Fybikon Art. Nr: 10009

MIC-30 Series Biological Microscope INSTRUCTIONS

This instruction manual is for the operation guide, troubleshooting and maintenance to the 30 series biological 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. This product complies with Biological Microscope National Standards.

Chongqing MIC Technology Co., Ltd

Contents *MIC-30 Series*

Before Use

1. Operation Notice

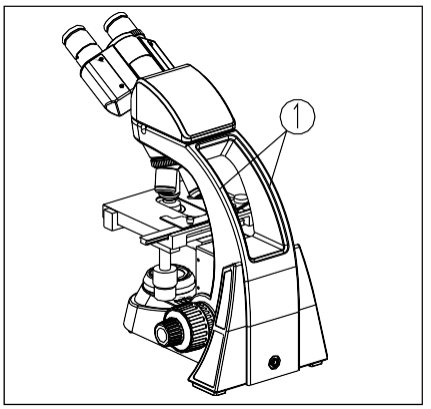


Fig.1

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, humid or dusty environment. Hard physical impacts or violent shaking might cause unrepairable damage to the equipment. Make sure the worktable is flat and horizontal. Following environment is required when operating: Indoor temperature: 5 ℃～40℃, Max relative humidity: 80%.

3. When moving the microscope, use both hands to hold its arm①, and lay it down carefully (see Fig. 1).

★ It might cause damage to the microscope if the focusing knobs or head are used to lift or move the microscope.

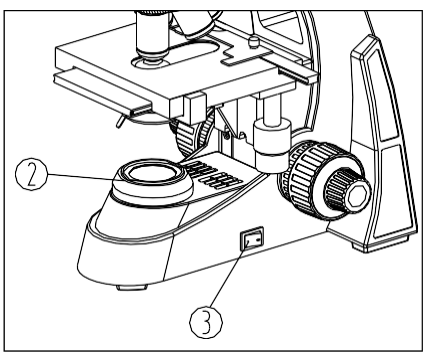


Fig.2

4. When working, the surface of condenser will be very hot. Make sure there is enough room for the heat dissipating around the condenser② (see Fig. 2).

5. For safety, make sure the power switch is at "O" (OFF) and power it off before replacing the bulb or fuse (See Fig. 2), and wait until both the bulb and bulb holder have cooled down.

6. Standard bulb: Single 3W LED bulb. (Fybikon item 10063)

2. Maintenance

1. Wipe the lenses gently with a soft tissue. Carefully wipe off dirt, 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 or turning off the electrical device, please use these chemical in a ventilated place.

2. Do not use organic solution to wipe the surfaces of the other components. Please use the neutral detergent if necessary.

