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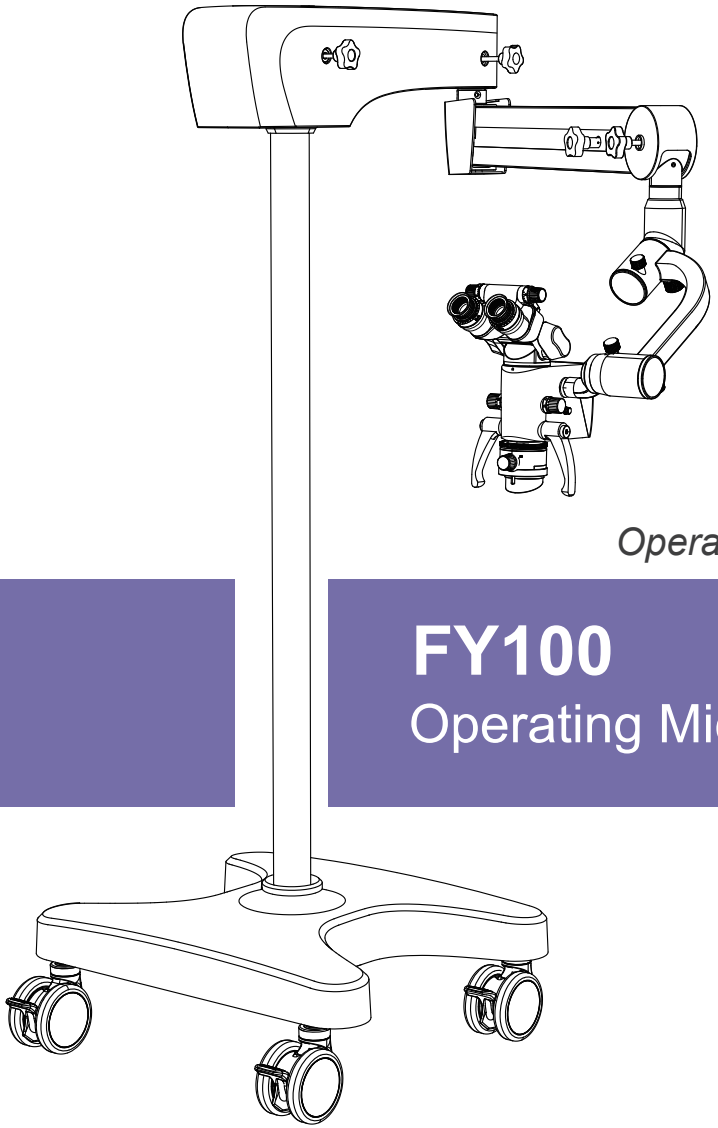

*Operation Manual*

# FY100

## Operating Microscope

***Contents***

**1.【Product Name】**Operating Microscope

**2.【Brand】**Vision Pro

**3.【Model】**FY100

**4.【Product Introduction】**

This product is a single person binocular surgical microscope.

Manual six speed zoom, the large objective lens is equipped with a mechanical focusing device for precise focusing, and the focal length can be adjusted between 190 and 300mm to obtain the working distance required for various microsurgeries.

The viewing angle of the eyepiece can be adjusted arbitrarily between 0°and 220°.

LED cold light sources with no damage to the organization shall be used for lighting, ensuring sufficient and uniform illumination. The brightness of the lighting can be freely adjusted through the knob. It has multiple modes such as yellow filter mode, green filter mode, and no filter mode.

The cross arm adopts an imported gas spring balance design, allowing the surgical microscope to move up and down freely according to operational needs and achieve hovering at any position. When the small cross arm moves up and down within the normal working range, the LED light source is turned on. When the small cross arm moves up beyond the working range, the LED light source will automatically turn off.

## 5.【Product Diagram】

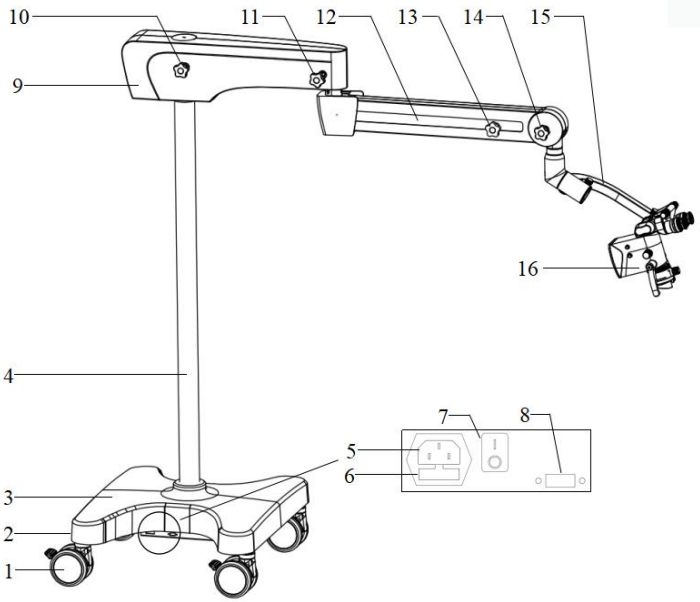


Figure 5.1 Front View of the Host Machine

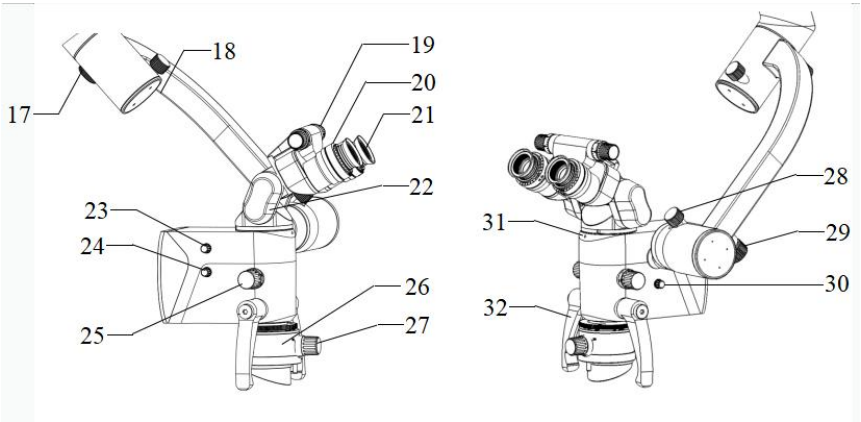


Figure 5.2 Schematic Diagram of Microscope Lens

**[01] Castors**

Used to support the machine and facilitate walking, the casters are equipped with foot brakes, press the foot brake to lock the casters, release the foot brake to unlock.

