



A Microscope for Everyone



LMC-1000

MICROSCOPE SERIES

USER MANUAL

LAXCO Inc.

22118 20th Ave SE | Suite 142 | Bothell, WA 98021

www.laxcoinc.com | TEL: 425-686-3083 | FAX: 425-424-2006

Before Use

1. COMPONENTS	1
2. ASSEMBLING	4
2-1 ASSEMBLING SCHEME	4
2-2 ASSEMBLING STEPS	5
3. OPERATION	7
3-1 SET ILLUMINATION	7
3-2 PLACE THE SPECIMEN SLIDE	7
3-3 ADJUST FOCUSING	7
3-4 ADJUST THE FOCUSING TENSION	8
3-5 ADJUST THE DIOPTR	8
3-6 ADJUST THE INTERPUPILLARY DISTANCE	8
3-7 ADJUST THE APERTURE DIAPHRAGM AND CONDENSER	9
3-8 USE THE OIL OBJECTIVE (100X)	9
3-9 USE THE COLOR FILTER	10
3-10 REPLACE THE FUSE (BUILT-IN SWITCH POWER SUPPLY)	10
3-11 USE THE USB DIGITAL HEAD	10
3-12 USE THE HDMI DIGITAL HEAD	11
3-13 ASSEMBLE AND USE THE TV DEVICE	11
3-14 USE THE STAGE FOR BIOLOGICAL OBSERVATION	11
3-15 USE THE CULTURE DISH FOR LIVING CREATURE	12
3-16 USE THE PLATE FOR STEREO OBSERVATION	12
4. TROUBLESHOOTING	13

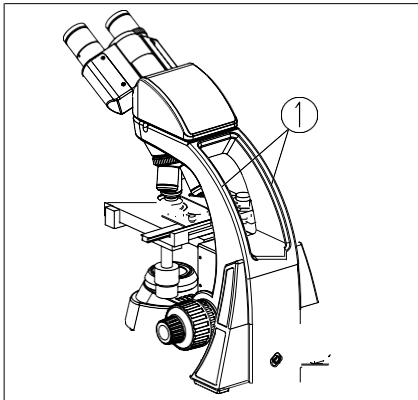
1. Operation Notice

Fig.1

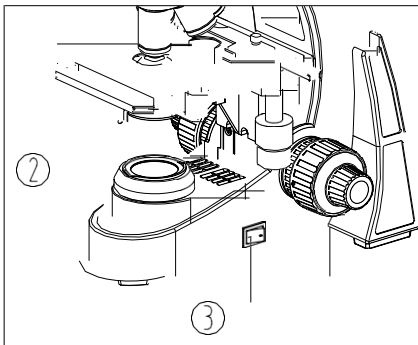


Fig.2

1. A microscope is a precision instrument, always operate it with care and avoid vibration during operation.
2. Do not expose the microscope to direct sunlight and avoid high temperatures, high humidity, dust and vibration. Place the microscope on a flat and stable surface. Operating conditions: Indoor temperature: 5°C ~40°C, Max relative humidity: 80%.
3. When moving the microscope, use both hands to hold its arm①, and place microscope on work surface carefully (see Fig. 1).
★ **Damage may occur from holding the stage, focusing knob or head when moving.**
4. When the microscope lamp is on, the surface of the field lens will be very hot. Make sure there is enough room for heat to dissipate around the condenser② (see Fig. 2).
5. For safety, make sure the power switch is in the “O” (OFF) position before replacing the bulb or fuse (See Fig. 2), and wait until both the bulb and bulb holder have cooled down.
6. Standard bulb: Single 3W LED bulb.
7. The power switch has been placed in a user friendly location on the right side of the microscope.

2. Maintenance

1. Wipe the lens gently with a lens cloth . Carefully wipe off oil and fingerprints on the objective surfaces with a lens cloth moistened with a small amount of lens cleaning solution.

★ As alcohol and ether is flammable, don't place these chemicals near an open flame. For example, when turning on or turning off the electrical device, please use these chemical in a ventilated place.


2. Don't use organic solutions to wipe the surfaces of the other components. Please use a neutral detergent if necessary.

