

Mshot

MF53-N

Inverted Fluorescence Microscope Instruction Manual



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Foreword

Fluorescence biological microscope MF53-N 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 $5^{\circ}\text{C}\sim 35^{\circ}\text{C}$, relative humidity is 20%~80% (25°C)

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 conducted and radiated disturbances of the MF53-N biological microscope.

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

Without the consent of Guangzhou Micro-shot Technology Co., Ltd., any reproduction, photo-plate making, digital post-processing, and copying are prohibited.

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 Technology Co., Ltd. or authorized operators.

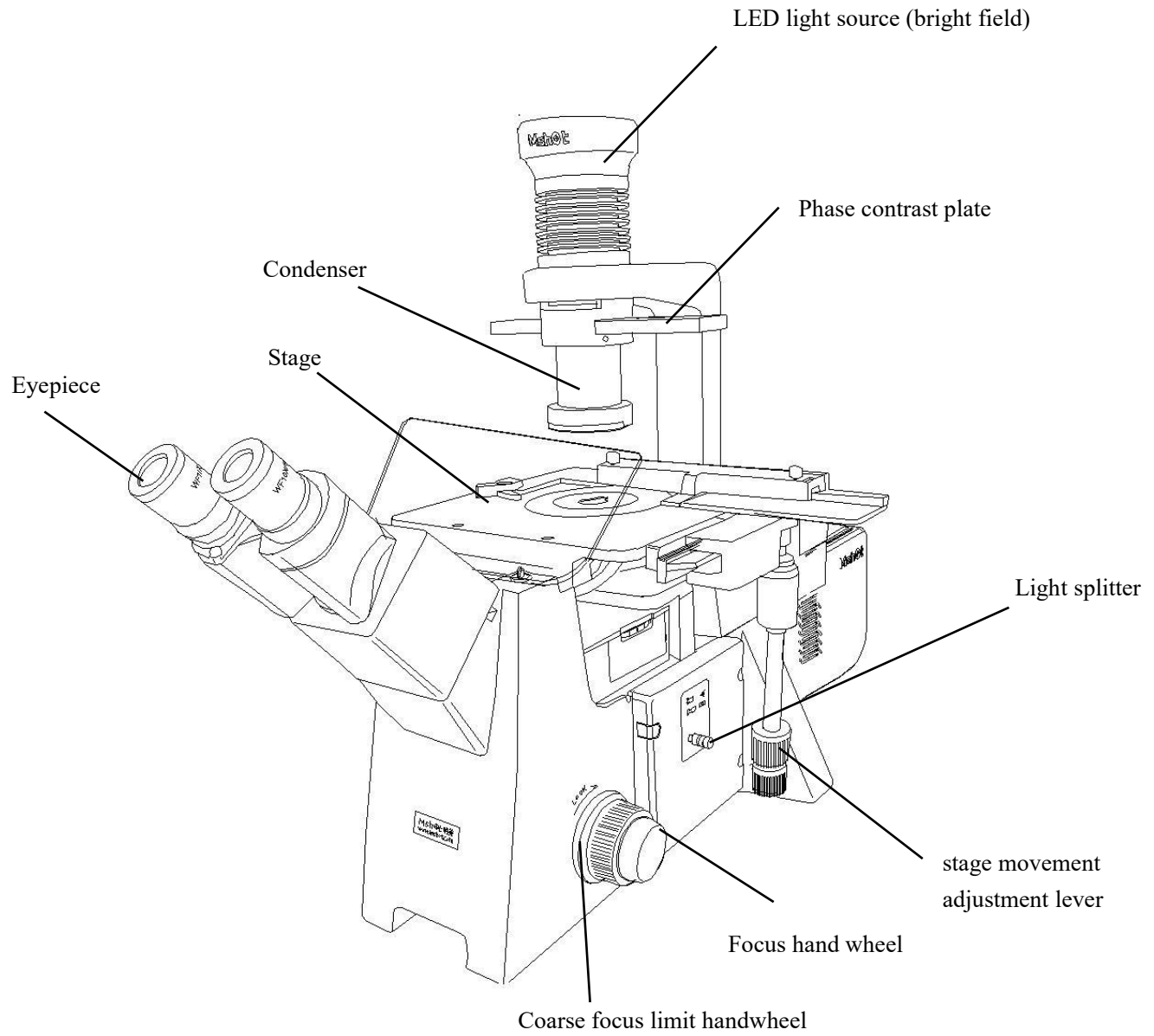
If you have any operational problems not mentioned, please contact the company in time.

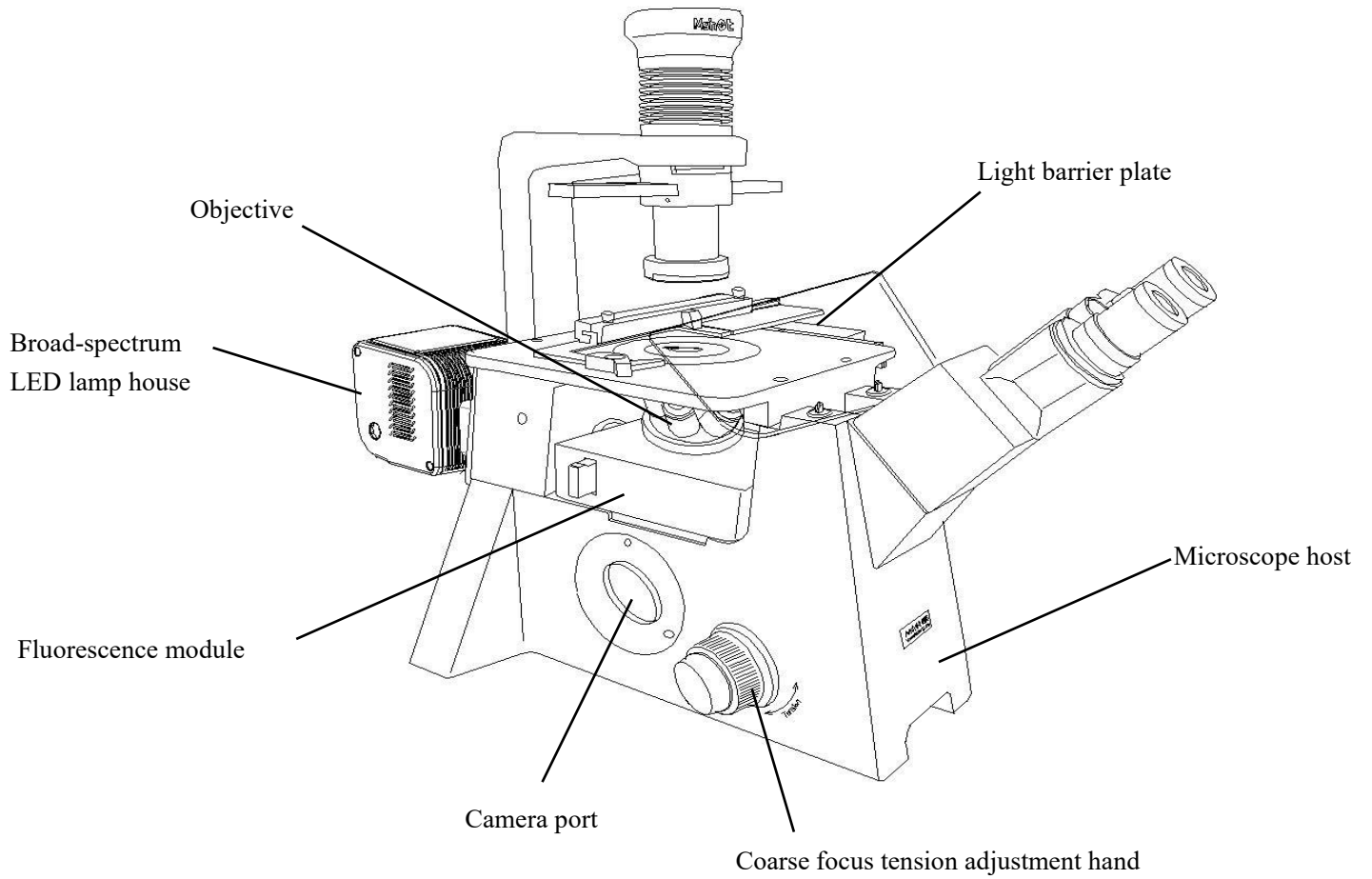
The content of the manual is subject to modification without prior notice.

