



OPTO-EDU (BEIJING) CO., LTD.

F-1501 Wanda Plaza, No.18 Shijingshan Road, Beijing 100043, China
Tel:+8610 88696020 Fax:+8610 88696085

A16.2601-NL

LED Fluorescent Microscope

Instruction Manual



To ensure the safety and obtain satisfactory performance, please study this instruction manual thoroughly before start to use the instrument.

Contents

⚠️Attentions!!	2
.....	
1. Applications	3
.....	
2. Principle	3
.....	
3. Instruction	4
.....	
4. Installation	5
.....	
5. Fluorescence Device Operation	8
.....	
6. Use of fluorescent centering device	11
.....	
7. Fluorescent mercury lamp replacement	12
.....	
8. Replacement of the fuse	12
.....	

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 manufacturer or 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 handle with care, severe shock can cause serious damage to equipment-related parts.

7. Installation

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

8. Operation Environment

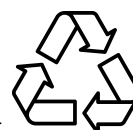
The required available environment for using of the equipment:

Indoor temperature: 0 °C ~ 40 °C 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.)!



10. Statement

Our company reserves the right to improve product design and outfits.

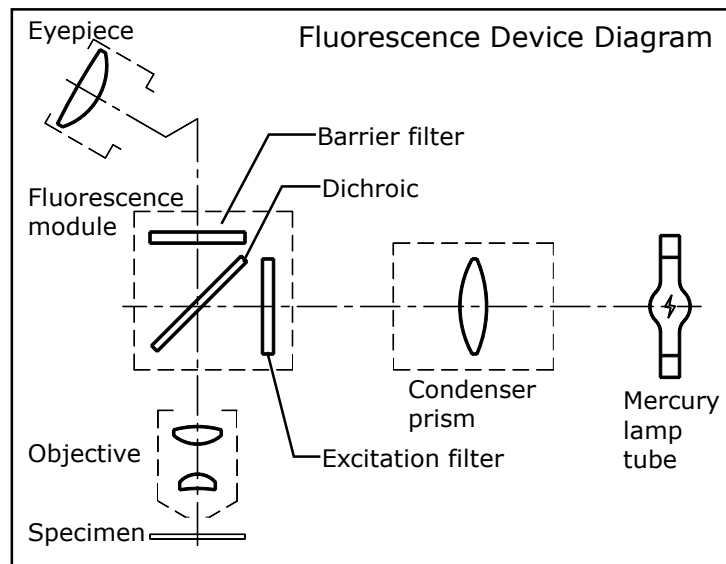
1. Applications

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.

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.

2. Principle

The device consisting of Epi-fluorescence illuminator, 100W direct current mercury lamp power box, fluorescence objectives is combined with microscope to make up fluorescence microscope. The device is designed and manufactured with Epi-excitation principle and standard provided with four group excitation filters system: blue (B), green (G), violet (V) and ultraviolet (UV).



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.

3. Instruction

The fluorescence microscope is building-block structure, it includes main body, fluorescence conversion device, fluorescence excitation modules, fluorescence light source lamphouse, power box and objective etc. Fluorescence device with disc conversion mode and six holes can install five excitation modules and bright field observation position, maximum to six excitation modules. Standard outfits: FL4 four-groups ,FL2 two-groups ,FL2-LED and special LED device for single .In addition can be with another excitation modules as per user's inquiry