3. If the microscope is exposed for liquid spill, please power it off immediately and wipe it dry.

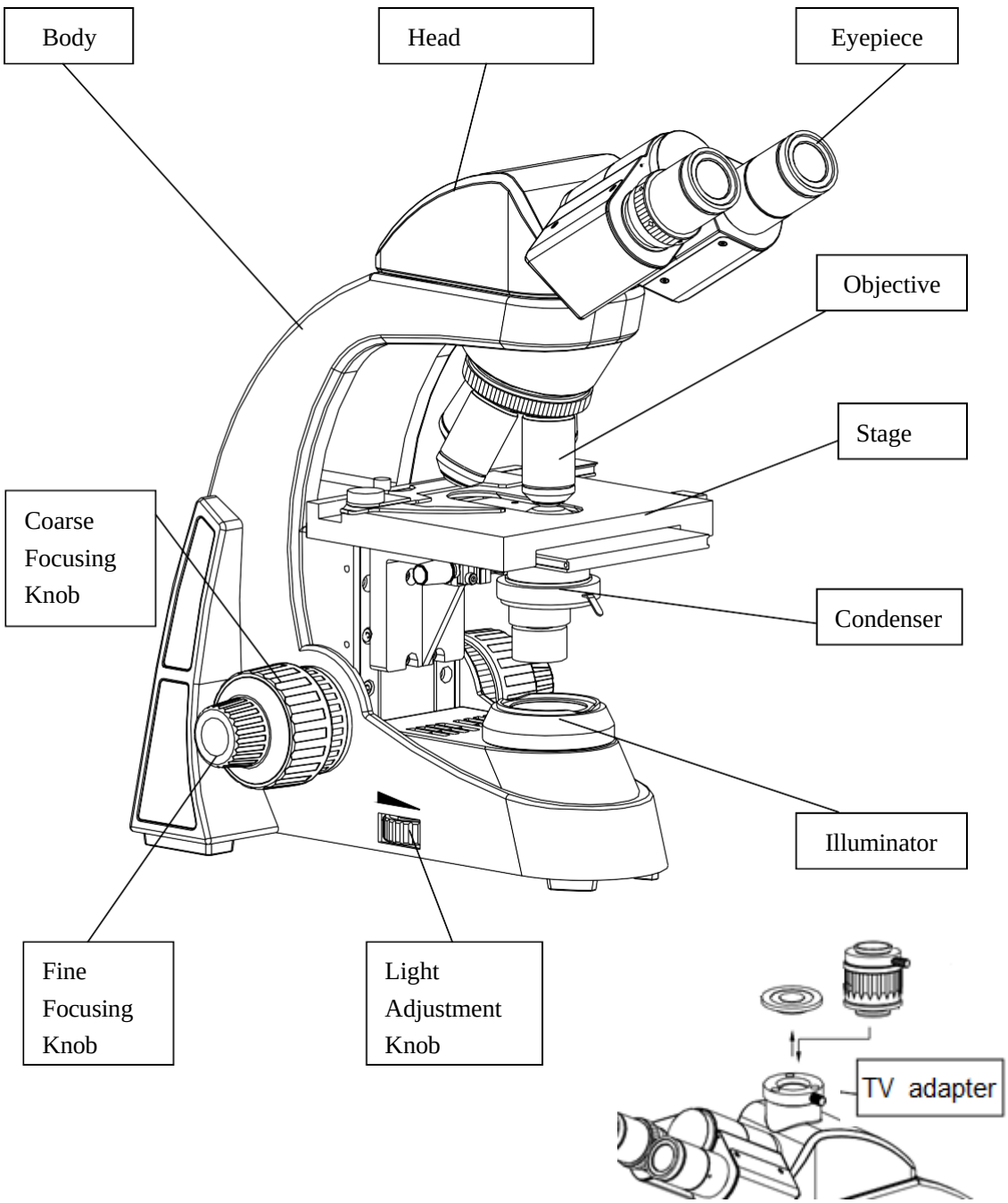
4. Never disassemble the microscope, otherwise the performance will be affected, or the instrument will be damaged.

