Labotronics

Biological Microscope

LB-62BIM

Index

1. Safety Measures

1.1 Attention!

Clean parts in contact with the sample: After observing the sample under the microscope, clean all parts that meet the sample (e.g., during oil immersion) to prevent contamination.

Proper handling while moving the microscope: When moving the microscope, ensure the sample is safely removed. Use one hand to hold the base (position ①) and the other hand to hold the upper part (position ②) to avoid damaging the equipment.

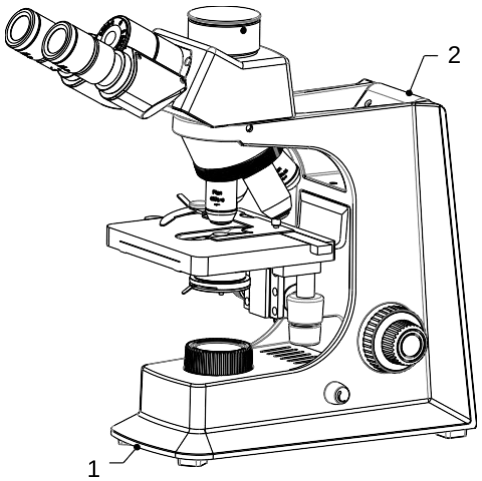


Figure 1

Protect damaged samples: If the sample is damaged, take immediate precautions to prevent contamination.

Maintain proper positioning of the microscope: When adjusting the microscope's height or moving its parts, ensure it remains in a horizontal position to avoid tilting or slipping the sample.

- This instrument is designed to operate with a wide input voltage range (100V-240V, 50/60Hz), making it suitable for use in most areas.
- However, if the supply voltage exceeds this range, the instrument may be severely damaged.
- The microscope uses a 3W LED or a 12V 20W halogen bulb, and the power adapter outputs DC5V 1A and DC12V 4A.
- The microscope should be placed on a stable, horizontal surface.
- In case of an unexpected situation, immediately disconnect the power adapter.
- Kindly follow the installation instructions carefully to prevent damage to the instrument.

1.2 Safety Mark

MARK	MEANING
	The surface will be hot, don't touch it.
	Kindly read the manual instructions carefully at first. Misuse will lead to body damage or instrument damage.
	It is near the fuse socket, which means be aware of electric leakage.
I	The main switch "ON"
O	The main switch "OFF"

1.3 Preparation

1. The microscope is a precise instrument; handle it carefully to avoid collisions and shaking.
2. The operating environment should not have direct sunlight, high temperatures, high humidity, or excessive dust. Avoid violent shaking.
3. The tension on the course focusing knob is adjustable.
4. Kindly leave at least 10 cm of space around the microscope for proper ventilation.
5. First, remove the sample, filters, and round-stage parts to prevent damage.
6. If the microscope is slightly tilted or not positioned correctly, the rubber gasket may fall off.

2. Introduction

Biological microscope LB-62BIM is an instrument with high quality optical system for superior specimen analysis. Aspheric system provides bright and convenient illumination for examination. LED illumination system enables specimen viewing with their natural colours. Various optional accessories upgrade unit and making it more flexible for advanced applications.

3. Features

- Aspheric system reduces spherical aberration
- Back handle and observing hole for convenient operation
- Coaxial coarse and fine focusing adjusting knobs
- Backward nosepiece for quick access to slides
- Finite optical system

4. Specifications

Model No.	**LB-62BIM**
Optical system	Finite optical system
Viewing head	Seidentopf Binocular
Viewing head inclination	Inclined at 30°, 360° rotatable
Interpupillary distance	48 mm ~ 75 mm
Eyepiece	WF10X/18 mm
Objective	Plan achromatic objective 4X, 10X, 40X/0.65 (S), 100X/1.25 (Oil) (S)
Nosepiece	Backward Quadruple
Stage	Double layer mechanical stage
	Size: 145 mm x 140 mm ; Cross Travel: 76 x 52 mm
	Scale 0.1 mm ; Two slide holder
Focusing	Coaxial coarse and fine focusing knobs
	Travel range:26 mm ; Scale:2 μm
Condenser	Abbe condenser NA1.25 with Iris diaphragm
Illumination	3W LED Illumination Systems, brightness adjustable
Dimension	420 x 280 x 450 mm
Weight	6.5 kgs

5. Applications

Used in academic institutes, research, physiology, biology, pathology, bacteriology, medical laboratories, industrial laboratories for sample analysis, to observe cell, tissues and other specimens.

