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A11.2601

Student Biological

Instruction Manual

To ensure the safety and obtain satisfactory performance, please study this instruction manual thoroughly be fore start to use the instrument.

CONTENTS

ATTENTIONS

1. Disassembly only by the professionals

The microscope has been adjusted before shipping, Unprofessional-person should not disassemble and remove any other parts. Disassemble and remove any other parts will result in equipment damage .

If you have any questions, please contact with manufacturer or local distributor.

2. Note the input voltage if correspond

This instrument designed for wide input voltage (100V~240V,50/60HZ), applicable to most area. But if the supply voltage exceeds this range, the instrument will be seriously damaged.

3. Prevent burns and fire

When using power equipment, bulbs and collecting mirror and other nearby parts of the set will rise sharply in temperature until it reaches a thermal equilibrium state. Pay attention to anti-hot logo, they should be careful not be burn when in use.

Alcohol, gasoline, paper and other flammable materials can't near the lamp in case of fire.

4. Notes on replacing the bulb

Replacement should be based on the identity of the instrument using the same specifications of the bulb (3.4V/3W LED or G4 12V/20W halogen), otherwise it may cause equipment damage.

The power supply must be cut off before bulb replacement, the bulb must be cooled off completely before proceeding! Don't left fingerprints,dust or oil on the bulb.

5. Carry and operation

Power must be cut off before moving. Be careful not to crush your finger when placed.

This instrument is a precision instrument, and it should be handle with care, severe shock can cause serious damage to equipment-related parts.

The required available environment for using of the equipment:

Indoor temperature: 0 ℃ ~ 40 ℃ Maximum relative humidity: 85%

High temperature or high humidity may cause mildew, fog or dew of the optical components, and make the instrument not work.

