STALWART

LED Fluorescent Microscope

STM-2036FB(LED)/FT(LED)

Instruction Manual

This manual is written for STM-2036FB(LED)/FT(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.

Contents

Attentions ! !

1) Purpose

The 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.

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

3) The proper usage.

Supply voltage must be consistent with the rated input voltage marked in the microscope. If beyond this range, equipment will be seriously damaged. Microscope is a precision instrument and should be operated carefully, and strongly rigid operation may damage the equipment. Operators should comply with appropriate safety procedures and assume responsibility for the safe use of this instrument.

4) Use in safe way, prevent burns and fire.

When the Instrument power in working, temperature of bulb and collector will rise sharply to meet the heat balance, so pay attention to anti-hot logo, to prevent burns.

Do not use alcohol, gasoline, paper and other combustibles near the instrument, to prevent a fire! !

5) Notes on replacing the bulb.

The correct bulb must be used as per the specification of the bulb in the microscope. Use of other bulbs may damage the equipment. Before replacing the lamp, must turn off power switch, and unplug it in order to avoid electric shock and damage to equipment. When replacing the lamp, be careful not to pollution bulb. Light shell surface shouldn't have dust , fingerprints, oil, etc..

The power supply must be cut off before bulb replacement. The bulb must be cooled down completely before proceeding! !

6) Requirements for handling and using environment

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.

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.

7) For the protection of the environment, please properly handle the microscope packing waste (such as: cardboard, foam, etc.)!

