

Вертикальные микроскопы LMC 1000

Технические характеристики

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1. Operation Notice

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 arm (1), and place microscope on work surface carefully (see Fig. 1).

* Damage may occur from holding the stage, focusing knob or head when moving.

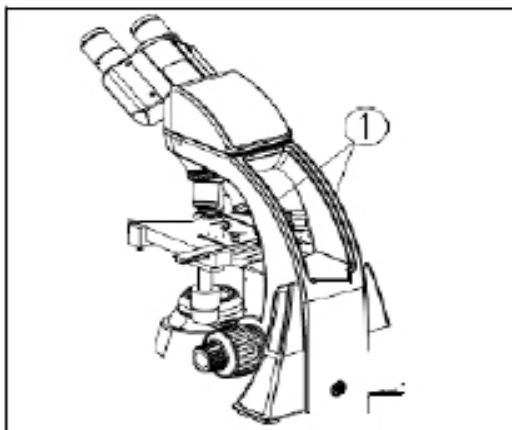


Fig. 1

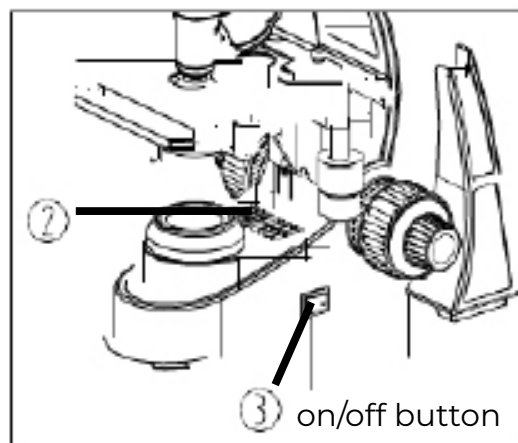



Fig. 2

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 condenser (2) (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.

