LED SURGICAL LIGHT
POWERLED MODEL E700/700

(version 2024-09-01)

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USER MANUAL

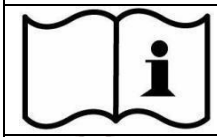
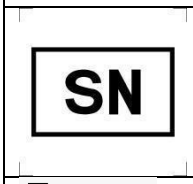
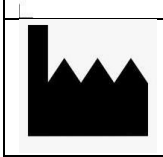
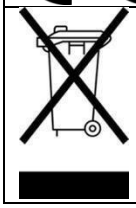
NANCHANG MICARE MEDICAL EQUIPMENT CO.,LTD

Add: No.666 Yaohu west 5th, Road hi-tech zone, Nanchang, Jiangxi, China Email: sales3@micare.cn

Web: www.micare-med.com / www.surgicallight.com / www.ledoperatinglamp.com

Symbol Explanation：

The following symbols are part of these operating instructions and/or the product label.

	**Safety warning symbol** **Caution:** Indicates a situation which, if not avoided, may result in minor or moderate injury. **WARNING:** Indicates a situation which, if not avoided, could result in death or serious injury. **DANGER:** Indicates a situation which, if not avoided, will result in death or serious injury.
Medical device	Medical device
	Instructions for use
	Instructions for use
	MICARE order reference number (item number)
	Serial number
	Manufacturer and date of manufacture
	CE marking
	This product must not be disposed of as normal household waste.

Hotline:

If you have any questions about how to handle a device or product or use it for clinical applications, do not hesitate to contact your Product Manager:
Phone: +0086-0791-88127989

For technical questions and questions regarding maintenance contracts and training, please contact our MICARE service center: sales3@micare.cn

NOTIFICATION:

To best answer your technical questions, our service technicians will require the catalog, reference number (REF), serial number (SN) and date of manufacture of the product. All this information can be found on the Ceiling Enclosure.

Notes for this document:

Possible danger to the lives of patients, users and other persons if these operating instructions are not followed!

This document applies equally to persons of all genders. References to different genders are avoided solely for reasons of readability.

Intended use
Special purpose

Operating lights may only be used to illuminate the operating or examination field.

Risk of serious injury due to electric shock!
To reduce the risk of electric shock, be sure to connect fixtures only to power systems that provide protective earthing.

Risk of injury due to unauthorized modifications to the product!
Any modification to the product may pose a danger to life due to electric shock caused by a malfunction of the luminaire. Moreover, this may cause the light to fall or the spring arm to rise sharply in response to the high spring force! Therefore, unauthorized modifications are strictly prohibited under any circumstances.

Risk of infection through contaminated system components!
Before starting any maintenance work on your lighting system, ensure that all system components have been properly cleaned and disinfected.

NOTIFICATION:

Risk of interference and malfunction:

• As a medical electrical device, the operating light is subject to special precautions regarding electromagnetic compatibility (EMC). The device must be installed and operated in accordance with EMC directives.

• Maintain separation distances.
Using a work light in combination with accessories other than those approved by the manufacturer may result in increased interference emissions and reduced noise immunity of the work light.

• The operating light should not be placed near or on other devices. If proximity to other devices cannot be avoided, be sure to check the functional reliability of the work light before using it in such an installation.

• Do not hang or route cables on or above the work lighting system.

Security Notices
General information:
MALER LED operating lights are quality products, designed and manufactured in accordance with recognized technical guidelines. Products leave the factory in completely safe operating condition. To maintain this status, you, the user, are required to refrain from or prevent any actions that could have a negative impact on the safety performance of the flashlights.

• Please read the safety instructions carefully when carrying out maintenance work!

• Be sure to follow the instructions in this document!

Be sure to follow the instructions in this document!
• Disconnect the flashlight from the power supply!
• Protect the lights and its components from dangerous contact! Place warning signs where necessary!
• Contact the manufacturer or service technician immediately!

Service works
• Any service work must be carried out:
– qualified persons specifically authorized by Micare to perform such tasks.
– in accordance with the instructions given in this manual.
– competently and with maximum accuracy
– in compliance with the relevant technical regulations, safety regulations and accident prevention regulations.

Inspection
• Check all safety related parts according to the inspection plan.

• The results should be documented in the audit plan.
We recommend regularly checking all lights functions, springs/guide arms, ceiling pipe and power supply to ensure they are working properly. Every 24 months an inspection must be carried out by an authorized person. thereby ensuring their serviceability and operational safety!

NOTIFICATION:
Only components or systems approved by MICARE as accessories may be connected, installed or secured to lighting systems.

Personal protection:
Risk of serious injury due to electric shock!


• Before starting any maintenance work, make sure that all power lines are power outage and cannot be live while working on the lights!

• The installation in the building must include a disconnect switch (for example, a circuit breaker) that allows the simultaneous and all-pole disconnection of all electrical circuits of the lights (mains supply 100-240 V, DC supply 24
-36 V) from the power source to which the lights is connected. connected The switch or circuit breaker used must comply with IEC60601-1 requirements for distances and clearances or must be CE listed.

• To reduce the risk of electric shock, be sure to connect fixtures only to power systems that provide protective earthing.

• For mobile lights with a removable power plug (power cord), free access to the socket must be provided at any time to ensure that the lights can be easily disconnected from the power source.

• The DC power supply to the lights must comply with Safety Extra Low Voltage (SELV) requirements in accordance with IEC60601-1.

• Be sure to turn off the circuit breaker on the building side before performing any maintenance on the lighting system!

• Power cables must be protected against accidental loosening or breaking at the terminals (strain relief)!

Risk of serious injury due to faulty lights!

Faulty work lights can cause harm or even endanger the lives of users and/or patients!

• Therefore, never use faulty lights!

Explosion hazard!

The operating light may only be used at a safe distance from openings or surfaces emitting or emitting anesthetic gases, oxygen or other flammable or oxidizing gases**.**

Risk of damage or injury due to heavy weight!

Some lighting system components are heavy!

Falling system components can cause personal injury and property damage.

• Never attempt to replace heavy system components that require disassembly alone, but always do so. with an assistant and, if necessary, support such components with a lifting device.

Risk of injury due to high spring force!

Spring arms whose weights (light heads or light head assemblies) are disconnected or whose transport the guard is removed, it can snap upward quickly and with great force and cause serious injury!