Table of contents

1. Name of each part	1
2. Simple observation process	3
3. Microscope installation and debugging	11
4. Maintenance and maintenance	17
Instrument cleaning	17
5. Parameter specification	18
6. Trouble shooting	20
6-1 Optics	20
6-2 Mechanical Part	20
6-3 Electrical Section	21
7. Instrument maintenance and maintenance	21
8. Symbol meaning	23
9.Special storage, transport conditions, methods	24
10.After-sales and maintenance services	24

1. The name of each part



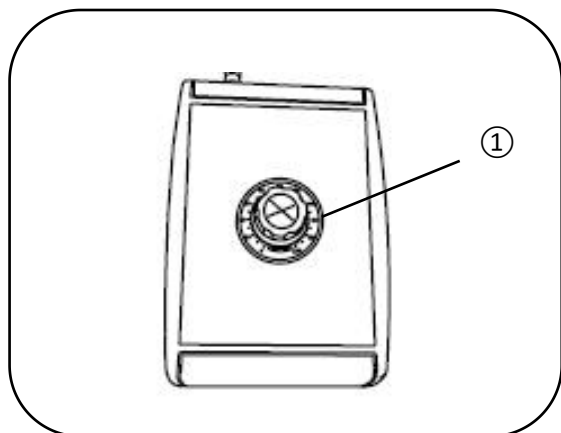


Wide Spectrum LED Power Supply Control Box



II. Simple observation process

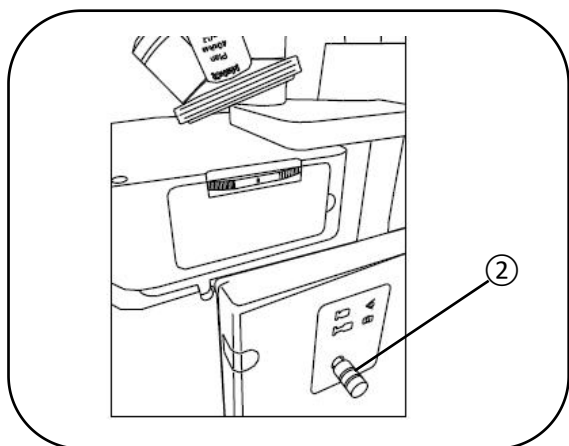
Bright field observation



① Turn on the bright field power/light intensity adjustment switch knob ①, and the sound of "click" means it is turned on.

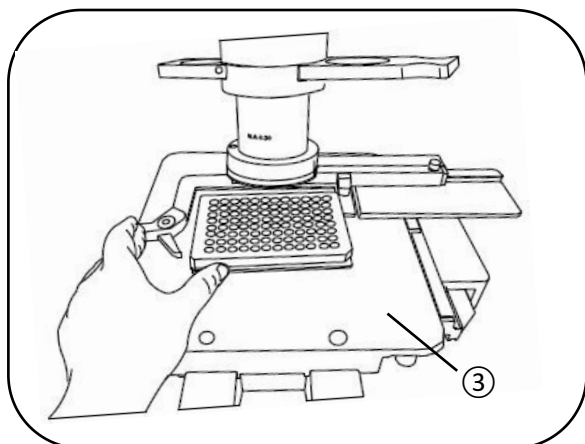
Adjust light intensity: Turn the knob on the bright field power control box to adjust the light source from "0" (off) to "100"

(brightest), and adjust the light source to the appropriate brightness.

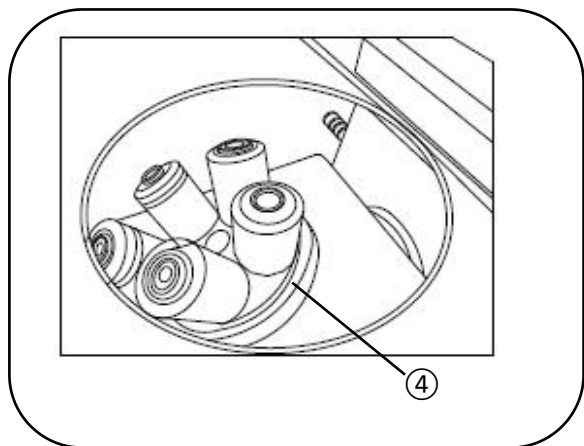


② Push the beam splitter lever ② to switch to the eyepiece observation state.

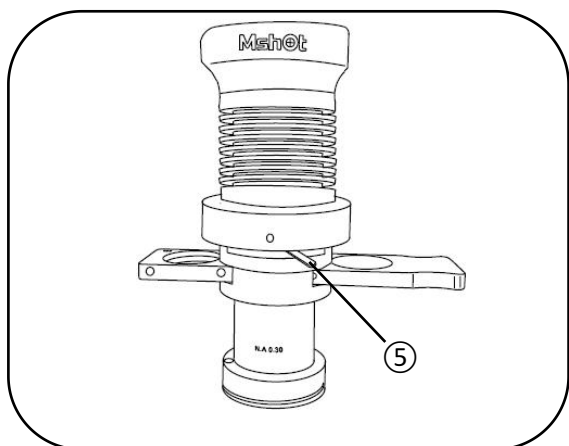
The light path can be switched between eyepiece observation and photomicrography/video using the beam splitter lever



③ Put the sample on the stage ③;

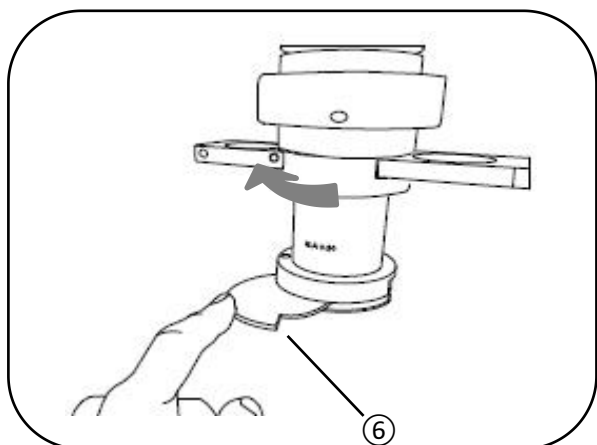


④ Turn the objective lens turret ④ to put the required multiple objective lens into the optical path.