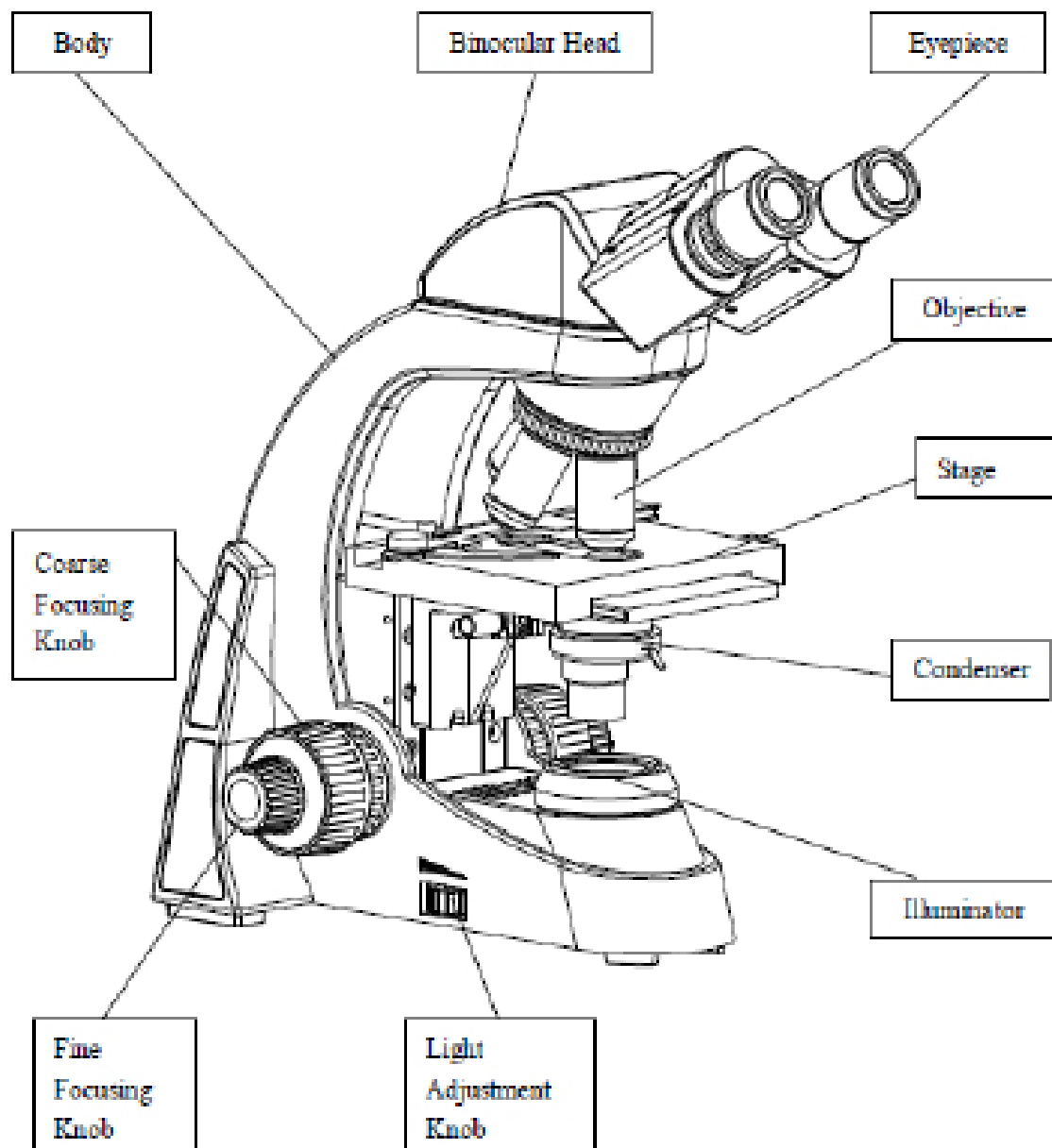
2. Maintenance

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 are flammable, don't place these chemicals near an open flame. Lens cleaning solution is flammable. Turning on or off electronic devices (including the microscope) may produce a spark which could ignite the lens cleaning solution. Use these chemicals in a well-ventilated area.
3. Don't use organic solutions to wipe the surfaces of the other components. Please use a neutral detergent if necessary.
4. If the microscope is exposed to liquid during operation, power it off immediately and wipe it dry.
5. Never disassemble the microscope, the performance will be affected or the instrument will be damaged.
6. After use, cover the microscope with a dust cover.

