

# SLIT LAMP

## Instructions for use



### Preface

Thank you for purchasing our BL-III slit lamp. Please read this manual carefully for the sake of your best use.

#### General Requirements for Safety

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

#### Precautions

1. Do not use this instrument in the flammable or explosive environment, keep it away from dusty locations or high temperature. Use it indoors and keep it clean and dry.
2. Check that all the wires are correctly and firmly connected before using. Ensure that the instrument is well grounded.
3. Please pay attention to all the rated values of the electrical connecting terminal.
4. Only use fuse according to the specifications and rated values stipulated by our product.
5. Use the power cable supplied with this instrument.
6. Don't touch the surface of the lens and prism with hand or hard objects.
7. Turn off the main power first before replacing the illumination bulb and fuse.
8. To prevent the instrument from falling down to floor, it should be placed on the floor where the inclination angle is less than  $10^\circ$ .
9. Turn off the power and cover the instrument with dust-proof hood when it is not in use.
10. In case there is any trouble, please first refer to the trouble-shooting guide. If it still can't work, please contact with the authorized distributor or our Repair Department.

#### THE SAFETY MARKS USED IN THIS INSTRUMENT



TYPE B



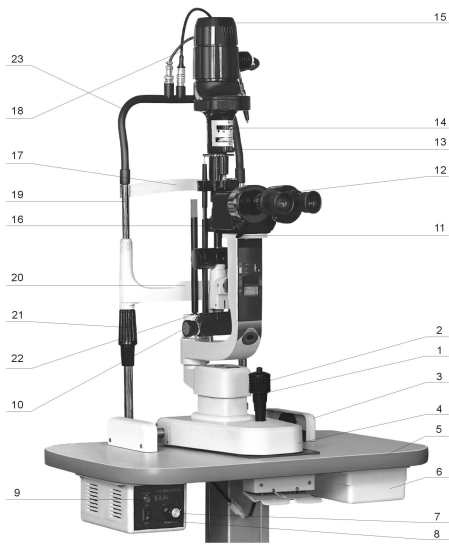
ATTENTION PLEASE  
REFER TO THIS MANUAL



TERMINAL OF THE  
PROTECTIVE GROUNDING

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## 1. Nomenclature

- 1 Joystick**  
Incline joystick to move the instrument slightly on the gorizontal surface and rotate it to adjust the elevation of the microscope.
- 2 Base Locking Screw**  
the base will be locked when fasten this screw.
- 3 Rail Cover**  
Protect the rail surface.
- 4 Base**  
Support the microscope and the illumination arms with the joystick controlling its movement
- 5 Worktable**
- 6 Accessory Drawer**  
Store the focusing test rod and other accessories.
- 7 Brightness Control Switch**  
Two levels are available-H(High), N(Normal). Avoid working continuously at high setting, as the service life of the bulb will be shortened.
- 8 Main power switch**
- 9 Pilot Lamp**
- 10 Slit Width Control Knob**
- 11 Magnification Changer Lever**  
Push the lever to either side to select the desired magnification of the microscope.
- 12 Diopter Adjustment Ring**  
Adjust the eyepieces diopter to obtain a clear image before using the instrument.
- 13 Aperture and Slit Height Control Knob**  
Rotate this knob to adjust the spot and the slif heght. Swing the knob horizontally to revolve the slit.
- 14 Slit Height and Aperture Display Window**
- 15 Lamp Cap**
- 16 Reflecting Mirror**  
The long mirror is provided. The observation pathway may be interfered as the included angle between the microscope arm and the illumination arm is only  $3^{\circ} \sim 10^{\circ}$ .
- 17 Forehead Belt**

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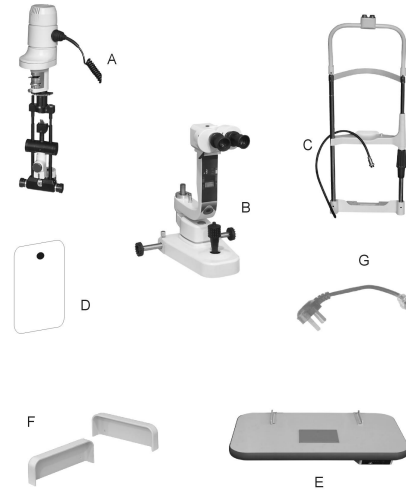
- 18 Fixation target**  
An illuminated fixed spot for patient to look at.
- 19 Horizontal Mark**  
When the horizontal center of the patient's eye is in line with this mark, the elevation of the microscope controlled by joystick is also in its center position.
- 20 Chin-rest**
- 21 Chin-rest Elevation Adjustment Knob**  
Rotate the knob to adjust the elevation of the chin-rest.
- 22 Protection Cap**

