# Epifluorescent Microscope
# Model 3002-F

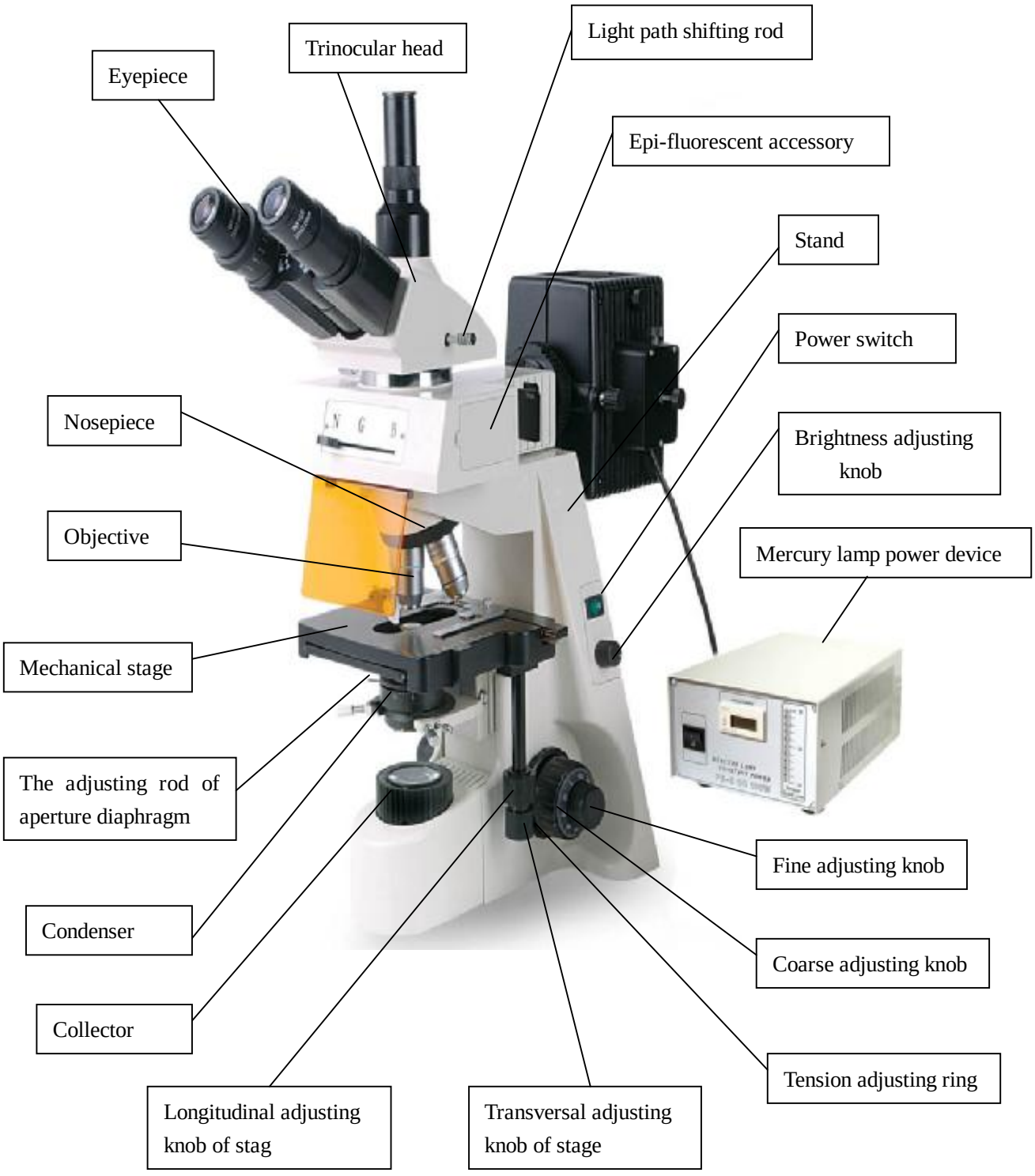
## 5901984

**Instructions Manual**

## Ⅰ APPLICATION:

Model 3002-F series Epi-fluorescent microscope is widely used in Biology, Iatrology, Immunology, Genetics, Material science, etc. It is usually outfitted with 2 wave bands B&G and you can also proceed general transmission view at the same time. U&V wave band is available for option. High quality optical system and B&G fluoroscope box bring you satisfactory fluorescent effect.

