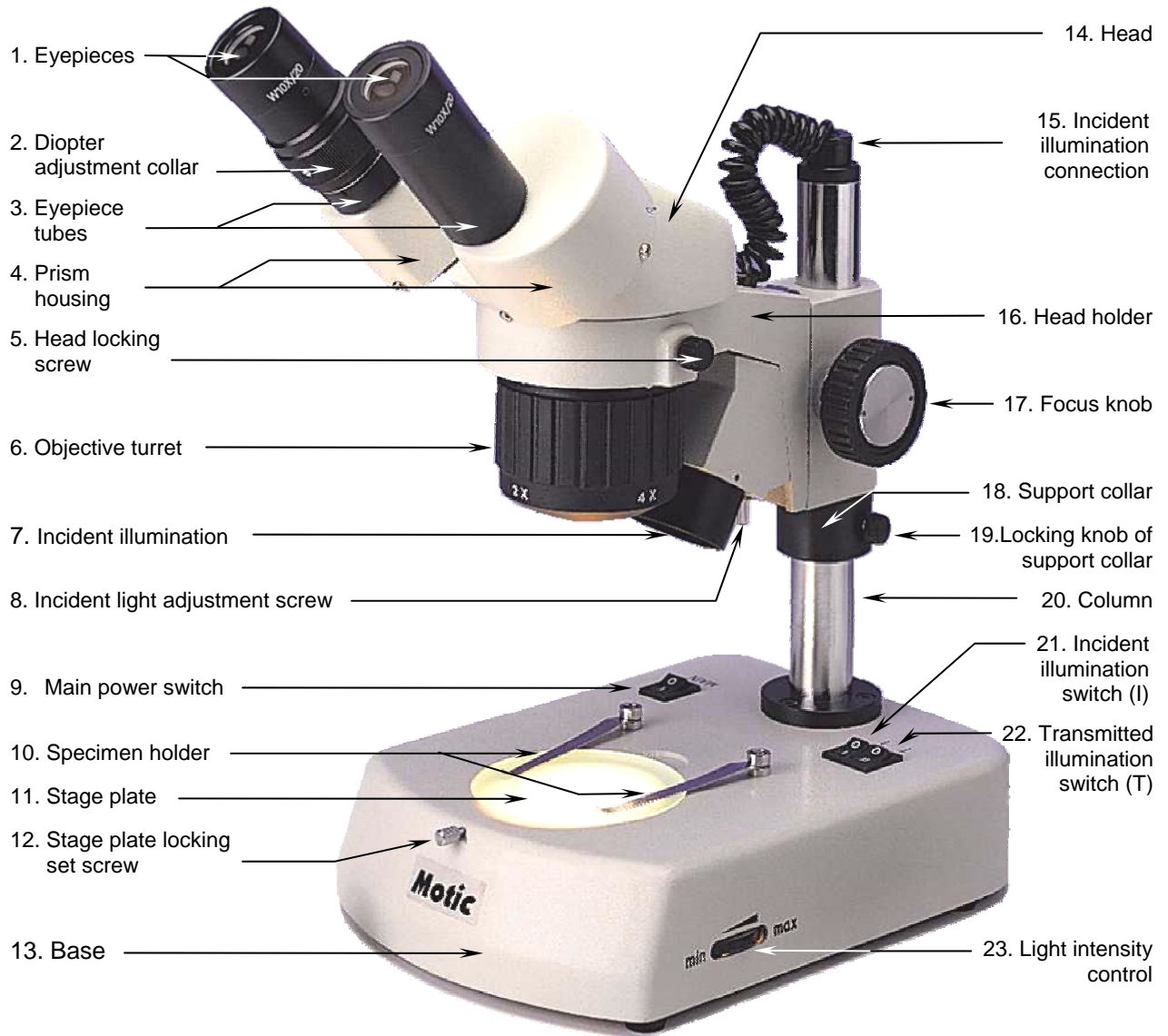


**Motic<sup>®</sup> Microscopes**

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*Instruction Manual*

*SFC-11 Series*



**SFC-11C-N2GG**

## **Introduction**

Thank you for your purchase of a Motic stereomicroscope. Motic stereomicroscopes are precision instruments, subjected to meticulous examination to reach you in perfect condition. Their design combines easy management and optimum functioning with minimum maintenance.

