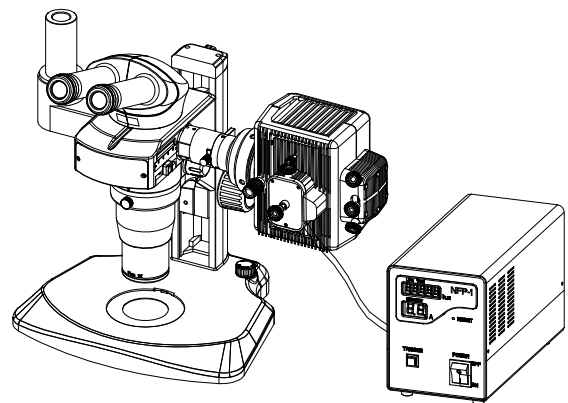




# **BS-3060F Series Stereo Fluorescent Microscopes**

## **Instruction Manual**



This manual is written for BS-3060F Fluorescent Stereo Microscopes. To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this attachment, it is strongly recommended that you read this manual carefully before using it.

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# IMPORTANT






BS-3060F series stereo fluorescence microscopes are high level stereoscopic fluorescent microscopes.

## Safety Note

1. The fluorescent Microscope is a precise instrument. Please open the packing carefully, and avoid dropping the accessories to ground and causing damage to them.
2. Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and vibrations.
3. Make sure that the burner is installed correctly and all cords are connected firmly.
4. Do not open the lamp housing while it is turned on or for at least 10 minutes after it has been turned off. Lamp housing parts are extremely hot and would cause burns if touched.
5. Always be sure to ground (earth) the equipment.
6. Verify that the voltage and the frequency of the AC mains outlet match the setting of the voltage switch and the frequency switch on the rear of the power supply unit.
7. Always use the power cord provided and make sure that the main switch is moved to “O”(OFF) before connecting the power cord plug to the wall outlet.
8. To prevent any hazard, always turn the main switch on the power supply unit to “O” (OFF), unplug the power cord plug from the mains outlet before replacing the burner or the fuse, and wait for at least 10 minutes before replacing the burner. (Be sure to use a GCQ-100 mercury burner.)
9. To prevent obstruction of the air flow, it is important to leave enough space around and above the lamp housing.


<b>Safety Symbols</b>
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The following symbols are found on the system. Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Explanation
	Indicates that the surface becomes hot, and should not be touched with bare hands.
	Indicates that high voltage (upper 1KV) inside, improper handling could result in an electric shock to the user.
	Before use, carefully read the user manual. Improper handling could result in personal injury to the user and/or damage to the equipment.
	Indicates that the main switch is ON.
	Indicates that the main switch is OFF.