• Before removing the load from the spring arm, always lock the spring arm vertically or secure it first!

Risk of injury and damage due to faulty service tools!

• Make sure that the installation and maintenance aids used, such as ladders, scaffolding and lifting frames, comply with current safety regulations!

Observe national/local safety regulations!

The Medical Devices Act (MPG) and the accident prevention regulations (BGV) are important parts of the legal framework that must be observed in Germany. Be sure to comply with applicable local laws, directives and regulations!

Screw lock:

All screws installed during initial installation or replaced during inspection or conversion must be original replacement screws equipped with thread locker.
The replacement screws supplied by MICARE are coated with PA (blue polyamide coating) as a thread locker.

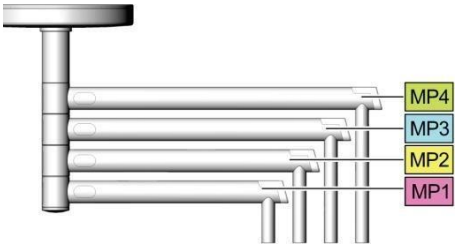
NOTIFICATION:
Danger of loose screw connections coming loose!
If screws are installed without thread locking fluid/paste, they may come out of control. time in the process of using light.

• Observe "Secure the screws with thread locker."
• When reinstalling removed screws, thread locking fluid must be used.
Screws that are susceptible to this risk are marked in this document with the following symbol.

Risk of injury from falling parts!
System parts may fall if safety screws are not tightened to the correct torque.

• Always tighten screws/nuts to the specified torque!
The components that are affected are highlighted in this document with the following symbol.

Declaration of weapons:



• The numbering of mounting locations starts clockwise from the right with MP1, next to the central potential equalization terminal.

• MP1 contains a consumer power supply on the lower tracking arm. In an example, this could be a camera on a separate bracket.

• If the configuration includes additional weapons systems (example: MP2 with illumination), then the power modules for their consumers are assigned the following mounting positions (MP2–MP4).

• The MP3 contains input terminals (120-230V) to supply power to a mains powered device.

The company constantly strives to improve its products and therefore reserves the right to supply, without prior notice, a product structure with characteristics different from those described in this manual; However, the Company guarantees that these improvements comply with applicable regulations and reserves all rights.

【Abstract】

You have just purchased an MICARE E700/500, operating light. We congratulate you on your choice and hope you are satisfied with its use and performance.

We recommend that you read this manual carefully before using the LED work light, become familiar with its operating method, and fully evaluate its effectiveness.

Please keep this manual in a safe place so that you can read it at any time. Thank you for your trust in our company.

[Quality assurance]

The user is responsible for compliance with applicable laws governing the use and maintenance of the equipment.

The company is not responsible for any malfunction, physical damage, injury or lack of quality caused by misuse or poor maintenance due to the user's failure to follow the suggested diagram.

The LED work light must not be used if the electrical or mechanical safety devices are faulty, or if the instructions for use and maintenance are not followed.

Only the Company or a third party designated by the Company may modify or expand the operating lamp itself. Such modifications must be in accordance with applicable regulations in the country of use and normal trade practice.

If there is any problem with the operating lamp, please contact the distributor or our company. We will do our best to provide you with quality service and assistance.

When you first use a surgical light, the company and your distributor will be happy to help and answer any questions you may have. delivery time is indicated in the invoice.
Under no circumstances may packaging materials manufactured by us be used for any purpose other than transportation.

The instructions in this manual fully explain the use of the LED work light.

Please send the correct warranty card back to the company within one month after installation, so that the company can effectively guarantee a 2-year free warranty on the entire work lamp and a 5-year safety warranty on all equipment. Otherwise, a free warranty period is provided. will start from the date of manufacture.
Attention: The manufacturer is responsible for the safety, reliability and performance of the equipment only if:

(1) Installation and any repairs or modifications must be carried out by qualified personnal.
(2) Job site electrical wiring must comply with all codes in effect at the time of installation.
(3) The product should avoid exposure to strong magnetic field or create strong electromagnetic interference in the environment used.

Follow the instructions:

This manual is intended to explain the operation, installation, debugging, operation, maintenance and troubleshooting of LED work lights.

The following is the meaning of this manual or the label on the outside of the equipment: Note. The

main content of the statement should be taken seriously.

Caution: Failure to comply with these instructions before performing certain operations may result in damage to the device. Warning: Failure to comply with these instructions before performing certain operations may result in equipment damage and compromise personal safety.

[Product Appearance Structure]

NO.1 : CEILING COVER NO.2: CEILING SUSPENSION WITH ARMS NO.3: BALANCE ARM NO.4: BENDING ARM NO 5: LAMP HEAD NO.6: LCD TOUCH SCREEN

[Product Name] Micare Powerled model E700/700 LED OPERATING LIGHT

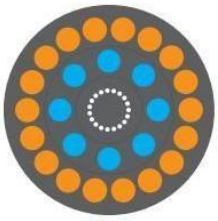
[Main technical indicators and reference data]

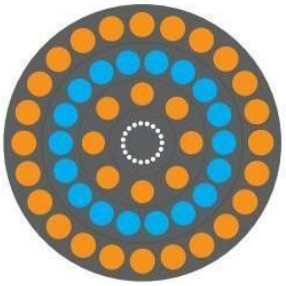
Light Intensity At (1M)	93,000-180,000/93,000-180,000 lux
LED Bulb Quantity	80PCS/80PCS
Bulb Life (HRS)	≥ 80,000
Color Temp (Kelvin)	3000 ~5500K (Adjustable)
Color Rendering Index (Ra)	⩾ 96
Color rendering index R9 (Red)	98
Light Beam Depth (MM)	1400
Diameter of Spot (MM)	150-350
Light Adjust Range	0% - 100% (12 Steps)
LED Bulb Power	80W
Temperature rise (surgical field)	⩽ 1℃
Working distance (MM)	700 -1500
Vertical movement (degrees)	⩾85°
Light head freedom of movement	≥ 4°
Voltage	AC100-240V 50/60HZ
Ceiling Height (M) (Rod length customized at request)	2.8 - 4
Back Up Battery	Optional
Sony Internal Camera (10X)	Optional
3d Arm for monitor	Optional

Basic structure and performance characteristics of the product

The basic structure of an LED work light consists of a base, a rotating arm, a balancer, an elbow and a lamp cover. The lamp head is fixed on the balancer suspension system by several lamp beads, has a stable position, can make vertical or circular movement, can meet the needs of working at different heights and angles. The elbow is an important structural part that connects the lamp base and the equalizer. The elbow can rotate on its own, creating the effect of a lamp body. The role of the balancer is to ensure that the lamp at different angles can achieve stable balance and meet the actual use. The rotary arm can change the position of parts to other positions through its own rotation to suit the operator's ease of use.