The information contained in this manual is likely to go beyond what the average user needs to know to use the stereomicroscope, however, it is provided to answer any queries that may arise.

Stereomicroscopes are used to study three dimensional objects, examine small parts, or dissect biological specimens. They also permit the observation of slide specimens.

These instructions should be read carefully before operating the microscope. They will permit you to use your new stereomicroscope to its fullest capabilities. Terminology used to describe components and controls can be found in the diagram on page 2.

These instructions are based on the assembly and use of SFC-11C-N2GG model, with additional notes applying specifically for the other models in the series. For those models with A objectives, objectives referred to are 1X and 2X (rather than 2X and 4X); whilst for models with B objectives, objectives referred to are 1X and 3X.

## **Unpacking**

All components of the stereomicroscope have been carefully packed to ensure they reach you in perfect condition. We recommend that you do not discard any packing containers in case you need to return the microscope or store it for long periods of time; or should it become necessary to transport it to a technical service for any repair, or maintenance procedure.

The box should contain the following components, depending on the model:

- SFC-11C-N2GG (Binocular): Base with illumination; a moveable head holder, also with illumination; an opaque black and white stage; a binocular head with eyepieces; eyepiece protectors; a frosted glass stage; a blue filter; a protective base and a hexagonal key measuring 1.5mm.
- SFC-11C-2LBB (Binocular): Base with illumination; a fixed head holder, also with illumination; an opaque black and white stage; a binocular head with eyepieces; eyepiece protectors; a frosted glass stage; a blue filter; a protective base and a hexagonal key measuring 1.5mm.

**Avoid touching optical elements and keep out of contact with dust, water or other contaminating agents, as they could stain, or damage the lens surface and affect the quality of the image.**

**Remove and handle all components of the stereomicroscope with extreme care.**

## Assembly

All the steps described for the assembly of the stereomicroscope must be undertaken with extreme care, and without forcing the placement of the distinct parts and elements of the microscope.

- A. Place the base (13) in an upright position on a flat, stable and clean surface.
- B. Ensure that the head holder support screw (Fig.1) is tight. (Not necessary for models with N3GG o 2LBB stands).
- C. Loosen the head locking screw (5), and place the head (14) in the head holder (16) with extreme care.
- D. Re-tighten the head locking screw.
- E. Connect the incident illumination in the connector (15) on the upper part of the column (20).

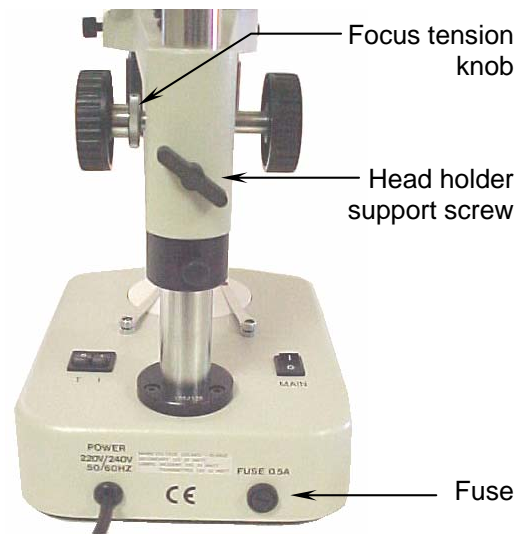


Fig. 1

## Operation

- A. Starting Up.

The stereomicroscope comes with two stages. One is frosted glass for the observation of microscopic specimens slides, or thin, or transparent samples such as leaves, insect wings, and so forth. The black/white stage is used to study opaque objects, or for dissection. The best contrast of a sample would depend on the side of the stage chosen.

**Warning:** ONLY use transmitted light with the frosted glass stage. HEAT GENERATED BY THE TRANSMITTED LIGHT MAY MELT OR DAMAGE THE BLACK/WHITE STAGE. SUCH DAMAGE IS NOT COVERED BY THE WARRANTY.

1. Changing the Stage.
  - a. Loosen the locking set screw (12) situated on the front, and remove the stage plate (11).
  - b. If using the frosted glass plate, insert the blue filter into the centre of the base, with the frosted surface facing down.
  - c. Place the glass plate on top, again, with the frosted surface facing down.
  - d. Re-tighten the locking set screw.
2. Before using the stereomicroscope, adjust the light intensity control (23) to minimum position. This should be repeated every time the stereomicroscope is switched on or off to prolong the use of the bulb. (Intensity control not available for models with the 2LBB base).