6. This eletrical instrument don't cause electromagnetic interferernce for other device.

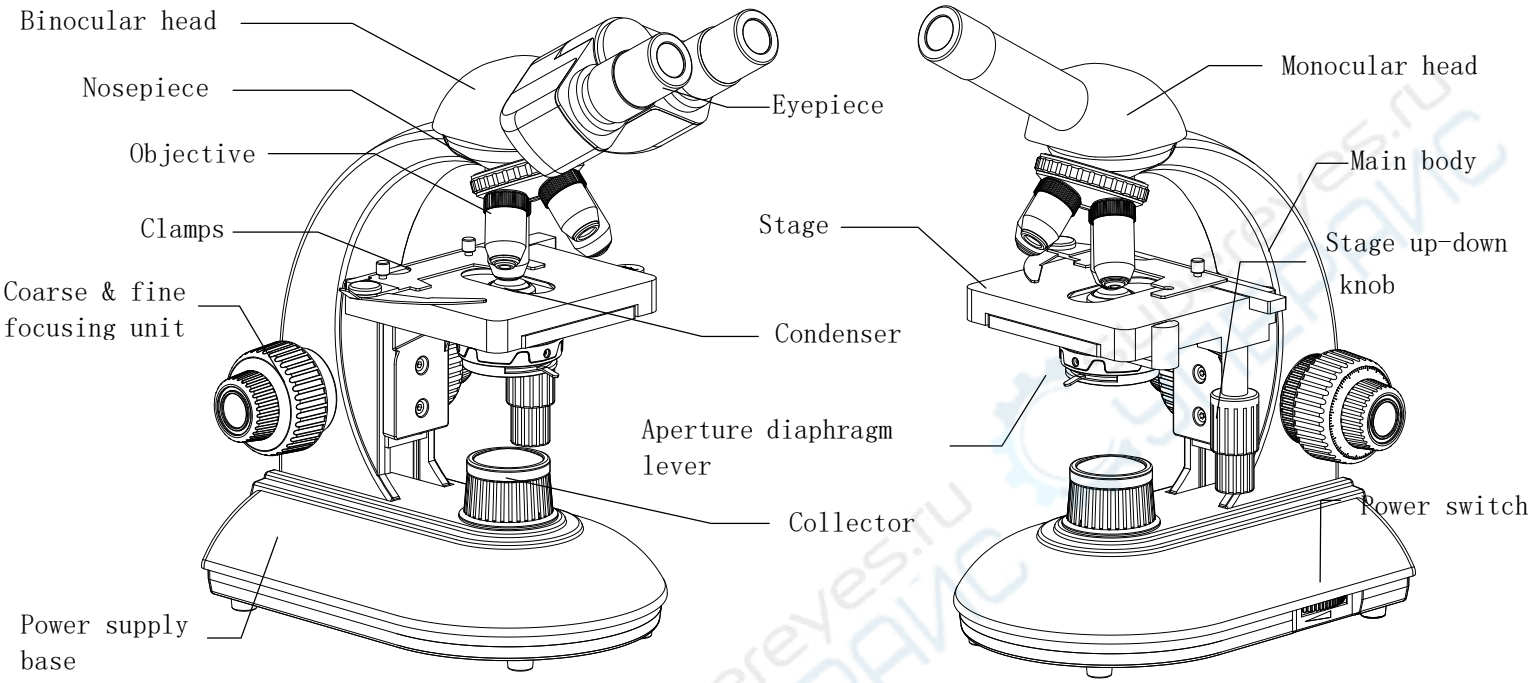

Fig.1 B Series Microscope Outside Drawing

1. Application

B series biological microscope is designed for teaching, clinical verify. The series microscope with original style, steady structure, convenient operation and clear image is suitable for observing various biological specimens, and mostly applied in school, college, hospital, etc.

2. Specifications

Item	B series	
Optical system	Finity	
Mechanical tube length	160mm	
Total Magnification	40X～1600X	
Objective	Category	Achromatic, plan achromatic, semi-plan
	Magnifying power	Based on the standard GB/T 2609.
Eyepiece	Magnification	10X. 16X（Optional）
	Obervation method	Binocular. Monocular (Optional）
	Observation tube	Binocular . Monocular（Optional）, Trinocular（Optional）
	Eyepiece and tube size	φ23.2 $\frac{F8}{h8}$
Nosepiece	Quadruple	
Condenser	Abbe	
Stage	Mechanical stage,Fixed stage（Optional）	
Focusing Unit	Fine adjusting unit, division 0.002mm.	
Illumination	Mirror（Optional）, 3W LED, 12V20W Halogen（Optional）	
Accessory	Photomicrographic device, dark-field illumination unit, microplotter.	

3. Installation and use

3.1 Installation

B series microscope with whole package is convenient for installation. Open the package carton, and insert eyepiece into the eyepiece tube of the head (eyepiece for monocular microscope has been inserted before packing). If objectives don't be fixed, please take objectives out from objectives packing box,

and drive them into the holes of nosepiece orderly and tightly according to the multiplying power in order.

Take out the oil bottle and dust cover, and place it properly for convenient use.

▲Please totally take out the devices in the packaging box.

▲Please don't throw package waste away freely to protect the enviroment.

3.2 Use

3.2.1 Power Supply

Make sure the supply voltage meets the instrument's requirement, then plug in the socket. Rotation potentiometer with switch used by the instrument is for protecting lamp, in case high electric current shock , prolong service time.

3.2.2 Place sample（Fig.2）

✧ Please place specimen on the stage, and the face with cover glass should be up, then clip it with clamp.

✧ Clipping specimen should be careful in order to avoid spoiling glass. Place specimen on the stage levelly.

✧ Making the specimen into optical path by adjusting vertical moving knob and horizontal moving knob.

3.2.3 Condenser（Fig.2）

1．Condenser up-down

Turn the condenser up-down knob to adjust the distance between condenser front and the specimen, and change the equal illumination to obtain the best brightness.

