LABDEX

Binocular Biological Microscope

LX1213BMC

Index

1. Safety Measures

- A microscope is a high-precision instrument that always operates it carefully and avoids physical shaking during the operation.
- Do not expose the microscope to the sun directly, either at high temperature, damp, dust, or during an acute shake.
- Make sure the worktable is flat and horizontal.
- The working environment should be indoor temperature: 5°C – 40 °C, Mac relative humidity: 80%.
- When moving the microscope use both hands to hold its arm ① and lay it down carefully.
- When working the surface of the condenser will be very hot and make sure there is enough room for the heat to dissipate around the condenser ②
- For safety make sure the power switch is at "O" (OFF) and power it off before replacing the bulb or fuse and wait until both the bulb and bulb holder have cooled down.
- All the power "**OFF**" devices have been set in a position that is easy to operate.

2. Introduction

Binocular Biological Microscope LX1213BMC is designed with a Siedentopf binocular head, reversed quadruple ball bearings revolving nosepiece and a pair of WF10X/18mm eyepiece. It has a 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 with Iris Diaphragm
- 3W LED as external source of illumination
- Double layer mechanical stage
- Compact and light in weight

4. Specifications

Model	LX1213BMC
Viewing head	Seidentopf binocular viewing head inclined at 30°, interpupillary 50-75mm, 360° rotation
Nosepiece	Reversed quadruple ball bearings revolving nosepiece
Eyepiece	A pair of WF10X/18mm eyepiece
Objectives	All with anti-fungus treatment Achromatic objective 4x/0.10 Achromatic objective 10x/0.25 Achromatic objective 40x/0.65, spring-loaded Achromatic objective 100x/1.25, spring loaded, oil
Focusing	Integrated design, coaxial focus system with upper limited and tension adjustment, coarse range: 25mm; fine precision: 0.002mm; provided with an adjustable tightness device to prevent slipping and mechanical upper limit device
Condenser	Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm
Illumination	3W High brightness energy-saving LED illumination for long life, brightness adjustable
Power	100-240V, 50/60Hz

