



STEINDORFF®

Inverted Fluorescence Microscope

NYMCS-702

Instruction Manual



This manual is written for Inverted Fluorescence Microscope NYMCS-702. For safety and for keeping the best performance, making you familiar with the instrument entirely, it is strongly recommended that you read this manual carefully before using the microscope.

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USER NOTICE

Safety Note

1. The epi-fluorescent attachment is a precise instrument. Open the box carefully, and avoid dropping the accessories to ground and causing damage to them.
2. Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and variations.
3. Make certain that the burner is installed correctly and all cords are connected firmly.
4. Do not open the lamp housing while it is turned on or for at least 10 minutes after it has been turned off. Lamp housing parts are extremely hot and cause burns if touched.
5. Always be sure to ground (earth) the equipment.
6. Verify that the voltage and the frequency of the AC mains outlet match the setting of the voltage switch and the frequency switch on the rear of the power supply unit.
7. Always use the power cord provided and make sure that the main switch is moved to "O" (OFF) before connecting the power cord plug to the wall outlet.
8. To prevent any hazard, always turn the main switch on the power supply unit to "O" (OFF), unplug the power cord plug from the mains outlet before replacing the burner or the fuse, and wait for at least 10 minutes before replacing the burner. (Be sure to use a GCQ-100 mercury burner.)
9. To prevent obstruction of the air flow, it is important to leave enough space around and above the lamp housing.

Safety Symbol

Symbol	Meaning
	The surface is very hot, not touch by your hands
	Before using, please read the instruction carefully, improper operation will result in bodily injure or instruction malfunction.
	The main switch on
	The main switch off

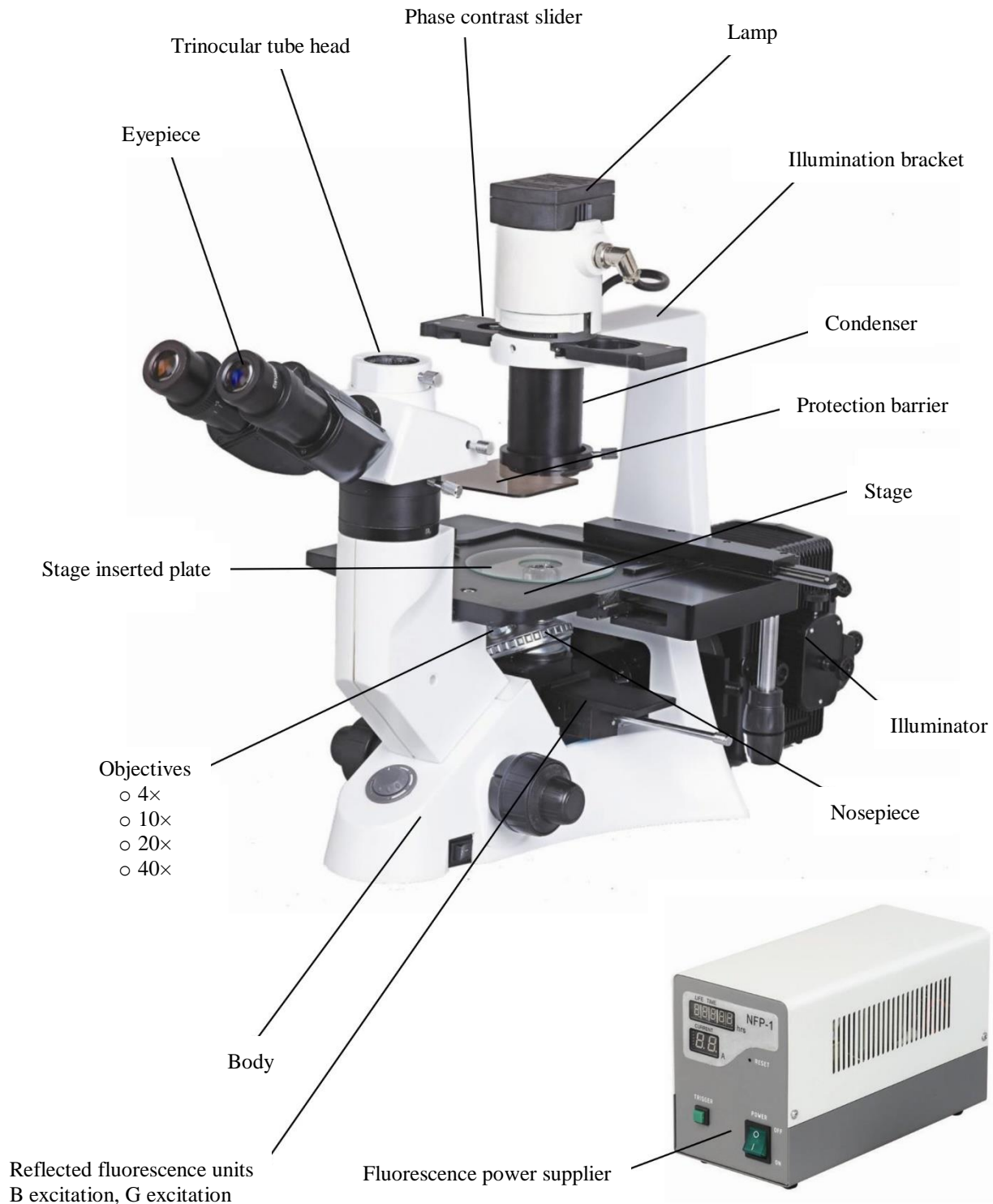
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Maintenance and Storage

1. Clean all glass components by wiping gently with gauze. To remove fingerprints or oil smudges, wipe with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).
 - △ Since solvents such as ether and alcohol are highly flammable, they must be handled carefully. Be sure to keep these chemicals away from open flames or potential sources of electrical sparks—for example, electrical equipment that is being switched on or off. Also remember to always use these chemicals only in a well-ventilated room.
2. Do not attempt to use organic solvents to clean the non-optical component of the equipment. To clean these, use a lint-free, soft cloth lightly moistened with a diluted neutral detergent.
3. Do not disassemble any part of the power supply unit as malfunction or damage may occur.
4. In order not to impair the safety of the equipment, replace the burner when the counter of NFP-1 indicates “100.00” hours. To prevent any hazard, always turn the main switch on the power supply unit to “O” (OFF), unplug the power cord plug from the mains outlet, and wait for at least 10 minutes before replacing the burner. High-pressure gas is sealed within the mercury burner. Thus, if it is continued to be used after its service life expectancy, the glass tube may deform and may sometimes rupture.