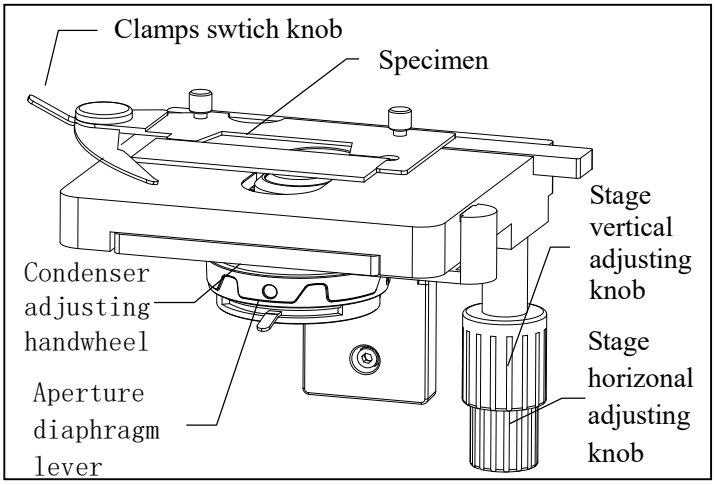

Fig.2 Stage and condenser

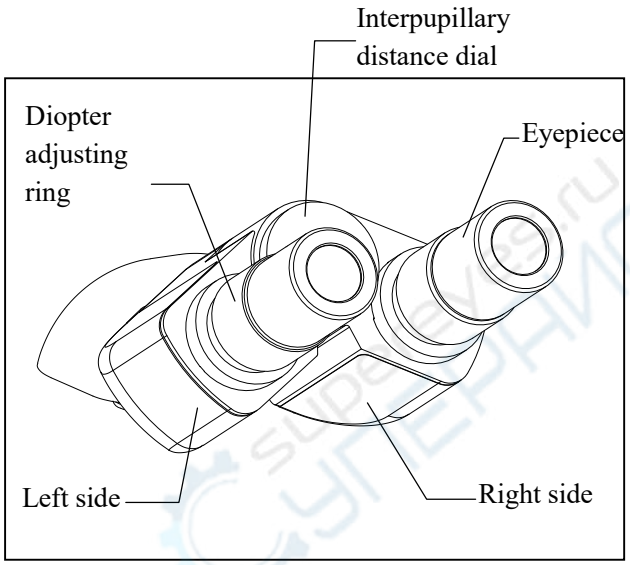

Fig.3 Adjustment of interpupillary distance and diopter

2. Aperture diaphragm adjustment

Rotating the handle of aperture diaphragm of condenser to adjust diaphragm size can adjust the contrast of the specimen.

In general, aperture diaphragm can be adjusted to 70% or 80% of objective exit pupil diameter , will get good image with best contrast.

3.2.4 Adjustment of interpupillary distance and diopter (Fig.3)

1. Adjustment of Interpupillary Distance

Please adjusting binocular tube to make left and right field coincide completely .

▲Interpupillar distance is different for everyone, so interpupillar distance should be adjusted before using binocular microscope.

2. Adjustment of diopter

As focusing for binocular, user should observe right eyepiece with right eye, and make the right eyepiece clear by focusing adjustment, then observe the left

eyepiece, at the same time, adjust the diopter ring of the left eyepiece tube(diopter difference compensation)to make the image of left eyepiece clear as same as the right eyepiece.

3.2.5 Focusing unit（Fig.4）

Usually 10X objective with large field of view and long depth of field should be used for focusing adjustment first.

Take 10X objective into bright path, then observe the specimen with right eyepiece by right eye and turn coarse focusing knob to find the image, then turn slowly fine focusing knob to make the image clear.

All objectives of our microscope are precisely adjusted, and approximate clear image should be found with the other objectives after getting the clear image with 10X objective. If the image isn't enough clear with the other objectives, please turn fine focusing knob slightly to find the satisfactory image.

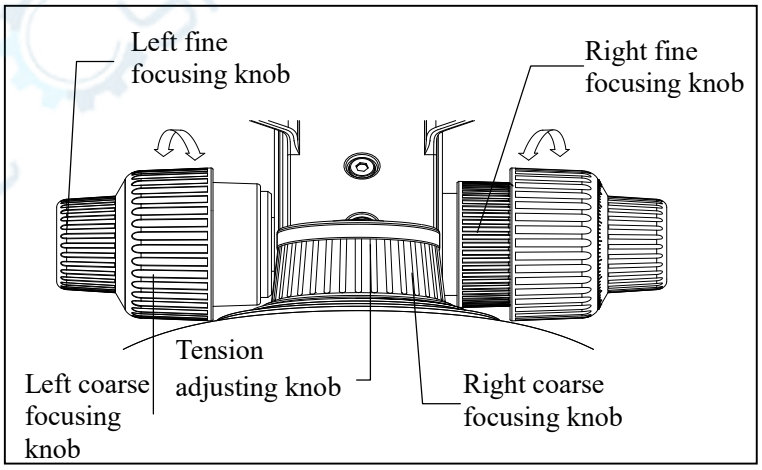

Fig. 4 Coarse & fine focusing knobs and tension adjusting knobs

▲Don't rotate the left & right coarse and fine focusing knobs in reverse direction at the same time, if so, the focusing system will be damaged.

▲Don't directly pull objective to turn nosepiece when user changes the different objectives,if so, optical quality of microscope possibly be affected.The right way

is to take the tooth-like part of the nosepiece to turn it, and make the objective into correct position and into the bright path.