5. Applications

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

6. Instrument Introduction

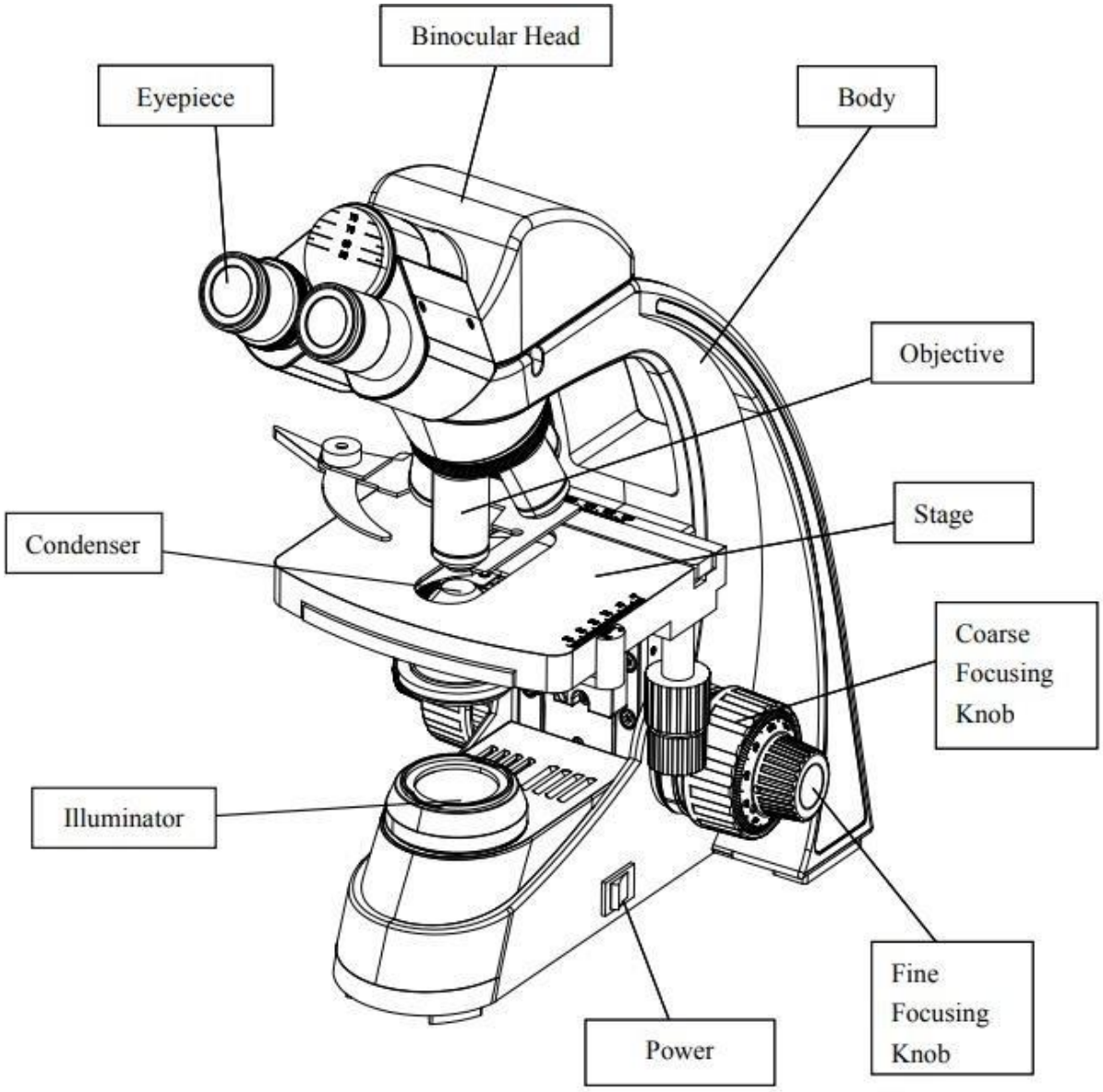

Figure-1

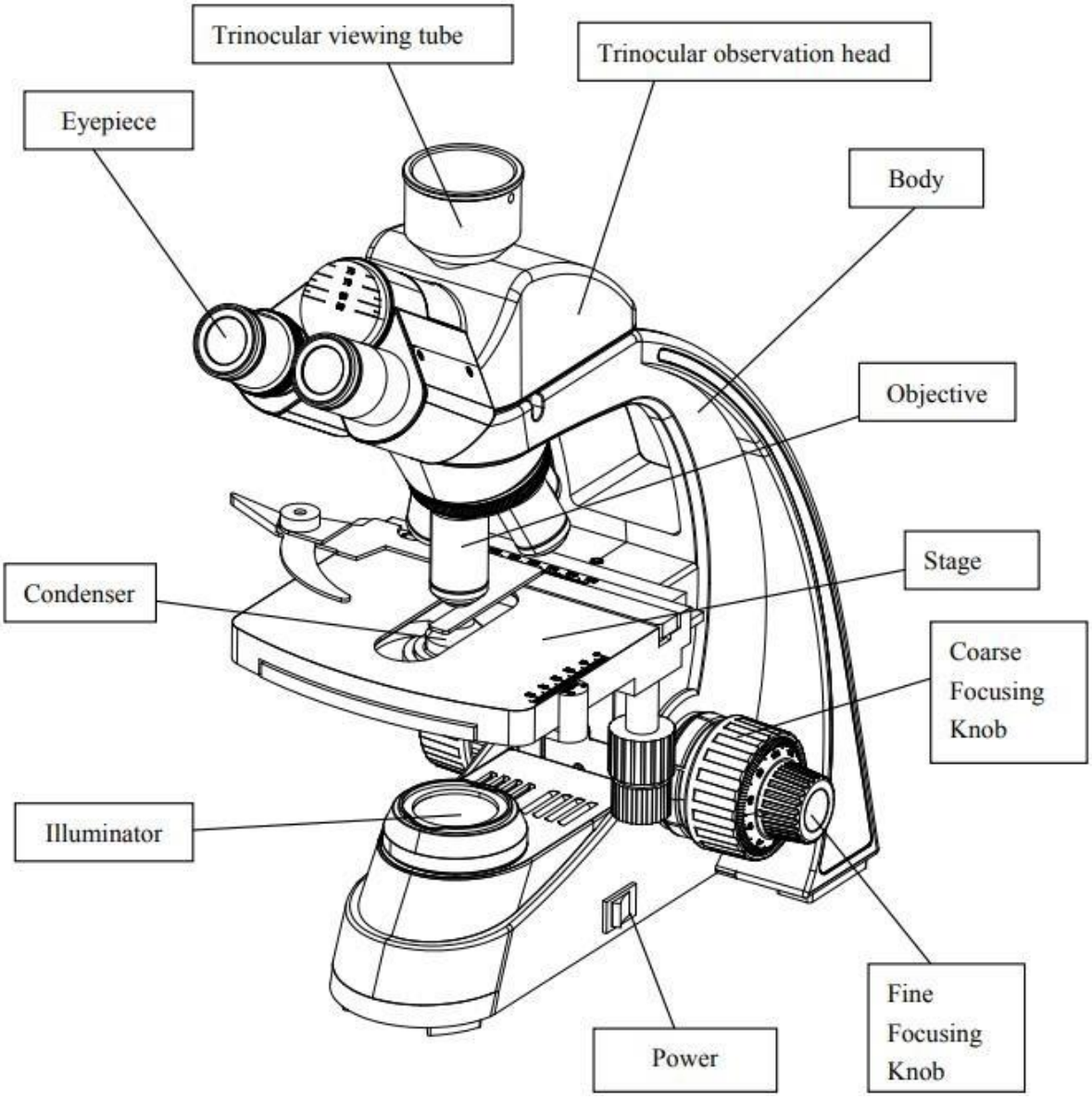
Trinocular viewing tube
Trinocular observation head
Eyepiece
Body
Objective
Stage
Condenser
Coarse Focusing Knob
Illuminator
Power
Fine Focusing Knob

Figure-2

7. Installation

Assembling Steps

1) Assemble the objective

Rotate the course focusing knob ① to lower the stage to a suitable location. Install the objectives into the nosepiece from the lowest magnification to the highest in a clockwise direction.

