

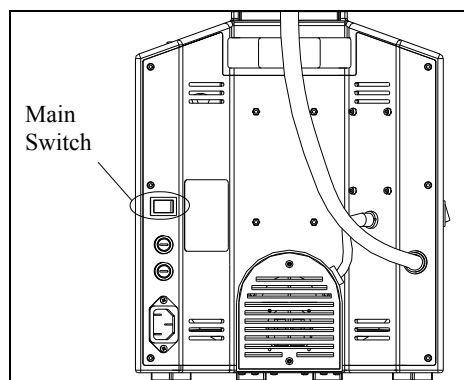
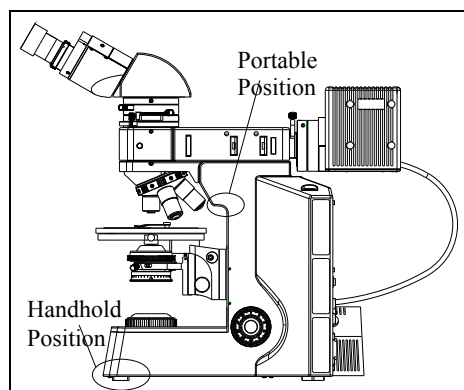
A15.0908 Series Polarizing Microscope INSTRUCTIONS

This instruction manual is for the operation guide, troubleshooting and maintenance to the A15.0908 Series Polarizing Microscope. Please study this manual thoroughly before operating, and keep it with the instrument. The manufacturer reserves the rights to the modifications by technology development. On the basis of operation ensured, technical specifications may be subject to changes without notice.

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1. Operation Notice



1. As the microscope is a high precision instrument, always operate it with care, and avoid physical shake during the operation.
2. Do not expose the microscope in the sun directly, either not in the high temperature, damp, dust or acute shake. Make sure the worktable is flat and horizontal. Following environment is required when operating: Indoor temperature: 5 °C ~ 40 °C, Max relative humidity: 80%.
3. When moving the microscope, use one hand to hold its front base and the other hand to hold its arm, and lay it down carefully (See the Fig. left).
★ It will damage the microscope by holding the stage, focusing knob, head or light source when moving.
4. When working, the surface of light source will be very hot. Make sure there is enough room for the heat dissipating around the light source.
5. Connect the microscope to the ground to avoid lightning strike.
6. For safety, make sure the power switch is at "O" (OFF) and power it off before replacing the bulb or fuse (See the Fig. left), and wait until both the bulb and bulb holder have cooled down.
★ Bulb selected only: 12V/50W Halogen bulb.
7. Wide voltage range is supported as 100~240V. Additional transformer is not necessary. Make sure the voltage is in this range.
8. Use the special wire supplied by our company.

2. Maintenance

(1) Wipe the lens gently with a soft tissue. Carefully wipe off the oil marks and fingerprints on the lens surfaces with a tissue moistened with a small amount of 3:7 mixture of alcohol and ether or dimethylbenzene.

★ As the alcohol and ether is flammable, don't place these chemical near to fire or fire source. For example, when turning on/ off the electrical device, please use these chemical in a ventilated place.

(2) Don't use organic solution to wipe the surfaces of other components. Please use the neutral detergent if necessary.

(3) If the microscope is damped by liquid when using, power it off immediately and wipe it dry.

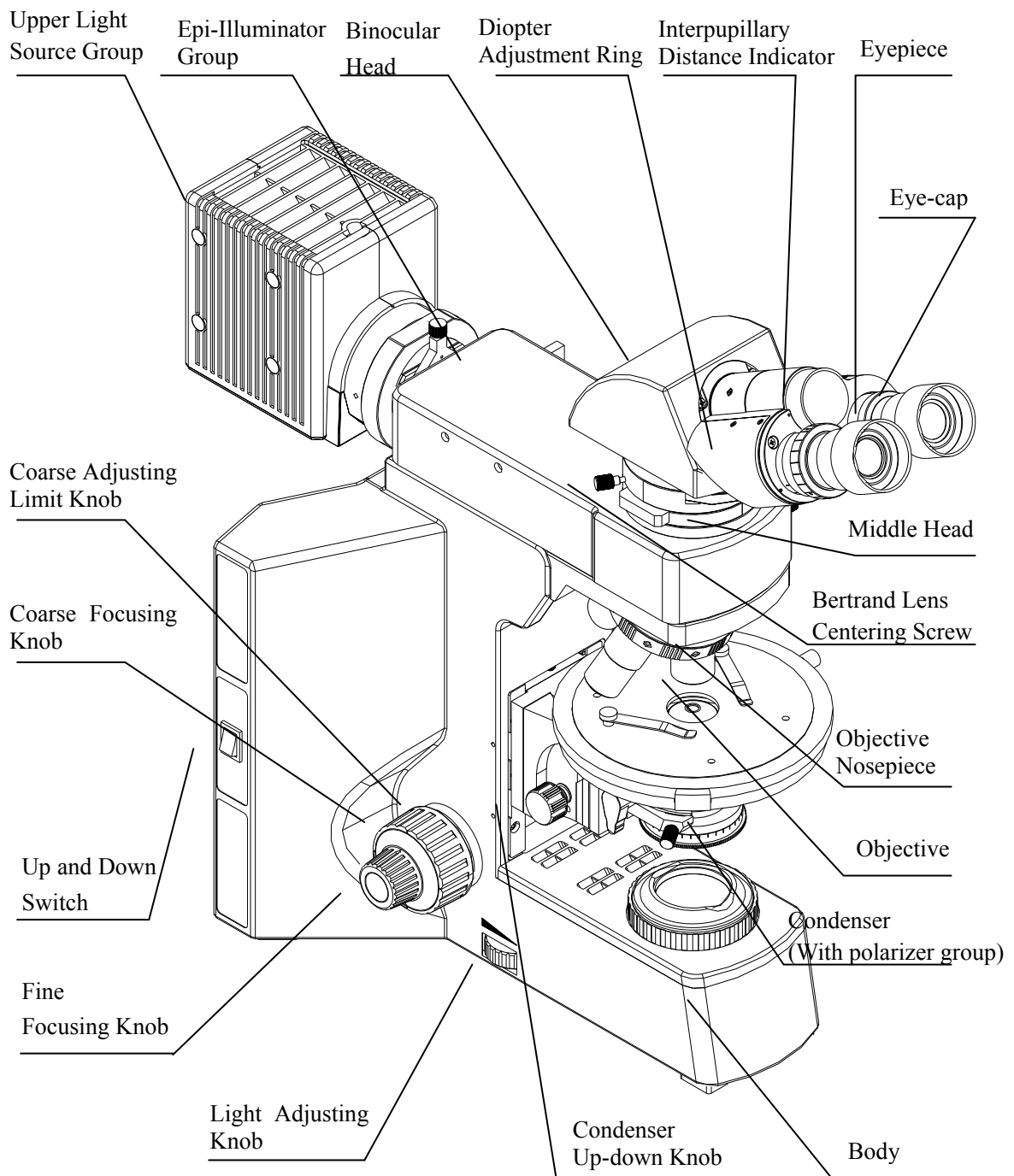
(4) Never disassemble the microscope, otherwise the performance will be affected or the instrument will be damaged.

