



Epi-LED FL Fluorescence Microscope Instruction Manual



Note

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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This User Manual has been prepared for users of the “Epi-LED FL” Module, a LED-light based Fluorescence attachment to be used in conjunction with Motic BA310 Upright Microscope.

We are constantly endeavoring to improve our instruments and to adapt them to the requirements of latest research techniques and testing methods. This involves modification to the mechanical structure and optical design of our instruments.

Therefore, all descriptions and illustrations in this instruction manual, including all specifications are subject to change without notice.

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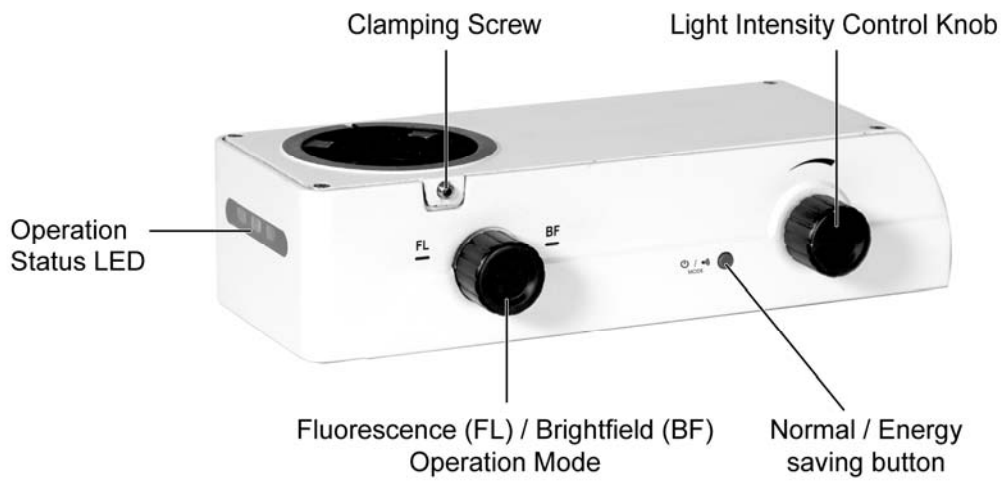
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1. NOMENCLATURE



BA310 Epi-LED FL



Epi-LED FL Illumination Module



Epi-LED FL Illumination Module

2. THE INSTRUMENT SETUP

2.1 Operation environment

The most suitable operation environment for the instrument should be free of direct sunlight, dust, vibration, high-temperature, or high-humidity. The use of the Instrument in such environment is limiting the performance of safety and functional features. Therefore the use of the Instrument is only guaranteed within below mentioned specifications and standard laboratory environment.

- Operation temperature: 5°C - 40°C
- Maximal relative humidity: 80%

The LED light source of the Epi-LED FL Illumination Module is emitting light according safety class 3B. For this reason, it is strongly advised not to look directly into the light or its reflections and to avoid any exposure of the skin to the emitted light. During work with the microscope, the use of the corresponding protective equipment is absolutely necessary.

Never look into the light beam - neither with or without optical instruments, not even for simple observation of the specimen. In case of disobeying the safety rules you may risk that your eyesight or skin will be damaged!

2.2 Setting up the microscope

Follow the instructions provided with BA310 Microscope manual.

For the application of simultaneous observation with phase contrast and fluorescence, attach the appropriate phase contrast components referring to the harmful provided instructions,.

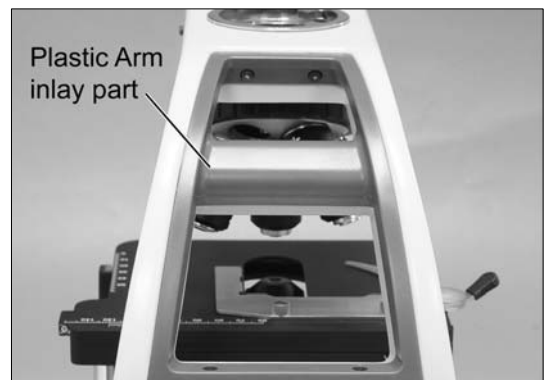
2.3 Epi-LED FL Illumination Module installation