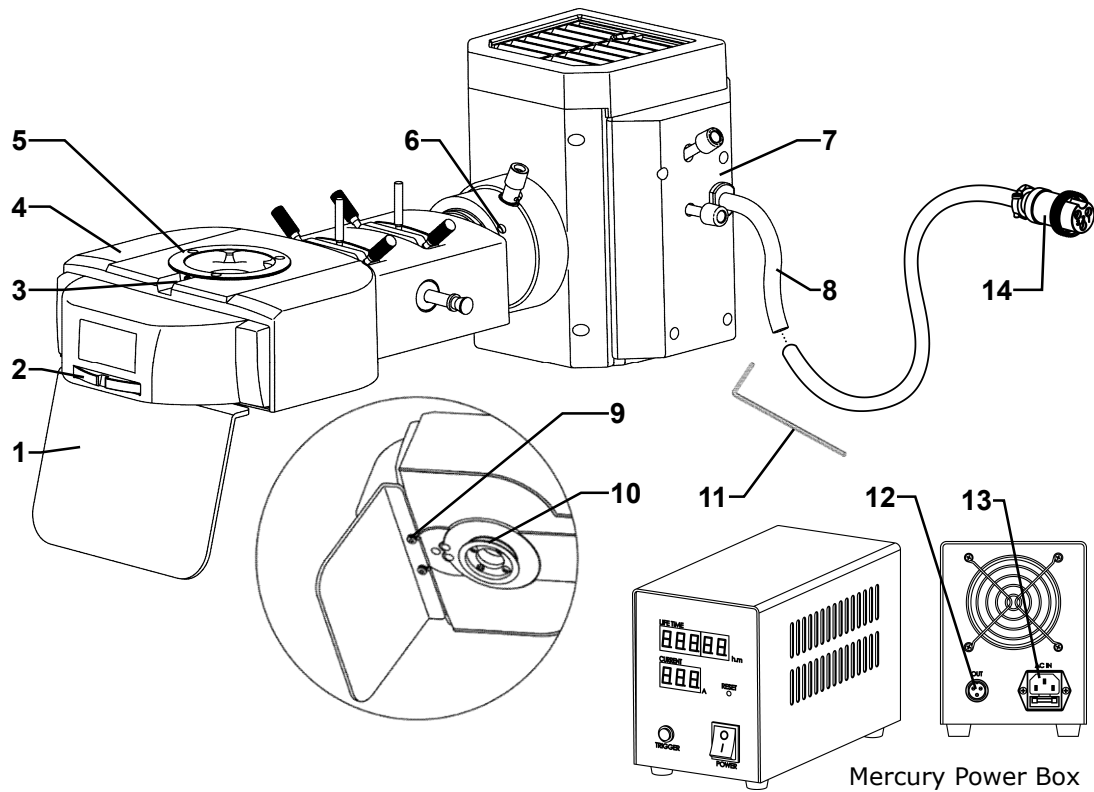
FL4 six-holes turret four-group fluorescence device standard equipped with mercury lamp light source, field adjustable diaphragm and aperture adjustable diaphragm, switch fluorescence module by turret device, standard equipped with B, G, Uv and V.

FL2 two-groups fluorescence device also equipped with mercury lamp light source , field adjustable diaphragm and constant aperture adjustable diaphragm(aperture adjustable diaphragm is optional),turret conversion two-group module and bright field observation ,standard equipped with B,G two-group, can also choose B, G, Uv and V to install as required.

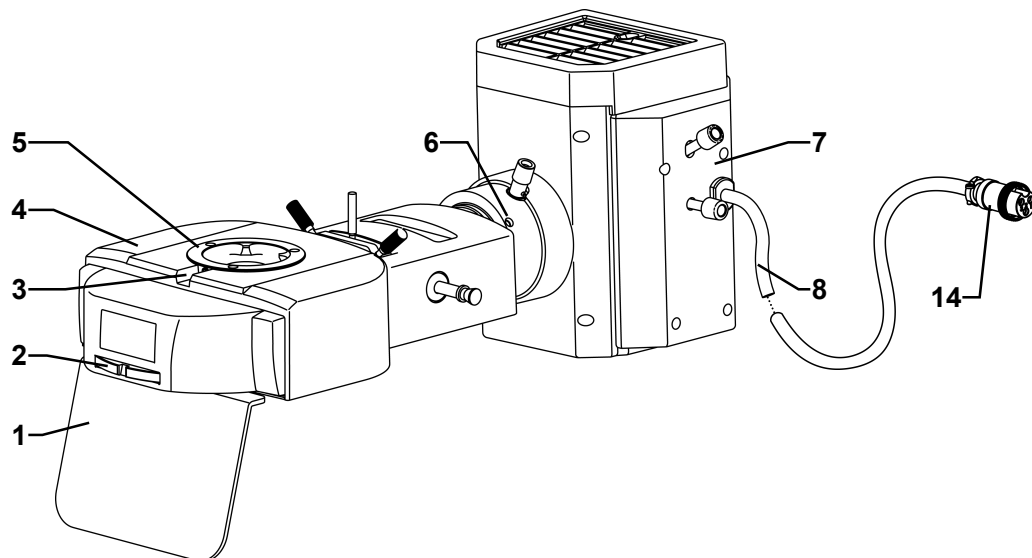
FL2-LED two-groups fluorescence device with led illumination, it has excellent feature ,without waiting startup time for lamp ,low voltage, no fever on lamp house etc. Standard equipped with B,G two group fluorescence module .Single LED fluorescence device is designed for single module , customize for especial requirement.

