HF-280CLED

LED operating lamp

Operation, Installation and Maintenance Manual (Technical Specifications）

Manual Issued date:April 25, 2024

Content

1. INTRODUCTION

1.1 YOUR QUALIFICATION AS USER

- **For trained technical staff only**

The LED operating lamp and these operating instructions are intended for medical and technical staff in the hospital and doctor's office who are familiar with the work involved from their medical training and hold a licence to that effect (in states where such a licence is required by law).

- **Adjustments to be carried out by trained service technicians only**

The work in the "Adjustments" section must be carried out by one of the service technicians in compliance with the safety information.

- **Cleaning to be carried out by trained cleaning staff only**

The equipment must only be cleaned by trained cleaning staff.

Please read through these operating instructions carefully before using the equipment. This will allow you to take advantage of all the benefits offered by this new item of equipment and to protect yourself and others from any harm.

PS: Please pay attention to the electromagnetic interference between the device and the device.

1.2 INSTRUCTIONS OF SAFE OPERATION

- **Use only after proper installation**

These operating instructions only apply after proper installation in accordance with the applicable installation instructions and proper commissioning by the authorized installation engineer. These operating instructions are not a replacement for training the user in the safe use, function, operation and care of the equipment.

- **Comply with safety instructions**

The equipment's construction and design are state-of-the-art and it is safe to use when operate in accordance with all the instructions and safety information contained in these operating instructions.
However, the equipment can constitute a hazard, in particular if it is operated by inexperienced staff or those with insufficient training, or if it is used incorrectly, in beach of the safety instructions contained in these operating instructions or not in accordance with its intended use.

- **In case of problems**

If you encounter problems which are not covered by these operating instructions, you should immediately call for the after-sale service for your own safety and that of your

patients.

1.3 PRODUCT DESCRIPTION AND APPLICATION

The product consists of light source and light stand. It is applicable in the operating room and treatment room for local illumination of the patient's surgery or examination area, main for surgical assisted illumination. It is a lighting fixture that does not have an automatic fail-safe function.

1.4 NOTICE

Light allergy disabled this product

1.5 WORKING PRINCIPLE

An LED secondary light-emitting tube is installed in each of the lamps, and the light of the secondary light-emitting tube is irradiated onto the convex mirror and then projected onto the illuminated surface. The convex mirror is the key component of the lamp. According to the surgical requirements, the dimensions of each part of the convex mirror are determined after precise optical calculation. The light passes through the aluminum shell that absorbs the heat of the diode, and then the convex mirror reflects the light to one meter to form a very bright cold spot. The doctor can clearly locate the spot in the diagnosis or treatment area.

1.6 PRODUCTION DATE

Please refer to the product label

1.7 WARRANTY

2 years

2. Important information for the operator

2.1 Security features

Trained personnel: The cleaning and disinfection of the LED operating lamp described in Section 13 must only be performed by trained cleaning personnel.

Trained service personnel: Inspection and maintenance work in Section 14 must be performed by trained service personnel only.

Maintenance, Repair, and Replacement: The manufacturer is legally responsible for the

safety of this equipment only if maintenance, repair, and replacement of the equipment is performed by the manufacturer or its representatives in accordance with the manufacturer's guidelines.

2.2 Training Responsibilities

Train users:

Use these operating manuals as a basis for training personnel on equipment operation, cleaning and care.

2.3 Retrofits and modifications

Unauthorized Alterations and Modifications:

For safety reasons, unauthorized modifications and modifications to the device are not permitted.

Unauthorized modifications and modifications to the equipment will void the manufacturer's warranty. The manufacturer is not liable for damage or damage caused by unauthorized alterations and modifications or the use of non-original spare parts.

Use original spare parts only: Use only original spare parts!

2.4 Safety instructions for the environment

Disposal of packaging materials:

The removed packaging materials should be disposed of in accordance with the national environmental protection requirements.

Disposal of equipment:

When the equipment has reached the end of its useful life, it must be taken out of service. The dismantled equipment should be classified according to the different materials of the product components.

