BS-2081L Scientific Microscope

Instruction Manual

This manual is for users of BS-2081L Scientific Microscope in laboratory. To ensure your safety, obtain optimum performance, and to familiarize yourself fully with the use of this microscope, we recommended that you study the instruction manual carefully.

Contents

Notice For Use BS-2081L

I. Safety Precaution

Symbol	Description
	During use, the power box of microscope become very hot, so should not be touched with bare hands.
	Before using, please read the user manual carefully. If can not use inappropriately, it will cause an accident that harm operators or damage instrument
	Power switch is open.
	Power switch is closed.

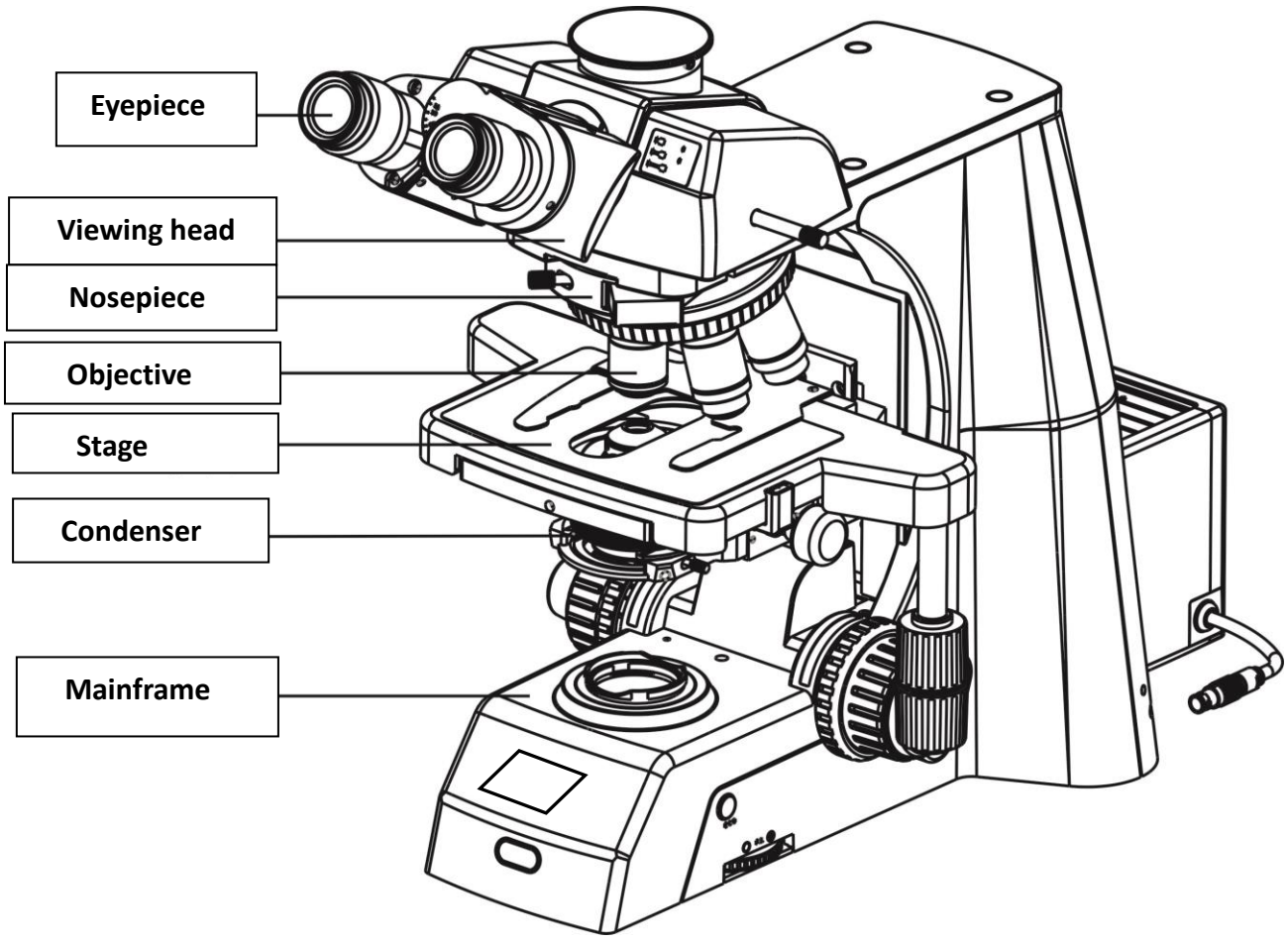
II. Safety Precaution

1. Be careful before opening box. Don't attach fingerprint and Perspiration on the camera lens. Prevent camera and some accessories from dropping and damaging.
2. Don't place microscope in direct sunlight, high temperature, high humidity or dusty, and vulnerable to strong vibration. Ensure that the objective table is flat ,level and strong enough.
3. When working, near the microscope lamp room will be a little fever. Please ensure that there is enough heat dissipation space around the room light.
4. Place the microscope on the grounding, avoid lightning strike.
5. ⚠To ensure safety, before change halogen lamp or fuse ,please guarantee the main power switch is "O", cut off light source, and wait for the light and lamp room are cooling. Check input voltage: the input voltage indicated on the back of microscope and the power supply voltage is consistent, otherwise it will lead to serious damage to the microscope.
6. Please use the special wire of the company to provide.