3.2.6 Use of tension adjustment knob (Fig.4)

The tension adjustment ring can adjust the tension of the coarse and fine focusing unit to prevent the stage from sliding down automatically and to improve the comfort of operation. Rotation clockwise makes tension decrease, and by contraries, rotation counterclockwise makes tension increase.

3.2.7 Use of oil immersion objective

The 100X objective can be used for observation even if without immersion oil. But little non-synthetic resin immersion oil or distilled water between the objective and specimens will fully grasp the objective function , bubbles and impurities can't in immersion oil which will affect image.

after adjusting with the 40X objective, adding moderate immersion oil between the front lens of 100X objective and the cover glass of specimen can make the image clearer. Please pay attention that air bubble and impurity can't be in the immersion oil, otherwise, the image would be affected.

▲After immersion oil used, the oil of specimen and the microscope surface should be cleaned with absorbent cotton, lens paper, gauze or soft cotton cloth with moderate mixture of pure industrial alcohol and ether (proportion 1:4)

▲Standard thickness 0.17mm cover glass should be chosen when high times objective used, and thickness error should be within 0.01mm, otherwise, image definition wouldbe affected.

3. 2.8 Use of powersupply

Plug the power line in base socket（Fig.5），plug the other end of power line into power socket. Adjusting LED lamp brightness by slide the base switch.

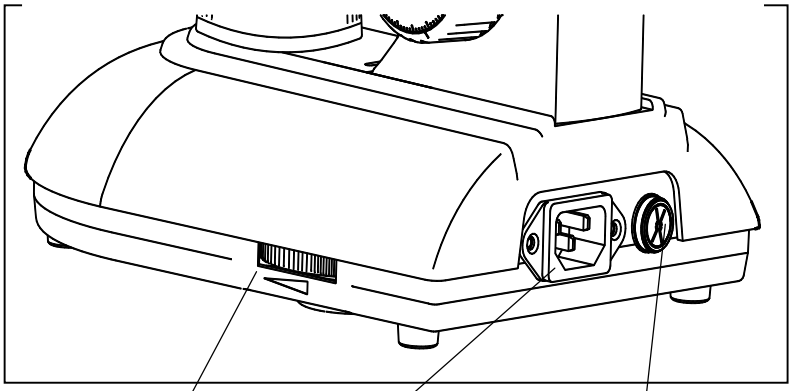

Fig.5 Replacement of fuse

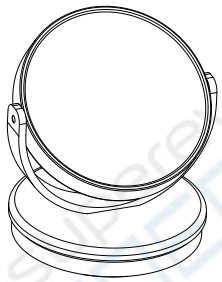

Fig.6 Reflector

3. 2.9 Reflector （Fig.6）

Reflector is optional accessary ,only use without electricity provided.

When use 100X objective ,not recommend reflector for illumination.

Carefully remove the collector from the base and connecting the reflector with the base.

Turning the reflector around the vertical axis so that the reflective side will face to the light direction.At the same time around the central axis to rotate the reflector, reflecting surface and horizontal plane is roughly 45°angle,making the light totally shining on the specimen.Concave mirror is suitbale for large area outdoor lighting source ,such as bright sky etc.

3. 2.10 Cautions after use

✧ Power of microscope should be turned off after using(turning potentiometer with click voice means be closed）, and the plug should be

pulled down. If immersion oil used, please clean objective and specimen soon. Finally, cover microscope with dust cover.

✧ Please take eyepiece and objectives out from microscope if user will stop using it for a long time, and place eyepiece and objectives into drier with drying agent. Cover microscope with dust cover.

4. Maintenance

4.1 Clean

4.1.1 Don't touch the lens with hand, Dust on lens should be cleaned by soft brush or absorbent cotton or cleaned by absorbent cotton, lens paper with the mixture of alcohol and ether (proportion 1:4).

4.1.2 Alcohol and ether all are burnt easily, please take them away from fire. Be careful for turn on and off power.

4.1.3 Don't clean painted metal and galvanizing metal with organic solvent such as alcohol, ether or the mixture of the both. Silicon cloth or soft cleaning preparation is suggested to clean it.

