



GIÁM ĐỐC
Phạm Tiến Chuyên

LED Operating Light

Operating instructions



1. General

1.1 Introduction

The General purpose description of led operating light can be described as:

1.1.1 Surgical operating illumination in the hospital. In particular, the operating light is available to the requirements of sterilization and purification surgical wards. Besides, illumination for encephalic, thoracic operating,

1.1.2 Operating illumination used in Laboratory.

operating, maintenance and troubleshooting of mermaid- series of operating light. (that can be simply LED) There is written description on wall and mobile products.

The special features of LED Light are:

- Balancer will make light body's balance stable and reliable.
- The device ensures that illumination degree of operating light is permanently efficient, excellent depth of illumination and low shadow level.
- Streamline design with lower air damp coefficient can be used in high-demand purifying operating room.
- Suitable light and color temperature provides high-quality optics performance.
- By means of controller device you can adjust operation conditions of operating light, such as light intensity and size of the operative field.
- Auto-monitoring computer program will track the whole process of using the device.
- Independent electrical system of combination products will improve device's reliability.

1.2 General information

- Manufacturer isn't responsible for any malfunction, physical destruction, and personnel damage or quality difference caused by improper use or maintenance due to user's inobservance of advised schemes. Under the circumstances that electrical and mechanical protection equipments have some deflection or provisions on maintenance procedure are disobeyed, operating of the device is forbidden.
 - Only manufacturer or the third party appointed by it may make any change or extension of device installation or device itself. These changes must conform to valid provisions established by the local country of device and conform to general trade customs.
 - Please keep the manual in a safe place for future reading at any moment. Before using the device, you should read the manual carefully, be familiar with the operating methods and make full use of its performance.
 - If power characteristics don't conform to Provision 1 in Chapter 7 Specifications before Installing Operating Light, Mermaid series of operating light can't make the most of its efficiency, and proper function can't be guaranteed.
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1.3 Guarantee

LED is guaranteed for 12 months, starting from the date of delivery to the end user. During the expiration date, fragile components such as bulb and fuse don't enjoy free quality guarantee.

1.4 Information about product liability

LED considers itself responsible for the consequences of safety, reliability and performance of the equipment only if:

- Installation, modifications or repairs have been performed only by the manufacturer, or by an agent expressly authorized by it.
- The equipment is used in accordance with the use's manual.

1.5 Receiving inspection

Transportation risks of the device will be born by the consignee.

- The declaration on the dispute of any loss or damage during transportation must be made under the circumstance that the carrier is on spot when delivering, and the specification must be enclosed in the consignment invoice.

1.6 Product transportation and storage

The device is transported and stored in the following environment:

Ambient temperature: between -10°C and +60°C

Relative air moisture: between 10% and 75%

Air pressure: between 500hPa and 1060hPa

2. Before Operating

2.1 Range of application

- LED is a medical light for use in hospital treatment room.
- As a matter of principle, light combinations with two or three light heads should be used for more security again light failure and a better brightness of the operating field than single light head, because a failure of some components in some circumstances is still possible.

2.2 Safety information



ATTENTION!

Incorrect operation and non-observance of safety measure can cause serious incidents. Therefore make sure that you read and understood the information in your user's manual.



ATTENTION!

The Collision of supporting arms and other mechanical parts should be avoided. A serious collision could result in light being damaged or parts knocked off and falling into the

surgical area.



ATTENTION!

The sign appears on the light source parts (see 4.2)

Its meanings: When replacing a worn led diode, you should do as follow,

- must cut off electric source
- taking off the worn led diode until it cools
- replacing the same type led diode



WARNING!

Disassembling or assembling the light head, bounce of the balance must be avoided when the light head is installed or uninstalled. Strong compression strength will make the balancer string up rapidly, and therefore cause the damage of balancer parts and people. (see 6.2.3)



WARNING!

To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth point. Connection reliability of it should be achieved

The device is not suitable for use in the presence of flammable mixtures.

Do not use the device in the presence of a flammable anaesthetic mixture with air or with oxygen or with nitrous oxide.

Do not use oxygen with this system.

Don't use in the place filled with inflammable gases, anaesthetic and NO gas.

No use-serviceable parts inside, before servicing to authorized representative or manufacturer!



CAUTION!

To avoid infection or contamination with bacteria please following Hygienic preparation section.