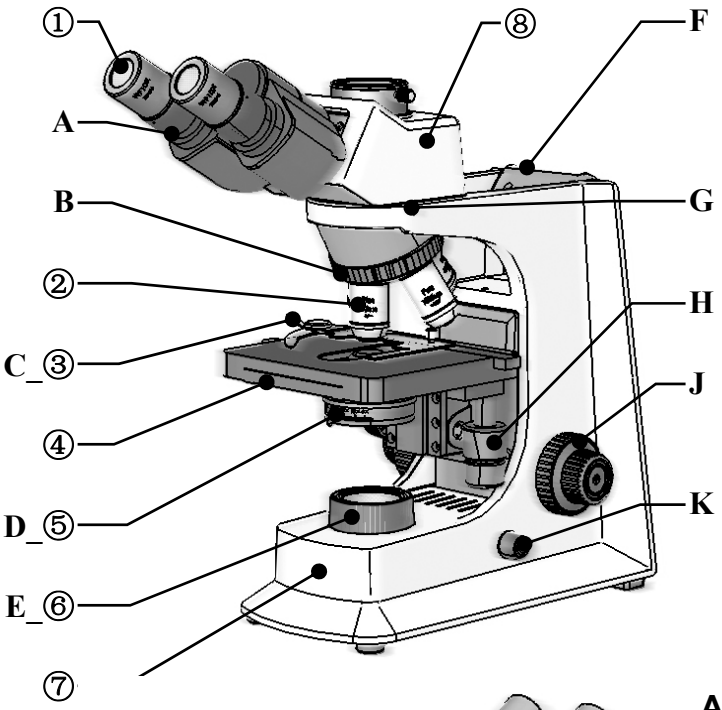
8) statement

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

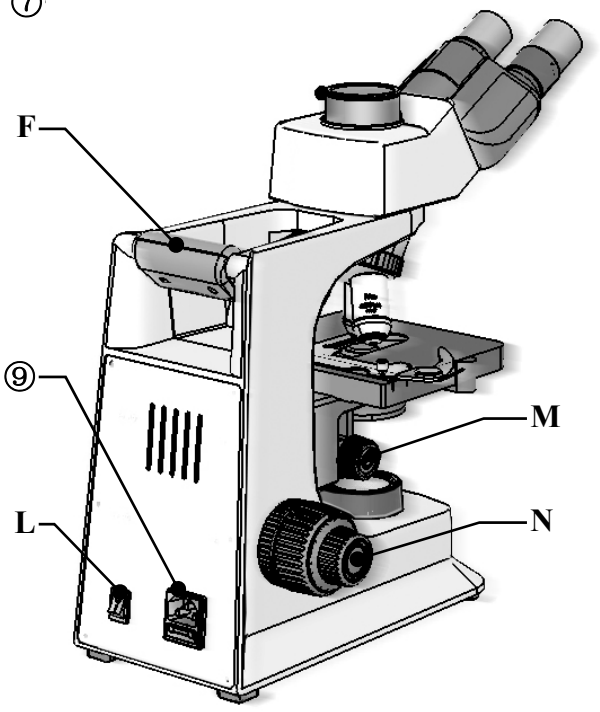
Microscope Body Part

STM-2036FB(LED)/FT(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



① Eyepiece
② Objective
③ Clamp
④ Mechanical Stage
⑤ Condenser
⑥ Light Collector
⑦ Main Body
⑧ Seidentopf Binocular Head (Trinocular Head)
⑨ { Power Input / Fuse



A Diopter Adjustment Ring
B Nosepiece
C Clamp Handle
D Handle of Iris Aperture Diaphragm
E Field Diaphragm Ring
F Body Handle
G Head Fixing Screw
H Mechanical Stage Moving Knob
J Right Coarse & Fine Focusing Knobs
K Potentiometer
L Power Switch
M Condenser Focusing Knob
N { Tension Adjustment Ring / Left Coarse & Fine Focusing Knobs

2. Specifications

2.1 Total magnifications

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

1.2 Objectives

Infinite E-Plan Objectives	Numerical Aperture (N.A.)	Objective Field	Resolving Power	Working Distance
4X	0.10	5mm	2.8μm	6.73mm
10X	0.25	2mm	1.1μm	4.19mm
20X (S) (Optional)	0.40	1mm	0.69μm	2.14mm
40X (S)	0.65	0.5mm	0.42μm	0.45mm
100X (Oil) (S)	1.25	0.2mm	0.22μm	0.12mm

1.3 The other specification

2.3.1 Mechanical tube length: 160mm

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 50-75mm, 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 filer

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

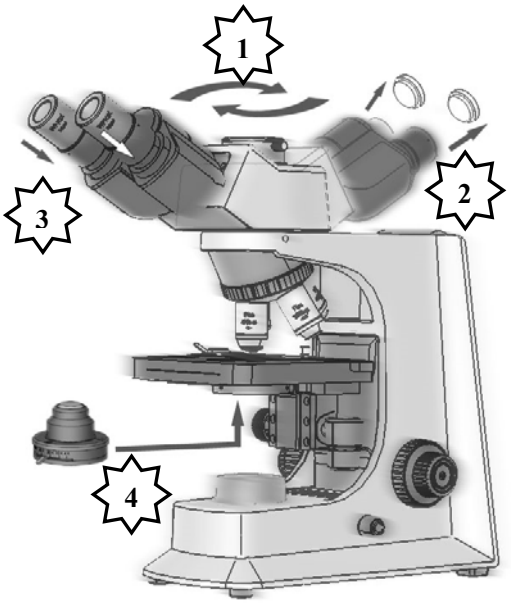
3. Installation

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.

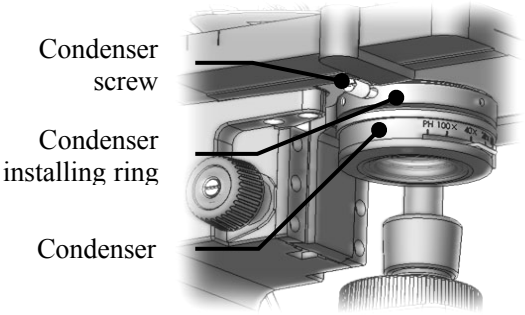
3.2 Put out the eyepiece dust cover.

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.