6. Instrument Introduction

Parts Name

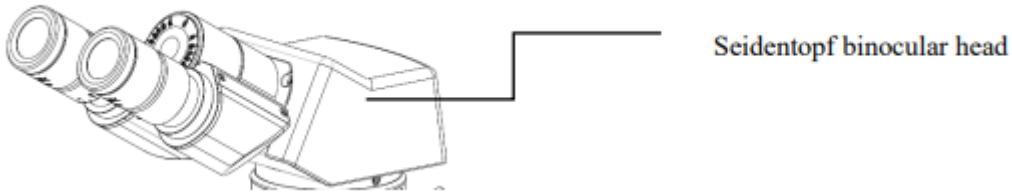


Figure 2

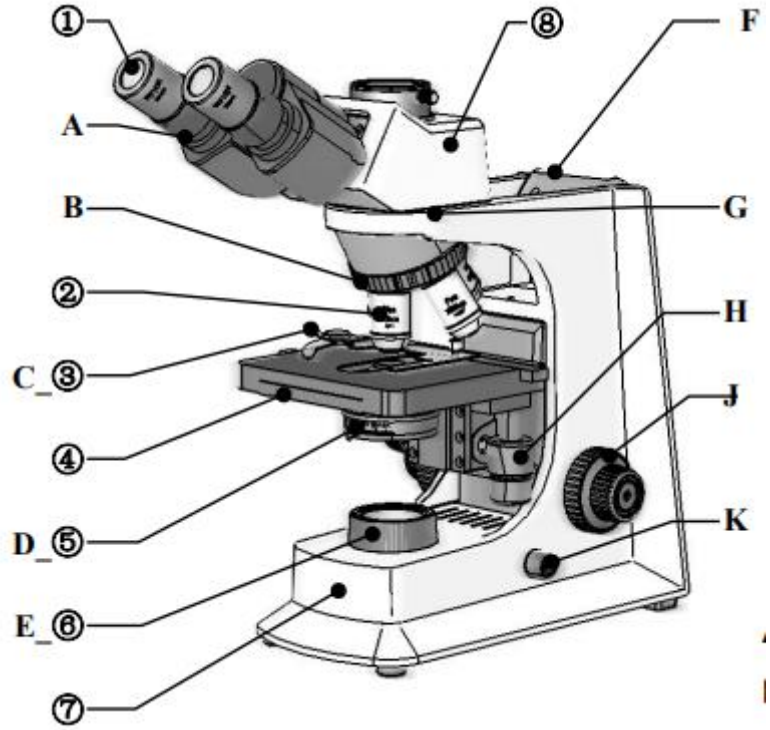


Figure 3

(1) Eyepiece
(2) Objective
(3) Clamp
(4) Mechanical Stage
(5) Condenser
(6) Light Collector
(7) Main Body
(8) Seidentopf Trinocular Head
(9) Power Input

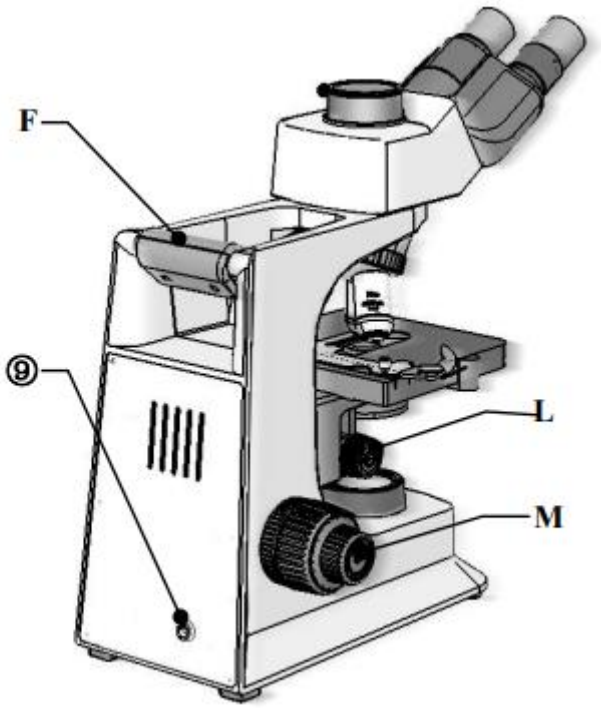


Figure 4

A	Diopter Adjustment Ring
B	Nosepiece
C	Clamp Handle
D	The handle of the Iris Aperture Diaphragm
E	Field Diaphragm Ring(optional)
F	Body Handle
G	Head Thrumb Screw
H	Mechanical Stage Moving Knob
J	Right Coarse & Fine Focusing Knobs
K	Potentiometer/Low-voltage Input with power switch
L	Condenser Focusing Knob
M	Tension Adjustment Ring
	Left Coarse & Fine Focusing Knobs

7. Installation

- Ensure the operation desk is clean before installation.
- Remove the microscope from its carton and place it on the desk.
- Verify that the supply voltage matches the instrument's requirements and ensure the power switch is turned off.

