



# Fluorescent Biological Microscope

## BS-2036F2B(LED)/F2T(LED)

### Instruction Manual



BS-2036F2B(LED)



BS-2036F2T(LED)

This manual is written for BS-2036F2B(LED)/F2T(LED) Series LED fluorescent biological microscope. To ensure the safety, obtain optimum performance and to familiarize you fully with the use of this microscope, it is recommended strongly that you study this manual thoroughly before using the microscope and retain this manual in an easily accessible place near the work desk for future reference.

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**Attentions! !**

**1. Purpose.**

This series microscopes are 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 areas. 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 related parts.

**7. Installation.**

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

**8. Operation Environment.**

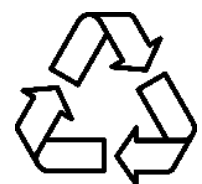
The required available environment for using of the equipment:

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. )!



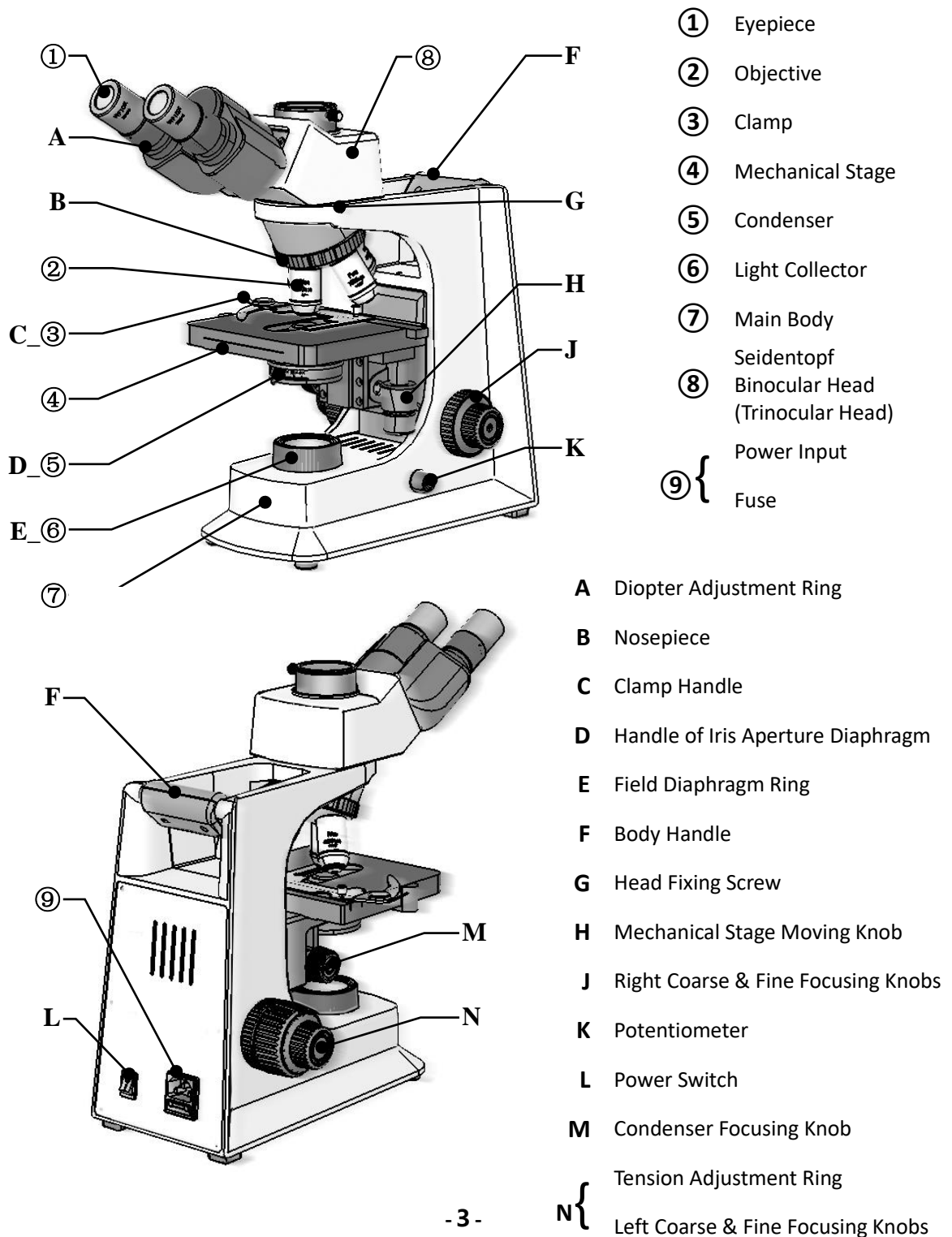
**10. Statement**

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

# Microscope Body Part

BS-2036F2B(LED)/F2T(LED) series LED fluorescent biological microscopes are designed for college teaching, medical and clinical identification. The microscope with modern design, steady structure, convenient operation and clear image is suitable for observing various biological specimens, they are mostly applied in colleges and hospitals.

## 1. Pars Name



## 2. Specifications

### 2.1 Total magnifications

Total Magnifications Eyepiece	Objective	4X	10X	20X (Optional)	40X	100X
	10X	40X	100X	200X	400X	1000X
16X	64X	160X	320X	640X	1600X	