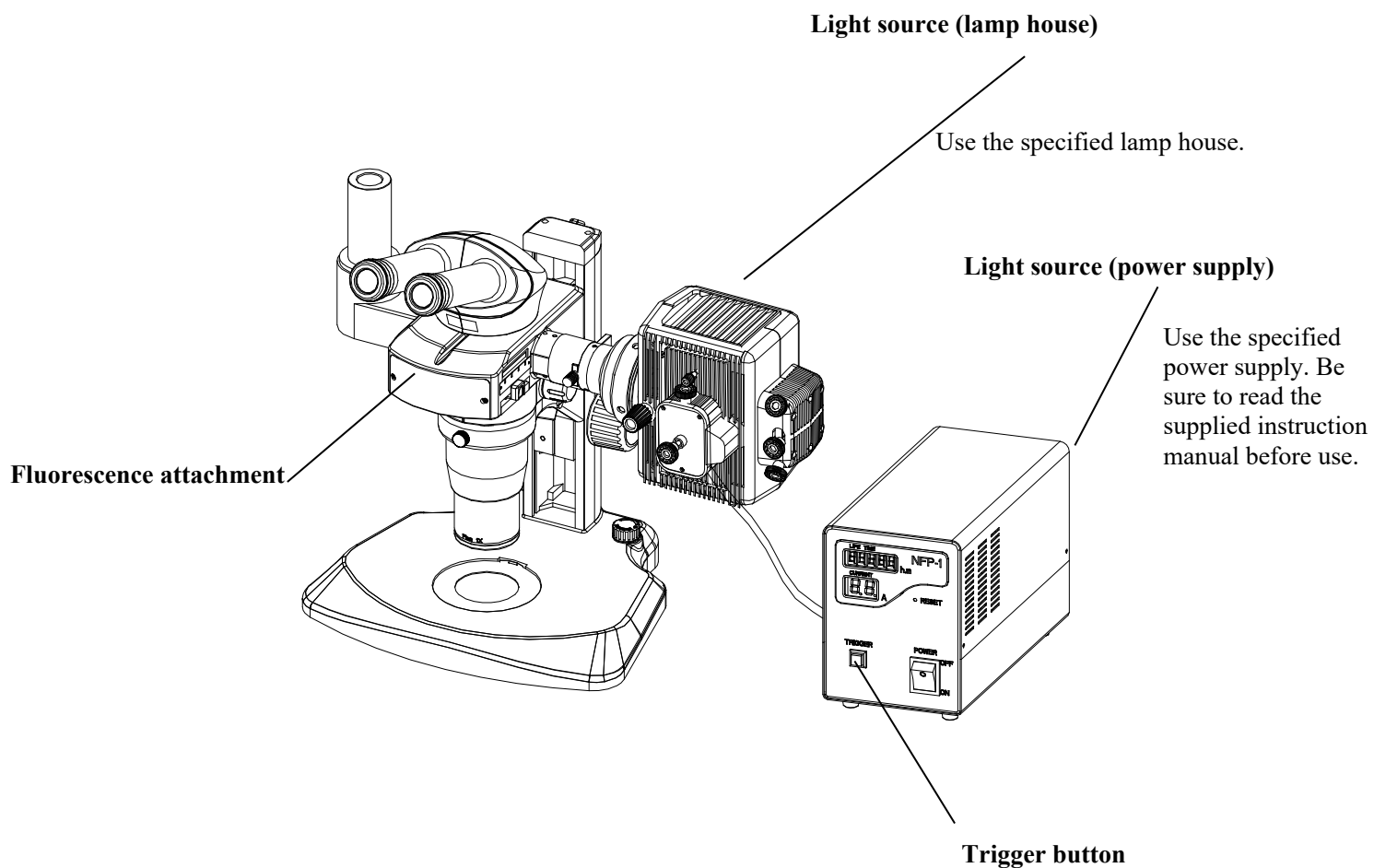
- This manual is written just for BS-3060F fluorescence microscope and before equipping it , be sure to learn how to use the stereoscopic microscopes.

## **Maintenance and Storage**

1. Clean all glass components by wiping gently with gauze. To remove fingerprints or oil smudges, wipe with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).  
 Since solvents such as ether and alcohol are highly flammable, they must be handled carefully. Be sure to keep these chemicals away from open flames or potential sources of electrical sparks—for example, electrical equipment that is being switched on or off. Also remember to always use these chemicals only in a well-ventilated room.
2. Do not attempt to use organic solvents to clean the non-optical component of the equipment. To clean these, use a lint-free, soft cloth lightly moistened with a diluted neutral detergent.
3. Do not disassemble any part of the power supply unit as malfunction or damage may occur.
4. In order not to impair the safety of the equipment, replace the burner when the counter of NFP-1 indicates “100.00” hours. To prevent any hazard, always turn the main switch on the power supply unit to “O” (OFF), unplug the power cord plug from the mains outlet, and wait for at least 10 minutes before replacing the burner. High-pressure gas is sealed within the mercury burner. Thus, if it is continued to be used after its service life expectancy, the glass tube may deform and may sometimes rupture.

# 1. Names of Component Parts

The picture below shows an overall view of the BS-3060F fluorescence microscopes.



**Eyepiece tube mount**

**Eyepiece tube clamp screw**

**Filter cube mounts**

Always set four filter cubes.

**Excitation plates**

Indicate the excitation methods of the filter cubes set inside the attachment.

**Filter cubes switchover**

Move the lever to put the desired filter cube in the optical path.

**Shutter slider**

Push in the slider to put the shutter in the optical path to block the light from the light source. To prevent the sample from fading, place the shutter in the optical path whenever you remove your eyes off the eyepieces. Make this a habit to protect important samples.

