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Inverted Fluorescent Microscope

NYMCS-1701

User Manual

This manual is written for Inverted Fluorescence Microscope NYMCS-1701. 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 Notices

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 virations.
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
O	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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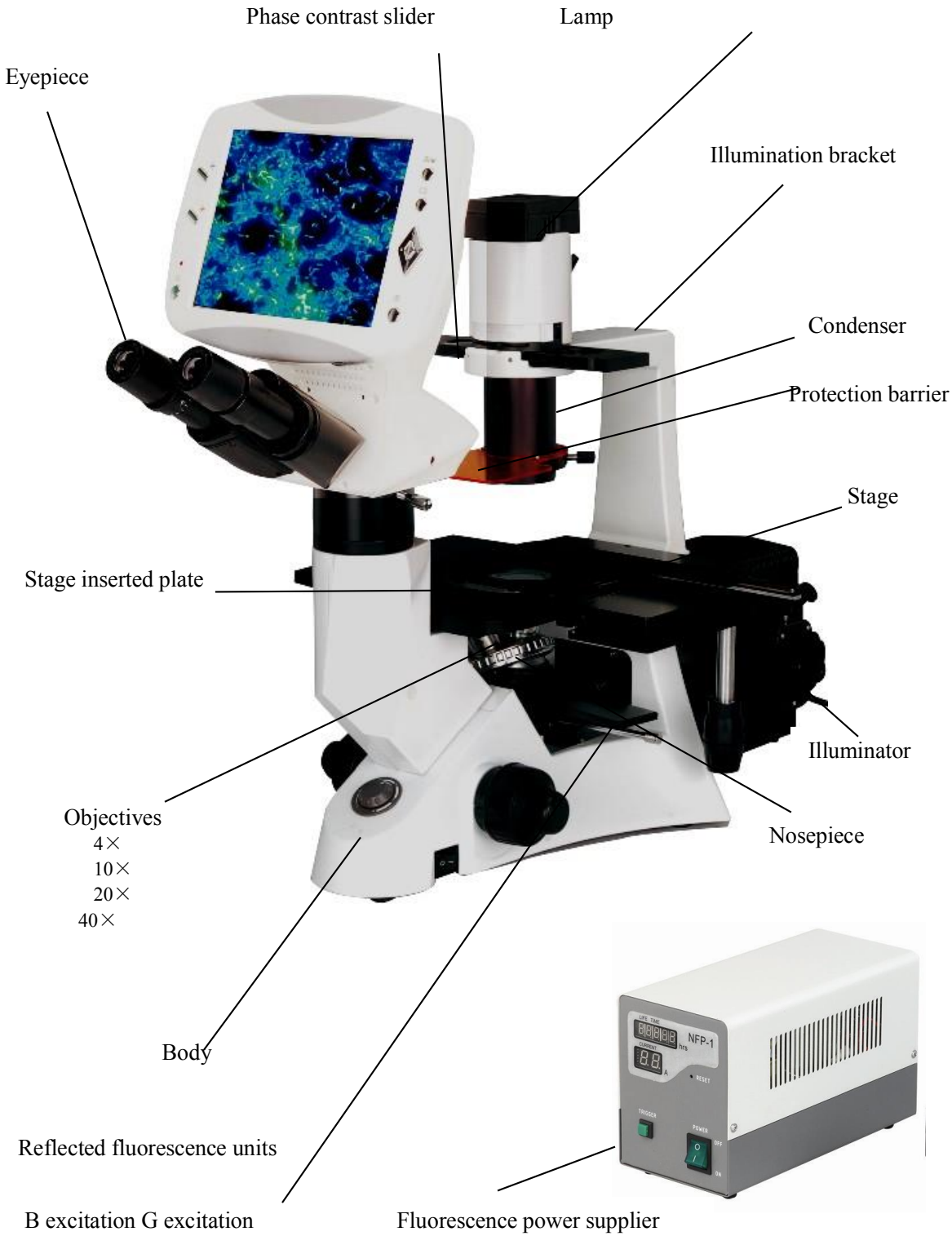
1. Components Name



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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 Installment steps

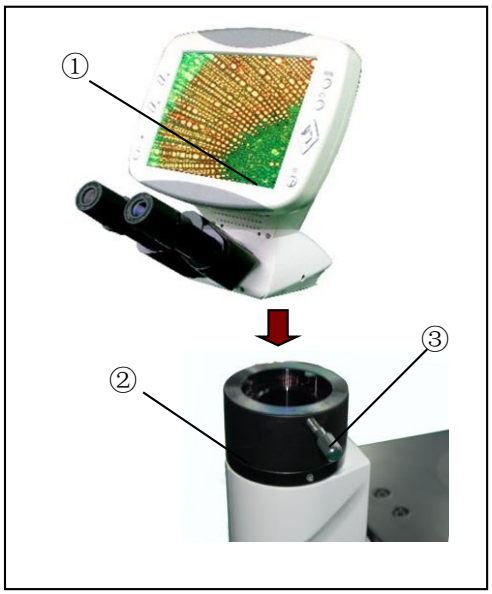

Fig 1

2.2.1 Installing viewing head (fig 1)

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

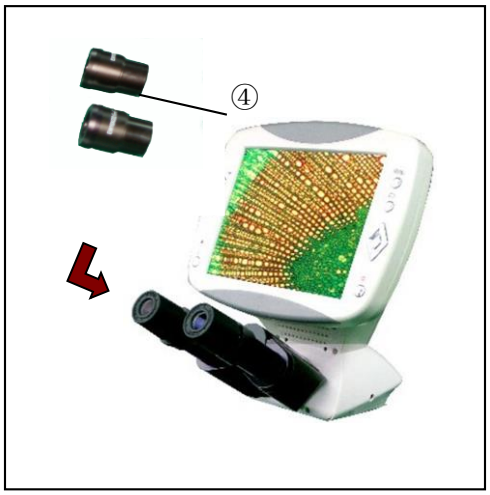

Fig 2

2.2.2 Installing eyepiece (fig 2)

Insert the eyepiece ④ into tube until they are against.

Fig 3

2.2.3 Installing condenser set (fig3)

Install the condenser into the right direction (fig3).