### 1.2 Objectives

Infinite Plan Objectives are optional.

Infinite Plan Objectives	Numerical Aperture (N.A.)	Objective Field	Resolution (μm)	Working Distance(mm)
4X	0.10	5mm	3.35	12.1
10X	0.25	2mm	1.34	4.64
20X (Optional)	0.40	1mm	0.83	2.41
40X (S)	0.65	0.5mm	0.50	0.65
60X (S) (Optional)	0.80	0.33mm	0.41	0.33
100X (Oil) (S)	1.25	0.2mm	0.26	0.12

### 1.3 The other specification

2.3.1 Mechanical tube length: 180mm

2.3.2 Conjugate distance: Infinity

2.3.3 Head: Seidentopf Binocular or Trinocular, Inclined 30°, Rotatable 360°, Anti-fungal systems. Interpupillary Adjustable Distance Is 48-75mm, Diopter adjustable range ±5.

2.3.4 Nosepiece: Quadplex nosepiece

2.3.5 Mechanical stage: Size 145mm×140mm, X-Y travel 76mm×52mm

2.3.6 Focusing systems: Coaxial Coarse and Fine Focusing Knobs, Coarse stroke 26mm,  
Fine division 2μm, Condenser up-down range 22mm

2.3.7 Condenser: Abbe condenser, N.A. 1.25, Adjustable aperture, Aperture center can be adjustable.

2.3.8 Illumination: Non-spherical System

2.3.9 Filter: Built in blue filter

2.3.10 Electric components: Input voltage AC85-265V/LED

Output voltage DC1.2-6V/LED,

Rotation potentiometer with power switch, Fuse 2A φ5×20

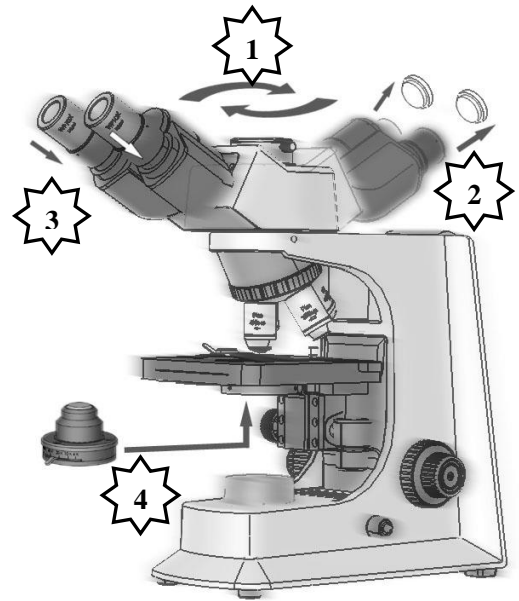
### 3. Installation

Please clean the operation desk before installation. Put out the microscope of the carton and put it on the desk.

Make sure the supply voltage meets the instrument's requirement and the power switch is off.

Installation Instruction Fig.:

1. Turn the binocular (trinocular) head to working position;
2. Put out the dust cover of the eyepiece tube;
3. Insert into the eyepiece;
4. Install Abbe Condenser.



#### 3.1 Eyepiece Tube:

Loose the Head Fixing Screw G, turn the tube to observing position, then tighten the Screw G.

