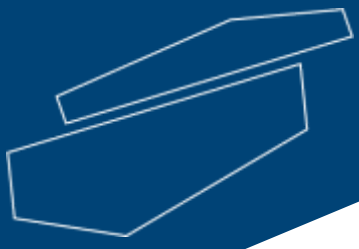
LYNX MICROSCOPES

Biological Microscope, Vision +

Please read the User Manual carefully before use and follow all operating and safety instructions!



user manual

English

User Manual

EN

Biological Microscope, Vision +

Preface

Users should read this Manual carefully, follow the instructions and procedures, and beware of all the cautions when using this instrument.

Service

If help is needed, you can always contact your dealer or Labbox via www.labbox.com (declare an incident). Please, provide the customer service representative with the following information:

- Serial number
- Description of the problem
- Your contact information

Warranty

This instrument is guaranteed to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident or abnormal conditions of operation.

For claim under the warranty, please contact your supplier.

CONTENTS

Use Notices

1. Safety note

1. Carefully open the box, avoid the accessories, like lens, 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 instrument, please use two hands to grip with the two sides of the microscope body.
4. When running, the lamp house and nearby parts will be very hot. Please ensure there is enough cooling room for them.
5. Make sure the instrument is earthed, to avoid lighting strike.
6. For safety, be sure the main switch is in "O" (off) state before replacing the halogen (LED) lamp or the fuse, then cut off the power, and do the operation after the lamp bulb and the lamp house completely cool. (specified lamp: Halogen Lamp 6V/20W or LED lamp 3W)
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 serious damage to the instrument.
8. Use the factory supplied power cord, please.

2. Maintenance

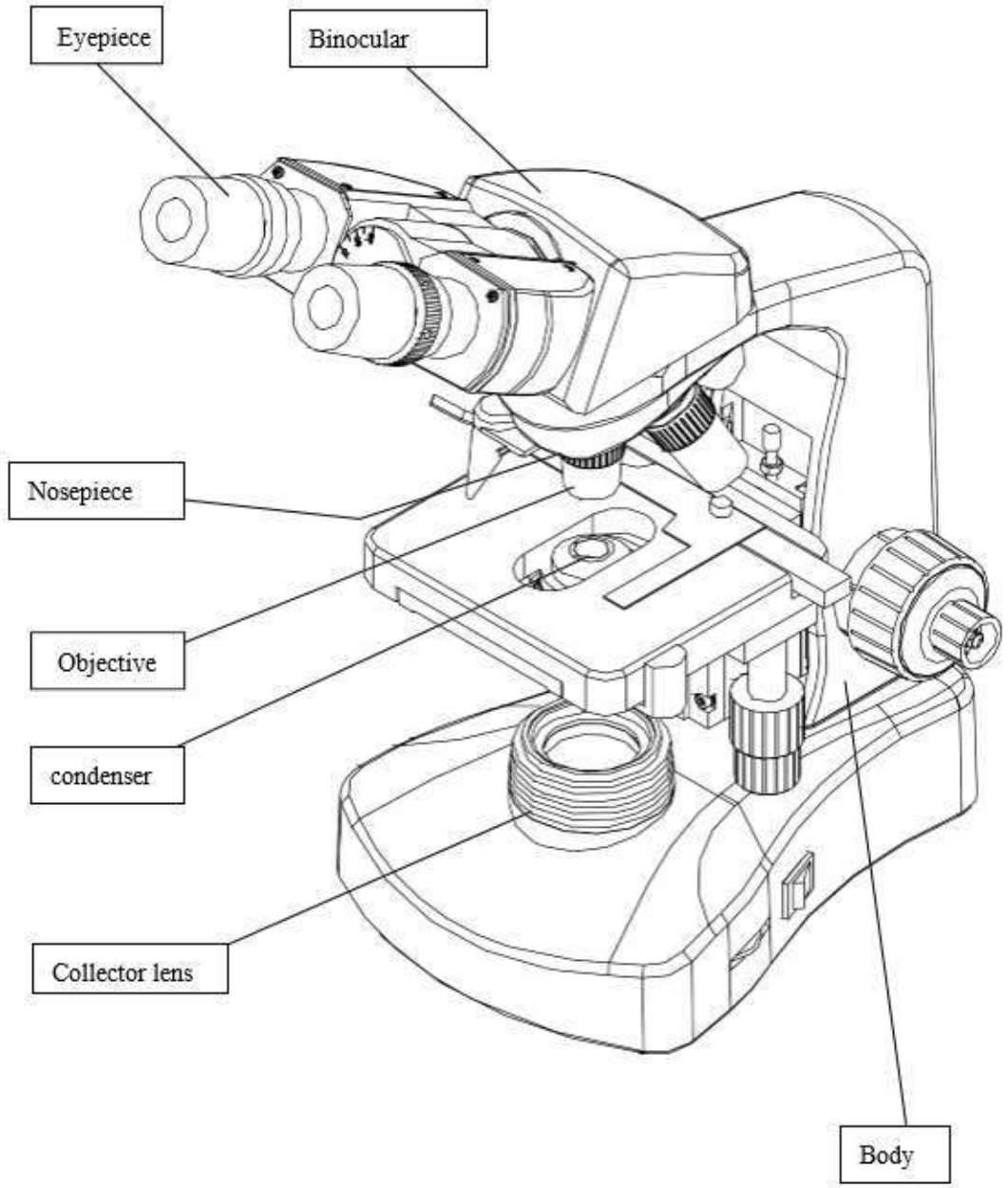
1. All the lenses have been well checked and adjusted. It is forbidden to disassemble them yourself.
2. The nosepiece and coarse/fine focus unit have a compact and precise frame, please don't disassemble

   them as possible as you can.
3. Keep the instrument clean, wipe dust regularly, and be attention to avoid contaminating the optical elements especially.
4. The contaminations on the prism, like finger mark and oil, could be gently wiped with a piece of soft cloth or tissue paper, gauze which has been immersed in pure alcohol or xylene. **(Note that the alcohol and the xylene are all burned easily, do not let them near the fire, and use them in a drafty room as possible as you can.)**

5. Don’t use an 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 splashed 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. Do wait for the lamp house to cool completely before cover.

SEIDENTOPF BINOCULAR HEAD

1. Name of Components



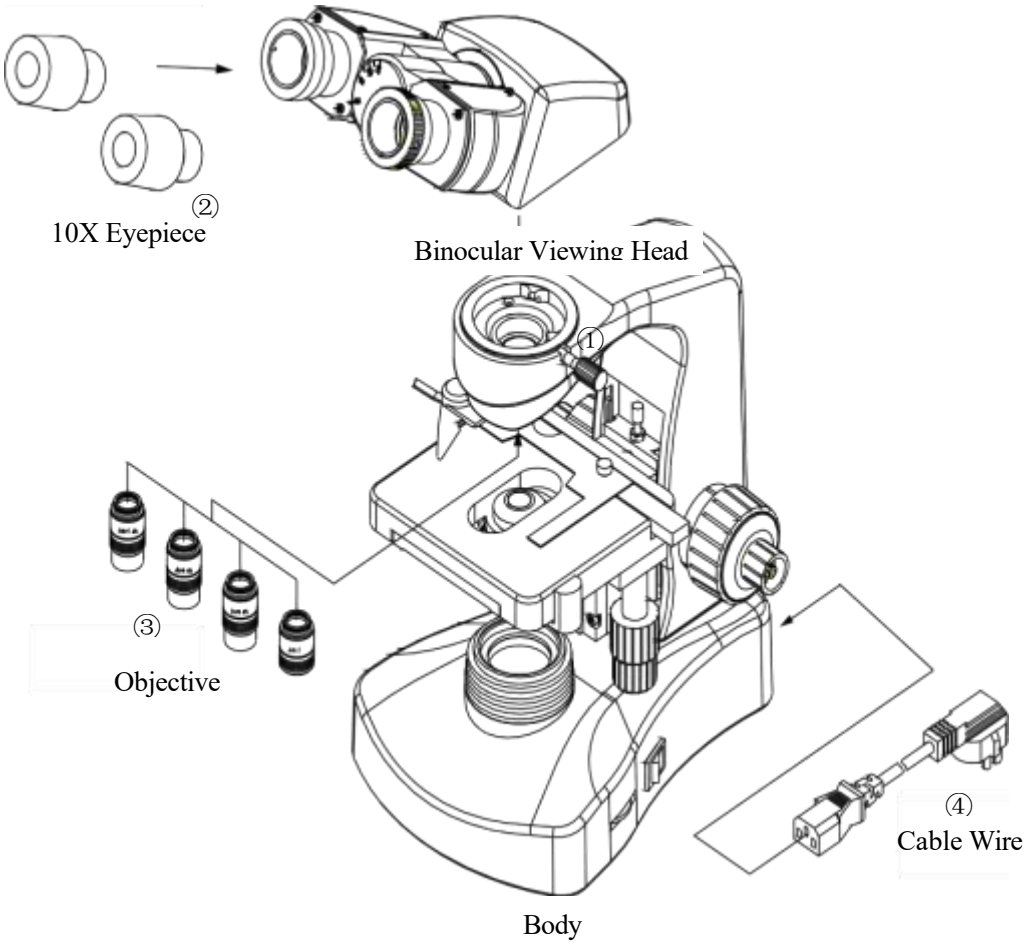
Biological Microscope Vision+

2. Installation

2.1 Installing Illustration

The following shows the installation order of the spare parts. The number expresses the installation process.