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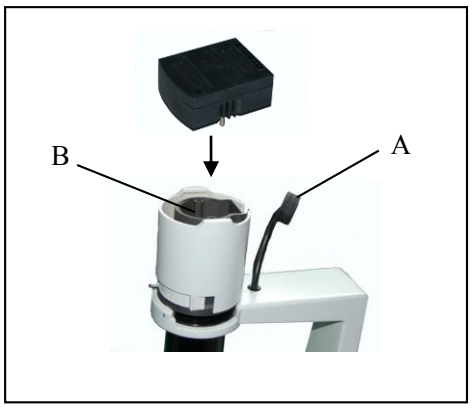

Fig 4

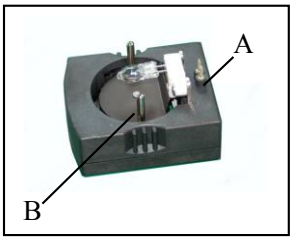

Fig 5

Fig 6

Fig 7

2.2.4 Installing lamp house (fig4, fig5)

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. (Fig 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 (fig6, fig7)

1. Keep the slider① 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 reaches the center of the light path (show as fig 7).

2. Turn the aperture diaphragm lever ①to 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℃～40℃, 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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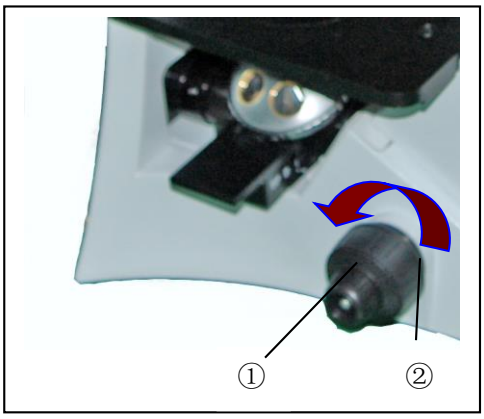

Fig 8

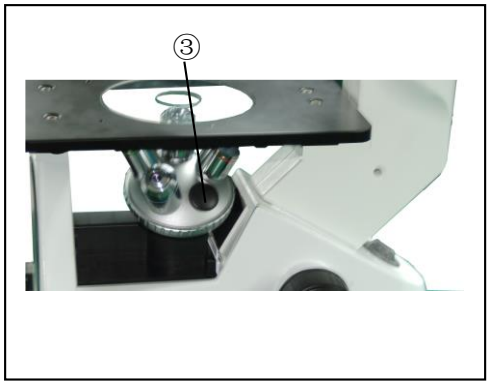

Fig 9

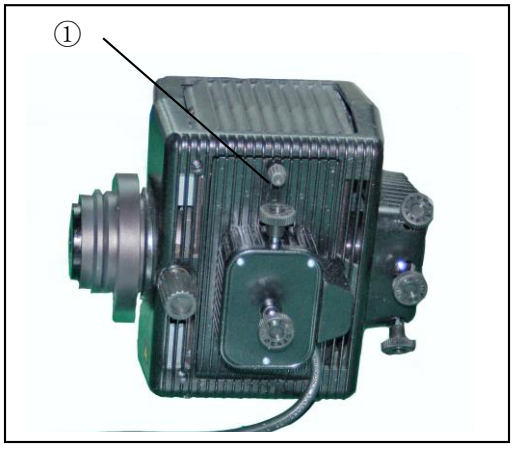

Fig 10

2.2.6 Installing the objective (fig8, fig9)

1. Turning the coarse fusing 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 (fig10, fig 11)

1. Loosen the burner socket clamping screw ①, and remove the burner socket.（fig.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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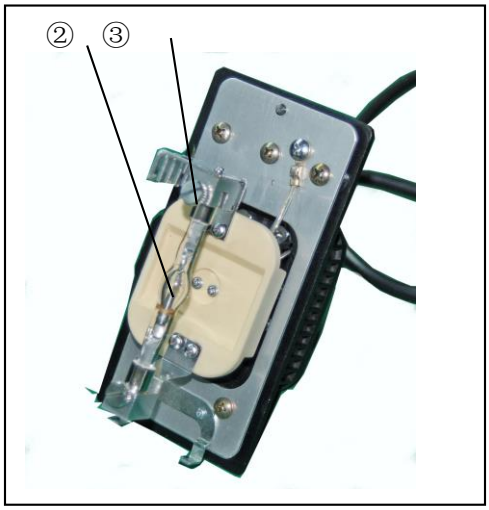

Fig 11

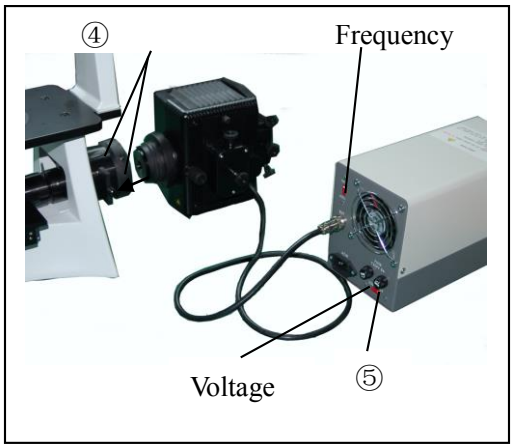

Fig 12

Fig 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 (fig 12, 13)

1. Mount the lamp housing into the other end of the attachment and fix it with two screws④.
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 BestScope and the same type power cord should be used if you lose or damage the old one

2.2.9 Fuse Replacement (fig 12, 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 holders⑦by 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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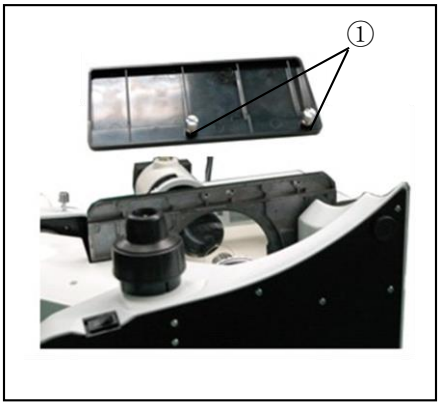