HBLED (High Brightness Light Emitting Diode); Each sublamp module consists of 10 beads, among which 6 are warm in color and shown in yellow, 4 are in cool white.





Schematic diagram of the arrangement of LEDs 700 light. Schematic diagram of the arrangement of LEDs 500 light

The brightness of the two types of beads can be controlled by PWM mode respectively to realize the adjustment of the overall brightness and color temperature. Each module is independent from each other. If one module is damaged, the others can continue to operate, reducing the impact on operation. Each module's lamp bead (warm color, cool color) is driven by one OCP2185 for constant current, and receives PWM according to the user's needs.

STC15F104E microprocessor unit (MCU) pulse width adjustment control, which can be continuously adjusted. The current flowing through each LED is about 120~320mA. The electrical circuit diagram of the LED work lamp is shown in the figure

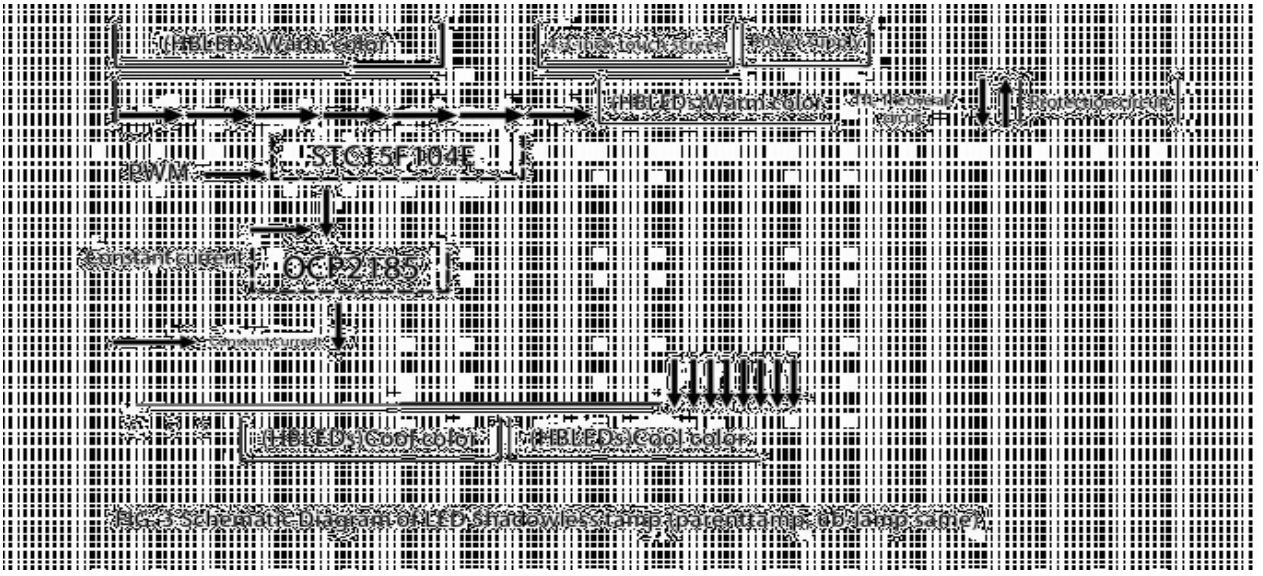


FIG. 3 Electrical circuit diagram of LED work light (main and secondary lamps are the same)

Driver fee

The drive plate is the core of the entire LED work light controller, which is mainly composed of 16 STC15F104E microcontrollers and 32-channel OCP2185 DC regulator circuit, as well as TTL communication circuit. The STC15F104E is a low-power microcontroller manufactured by Macro Crystal. Technologies. Its supply voltage is 5.5–3.8 V, which allows for low-power operation. It is suitable for many applications that require high integration and low cost, and can meet various performance requirements. All 175℃ 8 hours high temperature baking, guarantee high quality production.

The STC15F100 series microcontroller is a single clock/machine cycle (1T) microcontroller manufactured by STC. This is a new generation 8051 microcontroller with high speed, high reliability, low power consumption and ruggedness.

interference protection. It uses eighth generation encryption technology with strong encryption, and the instruction code is fully compatible with traditional 8051, but the speed is 6-12 times faster. Internal built-in high-precision radio-controlled clock, temperature drift ± 1%, temperature drift at room temperature 5‰, a wide range of 5-35MHz can be set, completely avoiding expensive external crystal vibration. Internal high-reliability reset, 8 levels of optional reset threshold voltage, can completely eliminate the external reset circuit.

The OCP2185 is a buck type constant current LED driver that can drive up to 8 1W white LEDs. The OCP2185's input voltage can range from 6V to 30V, and the output current can be adjusted using an external sampling resistor. The output current can reach up to 1A. OCP2185 can operate at high operating frequencies, up to 1 MHz, which significantly saves peripheral device size and PCB area. In addition, OCP2185 supports two dimming modes: analog dimming mode and PWM mode. OCP2185 is mainly used in MR16 lamp sockets, automotive LED lights and other LED lighting. Characteristics of the OCP2185 chip: 1. Drive output current up to 1 A; 2. 2. High precision DC current; 3. System efficiency up to 98%;

Integration of high voltage MOS with 0.25 ohm resistance; Operating switching frequency up to 1 MHz; Equipped with analog/PWM dimming function.