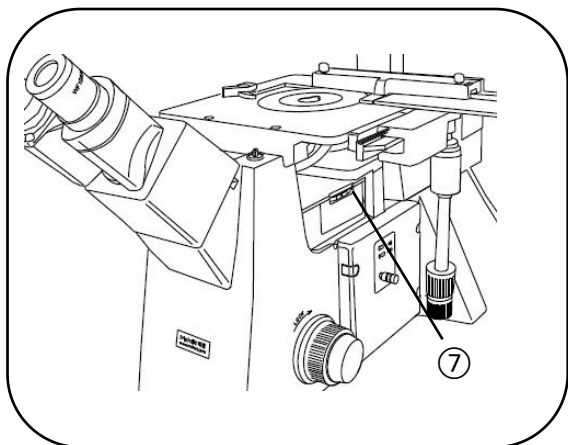


⑤ Adjust the aperture diaphragm adjustment lever ⑤ to change the intensity of the light passing through the condenser.

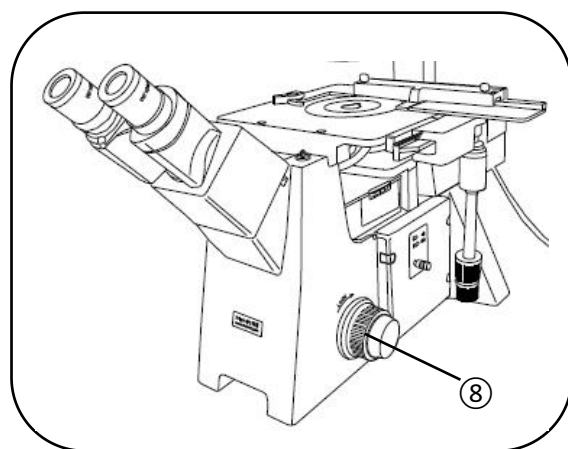
The position of the aperture diaphragm needs to correspond to the magnification of the objective lens. For example, when observing under a 10X objective lens, it is recommended to adjust the aperture diaphragm adjustment lever to the left-third position to the right, so that enough light passes through to ensure the best observation effect.



⑥ Move the condenser baffle ⑥ out, so that the light can reach the sample through the condenser.



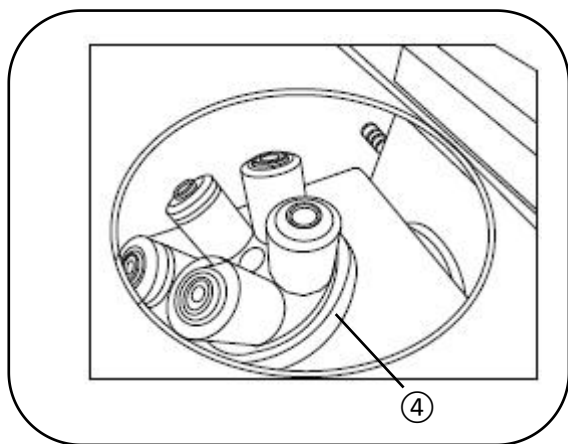
7 Turn the dial ⑦ on the right side of the fluorescence module to turn the neutral gear into the light path.



8 Adjust the focus knob ⑧ to focus on the sample.

When the right coarse focus and fine focus knobs are turned clockwise, the objective lens will be raised, otherwise the objective lens will be lowered; when the left coarse focus and fine focus knobs are turned clockwise, the objective lens will be lowered, otherwise the objective lens will be raised.

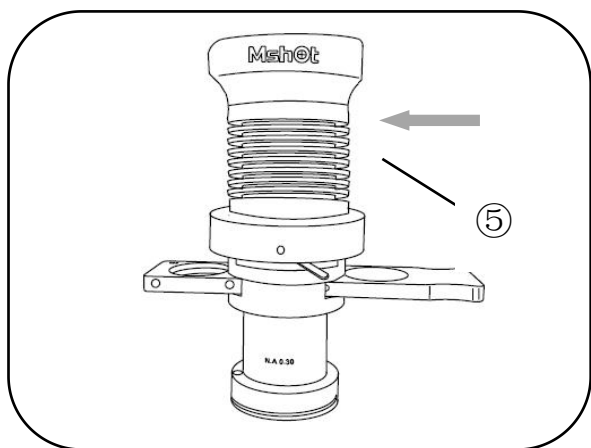
Phase contrast observation



9 On the basis of bright field observation, turn the objective lens revolving plate ④ to transfer the 10X phase contrast objective lens into the light path.

The phase contrast objective lens housing

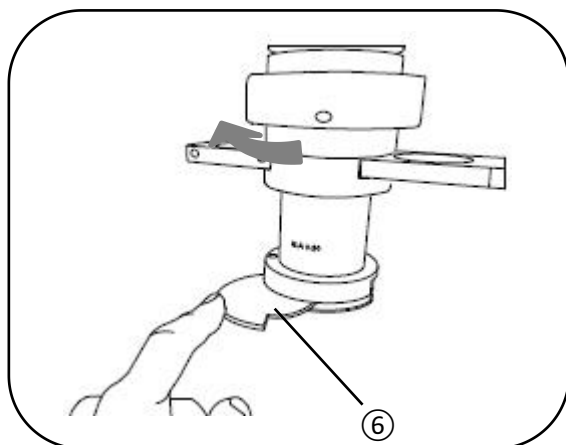
has the word "PH



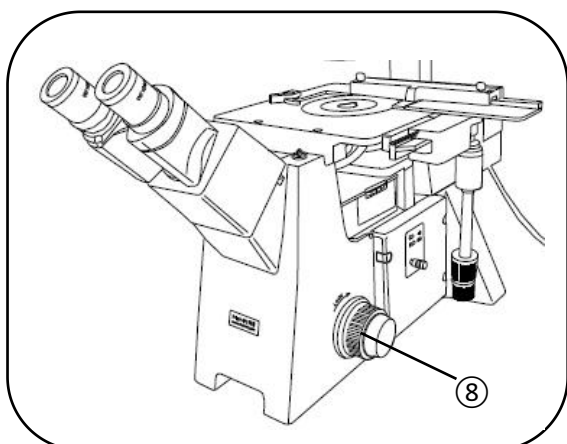
⑩ Push the phase contrast insert ⑤ into the phase contrast insert slot (refer to the installation of the phase contrast insert in the microscope installation step), so that the phase contrast ring corresponding to the multiple of the

objective lens is in the optical path. Adjust the aperture diaphragm adjustment lever to the corresponding position.

