



SOM2000C
OPERATION MICROSCOPE
INSTRUCTION MANUAL

66 VISION TECH CO., LTD.

THE PEOPLE'S REPUBLIC OF CHINA

Preface

Thank you for purchasing our SOM2000C Operation Microscope. Please read this specification carefully for the sake of your better use.

General Requirement for Safety

Please read carefully about following precautions to avoid unexpected personal injury as well as the product being damaged and other possible dangers.

Precautions

1. Do not use this instrument in the environment where is prone to fire and to blast or where there is much dust and high temperature. Use it in the room and simultaneously be careful to keep it clean and dry.
2. This instrument can't be exposed to corrosive liquid and gas. It should be protected when sterilizing.
3. Check that all the wires are correctly and firmly connected before use. Ensure that the instrument is well grounded.
4. Please pay attention to all the rating of the electrical connecting terminal.
5. Please only use fuse according to the specifications and rated stipulated by our product.
6. Use the power cable supplied with this instrument.
7. Don't touch the surface of the lens and prism with hand or hard objects.
8. Turn off the main power first before replacing the main bulb and fuse.
9. To prevent the instrument from falling down to floor, it should be placed on the floor that is horizontal.
10. Turn off the power and cover the instrument with dustproof cover when it is not in use.
11. In case there is any trouble, please first refer to the trouble-shooting guide. If it still can't work, please make contact with the authorized distributor or our Repair Department.

THE SAFETY MARKS USED IN THIS INSTRUMENT



TYPE B



ATTENTION



TERMINAL OF THE
PROTECTIVE
GROUNDING



SEPARATE
COLLECTION



UPWARD



CAUTION PLACE



AVIOD DAMP



SCALD WARNING

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1 General

1.1 Scope of Application

SOM2000C Operation Microscope is mainly used for operations, such as ophthalmic operation and etc. **No use contraindication.**

1.2 Features

SOM2000C Operation Microscope is a single binocular operation microscope with coaxial illumination. Its small and portable machine body makes it highly agile. It is sure to meet the requirements for difficult ophthalmic micro-surgical.

The microscope has zoom magnification offering sharp image and large field of vision. A cold light source is used in the illumination system, which is harmless to the tissue. With quality halogen bulbs, PHILIPS or OSRAM, being used, the illumination is bright and even. An intensifying red-reflex module is added. A spring balance system is designed for the arm so that the microscope can move upwards and downwards stopping at any desired position. The adjusting functions of the equipment include magnification, horizontally moving, focusing and inclination. While focusing, horizontally moving can also be controlled by foot switch.

The environment requirements for using this equipment is temperature +5°C to +40°C, relative humidity 30% to 75%, atmospheric pressure 700hPa to 1060hPa.

1.3 Components

SOM2000C operation microscope consists of stand pillar, arm, movement component, microscope component, focusing component and foot switch.

1.4 Specifications

(1) Parameter of microscope

Focus length of objective $f=200\text{mm}^{[1]}$

Eyepieces 12.5×16B

Magnification & Visual Field (with 30°~90°inclined binocular tubes):

Objective focus	Total magnification	Vision field (mm)	Illumination field (mm)
F200	4x~24x	Φ41.5mm~Φ7.5mm	≥Φ44

(2) Working distance 190mm

(3) Parameter of Binocular tube

Inclined binocular tubes 30°~90°(45°inclined binocular tubes optional)

Diopter adjustment range ±6D

[1] Other objectives are optional according to users' need

Pupil distance range	50mm~75mm
Height of eyecups	18mm
(4) Parameter of Illumination	
Microscope vision field illumination	6°+0° coaxial illumination
Intensity	40000lx or up
Filter	red-free filter (Single filter operated by lever, orange filter and blue filter are optional)
(5) Parameter of Position adjustment	
Maximum stretching radius of arm	1020mm
Vertical movement range	±250mm
Range of fine focusing adjustment	30mm
Moving range of coordinate device	50mm×50mm
Moving speed of coordinate device	≤2mm/s
(6) Parameter of Electric	
Input voltage:	AC220V±10% / 50Hz±1Hz、AC110V±10% / 60Hz±1Hz
Input power:	200VA
Fuse:	T2A L 250V or T4A L 125V (For example: 51S-020H、51S-040L)
Bulb:	15V/150W, Medical halogen lamp Bulb with cold reflection
Electrical safety:	Conform to GB9706.1—2007
Fuse working temp.:	130℃

