Labotronics

Biological Microscope

LB-92BIM

Index

1. Safety Measures

- Open the box carefully to avoid the accessories, like a lens, dropping to the ground or being damaged.
- Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and easy shaking environment. Make sure the stage is flat, horizontal and firm enough.
- When moving the microscope, carefully carry it with the handle and the base.
- When running, the lamp house and nearby parts will be very hot. Ensure there is enough cooling room for them.
- Make sure the instrument is earthed, to avoid lightning strikes.
- For safety, be sure the main switch is in an "O" (off) state and cut off the power supply before replacing the lamp or the fuse. If you replace the lamp during use or right after use, allow the lamp bulb and the lamp house to cool completely before touching it. (Specified lamp: S-LED lamp 1W)
- **Check the input voltage:** Be sure the input voltage signed in the back of the microscope is consistent with the power supply voltage, or it will bring serious damage to the instrument.
- Use the factory-supplied power cord.

2. Introduction

Biological Microscope LB-92BIM is an instrument that provides sharp and bright image for superior specimen analysis. It adopts infinity optical system and accommodates two slides at once. It is equipped with Seidentop head for convenient adjustment of interpupillary distance. Various optional accessories upgrade the unit makig it more flexible for advanced applications.

3. Features

1. Large viewing area with wide field eyepiece
2. High contrast Infinity plan achromatic objective
3. Rackless mechanical stage for comfortable operation
4. Backward nosepiece for crisp and clear image
5. Simultaneously accommodates two slides

4. Specifications

Model No.	**LB-92BIM**
Viewing head	Seidentopf Trinocular
Viewing head inclination	Inclined at 30°, 360° rotatable
Interpupillary distance	48 mm ~ 75 mm
Eyepiece	EW 10X/22 mm
	Eyepiece tube Φ 30 mm
Objective	Infinite plan achromatic objective 4X, 10X, 40X, 100X
Nosepiece	Backward Quintuple
Stage	Rackless stage
	Size 230 mm x 150 mm ; Cross travel 78 mm x 54 mm
	Low-positioned X/Y coaxial control knob
Focusing	Coaxial coarse and fine adjustment
	Fine division 0.002 mm
	Coarse stroke 37.7 mm/rotation
	Fine stroke 0.2 mm/rotation
	Moving range 22 mm
Condenser	Abbe condenser NA1.25 with aperture diaphragm
Illumination	12 V/20 W Halogen lamp, brightness adjustable
Dimension	380 x 260 x 510 mm
Weight	10 kgs

5. Applications

Used in biology, pathology, histology, pharmacology, genetics, hospitals, academic institutes, research centre, etc. to observe cell, tissues and other specimens.