⚠ **WARNING: First cut off all power to connected equipment before dismantling the equipment.**

3. Technical characteristics of LED lighting system

3.1 LED lights

LED operating lamp uses an innovative light source, namely LED (Light Emitting Diode).

Average service life:

LED lights have an advantage over conventional halogen or gas discharge lamps in that they have a very long service life.

Low heat production:

The bigger advantage of LEDs is that they generate less heat because they don't emit IR (infrared rays) or UV (ultraviolet rays), which can be irritating to the skin.

Extremely low failure rate:

By using a large number of LEDs, the lamp head has a very low failure rate, the failure of a single LED will not impair the function of the lamp head.

3.2 Technical parameters

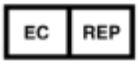
Electrical characteristics	
Content	HF-280CLED
Input power	50VA
LED bulb power rate	3.2V/1W
LED bulb quantity	19
Main fuse	F1.5AL250V
Power voltage	AC110-240V
Power frequency	50/60Hz
Technical data	
Rated illuminance	≥50,000lx
Color temperature	4000K±500K
Spot diameter	150mm
Total irradiance	Not over 1000W/m^2（Note that irradiance may exceed 1000W/m^2 in areas where several lamp caps overlap lighting）
Illuminance depth	20%:≥1500mm
Spot distribution	Spot diameter between 150mm,when edge illuminance reaches 50% of the center illuminance light, the diameter d_{50} should not be less than 50% of spot diameter d_{10}.
CRI	85≤Ra≤100
The ratio of irradiance to illumination	Irradiance Ee to illuminance Ec ratio should not exceed 6mW/(m^2lx)
Mechanical characteristics	

Content	HF-280CLED
Lamp head rotates around the bend tube	150°
Balance arm swings up and down	80°
Rotating body rotates around the fixed base	360°
Balancer rotates horizontally	360°
Lamp head rotates around the balancing arm	90°

4. Compliance description

4.1 Symbols of security requirements and their meanings

Symbol	Implication	Symbol	Implication
~	Alternating current	N	Permanent installation of intermediate connection points for equipment
	Refer to the instructions for use		Follow the operating manual note: "Follow the operating manual" on the device
	Package symbol, fragile, handle with care		Package symbol, keep the way up, it shows the correct upright position of the distribution packages for transport and storage.
	Package symbol, keep away from rain		Package symbol, do not roll over the package during transportation.
	Package symbol, stacking limit by number, it shows the maximum number of identical transport package which may be stacked on the bottom one, where “n” is the limiting number.		Package symbol, the package shall be stored, transported, and handled within temperature limits.
	Attention! Refer to the instruction		General warning symbols

	Mind Your Head		Non professionals are prohibited from dismantling
Class I	Equipment that relies on basic insulation and additional safety precautions for connecting protective grounding conductors to accessible parts	IPX0	The degree of protection against ingress of liquid is classified as ordinary equipment
⚠ WARNING	The operator SHOULD operate in accordance with the instructions under the symbol, otherwise it may cause personal injury.		Warning of electric shock that may cause serious injury or even fatal injury
CAUTION	The operator SHOULD operate in accordance with the instructions under the symbol, otherwise it may cause product failure, damage or affect the use.	 Prohibited	Operation prohibited by the operator
	This is used to indicate an action that must be performed		This symbol is used to identify the manufacture’ s series number
	CE Mark		This symbol is used to indicate the name and address of the manufacturer.
	Authorized Representative in the EUROPEAN COMMUNITY		Use-by date

4.2 Product Standards

Execute the product technical requirements of this product

4.3 Mandatory standards

The product fully implements GB9706.1-2020 "Medical Electrical Equipment Part I: General Safety Requirements" (equivalent to IEC601-1 "Medical Electrical Equipment Part I: General Safety Requirements") and industry standard YY 9706.241-2020 Medical Electrical Equipment No. 2-41 Part: "Special Requirements for Basic Safety and Basic Performance of Shadowless operating Lamps and Diagnostic Lighting Lamps"

5. TRANSPORT AND STORAGE

5.1 Ambient temperature: -40℃～+55℃

5.2 Relative humidity: ≤93% Indoor without corrosive gas and good ventilation.

5.3 Atmospheric pressure: 860hPa～1060hPa

6. ENVIRONMENT SAFETY

6.1 Disposal of packaging materials

The removed packaging materials should be disposed of in accordance with the national environmental protection requirements.

