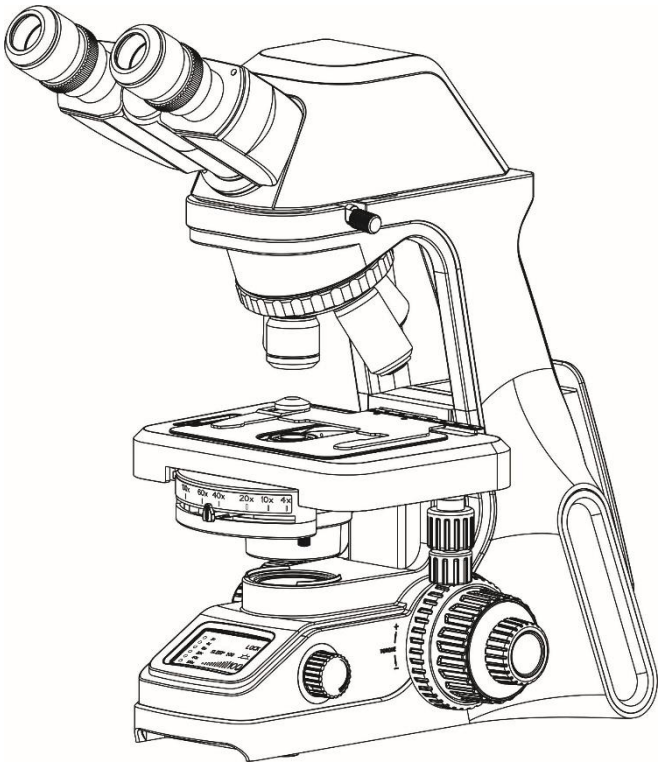
BS-2046 Biological Microscope

Instruction Manual



BS-2046B

This manual is for BS-2046 series biological microscopes. To ensure your safety, obtain optimum performance, and to familiarize yourself fully with the use of this microscope, we recommend that you learn the instruction manual carefully before using the microscope.

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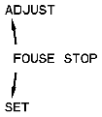
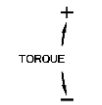
User Notices BS-2046

I. Safety Symbols

Symbol	Meaning
ON	Main power switch is on
OFF	Main power switch is off
	The WEEE flag, discarding this product must be sent to the appropriate facility for recycling and recycling.
	Represents the focusing limiting knob direction, “ADJUST”: adjust the upper limit, “SET”: locks the upper limit
	Represents the tension adjustment collar direction, “+”: tightening the collar, “-”: loosing the collar
	Light intensity and color temperature direction. Turn toward the tip, the light intensity and color temperature changes from strong to weak
CE	Pass CE

II. Safety Notes

1. Open the box carefully to avoid the accessories, like lens, being polluted by fingerprint or sweat strain, dropping to ground and being damaged.
2. Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and easy shaking environment. Make sure the stage is smooth, horizontal and firm enough.
3. When moving the microscope, one hand hook into the bottom slot front of the frame, and the other hand hold the rear end of the cross beam.
4. If the bacterium solution or the water splash to the stage, objective or viewing tube, pull out the power cord at once, and wipe up the microscope. Otherwise, the instrument will be damaged.
5. Be sure to keep at least 10cm away from the left, right, top, rear of the microscope from walls and other objects, so as not to plug natural convection air, which is used for cooling.
6. Make sure the instrument is earthed, to avoid lightning strike.
7. Check the input voltage: be sure the input voltage which signed in the back of the microscope is consistent with the power supply voltage, or it will bring a serious damage to the instrument.