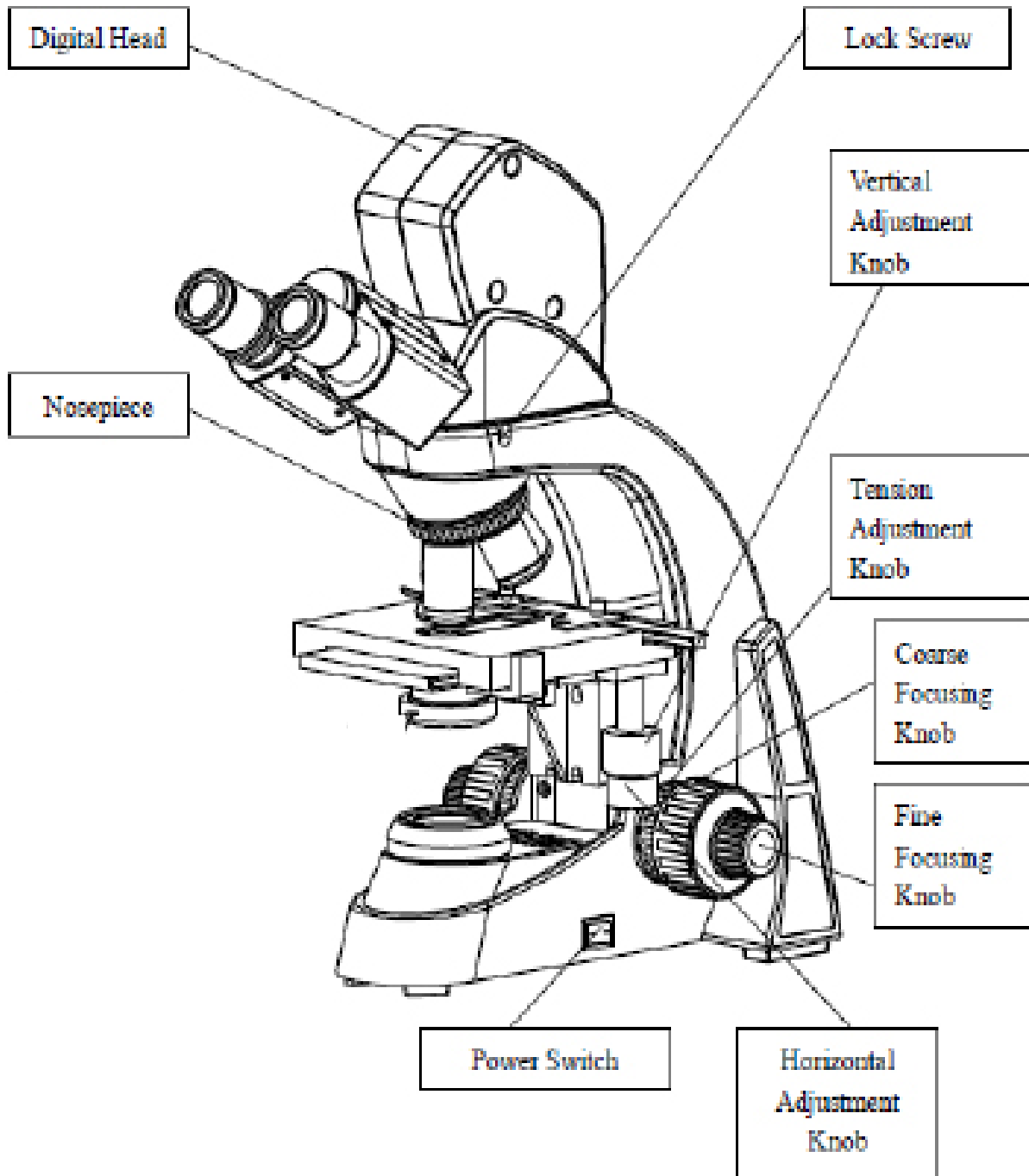
3. Safety Signs

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

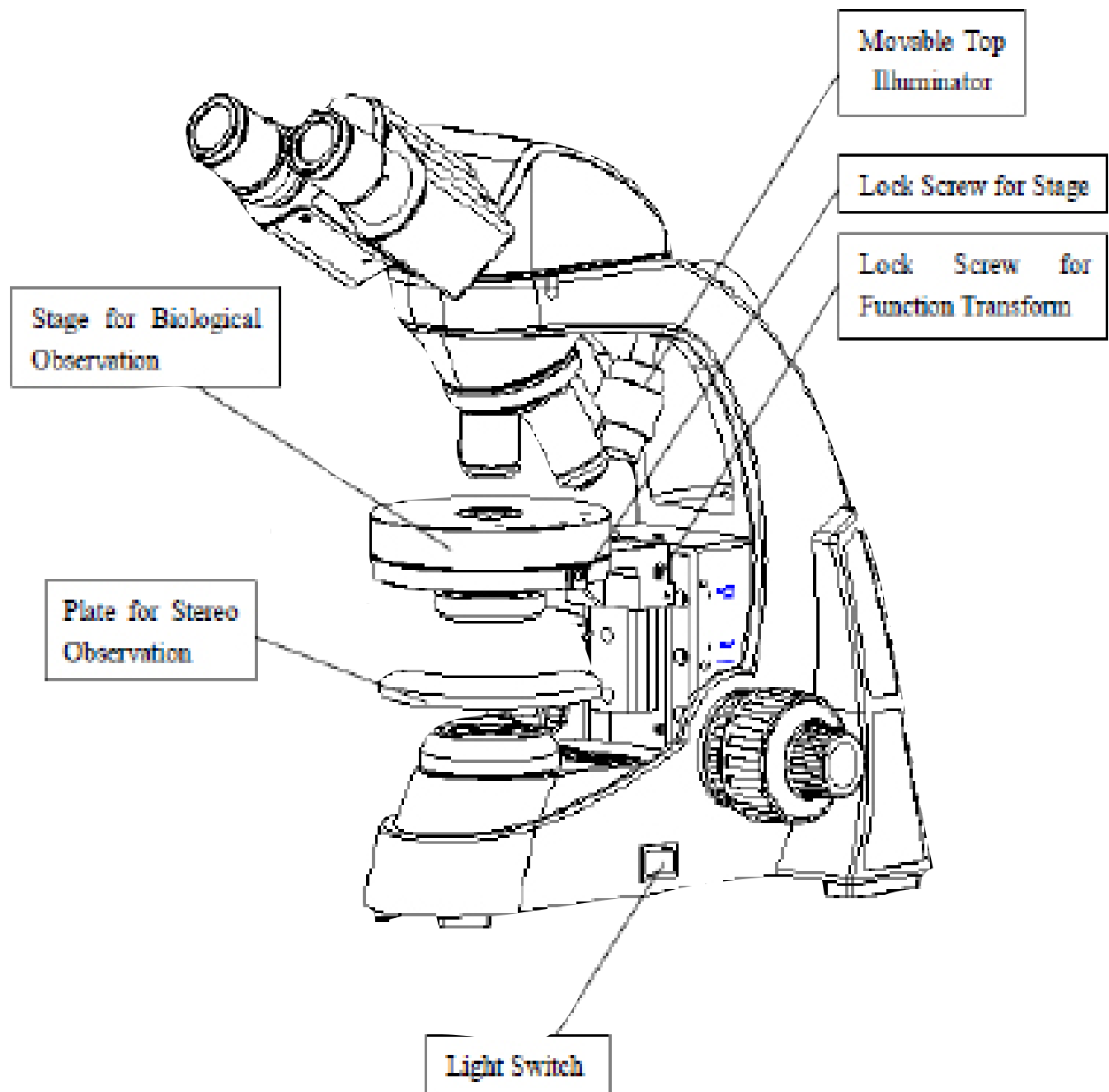
4. Instrument Components



4. Instrument Components



4. Instrument Components

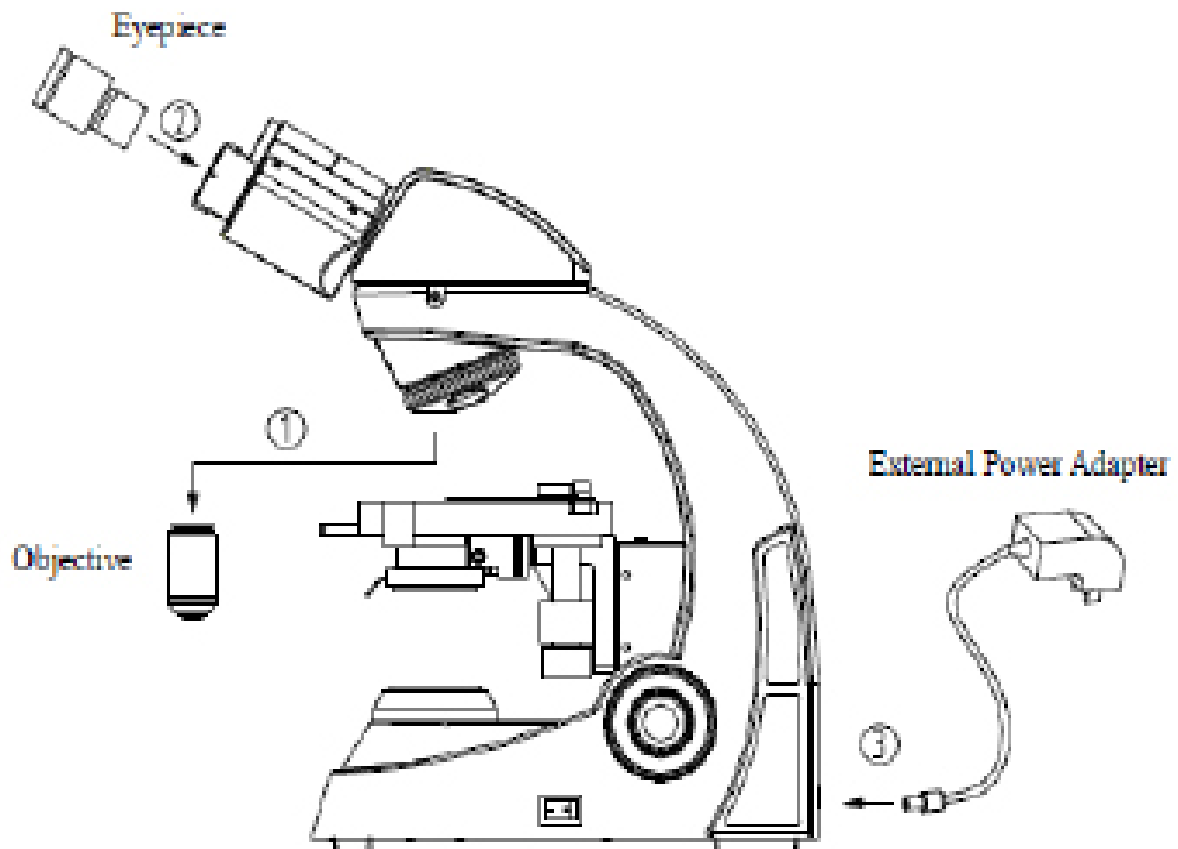


5. Assembly

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.



5. Assembly

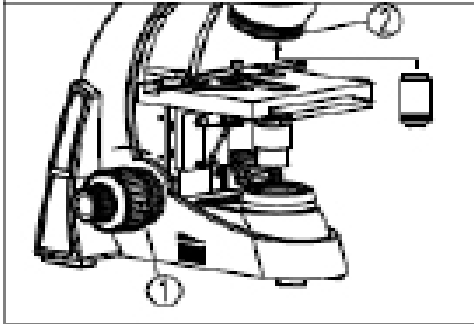


Fig. 3

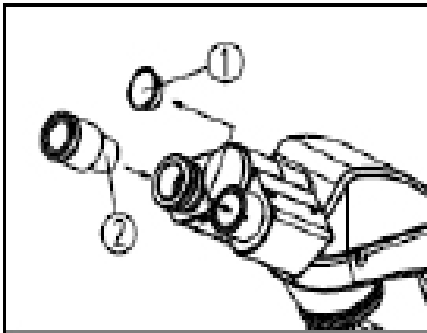


Fig. 4

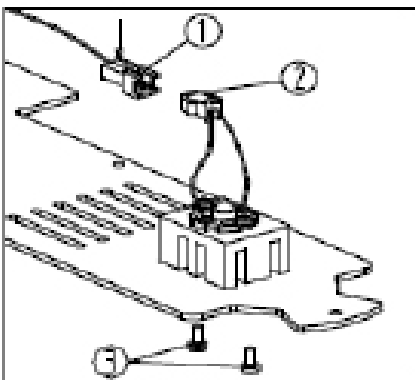


Fig. 5

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.

Eyepiece Assembly

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

Assemble or Replace the LED

Unplug microscope, 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, make sure microscope is unplugged, to avoid injury (burns etc.).