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## 2. Assembly

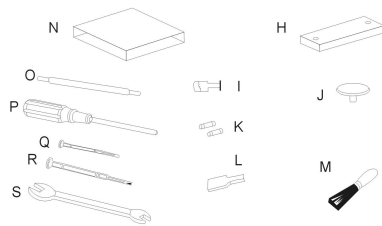
This section of the manual describes how to assemble BL-III slit lamp. All parts should be taken out with great care from the packing case before assembling.

### 2.1 Components



( Fig. 1 )

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( Fig. 2 )

Name	Quantity
A Illumination part	1
B Base Part(with Microscope)	1
C Head-rest part	1
D Breath Shield	1★
E Work Table with power Box	1
F Rial Cover	2
G Input power Cable	1
H Chin-rest paper	1
I Lamp	2
J Protection Cap	1
K Spare Fuse	2
L Spare Long Reflecting Mirror	1
M Brush	1★
N Dust Cover	1
O Focusing Test Rod	1
P Cross Screw Driver with wood Handle	1
Q Watch Screw Driver(small)	1★
R Watch Screw Driver(big)	1★
S Spanner	1★

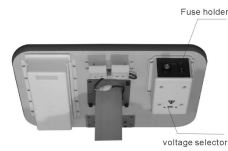
(\*Optionally available in some region.)

## 2.2 Assembly procedure

Necessary tools are as follows:

- Cross screwdriver with wood handle (P)
- watch screwdriver (R)
- spanner. (S)

### 1) Selecting Votage and Fuse



( Fig. 3 )

- ◆ Check the setting to 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 screwdriver (R).
- ◆ Open the fuse holder with screw driver(P) and take out the fuse, check and ensure that its rated value is corresponding to the mains voltage;
  - 110V.....1A
  - 220V.....0.5A
 It has been set to 220V, 0.5A before leaving our factory.

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

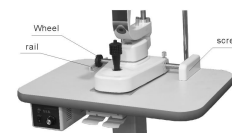
### 2) Assembling the Head-rest Part ( C )



( Fig. 4 )

- ◆ Put the Head-rest part into the drilled hole.
- ◆ Use spanner to make sure it's screw down.

### 3) Assembling the base part ( B ) and the rail cover ( F )



( Fig. 5 )

- ◆ Place the wheels of both sides of the base (B) on the rail on the worktable.
- ◆ Check whether the wheels can be rolled steadily on the rail.
- ◆ Remove four screws attached to the rail with the screw driver(P).
- ◆ Place the rail cover (F) to the rail, retighten the previously removed screws.

### 4) Assembling illumination part ( A )

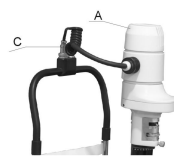


( Fig. 6 )

- ◆ Put the part (A) from the package.
- ◆ Aim the assembly hole of the illumination arm at the brass shaft/sleeve, then put it down with care.

### 5) Connecting plug

- ◆ Peel off the sticky tape attached to the lamp cap, which ensures that the cap is tightened to the lamp base during transportation.



( Fig. 7 )

- ◆ Insert the plug on the top of the head-rest part (C) into the socket of the lamp cap (18) on the illumination part (A).

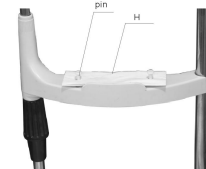
- ◆ Connect the two plugs below the head-rest part with the corresponding output socket of the power box.
- ◆ Insert the plug of the input power cable (G) into the input socket of the power box.
- ◆ Remove the cable clips from the bottom of the worktable with screwdriver (P) and wrap the output and input cables respectively, then re-attach them to the bottom of the worktable.