## Ⅱ CONFIGURATION:



## Ⅲ SPECIFICATION:

| Specification | | Model | | | |
|---|---|---|---|---|---|
| | | | | | 3002-F |
| Viewing head | Compensation free binocular head, inclined at 30°（55mm-75mm) | | | | |
| | Compensation free trinocular head, inclined at 30°（55mm-75mm) | | | | ● |
| | Sliding binocular head. inclined at 45° (52mm-74mm) | | | | |
| | Sliding trinocular head. inclined at 45° (52mm-74mm) | | | | |
| Eyepiece | WF10×/18mm | | | | |
| | WF10×/22mm | | | | ● |
| Objective | 195 fluorescent objective：4×、10×、40×(S)、100×(S) Oil | | | | |
| | Infinite fluorescent objective: 4×、10×、40×(S)、100×(S) Oil | | | | ● |
| | 20×,60×(S) | | | | ○ |
| Stage | Double layers mechanical stage | | | | ● |
| | Stage size：180mm × 150mm | | | | |
| | Moving range：75mm×50mm | | | | |
| Fluoroscope box | B, G Wave band | | | | ● |
| | U, V Wave band | | | | ○ |
| Condenser | N.A.1.25Abbe condenser with iris diaphragm & filter | | | | ● |
| Focusing | Coaxial coarse & fine focusing adjustment with rack and pinion mechanism . Fine focusing scale value 0.002mm | | | | ● |

| | | | | | |
|---|---|---|---|---|---|
| Epi-illumination | Super high pressure mercury lamp DC100W. (power voltage:220V or 110V) Pointer or digital display power device. | | | | ● |
| Transmission illumination | Halogen bulb 12V/30W AC 85V～230V | | | | ● |
| Optional accessory | 1.3 or3.0 Mega pixels CMOS electronic eyepiece | | | | ○ |
| | Photo and CCD attachment | | | | ○ |
| | 135 Digital camera | | | | ○ |

Note：“○”is Selective part.

## Ⅳ Main technical training data and specification:

1. The middle magnification:

* For 160 mm mechanical tube length optical system, the magnification is 1.25×

* For infinity optical system, the magnification is 1×

2. The range of the reflected fluorescence spectrum : 330nm~550nm
3. The range of the research fluorescence spectrum : 430nm~650nm
4.The exciting form of each wave brand and the optical data:

| Exciting form | Wavelength (nm) | Applicable range | Observing effect |
|---|---|---|---|
| U | Exciting 330～380<br>Dichroism 400<br>Cut-off 420 | 1.Automatic fluorescence observation<br>2.DAPI: DNA<br>3.Hoechest 33358,33342 | Green |
| V | Exciting 380～420<br>Dichroism 445<br>Cut-off 460 | 1.Catecholamine<br>2.Serotonin<br>3.Fetracyline | Green |
| B | Exciting 420～490<br>Dichroism 505<br>Cut-off 520 | 1.FITC<br>2.Acridine orange: DNA, RNA<br>3.Auramine O | Yellow-Green |
| G | Exciting 500～550<br>Dichroism 575<br>Cut-off 590 | 1.TRITC<br>2. Rhodamine B200<br>3. Propidium iodide: DNA | Red |

## Ⅴ OPERATION:

1. Instrument installation

(1) Remove microscope with both bands hold stand and bottom from box and Styrofoam packing, put it on a stable work table carefully.

(2) Remove plastic bags and dustproof cover of each adapter.

(3) Put the main body of the two wave band epi-fluorescent accessory into the adapter of stand

in place ,tighten the fixing screw with finger. (Fig.2)