5. Assembly

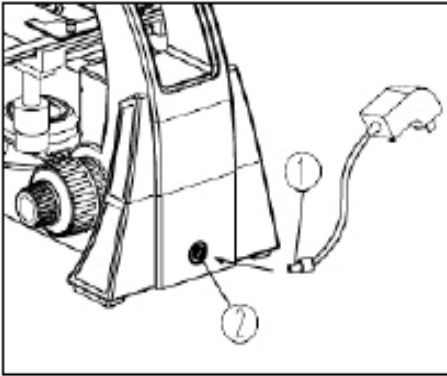


Fig. 6

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 adapter (1) into the power socket (2) 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.

5. Assembly

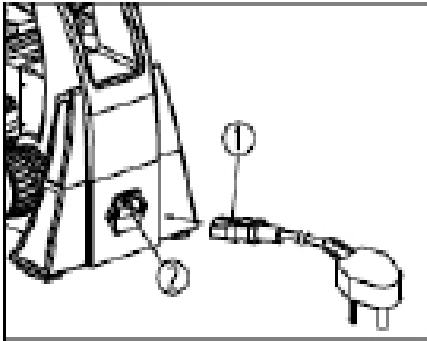


Fig. 7

For Built-in Switch Power Supply (halogen models)

1. Ensure the power switch is at "O" (OFF).
2. Insert end of power cord (1) into the power socket (2) 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 properly grounded.

6. Operation

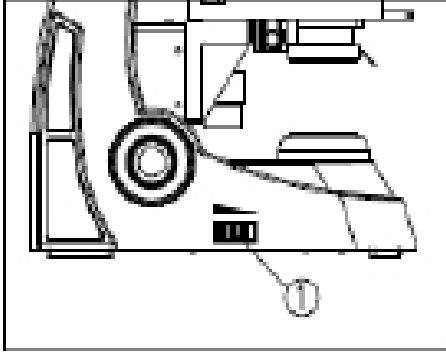


Fig. 8

Illumination

1. Turn on the main power switch to "O" (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).

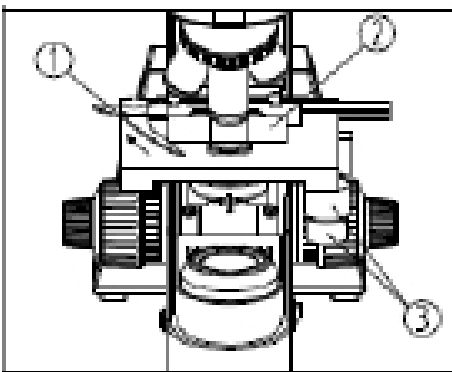


Fig. 9

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) and 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).

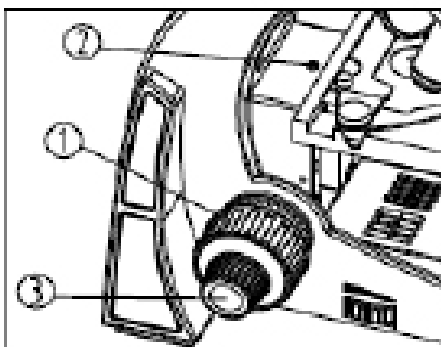


Fig. 10

Focus Adjustment (Fig 10)

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 of view (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.

6. Operation

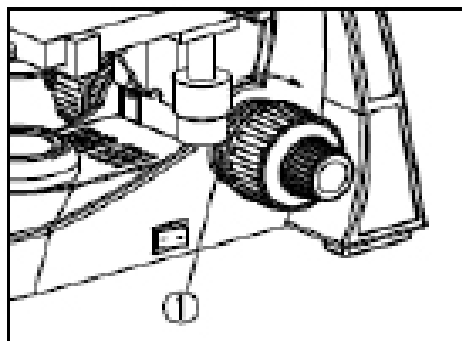


Fig. 11

Focus Tension Adjustment

If the coarse focus knob is difficult to rotate or the objective nosepiece “drifts” or loses focus this can typically be corrected by adjusting the focus tension.

1. Rotate the tension adjustment ring (1) according to the arrow direction in figure 11 to tighten the focus tension; rotate the tension adjustment ring in the opposite direction to loosen the tension.

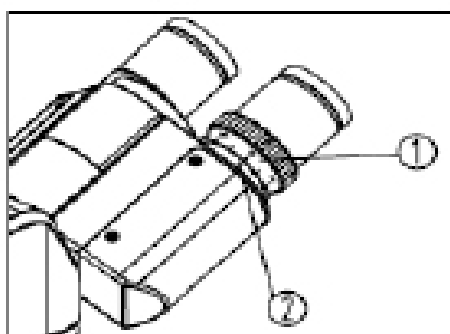


Fig. 12

Eyepiece Diopter Adjustment

Observe the right eyepiece with the right eye, focus it with the fine focus 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 ring (1) until the image is clear (See Fig.12).

- * There are ± 5 diopters on the diopter adjustment ring (1), the value aligned with the scale (2) is your eye's diopter.
- * Make note of your eye's diopter for future use.