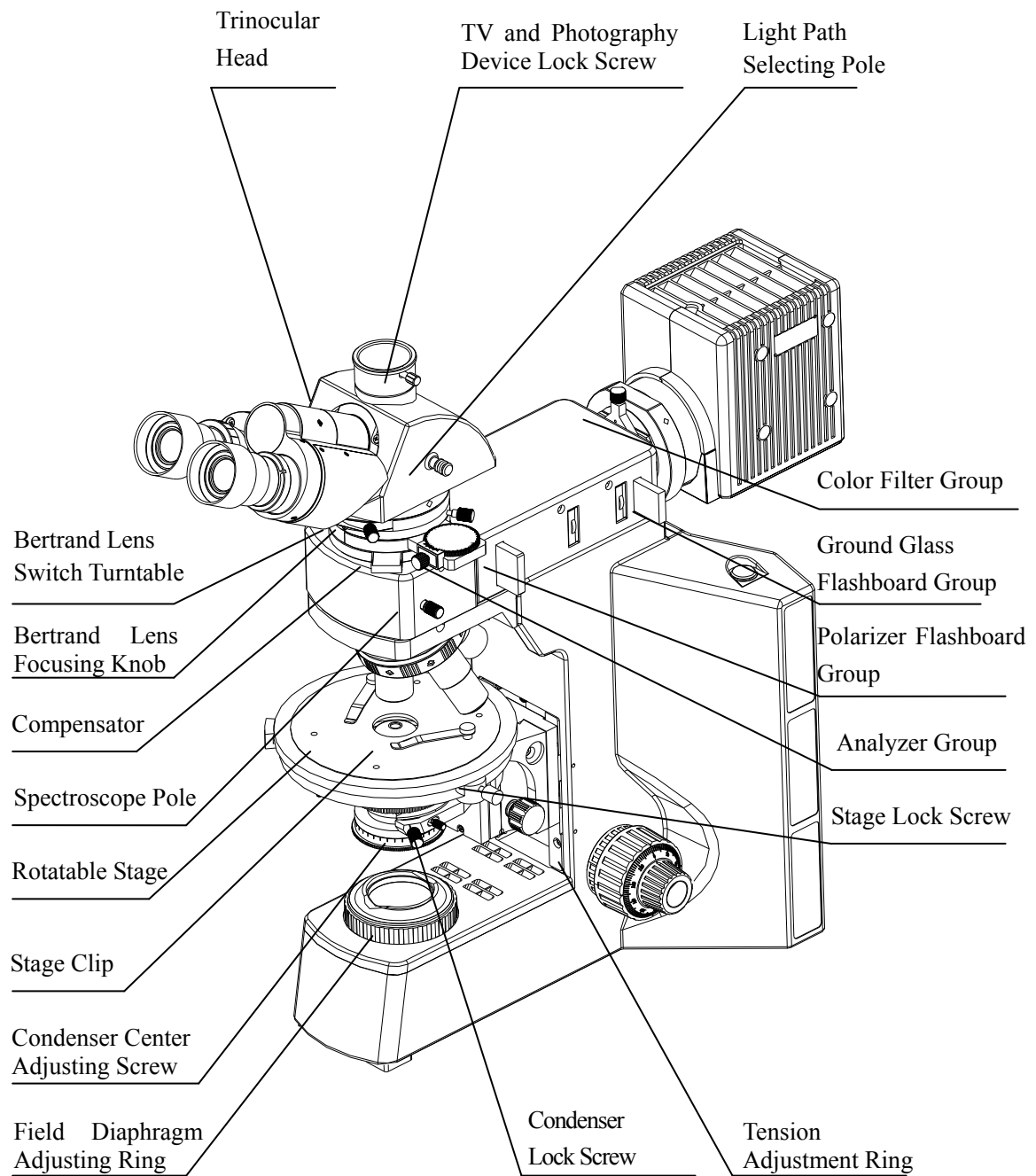
(5) After using, cover the microscope with a dust cover.

3. Safety Sign

Sign	Signification
	The surface gets hot and don't touch it with bare hand.
	Study the instructions before use. Unsuitable operation would lead to person hurt or instrument faulty.
	Main switch ON
O	Main switch OFF

Polarizing Microscope Components

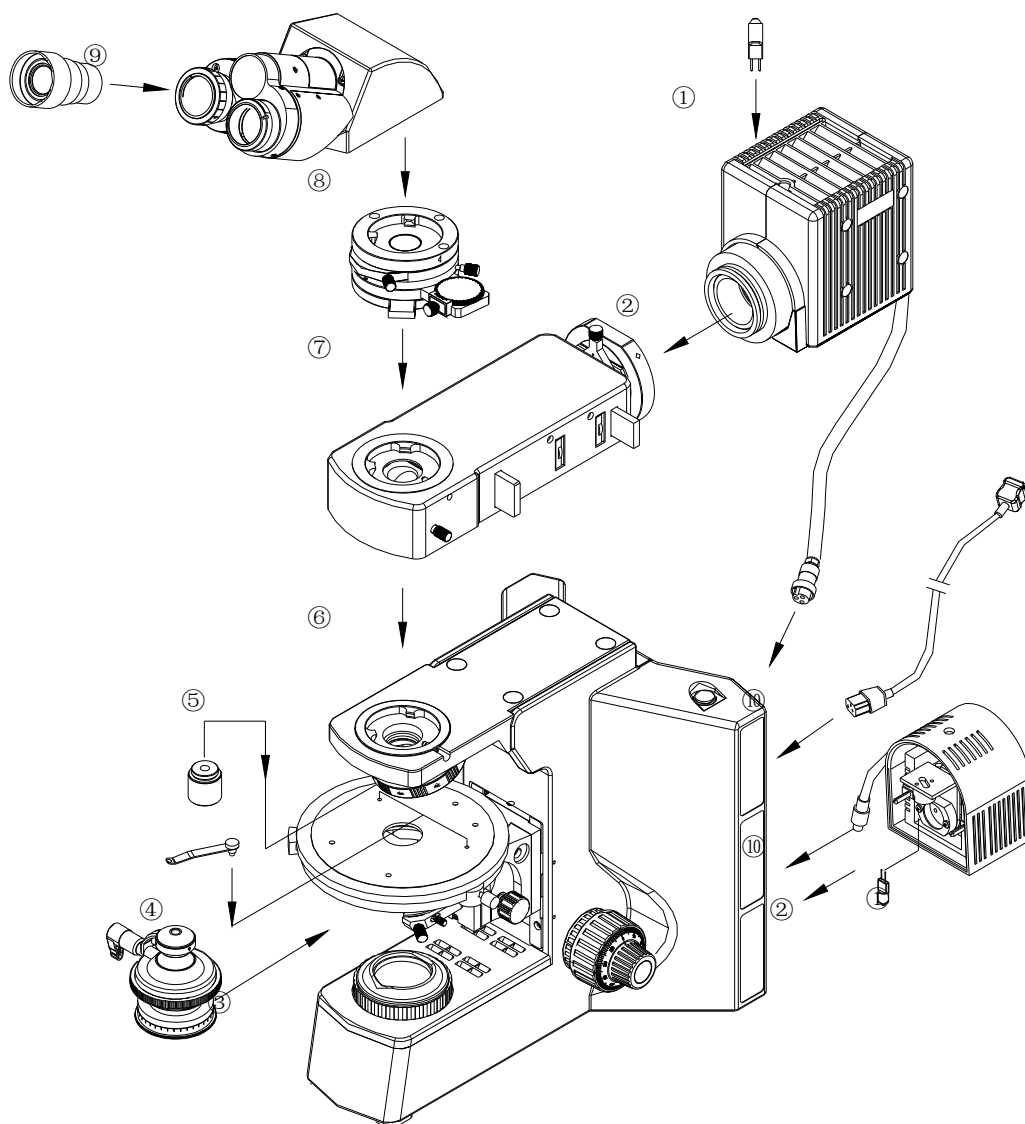




2-1 Assembling Scheme

Following is the Assembling Scheme, and the numbers denote the assembling order.