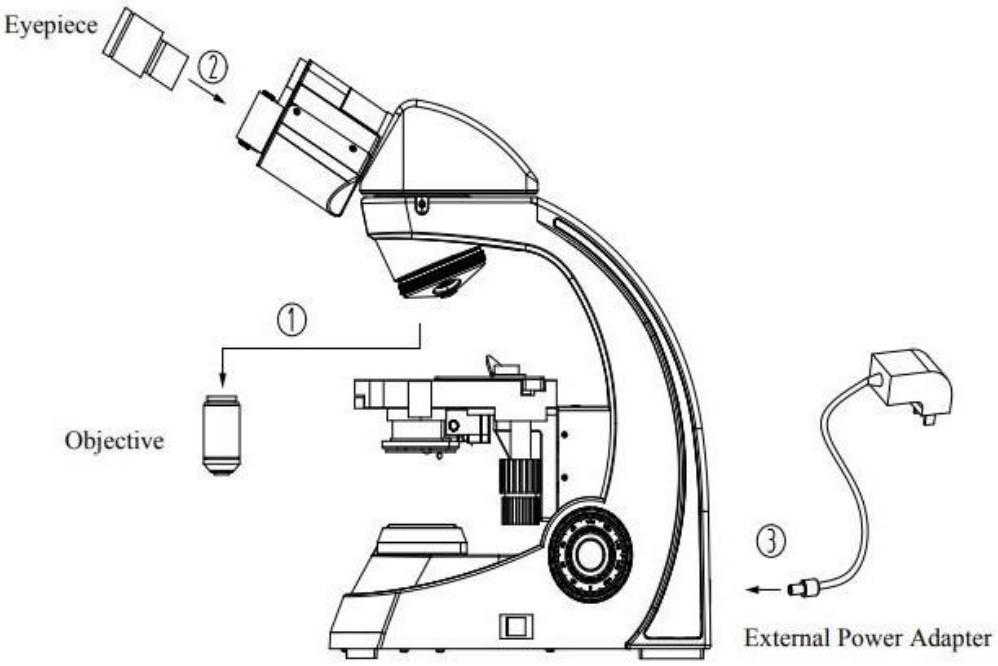

Figure-3

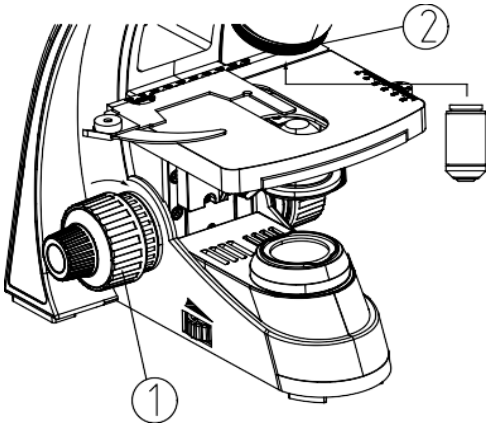

Figure-4

2) Assemble the eyepiece

Take down the cover of the eyepiece tube ①. Insert the eyepiece ② into the eyepiece tube, until touches the bottom.

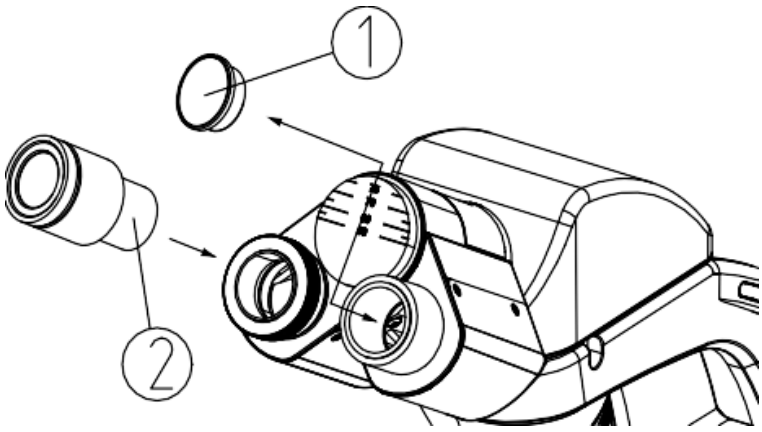

Figure-5

3) Assemble or replace the LED

Screw out the lock screw on the bottom group and take out the bottom group. Press on snaps on the connector socket ① (connected with LED control panel) according to the direction of the arrow as shown in the figure and pull out the connector ② (connected with LED). Screw out the two screws Fix the LED group by the two screws, plug the connector ② into the connector socket ①, and assemble the bottom group to the original place.

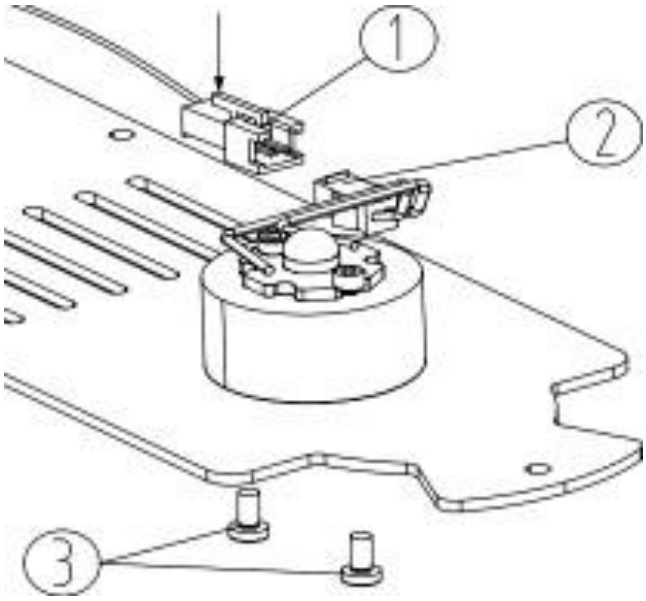

Figure-6

4) Connect the external power adapter (power cord/charger)