( Fig. 8 )

### 6) Assembling the chin-rest paper ( H )

- ◆ Pull out the two fixing pins from the chin-rest.
- ◆ Get rid of the paper package and let the pins go through its holes.
- ◆ Insert the fixing pins into the hole again.



( Fig. 9 )

## 2.3 Checking procedure after assembling

### 1) Power plug

- ◆ This instrument supplies a 3-wire cable. Please select a proper power socket as matched.
- ◆ Ensure that instrument is grounded well.

⚠ Attention:  
please uses the special cable supplied with this instrument.

### 2) The power box and the illumination part

- ◆ when the main power switch (8) of the power box is placed at " I ", it turns on, and " o " for turn off. The main power switch should be set at chit " O " position before connecting the input cable with the power socket.

- ◆ Turn on the main power switch, and the pilot lamp (9) will be lighted. Open the slit Width control knob (10) to examine the illumination.
- ◆ Press the brightness control switch (7) respectively at two positions and the brightness should be changed accordingly.
- ◆ Check the fixation target device to confirm it is lighting
- ◆ Check if all the moveable parts such as aperture and slit height control knob (13) filter selection lever (14), and magnification changer lever (11) etc. could be operated freely.
- ◆ After examining, turn off the main power and cover the instrument with the dust cover (N).

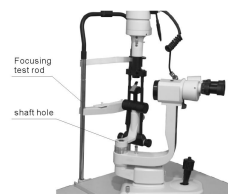
## 3 Operation procedures

### 3.1 Diopter compensation and pupil Distance adjustment

#### 1) Use of the focusing test rod ( o )

The rod is supplied as one of standard accessories for confirming if the microscope is adjusted correctly. Insert is into the main shaft hole with the flat surface facing the objective lens-the direction of the operator.

⚠ Attention:  
After adjusting, remember to take out the rod and insert the protection cap.



( Fig. 10 )

#### 2) Brightness adjustment

Switch on the main power switch and set the brightness control switch (7) at " N " position. Turn the slit width control knob (10) to make the slit width to be 2-3mm.

### 3) Diopter compensation

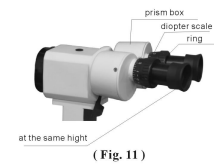
The focus of the microscope is calibrated according to the emmetropia. If the operator is an ametropia, he should adjust the eyepiece diopter.

- Suggest adjusting the diopter as following procedures.
- ◆ First, rotate the diopter adjustment ring counter clockwise down to the end.
  - ◆ Second, rotate the ring clockwise until a sharp slit image appears on the focusing text rod.
  - ◆ Adjust another eyepiece in the same Procedure.
  - ◆ Record the diopter value on each eyepiece for future reference.

### 4) Pupil 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.



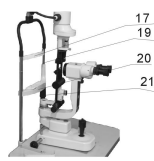
( Fig. 11 )

⚠ Attention:  
While adjusting P.D., ensure that both eyepieces are at the same height.

### 3.2 Patient position and fixation target

#### 1) Positioning the patient's head

Have the patient place his chin on the chin-rest (20) and the forehead against the forehead belt (17). Adjust the chin-rest elevation adjustment knob (21) below the chin-rest until the patient's canthus aligns with the horizontal mark (17).



( Fig. 12 )

#### 2) Use of the fixation target

- ◆ for fixing the patient's eyesight, just make him look at the fixation target (18) with the eye not to be examined. To change fixing position, move the lamp bar, as well as move the curved lever around the head-rest.



( Fig. 13 )

### 3.3 Base operation

#### 1) Horizontal rough adjustment

Keep the joystick (1) erect and move the base (4) to make the microscope move on the horizontal surface to aim at the object roughly.

#### 2) Vertical adjustment

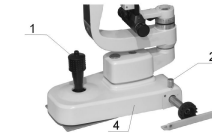
Rotate the joystick to adjust the microscope's height until it aligns with the target. Turn the joystick clockwise to raise the microscope and counter-clockwise to lower it.

#### 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 sharp image.

#### 4) Locking the base

When finishing the adjustment, fasten the base locking screw (2) to lock the base (4) and prevent it from sliding.