Fig 14

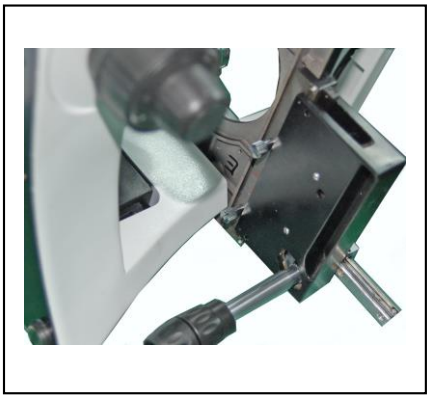

Fig 15

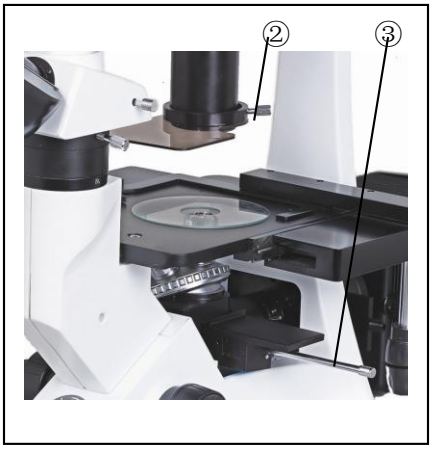

Fig 16

2.2.10 Installing the stage lengthen splint and the mechanical ruler (fig 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.

2.2.11 Installing protection barrier, glass plate, lever (fig 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 “1” (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 10mimutes, 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

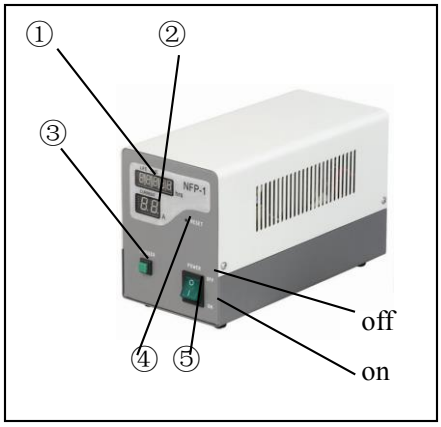
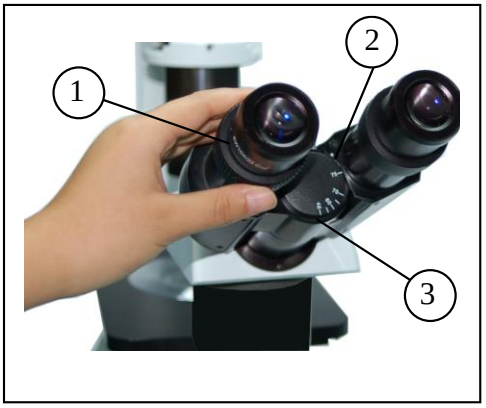


Fig 1



3.1.2 Function of button (fig 1)

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

3.1.3 Adjusting the diopter (fig 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 ring① 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.**

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Fig 3

3.1.4 Adjusting the interpupillar distance (fig3)

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, pointed by the spot "." on the eyepiece holder, shows the scale of the interpupillar distance.**

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

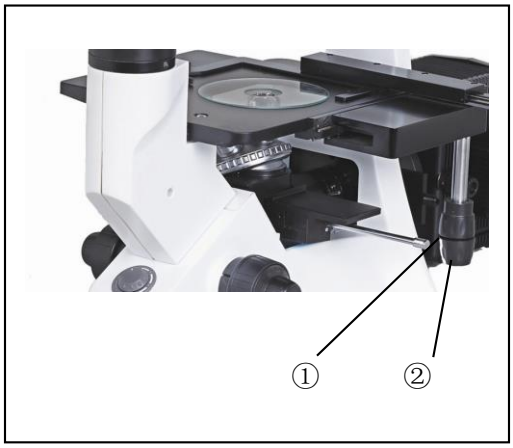

Fig 4

3.1.5 Mounting Auxiliary Stage (fig 4)

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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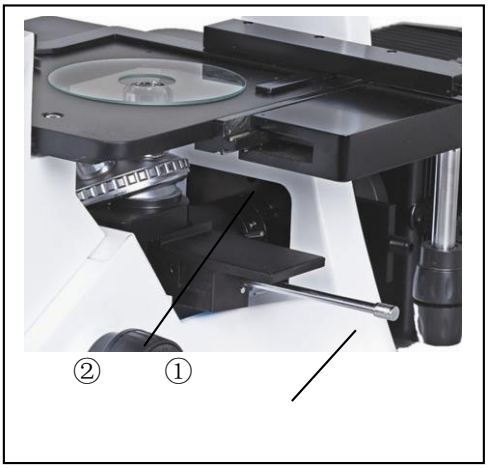

Fig 5

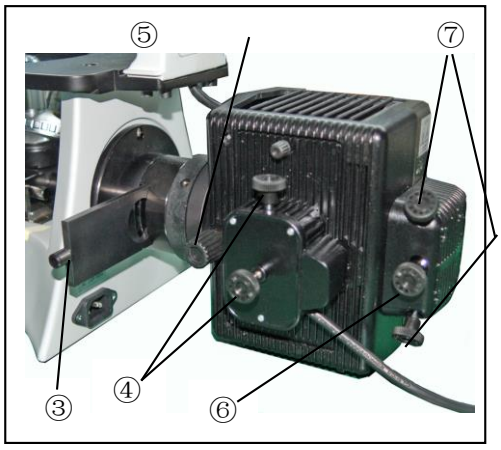

Fig 6

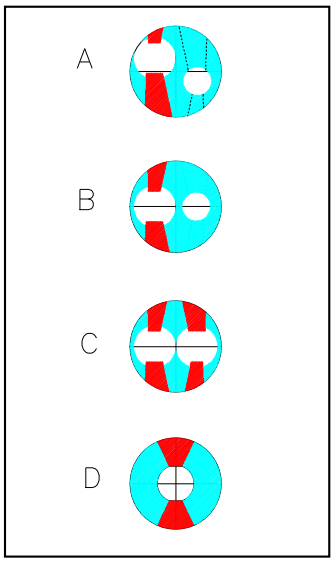

Fig 7

3.1.6 Centering the mercury burner (Fig.5-7)

◎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 (Fig.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, 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.