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1. COMPONENT NAMES



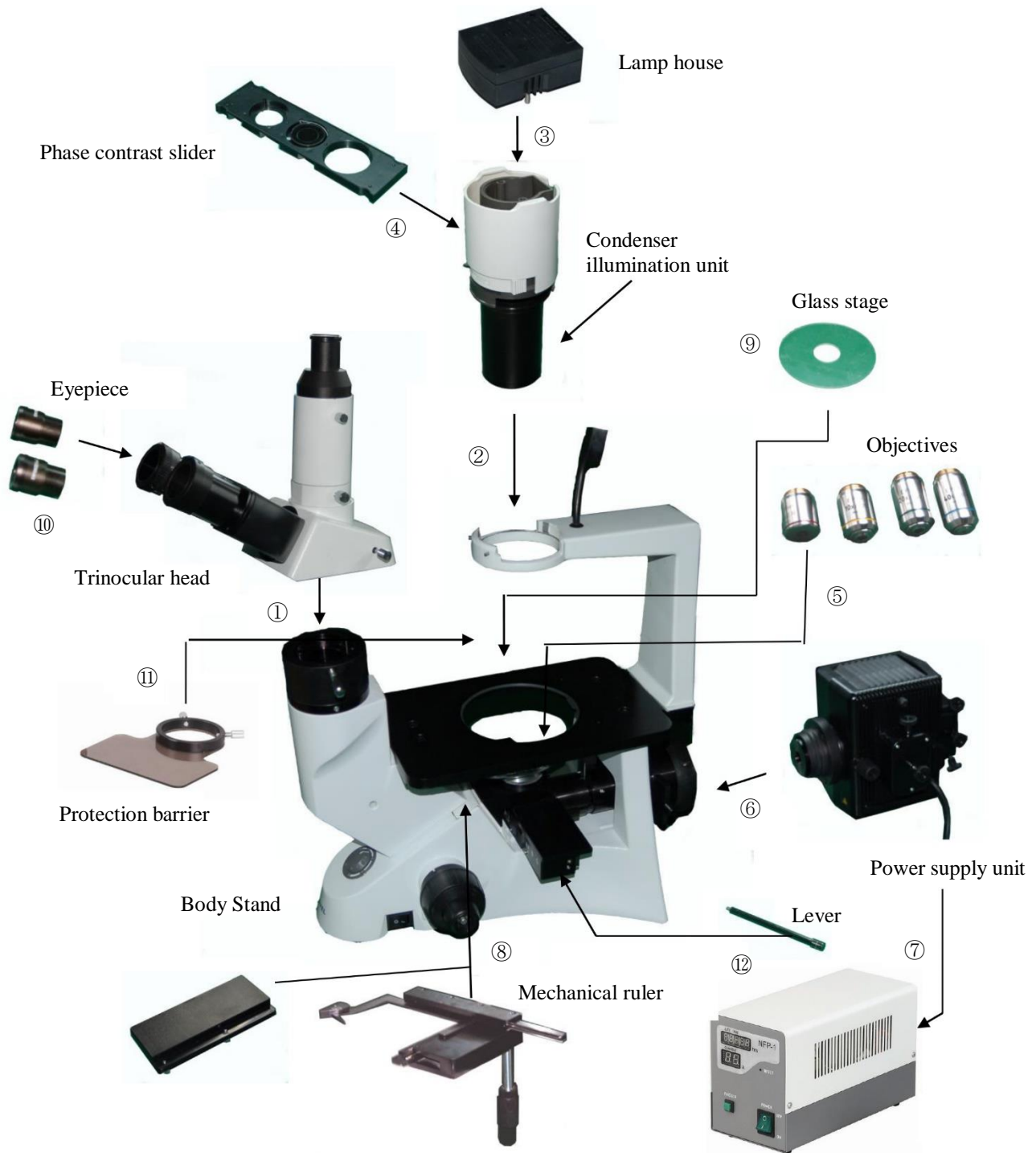
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2. INSTALLATION

2.1. Installing diagram

The following figure shows the installation sequence of the components. The number in the figure shows the installation steps.

- ❖ Before installing, be sure every components is clean, do not score any parts or glass surface.
- ❖ Keep well with the supplied hexagon wrench. When changing the components, you will need it again.



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2.2. Installing Steps



Figure 1

2.2.1. Installing trinocular head (Figure 1)

Loosen the setscrew (2) and insert the trinocular Viewing Head (1) into the body correctly, screw down with bolt (3).



Figure 2

2.2.2. Installing eyepiece (Figure 2)

Insert the eyepiece (4) into tube until they are against.



Figure 3

2.2.3. Installing condenser set (Figure 3)

Install the condenser into the right direction (Figure 3).

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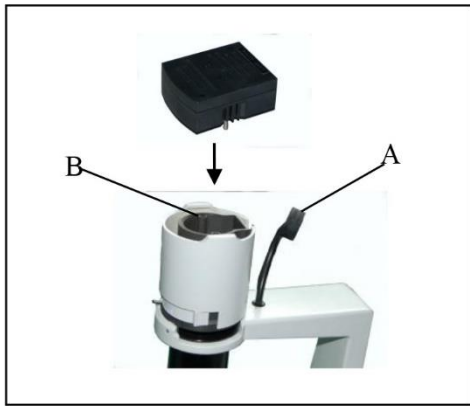


Figure 4

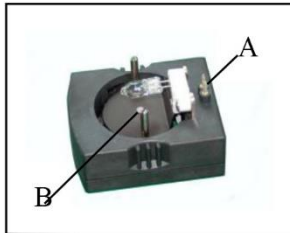


Figure 5



Figure 6



Figure 7

2.2.4. Installing lamp house (Figure 4, Figure 5)

Insert the plug "A" into hole "A" of power cord, then insert the plug B into the B hole of the condenser till there are against. (Figure 6)

Replace lamp

1. Turn the switch to off position when using or need replacement. Pull out the lamp house and then the lamp after it is cool down completely.
2. Insert the new lamp softly to prevent damage.
3. Do not touch the lamp by hands to prevent reducing lamp expectancy or explode. Clean the fingerprint by wiping slightly moistened with ether.

2.2.5. Installing phase contrast plate (Figure 6, Figure 7)

1. Keep the slider ① face (the surface which had character) up towards. Every light ring or opening has its own located position, so you need to move them until you heard the "clicked" to ensure the ring or the opening reach the center of the light path (as shown in Figure 7).
2. Turn the aperture diaphragm lever ① to adjust aperture. Turn the diaphragm to a big aperture when do phase contrast observation.
 - The light ring was centered beforehand, so it needn't to adjust in the use process. If the ring is not in the center, you could adjust by the centering bolt.
 - The 10X/20X light ring is worked with the 10X, 20X phase contrast objective, while the opening is used for bright field.

Notices

Requirement :

1. Temperature: 0°C~40°C, max humidity: 85%.
2. High temperature and moisture will damage instrument and affect performance.
3. Keep the instrument away from the dust environment, and take the dust cover when no using.
4. Lay the instrument without vibration place.