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

3. Safety Sign

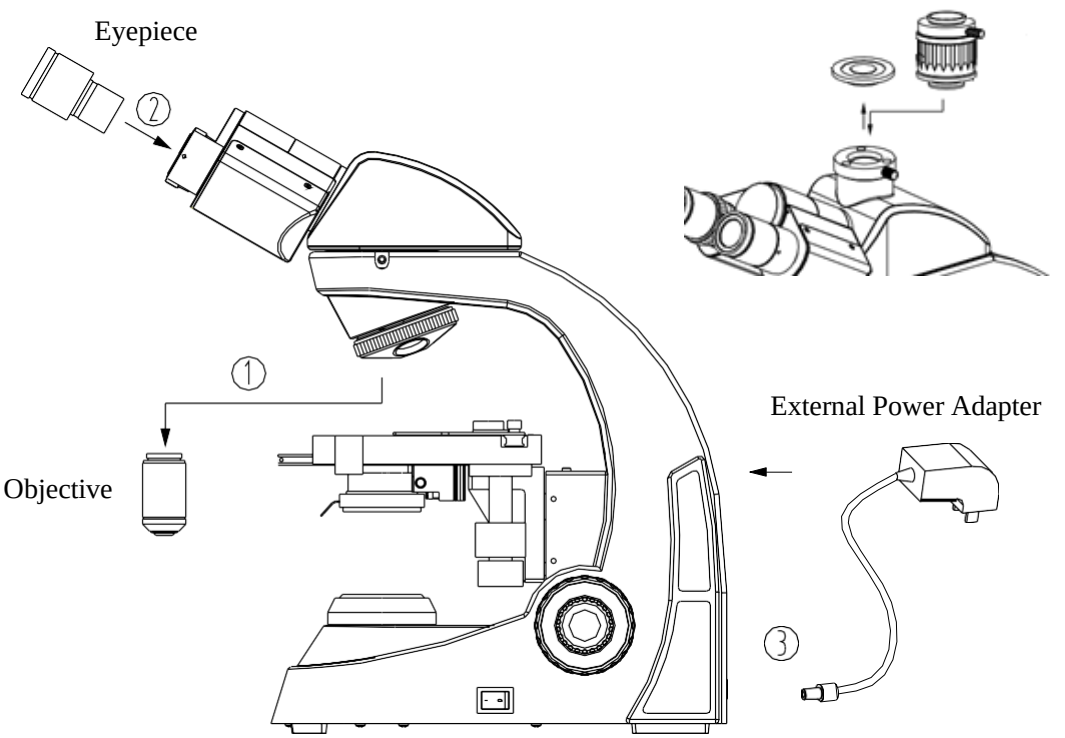
Sign	Signification
	Study the instructions before use. Unsuitable operation would lead to person hurt or instrument faulty.
|	Main switch ON
O	Main switch OFF

1. Components *MIC-30 Series*



2-1 Assembling Scheme

★ Before assembling, make sure all parts are clean and free of dust or dirt. Assemble carefully and do not scrape any part or touch the glass surface.



2-2 Assembling Steps

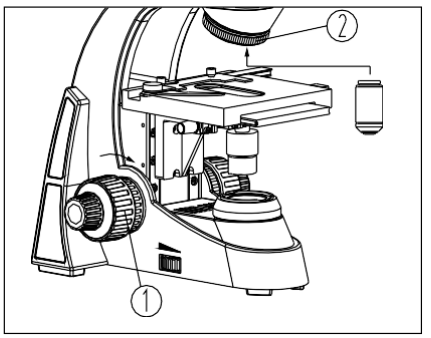


Fig.3

2-2-1 Assemble the Objective

1. Rotate the coarse focusing knob① to lower the stage to a suitable location (See Fig.3).
2. Install the objectives into the nosepiece from the lowest magnification to the highest in a clockwise direction.

★ Search and focus the sample by low magnification objective (4X or 10X) when operating. Then get change to the high magnification ones according to the observation requirements.

★ When replacing the objective, rotate the nosepiece until it sounds "click", to make sure the objective is in the center of the light path.

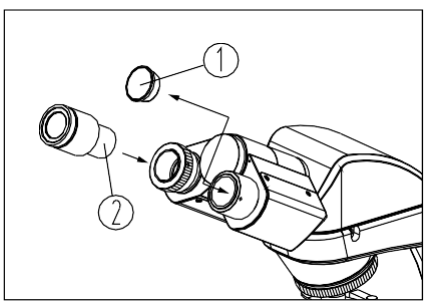


Fig.4

2-2-2 Assemble the Eyepiece and TV adapter

1. Move the plastic cover of eyepiece tube ①.
2. Insert the eyepieces ② into the eyepiece tube, until it touches the bottom (See Fig. 4).
3. Mount the TV adapter. (See chapter 3-10)

2-2-3 Assemble or Replace the LED

Unscrew the lock screw at the bottom assembly and lift the assembly away from microscope housing. Press the small locking handle on the connector socket to release the socket connection ① (See arrow on fig. 5). Pull out the connector ② Then screw out the two screws ③ that fixed the LED, replace with a new LED. Fix the LED by the two screws, plug the connector② into connector socket①, assemble the bottom assembly to original place in microscope housing.