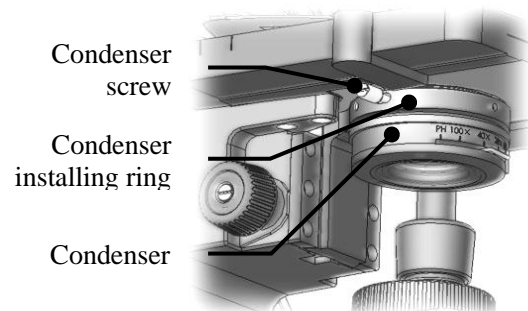
#### 3.2 Put out the eyepiece dust cover.

#### 3.3 Eyepiece

Put out the eyepiece of the carton, and insert it into the tube. Please don't touch the lens of the eyepiece by hand.

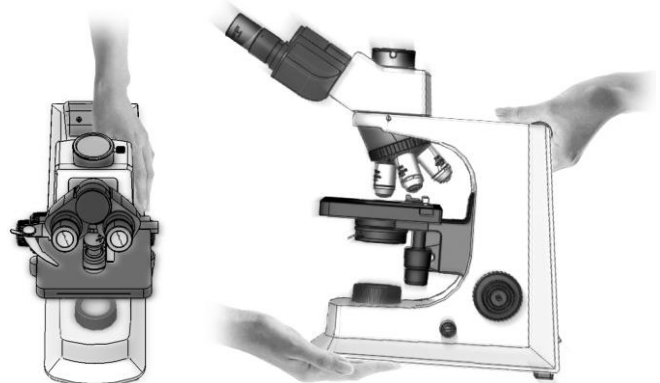
#### 3.4 Condenser

Put out the condenser of the carton, then turn Condenser Focusing Knob M to lower condenser installing ring. Loose the condenser screw, then install the condenser, and make the condenser graduation face to the front, Tighten the condenser screw, and higher the condenser installing ring to top. Please don't touch the lens by hand.