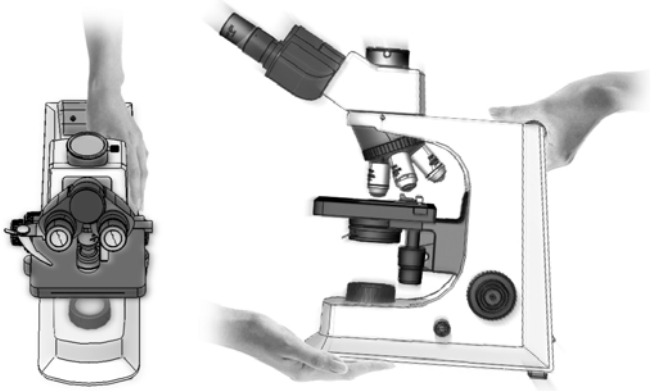
3.4 Condenser

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.



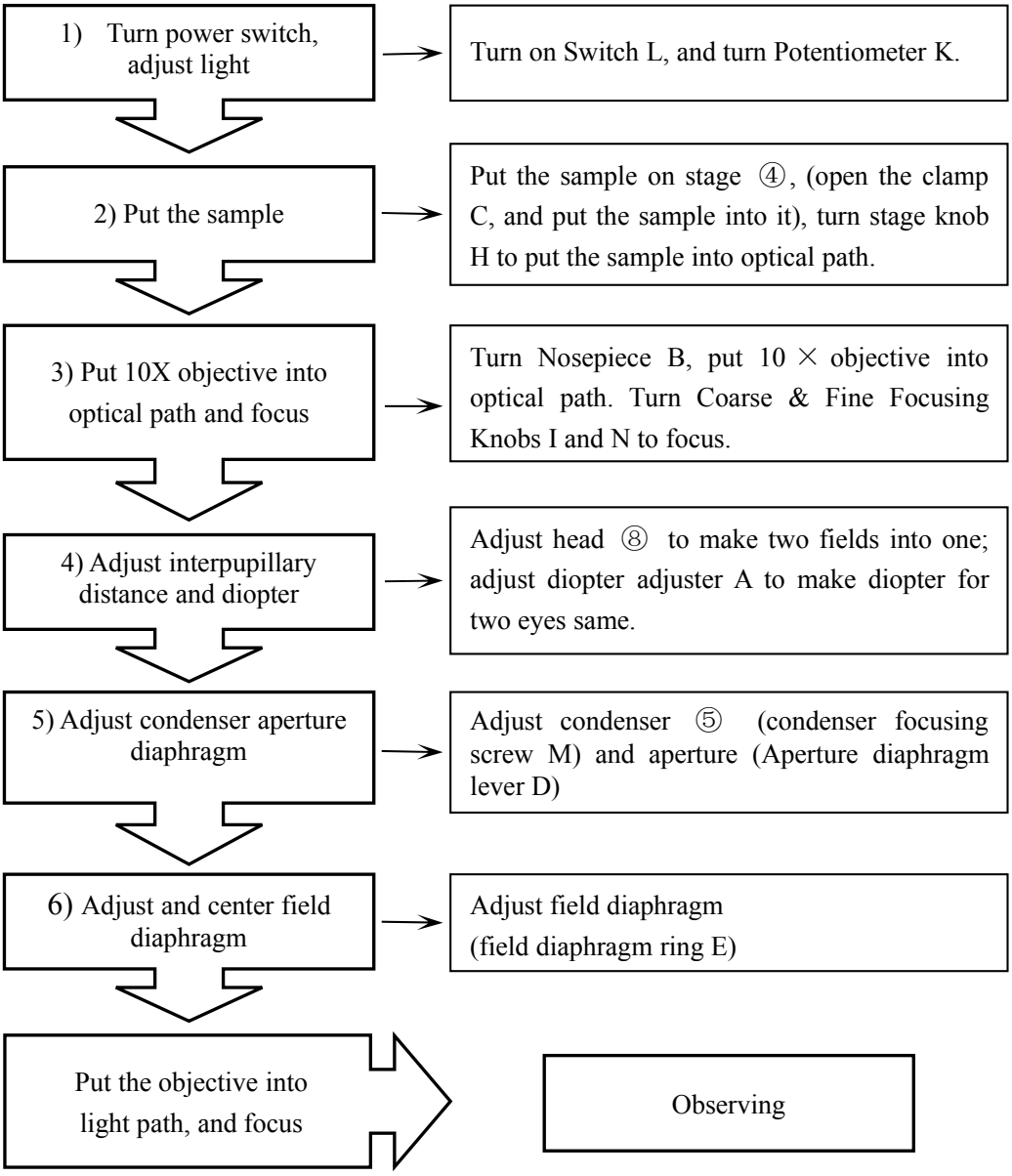
3.5 Power

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 nest operations.