6. Instrument Introduction

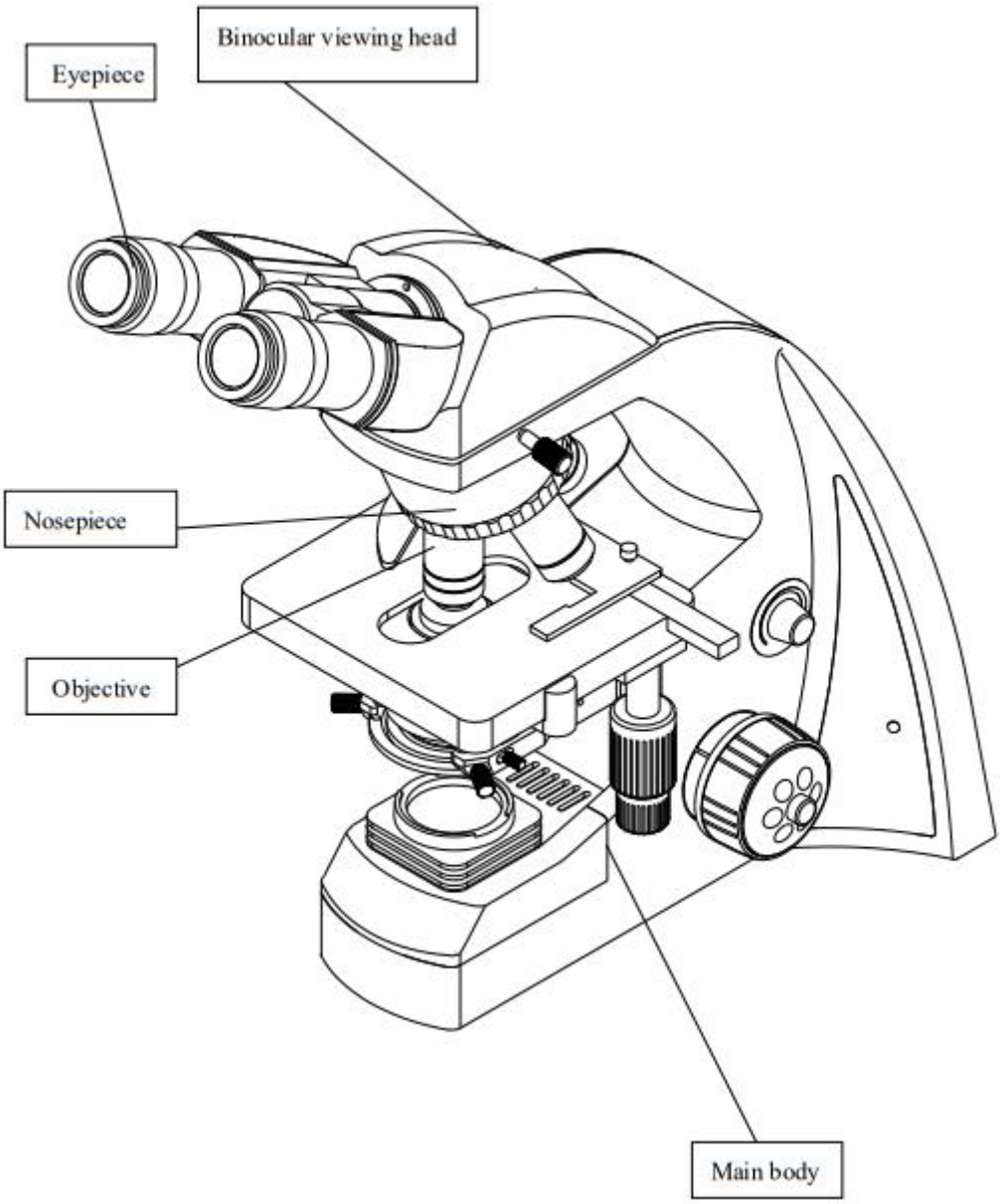

Figure-1

7. Installation

7.1 Assembly Diagram

The following figure shows the installation sequence of the components. The number in the figure shows the assembly steps.

Note:

- Before installing, be sure every component is clean, and do not store any parts or glass surfaces.
- Keep well with the hexagon wrench provided. When changing the components, you will need it again.