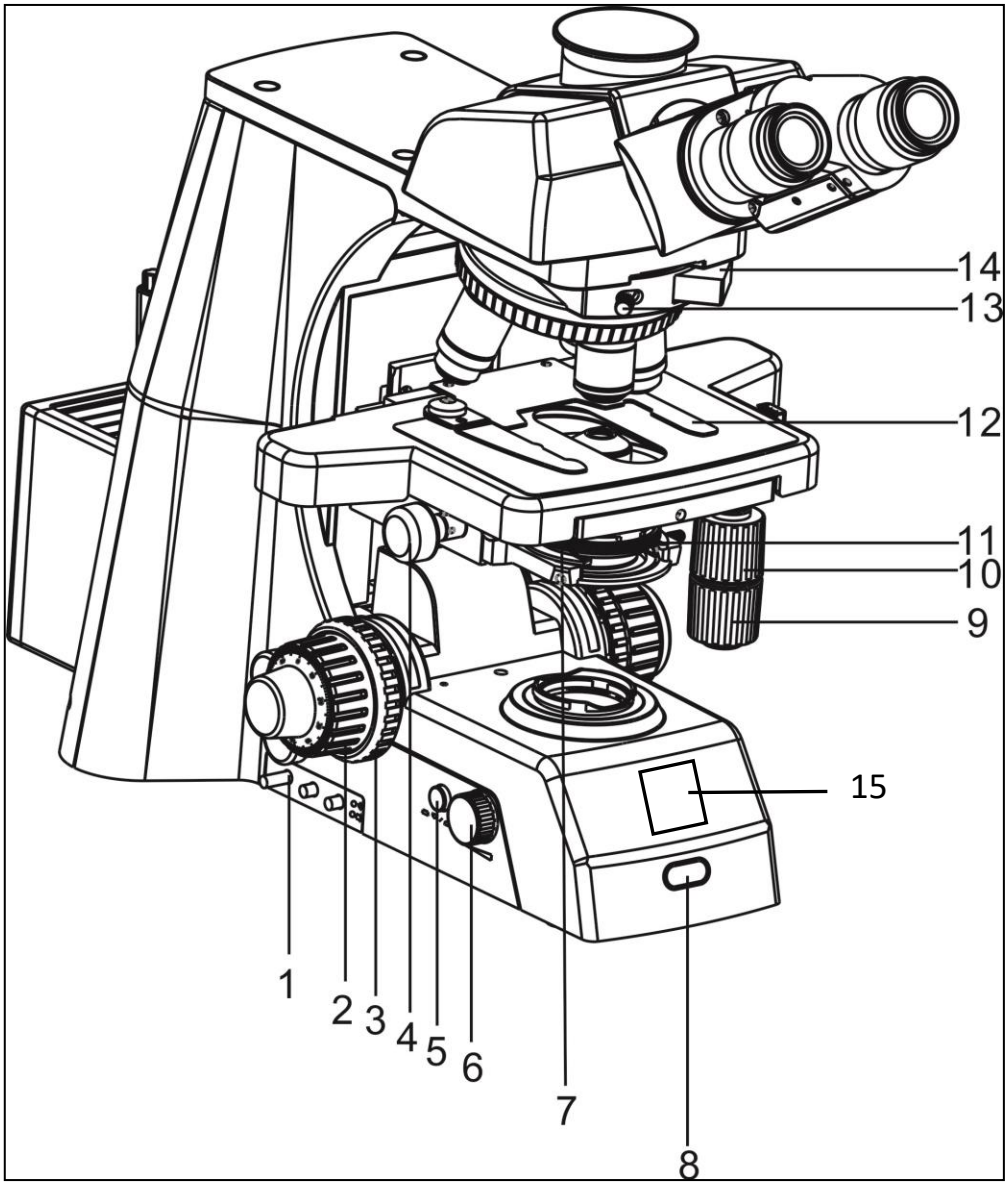
III. Maintenance and Storage

1. All camera lenses are proofread and adjusted. Please tear open outfit
2. Revolving nosepiece and coarse micro focusing mechanism, which structure are precise. Please don't remove easily.
3. Instruments shall be kept clean, always remove dust. Please care about that don't contaminate optic components.
4. Smears on the optic lens, such as fingerprint，oil and so on ,which are wiped by cotton，lens paper or gauze dipping anhydrous alcohol，xylene and ether.(⚠**Either, xylene and alcohol are highly flammable, which can not near open fire. Please use these chemicals in a well ventilated room.)**
5. Don't use organic solvent to wipe any optic components of microscope. If cleaning, please use neutral detergent.
6. When using, if the microscope gets wet by liquid, please close power source and wipe dry right now.
7. Don't open any component parts of the microscope. Because it will degrade the performance of the microscope.
8. Place instrument in a shady and dry space. If do not use microscope, please cover with dust cover. Before covering, please ensure that the light box has cooled.

1.Components Name BS-2081L

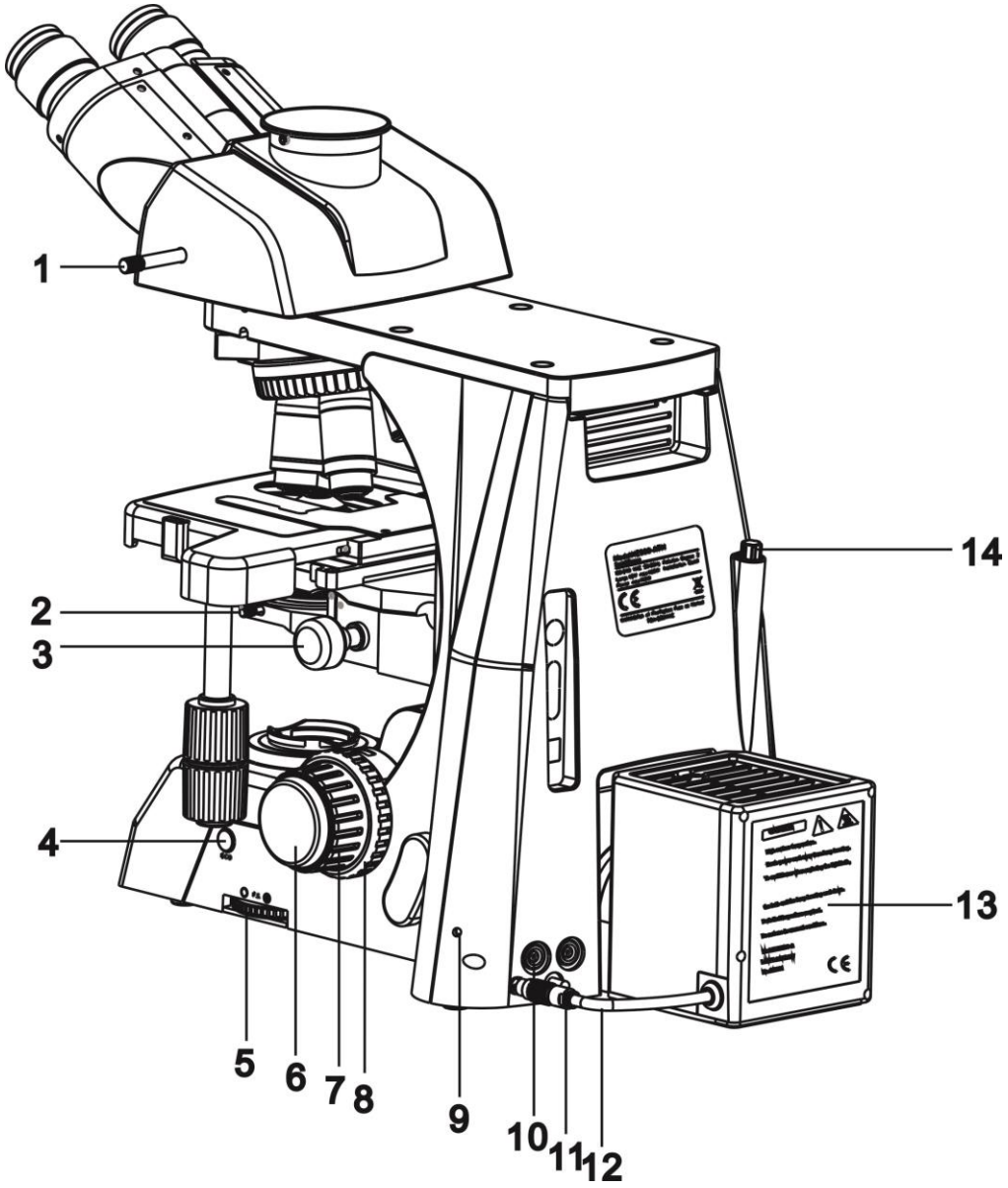


2.Structure Overview BS-2081L



1.Filter switching knob
2.Coarse and fine focusing handwheel
3.Focusing limiting and locking Handwheel
4.Condenser height adjustment wheel
5.Lighting switching button
6.Lighting adjustment handwheel
7.Condenser