Installation Instructions

1. Rotate the binocular (or trinocular) head to the working position.
2. Remove the dust cover from the eyepiece tube.
3. Insert the eyepiece into the tube.
4. Install the Abbe condenser.

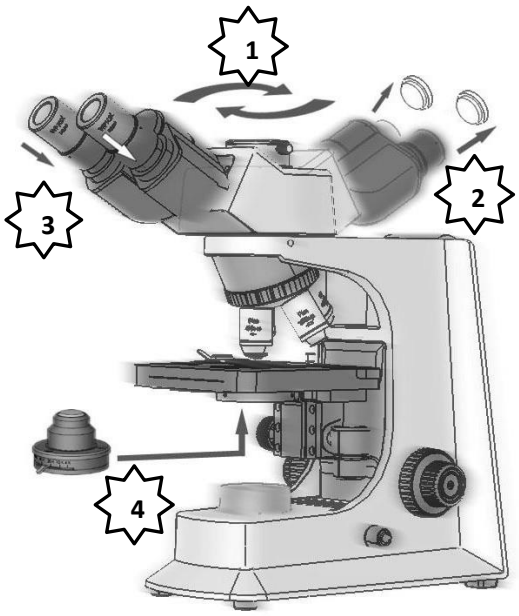


Figure 5

7.1 Eyepiece Tube

Loosen the Head Thumb Screw (G), rotate the tube to the observing position, and then tighten the Screw (G).

7.2 Remove the eyepiece dust cover.

7.3 Eyepiece

Take the eyepiece out of the carton and insert it into the tube. Avoid touching the lens of the eyepiece with your hands.

7.4 Condenser

Remove the condenser from the carton, then use the Condenser Focusing Knob (M) to lower the condenser installation ring. Loosen the condenser screw, install the condenser, and ensure the condenser graduation is facing forward. Tighten the condenser screw and raise the condenser installation ring to the top.

Avoid touching the lens with your hands.

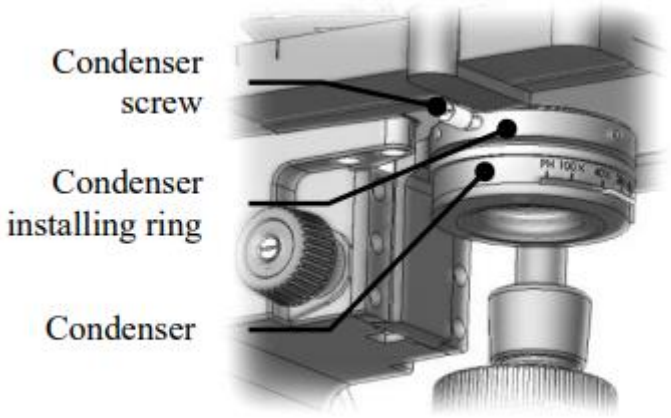


Figure 6

7.5 Power

- Turn on the power supply.
- Set Switch L to the open position.
- Adjust Potentiometer J as required.

