LED EPI-FLUORESCENSE MICROSCOPE

CODE HBF002

INSTRUCTION MANUAL

Note: This manual provides instructions for both mercury lamp and LED epi-fluorescense microscopes

Content

Attentions！！

1. Purpose

This series microscope is used only for microscopic observation, not available for other purpose, otherwise result in equipment damage.

2. Disassembly only by the professionals

The microscope has been adjusted before shipping, unprofessional person should not disassemble and remove any other parts. Disassemble and remove any other parts will result in equipment damage.

If you have any questions, please contact with local distributor.

3. Note the input voltage if correspond

This instrument designed for wide input voltage (100V~240V, 50/60HZ), applicable to most area .But if the supply voltage exceeds this range, the instrument will be seriously damaged.

4. Prevent Burns and Fire

When using power equipment, bulbs and collecting mirror and other nearby parts of the set will rise sharply in temperature until it reaches a thermal equilibrium state. Pay attention to anti-hot logo, they should be careful not be burn when in use.

Alcohol, gasoline, paper and other flammable materials can't near the lamp in case of fire.

5. Notes on Replacing the Bulb

Replacement should be based on the identity of the instrument using the same specifications of the bulb, otherwise it may cause equipment damage.

The power supply must be cut off before bulb replacement, the bulb must be cooled off completely before proceeding! !

6. Carry

Power must be cut off before moving. Be careful not to crush your finger when placed.

This instrument is a precision instrument, and it should be handled with care, severe shock can cause serious damage to equipment-related parts.

7. Installation

Please refer to the installation instruction in order to avoid damaging the instrument .

8. Operation Environment

The required available environment for using of the equipment:

Indoor temperature: 0 ℃ ~ 40 ℃ Maximum relative humidity: 85%

High temperature or high humidity may cause mildew, fog or dew of the optical components, and make the instrument not work.

9. Packing Waste Disposal

For the protection of the environment, please properly handle the microscope packing waste or send to salvage station (such as cardboard, foam, etc.)

1. Installation and use of fluorescence device

Fluorescence microscope has wide applications in basic theory research and clinical diagnosis about medicine, biology, as well as analysis and test in industry, agriculture, stockbreeding, criminal investigation, legal medical appraise, environmental protection etc.
Some objects can emit a ray which wavelength is longer than that of the excitation light when irradiated. This ray is called fluorescence, and observers can study the objectives through fluorescence microscope using the phenomenon.
The light emitted from the lamp is converted to the excitation light (e.g. blue light) with specified wavelength by going through the excitation filter, then passes through dichroic prism and objectives (the objective plays role of condenser) to irradiate vertically the object. The object is excited and emits fluorescence with specified wavelength (e.g. green and yellow) and make image passing through objectives, dichroic prism and eyepieces. The light (including excitation light) without fluorescence wavelength is reflected or absorbed by dichroic prism and barrier filter, and can not reach the view system.
Therefore, what can be seen in the view field is the bright fluorescence image against the dark background (Fig.1-1)

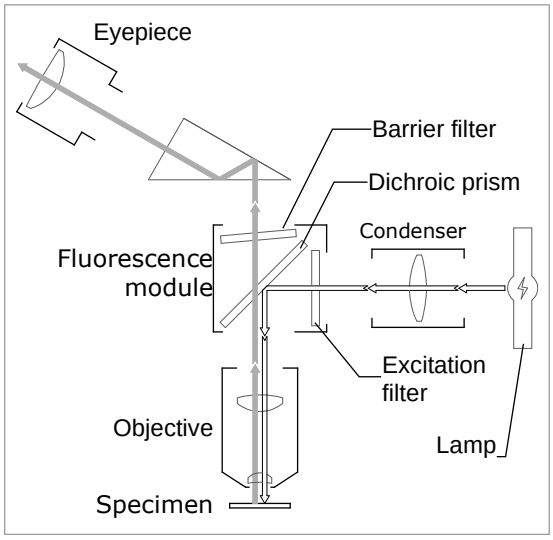
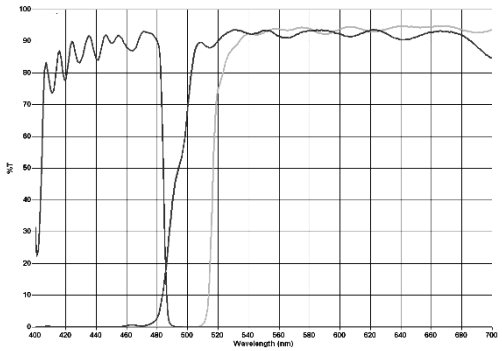