Three light switches are situated on the stereomicroscope base.

- MAIN : Turns the entire unit on or off.  
I : Turns incident light on or off. (Top illumination)  
T : Turns transmitted light on or off. (Bottom illumination)

3. Press the main switch (9) to position "I".
4. Press the incident (21) or transmitted illumination switch (22), or both at once, to position "I" or "II", according to necessities in examining the sample.

**NB:** For models with 2LBB base, omit steps 5 and 6, passing directly to 7.

5. Light intensity should be adjusted according to the objectives utilised, or the type of sample observed.
6. The angle of the incident illumination can be adjusted using the screw (8) that permits variation on the orientation of the illuminator lenses.
7. If the stereomicroscope does not work, please check the "Troubleshooting" section of this manual.

#### B. Interpupillary Adjustment.

1. Whilst looking through both eyepieces (1), move eyepiece tubes (3) on their axis, holding head by the eyepiece tubes housing the prisms. (4).
2. When a full field of view is obtained, and converted into a single image, interpupillary distance is correct for your eyes.
3. Each user should adjust interpupillary distance to match their eyesight.

#### C. Focusing.

1. Turn objective turret (6) so that the lowest magnification number 2X is facing the front of the microscope, lined up with the eyepiece, and the 4X magnification is located at the two sides, perpendicular to the eyepiece. The turret permits a  $\frac{1}{4}$  turn. Ensure that turret is "clicked" into its correct position.

**NB:** For models with N3GG or 2LBB bases, omit steps 2, 3 and 4, passing directly to 5.

2. Place a flat object, or a specimen slide on the centre of the stage (11).
3. Turn focus knobs (17) to mid-focus range.
4. The head holder (16) is mounted on a column (20), so that it can move up or down to accommodate the size of the object focussed.
  - a. Support the head (14) with one hand without touching any lens, and with the other, loosen the locking knob (19) on the locking support collar (18), so that the head can freely slide towards the base (13).
  - b. Without letting go of the head, loosen the head locking screw (Fig.1).
  - c. Whilst looking through the eyepieces of the microscope, move viewing head up and down on the column, until the object comes into focus
  - d. Firmly re-tighten the head locking screw, but do not let go of the head.
  - e. Position the support collar under the focussing block and tighten locking knob on support collar. The head can now be released.
  - f. It is not necessary to repeat these steps every time the object is changed, so long as the objects are of similar thickness or height.

5. Adjust again focus knob until the image is completely detailed.

D. Adjusting the diopter.

1. On the left hand eyepiece tube there is a diopter adjustment collar. Its normal position is when the lower part of the collar is aligned with the sign marked on the eyepiece tube.
2. In the case of differences in eyesight:
3. With the right eye, look through the right eyepiece (1) and adjust focus.
4. Now use the left eye to look through the left eyepiece, and adjust the focus by turning the diopter adjuster (2), on the left hand eyepiece tube, until a detailed image is achieved. Do not adjust the focus with the focus knobs (17).

E. Changing magnification.

Turn objective turret (6) so that the highest magnification number 4X is facing the front of the microscope, lined up with the eyepiece (1), and the 2X magnification at the two sides, perpendicular with the eyepiece. The turret permits a ¼ turn. Ensure that turret is correctly “clicked” into correct position.

1. Although this stereomicroscope comes parfocalled, the focus has to be adjusted owing to the greater field profundity offered by those objectives of lower magnification. Field profundity is the capacity to focus on distinct points, on distinct levels.
2. Once the image with objectives of higher magnification is brought into focus, it is not necessary to re-focus for those of a lower magnification level.