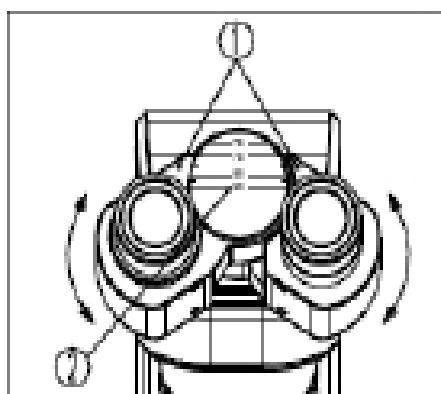


Fig. 13

Interpupillary Distance Adjustment

Observe specimen through both eyepieces, hold the base of the eyepiece 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 scale (2) 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.

6. Operation

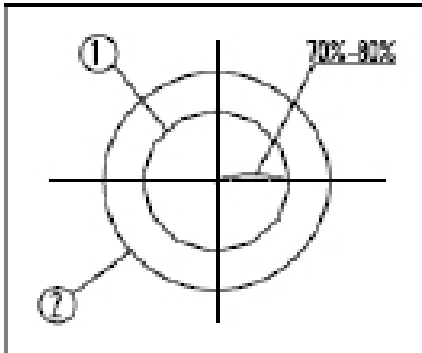


Fig. 14

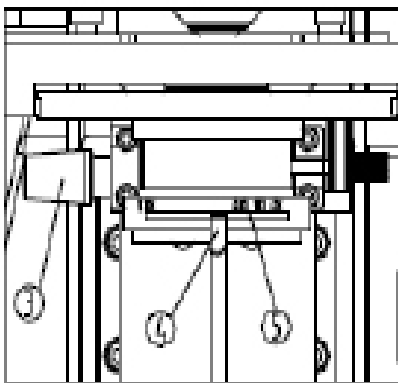


Fig. 15

Aperture Diaphragm and Condenser Adjustment

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 knob (3) 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 ring (4), align the arrow with the magnification position on the condenser (5). The eyepiece can be taken off if necessary to observe from the eyetube. Adjust the aperture diaphragm (14) adjustment ring (4) until it matches the figure as shown in Fig.14, to adjust the proportion (see Fig. 14&15, (1) is placing the image of the aperture- diaphragm, (2) is the edge of objective).

6. Operation

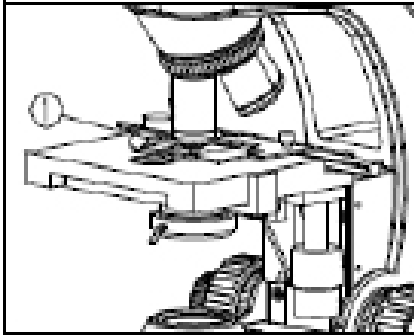


Fig. 16

Oil Objective (100X)

1. Use the 4X objective to focus the specimen.
2. Place a drop of oil (1) on the specimen (see Fig. 16).

Rotate the nosepiece counterclockwise and rotate the oil objective (100X) into 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 into the light path before wiping oil from the slide to avoid getting oil on a dry objective.

6. Operation

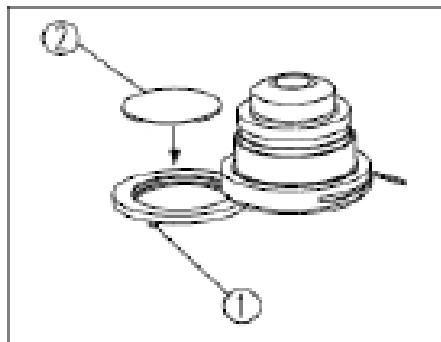


Fig. 17

Filters

Unscrew color filter holder (1) at the bottom of the condenser in a clockwise direction, install the filter (2) into the holder, then reinstall holder in a counterclockwise direction (See Fig.17).

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

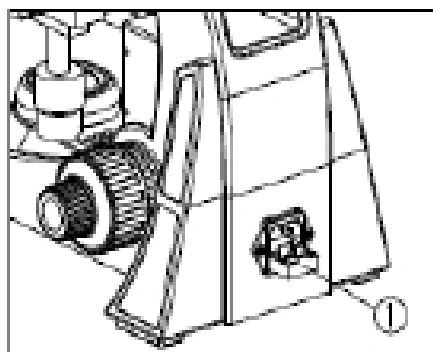


Fig. 18

Replacing the Fuse (Built-in Switch Power Supply)

Turn the main switch to "O" (OFF) and unplug the microscope before replacing the fuse. Remove the power cord. Pull the fuse base (1) until the fuse can be removed from the fuse base. Install a new fuse and reinsert the fuse base thoroughly (See Fig. 18).

