LABDEX

BINOCULAR BIOLOGICAL MICROSCOPE
LX1216BMC

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Index

1. Safety Measures

1) Open the box carefully to prevent the accessories, such as the lens, from falling or being damaged.
2) Keep the instrument away from direct sunlight, high temperatures, humidity, dust, and vibrations. Ensure the stage is level, horizontal, and stable.
3) When moving the microscope, handle it by the base and the handle to avoid damage.
4) Ensure the instrument is properly earthed to prevent electrical hazards.
5) For safety, make sure the main switch is in the "O" (off) position and disconnect the power supply before replacing the bulb or fuse. Allow the bulb and lamp housing to cool completely before touching if users need to replace the bulb during or immediately after use. (Designated bulb: 6V20W Halogen Lamp)
6) Verify that the input voltage specified on the back of the microscope matches the user's power supply voltage to avoid serious damage to the instrument.
7) Always use the power cord supplied by Novel.
8) Dispose of the microscope's electrical components as electronic waste.

2. Introduction

Binocular Biological Microscope LX1216BMC is designed with siedentopf binocular head, reversed quadruple ball bearings revolving nosepiece and a pair of WF10X/18mm eyepiece. It has coarse and coaxial focus system with upper limited and tension adjustment helps in better observation of the specimen. This microscope comes with LED as external source of illumination. It is compact and light in weight, it is perfect for routine microscopic analysis and easy to operate system.

3. Features

- Easy to operate
- It has binocular head
- NA 1.25 Abbe Condenser pre-centered, focusable, with iris diaphragm
- 3W LED as external source of illumination
- Double layer mechanical stage
- Compact and light in weight

4. Specifications

Model No.	LX1216BMC
Viewing head	Seidentopf binocular viewing head inclined at 30°, interpupillary 47-78mm, 360° rotation
Nosepiece	Reversed quadruple ball bearings revolving nosepiece
Eyepiece	A pair of WF10X/18mm eyepiece
Objectives	All with anti-fungus treatment Plan achromatic objective 4x/0.10 Plan achromatic objective 10x/0.25 Plan achromatic objective 40x/0.65, spring loaded Plan achromatic objective 100x/1.25, spring loaded, oil
Stage	Double layer mechanical stage, with size: 140x140mm, 75x50mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm
Focusing	Integrated design, coaxial focus system with upper limited and tension adjustment, coarse stroke 37.7mm per rotation, fine precision: 0.002mm moving range: 25mm, provided with an adjustable tightness device to prevent slipping and a mechanical upper limit device
Condenser	Abbe N.A. 1.25 condenser with aperture diaphragm
Illumination	High brightness energy-saving S-LED illumination for long life, brightness adjustable
Power	100-240V, 50/60Hz

5. Applications

The biological microscope can be used for routine microscopic analysis of samples in research laboratories, schools, institutes, and colleges.

6. Instrument Introduction

6.1 Components Name

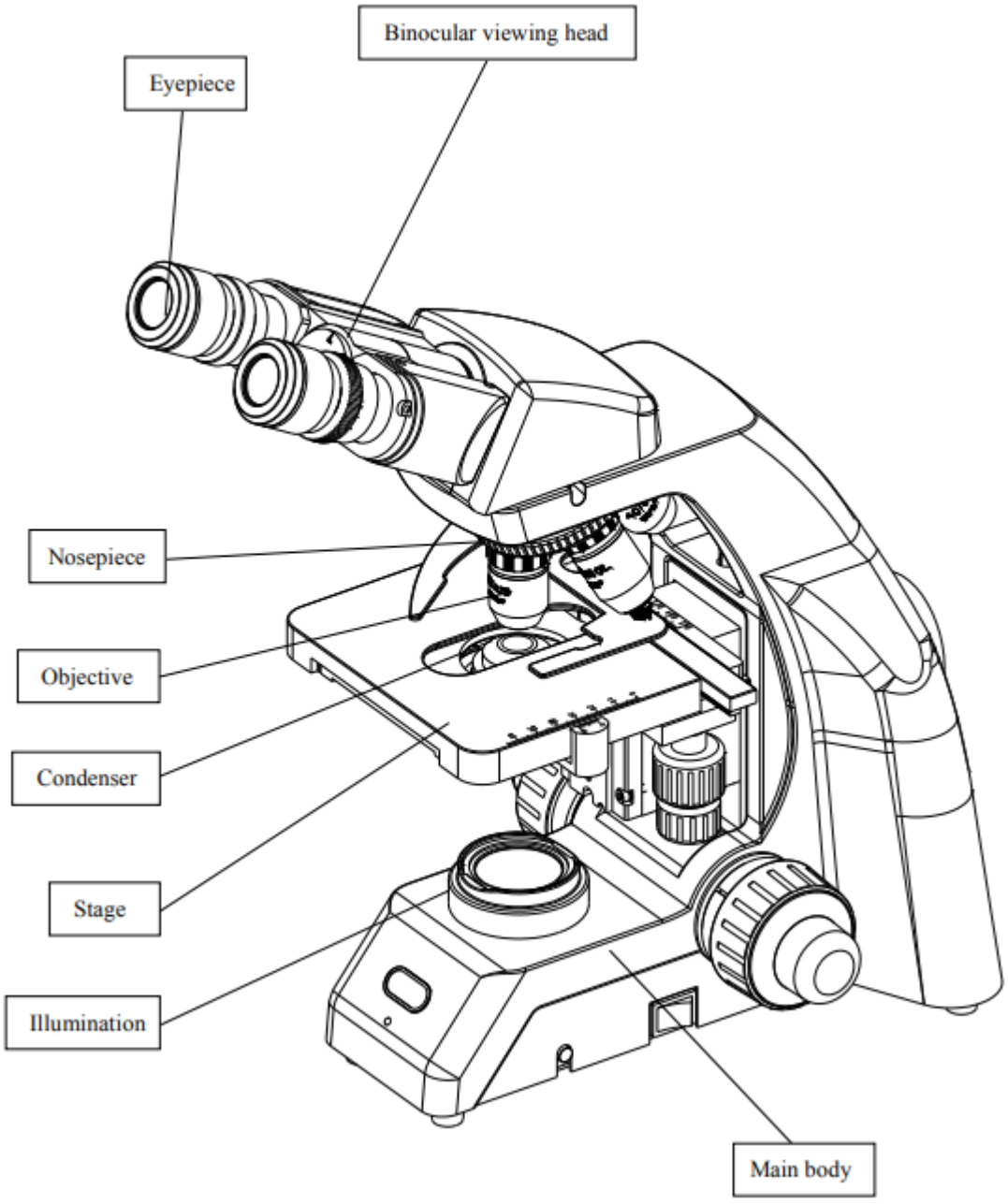

Figure-1

6.2 Eyepiece and Objectives

6.2.1 Achromatic Objective

Magnification	Numerical Aperture (NA)	Focal Length(mm)	Focal distance (mm)	Working Length (mm)	Objective
4X	0.100	0.17	31.05	37.5	Dry
10X	0.25	0.17	17.13	7.316	Dry
40X	0.65	0.17	4.65	0.632	Dry
100X	1.25	0.17	2.906	0.198	Oil