6.2 Disposal of equipment

The service life of LED operating lamp is 5 years. In order to ensure the safe use of the product by the user, please replace it after five years.

When the equipment has reached the end of its useful life, it must be taken out of service. The dismantled equipment should be classified according to the different materials of the product components.

⚠ WARNING: Cut off all power to connected equipment before dismantling the equipment.

7. PRE-INSTALLATION INSTRUCTION

7.1 Normal working conditions:

Power supply voltage: AC110-240V; frequency: 50/60Hz;

Working temperature: 10 ℃ ~ 30 ℃; relative humidity is not more than 80%;

Standard installation height: 2.4-2.9m.

The lamp head uses 24V extra low voltage.

The degree of protection against electric shock is no applied parts. Working system: continuous operation. It is a malfunction light.

Other models are permanent fixed installation equipment. They cannot be used in the environment of flammable anesthetic gas.

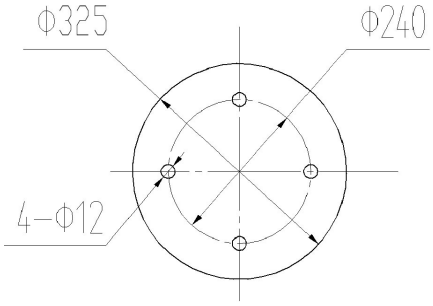
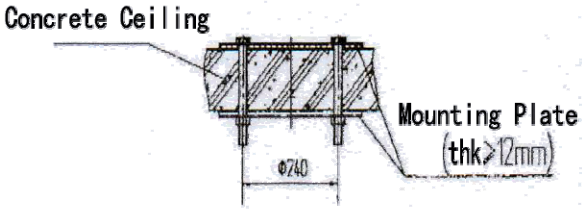
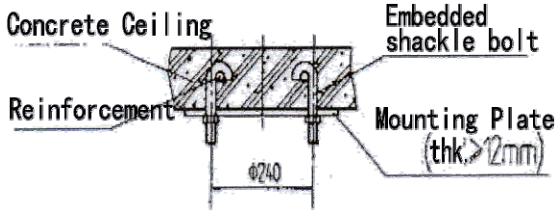
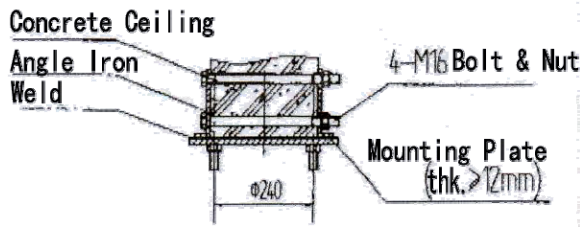
7.2 Basic requirements

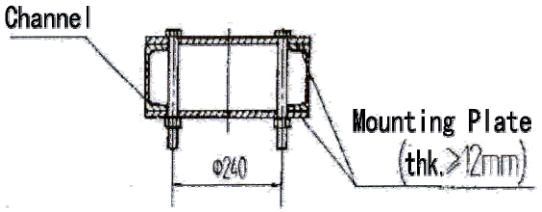
It is a special device fixed on the roof of the operating room, and the safety of the foundation placement is particularly important. The basic requirement of the company's products is that it can carry a static load of 500 kg and have sufficient rigidity to ensure that it can bear the load and rigidity.

The standard height of the operating room is 3 meters.

⚠ Note: Foundation construction and its safety are the responsibility of the user. Users must install AC110-240V power supply double-way cut-off switch on the wall.