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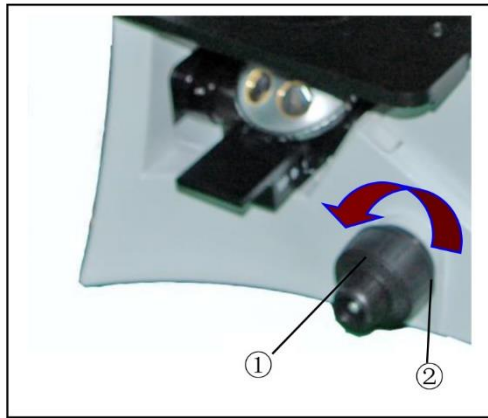


Figure 8

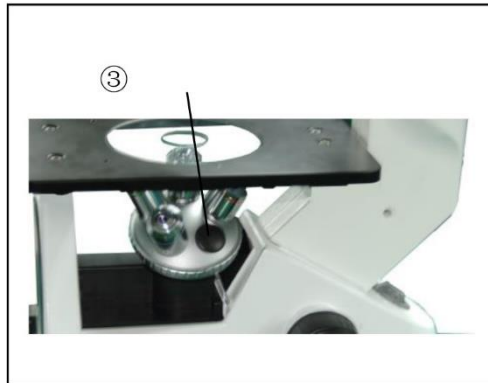


Figure 9

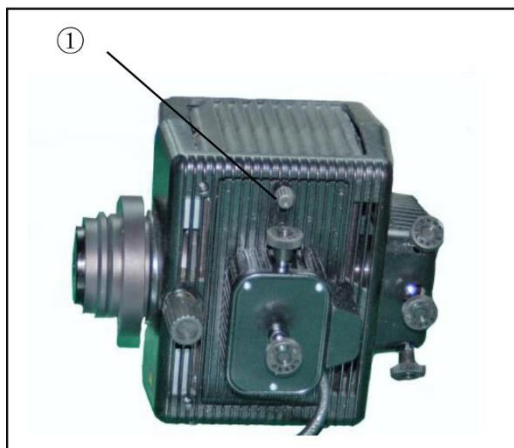


Figure 10

2.2.6. Installing the objective (Figure 8, Figure 9)

1. Turning the coarse focusing knob ① like the figure shows till the nosepiece get to its lowest position.
- ❖ **For ensuring the safety of the instruction on transportation, the nosepiece is located in the lowest position and the tension adjustment collar ② is adjusted in an appropriate tight tension while leaving the factory.**
2. Screw the lowest magnification objective on to the turret from the nearside, then turn the turret clockwise, mount other objectives according the magnification sequence of low to high.
 - Mount objective like this way will make the change of magnification to be very easy in using.
 - It also can install the objective through the stage opening.
 - ❖ Clean the objective regularly, the objective used in the inversed microscope is very sensitivity about dust.
 - ❖ Do cover all the unused holes with turret dust caps ③, to prevent the dust and contamination entering inside.
 - ❖ When operating, use the low magnification objective (4X or 10X) to search and focus the specimen at first, then replace the higher magnifications if necessary.
 - ❖ When replace the objective, slowly turning the nosepiece until you hear “clicked”, that means the objective enter into the right position—center of the light path.

2.2.7. Mounting the Mercury Burner (Figure 10, Figure 11)

1. Loosen the burner socket clamping screw ①, and remove the burner socket. (Figure 1)
2. After removing the foam backstop ②, securely insert the + pole (the wide head) of the specified mercury burner ③ to the lower terminal first and then the – pole (the thin head) to the upper terminal, then tighten the two socket clamping screws ④.
3. Close the burner socket with burner into the original position and tighten the socket clamping screw ①.

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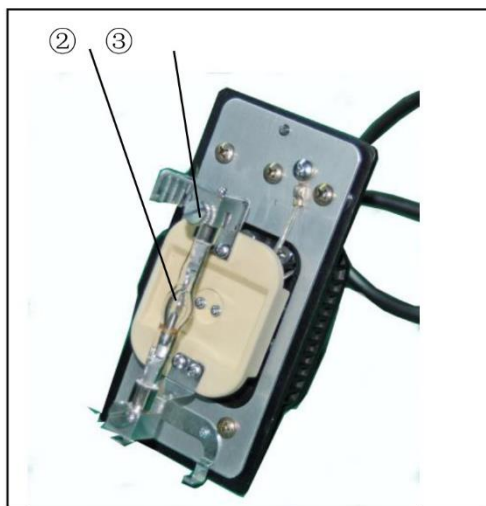


Figure 11

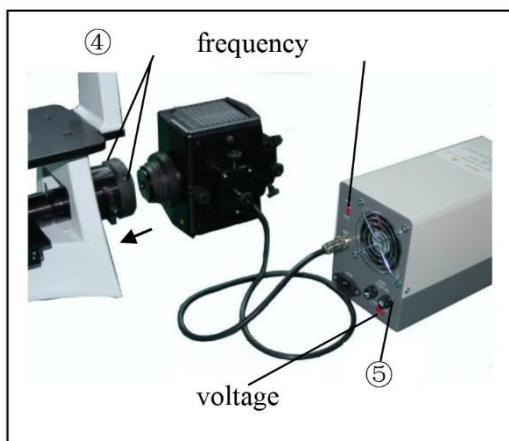


Figure 12



Figure 13

- Be sure to use a GCQ-100 mercury burner.
- Be sure to mount positive pole (the wide head) before the other, or the damage to the burner may occur.
- Never subject the burner to excessive force when mounting the Mercury Burner.
- Be careful and avoid leaving fingerprints or dirt on the mercury burner. Attached stain may cause distortion in glass which could result in a ruptured burner. If stained, wipe it a way gently with clean gauze.
- To prevent any hazard, always turn the main switch on the power supply unit to "O" (OFF), unplug the power cord plug from the mains outlet, and wait for at least 10 minutes before replacing the burner.

2.2.8. Assembly of the Fluorescent Attachment, Cable and Cord Connections (Figure 12, Figure 13)

1. Mount the lamp housing into the other end of the attachment and fix it with two screws ④.
 2. Plug the connector ⑤ from the burner socket securely into the connector on the power supply unit and make sure the cord is correctly connected. (Make sure that the main switch ④ of the power supply is set to "O" (OFF) before connecting cables)
 3. Connect the power cord connector ⑥ into connector on the power supply unit and make sure the cord is correctly connected.
- Verify that the voltage and the frequency of the AC mains outlet match the setting of the voltage switch and the frequency switch on the rear of the power supply units and improper setting may degrade burner performance, or in the worst case(although very rare), cause the burner to explode.
 - It is better to use the power cord provided by Labomed and the same type power cord should be used if you lose or damage the old one.