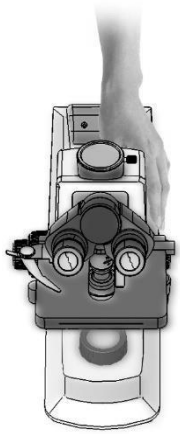
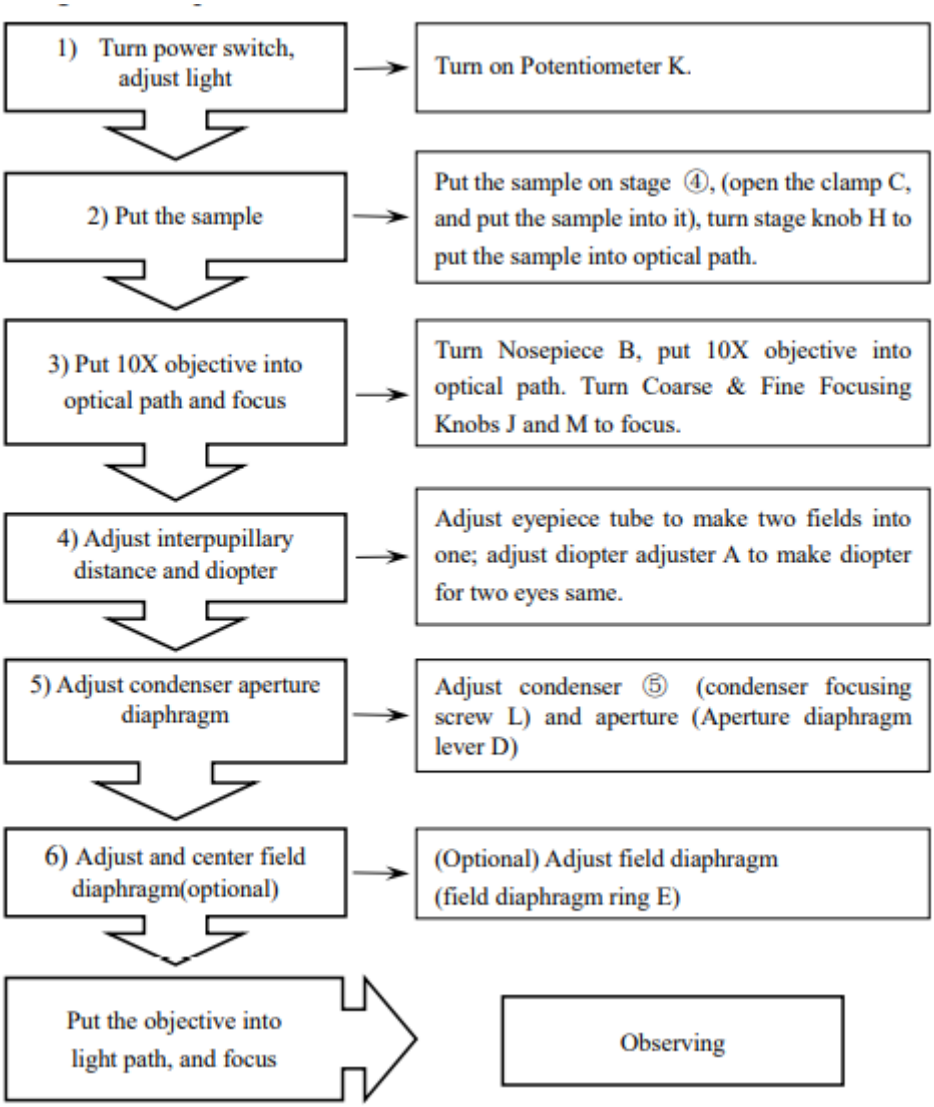


Figure 7

Figure 8

8. Operations

8.1 Brightfield Operation Process Instruction



- Do not forcibly rotate the left and right coarse or micro handwheels in reverse simultaneously, as this may damage the focusing mechanism.
- Do not switch the objective directly when changing it. Instead, rotate the toothed ring on the nosepiece to align the purpose with the optical path.
- It is necessary to readjust the pupillary distance of both eyes before using this instrument.
- The automatic mechanical stage moving downward may occur after long-term use.
- Tension adjustment ring R can adjust the firmness and comfortable sensation of the coarse and fine focusing knob, preventing moving downward.
- Clockwise rotation is relaxed, the reverse is fastening.

8.2 Parts Operation

8.2.1 Illumination

1. **Connect the Power Supply:** Attach the power adapter and cable to the microscope and ensure a stable power supply.
2. **Adjust Brightness:** Rotate Potentiometer K to set the desired brightness level.

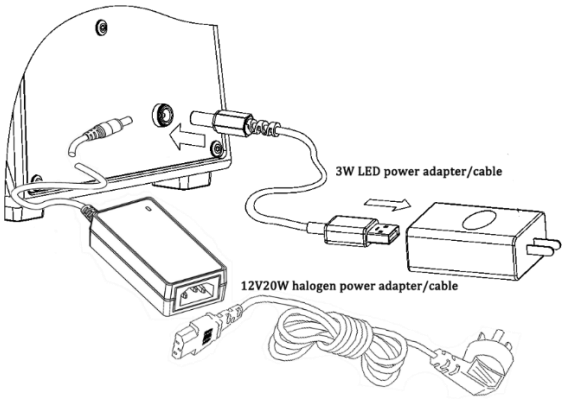


Figure 9

8.2.2 Condenser and Aperture Diaphragm

1. Turn the condenser focusing knob to adjust the distance between the sample and the condenser, achieving optimal brightness.