4. Installation

Four-Groups Fluorescence Device Installation Marking Graphs

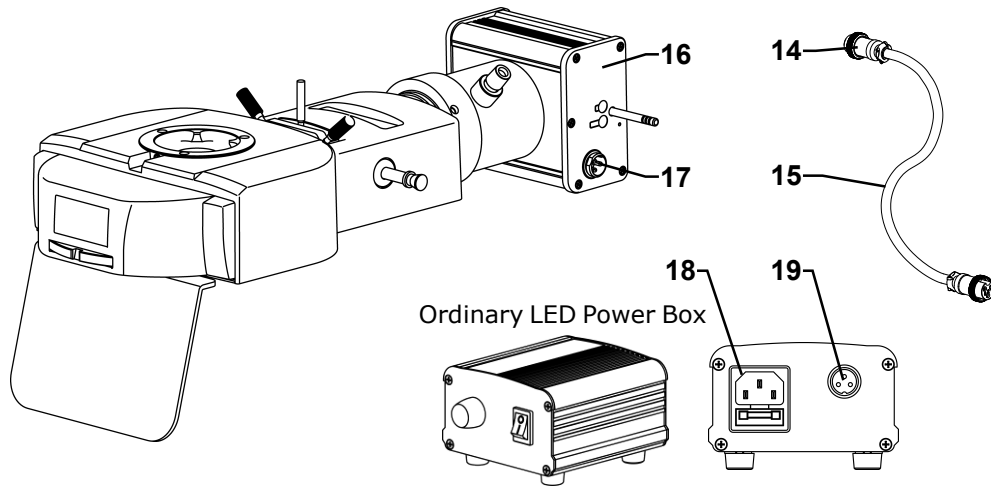


Two-Groups Fluorescence Device Installation Marking Graphs

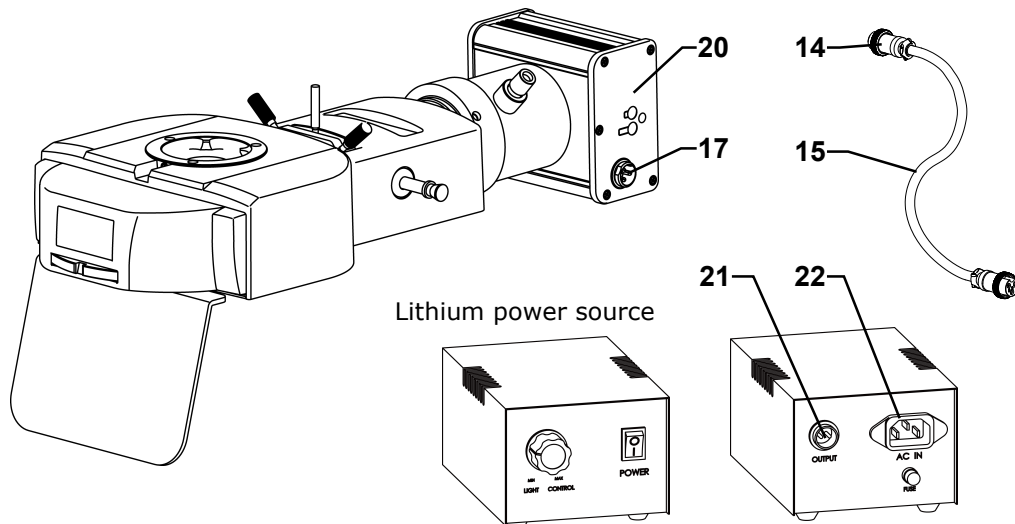


- | | |
|--------------------------------|--|
| 1 protective plate | 2 front shade |
| 3 observing tube locking screw | 4 fluorescence device main body |
| 5 observing tube mount | 6 light box locking screw |
| 7 mercury lamp light box | 8 connector wire for mercury lamp box |
| 9 protective plate screw | 10 connector for main body |