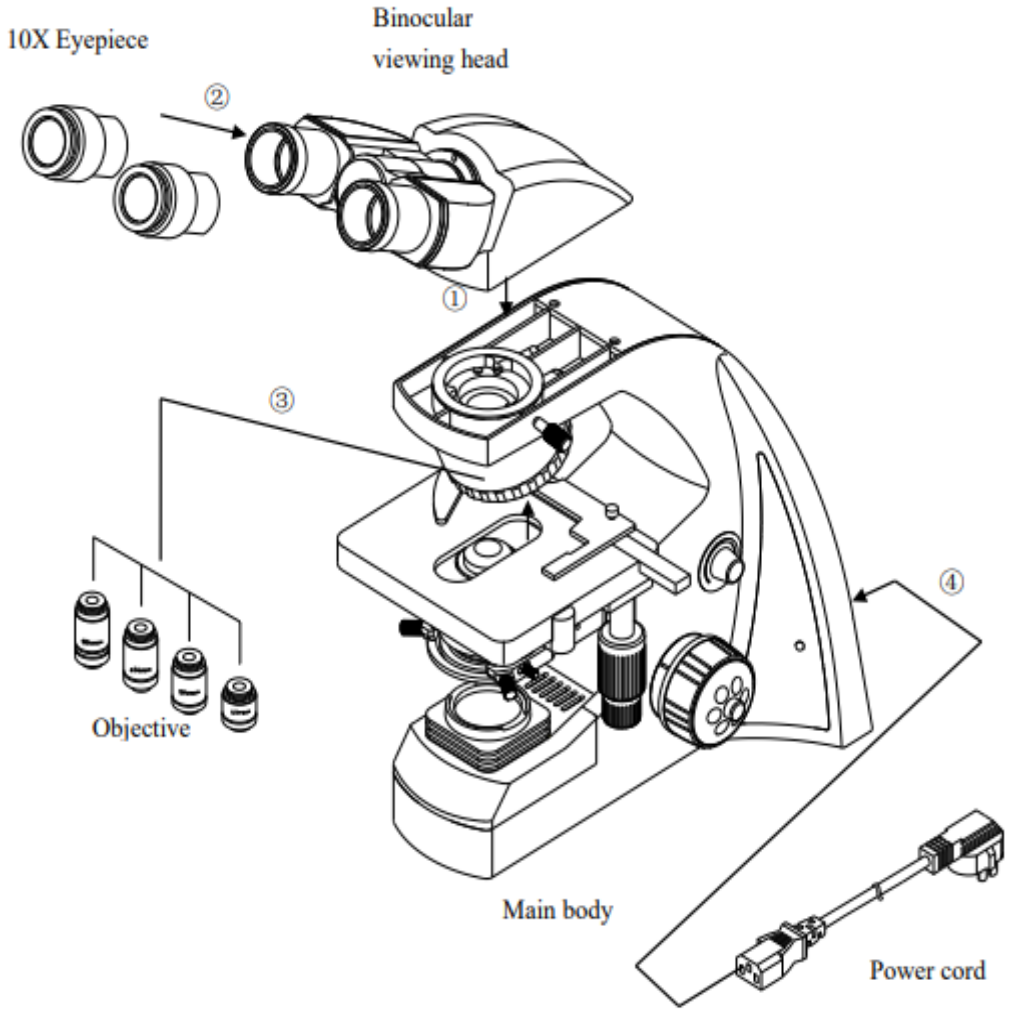

Figure-2

7.2 Assembly Procedure

7.2.1 Installing binocular viewing head (Figures 3 and 4)

Insert the binocular viewing head into the microscope head and turn it to a proper position, then screw down the bolt to fix it.

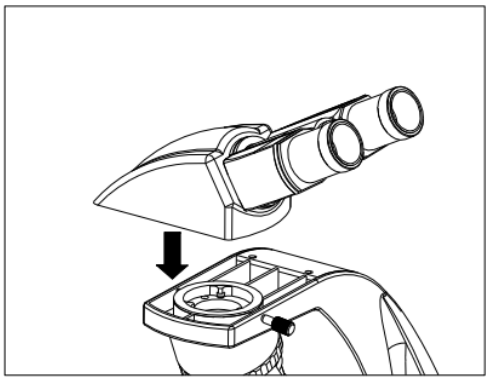

Figure-3

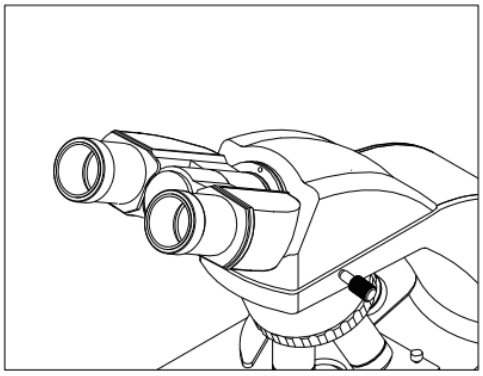

Figure-4

7.2.2 Installing the eyepiece (Figures 5 and 6)

Insert the eyepiece into the eyepiece tube until they are against each other, as shown in **Figure 6.**

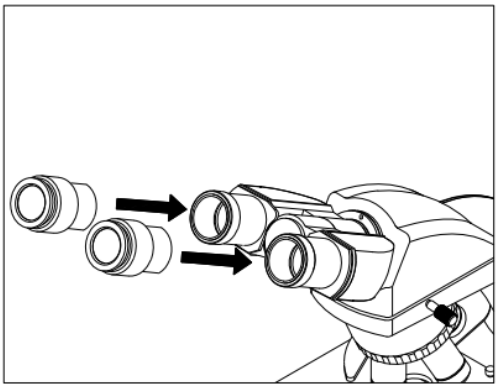

Figure-5

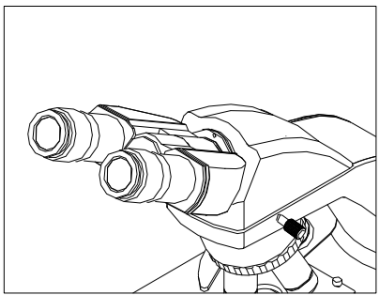

Figure-6

7.2.3 Installing the Objective (Figures 7 and 8)

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 to be easier during use.

Note:

- Clean the objective regularly, for the lens is susceptible to dust.
- When operating, use a 10×magnification objective to search and focus the specimen first, then replace it with a higher magnification objective if necessary.
- When replacing the objective, slowly turn the nosepiece until you hear **"clicked"**, which means the objective is in place.

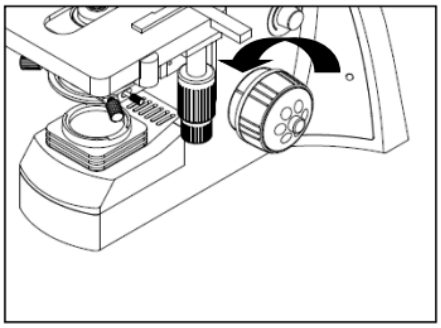

Figure-7

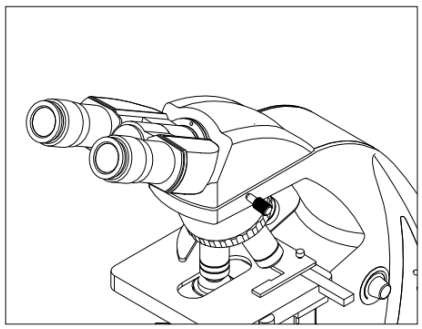

Figure-8

7.2.4 Mounting the filters (Figure 9)

Place the required filter in front of the condenser.
Note: The filter of the standard outfit is green.