2.2.9. Fuse Replacement (Figure 12, Figure 13)

1. Set the main switch to "O" (OFF) and unplug the power cord before replacing fuses.
 2. Using a flat-blade screwdriver, remove each of the fuses holder ⑦ by tuning it counter- clockwise and pulling out.
 3. Replace both fuses with new ones.
- Always use the designated fuses (8A). And make sure the voltage of the fuse match the voltage of the AC mains outlet.

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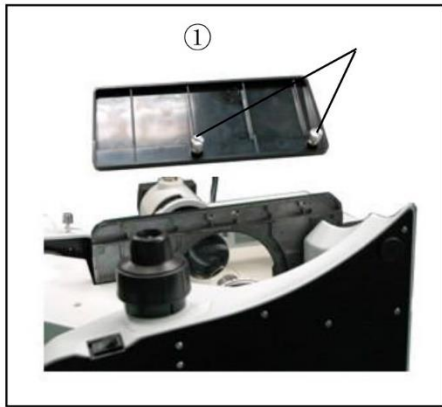


Figure 14

2.2.10. Installing the stage lengthen splint and the mechanical ruler (Figure 14, 15)

- Stage lengthen splint can be installed in either side of the stage to enlarge the work surface. But you can't install the mechanical ruler together.
- Generally, the mechanical ruler will be installed in the right side for comfortable adjustment.

1. Installing the stage lengthen splint.

First, Screw the fixed bolt ① on to the splint, then mount it on to the stage from right or left below, screwing down it until it stay hard.

2. Installing the mechanical ruler.

Please install the ruler like the way of the stage splint.

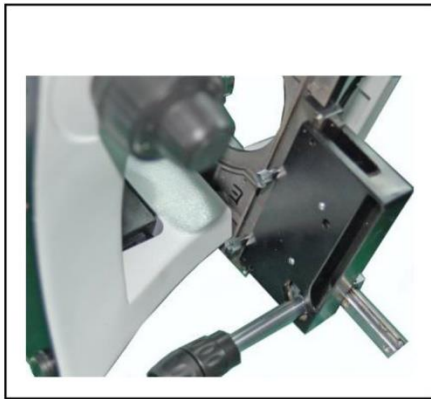


Figure 15

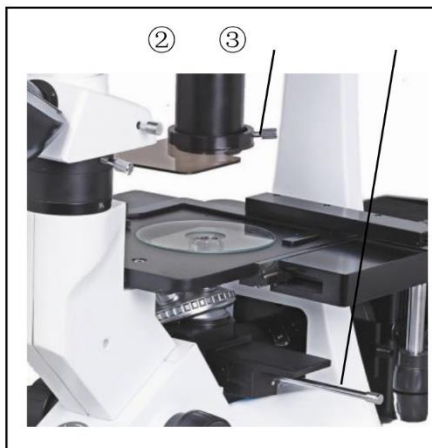


Figure 16

2.2.11. Installing protection barrier, glass plate, lever (Figure 16)

1. Install the protection barrier on the attachment by tightening the screw ②.
2. Placing the glass plate to the right position.
3. Screw the lever to the inversed components under the nosepiece.

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3. ADJUSTMENT AND OPERATION

3.1. Lamp adjustment for fluorescence observation

3.1.1. Connecting power

Set the main switch of the power supply unit to “I” (ON). It will stabilize in 5 to 10 minutes after ignition.

- Some mercury burners may not ignite the first time the power is turned on due to variance in production, and the safety mechanism in the starter in such a case. If this occurs, set the main switch to “I” (ON), then press the starter reset switch on the front panel of the power supply and between 1 to 4 seconds are required for igniting the burner. Repeat as necessary.
- To avoid shortening the burner life, do not turn the burner off within 15 minutes after ignition.
- The burner cannot be re-ignited for about 10 minutes, that is, until the mercury vapor inside it has cooled down and condenser to liquid.
- Ensure that the hour counter is reset to “000.00” after replacement of the burner. And you can insert a thin object such as a mechanical pencil tip into the reset hole on the front panel of the power supply unit to press the internal switch

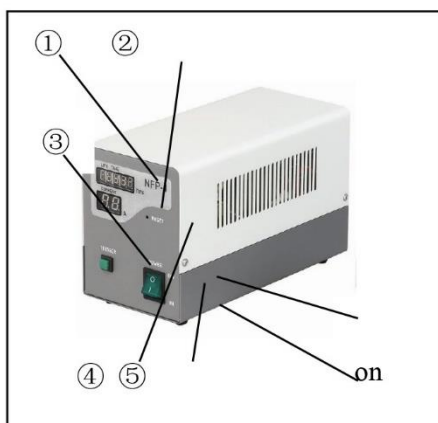


Figure 1

3.1.2. Function of button (Figure 1)

- ① Hour counter
- ② Ammeter.
- ③ Excitation button
- ④ Start reset button
- ⑤ Voltage switch

3.1.3. Adjusting the diopter (Figure 2)

1. Look into the right ocular by your right eye, then revolving the coarse focus knob to focus on the specimen.
 2. Then use your left eye to look into the left ocular. If the image is not sharp, just use the diopter adjustment ring ① to adjust please.
- ❖ There are ± 5 diopter in the adjustment ring. The number which the reticle on the eyepiece holder pointed is your eye's diopter graduation.

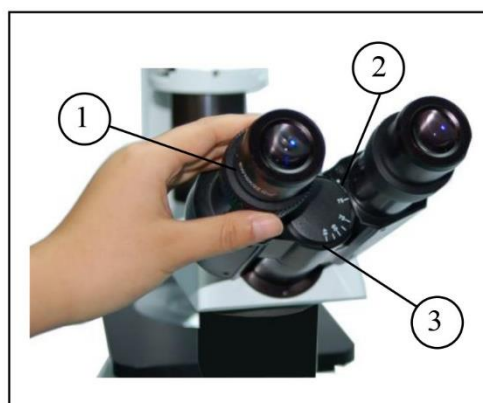


Figure 2

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Figure 3



Figure 4

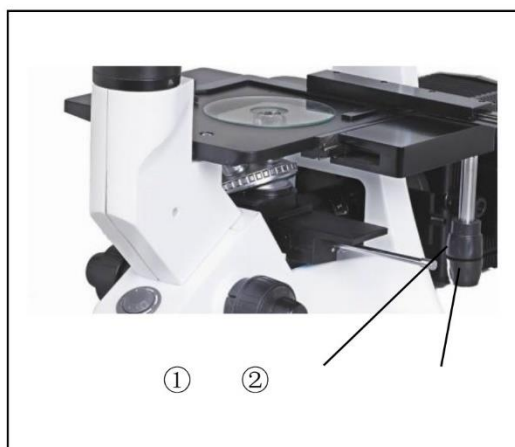


Figure 5

3.1.4. Adjusting the interpupillar distance (Figure 3, 4)

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

- ❖ The reticle on the interpupillar distance indicator ③, pointed by the spot “.” ② on the eyepiece holder, shows the scale of the interpupillar distance. (Figure 2)

The range of the interpupillar distance: 48~75mm.