- Before the installation, make sure there is no dust and stain on the spare parts. No marks by outside force on the surface of the spare parts or glass.
- Keeping the hexagon- spanner well, when changing the spare parts, you will use it.



2.2 Installing Steps

2.2.1 Install the binocular viewing head (Fig.1-2)

Insert the binocular viewing head in the head of the body, turn to the right place, then fix it up by bolts ①.

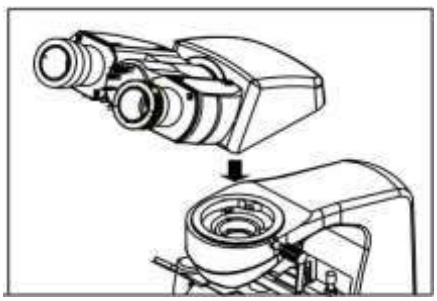


Fig. 1

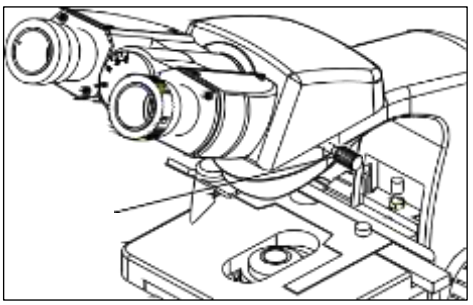


Fig. 2

2.2.2 Install the eyepiece (Fig.3-4)

Insert the eyepiece in the eyepiece tube till the end. Fig.4 picture shows the station after the installation

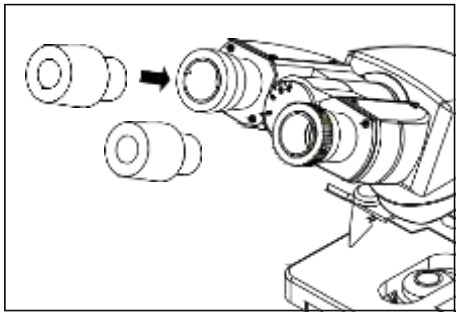


Fig. 3

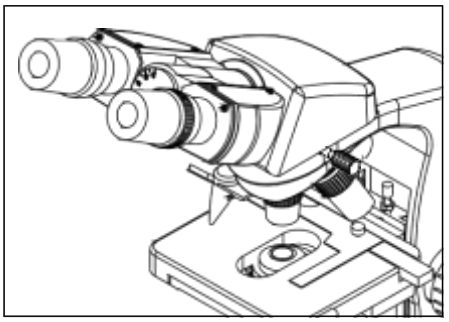


Fig. 4

Intention:

The working circumstance requirement of the microscope:

1. Room temperature: 0°C - 40°C, the highest relative humidity 85%.
2. High temperature of dampness will lead the mildew and Frogging of the microscope, and damage it.
3. Avoid placing the microscope in an environment filled with dust. When it is not used, we should cover it with dust guard.
4. The microscope should be put in a place without vibration and keep flat.

2.2.3 Installing the Objective (Fig.5-6)

1. Adjust the coarse focus knob, till the mechanical stage to the low limited place.
2. Screw down the objective to nosepiece from left or right side, low magnification objective first. Install all the objective from low to high magnification following the clock hand.
   - ✧ According to this way, to install the objective will make it easier to change magnification in operation.

Notes:

- *Clean the objective frequently.*
- *At first, use the 10X objective to look for image, then change to another one.*

- *Turn the objective till hear the "Kai. Kai" sound, make sure the objective enters the objective center.*

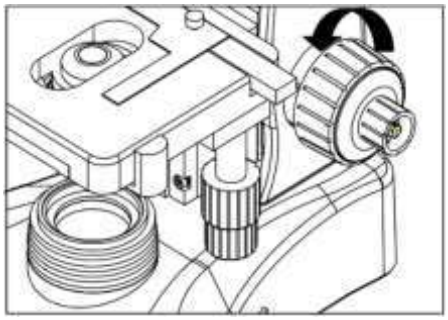


Fig. 5

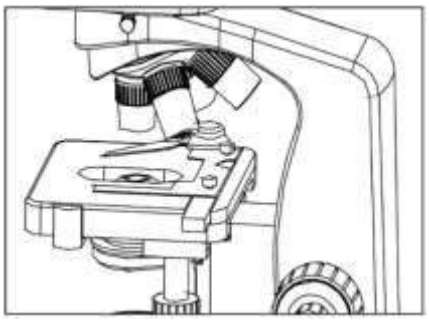


Fig. 6

2.2.4 Install the color filter (Fig.7)

1. Rotating the condenser holder① out as the Fig.7 shows.
2. Put the filter② into the condenser holder, then switch back the holder.

★ There is two types of color filter. The color is blue and green.

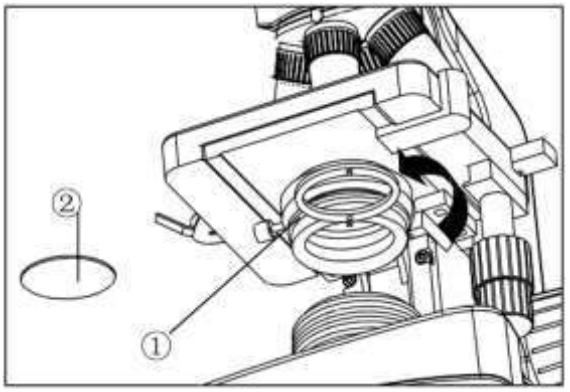


Fig. 7

2.2.5 Connecting the Power Cord (Fig.8-10)

★ Do not force on the Power Cord. The cable and wire are easier to damage when bended or wrapped.

1. Before connecting the power cord, switch the main On-Off ① to "O" (off).
2. Plug the power cord ② into the socket ③ on microscope safely. Make sure you are connected.
3. Plug the power cord ④ into the power source socket safely. Make sure you be connected.

★ Do use the supplied power cord all the time.

If lost or damaged, select the same standard cord, please.

★ The voltage of the machine can be selected between 110V and 220V. (when shipped from the factory, the switch is set to 110V and 220V)

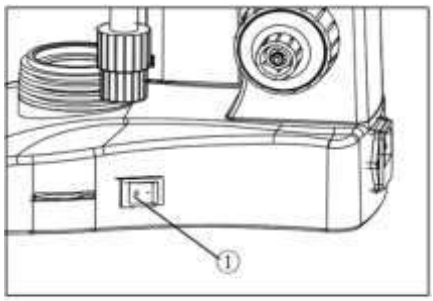


Fig.8

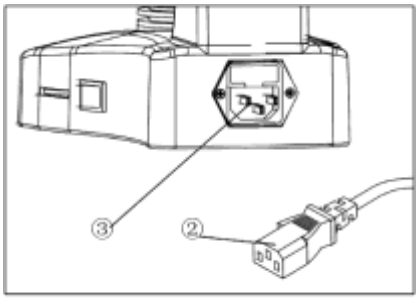


Fig.9

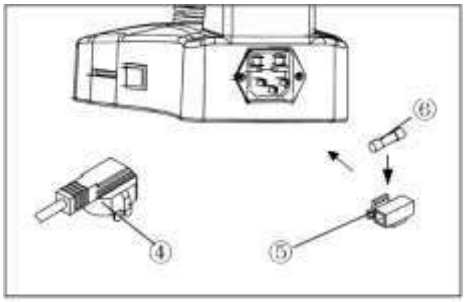


Fig.10

2.2.6 Replacing the fuse (Fig.7, 9, 10)

Do remember to turn the main switch① on the state of "O" (off) before replacing the fuse and unplug the power cord②. Dig the fuse⑤ kits out of the power source socket ③ with your fingers, replace a new fuse, then insert it into the power source socket again.

★ 250V500mA fuse for 220V.

★ 250V1A fuse for 110V.

2.2.7 Installing and replacing the lamp (Fig.11, 12, 13)

✧ There are two types of lamps for illumination, halogen Lamp 6V/20W and LED lamp 3W.

When changing halogen lamp:

1. When using, or soon after it is turned off, the lamp, the lamp house and nearby parts will be very hot and will cause serious burns. Please turn the main switch on "O" (off), pull up power plug, and make sure the bulb, the lamp house and periphery are all cool. Then, you can do your replacement.
2. Loosen the bolt ⑤ on the lamp holder window at the base of the microscope by screwdriver, screw lamp holder window ② out.
3. Pull out the halogen bulb ③, hold to the bulb after you wrap it with gauze or other protection materials, then depress the plugs into the jack on the lamp house.
4. Finally, cover the lamp holder window, screw down the bolt①.

★ Please insert the lamp gently, or it will be damaged by excessive extrusion.

★ Do not touch the Halogen bulb with your hands. It will shorten the service life or cause it to burst. If you leave fingerprints on the surface carelessly, clean it with a dry soft cloth.