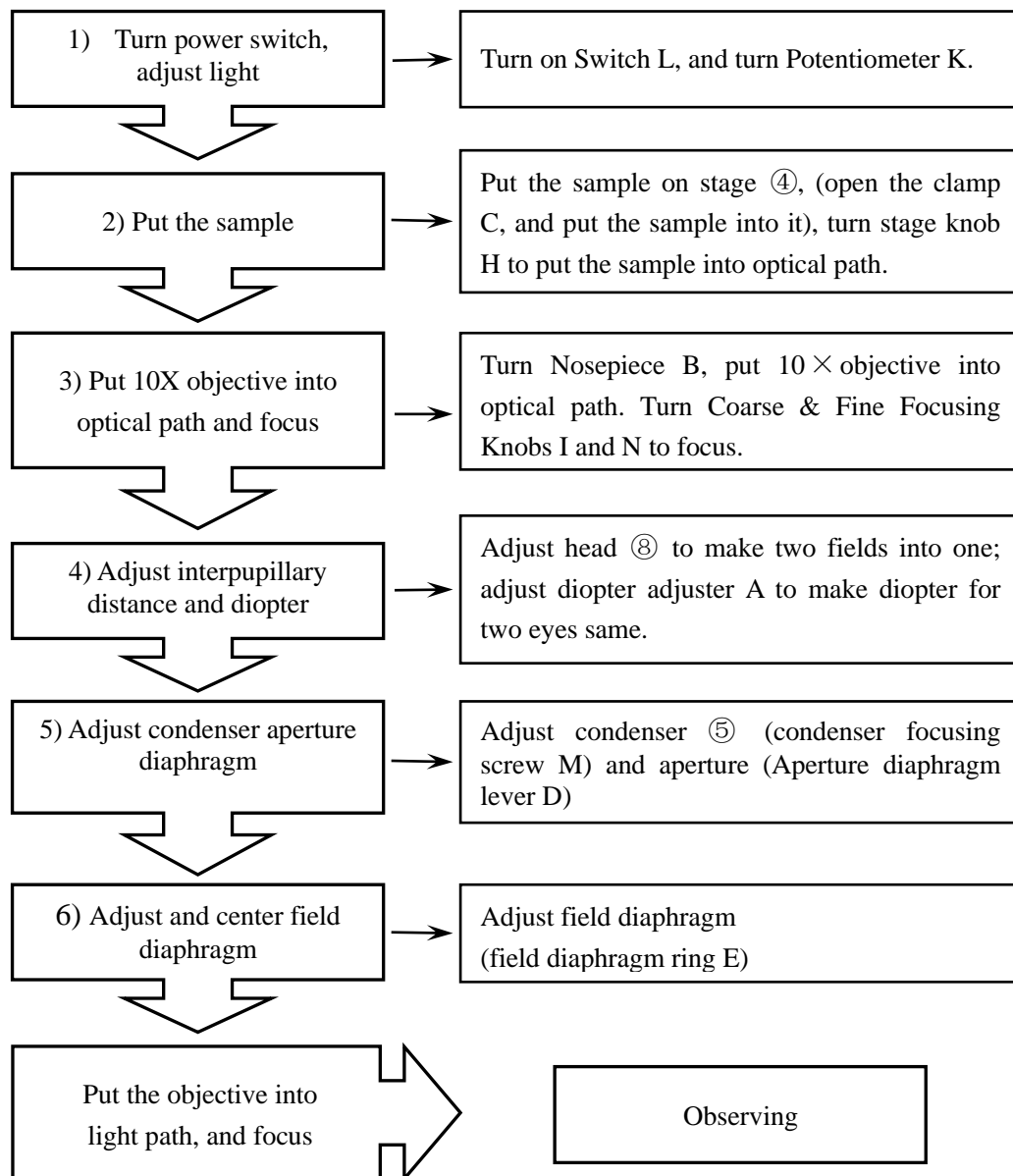
#### 3.5 Power

Put in power, open Switch, and turn Potentiometer.



### 4. Operation

4.1 Bright field operation process instruction



## 5. Image Collection

### 5.1 Installing

Connect the C-mount with CCD camera or connect camera with camera adapter, then connect it with c-mount, finally put it into microscope.

### 5.2 Using

First get a clear image from eyepiece, then put out lever on the side of trinocular head, and collect image with camera. Clear image should be in screen. Adjust B14 fine focusing knobs to get it clear if image is not clear.

## 6. Maintenance

### 6.1 Clean microscope

6.1.1 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 alcohol and ether (proportion 1:4).

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

6.1.3 Don't clean painted metal and galvanizing metal with organic solvent such as alcohol, ether or the mixture of the both. Silicon cloth or soft cleaning preparation is suggested to clean it.

6.1.4 Plastic should be cleaned by soft cloth with clear water.

### 6.2 Environment of using and placing

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

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

6.2.3 Removing equipment is suggested to be installed when microscope used in heavy humidity area to avoid fungus and mist damage instrument.

6.2.4 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.

### 6.3 Replacement of bulb

6.3.1 Turn off power, and pull out plug.

6.3.2 Wait the bulb become cool.

▲ Please be sure that the bulb is cool, then follow by the next operations.

6.3.3 Lay aside the microscope reliably, unscrew the knurled thumb screw of the lamp housing cover on the underside of base.

6.3.4 Pull over the lamp housing cover.

6.3.5 Pull out the bulb should be replaced, hold a new bulb with silk cloth to avoid fingerprint and dust affect bulb brightness and service life, and insert fully the contact pins into the bulb socket.

6.3.6 Close the lamp housing cover, and screw the knurled thumb screw.

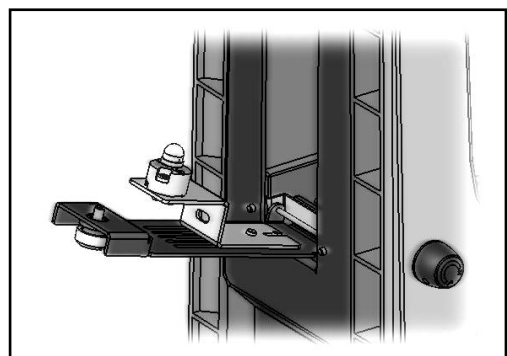
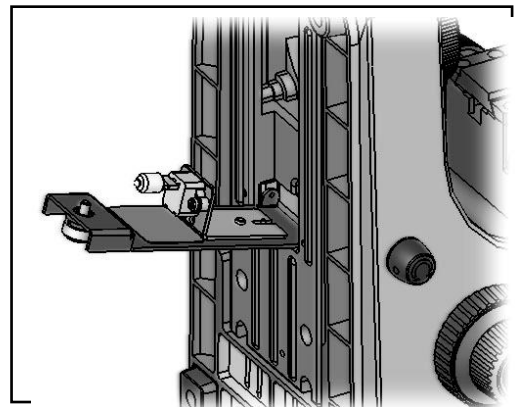
▲ After working for above 10 hours continuously, better cut off the microscope about 30 minutes.