**[02] Base**

**[03] Base Cover**

**[04] Column**

**[05] Power Socket**

**[06] Fuse Tube**

**[07] Power Switch**

Press the ‘ I ’ end to connect the surgical microscope to the power supply, and press the ‘O’ end to cut off the power supply.

**[08] HDMI Interface**

Reserved HDMI interface for connecting monitors.

**[09] Large Cross Arm**

Together with the small cross arm to form the arm extension system of the machine, forming a workspace.

**[10] Horizontal rotation locking knob of the large cross arm**

Adjust the damping of the horizontal rotation of the large cross arm and lock the horizontal rotation of the large cross arm.

**[11] Horizontal rotation locking knob of the small cross arm**

Adjust the damping of the horizontal rotation of the small cross arm, or lock the horizontal rotation of the large cross arm.

**[12] Small Cross Arm**

**[13] Move the locking knob up and down on the small cross arm**

After adjusting the small cross arm to reach a balanced state, use this knob to adjust the damping of the up and down movement of the small cross arm.

**[14] Horizontal rotation locking knob of the main mirror body**

Adjust the damping of the horizontal rotation of the microscope lens and lock the horizontal rotation of the main mirror body.

**[15] C-type Hanging Arm**

**[16] Microscopic Lens**

**[17] Left and Right Adjustment Knob**

Adjusting the damping for the left and right rotation of the C-type hanging arm.

**[18] Left and Right Balance Locking Knob**

Lock the C-type hanging arm to rotate left and right.

**[19] Pupil Distance Adjustment Knob**

Adjust the distance between eyepieces to match the pupil distance of the human eye.

**[20] Visual Adjustment Knob**

Visual adjustment range ± 7D, negative adjustment for myopia, positive adjustment for hyperopia.

**[21] High Eye Point Wide-Angle Eyepiece**

**[22] 0-220 ° Variable Angle Binocular Lens Tube**

Adjustable eyepiece angle as needed.

**[23] Brightness Adjustment Knob**

Adjusting the brightness of the light spot.

**[24] Green/Orange Filter Switch Knob**

By applying green spot irradiation, small nerves and blood vessels can also be clearly seen in a surgical environment with blood.

Applying orange spot lighting can prevent resin materials from curing too quickly.

**[25] Zoom Knob**

6-speed manual zoom, quick switching of magnification.

**[26] Zoom Objective Lens**

**[27] Objective Lens Focal Length Adjustment Knob**

Adjust the focal length of the objective lens, with an adjustment range of 190-300mm.

**[28] Front and Rear Balance Locking Knob**

Lock the lens and rotate it back and forth.

**[29] Front and Rear Adjustment Knob**

Adjusting the damping of the lens's forward and backward rotation.

**[30] Stepless Spot Size Adjustment Knob**

**[31] Set Screw**

After installing the binocular lens tube on the body of the surgical microscope, tighten this set screw to secure the binocular lens tube

**[32] Adjustable Angle Handle**

Press the metal button on the handle to release it and adjust the angle.

**6.【Product Composition】**

The surgical microscope consists of a base, a column, a large cross arm, a small cross arm, a C-shaped hanging arm, and a microscope lens.

**7.【Scope of Application】**

This product is suitable for enlarging the details of the surgical area during non ophthalmic surgeries.

**8.【Specifications and Technical Parameters】**

1) Power input: ~110V-220V, 50Hz/60Hz;
2) Input power: ≤ 65VA;
3) Host fuse: F1L 250V;
4) Host weight: 110Kg.
5) Main optical parameters
   Magnification: 3.4x, 5.3x, 6.9 x, 8.5x, 13.6x, 21.4x
   Field of view diameter: Ø 61.8, Ø 39.5, Ø 36.2, Ø 24.7, Ø 15.5, Ø 9.8
6) Objective lens focal length: adjustable within the range of 190-300mm
7) Eyepiece parameters
   Visual adjustment range: ± 7D
   Eyepiece magnification: 12.5x
8) Eyepiece barrel parameters
   Main eyepiece tube viewing angle: 0 ° -220 °
   Pupil distance adjustment range: 51-76mm
9) Lighting parameters
   Field of view lighting method: 4 ° lighting
   Maximum illumination on object surface: ≥ 70000LUX
10) Built-in filter: yellow and green filters
11) Position adjustment parameters
   Maximum extension radius: 1650mm
   Vertical adjustment range: 790mm-1310mm (from bottom to large objective)

**9.【Safety Characteristics】**

1) Group I Class A equipment;

2) Classification of protection level for liquid inlet: The host is a regular equipment (IPX0) and not waterproof;

3) Classification of safety levels when using flammable anesthetic gases mixed with air or flammable anesthetic gases mixed with oxygen or nitrous oxide:

Equipment that cannot be used in the presence of flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrous oxide

**10.【Environmental Requirements】**

**Usage Environment:**

1) Environmental temperature range: 0 ℃ ~ +40 ℃;

2) Relative humidity: RH ≤ 80%;

3) The altitude shall not exceed 4000m.

4) Indoor use

**Storage Environment:**

1) Storage temperature between -10 to +50 ℃;

2) Relative humidity: RH ≤ 80%;

3) Avoid direct sunlight;

4) Keep away from heat and ignition sources.