| 11 wrench | 12 power box output socket |
| 13 external power connector | 14 connector socket for mercury lamp box |

Two-Groups LED Fluorescence Device Installation Marking Graphs



LED Fluorescence Device Installation Marking Graphs

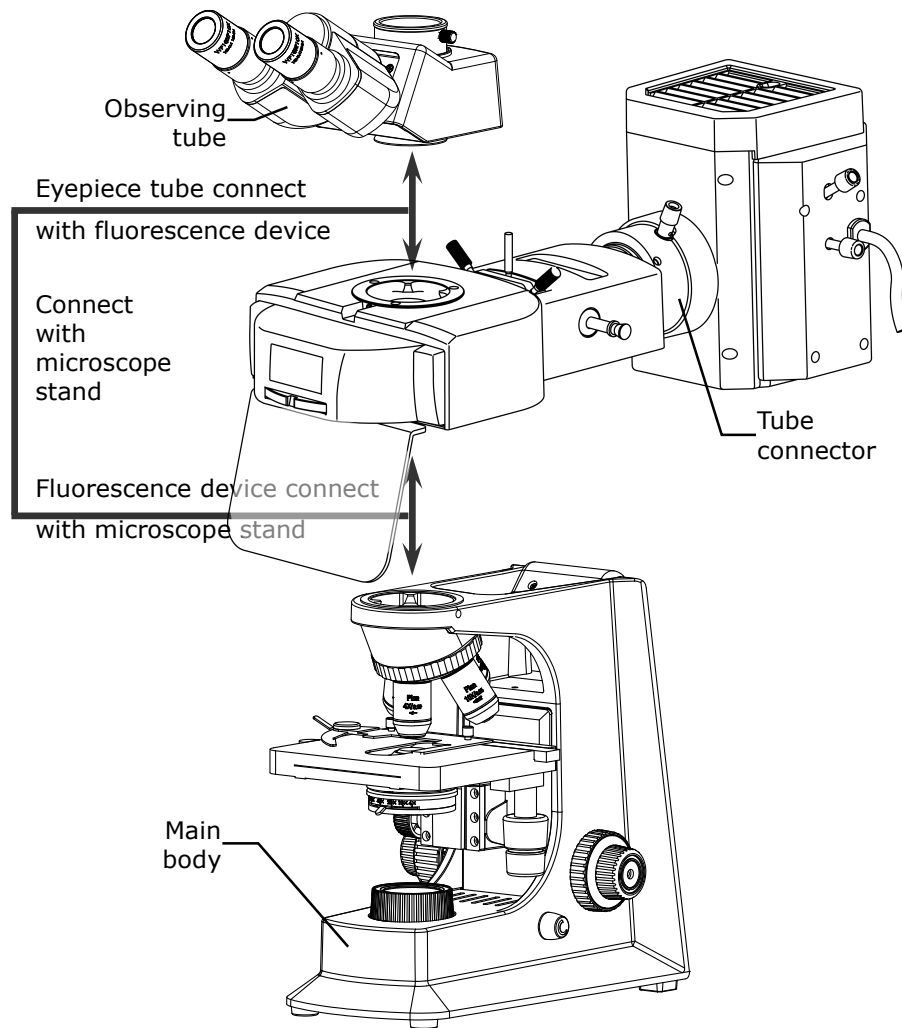


- 15 double ended connector wire for mercury lamp box
- 16 two group LED light box
- 17 light box power socket
- 18 external power port
- 19 LED power box output socket
- 20 single group LED fluorescence light box
- 21 output socket of lithium battery power box
- 22 external power connector