For external power adapter:

1) Make sure the power switch is at "**O**" (**OFF**).
2) Insert one end of the external power adapter① into the power socket ② of the microscope.
3) Then insert the other end into the power supply socket and make sure it is well-connected.

8. Operations

8.1 Set illumination

Put through the power and turn ON the main power switch to "—"(ON). Adjust the light adjustment knob ① until the illumination is comfortable for observation. Rotate the light adjustment knob clockwise to raise the voltage and brightness. Rotate the light adjustment knob counterclockwise to lower the voltage and brightness.

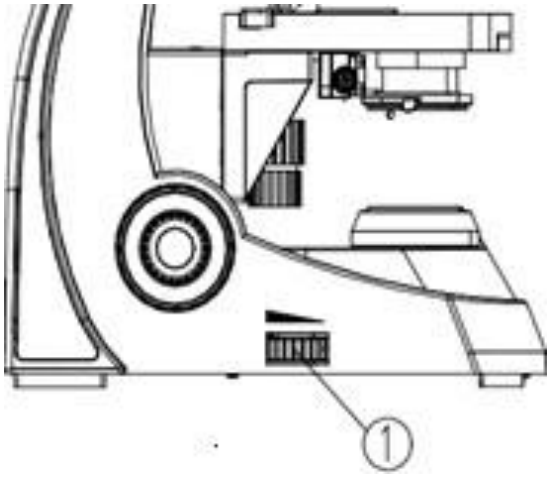

Figure-7

8.2 Place the specimen slide

Push the wrench of the specimen holder backward. Loosen the wrench① and clamp the slide② by the clips while the cover glass faces up. Rotate the X and Y-axis knob ③ move the specimen to the center (alignment with the center of the objective).

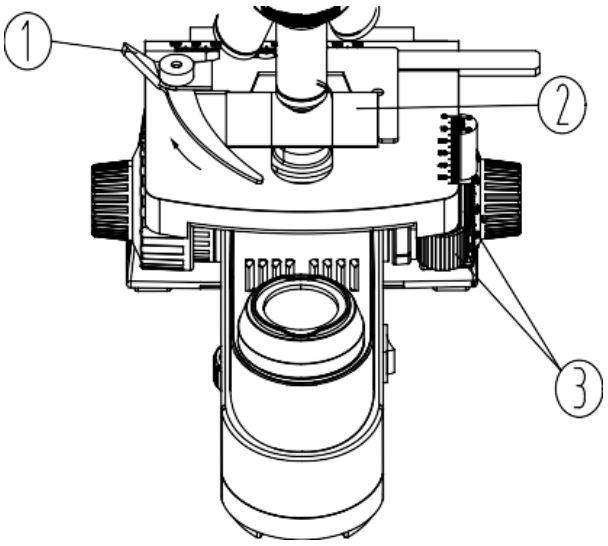

Figure-8

8.3 Adjust Focusing

Shift the 4X objective into the light path. Observe the right eyepiece with the right eye and rotate the course focusing knob until the image outline appears in the view field. Rotate the fine focusing knob for clear details.