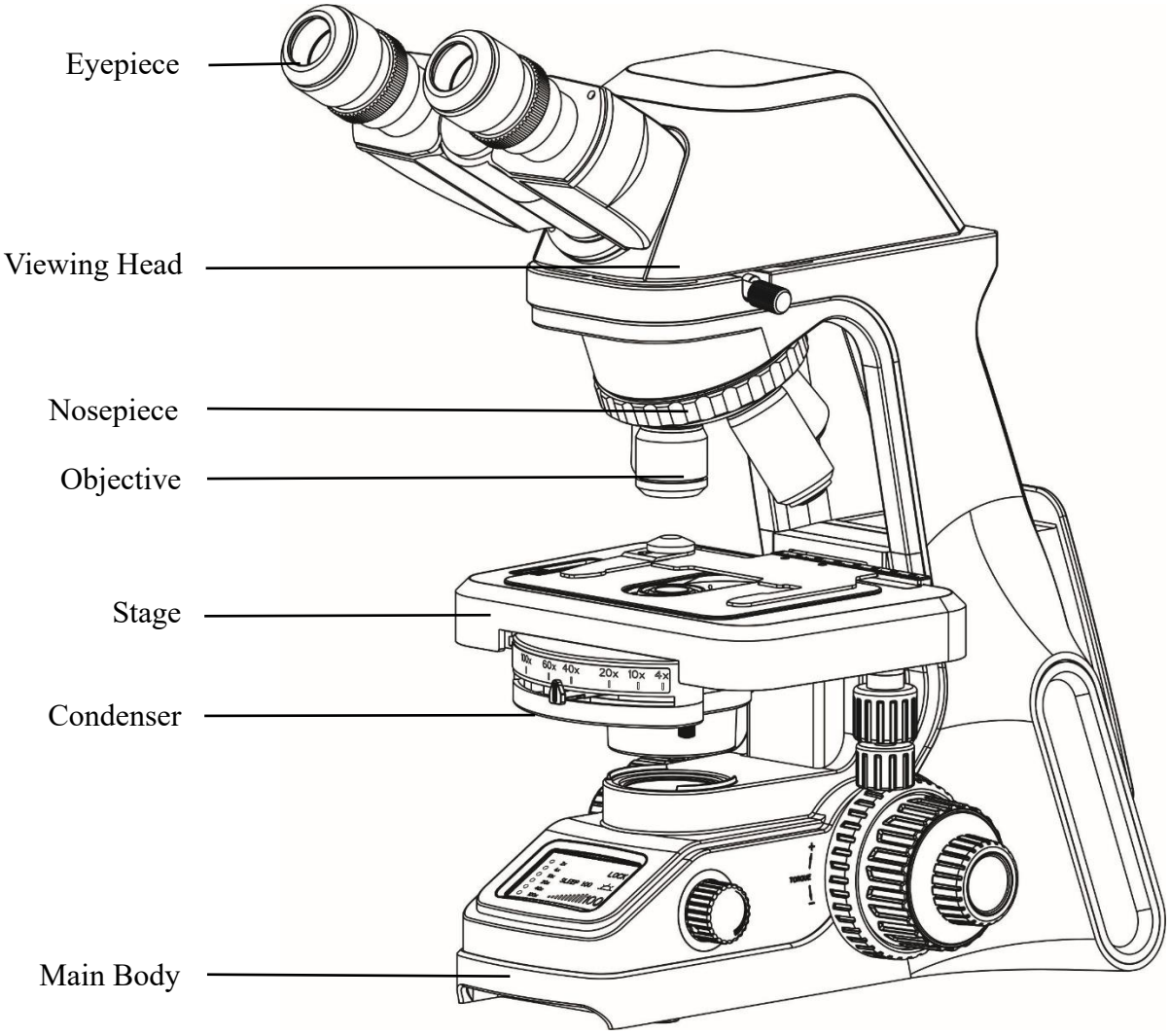
III. Maintenance

1. All the lenses have been well checked and adjusted. It is forbidden to disassemble them by yourself.
2. The nosepiece, coarse and fine focusing parts are so delicate that it is forbidden to disassemble them carelessly by yourself.
3. Keep the instrument clean, wipe dust regularly, and be attention to avoid contaminating the optical elements especially. The objective lenses should be cleaned every month by professional.
4. We can clean the contaminations such as fingerprints and oil smudges on the prism by using the tissue paper and solution, which is mixed by ether (70%) and alcohol (30%).

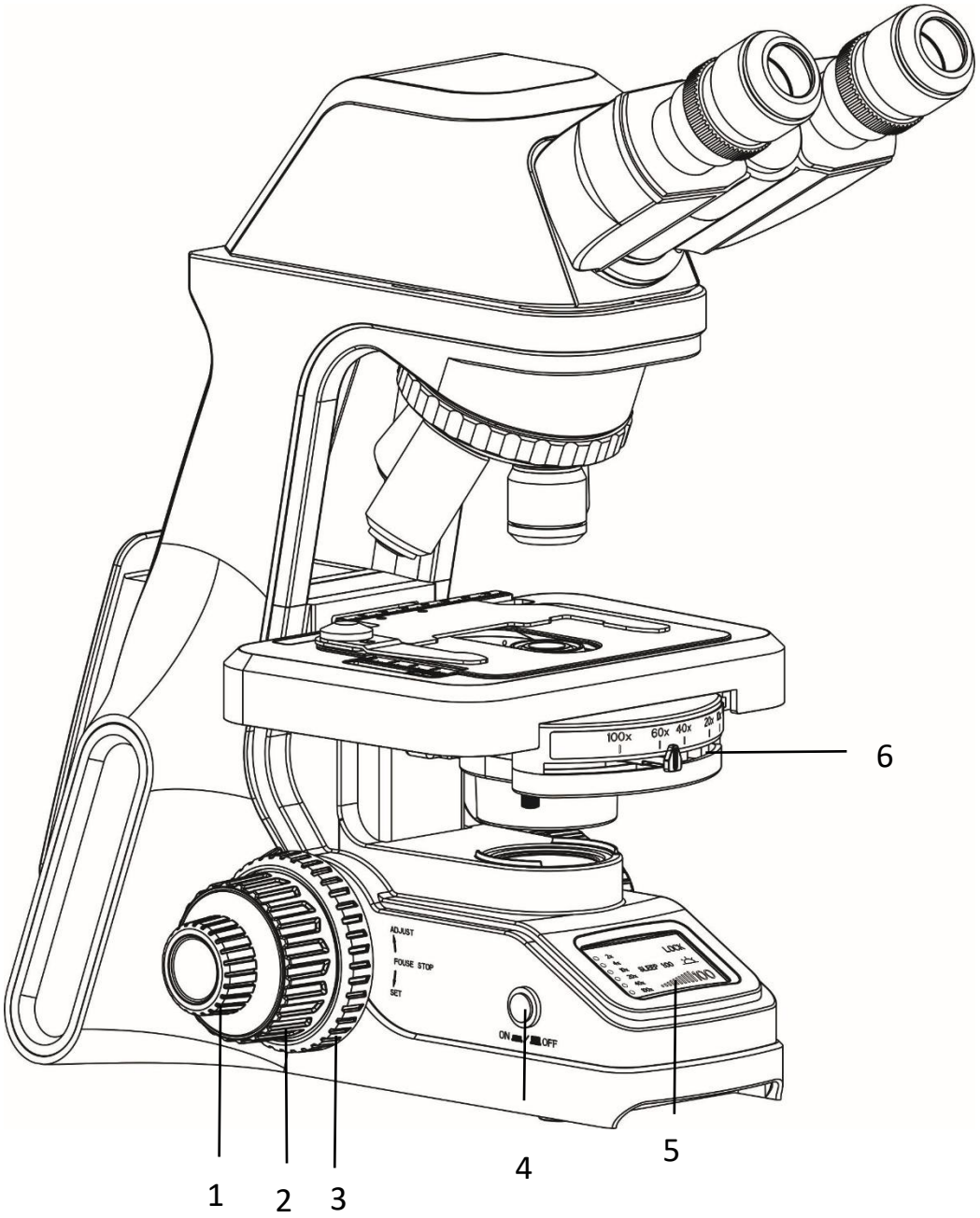
⚠ **Noting that alcohol and ether are highly flammable, do keep them away from the fire or potential sources of electrical sparks, and use them in a drafty room as possible as you can.**

