Guangzhou Micro-shot Technology Co., Ltd

MF53-N

Inverted fluorescence microscope

User manual

Website：www.m-shot.com
Tel:0086-20-38262481
Email: sales@mshot.com

Inverted fluorescence microscope MF53-N

Thank you for buying our product!

This unit is a precision optical instrument. Though with high safety design, wrong usage and overlook of this manual can do harm to you and your property. Thus, to ensure the life of this unit and maintain it properly, please read this manual carefully before operating.

Safety Reminder

Warning!

1. Be sure to turn off the power switch and remove the power cord before installing, replacing the bulb or fuse, plugging and unplugging the power supply.

To prevent electric shock or fire, be sure to turn off the power switch and remove the power cord before installing this unit, replacing the bulb or fuse, plugging and unplugging the power supply.

Warning!

2. Do not disassemble

Except the removable parts mentioned herein, no part of this unit shall be removed, otherwise the performance of this unit may be reduced, or may cause an electric shock, injury or damage to this unit. Please contact the supplier if any fault occurs.

Warning!

3. Input voltage

Check if the input voltage is consistent with your local voltage supply. If not, do not operate this unit and contact the supplier. Improper input voltage may cause a short circuit or fire thereby causes damage to this unit.

Warning!

4. Use specific bulb, fuse and power cord

Use of an improper bulb, fuse or power cord may cause damage or fire to this unit. Any extended power cord used must be grounded (PE).

Warning!

5. Protect this unit from high temperatures, dampness and foreign objects

To prevent short circuit or any other fault, do not expose this unit to any high temperatures or dampness environment for a prolonged period of time. A suitable operating environment is designated at a temperature of 5°C-35°C, and relative humidity of 20%-80% (at 25°C). If water splashes on this unit, turn off the power switch and remove the power cord immediately, and then wipe the water off with dry cloth. When any foreign object enters or drips onto this unit, please stop operating the unit and contact the supplier.

Warning!

6. Heat of light source

The lighting bulb generates high temperatures during operation. Do not touch the collector lens or lamp box when the lamp is illuminated, and do not touch the bulb within 30 minutes after the lamp goes out due to high temperatures arising from operation. When replacing the bulb, make sure it has cooled down properly (the lamp should be off for at least 30min).

★ To prevent burn, do not touch the bulb when the lamp is illuminated or within 30min after it goes out.

★ To prevent fire, do not place any fibrous product, paper, flammable or explosive material (e.g., gasoline, petroleum ether, alcohol) near the halogen lamp housing or mercury lamp housing.

Warning!

7. Coarse/fine focusing knobs

This unit employs a coarse/fine coaxial focusing mechanism. Do not turn the left/right coarse/fine focusing knob in the opposite direction. When the objectives lifting device reaches the limit of motion, do not continue to turn the coarse focusing knob, otherwise the focusing mechanism may be damaged.

Caution!

8. Storage place

This unit is a precision optical instrument, and improper operation or storage may cause damage or its precision may be adversely affected. Consider the following when selecting a storage place:

※ Avoid placing the unit under direct sunlight, directly under interior lighting or any other bright place.

※ A suitable operating environment is designated at a temperature of 5°C-35°C, and relative humidity of 20%-80% (at 25°C). Do not expose this unit to high temperatures, dampness or dust for a prolonged period of time, otherwise mist or mold may develop or dust may deposit on the lens, thus cause damage to this unit and shortening its life.

Caution!

9. Installation of bulb

Do not touch the glass surface of the bulb directly with bare hands. When mounting the bulb, wear gloves or wrap it with cotton material.

※ Wipe off any dirt on the surface of the bulb with a clean cotton fabric dipped in alcohol. If the dirt is not thoroughly removed, it would etch the surface of the bulb weakening its brightness and shortening its life.

※ Mount the bulb with care to avoid slipping off or injuries to your fingers.

※ When replacing the bulb, make sure its contact is intact. If its contact is damaged, the bulb may be disabled or short-circuited.

※ When replacing the bulb, the feet should be inserted into the holder as deeply as possible. If the feet are not tightly inserted, the bulb may go out or short circuit.

Caution!

10. Instrument handling

This precision optical instrument is heavy and should be handled with care. Strong impact and rough handling are strictly prohibited, it may cause damage to this unit.

11. Environmental protection

Please dispose the wastes from the packaging and operation of this unit by category such as cartoon, foam, plastic, bulb and etc. Do not discard the damaged mercury lamp carelessly in order to avoid creating environmental poll