3.1.5. Switching the light path (Figure 4)

- Pulling out the light path selector lever ④ by your thumb, select the light path you needed.
- When in the binocular observation, pushing in the lever until you heard a “clicked”. While in video or photography, pulling out the lever until it reached the “clicked” position.

3.1.6. Mounting Auxiliary Stage (Figure 5)

1. When using mechanical ruler. Located the specimen by moving the X,Y knob(120mmx78mm)
 2. Use the standard specimen cover (1.2mm) for best observation.
- Carefully replacing objectives or else the objective will touch the inserted glass plate when observing the specimen by short-working distance objective.

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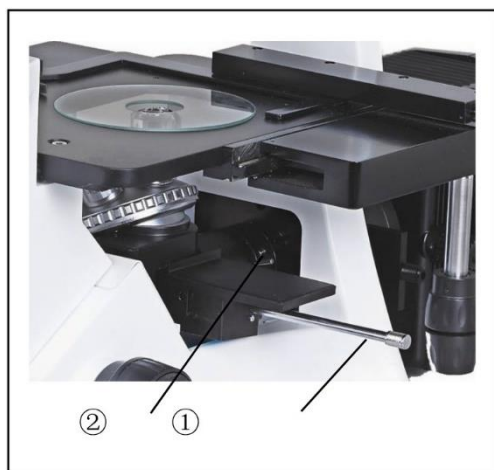


Figure 6

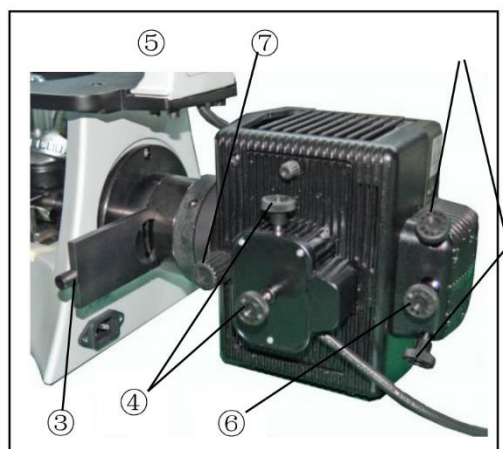


Figure 7

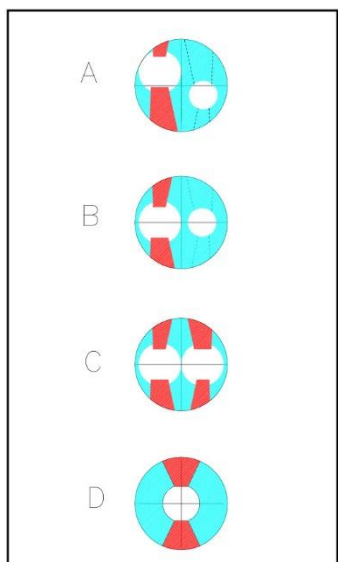


Figure 8

3.1.7. Centering the mercury burner (Figure 6-8)

- Before proceeding to center the burner, wait for the arc image to stabilize to protect against glare during arc image centering, it should be viewed across the excitation light protective shield.
1. Switch the light shutter ① to “●” position to shut off the light path.
 2. Revolve the filter block turret to engage the green or blue excitation filter block into the light path. If U/V excitation filter block used, be sure to use the protective shield.
 3. Revolve the nosepiece to engage 10× objective into the light path. Place the centering plate on stage, through transmission observation; adjust the stage until the cross is in the center of the field of view.
 4. Remove the objective from the revolving nosepiece position and engage this position in the light path.
 5. Pull out the field iris diaphragm lever ② to close the iris diaphragm and push in the aperture iris diaphragm lever ③ to open the iris diaphragm to the large limit.
 6. Switch the light shutter ① to “O” position to open the light path.
 7. Turn the collector adjusting knob ④ to project the arc image on the centering plate and sharpen it. (A)
 8. Revolve the burner adjusting knob ⑤ to move the arc image and the mirror reflected arc image in the symmetrical position. (B)
 9. Adjust the mirror focusing knob ⑥ (Figure 6) to sharpen the mirror reflected arc image. (C)
 10. Turn the burner adjusting knob ⑤ to overlap the arc image with the mirror reflected arc image. (D)
- Turn the collector adjusting knob ④ to make the field of view as bright as regular as possible.
 - Maintain this condition until the next time the burner is replaced.

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Note:

- When the hour counter indicates “100.0”, set the main switch to “o” (OFF) for safety, wait for more than 10 minutes, and then replace the lamp burner after making sure that the lamp housing has cooled down. A mercury burner seals high-pressure gas inside. If the burner is used beyond its service life, stress may accumulate inside the burner, and in the worst (but very rare) case, the burner could explode.
- After replacing with a new burner, reset the hour counter, be sure to press the reset switch until “000.00” is displayed.

Centering the mirror reflected image (Figure 6)

- ❖ The mirror reflected image has been centered before leaving the factory. Do not adjust the knob ⑦ please if not necessary. Only when the burner has been centered precisely, can the knob ⑦ be adjusted.

Note: once the knob is adjusted, the reflected mirror cannot be reconverted to the status when leaving the factory.

Knob control: (Figure 6)

1. The middle knob ⑥ is the mirror reflected image focusing knob which can sharpen the reflected image.
2. The knobs at both sides ⑦ can adjust the up/down or left/right position of the mirror reflected image.

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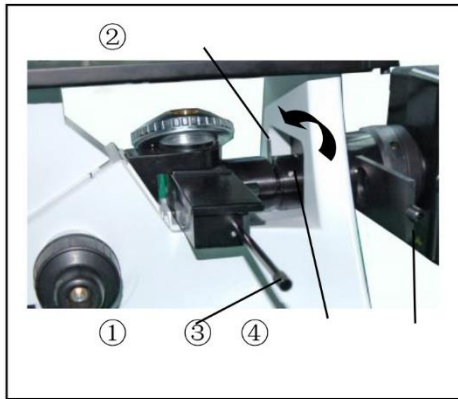


Figure 9

3.1.8. Centering the Field Iris Diaphragm (Figure 9, 10)

1. Engage the 10×objective in the light path, and place the specimen on the stage and bring into approximate focus.
2. Pull the field iris diaphragm lever ② out until the diaphragm comes into the smallest state.
3. Use the hexangular wrench to adjust the two field iris diaphragm centering screws alternately to move the image of the diaphragm to the center. (Figure 2 show the adjustment of diaphragm)
4. Push in the field diaphragm lever to open the diaphragm. As this makes slight deviation noticeable, adjust the centering precisely.
5. Enlarge the diaphragm until it just circumscribes the field of view.