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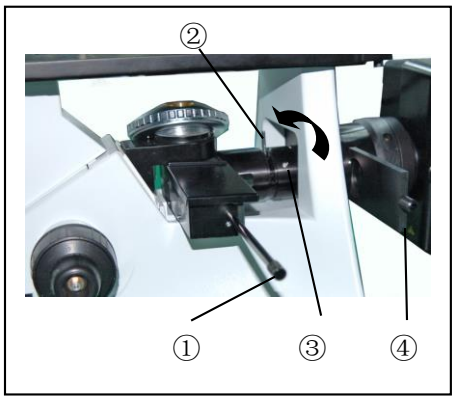
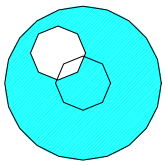
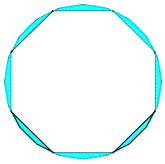


Fig 8



a



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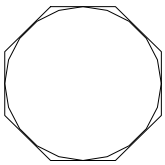

c

Fig 9

Centering the mirror reflected image (Fig.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: （Fig.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.

3.1.7 Centering the Field Iris Diaphragm (fig 8, 9)

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. (Fig.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.

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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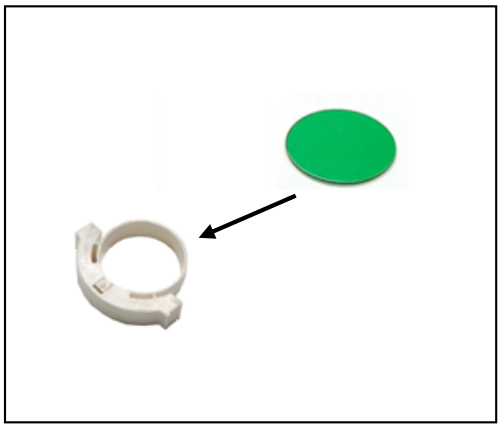

Fig 10

3.1.8 Using color filters（fig 10）

◎ 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）
LBD	Color temperature transit color filter（blue） （used for bright field observation and microphotography）

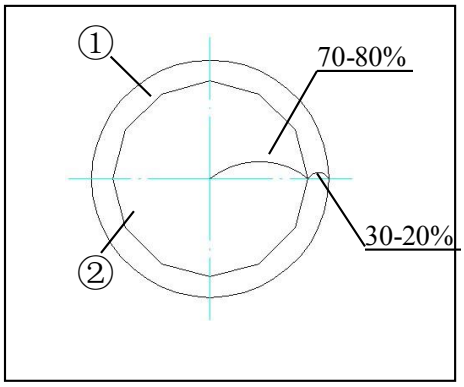

Fig 11

3.1.9 Using the aperture diaphragm（fig 11）

◎ 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. (①is 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

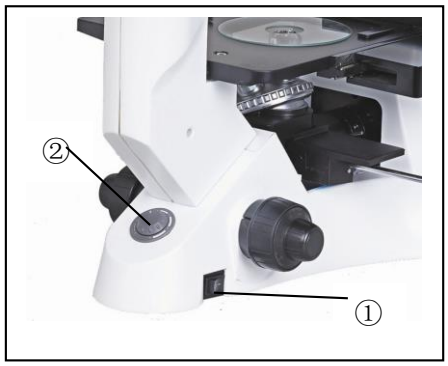

Fig 12

3.2.1 Turn power, adjusting brightness (fig 12)

Connect the power, turn on the main switch ① (shown on the fig.12) which 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.

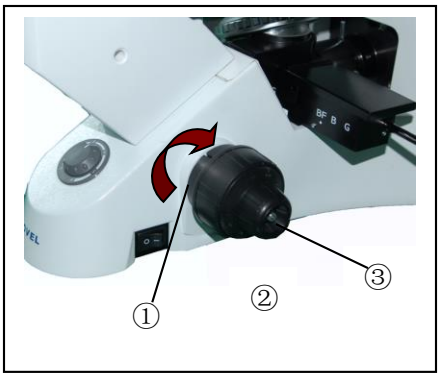

Fig 13

3.2.2 Adjusting the Tension Adjustment Collar (fig13)

The tension of the coarse focusing knob② 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.

knob

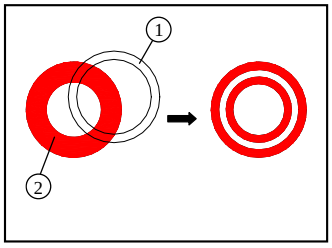

Fig 14

3.2.3 The centering ring (fig 14, 15)

★ 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.

Fig 15

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4. Using the CT to l: the light ring's image① and the phase contrast ring's image②, 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 ring②.
5. Adjusting the bolts of the two centering holes③ in the phase contrast slider by the screwdriver ③until 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.

★ 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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3.3 Digital LCD biological microscope operation interface

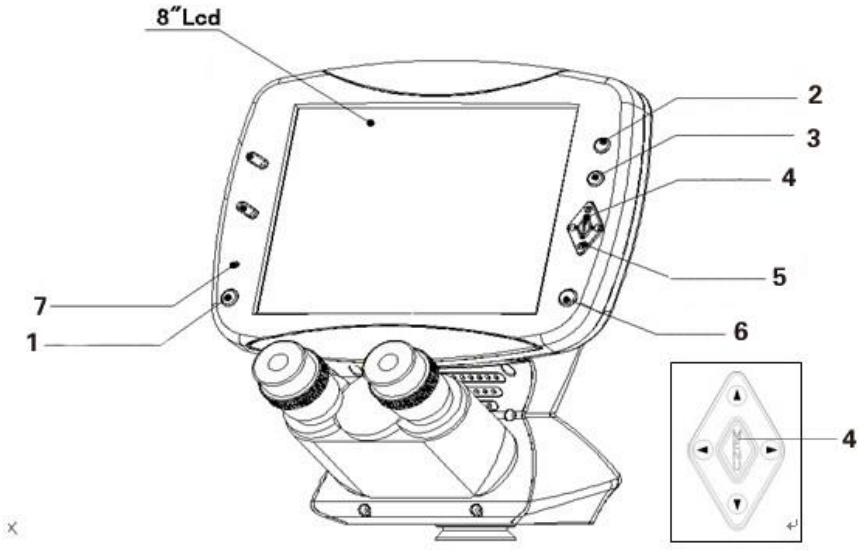

Fig.16

3.3.1 Power on

Before power on, please take out the SD card from the card reader firstly. Insert SD card into SD slot behind the microscope head completely until it is locked. Push softly the inserted SD card, it will eject out, then take it out (When the card is under reading or writing, do not pull it out. Better power off first before pulling out the SD card).