5. Don’t use organic solvent to wipe the non-optical elements, when you need to clean, use the soft detergent, please.
6. When using, if the microscope is splash by liquid, cut off the power at once, and wipe up the moisture.
7. Do not disassemble any parts of the microscope. That will affect the function or decline the performance of the microscope.
8. Place the instrument in a cool, dry position. After using the microscope, remember to cover it with dust helmet.

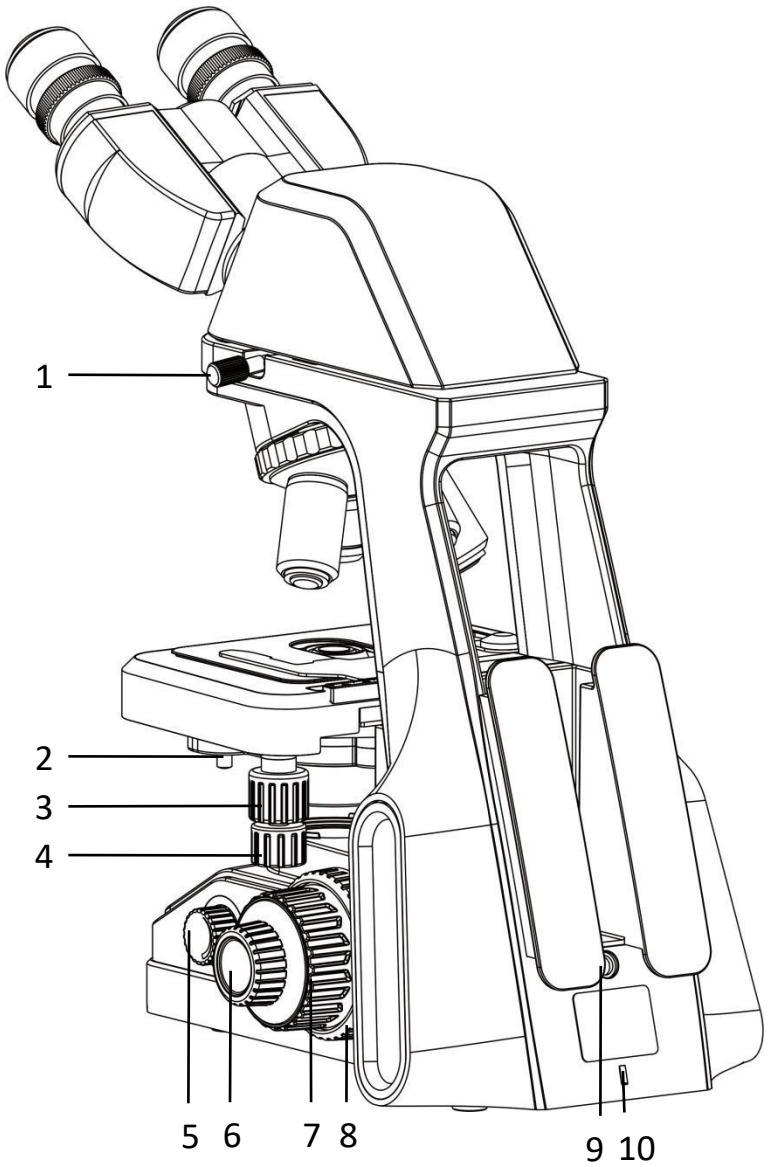
1. Components Name BS-2046



2. Structure Overview BS-2046



1. Left fine focus knob
2. Left coarse focus knob
3. Focusing limiting knob
4. Main switch
5. Display screen
6. Aperture diaphragm adjustment