### 6.4 Replacement of fuse

6.4.1 Cut off power of microscope, pull out the plug.

6.4.2 Unscrew fuse cap in the back of base, take out old fuse.

6.4.3 Replace a new fuse, then screw the fuse cap.





# Fluorescent Part

## 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.

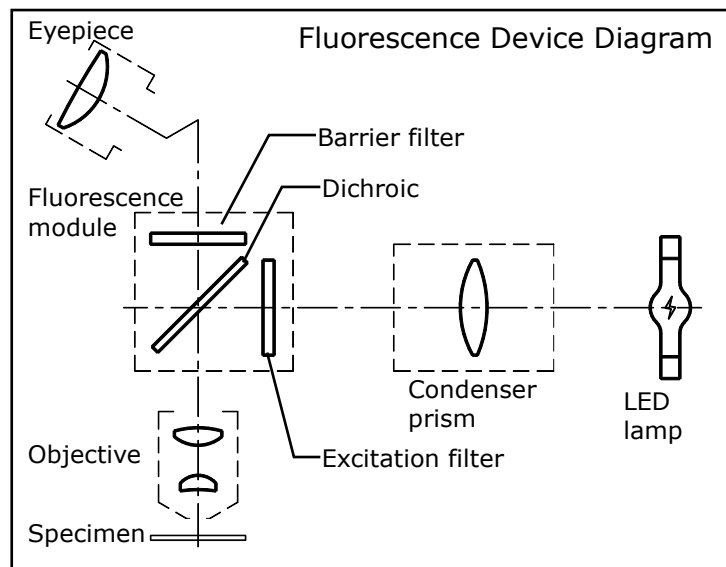
Fluorescence microscope has wide applications in basic theory research and clinical diagnosis about medicine, biology, as well as analysis and test in industry, agriculture, stockbreeding, criminal investigation, legal medical appraise, environmental protection etc.

## 2.Principle

The device consisting of Epi-fluorescence illuminator, 5W LED lamp, 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 two group excitation filters system: blue (B), green (G).

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.



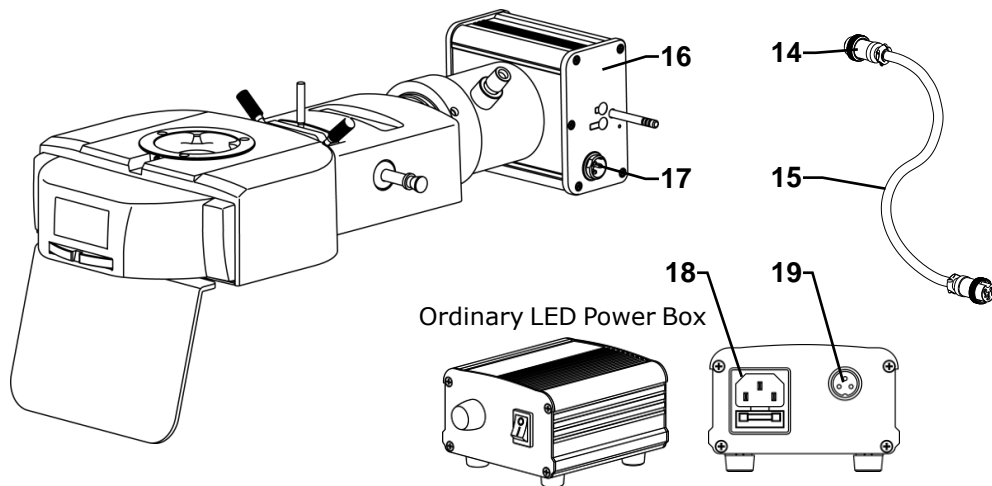
### 3. Instruction

The fluorescence microscope is building-block structure, it includes main body, fluorescence conversion device, fluorescence excitation modules, fluorescence light source lamphouse and objective etc. Fluorescence device with 2 position can install two excitation modules and bright field observation position. Standard outfits: FL2-LED and special LED device for single. In addition, other excitation modules can be used as per user's requirements.