★ Before assembling, make sure there is no dust or dirt. Assemble carefully and do not scrap any part or touch the glass surface.



2-2 Assembling Steps

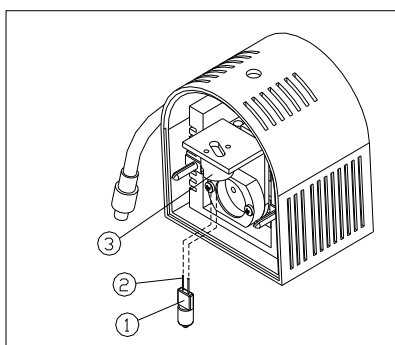


Fig.1

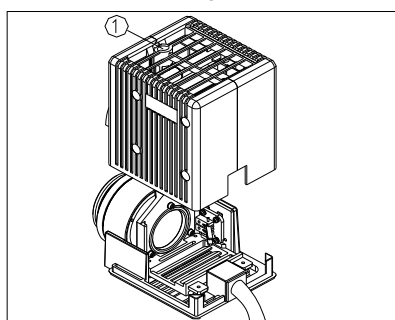


Fig.2

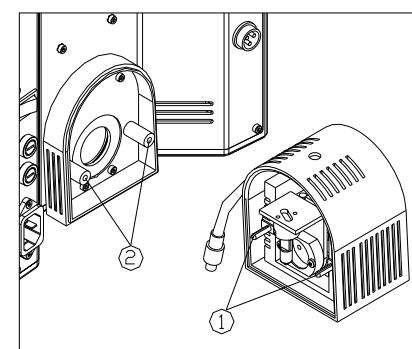
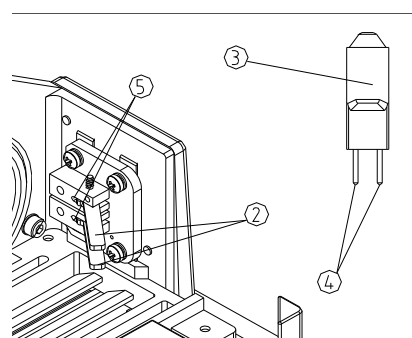


Fig.4

2-2-1 Assemble and Replace the Halogen Bulb

◎For Transmitted Illumination

When assembling the halogen bulb for transmitted illumination, hold the bulb ① with clean glove or tissue and insert the pins ② into the receptacles ③. Make sure the bulb is vertical (See Fig. 1).

◎For Reflected Illumination

(1) Loosen the lock screw ① with the M4 inner hexangular spanner which is equipped with the microscope, to take off the cover group (See Fig. 2).

(2) Open the bulb lock sheet ②, hold the bulb ③ with clean glove or tissue and insert the pins ④ into the receptacles ⑤. Make sure the bulb is vertical (See Fig. 3).

(3) Loosen the bulb lock sheet ② to lock the bulb, and put on the cover group.

★Before replacing, cut off the main power supply, and wait until the bulb and bulb holder have cooled down.

★Bulb selected only: 12V/50W HAL Bulb(Philips 7027).

★Don't touch the bulb with fingers. If there is fingerprint on it, clear it with clean tissue.

2-2-2 Assemble the Light Source Group

◎For Transmitted Illumination

Match the guide pins ① of bulb base with the guide receptacles ② of microscope body, and push the light source group into the microscope body thoroughly. (See Fig. 4)

◎For Reflected Illumination

(1) Fully loosen the lock screw ① of the reflected illuminator. (See Fig. 5)

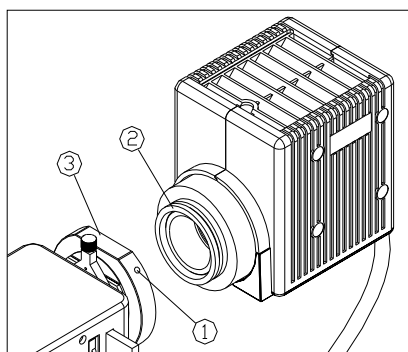


Fig.5

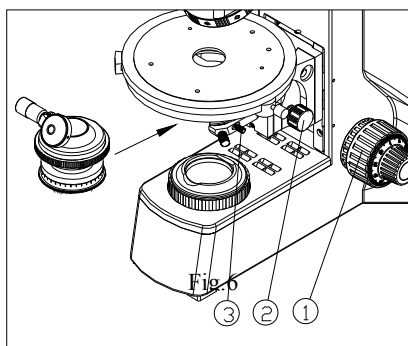


Fig.6

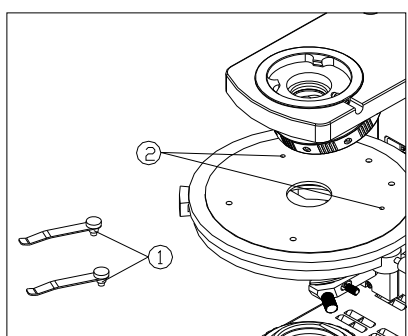


Fig.7

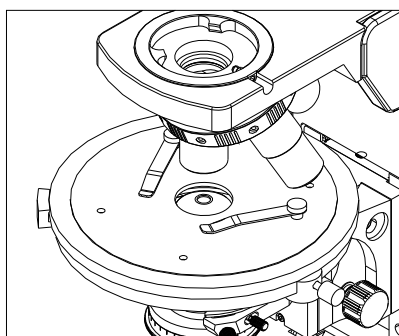


Fig.8

(2) Push the light source group base② into the reflected illuminator light source base③ thoroughly, then lock the lock screw①.

2-2-3 Assemble the Condenser (With Polarizer Group)

◎For Transmitted Illumination

- (1) Rotate the coarse focusing knob① to raise stage to the highest. (See Fig. 6)
- (2) Rotate the condenser up-down knob② to move the condenser bracket to the lowest.
- (3) Loosen the condenser lock-screw③ fully.
- (4) Swing out the front lens of condenser④ with the scale forward. Make the lock screw⑤ of condenser in alignment with the groove⑥ of the condenser base. Push the condenser into the innermost of base.
- (5) Screw down the condenser lock screw, and raise the condenser to the highest position with the condenser up-down knob.