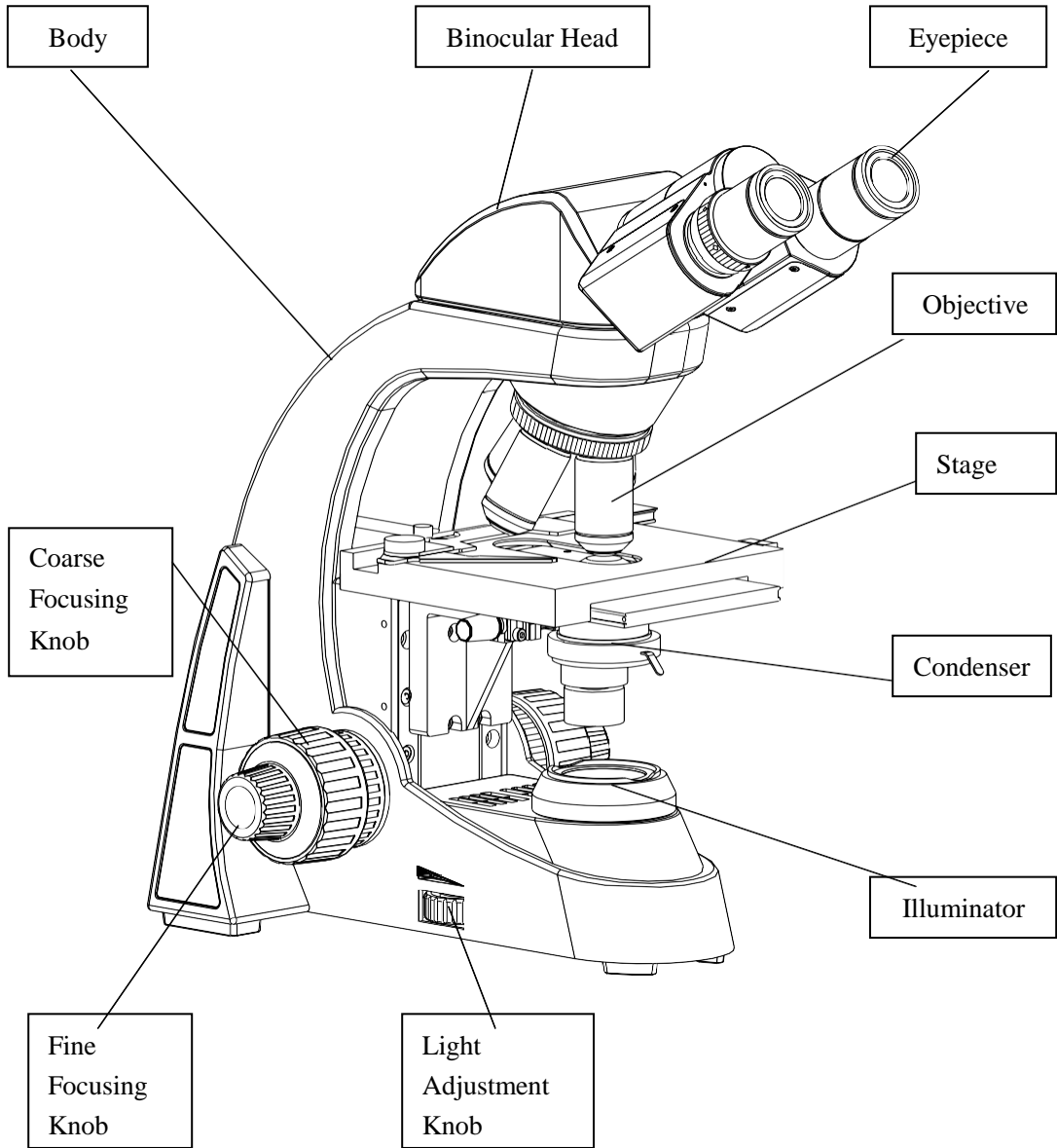
3. If the microscope is exposed to liquid during operation, please power it off immediately and wipe it dry.

