ML51-N

Biological Microscope Instruction Manual

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Foreword

Biological microscope ML51-N(hereinafter referred to as: this product) is a precision optical instrument. In order to ensure the service life of the instrument and correct daily maintenance, please read this manual carefully before using this instrument. The instruction manual is part of the product. Therefore, throughout the service life of this product, the instruction manual must be kept at the place where the equipment is operated at all times.

Warn

Before removing the chassis, opening the lamp replacement door, or removing the light box, unplug the power cord and make sure the power is off.

Do not use or place the instrument in a place with high temperature, humidity or dust for a long time .

Suitable working temperature is 5℃～35℃, relative humidity is 20%～80% (25℃)

Class A equipment is intended for use in an industrial environment, and there may be potential difficulties in ensuring electromagnetic compatibility in other environments due to ML 5 1- M biological microscope conducted and radiated disturbances.

Note: Do not immerse the instrument in water or solvents

Note: Do not place accessories not provided by our company in the frame body or other transmission parts

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This product is safe and reliable to use, except for the danger caused by special

factors, such as: caused by non-professional operation or used for other purposes. Therefore, please observe the following regulations when using to avoid accidents:

This product must be operated under instruction or authorization.

Equipment maintenance must be performed by technical attendants or skilled users of Guangzhou Micro-shot Optical Technology Co., Ltd. (company name) or authorized operators.

If you have any operational problems not mentioned, please contact Guangzhou Micro-shot Optical Technology Co., Ltd. (company name) in time.

The content of the manual is subject to change without prior notice

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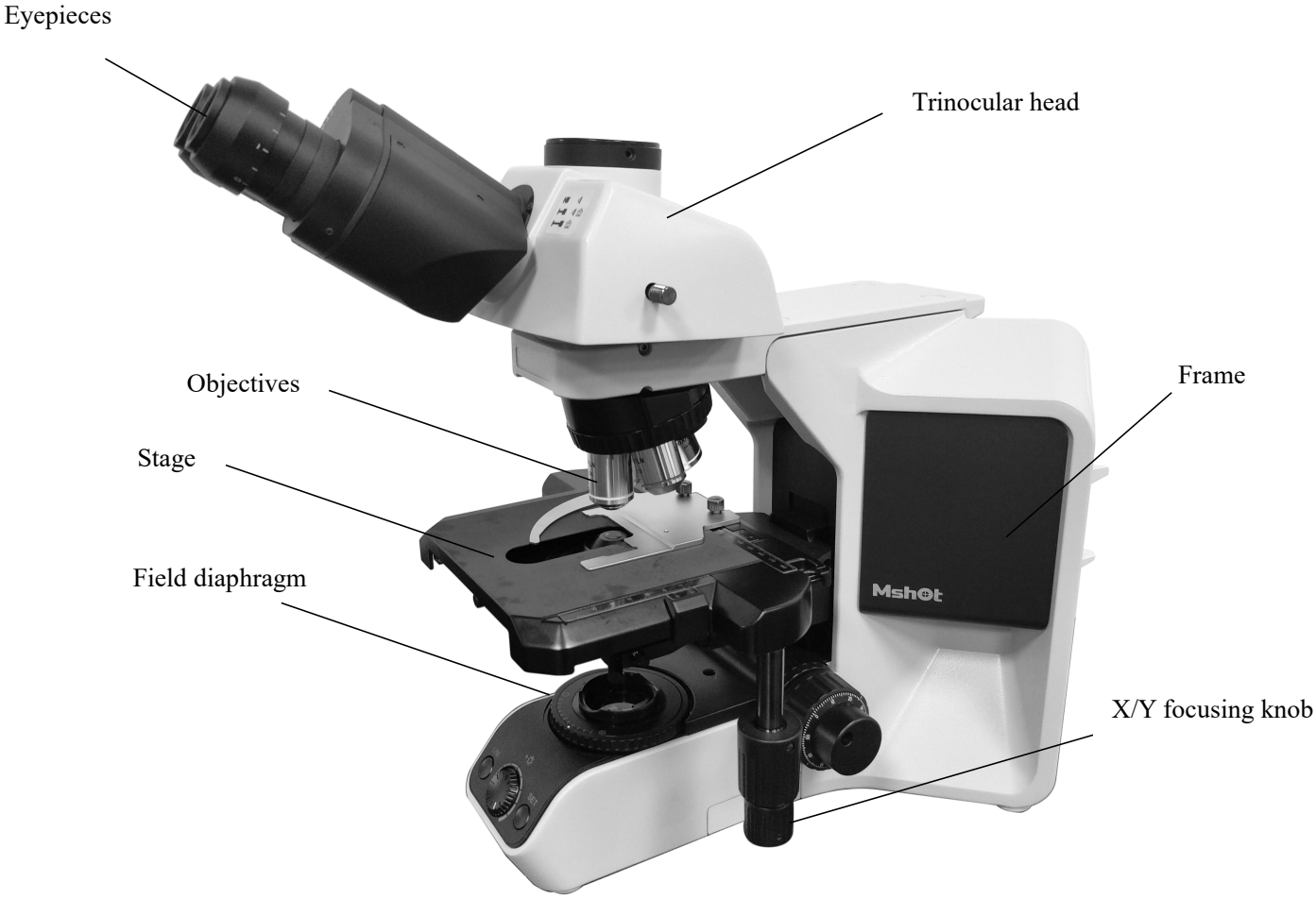
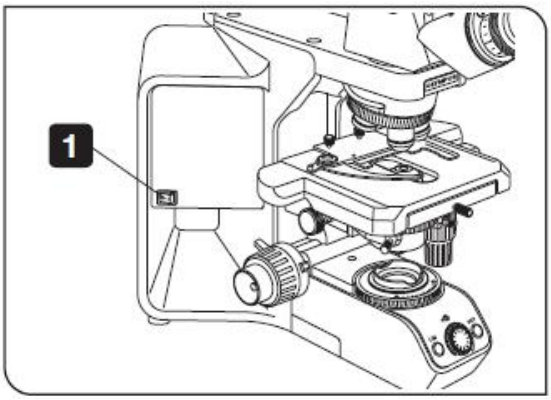
1. The name of each part