2.3.1 Mounting/dismounting the bracket

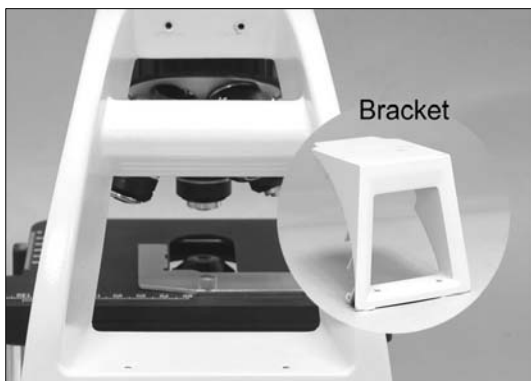
- Remove the observation tube (Fig.1) by loosening the clamping screw which is used to fix the tube to the stand, with a 3.5 mm Allen key wrench (delivered as accessory).
- Remove the Plastic Arm inlay part (Fig.2)
- Push the bracket in the same position as the plastic arm inlay, and fix it in this position with the four included fixing screws. The bracket carries a magnet sensor in it (Fig.3) which serves as a part of the interlock Safety system. (Fig.4)



(Fig.1)



(Fig.2)



(Fig.3)



(Fig.4)

2.3.2 Mounting the Epi-LED FL Illumination Module

- Insert the dovetail of Epi-LED FL Illumination Module in right angle (Fig.5) and slightly incline it with its dovetail mount on the stand.
- Position the Epi-LED FL Illumination Module horizontally and push it backwards within the dovetail mount, to align it to the outer edges of the stand and fix it with the set screw shown in Fig.6.



(Fig.5)



(Fig.6)

- * If the outer edges of the Epi-LED FL Illumination Module are not exactly aligned to the stand (Fig.7-2), it cannot be switched on due to an interlock safety feature which protects the user for accidentally exposure to the strong LED fluorescence illumination.



(Fig.7-1)



(Fig.7-2)

- Place the tube (Fig.8-1) onto the stand and tighten the clamping screw.

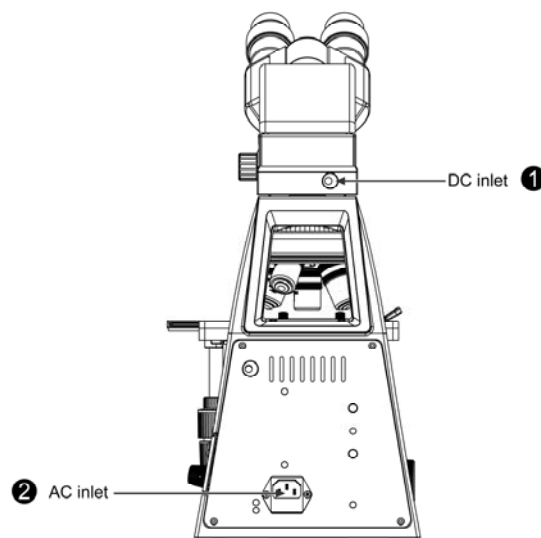


(Fig.8)

2.3.3 Setup BA310 Epi-LED FL power connections

There are 2 kinds of connection method:

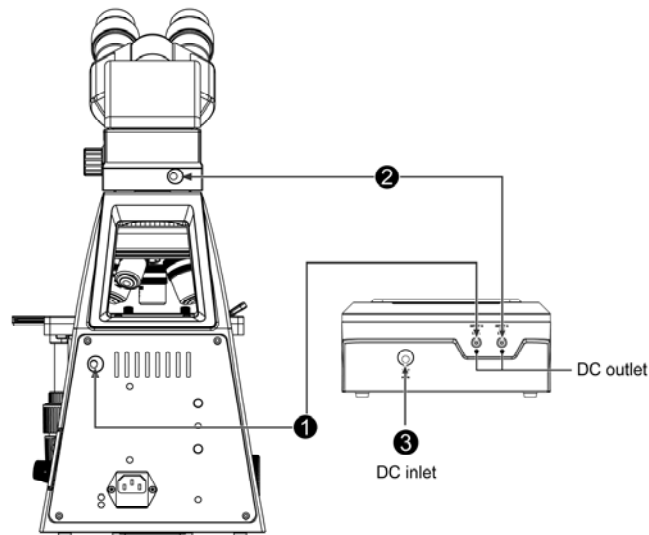
- (1) Epi-LED FL Illumination Module and BA310 have independent power supply (Fig.9).