When changing LED lamp:

1. The working life of LED lamp is very long, so it is hard to be damaged, if the bulb is really

damaged, please purchase a new one from supplier.

2. Removing the bottom board in the base of microscope by screwdriver, after removing the bolt ⑤, LED bulb can be taken down, displaced with a new one, the new bulb should be fixed on holder with bolt⑤.
3. Fix the bottom board to the base of microscope with the original bolt.

✧ Please take down the bottom board slowly when remove it, or the inside electrical wire may be pull-apart.

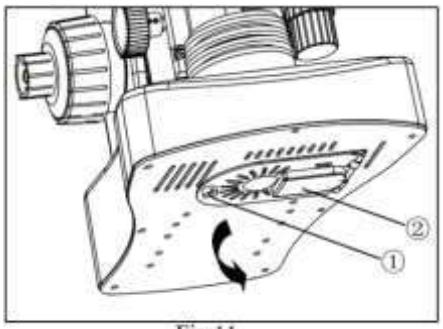


Fig.11

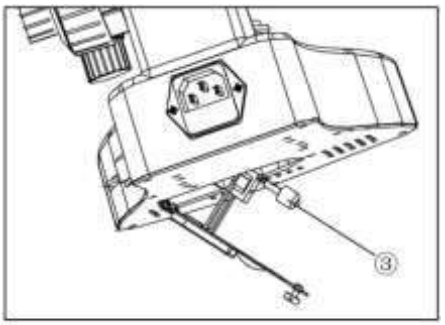


Fig.12

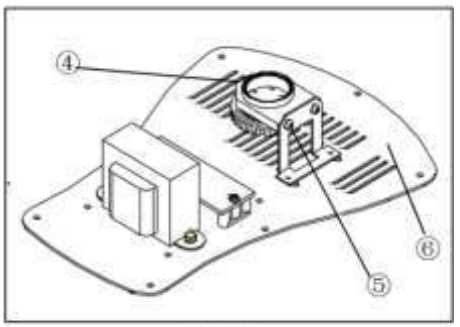


Fig.13

3. Adjustment & Operation

3.1 Adjustment Set Diagram (Fig.14-15)

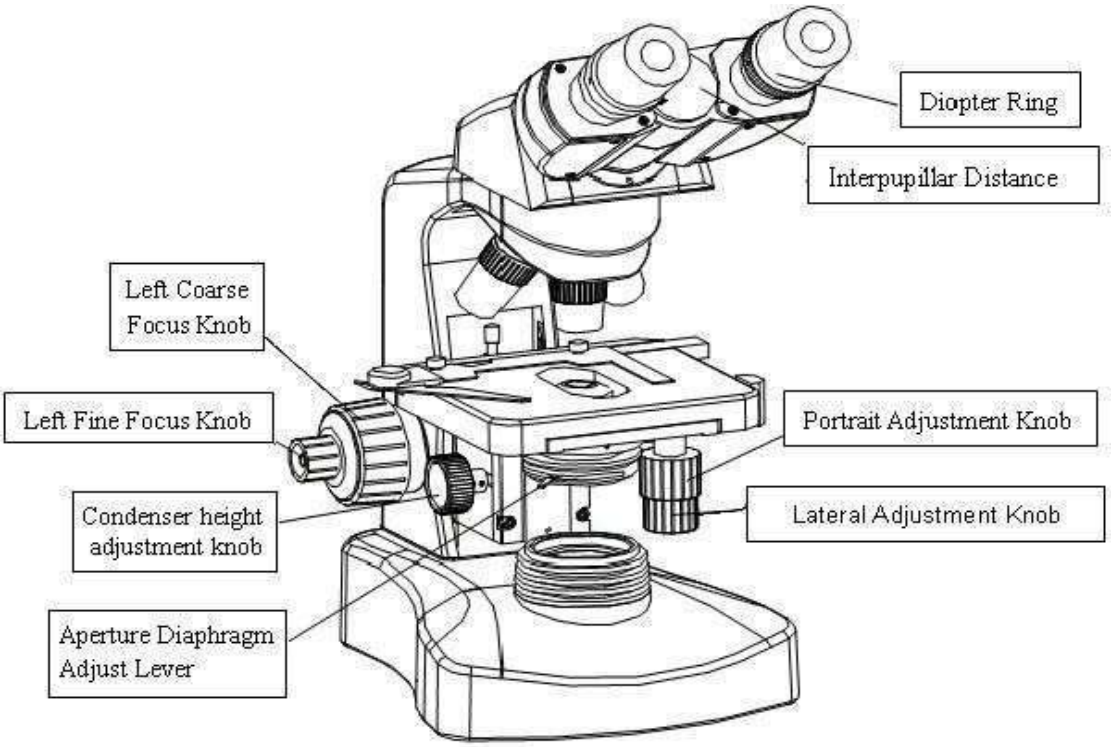


Fig. 14

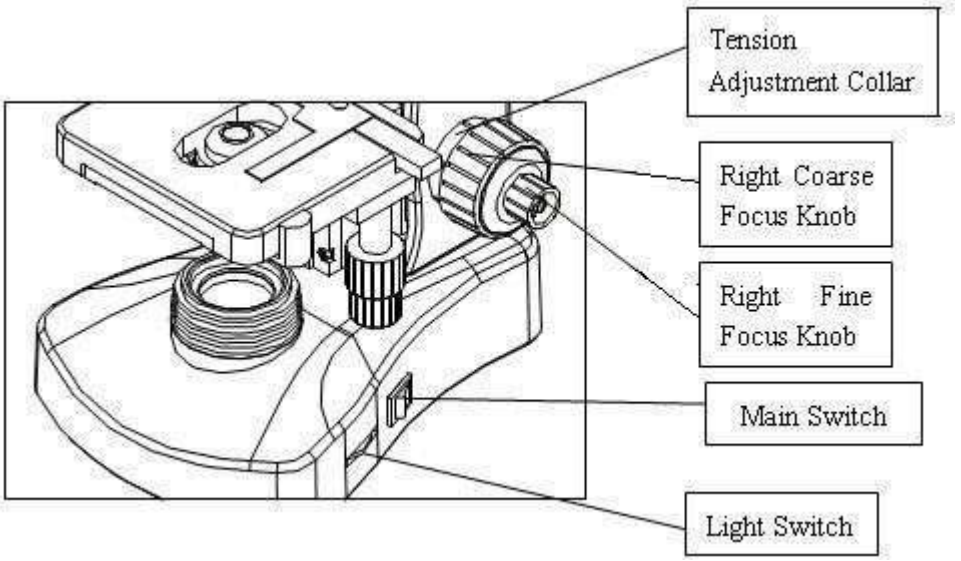


Fig. 15

3.2 Operation

3.2.1 Adjusting the brightness (Fig.16)

1. Connect the power, turn on the main switch ① (figures 15). to "-" (on).
2. Turning the brightness adjustment knob ② anticlockwise, the voltage rises, and the brightness strengthen; turning it clockwise, the voltage decline, and the brightness weakens.

◇ Using the lamp in a low voltage condition will prolong the use life.

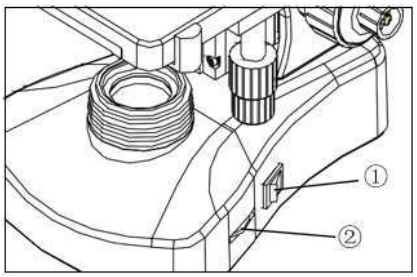


Fig.16

3.2.2 Placing Specimen (Fig.17)

1. Place the slide ③ on the mechanical stage. Use the slide holder to clamp the slide gently. Turn the portrait and lateral adjustment knob of the mechanical ruler④, move the specimen onto the required position.

★ Be careful when changing the objective. If you finish the observation with the short working distance objective, and want to change to another one, be careful not to let the objective touch the specimen.

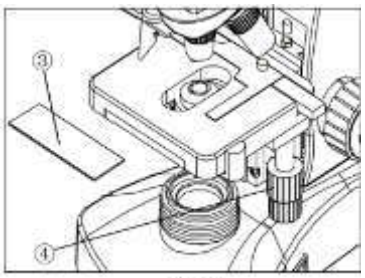


Fig.17

3.2.3 Focusing (Fig.18-19)

1. Use the 10xobjective focus, to avoid the objective touch with the specimen, you should 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 knob① to get the specimen down, and search images in the 10xocular simultaneously, then use the fine knob② to focus. At this moment, you can replace other magnification objectives safely and focus without the risk of destroying the specimen.

★ The tightness of the tension adjustment collar has adjusted before leaving factory, if finding it's loosing (the mechanical stage drop itself because of deadweight), please turning the tension adjustment collar③ until the tightness is in order.

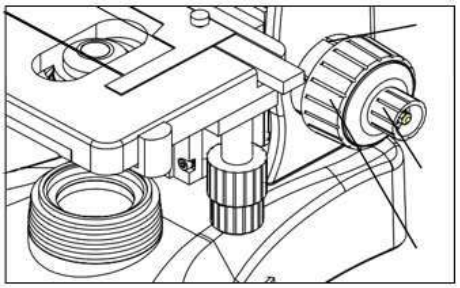


Fig.18

Fig. 19

3.2.4 Adjusting the center and height of the condenser (Fig.20)

Rotating the focus knob of the condenser, let the condenser move up and down, let the condenser raise when we use high-power objective, and go down when we use low power objective.