★Before replacing the LED, make sure to cut off the main power and wait for the LED to cool down, to avoid burns.

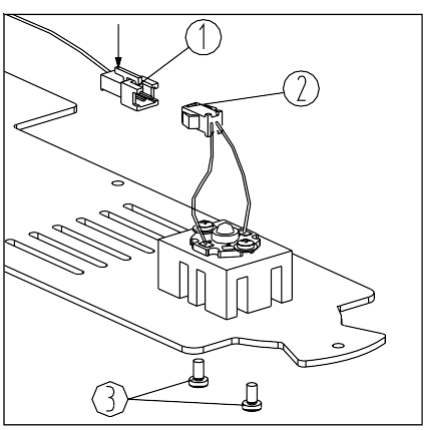


Fig.5

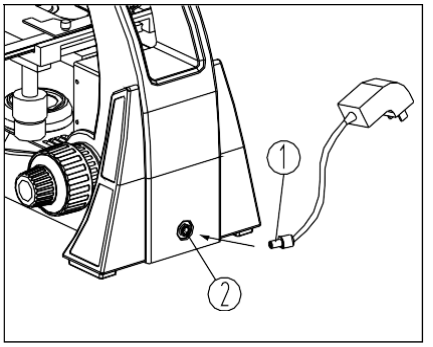


Fig.6

2-2-4 Connect the External Power Adapter (Power Cord/Charger)

★ Do not use force if the power cord is bended or twisted, otherwise it might be damaged.

★ Use the original external power adapter (power cord/charger). If it is lost or damaged, make sure to replace with unit of the same specifications (DC6V 1A). The unit has an internal battery that charges when power adapter is connected. Make sure to charge the battery 8 hours at first usag

1. Make sure the power switch is at "O" (OFF).
2. Insert one end of external power adapter① into the power socket② of the microscope. Then insert the other end into the power supply socket and make sure well-connected (See Fig. 6).
3. The unit has an internal battery that charges when power adapter is connected. Charging time of empty battery is approximately 2 hours. When instrument is fully charged, the charger indicator will change from orange to green.

Some models do not have any charging indicator led.

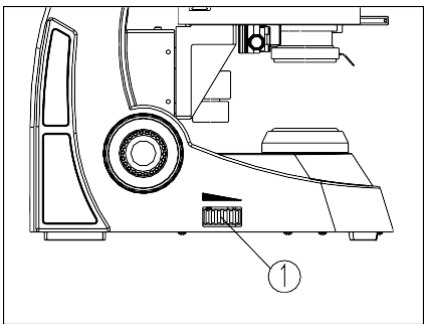


Fig.8

3-1 Set Illumination

1. Connect the power and turn the main power switch to"—"(ON).

2. Adjust the light adjustment knob ① until the illumination is comfortable for observation. Rotate the light adjustment knob clockwise to raise the voltage and brightness. Rotate the light adjustment knob counterclockwise to lower the voltage and brightness (see Fig. 8).

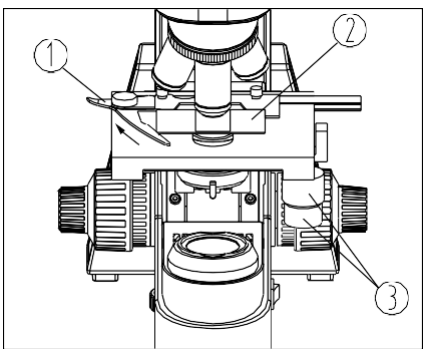


Fig.9

3-2 Place the Specimen Slide

1. Push the wrench of the specimen holder backwards.
2. Loosen the wrench①, and clamp the slide② by the clips while the cover glass faces up (see Fig. 9).
3. Rotate the X and Y-axis knob ③ . Move the specimen to the center (alignment with the center of the objective).