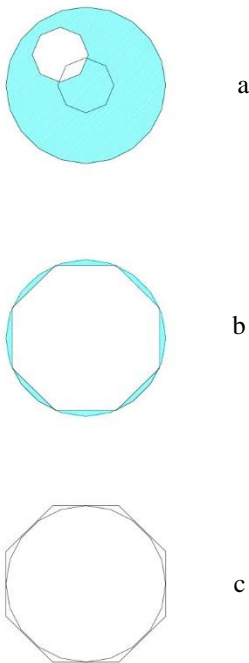


Figure 10

Adjusting the field iris diaphragm

The field diaphragm adjusts the diameter of the illuminating beam to obtain good image contrast.

Keeping the field diaphragm stopped down to the smallest required area for each observation makes it possible to prevent color fading of areas outside the observation target region.

According to the objective in use, adjust the diaphragm image using the field diaphragm lever so that the field of view is circumscribed by the field diaphragm to exclude stray light.

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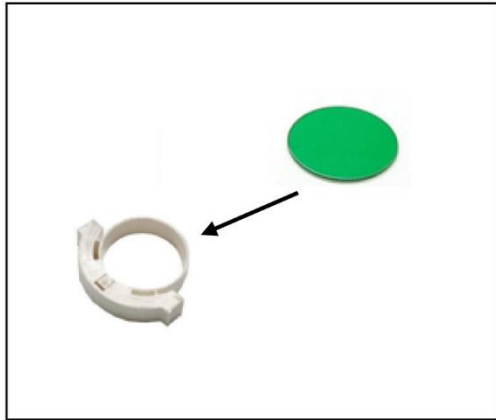


Figure 11

3.1.9. Using color filters (Figure 11)

- Selecting the appropriate color filters according your need, it became more effective to observe or photography the specimen. Especially, we suggest using the LBD color filter, which can compensate more neutral colors.
- You could pile up a group of color filters to the filter holder, if you ensure they are level and the whole thickness is less than 11mm.

Color Filter	Meaning
IF550	Single contrast color filter (green) (used for the phase contrast microscopy)
LED	Color temperature transit color filter (blue) (used for bright field observation and microphotography)

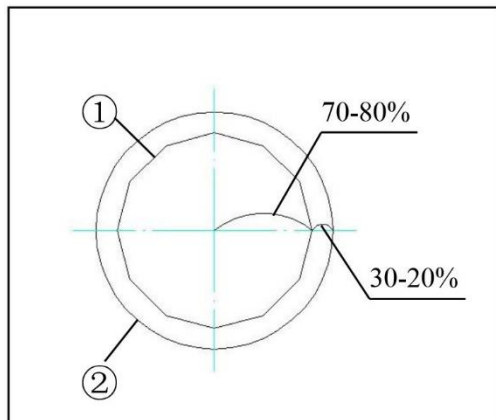


Figure 12

3.1.10. Using the aperture diaphragm (Figure 12)

- When in the bright field observation, the aperture diaphragm control the numerical aperture of the illumination system. Only when the numerical aperture of the objective and the illumination system being matching, you can obtain the higher image resolution and contrast, and the increased depth of field, too.

- To recognize the aperture diaphragm, you could remove the eyepiece if necessary (You also could insert in the center telescope), then looked into the viewing tube, you might see a field of view like the figure shown. The proportion could be changed by dialing the aperture adjustment lever according your need. (① is the image of the aperture diaphragm, ② is the edge of the objective).
- Generally, when observing the chromatic specimen, you need to set the size of the condenser aperture diaphragm at 70% ~80% of the numerical aperture which marked in the objective, but if observing the bacterium specimen which not colored, you could turn the aperture diaphragm lever at the direction of “⌚” (clockwise)

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3.2. Reflected observing illumination adjustment

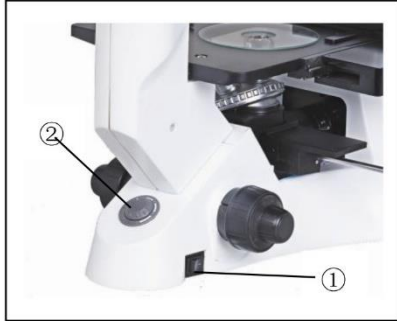


Figure 13

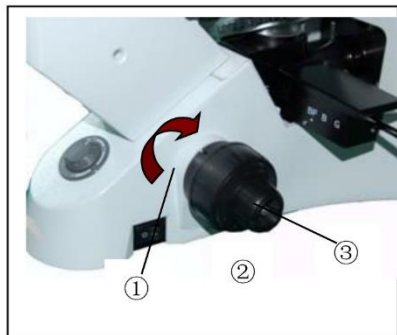


Figure 14

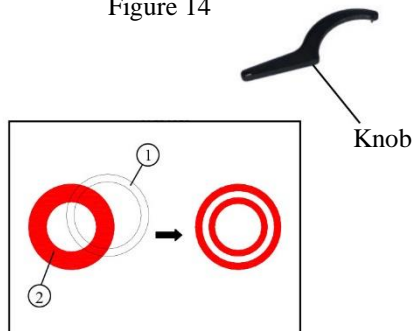


Figure 15

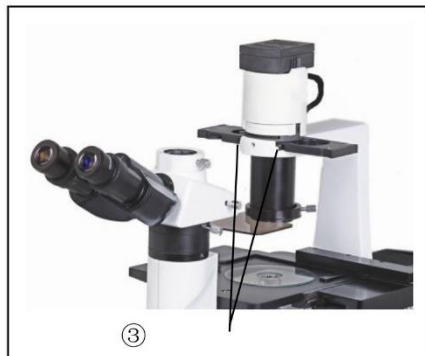


Figure 16

3.2.1. Turn power, adjusting brightness (Figure 13)

Connect the power, turn on the main switch ① on the bottom side of the base to “—” (on). Turning the brightness adjustment knob clockwise ②, the voltage raise, and the brightness strengthen; whereas turning at the contra direction, the voltage decline, and the brightness weaken.

- Using the lamp in a low voltage condition, will prolong the service life.

3.2.2. Adjusting the Tension Adjustment Collar (Figure 14)

The tension of the coarse focusing knob ② has already been adjusted properly before leaving factory.

- How to adjust tension of the coarse focusing knob?
Turn the tension adjustment collar ①. While revolving at the direction of the arrow in the figure, the tension of the coarse focusing knob ② is increasing, and if at the contra direction, the tension will decline.

