



User Manual

Multi-viewing Microscope

BS-2080MH4/4A



BS-2080MH4



BS-2080MH4A

This manual is written for multi-viewing microscope BS-2080MH4 and BS-2080MH4A. For safety, exerting best performance of the instrument, and making you familiar with the instrument entirely, we strongly recommended that you carefully read this manual before using the microscope.

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I. Safety note

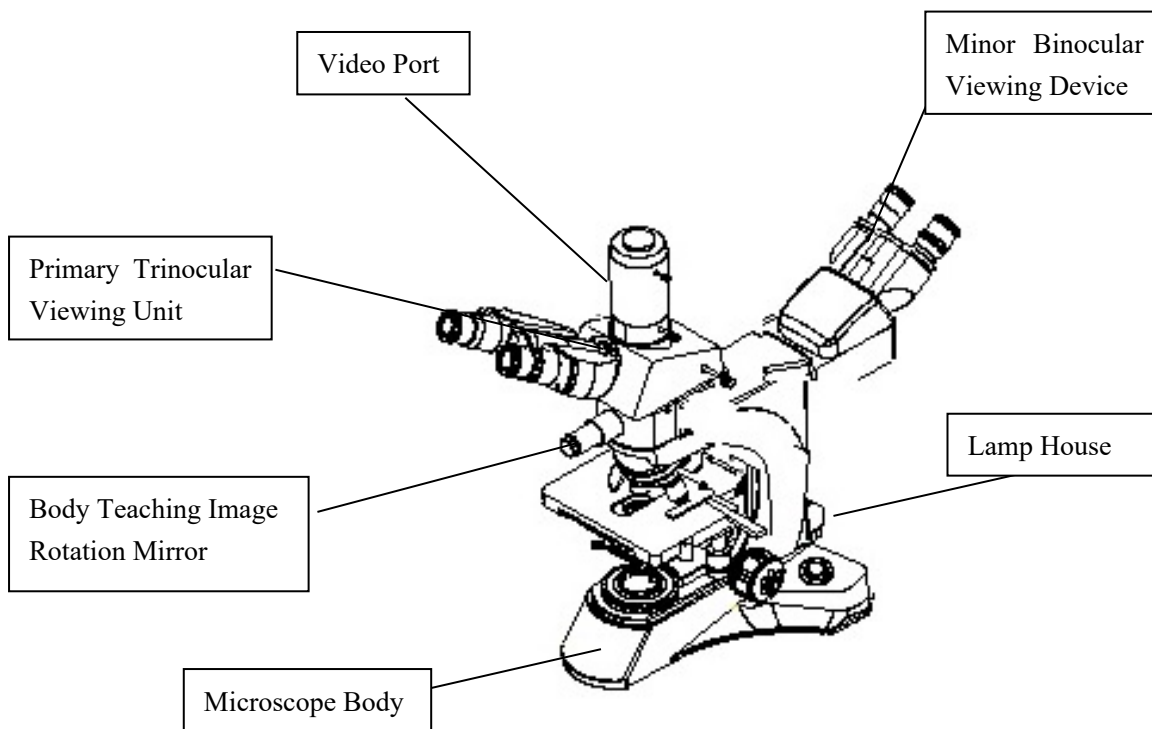
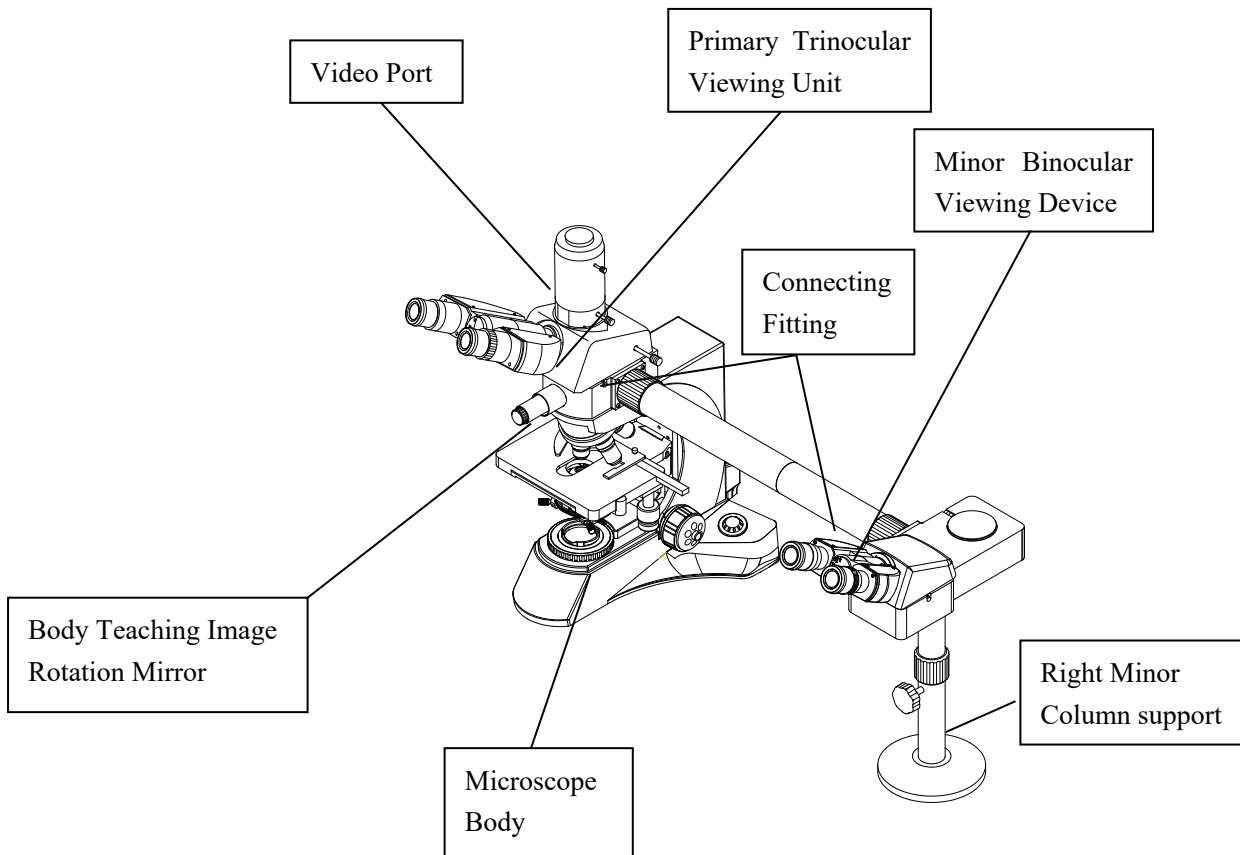
1. Carefully open the box, avoid the accessories, like lens, dropping to ground and being damaged.
2. Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and easy shaking environment. Make sure the stage is smooth, horizontal and firm enough.
3. If the bacterium solution 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.
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 replace the halogen lamp or the fuse, then cut off the power, and do the operation after the lamp bulb and the lamp house completely cool.
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.
8. Use the factory supplied power cord, please.