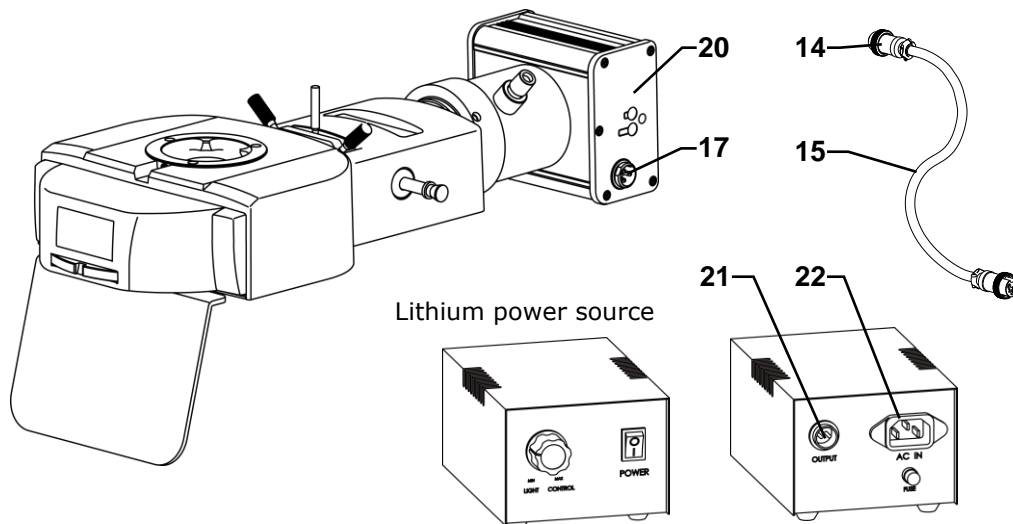
FL2-LED two-groups fluorescence device with LED illumination, it has excellent feature, without waiting startup time for lamp, low voltage, no fever on lamp house etc. Standard equipped with B,G two group fluorescence modules. Single LED fluorescence device is designed for single module, customize for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

### 4. Installation

Two-Groups LED Fluorescence Device Installation Marking Graphs



LED Fluorescence Device Installation Marking Graphs



- 14, 15 double ended connector wire for lamp box and power supply
- 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

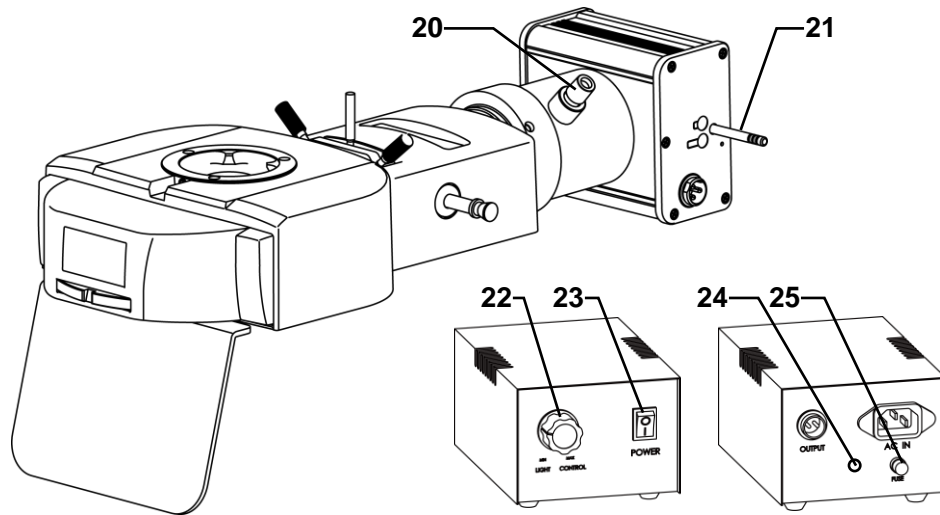
- 1) Take all parts from the package, remove the protective package and place it on the vacant bench.
- 2) Turn fluorescence device and put the protective plate in with the screw, then tighten it by wrench.
- 3) Then put the device in upright direction, then link the main body connector with main body 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 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:

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 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 power source (the input voltage should be within 100V-220V).
- 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) When use multigroup light source, can choose just compare with module conversion position witch in front of the fluorescence device .
- 10) 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 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.
- ▲ Fluorescence microphotograph requires a long exposure time, so it is better to use the high sensitivity camera.
- ▲ 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.