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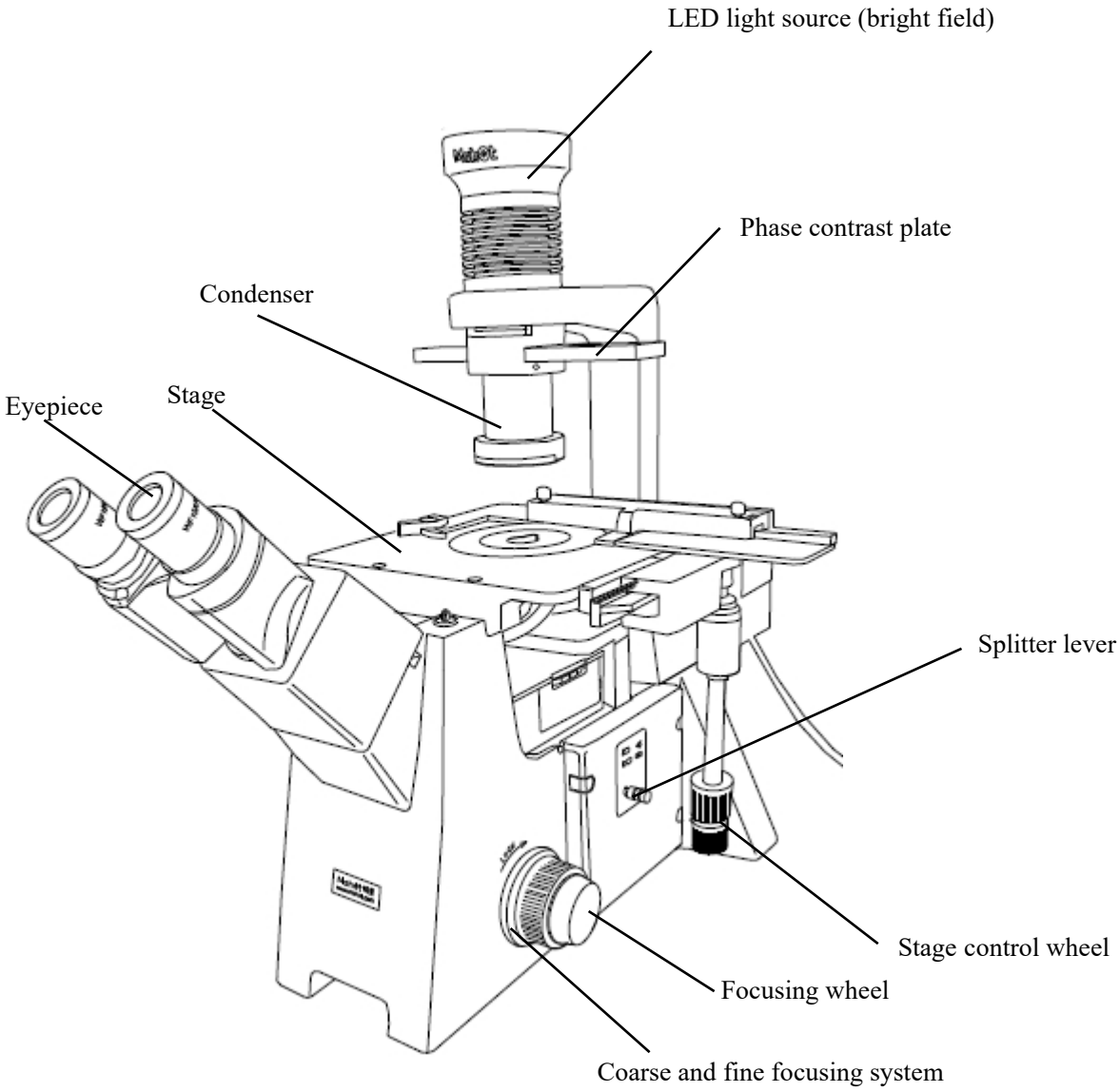
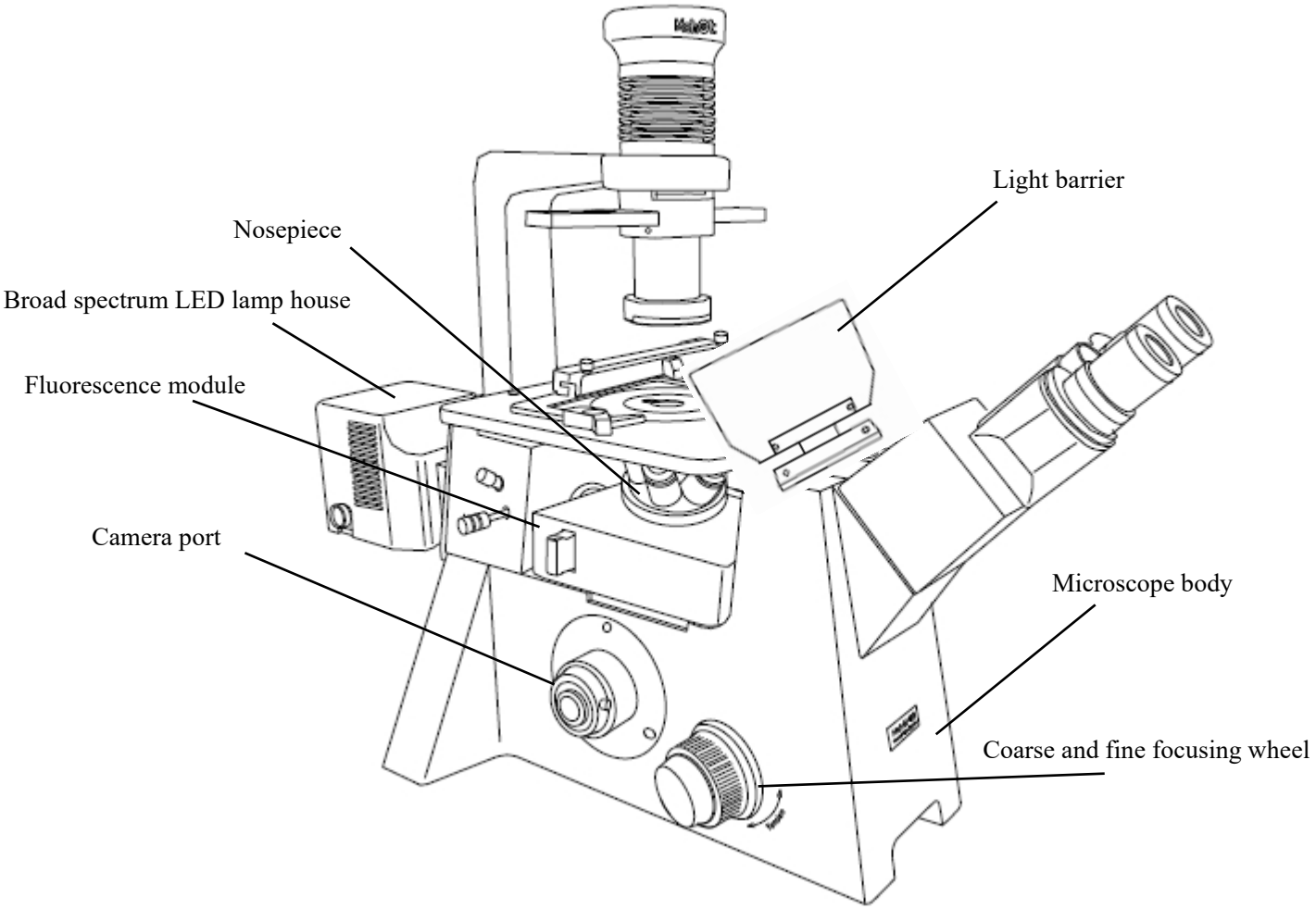
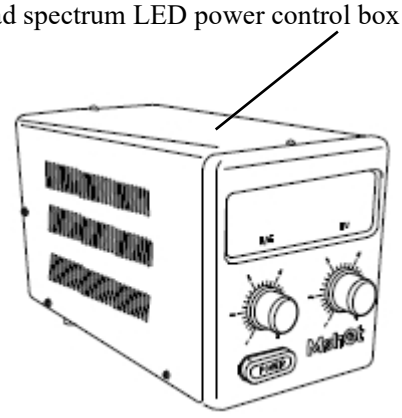
1、Components