Note: The magnification of the phase contrast ring should correspond to the magnification of the objective lens. If a 10X objective lens is used, a 10X hole position should be selected for the phase contrast insert .

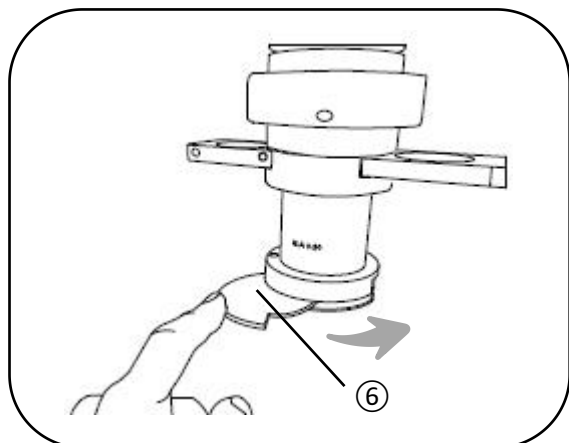


⑪ Move the condenser baffle ⑥ out, so that the light can pass through the condenser and reach the sample.



⑫ Adjust the focus knob ⑧ to focus on the sample.

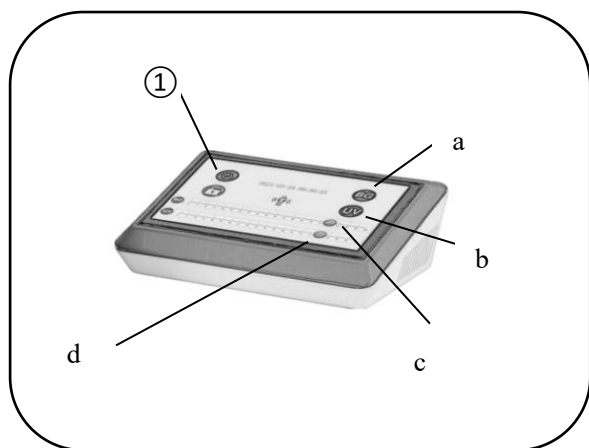
Fluorescence observation



13 Push the condenser shutter into the beam path. During fluorescence observation, Condenser baffles reduce stray light reflected from the condenser

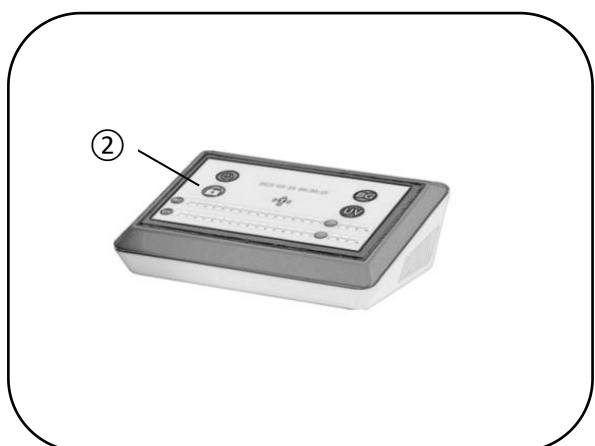
The optical path affects the effect of

fluorescence observation



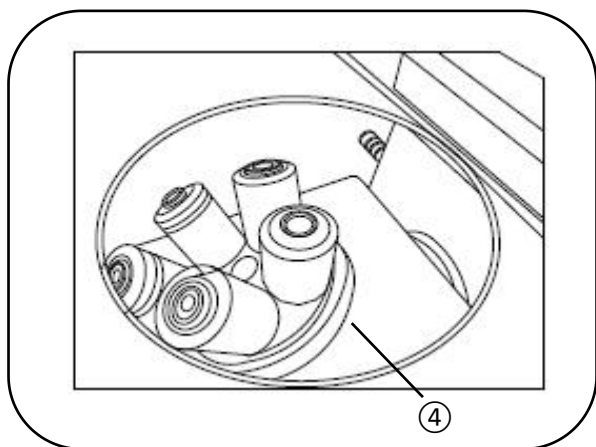
14 Press the start button ①, then press the B/G button a , and adjust the brightness of the B/G band light source through the B/G brightness lever c . The B/G digital display ranges from 0 to 100;

15 When switching to the UV light source, you need to cancel the B/G light button a, press the UV button b, and adjust the brightness of the UV band light source through the UV brightness lever d , and the UV digital display ranges from 0 to 100;



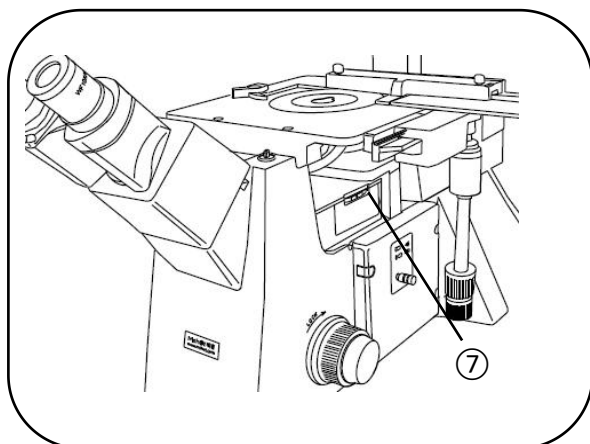
16 When you do not use B/G or UV, you can press key a or key b again, and the corresponding light source will be turned off .

Note: Press the ② key when the screen needs to be locked, the data cannot be modified.



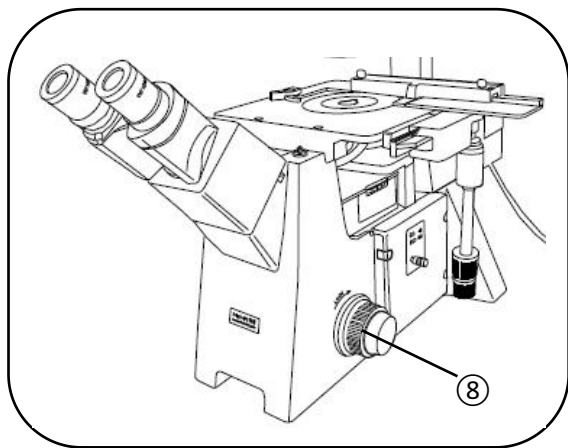
⑰ Turn the objective turret ④ to put the required multiple objective lens into the optical path.