6.2.2 Infinite semi-plan objective

Magnification	Numerical Aperture (NA)	Focal Length(mm)	Focal distance (mm)	Working Length (mm)	Objective
4X	0.100	0.17	45	16.8	Dry
10X	0.25	0.17	18	5.8	Dry
40X	0.65	0.17	4.5	1.43	Dry
100X	1.25	0.17	1.8	0.13	Oil

6.2.3 Eyepiece

Eyepiece	Magnification	Focal Length(mm)	Field of view (mm)
Wide field eyepiece	10×	24.95	Φ18
Wide field eyepiece	10×	25	Φ20

6.2.4 Total Magnification

Eyepiece	10×	10×	10×	10×
Objective	4×	10×	40×	100×
Total magnification	40×	100×	400×	1000×

7. Installation

7.1 Assembly Diagram

1) The following figure shows the installation sequence of the components.
2) The number in the figure shows the assembly steps.
3) Before installing, be sure every component is clean, do not store any parts or glass surfaces.
4) Keep well with the hexagon wrench provided.
5) When changing the components, you will need it again

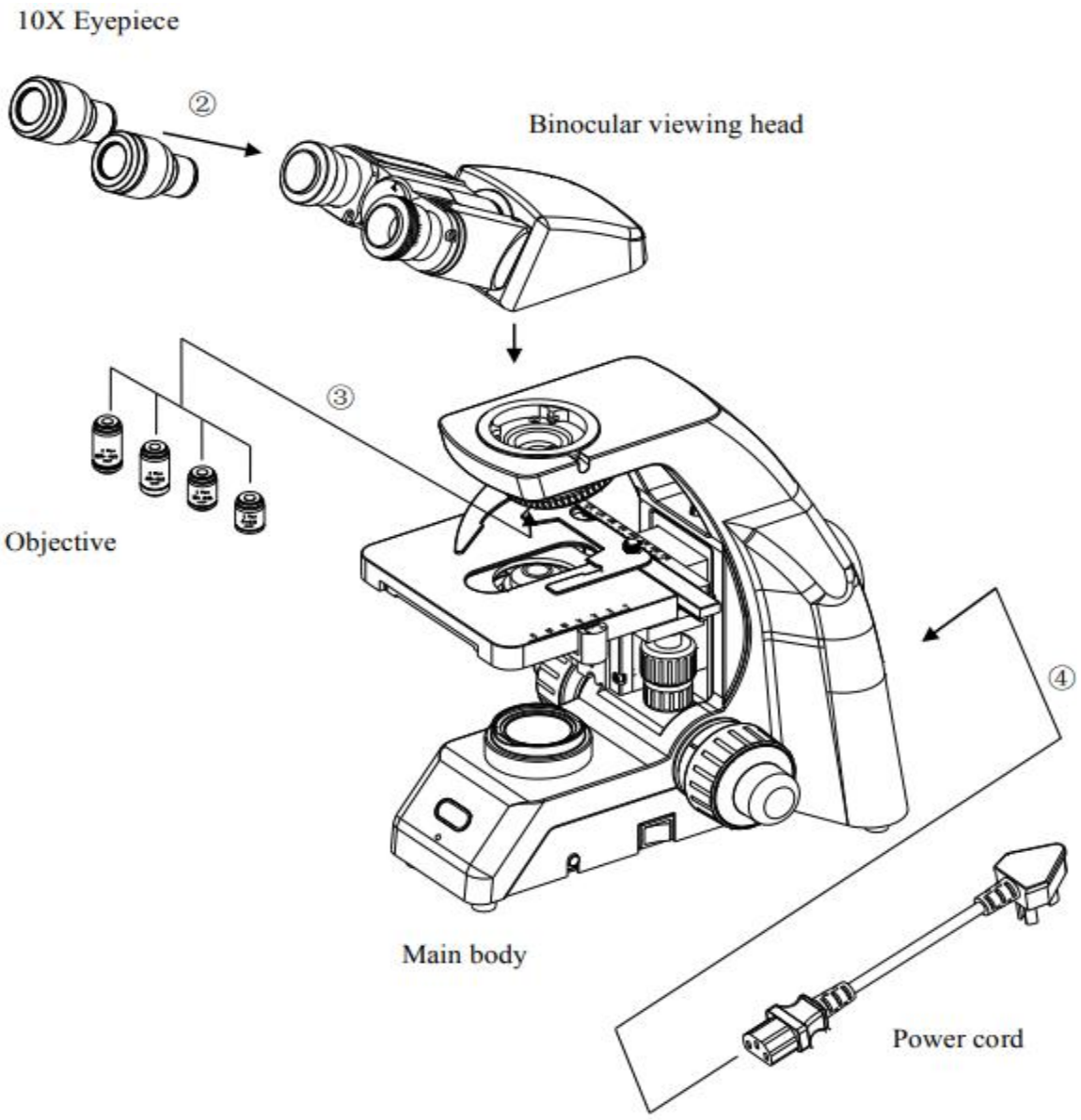

Figure-2

7.2 Assembly Procedure

7.2.1 Installing binocular viewing head

Insert the binocular viewing head into the microscope head and turn it to a proper position, then tighten it.