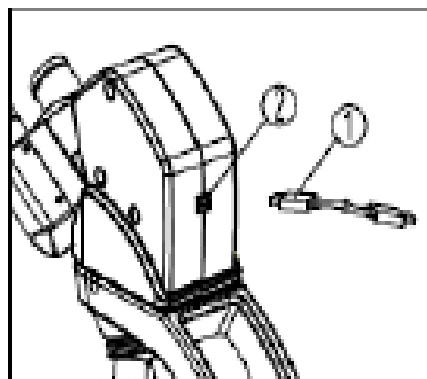


Fig. 19

USB Digital Head

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

Insert the connector (1) of data cable into the USB interface (2) on the back of microscope head, and insert the other connector into the USB interface of the computer (See Fig.19). View microscope video by video capture and analysis software and use binocular observation (Only for USB digital microscope.)
Digital USB interface: voltage 5V, current $\leq 500\text{mA}$.

6. Operation

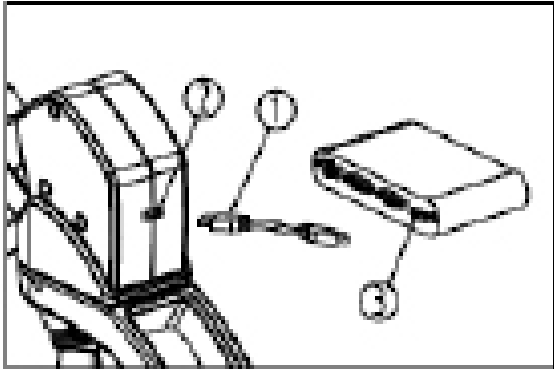


Fig. 20

HDMI Digital Head

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

Insert the connector (1) of HDMI cable into the HDMI Interface (2) on the back of microscope head, view the real time image by connecting the other end to the converter device (3) (See Fig.20 (Only for HDMI digital microscope.))

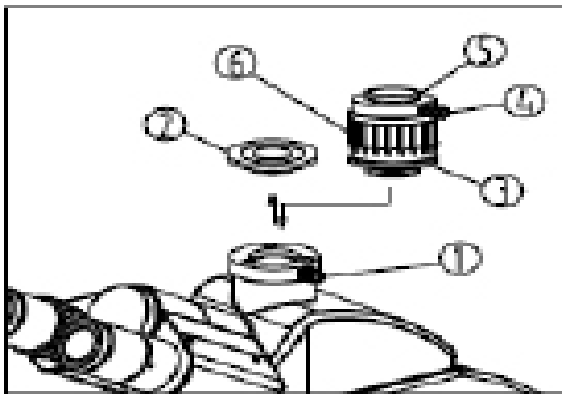


Fig. 21

C-Mount Assembly (Fig. 21)

1. Loosen the lock screw (1) of trinocular head, and the dust-cover (2) (See Fig.21).
2. Remove the dust-cover caps of the c-mount adapter (3) and the camera. Insert the screw thread end of c-mount adapter onto the camera, and then install the c-mount into the camera port.
3. Tighten down the lock-screw (1).
4. During observation, if the image displayed by the camera is not parfocal with the eyepieces, adjust the focus ring (6) on the camera adapter until the image is in focus.

6. Operation

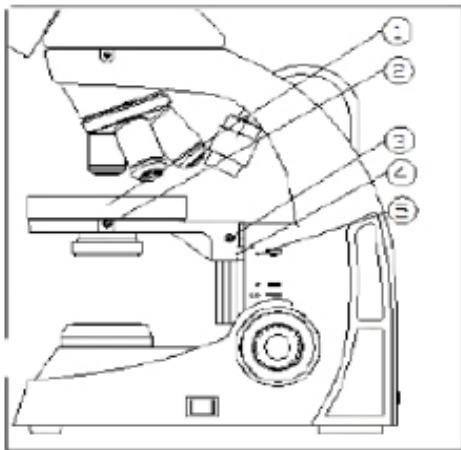


Fig. 22

Use the Stage for Biological Observation

Put the round stage (1) into the holder, use a hexagonal wrench lock the screw (2). Adjust coarse focusing wheel to lift the holder to the top position, loose the screw (3) to move the holder, and then lock the screw (3) when the mark 4 and 5 are horizontally aligned. (Fig.22).

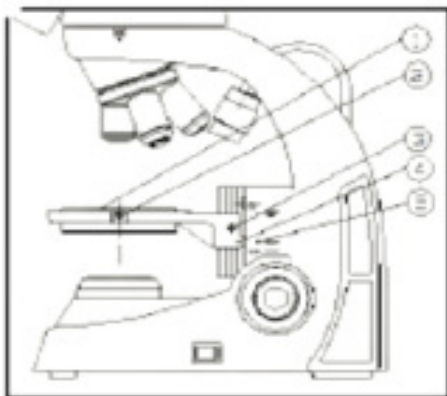


Fig. 23

Use the Culture Dish for Living Creature

Put the culture dish (1) into the holder, use a hexagonal wrench lock the screw (2) . Adjust coarse focusing wheel to lift the holder to the top position, loose the screw (3) to move the holder, and then lock the screw (3) when marks (4) and (5) are horizontally aligned. (See Fig.23) (Only available under 2X