3.2.3. The centering ring (Figure 15, 16)

❖ **Usually you do not need the operation of centering. If necessary, please accord to the following steps:**

1. Place the specimen on the stage and focus it.
2. Take out the eyepiece, replace it with the CT (the centering telescope), and inserted it into the viewing tube without diopter adjustment.
3. Make sure the matched phase contrast objective and light ring (in the phase contrast slider) have been in the center of the light path.
4. Using the CT to look the light ring's image ① and the phase contrast ring's image ②, if the light ring's image is not sharp, please shifting the CT's ocular until you can see a clear image of the light ring ②.
5. Adjusting the bolts of the two centering holes ③ in the phase contrast slider by the screwdriver ③ until the light ring center and the phase contrast center are coincided.
6. The 10X and the 20X phase contrast objective use the same light ring on the phase contrast slider. So you need to check the coincidence of the light ring center and the phase contrast center when changing the objective. If having departure, you ought to center again.

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- ❖ If the light ring is centering incorrectly, you will fail to obtain the best viewing effect of the microscopy.
- ❖ After removing or replacing a thick specimen, the light ring and the phase contrast ring are likely to deviate each other, which will result in a decline of the image contrast. So if happened, please repeat the steps as above.
- ❖ If the container or the cover flip which used to place the specimen is not flat, it maybe need to repeat the centering steps for obtaining a more contrast effect. Please center the light ring by the phase contrast objective, according to the sequence of low to high magnification.

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4. MICROSCOPE PHOTOGRAPHY AND VIDEO

4.1. Microscope video

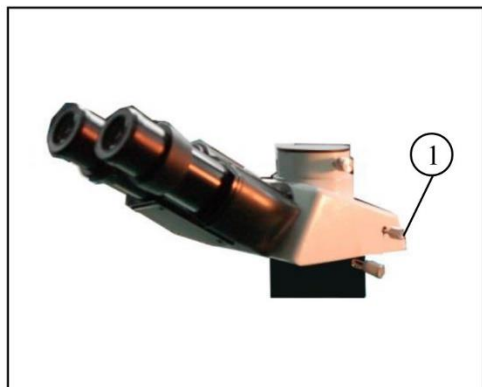


Figure 1

4.1.1. Selecting the light path (Figure 1)

❖ Just used in the trinocular observation

Pulling out the light path selector lever, until you heard the “clicked”.

- ❖ In dark specimen observation, you can make the focus by both eyes at first, then change the light path.

4.1.2. Installing the video set (Figure 2)

1. Loosen the locking bolt ① on the trinocular viewing tube, and take out the dust cap ②.
2. Remove the dust cover on the both ends of the video accessories ③, and revolve the screw head end into the CCD/CMOS port.
3. Install the accessories into the tri-through port, and screw down the bolt ①.

4.1.3. Focus (Figure 2)

Doing a binocular observation at 20% brightness, look the image on the video or the computer which connected with the microscope video system when the image is sharp. If it is not in focus, please turning the revolving video connected tube ④ until the image is sharp enough.

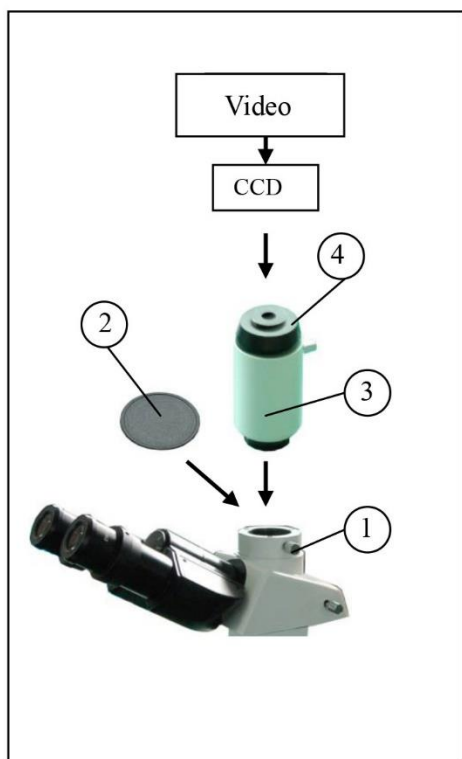


Figure 2

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4.2. Microscope photography

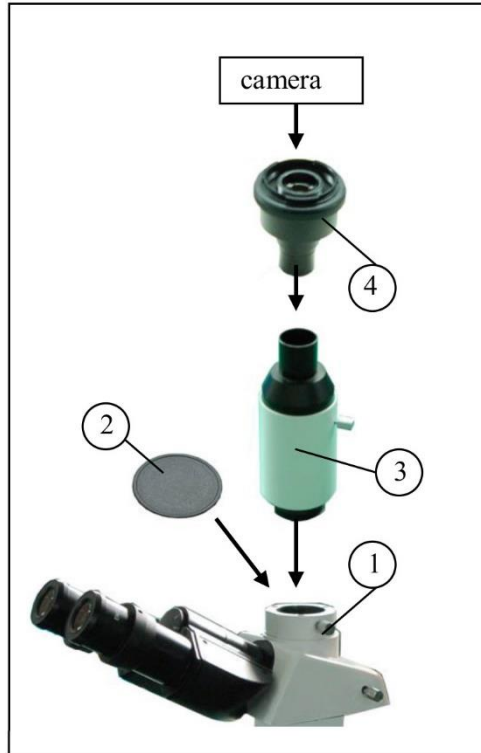


Figure 3

4.2.1. Selecting the light path

❖ Just used in the trinocular observation

The operation diagram is shown in the details reference is in 4.1.1.

4.2.2. Installing the photography set (Figure 3)

1. Loosen the locking bolt ① on the trinocular viewing tube, and take out the dust cap ②.
 2. Install the photography accessories ③ into the trinocular port, and screw down the locking bolts ①.
 3. Inserted the camera gate which on the digital photography connected head ④ into the correspond position of the camera set port, and screw it down clockwise.
 4. Plug the digital photo connected head into the photo tube, then screw down the locking bolts ①.
- Before connecting the camera and adapter, remove the camera lens first, then connect the lens port with the adapter. Pay attention to the gate type, please.
 - To avoid the disturbing from the ocular in the observation, please place the viewer finder on the two sides of the microscope when installing the camera set.
 - The camera magnification = objective magnification × camera lens magnification
- ❖ **When shooting the micrograph, the lens close will bring an impact in some camera. In order to weaken the impact, and obtain a clear image, you could select a longer time of exposure or decrease the brightness to have some compensation.**
- ❖ **This explanation is used for Nikon Single-lens reflex digital camera.**