Note: Do not use phase contrast objectives for fluorescence observation



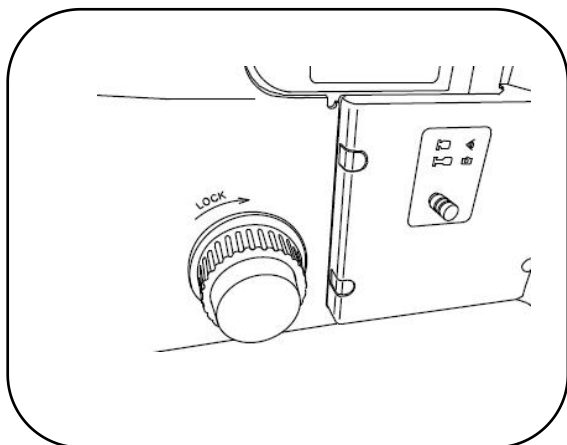
⑱ Turn the dial ⑦ on the right side of the fluorescence module to The optical gear is transferred into the optical path.

fluorescence	logo	EX band (nm)	DM band (nm)	EM band (nm)
UV	UV	330-380	400	420LP
blue	B	460 - 490	500	510LP
green	G	510-550	570	590LP
gap	/	/	/	/



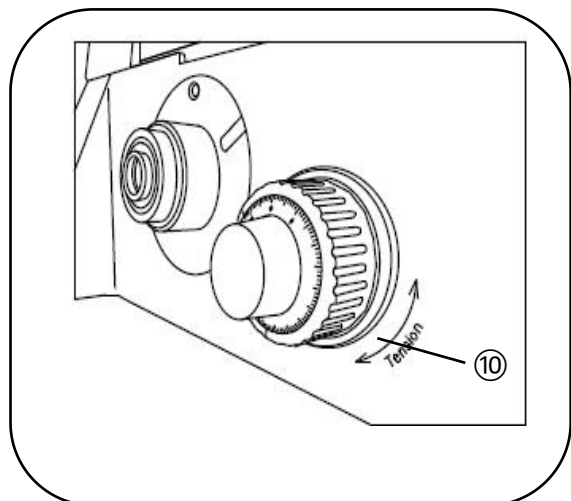
19 Adjust the focusing hand wheel ⑧ to focus on the sample.

The following steps apply to all observation modes



20 After focusing, adjust the coarse focus limit handwheel adjustment ring ⑨ to prevent the objective lens from colliding with the sample. Lock the limit handwheel in the direction of the arrow "LOCK" to lock the upper limit of coarse focus.

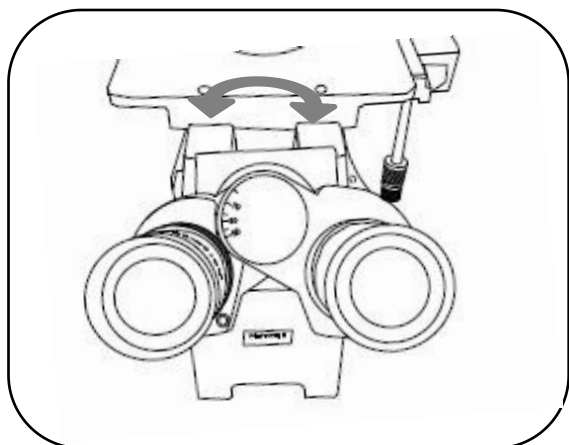
The device also simplifies focusing. After focusing on the sample, lock the limit handwheel, adjust the coarse focus handwheel to the limited position again to focus directly, and then use the fine focus handwheel for fine focus



21 Adjust the tension of the coarse focus handwheel according to user needs. ⑩ Turn the tension adjustment ring of the coarse focus handwheel in the direction of the arrow to increase the tension; conversely to

decrease the tension.

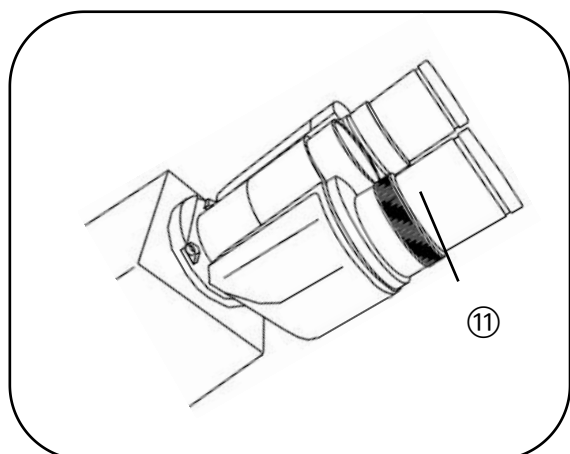
If the objective lens slides down by its own gravity, or defocuses quickly after using the fine focus handwheel to focus, this is caused by too small tension, you need to turn the coarse focus handwheel in the direction of the arrow to adjust the tension ring, increasing tension



22 Adjust the interpupillary distance: When observing through the eyepieces, adjust the binoculars until the left and right fields of view are completely consistent.

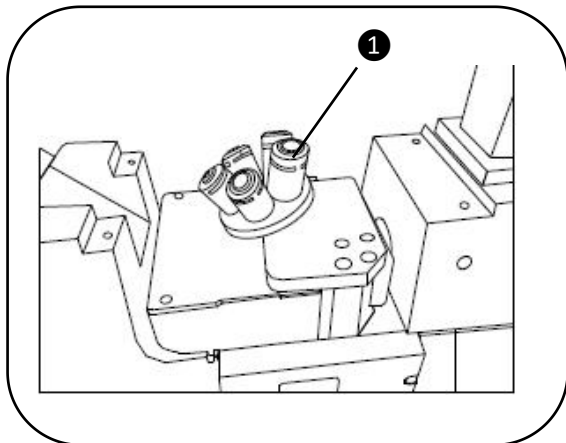
The indicator point "." indicates the interpupillary distance, write down your

interpupillary distance scale for the next use;

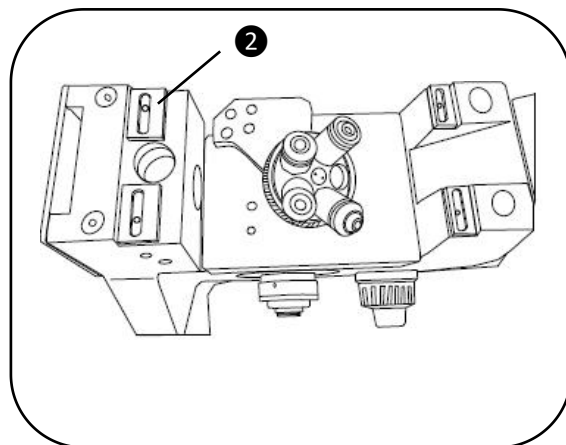


23 Diopter adjustment: After the right eyepiece tube is in focus, observe the left eyepiece tube. Adjust the diopter adjustment ring ⑪ on the left eyepiece tube until the image in the field of view is clear.