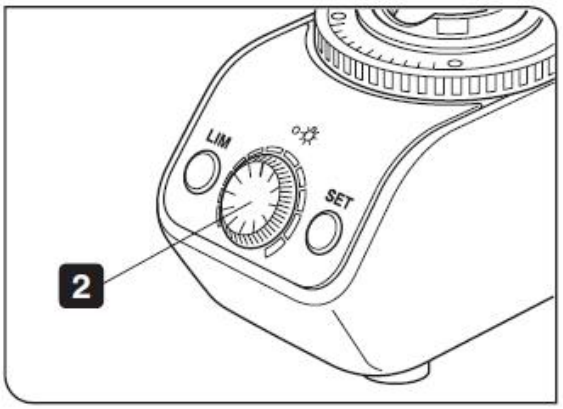


2. Adjustment and operation

2-1 . Basic operation

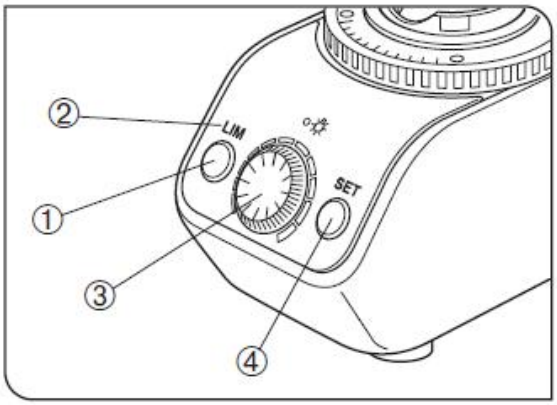


1. Turn on the power: turn on the power, and turn the main switch on the side of the microscope to the "-" (on) state;



2. Adjust light intensity: turn the knob to adjust the light intensity;

Set LIM (Light Intensity Manager) brightness



1、Turn off the LIM switch ① (at this time the LIM indicator ② is off), turn the low-magnification objective lens into the optical path, and focus on the sample;

2、Turn the brightness adjustment knob ③ to select the best observation brightness. Press the LIM setting button ④ (SET key) to input the current brightness.

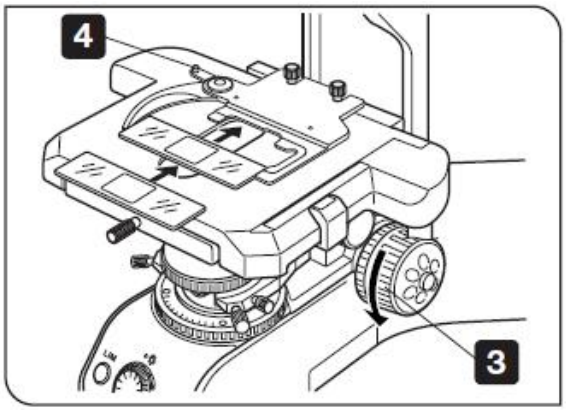
3、Repeat the above steps to set the optimum brightness for each objective lens.

Each objective can be individually set to a dedicated brightness. After setting the

brightness for the objective lens, when selecting this objective lens, turn on the LIM switch ①, and the brightness will be automatically adjusted to the preset value; Turn the objective lens with the best brightness into the optical path, turn off the LIM switch, and then repeat the above steps 3 and 4

3. Turn the knob to lower the stage;

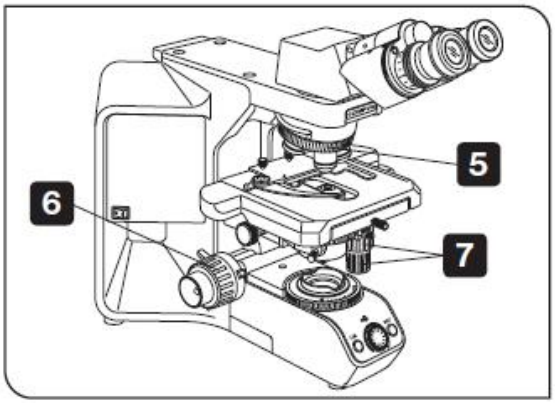
4. Pull open the slide holder and put the glass slide on;



5. Turn the objective turret to turn the 10X objective lens into the optical path; (adjust the fluorescence accessory to neutral)

6. Turn the coarse and fine quasi-focus screw to focus on the sample;

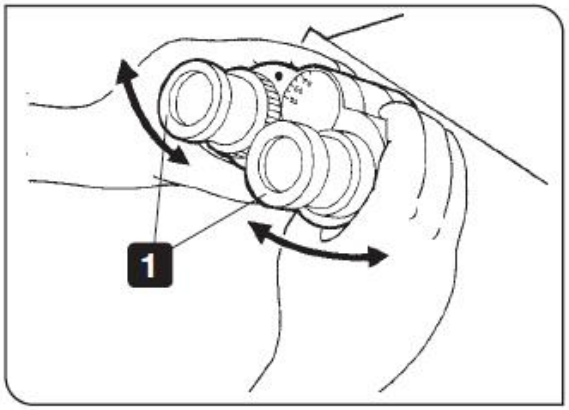
7. Turn the stage knob to adjust the observation position