II. 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, as 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 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. Do wait for the lamp house cooling completely before cover.

1.Name of Components

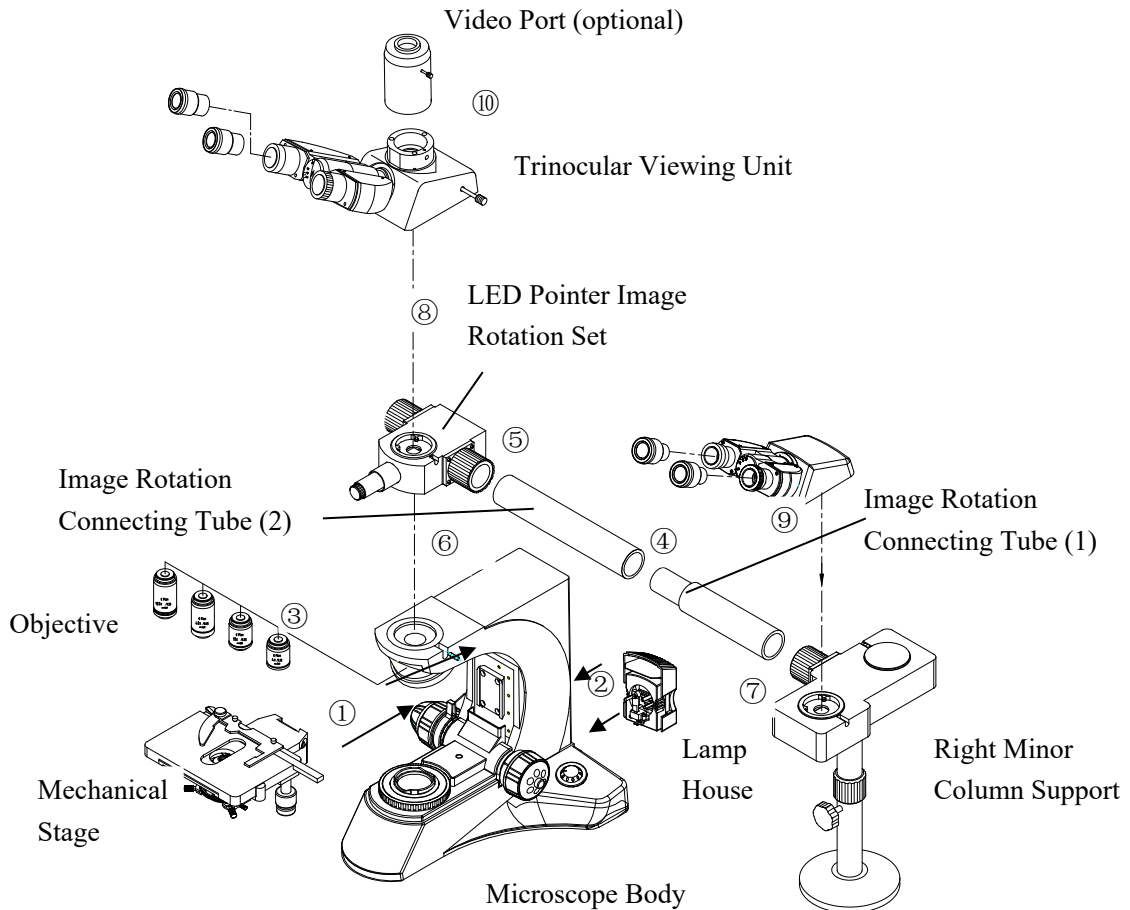
BS-2080MH4/BS-2080MH4A



2. Installation

BS-2080MH4/BS-2080MH4A

2-1 Order of Installation



- ① Installing the Mechanical Stage
- ② Installing the Lamp House
- ③ Installing the Objective
- ④ Connecting Teaching Image Rotation Set
- ⑤ Connecting Left\Right Minor Set
- ⑥ Stack Mounting Teaching Image Rotation Set
- ⑦ Stack Mounting Minor Set
- ⑧ Installing the Trinocular Viewing Unit
- ⑨ Installing Binocular Viewing Device
- ⑩ Installing Eyepiece and Video Port (optional)

*The installation of BS-2080MH4A is similar to BS-2080MH4.