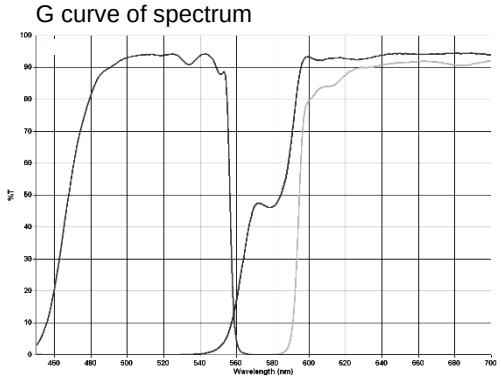
Fig.1-1

The device consisting of reflecting fluorescence illuminator, lamp power box and fluorescence objectives are combined with main body to make up fluorescence microscope. The device is designed and manufactured with Epi-excitation principle and provided with 4 group excitation filters system of FL4: blue (B), green (G), violet (V) and ultraviolet (UV). Auramine is optional used for tuberculosis 455mm.

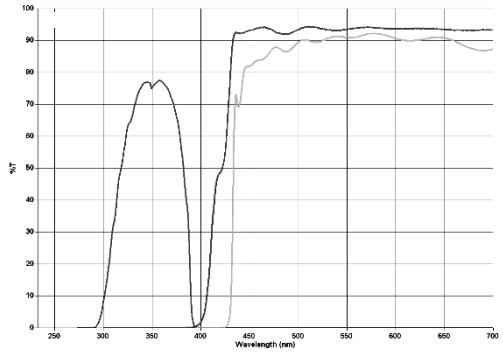
B curve of spectrum



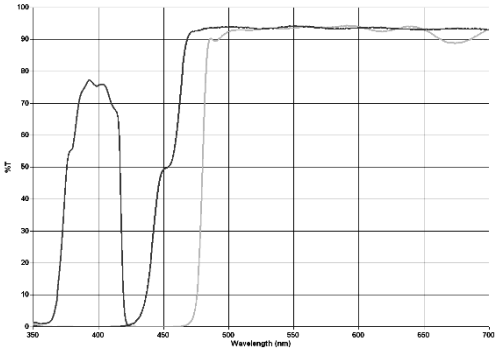
G curve of spectrum



Uv curve of spectrum



V curve of spectrum



1.1 Parts Name

Fig. 1-2 Fluorescence Device With Mercury Light Source

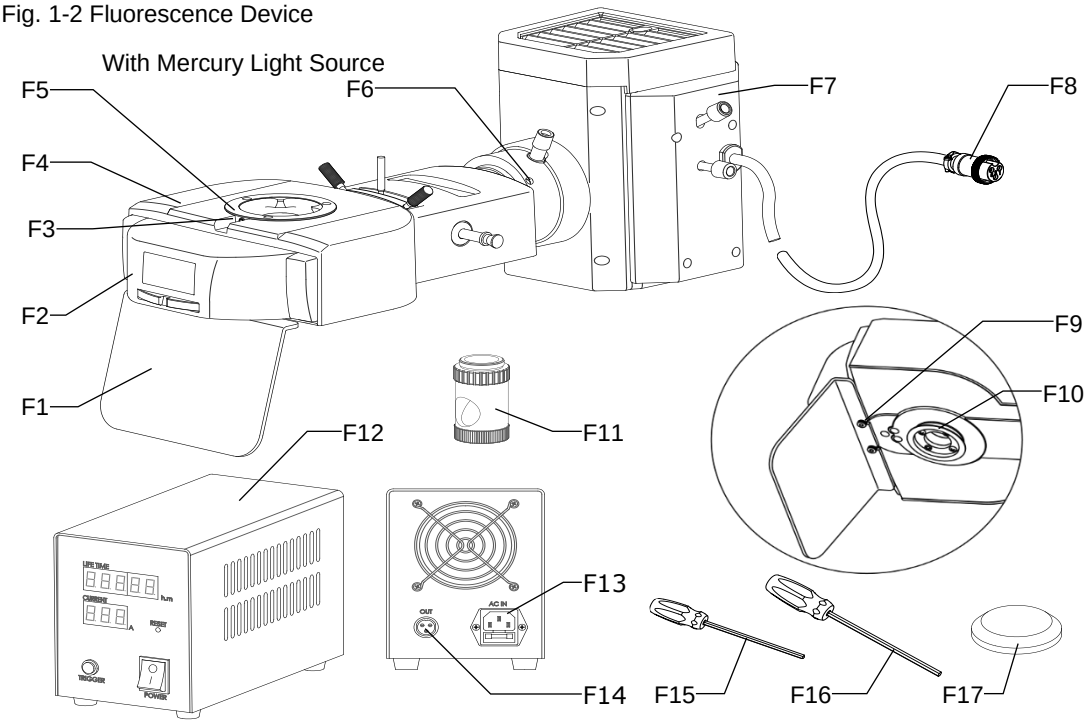