2-2-4 Assemble the Stage Clip

Plug the two stage clip pins① into the hole② on rotatable stage thoroughly. (See Fig.7)

When using the moving stage, plug the two $\phi 3\text{mm}$ forelocks into the two holes②, and lock them on stage with M4 screws.

★ Adjust the handle to “60” reticle (to “0”) when using the moving stage on X-axis, to avoid hurting objectives.

2-2-5 Assemble the Objective

Rotate the coarse focusing knob to lower the stage. Screw the 10X objective into the hole of nosepiece with red mark, then install the objectives into the nosepiece from the lowest magnification to the highest in a clockwise direction. (See Fig.8)

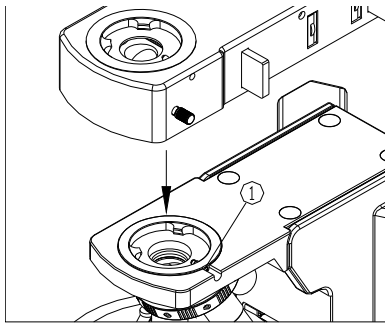


Fig.9

2-2-6 Assemble the Epi-Illuminator

- (1) Loosen the lock screw① of the Epi-Illuminator fully. (See Fig. 9)
- (2) From a little right position, insert the coattail interface on the bottom of Epi-Illuminator into the hole on the stand with a little left inclined, and then screw down the lock screw.

★The screw head should be pushed into the “V” slot on the right side of Epi-Illuminator coattail interface when locking.

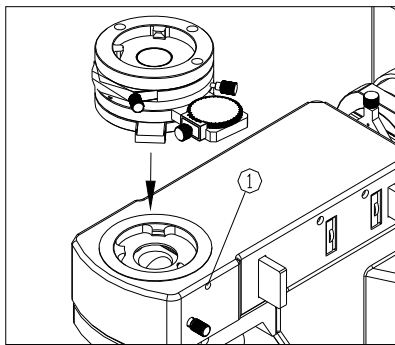


Fig.10

2-2-7 Assemble the Middle Head

- (1) Loosen the middle head lock screw① fully. (See Fig.10)
- (2) From a little right position, insert the coattail interface on the bottom of middle head into the hole on the Epi-Illuminator with a little left inclined, and then screw down the lock screw.

★The screw head should be pushed into the “V” slot on the right side of the middle head coattail interface when locking.

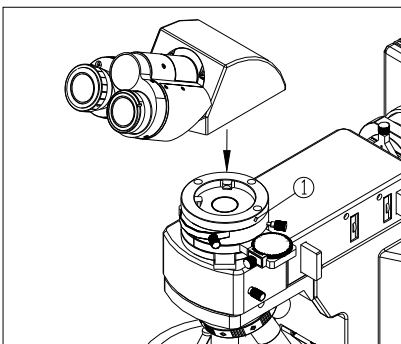


Fig.11

2-2-8 Assemble the Head

- (1) Loosen the head lock screw① fully. (See Fig. 11)
- (2) From a little right position, insert the coattail interface on the bottom of head into the hole of middle head with a little left inclined. Keep the two eyepiece tubes forward, and then screw down the lock screw.

★The screw head should be pushed into the “V” slot on the right side of the head coattail interface when locking.

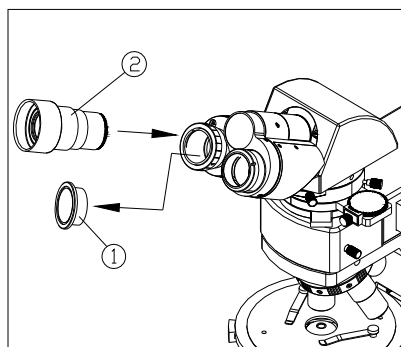


Fig.12

2-2-9 Assemble the Eyepiece

- (1) Take down the cover of eyepiece tube①. (See Fig. 12)
- (2) Insert the eyepiece② into the eyepiece tube to the bottom.

- ★ Install the eyepiece with cross ruler into the right eyepiece tube, and insert the square pins of the location ring into the square groove of the eyepiece tube.

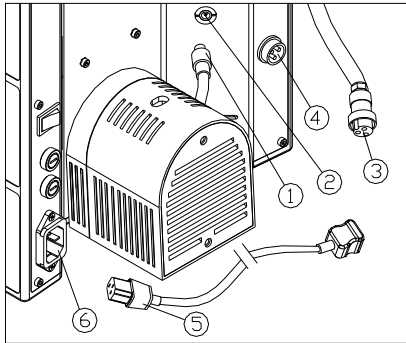


Fig.13

2-2-10 Connect the Power Cord

- (1) Make sure the power switch is at "O" (OFF). (see Fig. 13)
- (2) Insert the connector① of light source group into the power socket② of the microscope.
- (3) Insert the aviation plug③ into the aviation socket④ of the microscope.
- (4) Insert one end⑤ of the power cord into the microscope power socket⑥.
- (5) Insert the other end of the power cord into the power supply socket.

- ★ Cancel Step 3 for Transmitted Models, while cancel Step 2 for Reflected Models.

- ★ Don't use strong force when the power cord is bended or twisted, otherwise it will be damaged.

- ★ Use the special wire supplied by our company. If it's lost or damaged, choose one with the same specifications.

- ★ Connect the power cord appropriately to make sure the instrument is connected to ground.

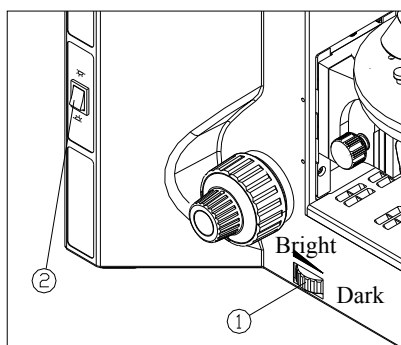


Fig. 14

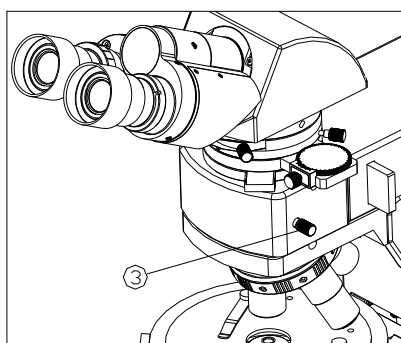


Fig. 15

3-1 Set Illuminations

- (1) Put through the power supply, and turn the main switch to “|”.
- (2) Move the analyzer flashboard group out of the light path.
- (3) Turn the Bertrand lens switch turntable to “0”, to move the Bertrand lens out of the light path until a sound of “KaDa” is heard.

◎ For Transmitted & Reflected Model

- (4) For transmitted illumination, set the switch ② to “”, and pull out the spectroscope pole ③ to move the spectroscope out of the light path, then adjust the light adjustment knob ① until the illumination is comfortable for observation. (See Fig. 14, 15)

For reflected illumination, set the switch ② to “”, and push the spectroscope pole ③ to the innermost, to move the spectroscope into the light path, then adjust the light adjustment knob ① until the illumination is comfortable for observation.