7.3 Precast Method (for information only)

Description of Requirements	Sketch
7.3.1 Dimension of Precast Mounting plate Fabricate four Φ14 holes on mounting plate. These holes shall be equally distributed around the center of a circle in diameter Φ240. Mounting plate: thickness ≥12mm, steel grade 45, outside diameter≥.Φ325mm (or ≥325mm if it is fabricated as a square plate)	
7.3.2 Mount through on-ceiling mounting plate couple Place and secure two mounting plates on both top and bottom surface of ceiling with M12 bolts, nuts, spring washers and flat washers. The threaded part of each M12 bolt shall be 60mm higher than the surface of mounting plate.	
7.3.3 Mount through embedded part in ceiling Embed four M12 shackle bolts into ceiling during construction and weld them to reinforcement. These bolts shall be located as per figure 1. The threaded part of each M12 bolt shall be 60 higher than the surface of mounting plate.	
7.3.4 Mount through beam attachments Securely weld mounting plate on angle iron, drill holes in beam, and attach plate on beam with M16 bolts. Weld 4 M12×60 bolts on mounting plate as per dimensions shown in Table 2.1.	

7.3.5 Mount through channel Install 2 channels on wall and secure mounting plate with M12 bolts. The threaded part of each bolt shall be 60mm higher than the surface of mounting plate. Note: The channels shall be arranged in such a way that during operation the shadowless operating lamp will not sway.	
Description of Requirements	
7.3.6 Versatility of Mounting Base Our base plate has the same installation dimension with those manufactured by other companies in China. There is no need to change base plate in case product will be changed. For the sake of safety, user is required to inspect the strength and other conditions of base plate before mounting on apparatus. We can also provide custom-tailored adapter plate when the existing base plate can not meet your requirements on dimensions.	
7.3.7 Solutions for Operating Room with Ultrahigh Ceiling Height If ceiling height of operating room exceeds 3.2m, an extending frame must be attached to the mounting plate. We provide custom-tailored extending frame.	
7.3.8 Wiring Requirements The power supply for shadowless operating lamp is rated at 220V±10%, 50Hz±1Hz. On the wall of operating room, the user should install main switch (T10AL-250V) and quick-acting fuse (T5AL-250V) in such a manner that the switch can cut off phase lines and zero line simultaneously. The wiring should be made from main switch to base plate with power cord rated at safe current 15A. External power line wiring should be **2.5M^2**. Refer to Figure 5 or Figure 6 for the specific requirements of the external power supply wiring emergency measures. Warning: Power supply must be reliably earthed by additional separate protection earthing line, which should be connected to protection earthing terminal of shadowless operating lamp.	

8. INSTALLATION INSTRUCTION

8.1 Preparation:

Please check the packing box according to the ordered product model, open the packing box, take out the protective packing material, and take out the parts of the LED surgical lighting.

Please check carefully according to the following packing list, if there is any missing parts, please contact our company immediately

Packing List

HF-280CLED
①Rotator*1 ②Balance arm*1 ③Lamp head*1 ④Handle*1 ⑤Service card*1、User manual*1、Qualified Certificate*1 ⑥Fuse*2

Note: Before installation, ensure that the protective packaging is intact to avoid damage or loss of equipment components.

⚠ **WARNING: Double check the condition of the foundation plate to ensure its safety.**

Fully check the electrical connection and safety to ensure its safety.

Strictly follow the following requirements and procedures for installation.

8.2 Installation(see Figure 01)

a.Fix the base on the wall first, fix the rotating body part and keep it horizontal;

b.Connect the balance arm with the rotating body;

c.Connect the balance arm with the lamp head;

Note 1: Please follow the same code to assemble the parts connection of the same set of products according to the same code, in order to prevent the parts from mismatching.

Note 2: When installing the surgical lighting, it should be carried out in accordance with the structural drawing installation diagram, and should not be changed privately.