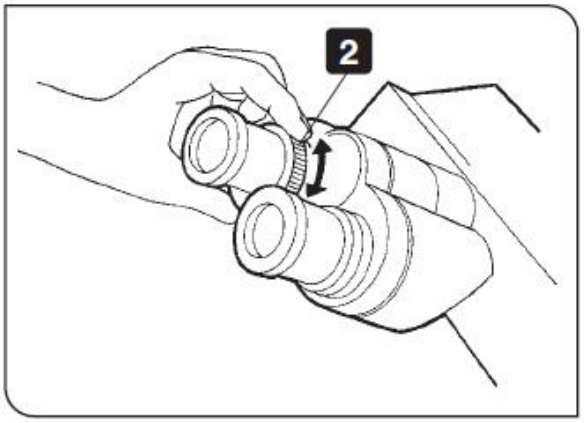
2-2 . Microscope adjustment

1、Adjust the interpupillary distance: adjust the binocular tube until the left,

The right field of view completely overlaps



2、Adjust the diopter: Turn the diopter adjustment rings on both sides to the scale "0", turn the 40X objective lens into the optical path, use the right eye to observe from the right eyepiece, and turn the coarse and fine focus screw to focus on the sample;

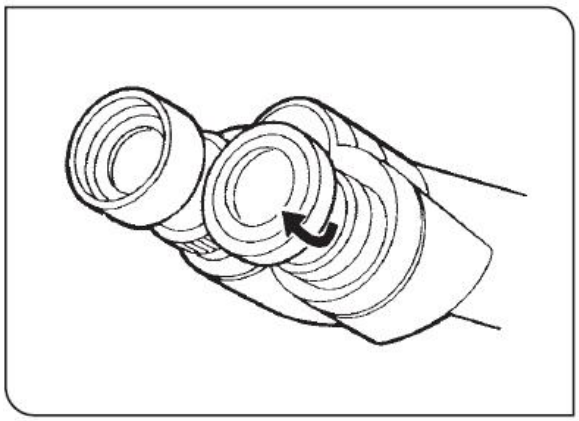


Turn the 10X objective lens into the optical path, turn the right diopter adjustment ring ① to focus on the sample; do not adjust the coarse and fine focus knobs during the focusing process;

Looking through the left eyepiece with the left eye, turn the left diopter adjustment ring ② to focus on the sample.

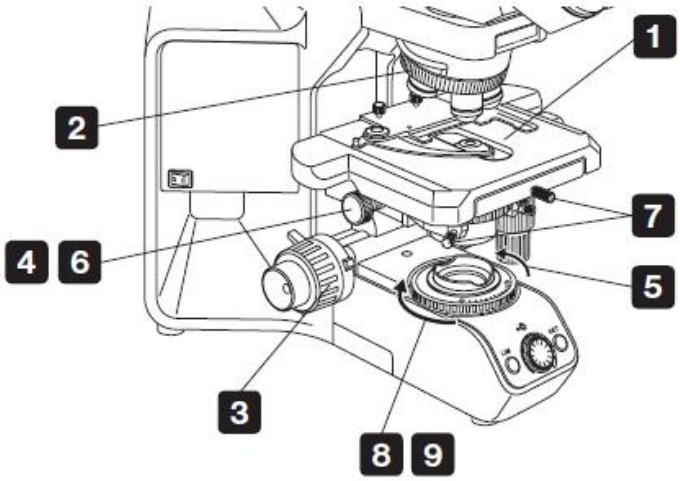
Use blindfold

Use the eyecup in its normal folded position when wearing glasses, which prevents the glasses from touching and scratching the eyepiece



When not wearing glasses, open the folded eyecup in the direction of the arrow to prevent extraneous light from entering between the eyepiece and the eye.

2-3 . Adjust the alignment



1、Put on the sample;

2、Turn the objective turret to select the 10X objective lens;

3、Turn the coarse and fine focus knobs to focus on the sample;

4、Turn the height of the condenser and adjust the knob of the condenser to raise the condenser to the highest level;

5、Turn the field diaphragm adjustment ring in the direction of the arrow to narrow the diaphragm;

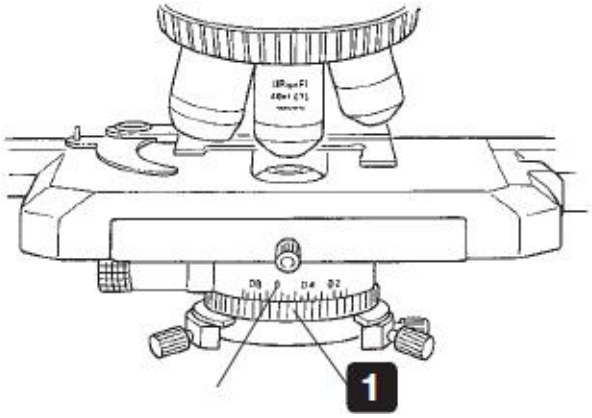
6、Turn the coarse and fine focus knobs to focus the field diaphragm image;