3. Microscope installation and debugging



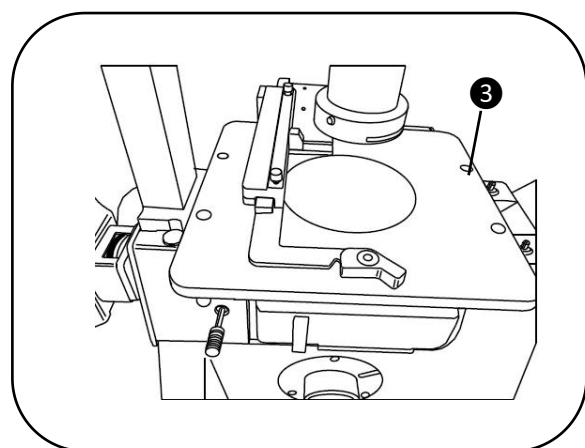
① Screw the objective lenses on the objective lens turntable in order of multiples.



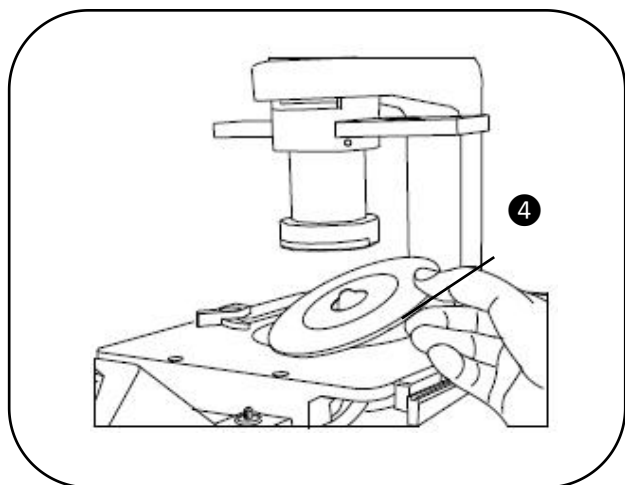
② Place the four square spacers on the stage support.

Wider spacers go on wide brackets, narrower spacers on narrow brackets

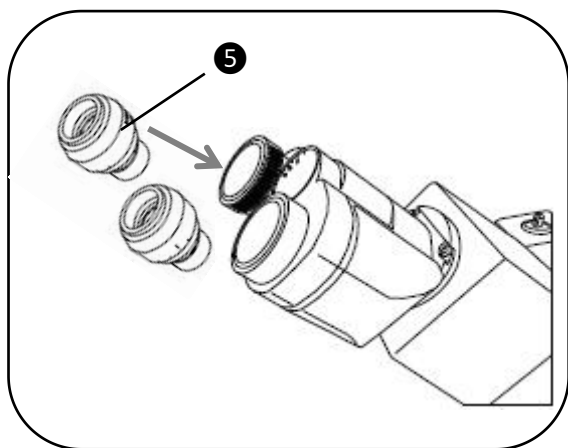
Do not cover the bottom screw holes



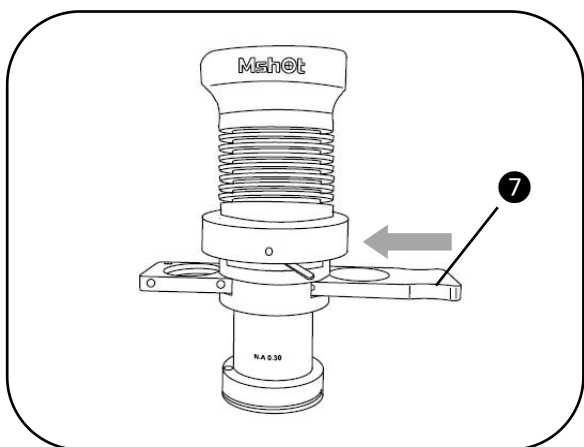
③ Place the stage on the bracket spacer (keep the screw holes aligned), and screw the hexagon socket screws into the screw holes to fix the stage.



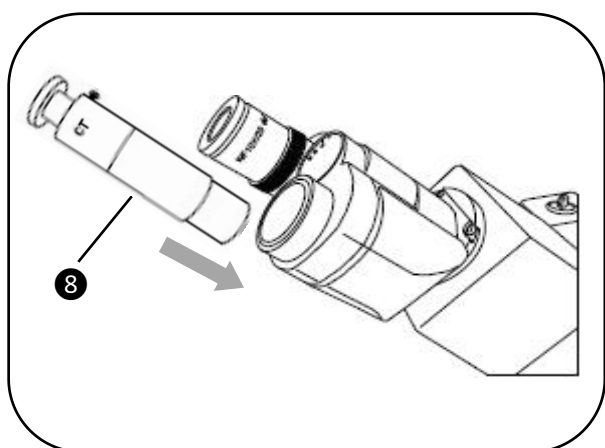
④ Place the drip plate on top of the stage.



⑤ Open the dust cover of the eyepiece tube, and snap the two eyepieces into the lens tube respectively.

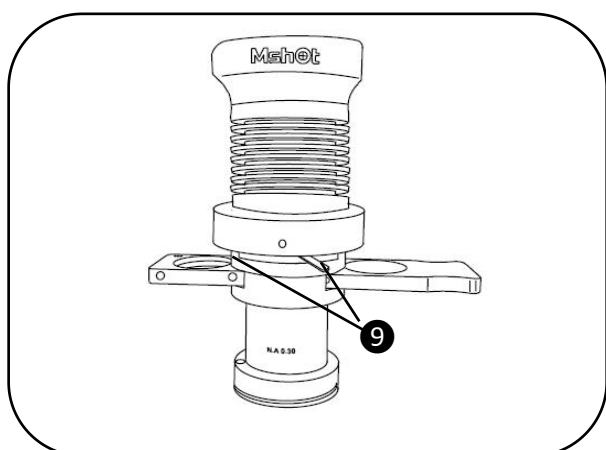


7 Insert the phase contrast insert into the insert slot above the condenser.



8 Remove the eyepiece on one side and insert the centering telescope into the eyepiece tube. The 10X objective lens is transferred into the optical path, and the phase contrast insert plate is pushed into the optical path

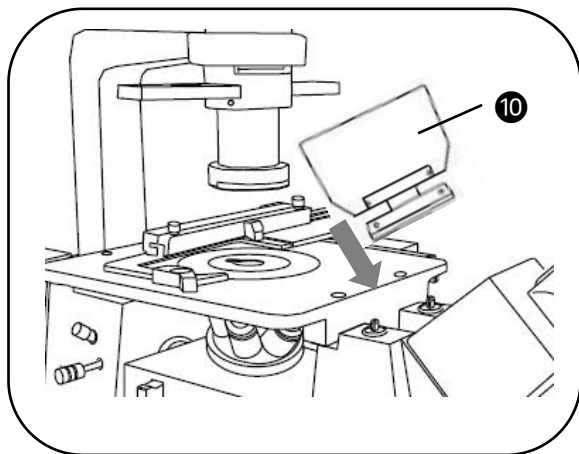
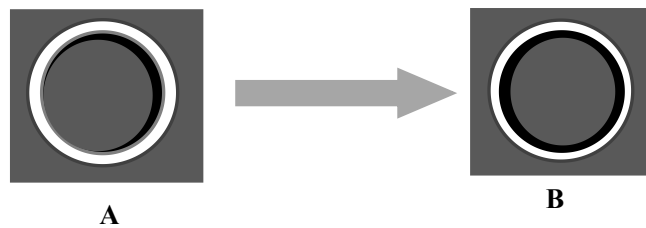
corresponding to the 10X hole. Loosen the screw on the top of the centering telescope and pull out the lens properly, observe the imaging in the centering telescope with one eye until two rings appear in the field of view, then tighten the screw to fix the final telescopic lens.