6. Operation

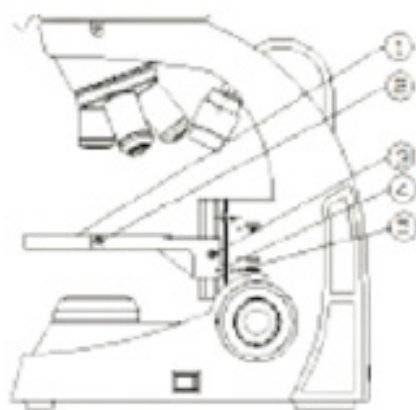


Fig. 24

Use the plate for Stereo Observation

Put the plate (1) into the holder and use a hexagonal wrench to lock the screw (2). Adjust coarse focusing wheel to lift the holder to the top position, loose the screw (3) to move the holder, and then lock when marks (4) and (5) are horizontally aligned. (See Fig.24)

(Only available under 2X objective)

7. Troubleshooting - Optical System

SYMPTOMS	POTENTIAL CAUSE	SOLUTION
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.
The side of the field of view is dark or not even.	The nosepiece is not engaged 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.
Stain or dust is observed in the field of view	Stains have accumulated on the specimen	Clean or change the specimen
	Stains have accumulated on the lens	Clean the lens
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 0.17mm.
	The specimen coverslip faces down.	Put the specimen align these 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.

7. Troubleshooting - Optical System

SYMPTOMS	POTENTIAL CAUSE	SOLUTION
One side of the image is dark or the image moves while focusing.	The specimen slide is not fixed. The nosepiece is not in the right position. Condenser is not centered.	Condenser is not centered. Turn the nosepiece into the right position. Center the condenser.
The eyes become fatigued easily. The right field of view doesn't superpose with the left.	Interpupillary distance is incorrect. The eyepiece for the right eye is different from the left one.	Adjust the interpupillary distance. Use the same eyepieces.

7. Troubleshooting - Mechanical System

SYMPTOMS	POTENTIAL CAUSE	SOLUTION
Cannot focus when using high magnification objective.	The cover glass faces down. The cover glass is too thick.	Put the cover glass facing up. Use a standard cover glass with thickness $\approx 0.17\text{mm}$.
The objective touches the cover glass while turning the nosepiece.	The cover glass faces down. The cover glass is too thick.	Put the cover glass facing up. Use a standard cover glass with thickness $\approx 0.17\text{mm}$.
Coarse focusing knob is too tight.	Tension adjustment knob is too tight.	Loosen it to an appropriate position.
Stage declines itself and cannot stay on the focal plane.	Tension adjustment knob is too loose.	Tighten it to an appropriate position.
Coarse focusing knob cannot rise.	The coarse focusing limit knob is locked.	Loosen the coarse focusing limit knob.
Coarse focusing knob can't decline.	The base of the condenser is too low.	Raise the base.
Cannot move the slide smoothly.	The slide is not fixed correctly. The movable specimen holder is not fixed properly.	Adjust it correctly. Adjust it correctly.
The image moves when touching the stage.	The stage is fastened incorrectly.	Fasten the stage correctly.

7. Troubleshooting - Electrical System

SYMPTOMS	POTENTIAL CAUSE	SOLUTION
The bulb does not work.	No power supply. The bulb is not installed correctly. The bulb is burnt out.	Check the connection of the power cable. Install it correctly. Replace it.
The bulb burns out often.	A wrong bulb is used.	Replace it with a correct one.
The field of view is not bright enough.	A wrong bulb is used. The use of light adjusting knob is incorrect.	Replace it with a correct one. Adjust it correctly.

8. Warranty Information

1. Statement of Limited Product Warranty
2. Laxco warrants its microscopes in respect to optical and mechanical components against defects in material and/or workmanship for 5 years from the date of original purchase to the original purchaser. Warranty for electrical items/components is 1 year from the date of original purchase. The warranty does not apply to any instrument which has become worn, defective, damaged or broken due to abuse, misuse, tampering, or unauthorized repairs. Under this warranty, Laxco Inc. will repair or replace, without charge to the purchaser, any part which upon our examination, appears to be defective in materials or workmanship.
3. Returned Goods Policy for Repair or Replacement Parts
4. To return goods for repair or replacement, please contact Laxco Customer Service at 425-686-3081.

Please be prepared to supply the following information:

- Your name, return shipping address and telephone number
- Catalog/Model number of the item(s) you are returning
- Serial Numbers if applicable
- Description of the product's problem or reason for the return
- Date the item was purchased.

The Customer Service Representative will issue you a Return Materials Authorization (RMA) number. Please label the outside of your shipping container with this number.

Thank you for purchasing our products. If you are unable to complete the installation of your products, contact Laxco Inc. customer support or with suggestions or comments on this manual? We are always working to meet the needs of our customers, and we appreciate your suggestions. Please e-mail us at sales@laxcoinc.com, making sure to include the title of this manual and the pertinent page numbers.

По вопросам продаж и поддержки обращайтесь:

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