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

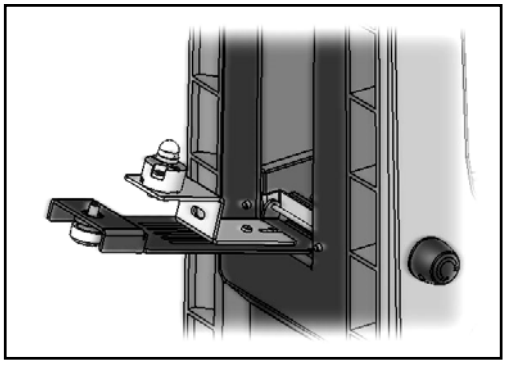
6.3.4 Pull over the lamp housing cover.

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, and 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.

LED Fluorescent Part

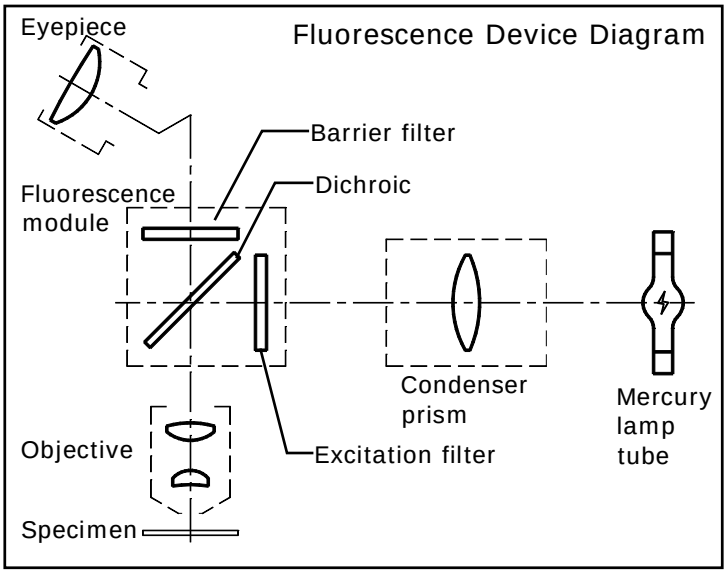
1. Applications

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, 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 provided with 2 group excitation filters system of FL2: blue (B), green (G). Or choose two group configuration from 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 excitated 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.

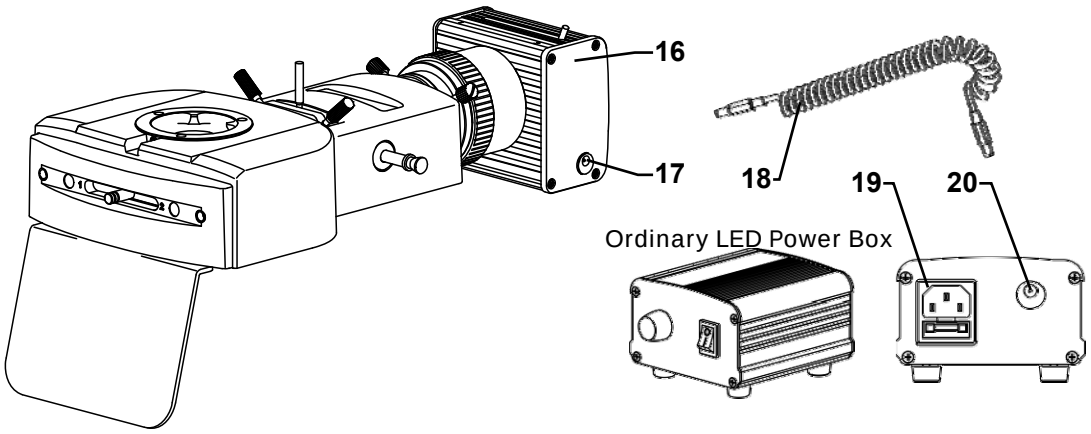
3. Instruction

BFL-LED2 sliding two-group LED fluorescence device can meet various need for configuration through the building modular collocation.