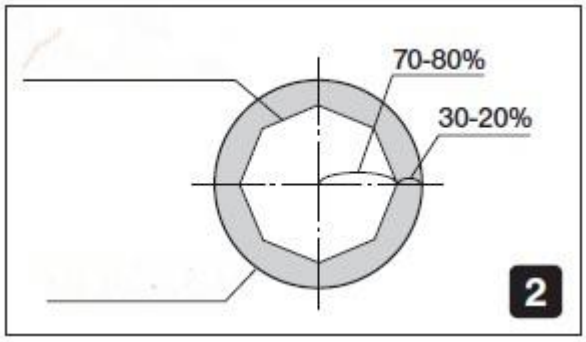
7、Turn the two condenser centering screws to move the field diaphragm image to the center of the field of view

8、Turn the field diaphragm adjustment ring so that the field diaphragm is inscribed in the field of view

Note: Do not screw the condenser fixing screw in the middle of the centering knob by mistake

2-4 . Adjust the aperture diaphragm

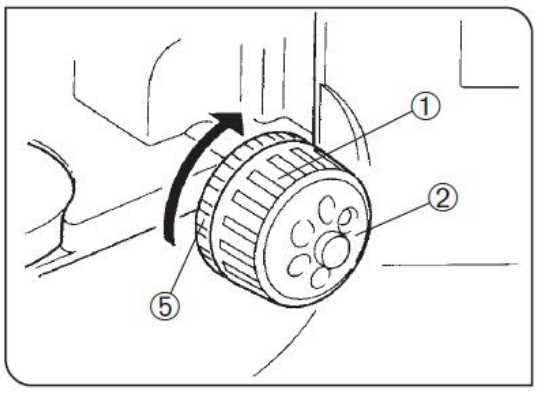




1、Turn the numerical aperture adjustment ring of the condenser to make the numerical aperture of the condenser equal to 70%-80% of the numerical aperture of the objective lens used. According to the image, the size of the aperture diaphragm can be fine-tuned to a position where the image resolution and contrast are moderate;

2、Remove the eyepiece and observe from the lens barrel, you can see the image of the aperture diaphragm, as shown in Figure 2 above.

2-5 . Focusing device

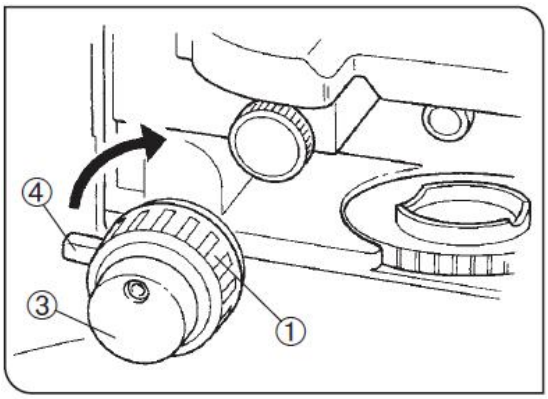


① Coarse focus knob: Move the stage up and down to achieve focus

② Fine focus knob (right of the frame): finely adjust the focus position

③ Fine focus knob (left of bracket) to finely adjust the focus position

④ Coarse focus limit device: set the upper limit of the stage position (avoid No sample contact with objective or simplified focusing)



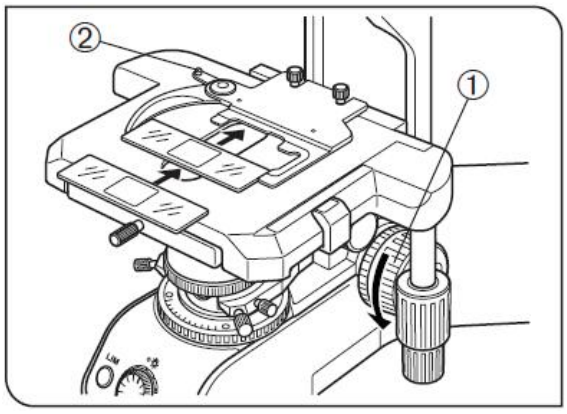
After locking the coarse and accurate focus limit device, the coarse adjustment motion stroke will be limited by the position set by the limit, and cannot be raised beyond the limit height.

⑤ Coarse precision focus elastic device: adjust coarse precision, focus rotation,

⑥ The tightness of the knob when turned. The coarse focus tensioner is pre-adjusted for ease of use.

If necessary, use the coarse quasi-focus elastic device ⑤ to change its elastic state. Turn the adjustment ring in the direction of the arrow, the tension of the coarse focus screw will increase, and vice versa, it will decrease.

2-6 , stage

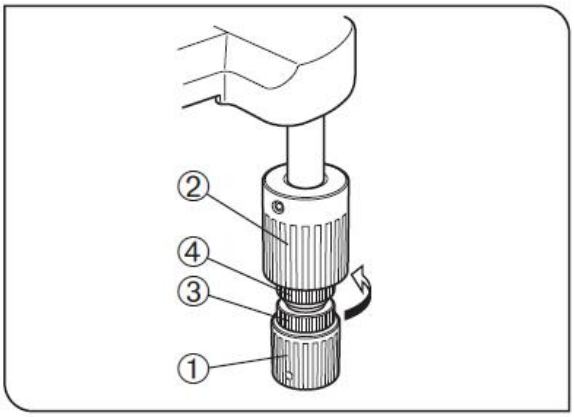


①Turn the coarse quasi-focus screw to lower the stage

②Open the spring-loaded finger ② on the clamper , and slide one or two sample slides into the stage from the front

③Push the glass slide as far as possible, and then gently open the finger

Slides should be 26 x 76 mm in size and 0.9 to 1.2 mm thick, with coverslips 0.17 mm thick. When observing very large samples, the clip can be removed and the sample can be placed directly on the stage