- 1) Take all parts from the package, remove the protective package and place it on the vacant bench.
- 2) Turn fluorescence device and put the protective plate in with the screw, then tighten it by wrench.
- 3) Then put the device in upright direction, then link the main body connector with main body bayonet, fasten the microscope with screw.
- 4) Slightly loosen the locking screw ,then connect the tube connector on the front and the back-tube of the fluorescence mercury power box, fixed with locking screw.

- 5) Joint the observing tube with bayonet, and then lock it with wrench.
- 6) Use lamp power line to connect lamp power socket and relevant socket.
- 7) According to the installation instruction to install microscope main body.

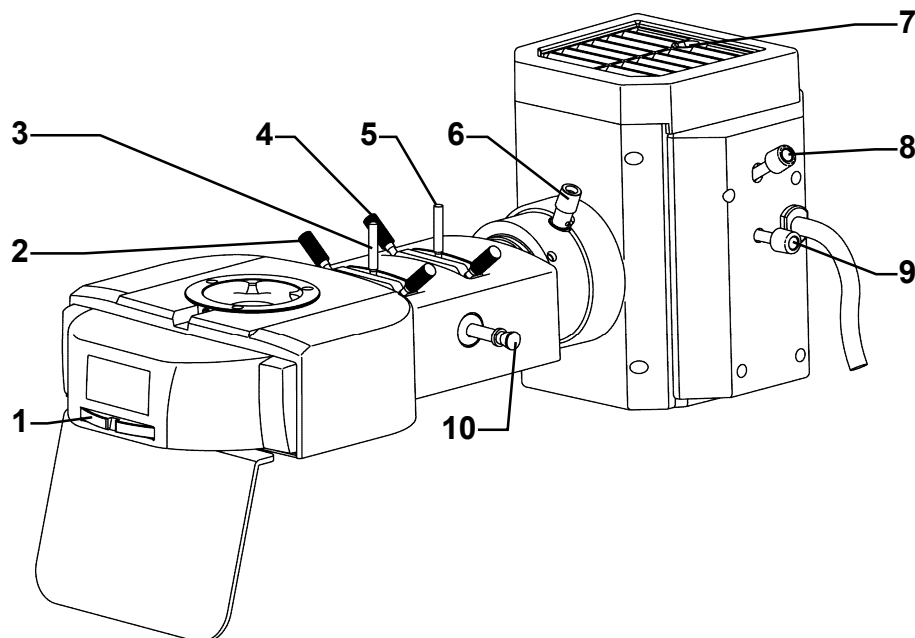
▲ Rechargeable Lithium power source specially for LED illumination.