Connect the DC plug of the power adapter to the "DC" jack on the microscope head. Press the power switch on the control board, "WELCOME" should appear on the LCD screen. After 3 seconds, the microscope system will be in the preview in the real time automatically when you can snap.

Adjust microscope's definition: according to its imaging focal length, make both images sharp from eyepiece and LCD display screen, and then the adjustment is done.

3.3.2 Operation buttons and functions

1. Power button：apply power，make microscope working；
2. Mode switching button：snap/video/playback；
3. AV output switching: LCD screen display/AV output switching button
4. Main menu button：menu function control and confirm
5. Menu direction button: menu function select by pressing up/down/left/right buttons
6. Snap button：snap and video function
7. Power indicator

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Adjustment & Operation

3．3.3 Screen display data

Press  button to select snap, video or playback.

1. Fig.17-01. Once the power on, the model is snap (photo) model. Press  button，the system will store the photo automatically.

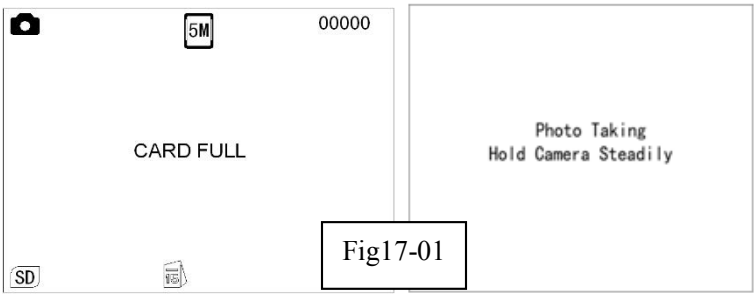

Fig17-01

2. Fig.17-02. Press the  button after power on, the model is video model. Press  button, the system will start to take video recording, press  button again, video recording is over. When the SD card is full, the system will show “SD full”.

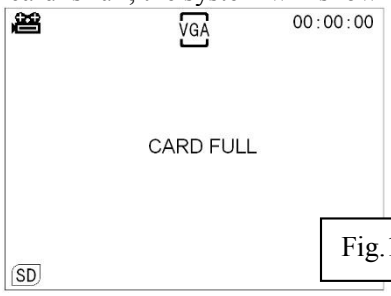

Fig.17-02

3. Fig.17-03. Press the  button 2times after power on, the model is playback model.

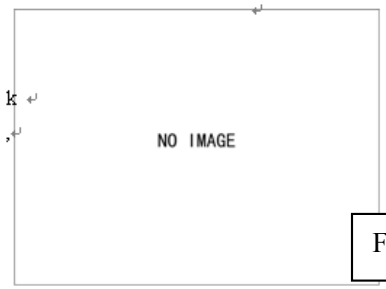

Fig17-03

Shown on the upper right corner is the Nos of photos that can be taken or the video recording time（“0000” means in the current setup mode, it still can shoot 0000pcs photos）.（“00：00：00” means in current setup mode it still can record 00min 00sec）.
On the upper left corner, indicates photo mode，indicates video mode.
Pic17-01, Shown on the top middle “5M” is the resolution of photos taken in Pixels.（“5M”indicating the pixels for photo taken at the present setup mode as 2560x1920.（“VGA” indicating the pixels for video taken at the present setup mode as 640X480.
“SD” show on the lower left corner means that SD card inserted is inserted in the LCD microscope head.
“CARD FULL” indicates that the memory of the SD card is full.

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4. Fig17-04, “MEMORU FULL” indicates that the memory of LCD microscope head is full.
Due to the built-in memory of the LCD microscope head is very small, it can be stored on piece photo .
Please insert SD card firstly before your snap.

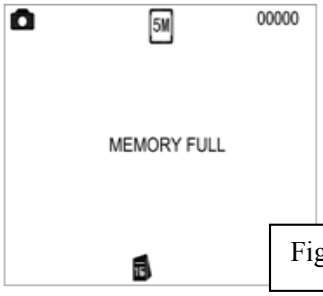


Fig.17-04

5. Fig17-05 ,When transfer the photo from the LCD microscope head to SD card ,press the left key to select “Yes” and confirm by the menu button .

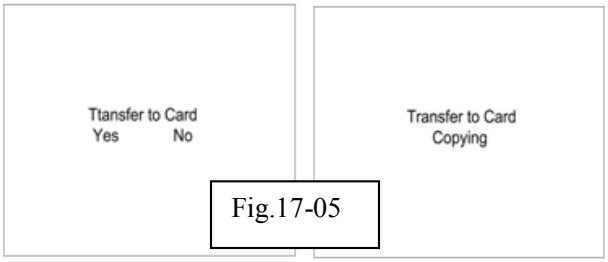
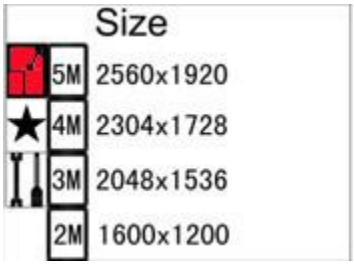


Fig.17-05

If you press “No” by menu button, the photo remains stored on the LCD Microscope head itself.

3．3.4 Function menu select

With the help of the function, one is able to carry out the setting of the whole system. The up and down key allows you to choose the following functions:



On the snap model, press menu button to enter menu interface. Use up & down key to select a setting from the above 3 items.
A：Image size /　　B：Image quality　/　　C：Setting data

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A、Image size

Fig.18-01

Fig.18-02

Select photo and video resolution.