OCP2185 chip is used for constant current with small current fluctuations, which can fully meet the requirement of surgical light

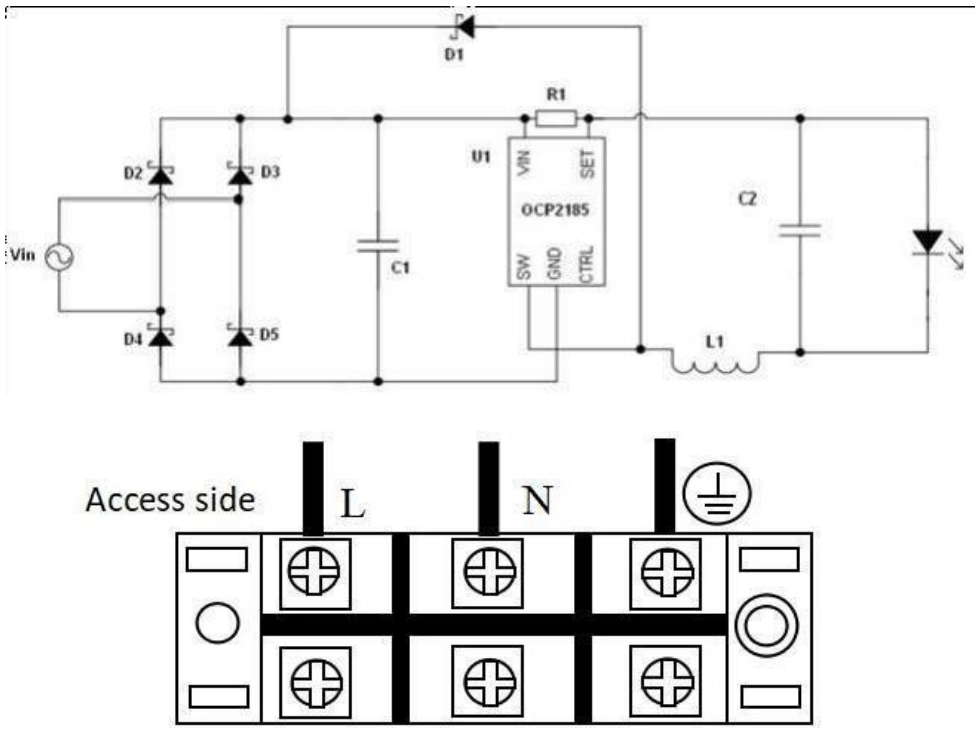
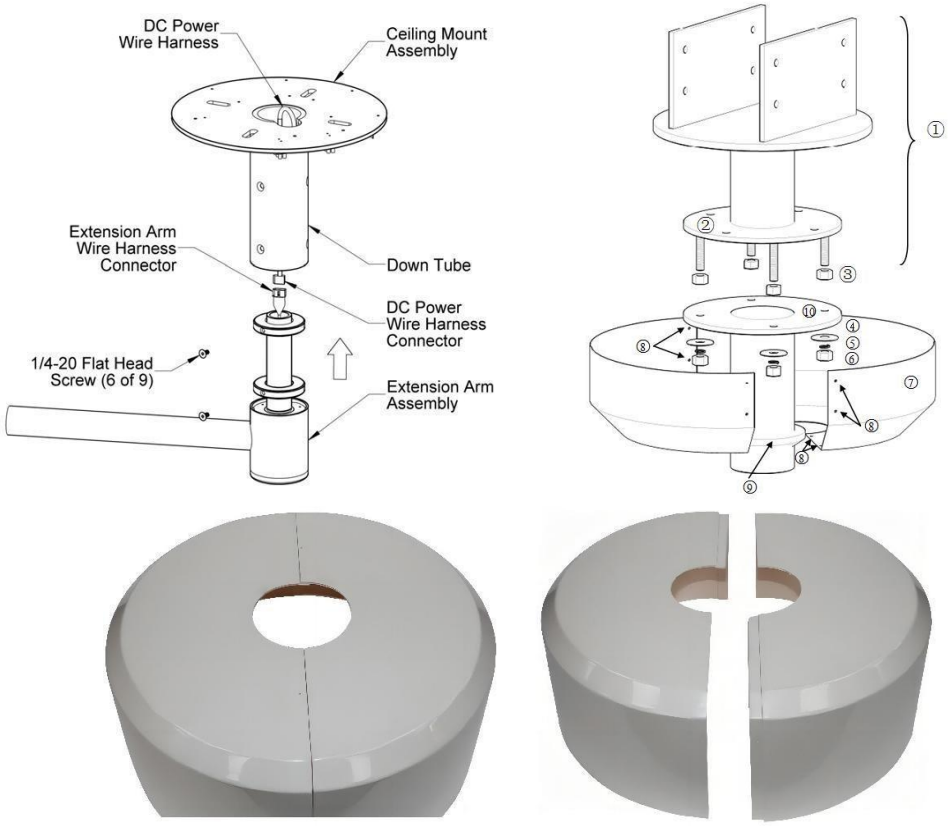


FIGURE. 4. Typical application diagrams for OCP218.

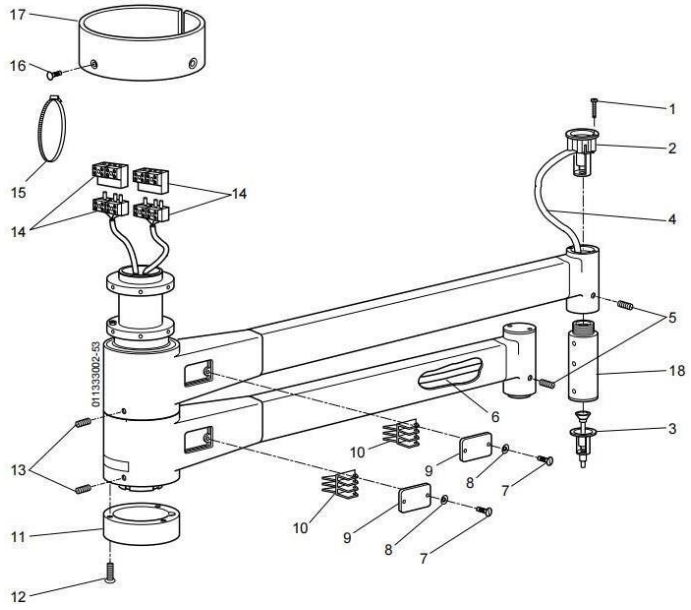
Description for each part of the light



After installing the ceiling mount assembly with two people, position the extension arm assembly under the down tube and connect the DC power harness connector to the extension arm harness connector. Next, push the arm assembly up into the down tube and line up the holes on the extension arm with the down tube. Secure the remaining six (6) ¼-20x½-inch flat head socket screws and tighten them in a circular pattern.