**Transportation instructions:**

1) During transportation, it is necessary to avoid rain and moisture, and place it upwards according to the markings;
2) The maximum number of stacking layers during transportation is 3;

## 11.【Installation Instructions】

This device is generally installed by the user according to this manual; For those who have difficulties in installation, they can contact our authorized distributor or manufacturer to handle installation matters on their behalf.

This equipment is packed in a packaging box and all components are removed in sequence. After unpacking, install in the following order.

### 11.1 Base and Column Installation

1) Remove the base from the pallet, place on the groundas,shown in Figure 11.1.1, Put the brake on the cardan wheel.

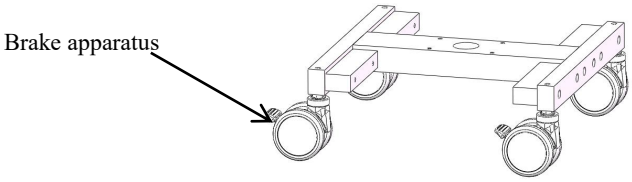


Figure 11.1.1 Castor Assembly and Cross Bar Assembly

2) Place the column on the crossbar, align it with the center hole as shown in Figure 11.1.2, and use the included No. 8 Allen wrench to lock the four M10 screws.

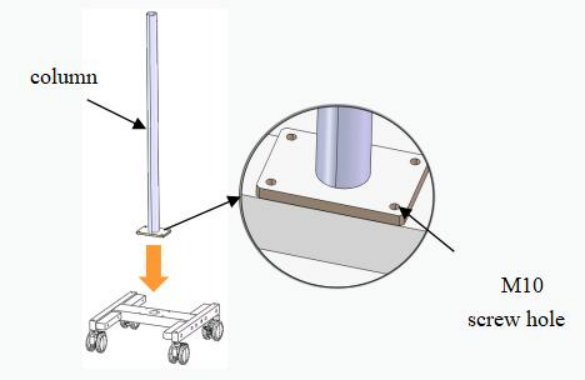


Figure 11.1.2 Column Assembly

3) Insert the base shell into the center hole from above the column and place it on the bottom caster assembly. There is a Velcro on the caster assembly to secure the base shell.

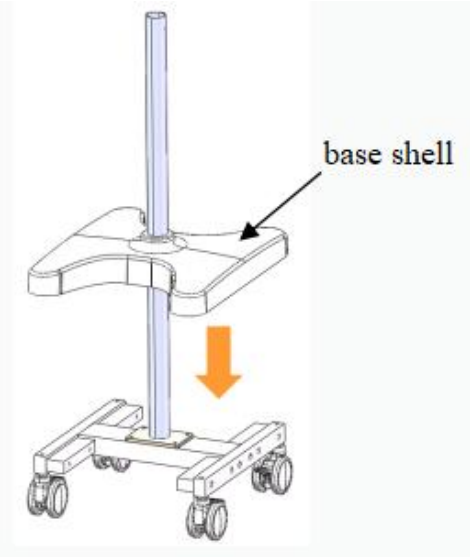


Figure 11.1.3 Assembly of Base Shell

***Attention: Due to the bulky base, it is recommended to assemble it with at least two people and handle it gently.***

### 11.2 Cross Arm Assembly

Take out the cross arm assembly and first place it above the column, pass the cable through the center hole of the column and lead it to the lower part of the base, then place the cross arm on the column, and make the screw holes on the large cross arm axis correspond to the through holes on the column. Tighten the M6 countersunk head screw with a No. 5 Allen wrench.

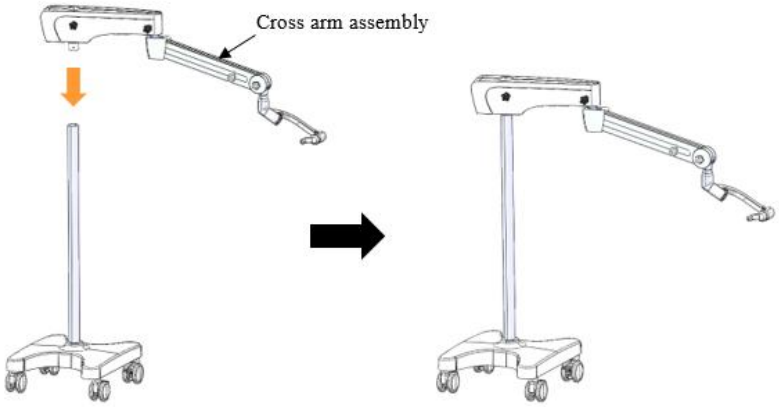


Figure 11.2.1 Cross Arm Assembly

***Attention: The cross arm component is relatively large, and it is recommended to assemble it with at least two people. The small cross arm is balanced using gas springs. The locking knob [13] of the small cross arm is in a locked state when it is moved up and down at the factory, and should be kept locked during assembly. If loosening is necessary during assembly, it is necessary to hold the small cross arm with your hand before loosening the knob to prevent it from suddenly popping up.***

### 11.3 Lens Assembly

1) Take out the handle and install it on both sides of the mirror body and tighten it, as shown in Figure 11.3.1. Then install the mirror body at the C-type hanging arm joint position. Pay attention to aligning the pin holes during installation. Then tighten the M6 screw from the rear of the C-type hanging arm by using the included No. 5 Allen wrench.