1. Fixing screw for Viewing Head
2. Fixing screw for condenser
3. X direction adjustment knob
4. Y direction adjustment knob
5. Brightness and color temperature adjustment knob
6. Right fine focus knob
7. Right coarse focus knob
8. Tension adjustment collar
9. Power socket
10. Anti-theft lock hole

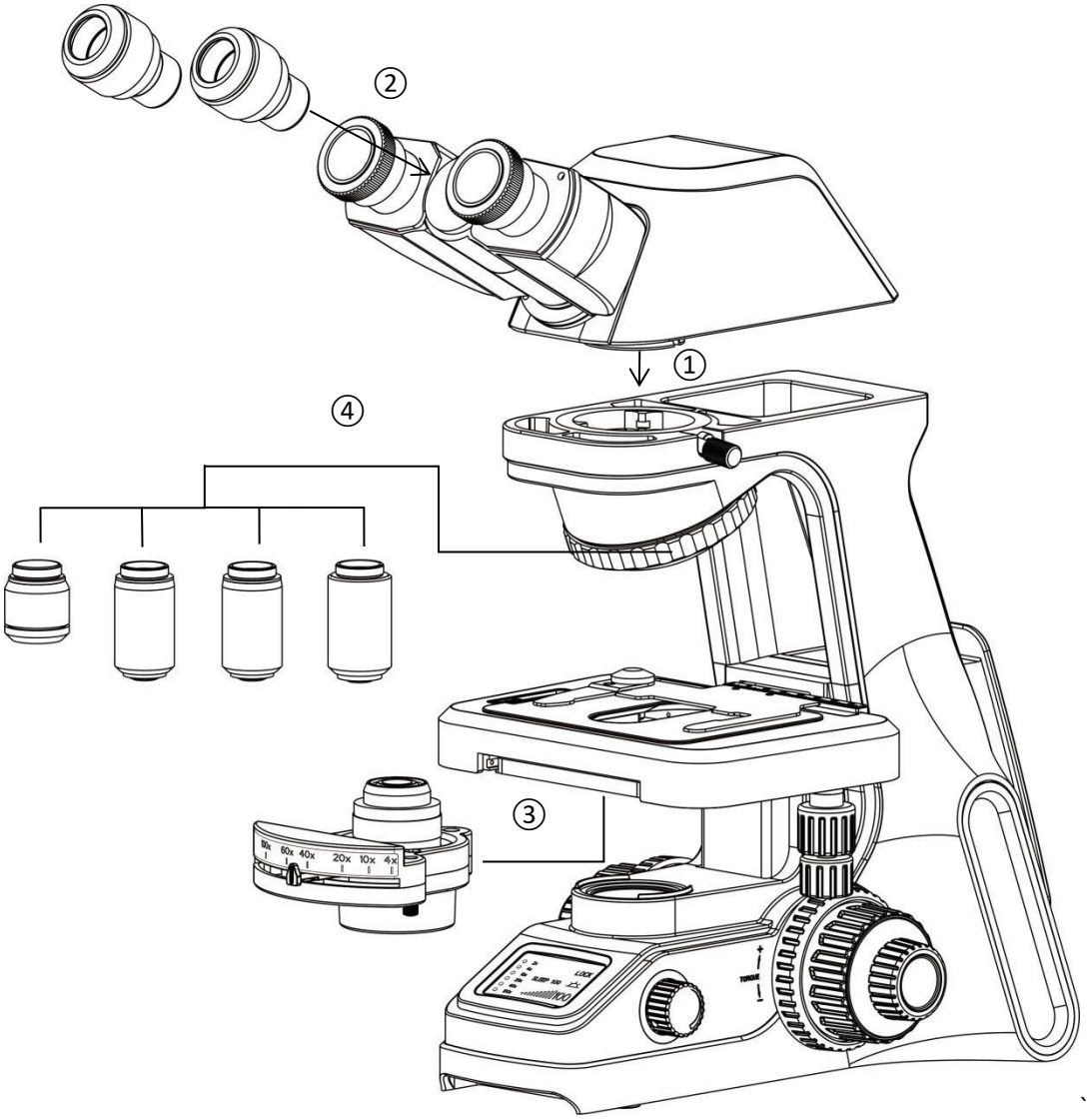
3.Installation BS-2046

3-1 Installing Diagram

The following figure shows the installation sequence of the components. The number in the figure shows the assembly steps.

★ **Before installing, be sure every component is clean, do not score any parts or glass surface.**

★ **Keep well with hexagon wrench provided. When replacing the components, you will need it again.**



3-2 Installation Steps

3-2-1 Installing the viewing head (Fig.1)

Install the viewing head into the microscope circular swallow tail by the path ① shown in Fig.1, tighten the auxiliary screw and turn it to the proper position, then fix up it by bolt.