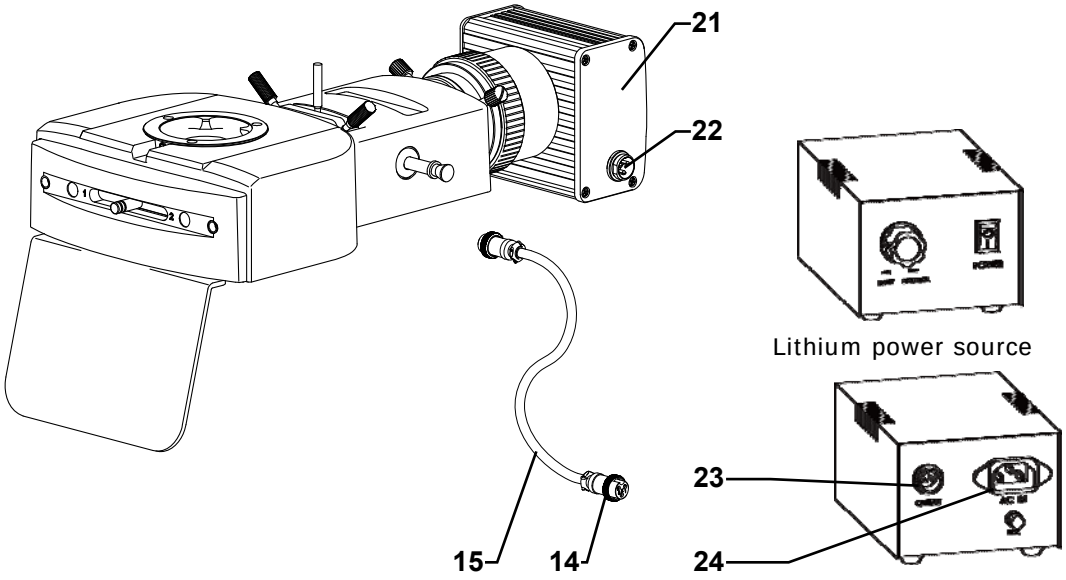
BFL-LED2 sliding two-group fluorescence device with fluorescence LED light source, which has excellent feature ,without waiting startup time for lamp, low voltage, no fever on lamp house etc., standard equipped with B,G, also can choose B, G, UV and V to install as required. Single fluorescence device is designed for single module, customize for especial requirement.