◎ For Transmitted Model

- (4) Adjust the light adjustment knob ① until the illumination is comfortable for observation.

◎ For Reflected Model

- (4) Push the spectroscope pole ③ to the innermost, to move the spectroscope into the light path, then adjust the light adjustment knob ① until the illumination is comfortable for observation.

★If using the trinocular head, push the light path selecting pole to the innermost when observed with two eyes.

★R represents the reflection illumination, while T represents the transmitted illumination.

★The switch is only for the Transmitted & Reflected Model.

3-2 Adjust Focusing

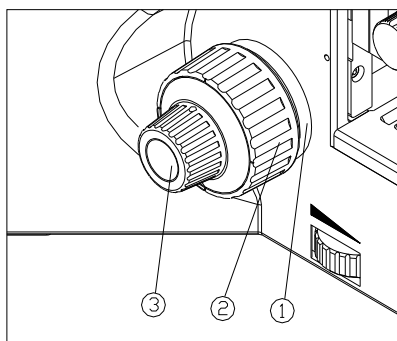


Fig.16

(1) Put the slice on the stage, hold it with the stage clip. Shift the 5X objective into the light path.

(2) Loosen the coarse adjusting limit knob①, observe the right eyepiece with the right eye. Rotate the coarse focusing knob② until the image appears in the view field, then lock the coarse adjusting limit knob①. (see Fig. 16)

★The random upper limit knob can prevent the slice from touching the objective when high magnification objective coarse focusing, to avoid damages to the objective or slice.

★The random upper limit knob does not react on the fine focusing knob.

(3) Rotate the fine focusing knob③ for clear details.

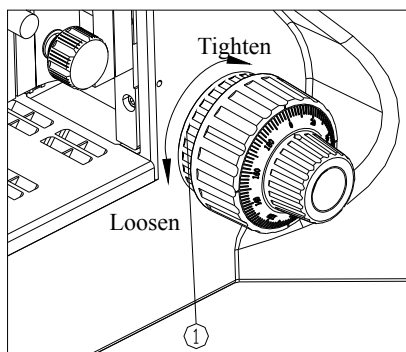


Fig.17

3-3 Adjust the Focusing Tension

If the handle is very heavy when coarse focusing or the specimen leaves the focus plane after focusing, or the stage declines itself, please rotate the tension adjustment ring① as the arrow direction, to solve the problem. (See Fig. 17)

3-4 Adjust the Diopter

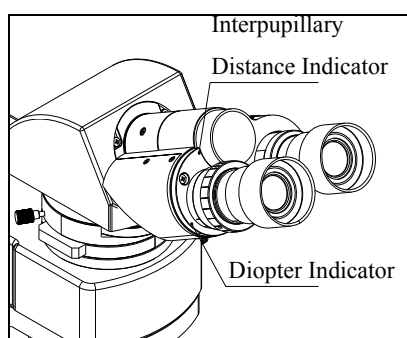


Fig.18

After the image is clear in the right eyepiece, observe the left eyepiece with the left eye. If the image is not clear enough, rotate the diopter adjustment ring① until the image is clear (See Fig. 18).

There are ± 5 diopters on the diopter adjustment ring, and the value aligned with the scale is your eye's diopter. The dot “.” on the left side can also indicate.

★Remember your eye's diopter, so that you can use it next time.

3-5 Adjust the Interpupillary Distance

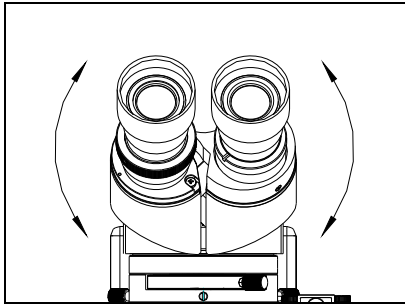


Fig.19

When using two eyes to observe, hold the bases of the prism and rotate them around the axis to adjust the interpupillary distance, until there is only one field of view when binocular observation (See Fig. 19).

Interpupillary distance adjustable range: 52~75mm.

The dot “.” on the left eyepiece base points to the scale of the interpupillary distance indicator. The scale value is the interpupillary distance.

★Remember your eye's interpupillary distance, so that you can use it next time.

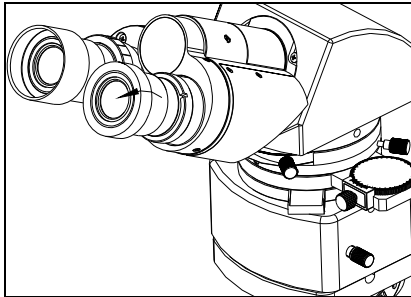


Fig.20

3-6 Use the Eye-cap

(1) Turn down the eye-cap if the user is wearing glasses, so that it can prevent the glasses touching the eyepieces and avoid damaging to both glasses and eyepieces.

(2) Open the eye-cap if the user doesn't wear glasses, so that it can prevent stray light disturbing the observation. (See Fig. 20)

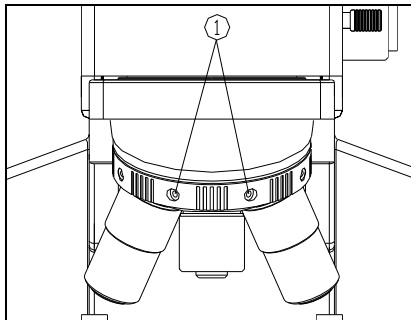


Fig.21

3-7 Adjust the Objective Center

All the objective centers could be adjusted. When adjusting, plug the two 1.5mm hexa spanners into the hexa bolthole on the corresponding objective nosepiece circle (see Fig. 21①). Adjust the objective center, superpose it with the rotary center of the rotatable stage.

Adjusting Method:

(1) Find a black dot in the image in observation, and move the slice, in order to locate it with point “a” in the center of cross in eyepiece. (See Fig. 22)

(2) Rotating the stage, if the objective center does not superpose with the stage rotary center, the dot will be away from the cross center and rotate with a circle, the center “c” is just the rotary center of the stage.

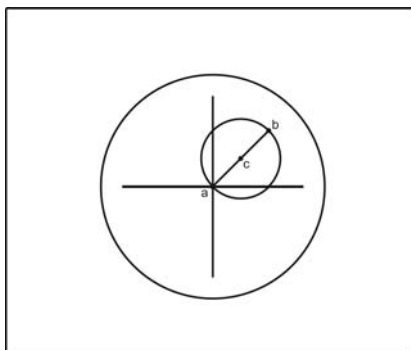


Fig.22

(3) Rotating the stage, turn the black dot to “b”, and adjust the objective in order to move the dot to the midpoint of ab, which is the center “c”.

(4) Move the slide to turn the dot from center “c” to point “a”. Rotate the stage, to see whether it is superposed with the cross center of eyepiece. If they are not superposed, do the above steps again until they are superposed.

3-8 Center the Condenser

◎For Transmitted Illumination

(1) Rotate the condenser up-down knob① to raise the condenser to the highest position.

(2) Rotate the spanner② to move the front lens into the light path (See Fig. 23).

★Move the front lens of the condenser into light path when use the objective beyond 20X.