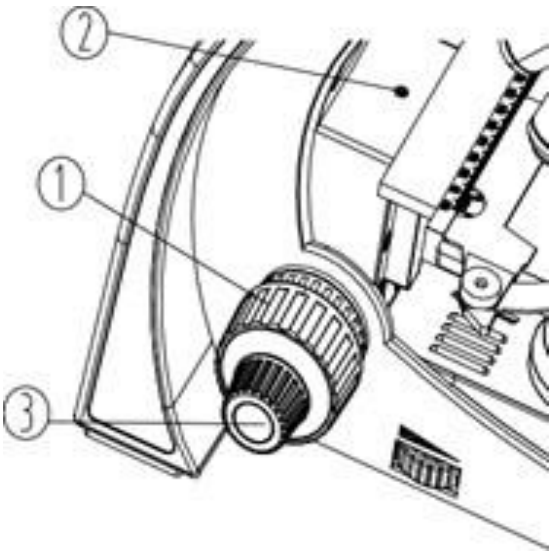

Figure-9

8.4 Adjust the focusing tension

If the handle is very heavy when focusing the specimen leaves the focus plane after focusing or the stage declines itself, rotate the tension adjustment knob① to resolve the problem. Rotate the tension adjustment knob ① according to the direction of the arrow as shown in the figure to lock the focusing system. Rotate it in the opposite direction to loosen the focusing system.

8.5 Adjust the diopter

Observe the right eyepiece with the right eye, focus it until the image is clear until the image is clear then observe the left eyepiece with the left eye if the image is not clear enough, rotate the diopter adjustment ring① until the image is clear.

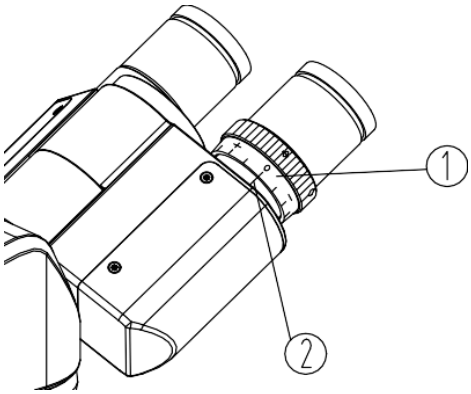

Figure-10

8.6 Adjust the interpupillary distance

When using two eyes to observe, hold the bases of the prism and rotate them around the axis to adjust the interpupillary distance, until there is only one field of view. The dot "·" ① on the eyepiece base points to the scale ② of the interpupillary distance indicator. The scale value is the interpupillary distance.

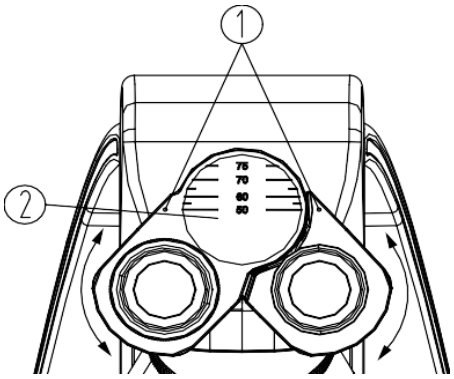

Figure-11

8.7 Adjust the aperture diaphragm and condenser

1) The aperture diaphragm decides the numerical aperture of the illumination system. If the N.A. of the illumination system matches the N.A. of the objective, it can obtain better resolution and contrast and increase the depth of field.
2) Adjust the condenser adjustment knob③ in a clockwise direction, raise the condenser to the top, and let the illumination light fill the field of view. As the specimen contrast is usually low, it is advised to adjust the condenser aperture diaphragm to be 70%-80% of the N.A. of the objective.

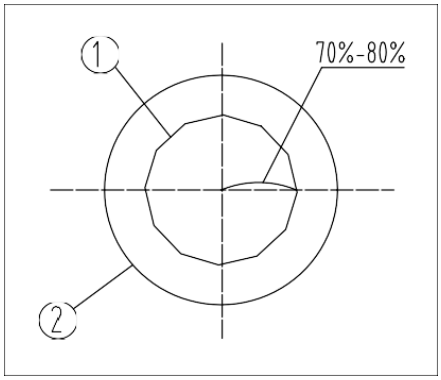

Figure-12

3) Rotate the aperture diaphragm adjusting ring④ and align the arrow with the magnification position on the diaphragm seat ⑤. The eyepiece can be taken off when it's necessary to observe from the tube.
4) Adjust the aperture diaphragm adjusting ring④ until see the figure as shown in Fig. 12, to adjust the proportion.