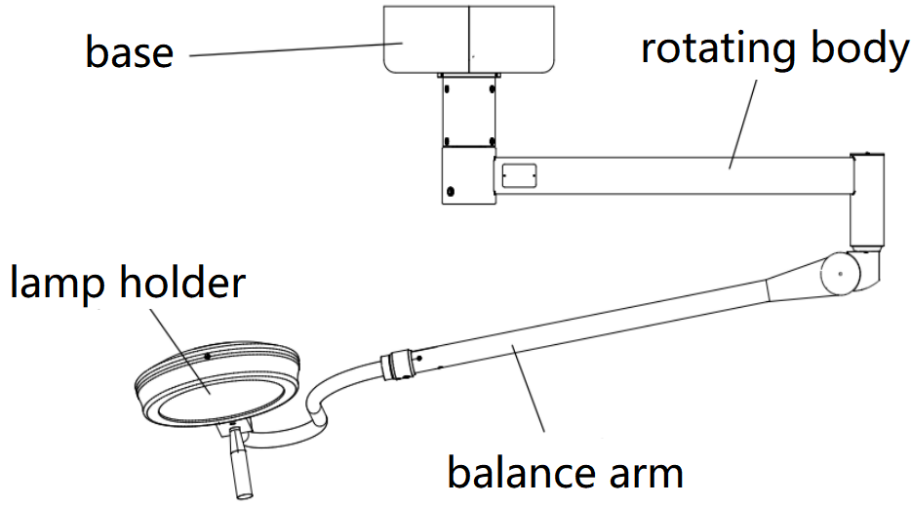


Figure 01

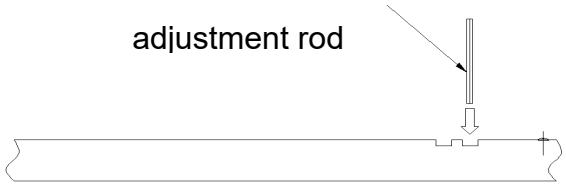
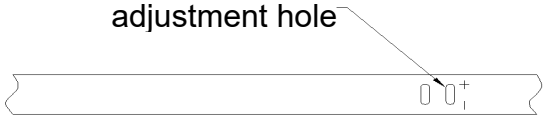
9. OPERATION INSTRUCTION

9.1. Power on use: Before surgery, plug in the power supply and the power indicator light

will be on, indicating that the device is powered on. Turn on the switch and operate it through the handle to adjust the position of the light body and the focal plane of the light spot to use.

9.2. Shutdown: After installation, debugging or use, the switch should be turned off in a timely manner, and then the power plug should be unplugged from the power socket to cut off the power supply to prevent the transformer from being in working condition for a long time.

10. BALANCE ARM REGULATION

Item	Picture	Detailed description
10.1 Adjusting the Spring Tension of the Balance Arm		Take out the adjustment rod on the reverse side of the cover to adjust the up and down angle of the balance arm, so that the adjustment hole is exposed.
		1. Insert one end of the adjustment rod into the adjustment hole, and rotate the adjustment hole clockwise according to the position of the balance arm in this picture (there is a + - mark on the balance arm, adjust in the + direction) 2. After every 3 adjustments, the balance arm moves up and down to check whether it can hover normally, and if it can hover normally, reset all accessories in the above order. If you cannot hover, repeat the adjustment.

11. TROUBLESHOOTING

Trouble	Cause	Solution	Reference
Suspension/handling performance section			
Colliding with other components	Height limit setting error	Adjust height limit	Content 10#

Optical systems/lighting technology section			
The interconnecting elements of the lighting module are not lit	Electronic component failure	Call the maintenance department	——
Low illuminance	The illuminance setting is too low	Increase illuminance	9.3
The lighting area is not circular	The lamp head is not in the surgical field	Reposition the lamp head	9.3
	The lighting area is not set correctly	Adjust the focus lighting area	9.3
The light is not on	Interruption of power supply	Check the power supply, check the fuse	——
	The lamp head has been turned off by the control panel	Press the on/Off button	9.4
	Electronic component failure	Call the maintenance department	——
Sterilized part			
The service life of detachable handle is too short	Incorrect sterilization techniques	Check sterilization technique	12.2.2
The detachable handle is damaged or cracked	It has reached its service life	Change handle	12.2.2

12. CLEANING, DISINFECTION AND STERILIZATION

12.1 Cleaning

⚠ Warning: 1. It is necessary to use a suitable cleaning agent and clean it with a slightly damp but not wet cloth.

2. Turn off the main power switch on the wall within the working range of the lamp to ensure that the lamp is powered off and prevent it from being turned on again.