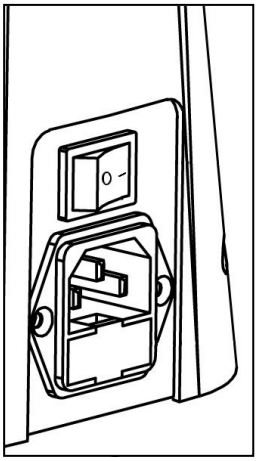
8."ECO"infrared sensor
9.Coaxial pinion for X stage movement
10.Coaxial pinion for Y stage movement
11.Condenser disk
12.Biopsy clip
13.Screw for fastening extensional board
14. Extensional board
15. LCD screen



1.pushing rod for switching light path
2.Condenser fastening screw
3.Condenser height adjustment wheel
4."ECO"button
5.Aperture size adjustment knob
6.Fine focusing handwheel
7.Coarse focusing handwheel

8.Focusing limiting and locking handwheel
9.Screw for fastening lamp chamber
10.Socket of lamp chamber
11.Grounding bar
12.Plug of lamp chamber
13.Lamp chamber
14.Allen wrench

3. Adjustment and Operation BS-2081L



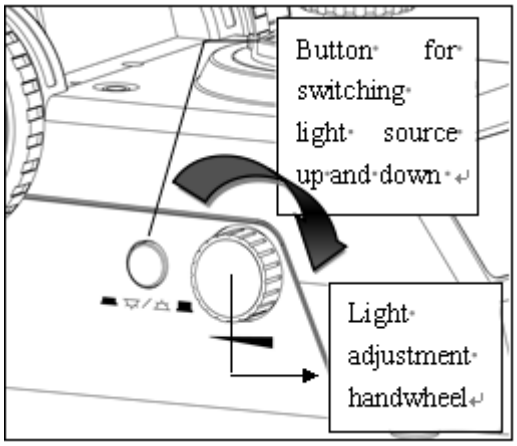


Fig 2

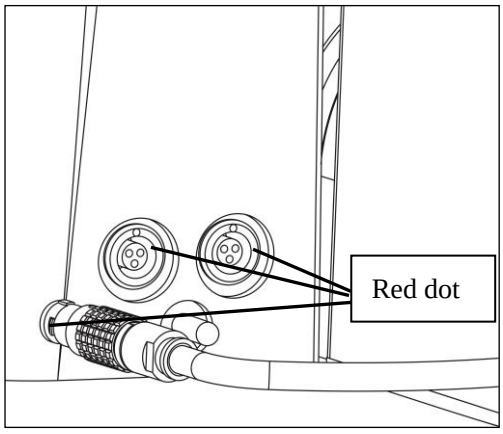


Fig 3

3.1 Open Power Source(fig.1)

Plug power source, toggle the main switch in '—'state，which on the back of microscope.

3.2 Adjust Lighting And Switch Light Source (fig 2)

1. Rotating the handwheel according to the direction indicated by an arrow on the figure 2, the brightness will increase. If not, brightness will reduce.

2. As shown in figure 2, when the light switch button is push-in, the light on the top is opening, as picture . When the light switch button is push-out, the light on the bottom is opening, as picture .

3.3 Light Source Socket(fig 3)

As shown in figure 3, the light socket and the plug all with red dots. Before plugging in the socket, please adjusting the direction until their red dots are aligned, then plugging the plug.

☆ the silk-screen is corresponding with the switch button of lights. As shown in the figure, is the socket of above light source. is the socket of under light source.

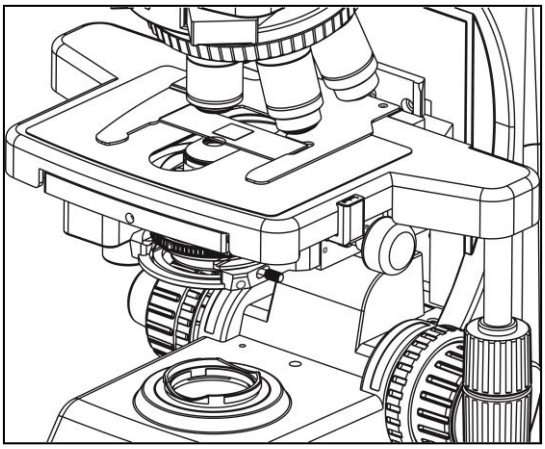


Fig 4

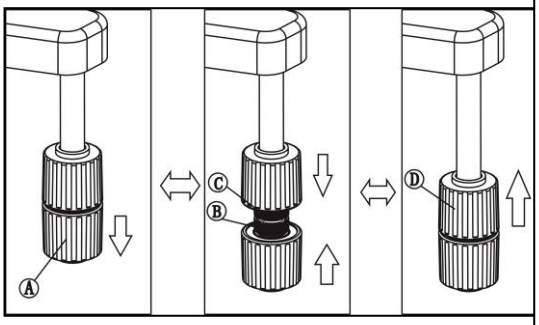


Fig 5

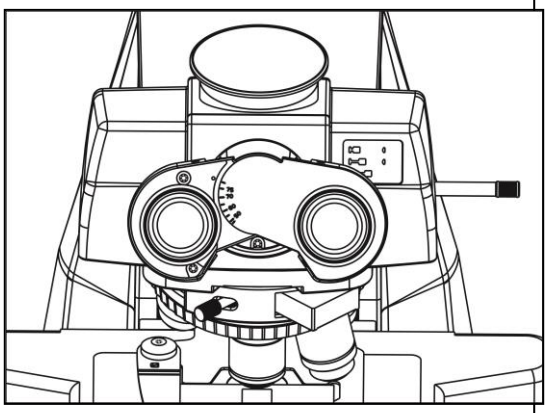


Fig 6

★ when switching light button, if found the button is not matched with the shown in the figure, please check that

3.4 Mount Specimen And Adjust Stage(fig 4， fig 5)

Push the cover glass slowly into the jaw, then clamp glass gently.

Rotate handwheel to move ruler athwartships or length ways. The specimen will be moved to a place you need.

★Be careful to change objectives. When you have observed the specimen with a Low-power objective and needed to change objective, objective may encounter specimen.

★The degree of tightness of handwheel can be adjusted. Please Draw down handwheel A and find two adjusting ring(B,C),then rotate ring. B is the adjusting ring of X direction. C is the adjusting ring of Y direction.

★the altitude of handwheel also can be adjusted. Draw down handwheel A and D can rise integral handwheels. You can also adjust it to negative direction and rise handwheels.