## Trouble shooting

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

Trouble	Causation	Remedy
Switch on but no light	Plug is unreliable	Plug in again
	Fuse is broken	Change fuse
Brightness of view field isn't enough or is Uneven	Light doesn't meet the requirement	Adjust the light intensity
	Brightness isn't adjusted correctly	Adjust rotation potentiometer
	Objective isn't in correct position	Make the objective in correct position
	The size of iris aperture is too small	Adjust the size of iris aperture
Brightness of view field isn't enough or is Uneven	Lens (objective, eyepiece, condenser, light collector) has dust	Clean it
	Position of condenser is too low	Higher condenser
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 40X objective to dip in immersion oil)	Clean it
	Immersion oil isn't used for 100X 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 way
	Size of iris aperture isn't proper	Adjust the size of iris aperture
	Position of condenser is too low	Readjust the position of condenser
One side of image is dark or image is moving as focusing	Objective isn't in correct position	Make the objective in correct position
	Specimen isn't placed correctly	Place specimen levelly on stage and clip it with clamp
Objective touches specimen as changing low times objective to high times objective	Cover glass of specimen isn't in up direction	Place specimen correctly
	Cover glass doesn't meet the requirement	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 according to two eyes
It is easy for eyes to be tired during observing	Diopter isn't adjusted correctly	Readjust diopter

## Outfits

Item	Specification			BS-2036 F2B(LED)	BS-2036 F2T(LED)
Optical System	Infinite Optical System			●	●
Viewing Head	Seidentopf Binocular Viewing Head, Inclined at 30°, 360° Rotatable, Interpupillary 48-75mm			●	
	Seidentopf Trinocular Viewing Head, Inclined at 30°, 360° Rotatable, Interpupillary 48-75mm, Light Distribution 20:80				●
Eyepiece	WF10×/20mm			●	●
	WF16×/13mm			○	○
	Reticule Eyepiece WF10×/20mm (0.1mm)			○	○
Objective	Infinite Plan Achromatic Objective 4×, 10×, 40×, 100×(Oil)			●	●
	Infinite Plan Achromatic Objective 20×, 60× (S), 100× (Dry, S)			○	○
	Infinite UPlan fluorescent objective 10×, 20×, 40×, 100×			○	○
Nosepiece	Backward Quadruple Nosepiece			●	●
	Backward Quintuple Nosepiece			○	○
Focusing	Coaxial Coarse & Fine Focusing knobs, Travel Range: 26mm, Scale:2um			●	●
Stage	Stage Size: 145×140mm, Cross Travel 76×52mm, Scale0.1mm, Two Slide Holder			●	●
	Rackless Double Layers Mechanical Stage, Size: 140×135mm, Cross Travel 75×35mm, Scale0.1mm, Two Slide Holder			○	○
Condenser	Abbe Condenser NA1.25 with Iris Diaphragm			●	●
Transmitted Illumination	3W-LED Illumination, Brightness Adjustable			●	●
	12V/20W Halogen Lamp, Brightness Adjustable			○	○
	6V/30W Halogen Lamp, Brightness Adjustable			○	○
Fluorescence Attachment	Epi fluorescence unit ( 2 positions for Uv /V/B/G fluorescent filters), 5W-LED fluorescence lamp			●	●
Fluorescent filters		Excitation	Dichroic Mirror	Barrier Filter	
	Blue excitation	420-490	505	520	●
	Green excitation	500-550	575	590	●
	Ultraviolet Excitation	330-380	400	435	○
	Violet Excitation	380-420	430	460	○
Filter	Blue /Green /Yellow			○	○
Optional Accessories	Field Diaphragm, Photo adapters(for DSLR cameras), Video adapters(1X, 0.5X), Polarization set, Phase contrast kit, mirror,			○	○

	Cable Winding Device		
Package	42cm*28cm*45cm, 40cm*20cm*40cm, 12kg	•	•

Note: ●Standard Outfit, ○Optional