★ The center of the condenser should be coaxial with the optical axis of objective, it has adjusted before leaving factory, you don't need to adjust it by yourself.

★ The high limited place of the condenser has adjusted before leaving factory, you don't need to adjust it by yourself.

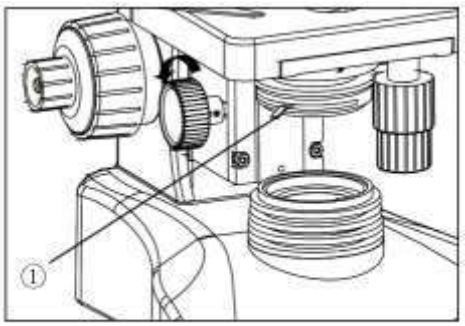


Fig.20

3.2.5 Adjusting the aperture diaphragm (Fig.20, 21)

Rotating the Aperture diaphragm adjust lever①, change the opening of the aperture diaphragm.

If the opening of the aperture diaphragm is too small, it will lead to low brightness and low resolution. But the contrast and the depth of field will increase. Reversely, if opening of the aperture diaphragm is too large, the brightness and the resolution will increase, but the contrast and depth of field will decrease.

Generally, we can get a good quality image with sufficient contrast when the aperture diaphragm opens to the 70 ~ 80% of the objective's numerical aperture. If the opening of the aperture diaphragm is too small, then it will lead to low resolution. Thus, when we observe a clarity specimen, please do not reduce the size of the aperture smaller than 60% unless we only need very low contrast.

The value of the numerical aperture is signed on the tube of each objective, for example, the sign of 10/0.25 means the magnification is 10 ×, and the numerical aperture is 0.25mm.

To observe the image of the aperture diaphragm, remove the eyepiece , observe the image through the tube directly.

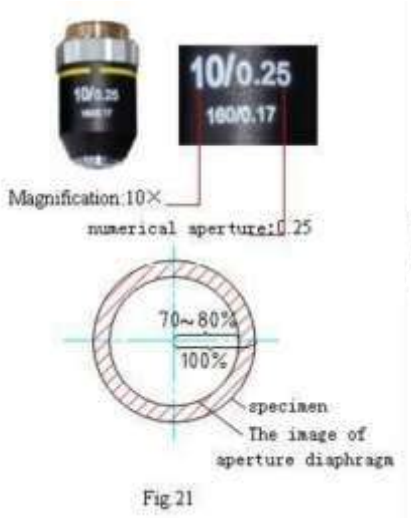


Fig 21

3.2.6 Adjusting the interpupillary distance (Fig.22)

The interpupillary distance range: 55mm ~ 75mm.

When observing with two eyes, hold on the left and right prism holder, turn around the axis, adjust the interpupillary distance until the left and right fields of view coincide completely.

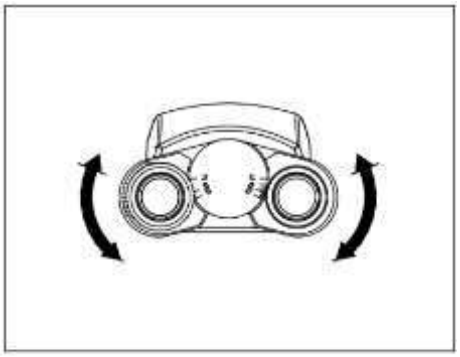


Fig.22

3.2.7 Adjusting the Diopter (Fig.23)

1. Observe the right ocular tube with your right eye. Turn the Coarse & Fine Focus Knob to focus the specimen.
2. Observe the left ocular tube with your left eye. If not in focus just adjust the Diopter Ring① to make it in focus.

★ The range of Diopter Ring is ± 5, as the value align the reticle② of the ring.

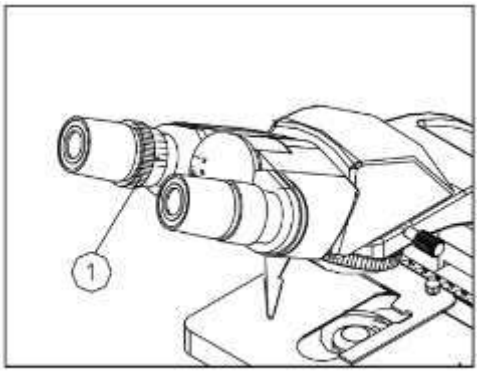


Fig.23

4 Technical Specifications

A. Main specifications

Tube Length	**160mm**
Viewing Head	Compensation Free Trinocular Head, Inclined at 30, Interpupillary distance: 55-75mm
Eyepiece (Ocular)	Viewfield line 18mm
Nosepiece	Backward Quadruple Nosepiece
Objective	Achromatic: 4×, 10×, 40×, 100×
Focus System	Coaxial Coarse and Fine Focusing System, Sensitivity and Graduation of Fine Focus: 0.004mm, range 24mm
Condenser	Abbe NA 1.2
Stage	Double layer mechanical stage, area: 132×142mm, movement range: 75×40mm
Lamp-House	Halogen lamp 6V20W or LED lamp 3W

B. Eyepiece, Objectives

1. Objectives

Magnification	**Numerical Value Aperture Diaphragm (NA)**	**Cover Glass Thickness (mm)**	**Focus f (mm)**	**Working Distance (mm)**	**Working Mode**
4×	0.10	0.17	31.05	18	dry
10×	0.25	0.17	17.13	6.5	dry
40×	0.65	0.17	4.65	0.53	dry
100×	1.25	0.17	2.906	0.13	oil

2. Eyepiece

Kind	Magnification	Focus f (mm)	Linear Field of View (mm)
Plan Eyepiece	10×	24.95	Φ 18

3. Sum magnification assembled by eyepieces and objectives

Eyepiece	10×	10×	10×	10×
Objectives	4×	10×	40×	100×
Sum Magnification	40×	100×	400×	1000×

5 Standard Outfit table

Component name	Specification	Number	Standard outfit
Body	Frame	1	○
	Double layer mechanical stage	1	○
	Condenser holder	1	○
Viewing system	Compensating Free Trinocular Head	1	○
Condenser	Abbe NA 1.2	1	○
Nosepiece	Quadruple Nosepiece	1	○
Lamp-House	Halogen lamp 6V20W (or LED lamp)	1	○
	Standby lamp（halogen lamp 6V20W）	2	○
	Standby fuse 50T250V500mA	1	○
Eyepiece	Plan 10×	2	○
Objective	Achromatic 4×	1	○
	Achromatic 10×	1	○
	Achromatic 40×	1	○
	Achromatic 100×（oil、 spring）	1	○
Condenser	Bright field condenser with iris diaphragm	1	○
Filter	Bule green	1 piece each color	○