(Fig.9)

- Insert the connector of plug-in power unit into the DC socket of the Epi-LED FL Illumination Module (Fig.9-1).
- Connect the power unit to a power outlet suitable to the specified specification in the manual.
- Connect the socket of the power cord to the AC inlet on the rear of the base of the BA310 LED mainstand (Fig.9-2). Plug in the other end of the cord to an AC outlet with ground conductor.

(2) Epi-LED FL Illumination Module using Motic battery pack supplies power (Fig.10).

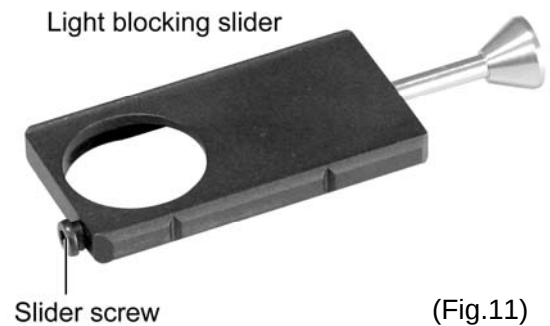


(Fig.10)

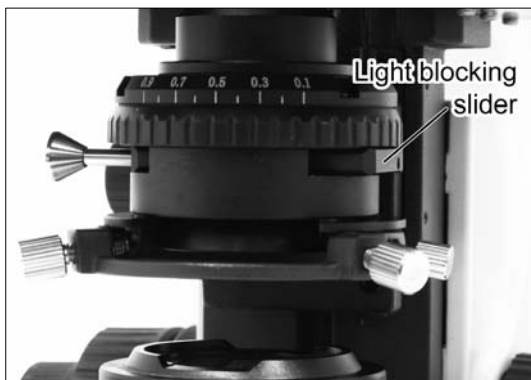
- Insert the connector of the battery supply unit into the DC socket of the Epi-LED FL Illumination Module (Fig.10-2)
- Insert the connector of plug-in power unit into the DC connection socket of the Battery Pack (Fig.10-3)
- Connect the power unit to a power outlet suitable to the specified specification in the manual.
- * This version could only be applied on BA310 LED whose transmitted illumination source is LED.
- Make sure that the specified input voltage of the power supply matches your available electrical power line specifications. (The power specifications are also printed on the power supply surfaces)
- Use only power cords which are rated for the electrical power used in your area and that has been approved to meet local safety standards.
- When using the extension cord, only use a power supply cord with a protective earth (PE) wire.

2.3.4 Setting up the condenser with phase and stop slider.

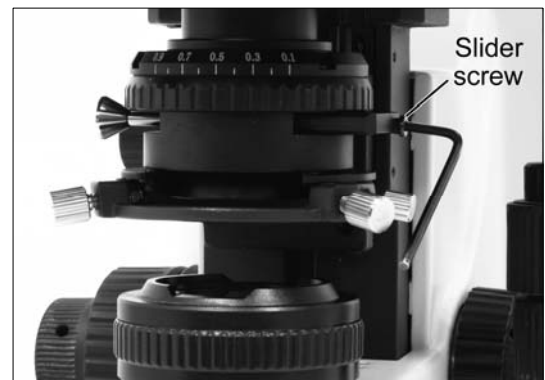
Push the light blocking slider into the condenser (Fig.11)



- Unscrew the slider's screw (Fig.11) firstly. Then, push the slider from the right to the left as far as it will go into the condenser (Fig.12.1) and screw the slider screw (Fig.12.2) back in again.
- Push the slide to the left side is for fluorescence observation (Fig.13.1). Push the slide to the right side is for bright field observation. (Fig.13.2)



(Fig.12.1)



(Fig. 12.2)



(Fig.13.1)



(Fig. 13.2)

2.3.5 Using Eyecups for stray light protection

If there is no darkroom available, use the special eyecups (Fig.14) for stray light protection.