2 The name and use of components

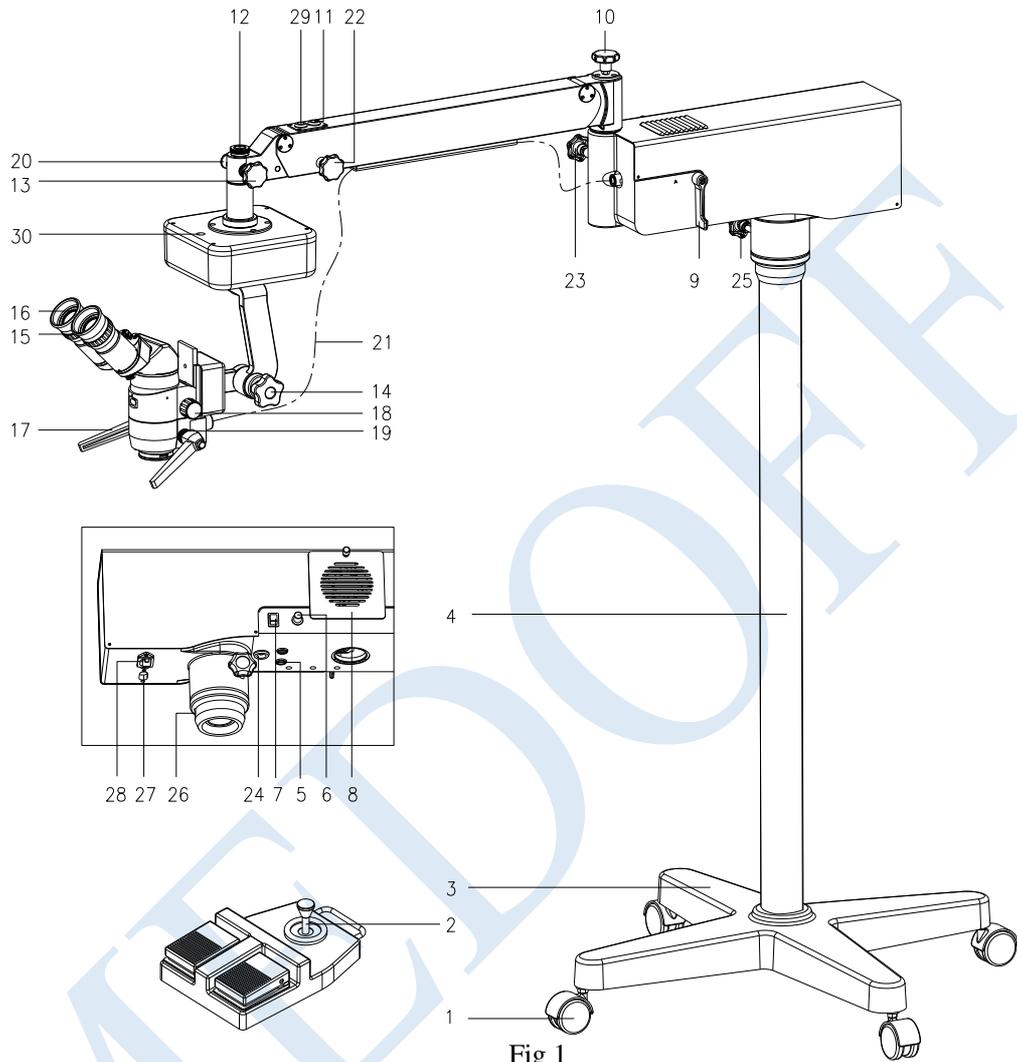


Fig 1

- [1] Caster
Move and support the equipment
- [2] Foot control switch
Be used to control the XY moving and focusing functions of microscope
- [3] Floor stand
Be used to support & fix stand pillar
- [4] Stand pillar
- [5] Fuse
Two (2.0/4A) are used to power supply
- [6] Light-adjusting knob
Used for continuous adjustment of illumination intensity.
- [7] Power supply switch