(3) Rotate the 20X objective into the light path and focus the specimen.

(4) Rotate the field diaphragm adjustment ring③ to put the field diaphragm to the smallest position. Then, the image of field diaphragm can be observed in the eyepiece.

(5) Rotate the condenser up-down knob, to adjust the image to be clearest.

(6) Adjust the condenser center adjustment screw④ and move the image to the center of the view field.

(7) Open the field diaphragm gradually. If the image is in the center all the time and inscribed to the field of view, it shows condenser has been centered correctly (See Fig.24).

(8) In actual use, enlarge the field diaphragm a bit and make the image circumscribed to the field of view.

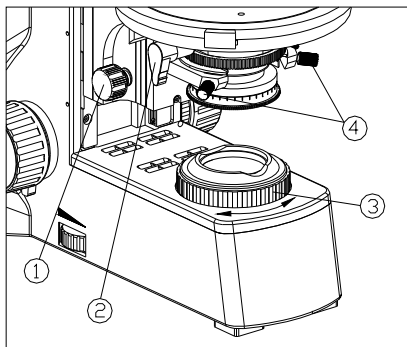


Fig.23

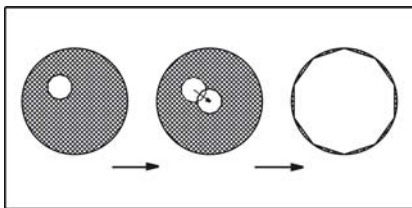


Fig.24

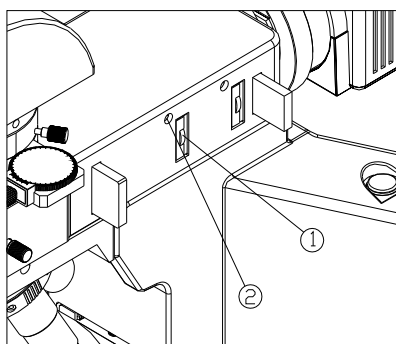


Fig.25

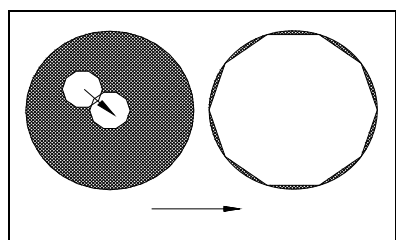


Fig.26

3-9 Adjust the Field Diaphragm

By limiting the diameter of light entering the condenser, the field diaphragm can prevent other light and strengthen the image contrast. When the image is just on the edge of the field of view, the objective can perform best and obtain the clearest image.

◎ For Reflected Illumination

- (1) Turn the field diaphragm turntable ① to the lowest, to minimize the field diaphragm (See Fig. 25).
- (2) The image of field diaphragm can be observed in the view field through eyepiece.
- (3) Plug the two M4 hexa spanners into the left and right field diaphragm centering bolthole ②, until the image is adjusted to the center.
- (4) Open the field diaphragm gradually, if the image of field diaphragm is inscribed with the field of view, then the field diaphragm is centered correctly (See Fig. 26).
- (5) In actual use, enlarge the field diaphragm a little, to make its image circumscribed to the field of view.

◎For Transmitted Illumination

Rotate the field diaphragm adjustment ring ③ in clockwise, to enlarge the field diaphragm; otherwise, to decrease it in counterclockwise. (See Fig. 23)

3-10 Adjust the Aperture Diaphragm

The aperture diaphragm decides the numerical aperture of the illumination system. If the N.A. of illumination system matches with the N.A. of the objective, it can obtain better resolution and contrast, and increase the depth of field.

As the contrast of microscopic samples is usually low, it is advised to adjust the diameter of aperture diaphragm to be 70%-80% of the N.A. of objective (it is allowed to take down the eyepiece and observe through the eyepiece tube). In actual use, adjust it on the basis of good contrast and comfortable observation.

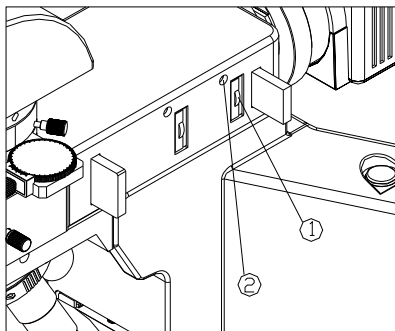


Fig.27

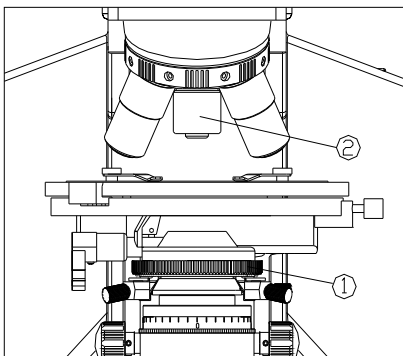


Fig.28

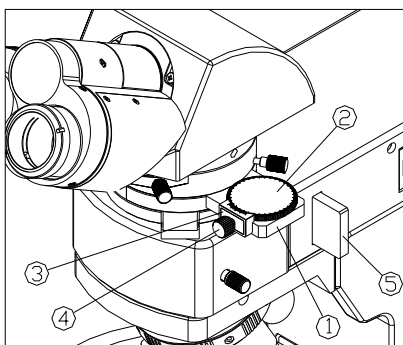


Fig.29

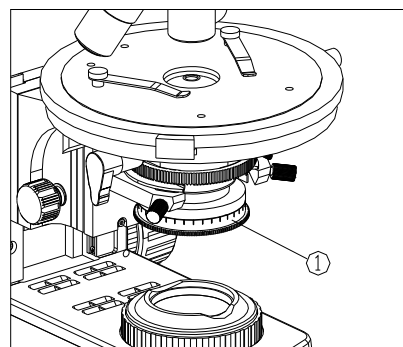


Fig.30

◎For Reflected Illumination

The changing direction of the aperture diaphragm is as same as the field diaphragm, adjust its size by the aperture diaphragm turntable ①. Adjust the two aperture diaphragm centering screws ②, to move the image of aperture diaphragm to the center of the aperture (See Fig. 27).

◎For Transmitted Illumination

Change the size of aperture diaphragm by turning the aperture diaphragm adjusting ring ①. (See Fig. 28).

Use of graduation: Put the N.A. of condenser to the 80% of the N.A. ② of objective.

3-11 Adjust the Analyzer

(1) Insert the analyzer flashboard ① upward into the socket of the intermediate lens group until to the innermost, and the analyzer is shifted into the light path. (See Fig. 29)

(2) Loosen the lock screw ④, turn the analyzer turntable ②, to change the vibrated direction of the analyzer. A grid value of scale is 2° , and the adjusting range is 360° . When observed orthogonally, the “0” reticle on turntable ② should be leveled with the “0” reticle on the vernier ③. A grid value of vernier is $6'$.