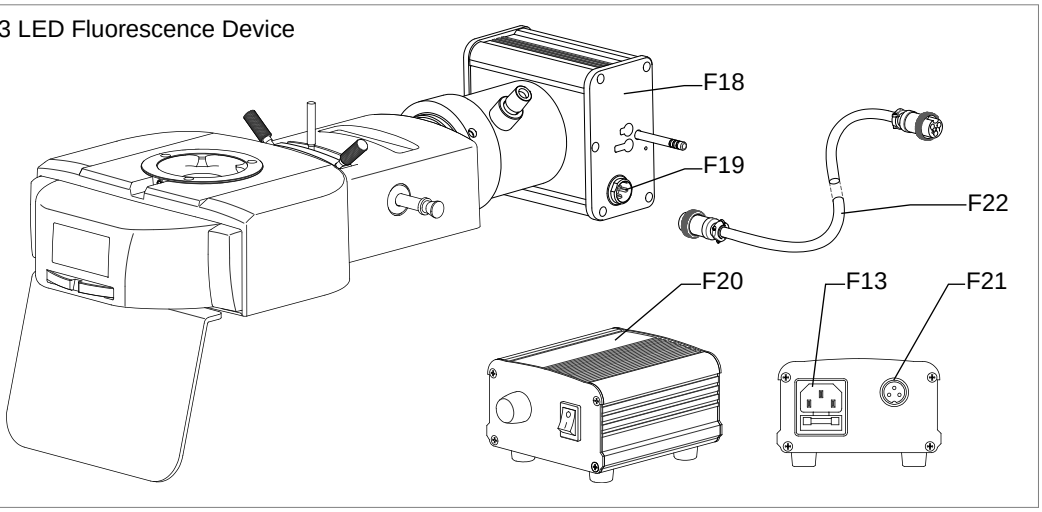


Fig. 1-3 LED Fluorescence Device



F1. Protective plate
F2. Front cover
F3. Locking screw for observing tube
F4. Main body
F5. Observing tube connector
F6. Lamp box locking screw
F7. Fluorescence mercury lamp box
F8. Power socket
F9. Mounting screw for protective plate
F10. Main body connector
F11. Fluorescent centering device
F12. Mercury lamp power box
F13. Power input socket
F14. Output interface
F15. Hexagon wrench (2.5mm)
F16. Hexagon wrench (3mm)
F17. Condenser cover
F18. LED fluorescent illuminator
F19. Illuminator input socket
F20. LED power box
F21. Output socket for power box
F22. Power connecting wire

1. 2 Installation (In mercury lamp)

Step 1.