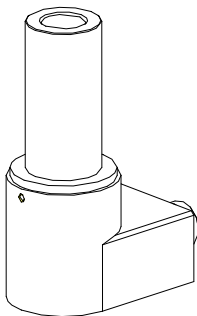
**connector mount**

Attach the specified lamp house.

**Fluorescence attachment port clamp screw**

**Fluorescence attachment port mount**

To take photos or to monitor fluorescence images, attach the fluorescent attachment port here. And then, attach a photomicrographic device or video camera.



**Fluorescence attachment port**

**Optical path switchover lever**

Set to BINO for observation through eyepieces. Set to PHOTO to take photos or to monitor the fluorescence image through the fluorescence attachment port. (When the optical path is set to PHOTO, the image cannot be observed through the left eyepiece.)

## 2. Assembly

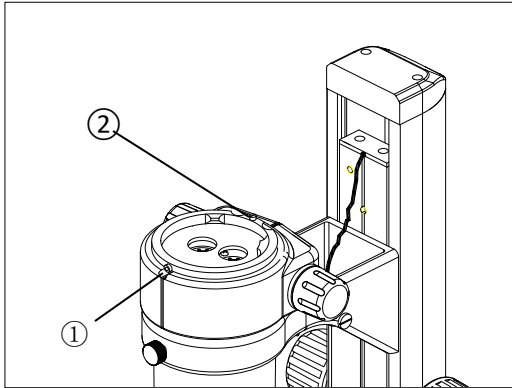


Fig.1

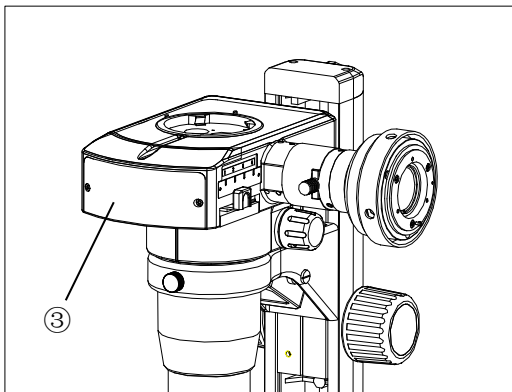


Fig.2

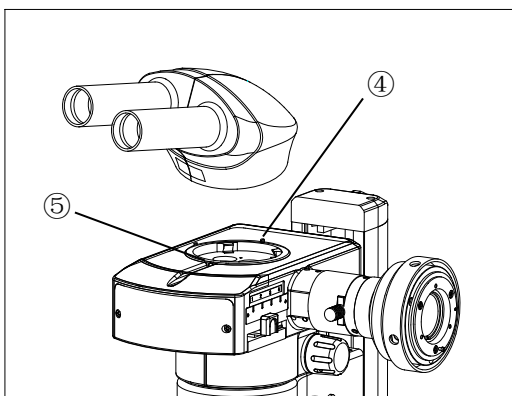


Fig.3

### 2.1 Preparation

Open the box carefully, remove all packing material and take the attachment out.

Before mounting the fluorescence attachment to the stereoscopic microscope, read the chapter “safety note” at the top of this manual.

Read the instruction manual supplied with the NFP-1 super high pressure mercury lamp power supply for how to mount and use the light source. The wrong use of the mercury lamp may lead to lamp burst, leak of inner sealed gas or loss of eyesight due to ultraviolet rays.

### 2.2 Assemble the stereoscopic microscope except the binocular eyepiece tube.

(See the instruction manual supplied with the stereoscopic microscope for details.)

### 2.3 Mount the fluorescence attachment on the zooming body of the microscope. (Fig.1, 2)

Match the groove on the bottom of the fluorescence attachment ③ with the positioning pin ② on the zooming body when mounting the attachment on the zoom body. Tighten the clamp screw ① with the hexagonal screwdriver to fix.

### 2.4 Mount the binocular eyepiece tube. (Fig.3)

Match the groove on the bottom of the eyepiece tube with the positioning pin ④ on the attachment when mounting the eyepiece tube on the attachment. Tighten the clamp screw ⑤ with the hexagonal screwdriver to fix.