Fig.18-01.On snap model, press button as shown the “Size” ,then press the right key to select the pixels for photo taken base on 5M/4M/3M/2M use by up & down keys. Press menu button again to save your selection. Exit from the setting up after confirmation, the model comes back to the snap model.

Fig.18-02.On video model, press menu button as shown the “Size” ,then press the right key to select the pixels for video taken base on 640X480 or 320X240 use by up & down keys. Press menu button again to save your selection. Exit from the setting up after confirmation, the model comes back to the video model.

B、Image quality

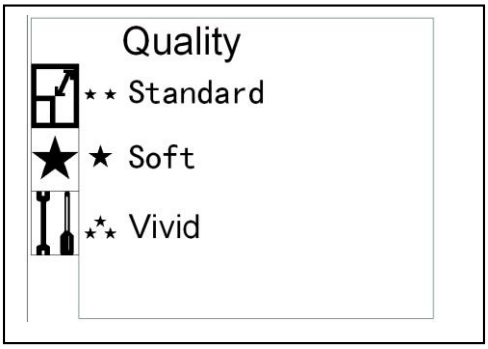

Fig.19

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Fig.19**. Quality: image quality**

On snap model, press button as shown the “Size”, then press the down key to enter the “Quality”.

Then press the right key to select as Standard/Soft/Vivid by pressing up & down keys . Press menu button again to save your selection.
Exit from the setting up after confirmation, the model comes back to the snap model.

C、Setting date

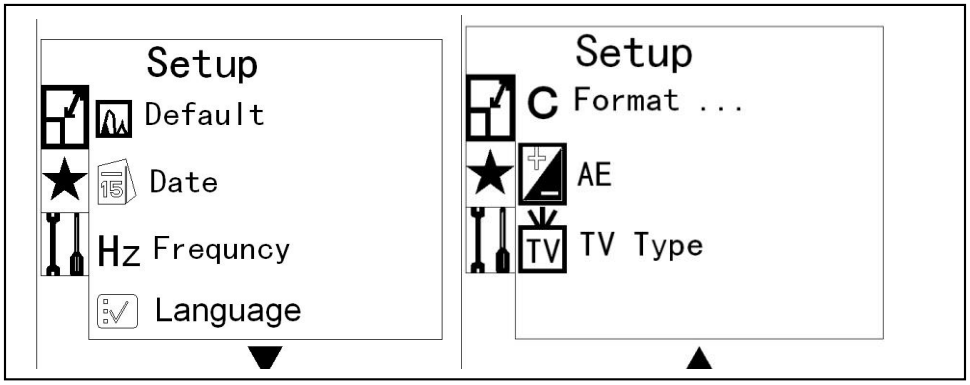

Fig.20

Fig.20.Setup: Setting up each item.

On snap model, press button as shown the “Size”, then press the down key to enter the “Setup”.

Then press the right key to select as Default /Date/Frequency/Language/Format/ AE/TV Type by pressing up & down keys . Then press the right key to enter the setting items by use up & down keys to select the option. Press menu button again to save your selection. Exit from the setting up after confirmation, the model comes back to the snap model.
On video model, the operation is same.

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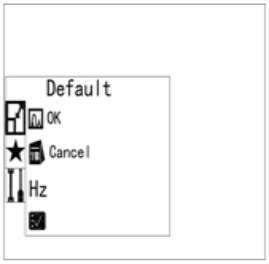
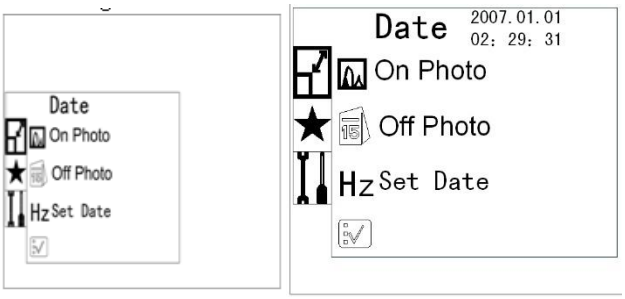
3. 3.5 Setting items details

A. Default



This camera will save all of functions after you set up, even power off; the setting changes will be stored after press menu button . If you want come back to the original settings, please find “Default” in the menu, select “ok” and confirm. When you select “Cancel” and press menu button, the model comes back to the snap model.

B. Date



Date and time information can be stored together with photo taken in SD card. File names also contain date and time information. Before using this camera, please set the date and time properly. Setting method is the following:

On snap model, press button as shown the “Size” ,then press the down key to enter the “Setup”. Then press the right key to select “Date”, press the right key once again to select On Photo/Off Photo/Set Date by up & down keys . Press menu button to confirm selecting “On Photo”, the present date and time will be indicated on the lower right corner of the photo. Select “Off Photo” to turn off the time recording on the photo taken.

When you press the left key , it will be return the previous set position.

When you select “Set Date”, press the right key to select year, month, day, hour, minute and second on the upper right corner. The up/down/right/left keys can be used to set up the current date and time. Press menu button to save your setting. Exit from the setting up after confirmation, the model comes back to the snap model.
To select “On Photo” or “Off Photo”, it will decide whether the date and time information is stored with photos in SD card or not. This camera shows time as Year/ Moth/ Date and 24 hours.
On video model, the operation is same.

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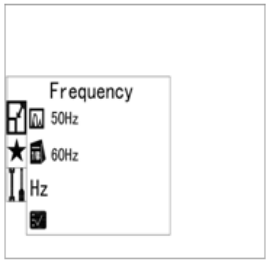
C．Hz: Frequency



Pressing up/down keys to select 50Hz/60Hz according to the local power frequency.

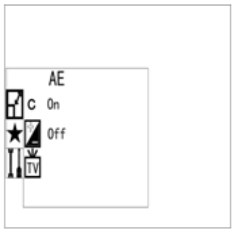
D. Language

Pressing up/down keys to select English

E. Format

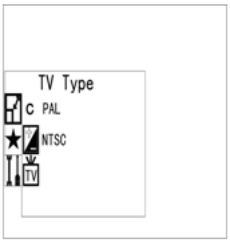
Select “OK” can format all the SD card inserted； (Attention：Even the protected content will be deleted when formatting, cannot be resumed again.) Select “Cancel” and press menu button, the model comes back to the snap model.