2-2 Installing steps

2-2-1 Installation Body's Chassis

1. Installing the Mechanical Stage Support Device

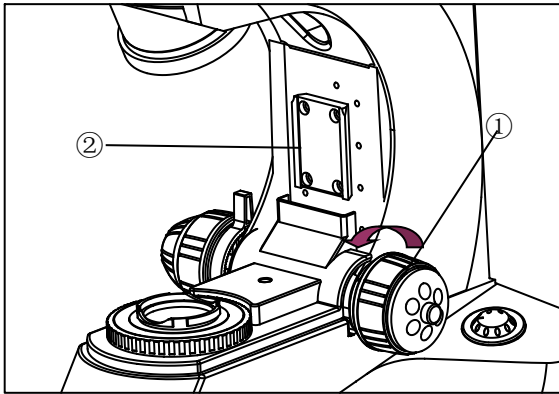


Figure 1

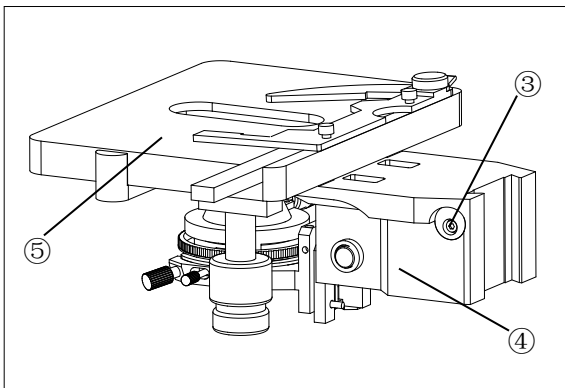


Figure 2

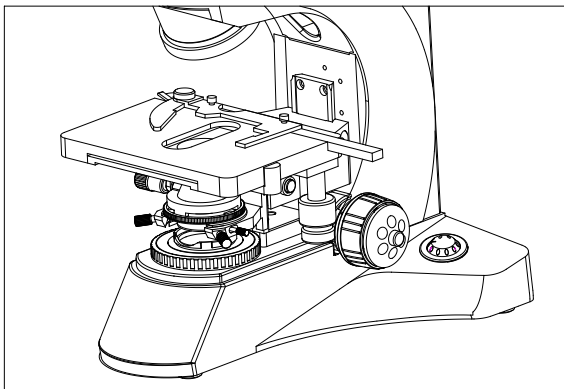


Figure 3

★ Before installing the device, be sure to adjust the coarse focus knob ①. Make the guide board ② (see figure 1) down to the lowest position, so you can install the mechanical stage support device easily.

◇ Hold on the mechanical stage support device (figure 2), place it from the top of the guide board (figure 1), let the device (figure 2) falling free until it reach the limit position. Use the hexagon wrench screw down the locking block ③, make the stage support device (figure 1) and the guide board fixed together.

★ The mechanical stage ⑤ have been adjusted horizontally with ④ and fixed together before leaving factory. Do not disassembly unless necessary, that may affect the observation precision of the instrument.

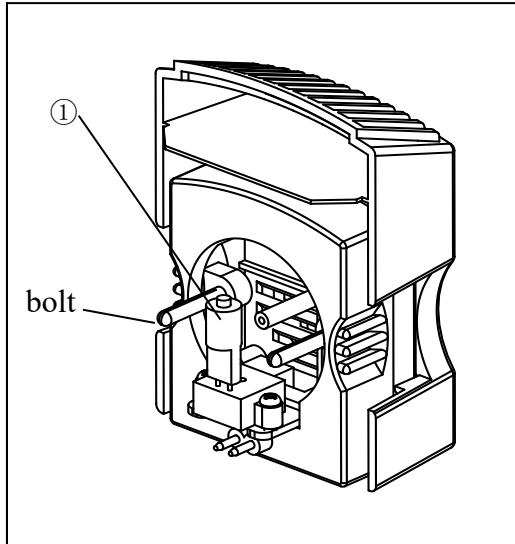


Figure 4

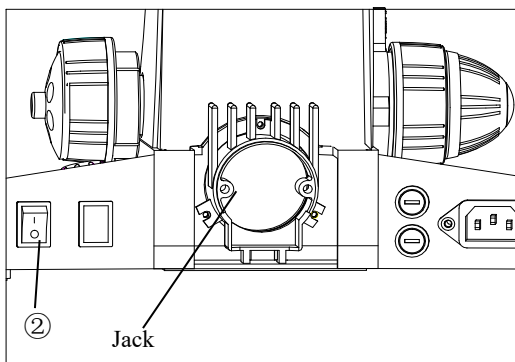


Figure 5

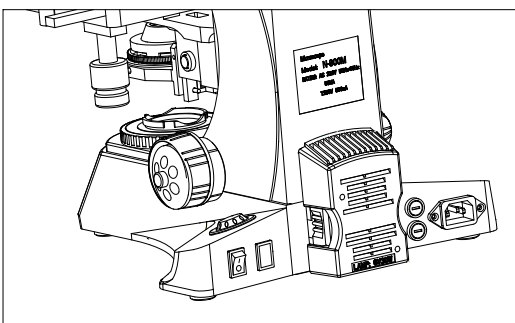


Figure 6

2-2-2 Installing and Replacing the Lamp (figure4, 5)

✧ Please use the specified halogen Lamp 6V30W①.