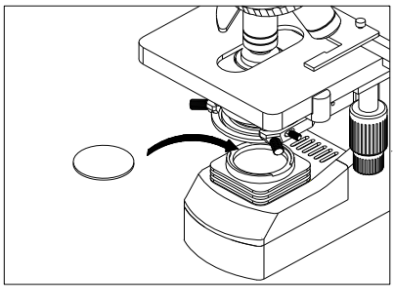

Figure-9

7.2.5 Connecting the power cord (Figures 10 and 11)

1) Set the main switch ① to an "O" (off) state before connecting the power cord.
2) Insert the plugs ② into the power jack ③of the microscope safely.
3) Plug the power cord ④ into the power supply receptacle ⑤. Make sure the connection is well.

Note:

- The cable and cords are vulnerable when bent or twisted, never subject the power cord to excessive force.
- Do use the supplied power cord all the time. If lost or damaged, select the same standard cord.
- A wide range of voltage, like 100 - 240V, is acceptable for this microscope.

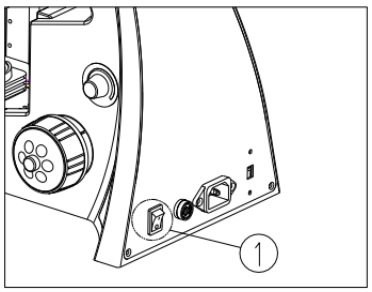

Figure-10

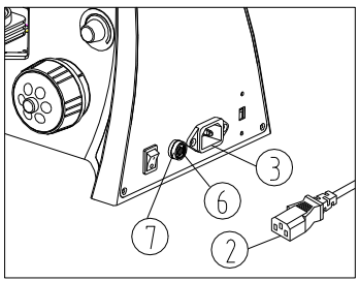

Figure-11

7.2.6 Replace the fuse (Figures 11 and 12)

Do remember to set the main switch ① to the state "O" (OFF) and unplug the power cord before replacing the fuse. Rotate the fuse ⑥ out of the holder ⑦ with the "--" type screwdriver, replace it with a new fuse, and then rotate it back to the holder again.

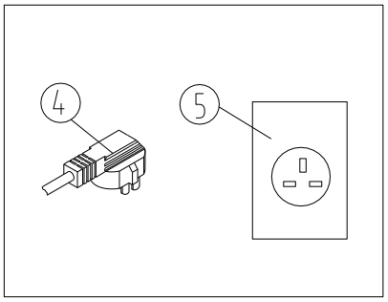

Figure-12

7.2.7 S-LED lamp replacement (Figures 13 and 14)

1) Generally, S-LED lamp is very durable, so it is not easy to damage. If it is unfortunately damaged, please purchase the S-LED **(Figure 14)** from your vendor.
2) Open the bottom plate ① by screwdriver, loosen screw ② to take the S-LED lamp ③ down and unplug the connector ⑥from the breadboard. Mount the new S-LED lamp, tighten the screw ② and insert the connect to ④ fully into the breadboard.
3) Mount the bottom plate back onto the microscope.

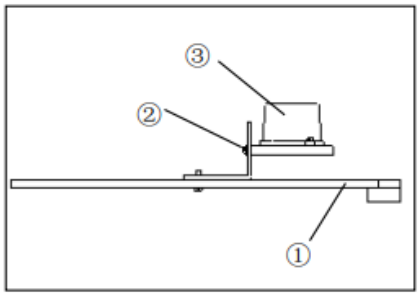

Figure-13

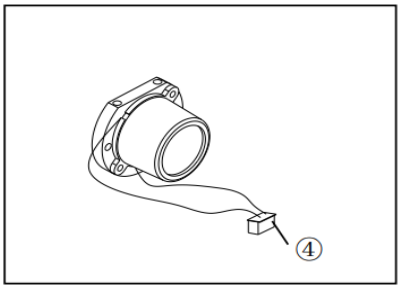

Figure-14

Note: Be careful to take the bottom plate down slowly in case the wire of the lamp is pulled apart.