1.2.1. Take out the component from the packaging box, remove the protective package and place the main body on the vacant working table.

1.2.2. Install the main body by following the Installation Steps .

1.2.3. Take out the fluorescent device , turn it over, stick the protective plate **F1** into mounting screw **F9**, and tighten the screw with wrench (Fig.1-2).

1.2.4. Finally, keep fluorescent device in upright position, insert **F10** main body connector into connective hole (Fig.1-4) , use locking screw to fasten.

Step 2.

1.2.5. Use **F15** hexagon wrench to loosening **F6** locking screw, connecting the lamp box front connector with fluorescent device's rear lens connector (Fig.1-4), adjust the lamp box and fasten **F6** locking screw .

1.2.6. Insert **F8** lamp box power plug into **F14** output interface，properly locking the screw.

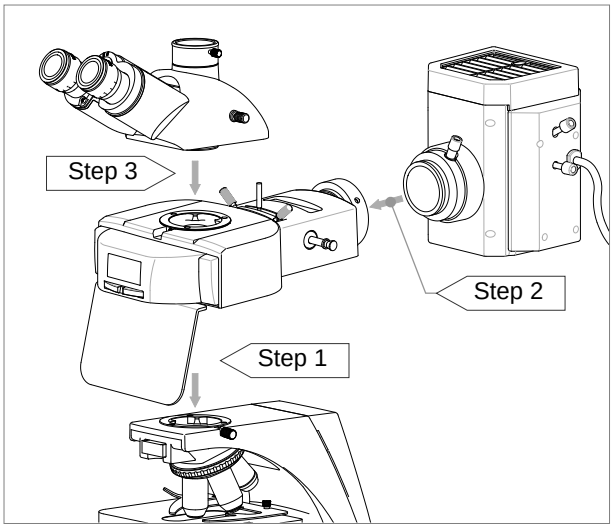


Fig. 1-4

Step 3.

1.2.7. Loosen **F3** locking screw with **F15** hexagon wrench.

1.2.8. Reference installation Step 1, inserting connecting base into observing tube connector, with **F15** hexagon wrench to locking screw **F3** for observing tube.

1.2.9. Insert external power source plug in **F13** power socket.

Installation finished.（Fig. 1-5）

▲ Please carefully check whether power supply voltage is in conformity with input voltage**.** Switch on the power.