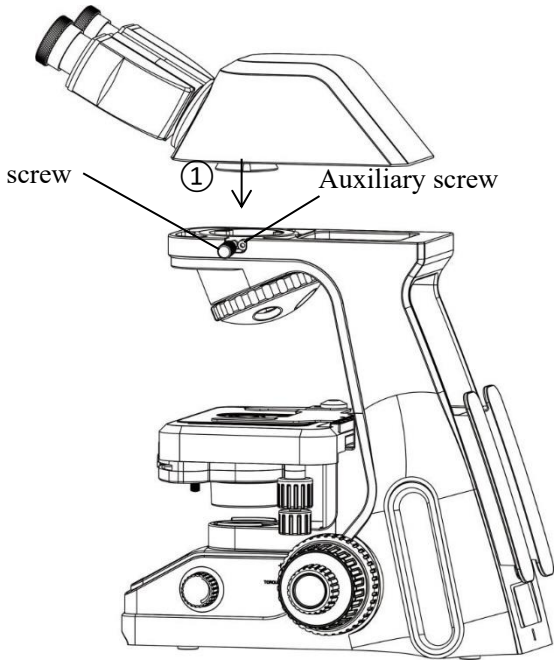


Fig.1

3-2-2 Installing the eyepiece (Fig.2)

Insert the eyepieces into the eyepiece tube until they are against each other according to the path ② shown in Fig.2.

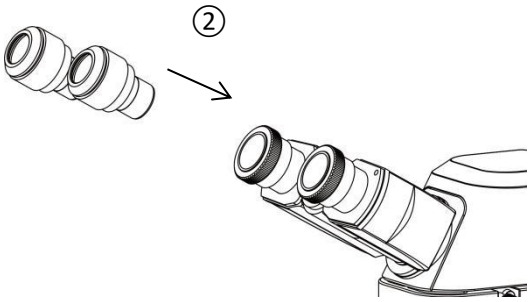
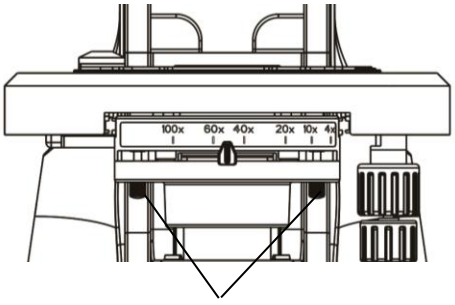


Fig.2

3-2-3 Installing the condenser (Fig.3)

Place the condenser in right place so that the adjustment position mark of the aperture iris diaphragm faces front. Then tighten two screws to fix up the condenser.



Fastening screw for condenser

Fig.3

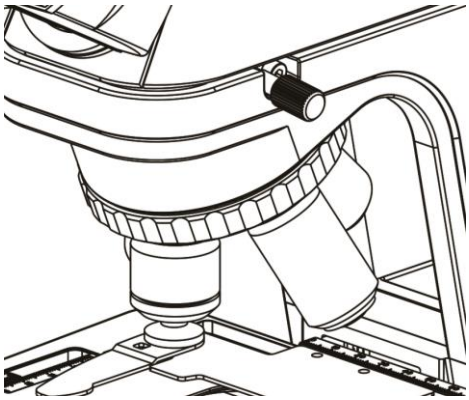


Fig.4

3-2-4 Install the Objective (Fig.4)

1. Adjust the coarse &fine focus knob, till the mechanical stage to the low limited place.

2.The objective with the lowest magnification rate is twisted to the nosepiece from the left or right side, then push the objective nosepiece clockwise, Install other objective lenses in order from low to high magnification. (The objective magnification shall be consistent with the show on the display, and the product was installed at the factory).

★ Clean the objective frequently.

★ At first, use the 10X objective to looking for image, then change another one.

★Turn the objective till hear the "click" sound, make sure the objective enter the objective center.

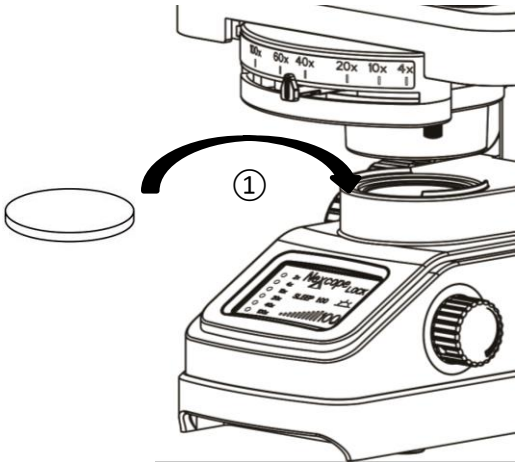


Fig.5

3-2-5 Install the Filter (Fig.5)

Put the filter in the seat of illuminator according to the path ① shown in Fig.5 .

★ The standard filter is green.