Eye glass wearers need to be find the best setup up between special eyecups and standard version.



(Fig.14)

2.4 Switch BA310 Epi-LED FL On/Off

2.4.1 BA310

- Push the slide to the right side for bright field observation.
- To select Fluorescence mode rotate FL/BF changeover switch to the “**BF**” position. (Fig.15.1)
- When use AC power supply, press the On/Off switch (Fig.15.2) to “**On**” and adjust the intensity to be the desired intensity with the light intensity control knob (Fig.15.2).



(Fig.15.1)



(Fig.15.2)

- When use the battery back supplies the power to BA310 LED main body, should press the On/ff switch on battery pack. (On/Off switch on BA310 LED main body doesn't work in this situation)

2.4.2 BA310 Epi-LED FL

- Push the slide to the left side for fluorescence observation.
- To select Fluorescence mode rotate FL/BF changeover switch to the “**FL**” position. (Fig.16-1)
- Switch on and adjust brightness of the illumination use the light intensity control knob (Fig.16-2), the indicator (Fig.17) at the front of the Epi-LED FL Illumination Module lights with the blue light.



(Fig.16)



(Fig.17)

!! The BA310 Epi-LED FL microscope is equipped with an interlock safety feature, which switches off the Epi-LED FL Illumination Module as soon as the module is not aligned to the stand or detached.

2.4.3 Energy saving mode (Only for fluorescence observation)

- The Epi-LED FL Illumination Module's default working mode is the normal working mode.
- Press the **Normal / Energy saving button** (Fig.18) to change the operation mode.



(Fig.18)



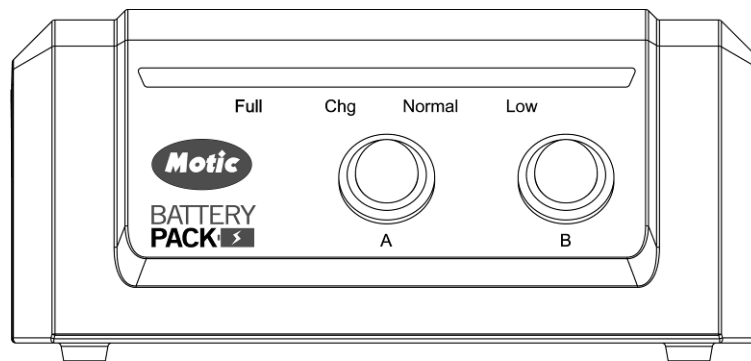
(Fig.19)

- In normal mode, the indicator at the front of the Epi-LED FL Illumination Module (Fig.19) is blue.
- In energy saving mode, the above white indicator turns to be shining blue. (Fig.19)
- In Energy saving mode, the Epi-LED FL Illumination Module will switch-off automatically after the user leaves the microscope, and would be switch-on immediately once the user comes back. (Fig.19)

2.4.4 Battery pack operation

Depending on the capacity of battery used, the microscope unit could be operated about 6 to 8 hours with battery power (Fig.20).

And switch A controls output A. Switch B controls output B.



(Fig.20)

Status LED on Battery Pack use:

- **“Full”** LED lamp glows means battery power pack is ready to supply the unit.
- **“Chg”** LED lamp lights as long as the charging process continues and goes out as soon as charging has been finished.
- **“Normal”** LED glowing means normal operation mode, the Battery can supply power to the EPI Fluorescence module and the microscope.
- **“Low”** indicates that the battery pack the output status will decay soon, and output would be cut automatically

3. OPERATION

3.1 BA310 transmitted-light bright field

The unit can be used to carry out “normal” Bright Field examinations

- Set the FL/BF changeover switch to the BF position (Fig.21) and push the blocking slide in condenser to the right side. Please refer to the BA310 user manual for transmitted light application.
- BF application mode will be indicated by white status LED in front of Epi-LED FL Illumination Module when Epi-LED FL illumination module is working.
- Only BA310 LED version could use battery pack.



(Fig.21)

3.2 BA310 transmitted-light phase contrast and darkfield

Please refer to BA310 manual for the operation guide.

- Set the FL/BF changeover switch to the BF position firstly.
- Before phase contrast or darkfield observation, insert the phase slider or darkfield slide into the condenser.