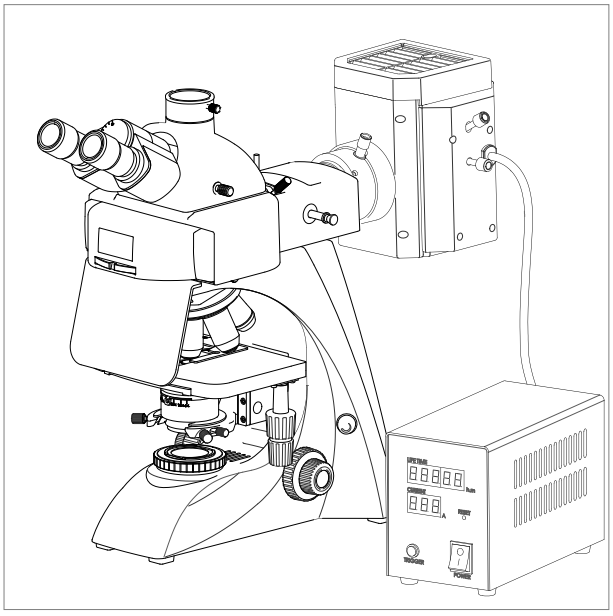


Fig. 1-5

1.3 Operational parts name

Fig.1-6 Fluorescence Device with Mercury Lamp

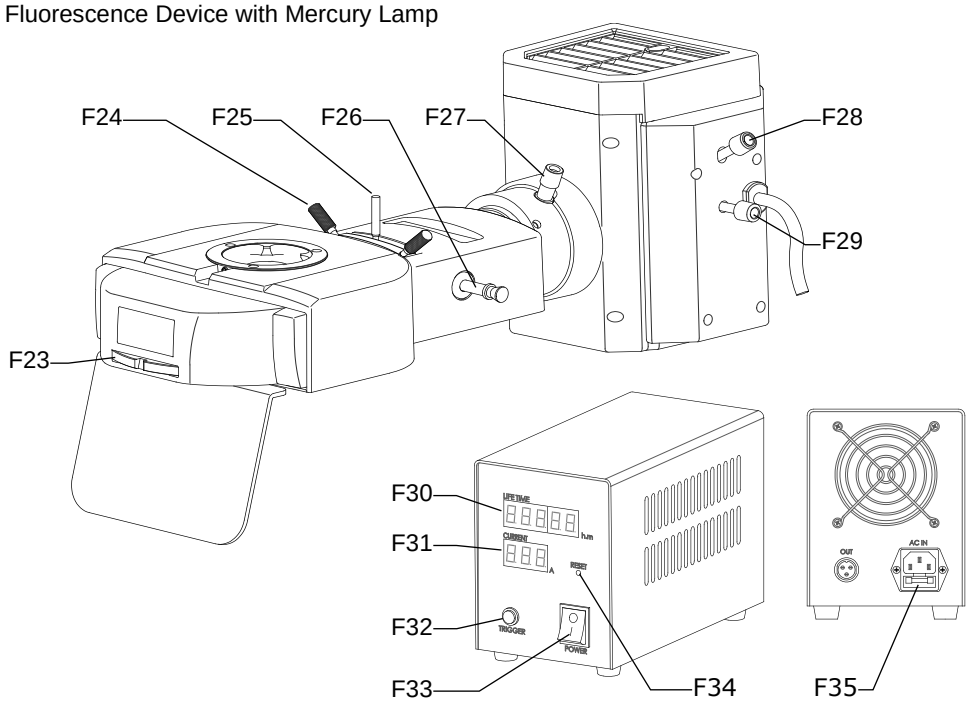
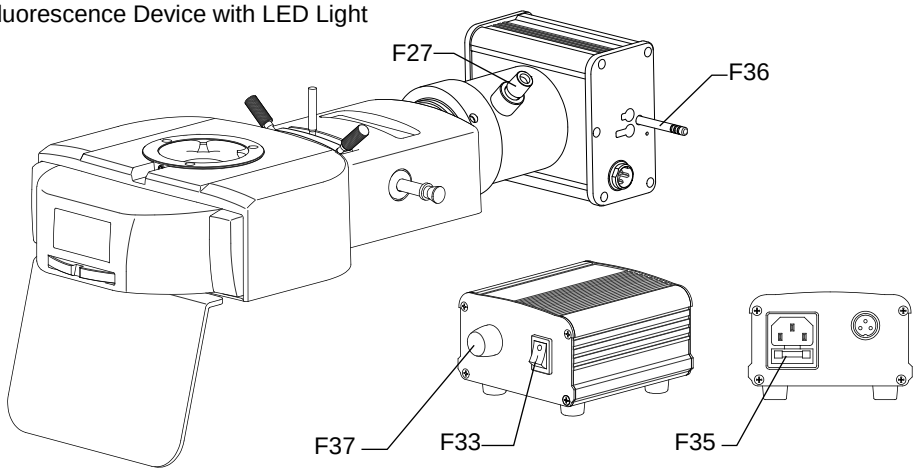


Fig.1-7 Fluorescence Device with LED Light



F23. Fluorescence module switch driver
F24. Field diaphragm centering handle
F25. Field diaphragm adjusting lever
F26. Light switch lever
F27. Condenser adjusting lever
F28. Light source vertical adjusting knob
F29. Light source horizontal adjusting knob
F30. Time display window
F31. Electricity display window
F32. Mercury start button
F33. Power box switch
F34. Reset button
F35. Fuse holder
F36. LED light source switch lever
F37. Brightness adjusting knob (optional)

1.4 Operation of fluorescence unit

Adjust the instrument with bright field methods and use the following steps :