7.3 Adjustment Set Diagram (Figures 15 and 16)

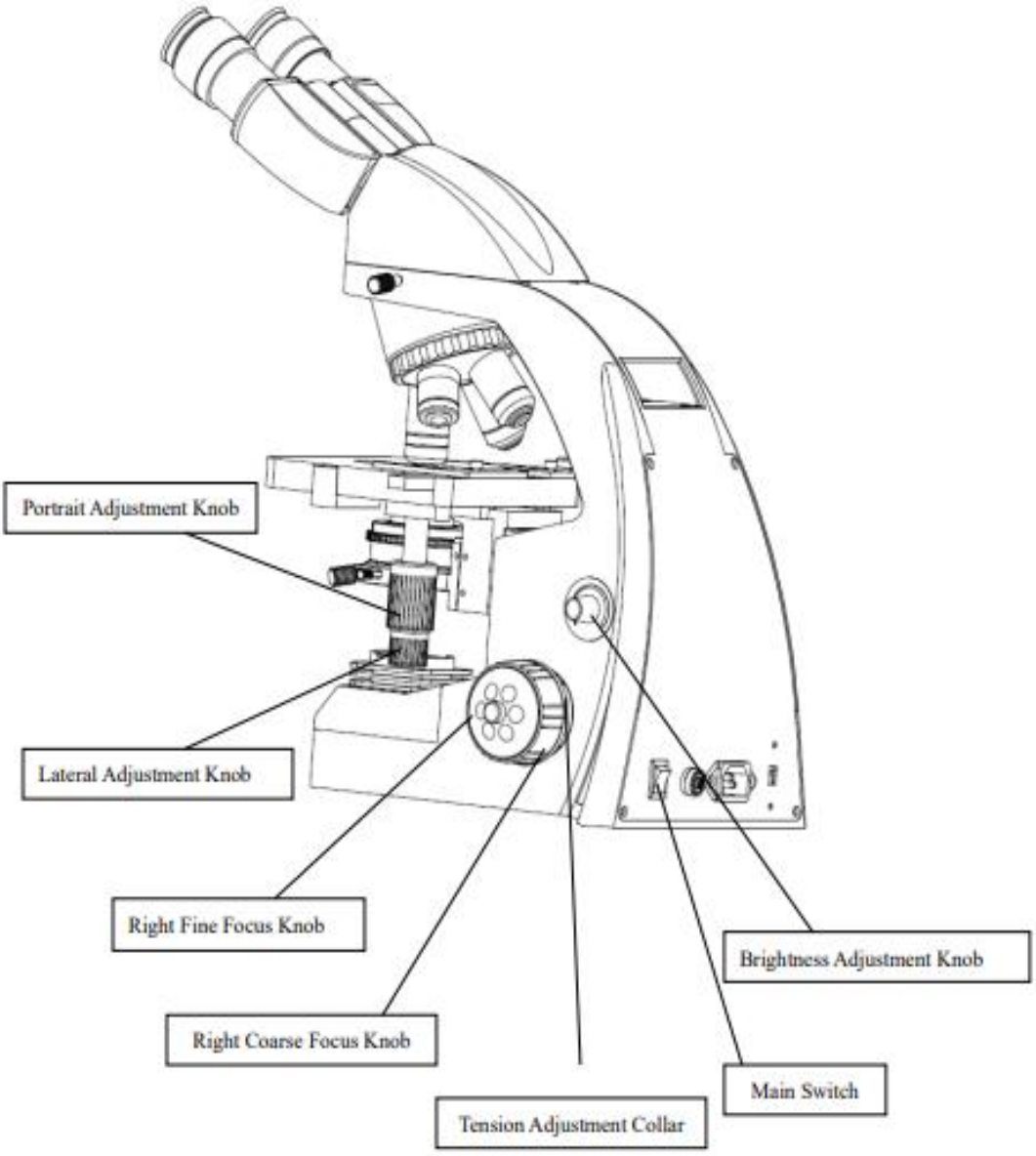

Figure-15

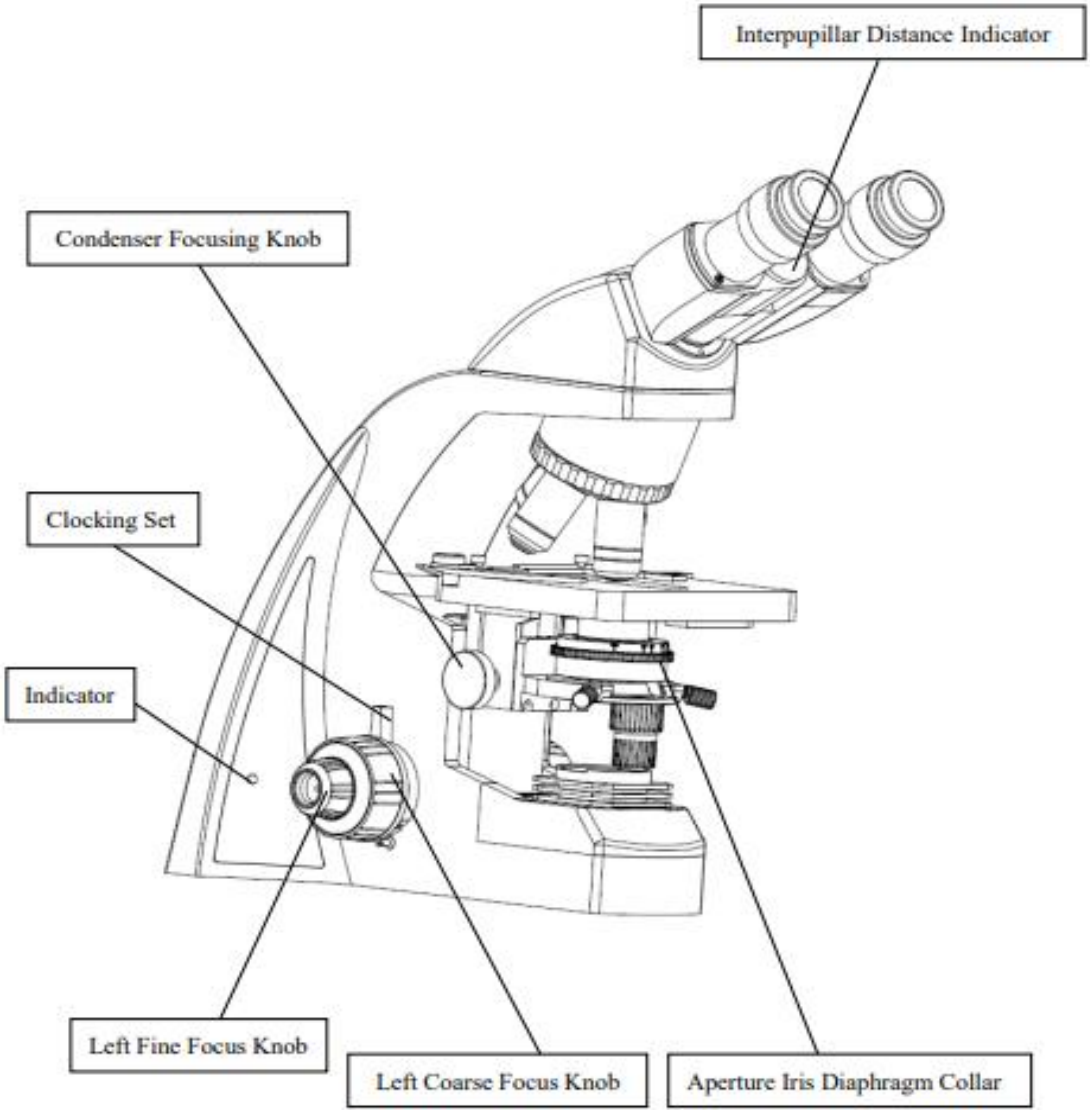
Interpupillar Distance Indicator
Condenser Focusing Knob
Clocking Set
Indicator
Left Fine Focus Knob
Left Coarse Focus Knob
Aperture Iris Diaphragm Collar

Figure-16

8. Operations

8.1 Brightness Adjustment (Figure 17)

1) Connect the power cord and set the main switch to " - " state (ON).
2) Turning the brightness adjustment knob clockwise, the voltage raise and the brightness strengthen; whereas turning in the contra direction, the voltage decline and the brightness weakens.