- Be used to switch on or switch off power supply.
- [8] Light source box
Be used to change the bulb
- [9] Bulb change knob
Rotate it to switch bulb. When the normal bulb has troubles, stir the handle to spare bulb to continue the operation.
- [10] Spring adjustment knob (sterilized caps)
Adjust the force of spring in the small arm
- [11] 5-pin plug/socket
Connect the focusing controller
- [12] Fixing nut
This nut lets microscope suspend on the small horizontal arm. Though there is protective melt, you must check this nut tightened or not.
- [13] Star fixation knob (sterilized caps)
Fix the revolving angle of the suspended spindle of microscope.
- [14] Star fixation knob (sterilized caps)
Lock the microscope and make it not revolve at up and down plane.
- [15] Diopter adjusting ring
Adjust ocular diopter by rotating this ring. The range of adjustment is $\pm 6D$.
- [16] Eyecups
Adjust exit-pupil distance. Its height is 18mm and it may be taken off or rolled down.
- [17] Manipulating handle (with sterilized cap)
For rough focusing, move the microscope up and down or right and left.
- [18] Magnification knob (with sterilized cap)
With different objectives the magnification factor of each step differs. Rotate the knob to change the magnification.
- [19] Fixing block circle
Fix the manipulating handle so that it will not loose.
- [20] Locking pin
Avoid the microscope dropping when the fixing nut looses while unloading it or suspending it.
- [21] Fiber optic
Lead the light beam from bulbs to the operating position.
- [22] Star fixation knob
Tighten it in order to lock the little arm and make the microscope not to move vertically.
- [23] Star knob fixation bolt
Tighten it in order to lock the little arm and make the microscope not to rotate.
- [24] 14- pin plug/socket
Connect the foot switch.

[25] Star fixation knob

Tighten it in order to lock the light source box to make it not revolve when moving or storing.

[26] Inner hexagonal tightening bolt

Lock the stand pillar and the light source box

[27] 110/220V selecting switch.

[28] Power plug

Input power supply.

[29] 7-pin plug/socket

The control line connector for the coordinate device

[30] Reposition button

Press the button to make the coordinate moving device return back to the center position.

3 Assembly

This equipment may be installed either by user self with reference to the manual or by the servicemen sent by the manufacturer or authorized representatives when facing real difficulties.