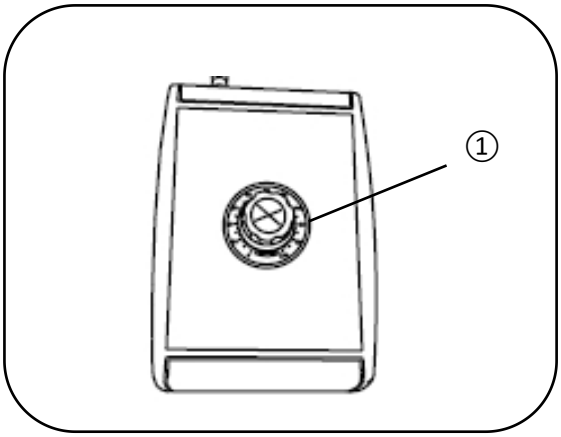
LED light control box（bright field）

Broad spectrum LED power control box（fluorescence）



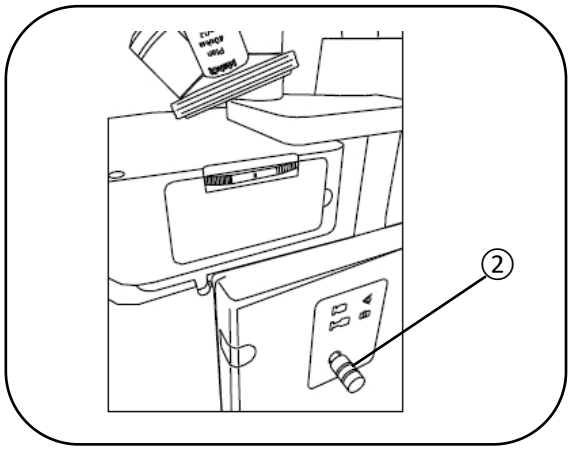
2、Main observation steps

Bright field observation



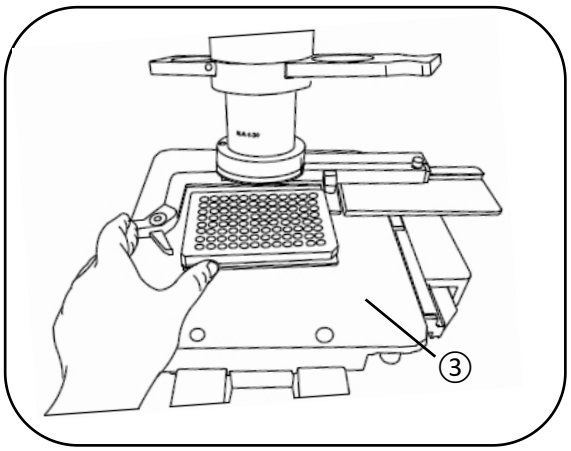
❶Turn on the bright field power supply / light intensity adjustment switch knob (1), and the sound of "Ta" indicates that it is on.

Adjust the light intensity: rotate the knob on the control box of bright field power supply to adjust the light source from "0" (off) to "100" (brightest), and adjust the light source to the appropriate brightness.

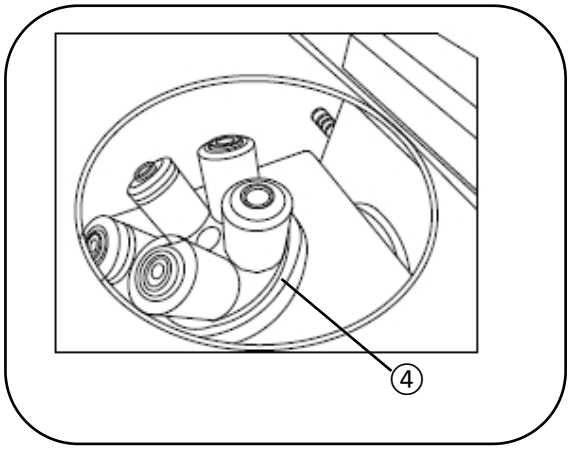


❷Push the splitter lever ② forward and switch to the eyepiece observation state.

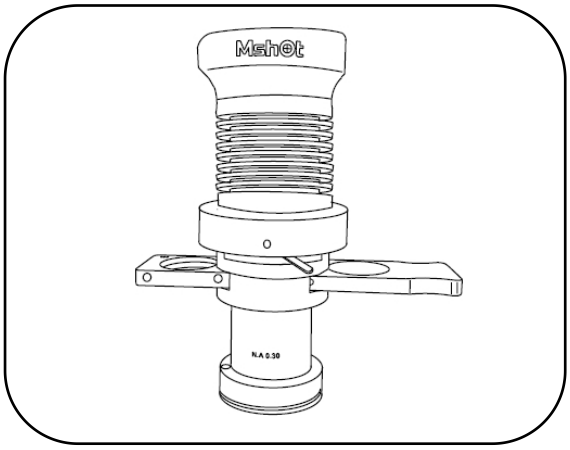
The light path can be switched between eyepiece observation and eyepiece / camera using the splitter lever.



❸Put the sample on stage ③.

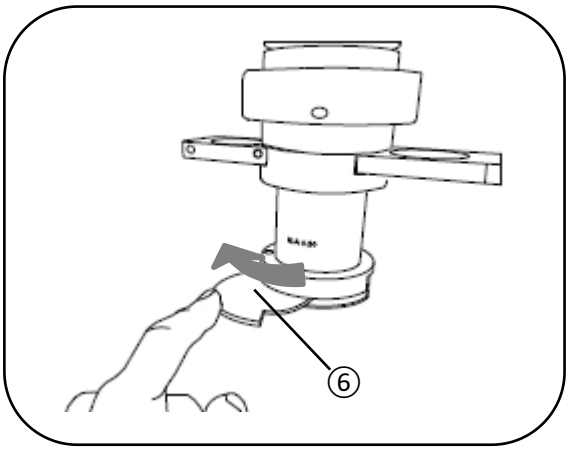


❹Turn the objective nosepiece ④ to turn the required multiple objective into the light path.

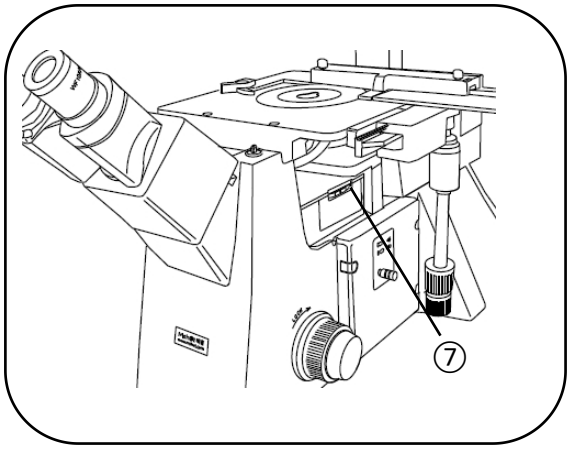


❺Adjust the aperture diaphragm adjusting rod ⑤ to change the intensity of light passing through the condenser.

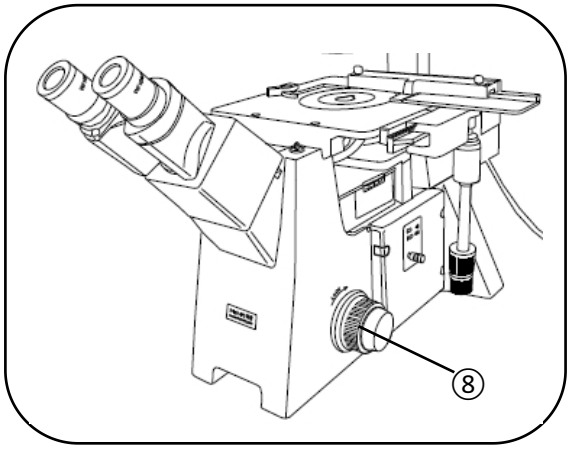
The position of the aperture should correspond to the magnification of the objective lens. For example, when observing under the 10x objective lens, it is recommended to adjust the adjusting rod of the aperture to one third to the right and one third to the left, so that the light passing through is enough to ensure the best observation effect.