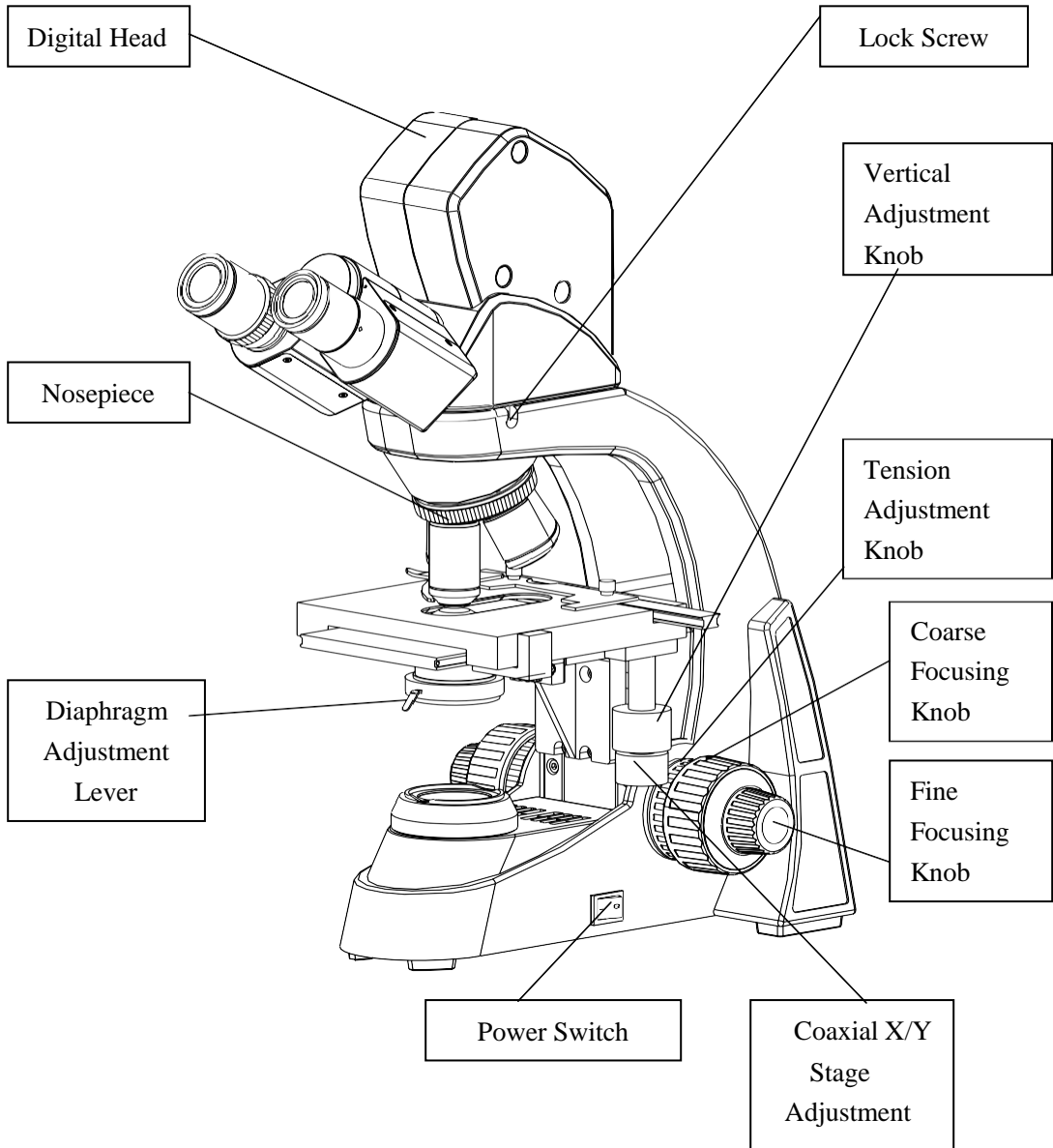
4. Never disassemble the microscope, the performance will be affected or the instrument will be damaged.

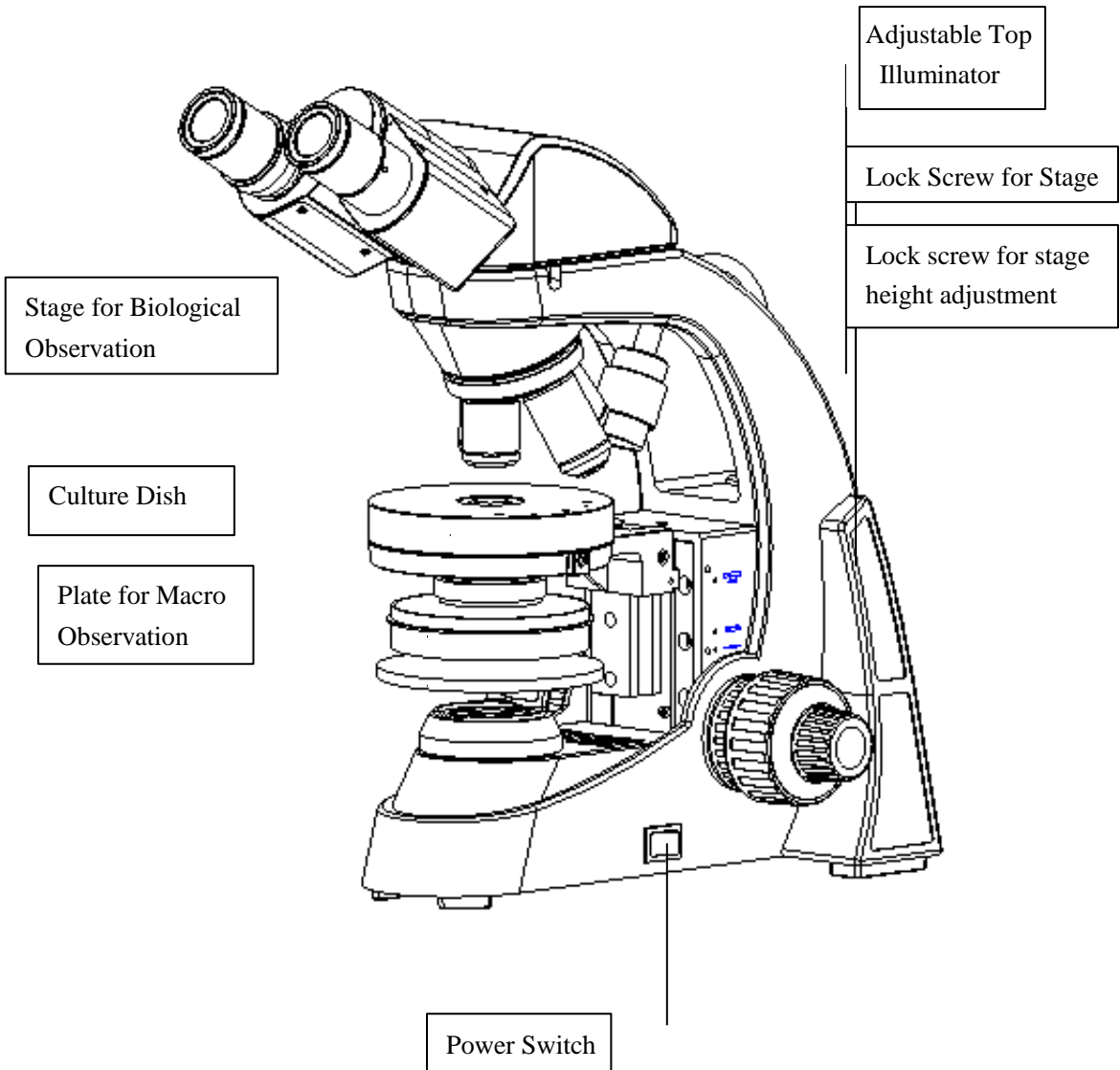
5. After use, cover the microscope with a dust cover.