4.1.4 Plastic should be cleaned by soft cloth with clear water.

4.2 Operational environment

4.2.1 This instrument should be placed in cold ,dry , no acid-base steam and anti-corrosive gas environment.

4.2.2 The required operation environment :

Indoor temperature: 0 ℃ ~ 40 ℃ Maximum relative humidity: 85%

4.2.3 Dehumidification equipment is suggested to be installed to avoid fungus

and mist damage when microscope is used in heavy humidity area.

4.2.4 Please pay attention to prevent microscope from violent shake and vibration in application and in carrying. Don't drag it on the surface of worktable to avoid damage microscope and worktable.

4.3 Replacement of bulb

4.3.1 Halogen

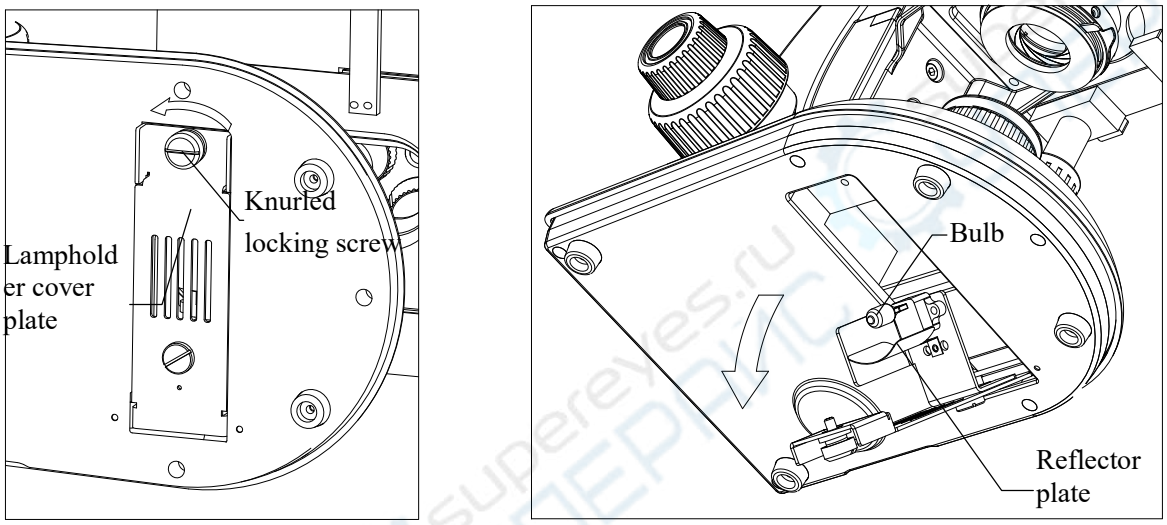

Fig. 7

1. Loosening screw 2. Open lampholder cover, replace bulb, cover the plate and tightening the screw.

A. Turn off power, and pull out plug.

B. Wait for a while unitil the bulb become cool.

▲ Please be sure that the bulb is cool, then follow by the operations.

C. Lay aside the microscope reliably, unscrew the knurled thumb screw of the lamphold cover plate on the underside of base.

D. Pull over the lampholder cover plate.

E. Pull out the broken bulb.

F. Hold a new bulb with silk cloth to avoid fingerprint and dust affect bulb brightness and service life, and insert fully the contact pins into the bulb socket.

G. Close the lampholder cover, and tighten the knurled thumb screw.

4.3.2 LED Lamp

A. Cut off the power: Unplug the power in base.

B. Open the base: Laying the microscope steadily on the table,unscrew the fixed screw and pull out the buttom base cover. (Fig.8)

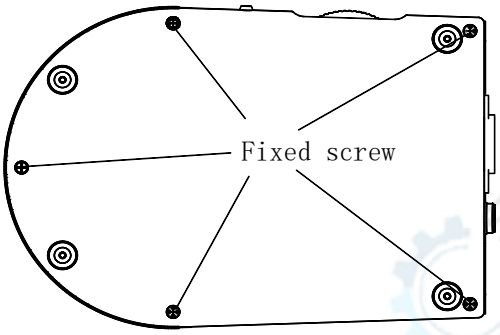

Fig.8

C. Replacement

Take out LED fastening screw，pull out the two power line’s connector for LED and replace LED bulb.Insert new line’s connector separately, fixed the LED bulb on the heat sink base.