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5. OUTFIT

5.1. Specifications

Optical system	Infinite optical system				NYMCS-702
Reflected light source	Excitation units	excitation	Dichroic mirror	Barrier filter	
	Blue Excitation	BP460~490	DM500	BA520	●
	Green Excitation	BP510~550	DM570	BA590	●
	Ultraviolet Excitation	BP330~385	DM400	BA420	○
	Violet Excitation	BP400~410	DM455	BA455	○
Viewing Tube	Trinocular head, 30° incline; inter-pupillary range 48-75mm				●
Eyepiece	High point, extra-wide field eyepiece EW10×/22mm				●
Centering	Centering (φ30mm)				○
Nosepiece	Backward Quintuple Nosepiece				●
Objectives	In finite plan long working distance objective 4×				●
	In finite plan long working distance objective 10×				○
	In finite plan long working distance objective 20×				○
	In finite plan long working distance objective 40×				●
	In finite plan phase contrast objective PH10×				●
	In finite plan phase contrast objective PH20×				●
	In finite plan phase contrast objective PH40×				○
Phase contrast slider	10×-20×, 40×phase annulus plate				●
	10×-20×, 40×phase annulus plate				○
Mechanical stage	Stage: 160×250mm, inserted plate, Stage strengthen plate:70×180mm.				●
Mechanical ruler	Movement: 120×78mm				●
Reflected illumination	6V30W Halogen lamp, brightness adjustable				●
Illumination	100WHBO ultra Hi-voltage spherical mercury lamp				●
Protection barrier	Barrier to resist the ultraviolet light				●
Photography Attachment					●
Video					○
Power	Power supplier NFP-1, 220V/110V interchangeable ,digital display				●
Condenser	Ultra-long working distance condenser, aperture number 0.3, working distance 72mm				●
Filter	45mm blue, green and ground glass				●
Focusing	Coaxial coarse and fine adjustment, vertical objectives movement. Coarse stroke: 37.7mm per rotation. Fine stroke :0.2mm per rotation				
Operation condition	<ul style="list-style-type: none"> ● Use indoor ● Altitude: Maximum 2000 m ● Temperature: 5°C~40°C (41°F~109°F) ● Maximum Relative Humidity: 80% at 31°C (88°F), then Fall Linear. ● 70% at 34°C (93°F), 60% at 37°C (104°F), 50% at 40°C (104°F). ● Pollution Degree:2 (refer to IEC60664) 				

Note : ● = Standard outfit , ○ = Optional

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5.2. Objective Specifications

Type	Magnification	Numerical Aperture (N.A.)	Working Distance (mm)	Conjugate Distance (mm)	Focus Distance (mm)	Cover Slip Thickness
Infinite Long Working Distance Plan Achromatic Objective	4X	0.1	25.2	∞	45	—
	40X	0.6	3.2	∞	45	1.2mm
Infinite Long Working Distance Plan Phase Contrast Objective	10X	0.25	11	∞	45	0.17
	20X	0.4	6	∞	45	0.17

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6. TROUBLESHOOTING

Under certain condition, some no-fault factors will bring a reversible influence to the instrument's performance. If the problem is happened, please take proper measures according to the follow table. If you can't solve the trouble by the supplied methods, please contact with the sales department of our company.

PROBLEM	REASON	Solution
I. Optical Part:		
1. The illumination is opening, but the field of view is dark.	The plug of the lamp holder is not connected into the illumination set	Connect them well
	The bulb burnt out	Change a new lamp
	The brightness is too low	Adjust to a proper position
	The color filter is piled too much	Minimize the number of the filters
	No use the appointed lamp bulb	Use the specified halogen Lamp 6V30W
2. The edge of the field of view has shadow or the brightness is asymmetry	The nosepiece is not in the located position	Turn the nosepiece into the position where you can hear "clicked"
	the color filter is stopped midway	Insert deeply
	The phase contrast slider is not located in the proper position	Turn the slider into the "clicked" position
3. Find dust and stain in the field of view	There are stains on the specimen	Change a clean specimen
	There are stains and dust on the eyepiece	Clean the eyepiece
4. Appear double image	the size of the aperture diaphragm is too small	Open up the aperture diaphragm
5. Resolution problems: <ul style="list-style-type: none"> • Image is not sharp; • The contrast is not high; • The detail is not clear; • Don't obtain the phase contrast effect 	The nosepiece is not in the center of the light path	Ensure the nosepiece is turned into the "clicked" position
	the aperture diaphragm in the view of field is opened too large or too small	Adjust the aperture diaphragm correctly
	The lens (condenser, objective, ocular or culture dish) become dirty	Clean all
	In the phase contrast observation, the bottom thickness of the culture dish is more than 1.2mm.	Use a the culture dish whose bottom thickness is less than 1.2mm
	Use a bright field objective	Change to the phase contrast objective
	The condenser ring is not coincident with the objective phase ring	Adjust the condenser ring to match the objective phase ring
	The light ring and the phase contrast kits is not centered	Adjust the bolts to center them
	The objective used is not fit to the phase contrast observation	Please use the compatible objective
	When looking at the edge of the culture dish, the phase contrast ring and the light ring is deviated each other	Moving the culture dish until you obtain phase contrast effect. You also can demount the slider, dial the field diaphragm with the direction of 

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6. One side of the image is unfocused	The nosepiece is not in the center of the light path	Insure the nosepiece is in the “clicked” position
	The specimen don’t place properly	Place the specimen on the stage correctly.
	The optical performance of the culture dish bottom is poor (such as erose figure and soon)	Please use a regular culture dish
II. Mechanical Part:		
1. The coarse focus knob is hard to run	The tension adjustment collar is too tight	Loose properly
2. The image can’t stay on the focal when observation	The tension adjustment collar is too loose	Tighten properly
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 burns out in a high frequency	Not use the specified lamp	Use the required lamp
3. The height of the brightness is not enough	Not use a appointed lamp	Use an appointed lamp
	The brightness adjustment knob is used wrong	Adjust the brightness adjustment knob in a correct way
4. The light glimpse	The bulb is going to spoil	Change the bulb
	The power cord have a poor contact	Check the power cord, and connect them exactly
IV. Viewing tube		
1. The two eyes’ field of view is different	The interpupillary distance is not correct	Adjust the interpupillary distance
	The diopter is not right	Adjust the diopter
	Not adapted to the microscope observation	When observing, do not stare at the specimen but at the whole field of view, or move the eyes away to see other things, then back into the objective
V. Microscope video		
1. The image is unfocused	Focus incorrectly	Adjusting the focus system, make the double reticle and the specimen distinctly to see
2. There is faintness around the image	It is an inherent character of the achromatic objective	The problem is unavoidable if you used an achromatic objective
3. The indoor window or the fluorescence lamp develop	The extra light entered into the eyepiece and viewfinder is reflected	Cover up the eyepiece and the viewfinder of the microscope illumination system