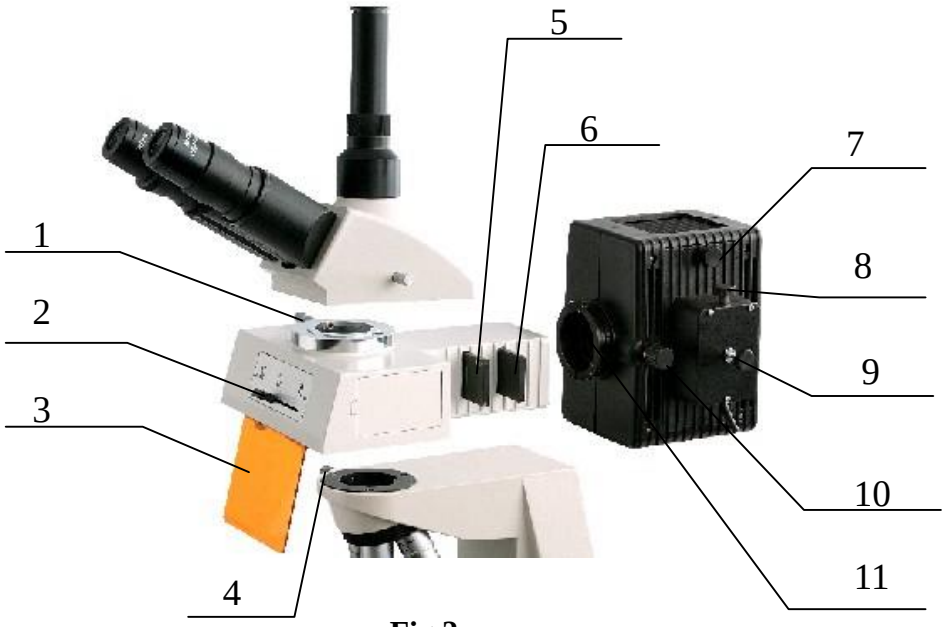



**Fig.2**

1. Knurled screw 2. Fluorescent wave band shifting handle 3. UV protector
4. Fixing screw 5. Light reducer 6. Light shield
7. Right side plate installing knob 8. Filament up &down adjusting knob
9. Filament left &right adjusting knob 10.Condenser focusing knob
11.Installing ring of lamp housing adapter

(4) Take out the orange UV protector from the plastic bag, loose the screws located under the main body, insert the UV protector, then fasten the fixing screw anew.(Fig.2)

(5) Please turn anticlockwise the ring at the rearward of the main body to anchor point, then aim the groove under the lamp housing connector to the inferior fixing pin of the connector of main body, in the meantime, hold the lamp housing by hand, fastening the both parts by rotating the ring to anchor point clockwise.

(6) Put the binocular head or the trinocular head into the adapter of the main body in place, tighten the knurled screw with finger.

(7) Familiarize yourself the mechanical parts of your microscope. Gently operate each part by hand to see how it behaves and what result it produces.

(8) Insert the plug in to the socket in back of microscope .Insert another end of the power wire to the supply socket.

Note：1) The microscope must be earthed.

2) Make sure the power voltage in accordance with the microscope's marking voltage.

2. Operating step of normal observation

(1) Shift the fluorescent wave band shifting handle into the "N" position . (Fig.2)

(2) Push the light shield into the light path at the rearward of main body.
(3) Turn on the power switch, adjust the brightness knob to make the brightness 70% of the full load.
(4) Place the specimen (slide) to be viewed smoothly onto the stage, cover slip to face to the objective. Clamp specimen (slide) carefully with the movable spring clip.
(5) The magnitude of incident beam of light can be changed when adjusting the aperture diaphragm. The highest resolution of the objectives can reach when the fitted aperture diaphragm is adjusted. When the objectives is changed, in order to get the best resolution of the objective, please take off the eyepiece to observe the size of aperture diaphragm in the eyepiece tube. It is better to adjust aperture diaphragm till it is a little smaller than the aperture of the objective.

Note：Aperture diaphragm is not for adjusting the brightness, the brightness is adjusted through brightness adjusting knob.
(6) Swing out the filter holder, according to user's needs put filter in the filter holder and then backtrack.
(7)Turn the nosepiece when changing the objective 4×or 10×, and make sure the objective is shift in the light path until hear a "click ".
(8) When adjusting the focus， in order to prevent objective touch the specimen, turn the coarse focusing knob until the specimen is approximately 1/8″ from the objective.
Slowly turn the coarse focusing knob until a clear image is obtained, then use the fine focusing knob to enhance the observation of the specimen to it's clearest image. If the magnification is increased, here you can obtain clear image under other higher magnification objectives with a little fine adjustment.
(9) When using objective 100× to observe, lift the condenser to the highest position, then drop a little cedar oil on surface of objective 100×and specimen (cover slip).If there's air bulb in oil, it will influence observation. Take out air bulb by swinging nosepiece several times. The 100× oil immersion objective and specimen should be wiped off with a piece of soft clean cloth or lens tissue to remove the cedar oil with xylene immediately after using.
(10) If you find to lift the mechanical stage too tension or loosen in use. Turn the tension adjusting ring. Coarse focusing knob would be tightening if it turns in the clockwise direction, on the other hand it would be loosen.
(11) You may lock up the focusing stopper in the other side of the microscope, when you see the image of the specimen clearly. Then the mechanical stage only to be able to rise and fall below the focusing position. When you do not the location, you can turn the flange of the focusing stopper and loose it.
(12) Turn transversal and longitudinal direction adjusting knobs located just below the stage, the specimen may be moved to the center of the eyepiece's viewing field for observation.
(13) Turn coarse & fine focusing knob to focus the specimen till you see clear image of specimen when observing the fixed eyepiece with eye. Then rotate the diopter adjusting ring, if the image is unclear when observing the another eyepiece with another eye, also still you see clear image of specimen (Remember your eye's diopter, so that you could use next time).When using two eyes to observe , hold the base of the prism and rotate them around the

axis until there is only one field of view.