( Fig. 14 )

### 3.4 Illumination parts operation

#### 1) Changing the slit width

Turn the slit width control knob (12) and the slit width will be changed from 0mm to 9mm. The slit becomes a circle at the 9mm size.

Knob (13) and 6 different circular beams of light are available at full aperture-9, 8, 5, 3, 0, 2 diameter respectively. With a slit image, the slit height can be changed continuously from 1 to 9mm.



( Fig. 15 )



( Fig. 16 )

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

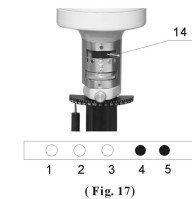
Turn the aperture and slit height control

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### 3) Filter selection

Turn the filter selection lever (14) in the horizontal surface to add four different kinds of filters respectively into the illumination pathway. Usually the heat absorption filter is used so that the patient may feel more comfortable in long period of examination.

- 1ND 2heat absorption 3grey  
4red-free 5 blue



( Fig. 17 )

### 4 Maintenance

#### ⚠ Attention:

The replaced waste materials should be treated as industrial rubbish.

#### 4.1 Replacing the illumination bulb

- ◆ Turn the main power switch (8) off.
- ◆ Loosen the screws in the lamp cap. Loosen two small screws in the lamp cap then take out the lamp base.

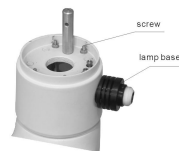
#### ⚠ Attention:

The bulb is hot

- ◆ Place the lamp cap in the original position and rotate it clockwise and insert the connecting plugs.
- ◆ Turn on the main power switch and check whether the new bulb works or not.



( Fig. 18 )



( Fig. 19 )

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### 4.2 Replacing the reflecting mirror

- ◆ Set the angle between the microscope and the illumination arm to exceed 30°
- ◆ Remove the long mirror by holding the extended surface.
- ◆ Insert new long reflecting mirror.



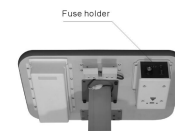
( Fig. 20 )

### 4.3 Replacing the fuse

- ◆ Turn off the main power switch (8) and pull out the input cable from the power socket.
- ◆ Screw off the fuse holder cover with the screw driver (p).
- ◆ Replace it with a new fuse, then fasten the cover.
- ◆ The fuse specifications are as follows:  
110V 1A, 250V  
220V 0.5A, 250V

#### ⚠ Attention:

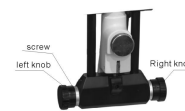
Please select the fuse of the same type, specification and rating.



( Fig. 21 )

### 4.4 Adjusting the tightness of the slit width knob

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 (o), then hold the left knob firmly with one hand, while the other hand rotate the right knob clockwise to adjust its tightness. When it is appropriate, fasten the screw of the right knob firmly again.

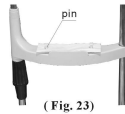


( Fig. 22 )

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#### 4.5 Replacing the chin-rest paper

When the paper is exhausted, pull upwards two fixing pins of the chin-rest and place a new package of paper, then fix the fixing pins again.



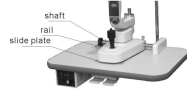
( Fig. 23 )

#### 4.6 Cleanging

##### 1) Cleaning the lenses and mirrors

If any dust stick on the lenses of reflecting mirrors, brush them with the brush (M) supplied in the standard accessories. In case and dust still remains, wipe it off with soft cotton dipped with absolute alcohol.

Clean the plastic parts such as chin-rest bracket, forehead belt with soft cloth dipped with soluble detergent or water, sterilize with medicinal alcohol.



( Fig. 24 )

##### △ Attention:

Never scratch with fingers of any other hard materials.

##### 2) Cleaning the slide plate, rail and shaft

If the slide plate, rail and shaft are dirty, the vertical and horizontal movement will be unsteady. Wipe them with clean soft cloth.

Attention: Don't wipe with any corrosive detergent lest that the surface should be damaged.

##### 3) Cleaning and sterilizing the plastic parts

#### 4.7 Consumables

Please specify names and quantities when ordering following consumables.

	Part name	Outlook
BL-III Slit Lamp	Illumination bulb	
	Long reflecting mirror	
	Chin-rest paper	
	Fuse 1A (110v) 0.5A (220v)	

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#### 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 66 Vision Tech Co., Ltd. Or an authorized distributor.