3-12 Adjust the Polarizer

◎For Reflected Illumination

(1) Insert the polarizer flashboard ④ forward into the socket of illumination system. The polarizer is moved into the light path until two sounds of “KaDa” is heard. (See Fig. 29)

◎For Transmitted Illumination

(1) Turn the polarizer adjusting ring ①, to adjust the vibrated direction of the polarizer which is 360° rotatable. When observed orthogonally, the “0” reticle on adjusting ring should be leveled with the reticle on the base. (See Fig. 30)

3-13 Check H-V Location

The system will be in H-V location when both the analyzer and polarizer are adjusted to “0”. In addition, it could be checked under the method as following: no specimen on the stage, take off the eyepiece and the objective, move the Bertrand lens out of the light path, adjust the analyzer to “0”, and rotate the polarizer adjustment ring, observe the brightness changing of view field from the eyepiece tube, the system is in H-V location when it is the darkest. At the same time, the polarizer should be almost levelled to “0”.

★ **For orthogonal polarization observation, insert the analyzer other than Bertrand lens, and make the vibration direction of polarizer be vertical with the analyzer.**

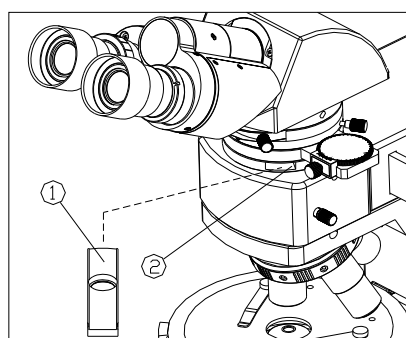


Fig.31

3-14 Use the Compensator

The compensator① is inserted into the slot② of the middle head in 45° declined. The surface with alphabetic character is upwards, the λ , $\lambda/4$ and dustproof board should be inserted thoroughly, and the quartz chock can be inserted if necessary. (See Fig. 31)

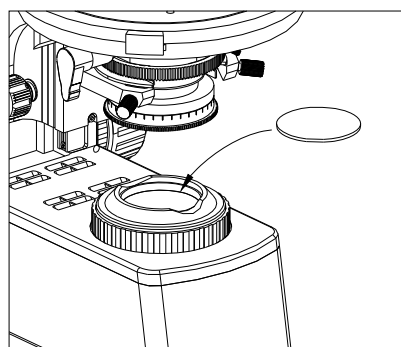


Fig.32

3-15 Use the Rotatable Stage

Rotatable stage is a high accuracy component, which cannot stand the impact and the user should turn it gently. The surface has been printed with wearable plumbaginous coat. A grid value of scale on stage is 1° , a grid value of vernier is $6'$. The stage cannot turn when the lock screw is locked.

3-16 Use the Color Filter

The color filter can make the background light more suitable and strengthen the image contrast (See Fig. 32).

There are four colors of filter selectable: blue, green, yellow and white.

★ Place the filter's rough side downwards.

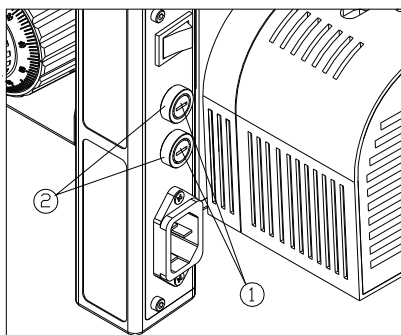


Fig.33

3-17 Replace the Fuse

Turn the main switch to "O" (OFF) before replacing the fuse. Pull out the power cord. Then screw off the fuse group ① from the fuse base ② with a "-" type screwdriver. Install a new fuse and screw it in the fuse base (See Fig. 33).

★ Specification of the fuse: 250V, 3.15A.

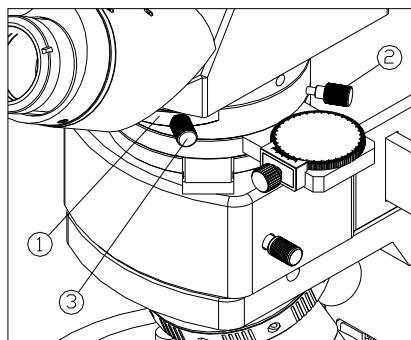


Fig.34

3-18 Use the Bertrand Lens

(1) Move the high magnification objective (50X) into the light path, and set the polarizer and the analyzer in the H-V location. (See Fig. 34)

(2) Put in the slice (as Mica), then turn the coarse and fine focusing knobs until the image is clear.

(3) Rotate the Bertrand lens switch turntable ①, locate it on position "B", to move the Bertrand lens into light path. At that time, the "black cross" can be seen in the eyepiece, which is the interference pattern. (Turn the stage to observe.)

★ It should use 20X or above objective when using Bertrand lens.

★ Normally, Bertrand lens is suitable to be used in transmission light.

(4) Adjust the Bertrand lens centering screw ② (turning both left and right sides at the same time), to move the interference pattern to the center of the view field.

(5) Turn the aperture diaphragm adjusting ring on condenser group, to enlarge the aperture diaphragm.

(6) Turn the Bertrand lens focusing screw ③, to adjust the interference pattern to be clearest.

★ **Conoscopic observation is based on the orthogonal polarization observation, add the Bertrand lens, i.e. the polarizer, analyzer and Bertrand lens are in the light path at the same time.**

3-19 Use the Trinocular Head, TV and Photography

Device

3-19-1 Select the Light Path

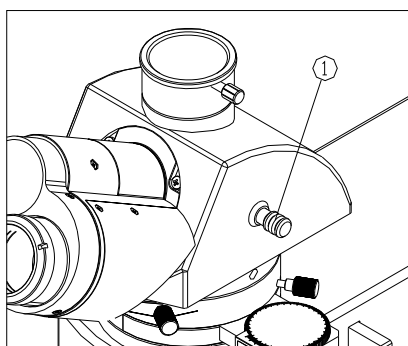


Fig.35

For the trinocular head, the light path selecting pole ① can control the optical energy ratio for binocular and three-links. Push the light path selecting pole to the innermost, the light all comes into the binocular head. Pull the light path selecting pole to the outermost, the ratio of binocular and three-links is 5:5. Usually, push the light path selecting pole to the innermost for binocular observation, pull the light path selecting pole to the outermost for trinocular observation (TV and photography). (See Fig. 35)

3-19-2 Assemble and Use the TV Device

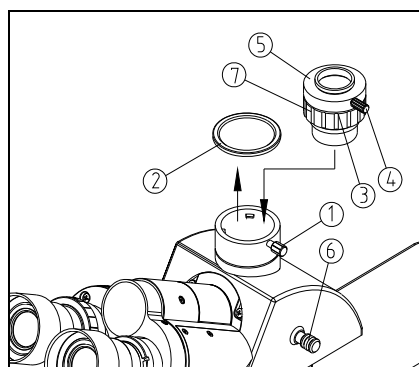


Fig.36

- (1) Loosen the lock screw① of trinocular head, take out the dust-cover②. (See Fig. 36)
- (2) Take down the dust-cover of the TV adapter③. Insert the TV adapter into the trinocular head according to the figure and screw down the lock screw①.
- (3) Loosen the lock-screw④ of the TV adapter. Take down the vidicon interface (C type) ⑤ from the TV adapter, and screw in the CCD or vidicon. Then install the interface with CCD or vidicon into the TV adapter, and screw down the lock-screw④.
- (4) Do binocular observation, after the image is clear, pull the light path selecting pole⑥ to the outmost and observe the image. If the image is unclear, rotate the adjustment tube⑦ to focus, until it is clear.

