjustment of Diopter compensation

The focus of the microscope is calibrated according to the emmetropia. If the operator is an ametropia, he should adjust the eyepiece diopter. (Fig.3.1.3).

Suggest adjusting the diopter as following procedures:

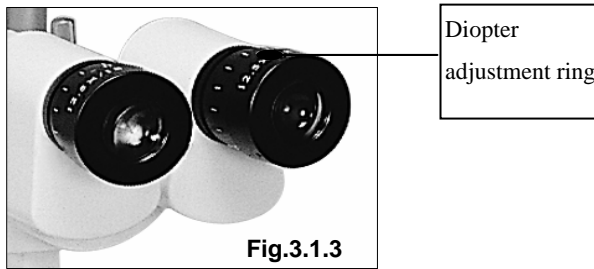
First, rotate the diopter adjustment ring counter clockwise until the end.(Fig.3.1.3)

Second, rotate the ring clockwise until a fine slit image appears on the focusing text rod. At this time, it is also the clearest observation of the reticule in the eyepiece

Adjust another eyepiece in the same way.



Record the diopter value on each eyepiece for future reference.



#### ④ Interpupillary distance adjustment

Separate the prism box of the microscope with both hands to adjust the P.D. until both eyes could see the same image on the focusing test rod through the eyepieces, and at the same time a stereo vision will be obtained. When adjusting, be sure that the eyepieces are at the same level (Fig.3.1.4).



### 3.2 Patient position and use of fixation target

#### 1) Position of the patient's head

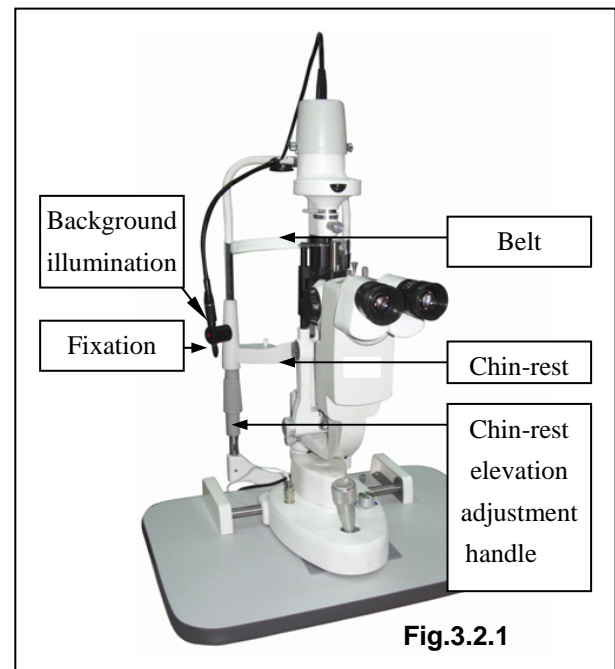
Place the patient's chin on the chin-rest with the forehead against the forehead-rest belt. Adjust the chin-rest elevation adjustment knob below the chin-rest until the patient's can thus align with the horizontal mark (Fig.3.2.1).

#### 2) Use of the fixation target

For fixing the patient's sight, just make him look at the fixation target with the eye not to be examined. Move the lamp bar to change fixing position, so as to achieve the correct lamp position

### 3) Background illumination module

This is used to provide supplementary illumination. Press the red button to turn on the module. And the module can be rotated to the comfortable angle the user need. Please turn of the module when no in use.



### 3.3 Base operation

#### 1) Horizontal rough adjustment

Keep the joystick erect and move the base to make the microscope move on the horizontal surface to aim at the object appropriately (Fig.3.3.1)

#### 2) Vertical adjustment

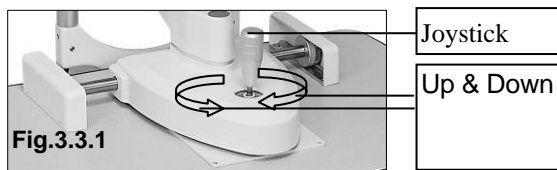
Rotate the joystick to adjust the microscope's height until it aligns with the target. Turn the joystick clockwise to raise the microscope and counter clockwise to lower it. (Fig.3.3.1).

#### 3) Horizontal Fine adjustment

Tilt the joystick to make the microscope move slightly on the horizontal surface.