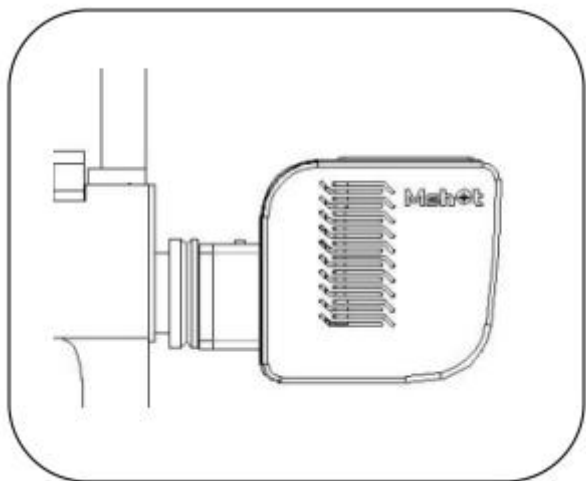
9 Use the hexagonal key to adjust the two screws on the left and right of the left and right 10X holes, so that the bright

ring and dark ring in the field of view of the centering telescope become concentric circles (AB). After adjustment, take out the centering telescope and replace it with the eyepiece for observation.

Adjust the centering of the optical path of the phase contrast objective lens with different magnifications

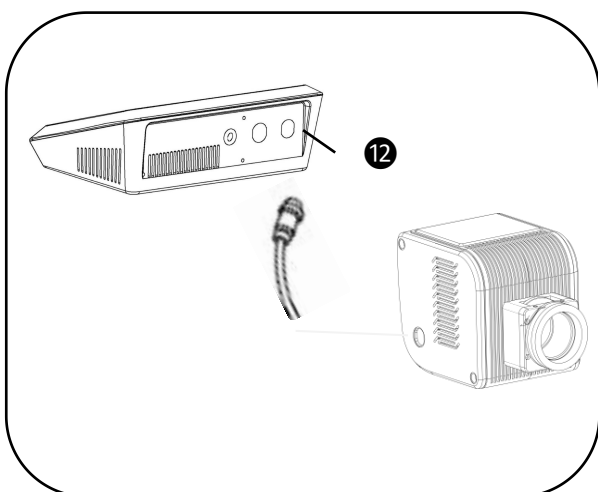


⑩ Clip the fluorescent baffle into the screw on the front of the microscope stand. Fluorescent baffle protects observer's eyes

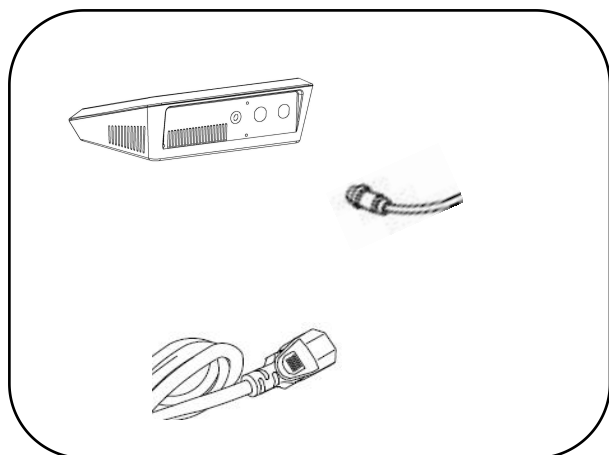


⑪ The wide-spectrum LED light source lamp box interface card is inserted into the small mirror bracket behind the lamp box, and the two screws on the side are fixed to fix the lamp box.

Note: install the lamp box when you need to stabilize the lamp box, ensure that the lamp box is fixed, and the lamp box will fall off.



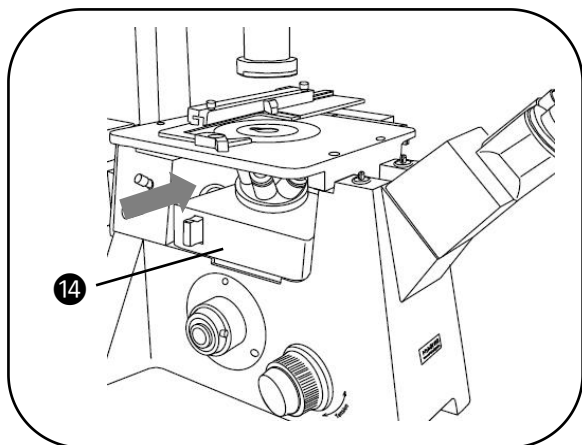
⑫ Pull out the plug of the power socket at the back of the fluorescent power control box, and connect the wide-spectrum LED light source light box to the power control box.



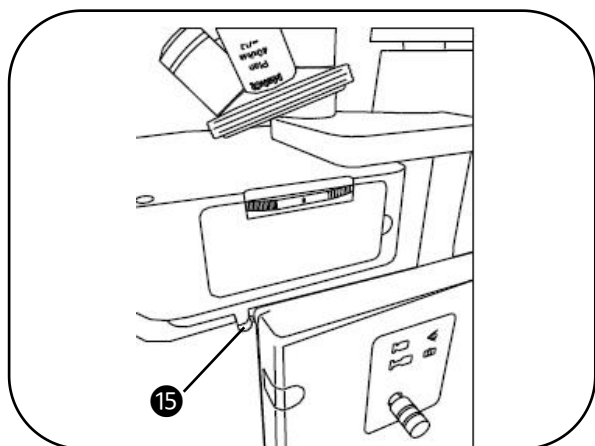
⑬ Connect the power adapter to the fluorescent power control box and power on .

Note: Please operate carefully with both hands during installation, and beware of falling

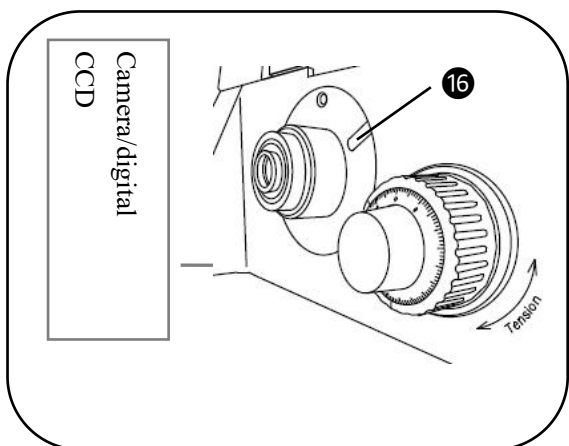
and damaging the light source and accessories!