Ensure sterile conditions during bronchial aspiration, and always use sterilizable handle.

To reduce the risk of increased bacterial growth, infection, illness, or injury from contamination, thoroughly clean, disinfection, sterilizing and dry all reusable detachable parts of the device and thoroughly dry any moisture or condensation in the tubing at the end of every treatment, following the instructions for it . (see 4.4)



CAUTION!

Electric equipment should never be left unattended when power on. Always switch off immediately after using.

Main power must be off before cleaning.

Do not use or store outside of specified environmental conditions.

Not use accessories not recommended by the manufacturer.

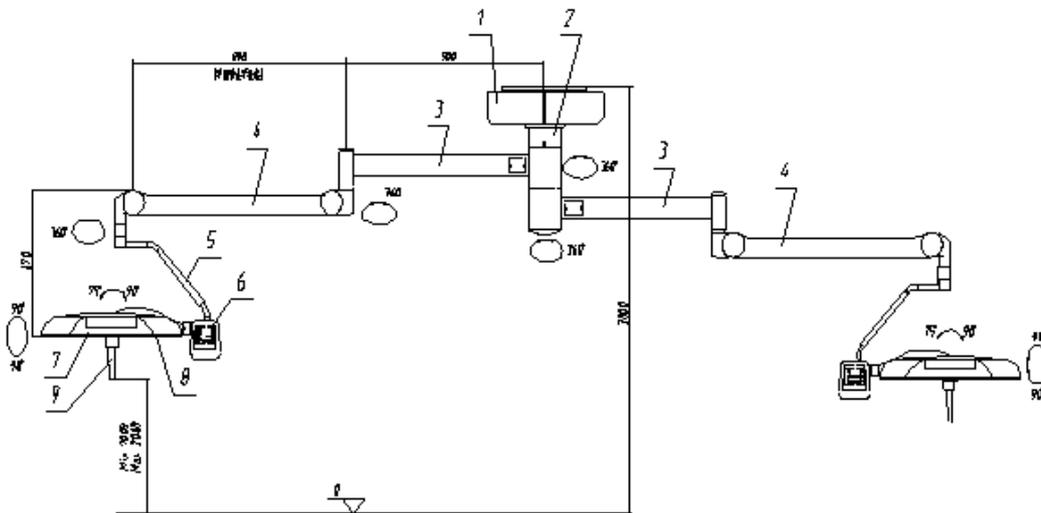
The device must be used for the designated purpose only.

DO NOT use attachments not recommended by manufacturer.

Before use, check the device for proper assembly. All parts should be seated firmly in place. Improper use of the grounding plug can result in a risk of electrical shock.

3. Components

3.1 LED 2



1.Ceiling cover

2.Drop Tube

3.Horizontal swivel arm

4.Balancer

5.Vertical gimbal joint

6.Control panel

7.Light head

8.Plastic panel

9.Sterizable handle

4. Operation

WARNING: Before operating for the first time according to the contents in the section, please make sure that operating light has been installed correctly and debugged properly

4.1 LED LIGHT CONTROL PANEL:

After the shadowless lamp is energized, the control panel will be lit, press the knob, and the shadowless lamp will be lit.

When the light goes out, the liquid crystal displays the current main luminance level and toning luminance level. Press the knob to switch you

To adjust the brightness window (the highlight window is shown in the light box), turn the main brightness clockwise

Or the color temperature increases, and vice versa.

Long press the knob to save the shutdown.

4.2 adjust focus

The shadowless lamp handle is for focusing, and the rotation handle can adjust the spot diameter.



4.3 sterilized the focus handle

Remove shadowless lamp handle (press the button on the base of your thumb), and focus the handle. Disinfection and sterilization method parameters, residue composition and treatment methods are as follows:

- ① Pressure steam sterilization (high temperature disinfection, temperature below 135 °C).
- ② Ethylene oxide gas sterilization.

(1) Sterilization procedures, including preheating, prewetting, pumping air into vacuum state, pass into the gasification epoxy ethane to the expected concentration, maintain the sterilization time, sterilization, ethylene oxide gas contained in the resolution of ethylene oxide sterilization items within the residual process, etc.

(2) 100% pure ethylene oxide or ethylene oxide mixed with carbon dioxide shall be used for sterilization.