3. Safety Sign

Sign	Signification
	Read the manual before use. Unsuitable operation would lead to injury or instrument failure
	Main switch ON
O	Main switch OFF



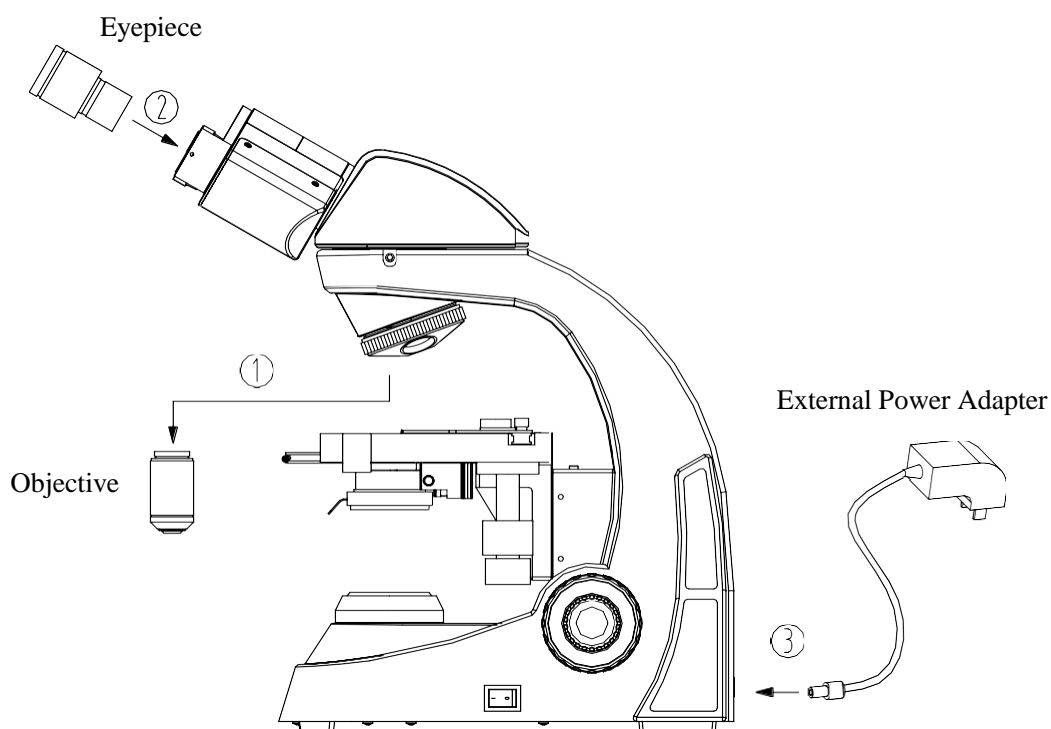




2-1 Assembling Scheme

The assembly order below is denoted by the number associated with the component.

★ Before assembling, make sure the components are free of dust and dirt. Assemble carefully and avoid touching any lens or glass surface.



2-2 Assembling Steps

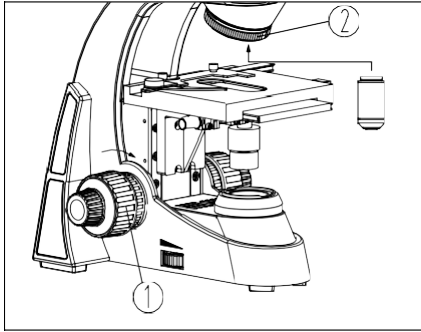


Fig.3

2-2-1 Assemble Objectives

1. Rotate the coarse focusing knob ① to lower the stage to a suitable location (See Fig.3).
2. Install the objectives into the nosepiece from the lowest magnification to the highest in a clockwise direction.

★ Search and focus the sample with a low magnification objective (4X or 10X) then change to the high magnification objective according to the observation requirements.