❻Remove the condenser barrier plate ⑥ so that the light can reach the sample through the condenser.



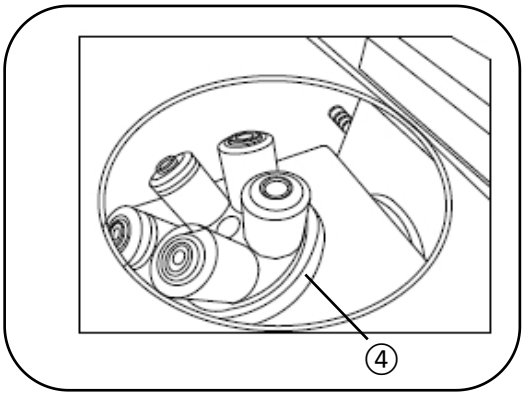
❼Turn the dial ⑦ on the right side of the fluorescent module to turn the neutral into the light path.



❽Adjust the focusing hand wheel ⑧ to focus the sample.

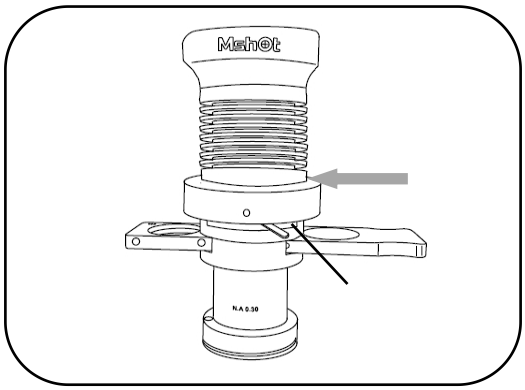
When the right hand wheel of coarse focus and fine focus is rotated clockwise, the objective rises, otherwise the objective falls. When the left coarse focus and fine focus knobs are rotated clockwise, the objective decreases, otherwise, the objective increases

Phase contrast observation



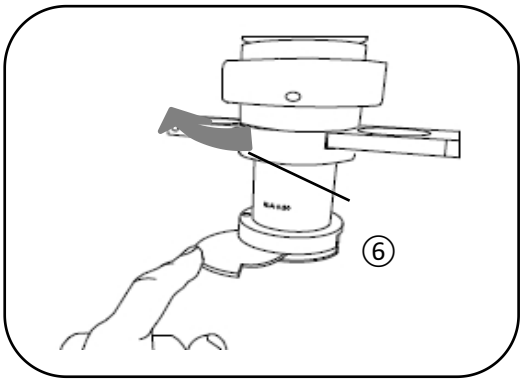
❾On the basis of bright field observation, rotate the objective nosepiece ④ to turn the 10x phase contrast objective into the optical path.

The shell of phase contrast objective has the word "pH"

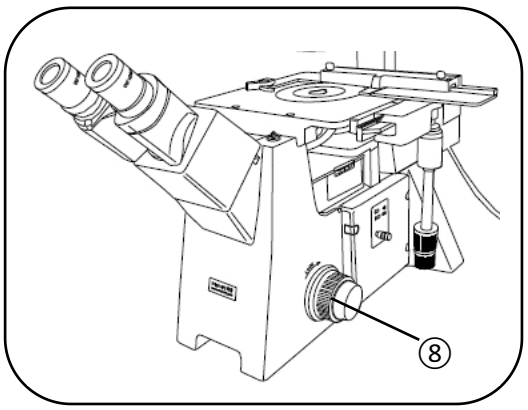


❿Push the phase insert plate ⑤ into the slot of the phase insert plate (refer to the installation of the phase insert plate in the installation procedure of the microscope), so that the phase difference ring of the corresponding multiple of the objective lens is in the optical path. Adjust the adjusting rod of aperture diaphragm to the corresponding position.

Note: the multiple of the phase contrast ring should correspond to the multiple of the objective lens. If the 10x objective lens is used, the 10x hole should be selected for the phase contrast insert plate

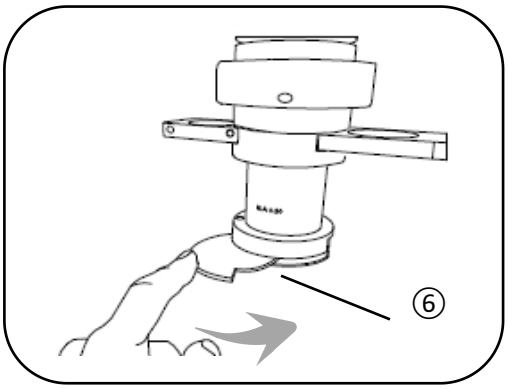


⓫Remove the condenser barrier plate ⑥ so that the light can reach the sample through the condenser.



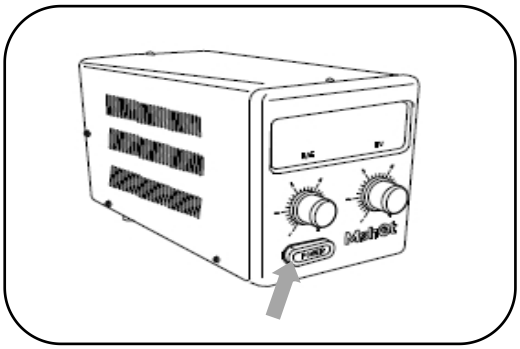
⓬Adjust the focusing hand wheel ⑧ to focus the sample.

Fluorescence observation



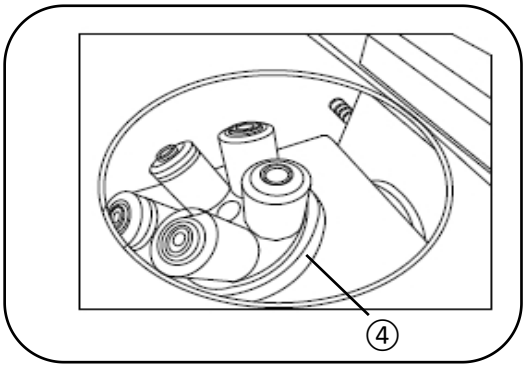
⓭Push the condenser baffle plate into the light path.

In fluorescence observation, the baffle of the condenser can reduce the stray light reflected by the condenser into the light path and affect the fluorescence observation effect



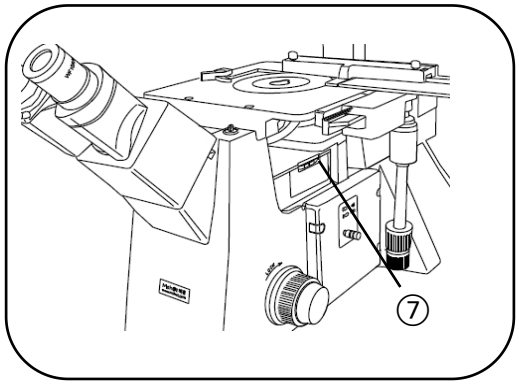
⓮Gently press the word "play" on the left side of the fluorescent power control box to turn on the fluorescent light source, and adjust the fluorescent light intensity knob to the appropriate brightness.