1.4.1. Shut off the power switch，turn on mercury power box switch F33,waiting 2 minutes for stable operation mode. Press F32 mercury start button（Fig.1-8）.（It will take 10 minutes to stable operation mode for maximum luminous efficiency.）

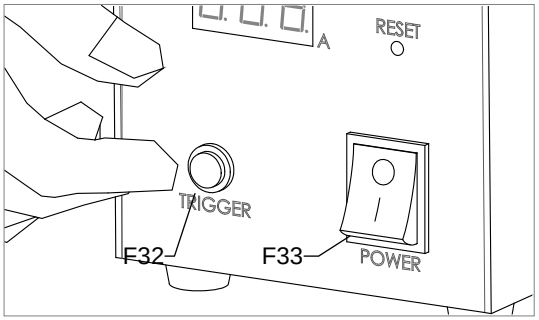


Fig.1-8

1.4.2. Putting 10×fluorescence objective in light path and lowering condenser to the lowest position, or swing out the Condenser Top Lens, cover with lid or remove the condenser .（Fig.1-9）

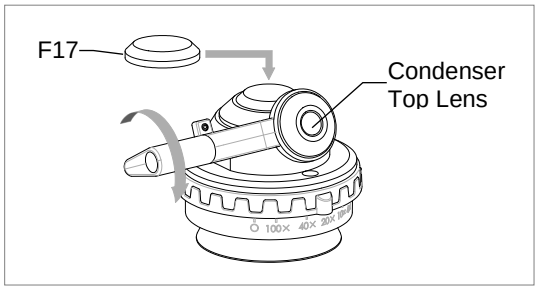


Fig.1-9

1.4.3. Placing fluorescence sample on stage， fixed with clamps，adjusting Vertical adjusting hand wheel and Horizontal adjusting hand wheel，to make the sample in light path.

1.4.4. According to the front label identifiers, pull the filter converting lever to the needed position. （Fig.1 -10）.
To make light source match each other, when with LED fluorescent illuminator F18 ,must use LED light source switch lever.

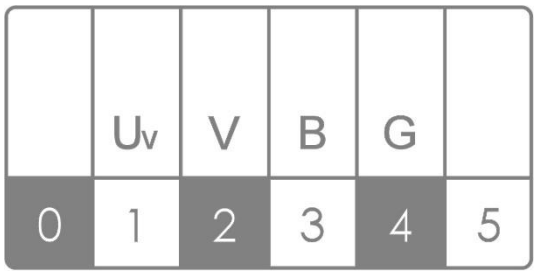


Fig.1-10

1.4.5. Adjusting field diaphragm lever F25 to the maximum open scale(if necessary，adjusting the field diaphragm centering handle F24 to diaphragm and field in the same center.（Fig .1-11）

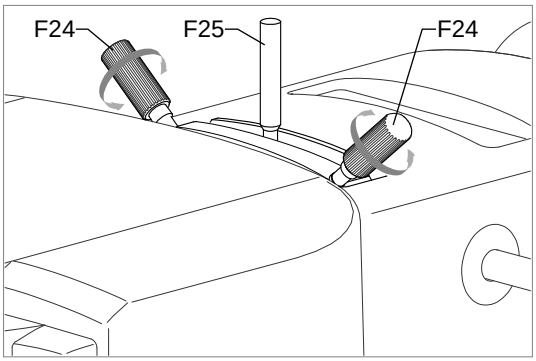


Fig.1-11

1.4.6. Adjusting coarse and fine focusing knobs to get clear image.

1.4.7. When field background luminance is uneven, can rotate condenser adjusting lever F27 to adjust. （Fig.1-12）

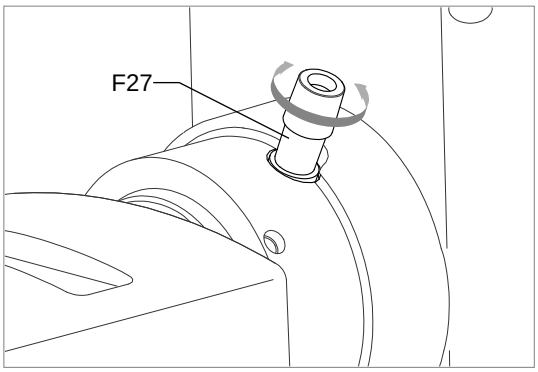


Fig. 1-12

1.4.8. After getting ideal imaging, can with the other objective to make observation

▲ Before performing epi-fluorescence observation, locate the specimen with the transmission light first.