While watching through the eyepieces, tilt the joystick to aim accurately at the object for a fine image. (Fig.3.3.1)



#### 4) Locking the base

When finishing the adjustment, fasten the base locking screw to lock the base to prevent it from sliding. (Fig.3.3.2)

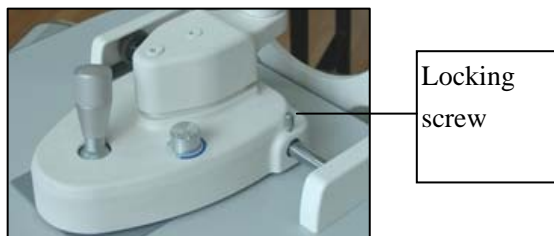
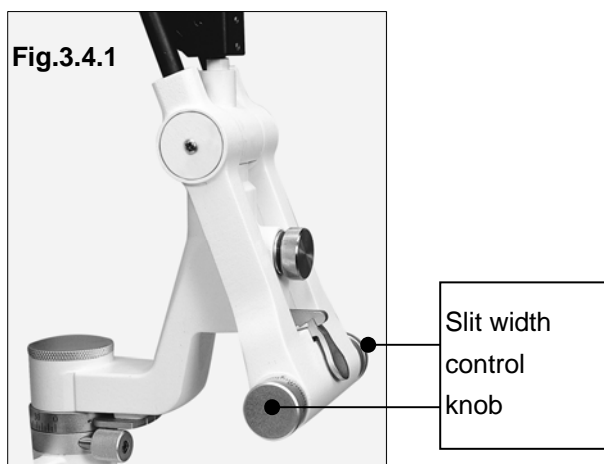


Fig.3.3.2

### 3.4 Operation of illumination unit

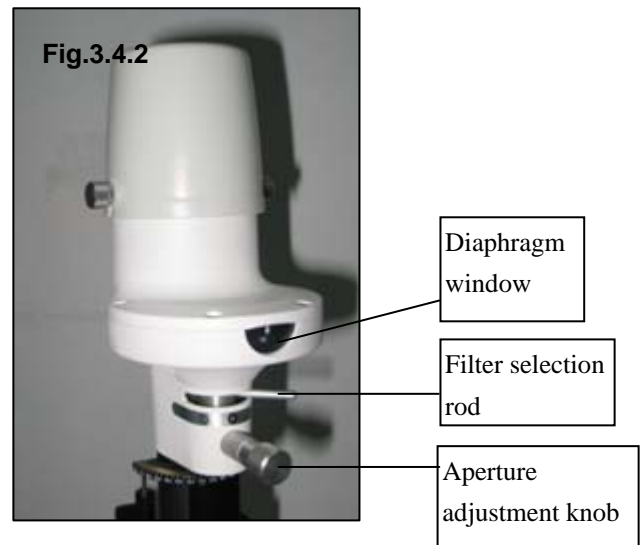
#### 1) Changing the slit width

Turn the slit width control knob (Fig.2.3.1) and the slit width will be changed from 0mm to 14mm. The slit becomes a circle at the 14mm size. The width value is indicated approximately by the scale on the knob. (Fig.3.4.1)



#### 2) Changing the aperture and slit height

Turn the aperture and slit height control knob and 7 different circular beams of light are available at full aperture: 14,10,5,3,2,1,0.2 Dia. Respectively and one continuously changing aperture. With a slit image, the slit height can be changed continuously from 1 to 14mm, which is indicated through the display window (Fig.3.4.2).

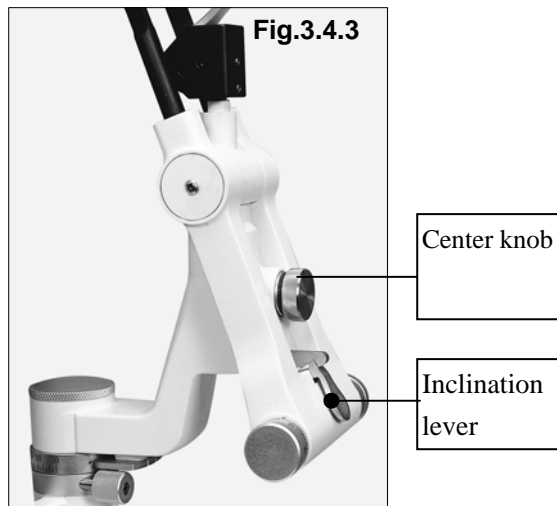


#### 3) Rotating the slit image

Swing the aperture and slit height control knob horizontally to revolve the slit image at any angle in the vertical or horizontal direction. The angle of image rotation is indicated by the rotation angle scale with small division for 5° and big division for 10° (Fig.3.4.3).