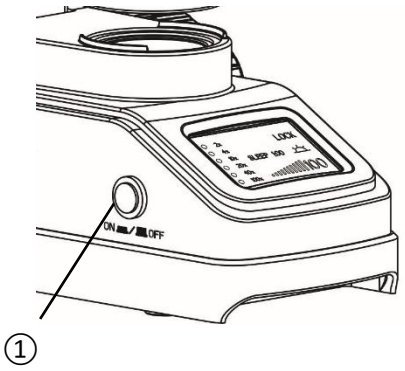


Fig.6

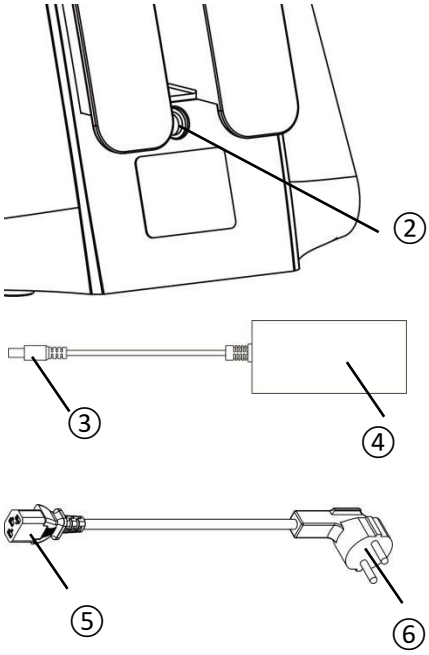


Fig.7

3-2-6 Connecting the Power Cord (Fig.6,7)

★ The cable and cords are vulnerable when bent or twisted, never subject the power cord to excessive force.

1.Set the main switch ① to "■OFF" (off) state before connecting the power cord.

2.Insert the plugs of power cord ⑤ into the power jack ④ of the adapter safely. Make sure the connection is well.

3.Insert the plugs of adapter ③ into the power jack ② of the microscope safely. Make sure the connection is well.

4.Insert the plugs of power cord ⑥ into the power jack of the power supply receptacle. Make sure the connection is well.

★ Do use the supplied power cord all the time. If lost or damaged, select the same standard cord, please.

★ A wide range of voltage ,like 100V～240V, is acceptable for this microscope.

4. Adjustment and Operation BS-2046

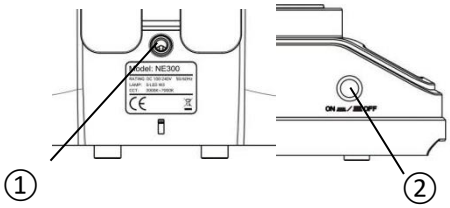


Fig.1

4-1 Turn on the power (Fig.1)

Connect the power ①, turn on the main switch ② on the back of microscope to "ON ▬"(on).

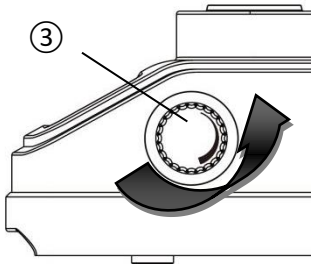


Fig.2

4-2 Adjust the brightness and color temperature (Fig.2,3,4,5,6,7)

★ Push in+upward rotation: Switch to the color temperature adjustment state;

★ Push in+downward rotation: Switch to the brightness adjustment state;

The adjustment knob ③ adjust the brightness when the screen is shown as Figure 3. Turning the brightness adjustment knob according to the direction indicated by an arrow on the figure 2, the brightness decreases.On the contrary, the brightness strengthen.

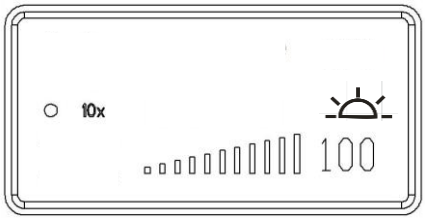


Fig.3

The knob adjust the color temperature when the screen is shown as Figure 4. Turning the color temperature adjustment knob according to the direction indicated by an arrow on the figure 2, the color temperature decreases. On the contrary, the color temperature strengthen.

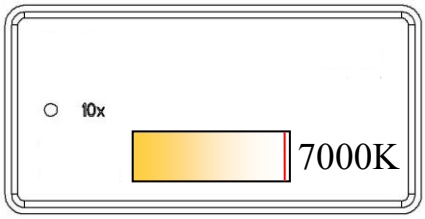


Fig.4

◎ Other operation of brightness adjustment knob for BS-2046 model

Fig.5

1. Click Knob: enter the standby state and "SLEEP" appears on the screen (Fig.5). Click again to eliminate the state, the "SLEEP" on the screen disappears and the normal working state is displayed;

Fig.6

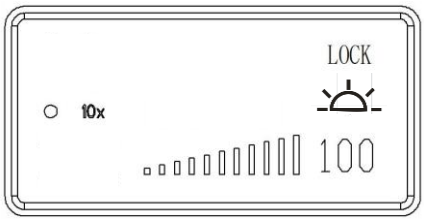


Fig.7

2. **Long press the knob for 3s: choose to set sleep (Fig.6), and the value of minute starts to beat. The value of hours tarts to beat after clicking the knob.** The time can be increased or reduced by turning the knob. The increase or decrease of lattice value is 1 minute and the maximum value can be set to 8 hours. After setting to the required time, the time number beats three times and then stops beating, which meaning the setting is successful. Time begins to decrease by minute;

3. Double-click Knob: lock brightness or unlock (Fig.7). The brightness adjustment knob fails when locking, and ”LOCK” appears on the LCD screen; ”LOCK” means that the user sets specific brightness when using a certain magnification objective, and uses the lock function to prevent it from being changed by another user. (In this case, when switching to another magnification objective,

the brightness automatically change to the brightness of the corresponding magnification, but the brightness adjustment knob fails. Double-click the knob again to release the lock and the “LOCK” on the screen disappears.