1. Hold the bulb① after you wrap it with gauze or other protection materials, and then deeply insert it into the lamp holder.

2. Replacing Lamp when using or soon after

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 switch② on “O” (off), pull out power plug, and make sure the bulb, the lamp room and periphery are all cool. Then, you can do your replacing.

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

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

2-2-3 Installing the Lamp House (figure 4, 5, 6)

✧ Keep the bolt on the lamp house (figure 4) in line with the jack on the back of the microscope (like the show of figure 5), then pushing the lamp holder into the illumination kits gently until they are against each other (figure 6).

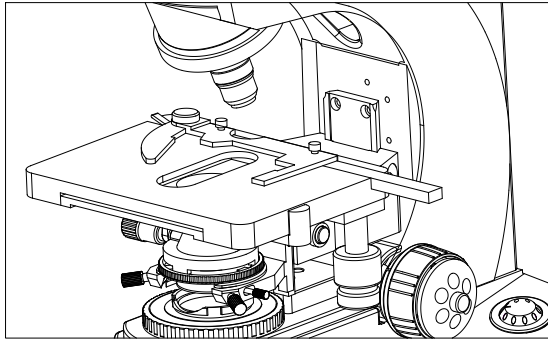


Figure 7

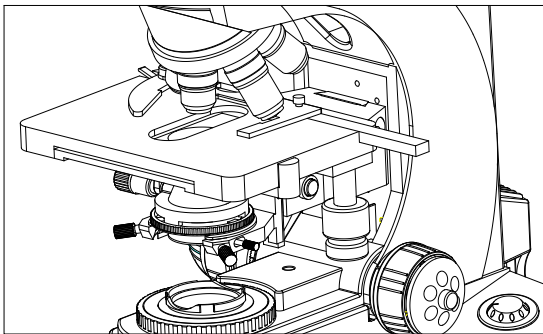


Figure 8

2-2-4 Installing the Objective

1. Adjusting the coarse focus knob until the support device of the mechanical stage reach its low limit position.
2. Wresting the lowest magnification objective onto the nosepiece from the left or the right side (figure 7), then push the nosepiece clockwise, then place other objectives by the sequence of low to high magnification (figure 8).

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

★ **Clean the objective regularly, the objective of the inversed microscope is very sensitive to dust.**

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

★ **When replacing the objective, slowly turning the nosepiece until you hear “clicked”, that means the objective enter the required position--the light path center.**

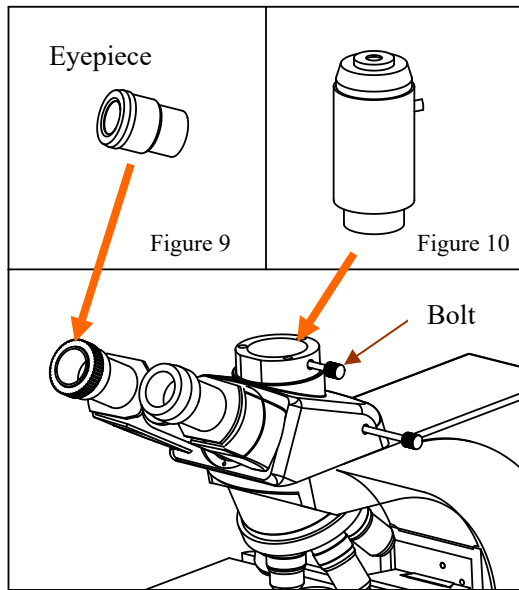


Figure 11

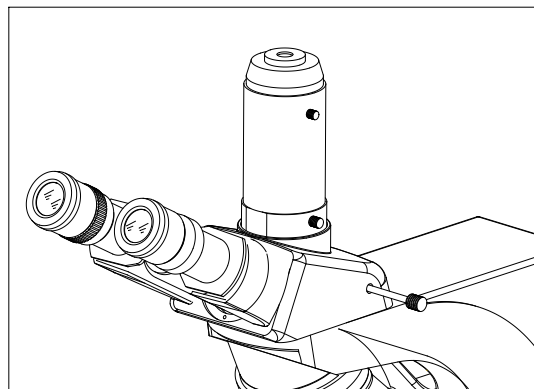


Figure 12

2-2-5 Installing Eyepiece

Pull out the lid of eyepiece which on the eyepiece tube, insert eyepiece (figure 9) into eyepiece tube until end. The result is showing in the figure 12.

2-2-6 Installing Video Port (optional)

4. Insert the video port (figure 10) into the trinocular unit (figure 11), then screw down the bolt to fix it, the result is showing in figure 12.