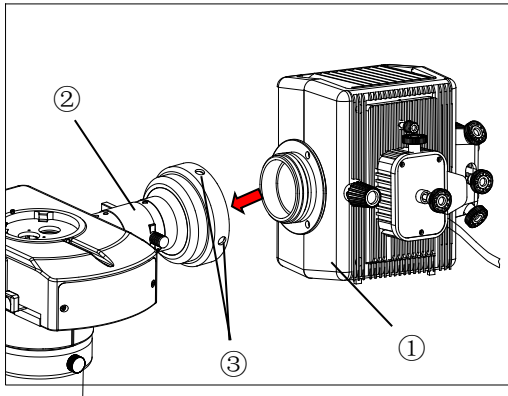


Fig.4

**2.5 Attach the eyepieces.**

See the instruction manual supplied with the stereoscopic microscope for details.

**2.6 Attach the light source. (Fig.4)**

Mount the lamp housing① into the other end of the attachment② and fix it with two screws③.

**2.7 Attach the filter cubes. (Fig.5-8)**

1 Push in the filter cube switchover lever④.

2 Remove the front cover of the fluorescence attachment by loosening the clamp screw⑤ with the Allen screwdriver.

3 Remove the filter cube fixing plate⑥ by loosening the clamp screw with the Allen screwdriver.

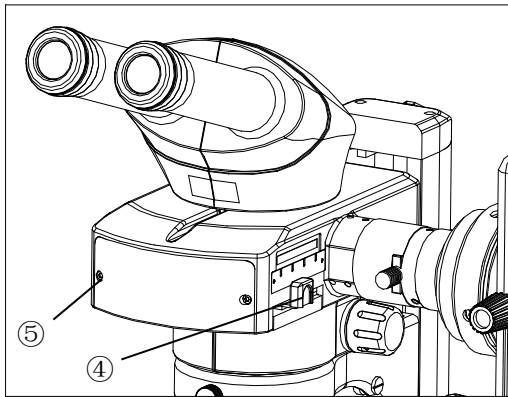


Fig.5

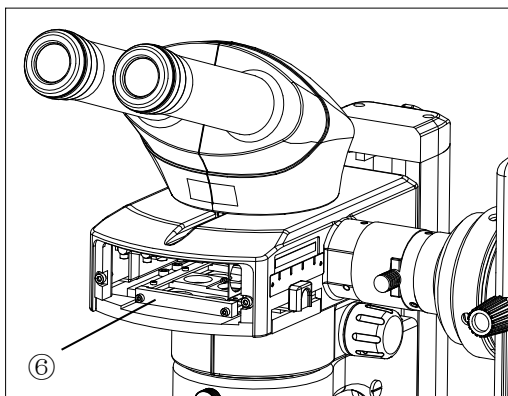


Fig.6



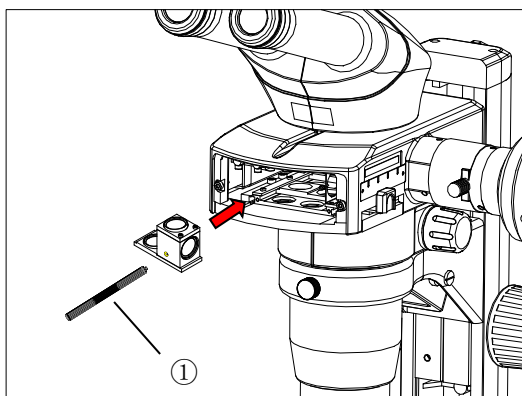


Fig.7

4 Screw on the supplied attachment tool ① to the filter cube. Hold the tool and insert the cube into the groove on the fluorescence attachment. Screw off the attachment tool.

5 Attach the excitation plate of the filter cube just mounted into the rearmost pocket. Filter cube switchover lever Filter cube fixing plate Attachment tool Insert the excitation plate to this pocket.

6 Install the remaining three filter cubes to the fluorescence attachment in the same way and return the filter cube fixing plate to its original place. Insert the excitation plates in the order of installation starting from the rear to the front.

7 Return the front cover to its original place.

★Be sure to install four filter cubes. If filter cubes needed for observation is less than four, use the dia-filter cube ② supplied with the attachment so that the total of four filter cubes are installed.