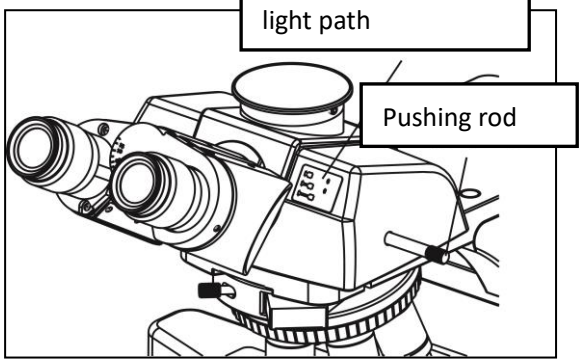


Fig 7

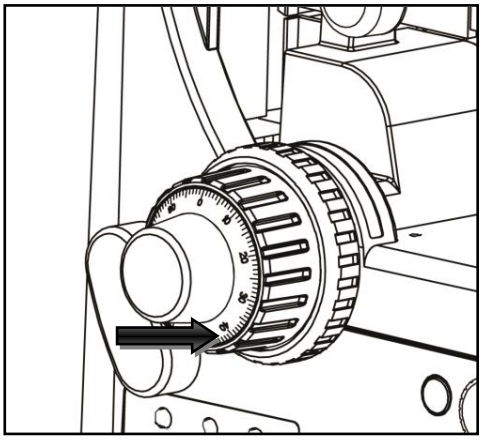


Fig 8

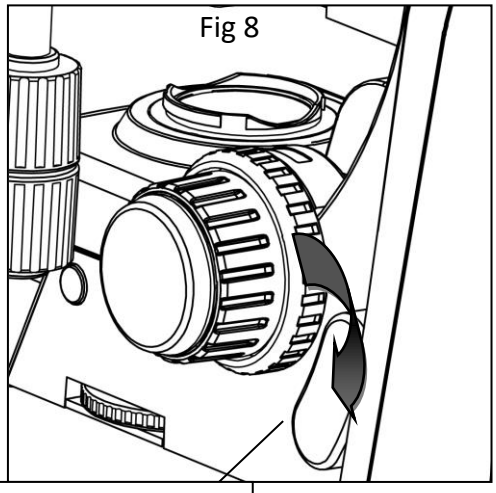


Fig 9

3.5 Adjust Interpupillary Distance(fig 6)

The range of interpupillary distance is 47mm~78mm. when observing with binocular, holding the prism table and pivoting to adjust the interpupillary distance, until two sides of field roll into one and observe with binocular comfortably.

3.6 Three Light Path Switching(fig 7)

Icon	Operation	Proportion of camera brightness
	Push rod in completely	100:0
	Push rod to middle	20:80
	Push rod out completely	0:100

3.7 Focusing(fig8,fig 9)

1. When the camera is not used.

Completely push the light path switching rod (fig.7) and observe by objective of 10X. In order to avoid the specimen and objective collision, we should rise mechanical object stage and let the specimen near the objective. Widdershins rotating the coarse adjustment knob slowly and dropping the specimens, then searching image with the objective of 10X. At last, focusing to clear with fine-turning handwheel.

2. When the camera is used

Push the light path switching rod completely(fig.7) and binocular observing, until the image is clear, then pulling out the rod, observing the image through the video, which connects with microscope.

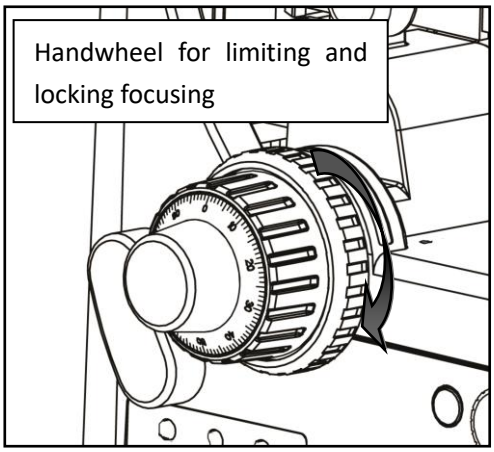


Fig 10

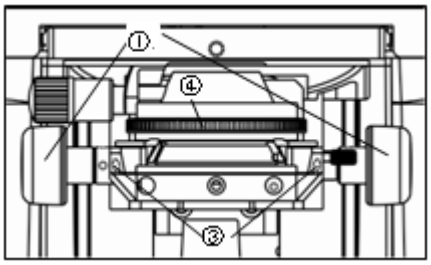


Fig 11

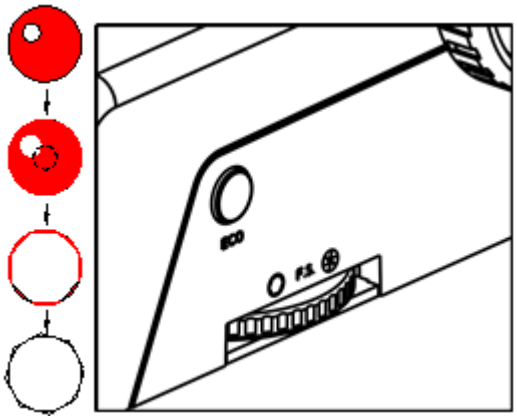


Fig 12

★On both sides of the fine focusing handwheels are removable. According to the direction of arrow, hold one end of handwheel and make another cock. Then stir it from the cock end. About install it, only need to align the center of handwheel and assemble it. This function is helpful to exchange two fine adjusting handwheels and avoid cause the collision between fine adjusting handwheel and stage.

3.8 Handwheel For Adjusting The Tightness Of Focusing (fig.9)

Accord the direction indicated by an arrow in figure 8 to adjust the tightness of handwheel. The more rotating, the tighter of the focusing handwheel, otherwise looser.

3.9 The Limit of Focusing (fig 10)

In actual use, if you need to lock the focusing limit position(the height of platform), you can rotate the handwheel tightly at the focusing limit position according to the direction indicated by an arrow on the figure 3.

3.10 Adjust the Pendulum Type Condenser (fig 11, fig 12)

● Condenser center should be coaxial with optical axis of the objectives, which has been adjusted well before leaving factory, so users need not to adjust by self.

● The top of the condenser, which has been adjusted before leaving factory, so users need not to adjust by self.

●Rotating the focusing handwheel of condenser①, condenser will move up and down. when using high power objective, condenser will up. When using low power objective, condenser will move down.

Condenser centering:

1. Rotating the focusing handwheel of condenser① and rising the condenser to the top position.

2. Focusing the specimen with the objective 10x.

3. Rotating the field diaphragm ②, shrinking image of field diaphragm to view.

4. Rotating the focusing handwheel ① to focus the image of field diaphragm.

5. Using spanner to rotate screw③ and move the field diaphragm to view center.

6. Opening the field diaphragm step by step**.** If the image of field diaphragm at center and in a field of view, the condenser has been centered.

7. In an actual use, increase the field of diaphragm and the image will exterior contact with view.

8. The adjustment of aperture diaphragm④

Aperture diaphragm is to adjust numerical aperture, not to adjust brightness. When the aperture diaphragm is opened to the 70%~80% of objective aperture, it will get enough good image contrast.