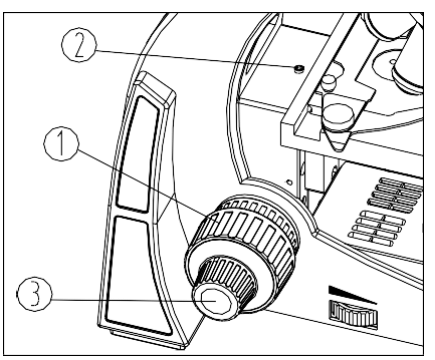


Fig.10

3-3 Adjust Focusing

1. Start with the 4X objective into the light path.
2. Observe the right eyepiece with the right eye. Rotate the coarse focusing knob① until the image outline appears in the view field (See Fig.10).
3. Rotate the fine focusing knob③ for clear details.

★ The lock screw ② can be adjusted to prevent the objective from touching the slice when focusing.

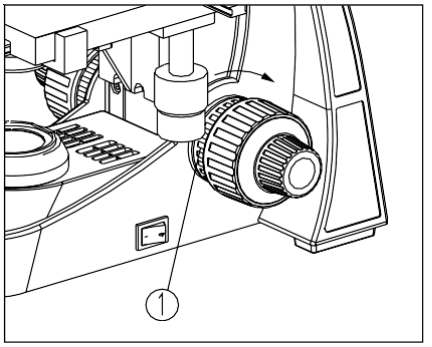


Fig.11

3-4 Adjust the Focusing Tension

If the handle is very heavy when focusing, or the specimen leaves the focus plane after focusing, or the stage declines itself, rotate the tension adjustment knob① to resolve the problem (See Fig. 11).
Rotate the tension adjustment knob① according to the direction of the arrow as shown in the figure, to lock the focusing system. Rotate it to the opposite direction to loosen the focusing system.

3-5 Adjust the Diopter

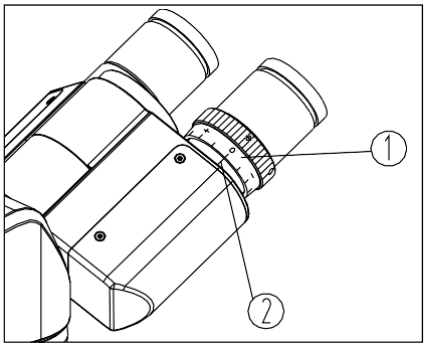


Fig.12

Observe the right eyepiece with the right eye, focus it until the image is clear. Then 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.12).

★There are ±5 diopters on the diopter adjustment ring①, and the value aligned with the scale② is your eye's diopter.

★ When using diopter adjustable eyepiece, do eyepiece diopter zero adjustment first. Adjust eyepiece diopter to make the image clear when operating.

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

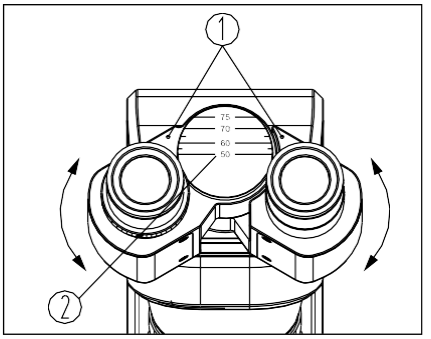


Fig.13

3-6 Adjust the Interpupillary Distance

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. The dot "·"① on the eyepiece base points to the scale② of the interpupillary distance indicator. The scale value is the interpupillary distance (See Fig. 13). Adjustable range: 50~75mm.