ADJUSTING STANDARD CONSTRUCTION (CEILING MOUNTING)

There are two types of structure adjustments:
- **Brake screw main structure**
- **Brake bearing housing**



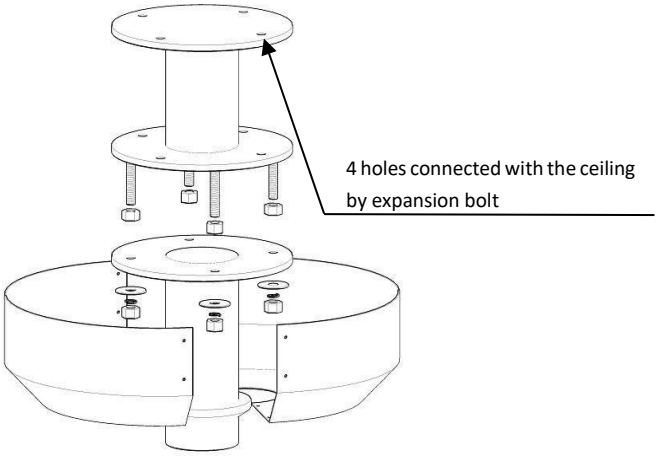
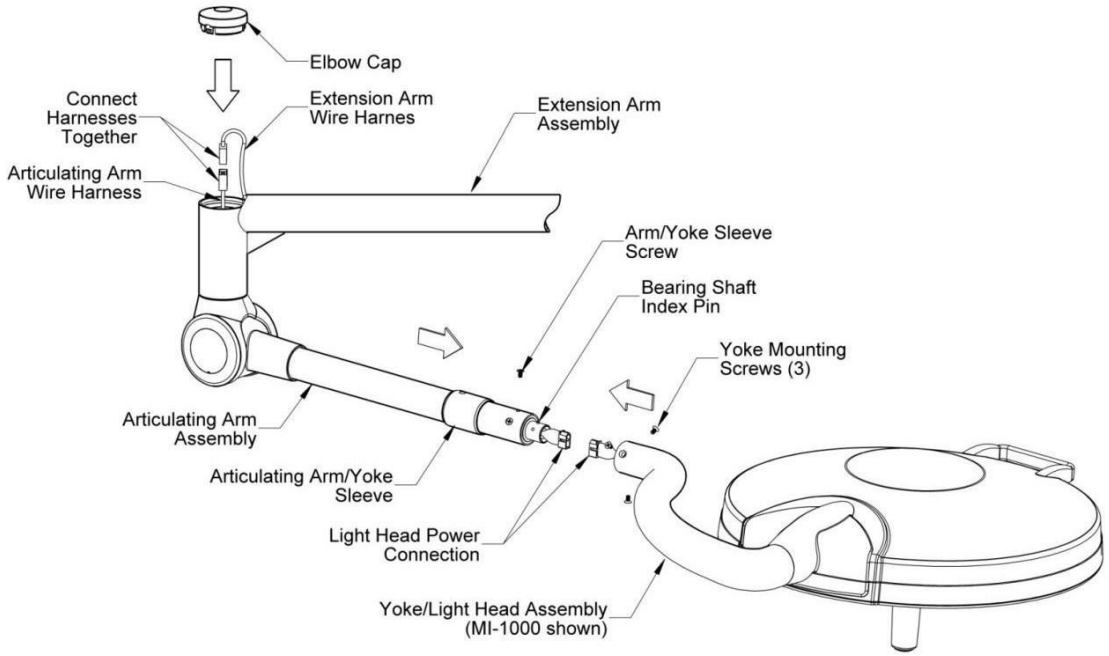


Figure 2

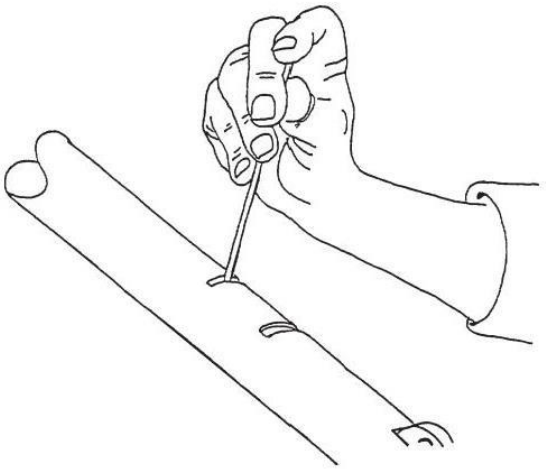
Light head installation:

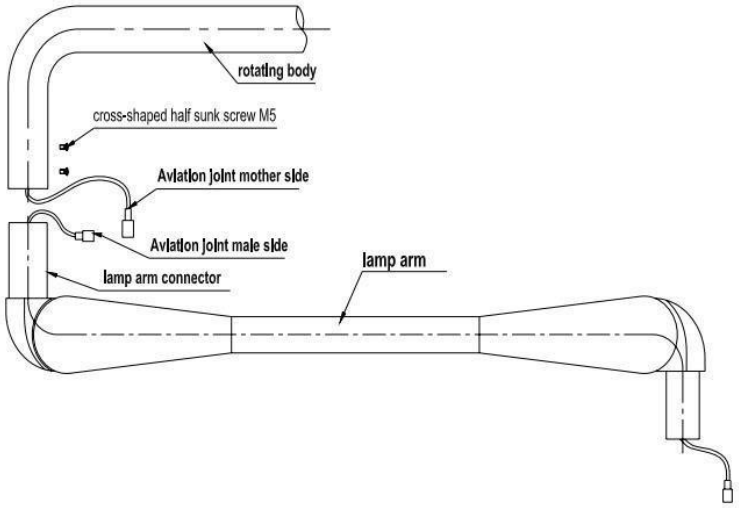


Brake screw main structure

Adjust the brake screws to prevent the levers from moving or becoming difficult to move.
- Remove the blue brake screw cover and insert a 7mm hex key.
- Increase the braking force by turning the screw clockwise.

• Reduce the braking force by turning the screw counter clock wise. When tuning; replace the cover.