#### 4) Decentering the illumination light

Loosen the centering knob and swing the slit width control knob back and forth so the light spot moves away from the center of the microscope vision field. It is mainly used to examine the eyes by indirect retro-illumination. Fasten the centering knob and the slit light will return to the center of the microscope vision field (Fig.3.4.3).



### 5) Oblique illumination

Oblique illumination is used for sectional or fundus examination by use of a contact lens. Press down the inclination lever so that the illumination part may incline to 20°, (5° of each division). **Since the illumination part may touch the patient's head, operate carefully** (Fig.3.4.3)

### 6) Filter selection

By shifting the selection lever four different filters can be inserted into the illumination pathway. Usually the thermal safety filter can make the patients feel comfortable. After using the other filters, we should turn back to the thermal safety. (Fig.3.4.3).

From left to right: No Filter, Heat-absorbing filter, ND filter, Red-free, Cobalt Blue.



**Caution:** The no filter is used for proofreading by the manufacturer.

## 3.5 Operation notes

1) In the course of the operation the operator should learn more about the contents of the user menu, to master the structure and function of slit lamp microscope so as to

carry out the right operation and diagnosis.

2) In order to prevent unnecessary observations arising from the misuse of the judge, operators should observe clearly the different locations in the knob corresponding to a different scale and different directional marks in the process of using the SLM.

3) Operator should adjust the interpupillary distance and diopter correctly in the operating or which may lead a feeling of dizziness

4) Operator may have a feeling of dizziness in long time observing, so please adjust observing time according to personal habit.

5) There will be a branch of crack-ray irradiation in patients' eyes, when they receiving SLM diagnosis. So if the light is too dark, it will affect the observing effect. Conversely, if the light is too bright, in a long time exposure patients' vision might be affected. If patients feel uncomfortable, please tell the operator or take medical treatment. Therefore, please try to avoid prolonged exposure of patients' eyes in the bright light.

Please make sure the pole of the beam splitter (combined inside the digital module) be pressed down. Only in this condition, the digital module can capture images, however, the light through the eyepieces will be lessened. So it's normal that the brightness of viewing field declines. (fig.3.5.1)



## 4 Cleaning and disinfection:

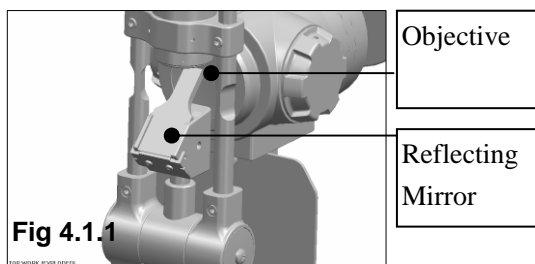
**⚠ Attention:** The replaced waste materials should be treated as industrial rubbish.

### 4.1 Cleaning

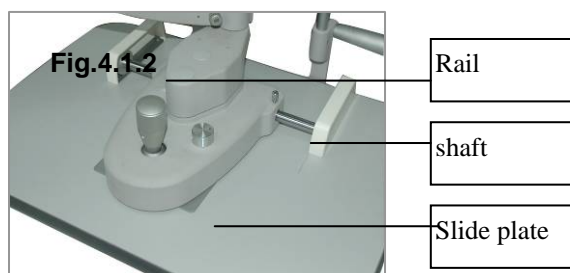
#### 4.1.1 Cleaning way

- ① **Cleaning the lens and reflecting mirror:** If any dust stick on the lenses or reflecting mirror, wipe it off with soft cotton dipped with absolute alcohol. (Fig.4.1.1).

**⚠ Attention:** Don't wipe with hands or hard project or any corrosive detergent lest that the surface should be damaged.



- ② **Cleaning the tie plate, rails and shaft:** If the slide plate, rails and shaft are dirty, the vertical and horizontal movement will be unsteady. Wipe them with clean soft cloth. (Fig.4.1.2).



- ③ **Cleaning and sterilizing the plastic parts:** Clean the plastic parts such as chin-rest bracket, forehead-rest belt with soft cloth dipped with soluble detergent or water, then sterilize with medicinal alcohol. **Attention:** Don't wipe with any corrosive detergent lest that the surface should be damaged. (Fig.3.2.1).