The left light intensity adjustment knob is the "UV" band brightness adjustment knob, and the right light intensity adjustment knob is the "B, G" band brightness adjustment knob. At this time, the bright field light source should be turned off



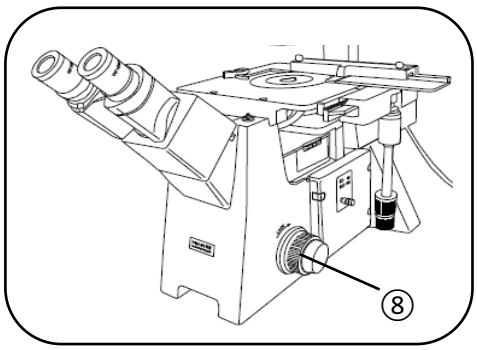
⓯Turn the objective nosepiece ④ to turn the required multiple objective into the light path.

Note: do not use phase contrast objective lens when fluorescent observation



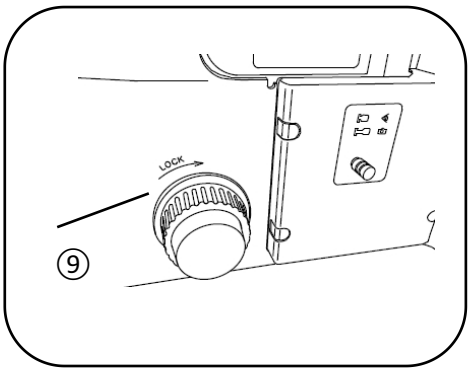
⓰ Turn dial ⑦ on the right side of the fluorescent module to turn the desired fluorescence gear into the optical path.

Fluorescence	Mark	EX wavelength（nm）	DM wavelength（nm）	EM wavelength（nm）
UV	UV	330-380	400	420LP
Blue	B	460–490	500	510LP
Green	G	510–550	570	590LP
Neutral	/	/	/	/

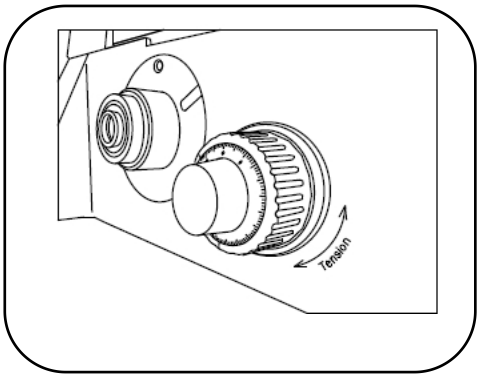


⓱Adjust the focusing hand wheel ⑧ to focus the sample.

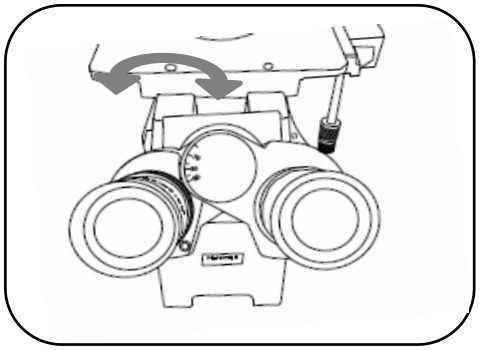
The following procedure is applicable to all observation methods



⓲After adjustment, the coarse focusing limiting hand wheel adjusting ring can prevent the object from colliding with the sample. Lock the limit handwheel along the arrow "lock" direction, that is, lock the upper limit of coarse focusing. **The device can also simplify focusing. After focusing the sample, lock the limit handwheel, adjust the coarse focusing handwheel to the limited position again to focus directly, and then use the fine focusing handwheel to focus precisely**

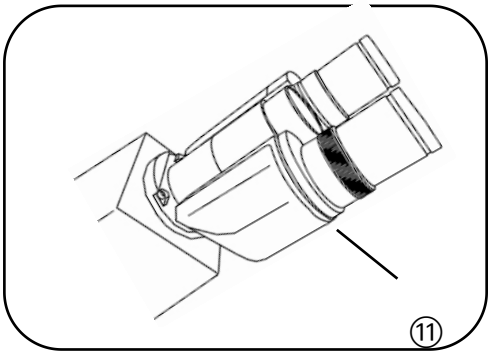


⓳Adjust the tension of the coarse focusing hand wheel according to the user's needs. ⑩ Turn the tension adjusting ring of the coarse focusing hand wheel in the direction of the arrow to increase the tension.On the contrary, reduce the tension. If the objective slides down due to its own gravity, or defocuses rapidly after focusing with the fine focusing handwheel, it is caused by too small tension. It is necessary to turn the coarse focusing handwheel tension adjusting ring along the direction of the arrow to increase the tension



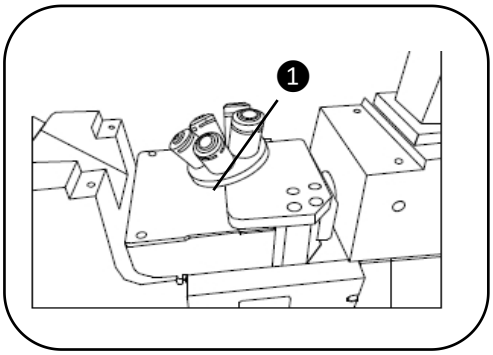
⓴Adjust the pupil distance: when observing through the eyepiece, adjust the binocular until the left and right fields of view are completely consistent.

The indicator dot "." indicates the pupil spacing. Write down your pupil spacing scale for next use

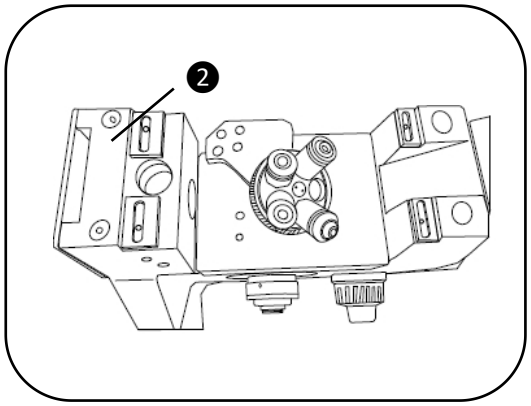


㉑Adjust the diopter: after focusing the right lens tube clearly, observe the left lens tube again. Adjust the diopter adjustment ring on the left eyeglass tube ⑪ until the image is clear in the field of view.