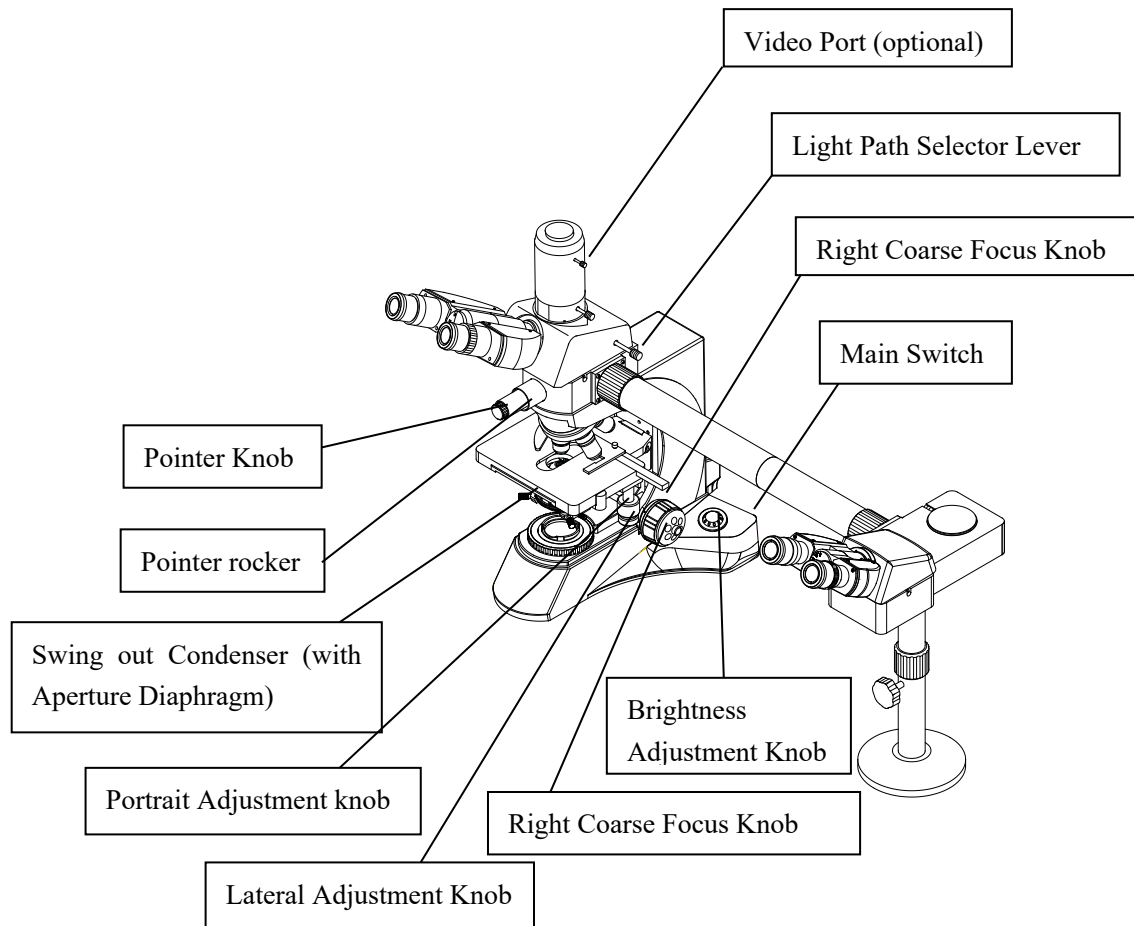


Figure 13

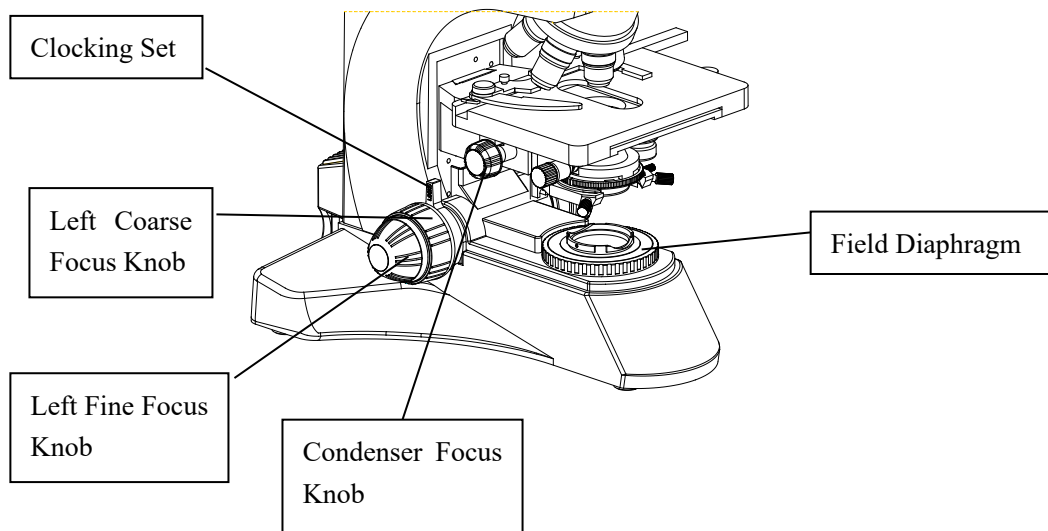


Figure 14

4. Operation

BS-2080MH4/BS-2080MH4A

4-1 Primary Set Operation

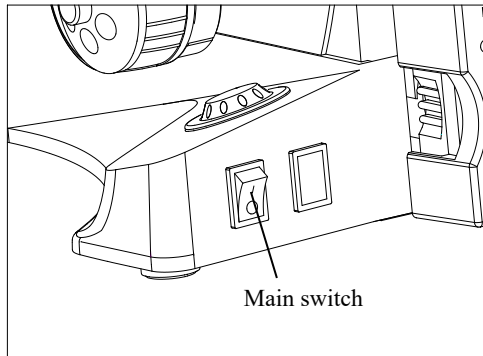


Figure 15

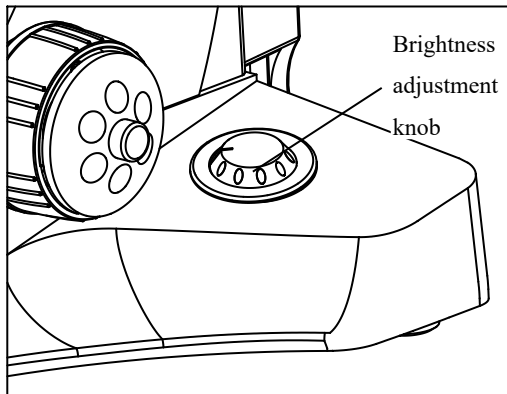


Figure 16

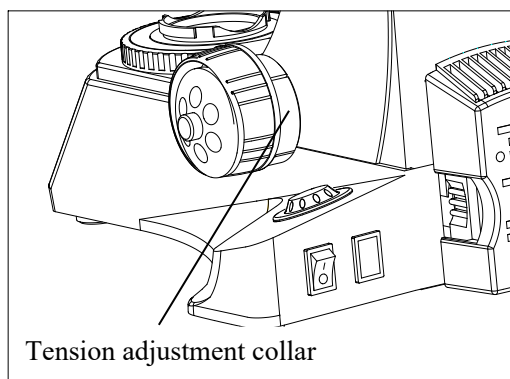
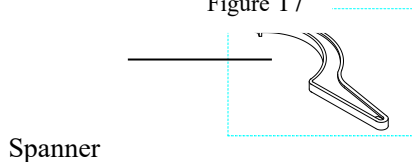


Figure 17



4-1-1 Turning on the Lamp (Figure 15)

Connect the power, turn on the main switch to “—”(on).

4-1-2 Adjust Brightness (Figure 16)

Turning the brightness adjustment knob clockwise, the voltage raise, and the brightness strengthen; turning with the anti-direction, the voltage decline, and the brightness weaken.

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

4-1-3 Adjust the Tension Adjustment Collar (Figure 17)

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

4-1-4 Placing Specimen(Figure 18)

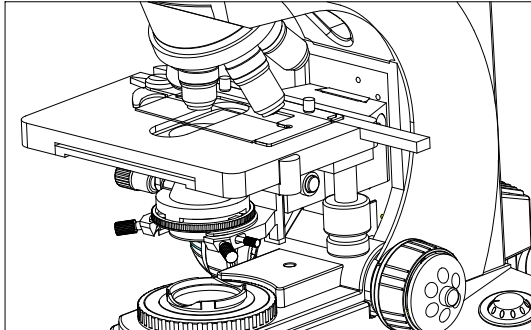


Figure 18

Place the slide on the mechanical stage. Use the stage clips to clamp the slide gently.