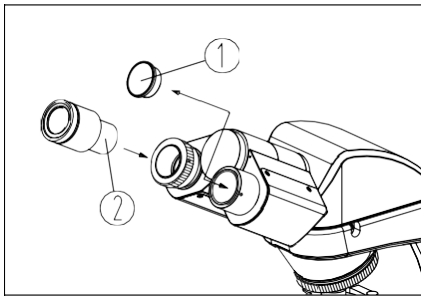


Fig.4

2-2-2 Assemble the Eyepiece

1. Remove the eyetube cover ①.
2. Insert the eyepiece ② into the eyetube. Ensure it is fully inserted (See Fig. 4).

2-2-3 Assemble or Replace the LED

Remove the lock screw on the base plate and remove base plate. Unplug connector to remove base plate from the microscope ① and ②. Remove the two screws ③ to remove LED module. Replace with a new LED module. Reinstall the LED module by replacing the two screws on the base plate, connect plug connector ② into connector socket ①, reinstall baseplate onto microscope (See Fig.5).

★ Before replacing the LED, turn off main power and wait for LED module to cool down, to avoid injury (burns etc.).

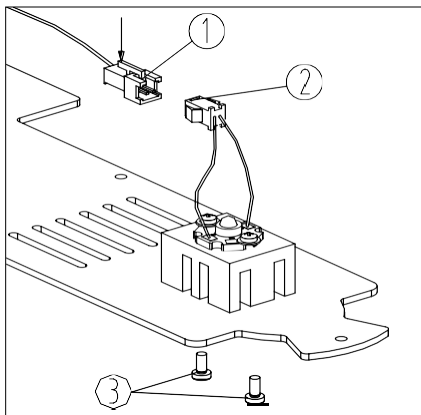


Fig.5

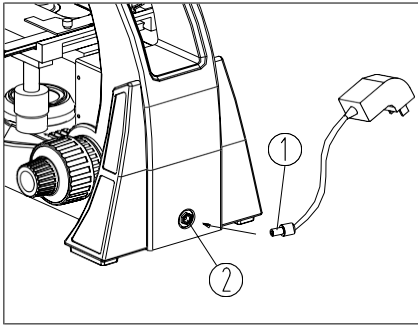


Fig.6

2-2-4 Connect the External Power Adapter (Power Cord/Charger)

- ★ **Avoid using excessive force, bending or twisting power cord which will cause damage.**
- ★ **Use the special external power adapter (power cord/charger) supplied with the microscope. If it's lost or damaged, only replace with a power adapter with the same specifications.**

◎ **External Power Adapter**

1. Ensure the power switch is at "O" (OFF).
2. Insert the plug of the external power adapter① into the power socket② of the microscope, then insert power adapter into wall socket.

(See Fig. 6).

- ★ **Use a DC6V 2A external power supply on upright compound model. Only use an external power adapter that complies with this requirement.**
- ★ **Macro/Micro models with rechargeable battery must use DC6V 1A external battery charger for charging. When instrument is fully charged, the charger indicator will change from orange to green. When replacing rechargeable battery, use high-quality 5 # rechargeable battery.**

◎ **For Built-in Switch Power Supply (halogen models)**

1. Ensure the power switch is at "O" (OFF).
2. Insert end of power cord① into the power socket② of the microscope. Then insert the power cord into a wall socket. (See Fig.7).

- ★ **The power supply box supports voltage from 100-240V. No additional external power adapter is needed.**

- ★ **Connect the power cord correctly to ensure the instrument is connected to ground.**

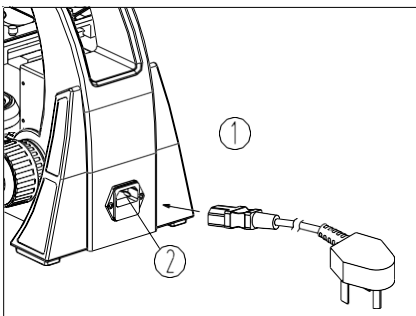


Fig.7

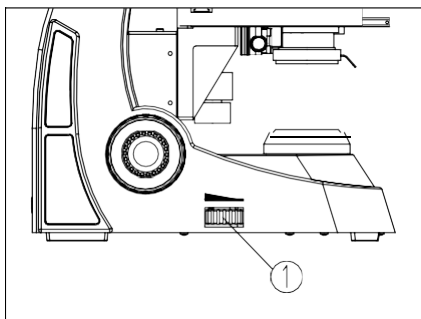


Fig.8

3-1 Illumination

1. Turn on the main power switch to “—”(ON).
2. Adjust the dimmer knob ① until the desired illumination is reached. Rotate the dimmer knob clockwise to increase the brightness. Rotate the dimmer knob counterclockwise to reduce the brightness (see Fig. 8).

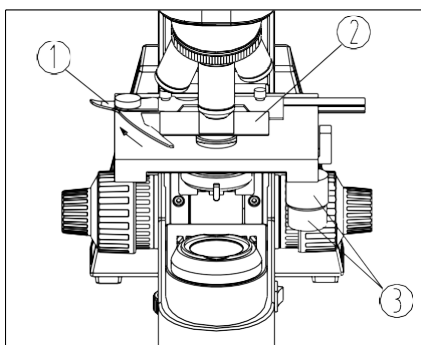


Fig.9

3-2 Placing the Specimen/Slide

1. Open the slide holder by pressing the slide holder lever ① towards the back of the microscope, insert slide with cover slid up ② secure the slide by gently releasing the slide holder lever (see Fig. 9).
2. Rotate the X and Y-axis knob ③ to move the specimen to the center (alignment with the center of the objective).