#### 4.1.2 Cleaning circle

- a) Clean the eyepieces, objective lens and refractor:

Cycle: suggested once every two months. The lenses are plated with a reflection reducing coating and reflective coating on its surface. Although the coating is hard enough, too frequent wiping will weaken it, which leads to a bad observing optical effect. Two month is a recommendation; if there is lots of dust on the lens, please wipe it immediately.

- b) Cleaning the slide plate, rails and shaft:

Cycle: suggested once a month

These parts won't get dirty in a clean environment such as hospital in one year. However, we suggest you clean them once every 6 months so that you can get a much better movement effect.

- c) Cleaning the plastic parts:

Cycle: suggested once a day

These two parts contact with the patients directly, so please clean them timely. Please replace a new and clean chin-rest paper for each patient.

- d) Cleaning the whole machine:

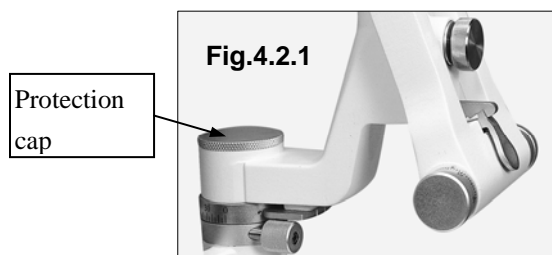
Cycle: suggested once every two months.

## 5 Protecting and maintaining

Correct and periodical protecting and maintaining can prolong the service life of the slit lamp. The suggested maintaining circle is two months.

### 5.1 Protecting

There are always dusts and physiological salt solution dropping into the main shaft hole of the illumination ram during the operation. Please cover the main shaft hole with the protection cap lest the instrument would be damaged. Take off the cap when the focus test rod needs to be assembled (Fig.5.1.1).



## 5.2 Maintaining

### 5.2.1. Adjust the slit width control knob

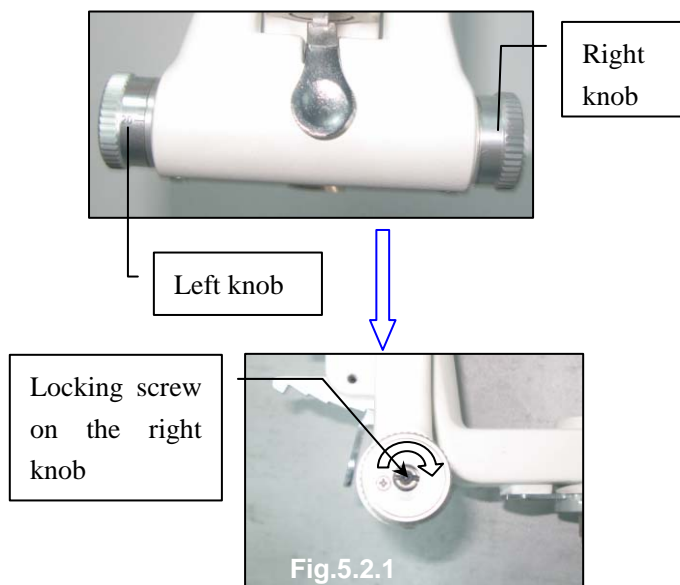
#### PART ONE:

If the slit width control knob is too loose, the slit width may be out of control. Loosen the screw on the right knob with the screw driver, then hold the left knob firmly with one hand, while the other hand rotate the right knob clock-wise to adjust its tightness. When it is appropriate, fasten the screw of the right knob firmly again (Fig.5.2.1.1).



#### PART TWO:

1. If the slit width control knob is too loose, the slit width may be out of control. Fasten the locking screw on right side clockwise with a hexagon type screw driver.



2. Follow the steps listed below to do the adjustment.

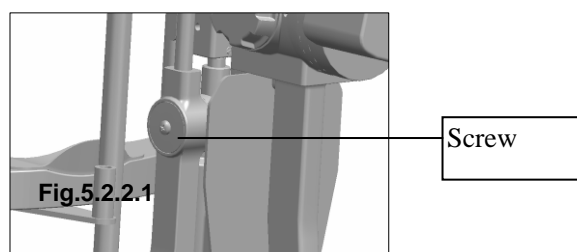
a) Rotate the locking screw with a hexagon type screw driver.



b) If the knob is too loose, adjust the screw clockwise (as fig. 5.2.1.8 shows). If the knob is too tight, rotate the screw anticlockwise till the knob is comfortable to use.