4-3 Mount and move the Specimen (Fig.8)

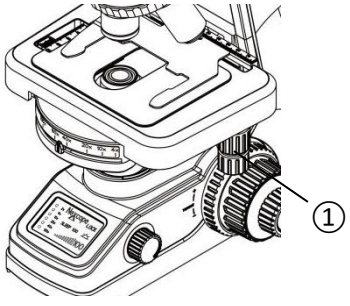


Fig.8

Pull out the movable claw, place the specimen in the center of the mechanical stage, loosen the movable claw and clamp the specimen.

★ Be careful when changing the objective. When the objective needs to be replaced after observing the specimen with a short working distance objective, the objective may collide with the specimen

Turn the X-Y direction adjustment knob ① of the mechanical ruler, move the specimen to the required position.

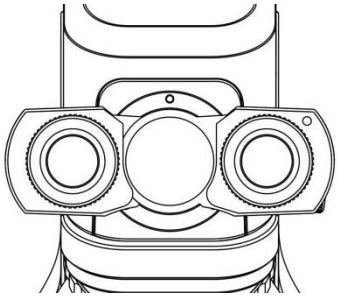


Fig.9

4-4 Adjusting the interpupillary distance (Fig.9)

The interpupillary distance range: 48mm~75mm. While looking through the eyepieces, adjust for binocular vision until the left and right fields of view coincide completely.

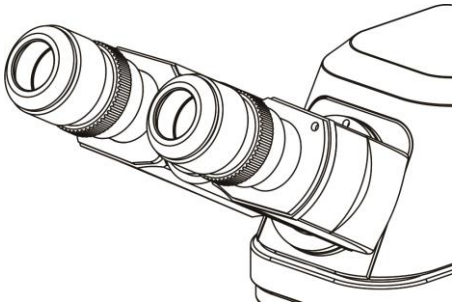


Fig.10

4-5 Diopter Adjustment (Fig.10)

Turn the eyepiece to adjust the diopter while looking through it.

★ The diopter range of the eyepiece is ±5 diopter. The number aligned to the line on the viewing head is the diopter in use.

Aperture diaphragm adjustment staff

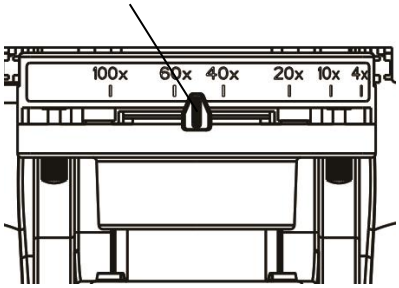


Fig.11

4-6 Adjusting the condenser (Fig.11)

Centering the Condenser:

The condenser and the objective are coaxial. It has been adjusted before leaving factory, so the user needn't to adjust them by self.

Adjusting Aperture Iris Diaphragm:

The aperture iris diaphragm is designed for the adjustment of the numerical aperture, not for the brightness. Generally, setting the aperture iris diaphragm to 70- 80% of the N.A. of the objective in use will provide an image with good contrast. If you want to observe the image of the aperture iris diaphragm, remove one eyepiece and look through the tube. You will see a dark circle encroaching on the bottom of the tube.

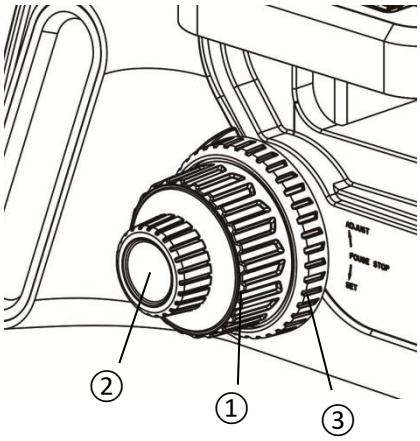


Fig.12

4-7 Focusing (Fig.12,13)

1. Use the 10×objective focus, to avoid the objective touch with the specimen, you should turn the coarse focus knob ① to raise the mechanical stage at first, let the specimen close to the objective, then slowly separating them to focus.

2. The operator can converse turn the coarse focus knob to get the specimen down, and search images in the 10×ocular simultaneously, then use the fine knob ② to focus. At this moment, you can replace other magnification objectives safely, and focus without the risk of destroying the specimen.

★ If you need to fix the stage on a vertical position to make the observation become more convenience, take use of the position hand-wheel.

4-8 Focus upper limit (Fig.12)

In actual use, if you want to lock the stage height, that is, the upper limit position of focusing according to the situation. Turn the focusing limiting knob ③ through in the direction of “set” in the corresponding upper limit position.