F．AE



”On” means auto exposure，The programmer will adjust exposure value automatically according to the lightness of the shooting object. Select “off”, the exposure will depend on environment brightness.

G. TV Type



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Pressing up/down keys to select NTSC/PAL for the video output according to local video signal.
This function need be set up when this camera is connected to TV in other countries. Make sure the correct video system type was selected before connecting AV cables. Otherwise the recorded video cannot be showed on TV.

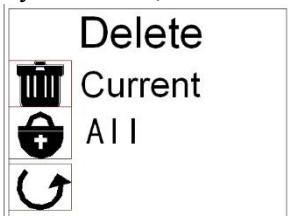
TV system of the main countries and areas:
NTSC: North America，Japan，Taiwan，South Korea
PAL: Europe，China

On video model, the operation is as same as above.

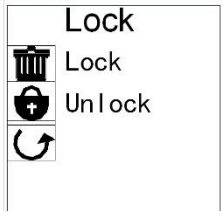
3．3.6 Shooting and edit

Press  button 2time to select playback model.
Press up & down keys to browse every photo and video which is taken and stored in the SD card.
Press left key, the screen will display multi photos and videos. Index display helps to find target photo or video quickly in many pictures and videos.
Select some photo, then press menu button to display the single photo on LCD screen.
Select some video, then press menu button to play the video recording on LCD screen.

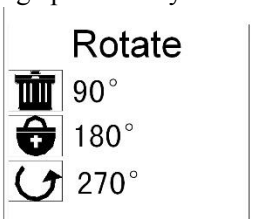
On playback mode, press menu button to find “Delete” function ,press right key and select “Current” or “All” use up& down keys to delete single photo(video) or all photos(video).
Press menu button to find “Lock “function by down key. Then press the right key to select “lock” or “unlock” use by up & down keys. (Locked photos and videos cannot be deleted, but can be formatted).
”Rotate” function can rotate photos（90，180，270）degrees。
On playback mode, select the three functions on the menu as below by pressing up/down keys：



A. Delete Photo or video



B. Lock Photo or video



C. Observation of rotating Photo

3. 3.7 USB data communication

USB mode

You can use USB cable to connect to computer, Install the driver on PC as we attached, the photos stored in SD card will be sent to computer easily via USB. You also can take photos and videos on PC.

A. Mass Storage mode（MSDC）

To read the stored information in LCD microscope head through computer。

Connect to PC with USB cable, power on, press the menu button on MSDC mode (Fig.16-02). There is a removable disc icon in PC, click DCIM/100MEDIA/，can down load pictures；Also can be used a U driver to store any format files.

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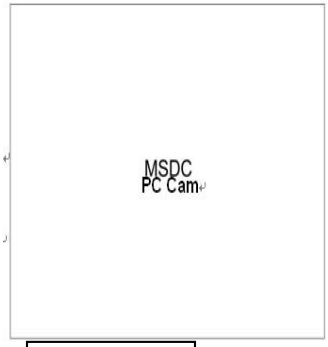

Fig21-01

Fig.21-02

Fig.21-03

B. PC mode（PC CAM）

Connect to PC with USB cable, power on, press up& down keys to select" PC CAM "mode, and confirm by the menu button (Fig.21-03). Meantime the screen become blue.

Now we can open the installed driver and find "PCCam" on the desktop of PC.
Choose option to preview the real time imaging or take photo and video through PC. This function requires an observation software installed.

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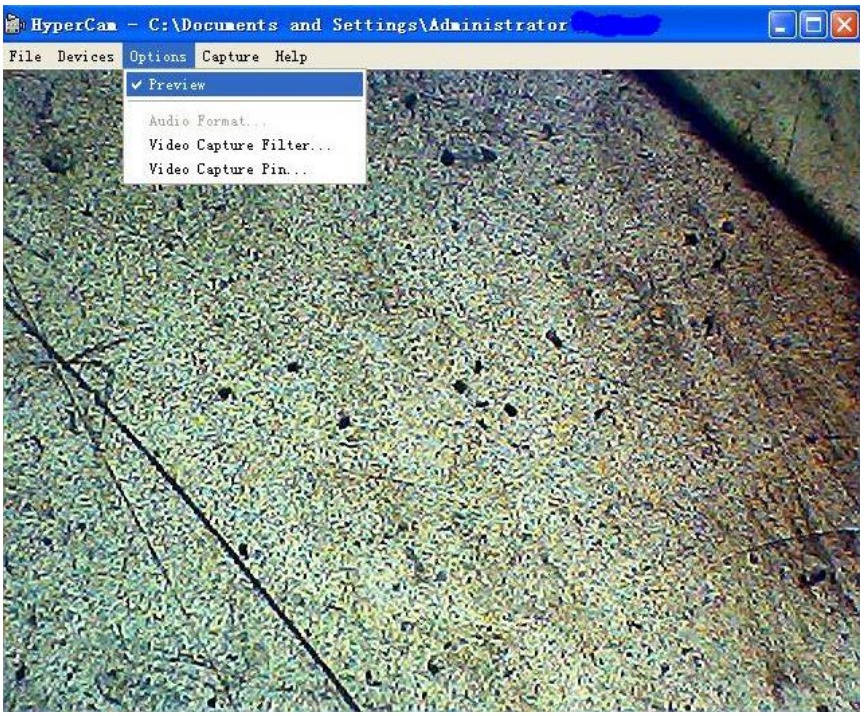
Preview:



Take video

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Take photo

3. 3.8 Image definition

Base on the pixel limitation (800*600) of microscope LCD screen, so through AV outputting, TV can show a sharper picture than on microscope screen. Also, the microscope shoots pictures as 2560*1920 pixels, when playback on TV or PC, picture is sharper and clearer than the image on real time preview model.