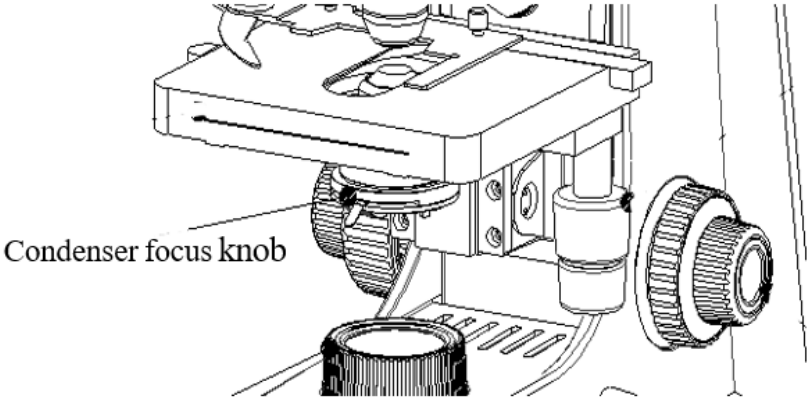


Figure 10

2. **Adjust the Aperture Diaphragm**
   - Use the aperture diaphragm lever to modify the diaphragm size and adjust the sample's contrast.
   - Shrinking the aperture diaphragm decreases brightness and resolution but increases contrast and depth of field.

- Conversely, opening the diaphragm increases brightness and resolution while reducing contrast and depth of field.

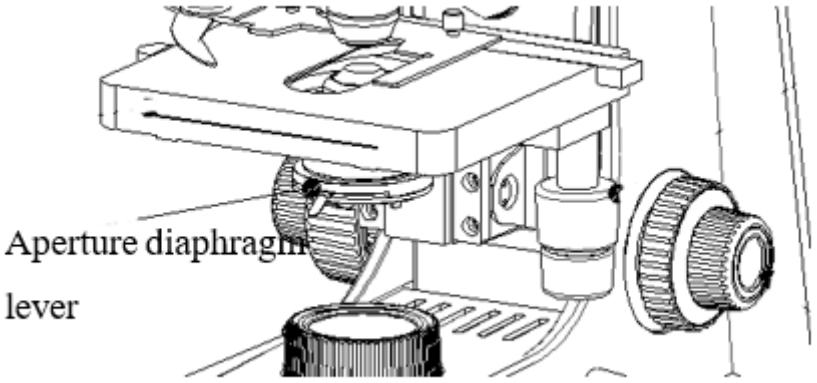


Figure 11

- The numerical aperture depends on the illumination system, while the objective aperture diaphragm should match the illumination system's aperture diaphragm. This alignment ensures optimal image resolution and contrast and increases the depth of field.
- Since sample contrast is generally low, the condenser aperture diaphragm should be set to 70% to 80% of the numerical aperture. Additionally, you can observe through the eyepiece tube or adjust the microscope without the eyepiece for fine-tuning.

(If the Aperture Diaphragm size is too small, will get a double image)

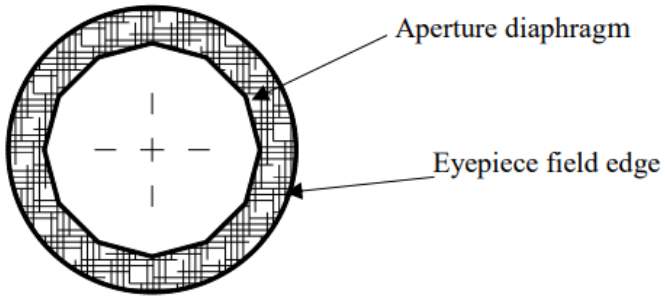


Figure 12

8.2.3 Filter

Insert the required matching filters into the holder of the condenser or place them on the collector, as needed.

- Remove the filter before moving the microscope to avoid damaging it.
- It is also recommended to remove the filters after use to prevent dirt buildup.

8.2.4 Independent Phase Contrast Unit

The independent phase contrast unit includes a phase contrast objective (10X/20X/40X/100X), a telescope, an independent condenser, a green filter, and a phase contrast slider (each slider is labeled with its corresponding magnification).