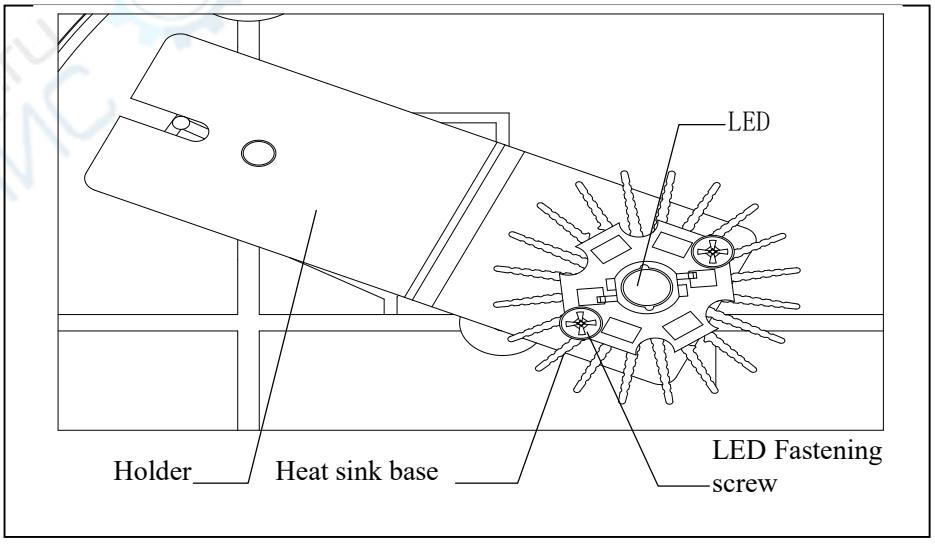

Fig.9 LED Lamp

D. Install the bottom base：Connect the bottom base with fastening screw and keep stable.

▲ After working for above 10 hours continuously, must cut off the microscope about 30 minutes.

4.4 Replacement of fuse（Fig.5）

A. Cut off power of microscope, and pull out the plug.

B. Unscrew fuse cap in the back of base, take out old fuse.

C. Replace a new fuse, then screw the fuse cap.

4.5 Microscope not in use

1. Please cut off power, cover the dust cover, and place it in a cool and dry environment.
2. Objective and eyepiece must be placed in dry container with desiccant.

4.6 Regular checking the microscope for best performance.

▲ To maintain the instrument's performance, suggest checking instrument regularly. If any trouble need to repair, please contact with the anufacturer or local dealer.

5. Troubleshooting

Trouble	Causation	Remedy
Switch on but bulb dark.	Plug is unreliable	Plug in again
	Bulb is broken	Change bulb
	Fuse is broken	Change fuse
Bulb is flickering or brightness is unsteady.	Bulb is unstable	Insert it again
	Bulb is broken	Replacing bulb
Brightness of view field isn't enough or uneven.	Bulb specification doesn't meet the requirement.	Replacing bulb
	Brightness is too low.	Rotating potentiometer to adjust.
	Objective isn't in correct position.	Make the objective in correct position.
	The size of iris aperture is too small.	Adjust the size of iris aperture.

Trouble	Causation	Remedy
	Lens (objective, eyepiece,condenser, light collector) has dust.	Clean it
	Position of condenser is too low.	Higher condenser
Image isn't clear (contrast or definition isn't enough)	Cover glass of specimen doesn't meet the requirement.	Use required thickness cover glass. (0.17mm)
	Cover glass of specimen isn't in up direction.	Place specimen correctly.
	Surface of objective lens is dirty (especially it is easy for the front lens of 40X objective to dip in immersion oil).	Clean it
	Immersion oil isn't used for 100X objective (oil).	Use immersion oil
	Immersion oil doesn't meet the requirement.	Use immersion oil supplied by producer.
	There is bubble in immersion oil.	Clear the bubble way
	Size of iris aperture isn't proper.	Adjust the size of iris aperture.
	Position of condenser is too low.	Readjust the position of condenser.
One side of image is dark or image is moving as focusing.	Objective isn't in correct position.	Make the objective in correct position.
	Specimen isn't placed correctly.	Place specimen levelly on stage and clip it with clamp.
Objective touches specimen as changing low times objective to high times objective.	Cover glass of specimen isn't in up direction.	Place specimen correctly.
	Cover glass doesn't meet the requirement.	Use required thickness cover glass. (0.17mm)
Image observed by two eyes aren't in superposition entirely.	Interpupilary distance isn't adjusted correctly .	Adjust interpupilary distance according to two eyes.
It is easy for eyes to be tired during observing.	Diopter isn't adjusted correctly.	Readjust diopter