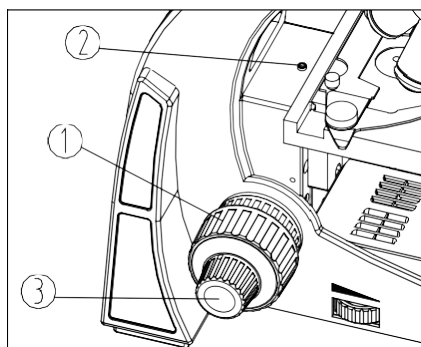


Fig.10

3-3 Adjusting Focus

1. Rotate the 4X objective into the light path.
2. Observe specimen through the eyepieces. Rotate the coarse focusing knob ① until the image appears in focus in the view field (See Fig.10).
3. Rotate the fine focus knob ③ until the image is in clear focus.

★ The lock screw ② can prevent the objective touching the slide when focusing.

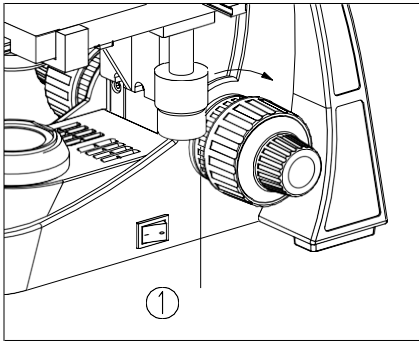


Fig.11

3-4 Adjust the Focusing Tension

If the coarse focus knob's tension is greater than desired or the stage drifts under normal observation, you can resolve this issue by adjusting the tension adjustment ring (See Fig. 11).

Rotate the tension adjustment knob① 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.

3-5 Adjusting Eyepiece Diopter

Observe the right eyepiece with the right eye, focus it until the image is clear. Then observe the left eyepiece with the left eye, if the image is not in focus, rotate the diopter adjustment ring① until the image is clear (See Fig.12).

★There are ± 5 diopters on the diopter adjustment ring①, the value aligned with the scale② is your eye's diopter.

★

★Make note of your eye's diopter for future use.

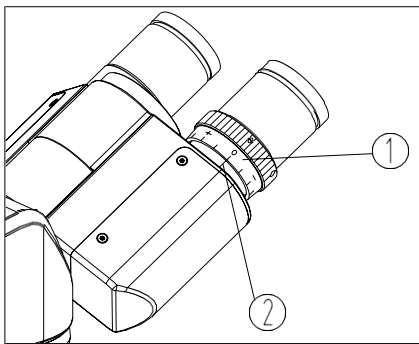


Fig.12

3-6 Adjusting Interpupillary Distance

Observe specimen through both eyepieces, hold the base of the prism and rotate them around the axis to adjust the interpupillary distance, until there is single field of view. The dot “.”① on the eyepiece base points to the scale② of the interpupillary distance indicator. The scale value is the interpupillary distance (See Fig. 13). Adjustable range: 50~75mm.

★Remember your eye's interpupillary distance for future use.

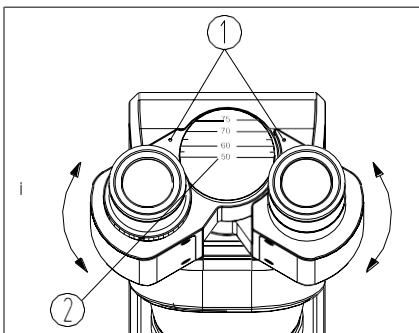


Fig.13

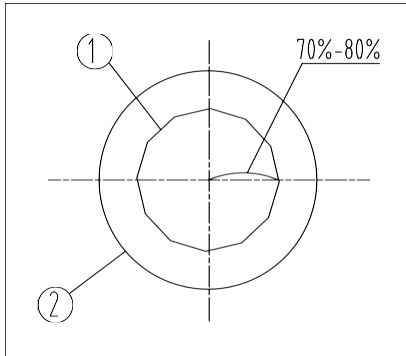


Fig.14

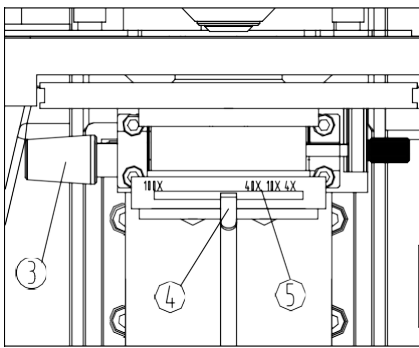


Fig.15

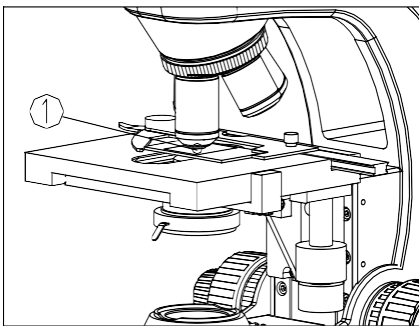


Fig.16

3-7 Adjust the Aperture Diaphragm and Condenser

1. The aperture diaphragm determines the numerical aperture of the illumination system. If the N.A. of illumination system matches with the N.A. of the objective, it can obtain better resolution and contrast, and increase the depth of field.