3. Avoid splashing wet equipment, do not wet clean the system.

4. Do not insert any objects into the holes of the device.

Note
Surface damage 1. Do not use any substances that can cause abrasion, detergents containing gasoline solvents, paint thinners, alkaline, acidic, ethanol-based (such as ethanol, propanol) or cleaning substances containing acetaldehyde. 2. Use a small amount of detergent to ensure that no liquid enters the lamp cap or suspension system

12.2 Disinfection and sterilization

12.2.1 Disinfection

⚠ Warning: 1. It is necessary to use a suitable disinfectant, and use a slightly damp but not wet cloth for disinfection.

2. Turn off the main power switch on the wall within the working range of the lamp to ensure that the lamp is powered off.

And prevent it from being opened again.

3. Avoid splashing wet equipment, and do not perform wet disinfection on the system.

4. Do not insert any objects into the holes of the device.

5. The detoxification of the lamp holder can only be performed when the lamp holder is cooled.

Warning
Harmful to health Disinfectants may contain substances that are harmful to health 1. Use only disinfectants that meet hospital health regulations 2. The operator must disinfect according to the requirements of the national authority responsible for sanitation and disinfection

Note
Surface damage 1. To avoid damage to stainless steel components, do not use disinfectants containing chlorine or halogen-based 2. To avoid brittleness of plastic components, use only low-ethanol detergents 3. Use a small amount of disinfectant to ensure that no liquid enters the lamp or suspension system

12.2.2 Sterilization of removable handles

Warning
Harm to the patient **Please replace damaged handles with cracks or deformation immediately as they may fall into the surgical wound** **The operator must clean and disinfect according to the requirements of the relevant national committee**

Removing/installing the detachable handle

Press the buttons on both sides of the detachable handle and pull the handle out.

Push the detachable handle inward until you hear the sound of the lock engaging, and then check whether the connection is firm.

Cleaning and Sterilization of the Removable Handle

You can use a weak alkaline cleaner that does not contain active chlorine, and use a cleaning cloth or a sterile cloth to wipe it clean. The cleaner must be completely rinsed off with water.

The detachable handle must be rinsed with running water prior to sterilization to initially remove contaminants.

The sterilization method of the detachable handle is steam sterilization, the pressure is 102.9kPa, the temperature is sterilized at 121°C for 20 minutes, once per operation, the detachable handle is placed vertically with the open side facing down, and it can be detached during the sterilization process. The handle cannot come into contact with other objects.

When the detachable handle is taken out after sterilization, it can only be moved when the temperature drops to room temperature, and check whether the detachable handle is damaged and the surface is cracked to prevent unqualified occurrence.

During certain inspections/inspections and maintenance, it is necessary to check the safety and functionality of your equipment.

13 INSPECTION, MAINTENANCE AND REPAIR

13.1 Do the inspection before each use as below

13.1.1 Please check whether the function button on the panel normal works well

A. 13.1.2 Under normal conditions of turning on the lights, please check whether the screws and parts are loose, and whether the joints can be with flexible rotation, to confirm whether the conduction of the lamp is defective, and whether the service life of the lamp is

overdue, etc., and it can be used only after checking the normal condition.
13.1.3 Whether the appearance of paint is damaged; (dangerous to open wounds)
13.1.4 Check if the consumables is replaced regularly, and replace it immediately if there is any crack or deformation.

Model number	Consumable	Recommended replacement cycle	Operation
HF-280CLED	Removable handle	Replace after 50-time sterilization	Please refer to 12.2.2

13.2 Annual maintenance and repair

13.2.1 Safety inspection of joints

Since the LED operating lamp is a permanently suspended device, its safety is of paramount importance. It is necessary to regularly check the status of the connecting nuts and other connecting screws on the chassis of the rotating body, and tighten them immediately if any looseness is found.

13.2.2 Electrical Safety Inspection

Check the connection status of the power line on the power board inside the top cover. If the connection is found to be loose, immediately tighten the connection screw on the terminal block. If there is oxidation, replace the connection terminal. Use a shaker to check that the protective ground wire is firmly connected.

NOTE: The above inspections are performed at least once a year.

WARNING: The mains power must be cut off for electrical inspection.