3、Installation and debugging of microscope



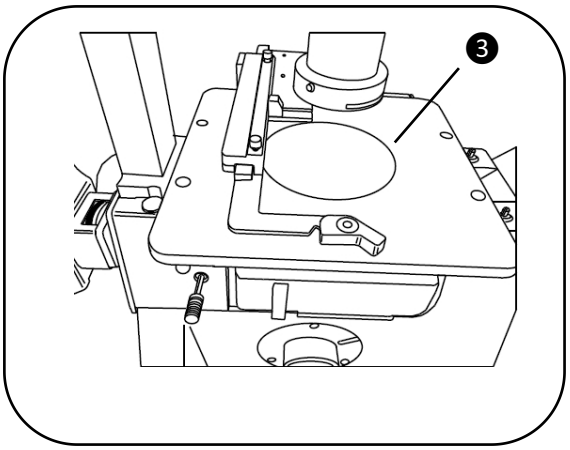
❶Screw the objective on the objective nosepiece in order of multiple size.



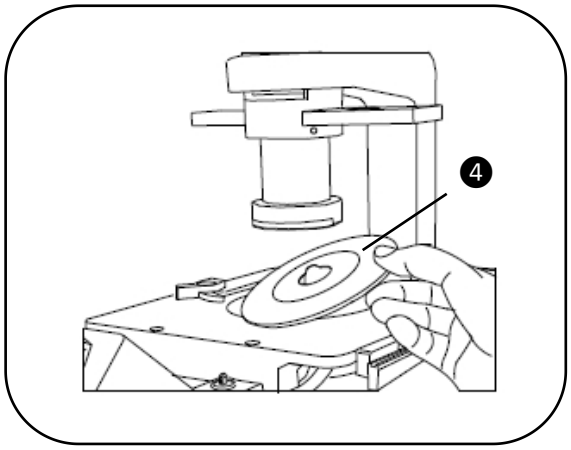
❷Place four square gaskets on the stage bracket.

The wider gasket is placed on the wide bracket, and the narrower gasket is placed on the narrow bracket.

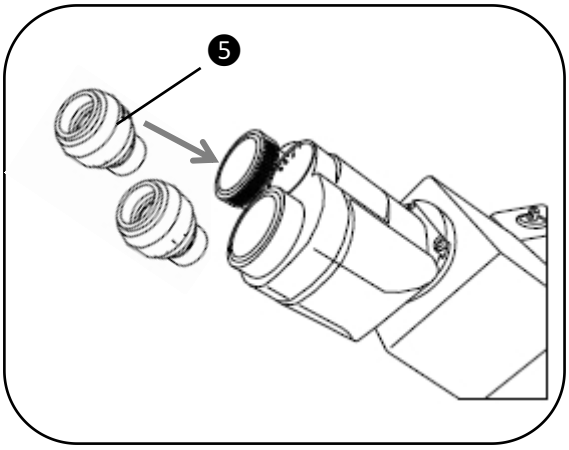
Do not cover the bottom screw hole.



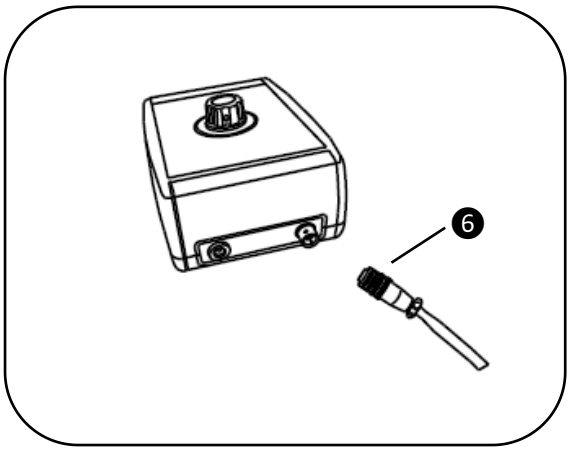
❸Place the stage above the bracket gasket (keep the screw holes aligned), and screw the hexagon screw into the screw hole to fix the stage.



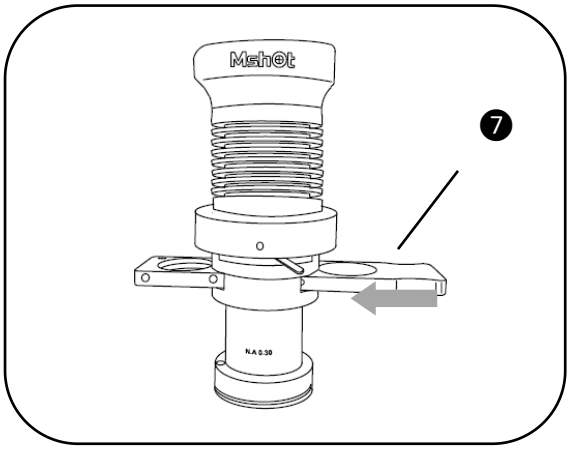
❹Place the drip plate over the stage.



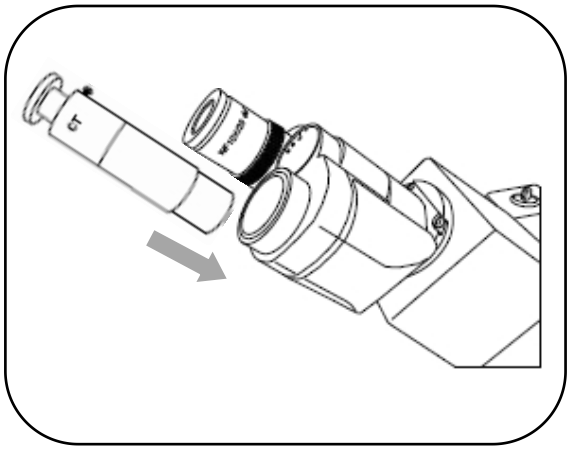
❺Open the dust cover of the eyepiece tube and clip the two eyepieces into the tube respectively.



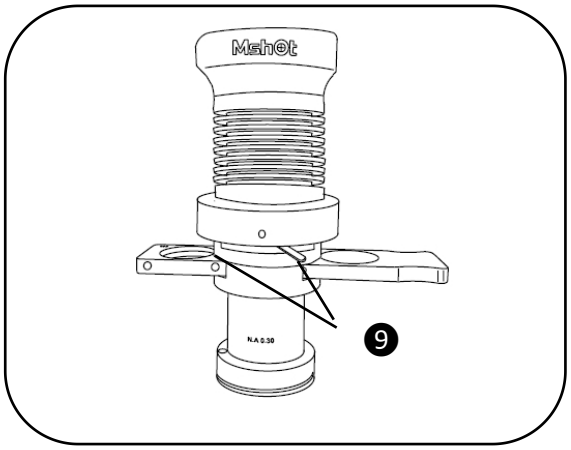
❻Connect the bright field power cable on the microscope bracket to the bright field light source control box, and connect the adapter on the other end to power on the microscope



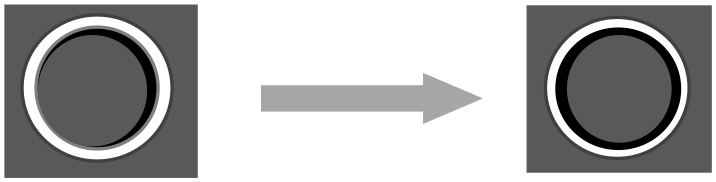
❼Insert the phase contrast plate into the slot above the condenser.