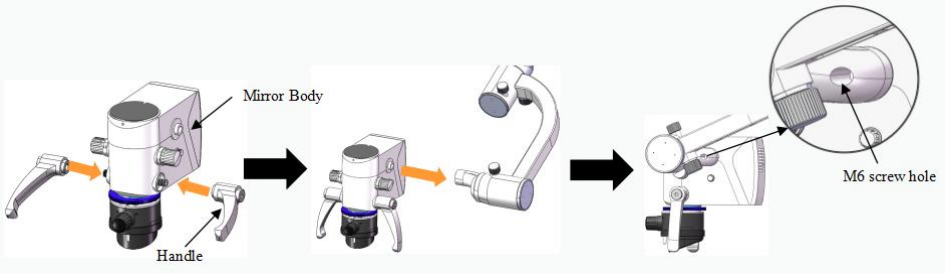


Figure 11.3.1 Mirror body assembly

2) Take out the binocular lens tube, loosen the set screw [31] on the upper part of the lens body, and remove the dust cover. The ⚠ mark indicates the position of the set screw. Insert the mirror body as shown in Figure 11.3.2. When inserting, the positioning groove on the bottom surface of the eyepiece cylinder must match the positioning pin on the mirror body, and the installation surface must be flat. Then, use the included No. 2 Allen wrench to tighten the set screw on the upper part of the mirror body. Finally, insert the cable male connector on the cross arm component into the cable interface at the rear of the mirror body.

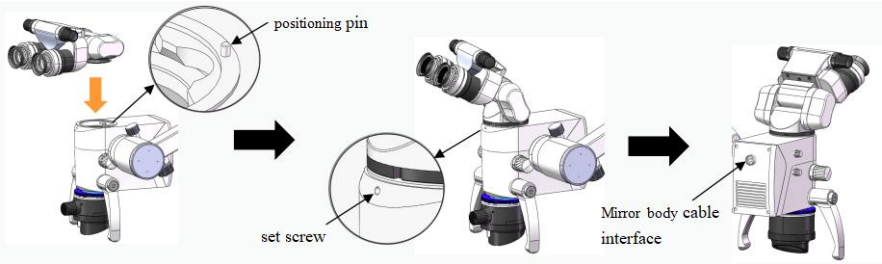


Figure 11.3.2 Mirror Tube Assembly

### 11.4 Power Box Assembly

Take out the power box and place it under the base. Insert the cable connector and HDMI cable connector that come out of the base into the corresponding ports. Then use the included No. 4 Allen wrench to tighten the M5 screws around the power box. Insert the attached power cord into the power socket again, and the microscope assembly is complete.

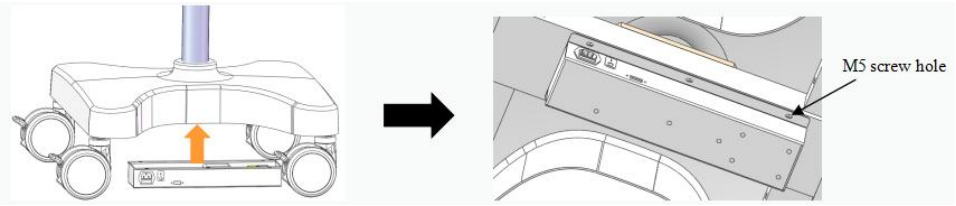


Figure 11.4.1 Power Box Assembly

## 12.【Instructions for Use】

12.1 Necessary conditions for equipment operation

Before starting the machine, please confirm that the following terms have met the requirements:

1) Check if the local power supply voltage and frequency are consistent with the power supply voltage and frequency of this equipment. If there is any discrepancy, do not start this device;

   ***Note: Please ensure that the input voltage/frequency of the device is consistent with the local power grid voltage/frequency***

2) Check the grounding of the power supply to ensure good grounding of the equipment;

3) This device is equipped with a three core power cord. Please choose a suitable power socket to match it;

   ***Attention: Please use a power cord specifically designed for this device or one that meets the IEC227 standard to ensure good grounding of the device.***

4) The power switch [5] has two states. When the switch is set to "I" and the power is turned on, the switch emits a green light; When set to "O", the power is cut off, and the switch does not light up. Before connecting the equipment power cord to the power socket, the power switch should be in the "O" state;

5) Insert the plug of the device power cord into the socket;

6) Turn on the power switch [07], and the light source indicator light will be on. Observe the lighting of the equipment to confirm that it is emitting normally.

### 12.2 Precautions for use

1) Do not look directly at the light source through optical components such as an objective lens;
2) Do not block the heat dissipation holes at the back of the mirror body;
3) Please pay attention to the warning labels on the equipment.

### 12.3 Equipment adjustments before use

1) Adjust the balance of the lens.

   The balance arm of this device adopts an imported gas spring balance arm, which can make the lens hover at any position within the travel range. The balance arm and lens of this device have been set for balance when it leaves the factory, when adding or reducing lens accessories, it is necessary to adjust the left and right and front and rear motion damping of the lens by tightening or loosening the left and right adjustment knobs [17] and the front and rear adjustment knobs [28] to make the lens reach a balanced state again.

   (The sign  indicates the direction of knob rotation, increasing damping by turning in the + direction and decreasing damping by turning in the - direction)

2) Adjust the visibility. In order for the microscope to observe a clear image at the working distance of the objective lens, it is necessary to adjust the visibility of the eyepiece. The eyepiece visibility adjustment ring has a value of 1D per grid, and the adjustment range is ± 7D. Rotate the visibility adjustment knob [20], correspond the scale value of the white line on the ring to the refractive index of the surgeon.

   If the surgeon is nearsighted, in the naked eye state, the visual acuity needs to be adjusted to a negative value corresponding to the degree; If the surgeon has hyperopia, it is necessary to adjust the visual acuity to a positive value corresponding to the degree. If the surgeon wears glasses for surgery and the glasses have corrected the surgeon's

diopter, then simply align the white line on the diopter adjustment knob to position 0.

If the doctor's eye diopter is unknown, the following method can be used to adjust the diopter. Adjust both eyepieces to+5D, remove the binocular tube and eyepiece together from the surgical microscope body, and aim it at a distant object, just like using a binocular. At this point, the image of the object is unclear, Slowly turn the visibility adjustment knob on the eyepiece clockwise until the image of the object is clear.