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3.3.9 Cross Hair& Reticle Control

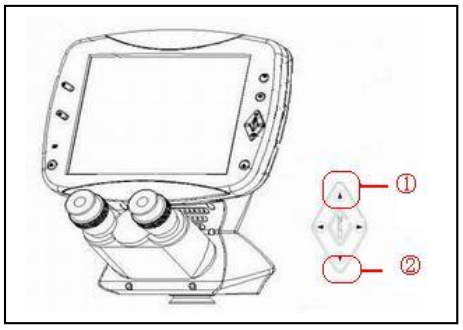

Fig.22

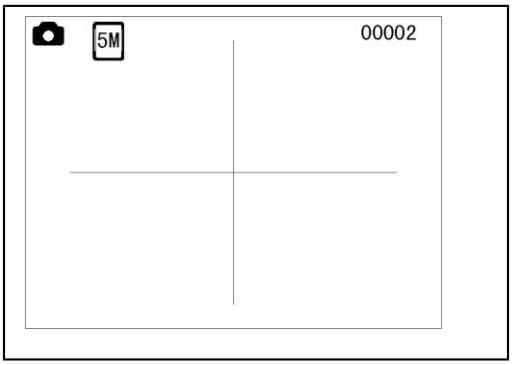

Fig.23

On snap model, you can press the up key of the menu button (Fig.22 ①) to select self-definition graphics, including the crossing line and reticle with crossing line. The graphics is display on the LCD screen to carrying out simple locating and measurement

Press the up key one time, the cross hair will be showed on the LCD screen (Fig.23).Then press the down key of the menu button (Fig.22.②),there are 5colors available(green, blue, black, white and red） .It used to select among colors of the self-definition graphics, facilitating the clear indication under different color materials

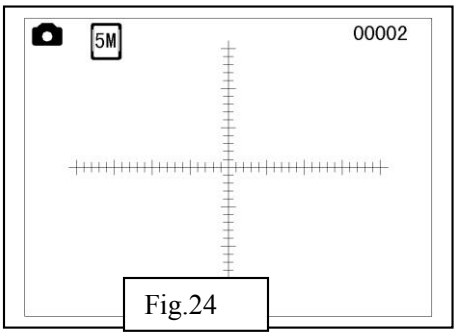

Fig.24

If you press up key (Fig.22①) two time, the reticle will be showed on the LCD screen (Fig.24)

Numerical value of graduation, Please refer to the below:

A graduation equals 0.05mm under 4X objective
A graduation equals 0.02mm under 10X objective
A graduation equals 0.005mm under 40X objective
A graduation equals 0.002mm under 100X objective

Then, press the up key (Fig.22 ①) once again on the Fig.24, the cross hair will disappear.

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3.3.10 How to use the reticle to measure?

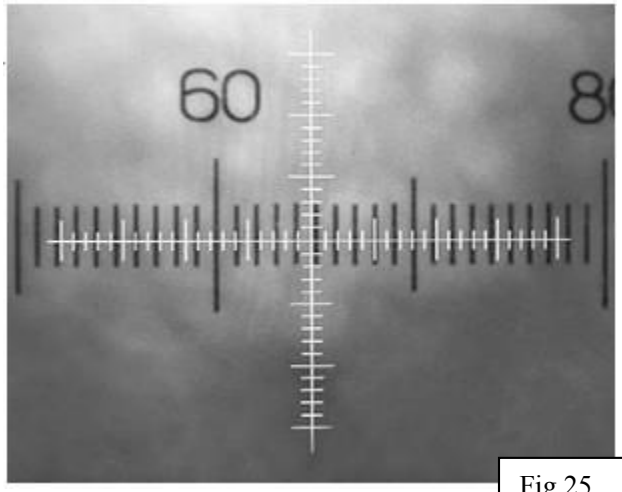

Fig.25

Example

Selected the standard graduation of 0.05mm under a given power and move the micro-ruler when clearly focused so that the coordinate corresponds with the micro-ruler. The standard ruler of every 12 graduations correspond to 19 graduations of the coordinate ruler, then each graduations of the coordinate ruler is about 0.03mm.In this case, user can carry out the measurement for the object observed under microscope according the distance of coordinate ruler(requiring re-calibration of the separation of coordinate ruler each time for a changed power).

4. Outfit

4.1 Specification

Optical system	Infinite optical system				NYMCS-1701
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；interpupilary range 48-75mm				●
Eyepiece	High point ,extra-wide field eyepieceEW10×/22				●
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×				○

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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	● Use indoor ● Altitude: Maximum 2000 m ● Temperature: 5℃~40℃（41°F~109°F） ● Maximum Relative Humidity: 80% at 31℃ (88°F), then Fall Linear. ● 70% at 34℃ (93°F), 60% at 37℃ (104°F), 50% at 40℃ (104°F). ● Pollution Degree:2 (refer to IEC60664)	

Note：●standard outfit，○ optional

4.2 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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5. 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: ● 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, dail the field diaphragm with the direction of "  "
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 erode figure and soon)	Please use a regular culture dish

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PROBLEM	REASON	SOLUTION	PAGE
II. Mechanical Part:			
1. The coarse focus knob is hard to run	The tension adjustment collar is too tight	Loose properly	8
2. The image can't stay on the focal when observation	The tension adjustment collar is too loose	Tighten properly	8
III. Electric Part:			
1. The lamp can't light	No power supply	Check the power cord, and connect them exactly	6
	the installation of the bulb is wrong	Install the bulb correctly	3
	The bulb burn out	Change a new bulb	3
The bulb burns out in a high frequency	Not use the specified lamp	Use the required lamp	3
1. The height of the brightness is not enough	Not use a appointed lamp	Use an appointed lamp	3
	The brightness adjustment knob is used wrong	Adjust the brightness adjustment knob in a correct way	8
2. The light glimpse	The bulb is going to spoil	Change the bulb	3
	The power cord have a poor contact	Check the power cord, and connect them exactly	6
Ⅳ. Viewing tube			
The two eyes' field of view is different	The interpupillary distance is not correct	Adjust the interpupillary distance	10
	The diopter is not right	Adjust the diopter	10
	Not adapter 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	10
There is faintness around the image	It is a 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