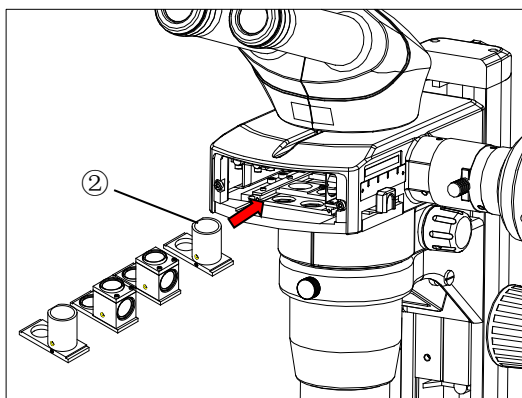


Fig.8

### 2.8 Mount the Video Port. (Fig.9)

1 Remove the cap on the fluorescence attachment port mount by loosening the clamp screw ③ with the hexagonal wrench.

2 Mount the fluorescence attachment port and tighten the clamp screw.

3 Remove the cap ④ on the fluorescence attachment port and mount the photomicrographic equipment.

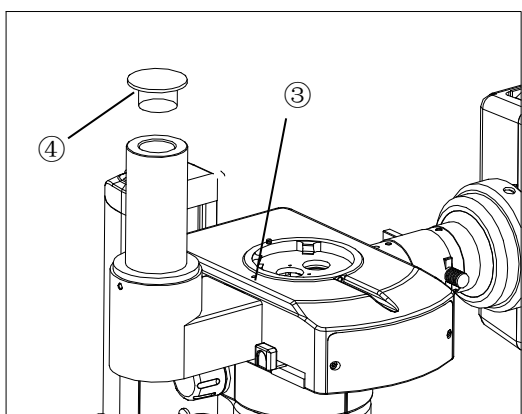


Fig.9

## 3. Usage

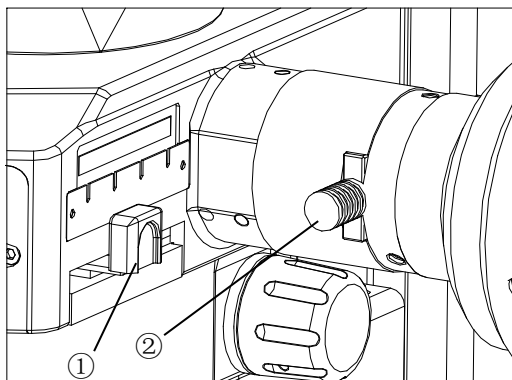


Fig.10

### 3.1 Turning On and Off the Lamp

Turn on and off the lamp by turning on and off the power supply of the light source.

Read the instruction manual for the light source of the super high pressure mercury lamp power supply carefully before operating and use it correctly according to the notices in the manual.

### 3.2 Centering the lamp

Center the lamp before using the fluorescence attachment for the first time, or after you have exchanged the lamp. If the lamp is not centered correctly, the image can be dark, or there might be an uneven illumination.

Please perform the lamp centering referring to the procedure listed below.

#### 1 Turn on the lamp.

Refer to the instruction manual of the super high pressure mercury lamp power supply for details.

#### 2 Put the filter cube for the fluorescence microscopy in the optical path. (Fig.10)

Use the filter cube switchover lever ① to put the desired filter cube for the fluorescence microscopy into the optical path. (Note that the lamp centering cannot be performed with the dia-filter cube.)

#### 3 Raise the microscope to its uppermost position.

Turn the coarse focus knob to raise the zooming body to the uppermost position of the focusing mount.

#### 4 Zoom out the microscope.

Turn the zoom knob so that the zoom magnification becomes lowest.

#### 5 Open the shutter.

Pull out the shutter slider ② to remove the shutter from the optical path.