### 5.2.2 Adjusting the inclination of the illumination part

If the inclination mechanism of the illumination part is too loose, fasten the screw on both sides of the pivot point with the screw driver. (Fig.5.2.2.1)



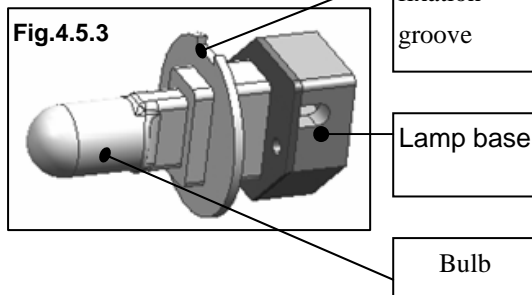
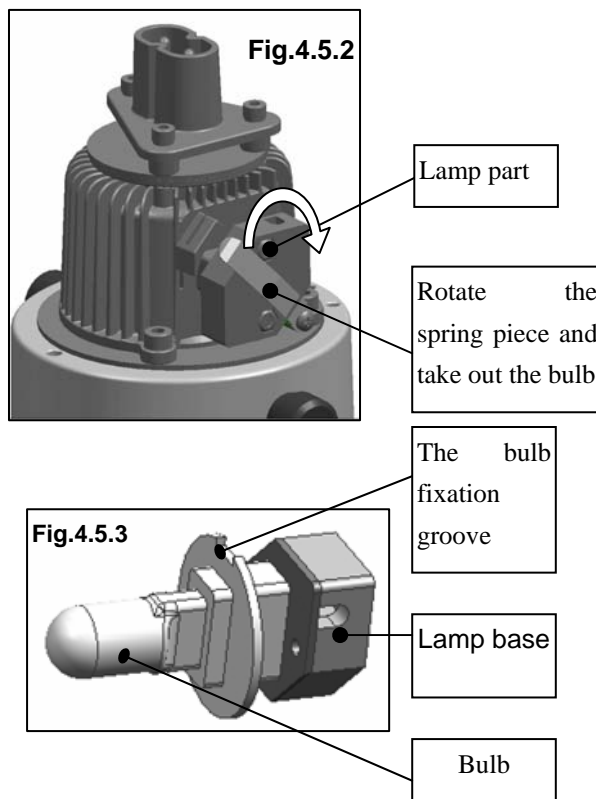
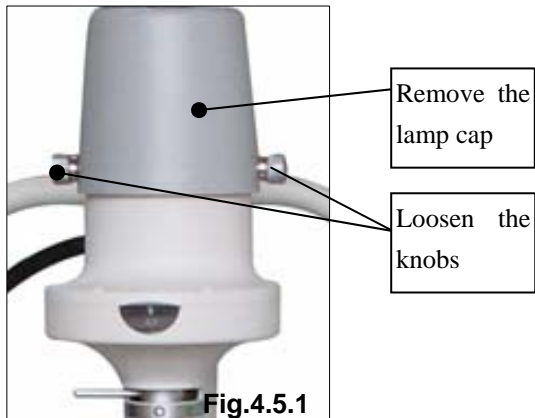
## 5.3 Replacing the illumination bulb

**L slit lamp** adopts the 3V3W Led module. The life span of the module is more than 20000 hours. So it's no use to replace the module.

**H slit lamp** adopts 6V20W Halogen bulb. The life span of the bulb is 480 hours. Please replace the bulb according to the following steps when the luminance declines,

1. Turn the main power switch off. (Fig.3.1.3);
2. Pull out the plug attached to the lamp house, remove out the fixation knob. Pull up

the lamp cap from the illumination unit. (Fig.4.5.1& 4.5.2)



3. Take out the old lamp part (Fig.4.5.2), replace it with a new one. The groove in the bulb fixation disc should be aligned with the flange of the lamp base, otherwise the illumination may be uneven (Fig.4.5.3), Fix the lamp part with three knobs.