**Specification chart:**

Objectives		Eyepieces									
		WF5x (optional)		WF10x		WF15x (optional)		WF20x (optional)		Working distance	
		Total magnification	Field size	Total magnification	Field size	Total magnification	Field size	Total magnification	Field size	Binocular	Trinocular
A	1x	5x	22 mm	10x	20 mm	15x	13 mm	20x	9,5 mm	95 mm	95 mm
	2x	10x	11 mm	20x	10 mm	30x	6,5 mm	40x	4,8 mm		
B	1x	5x	22 mm	10x	20 mm	15x	13 mm	20x	9,5 mm	94 mm	80 mm
	3x	15x	7,3 mm	30x	6,7 mm	45x	4,3 mm	60x	4,3 mm		
C	2x	10x	11 mm	20x	10 mm	30x	6,5 mm	40x	4,8 mm	94 mm	80 mm
	4x	20x	5,5 mm	40x	5 mm	60x	3,3 mm	80x	3,3 mm		

## **Maintenance**

**WARNING:** FOR YOUR OWN SAFETY SWITCH OFF AND DISCONNECT THE MICROSCOPE FROM ANY ELECTRICAL SOURCE BEFORE ATTEMPTING ANY MAINTENANCE PROCEDURE TO AVOID THE RISK OF ELECTROCUTION.

CONSULT YOUR DISTRIBUTOR IF ANY REPAIR OR MAINTENANCE PROCEDURE IS REQUIRED TO YOUR MICROSCOPE THAT DOES NOT APPEAR IN THIS INSTRUCTION MANUAL.

### A. Optical maintenance.

Do not attempt to disassemble any optical component. For any repair work not specified in this manual, consult the technical service responsible in your area.

Before cleaning the lens surface, remove dust with a brush specifically for lenses, or with low pressure compressed air, found in any photography shop.

#### 1. Cleaning the eyepiece

- a. Do not remove the eyepiece (1) from the eyepiece tube (3).
- b. Only clean the outer surface, misting the lens with breath.
- c. Next, dry the lens with special lens paper in circular motions, from the centre of the lens, outwards. Do not clean the lens when dry, as they scratch easily.

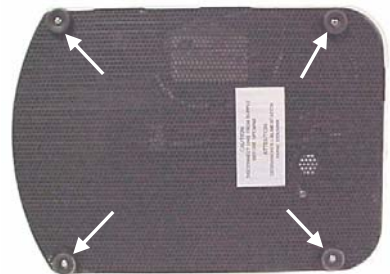
#### 2. Cleaning the objectives.

- a. Do not remove the objectives from the stereomicroscope.
- b. Only clean the outer surface, dampening a soft cotton cloth slightly with Xylene, and afterwards, drying the lens with the same cloth.

### B. Electrical maintenance.

#### 1. Changing the bulb (For N2GG and N3GG)

- Changing the transmitted illumination bulb.
  - a. Turn the stereomicroscope on its side with extreme care, especially with the eyepieces (1) and the stage (11).
  - b. Unscrew the four screws indicated. (Fig. 3)
  - c. Open the cover on the base.
  - d. Using a cloth, carefully pull out the bulb to disconnect it from the socket.
  - e. Do not touch the new bulb with bare hands, use a clean cloth. Insert the pins of the bulb in the socket.
  - f. If the bulb is accidentally touched with bare hands, it must be cleaned, as this could affect the transmission of light, and life span of the bulb.
  - g. Close the cover on the base and screw down firmly.



**Fig. 3**

- Changing incident illumination bulb.
    - a. Unscrew the illuminator protector tube (7), turning it anti-clockwise, and removing the tube from that of the lenses.
    - b. With a cloth carefully pull out the bulb to disconnect it from the socket.
    - c. Do not touch the new bulb with bare hands, use a clean cloth. Insert the pins of the bulb in the socket.
    - d. If the bulb is accidentally touched with bare hands, it must be cleaned, as this could affect the transmission of light, and life span of the bulb.
    - e. Replace illuminator lens tube, turning in clockwise, and screwing in the protector tube.
2. Changing the bulb (For 2LBB)
- Changing the transmitted illumination bulb.
    - a. Turn the stereomicroscope on its side with extreme care, especially with the eyepieces (1) and the stage (11).
    - b. Unscrew the four screws indicated. (Fig. 3)
    - c. Open the cover on the base
    - d. With a cloth, carefully take the bulb and apply pressure towards the socket, turning  $\frac{1}{4}$  anti-clockwise. Release pressure and the bulb will be disconnected from the socket.
    - e. Insert the new bulb applying pressure towards the socket, and turning  $\frac{1}{4}$  clockwise.
    - f. Clean the bulb of any smudges that could affect light transmission and life span.
    - g. Close the cover on the base and screw down firmly.
  - Changing the incident illumination bulb.
    - a. Unscrew illuminator lens tube, turning it anti-clockwise.
    - b. With a cloth carefully take the bulb, and apply pressure towards the socket, turning it  $\frac{1}{4}$  anti-clockwise. Release pressure and the bulb will be disconnected from the socket.
    - c. Insert the new bulb, applying downward pressure and turning it  $\frac{1}{4}$  clockwise.
    - d. Clean the bulb of any smudges that could affect light transmission and life span.
    - e. Replace illuminator lens tube, turning it clockwise.
3. Changing the fuse.
- a. With a flat screwdriver, lightly press on the slot of the fuse holder cover (Fig. 1) and turn  $\frac{1}{4}$  in the direction of the arrow marked.
  - b. Release pressure and completely remove the loosened cover.
  - c. Remove the fuse from the removed cover, and insert the new one, make sure that it is 0.5 Amps.