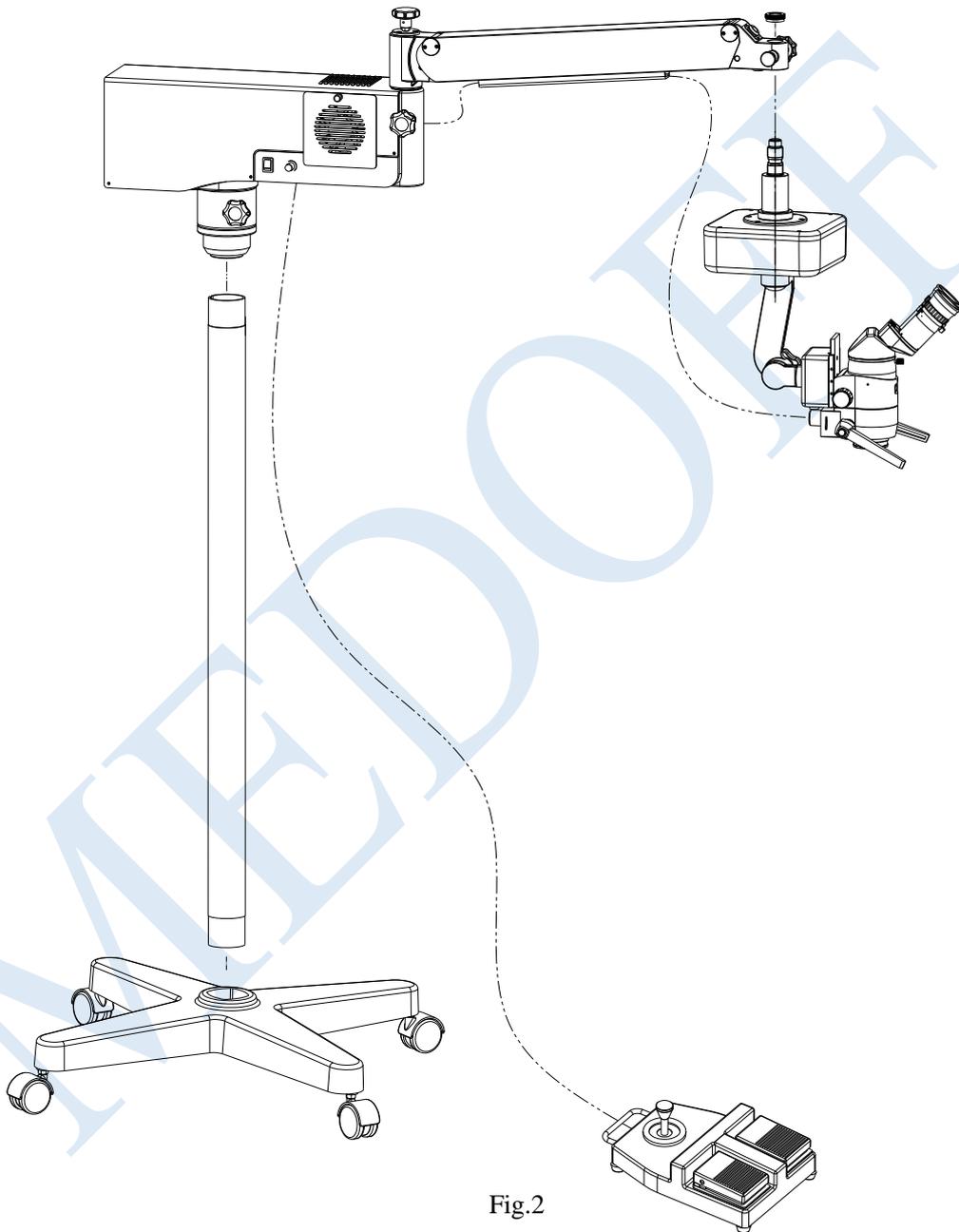


Fig.2

This equipment is packed in one package. Please open the packages in the direction indicated by the mark on the packages. Take out all the parts and assemble them according to the following procedures:

3.1 Assembly of stand pillar

- (1) Please take out the floor stand [3] from the package, lay it on the ground.
- (2) Take out the stand pillar [4], turn out the inner hexagonal bolt and gasket of its end, insert it into the hole of the floor stand [3], and then turn the stand pillar [4] to make the column pin on the base support clip in the groove on the end of stand pillar, assemble in order the unassembled gasket, spring gasket, inner hexagonal blot, and fasten it firmly with 10mm hexagonal wrench (Fig.2).

3.2 Assembly of light source box

Take out the light source box while not loosen the tightening bolt of the star knob [22] in order to avoid the small arm rebounding and harm people, set the bottom of the light source box into the stand pillar [4] and insert the inner hexagonal tightening blot [26] into the groove of the end of stand pillar [4] and fasten it firmly with 6mm hexagonal wrench (Fig.2).

3.3 Assembly of microscope

First check the tightening blot of star knob [13], make sure that the end of the bolt does not protrude out of the hole.

Remove the fixing nut [12]. Pull out the safety pin [20] with one hand. Hold the connecting part of microscope with another hand. Insert the shaft into the hole of the arm from the bottom to top. Then release the safety pin [20], it will spring back to the groove on the shaft. Finally fasten the fixing nut [12] (Fig. 2).

Insert the 7-pin plug [29] into the 7-pin socket. Pay attention to align marks for alignment on both the plug and socket.

Insert the 5-pin plug [11] into the 5-pin socket. Pay attention to align marks for alignment on both the plug and socket.

3.4 Assembly of manipulating handle

Insert the manipulating handle [17] into the holes on the two sides of the microscope holder respectively. The proper handle position should be down to an angle of 40° (as shown in Fig. 1). Then fasten the fixing block circle on the project plane of the two sides of the microscope and make the manipulating handle not to move axial direction (Fig. 2).

3.5 Assembly of fiber optics

Remove the fiber optics protective cover.