(3) Must pass a resolution (remove residues) after sterilization, parsing time: 50 °C, 12 h; 60 °C, 8 h; Residual ethylene oxide should comply with the requirements of GB/T 16886.7. Parsing process should be in ethylene oxide sterilization cabinet, should be subject to effective input air filter (filter acuity 0.3 microns particles more than 99.6%), or in a special dun wind ark, should not be parsed by the natural ventilation method.

(4) Sterilization media residue information and treatment method: after sterilization, the residue is ethylene oxide. If the residue exceeds the standard, the analytical process can be repeated.

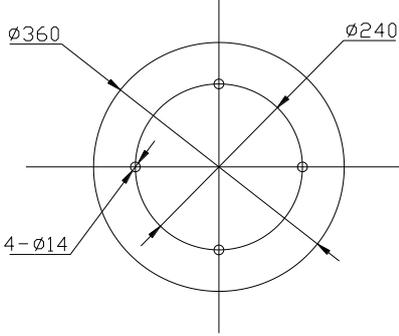
5. Safety regulations, Trouble shooting

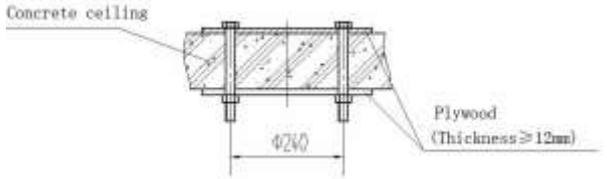
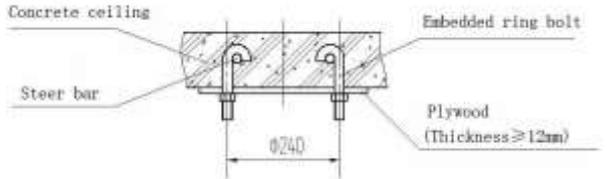
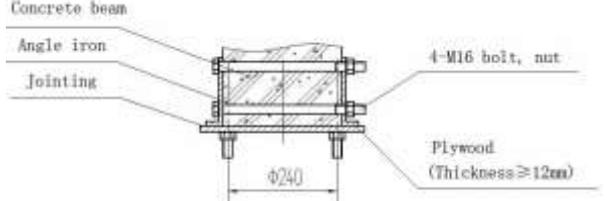
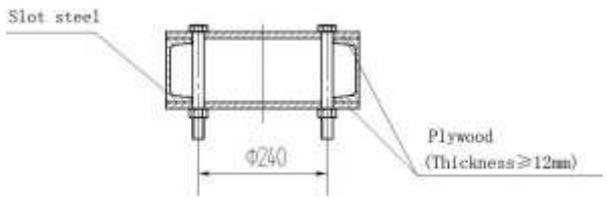
5.1 Basic requirement

Operating light is a special device hanging in the roof of operating room, and the security of basic installation is especially important. The product's basic requirement is to be capable of loading 500 kg static load, have enough rigidity, and insure bearable load and rigidity. Standard height of operating room is 3 meters.

Notice: the users are responsible for infrastructure construction and security.

Preset modes (only for reference)

Requirement description	Design
<p>5.1.1 Dimensions of preset plywood Four $\Phi 14$ holes are processed on the plywood, and hole positions are evenly distributed among $\Phi 240$ mm diameters. Plywood thickness ≥ 12mm, and the material is No.45 Steel. Plywood external diameter $\geq \Phi 360$mm, and may also be processed into square dimension ≥ 360mm.</p>	

<p>5.1.2 Ceiling plywood-type A piece of plywood is placed respectively at the top and bottom of the ceiling and it should be fixed with M12 bolt, nut, spring gasket and flat gasket. M12 bolt (with screw thread) should be longer 60mm than the plywood.</p>	
<p>5.1.3 Ceiling pre-embedding When construction is being performed on the ceiling, four ring bolts (M12) should be embedded into the ceiling, and ring bolts must be jointed with the steel bar. Position and dimension of ring bolts should be decided according to the requirements in Figure 1. M12 bolt (with screw thread) should be longer 60mm than the plywood.</p>	
<p>5.1.4 Beam joining mode The plywood should be jointed with the angle iron, and the holes should be drilled in the beam and then M16 bolts and nuts should be fixed in the beam. Four M12×60 bolts should be jointed on the plywood, and their dimensions should be processed according to the requirements in Table 2.1.</p>	
<p>5.1.5 Installation modes of channel steel Two pieces of channel steel will be installed on the wall, and the plywood will be fixed with M12 bolts. M12 bolt (with screw thread) should be longer 60mm than the plywood. Notice: The installation of channel steel must ensure that operating light won't shake when it is used.</p>	
<p>Requirement description</p>	
<p>5.1.6 Basic currency Soleplate's dimension of the company is identical with other domestic companies. If the user replaces the product, foundation board needn't be altered. If the user replaces the product, foundation board needn't be altered. For safety, the user should carefully check the intensity and status of original foundation board. If the dimension of existing foundation board doesn't conform to the dimension</p>	