4. Place the lamp cap in the original position, fix the lamp cap with the knob,

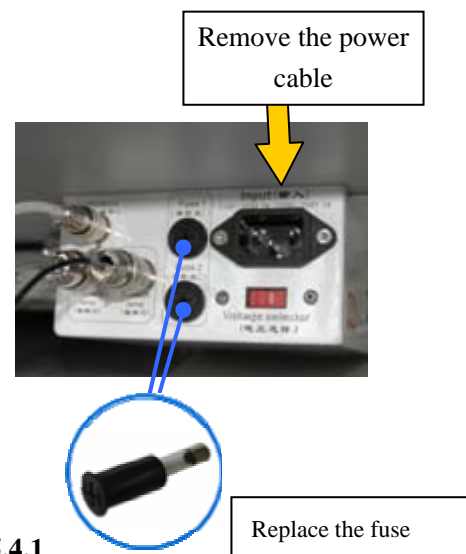
insert the connecting plug.

5. Turn on the main power switch and check whether the new bulb is illuminating. Check the spot to make sure it round and no false light. (Fig.3.1.3)

## 5.4 Replacing the fuse

1. Turn off the main power switch (Fig.3.1.3), remove the power cable from the socket. (Fig.5.4.1).

2. The fuse is inserted in the fuse box which has fuse mark. Please rotate the fuse part out (Fig.5.4.1) by pressing the fuse box with a screw or a coin. One fuse is in use, the other is in spare. Please check them, if the one in use is burnt, please replace it with the spare one and then place both the two fuse parts into original place.



3. The fuse specification:

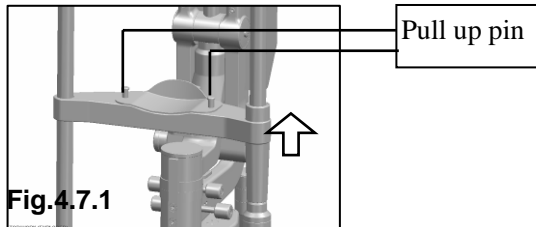
F1AL250V



**Attention: Please select the fuse of the same type, specification and rate value.**

## 5.5 Replacing the chin-rest paper

When the paper is depleted, pull upward two fixing pins of the chin-rest and place a new package of paper, then fix the fixing pins again. (Fig.4.7.1).



## 5.6 Consumables

Fuse: 1A/250V ..... 1 piece

Bulb: 6V20W (For the use of H slit lamp.  
The life span is 480 hours. The brightness of  
the bulb will decline beyond the time limit;  
however, it can still work. )

## 5. Trouble shooting guide

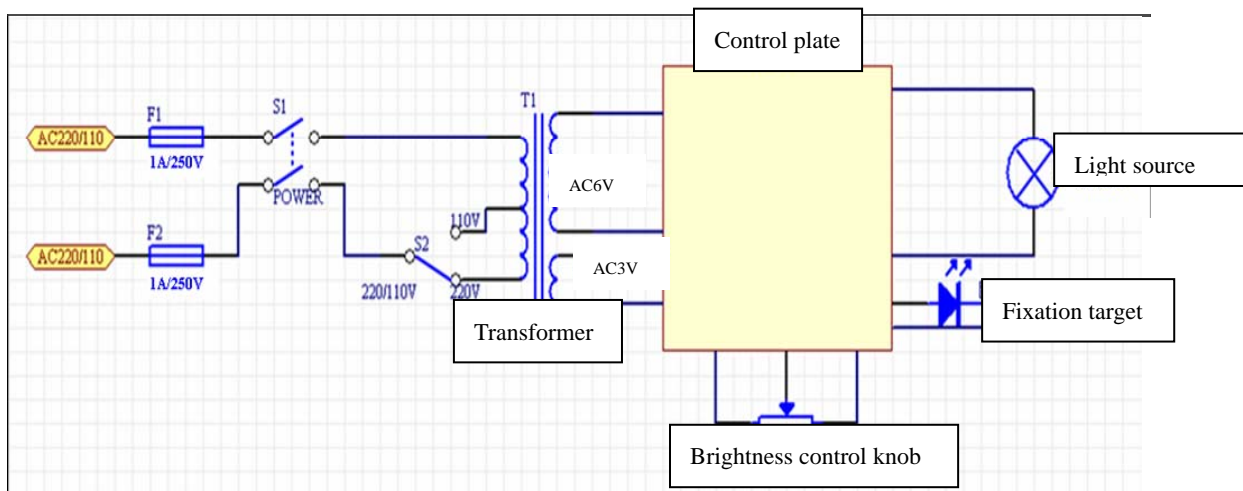
In case there is any trouble, please check according to the following table for reference. If it still cannot work, please contact the Repair Department of Shanghai MediWorks Precision Instruments Co., Ltd. or an authorized distributor.