Insert one end of the fiber optics [21] into the side hole of the light source box and insert another end into the hole behind the microscope (Fig. 2).

4 Preparations for use

Check whether the mains voltage, frequency complies with what required by the equipment.

If it is not, do not start it.



Caution: Set the input voltage at 220V. When it is 110V, please switch the selecting switch [27] to the 110 block and change the fuse[5] as type T4A L 125V we supplied.

Check the grounding of power supply. Make sure the equipment have a good ground-wire connection.

The equipment comes with a three-core power cable. Please select matched power socket.



Caution: Please use the power cable provided by the manufacturer or the power cable according with IEC227 standard to ensure that the equipment is well grounded.

When the powder switch [7] on the power controlling box is pressed at "ON" position, power is on. When pressed at "OFF" position, power is off. The switch should always be "OFF" before the power wire is connected with power socket.

Insert the plug of the power wire of the equipment into the mains' outlet (It must be well grounded).

Switch on the power. Check whether the illumination system works properly.

After checking, please turn off power switch on power controlling box and disconnect the power plug and cover the equipment with dust cover.

5 Use of the instrument

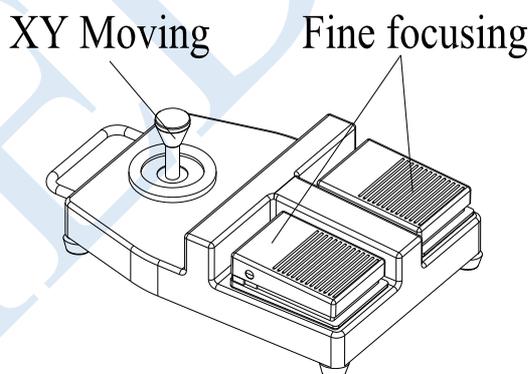


Fig.3

5.1 Use of the foot control switch

- (1) First connect the 14-pin plug on the foot control switch [2] with the 14-pin socket [24] under the power controlling box (Fig.1). Pay attention to align marks for alignment on both the plug and socket. Then connect power cable with mains outlet and switch on the power switch [7]. Then you can start foot control.
- (2) For fine focusing, step down the left pedal of the foot control switch, the microscope

moves down; while step down the right pedal, the microscope moves up (Fig.3).

5.2 Installation & adjustment before the use

- (1) Sterilize the manipulating handles and sterilized caps in advance.
- (2) Make the little arm to be in a horizontal position. Adjusting the height, ensure that the objective is about 190mm from the surgical site.
- (3) Switch on power supply, check the bulbs. If any bulb burns, replace it immediately.



Caution: Burnt bulbs must be replaced before an operation to ensure that the operation may be performed without interruption.

5.3 Adjustment during using

- (1) First move the equipment to a proper position and skid the brake to prevent the equipment from moving easily. Connect the power plug with power socket [29] on the microscope.
- (2) Place the foot switch [2] to a suitable position. Connect the 14pin plug of the foot switch with the socket under the power controlling box.
- (3) Insert the plug of power cable under the power controlling box into the mains outlet. Then switch on power switch [7].
- (4) Press the reposition button [5] on the coordinate device and the reposition button [63] on the focusing device making the adjustment be original position.
- (5) Move the fine focusing drag to the starting position, where the fine focusing indicator points to the central point of the drive by using the foot switch [2] or the focusing knob.
- (6) Illumination intensity adjustment. Rotate the light adjusting knob [6] on the power controlling box clockwise to increase the intensity, counterclockwise to reduce the intensity. Adjust it until appeal the operation.
- (7) Rough focusing. Loose the star fixation knob [23], hold the handle [18]to move the microscope upwards or downwards to position the light spot on the surgical site and adjust the focus till the image is clear with 8x magnification. Manipulating method refers to 5.1(2).
- (8) Eyecup adjustment. The eyecup [17] can reduce the observing disturbance coming from the foreign light. The height is limited to 18mm. If a doctor wearing glasses makes the operation, need to roll down the eyecup, that is turn the rubber eyecup over the ocular tube.
- (9) Diopter adjustment. The adjustment range of the diopter adjusting ring [16] of the ocular is $\pm 6D$, with 1D for each division. Rotate the diopter adjusting ring, match the value on the scale of the diopter adjusting ring with the diopter of the surgeon. If the surgeon wears glasses, align "0" position on the diopter adjusting ring to the white line mark on the ocular tube because glasses has corrected the surgeon's vision.
- (10) Pupil distance adjustment. While adjusting the pupillary distance, you can observe while rotate the pupillary distance adjusting knob, until both eyes see properly, visual fields

coincide and stereoscopic effect obtained. If the pupillary distance of the surgeon is known, adjust directly to this value indicated on the surface of the PD adjusting rod.