▲ To prevent the fluorescence from attenuation quickly, block the excitation light with barrier when preparing for fluorescence observation or photography. Only when observing or photographing, irradiate the specimen with the excitation light. (Fig .1-13)

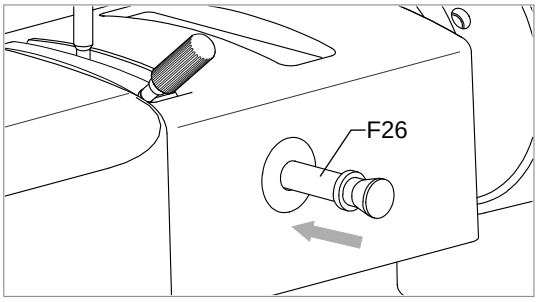


Fig. 1-13

▲ If mercury lamp with strong light source，should in half-light position of light shutter in case of sample cancellation.（Fig.1-13）

▲ Don’t turn off the mercury lamp within the initial 15 minutes ,repeat switch will shorten working life. The user can cut off the light by pushing in light switch lever F26 if leaving for a short time, and the lamp once turned off should be lighted on again after 3 minutes.

▲ Fluorescence microphotograph requires a long exposure time, so the fluorescence digital photography device is the best choice.

2. Maintenance

2.1 Clean

2.1.1. Don’t touch the lens with hand, Dust on lens should be cleaned by soft brush or absorbent cotton or cleaned by absorbent cotton, lens paper with the mixture of ethyl alcohol and ether. (proportion 1:4)

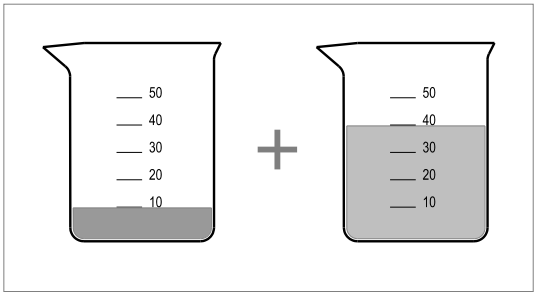


Fig. 2-1

2.1.2. Alcohol and diethyl ether all are burnt early, please take them away from fire. Be careful with turn on and off power.

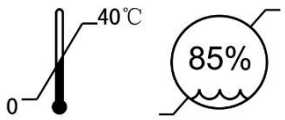
2.1.3. Don’t clean painted metal and galvanizing metal with organic solvent such as alcohol, diethyl ether or the mixture of the both. Silicon cloth or soft cleaning preparation can clean it.

2.1.4. Plastic surface should be cleaned by soft cloth with clear water.

2.2 Environment for use and storage

2.2.1. Microscope should be used and placed in a cool, dry, non-dust, non-shake and non-corrosive gases environment.

2.2.2. Microscope should be used in environment of indoor temperature 0°-40°C and maximum relative humidity 85%.



2.2.3. In high humidity area, dehumidifiers should be installed in case for mildew and frog.

2.2.4. Please pay attention to prevent microscope from violent shake and vibration in application and in carrying. Don’t drag it on the surface of worktable to avoid damage to microscope and worktable.