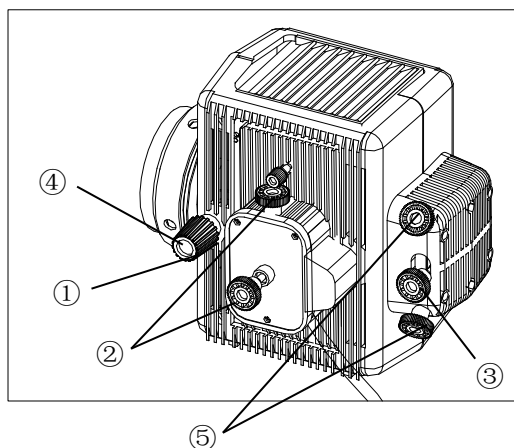


Fig.11

**6 Center the arc image and the mirror image of the arc. (Fig.11, 12)**

Place a piece of white paper on the stage, turn the collector lens focusing screw ① to project the arc image on the centering plate and sharpen it.(A)

Revolve the burner adjusting knob ② to move the arc image and the mirror reflected arc image in the symmetrical position. (B)

Adjust the mirror focusing knob ③ to sharpen the mirror reflected arc image. (C)

Turn the burner adjusting knob ② to overlap the arc image with the mirror reflected arc image.(D)

☉ Maintain this condition until the next time the burner is replaced.

**7 Widen the illuminated area.**

Turn the collector lens focusing knob ① to make the field of view as bright as regular as possible. Tighten the screw ④ at the root of the collector lens focusing knob to fix the position of the collector lens.

**8 Put the shutter in the optical path.**

Push in the shutter slider to put the shutter in the optical path. To prevent the sample from fading, put the shutter in the optical path whenever you remove your eyes off the eyepieces. (Make this a habit to protect important samples.)

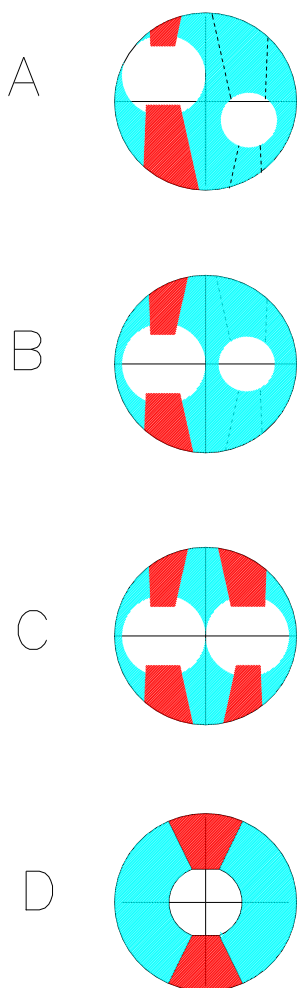


Fig.12

**Centering the mirror reflected image (Fig.11)**

★ The mirror reflected image has been centered before leaving the factory. Do not adjust the knob ⑤ please if not necessary. Only when the burner has been centered precisely, can the knob ⑤ be adjusted.

**Note: once the knob is adjusted, the reflected mirror cannot be reconverted to the status when leaving the factory.**

Knob control:

1. The middle knob ③ is the mirror reflected image focusing knob which can sharpen the reflected image.
2. The knobs at both sides ⑤ can adjust the up/down or left/right position of the mirror reflected image.

**3.3 Fluorescence microscopy**

☉ **Before the observation**

- Check the total elapsed time of the lamp turned on. If the total elapsed time exceeds the expected average life time of the lamp, exchange the lamp. (And do not forget to center it before usage.)