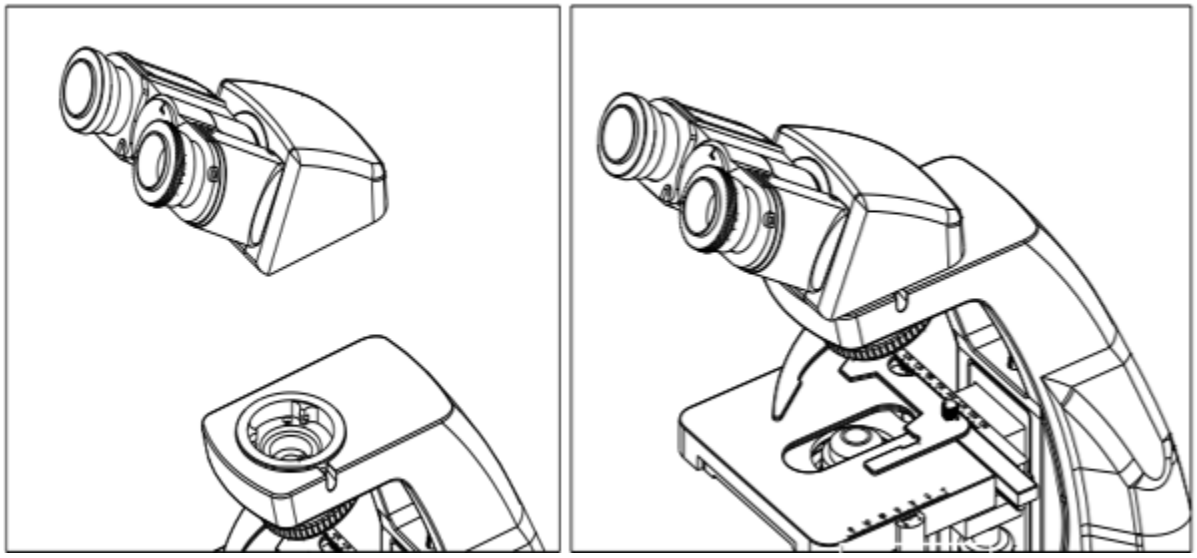

Figure-3

7.2.2 Installing the eyepiece

Insert the eyepiece into the eyepiece tube until they are against each other.

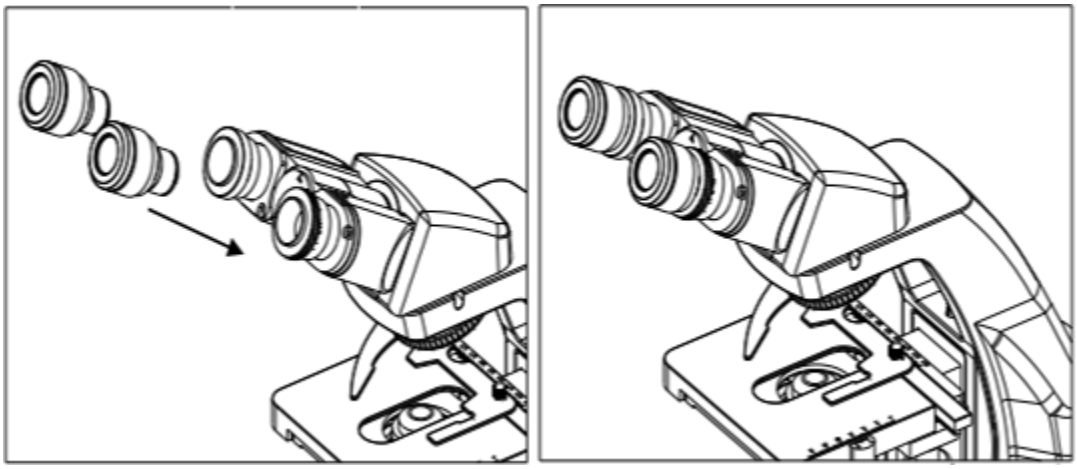

Figure-4

7.2.3 Installing the objective

1) Adjust the coarse focus knob until the support device of the mechanical stage reaches its low limit position.
2) Screw the lowest magnification objective into the nosepiece from the left or the right side, then revolve the nosepiece clockwise and mount other objectives by the sequence of low to high magnification
3) Installing the objective this way will make the change of magnification easier during use.
4) Clean the objective regularly, for the lens is susceptible to dust.
5) When operating, use a 10 × magnification objective to search and focus the specimen first, then replace it with a higher magnification objective if necessary.
6) When replacing the objective, slowly turn the nosepiece until you hear “clicked”, which means the objective is in place.

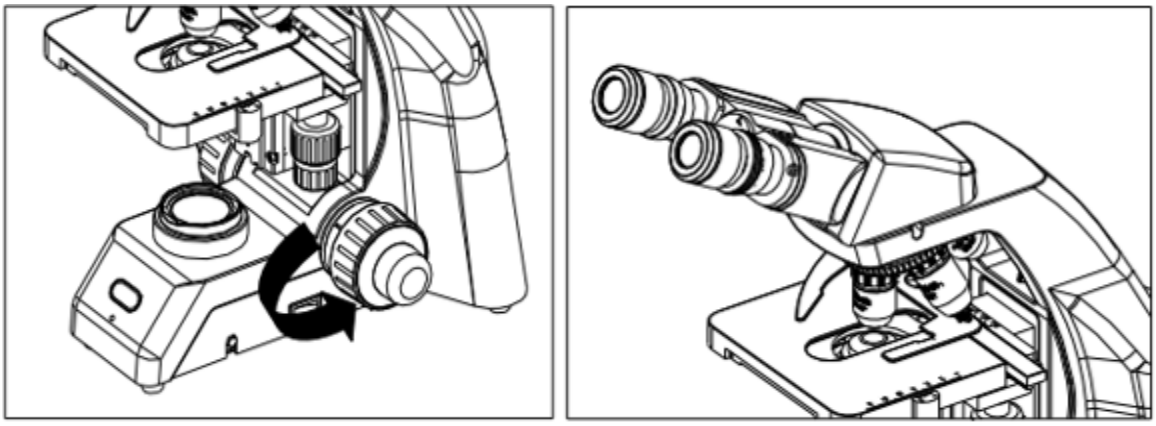

Figure-5

7.2.4 Mounting the Filters

1) Open the condenser carriage①.
2) Place the required filter② into the condenser.
3) then close the condenser carriage.
4) the filter of the standard outfit is green and baby blue.