Trouble	Possible cause	Remedy
No illumination	The cable isn't connected correctly with the power socket	Connect the power cable correctly
	The main power switch is on 'O' position	Place the switch on 'I' position
	The plug on the power box is loosen	Insert the plug firmly
	The plug on the lamp cap is loosen	Insert the plug firmly
	The bulb has burnt out	Change the bulb
	The fuse has blown	Change the fuse
	The bulb is not assembled properly	Assemble the bulb properly
	The filter lever is in the middle position or in the position of gray filter	Set the filter lever to the correct position
	the brightness adjustment knob is at min.	the brightness adjustment knob
Slit is too dark	Voltage selector is wrongly set	Set the voltage selector correctly
	The coat of the reflecting mirror is oxidized	Change the reflecting mirror
	Too much dust on the reflecting surface	Clean the surface with the brush
Fuse has blown	Voltage selector id wrongly set	Set the voltage selector properly
	The fuse doesn't comply with the specification	Replace it with a suitable fuse
Slit width closes automatically	The slit width control knob is too loose	Adjust the tightness of the control knob
Fixation bulb is off	The output plug is loose	Insert the output plug firmly

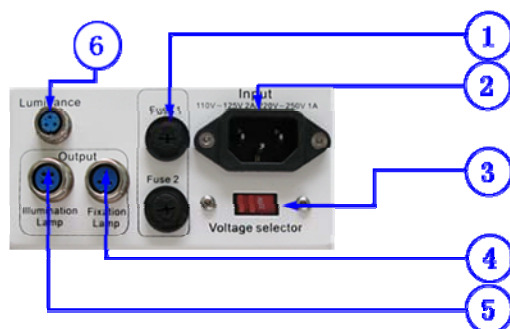


## Appendix A

### Electronic Circle Drawing

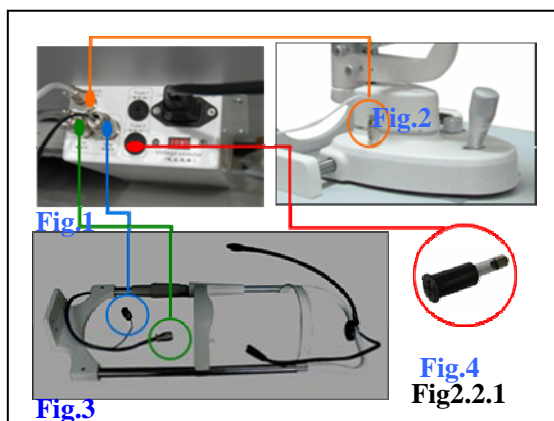


### Illustration of the board of power box:

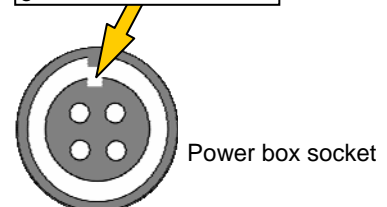


- 1) Fuse box
- 2) Power socket
- 3) 110V/220V voltage selector
- 4) Fixation lamp socket
- 5) Illumination lamp socket
- 6) Brightness control knob socket

### Assembly of power supply:




There is a limit groove on the socket. Please align the plug with the groove.






1. Please connect the slit lamp with power supply (as fig. 1 shows). Refer to Fig.2, take out the link wire of brightness control knob on the base and connect it to the corresponding socket on the power box. Refer to Fig.3, insert the plug of chin-rest bracket in the correct socket, and fasten it.

 **Caution:** Make sure the main power plug is not connected.

2. Check the voltage selector, this power box support working under the voltage of 110V and 220V. Please select the right voltage according to the voltage in your country.

 **Caution:** Wrong power selection may lead to damage of the instruments.

3. Open the fuse box and make sure there is a fuse assembled (as Fig,4 shows).

Specification of the fuse: 1A/250V

4. Insert the main power cable and turn on the switch. Referring to the instruction of brightness control knob, the brightness of the bulb is adjustable.
5. Please do unplug all the cables connected between slit lamp and the power box when moving the slit lamp to a new place, in case there is any danger caused.

**Subject to change in design or specifications without advance notice**

version: 1.0

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GR-54CCD

SLIT LAMP