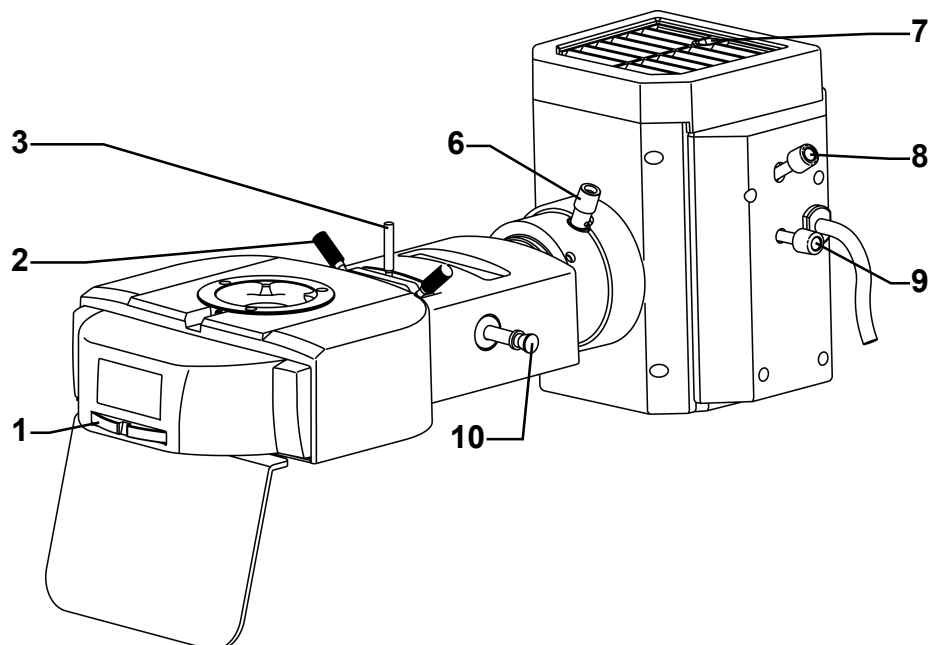
5. Fluorescence Device Operation

Please adjust microscope in bright field method and operate fluorescence attachment as follows:

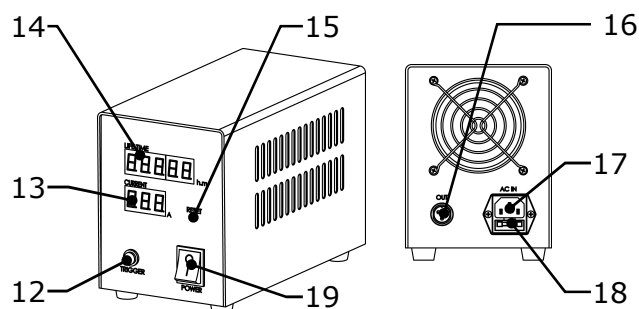
Four-Groups Fluorescence Device Installation Marking Graphs



Two-Groups Fluorescence Device Installation Marking Graphs

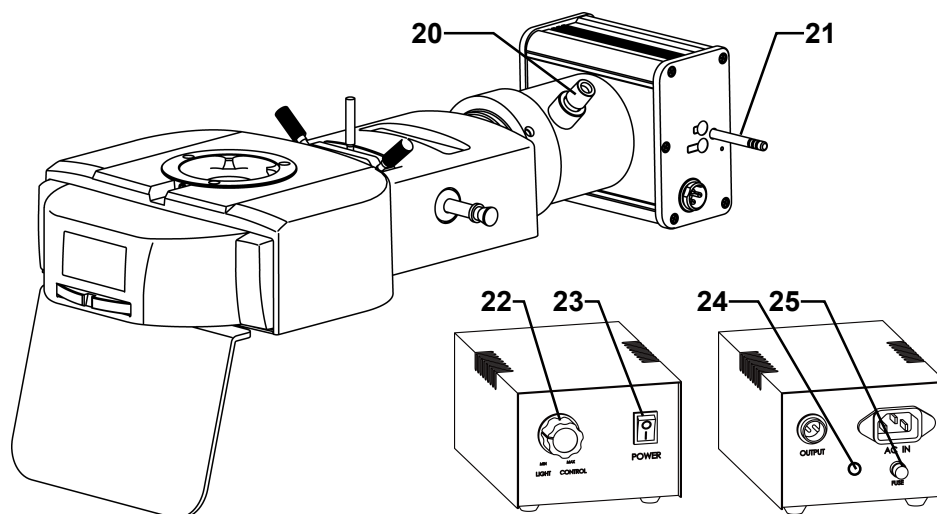


- | | |
|--|--|
| 1 Fluorescence module switch driver | 2 Field diaphragm centering handle |
| 3 Field diaphragm adjusting lever | 4 Aperture diaphragm centering handle |
| 5 Aperture diaphragm adjusting lever | 6 Lamp condenser adjusting lever |
| 7 Screw for opening mercury lamp | 8 Light source vertical adjusting knob |
| 9 Light source horizontal adjusting knob | 10 Light switch lever |