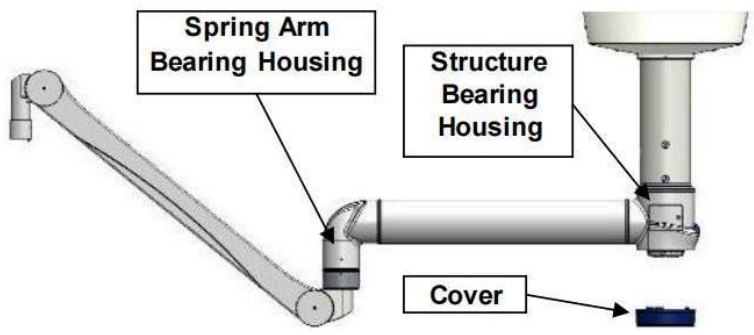




Bearing housing Brake screw (standard models)
Adjust the two brake screws that are located opposite each other on the spring arm bearing housing using a 2.5mm hex wrench.

• Increase the braking force by turning the screw clockwise.
• Reduce the braking force by turning the screw counterclockwise.
• Make sure all screws are adjusted equally.

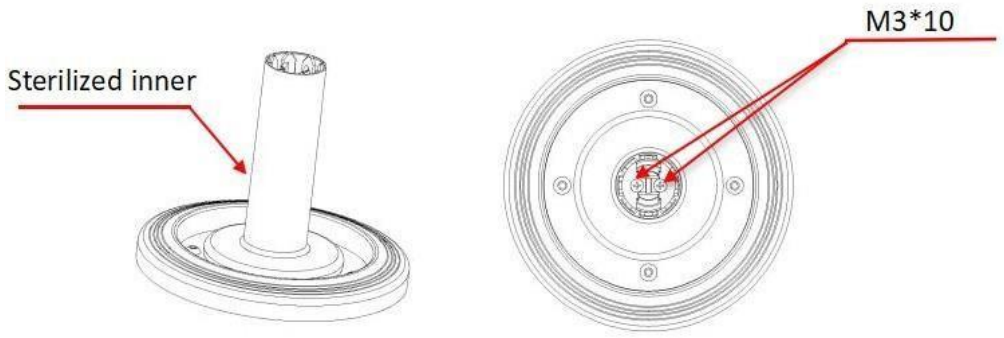
Main spindle stop adjustment (if installed)
• Remove and save the three cap screws and carefully lower the cap from the bearing housing.
• Place the cover on a clean surface, see illustration

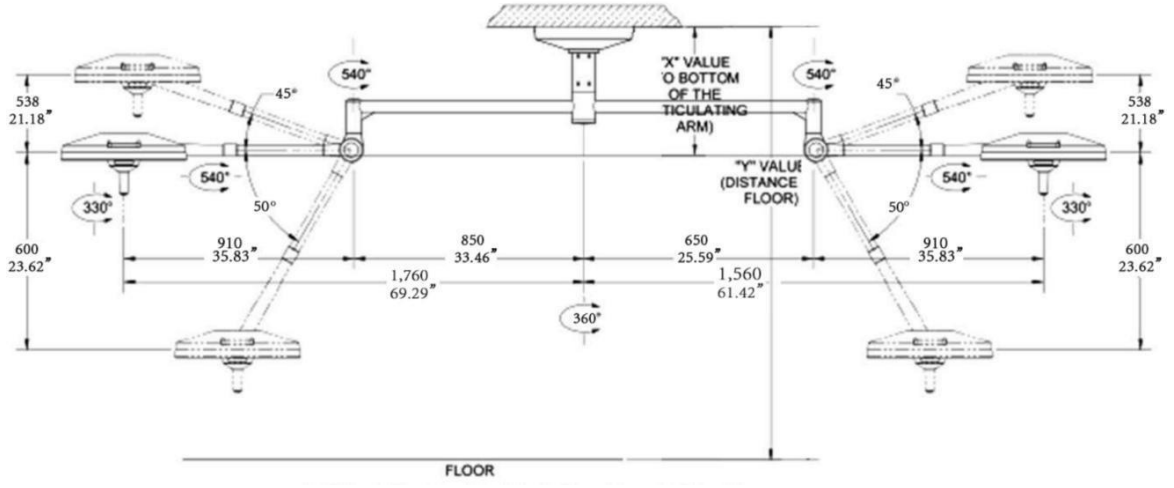


Vertical Height - Spring Arm Angle Adjustment

• Remove and save the 2 mounting screws, then use a thin screwdriver to carefully press and release the two screws. halves of the outer cover, then remove. See Figure 22

• A rod with a diameter of 4 mm and a length of 110 mm, supplied complete with a spring lever, should be inserted into the adjusting device.
hole. See Figure 23.
• Turn the adjusting nut inside the arm, moving the rod up and down as needed. For low
ceiling models
• Move up (counterclockwise) to raise
• Move down (clockwise) to decrease the height range.
• Move down (counterclockwise) to raise
• Move up (clockwise) to decrease the height range.
• After adjustment, replace the covers and mounting screws.





Installing and removing disinfection handles:
Lift the disinfectant pen clamp groove, hear a click, put the disinfectant pen in place, press the button under the handle with your thumb and remove the disinfectant pen.

Cleaning Instructions:

The front lens is made of UV-resistant polycarbonate plastic with a scratch-resistant hard coating on the outside. Clean the lens using glass/plastic cleaner or a mixture of mild soap and water. It is very important to use a clean, soft cloth to avoid scratching the diffuser. Never spray cleaning liquid directly onto the surface of the lens, but spray it onto a clean cloth and then wipe the lens.

Clean the light body and bracket using a mixture of mild soap and water. Apply this mixture to a clean cloth and wipe the head and lamp bracket. Never spray cleaning fluid directly onto the head or light bracket. Instead, spray the cleaning liquid onto a clean cloth and then wipe the head and light bracket.

Do not use harsh cleaners, solvents or detergents. Failure to do so may result in equipment damage.

The front lens is equipped with a protective hard coating to prevent scratches. Never use abrasive cleaners to clean the front lens. Failure to do so may result in equipment damage.

Do not expose the device to excessive moisture. Failure to do so may result in personal injury and/or property damage.

This product must be installed according to the manufacturer's engineer's instructions. Note:

1. During the installation process, the electrical circuit (power line must be connected to 220V AC power) and the fastening of each connecting part must be tightened (important); 2.
2. During the installation process, the level must be strictly calibrated with a level gauge (very important).
3. Customer must provide 220V/10A switch/circuit before installing the surgical light.

circuit breaker to fully protect the circuit insulation (important).

Installing the lamp socket and bracket

Once the hanger has been installed correctly and confirmed to be secure, refer to the included installation diagram. First, tighten 6 M8x16 hex head screws with S=6 wrench on the lamp crossbar to the seat and fix them firmly. Please refer to the attached picture for details.