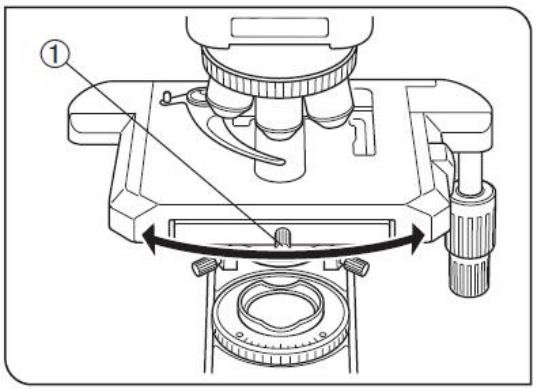
2-7 . Adjust the tension of the X-axis and Y-axis knobs

1、Hold the X-axis knob ①, and turn the Y-axis knob ② upward to expose the knob rod;

2、Turn the X-axis adjustment knob ③ or Y-axis knob ④ clockwise (direction of the arrow) to increase the tension, and counterclockwise to decrease the tension.

If the tension is adjusted too tightly, a rattling noise may be heard when the stage is raised or lowered, or the stage may stop less accurately.

rotating stage

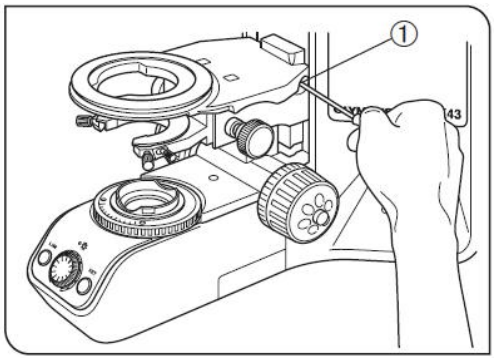


1. Slightly loosen the stage fixing knob ①;

2. Using the fixed knob of the stage, the stage can be rotated clockwise or counterclockwise.

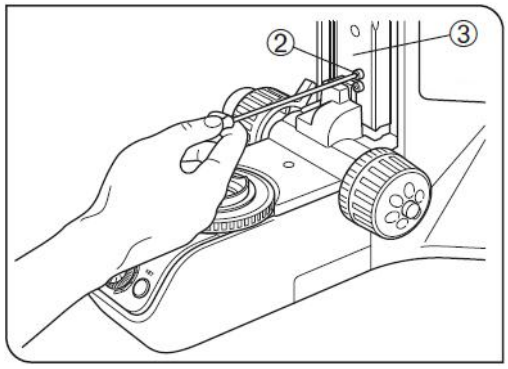
You may hear and feel a click during rotation, this is normal

Adjust stage height



1. Lower the stage to the lowest level, and then remove the stage from the microscope;

2. Use a hex screwdriver to loosen the fixing screw ① of the stage bracket and remove the stage bracket



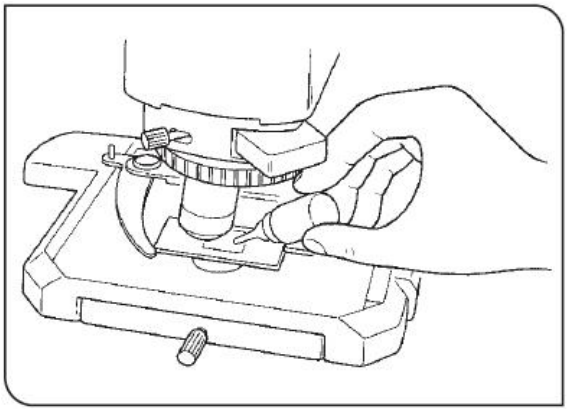
3. Turn the coarse and accurate focus knob, and raise the focusing slide ③ to the place where the limit screw can be seen from the mirror arm

4. Use a hex screwdriver to loosen and remove the upper limit screw ②;

Reinstall the stage bracket and stage

Please keep the removed screws in a safe place for reuse.

Use oil immersion



1. Focus on the sample in the order of observation from low magnification to high magnification

2. Before using the oil lens, drop a drop of immersion oil on the area to be observed of the sample

3. Turn the objective lens turntable to move the oil lens into the optical path, and then adjust the fine focus knob to focus

Air bubbles in the immersion oil will affect the observation, please make sure there are no air bubbles in the immersion oil

3. Detailed installation steps

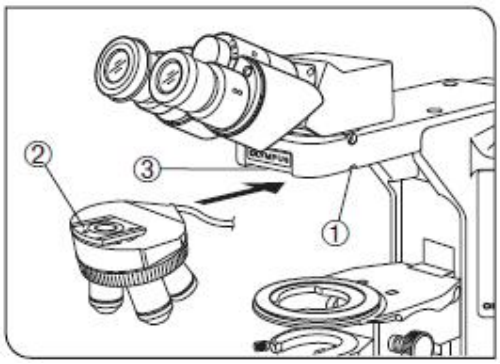
3 -1 . Install the LED lamp house

1、Align the fixing screw ② with the screw hole ②, and install the LED lamp housing ① into the mounting hole on the back of the microscope.

2、Tighten the set screw ② with the hex key.

3、Insert the plug ④ on the lamp housing into the microscope socket ⑤.

3 -2 . Install the objective lens turret



1、Turn the coarse focus knob to lower the stage.

2、Slightly loosen the objective turret fixing screw ①.