2. Adjust condenser adjustment knob③ in a clockwise direction, raise the condenser to the top to allow the illumination to fill the field of view. If the specimen contrast of your sample is low, it is advised to adjust the condenser aperture diaphragm to be 70%-80% of the N.A. of objective. Rotate the aperture diaphragm adjustment ring④, align the arrow with the magnification position on the condenser⑤. The eyepiece can be taken off if necessary to observe from the eyetube. Adjust the aperture diaphragm adjustment ring④ until it matches the figure as shown in Fig.14, to adjust the proportion (see Fig. 14&15, ① is the image of aperture diaphragm, ② is the edge of objective).

3-8 Using the Oil Objective (100X)

1. Use the 4X objective to focus the specimen.
2. Place a drop of oil① on the specimen (see Fig. 16).
3. Rotate the nosepiece counterclockwise and rotate the oil objective (100X) to the light path. Then use the fine focus knob to focus.

★ Make sure there is not an air bubble in the oil

A. Remove 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 appears round and light).

B. Rotate nosepiece slightly and swing the oil objective a few times to remove the air bubble.

4. After use, wipe the front lens with a lens cloth and lens cleaning solution. Clean oil from the slide.

★ **Don't rotate another objective to the light path before wiping oil from the slide to avoid getting oil on a dry objective.**

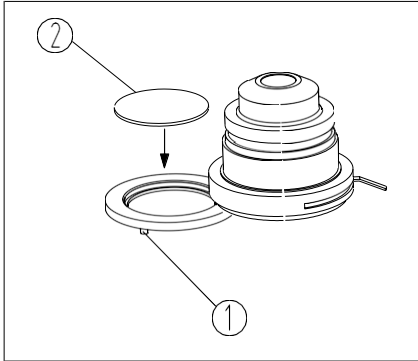


Fig.17

3-9 Filters

Unscrew color filter holder① at the bottom of the condenser in clockwise direction, install the filter② into the holder, then reinstall holder in counterclockwise direction (See Fig.17).

★ **There are three color filters available: blue, green and yellow.**

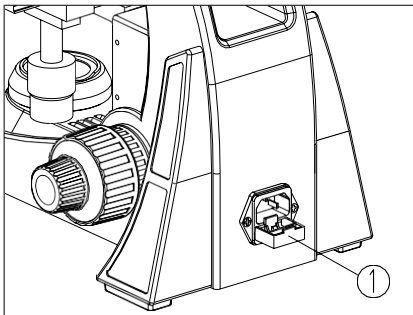


Fig.18

3-10 Replacing Fuse (halogen models)

Turn the main switch to "O" (OFF) before replacing the fuse. Remove the power cord. Pull the fuse base① until the fuse can be removed from the fuse base. Install a new fuse and reinsert the fuse base thoroughly (See Fig. 18).

3-11 Use the USB Digital Head

★ **Avoid using excessive force, bending or twisting USB cable which will cause damage.** Insert the connector① of cable into the USB port② on the back of microscope head, then insert cable into the USB port of the computer (See Fig.19), Digital USB interface: voltage 5V, current \leq 500mA.

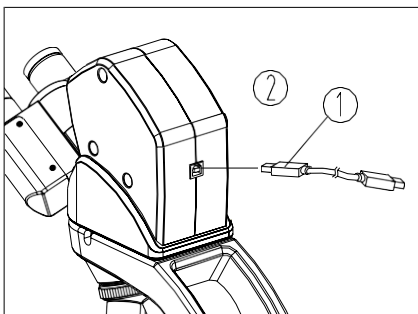


Fig.19

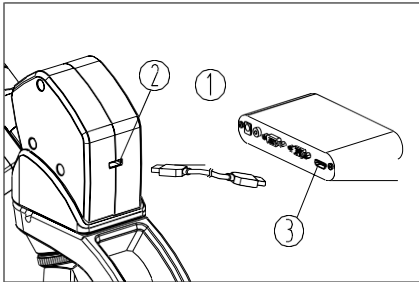


Fig.20

3-12 Use the HDMI Digital Head

★ **Avoid using excessive force, bending or twisting cable which will cause damage..**

Insert the connector① of HDMI cable into the HDMI interface② on the back of microscope head, view the real time image by connecting the other end to the converter device③ (See Fig.20 (Only for HDMI digital microscope.))