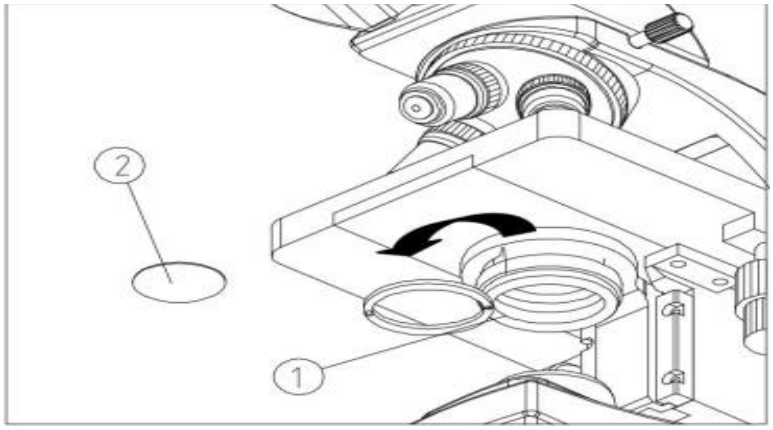

Figure-6

7.2.5 Connecting the power cord

1) The cable and cords are vulnerable when bent or twisted, never subject the power cord to excessive force.
2) Set the main switch in the (off) state before connecting the power cord.
3) Insert the plugs into the power jack of the microscope safely.
4) Plug the power cord into the power supply receptacle.
5) Make sure the connection is well.
6) Do use the supplied power cord all the time. If lost or damaged, select the same standard cord.
7) A wide range of voltage, like 100V to 240V, is acceptable for this microscope.