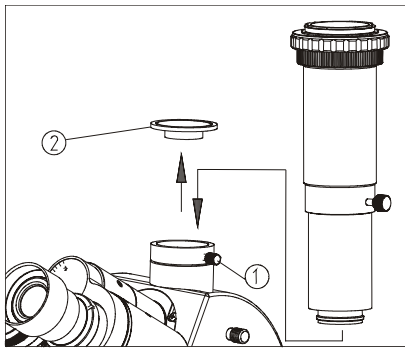


Fig.37

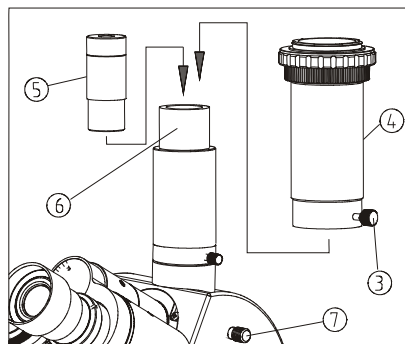


Fig.38

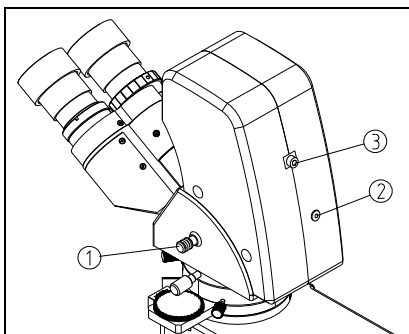


Fig.39

3-19-3 Assemble the Photography Device

- (1) Loosen the lock screw① of trinocular head, take out the dust-cover②. (See Fig. 37)
- (2) Insert the photography device into the trinocular head as shown in the figure, and screw down the lock screw①.
- (3) Loosen the lock-screw③ of the photography adapter and take down the photography adapter④ (See Fig. 38).
- (4) Insert the 3.2X photography eyepiece⑤ into the eyepiece base ⑥, install the photography adapter④ and tighten the lock-screw③.
- (5) Do binocular observation, after the image is clear, pull the light path selecting pole⑦ to the outmost, then operate the photography device according to its instructions.

3-20 Use the Digital Viewing Head

3-20-1 Connect the Power Cord

Insert the output connector of the transformer into the power socket② on the back of the head, insert the video cable into the C-Video video output port/USB port③ on the back of the head. (See Fig. 39)

★ When using the digital viewing head, the power supply is provided by USB.

3-20-2 Signal Output

Pull the light path selecting pole① of viewing head to the outmost, which can do projection of both the binocular and TV at the same time, with the light ratio of 80:20. Push the light path selecting pole to the innermost, 100% of the light can enter the binocular observation system. (See Fig. 39)

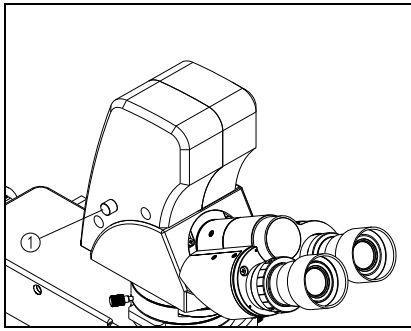


Fig.40

3-20-3 Use the White Balance

The white balance function is disabled when the white balance switch ① is popup, while it is enabled when the switch is pressed down. The switch is mainly for adjusting the color of the microscope TV image. (See Fig. 40)

★ When using the digital viewing head, the white balance function can be controlled by software.

4. Troubleshooting

A15.0908 Series

As the performance of microscope can't play fully due to unfamiliar operations, the table below can provide some solutions.

Problem	Cause	Solution
1. Optical System		
(1) When doing single polarizer observation, the bulb is bright but it is dark in the field of view.	Field diaphragm is not large enough.	Enlarge the field diaphragm.
	Aperture diaphragm is not large enough.	Enlarge the aperture diaphragm.
	Condenser is not in the right position.	Adjust the condenser.
	Condenser is too low.	Adjust the condenser.
	Condenser is not centered.	Center the condenser.
	Light path selecting pole is in the trinocular observation position.	Push the light path selecting pole to the binocular observation position.
(2) The view field did not in the darkest location when the analyzer and the polarizer were in the H-V location.	The screw head is not pushed into the V slot when locking the middle head.	Adjusting the locking position.
(3) The side of the view field is dark or not even	The nosepiece is not in the right position.	Turn the nosepiece into the right position.
	Stain or dust has accumulated on the lens (objectives or eyepieces).	Clean the lens
(4) Stain or dust is observed in the view field.	Stains have accumulated on the specimen.	Clean the specimen.
	Stains have accumulated on the lens.	Clean the lens.
(5) Unclear image	The aperture diaphragm is not opened correctly.	Adjust it.
	Stain or dust has accumulated on the lens of eyepiece.	Clean the lens.
	Condenser is too low.	Adjust the condenser.
(6) One side of the image is dark or the image moves while focusing.	The specimen slide is not fixed.	Fix it with clips.
	The nosepiece is not in the right position.	Turn the nosepiece into the right position.
	Condenser is not centered.	Center the condenser.
	Compensator or dustproof board in the compensator socket is not in the right position.	Insert it into the right position.
	The Bertrand Lens switch turntable is not in the right position.	Turn it to the right position.
	The analyzer is not in the right position.	Adjust the analyzer.
(7) The eyes feel tired easily. The right field of view doesn't superpose with the left one.	Interpupillary distance is incorrect.	Adjust the interpupillary distance.
	Diopter adjustment is incorrect.	Adjust the diopter.
	The eyepiece for the right eye is different from the left one.	Use the same eyepieces.

2. Mechanical System		
(1) Cannot focus when using high magnification objective.	There is cover glass on the surface of specimen.	Remove the cover glass.
(2) Coarse focusing knob is too tight.	Tension adjustment ring is too tight.	Loosen it to an appropriate position.
(3) Stage declines itself and cannot stay on the focal plane.	Tension adjustment ring is too loose.	Tighten it to an appropriate position.
(4) Coarse focusing knob cannot rise.	The coarse focusing limit knob is locked.	Loosen the coarse focusing limit knob.
(5) Cannot move the slide smoothly.	The slide is not fixed correctly.	Adjust it correctly.
	The movable specimen holder is not fixed properly.	Fix it correctly.
3. Electrical System		
(1) The bulb does not work.	No power supply.	Check the connection of the power cord.
	The bulb is not installed correctly.	Install it correctly.
	The bulb burns out.	Replace it.
(2) The bulb burns out usually.	A wrong bulb is used.	Replace it with a correct one.
(3) The field of view is not bright enough.	A wrong bulb is used.	Replace it with a correct one.
	The use of light adjusting knob is wrong.	Adjust it correctly.
(4) The bulb flickers or the brightness is not stable.	The bulb will burn out soon.	Replace it with a new one.
	The wire doesn't connect well.	Connect it correctly.