- | | |
|-----------------------|--|
| 12 Trigger knob | 13 Current |
| 14 Life time | 15 Reset |
| 16 Lamp box connector | 17 Power interface |
| 18 Fuse cap | 19 Power switch of mercury lamp power source |

LED Fluorescence Device Operational Parts Marking Graphs



- | | |
|-----------------------------------|---------------------------|
| 20 Lamp condenser adjusting lever | 21 LED switch shift lever |
| 22 brightness adjusting knob | 23 power switch |
| 24 charging indicator | 25 fuse tube |
- (Single group LED lamp source is similar as two group lamp source)

- 1) Insert the plug of the mercury power source into external power supply socket (please make sure the rated current and voltage are coincided with the input supply voltage at first).
- 2) Turn off the Epi-fluorescence switch and turn on the mercury power source (the input voltage should be within 100V~220V). Mercury Power Box should be opened by pressing start button (START or TRIGGER)to excitation mercury lamp,it takes 10 minutes to make the mercury lamp reach the stable state and max. luminescence efficiency.
- 3) Put 10X fluorescence objective in the optical path and lower transmission condenser to a minimum or take off.
- 4) Place the fluorescence specimen on the stage and fix it with the clamp, adjust the stage knobs to move the specimen in the optical path.
- 5) Pull the filter converting lever to the needed position.

- 6) Maximize the field diaphragm by manipulating the field diaphragm adjust lever on the Epi-fluorescence device.
- 7) Focusing by rotating the coarse and fine focusing knobs to make the image clear.
- 8) To observe with other magnification objectives after getting ideal image.
- 9) Centering the filament image of the high pressure mercury lamp.
Indistinct bright block of mercury lamp filament image can be seen in the view field after getting the clear fluorescence image, pulling the light condenser to move the light condenser axially to move the bright block in the brightest position. If the bright block diverges the view field center, it can be centered by adjusting the horizontal or vertical lever on the mercury lamp house (the instrument has been adjusted before dispatching, in normal case, it would be better not to center again).
- 10) When use multigroup light source , can choose just compare with module conversion position witch in front of the fluorescence device .
- 11) Rechargeable Lithium power source specially for LED illumination can be used above 10 hours continuously without external power supply. When it is charging, the indicator is dark as the battery capacity lower than 80%, and the indicator is flashing as the the battery capacity is 80%. The indicator is bright as the battery capacity is full. The indicator comes dark after the external power supply cut.

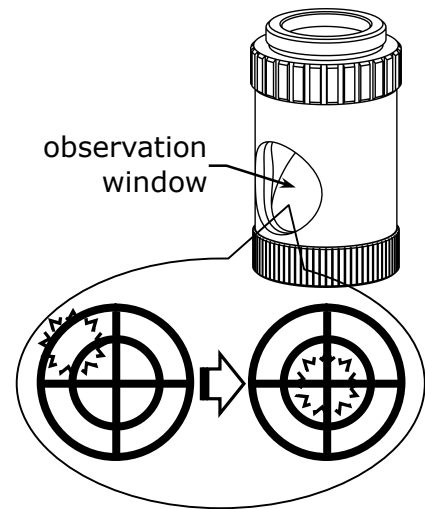
- ▲ Before perform fluorescence observation, locate the specimen with the transmission light first.
- ▲ To prevent the fluorescence from attenuation quickly, block the excitation light with barrier when preparing for fluorescence observation or photography. Only when observing or photographing, irradiate the specimen with the excitation light.
- ▲ Don't switch off the mercury lamp within the initial 15 minutes it lights on for avoiding shorten its lifetime. The user can block the light with the barrier when 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 it is better to use the high sensitivity film (e.g.27 DIN).
- ▲ If Mercury lamp with strong light source , should in half light position of light shutter in case of sample cancellation.
- ▲ Ordinary LED Power Box and Lithium power source without start button.
- ▲ Operation Marking Instruction

	ON	FD	Field Diaphragm
	OFF	AD	Aperture Diaphragm
	Direction Switch for Diaphragm, Hollow Round means big , non-hollow round means small.		
	No Light pass		Attentions
	50% light pass		High temperature
	100% light pass		Shut down the power and wait until the lamp cool when replace lamp.