9. The controlling of the field of aperture diaphragm

When operating, rotating the field diaphragm ② and shrink the field of aperture diaphragm, then observe it. If the image is blurry, you can rotate the focusing handwheel of condenser. rising bracket of condenser, the image will be clear, then rotating field diaphragm and adjusting the image fulls of eyepiece, to reduce the noise of light and produce the quality of image.

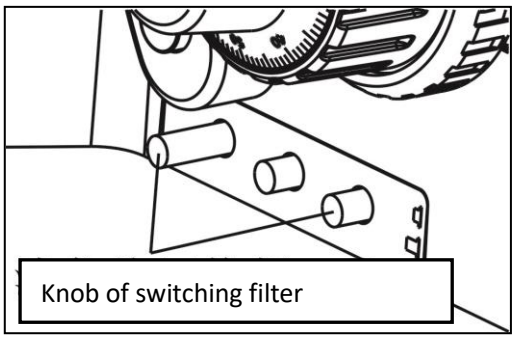


Fig 13

3-11 Using Frosted Sheet (figure 13)

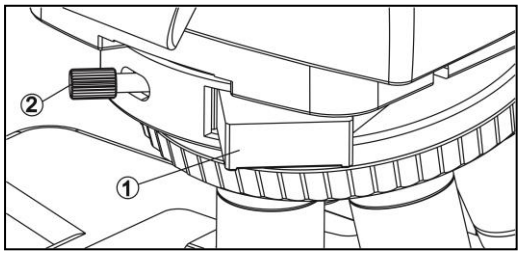


Fig 14

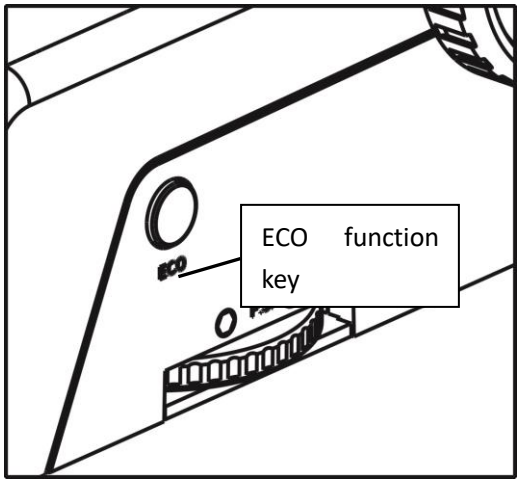


Fig 15

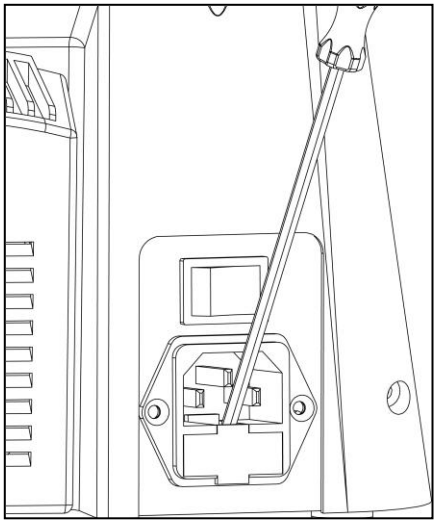


Fig 16

As shown in figure 13, the state of using filter is push in the rod. When push out the rod, filter is in an empty state. LBD is a filter of increasing color temperature. ND25 is a filter of 25% light transmittance. ND6 is a filter of 6% light transmittance.

3-12 The Using of Extensional Function Board (fig 14)

As shown in fig13, converter reserves a slot to hold the extensional function board. The ordinary light field board has been inset the slot before The lens of microscope leaving factory. If using other extensional function board, only need to tear down and loosen ②, pull out the standard light field board, then inset the extensional function board into the slot and freeze the bolt of ② .

3-13“ECO” Function Key (fig 15)

When people leave microscope after 15 minutes, the light will be off and the indicator light will flash once every 3 seconds. When people back, press ECO function key, which will prompt light open.

Long press button for 3 seconds will cause red indicator off and floodlight always lighting. If again Long press button for 3 seconds, it will result in red indicator light lighting and recover the first time working state.

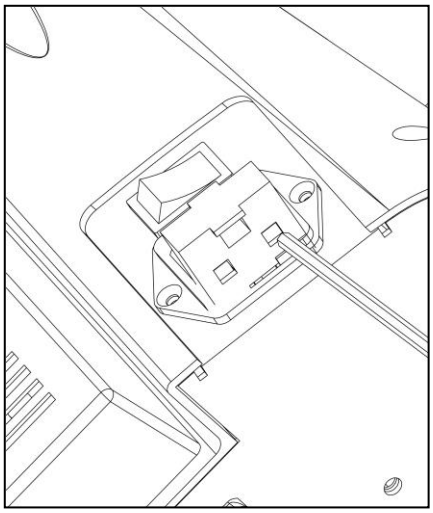


Fig 17

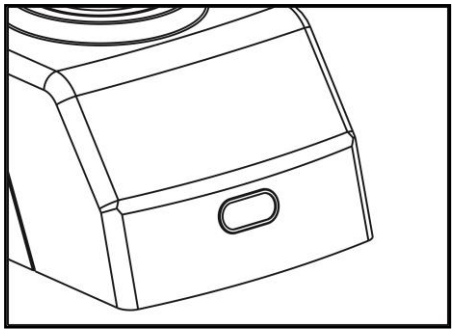


Fig 18

3-14 Replace the Fuse (fig 16, fig17)

As shown in the figure 16, first using the general wrench push aside the drawer of fuse. Then referencing figure 17, through the square hole under of the fuse drawer gently drag the fuse upward.

There is a thin glass in the middle of the fuse, please operate carefully and gently when pushing aside the drawer and drag the fuse.

★there is a thin glass in the middle of fuse, Before pushing drawer and dragging fuse, please operate gently.

3-15 “ECO” Device (fig 18)

As shown in the figure 17, the device can detect the front object within 1meter.

When people observing within one meter ahead, the device displays that red light has been bright, and the light of microscope does not turn off.

When the light is not on, which shows the microscope light source is in an off state

Operation of the intelligent management system

(1) Use a dimming knob on left of the base to achieve multiple functions.

One Click: Enter standby status
Double Clicks: Light lock or unlock
Rotation: Adjust brightness
Press + Up-spin: Switch to the upper light source
Press + Down-spin: Switch to the under light source
Press 3 seconds: Set the time of turning off the light after leaving.

(2) The display of microscope working status.

The LCD on the front of the microscope can display the working status of the microscope, including magnification, light intensity, sleepy model and so on.

Start& working mode

Lock mode

ECO mode

Sleep mode

(3) Color temperature adjustment function.

The color temperature can be adjusted from yellow to white, which can lead to a better contrast and meet the requirements of various research.