Turn the portrait and lateral adjustment knob of the mechanical ruler, 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.

4-1-5 Adjusting the Interpupillary Distance (Figure 19)

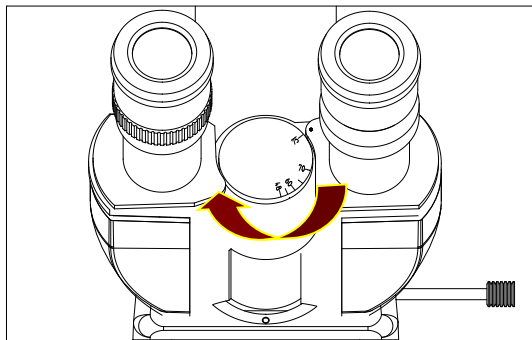


Figure 19

The interpupillary distance range: 48mm~75mm. When observing with two eyes, hold on the left and right prism holder, turn around the axis, adjusting the interpupillary distance until the left and right fields of view coincide completely.

4-1-6 Adjusting the Diopter (Figure 20)

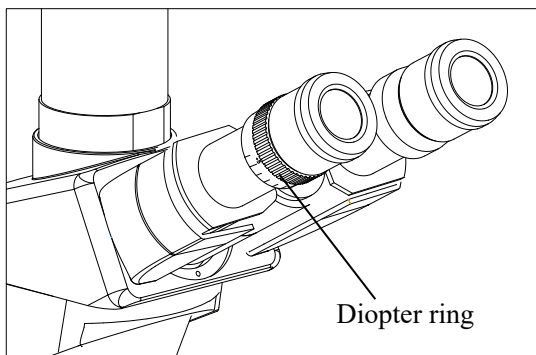


Figure 20

The right ocular tube is fixed. So by turning the left diopter ring after the right ocular focus on the specimen, the operator who's left and right eye has different eyesight can obtain a comfortable focus position with both eyes.

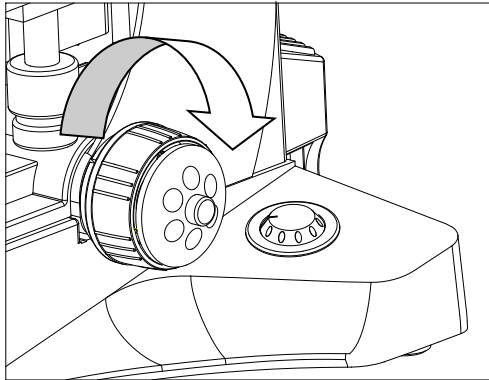


Figure 21

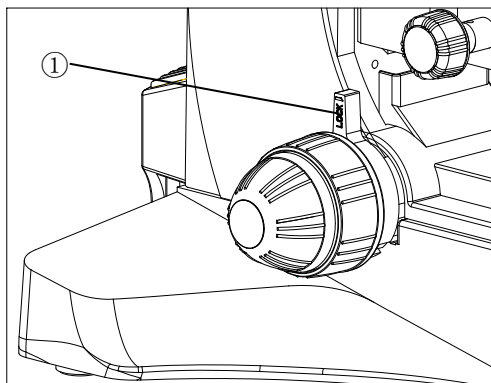


Figure 22

4-1-7 Focus (figure21, figure22)

1. When not using the video set

Push in the light path selector lever (figure 26) completely, then observe with both eyes. Use the 10×objective 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.