Maintenance and repair:

The LED work light should be checked regularly by professional maintenance personnel, and the time should be indicated in Table 2 and recorded; if any problem is found, solve it according to product instructions. If the problem cannot be solved, please contact our factory in time.

T a b l e 2 .

Project	**Frequency time**
Check the fastening condition of each connecting part of the surgical light.	Every two months
Check whether the line contact of the LED work light is good.	Every two months
Check the flexibility of every moving part of the LED work light.	Every two months
Checking the light bulb and socket for reliability	Checking the light bulb and socket for reliability
Replacing light bulbs	When the backup lamp turns on (PCB B indicator lights up)

The outer surface of the LED work light (including overwritten when the handle is installed) should be in the surgical room to be cleaned and disinfected, the cleaner should use neutral household detergents and antistatic agents, can not use phenolic or iodide base or dialdehyde-based disinfectant, clean the surgical lamp, please use a soft cloth or sponge, damp cloth or detergent, do not use hard brush, wire brush, and do not use scouring powder, paint, lacquer thinner such as acid used to clean any surfaces. After using detergent, wipe down the surgical lamp. with a damp cloth and then wipe with a dry cloth.
Medical gauze is often used to remove dust from the glass surface of the front mask to improve illumination. Finally, dry all surfaces with a clean cloth.

Note:

1. To clean and disinfect the LED work light, you must first turn off the power and prevent liquid from entering the lamp;
2. Do not clean the transparent plate with a brush, wire paste or other abrasive materials.
3. Users must strictly follow the above instructions. 4. The concentrator pen must be disinfected with alcohol or ether, or used at a temperature ≤ 134℃±4℃.

Fault phenomenon	Fault phenomenon	Processing method	Note
LED work light stops working	1. damage to the lamp bulb 2. The fuse has blown.	1. Replace the lamp bulb. 2. Replace the fuse.	

The LED work light is not bright enough.	1, external voltage is low 2. Maximum brightness is not set.	1. Check the voltage with a multimeter. 2. Turn the control panel brightness to maximum.	External voltage is often unstable on the low voltage side, it is best to use a stabilized AC voltage source.
Astral lamp cap vertical no positioning	Balance spring loosens or tightens	Adjust the balance spring pressure	
The support around the rotation of the lamp holder is too tight or cannot be positioned arbitrarily.		Adjust the bracket center tube damper (marked) using an internal hex wrench (S=4), tighten clockwise until the bracket rotates properly and can be balanced and installed as desired.	
The spring arm and straight pipe are too tight or cannot be positioned freely when rotating around the bracket.		The spring arm and straight pipe are too tight or cannot be positioned freely when rotating around the bracket.	

NO.	NOW LIKE	HANDLE MENTHOD
1	Turn on the external power switch of the surgical light and the power indicator on the control panel will not light up.	1. Check whether the LED work light holder needs to be supplied with power. 2. Check the power circuit and power indicator of the LED work lamp. Either the transmitter on the balancer must be in normal contact.
2	Turn on the external power switch and the control panel switch of the LED work lamp, the illumination indicator will be on, while the fault indicator of the LED work lamp and the main and auxiliary lamps will be off.	Repair the control circuit and check the wire color connection is correct.

Note. Any electrical line failure must be repaired by qualified service personnel.

5. Storage and transportation.

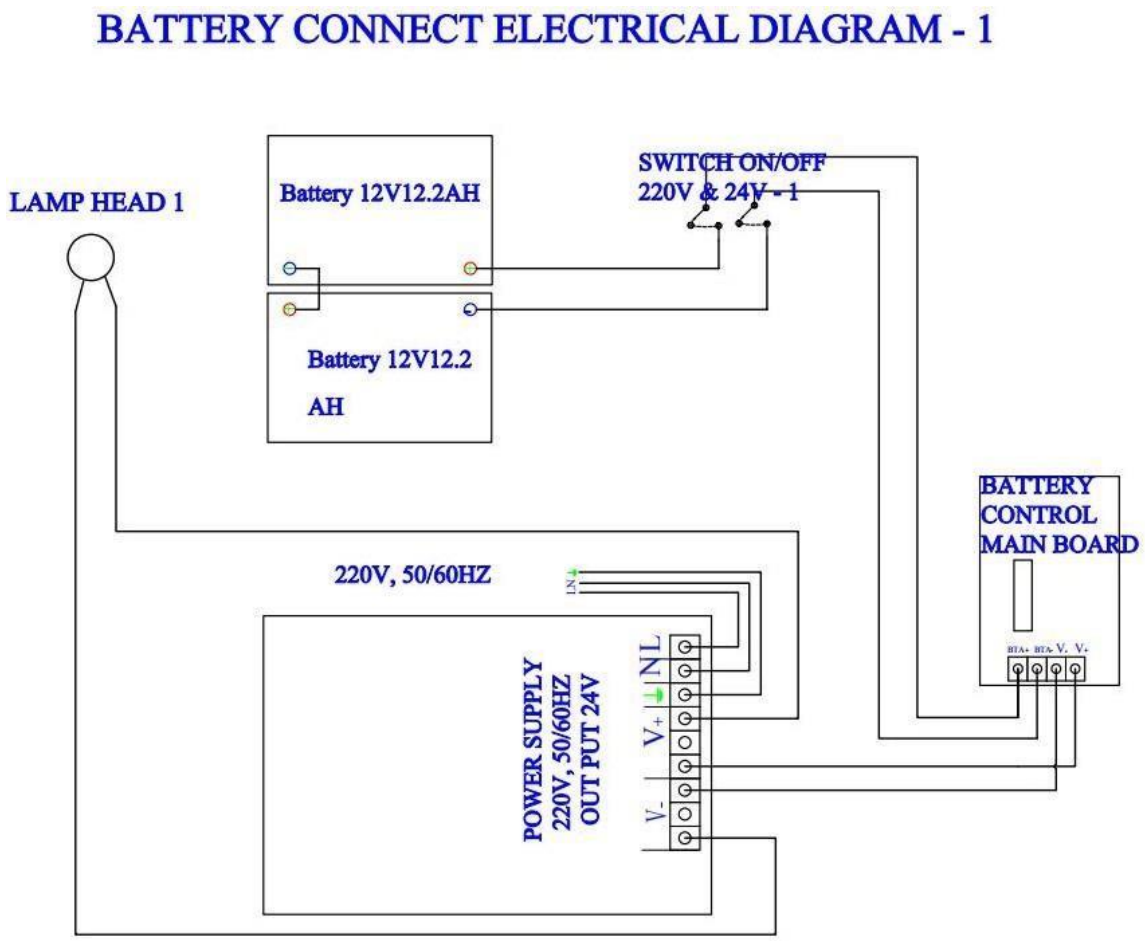
The operating bed should be transported and stored under the following conditions: Ambient temperature: -40C~55C
Relative humidity: ≤ 93%
Atmospheric pressure: 500 hPa ~ 1060 hPa.
The astral lamp is fragile, vulnerable to sharp or hard objects, scratches or damage, please use Original packaging during transportation, and let the transportation be handled by an experienced shipping agent.