Stop turning the adjustment knob, and if necessary, repeat this process three times to take the average of the visibility. Adjust the second eyepiece using the same method. Reinstall the binocular tube and eyepiece onto the surgical microscope body, and tighten the set screws [31] on the body to secure them;

3) Adjust focus. Adjust the eye mask to see the full field of view, and adjust the magnification of the surgical microscope to the highest magnification, Focus and image the object surface clearly, then adjust to the required working magnification. When the magnification changes, it can still maintain clear imaging of the image plane, but the depth of field at each magnification is different;

4) Pupil distance adjustment. According to the doctor's pupil distance value, rotate the pupil distance adjustment knob [19], and the scale value aligned with the white line is the current binocular lens pupil distance.

   If the distance between the eyes of an unknown doctor can be adjusted according to the following method. Rotate the pupil distance adjustment knob [19], completely separate the two eyepieces to the maximum position, observe with both left and right eyes, and then retract the two eyepieces towards the middle until both eyes can see and only see a circular field of view. Observe the value corresponding to the current white line, and this indicator is the pupil distance. Record this pupil

distance and adjust it directly to this reading for the next observation or observation under another microscope.

***Note:*** *If multiple surgeons use a surgical microscope, it is necessary to create a table, fill in the diopter and pupil distance of each doctor, and place the table near the surgical microscope*

### 12.4 Equipment inspection before use

Before use (when there are no patients), please check according to the following points:

1) Confirm that the device has been disconnected from the power supply;
2) Check and confirm that all locking knobs have been tightened;
   Inspection after turning on the power switch:

12.4.1 Lighting inspection

1) The light source is working normally;
2) When the small cross arm moves up and down within the normal working range, the LED light source is turned on. When the small cross arm moves up beyond the normal working range, the LED light source will automatically turn off.

12.4.2 Mechanical component settings

1) The cross arm system has been set for balance.
2) The damping of the large cross arm, small cross arm, C-shaped hanging arm, and lens in all directions has been adjusted.
3) The foot brake of the casters on the base has been locked, and the equipment is stable on the ground.

12.4.3 Adjustment of optical components

1) The zoom knob [25] can operate normally.

2) Eyepiece and binocular tube

1. The surgical microscope and binocular tube have been adjusted to a position that is convenient for surgery.
2. The set screw [31] of the binocular lens barrel has been securely tightened.
3. The correct pupil distance has been set.
4. The eye mask has been adjusted to a position where the full field of view can be seen.
5. The visibility of the eyepiece has been adjusted to the correct scale.

12.4.4 Protective sleeve

Users should put disinfection covers on the locking knobs, zoom knobs, stepless spot size adjustment knobs, pupil distance adjustment knobs, mirror body handles, and other parts of the large and small arms.

**12.5 Equipment usage steps**

1) Confirm that the preparation work before use has been completed.
2) The equipment is inspected as required and in good condition.
3) Turn on the power.
4) Move the surgical microscope to its working position.
5) Turn on the light source and adjust it to the appropriate brightness using the brightness adjustment knob [23] (the symbol  indicates the brightness adjustment knob).
6) Select the filter you want to use.

7) Move the surgical microscope lens above the surgical area and adjust it to a suitable surgical posture.

8) Adjust the zoom knob to select the required magnification.

9) Grasp the handle of the surgical microscope and move and rotate the surgical microscope lens. The C-shaped hanging arm can rotate the lens forward, backward, left, and right (The symbol  indicates that the C-type hanging arm can rotate left and right around this axis,

The symbol  indicates that the lens can rotate back and forth around this axis)

Align the objective lens with the patient's surgical area and perform coarse focusing on the surgical area through eyepiece observation. Then adjust the focus of the objective lens by adjusting the knob to achieve a clear field of view. After adjusting the lens position, each locking knob can be tightened to prevent accidental touch from causing the lens to move.

(The symbol 

indicates the direction of rotation of the knob, turning it in the + direction for locking, and turning it in the - direction for loosening).

10) After the surgery is completed, move the small cross arm up to its non working range and turn off the light source.

11) When the surgical microscope is no longer in use, cut off the power supply.

***Attention: When using, it should be confirmed that the heat dissipation holes at the back of the mirror body are not covered.***

### 12.6 Equipment movement and storage after use

1) Turn off the power switch and disconnect the power cord from the power source.
2) Remove all disinfection covers and handles for disinfection before next use.
3) Close the cross arm to the closest position to the column, tighten each locking knob, so that the joints of the cross arm and the microscope lens cannot rotate freely.
4) Release the foot brake of the casters and unlock the casters.
5) When moving, hold the column and move slowly and carefully to avoid collisions.
6) After moving to the predetermined position, press the foot brake of the casters to lock the casters.
7) Cover the surgical microscope head with a dustproof bag.

## 13.【Precautions】

1) Do not use this device in flammable, explosive, hot, and dusty environments; It should be used indoors and attention should be paid to keeping the product clean and dry;
2) Before use, please check the correct connection of all wire plugs and sockets, and ensure that the equipment is well grounded;
3) Please pay attention to the ratings of all electrical connection ports;
4) Please use fuse tubes that meet the type and rating specified in this product;
5) The dedicated power cord for this device should be used;
6) The equipment should be placed on a flat surface to prevent it from tipping over.
7) Do not touch the surface of each optical lens with hands or hard objects.
8) To replace LED lights and fuse tubes, first turn off the main power switch and unplug the power cord plug.
9) LED lights have a high temperature after use, and direct contact with burns should be avoided.
10) When the device is stopped from use, the cross arm should be folded and locked first, then the power should be cut off, and a dust cover should be put on.
11) If a malfunction occurs, please read the troubleshooting guide first; If the problem cannot be resolved, please contact our authorized dealer or the manufacturer's repair department.
12) Our company is a professional manufacturer of medical devices. The maintenance, repair, and modification of this machine are carried out by our company or authorized technical personnel, and the components can only be provided by our company or authorized institutions. Otherwise, our company is not responsible for the safety of the equipment.