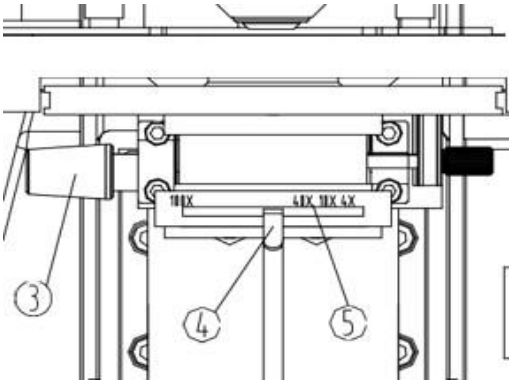

Figure-13

8.8 Use the oil objective (100X)

Use the 4X objective to focus the specimen. Place a drop of oil① on the specimen. Rotate the nosepiece counterclockwise and rotate the oil objective (100X) to the light path. Then use the fine focusing knob to focus. After using, wipe the front lens with a tissue moistened with a small amount of 3:7 mixture of alcohol and ether or with dimethylbenzene. Wipe off the oil on the specimen.

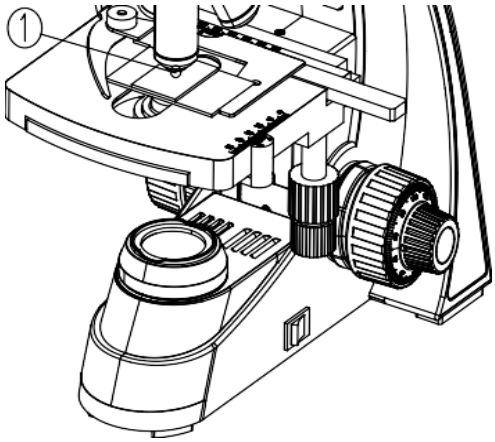

Figure-14

1) Make sure there is no air bubble in the oil for fear affect the image

Move the eyepiece to examine the air bubble. Open the aperture diaphragm and field diaphragm fully and observe the edge of the objective from the tube (It seems round and light). Rotate the nosepiece slightly and swing the oil objective for some time to remove the air bubble.

2) Use a color filter

Screw out the color filter frame ① at the bottom of the condenser in a clockwise direction, press the filter② into its hole, then screw in the frame in a counterclockwise direction.

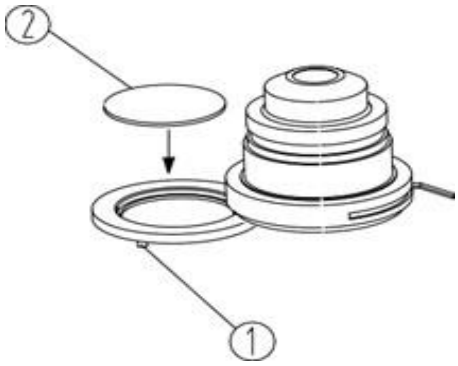

Figure-15

8.9 Assemble and Use the CTV device

1) Loosen the lock screw ① of the trinocular head and take out the dustcover②.
2) Take down the dust cover of the CTV adapter③ insert the CTV adapter into the trinocular head as shown in the figure and screw down the lock screw①.
3) Loosen the lock screw④ of the CTV adapter take down the vidicon interface (C type) from the CTV adapter and screw it into the CCD or vidicon then install the interface into the CTV adapter and screw down the lock screw ④.
4) For binocular observation, observe the CCD image when the image is clear. If the image is unclear, rotate the adjustment tube⑥ until it is clear.