If the user signs a service agreement with the company, the company can conduct regular inspections for the user.

To avoid damage or destruction, if any damage or failure occurs, please contact the Customer Service Department immediately.

13.3 The following circumstances are exempt from liability

13.3.1 damage caused by force majeure or natural disasters;

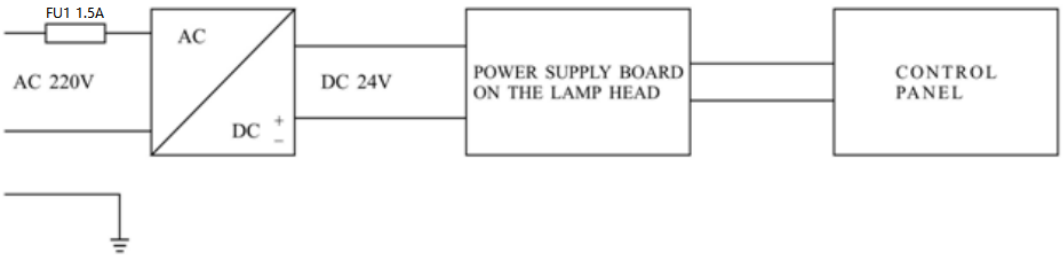
13.3.2 If the room height exceeds the (2.4-3.2M) range, it affects the use of product performance characteristics, or the grid voltage exceeds the specified range of the product, resulting in damage caused by non-product reasons;

13.3.3 exceeds the product lifespan;

13.3.4 Failure to operate, maintain or maintain the product in accordance with the

requirements of the product manual;

14. CIRCUIT DIAGRAM



15. Appendix A (PRODUCT DIAGRAM)

Appendix B (EMC)

Attention

- This HF-280CLED operating lamp meets the requirements of YY9706.102-2021 standard electromagnetic compatibility;
- Users should install and use the electromagnetic compatibility information provided by the random file.
- Portable and mobile RF communications equipment may affect the performance of this product, avoiding strong electromagnetic interference when used, such as near

mobile phones, microwave ovens, communication equipment, etc.

- The start-up and operation of this HF-280CLED operating lamp may affect the operation of other peripheral equipment electrical appliances or medical equipment. Please keep away from interference with other equipment when using.
- In addition to the cables sold by the manufacturer of the HF-280CLED operating lamp as spare parts, the use of accessories other than the specified accessories, such as cables, may result in increased emissions or reduced immunity of this lamp.
- This HF-280CLED operating lamp should not be used close to or stacked with other equipment. If it must be used close to or stacked, it should be observed to be able to operate normally in its configuration.
- The guidelines for electromagnetic radiation and the manufacturer's declaration are detailed in the table below.:
- Guide to electromagnetic radiation and manufacturer's declaration - electromagnetic emissions - for all equipment and systems

Table 1#

<table>
<tr><td colspan="3">Guide to electromagnetic radiation and manufacturer's statement - electromagnetic emissions</td></tr>
<tr><td colspan="3">This HF-280CLED operating lamp is intended to be used in the electromagnetic environment specified below, and the person purchasing or using the device should ensure that it is used in this electromagnetic environment.</td></tr>
<tr><td>Emission test</td><td>conformity</td><td>Electromagnetic environment - guide</td></tr>
<tr><td>Radio frequency emission GB 17743</td><td>1set</td><td>This HF-280CLED operating lamp uses RF energy only for its internal functions, so its RF emissions are low and may not cause any interference to nearby electronic equipment.</td></tr>
<tr><td>Radio frequency emission GB 17743</td><td>A type</td><td rowspan="3">This HF-280CLED operating lamp is suitable for use in all facilities that are not directly connected to the public low-voltage power supply network of non-domestic and residential homes.</td></tr>
<tr><td>Harmonic emission GB 17625.1</td><td>Not applicable</td></tr>
<tr><td>Voltage fluctuation / flicker emission GB 17625.2</td><td>Not applicable</td></tr>
</table>

Table 2#

<table>
<tr><td>Guide to electromagnetic radiation and manufacturer's declaration - electromagnetic immunity</td></tr>
<tr><td>This HF-280CLED operating lamp is intended to be used in the following electromagnetic environment, and its purchaser or user should ensure that it is used in this electromagnetic environment.</td></tr>
</table>