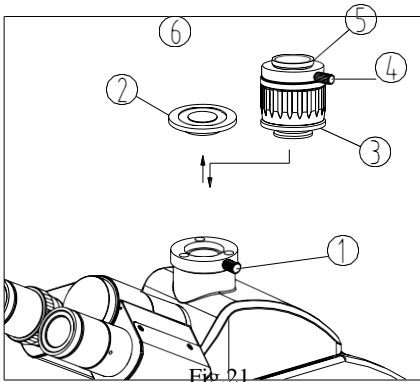
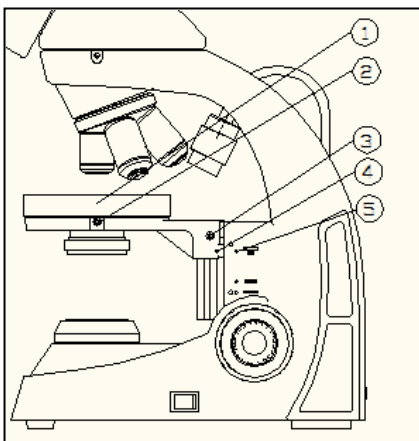


Fig.21

3-13 Installation of camera

1. Loosen the lock screw① on the trinocular head, and remove the dust cap② (See Fig.21).
2. Remove dust caps from camera adapter③. Insert the camera adapter into the trinocular head as shown in the figure and tighten the lock screw①.
3. Attach camera to camera adapter.
4. To adjust parfocality of camera image, focus on specimen through the eyepieces. If the camera image is not in focus rotate the camera adapter focus adjustment⑥ until it is clear.



3-14 Use the Stage for Biological Observation

Place the round stage ① into the holder, tighten set screw ②. Adjust coarse focus knob to raise the stage to the top position, loosen the screw③ to adjust the height of the stage, then tighten the lock screw ③when marks ④ and ⑤ are horizontally aligned. (See Fig.22)

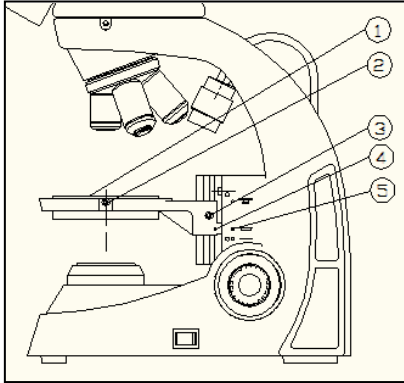


Fig 23

3-15 Using the Culture Dish

Place the culture dish ① into the holder, then tighten the lock the screw ②. Adjust coarse focus knob to raise the stage to the top position, loosen the screw ③ to adjust the height of the stage, then tighten the lock screw ③ when marks ④ and ⑤ are horizontally aligned. (See Fig.23)

(Only available under 2X objective)

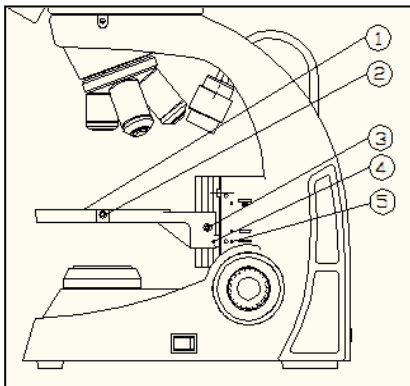


Fig 24

3-16 Use the plate for Stereo Observation

Place the stage plate ① into the holder, then tighten the lock the screw ②. Adjust coarse focus knob to raise the stage to the top position, loosen the screw ③ to adjust the height of the stage, then tighten the lock screw ③ when marks ④ and ⑤ are horizontally aligned. (See Fig.23)

Problem	Cause	Solution
1. Optical system		
(1) The bulb is bright but it is dark in the field of view.	Field diaphragm is not large enough.	Enlarge the field diaphragm.
	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 into the 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 thickness of $\delta 0.17\text{mm}$.
	The specimen faces down.	Put the specimen to face up.
	The immersion oil has accumulated on the dry objective.	Clean thoroughly.
	The immersion oil is not used for oil objective.	Use immersion oil.
	Air bubble in the immersion.	Get rid of the air bubble.
	Use wrong immersion oil.	Use a correct one. (Cedar oil)
	The aperture diaphragm is not opened correctly.	Adjust it.
	Stain or dust has accumulated on the lens of eyepiece.	Clean the lens.
Condenser is too low.	Adjust the condenser.	
(5) One side of the image is dark 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 into the right position.
	Condenser is not centered.	Center the condenser.
(6) The eyes feel tired easily. The right field of view doesn't superpose with the left.	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
2. Mechanical system		
(1) Cannot focus when using 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 thickness δ 0.17mm.
(2) The objective touches the cover glass while turning the nosepiece.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is too thick.	Use a standard cover glass with thickness δ 0.17mm.
(3) Coarse focusing knob is too tight.	Tension adjustment knob is too tight.	Loosen it to an appropriate position.
(4) Stage declines itself and cannot stay on the focal plane.	Tension adjustment knob is too loose.	Tighten it to an appropriate position.
(5) Coarse focusing knob cannot rise.	The coarse focusing limit knob is locked.	Loosen the coarse focusing limit knob.
(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.
3. Electrical Part		
(1) The bulb does not 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 light adjusting knob is incorrect.	Adjust it correctly.