Note: Using the microscope with low voltage in the voltage range can prolong the service life of the bulb.

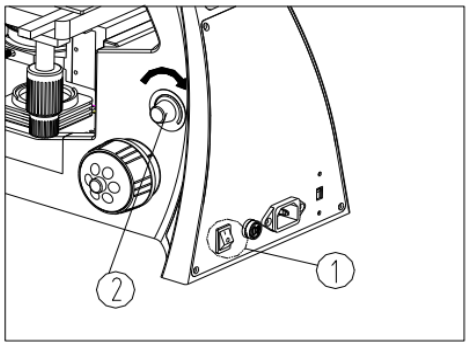

Figure-17

8.2 Placing the specimen (Figure 18)

1) Place the specimen① in the center of the mechanical stage and use the stage clips to clamp it.
2) Turn the portrait and lateral adjustment knob② of the mechanical ruler and move the specimen to the required position.

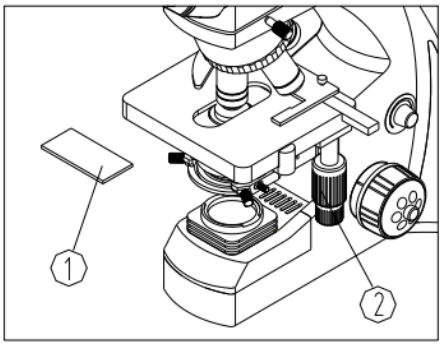

Figure-18

Note:
Be careful when changing the objective. 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.