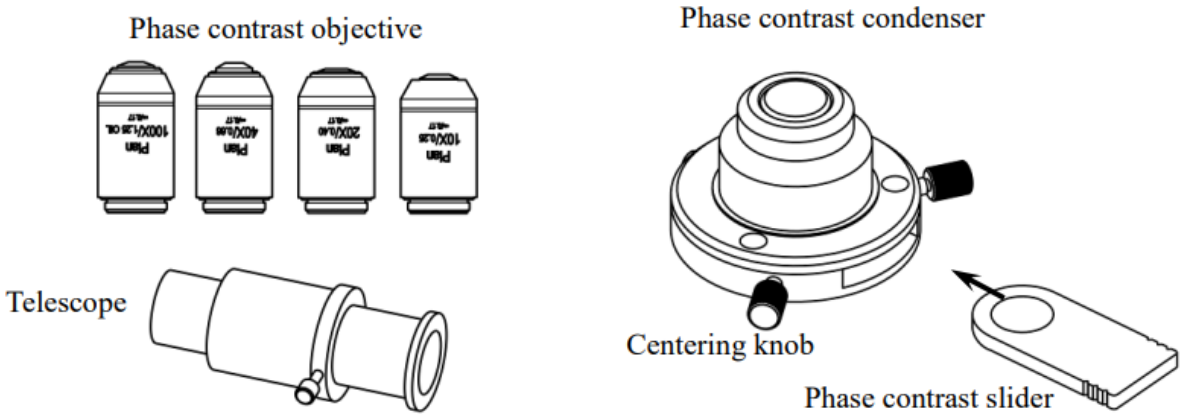


Figure 13

1. Insert the phase contrast slider into the slot on the condenser and place the corresponding magnification phase contrast objective lens into the optical path.
   Note: The "TOP" label on the phase contrast slider should face upward.

2. If a centering telescope is available, use it to observe the overlap of the bright and dark rings in the field of view. If the rings do not overlap, adjust the centering knob until the two rings align properly.

   Centering Adjustment (Use 10X PH Objective as an example):

   1) Place the 10X PH objective in the light path, adjust the relevant hole on the slider move the turntable to the "10X" mark, and set the aperture diaphragm to its maximum.
   2) Replace one eyepiece with the centering eyepiece, loosen the fixed screw, pull the eyepiece up, and observe the field. Ensure the phase contrast slider provides a clear image, then lock the screw in place.

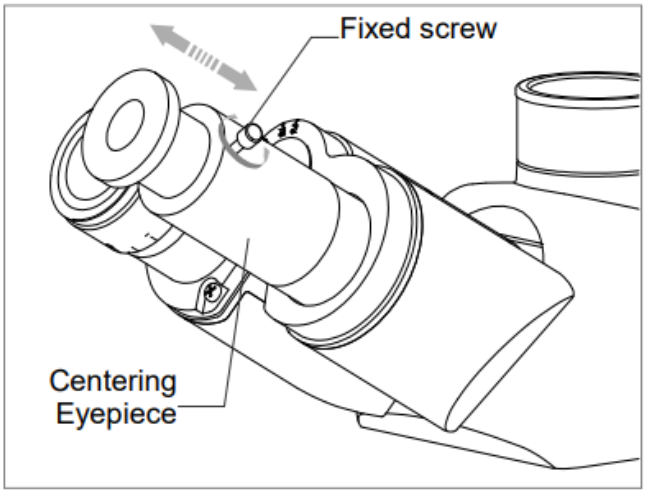


Figure 14

3) Adjust the centering lever of the phase contrast condenser to align the overlapping circles.

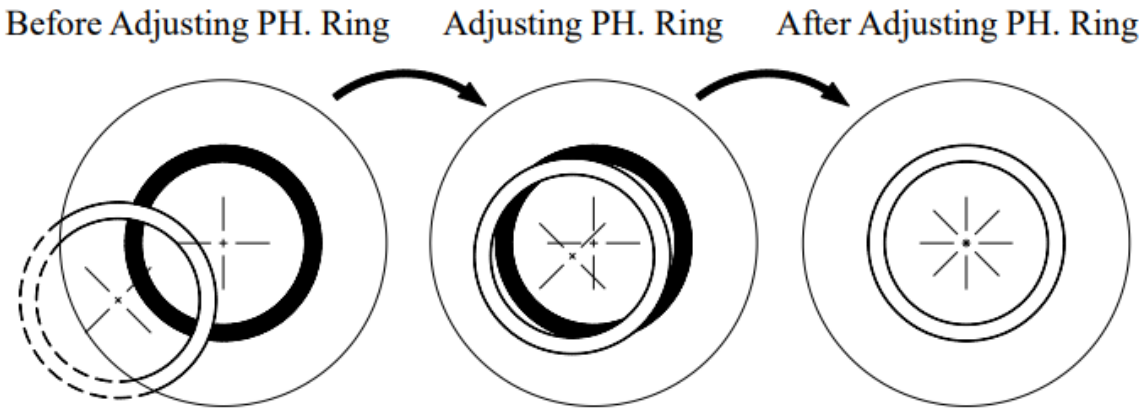


Figure 15

8.2.5 Simple Polarizing Unit

The polarizing unit consists of an analyzer and a polarizer, which can be used to identify the isotropic and anisotropic nature of materials.