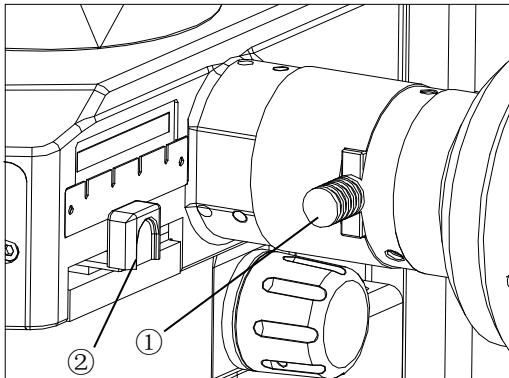


Fig.13

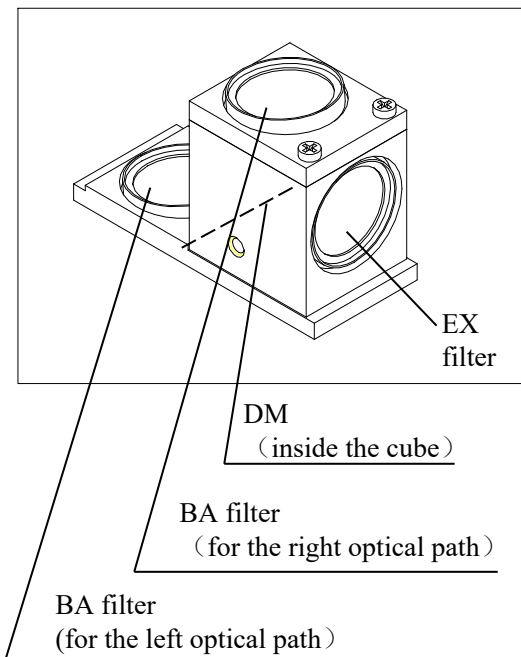


Fig.14

- Use a non-fluorescent slide glass.
- Place the shutter in the optical path whenever you remove your eyes off the eyepieces to protect your sample from fading.

**1 Put the shutter in the optical path and light the mercury lamp.**

**2 Put the filter cube for the fluorescence observation in the optical path.**

Move the filter cube switchover lever to put an excitation filter cube in the optical path.

**3 Remove the shutter and perform diopter and interpupillary adjustment.**

See the instruction manual of the stereoscopic microscope for details.

**4 Focus on the sample.**

See the instruction manual of the stereoscopic microscope for details.

**5 Observe with the most adequate zoom magnification.**

See the instruction manual of the stereoscopic microscope for details on zoom magnification.

Put the shutter in the optical path whenever you remove your eyes off the eyepieces (and make it a habit).

### 3.4 Other microscopies. (Fig.13)

When performing microscopies other than the fluorescence microscopy using the diascope stands or halogen illuminators, place the shutter ① in the optical path and move the filter cubes switchover ② to put the dia-filter cube in the optical path.

### 3.5 Filter cubes(Fig.14)

A filter block consists of three types of optical components: an excitation filter(EX filter), two barrier filters (BA filters), and a dichroic mirror (DM).

### 3.6 Fluorescence photomicrography

To take photos or to monitor fluorescence images, attach the fluorescent attachment port onto the port mount. And then, attach a photomicrographic device. When taking a photo or monitoring an image, move the optical path switchover lever to the “PHOTO” position. The image passes the optical path for the port. (Note that when the lever is set to the “PHOTO” position, the image cannot be observed through the left eyepiece.)

## 4. Troubleshooting Guide

Under certain conditions, performance of the attachment may be adversely affected by factors other than defects. If problems occur, please review the following list and take remedial action as needed.

<b>PROBLEMS</b>	<b>CAUSE</b>	<b>SOLUTION</b>
<b>I. Optical Part</b>		
a) Although the mercury burner illumination is on, the field of view is invisible or dark.	The light shutter closes the light path	pull-out the shutter slider
	The fluorescent mirror block is improperly engaged in the light path	Engage it properly
b) Visibility is poor. Image is not sharp. Contrast is poor.	The objective or filter is dirty	Clean them thoroughly
	The fluorescent mirror block is not proper for the specimen	Use proper mirror block
c) The edge of the field of view is obscured or not evenly illuminated	The objective is improperly engaged in the light path	Make sure the nosepiece clicks properly into place
	The fluorescent mirror block is improperly engaged in the light path	Engage it properly in the light path
	The field of view doesn't open fully	Open it fully
	The mercury burner is not centered.	Center it
d) Shadow exists in the field of view	The collector focus position is not correct	Adjust it to an optimum position
	The burner or collector is dusty or stained	Clean them thoroughly
<b>II. Electrical System</b>		
a) The main switch cannot supply power to the system	The power cord is connected improperly	Connect it properly
	A fuse is blown	Replace the fuses
b) The main switch can be set to ON but the burner doesn't ignite	The lamp housing connecting cord is connected improperly	Connect it properly to the connectors
	The mercury burner is not mounted	Attach a mercury burner
	The exciting voltage is too low to ignite the burner	Keep pressing the trigger button less than twenty seconds. (Repeated this after twenty seconds if the burner still doesn't ignite).
c) The mercury burner flickers or the brightness is low	The phenomenon is observed in a short period after ignition	Wait for 10 minutes or more after ignition
	The burner life has expired	Replace the mercury burner