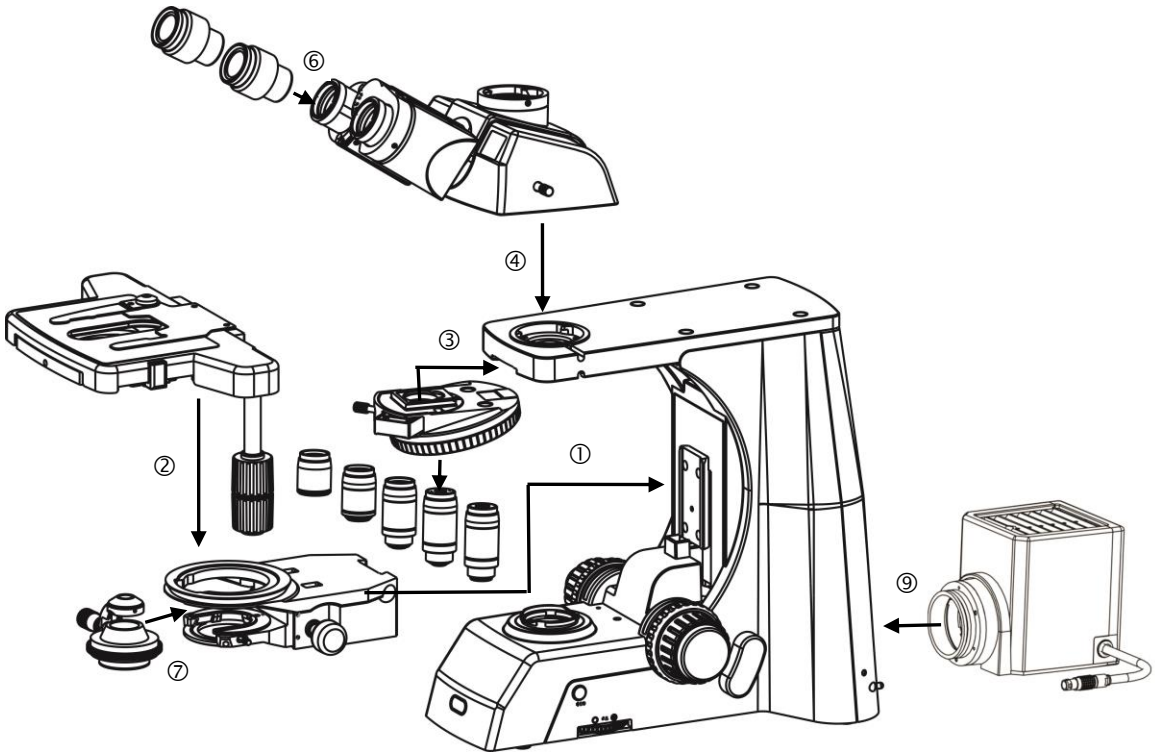
4.Installation BS-2081L

4.1 Installation Diagram

The diagram as below shows the order of each component's installation. The figures in the diagrams show the installation steps.

★Before installing, please ensure that all components are clean. Don't cut any component or surface of glass.

★Keep the hex wrench provided well, which can be used When you changing the components.



4-2Procedure BS-2081L

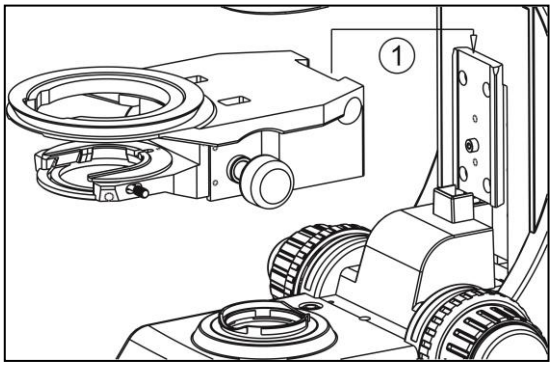


Fig 1

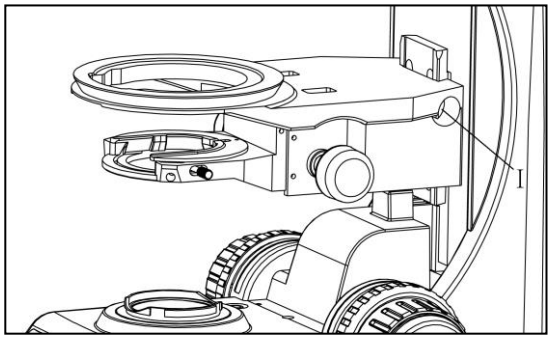


Fig 2

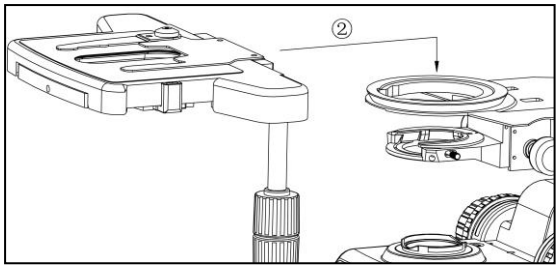


Fig 3

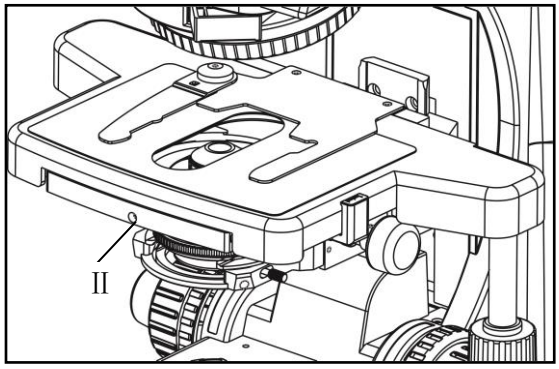


Fig 4

4-2-1 Install the Mechanical Slide Bracket (fig 1, fig 2)

★ Install the platform bracket according to the path of ① in figure 1. The dovetail slot needs to align with the slot of platform bracket, sliding it until the screw fix it. Then use the hex wrench tighten the screw shown as I in figure 2.

4-2-2 Install The Mechanical Object Stage (fig 3, fig 4)

★Install the mechanical object stage according to the path of number ② in figure 2. First align the object stage's hole center and the bracket circle center, then object stage downward slides the bracket locating ring

✧ After placing the object stage steady, using the hex wrench screw the bolt, which shown as I in the figure 4, and the object stage will not waggle.

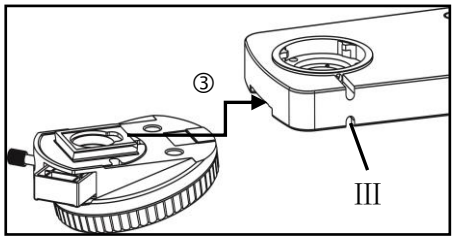


Fig 5

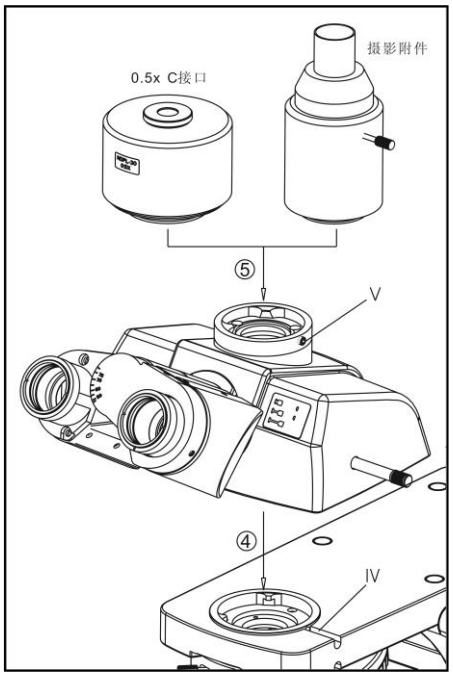


Fig 6

4-2-3 Install Nosepiece (fig 5)

Connect the plug of nosepiece with socket, then inset the dovetail groove of microscope according to the path ③ shown in figure 5. At last, use hex wrench tight up the bolt shown as Ⅲ.