## 14.【Daily Maintenance, Cleaning, and Disinfection of Equipment】

Our company recommends that users maintain, clean, and maintain the equipment every three months or as needed.

1) This equipment belongs to precision equipment, please do not disassemble it casually unless it is maintained by our company's maintenance personnel or qualified professionals.
2) After passing the inspection, the equipment leaves the factory to ensure normal use, but it must be properly maintained and maintained. When users are unfamiliar with the structure and performance of the device, please do not disassemble it casually to prevent damage or reduce the performance of the device.
3) Equipment should be avoided as much as possible in environments with dust, moisture, and corrosive gases to prevent damage to the equipment.
4) To prevent dust, the optical lens and lens body should not be placed open after removing the objective, binocular tube, and eyepiece. When not in use, the objective and eyepiece should be covered with a protective cover. The blood stains, body fluids, and other dirt on the surface of the optical lens should be first wiped off with optical wiping paper or degreased cotton, dipped in distilled water and a little household detergent. The remaining stains can be lightly wiped off by wiping the lens with a small amount of solvent such as a mixture of anhydrous ethanol and ether (1:1) using lens wiping paper or degreased cotton. Do not use corrosive or abrasive cleaning agents.
5) Accessories that are not currently in use should be removed and stored in equipment boxes containing desiccants.
6) The knob disinfection cover can be disinfected using a high-pressure disinfection pot. The recommended temperature and time are as follows: the disinfection temperature is 134 ℃, and the disinfection time is 10 minutes. The disinfection cover provided by the manufacturer must be used.

***Attention:*** *After using the equipment, the dirt on the lens should be cleaned in a timely manner. Dirt that dries up on the objective lens and other lenses will make cleaning and disinfection very difficult. If possible, the equipment should be regularly cleaned and disinfected.*

## 15.【Consumable Replacement and Troubleshooting Methods】

### 15.1 Replacement of Consumables

15.1.1 Replacing the LED light source

If the LED light source is damaged, please contact the manufacturer or authorized dealer

15.1.2 Replacing the fuse tube

The fuse tube is located in the power input socket. Please replace the fuse tube as follows:

1) Turn off the power switch of the device and disconnect the connection between the device and the power supply;
2) Unplug the power cord plug from the power socket;
3) The fuse holder and power socket are integrated, and gently push out the fuse holder from the position shown in Figure 15.1 using the accompanying flat screwdriver or similar tool;

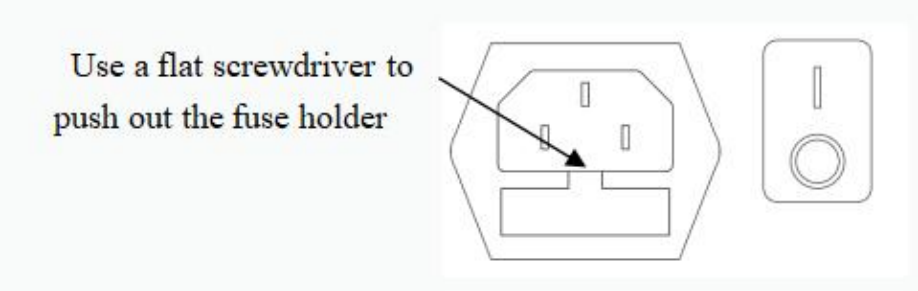


Figure 15.1 Replacing the fuse tube

4) Remove the blown fuse;
5) Install a new fuse tube and reinsert the fuse holder. Fuse specification and model: F1L250V 0218015.MRET1P;

6) Plug in the power cord;

***7)*** Turn on the power switch of the device, connect the device to the power supply, and check if the device can operate normally;

***Attention: Please choose the fuse tube with the specified specifications for this equipment***

### 15.2 Common faults and solutions

If the equipment malfunctions, please first check the troubleshooting guidelines listed in Table 1.

If the problem still cannot be solved, please explain the phenomenon of equipment malfunction and contact our authorized dealer or our after-sales service department.

| Fault Phenomenon | Possible Causes | Processing Method |
|---|---|---|
| Equipment loss of power | Power not connected | Turn on the power switch or plug in the power cord |
| | Mains power failure | Contact local electrician |
| LED light does not light up | The power cord is not properly plugged in | Plug in the power cord properly |
| | The power switch is not turned on | Turn on the power switch |
| | Fuse tube blown | Replace the fuse tube |
| | Power cord failure | Replacing the power cord |
| | Power failure | Contact local electrician |
| | Equipment electrical failure | Contact the maintenance service agency |
| | The surgical microscope is in the non working area and the microswitch of the small cross arm is disconnected | Move the surgical microscope's small cross arm down from the non working area to the working area |
| | LED light source damaged | Contact the maintenance service agency |

| | | |
|---|---|---|
| The illumination spot brightness is too dim | Expiration of LED light source lifespan | Contact the maintenance service agency |
| | The heat dissipation hole of the LED light source is covered by an object, or the heat dissipation hole fails due to a blockage, resulting in the light attenuation of the LED light source. | Remove the cover and clean the heat sink. Contact the maintenance service agency to confirm if the LED light source needs to be replaced. |
| During the surgery, the lighting often goes out and then comes on again | The heat dissipation hole of the LED light source cover is covered by an object, or the heat dissipation hole fails due to blockage | Remove the cover and clean the heat dissipation hole |
| | Fan damage | Contact the maintenance service agency |
| | Equipment electrical failure | Contact the maintenance service agency |
| The adjustment of the surgical microscope up and down is not flexible | The locking knob for the up and down movement of the small cross arm is tightened too tightly | Loosen the locking knob to make the damping size appropriate |
| Failure in rate switching | Unable to switch magnification | Contact the manufacturer's after-sales service department |
| The filter is defective or cannot be switched | Unable to switch filters or other abnormalities | Contact the manufacturer's after-sales service department |

**16.【Taboo】**

Users who are equipped with pacemakers or implanted with other electronic devices, or doctors remind them not to use small household appliances such as shavers and hair dryers, are prohibited.