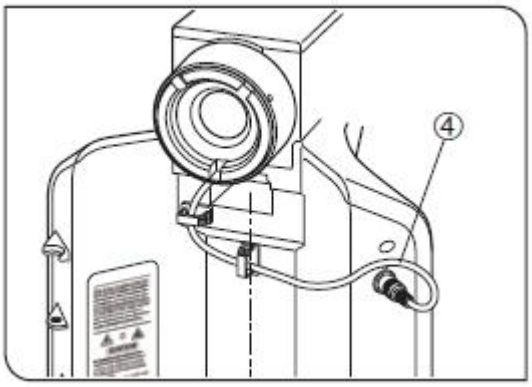
3、Do not tighten the fixing screw ① too loosely, otherwise it will be difficult to reinstall the objective lens turret.

4、Hold the objective lens turntable firmly, keep the dovetail mounting port ② horizontal, insert it into the dovetail groove ③ on the microscope arm, and push it into the innermost part gently.

5、Tighten the objective turret fixing screw ①.

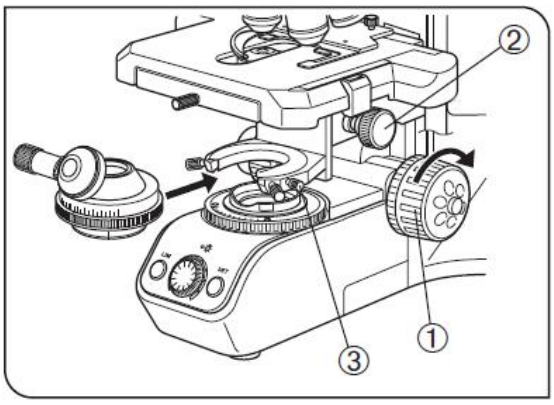
When installing or removing a nosepiece with a cable, the cable must be unplugged beforehand

3 -3 , install the cable



Pass the cable ④ through the mirror arm, lead to the rear panel, let the cable go through the cable holder, and then insert the cable into the socket on the rear panel.

3-4 . Install the condenser



1、Turn the coarse focus knob ① to raise the stage to the highest position.

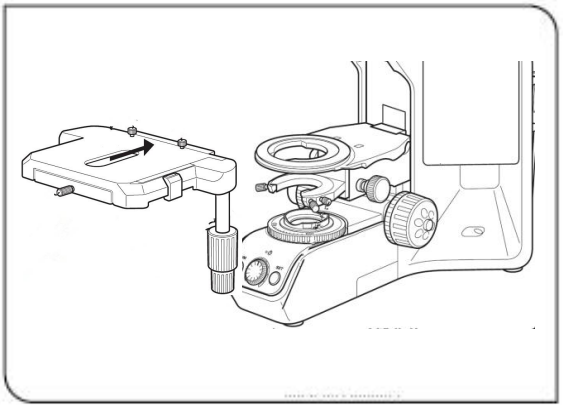
2、Turn the condenser height adjustment knob ② to lower the condenser frame to the lowest position.

3、Completely loosen the condenser fixing screw ③.

4、Hold the condenser so that the numerical aperture number faces forward. Carefully push the condenser all the way in along the dovetail.

5、Tighten the condenser fixing screw ③, and then raise the condenser to the highest position.

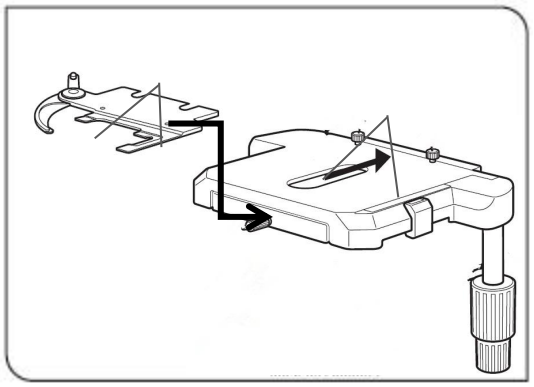
3 -5. Install the stage



1、Gently place the stage on the stage bracket of the microscope body, and snap it into the fixed position of the bracket so that the stage cannot shake up and down.

2、Tighten the stage fixing screw ①.

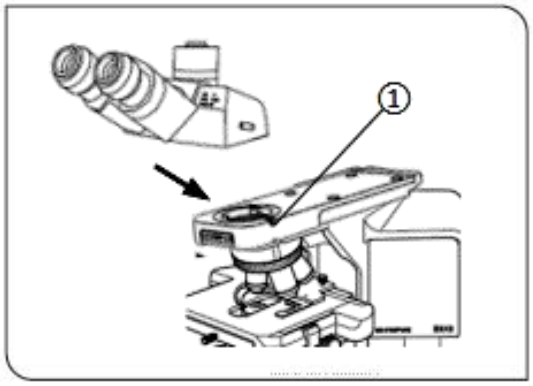
3 -6. Install the clip



1、Gently snap the two bayonets ① of the clip along the stage into the clip fixing screws ② of the stage.

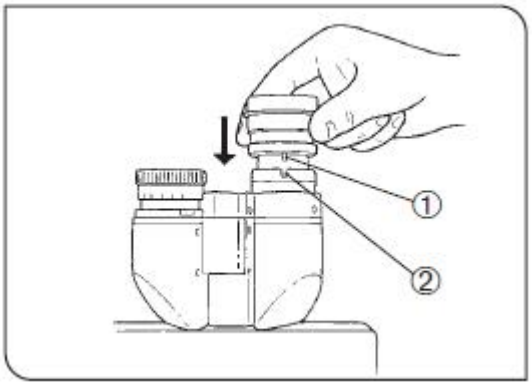
2、Tighten the clip set screw ②.

3 **- 7. Install the eyepiece tube**



Insert the dovetail interface of the trinocular tube into the dovetail groove on the top of the fluorescence module, and tighten the hexagon socket screw ① on the right to fix it.