14 Put the fluorescence module into the module base from the left side of the microscope, and push it slowly along the base track to make the module snap into the template bottom plate.



15 Use a hexagonal key to tighten the fixing screws on the bottom plate of the module on the right side of the microscope, so that the fluorescence module is fixed on the bottom plate to avoid shaking.



16 Loosen the side fixing screws to remove the dust cover at the camera interface , snap the C-type CCD adapter into the camera connection port above the trinocular tube, and tighten the side

fixing screws.

Screw the camera/digital CCD into the thread above the adapter and make sure the camera/digital CCD is tight.

4. Maintenance and Maintenance

Instrument cleaning

Do not touch the exposed lens surface with hands. The dust on it can be removed with a soft brush or gauze. If necessary, it can be wiped with a clean soft cloth, absorbent cotton lens paper, etc. dipped in a little alcohol and ether 1:4 mixture.

Alcohol, ether, etc. are extremely flammable and should be kept away from fire sources. Be careful not to catch fire when switching on the power switch; Avoid using organic solvents such as alcohol, ether or their mixtures for cleaning metal painted surfaces and electroplated surfaces. It is recommended to use silk cloth or soft cleaners for cleaning.

The plastic surface should be cleaned with a soft cloth dipped in water.

Use and placement environment

The instrument should be used and placed in a cool, dry, dust-free, shock-proof environment, free of acid and alkali steam and any corrosive gas; Conditions for normal operation of the instrument: indoor temperature 0° C-40° C, maximum relative humidity 85%.

When using a microscope in a high-humidity area, it is recommended to install a dehumidification device to prevent the optical components of the instrument from becoming moldy and foggy.

When using and handling, the action should be careful and avoid strong vibration and collision. When moving the instrument, lift the instrument

with both hands; do not drag it on the work surface, so as not to scratch the table and damage the instrument.

When the instrument is not working, cut off the power supply, cover with a dust cover, and place it in a dry and cool place.

In order to maintain the performance index of the instrument, it is recommended to check the instrument regularly. If the instrument is found to be faulty and needs to be repaired, please contact the manufacturer or the nearest dealer .

5. Parameter Specifications

Part	Specification
Eyepiece	WF10X/23 plan eyepiece, high eye point
	centering telescope
Eyepiece tube	45° tilt, interpupillary distance adjustment 50–75mm, diopter adjustable
Objective lens	Infinity Long Working Distance Plan Achromatic Objective LWDPlan 4X/0.1 WD: 11.98mm
	Infinity long working distance semi-compound fluorescence objective Plan Fluor 10X/0.3 WD: 7.1mm
	Infinity long working distance semi-compound fluorescence objective Plan Fluor 40X/0.65 WD: 1.6mm
	Infinity Long Working Distance Plan Achromatic Phase Contrast Objective Lens Plan10X/0.25 PH Working Distance: 4.1

	mm	
	Infinity Long Working Distance Plan Achromatic Phase Contrast Objective Lens Plan20X/0.45 PH Working Distance: 5mm	
Epi Fluorescent Illumination System	Multi-band LED light source MG-100/MG120	
	6-hole fluorescence module	
	Exciter block	Fluorescence band
	Ultraviolet (U)	EX:375/30nm; DM:415; EM:460/50nm
	blue (B)	EX:475/30nm; DM:505; EM:530/40nm
	Green (G)	EX:540/25nm; DM:565; EM:605/55nm
Focus mechanism	Coarse and fine adjustment coaxial, equipped with limit device and locking device, low hand position coaxial focusing handwheel, fine adjustment handwheel scale value 1 μm	
Nosepiece	Six-hole internal positioning converter, ball bearing internal positioning, with anti-mildew device	
Stage	Fixed stage 240mm×260mm; moving range: 135mm×85mm	
	water drop slide	
Trans-illumination system	Warm LED, brightness continuously adjustable	
	LED Knob Type Brightness Adjuster	
	Condenser: ultra-long working distance 72mm, numerical aperture NA=0.30, equipped with three-hole phase contrast ring plate	

6. Troubleshooting

6-1 Optical part

question	reason	Solution
Dark edges or uneven field of view	The converter is not in the positioning position (the objective lens is not in the center of the optical path)	Go to the positioning position (rotate the objective lens so that it enters the light path correctly)
	There is dirt on the lens (referring to the condenser lens, objective lens, eyepiece lens, and light collector lens)	Wipe clean with lens tissue dampened with alcohol
One side of the image is dark	Converter is not in position	turn it into place
	Specimen is floating	Reliably reinforced
Image moves when focusing	The specimen floats on the surface of the stage	should be firmly placed
	Converter is not in position	turn it into place
Lighting is not bright enough	Aperture diaphragm opened too small	readjust
	Insufficient brightness adjustment	Adjust brightness knob

6-2 Mechanical part

question	reason	Solution
Binocular images do not overlap	Interpupillary distance is not adjusted correctly	readjust

eye fatigue	no diopter adjustment	correct diopter adjustment
	The brightness of the lighting is not suitable	Adjust bulb voltage

6-3 Electrical part

Symptom	reason	Countermeasures
Bulb does not light up when switch is on	No power or bad connection	Check the wire connection
	light bulb is broken	replace
	voltage too low	increase voltage
Lamp flickering or brightness is unstable	voltage problem	Check voltage stability
	The light bulb is not inserted correctly into the socket	Check and plug it in securely

7. Instrument maintenance 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 "0" 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 of the two is about Alcohol 20–30%, ether 70–80%)



Warning

Generally speaking, in the direction shown in the figure, wipe the surface of the mirror relatively easily from the inside.



Wrong



Correct

(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

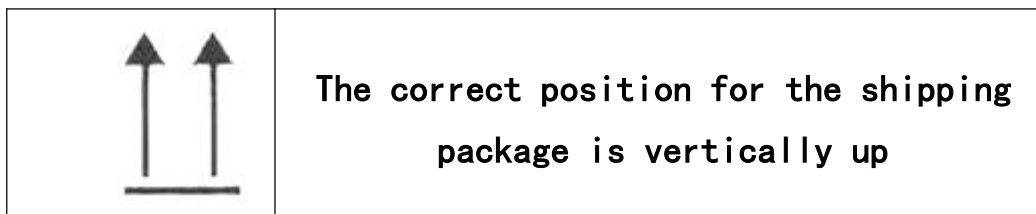


Warning

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.

8. The meaning of the logo

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



9. Special storage, transportation conditions and methods

Storage: Fluorescent 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.

10. 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.

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

[Address]: Room 506, No. 1933, Huaguan Road, Tianhe District, Guangzhou

【Product production date】 : see product label

【Product lifespan】 5 years