3.3 BA310 Epi-LED FL for transmitted-light and Epi-fluorescence illumination application

** BA310 microscope with Epi-LED FL Illumination Module is equipped with an interlock safety function to protect the user for accidental exposure to harmful light radiation. In case of a misalignment or detaching of the Epi-LED FL module, the module will be automatically switched off

** Follow the steps in BA310 Microscope manual to do primary adjustment as for bright field application.

- Set the FL/BF changeover switch (Fig.22-1) to the FL position
- To avoid disturbing auto fluorescence effects (caused by the transmitted-light LED), insert the blocking slider (“light trap”) (Fig.22-2) into the condenser and push the slider to the left side.

- Switch on the Epi-LED FL Illumination Module by the intensity control knob (Fig.22-3) and adjust the illumination Intensity to a comfortable level for observation. The indicator (Fig.22-4) at the front of Epi-Fluorescence illuminator shows blue status light.
- Focus on the specimen by the focusing knob and follow your specific applicative procedures.

If the microscopic examinations are done in room which is not darkened, the special eyecups with light protection can be used. They are, however, not suitable for spectacle wearers and must not be folded over, otherwise, the required dimensional stability would get lost.



Fig.22

4. TROUBLESHOOTING

4.1 Electrical

No light from Epi-LED FL Illumination Module or BA310 transmitted illumination	Power supply not plugged in
	LED burned out
	Fuse problem
LED light flickers	Connectors are not securely connected
	LED near end of service life
	Module not securely assembled

4.2 Optical

Image not visible	Shutter slider in light path
	Filter cube unsuitable for specimen
	Filter not completely in light path
Image is unclear or has no contrast	LED source is not centred
	Filter cube unsuitable for specimen
	Objectives are dirty
	Specimen slide or cover glass dirty
	Cover glass is missing
	Eyepieces dirty
	Room light is too bright
Field of view is partially obscured	Revolving nosepiece not clicked into position
	Shutter slider in intermediate position
	Field diaphragm out of centre
	Field diaphragm is stopped down

4.3 Epi-LED FL Illumination Module

Epi-LED FL Illumination Module could not be switched on	FL/BF changeover switch not be set to "FL" position
	Epi-LED FL Illumination Module not aligned exactly to microscope stand or displaced, which leads to interruption of power supply by interlock function

5. CARE AND MAINTENANCE

5.1 Lens and filters

- To clean the lens surface or filter, first remove the dust by air blower. If dust still persists, use a soft / clean brush or gauze.
 - A soft gauze or lens tissue moistened with pure alcohol should only be used to remove grease or fingerprints.
 - Immersion oil could be removed by the mixture from 25% alcohol and 75% ether
 - Immersion oil from objective lenses could be removed by the mixture from 25% alcohol and 75% ether.
 - The alcohol and the mixture of 25% alcohol and 75% ether are both flammable.
 - Do not use the same area of gauze or lens tissue to wipe lens more than once.
- ** Caution: Never use near to open flame or other not suitable environment.

5.2 Cleaning the painted or plastic components

- Do not use organic solvents such as alcohol or thinners etc, for doing so could destroy the painting surface.
- For stubborn dirt, moisten a piece of gauze with diluted detergent and wipe clean.

5.3 When not in use

- When not in use, cover the instrument with the desired vinyl dust cover and store it in a place with specified humidity and temperature.
- Objectives, eyepieces and filters should be stored in a container with drying agent.

5.4 Fluorescence filter cube (Ø25mm series)

Epi-LED FL Illumination Module could accommodate 1 filter block for fluorescence application. FL/BF changeover switch enables normal bright field observation and fluorescence application could be switched conveniently. The filter cube could be chosen according to different requirement.

The excitation filters deteriorate with time due to exposure to heat and intense light. Replace when necessary.

Standard Auramine O Fluorescence filter cube for BA310 Epi-LED FL is used for tuberculosis diagnosis.

Exciter 470SP

Dichroic 480DRLPXR

Emitter 485LP

Proper handling of the microscope will ensure years of trouble free service. If repair becomes necessary, please contact your Motic agency or our technical service directly.



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