6. Normal working environment.

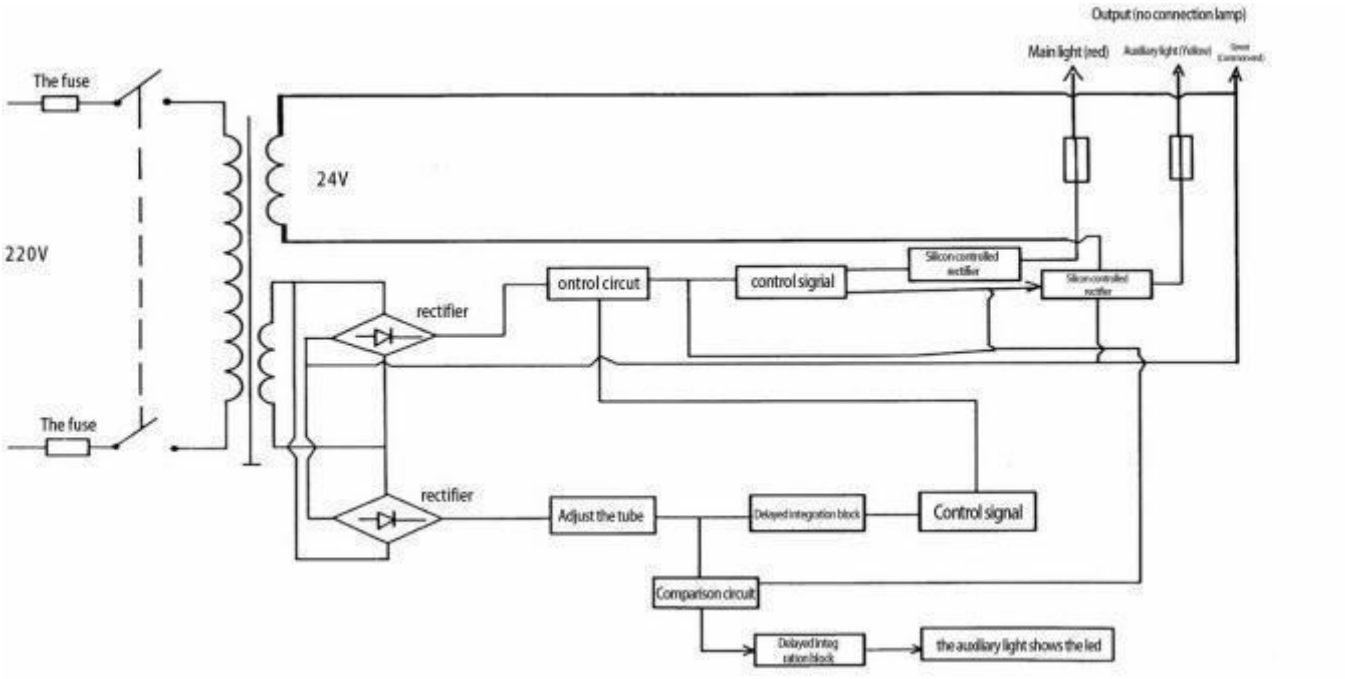
To ensure the normal operation of the operating table, the technical environmental requirements are as follows:

Ambient temperature range: 5C~40C Relative
Humidity Range: ≤80%
Atmospheric pressure range: 860 hPa ~ 1060 hPa

Battery Connect:



Safe use period:



LED work light circuit

The reflector of this product is a losing part. If the reflector cannot provide the required illumination due to aging, it can continue to be used after replacing the reflector; Other components such as mechanical welding parts coated with anti-corrosion paint or anti-corrosion oil to prevent damage caused by rust or destruction, and combined with similar products in the industry, as usual.
During use, it is recommended that the period of safe use does not exceed ten years.

Precautions, warnings and explanations.

Design, installation, debugging and operation must be carried out strictly according to the steps described in the installation manual.

When replacing a lamp, you must purchase a light bulb that matches the specifications, models, and manufacturers specified by the manufacturer. Do not use similar bulbs to avoid explosion. (Before use, please make sure the lamp specifications are correct to avoid damaging the control circuit.)

Please check whether surgical lamps are loosened frequently to prevent accidents.

Please do not remove the surgical lamp and control circuit without factory permission.

This surgical lamp is safe for ten years and comes with a one-year free warranty (except for the bulb, which is susceptible to damage). Damage caused by improper use of the lamp is not covered by the free warranty and the product is provided with lifetime maintenance.

Astral lamp items other than equipment are strictly prohibited.

To ensure the normal use of surgical lamps, non-professional personnel are prohibited from removing or replacing the filter, and the lamp holder body is strictly prohibited from being opened.

Packing list (Double Ceiling Mounted)		
Serial number	**Name**	**quantity**
1	**Ceiling Rotating Body + Suspension Arm**	**1 Set**
2	**Celing Cover**	**1 set**
3	**Base round bracket**	**1 set**
4	**Balance arm**	**2 set**
5	**Lamp heads**	**2 set**
6	**Sterilizing handles**	**8 set**
7	**Instruction manual**	**1 Pcs**
8	**M5×10 screws**	**2 Pcs**
9	**M4×10 Self-tapping yarn**	**5 Pcs**
10	**3mm、4mm、5mm Hexagonal spanner**	**One each**
11	**M12×70 bolts**	**2 Pcs**
12	**M12nuts**	**10 Pcs**
13	**Phillips, flat-head screwdrivers**	**One each**
14	**M8×15 Pushing thread**	**1 Pcs**