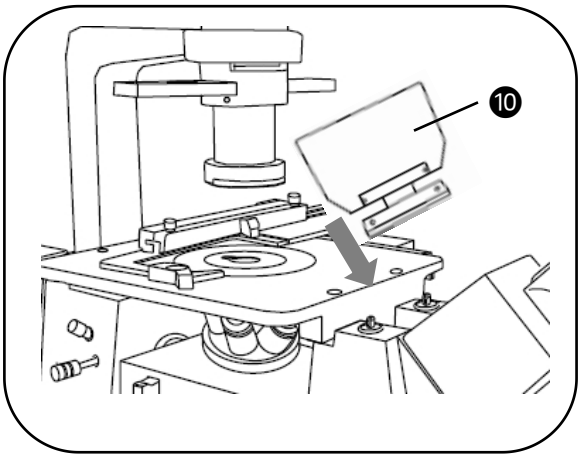
❽Remove one eyepiece and insert the centering telescope into the eyepiece tube. The 10x objective is turned into the optical path, and the phase insert plate is pushed into the optical path corresponding to the 10x hole position. Loosen the screw above the centering telescope, pull out the lens properly, observe the imaging in the centering telescope with one eye until two rings appear in the field of vision, and then tighten the screw to fix the lens.



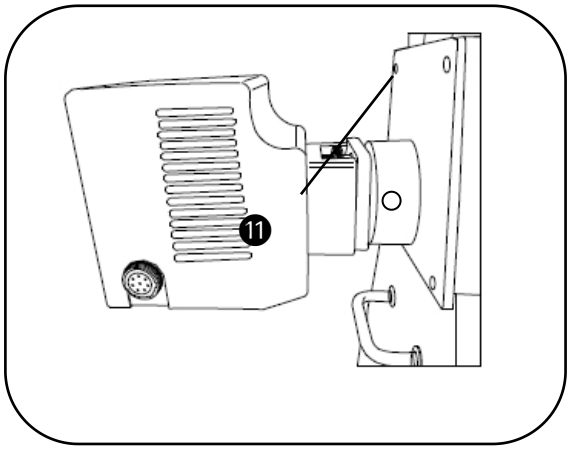
❾Use a hexagon key to adjust the left and right screws of the left and right 10x holes, so that the bright ring and dark ring in the field of view of the centering telescope become concentric circles (a-b). After adjustment, take out the centering telescope and replace it with eyepiece for observation.Adjust the alignment of different multiples of phase contrast objective respectively.



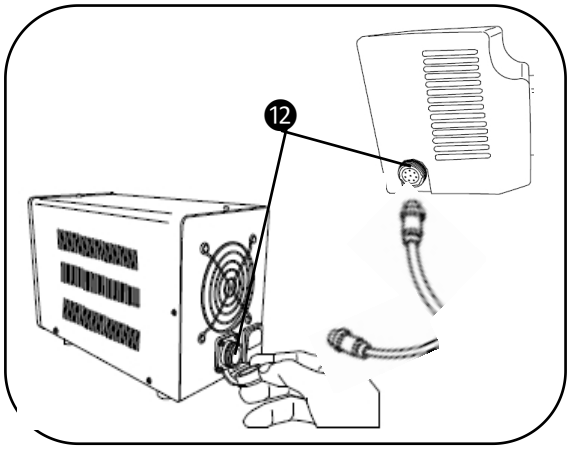
A **B**



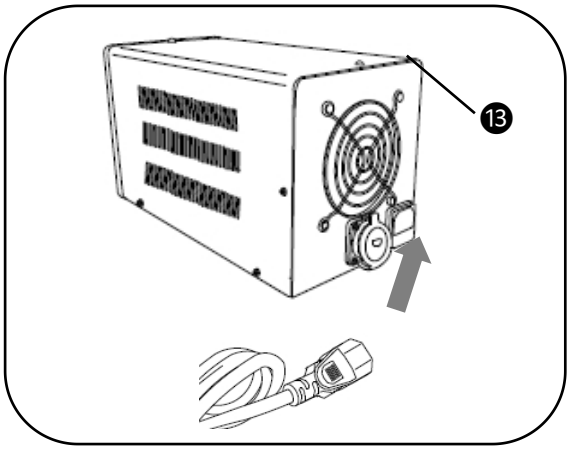
⑩Clip the fluorescent baffle into the screw in front of the microscope bracket. The fluorescent baffle can protect the eyes of the observe.



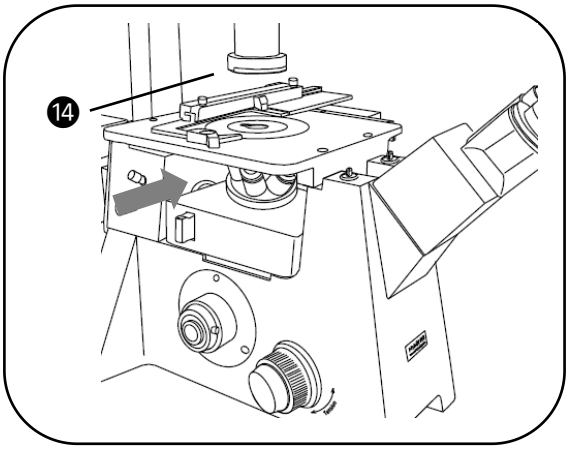
⑪Clip the light box interface of wide spectrum LED light source into the light box bayonet behind the microscope bracket, and tighten the two screws on the side to fix the light box. **Note: when installing the light box, hold the light box firmly and tighten the screws to ensure that the light box is fixed to prevent the light box from falling.**



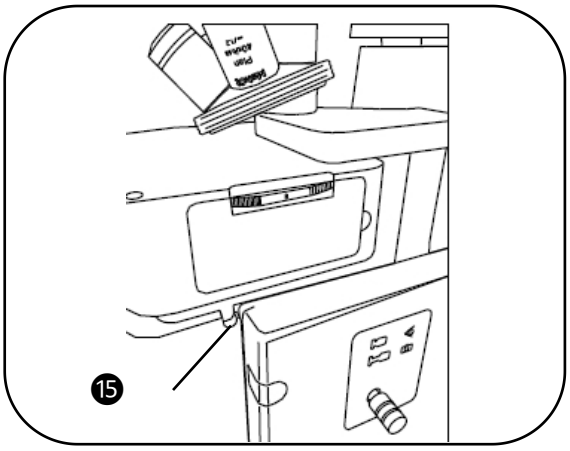
⑫Pull out the plug of the power socket behind the fluorescent power control box, and connect the wide spectrum LED light source lamp box with the power control box.