4. Installation

Two-Group LED Fluorescence Device Installation Marking Graphs



LED Fluorescence Device Installation Marking Graphs

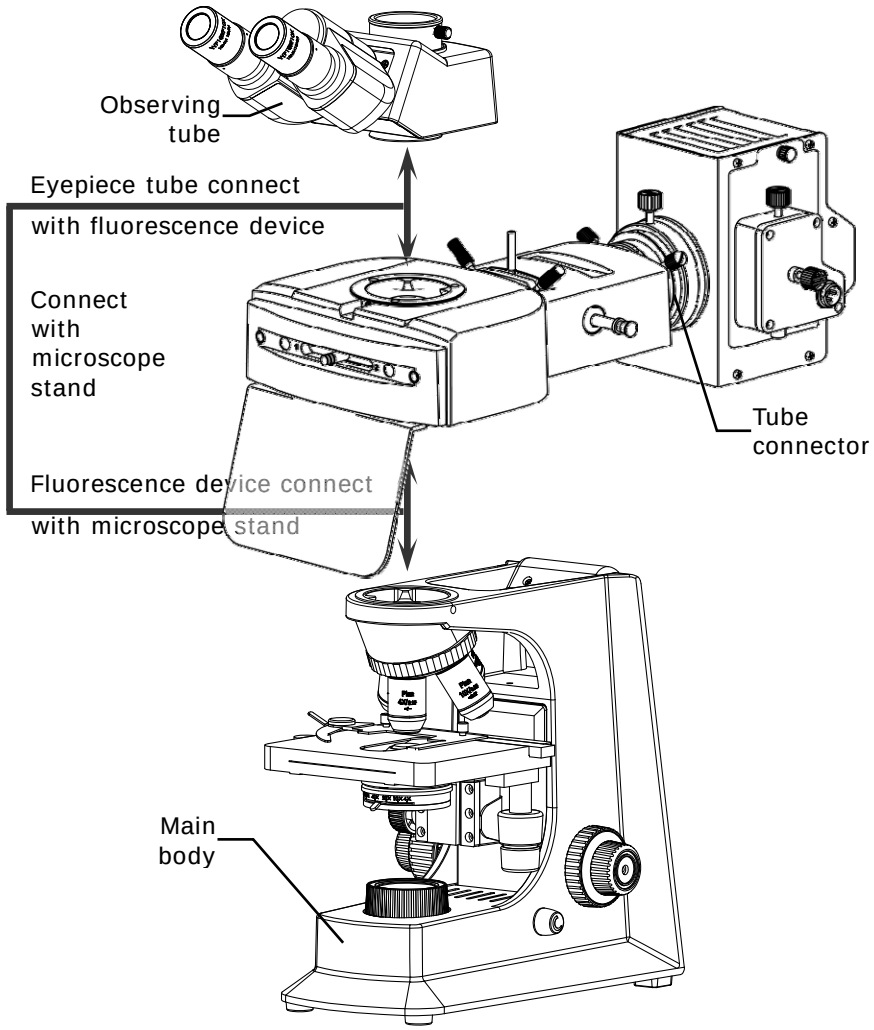


16 two group LED light box
17 light box power socket
18 ordinary power connecting wire
19 external power port

20 power box output socket
21 single group LED fluorescence light box
22 power socket of light box
23 output socket of lithium battery power box
24 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.

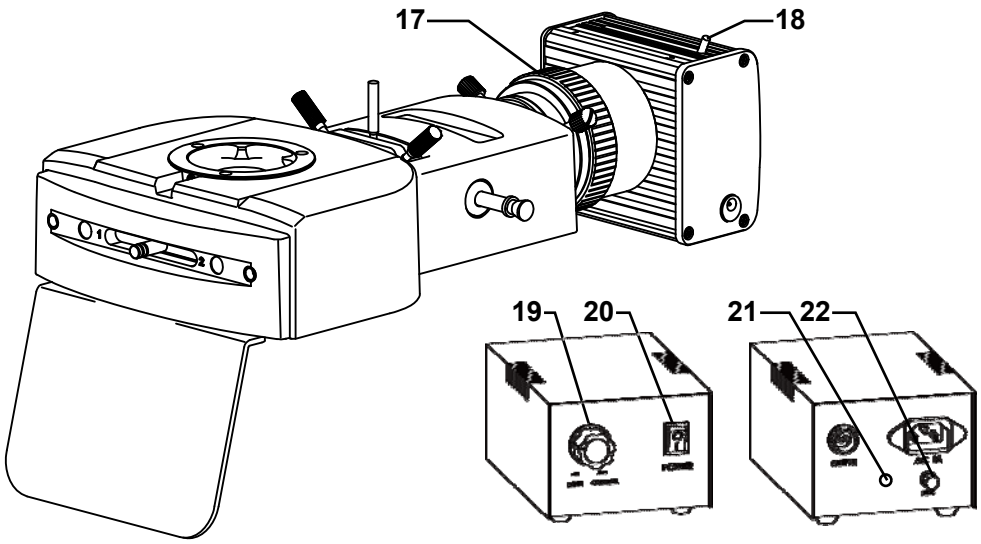
▲ Rechargeable Lithium power source specially for LED illumination.