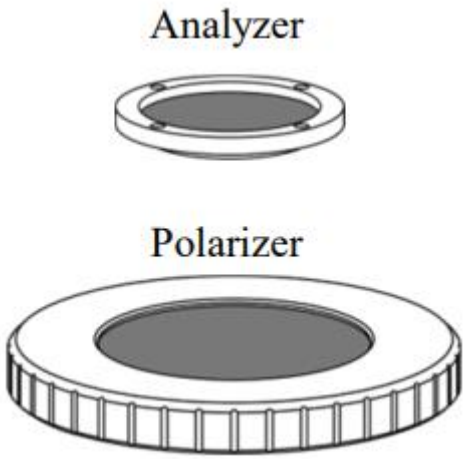


Figure 16

8.2.5.1 Installation

- Loosen the screw on the head, then remove the observation head.
- Insert the analyzer into the main body and reinstall the observation head.
- Place the polarizer onto the collector.

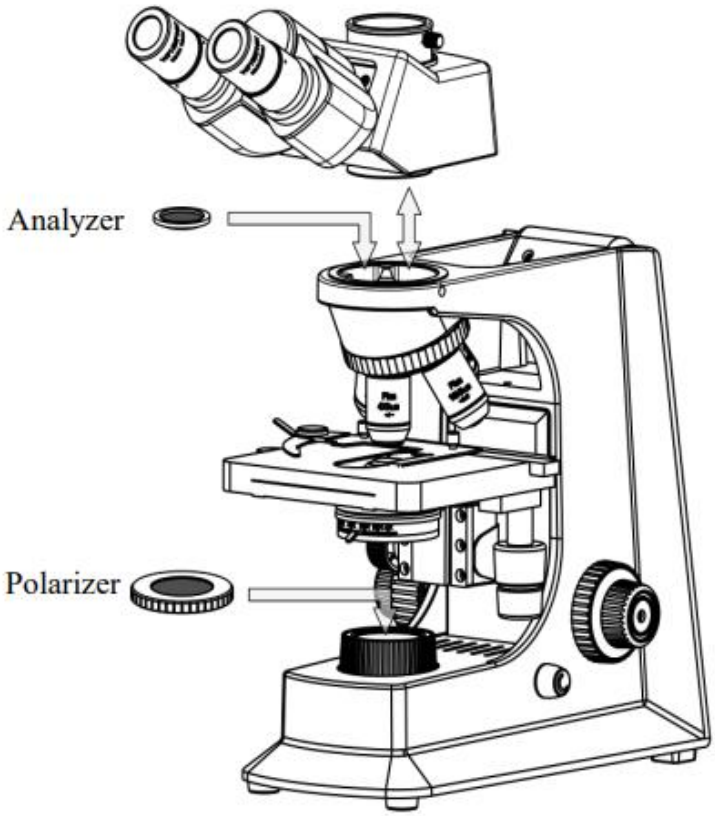


Figure 17

8.2.5.2 Operation

1) Follow the bright field operation procedure to adjust the microscope. Set the aperture diaphragm lever to its maximum position. Move the sample out of the eyepiece field and rotate the polarizer 360°. The field will change from light to dark until it reaches complete darkness.
2) Place the sample in the field of view and perform qualitative observation with orthogonal polarization.

8.2.6 Darkfield Condenser

Observation with the dark field unit allows the detection of microscopic objects or points smaller than the resolution limit, which may not be visible in standard field observation. It presents a bright outline against a dark background, making it especially useful for observing points with low contrast and high refractive properties.

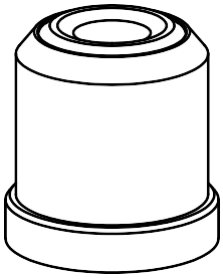


Figure 18

8.2.7 Digital/SLR Camera Installation

8.2.7.1 Installing

- Connect the C-mount to the CCD/CMOS camera or attach an SLR camera using a camera adapter, then insert it into the microscope.
- Before connecting the microscope camera, ensure the CCD/CMOS camera software is installed on the computer.

8.2.7.2 Using

- First, obtain a clear image through the eyepiece, then capture the image with the camera.
- Ensure the image on the screen is clear. If the image is not clear, adjust the fine focusing knobs to achieve clarity.