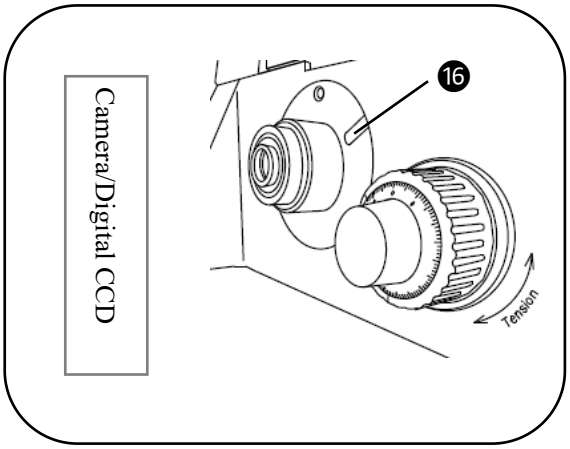
⑬Pull out the plug of the power socket behind the fluorescent power control box, and connect the wide spectrum LED light source lamp box with the power control box.



⓮Clip the fluorescent module into the module base from the left side of the microscope, and slowly push it along the base track to make the module clip into the template base plate.



⓯Use a hexagon key to tighten the fixing screw on the bottom plate of the module on the right side of the microscope to fix the fluorescent module on the bottom plate to avoid shaking.



⓰Loosen the side fixing screw, remove the dust cover at the camera interface, clip the C-type CCD adapter into the camera connection above the three lens barrel, and tighten the side fixing screw.

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

4、Maintenance

Cleaning of instruments

The surface of exposed lens shall not be touched by hand. The dust on it can be removed by soft brush or gauze. If necessary, it can be wiped by using clean soft cloth, absorbent cotton lens paper, etc. dipped

in a little alcohol ether 1:4 mixture;

Alcohol, ether, etc. are highly combustible, Keep away from fire 。 Be careful not to catch fire when switching the power supply;

Avoid using organic solution such as alcohol, ether or their mixture to clean the metal paint surface and electroplating surface. It is recommended to use silk cloth or soft detergent to clean;

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

Use and place environment

The instrument should be used and placed in a cool, dry, dust-free, shockproof, acid-base steam free and any corrosive gas environment;

Conditions for normal operation of the instrument ： Indoor temperature 0 ° C-40 ° C Maximum relative humidity 85%；

If the microscope is used in high humidity area, it is recommended to install dehumidification equipment to prevent the optical elements of the instrument from mildew and fogging;

When using and handling, be careful to avoid strong vibration and collision. When moving the instrument, lift the instrument with both hands; Do not drag on the worktable to avoid scratching the table and damaging the instrument;

When the instrument does not work, cut off the power supply, put on the 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. Please contact the manufacturer or the nearest dealer if you find that the instrument is faulty and needs to be repaired.

5、Specification

Observation	Binocular observation tube, 45°inclined, pupil distance adjust range 50-75mm, diopter adjustable	
	0%/100% light pass for digital camera or eyepiece	
Eyepieces	WF10X/23 plan eyepiece, high eyepoint	
	Centering telescope	
Objectives	Infinite long working distance plan achromatic: LWDPlan 4X/0.1	
	Infinite long working distance plan achromatic: Plan10X/0.25, working distance 4.1mm	
	Infinite long working distance plan achromatic: Plan 40X/0.58, working distance 2.5mm	
	Infinite long working distance plan achromatic phase contrast: Plan10X/0.25 PH, working distance 4.1mm	
	Infinite long working distance plan achromatic phase contrast: Plan20X/0.45 PH, working distance 5.0mm	
	Optional objectives	Long working distance semi-apochromats fluorescence objective: Plan Fluor 4X/0.13 WD:18.5mm
		Long working distance semi-apochromats fluorescence objective: Plan Fluor 10X/0.3 WD:7.1mm
		Long working distance semi-apochromats fluorescence objective: Plan Fluor 20X/0.45 WD:5.9mm
		Long working distance semi-apochromats fluorescence objective: Plan Fluor 40X/0.65 WD:1.6mm
Focus system	Coaxial coarse and fine with limit and locking devices, low coaxial focus adjusting handle,	
	Minimum adjustment gradations: 1 μm	
Nosepiece	Quintuple revolving nosepiece with bearing inner location and anti-fungus device	
Stage	Fixed stage 240mmX260mm; with low-positioned X/Y coaxial control knob, travel distance 135mmX85mm	
	Water drop slide holder（Φ118mm）	
	Multif-unction slide holder（76mmX26mm, Φ54mm)	
	Optional micro slide	Multi-function slide holder (Φ35mm)
		Multi-function slide holder (Φ90mm)
Epi-illuminating fluorescence system	Broad-spectrum high power LED light source MG100	
	Digital mercury light source power box AC100V or 220V	
	Quintuple / Sextuple reflected fluorescence illuminator with iris field diaphragm and aperture diaphragm	
	Excitation filter units	**Filter wavelength**
	UV (U)	EX:330-380nm,DM:400nm,EM:420nmLP

	Blue (B)	EX:460-490nm,DM:500nm,EM:510nmLP
	Green (G)	EX:510-550m,DM:570nm,EM:590nmLP
Condenser	Long working distance condenser 72mm, NA 0.30 with triple phase contrast slider	
Transmitted illumination system	9W warm LED brightness contentiously adjustment	
	LED rotary brightness control knob	
Camera adapter	0.75X C-mount adapter	

6、Troubleshooting

11-1 Optical part

Problems	Reason	Solutions
Edge dark or uneven field of view	The converter is not in the positioning position (the objective is not in the center of the optical path)	Turn to the positioning position (turn the objective lens to enter the light path correctly)
	Dirt on lens （containing condenser, objectives and eyepiece）	Turn to the position (turn the objective to make it enter the light path correctly) wipe it clean with the wiping paper dipped in alcohol
Dark on one side of the image	The converter is not in position	Turn to make it in place
	The specimen is floating	Reliable reinforcement
Image moving during focusing	Specimen floating on the surface of the loading platform	It should be placed firmly
	The converter is not in position	Turn to make it in place
The illumination is not bright enough	The aperture is too small	Readjustment
	Insufficient brightness adjustment	Adjust brightness knob

11-2 Mechanical part

Problems	Reason	Solutions
The binocular images do not coincide	The pupil distance is not adjusted correctly	Readjustment
Eye fatigue	There is no diopter adjustment	Correct adjustment of visibility
	The illumination is not suitable	Adjust the bulb voltage

11-3 Electrical part

Symptom	Reason	Solutions

The bulb does not light when the switch is on	No power supply or poor contact	Check the wire connection
	The light bulb is broken	Replace
	The voltage is too low	Increase the voltage
Flashing or unstable light bulb	Voltage problem	Check voltage stability
	The bulb is not properly inserted into the socket	Check and firmly plug it in