6 Trouble shooting

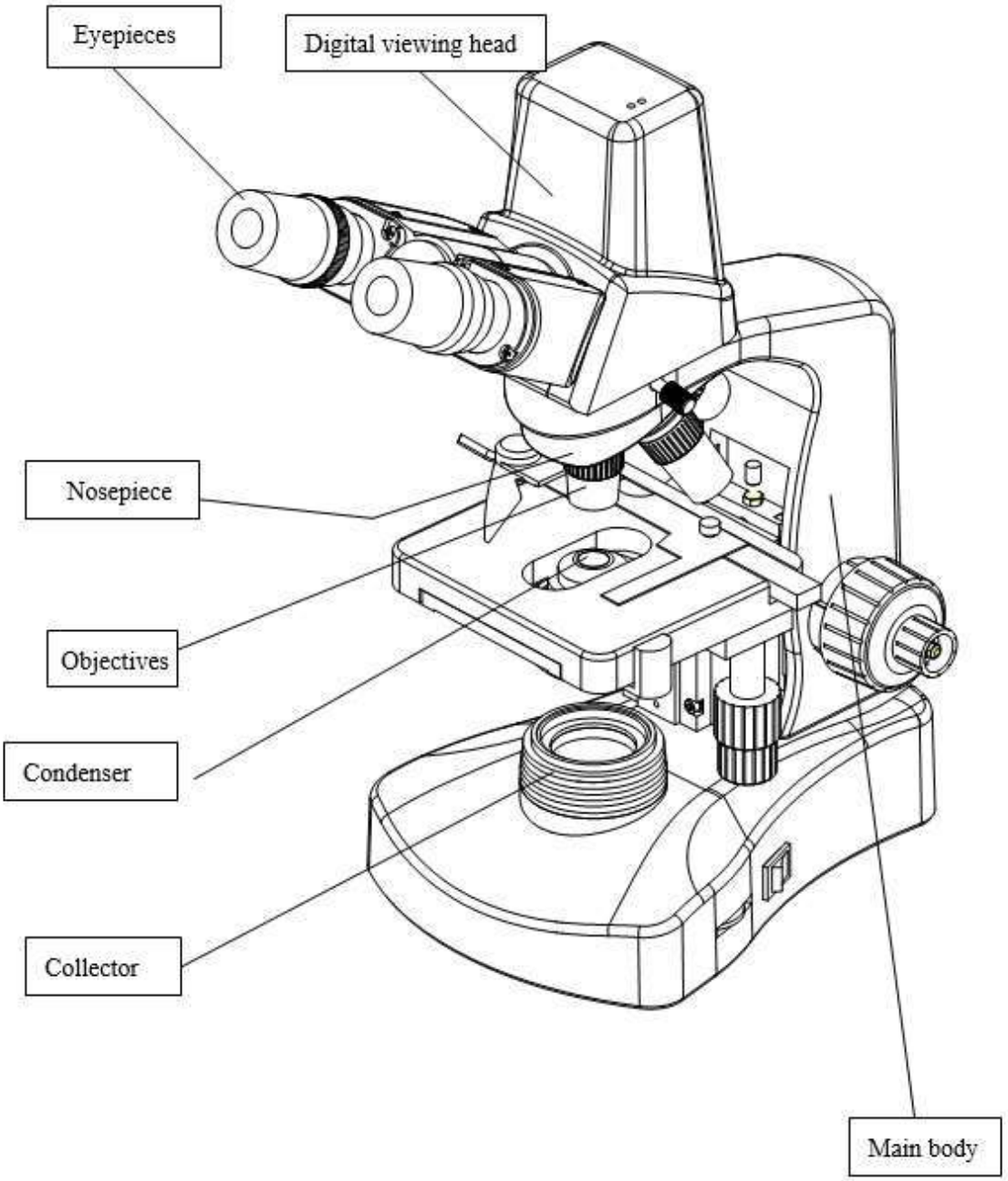
Problems	Reason for problems	Solution
1 Optical Part:		
1 The edge of the field of view has shadow or the brightness is asymmetry	The nosepiece is not in the location Position (The objective is not in the center of the light path)	Adjust it into the position located (turning the objective to let it in the center of the light path correctly)
	The filament shadow not in center	Adjust it to center
	The surface of the lens has contaminants (condenser, objective, eyepiece, Collector lens)	Clean the lens
2 Find dust and stain in the field of view	The surface of the lens has contaminants (condenser, objective、 eyepiece、 Collector lens)	Clean the lens
	There are stains on the slide	Clean the lens
	The position of condenser is too low	Loosen the bolt of the condenser, adjust its position and tighten it again
3 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 normal thickness cover glass(0.17mm)
	The specimen is on the reverse side	Turn it around
	Oil the dry objective (especially easy to happen on 40X)	Clean the objective
	The surface of the lens has contaminants (condenser, objective, eyepiece, Collector lens)	Clean the lens
	No oil with oil objective	Use oil
	There are air bubbles in the oil	Eliminate the bubbles
	Use the unspecified oil	Use the specified oil
	The opening of the 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 the Aperture diaphragm is too small	Opening it to the proper size
	The position of condenser is too low	Adjust its position
4 The image on one side is clear and the other side is faint	The condenser is not in the center of the field or the condenser incline	Reset the condenser and adjust the Central bolt of the condenser carefully
	Nosepiece is not in the located position	Rotate the nosepiece to the required position
	The specimen is in the floating state	Fix it firmly
5 The image moves when focus it	The specimen is floating on the stage	Fix it firmly
	Nosepiece is not in the located position	Rotate the nosepiece to the required position
6 The image seems yellow slightly	Not using the blue filter	use the blue filter
7 The height of the brightness is not enough	The opening of the Aperture diaphragm is too small	Adjust it again
	The position of condenser is too low	Adjust its position
	The surface of the lens has contaminants (condenser, objective, eyepiece, Collector lens)	Clean the lens
2 Mechanical Part:		
1 The image can't focus using high-power objective	The slide is on the reverse side The cover glass is too thick	Reverse the slide Use normal thickness cover glass(0.17mm)
2 The objective touches the cover glass when it changes from low power to high-power	The slide is on the reverse side The cover glass is too thick	Reverse the slide use normal thickness cover glass(0.17mm)
3 The specimen moving not fluently	The slide holder is not fixed effectively	Fix it firmly
4 The left and right fields of view are not coincided.	The interpupillary distance is not correct	Adjust it correctly
5 The eyes are uncomfortable	The diopter is not right	Adjust the diopter according to your sight

	The brightness of illumination is not properly	Adjust the bulb voltage
3 Electric Part:		
1 The lamp can't light	No power supply	Check the power cord, and connect them exactly
	The installation of the bulb is wrong	Install the bulb correctly
	The bulb burns out	Change a new bulb
2 The bulb burns out suddenly	Not using the specified lamp, the voltage is too high	Use the required lamp, if the situation has not changed after replacing the bulb, please connect with maintenance department
3 The height of the brightness is not enough	Not using a appointed lamp the voltage is too low	Use a appointed lamp Add the voltage
4 The light glimpse	The bulb is going to spoil	Change the bulb
	The bulb is not plugged in the socket correctly	Check it and plug it in the socket firmly

DIGITAL BIOLOGICAL MICROSCOPE

1. Components



Vision+ Digital Biological Microscope

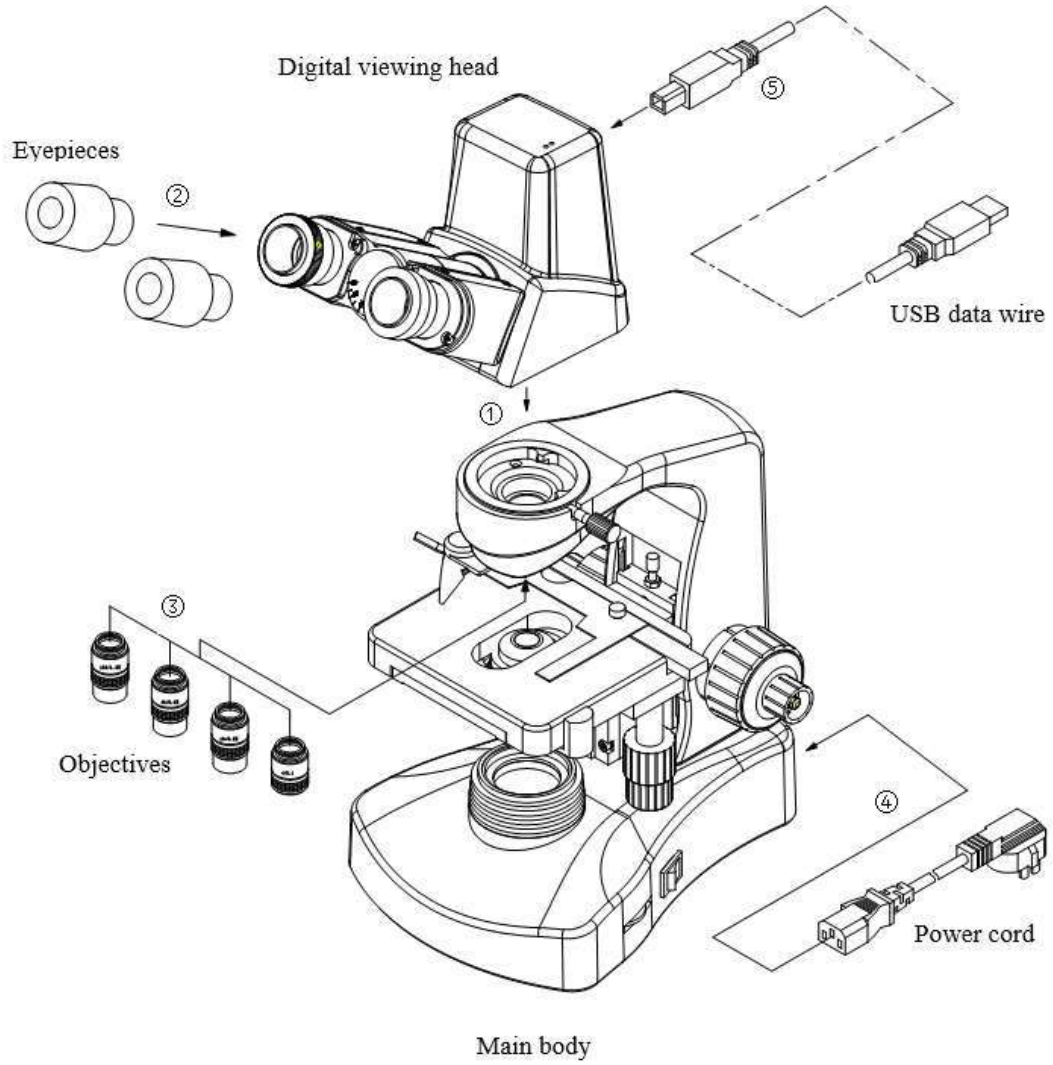
2. Assembly

2.1 Assembly 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.



2.2 Assembly Steps

2.2.1 Installing digital viewing head（Fig.1, 2）

Insert the digital viewing head into the microscope head, turn into the right position, then screw down the bolt ① to fix it.