- d. Insert the cover.
- e. Repeat step (a.) but turning 1/4 in the opposite direction to the arrow. The cover must be firmly closed.

C. Mechanical maintenance.

1. Adjusting the tension of the focus.

Tension comes pre-adjusted by the factory. The best point of tension is that which permits the focus knobs to move as loosely as possible, without the head sliding down with its own weight.

The tension adjustment collar for focussing (Fig.1) is situated between the focussing knob (17) and the head holder (16).

**NB:** In the models with the 2LBB stand, the tension adjustment collar can be found between the focus knob and the arm of the microscope.

- a. Loosen the screw located in the collar hole with the 2mm hexagonal key.
- b. To increase the tension, turn the collar anti-clockwise; to decrease it, turn the collar clockwise.
- c. Re-tighten the hexagonal key.

## Troubleshooting:

### ELECTRICAL PROBLEMS

PROBLEM	CAUSE	SOLUTION
The bulb does not work.	Outlet inoperative. Cable not connected. Bulb burned out. Fuse blown. Wrong Bulb.	Have it repaired by a qualified specialised technician. Connect the cable to the power source. Replace bulb. Replace fuse. Replace with appropriate bulb.
Bulb has short life span.	Very high voltage.	Reduce light intensity to the minimum before turning on or off the stereomicroscope.
Bulb burns out immediately.	Wrong bulb.	Replace with the appropriate bulb.
Bulb flickers.	The bulb is not inserted correctly into socket. Bulb on the point of burning out. Fuse cover badly closed. Bad connection with power source.	Insert bulb correctly. Replace bulb. Close correctly. Have repaired by a qualified specialised technician.
Fuse blown quickly	Wrong fuse.	Replace with appropriate fuse.
Fuse blown instantly	Short circuit.	Have repaired by a qualified specialised technician.

### IMAGE QUALITY

PROBLEM	CAUSE	SOLUTION
No image.	Objectives turret badly positioned.	Adjust, until it "clicks" into place.
Poor resolution.	Eyepieces dirty. Objectives dirty.	Clean eyepieces. Clean objectives.
Spots, or stains in field of view.	Eyepieces dirty.	Clean eyepieces.

\* NB. Stains in field of view may also be attributed to dirt on the inside of the eyepiece. It is recommended therefore that the lens be cleaned by a recognised service technician.

### MECHANICAL PROBLEMS

PROBLEM	CAUSE	SOLUTION
It does not stay in focus.	The head drops down.	Adjust the tension of the coarse focus knob.

### **Moving the microscope**

- If possible, avoid moving the stereomicroscope.
- Carry the stereomicroscope in both hands. One hand should hold the stereomicroscope arm (20), and the other should support it under the base (13).
- Maintain the stereomicroscope in a vertical position.

### **Reparation**

If the stereomicroscope needs repairing, or revision by authorised personnel, we would recommend that it be stored in its polystyrene box and returned to the distributor. Attach a note with a description of the problem, or details of the required revision.

### **Warranty**

All MOTIC microscopes are warranted against any manufacturing defect for a 5 year period. Damage occurring by any unauthorised repair work, or occurring through misuse or modification of the microscope will not be included under the conditions of the warranty. Bulbs and fuses are not under warranty.

The warranty service is provided by MOTIC, or its authorised distributors. Defective products will be repaired free of charge when returned to MOTIC, or one of its distributors. Transport costs will be covered by the purchaser.

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