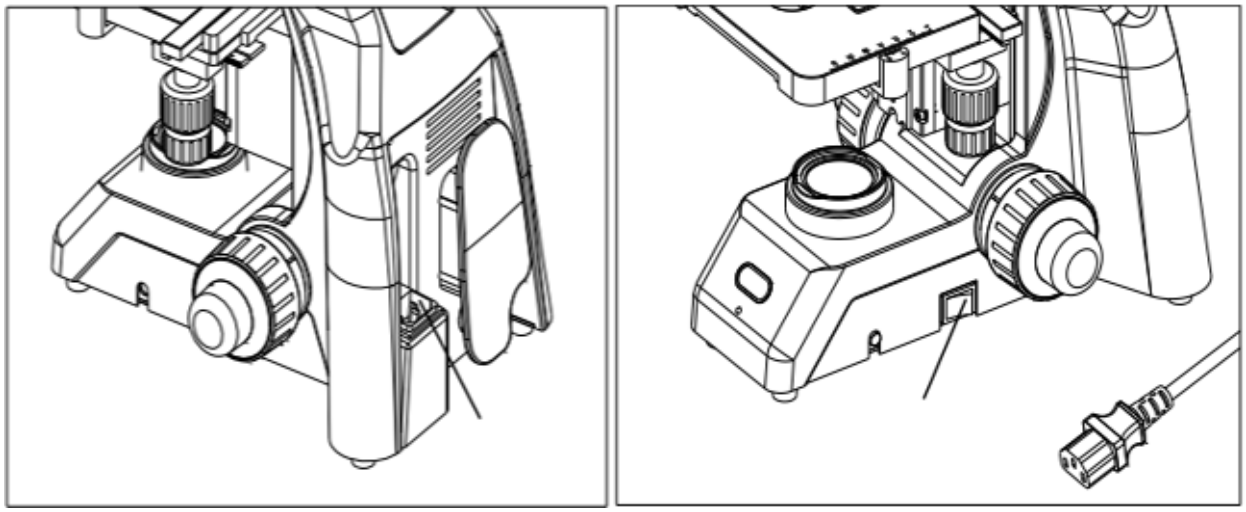

Figure-7

8. Operations

8.1 Adjustment set diagram

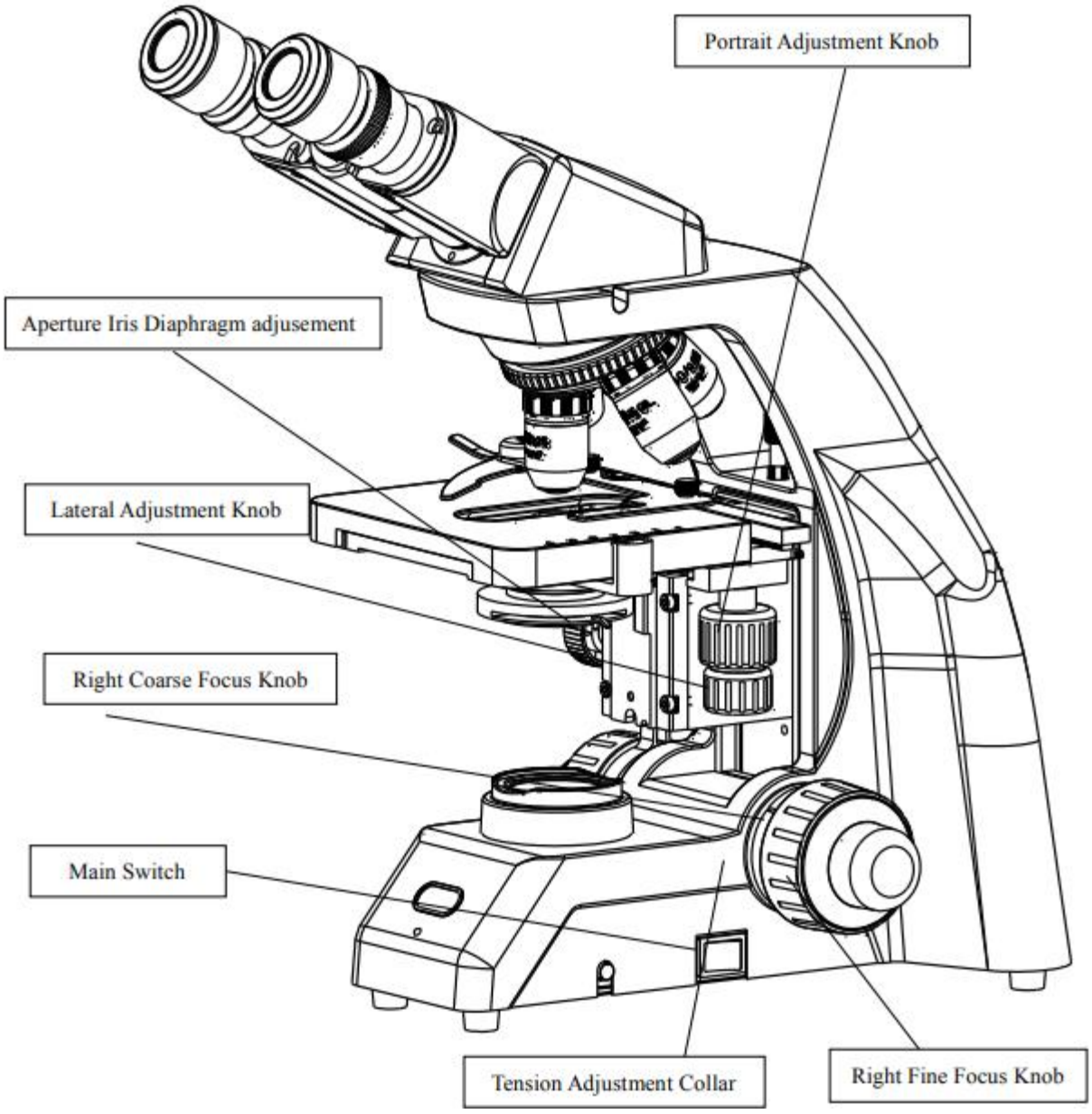

Figure-8

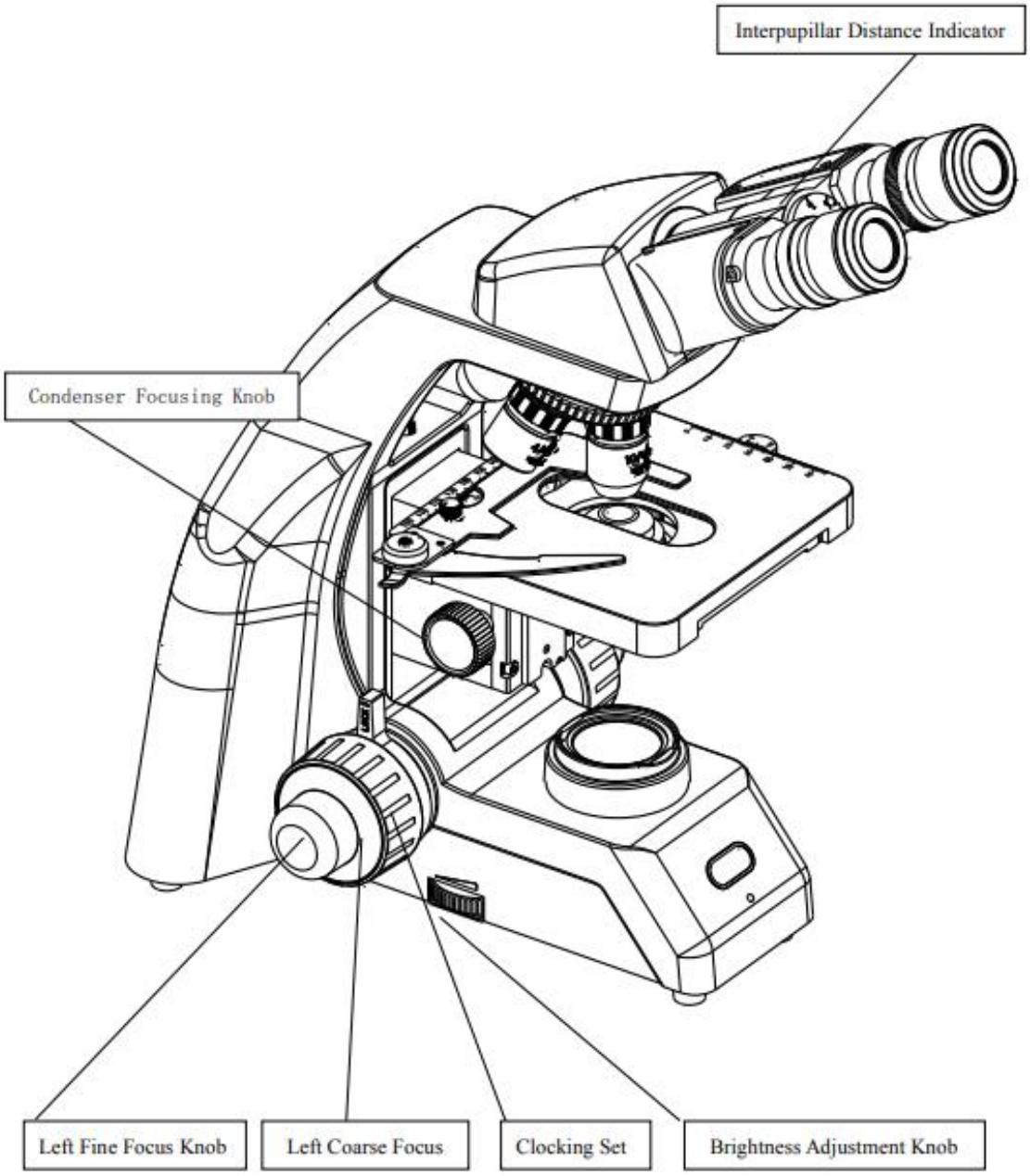
Interpupillar Distance Indicator
Condenser Focusing Knob
Left Fine Focus Knob
Left Coarse Focus
Clocking Set
Brightness Adjustment Knob

Figure-9

8.2 Adjustment and Operation

8.2.1 Brightness Adjustment

1) Connect the power cord and set the main switch ① to "—" state (ON).
2) Turning the brightness adjustment knob ②.

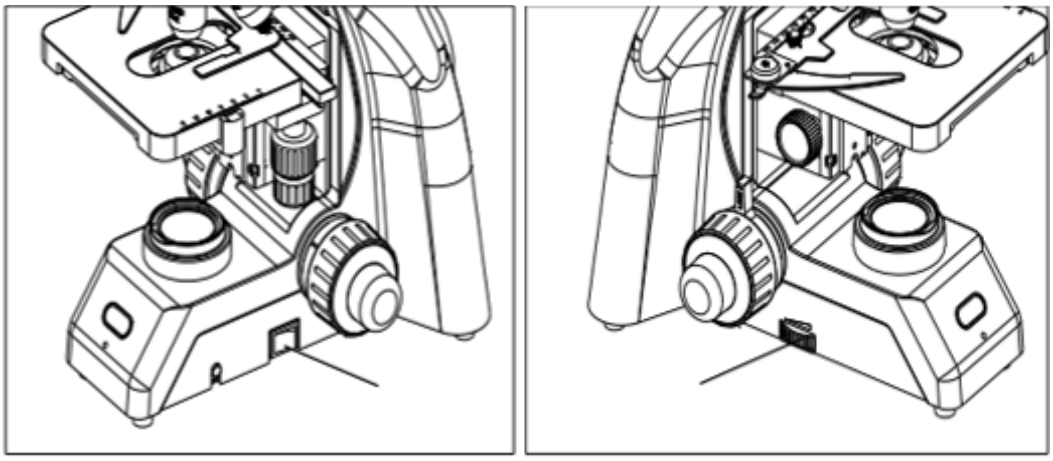

Figure-10

8.2.2 Placing the Specimen

1) Place the specimen in the center of the mechanical stage and use the stage clips to clamp it.
2) Turn the portrait and lateral adjustment knob① of the mechanical ruler and move the specimen to the required position.
3) Be careful when changing the objective.
4) If you finish the observation with the short working distance objective and want to change another one, be careful not to let the objective touch the specimen.