## 17.【Symbol Description】

| | | | |
|---|---|---|---|
| | registered trademark | | Storage temperature -10 ℃~+50 ℃ |
| | KEEP DRY | | date of manufacture |
| | manufacturer | | fragile products |
| SN | serial number | | Please read the instruction manual |
| | Storage humidity not exceeding 80% RH | IPX0 | Waterproof grade |
| | Warning | | recovery |
| | Dispose of waste products and | | Brightness adjustment knob |
| | Knob adjustment direction | | Carrying weight less than 7kg |
| | The C-type hanging arm can rotate around | | The lens can rotate around this axis |
| | Protective grounding | 3 | Stacking limit 3 layers |
| | Sheltering from rain | | Fragile products |
| | Up | | Recycling |

## 18.【Electromagnetic Compatibility】

The FY100 surgical microscope is a Group A product that requires special precautions regarding electromagnetic compatibility (EMC). Measures must be taken and installed and used in accordance with the electromagnetic compatibility information specified in this manual. Portable and mobile RF communication devices may have an impact on this device.

Basic Product Performance

| Name | Specific Description |
|---|---|
| Normal Operation | The equipment is working normally without any crashes; Illuminance should not increase or decrease unexpectedly.<br><br>The filter switching component and microscope zoom function should not malfunction. |

The following cables must be used to comply with electromagnetic emission and anti-interference requirements:

| Cable Name | Length |
|---|---|
| Power Cord | 2m |
| | |

Except for cables (transducers) sold as spare parts for internal components, the use of accessories and cables (transducers) outside of regulations may result in an increase in equipment or system emissions or a decrease in immunity.

The FY100 surgical microscope should not be used in close proximity or stacked with other devices. If it is necessary to use in close proximity or stacked, it should be observed and verified that it can operate normally in the configuration in use.

Guidelines and Manufacturer's Declaration - Electromagnetic Emissions

<table>
<tr><td colspan="3">The FY100 surgical microscope is expected to be used in the following specified electromagnetic environment, and the purchaser or user should ensure that it is used in this electromagnetic environment:</td></tr>
<tr><td>Launch test</td><td>Compliance</td><td>Electromagnetic Environment - Guidelines</td></tr>
<tr><td>RF Emission GB 4824 (CISPR 11)</td><td>1 set</td><td>The FY100 surgical microscope only uses radio frequency energy for its internal functions.Therefore, its RF emission is very low and the possibility of interference to nearby electronic devices is very low.</td></tr>
<tr><td>RF Emission GB 4824 (CISPR 11)</td><td>Class A</td><td rowspan="3">The FY100 surgical microscope is suitable for use in non household and all facilities that are not directly connected to the public low-voltage power supply network of residential buildings.</td></tr>
<tr><td>Harmonic radiation GB 17625.1</td><td>Not applicable</td></tr>
<tr><td>Voltage fluctuation/flicker emission GB 17625.2 (IEC61000-3-3)</td><td>Not applicable</td></tr>
</table>

Guidelines and Manufacturer's Declaration - Electromagnetic Immunity

| The FY100 surgical microscope is expected to be used in the following specified electromagnetic environment, and the purchaser or user should ensure that it is used in this electromagnetic environment: | | | |
|---|---|---|---|
| Immunity test | IEC60601 Test level | Compliance level | Electromagnetic Environment-Guidelines |
| Electrostatic discharge (ESD)<br><br>GB/T 17626.2 (IEC61000-4-2) | ±6kV contact discharge<br><br>± 8kV air discharge | ± 6kV contact discharge<br><br>± 8kV air discharge | The ground should be made of wood, concrete, or ceramic tiles. If the ground is covered with synthetic materials, the relative humidity should be at least 30% |
| Electrical Fast Transient Pulse Group GB/T 17626.4 (IEC61000-4-4) | ± 2kV to power line<br><br>± 1kV for input/output lines | ± 2kV to power line<br><br>Not applicable | The network power supply should have the quality used in typical commercial or hospital environments. |
| Surge GB/T 17626.5 (IEC61000-4-5) | ± 1kV line to line<br><br>± 2kV line to ground | ± 1kV line to line<br><br>± 2kV line to ground | The network power supply should have the quality used in typical commercial or hospital environments. |
| Voltage dips, short interruptions, and voltage | <5% UT for 0.5 cycles (on UT,>95% dip) | <5% UT for 0.5 cycles (on UT,>95% dip) | The network power supply should have the quality used in typical commercial |

| | | | |
|---|---|---|---|
| changes on the power input line<br><br>GB/T 17626.11<br><br>(IEC61000-4-11) | 40% UT for 5 cycles (60% temporary drop on UT)<br><br>70% UT for 25 cycles (on UT, 30% temporary drop)<br><br><5% UT for 5 seconds (on UT,>95% temporary drop) | 40% UT for 5 cycles (60% temporary drop on UT)<br><br>70% UT for 25 cycles (on UT, 30% temporary drop)<br><br><5% UT for 5 seconds (on UT,>95% temporary drop) | or hospital environments.<br><br>If users of FY100 surgical microscopes need to operate continuously during power outages, it is recommended that the equipment be powered by an uninterruptible power supply or battery. |
| Power frequency magnetic field (50/60Hz) GB/T 17262.8 (IEC 61000-4-8) | 3 A/m | 3 A/m | The power frequency magnetic field should have the horizontal characteristics of the power frequency magnetic field in typical commercial or hospital environments. |
| Note: UT refers to the AC network voltage before applying the test voltage. | | | |