<p>required by the company, the company may customize commutating board for the users.</p>
<p>5.1.7 Solutions of super-high operating room If the height of operating room is more than 3.2 meter, height-extending shelf must be installed on the plywood, and the users may order the shelf in the company.</p>
<p>5.1.8 Power cabling requirements Power requirement for operating light is (220-230V~, 50Hz, 500VA) The users must install power switch (10A) on the metope in operating room, and the power switch must cut off phase line and neutral line of the power simultaneously. Cabling position of power supply cords should be from power switch to foundation board. Secure capacity of power supply cords is 15A.</p> <p>WARNING: (1) grounding cords of the power part must be reliable. Independent safety grounding cords must be connected, and be connected with protection earth terminal of operating light. (2) Wire fixed by user has to meet the request for 227 IEC 53 (3) The power switch should comply with the standard IEC 61058-1and IEC60601-1</p>

5.2 Troubleshooting performed by the users

Phenomenon	Possible reason	Solution
Power indicator light on the control panel isn't on	Power isn't switched on	Turn on power's switch on the wall
	Power board's electrical wires are cut off	Reconnect power board's electrical wires
Power indicator light on the control panel isn't on	Fuse is burned out	Replace the fuse
Light source of operating light is glittering	Network power's voltage is too low	Install balanced power supply
Some led chip isn't light	circuit wafer spoilt	Replace the circuit wafer
Balancing force is too tight or too loose	Balancer's spring is too big or too small	Adjust balancer's spring
Revolver can't be oriented	Revolver's chassis isn't horizontal	Adjust chassis's nuts
	Damper is loose	Screw tight the damper

Light body can't be oriented	The bolts of light body rubber gasket are loose	Screw tight the bolts
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Above-mentioned troubleshooting operating should be performed according to related chapters in the manual.

WARNING:

- **When performing the troubleshooting, network power must be cut off.**
- **Repairs or adjustments must be made only by the manufacturer, or by an agent expressly authorized by it or their official authorized agent.**
- **Interference by a third party will invalidate any customer claims under our guarantee.**

6. Installation, Debugging

6.1 Packing box

Shipping list for products with above-mentioned specifications is as follows:

Product model	Packing box's name	Amount	Weight
SX -II 700	Single revolver, balancer	1	50kg
	light head box	1	22kg
SX-II 500	Single revolver, balancer	1	50kg
	light head box	1	16kg
SX-II 700 /700	double revolver, balancer	1	73kg
	light head box	2	22kg+22kg
SX-II 700 /500	double revolver, balancer	1	73 kg
	light head box	2	22kg+16kg
SX-II 500/ 500	double revolver, balancer	1	73kg
	light head box	2	16kg+16kg

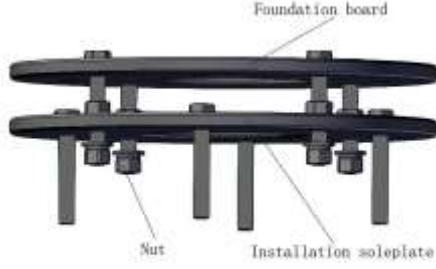
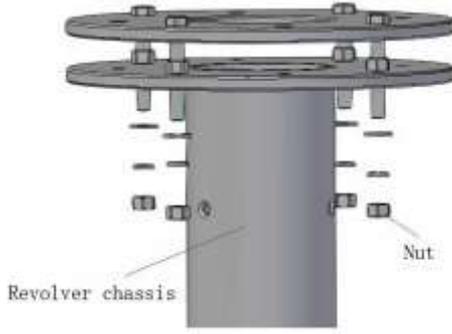
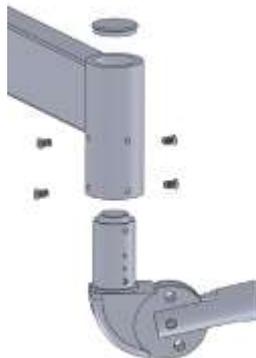
6.2 Device installation