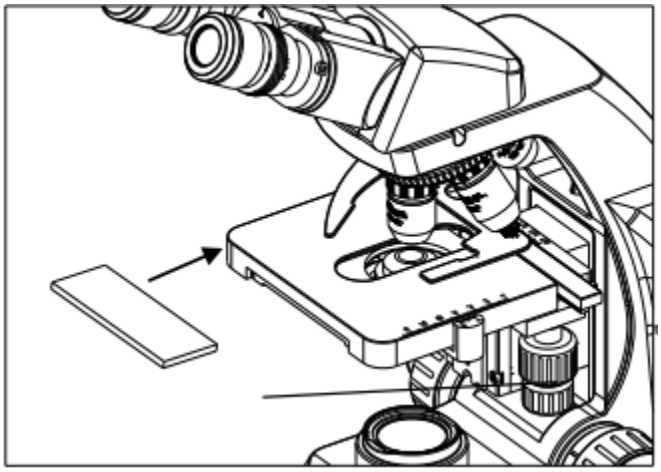

Figure-11

8.2.3 Focusing the specimen

1) Focus the specimen with a 10X objective.
2) To avoid the objective touching the specimen during focusing, you should raise the mechanical stage to let the specimen close to the objective at first, then slowly separate them to bring the specimen to focus.
3) Turn the coarse focus knob① conversely to lower the specimen and search images in the 10×ocular simultaneously, and then use the fine knob② to focus.
4) After that, you can replace it with other magnification objectives safely, and focus without the risk of damaging the specimen.
5) To see more convenient, you can use the locking set③ to fix the stage in a vertical direction.

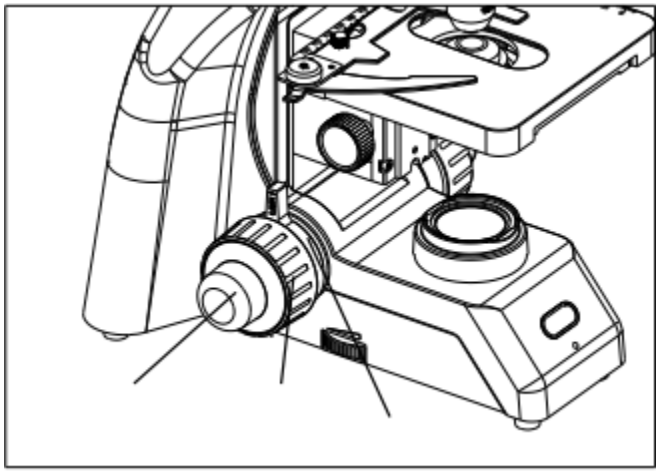

Figure-12

8.2.4 Condenser Adjustment

1) Turn the condenser focus knob① to move the condenser up and down. Raise the condenser when using the high magnification objective and descend it when using the low magnification one.
2) Focus the specimen with a 10× objective.
3) Adjust the condenser focus knob to get a clear image of the field iris diaphragm
4) Turn the condenser-centering knobs to center the image of the field iris diaphragm in the field of view.
5) The condenser and the objective are coaxial.
6) It has been adjusted before leaving the factory, so the user needn't adjust them by self
7) The highest position of the condenser has been adjusted too.
8) It also needn't any user's operation. (The top surface of the condenser is 0.03mm-0.4mm lower than the stage top surface).

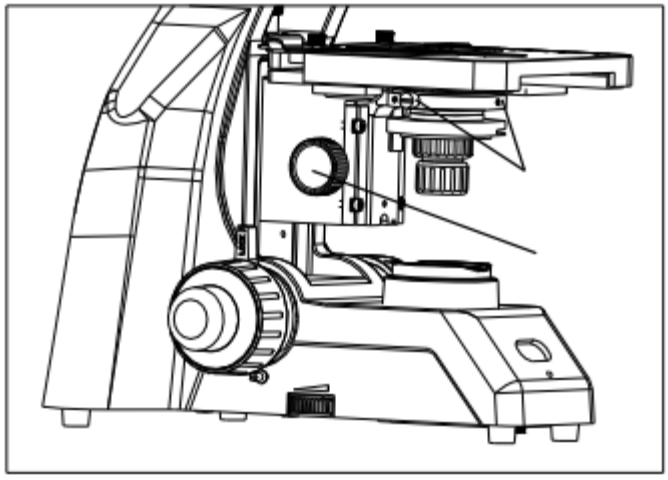

Figure-13

8.2.5 Aperture iris diaphragm

1) Turn the aperture iris diaphragm stick① to adjust the aperture iris diaphragm.
2) The aperture iris diaphragm is designed for the adjustment of the numerical aperture, not for the brightness.
3) Generally, setting the aperture iris diaphragm to 70- 80% of the N.A. of the objective in use will provide an image with good contrast.
4) If you want to observe the image of the aperture iris diaphragm, remove one eyepiece and look through the tube.
5) Users will see a dark circle encroaching on the bottom of the tube.