2. 3 Replacement of fuse tube

Fuse tube should be installed in power input socket F35.(Fig.1-2, Fig.1-3)

2.3.1 Please turn off the power, unplug the power line.

2.3.2 Remove the input socket fuse holder which behind the main body or power box(be careful not to be scratched by old fuse when with screwdriver).（Fig.2-11）

2.3.3 Take out old fuse tube. (Fig.2-11)

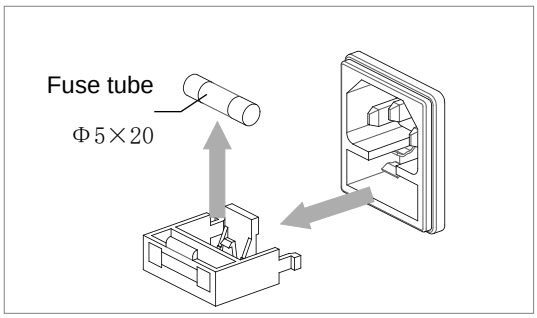


Fig.2-11

2.3.4 Replace with same size tube，insert into socket again.

2.4 Storage

2.4.1 When not in use, must turn off power and placed in a cool, dry environment with dust-cover.

2.4.2 Eyepiece and objective should be placed in dry container with desiccant.

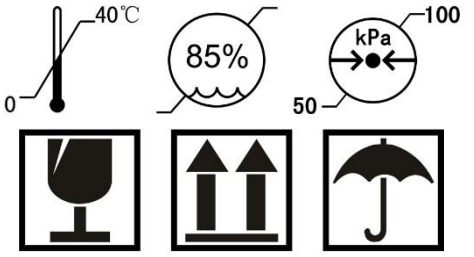
Appendix 1：Troubleshooting

In the period of using microscope, if there is any trouble occurs, please referring to the following sheet listed some common troubleshooting resolve them.

Trouble	Cause	Remedy
Switch on but bulb dark	No bulb	Install bulb
	Plug is unreliable	Check joint again
	Bulb is broken	Replace bulb
	Fuse is broken	Replace fuse
Bulb is flickering or brightness is unsteady.	Bulb is unstable	Insert again
	Bulb is broken	Replace bulb
Image isn't clear (contrast or definition isn't enough)	Cover glass of specimen doesn't meet the requirement.	Use required thickness cover glass (0.17mm).
	Cover glass of specimen isn't in up direction.	Place specimen correctly.
	Surface of objective lens Is dirty (especially it is easy for the front lens of 40× objective to dip in immersion oil).	Clean it
	Immersion oil isn't used for 100× objective (oil)	Use immersion oil
	Immersion oil doesn't meet the requirement.	Use immersion oil supplied by us.
	There is bubble in immersion oil.	Clear the bubble away
	Size of iris aperture isn't proper.	Adjust the size of iris aperture.
One side of image is dark or image is moving as focusing.	Objective isn't in correct optical path.	Make the objective in correct position.
	Specimen isn't placed correctly.	Place specimen levelly on stage and clip it with clamp.
Objective touching specimen as changing low power to high power	Cover glass of specimen doesn't meet the requirement.	Place specimen correctly.
	Cover glass is too thick.	Use required thickness cover glass (0.17mm).
Image observed by two eyes aren't in superposition entirely.	Interpupillary distance isn't adjusted correctly.	Adjust Interpupillary distance.
	Diopter isn't adjusted correctly	Adjust diopter
	Left and right eyepiece is different.	Replace same eyepieces.
It is easy for eyes to be tired during observing.	Interpupillary distance isn't adjusted correctly.	Adjust Interpupillary distance.
	Diopter isn't adjusted correctly.	Adjust diopter
	Brightness isn't enough	Adjust brightness

Appendix 2：Transport Environment

1. Temperature range in transit：0～40℃.
2. Maximum relative humidity：85%
3. Air pressure range：50kPa～100kPa
4. Handle with care in case for damage.
5. Keep upward following sign .
6. Keep waterproof or infiltrate during transit.



Appendix 3：Identifier Meaning

I	Main Switch “ ON ”
O	Main Switch “ OFF ”
	Fuse
	Attention
	Alternating current
	Ground connection
	Can’t touch the hot surface with hand, operation after power off and cooling down.
	Diaphragm directions, hollow circle is turn up, solid is turn down.
FD	Field Diaphragm
AD	Aperture Diaphragm
	Optical Shutter Pass 0
	Optical Shutter Pass 50%
	Optical Shutter Pass 100%
	Switch Directions , an enhanced thickness means heavy.
	Recycle Mark