Trouble	Possible cause	Remedy	Refer to
No illumination	The cable isn't connected correctly with the power socket	Connect the power cable correctly	P7
	The main power switch is on "O" position	Place the switch on "I" position	P7
	The plug on the power box is loose	Insert the plug firmly	P7
	The plug on the lamp cap is loose	Insert the plug firmly	P6
	The bulb has burnt out	Change the bulb	P11
Slit is too dark	The fuse has blown	Change the fuse	P13
	The bulb is not assembled properly	Assemble the bulb properly	P12
	The filter lever is in the middle position or in the position of gray filter	Set the filter lever to the correct position	P11
	Voltage selector is wrongly set	Set the voltage selector correctly	P5
	The coat of the reflecting mirror is oxidized	Change the reflecting mirror	P12
Fuse has blown	Too much dust on the reflecting surface	Clean the surface with the brush	P13
	Voltage selector is wrongly set	Set the voltage selector properly	P5
	The fuse doesn't comply with the specification	Replace it with a suitable fuse	P12
Slit closes automatically	The slit width control knob is too loose	Adjust the tightness of the control knob	P12
Fixation target is off	The output plug is loose	Insert the output plug firmly	P7

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#### 6 Responsibility

We will supply the circuit diagram of the instrument, electric component list, drawing annotation and calibration details according to the customer's need for repair. If there is any need for enquiry of relative information and relative service or some questions, please contact with us directly or authorized distributors.

#### 7 Transportation and storage

During the transportation, be careful to protect it from wetness, upside down and violent vibration. The relative humidity should be 10% to 90%, and environment temperature -25°C to 40°C. This instrument should be stored in a well ventilated room without corrosive gas where the relative humidity should be 10% to 80% and environment temperature -10°C to 40°C. If the assembled instrument should be moved or transported in short distance, please lock all the movable parts. Move this instrument carefully with hands pushing or carrying its table. If for long distance transportation, please repack it with original package.

#### 8 Optional accessories (purchase in addition)

##### 8.1 10x measuring eyepiece

Replace the common eyepiece with this one to measure the length and angle.

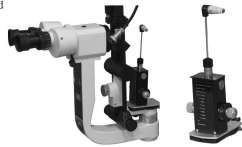
Scale specification  
Length scale: 16mm (0.5mm minimum graduations)  
Angle scale: 360° (5° minimum graduations)  
Measuring parameters  
Length scale: To be used at 10x only  
Diopter compensation: -5D to +5D  
Angle scale: No limitation



( Fig. 25 )

##### 8.2 Applanation tonometer

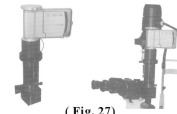
This BL-III slit lamp could be equipped with YZ30R, Haag-Streit AG Model R-900 or Model T-900 applanation tonometer for measuring the intraocular pressure.



( Fig. 26 )

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#### 8.3 Nikon Camera (purchase in addition)



( Fig. 27 )

#### 9 Specifications

Misroscope	Cross-angle stereovision
Type	Change the objective for 2-grade magnification
Model of magnifying	10x
Eye-piece	Objective x Eye-piece = magnification rate/ vision field
Total magnification rate	1x 10x 10x $\Phi$ 18mm 1.6x 10x 16x $\Phi$ 14.5mm
Range of F.D adjustment	10x eyepiece 55mm to 82mm
Diopter adjustment	10x eyepiece $\pm$ 5D
<b>Movement base</b>	
Fore and back movement	90mm
Left and right movement	100mm
Fine movement	15mm
Vertical movement	30mm
<b>Chin-rest parts</b>	
Vertical movement	80mm
Fixation target	Red LED
<b>Power source</b>	
Input voltage	100/220V $\pm$ 10%
Input frequency	50/60Hz $\pm$ 1Hz
Input power	58VA
Output voltage	Illumination bulb 9.8V, 11.6V Fixation target 7.2V
Electric safe standard	Conform to Standard IEC601-1, Class I Type B
<b>Dimension and weight</b>	
Packing box	670mmx570mmx510mm
Total weight	23kg
Net weight	20kg

Subject to change in design or specifications without advance notice.

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