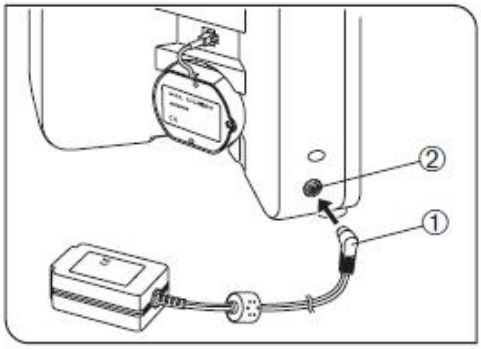
3 - 8. Install the eyepiece



Gently insert both eyepieces into the eyepiece tube all the way to the tip.

When using eyepieces with a micrometer, the eyepiece can be mounted in the right eyepiece tube

3 - 9. Install the adapter



Insert the plug ① of the power adapter into the socket of the microscope.

The power cord is easily damaged when bent and

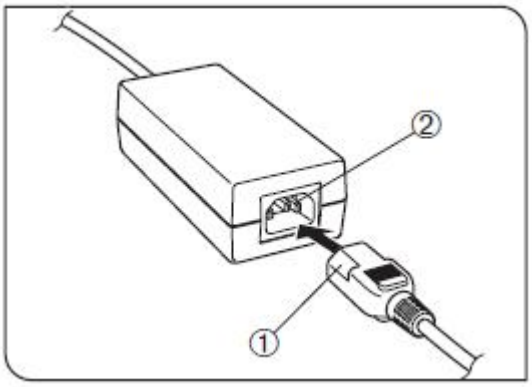
twisted, so do not use excessive force.

Before connecting the power cord, be sure to turn off the main switch

Always use the specified adapter to avoid malfunction

3 -1 0. Install the power cord

1. Insert the power cord plug ① firmly into the input socket ② of the adapter.



4. Troubleshooting guidance

question	reason	deal with
light is not on	not plugged in	Turn on the brightfield power switch
field of view dark	Incorrect LIM settings	Reset LIM
	Aperture stop and field stop not wide enough	adjust to fit
	The beam splitter lever is in position	Move the splitter lever to or
	Condenser not centered correctly	Re-center the condenser
	Condenser lowered too low	Adjusting the Condenser Height

Brightness does not change	The LIM function is turned on	Disable the LIM function
	Condenser not centered correctly	Re-center the condenser
	Condenser lowered too low	Adjusting the Condenser Height
	normal circumstances	If you need to reduce the brightness, you can use a brightness attenuation film
The field of view is not bright, or even the field of view is not illuminated	The objective turret is not locked in place	Be sure to let the objective lens turret click into the locked position
	The nosepiece is not installed correctly	Push the sliding dovetail connector all the way in
	Condenser not installed correctly	Reinstall the condenser
	Condenser not centered correctly	Re-center the condenser
	The field diaphragm is too small	Open the field diaphragm until the circumscribed field of view
Seeing dirt or dust in the field of view	Dirt or dust on the eyepiece	wipe it all
	Dirt or dust on the condenser surface	

	Dirt or dust on the sample	
	Dirt or dust on filter inside fluorescence accessory	Blow it off with an ear wash
poor visibility/ The image is not obvious/ poor contrast/ details unclear/ dazzling image/	Condenser lowered too low	Adjusting the Condenser Height
	Aperture stop is too small	Open the aperture diaphragm to the optimum position
	The nosepiece is not installed correctly	Push the dovetail connector all the way in
	The objective lens is dirty	wipe the objective lens
	For oil lenses, no immersion oil is used	use immersion oil
	bubbles in immersion oil	remove air bubbles
	Dirt or dust on the sample	clean
	Dirt or dust on the condenser	
blurry side of the image	The objective turret is not locked in place	Be sure to let the objective lens turret click into the locked position
	The stage is installed incorrectly	Reinstall the stage
	Nosepiece mounted incorrectly	Push the dovetail connector all the way in

	Condenser misaligned	Re-center the condenser
	Sample thickness is not uniform	Change sample or re-sample
image fluctuates	Nosepiece mounted incorrectly	Push the dovetail connector all the way in
	The objective turret is not locked in place	Be sure to let the objective lens turret click into the locked position
	Condenser misaligned	Re-center the condenser
Focus knob is hard to turn	The focus knob elastic device is adjusted too tight	Loosen the adjustment knob tensioner
	After locking the limit device of the coarse focus knob, try to use the coarse focus knob to adjust the stage up	Open the Coarse Focus Knob Limiting Device
The image cannot be focused/the stage slides down automatically/the coarse and fine focus knob slides	Coarse focus knob elastic device is adjusted too loose	Tighten the elastic device of the coarse focus knob

Coarse focus can never increase	Coarse focus knob limit device blocks the stage	Open the Coarse Focus Knob Limiting Device
Coarse focus can never be reduced	Condenser mount is too low	Elevate Condenser Holder
Before focusing, the objective lens hits the sample	The sample is loaded upside down	Load the sample correctly
One eye has a different field of view than the other eye	The interpupillary distance is not adjusted correctly	Correctly adjust the interpupillary distance
	Diopter not adjusted correctly	correct diopter adjustment
	Different eyepieces for left and right eyes	Use two identical eyepieces
	Not suitable for microscope observation	When looking through the eyepieces, focus on the entire field of view before focusing on the sample area
X-axis and Y-axis knobs are too tight or too loose	Horizontal tension on the X- or Y-axis knobs is too high or too low	Adjust tension

Please operate carefully with both hands during installation, and beware of falling and damaging the light source and accessories!