4-2-4 Install Camera Lens and Photo Acc /0.5X C-mount (fig 6)

1. Install camera lens

Install camera lens into the microscope groove according to the path ④ shown in the figure 6, then use hex wrench tight up the bolt shown as Ⅳ and fix the camera lens.

2. Install photo acc(optional)

Accord the path of ⑤ shown in figure 6 to insert the trinocular viewing unit into the microscope head. Then use the hex wrench screw the fixed bolt shown as Ⅴ.

★ During install camera lens, please always pay attention to hold camera lens, and prevent it from falling and breaking.

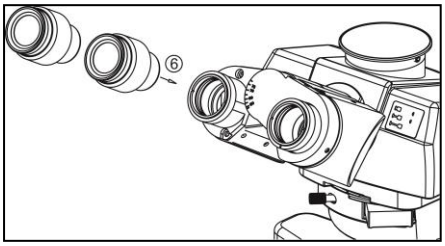


Fig 7

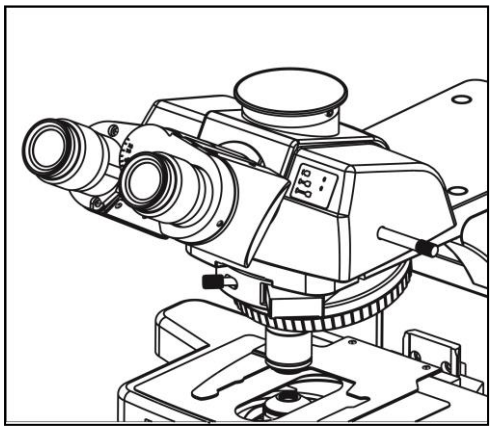


Fig 8

★ If not use the ternary camera lens and the photo accessories, please use the corresponding dust cover to cover the ternary attachment interface and eyepiece interface, to prevent into ashes.

4-2-5 Install Eyepiece (fig 7)

1.Inset eyepiece into the eyepiece sleeve according to the path ⑥ shown in the figure 7.

4-2-6 Install Objectives (fig 8)

1. Adjust the coarse focusing handwheel, until object stage of the mechanical device stent down to its lower limit.

2. Twist the minimum objective to a hole of the nosepiece. Then move the nosepiece and clockwise twist other objectives to the corresponding hole according to the order of magnification from low to high.

✧ This installation method can ensure that during using, it will be easy to change the magnification.

★ Clean the objectives regularly. Because the objective lens is sensitive to dust.

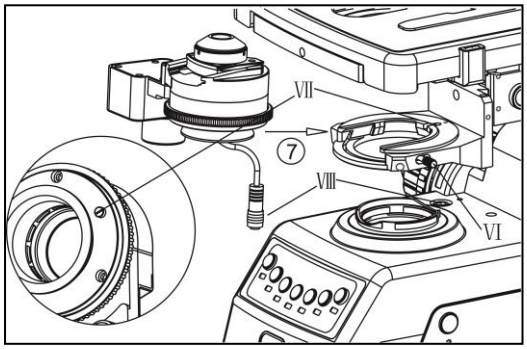


Fig 9

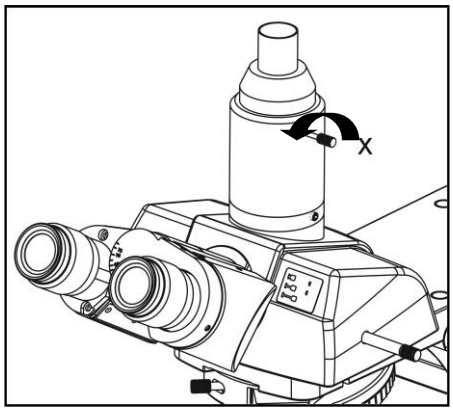


Fig 10

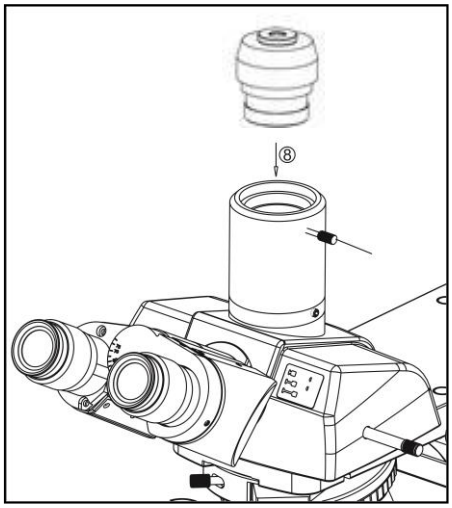


Fig 11

★ when operating, first under of the objective 10x search the sample and focus, then switching to other ratio of objective lens.

★ When switching objectives, turn the objective nosepiece. It does not ensure the objective lens into the heart of the light path until hear the “click” sound

4-2-7 Install the Electric Condenser (fig 9)

Drop the small stent to the lowest location, and Inset condenser into the small stent according to the path ⑦ shown in the figure 9, until the Ⅷ bolt piles into the Ⅶ slot completely. Then screwing in the Ⅵ slot to fasten the condenser according to the shown direction and stick electric condenser tightly.

4-2-8 Replace the Camera Interface (optional) (fig 10,11)

As shown in the figure 10, spin out the X bolt a distance in the direction shown by the arrow and don’t tight the camera interface, then spin out it.

As shown in the figure 11, screw the camera interface into the ternary camera barrel to an appropriate position. Then screw in the number XI bolt to fasten the camera interface.

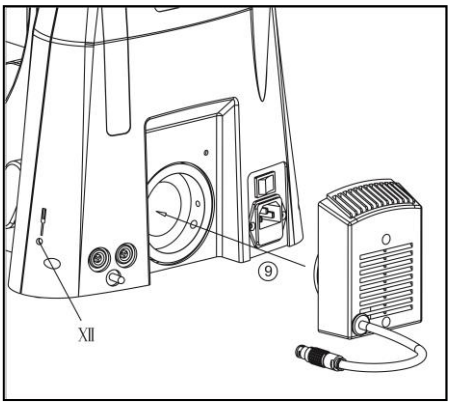


Fig 12

★ In order to ensure the appropriate position of camera interface, first use eyepiece to observe and adjust the sample to a clean imaging position. Then install the camera and observe. At the same time, accordingly adjust the position of camera interface until to the clearest position, then screw the number XI bolt.