9 Maintenance

9.1 Clean Microscope

1) **Lens Cleaning:** Avoid touching the lens with your hands. Dust on the lens should be removed with a soft brush or absorbent cotton. For thorough cleaning, use absorbent cotton or lens paper with a mixture of alcohol and ether (in a 1:4 ratio).
2) **Flammability Warning**: Both alcohol and ether are highly flammable. Keep them away from heat or open flames, and exercise caution when turning the power on or off.
3) **Cleaning Metal Surfaces**: Do not use organic solvents, such as alcohol, ether, or their mixtures, to clean painted or galvanized metal surfaces. It is recommended to use a silicone cloth or a soft cleaning solution.
4) **Plastic Cleaning**: Clean plastic surfaces using a soft cloth dampened with clear water.

9.2 Environment of using and placing

1) The microscope should be used and stored in a cool, dry, dust-free environment, free from vibration and corrosive gases.
2) The microscope should be operated in an indoor environment with a temperature range of 0°C to 40°C and a maximum relative humidity of 85%.
3) In areas with high humidity, it is recommended to install dehumidifying equipment to prevent fungus and moisture damage to the microscope.
4) Take care to prevent the microscope from experiencing violent shaking or vibration during use or transport. Do not drag it across the work surface to avoid damaging both the microscope and the work table.

9.3 Replacement of bulb

1) Turn off the power and unplug the microscope.
2) Wait for the bulb to cool down.

Note: Ensure the bulb is completely cool before proceeding with the following steps.

3) Securely place the microscope aside and unscrew the knurled thumb screw on the lamp housing cover located on the underside of the base.
4) Remove the lamp housing cover.
5) Carefully remove the bulb to be replaced. Hold the new bulb with a silk cloth to avoid fingerprints and dust, which could affect the bulb's brightness and lifespan. Insert the bulb fully into the socket, ensuring the contact pins are properly aligned.
6) Replace the lamp housing cover and screw the knurled thumb screw back into place.

Note: After running the microscope for more than 10 hours continuously, it is advisable to power off the microscope for about 30 minutes to prevent overheating.

9.4 Maintenance and Store

- Use gauze with a mixture of 70% ether and 30% alcohol to gently wipe the lens.
- Since alcohol and ether are flammable, keep them away from fire. Be cautious when turning the power on and off. Ensure the area is well-ventilated.
- Use a soft cloth with a neutral detergent to clean parts other than the glass components.
- When not in use, kindly cover the microscope with a dust cover.
- After unpacking the carton, kindly keep the packing materials for storage and transportation.

10. Troubleshooting

During the use of the Smart series microscope, if any issues arise, kindly refer to the following sheet, which lists some common troubleshooting steps to resolve them.

Trouble	Causation	Remedy
Switch on but the bulb dark	Plug is unreliable	Plug in again
	Bulb is broken	Change bulb
	Fuse is broken	Change fuse
The bulb is flickering, or the brightness is unsteady.	Bulb is unstable	Insert it again
	Bulb is broken	Replacing bulb
The brightness of the view field isn't enough or is Uneven.	The bulb specification doesn't meet the requirement.	Replacing bulb
	Brightness isn't adjusted correctly.	Adjust the rotation potentiometer.
	The objective isn't in the correct position.	Make the objective incorrect position.
	The size of the iris aperture is too small.	Adjust the size of the iris aperture.
The brightness of the view field isn't enough or is Uneven.	The lens (objective, eyepiece, condenser, light collector) has dust.	Clean it
	The position of the condenser is too low.	Higher condenser
The image isn't clear (contrast or definition isn't enough).	The cover glass of the specimen doesn't meet the requirement.	Use the required thickness cover glass (0.17mm).
	The cover glass of the specimen isn't up direction.	Place specimen correctly.
	The surface of the objective lens is dirty (especially since it is easy for the front lens of the 40X objective to dip in immersion oil).	Clean it.
	Immersion oil isn't used for 100X objective (oil).	Use immersion oil.
	Immersion oil doesn't meet the Requirement.	Use immersion oil supplied by us.
	There is a bubble in the immersion oil.	Clear the bubble way.
	The size of the iris aperture isn't Proper.	Adjust the size of the iris aperture.

	The position of the condenser is too low.	Readjust the position of the condenser.
One side of the image is dark, or the image is moving as focusing.	The objective isn't in the correct position.	Make the objective in the correct position.
	The specimen isn't placed correctly.	Place the specimen levelly on stage and clip it with a clamp.
Objective touches specimen as changing low time's objective to high times objective.	The cover glass of the specimen isn't in the right direction.	Place specimen correctly.
	Cover glass doesn't meet the requirement.	Use the required thickness cover glass (0.17mm).
The image observed by two eyes isn't in superposition entirely.	The interpupillary distance isn't adjusted correctly.	Adjust interpupillary distance according to the two eyes.
It is easy for the eyes to be tired during observing.	The diopter isn't adjusted correctly.	Readjust diopter.