8.3 Focusing the specimen (Figure 19)

1) Focus the specimen with a 10X objective. 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.
2) Turn the coarse focus knob ①conversely to lower the specimen and search images in the 10×ocular simultaneously, and then use the fine knob② to focus. After that, you can replace it with other magnification objectives safely and focus without the risk of damaging the specimen.

Note:
To see more convenient, you can use the locking set③ to fix the stage in a vertical direction.

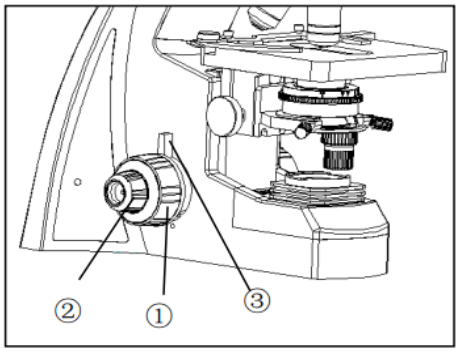

Figure-19

8.4 Condenser adjustment (Figure 20)

Turn the condenser focus knob 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.

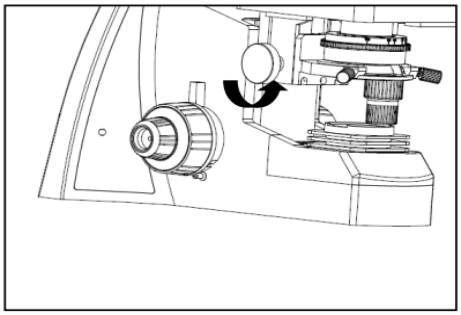

Figure-20

Note:

- The condenser and the objective are coaxial. It has been adjusted before leaving the factory, so the user needn't adjust them by themselves.
- The highest position of the condenser has been adjusted too. It also needn't any user's operation.

8.5 Aperture Iris Diaphragm Adjustment (Figure 21)

Turn the aperture iris diaphragm collar ① to adjust the aperture iris diaphragm.

Note:

The aperture iris diaphragm is designed for the adjustment of the numerical aperture, not for the brightness.

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. If you want to observe the image of the aperture iris diaphragm, remove one eyepiece and look through the tube. You will see a dark circle encroaching on the bottom of the tube.

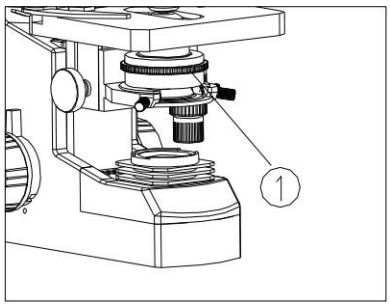

Figure-21

8.6 Adjusting the Interpupillary Distance (Figure 22)

The interpupillary distance range is 48mm - 75mm. While looking through the eyepieces, move both eyepieces until the left and right fields of view coincide completely.

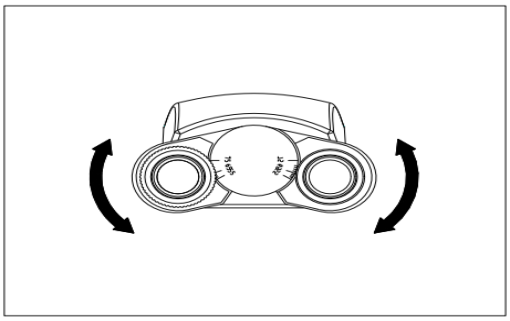

Figure-22

8.7 Adjusting the Diopter (Figure 23)

Turn the eyepiece ① to adjust the diopter while looking through it.

The diopter range of the eyepiece is ±5 diopter. The number aligned to the line on the viewing head is the diopter in use.

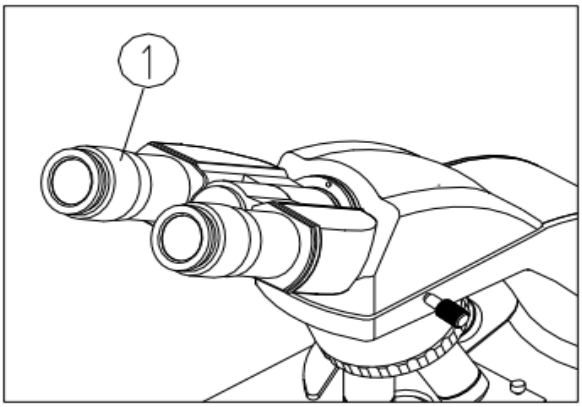

Figure-23

8.8 Adjusting the tension adjustment collar (Figure 24)

Turn the tension adjustment collar ① with your fingers. When the collar is turned in the direction of the arrow, the tension of the coarse adjustment knob ② increases. Turning the collar in the opposite direction decreases the tension.
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 knob ③, it means the tension of the coarse adjustment knob is too low. Turn the collar in the direction of the arrow to increase the tension.