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 to focus. At this moment, you can replace other magnification objectives safely, and focus without the risk of destroying the specimen.

2. When using the video set

Pull out the light path selector lever (see figure25), observe with both eyes, when the image is sharp, you can see the pictures directly on the video screen which connected by the microphotograph system through the video mount.

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

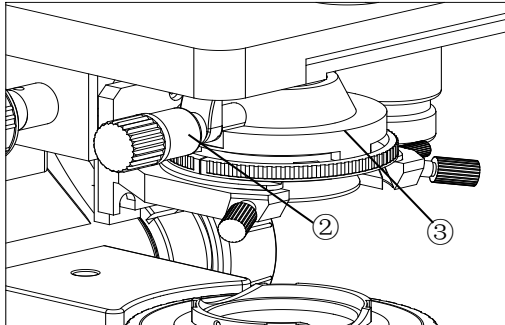


Figure 23

4-1-8 Adjusting the Swing out Condenser (Figure 23)

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

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

Turn the condenser focus knob to shift the condenser. It needs to raise the condenser when using the high magnification objective, and to decline when using the low magnification one.

1. Using the Swing out Condenser

When using the low magnification objective, turn out the condenser, and let it away from the light path. While using the high magnification objective, turn it into the light path.

2. Adjusting the Aperture Diaphragm

The aperture diaphragm is designed for the adjustment of the numerical aperture, not for the brightness. Generally, reducing the diaphragm opening to 70- 80% of the N.A. value of the respective objective will provide an image of acceptable quality. If you want to observe the image of the

4-1-9 Adjusting the Field Diaphragm (Figure 24)

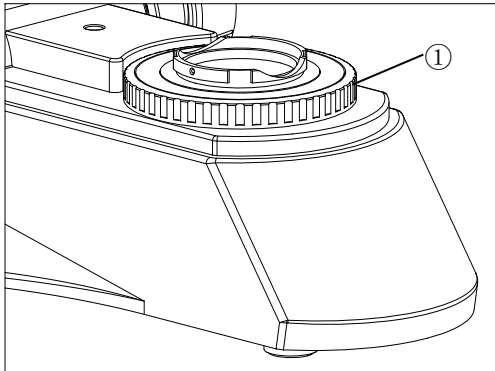


Figure 24

The control for the field diaphragm is a ring used for adjusting the area of field diaphragm. When using, turn the ring ① to reduce the field diaphragm, look into the field, if the diaphragm image is faintness, do the follow steps: first, turn the condenser focus knob, shift the condenser holder to the position where the observed image of the field of view is sharp; then open the field diaphragm, let the image full of the field of view, reduce the mixed light, improving the quality of the image.

4-1-10 Adjusting Pointer (figure 25)

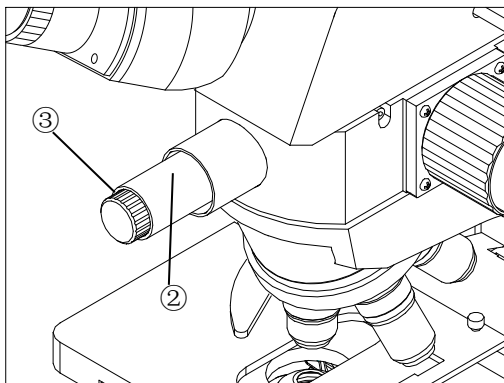


Figure 25

When the image is sharp by observe with both eyes, the image of pointer will on the field of view simultaneity. If not, you can turn the pointer rocker ② in four direction (up, down, left, right) gently, make the pointer on the field of view. If the image of pointer is unclear, you can turn the pointer knob ③ to adjust the lightness until turn up a green sharp image.

- ★ Please gently when turn the pointer rocker or spin the pointer knob, to protect inner circuit of the pointer knob.

4-1-11 Switching the Light Path Selection (Figure 26)

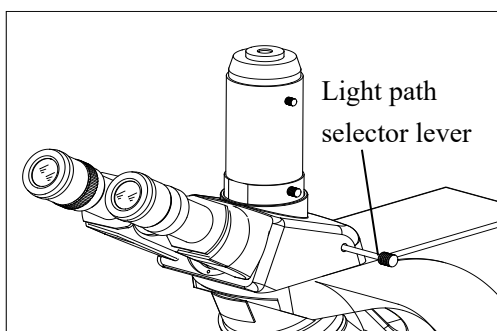


Figure 26

When the light path selector lever on the trinocular viewing set is pushed in, all the light enters the binocular tube, so you can do the binocular observation. While the lever pull out, some part of light enters the binocular tube, the left go up, enter the video tube, so you can observe through the video equipment.