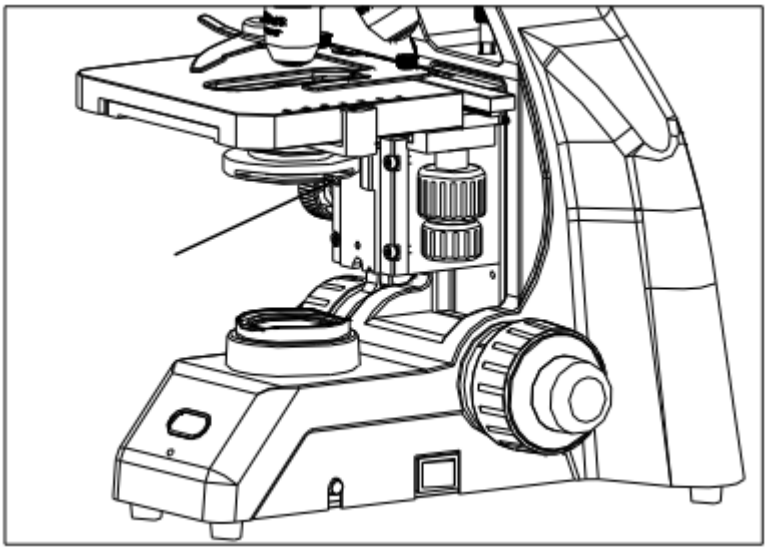

Figure-14

8.2.6 Adjusting the interpupillary distance

1) The interpupillary distance range is 55 mm to 75mm.
2) While looking through the eyepieces, move both eyepieces around until the left and right fields of view coincide completely.

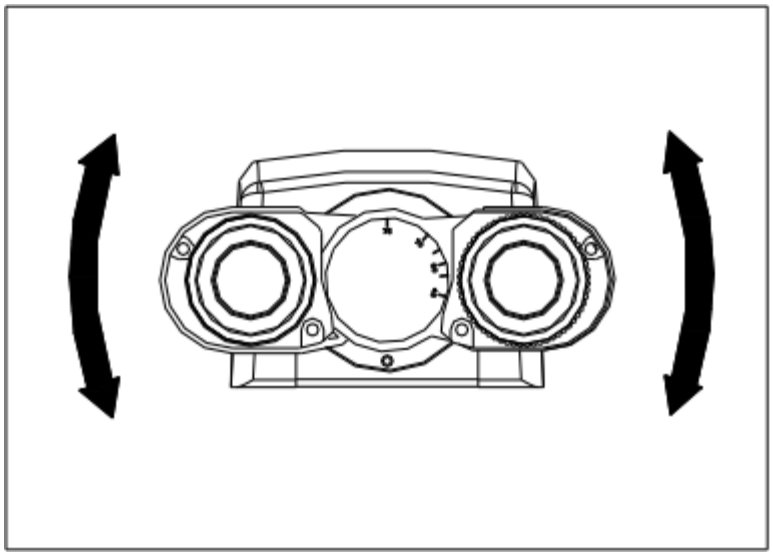

Figure-15

8.2.7 Adjusting the diopter

1) Turn the eyepiece① to adjust the diopter while looking through it.
2) The diopter range of the eyepiece is ±5 diopter.
3) The number aligned to the line on the viewing head is the diopter in use.

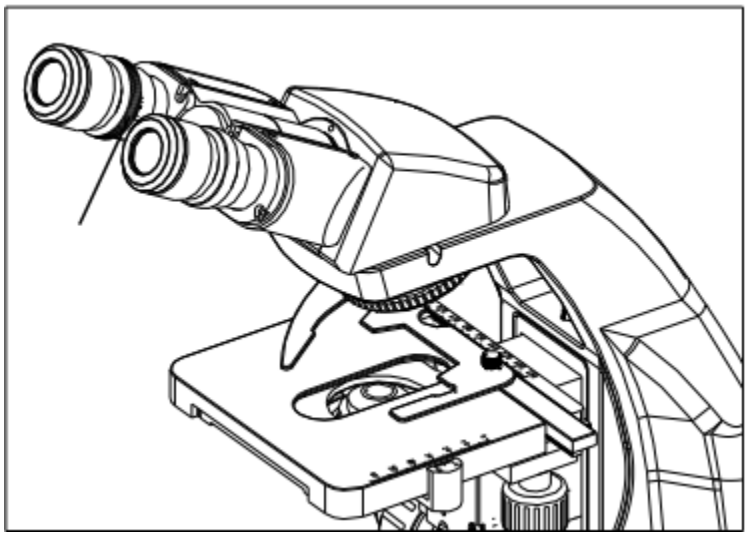

Figure-16

8.2.8 Adjusting the tension adjustment collar

1) Turn the tension adjustment collar① with your fingers.
2) When the collar is turned in the direction of the arrow, the tension of the coarse adjustment knob② increases.
3) Turning the collar in the opposite direction decreases the tension.
4) If the nosepiece descends on its own or if the specimen gets out of focus quickly even when it is brought into focus using the fine adjustment knob③, it means the tension of the coarse adjustment knob is too low.
5) Turn the collar in the direction of the arrow to increase the tension.

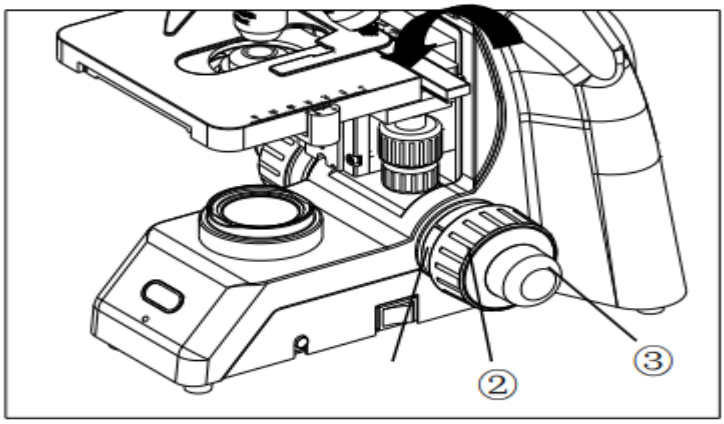

Figure-17

8.2.9 Adjusting the interpupillary distance

1) **The microscope with ECO:** The equipment can induct the front surroundings in 1m.
2) When it is light red, the light source keeps working.
3) When people left and no object within the front 1m, the red light flashed.
4) After 15 minutes, the light source stops working.