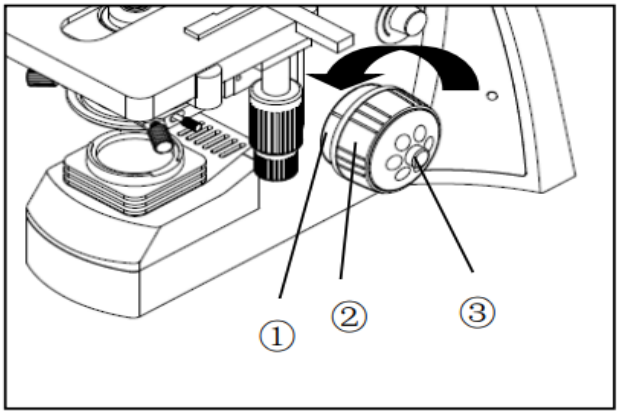

Figure-24

9. Maintenance

1) All the lenses have been adjusted properly; do not dismount them by yourself.
2) The nosepiece and coarse and fine focusing parts are so delicate that it is forbidden to disassemble them carelessly by yourself.
3) Keep the instrument clean, and do not pollute the optical element when wiping away the dust on the instrument.
4) The contaminations on the prism, like fingerprints and oil smudges, could be gently wiped with a piece of soft cloth tissue paper, or gauze which has been immersed in pure alcohol or ether. (Note that the alcohol and ether are highly flammable, do keep them away from the fire or potential sources of electrical sparks, and use them in a drafty room as possible as you can.)
5) Do not attempt to use organic solvents to clean the microscope components other than the glass components. To clean them, use a lint-free, soft cloth slightly moistened with a diluted neutral detergent.
6) When using, if the microscope is splashed by liquid, cut off the power at once, and wipe away the splash.
7) Do not disassemble any parts of the microscope, as this will affect the function or reduce the performance of the microscope.
8) Place the instrument in a cool, dry position. When not using the microscope, keep it covered with a dust cover. Make sure the lamp socket is cool before covering the microscope.

10. Troubleshooting

10.1 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 where it clicks
	The surface of the lamp becomes black.	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 the eyepieces
Visibility is poor Image is not sharp; Contrast is poor; Details are indistinct	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 the objective, eyepiece and condenser.
	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 the eyepiece.
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 image shift during focusing	The specimen slips on the stage	Fix the specimen slips.
	The nosepiece is not in the right position	Turn it to the “clicked” position
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 the lens.

10.2 Mechanical System

Trouble	Cause	Solution
Image cannot be focused	When adjusting stage height, you forgot to reattach the upper stopper screw	Reattach the upper stopper screw
Objective contacts the specimen before focus is obtained	The specimen is mounted upside down	Mount specimen correctly
The specimen cannot be moved freely	The slide is not clamped	Clamp the slide firmly
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

10.3 Electrical System

Trouble	Cause	Solution
The lamp can't light when the switch is turned on	There is no power	Check the connection of the power cord.
	The lamp burns out	Replace the lamp.
The lamp burns out suddenly	Use a substandard lamp The voltage is too high	Use the specified lamp to replace it.
The brightness is not enough	Use a substandard lamp The voltage is too low	Use the specified lamp to increase the voltage
The lamp flickers or the brightness is vertiginous	The lamp is going to burn out	Replace the lamp.

11. Accessories

Accessory No	Accessory	Specifications
92BIMA1	Eyepiece	WF15X/16 mm
92BIMA2	Eyepiece	WF20X/12 mm
92BIMA3	Objective	Infinite plan achromatic objective 20X
92BIMA4	Objective	Infinite plan achromatic objective 60X
92BIMA5	Nosepiece	Backward Quadruple
92BIMA6	Illumination	Halogen Lamp 6V/20W
92BIMA7	Illumination	12V/30W Halogen Lamp
92BIMA8	Illumination	Kohler Illumination
92BIMA9	Photo attachment	Nikon (Connect to Nikon Digital Single Lens Reflex)
92BIMA10	Photo attachment	Canon (Connect to Canon Digital Single Lens Reflex)
92BIMA11	Video attachment	0.5X microscope adapter
92BIMA12	Phase contrast kit	Sliding phase contrast kit (10X\40X\100X phase plan objective)
92BIMA13	Phase contrast kit	Turret Phase contrast kit (10X\40X\100X phase plan objective)
92BIMA14	Dark field attachment (Dry) NA0.9	
92BIMA15	Dark field attachment (Oil) NA1.25-1.36	
92BIMA16	Fluorescent attachment	Epi-fluorescent Attachment (B,G, 100W mercury lamp)
92BIMA17	Fluorescent attachment	BFL-LED1 Epi-fluorescent Attachment