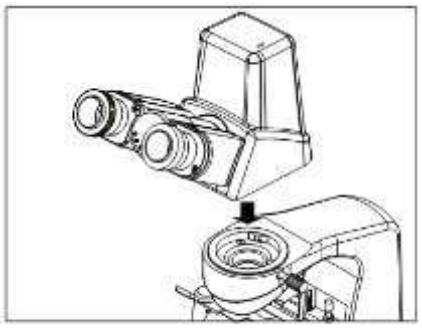


Fig.1

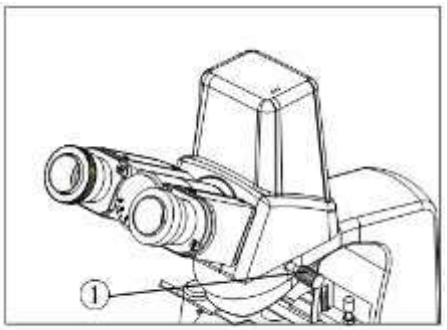


Fig.2

2.2.2 Installing the eyepieces (Fig.3, Fig.4)

Insert the eyepieces into the eyepiece tube until they are against each other as shown in Fig.4.

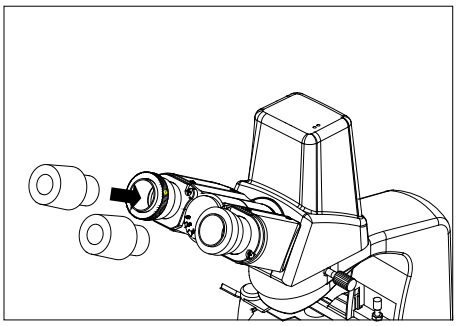


Fig.3

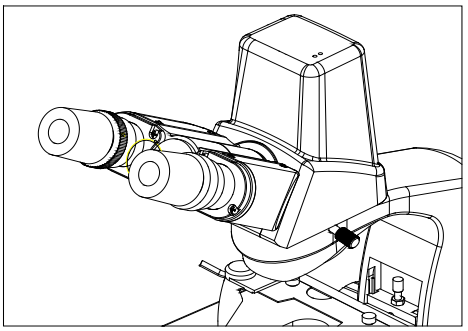


Fig.4

Note:

Operation conditions:

1. Temperature: 0°C ~ 40°C, Maximum Relative Humidity: 85%

2. High Temperature: High Temperature and humidity will result in a mildewing, dew and even ruinous instrument.

3. Avoid placing the instrument in a dusty environment. When ending your microscope operation, please cover it with the dust cap.

4. Lay the microscope in a plan and stable position, please.

2.2.3 Installing objectives (Fig.5 & 6)

1. Adjusting the coarse focus knob until the support device of the mechanical stage reaches its low limit position.
2. Screw the lowest magnification objective into the nosepiece from the left or the right side, then revolve the nosepiece clockwise and mount other objectives by the sequence of low to high magnification

◇ Installing objective this way will make the change of magnification to be easier during using.

★ Clean the objectives regularly, for lens is susceptible to dust.

★ When operating, use 10×magnification objective to search and focus specimen firstly, then replace with higher magnification objective if necessary.

★ When replacing the objective, slowly turn the nosepiece until you hear “clicked”, which means the objective is in the required position---center of the light path.

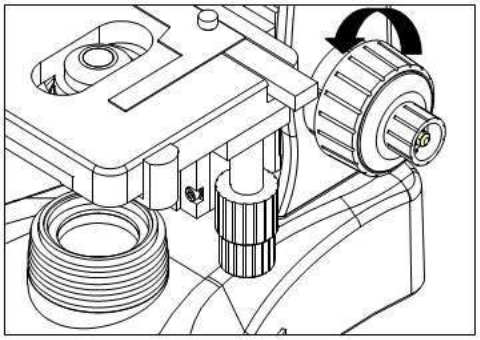


Fig.5

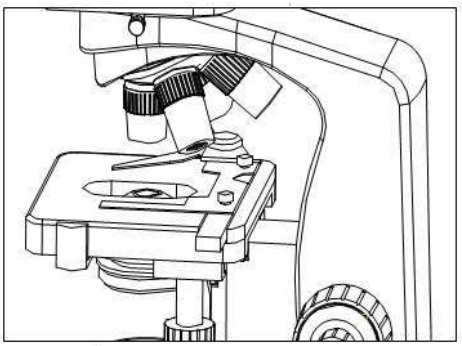


Fig.6

2.2.4 Installing the color filters (Fig.7)

1. Turn the condenser bracket① out at the direction of arrow in Fig.7
2. Put the required filters② into the holder on the bracket, and then turn the bracket back to the right position.

★ Baby blue and green filters are available in standard outfit.

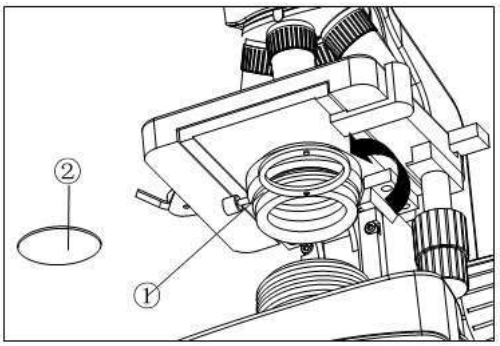


Fig.7

2.2.5 Connecting the power cord (Fig.8, 9,10)

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

1. Turn the main switch① to “O” (off) state before connecting the power cord.
2. Insert the power plugs② into the power jack③ of the microscope; make sure the connection is well.
3. Plug the power cord ④ into the power supply receptacle safely. Make sure the connection is well.

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

★ Either 110V or 220V can be selected as the input voltage of this microscope. (The input voltage has been preset in the microscope before leaving factory.

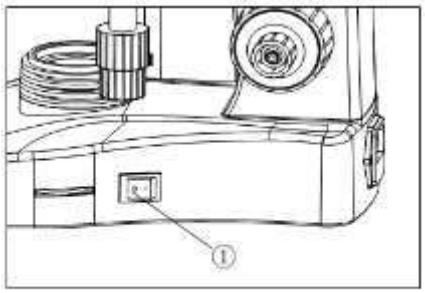


Fig.8

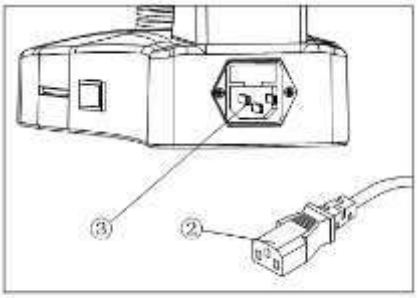


Fig.9

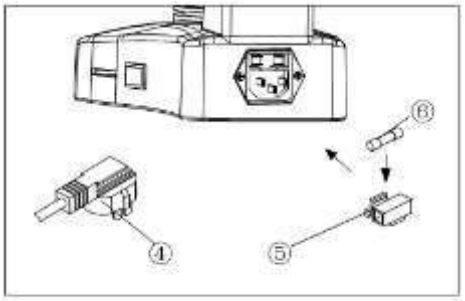


Fig.10

2.2.6 Replacing the Fuse (Fig. 8, 9, 10)

Do remember to set the main switch① to the state of "O" (OFF) and unplug the power cord ②before replacing the fuse. Scratch the fuse holder⑤ out from the power socket③ on the microscope, replace with a new fuse in the holder, then press the fuse holder back again.

★ There is a spare fuse in the fuse holder.

★ For 220V input voltage, use fuse of rating (250V500mA).

★ For 110V input voltage, use fuse of rating (250V1A).

2.2.7 Installing and replacing the lamp (Fig.11,12,13)

◇ There are two types of illuminator available for this microscope, one type is halogen lamp 6V20W, the other is 3W LED. During use or just after using, the lamp house and nearby parts will be very hot. Please set the main switch to "O" (off) state before replacing, and make sure the bulb, the lamp room and periphery are all cool enough to carry no burn. Then, you can do your replacing.

1. Loose the bolt① and open the window② on the bottom of the microscope base with "—" type screwdriver.
2. Pull out the old bulb③, hold the new bulb after you wrap it with gauze or other protection materials, and insert its pin as deeply as possible into the jack in the lamp holder.
3. Close the window and tighten the bolt①. ★ Please insert the bulb gently, or it will be damaged by excessive extrusion.

★ Do not touch the halogen bulb with bare hands. It will shorten the service life or cause it to burst. If you leave fingerprints on the surface carelessly, clean it with a piece of dry soft cloth.

When replacing LED :

1. Generally, the LED has long service life and is not easy to damage, if unfortunately it damaged, purchase a new one from the supplier.

2. Remove the base plate② from the bottom side of the microscope base with screw driver, loose the bolt⑤ to take the old LED off, replace with a new one.
3. Put the new LED unit back onto the bracket with the bolt⑤ and the base plate② onto the bottom side of the microscope.

◇When you take down the base plate, please do it gently and slowly, to avoid damaging internal electrical wires.