(14) Removed dustproof cover in used the trinocular head, the CMOS electronic eyepiece, photo and CCD attachment put conveniently into the trinocular tube. You may be ready to begin working after shift the light path by moving the light path shifting rod into the working position.

3. Operating step of fluorescent observation

(1) Turn off the power switch of transmission illumination.

(2) Shift the fluorescent wave band shifting handle into the "B" or "G" position.

(3) Please insert plug of the power device and the lamp house into the socket respectively, then turn on the power switch. If it is the mercury lamp, please press the touch button as soon as the power switch is turned on, you can operate only after the lamp lighting last about 5 minutes and steady.

**Note: The light from lamp house can not be observed directly by eyes, it will damage the eyes.**

(4) Put the observing slide in the clip of the stage, pull out the light shield and observe with 10× Objective. Turning the focusing knob to obtain the clear image.

(5) Adjusting the adjustable knob at the right side of lamp house, adjust the center location of the lamp, make the light of field fringe even, then turn the focusing knob of the condenser which located at the right front of the lamp house, make the whole field of the illumination even and the brightness is maximum.

(6) Please select different magnification objectives and appropriate wavelength filter to observe as per requirement. If the light for specimen imaging is too strong, please insert the light reducer into the system. When using high magnification oil immersion objective, you should drop fluorescence free oil.

(7)In order to obtain the optimal effect of fluorescence, when fluorescence observing is proceeding, prevent the over lighting around the microscope, take out the original transmitted condenser or lower it to maximum, at the same time, pay attention to aeration around the lamp housing. If observation is intermitted, you can push light shield into the light path.

(8) Refer to light source of the mercury lamp, you must wait for 10 minutes to restart after the mercury lamp go out.

(9) Please don't touch the radiator directly when the lamp house works or shut-off within 15 minute.

(10) Replace the fluorescence filter box:

The general 2 wave band B.G Filter box is mounted in the fluorescence main body. The filter box need to be changed, when you purchasing the U.V wave band filter box. First, move the window cover at the right side of the main body of accessory, screw in the installing lever to pull out the filter box from guide way slightly, revolve the installing lever out, then revolve the installing lever on the required filter box, move the fluorescence wave band shifting handle, make the guide way close to the window, and press the shifting handle, then insert the required filter box into the guide way by using installing lever carefully. When the hand feeling a little shake, indicate that the filter box has installed properly, here, screw out the installing lever lightly, put on the window cover. ( Fig.3. Fig.4 ).

Note: Regarding the B.G general 2 wave band fluorescence, the serial number of the filter box should be matched with indication of the accessory ( installing seriation is opposite to indication of marked label )

**Fig.3**

**Fig.4**

4. Mercury lamp, halogen bulb and fuse replacement: (the power wire must be disconnected).

(1) Mercury lamp replacement: (Fig.5)

The using of the Mercury lamp must comply with the instruction manual strictly. Before replacing the lamp, cutting off the power supply and pull out the plug first, the lamp can only be changed after its house becomes cool completely. Loose the installing knob at the upside of right side plate firstly, holding the right side plate by hand and take off the plate by lightly forced outward and upward. Loose the lamp socket fixing screw on the house, pull the downward spring connector at down, remove the used lamp, replace the new lamp ,pay attention that the anode of lamp is downward(the thicker metal head side) when setting the lamp. Finally, please tighten the fixing screws on the lamp socket.