★the way to ensure the appropriate position of camera interface: first observe through eyepiece and adjust specimen to a clear imaging position. Then install camera and observe image. At the same time, adjust camera interface until to a appropriate position. Then screw bolt XI tightly.

4-2-9 Install the LED Lamp Chamber (fig 12)

Insert the lamp box into the position at back of chassis base according to the path ⑨ shown in the figure 12.

Then use wrench screw the XII bolt, until the lamp box is tight.

5.Technical Specification BS-2081L

(1) Main Technical Specification

Optical System	NIS60 Infinite optical system	BS-2081L
Viewing Head	Seidentopf Trinocular Head, 30° inclined, interpupillary distance: 47mm-78mm; splitting ratio Eyepiece: Trinocular =100:0 or 20:80 or 0:100	●
	Ergo Tilting Trinocular Head, adjustable 0-35° inclined, interpupillary distance 47mm-78mm; splitting ratio Eyepiece: Trinocular=100:0 or 20:80 or 0:100	
Eyepiece	Extra Wide Field Eyepiece EW10X/25, Coordinate eyepiece tube Φ30mm	●
Nosepiece	Sextuple Nosepiece (with DIC slot)	●
Objective	Infinite Plan Achromatic Objective:4×, 10×, 20×, 40×, 100×	●
Focusing	Coaxial coarse and fine adjustment, fine division 0.001mm	●
Stage	Double layer mechanical stage 185×142mm, Moving range 75×55mm	●
	Double layer mechanical stage 185×142mm, Moving range 75×55mm, with Sapphire Crystal Glass Insert	
Kohler transmitted Light	3W S-LED Light	●
Condenser	Swing-out type condenser N.A.0.9/0.25	●

Note: ● Standard Outfit, ○ Optional

(2) Configuration Table

Viewing Head	Seidentopf Type Trinocular Head	●
Eyepiece	Extra Wide Field Eyepiece	●
Objective	Infinite Plan Achromatic Objective: 4×, 10×, 20×, 40×, 100×	●
Condenser	Swing condenser NA0.9/0.25	●

Photo Attachment	Photo adapters for Nikon or Canon DSLR cameras	o
Video Adapter	C Mount 1×	o
	C Mount 0.5×	o
Polarization Kit	Simple Polarizing kit with polarizer and analyzer	o
DIC Attachment		o
Phase contrast Kit	Turret Phase Contrast Attachment	o
Dark field device	Dark-field Condenser (Dry)	o
	Dark-field Condenser (Oil)	o
Fluorescence device	Reflected Fluorescent Attachment (with mercury lamp, B, G fluorescent filters)	o
	Reflected Fluorescent Attachment (with LED lamp, B, G fluorescent filters)	o

Note: ● Standard Outfit, ○ Optional

(3) Objective Parameters

Model	N.A.	W.D. (mm)	Cover glass thickness	Conjugate distance(mm)
4X	0.10	30	-	∞
10X	0.25	10.2	-	∞
20X	0.40	6.4	0.17	∞
40X	0.65	0.7	0.17	∞
100X	1.25oil	0.2	0.17	∞

(4) Electrical parameter

① input voltage: AC100-240V, 50/60 Hz

② Fuse Size: T500mAL250V

③ Illumination: 3W LED lamp

6.Trouble shooting guide

6.1 Optical Part

TROUBLE	CAUSE	SOLUTION
The edge of the field of view is dark or the brightness is not uniform	The nosepiece is not in the located position (objective and light path are not coaxial)	Locate the nosepiece properly where it clicks
	The image of filament is not centered	Center the filament
	The lens (objective, condenser, eyepiece or collector) is dirty	Clean it thoroughly
Find dust and stain in the field of view	There are stains on the lens (including condenser, objective, eyepiece and collector)	Clean it up
	There are stains on the specimen	Clean it up
	The position of condenser is too low	Loosen the condenser's locking bolt, adjust the condenser to the right position
The image is defocused (low resolution\contrast)	There is no cover slip on the specimen	Add cover slip
	The cover slip is too thick or too thin	Use the standard coverslip(0.17mm)
	The specimen is placed inversely	Reversal it back
	There was oil on the dry objective(easily happened in 40x objective)	Clean it up
	There are stains on the lens(including condenser, objective, eyepiece and collector)	Clean it up
	Didn't use oil for the oil objective	Use immerse oil

	There was bleb in the oil	Eliminate the bleb
	Have used the unsuitable oil	Use standard immerse oil
	The size of the aperture diaphragm is too large	Minify it
	There are stains on the incident lens of the binocular tube	Clean up
	The size of the aperture diaphragm is too small	Open it up
	The position of the condenser is too low	Adjust the position
One side of the image is dark	The condenser is not in the center of the field of view\the condenser inclines	Install the condenser again and adjust the center carefully by centering
	The nosepiece is not in the right position	Turning it until it reach the “clicked” position
	The specimen is floating	Fix it
The image shift during focusing	The specimen slips on the stage	Fix it
	The nosepiece is not in the right position	Turning it until it reaches the “clicked” position
The brightness is not enough	The size of the aperture diaphragm is too small	Adjust again
	The position of the condenser is too low	Adjust the position
	The Kohler incident light is not in the center	Adjust the bolt of Kohler incident light

6.2 Mechanical System

TROUBLE	CAUSE	SOLUTION
The image can not focus when using high magnification objective	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip (0.17mm)
The objective touches the specimen when changed from low magnification to high magnification	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip (0.17mm)
The specimen is not easy to move	The specimen holder is not fixed	Fix it
The binocular image is not coincident	The interpupillary distance is not correct	Adjust again
Eyes are too tired	No diopter adjustment	Adjust the diopter correctly
	The brightness is not suitable	Adjust the voltage of the lamp
When in less than 10x objective observation, the electric condenser move in. When in more than 10x objective observation, the electric condenser moves out.	The objectives incorrectly install in the matched nosepiece holes, or the setting of software is not matched with the actual installation.	Objectives install in the correct holes, or resetting the software matched with reality.

6.3 Electrical System

TROUBLE	CAUSE	SOLUTION
The lamp can't light when the switch is turned on	No power	Check the connection of the power cord
	The bulb is not inserted	Insert it correctly
	The bulb burns out	Replace it
The lamp burns out suddenly	Use a substandard lamp	Use the specified lamp to replace, if the problem is not solved, contact with worker
The brightness is not enough	Use a substandard lamp	Use the specified lamp
	The voltage is too low	increase the voltage
The bulb flickers or the brightness is vertiginous	The bulb is going to burn ou	Replace it
	The bulb is not entirely inserted into the holder	Check and insert it again
After the setting time, people has left and the light is always bright	There are other things in front of microscope within one meter	Move away the things within one meter
Can not capture	Driver hasn't installed correctly	Accord the type of camera and install the corresponding driver
	The line connection is abnormality	Check the connection between microscope, computer and camera has reconnected correctly