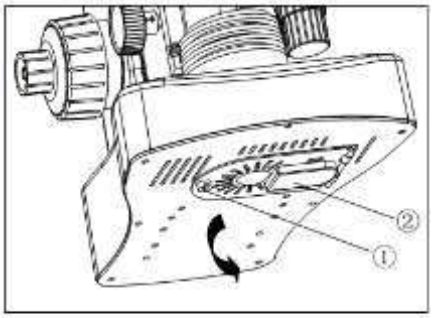


Fig.11

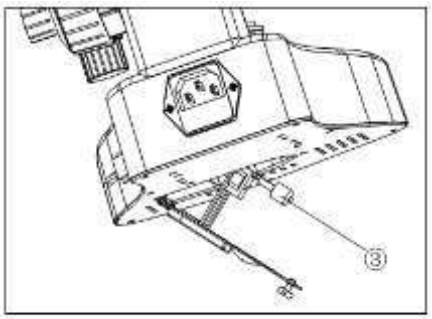


Fig.12

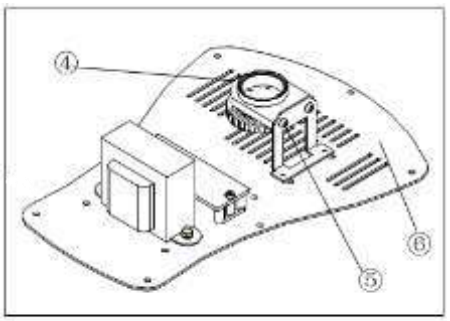


Fig.13

3. Adjustment & Operation

3.1 Adjustment Sets （Fig.14, Fig.15）

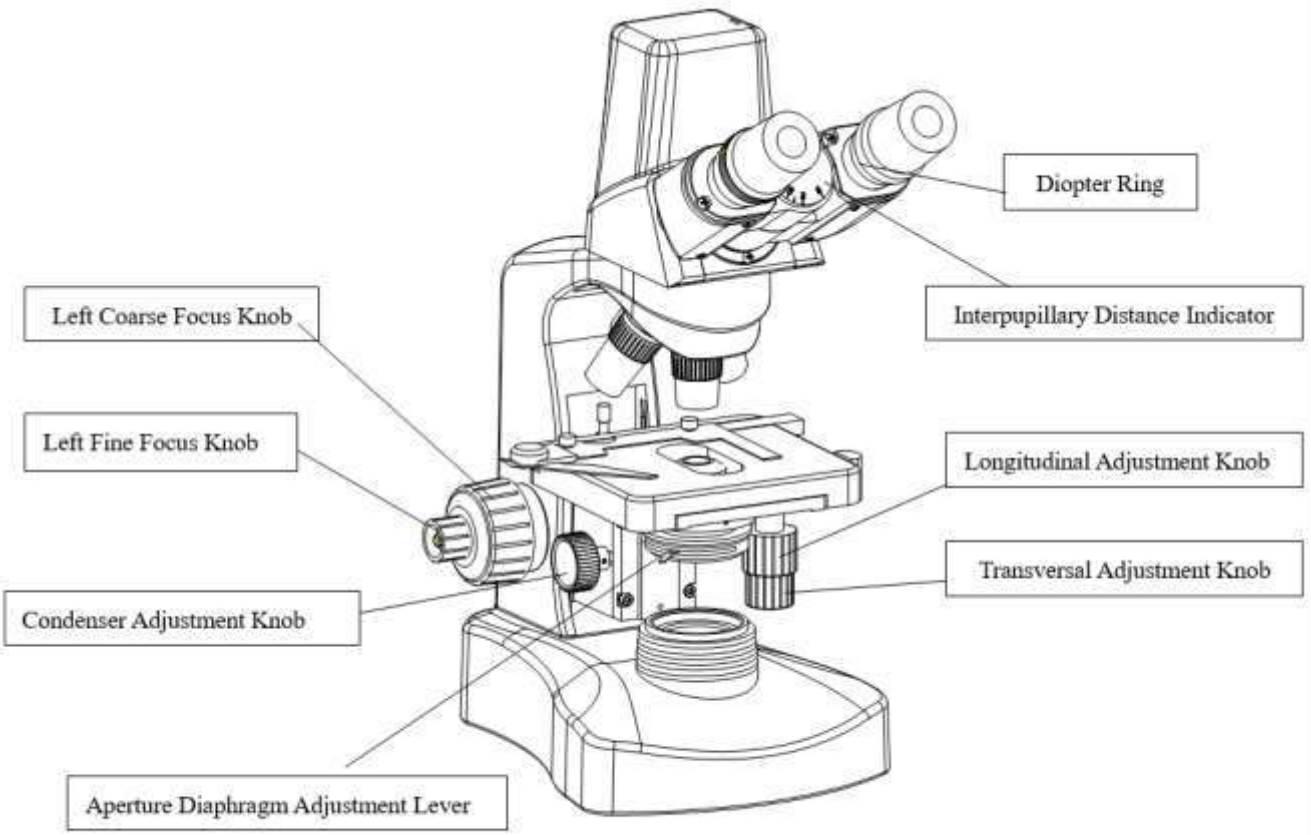


Fig.14

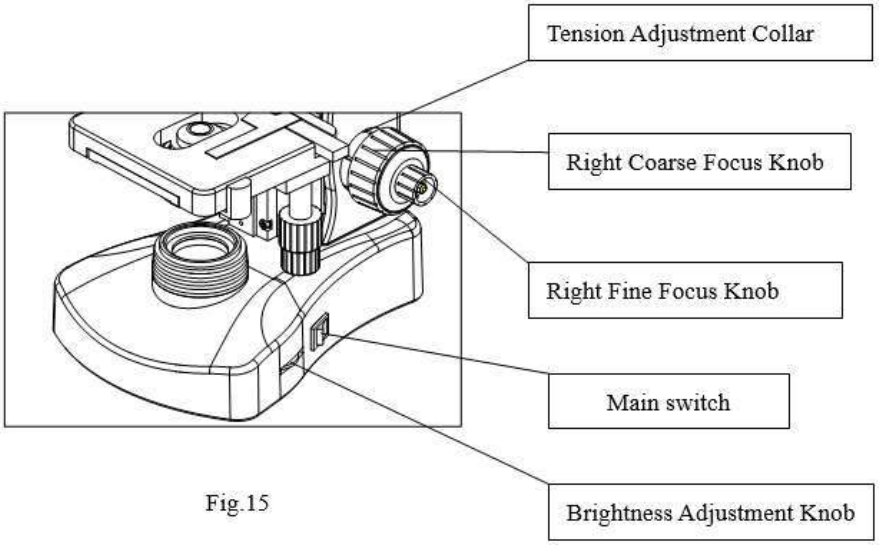


Fig.15

3.2 Operation

3.2.1 Adjusting the brightness (Fig.16)

1. Connect the power, turn on the main switch ① shown in the figure which on the bottom side of the base to "—" (on).
2. Turning the brightness adjustment knob ② clockwise, the voltage decline, and the brightness weaken; Whereas turning at the opposite direction, the voltage raise, and the brightness strengthen.

★ Using the microscope at a lower voltage can prolong the service life of the bulb.

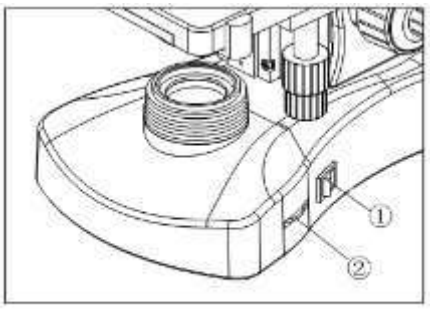


Fig.16

3.2.2 Placing the specimen (Fig.17)

1. Place the specimen ③ on the center of the stage and then hold it with the specimen holder ④.
2. Turn the transversal and longitudinal adjustment knobs which on the mechanical ruler to move the specimen onto the required position.

★ Be careful when changing the objective. If you finish the observation with the short working distance objective, and want to change another one, be careful of not letting the objective touch the specimen.

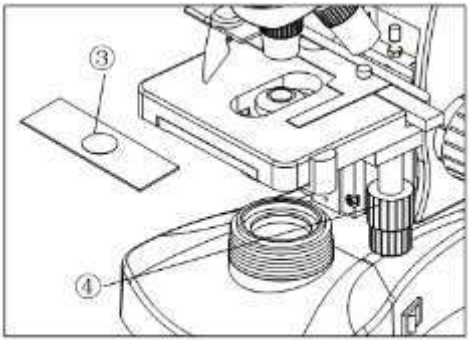


Fig.17

3.2.3 Focusing the specimen (Fig.18, 19)

1. Focus the specimen with 10X objective. To avoid the objective touching the specimen during focusing, you should raise the mechanical stage to let the specimen close to the objective at first, then slowly dispart them to bring the specimen to focus.
2. Turn the coarse focus knob ① (conversely to lower the specimen and search images in the 10×ocular simultaneously and then use the fine knob② to make focus. After that, you can replace with other magnification objectives safely and focus without the risk of damaging the specimen.

★ The tight tension of the coarse focus knob has already been adjusted before leaving factory. If loosen (e.g. the stage slips down by its weight), please screw the intension adjustment collar③ to the right position by the supplied spanner.

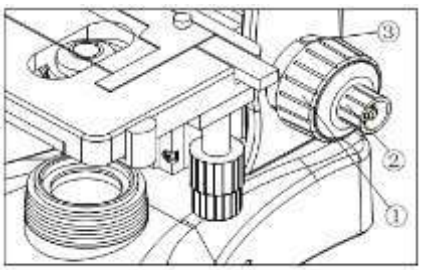


Fig.18

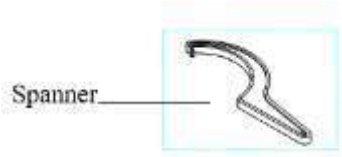


Fig.19

3.3.4 Condenser Adjustment (Fig.20)

Turn the condenser focus knob to move the condenser up and down. Raise the condenser when using the high magnification objective... and descend it when using the low magnification one.