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

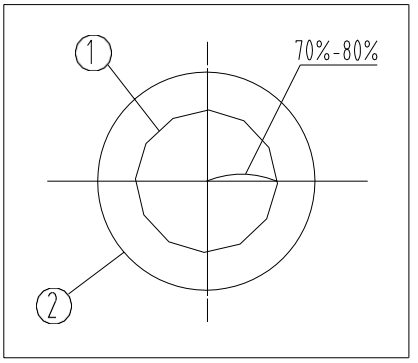


Fig.14

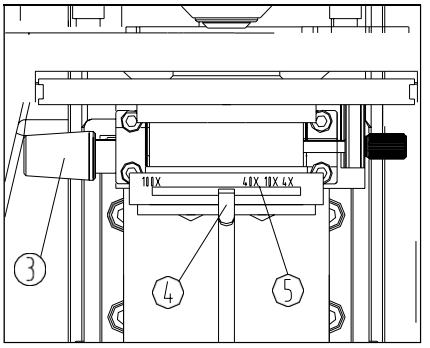


Fig.15

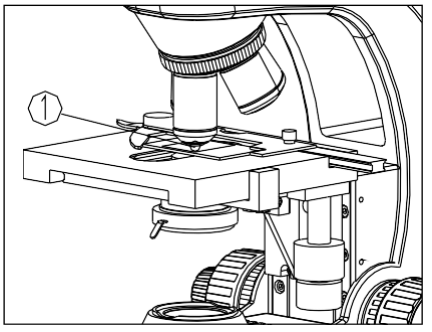


Fig.16

3-7 Adjust the Aperture Diaphragm and Condenser

1. 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.

2. Adjust condenser adjustment knob③ in clockwise direction, raise the condenser to the top, let the illumination light fill the field of view. As the specimen contrast is usually low, it is advised to adjust the condenser aperture diaphragm to be 70%-80% of the N.A. of objective. Rotate the aperture diaphragm adjusting ring④, align the arrow with the magnification position at the diaphragm seat⑤. The eyepiece can be taken off when it is necessary to observe from the tube. Adjust the aperture diaphragm adjusting ring④ until you see the figure as shown in Fig.14, to adjust the proportion (see Fig. 14&15, ① so the image of aperture diaphragm, ② is at the edge of objective).

3-8 Use the Oil Objective (100X)

1. Use the 4X objective to focus the specimen.
2. Place a drop of oil① on the specimen (see Fig. 16).
3. Rotate the nosepiece counterclockwise and rotate the oil objective (100X) to the light path. Then use the fine focusing knob to focus.

★ Make sure there is no air bubble in the oil that might affect the image:

A. Move the eyepiece to remove the air bubble, if any. Open the aperture diaphragm and field diaphragm fully and observe the edge of the objective from the tube (It seems round and light).

B. Rotate nosepiece slightly and swing the oil objective several times to remove the air bubble.

4. After using, wipe the front lens with a tissue moistened with a small amount of 3:7 mixture of alcohol and ether or with dimethylbenzene. Wipe off the oil from the specimen.

★ **Do not place another objective in the light path before the oil is wiped off to avoid polluting dry objectives.**

★ **Too much dimethylbenzene would dissolve the lens's stickiness.**

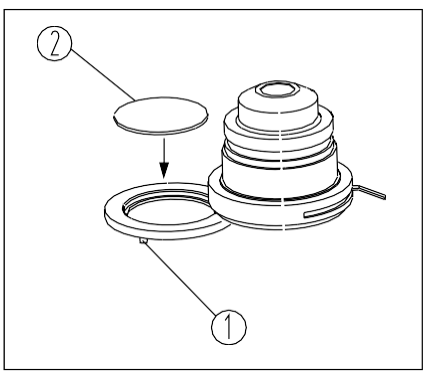


Fig.17

3-9 Use the Color Filter

Tilt out the color filter frame① at the bottom of the condenser in clockwise direction, place the filter② into its hole, then tilt the frame in counterclockwise direction (See Fig.17).