★**The above steps should be done before surgeon's personal sterilization.**

(11) Move the microscope upwards. Put the sterilized caps at the following places:

Star fixation knob [10], [13], [22], [23], [25], [14] Manipulating handle [17]

Magnification knob [18]

★**Disposable sterile cover may be used to cover the microscope at the surgeon's choice. After that, move the microscope to position the light spot on the center of the surgical site.**

5.4 Movement & storage after the using

Put off all of the sterilized cap and knob and sterilize them for the next use.

Draw the microscope back to the nearest position to the stand. Fasten every star knob firmly so as to fix the arm and the microscope.

Disconnect power wire and foot switch plug, store in a suitable place.

Loose the brake of the caster [1] before moving.

Grasp the power control box firmly with two hands in order to move the equipment slowly and carefully meanwhile avoid bumping and leaning.

Replace burnt bulb if any for the next use. Refer the method to 5.1.1.

6 Maintenance

6.1 Replace the consumable parts.



Caution: Replaced parts are treated as ordinary industrial rubbish.

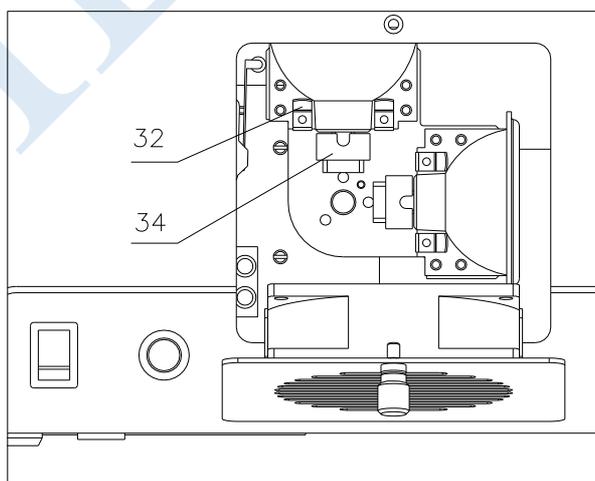


Fig.4

6.1.1 Replace the bulbs

Rotate the knob [9] to switch to the spare bulb in order to continue the operation.



Caution: Please use the special bulb for the equipment

6.1.2 Replace the burnt bulb after the operation

Open the door of Light source box

Pull out ceramic socket and take the bulb out of two clamping springs. Pull out the socket [34]. Then replace a new bulb in a reverse way

6.1.3 Replacing the fuse

Remove the fuse holder under the power controlling box. Replace it with a new fuse, then fasten the cover.



Caution: Only use fuses of the same type, specification and rated value. To be safe, please disconnect power from the mains outlet before remove the lower cover and replace the fuse.

6.2 Cleaning & sterilization

Each equipment has been fully checked before delivery ensuring its proper performance. However, a proper maintenance is necessary. It should not be disassembled by unskilled or unqualified technicians. Otherwise the equipment may be damaged and the performance may be affected. It is advised by the manufacturer that the equipment takes regular maintenance at three month's interval or according to the specific condition.

Do not place the equipment in a dusty, moist or corrosive environment to avoid damage to the equipment.

Do not disassemble lenses yourself. If there is dust stained on the lens, blow them with a blowball or brush them with a dust pen. Greasy or water stains can be cleaned off with mirror-cleaning paper or a drop of liquid solvent (1:1 mixture of C_2H_5OH and CH_3OCH_3), then blow it carefully. Be careful to prevent the solvent from infiltrating the edges of lens.