★ The condenser and the objective are coaxial. It has been adjusted well before leaving factory, so the user needn't to adjust them by self (the distance between the top of the condenser and the stage should be in the range of 0.03mm~0.4mm.)

★ The highest position of the condenser has been adjusted too. It also needn't any user's operation.

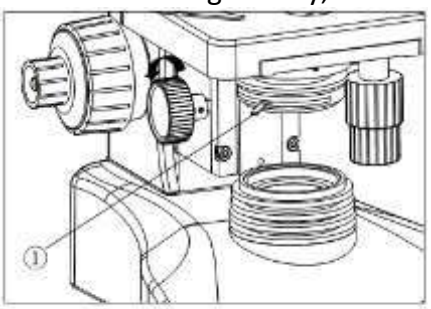


Fig.20

3.3.5 Aperture Iris Diaphragm Adjustment (Fig.20,21)

Turn the aperture iris diaphragm lever① to adjust the aperture iris diaphragm.

★ 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 the size of the aperture diaphragm minified, the brightness and the resolution declined, while the contrast and the depth of field increased; In other words, if the size largen, the brightness and the resolution improved, but the contrast and the depth of field declined.

★ Generally, setting the size of the condenser aperture diaphragm at 70%~80% of the numerical aperture, you can obtain a clear image with enough contrast. If the open of the aperture diaphragm is too small, the resolution were very low, so please don't minify the aperture below 60% of the objective's numerical aperture unless in a special case, for instance, observing an almost transparent specimen.

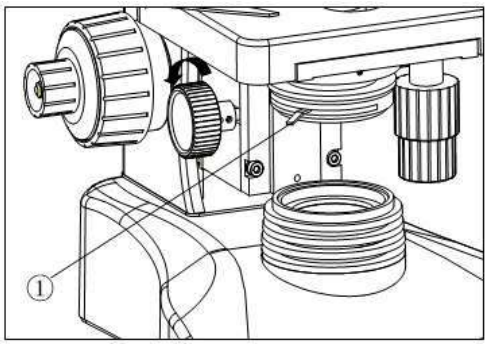


Fig.20

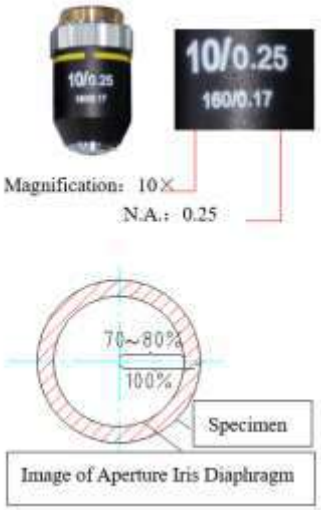


Fig.21

★ The numerical aperture is marked on the objective. For example, the mark "10/0.25" means the magnification is 10×, and the numerical aperture is 0.25.

★ 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.

3.3.6 Adjusting the Interpupillary Distance (Fig.22)

The interpupillary distance range:

- 48mm~75mm.

When observing with two eyes, hold on the left and right prism holders, turn them around the axis to adjust the interpupillary distance until the left and right fields of view coincide completely as shown in Fig.22.

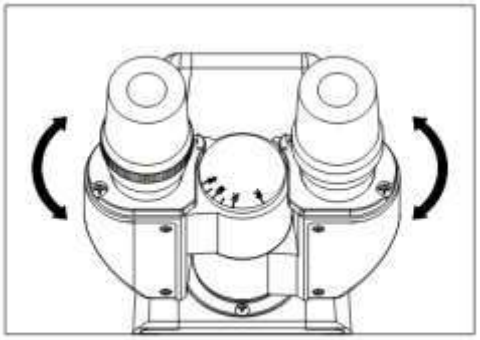


Fig.22

3.3.7 Adjusting the diopter (Fig.23)

1. Looking through the right ocular with your right eye, revolve the coarse and fine focusing adjustment knob to focus on the specimen
2. Then look through the left ocular with your left eye. If the image is not sharp, turn only the left diopter adjustment ring① to focus on the specimen please.

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

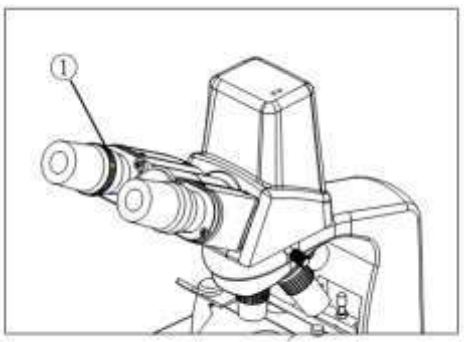


Fig.23

4. Specification Table

4.1 Main specifications

Mechanical Tube Length	160mm
Viewing Head	Compensating free binocular head, , Inclined at 30°, Interpupilary Distance 48-75 mm
Eyepiece	Field of view: ϕ18mm
Nosepiece	Backward Quadruple Nosepiece
Objective	Achromatic objectives 4×， 10×， 40×、100×
Focusing	Coaxial coarse and fine focusing knob; the minimum division of fine focusing: 0.004mm; focusing adjustment range: 24mm
Condenser	Abbe Condenser， NA=1.2 with iris diaphragm

Stage	Double Layers Mechanical Stage 132mm×142mm， Moving Range 74×40mm
Illumination	Halogen Lamp 6V20W or LED 3W

4.2 Eyepieces and Objectives

1. Objectives

Magnification	Numerical Aperture (NA)	Thickness of glass slide (mm)	Focal length (mm)	Working Distance (mm)	Type
4×	0.10	0.17	31.05	18	Dry
10×	0.25	0.17	17.13	6.5	Dry
40×	0.65	0.17	4.65	0.53	Dry
100×	1.25	0.17	2.906	0.13	Oil

2. Eyepieces

Category	Magnification	Focal length f (mm)	Field of view (mm)
Plan eyepiece	10×	24.95	Φ18

4.3 Total Magnification

Eyepiece	10×	10×	10×	10×
Objective	4×	10×	40×	100×
Total Magnification	40×	100×	400×	1000×

5. Outfit

Component Name	Specification	Quantity	Standard Outfit
Main body	Main Standard	1	○
	Double Layers Mechanical Stage	1	○
	Condenser Holder	1	○
Viewing Head	Compensation free digital binocular head	1	○
	USB data wire (2 meters)	1	○
Condenser	Abbe condenser for bright field with iris diaphragm NA=1.2	1	○
Nosepiece	Quadruple	1	○
Illumination	Halogen Lamp 6V20W (or LED 3W)	1	○
	Spare lamp （6V20W Halogen lamp）	2	○
	Spare fuse (50T250V2A or 500mA)	1	○
Eyepieces	10×Plan Eyepieces	2	○
Objectives	Achromatic objective 4×	1	○
	Achromatic objective 10×	1	○
	Achromatic objective 40×	1	○
	Achromatic objective 100×（oil, spring）	1	○
Filter	Baby Blue, Green	1 ea.	○

6. Troubleshooting Guide

1. Optical system

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 not coaxial)	Locate the nosepiece properly where it clicks
	The image of filament is not centered	Center the filament
	A lens (the 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 the 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 coverslip
	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
	Use a unsuitable oil	Change to the specified one
	The size of the aperture diaphragm is too big	Minify it
	There are stains on the incident lens of the binocular tube	Clean it 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 bolt
	The nosepiece is not in the right position	Turning it until it reaches 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	Turn it to the "clicked" position
The image is a little yellow	Not use of the blue color filter	Use the blue filter
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
	There are stains on the lens (including condenser, objective, eyepiece and collector)	Clean it up

2. Mechanical system

TROUBLE	CAUSE	SOLUTION
The image cannot focus when using high magnification objective	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip（0.17 mm）
The objective touches the specimen when changed from low magnification to the higher magnification	The specimen is placed inversely The coverslip is too thick	Turn inversely Use the standard coverslip（0.17 mm）
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 it
Eyes are too tired	No diopter adjustment	Adjust the diopter correctly
	The brightness is not suitable	Adjust the voltage of the lamp

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 The voltage is too high	Use the specified lamp to replace, if the problem is not solved, contact with the service department
The brightness is not enough	Use a substandard lamp The voltage is too low	Use the specified lamp increase the voltage
The bulb flickers or the brightness is vertiginous	The bulb is going to burn out	Replace it
	The bulb is not entirely inserted into the holder	Check and insert it again

Nota importante para los aparatos electrónicos vendidos en España
Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:

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De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

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L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

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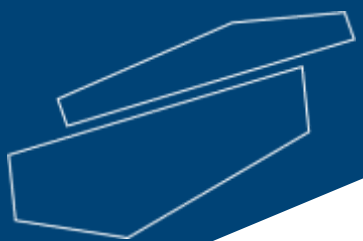
Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.
In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.



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