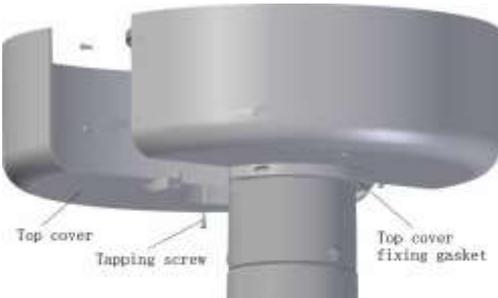
WARNING: (1) Check foundation board's status once again, and make sure its security.

(2) Check electrical connection and safety fully, and make sure its security. The installation must be performed strictly according to the following requirements and procedures.

Installation description	Design
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<p>6.2.1 Installing the soleplate</p> <p>Screw four M12 nuts into the foundation soleplate; embed four holes of installation soleplate into 4 pieces of screw of foundation soleplate, and then screw plat gasket, spring gasket and nuts. Adjust bottom nuts so as to make installation soleplate keep horizontal. Screw tight the above 4 nuts.</p>	
<p>6.2.2 Installing the Drop tube</p> <p>Screw four M12 nuts into the installation soleplate; embed four holes of revolver chassis into 4 pieces of screw of foundation soleplate, and then screw plat gasket, spring gasket and nuts. Adjust bottom nuts so as to make the revolver's chassis keep horizontal, and screw tight the nuts.</p>	
<p>6.2.3 Installing the balancer</p> <p>Remove the cover plate according to the figure, insert the rotating arm hole into the shaft end of the balance arm, tighten the screws, connect the power line according to the color, and cover the cover plate.</p>	
<p>6.2.4 Installing the light body</p> <p>Insert the shaft end of the balance arm according to the figure, tighten the screw, connect the power line according to the color, and cover the plastic cover plate</p>	

<p>6.2.5 Installation of switching power supply</p> <p>Remove the four screws on the switch power supply, install the switch power supply on the power supply rack, and fix it with four screws.</p> <p>Note: according to the wiring diagram, the switch power supply on the rotating body is firmly connected with the network power supply, and the protective grounding wire is connected. Check that the switch power supply voltage selection button should be in the specified power supply voltage gear.</p>	
<p>6.2.6 Installing the top cover</p> <p>Loosen the bolts on top cover's fixing gasket, place the top cover on the revolver, and then join the top cover with 6 tapping screws.</p> <p>Fold the top cover's fixing gasket, and embed the steps of top cover fixing gasket into the top cover's holes. Push up the top cover so as to make the top keep horizontal with the revolver's chassis or ceiling. Screw tight inner hexagon bolt of top cover fixing gasket.</p>	

6.3 Wire connection, replacing the fuse

- Cutline of power board connection
Electrical wires connection of power board should be performed according to the cutline requirements. Electrical wires connection of power board, transformer and DC input have been performed properly before leaving the factory. Connecting the network power to AC input will
- When the voltage dips for 100ms(40%), the light flickers, once removing the interference, it can restore to its normal mode by itself at once. that above phenomenon will not affect diagnosis or treatment, So user can equip uninterruptable power supply for the light.
- Power cord specification: 227 IEC 53, 300/500, nominal cross-sectional area: 1.5(mm² Cu)

- Cutline of replacing the fuse
Pull out the damaged fuse from the plugboard, and perform the replacement according to fuse specification marked in Section 2 Chapter 7 Troubleshooting of operating light in the instructions.

WARNING: Before replacing the fuse, power must be cut off.

Reference standard of sign of the protection ground :IEC 601-1-1988

WARNING: Power wires must be connected according to cutline colors.

7. Technical data

7.1 Standard model configuration

700 700(700mm+700mm Lamp Head)

700 500(700mm+550mm Lamp Head)

500 500(700mm+550mm Lamp Head)

700 (700mm Lamp Head)

500 (550mm Lamp Head)

7.2 Technical specifications for LED light

Technical specifications for lights	700 Lamp head	500 Lamp head
Central illuminance at 1m working distance	40,000~16,0000 lux	40,000~120,000 lux
Focusable light-field size at 1 m distance	160~300mm	160~300mm
Colour temperature	3400±500K	3400±500K
Depth of Focus	>140mm	>100mm
Colour Index Ra	>96	>96
Power	110-240V 50/60Hz	110-240V 50/60Hz
Effective bulb service life	>50,000h	>50,000h
Diameter of lamp housing	700mm	500mm
Installation height (Ceiling type)	290 cm	290cm

8、 Receiving inspection

Open shadowless lamp switch and check if the light is in normal operation.