★ **There are three colors of filter selectable: blue, green and yellow.**

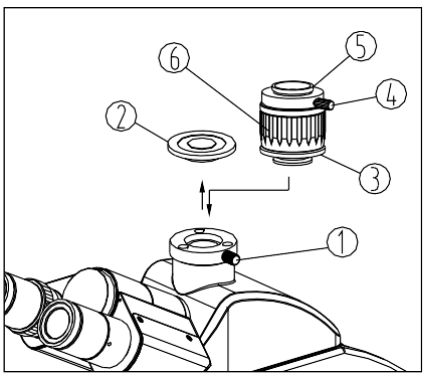


Fig.21

3-10 Assemble and use of the TV Device

1. Loosen the lock screw① of trinocular head, and remove the dust-cover② (See Fig.21).
2. Move the dust-cover from the TV adapter③. Insert the TV adapter into the trinocular head as shown in the figure and tighten the lock screw①.
3. Loosen the lock screw④ at the TV adapter. ⑤install the interface into the TV adapter, and tighten the lock screw④.
4. For trinocular observation. If the image is unclear (when image is adjusted/clear by binocular usage), rotate the adjustment tube⑥ until image it is clear.

As the performance of microscope can be disturbed by a number of unfamiliar operations, the table below can provide some solutions to the most common errors.

Problem	Cause	Solution
1. Optical system		
(1) The bulb is bright, but it is dark in the field of view.	Field diaphragm is not large enough.	Enlarge the field diaphragm.
	Condenser is too low.	Adjust the condenser.
(2) The side of the field of view 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 (condenser, objective, or eyepieces).	Clean the lens.
(3) Stain or dust is observed in the field of view.	Stains have accumulated on the specimen.	Clean the specimen.
	Stains have accumulated on the lens.	Clean the lens.
(4) Unclear image	No cover glass on the specimen slide.	Add the cover glass.
	The cover glass is not standard.	Use a standard cover glass with thickness of δ0.17mm.
	The specimen faces down.	Put the specimen to face up.
	The immersion oil has accumulated on the dry objective.	Clean objective thoroughly.
	The immersion oil is not used for oil objective.	Use immersion oil.
	Air bubble in the immersion.	Get rid of the air bubble.
	Use wrong immersion oil.	Use a correct oil. (Cedar oil)
	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.
(5) 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.
(6)The eyes feel tired easily. The right field of view does not superpose with the left.	Interpupillary distance is incorrect.	Adjust the interpupillary distance.
	The eyepiece for the right eye is different from the left one.	Use the same eyepieces.

Problem	Cause	Solution
2. Mechanical system		
(1) Cannot focus when using high magnification objective.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is too thick.	Use a standard cover glass with thickness δ0.17mm.
(2) The objective touches the cover glass while turning the nosepiece.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is too thick.	Use a standard cover glass with thickness δ0.17mm.
(3) Coarse focusing knob is too tight.	Tension adjustment knob is too tight.	Loosen it to an appropriate position.
(4) Stage declines itself and cannot stay on the focal plane.	Tension adjustment knob is too loose.	Tighten it to an appropriate position.
(5) Coarse focusing knob cannot rise.	The coarse focusing limit knob is locked.	Loosen the coarse focusing limit knob.
(6) Coarse focusing knob can not decline.	The base of the condenser is too low.	Raise the base.
(7) Cannot move the slide smoothly.	The slide is not fixed correctly.	Adjust it correctly.
	The movable specimen holder is not fixed properly.	Adjust it correctly.
(8) The image moves obviously when touching the stage.	The stage is fastened incorrectly.	Fasten the stage correctly.
3. Electrical Part		
(1) The LED does not work.	No power supply.	Check the connection of the power cable.
	The LED is not installed correctly.	Install it correctly.
	The LED burns out.	Replace it.
(2) The LED burnt out often	A wrong LED is used.	Replace it with a correct one.
(3) The field of view is not bright enough	A wrong LED is used.	Replace it with a correct one.
	The use of light adjusting knob is incorrect.	Adjust it correctly.