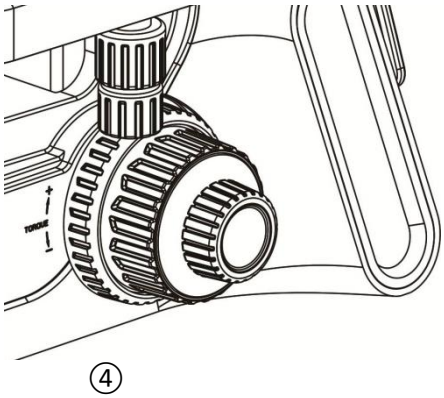


Fig.13

4-9 Adjust the tension adjustment collar (Fig.13)

10. The tension of the coarse focus knob has already been adjusted before leaving factory. If loosen (e.g. the stage slip down by its weight), please screw the tension adjustment collar ④ to the right position.Turning the collar in the direction of “+” increases the tension. When the collar is turned in the direction of “-”, the tension of the collar decreases.

If the stage descends on its own or if the specimen gets out of focus quickly even when it is brought into focus using the fine adjustment knob③, it means the tension of the coarse adjustment knob is too low. Turn the collar in the direction of “+” to increase the tension.

5.Technical specification BS-2046

5.1 Main Technical Specification

Compor	Specification	BS-2046B	BS-2046T
View head	Seidentopf Binocular Head	●	○
	Seidentopf Triocular Head	○	●
Eyepiece	10×/20x Plan Eyepiece	●	●
Nosepiece	Quadruple	●	●
Objective	Infinite Plan Objective:4×, 10×, 40×, 100×	●	●
Stage	Rackless stage, size:180×130mm, moving range: 74×30mm	●	●
Illumination	3W LED lamp	●	●
Condenser	NA1.25	●	●
Display	objective magnification, brightness, color temperature	●	●

NOTE: ● standard outfit; 〇 optional

5.2 Objective Parameter

Magnification	Numerical Aperture (N.A)	Focal Length (mm)	Cover glass thickness	Objective
4X	0.10	28.0	0.17	dry
10X	0.25	7.4	0.17	dry
40X	0.65	0.7	0.17	dry
100X	1.25oil	0.14	0.17	oil

5.3 Electrical parameter

1) Input voltage: VAC100-240V 50/60 Hz
2) Lighting: 3W S- LED

6.Troubleshooting BS-2046

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 (The objective is not in the center of the light path)	Adjust it into the located position (turning the objective to let it in the center of the light path correctly)
	The LED is not centered	Adjust it to center
	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean it thoroughly
Find dust and stain in the field of view	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean it thoroughly
	There are stains on the slide	Clean it thoroughly
Bad image quality (low-resolution, bad Contrast)	No cover glass on the specimen	Add cover glass
	The cover glass is too thick or too thin	Use standard cover glass with thickness of 0.17mm
	The specimen is on the reverse side	Turn it over
	Dry objective has oil on it. (Especially for 40X objectives)	Wipe the oil
	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean it
	Immersion oil is not used with the 100x objective	Use specified oil
	Air bubbles existed in the immersion oil	Eliminate the bubble
	Use the unspecified oil	Use the specified oil
	The opening of Aperture diaphragm is too large	turn it down to the proper size
	There are stains on the incidence lens of the binocular head	Clean the lens
	The opening of Aperture diaphragm is too small	Opening it to the proper size
One side of the image darkens	The condenser is not in the center of the field or the condenser incline	Reset the condenser
	The nosepiece is not in the located position	Rotate the nosepiece to the required position
	The specimen is in the floating state	Fix it firmly
The image move when focus it	The specimen is floating on the stage	Fix it firmly
	The nosepiece is not in the located position	Rotate the nosepiece to the required position
The brightness is not enough	The brightness is not adjusted accurately	Adjust the brightness adjustment knob
	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean it thoroughly

6.2 Mechanical Part

TROUBLE	CAUSE	SOLUTION
The image can't focus using high-magnification objective	The slide is on the reverse side	Reverse the slide
	The cover glass is too thick	Use standard cover glass with thickness of 0.17mm
The objective touch the cover glass when it change from low magnification to high-magnification	The slide is on the reverse side	Reverse the slide
	The cover glass is too thick	Use standard cover glass with thickness of 0.17mm
The binocular images do not coincide	The interpupillary distance is not correct	Adjust it correctly
Eyes too tired	The diopter is not proper	Adjust the diopter properly
	The brightness of the illumination is not proper for eyes	Adjust the lamp voltage
The objective magnification does not match the screen display magnification	The objective is not properly installed to the specified converter hole	Adjust the objective to the corresponding hole position depend on the display

6.3 Electric Part

TROUBLE	CAUSE	SOLUTION
The LED lamp does not light when the switch is on	No power or the fuse burn out	Check the connection of the power cord or the fuse
	The LED lamp is broken	Replace it
The brightness is not enough	LED lamp attenuates after long time use	Replace the LED lamp
The bulb flickers	The light bulb is going to wear out	Replace it
The LED lamp does not light when the switch is on	No power or the fuse burn out	Check the connection of the power cord or the fuse
Display is not working properly	Improper screen connection	Check the internal connections and reconnect well

After-sales service commitment:

Within 36 months from the date of delivery, on the condition that the instrument cannot work due to non-human factor quality problem, our company guarantee the repair and replace the parts.

Our company provide lifelong maintenance service for the products, in addition, beyond warranty, we supply spare parts in the long run, which has a concessional price.

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