Guidelines and manufacturer's declaration - Electromagnetic immunity

| The SM610/SM620 surgical microscope is expected to be used in the following specified electromagnetic environment, and the purchaser or user should ensure that it is used in this electromagnetic environment: | | | |
|---|---|---|---|
| Immunity test | IEC 60601 Test Levels | Compliance level | Electromagnetic Environment - Guidelines |
| Radio frequency conduction GB/T 17262.6 (IEC61000-4-6)<br><br>RF radiation GB/T 17262.3 (IEC61000-4-3) | 3 V (effective value) 150kHz -80MHz<br><br>3 V/m 80MHZ -2.5GHZ | 3 V (effective value)<br><br>3 V/m | Portable and mobile RF communication devices should not be used closer to any part of the FY100 surgical microscope than the recommended isolation distance, including cables.<br>The recommended isolation distance is calculated by the formula corresponding to the transmitter frequency for this distance.<br>$d=1.2\sqrt{(P)}$<br>150kHz-80MHz<br>$d=1.2\sqrt{(P)}$ 80MHz-800MHz<br>$d=2.3\sqrt{(P)}$ 800MHz-2.5GHz<br>In the equation:<br>P - Based on the maximum rated output power of the transmitter provided by the transmitter manufacturer, in watts (W);<br><br>d - is the recommended isolation |

| | | | |
|---|---|---|---|
| | | | distance, in meters (m).<br>The field strength of a fixed RF transmitter is determined by surveying the electromagnetic field a, and should be lower than the corresponding level b in each frequency range.<br>Interference may occur near devices marked with the following symbols.<br>  |
| Note 1: At the frequencies of 80MHz and 800MHz, the formula for the higher frequency band is used.<br>Note 2: These guidelines may not be suitable for all situations, as electromagnetic propagation is affected by absorption and reflection from buildings, objects, and the human body. | | | |
| Fixed transmitters, such as base stations for wireless (cellular/cordless) telephones and ground mobile radios, amateur radios, AM and FM radio broadcasts, and television broadcasts, cannot accurately predict their field strengths in theory. To evaluate the electromagnetic environment of fixed RF transmitters, consideration should be given to the investigation of electromagnetic sites. If the measured field strength of the location where the equipment is located is higher than the applicable RF compliance level mentioned above, the equipment should be observed to verify its normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or repositioning the equipment. Within the entire frequency range of 150kHz to 80MHz, the field strength should be less than 3V/M. | | | |

Recommended isolation distance between portable and mobile RF communication equipment and FY100 surgical microscope

<table>
<tr><td colspan="4">The FY100 surgical microscope is expected to be used in an electromagnetic environment with controlled radio frequency radiation disturbance. Based on the maximum rated output power of communication equipment, buyers or users can prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication devices (transmitters) and FY100 surgical microscopes as recommended below.</td></tr>
<tr><td>Maximum rated output power of transmitter W</td><td colspan="3">Isolation distance corresponding to different frequencies of the transmitter/m</td></tr>
<tr><td></td><td>150kHz - 0MHz<br>$d = 1.2\sqrt{(P)}$</td><td>80MHz - 800MHz<br>$d = 1.2\sqrt{(P)}$</td><td>800MHz - 2.5GHz<br>$d = 2.3\sqrt{(P)}$</td></tr>
<tr><td>0.01</td><td>0.12</td><td>0.12</td><td>0.23</td></tr>
<tr><td>0.1</td><td>0.38</td><td>0.38</td><td>0.73</td></tr>
<tr><td>1</td><td>1.2</td><td>1.2</td><td>2.3</td></tr>
<tr><td>10</td><td>3.8</td><td>3.8</td><td>7.3</td></tr>
<tr><td>100</td><td>12</td><td>12</td><td>23</td></tr>
<tr><td colspan="4">For the maximum rated output power of transmitters not listed in the above table, it is recommended to isolate the distance d in meters (m), which can be determined by the formula in the corresponding transmitter frequency column. Here, P is the maximum rated output power of the transmitter provided by the transmitter manufacturer, in watts (W).<br>Note 1: At the 80MHz and 800MHz frequency points, the higher frequency band formula is used.<br>Note 2: These guidelines may not be suitable for all situations, as electromagnetic propagation is affected by absorption and reflection from buildings, objects, and the human body.</td></tr>
</table>

★ Design or specifications are subject to change without notice.

**19.【**Special Explanation**】**

Our company may provide circuit diagrams, component lists, annotations, calibration details, or other necessary information to assist qualified technical personnel in repairing equipment components designated by the manufacturer as repairable, as required.

If you need to inquire about relevant information, provide relevant services, or have any questions, please contact our authorized distributor or directly contact the manufacturer.

Our company reserves the right to modify the machine design, product technology or accessories, user manual, and machine packaging content at any time without prior notice. The product is subject to the physical object, and the final interpretation rights belong to Guilin Yikeshi Medical Instrument Co., Ltd.

If the installed equipment needs to be transported or moved over a short distance, all movable parts in the equipment should be locked tightly, and the equipment should not tilt more than 10 °. If the equipment needs to be transported over a long distance, it should be repackaged before being transported. If the storage period of the equipment exceeds 5 years, please contact the manufacturer or authorized distributor to retest the equipment.

Equipment scrapping shall be handled in accordance with local environmental protection laws and regulations, please do not pollute the environment. First registration software release version: FY100_ V1.

**20.【Shipping List】**

| No. | Item | QT | Notes |
|---|---|---|---|
| 1 | Surgical microscope | 1 | Packaging with dispersed components |
| 2 | Power cord | 1 | |
| 3 | toolkit | 1 | Including 1 set of Allen wrenches, 1 cross screwdriver, 1 flat |
| 4 | Fuse tube | 2 | |
| 5 | Dust cover | 1 | |
| 6 | Zoom knob disinfection cover | 2 | |
| 7 | Pupil distance adjustment knob disinfection cover | 2 | |
| 8 | Locking knob large disinfection cover | 1 | |
| 9 | Locking knob small disinfection cover | 3 | |
| 10 | Adjusting knob disinfection cover | 3 | |
| 11 | Certificate of conformity | 1 | |
| 12 | instructions | 1 | |
| 13 | Warranty Card | 1 | |

Production date: see label

Product service life: 15 years

Compilation date of the manual: 2023.9.10 V1.0


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