Immunity test	IEC60601 test level	Compliance level	Electromagnetic environment - guide
Electrostatic discharge GB/T 17626.2	±6KV contact discharge ±8KV air discharge	±6KV contact discharge ±8KV air discharge	The floor should be wood, concrete or ceramic. If the floor is covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient burst GB/T 17626.4	±2kV to power cord ±1kV to input/output line	±2kV to power cord ±1kV (Not applicable)	The network power supply should have the quality used in a typical commercial or hospital environment.
Surge GB/T 17626.5	±1kV line to line ±2kV line to ground	±1kV line to line ±2kV line to ground	The network power supply should have the quality used in a typical commercial or hospital environment.
Power input line voltage Suspended, short interruptions and Voltage change GB/T 17626.11	< 5% UT for 0.5 cycles (on the UT, >95% sag) 40% UT for 5 cycles (on the UT, 60% sag) 70% UT for 25 cycles (on the UT, a 30% sag) < 5% UT for 5 s (on the UT, >95% sag)	< 5% UT for 0.5 cycles (on the UT, >95% sag) 40% UT for 5 cycles (on the UT, 60% sag) 70% UT for 25 cycles (on the UT, a 30% sag) < 5% UT for 5 s (on the UT, >95% sag)	The network power supply should have the quality used in a typical commercial or hospital environment. If the user of the HF-280CLED operating lamp needs continuous operation during the power interruption, it is recommended that the LED operating lamp be powered by an uninterruptible power supply or a battery.
Power frequency magnetic field （50Hz） GB/T 17626.8	3A/m	3A/m	The power frequency magnetic field should have the characteristics of the power frequency magnetic field in a typical place in a typical commercial or hospital environment.
Note: UT refers to the AC network voltage before the test voltage is applied.			

Table 4#

Guide and manufacturer's statement - electromagnetic immunity
This HF-280CLED operating lamp is intended to be used in the following electromagnetic environment, and its purchaser or user should ensure that it is used in this electromagnetic environment.

Immunity test	IEC60601 test level	Compliance level	Electromagnetic environment - guide
Radio frequency conduction GB/T 17626.6 Radio frequency radiation GB/T 17626.3	$3V_{rms}$ 150kHz ～ 80MHz 3V/m 80MHz ～ 2.5GHz	3 Vrms 3 V/m	Portable and mobile RF communications equipment should not be used closer to any part of this HF-280CLED operating lamp, including cables, than the recommended isolation distance. This distance should be based on the formula corresponding to the transmitter frequency. Recommended isolation distance *d* =1.2 $\sqrt{P}$ *d* =1.2$\sqrt{P}$ MHz～800 MHz *d* =2.3$\sqrt{P}$ 800 Hz～2.5 GHz P is the maximum output of the transmitter provided by the transmitter manufacturer Constant power in watts (W), d is the recommended isolation distance to Meter (m) is the unit. Field strength of a fixed RF transmitter, through the investigation of electromagnetic fields Test a to determine that each frequency range b should be lower than the compliance level. Interference may occur near devices that mark the following symbols

			
Note 1: At frequencies of 80 MHz and 800 MHz, the formula for the higher band should be used. Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by the absorption and reflection of buildings, objects and the human body.			
A. fixed transmitter, such as base stations for wireless (cellular/cordless) telephones and terrestrial mobile radios, amateur radio, AM and FM radio broadcasts, and television broadcasts, whose field strength is not theoretically predictable. In order to assess the electromagnetic environment of a stationary RF transmitter, an electromagnetic field survey should be considered. If the field strength of the location where the HF-280CLED operating lamp is located is higher than the above-mentioned radio frequency compliance level, the HF-280CLED surgical lighting should be observed to verify that it can operate normally. Additional measures may be necessary if abnormal performance is observed, such as reorienting the orientation or position of the HF-280CLED operating lamp. B. The field strength should be less than 3 V/m over the entire frequency range from 150 kHz to 80 MHz.			