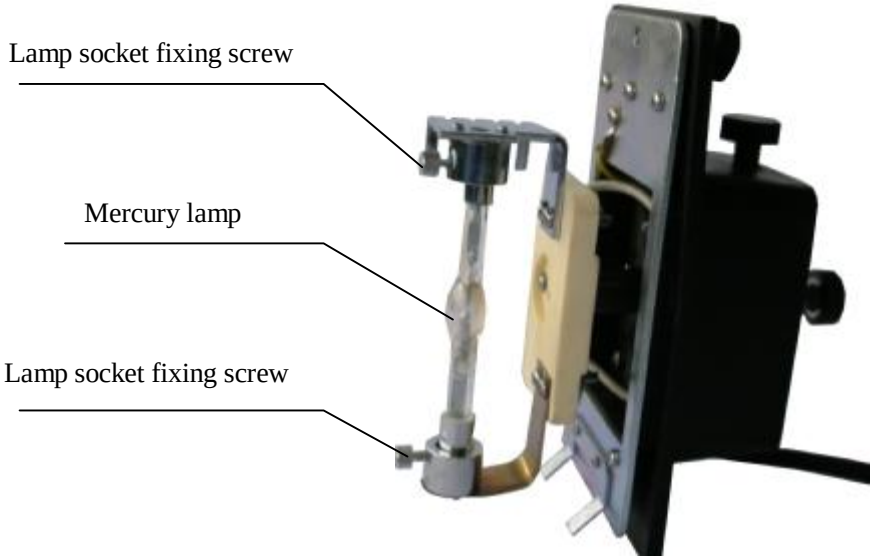



**Fig.5**

Note:

1) The spare lamp is supplied when the accessory leave the factory.

2) Replacing the lamp: the life of the lamp is limited, the lamp should be replaced in time when the accumulative working time closed to the designed life of lamp, or else the brightness of lamp will be reduced or lamp cracking.

3) When installing the lamp, don't touch the glass cover of the lamp directly by hand, you should wear the gloves or mantle the lamp with protective cover. If you touch the glass of the lamp imprudently, please clean the finger mark and the smear by clean cloth with absolute alcohol, as the finger mark and the smear will reduce the brightness and cause the lamp broken.

**In avoid damaging the body skin and eyes, all lamp housings is strictly prohibited to lighten before they are installed on the main body separately.**

(2) Halogen bulb of the bottom (transmitted light) replacement :

Slide the frontal undrawing type light collector framework out , to expose the bulb, then backtrack the light collector framework to the previous position after the replacement bulb.(Fig.6)

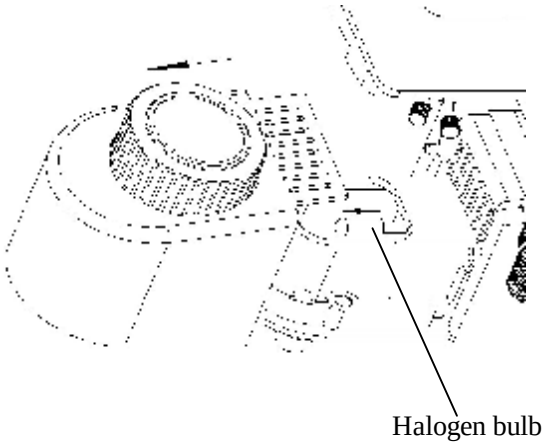



**Fig.6**

Note：

a). The bulb will become very hot when using or after using. Remove the old bulb after it becomes cool.

b). Only can use the same specification halogen bulb.

c). Don' t touch the new bulb with finger, if there is a fingerprint and dirt, that will decrease the brightness and shorten the life of the bulb, wipe it with clean and soft cloth. Hold the new bulb with clean gloves or gauze and vertically insert the pins to the jack.

(3) Fuse replacement: Open the fuse holder with a "－" screwdriver in the back of the microscope . Remove the old fuse and install a new fuse with the same specification. Replace fuse holder in place.

## Ⅵ MAINTENANCE:

1. The microscope must be placed in where is shady, dry, clean and there is no acid, alkaline & steam. Don't let it expose under sun light directly。

2. Working environment: Indoor temperature :0℃～40℃.
Maximum relative humidity: 85%.

3. The microscope has be calibrated and inspected strictly before leaving factory, the users must not knock down the instrument discretionally.

4. If there's dust on the lens, blow it by rubber ball blower, after that clean the lens gently with a soft brush pen, carefully wipe off oil or fingerprints on the lens surface with lens tissue or absorbent cotton moistened with a few organic solvent (mixture of ether and alcohol 7:3).

5. Don't wipe the lens surface regularly, or else the lens will be scraped, reduce the quality of the transmission and imaging. Please keep the instrument clean.

6. Keep the mechanical parts clean and wipe regularly.

7. Shut off the power and pull out the plug when the microscope is not used, adjust the brightness knob to the minimum, cover the microscope with a dust cover.