6. Use of fluorescent centering device

The Fluorescent centering device can center directly the light source for convenient using. The size of the device is similar to the normal objective, and there is an observation window in the side of cover.

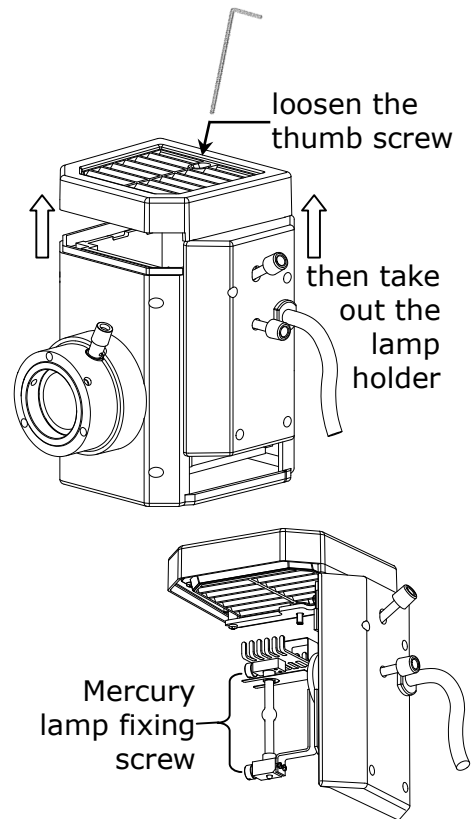
- Hold the silvery colour gear in the centering device, and install it on the nosepiece ,turn the cover of centering device to align the observation window .
 - Turn the fluorescence device to G, and watch the light source's position through the widow.
 - Adjust the handle of light source condenser properly, and make the outline of the light source clear, adjusting the knob on fluorescence lamp house to center.
 - The cross line center in observation window must be aligned with the lamp house .
- ▲ Please turn the fluorescence device to G, because the brightness of G is suitable for observation better to avoid to feel unconformable for high brightness.
- ▲ Maybe can't get better image afer adjustment ,you need to fine adjusting again in normal specimen observation.



7. Fluorescent mercury lamp replacement

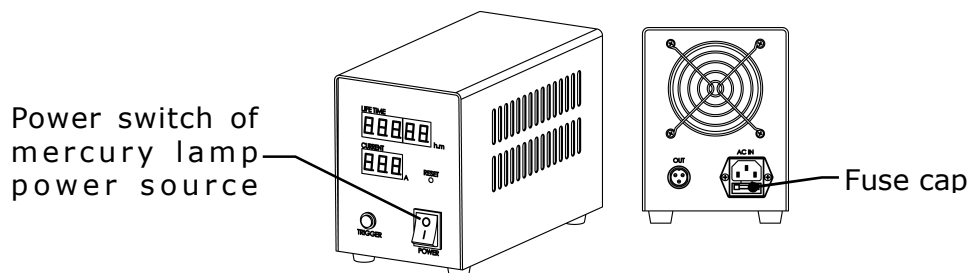
Turn off the power supply, loosen the thumb screw, then take out the lamp holder slowly and aslant. Loosen the two fixing screws of mercury lamp, replace the used lamp with a new one, then screw down the two fixing screws, take back the lamp holder and tighten the thumb screw. At last, center the mercury lamp.

- ▲ Danger! It is absolutely forbidden to take the lamp holder out of the lamp house while the mercury lamp lights on.
- ▲ The mercury lamp should not be replaced until it cools down completely.
- ▲ Clean the bulb with the gauze soaked with a few mixture of alcohol and ether (4 : 6). Stains such as dust and fingerprint are not allowed on the bulb surface.



8. Replacement of the fuse

Cut off the power supply, screw off the fuse cap on the power source, then replace the fuse.





Smart-FL Fluorescence Microscope