4-2 Adjusting Minor Set

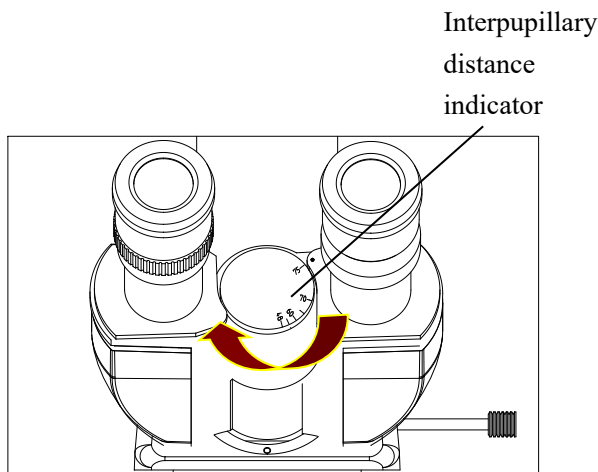


Figure 27

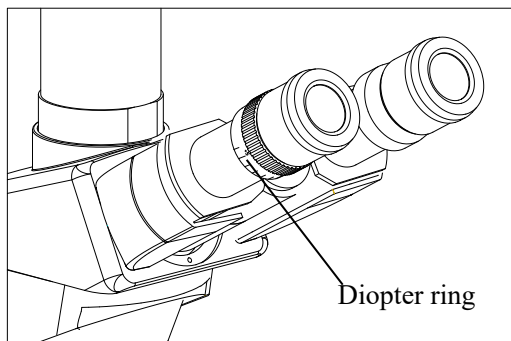


Figure 28

4-2-1 Adjusting Interpupillary Distance (figure27)

After adjusting the Primary set, observing the minor set, it will be a sharp image simultaneously. When observing with two eyes, hold on the left/right prism border, turn around the axis, adjusting the interpupillary distance until the left/right fields of view coincide completely.

4-2-2 Adjusting Diopter(figure28)

By turning the left diopter ring after the right ocular focus on the specimen, the operator whose left and right eye has different eyesight can obtain a comfortable focus.

4-2-3 Adjusting Pointer (figure25)

It will be a clear green pointer image after adjusting the Primary set, if the pointer not clear or invisible, you can turn the pointer knob moderately or turn the pointer rocker in four direction (up, down, left, right) gently to adjust lightness and height of the pointer, which will see the clear pointer image simultaneous on the field of view of primary set and minor set.

5. Technical Specifications
BS-2080MH4/BS-2080MH4A
I. Main specifications

Optical System	Infinite Optical System
Viewing Head	Compensation free trinocular head, inclined at 30° , Interpupillary distance: 48-75mm
	Compensation free binocular Head, Inclined at 30° , Interpupillary distance:48-75mm
Eyepiece (Ocular)	Exceed wide field ocular EW10X/22, tube Φ 30 matched
Nosepiece	Backward Quintuple Nosepiece
Objective	Infinite plan Achromatic: 4×, 10×, 40×, 100×, 20× (optional)
Focus System	Coaxial Coarse and Fine Focusing System, Sensitivity and Graduation of Fine Focus: 0.001mm
Stage	Double layer mechanical stage, area: 185×142mm, movement range: 75×55mm
Koehler Illumination	Exposed illumination system, Aspheric collector, halogen lamp 6V30W
Condenser	Swing out condenser NA0.9/0.25

II. Configuration Table

Viewing Head	Compensation Free Trinocular Head	●
Eyepiece	Extra Wide Field Eyepiece	●
Objective	Infinite plan objective: 4×, 10×, 40×, 100×	●
	Infinite Plan Objective: 20×	○
Condenser	Swing out Condenser NA0.9/0.25	●
Video Accessories		○
Video Mount	C Mount 1×	○
	C Mount 0.5×	○
Polarization Device		○
Turret Phase Contrast Device		○
Dark Field Device		○
Fluorescent Attachment		○
Temperature Control Device		○

Note: ●Standard outfit, ○ Optional

III. Objective Specifications

Magnification	Numerical Aperture(N.A)	Working Distance(mm)	Thickness of Cover Slip	Conjugate Distance(mm)	Magnification Sign (Color loop)
4X	0.10	25.42	0.17	∞	Red
10X	0.25	11	0.17	∞	Yellow
40X	0.65	0.75	0.17	∞	Baby Blue
100X	1.25	0.21	0.17	∞	Black and White Circle

6. Trouble Shooting
BS-2080MH4/BS-2080MH4A

PROBLEMS	REASON FOR PROBLEMS	SOLUTION
I. Optical Part:		
1. The edge of the field of view has shadow or the brightness is asymmetry	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 filament shadow not in center	Adjust it to center
	The surface of the lens has contaminant (condenser, objective, eyepiece, Collector lens)	Clean the lens
2. Find dust and stain in the field of view	The surface of the lens has contaminant (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 contaminant (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 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
The position of condenser is too low	Adjust its position	

4. The image 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
	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
5. 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
6. The image seems yellow slightly	Not use the blue filter	use the blue filter
7. The height of the brightness is not enough	The opening of Aperture diaphragm is too small	Adjust it again
	The position of condenser is too low	Adjust its position
	The surface of the lens has contaminant (condenser, objective, eyepiece, Collector lens)	Clean the lens

II. 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 touch the cover glass when it change 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 is 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 your sight
	The brightness of illumination is not properly	Adjust the bulb voltage
III. 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 burn out	Change a new bulb
2. The bulb burn out suddenly	Not use the specified lamp The voltage is too high	Use the required lamp, if the situation has not change after replacing the bulb, please connect with maintenance department
3. The height of the brightness is not enough	Not use 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 plug in the socket correctly	Check it and plug in the socket firmly