★ Clean the objective lens regularly, the objective lens is very sensitive to dust.

★ When operating, first use a low magnification (such as 4X/10X) objective lens to search and focus on the sample, and then switch to another magnification objective lens for observation as required.

★ When changing the objective lens, turn the objective lens changer until you hear a "click" sound to ensure that the required objective lens enters the optical path.

★ To determine the most suitable position of the camera interface, you can first observe with the eyepiece, adjust the specimen to a clear position, and then install the camera to observe its imaging, and at the same time adjust the position of the camera interface to the clearest imaging position , and then tighten the screw at number XI.

★ The middle of the fuse is made of thin glass, please be careful and light when opening the drawer of the fuse box and pushing out the fuse.

5. Technical specifications

Part	Specification	quantity
Microscope Main Frame	host rack	1
	Quintuple nosepiece	1
	XY Double Stage	1
	Section sample holder	1
	Abbe Condenser, NA 1.1	1
	Warm white LED transmitted light source	1
eyepiece	Large field of view 10X/25, adjustable diopter	2
eyepiece tube	Hinged trinocular viewing tube, high eye point, 30° tilt, interpupillary distance adjustment 50–75mm	1
objective lens	Plan semi-compound fluorescence objective lens M-UPLFLN 4X/0.13; WD: 17.15mm	1
	Plan semi-compound fluorescence objective lens M-UPLFLN 10X/0.30; WD: 7.68mm	1
	Plan semi-compound fluorescence objective lens M-UPLFLN 40X/0.75; WD: 0.78mm	1
	Plan semi-compound fluorescence objective lens M-UPLFLN 100X/1.30; WD: 0.15mm	1
wire assembly	Standard three-hole power cord	1
adapter	100-240V 47~63Hz	1

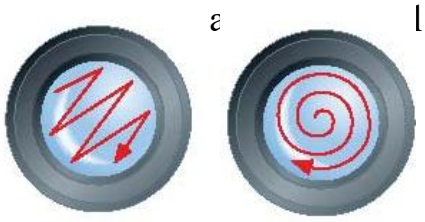
screwdriver	M3.0 hex screwdriver	1
mirror oil	Fluorescence Free Lens Oil, 8ml	1
Micro-shot special dust cover	Dust cover 650*600	1

6. Instrument care and maintenance

(1) The power switch of the host is controlled by power supply. When the observation is completed or the use is suspended, press the switch "O" to cut off the power, so as to prevent the electrical components in the instrument from still working. When not in use for a long time, the power plug should be pulled out from the power socket and all kinds of connecting lines should be kept properly.

(2) The instrument should be kept clean. You can use clean gauze (or silk cloth, absorbent cotton) dipped in a little ethanol to wipe off the oil on the lens and the body, and cover it with a dust cover after it is completely cooled and dried.

(3) Clean the lens: Blow it off with a blower or wipe off the dust on the lens with a soft brush; heavy dirt and fingerprints can be wiped gently with lens paper or a soft cloth dipped in a little alcohol and ether mixture (the mixture ratio a l 20-30%, ether 70-80%)



wrong correct

Warning! Generally, it is easier to wipe the surface of the lens from the inside in the direction shown in the figure.

(4) Clean the surface of the instrument: Wipe it with a clean soft cloth; heavy dirt can be scrubbed with a neutral detergent.

(5) Storage: When the microscope is not in use for a long time, please turn off the power of the instrument, fully cool the bulb, cover the microscope with a dust cover, and store it

in a dry, ventilated, clean place without acid and alkali vapors to prevent the lens from becoming moldy.

(6) Regular inspection: In order to maintain the performance of the microscope, the instrument should be inspected and maintained regularly.

(7) When using organic solutions such as ethanol, keep the environment ventilated and keep away from fire sources or instruments and equipment that are prone to sparks

Warning!

Do not use organic solvents (such as: alcohol, ether and its diluents, etc.) to wipe the surface of the instrument to avoid paint peeling off the surface of the instrument. It is recommended to apply a layer of non-corrosive lubricant to the moving part of the microscope before covering the dust cover. The eyepiece and objective lens are placed in a container with desiccant.

7. Meaning of the logo

	**Refer to the instructions for use**
	**Notice. Refer to attached document**
	**fragile, handle with care**
	**avoid rain**
	**The number of stacking layers is limited to 7 layers**
	**Stacking weight limit 60kg**

	**The correct position for the shipping package is vertically up**

8. Special storage, transportation conditions and methods

Storage: Biological microscopes should be stored in a sheltered place, free from acid gases, alkalis, organic solvents and other harmful substances.

Transport: Fluorescence microscopes should be transported in a sheltered carrier.

Packaging: product packaging should comply with the relevant provisions of GB/T 15464.

9, After-sales and maintenance services

This product implements 1-year free warranty and lifetime maintenance.

1. Warranty period: from the date of normal use of the product after acceptance.

2. Lifetime maintenance: Only a small amount of maintenance cost will be charged for products outside the warranty period.

3. Re-warranty period for repaired products outside the warranty period: half a year from the date of repair.

4. Vulnerable and consumable items (such as fuses, electric bulbs, etc.) are not covered by the warranty.

Warranty phone:0086- 020-37213662

[After-sales service unit]: Guangzhou Micro-shot Optical Technology Co., Ltd.

[Address]: Room 506, No. 1933, Huaguan Road, Tianhe District, Guangzhou (Commercial and Office Building A)

【Product production date】: see product label

【Product lifespan】: 5 yea