5. Fluorescence Device Operation

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

LED Fluorescence Device Operational Parts Marking Graphs



17 condenser adjustable ring　　18 LED switch shift lever
19 brightness adjusting knob　　20 power switch
21 charging indicator　　22 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 220V±10V, otherwise the starting will be affected). 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

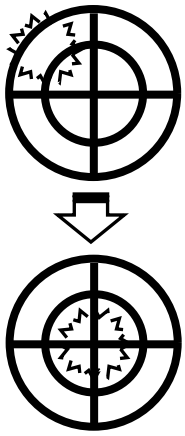
house (the instrument has been adjusted before dispatching, in normal case, it would be better not to center again).

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.

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.

a. Hold the silvery color gear in the centering device, and install it on the nosepiece ,turn the cover of centering device to align the observation window .
b. Turn the fluorescence device to G, and watch the light source's position through the widow.
c. 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.
d. 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.

7. Replacement of the fuse

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

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 bulb dark	Plug is unreliable	Plug in again
	Bulb is broken	Change bulb
	Fuse is broken	Change fuse
Bulb is flickering or brightness is unsteady	Bulb is unstable	Insert it again
	Bulb is broken	Replacing bulb
Brightness of view field isn't enough or is Uneven	Bulb specification doesn't meet the requirement	Replacing bulb
	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 isdirty (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	Interpupilary distance isn't adjusted correctly	Adjust interpupilary distance according to two eyes

Image observed by two eyes aren't in superposition entirely.	Interpupilary distance isn't adjusted correctly	Adjust interpupilary distance according to two eyes
It is easy for eyes to be tired during observing	Diopter isn't adjusted correctly	Readjust diopter

Outfits

Model					STM-2036FB(LED)	STM-2036FT(LED)
Optical System	Infinite Optical System				Standard	Standard
Viewing Head	Seidentopf Binocular Viewing Head, Inclined at 30°, 360° Rotatable, Interpupillary 50-75mm				Standard	
	Seidentopf Trinocular Viewing Head, Inclined at 30°, 360° Rotatable, Interpupillary 50-75mm					Standard
Eyepiece	WF10×/20				Standard	Standard
	WF16×/13				Optional	Optional
Objective	Infinite E-Plan Achromatic Objective 4×, 10×, 40×, 100×(Oil)				Standard	Standard
	Infinite Plan Achromatic Objective 20×, 60×				Optional	Optional
Nosepiece	Backward Quadruple Nosepiece				Standard	Standard
	Backward Quintuple Nosepiece				Optional	Optional
Focusing	Coaxial Coarse & Fine Focusing knobs, Travel Range: 26mm, Scale:2um				Standard	Standard
Stage	Stage Size: 145×140mm, Cross Travel 76×52mm, Two Slide Holder				Standard	Standard
Condenser	Abbe Condenser NA1.25 with Iris Diaphragm				Standard	Standard
Illumination	6V/20W Halogen Lamp, Brightness Adjustable				Standard	Standard
	6V/30W Halogen Lamp, Brightness Adjustable				Optional	Optional
	3W-LED Illumination Systems (non-rechargeable), Brightness Adjustable				Optional	Optional
	0.3W-LED Illumination Systems (Rechargeable), Brightness Adjustable				Optional	Optional
Optional	Photo attachment, Video attachment, Polarization set, Phase contrast kit				Optional	Optional
Reflected Light Source		Excitation	Dichroic Mirror	Barrier Filter		
	Blue excitation	BP460~490	DM505	BA515	Standard	Standard
	Green excitation	BP510~550	DM570	BA590	Standard	Standard
Lamp	3W LED Lamp(465-476nm)				Standard	Standard
Immersion Oil	Fluorescent Free Oil				Standard	Standard
Package	42cm*28cm*45cm, 40cm*20cm*40cm, 12kg				Standard	Standard