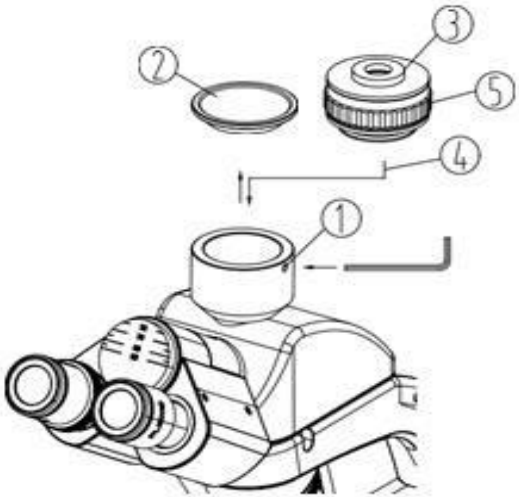

Figure-16

9. Troubleshooting

Problem	Cause	Solution
Optical System		
(1) The bulb is bright, but it is dark in the field ofview.	The field diaphragm is not large enough.	Enlarge the field diaphragm.
	The condenser is too low.	Adjust the condenser.
(2) The side of the field of view is dark or not even.	The nosepiece is not in the right position.	Turn the nosepiece intothe right position.
	Stain or dust has accumulated on the lens(condenser,objective, or eyepieces).	Clean the lens.
(3) Stain or dust is observed in the field of view.	Stains have accumulated on the specimen.	Clean the specimen.
	Stains have accumulated on the lens.	Clean the lens.
(4) Unclear image	No cover glass on the specimen slide.	Add the cover glass.
	The cover glass is not standard.	Use a standard cover glass with a thickness-δ0.17mm.
	The specimen faces down.	Put the specimen faceup.
	The immersion oil has accumulated on the dry objective.	Clean thoroughly.
	The immersion oil is not used for oil objectives.	Use immersion oil.
	Air bubbles in the immersion.	Get rid of the air bubble.
	Use the wrong immersion oil.	Use the correct one: Cedar oil.
	The aperture diaphragm is not opened correctly.	Adjust it.
	Stain or dust has accumulatedon the lens of the eyepiece.	Clean the lens.
	The condenser is too low.	Adjust the condenser.
(5) One side of the image is dark, or the image moves while focusing or the image moves while focusing.	The specimen slide is not fixed.	Fix it with clips.
	The nosepiece is not in the right position.	Turn the nosepiece intothe right position.
	The condenser is not centered.	Center the condenser.
(6)The eyes feel tired easily. The right field of view doesn't superpose with the left.	The interpupillary distance is incorrect.	Adjust the interpupillary distance.
	The eyepiece for the right eye is different from the left one.	Use the same eyepieces.

Problem	Cause	Solution
Mechanical system		
(1) Cannot focus when using the high magnification objective.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is too thick.	Use a standard cover glass with a thickness of δ0.17mm.
(2) The objective touches the coverglass while turning the nosepiece.	The cover glass faces down.	Put the cover glass toface up.
	The cover glass is too thick.	Use a standard cover glass with a thickness of δ0.17mm.
(3) Coarse focusing knob is too tight.	The tension adjustment knob is too tight.	Loosen it to an appropriate Positions.
(4) Stage declinesitself and cannot stay on the focal plane.	The tension adjustment knob is too loose.	Tighten its position. to an appropriate
(5) Coarse focusing knob cannot rise.	The course focusing limit knob is locked.	Loosen the course focusing limit.
(6) Coarse focusing knob can't decline.	The base of the condenser is too low	Raise the base.
7) Cannot move the slide smoothly.	The slide is not fixed correctly.	Adjust it correctly.
	The movable specimen holder is not fixed properly.	Adjust it correctly.
(8) The image moves Obviously when touching the stage.	The stage is fastened incorrectly.	Fasten the stage correctly.

Problem	Cause	Solution
Electrical Part		
(1) The bulb doesnot work.	No power supply.	Check the connection of the power cable.
	The bulb is not installed correctly.	Install it correctly.
	The bulb burns out.	Replace it.
(2) The bulb burnt out usually.	A wrong bulb is used.	Replace it with a correct one.
(3) The field of view is not bright enough.	A wrong bulb is used.	Replace it with a correct one.
	The use of a light-adjusting knob isincorrect.	Adjust it correctly.