The outer surface of the equipment may be cleaned with wet cloth. The remaining stains can be cleaned off with the mixture of 50% C_2H_5OH and 50% H_2O (distilled). Please not use corrosive cleaning agent.

Eyecups should be cleaned with water. Place them on the eyepieces after dry.

All sterilized caps should be autoclave sterilized. Suggested conditions are as following: temperature: $120^{\circ}C$, time: 20min; or temperature: $134^{\circ}C$, time: 5min.

The accessories not in use should be put in a closed box with desiccant.

6.3 Trouble-shooting guide

In case there is any trouble, please check the following table. If it still does not work, please contact the Repair Department of 66 Vision Tech Co., Ltd. General Factory. (Refer to Table 1 Trouble Shooting Guide)

Trouble	Possible Cause	Remedy
Illumination doesn't light	The cable isn't connected correctly with the power socket.	Connect the power cable correctly.
	The position of the light adjusting knob is wrong after switching on power switches.	Adjust the light-adjusting knob
	The bulb plug doesn't connect correctly with its socket.	Take out bulb, scrape oxide. Then reinstall, screw the locking bolt firmly.
	The bulb has burnt (The mains exceed voltage rating).	Replace new bulb (stabilize the voltage rating).
	The fuse has blown.	Change the fuse.
The foot switch does not work.	The plug of foot switch is not well connected with the socket under the powder controlling box. The two connectors on the second arm are not well connected.	Connect again.
The light spot is too dark or not even.	The bulb is not in position.	Re-position the bulb to point the light of the bulb right to the fiber optics head.
	The fiber optics is not inserted to the end.	Insert it to the end.

Order consumable parts

	Name	Specification	Suggested Type
SOM2000C Operation Microscope	Medical halogen bulb with cool reflection.	AC15V/150W	HLX64634 (OSRAM)
	Fuse	T2A L 250V or T4A L 125V	51S-020H,51S-040L (HOLLYLAND CO.,LTD.)

7 Responsibility

We may provide the circuit diagram, electric component list and other details of the

equipment at the request of customers to meet their need for repairing.

If any information, service or consultation is needed, please contact with us directly or with our authorized distributors.

8 Transportation, Storage & Rejection

During the transportation, take care to protect it from wetness, upside down and violent vibration. The relative humidity should be 10% to 90%, environmental temperature -10°C to $+40^{\circ}\text{C}$ and atmospheric pressure 500hPa to 1060hPa.

This equipment should be stored in a well-ventilated room without corrosive gas where the relative humidity should be 10% to 90% and environmental temperature -10°C to $+40^{\circ}\text{C}$. If the assembled equipment should be moved or transported in short distance, please lock all the movable parts (refer to 5.4). The inclination angle should be less than 10° . If for long distance transportation, please repack it with original packages.

If it is stored for over five years, please contact with us directly or with our authorized distributor to check the equipment again.

Discard the equipment according to the local environment protection regulations. Do not pollute environment.

9 Spare parts & tools of the instrument

- | | |
|---|---|
| 1. Sterilized cap for star fixation knob | 6 |
| 2. Sterilized cap for magnification knob | 2 |
| 3. Sterilized cap for manipulating handle | 2 |
| 4. Medical halogen bulb with cool reflection (15v 150w) | 1 |
| 5. T2A L 250V or T4A L 125V fuse tube | 4 |
| 6. 6mm inner hexagonal wrench | 1 |
| 7. 10mm inner hexagonal wrench | 1 |
| 8. P54M bulb socket | 2 |





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ENCASEMENT LIST
OF SOM2000C OPERATION MICROSCOPE

Content	Number
Instruction manual	1
Power supply wires	1
Manipulating handle	2
Microscope	1
Arms	1
Fiber optic	1
Base	1
Foot control switch	1
Column	1
Medical halogen bulb with cool reflection (15v150w)	1
Fuse ,T2A L 250V or T4A L 125V	4
Sterilized cap of star fixation knob	6
Sterilized cap of manipulating handle	2
Sterilized cap of magnification knob	2
6mm inner hexagon spanner	1
8mm inner hexagon spanner	1
P54M bulb-socket	2

(With the pack sketch map on the back)

Suzhou 66 Vision Tech Co., Ltd

PLANE SKETCH MAP