1、 Check the electric dimming control panel of shadowless lamp control handle.

A Touch control panel switch and check if it is sensitive.

B Touch control panel light source button and check if it is sensitive.

2、、 Rotate the lamp holder handle, adjust the focusing surface of the light, and check whether

the light source can concentrate light at the focus. (Focusing height is 1M)

3. Rotate and pull the rotating body, balancer and lamp holder body to check whether the shadowless lamp can be positioned at each position.

9、 Operation

1、 Inspection,

A. Remove shadowless lamp handle to disinfect, then install the disinfected handle. (press the button on the base of your thumb)

B. Open the power supply switch and inspect if the device in normal operation.

2、 Procedures and methods in operation.

A. Open the power supply switch on the wall, touch the open button on the lamp holder control panel.

B. Adjust the rotating body, balancer and lamp holder position to make the device in an ideal working status.

C. Adjust the focus surface to the operating position by turn the spotlight handle, press the handle control panel, touch the switch and adjust an ideal brightness with increasing and decreasing the light illumination.

D. Press the on-off button on the control panel, turn off the device and the power supply switch on the wall when finishing the operation.

3 Warning:

The main power supply must be cut off otherwise the components will be damaged.

10、 Service

1. Shadowless lamp should be inspected annually by professional person, if any loose parts should be fastened.

2. Repairs or adjustments must be made only by the manufacturer,

Interference by a third party will invalidate any customer claims under our guarantee.

3. Our products warranty is one year.

4. The products sold by our company enjoy lifelong maintenance after the warranty period!

11、 Security;

1、 Our produced operating shadowless lamps with seven years safety performance and service life.

To ensure the safety use, we great recommended to continued use our products after the expiration of its service life, we will give the maximum discounts.

2、 The load capacity up to 500kgs to avoid the shadowless lamp falling.

3、 All connecting parts should be inspected annually to avoid any falling accidents.

4、 Output line and lead-out line should be connected correctly according to the different colors when installing the lamp lines.

(The person must have the basic professional knowledge.)

12、 Troubleshooting and repair

1、 Troubleshooting performed by the users.

Phenomenon	Possible reason	Solution
Power indicator light on the control panel isn't on	Power isn't switched on	Turn on power's switch on the wall
	Power board's electrical wires are cut off	Reconnect power board's electrical wires
Power indicator light on the control panel isn't on	Fuse is burned out	Replace the fuse
Balancing force is too tight or too loose	Balancer's spring is too big or too small	Adjust balancer's spring
Revolver can't be oriented	Revolver's chassis isn't horizontal	Adjust chassis's nuts
	Damper is loose	Screw tight the damper
Light body can't be oriented	The bolts of light body rubber gasket are loose	Screw tight the bolts

Above-mentioned troubleshooting operating should be performed according to related chapters in the manual.

WARNING:

- 1、 When performing the troubleshooting, network power must be cut off.
- 2、 Replacing shadowless lamp bulb.

Remove the disinfection handle, loosen the three connecting screws, pullout the light source components and replace the bulb.

Notice: To ensure the optical quality, we recommend to buy our company bulb without using other bulbs. Don't take the bulb by hand to avoid any fingerprints on the bulb and affect the light source.

- 3、 If the rotating parts and body can be positioned, also the lamp drifts, pls have a view of the screw.
- 4、 Informing our company;

If the device still will not work after eliminating the above faults, pls kindly contact us at the first time.

13、 Maintenance

- 1、 All the connecting parts should be inspected each month to ensure the device can work smoothly without any accidents.
- 2、 After each operation, besides the normal disinfection and cleaning, the disinfection handle also must be removed to disinfect and then install the detachable handle.
- 3、 Always wipe the lamp body with soft cloth to prevent floating dust.
- 4、 The lamp holder should be wiped with glass cleaner.

Notice: Handle、 disinfection handles and lamp panel shall not be cleaned with organic solvent.