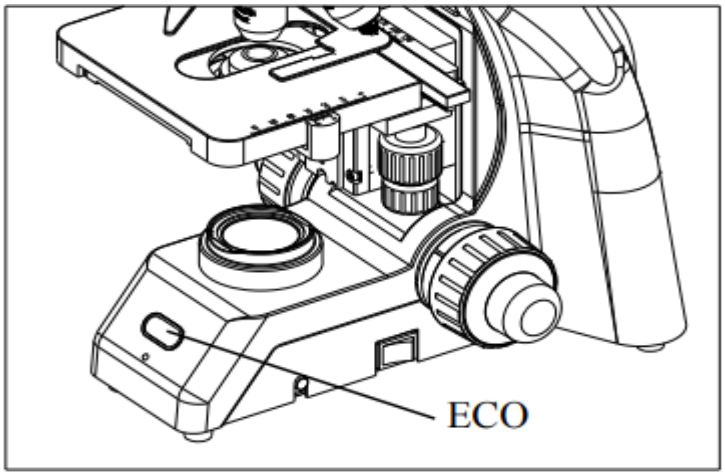

Figure-18

9. Troubleshooting

9.1 Optical System

TROUBLE	CAUSE	SOLUTION
The edge of the field of view is dark or the brightness is not uniform.	The nosepiece is not in the located position (objective and light path not coaxial).	Locate the nosepiece properly.
	The surface of the lamp becomes black.	Where it clicks, change a new lamp bulb.
	A lens (the objective, condenser, eyepiece, or collector) is dirty.	Clean it thoroughly.
Dirt or dust is visible in the field of view.	Dirt/dust on the specimen.	Replace with a clean specimen.
	Dirt/dust on the eyepieces.	Clean them.
	The specimen is not covered.	Add cover glass on it.
	The thickness of the cover glass is not suitable.	Use a standard cover glass with a thickness of 0.17mm.
	The specimen is placed reversely.	Turn it over
	The dry objective has oil on it. (Especially for 40X objectives)	Wipe the oil.
	A lens (the objective, condenser, eyepiece, or collector) is dirty.	Clean it.
	Immersion oil is not used with the 100x objective.	Use specified oil.
	Air bubbles existed in the immersion oil.	Eliminate the bubble.
	The aperture iris diaphragm is stopped down too far.	Adjust the aperture iris diaphragm properly.
	Dirt or dust on the eyepiece.	Clean it.
One side of the image is blurred.	The condenser is not properly centered.	Center the condenser with the centering screw.
	The nosepiece is not properly engaged.	Engage the nosepiece properly.
	The specimen is not clamped.	Clamp it with stage clips.
The brightness is not enough.	The aperture iris diaphragm is too small.	Adjust it properly.
	The condenser is too low.	Adjust it properly.
	A lens (the objective, condenser, eyepiece, or collector) is dirty.	Clean it.

9.2 Mechanical System

TROUBLE	CAUSE	SOLUTION
The field of view of one eye does not match that of the other.	The interpupillary distance is incorrect.	Adjust interpupillary distance.
Observation is tiring.	The diopter is not proper.	Adjust the diopter properly.
	The brightness of the illumination is not proper for the eyes.	Adjust the lamp voltage.

9.3 Electrical System

TROUBLE	CAUSE	SOLUTION
The bulb cannot light.	No power supply.	Check the power cord connection.
	The pin of the bulb doesn't insert properly.	Insert the pin deeply.
	The bulb is broken.	Replace with a new one.
The bulb burns out suddenly.	The bulb is not the specified one; The voltage is too high.	Use the specified bulb; lower the voltage.
The illumination is not bright enough.	The voltage is too low.	Raise the voltage.
Image flicks.	The bulb is about to burn out.	Replace with a new one.
	The bulb is not inserted deeply.	Check its connection.

10. Replacement

10.1 Replacing the fuse

1) Do remember to set the main switch ①to the state (OFF) and unplug the power cord before replacing the fuse.
2) Rotate the fuse out of the holder③, replace it with a new fuse, then rotate it back to the holder again.

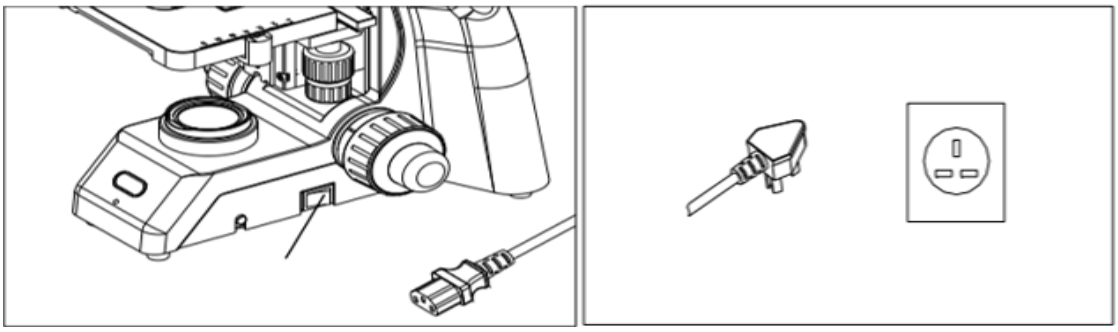

Figure-19

10.2 Installing and replacing the bulb

1) Use the specified halogen Lamp 6V20W.
2) Losing the screw①.
3) Hold the bulb② after users wrap it with gauze or other protection materials, and then insert its pin deeply into the jack in the lamp holder.
4) During microscope use or soon after it is turned off, the bulb, the lamp house, and nearby parts will be very hot and will cause serious burns.
5) Turn the main switch (off) disconnect the power plug, and make sure the bulb, the lamp room, and the periphery are all cool.
6) Then, users can do your replacement.
7) Insert the bulb gently; squeezing too hard will damage the bulb.
8) To prevent reduced bulb life or cracking, do not touch the bulb with bare hands.
9) If fingerprints are accidentally left on the bulb, wipe the bulb with a soft cloth.

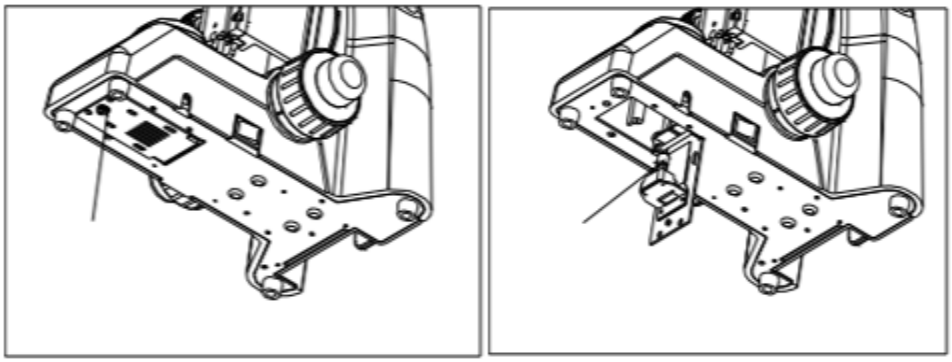

Figure-20