PANALEX-B

Operating Light

Use, Installation, and Maintenance Manual

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Shanghai, China

Published in September 2020

Contents

Chapter 1 General characteristics

1.1 General description and definitions

1.1.1 General description

The purpose of this manual is to describe the performance, installation, commissioning, operation, maintenance and troubleshooting of the surgical shadowless light. Additional written instructions are available for wall-mounted and mobile products.

Symbols on the product  : Meaning: Caution! Check the accompanying documentation.

WARNING: This product is intended for surgical lighting in medical units only and is not to be used for any other purpose. Modifications to this product or components without written authorisation from the company are prohibited.

1.1.2 Definition

The following are the meanings of the symbols used in the manual.

ATTENTION: Indicates important content that must be taken into account.

WARNING: Violation of these regulations prior to certain operations may damage the product and endanger personal safety.

1.2 Product introduction

1.2.1 Product features

1.2.1.1 Equipped with high quality balancing arms for stable and reliable balancing of the light body.

1.2.1.2 The use of advanced LEDs and high quality lenses provides the excellent optical performance to meet the illumination and colour temperature required for most procedures.

1.2.1.3 The cooling element is made of aluminium materia, making the LED light-emitting diode a much longer service life for the light source.

1.2.1.4 Sterilisable sterile handle ensure sterile manipulation of the light head during the procedure.

1.2.1.5 The electrical systems of the combined products are independent and Fail-save compliant; an electrical failure of a single light head does not affect the lighting of the other heads.

1.2.1.6 Consistant illumimnation: In the light head, is a single or 12 leds in the light module fail to go out, the leds in the other modules will continue to light up without affecting the use.

1.2.1.7 Intended use：Lighting for operating theatres to minimise shadows in the working area caused by partial obscuration by surgeons.

1.2.1.8 The surgical shadowless light is a non-failure-proof surgical shadowless light.

1.2.2 Technical data

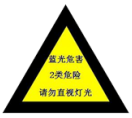
Electrical characteristics	
Model	PANALEX-B
Supply voltage	AC220V±10％
Power supply frequency	50Hz
Input power	275VA
LED bulb power	（3W/pc）×80 pcs
Performance characteristics	
Content	PANALEX single head
Central illumination Ec	160000lx（0，-15%）
Color temperature Tc	3500K-5100K
Column depth L1+L2	≥ 1000 mm
Total irradiance	≤ 600 W/m^2
Colour rendering index Ra	≥ 90
Diameter of operating field d_{10}	160 mm ≤ d_{10} ≤ 320 mm
Remaining illuminance with one mask	≥ 50 %
Remaining illuminance with two masks	≥ 40 %
Remaining illuminance with tube	≥ 95 %
Remaining illuminance with tube and one mask	≥ 50 %
Remaining illuminance with tube and two masks	≥ 40 %
Mechanical properties	
Conventional light head movement range	
Rotation of the cross arm around the fixed central axis	360°
Rotation of the balance arm around the straight tube of the cross arm	360°
Balance arm rotates up and down	90°
Light arm rotates around the balance arm	360°
Light body rotates around the light arm	180°
Camera light head movement range	
Rotation of the cross arm around the fixed central axis	300°
Rotation of the balance arm around the straight tube of the cross arm	540°

Balance arm rotates up and down	90°
Light arm rotates around the balance arm	500°
Light body rotates around the light arm	180°

Attention: The LED bulbs in the table have an average service life of 50,000 hours.

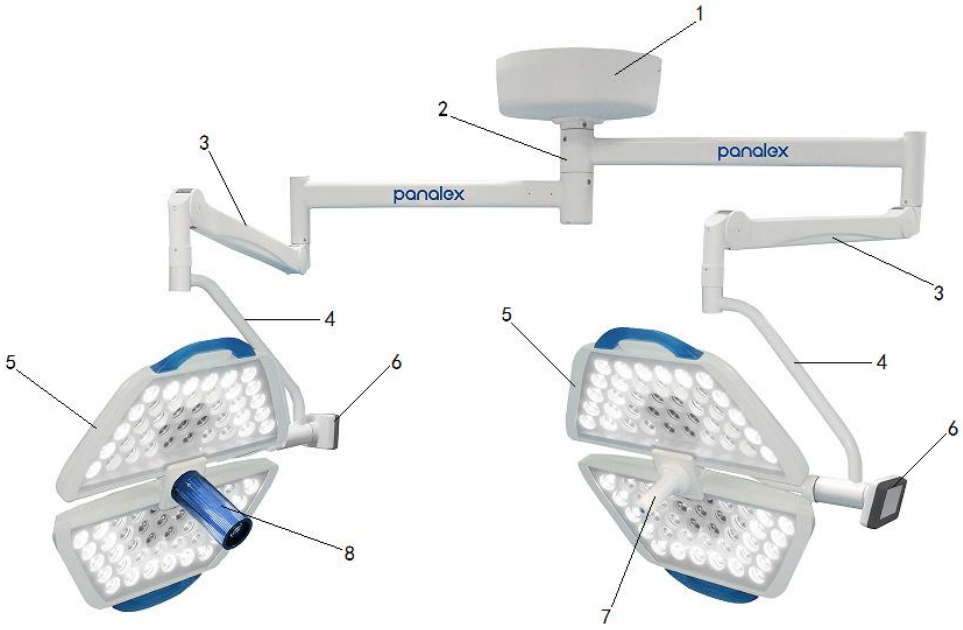
Warning: As the combined illumination of several heads of the surgical light may exceed 1000W/m^2 of irradiance in the illuminated area, the illuminated area is at risk of injury to the patient. Therefore, when using combined lighting, it is important to ensure that the maximum illumination of the illuminated area is not greater than 160,000 (Lux) and that the irradiance does not exceed 1000 W/m^2, which is a guarantee of safe clinical use.

Warning: According to the requirements of the standard IEC62471 :2006 "Photobiological Safety of Lights and Light Systems", we have assessed the blue light hazard of the LED bulbs of this product as a category 2 hazard, i.e. a moderate hazard. Do not look directly into the light.



1.2.3 Product Structure Overview

1.2.3.1 PANALEX-B Operating Light



1. Top cover
2. Central axis
3. Balance arm
4. Light head holding system
5. Light head
6. Control panel
7. Sterile handle
8. Camera

1.3 Conformity statement

1.3.1 Product Type

Class	I
Type	No application section
Mode of operation	Continous operation
Degree of protection	General equipment (closed equipment not protected against liquid ingress)
Place of use	Equipment that cannot be used in the presence of a mixture of flammable anaesthetic gas and air or a mixture of oxygen or nitrous oxide

1.3.2 Product technical requirements

Implementation of product technical requirements.

1.3.3 Compulsory standards

The products fully implement IEC 60601-1:2005+A1:2012 Medical electrical equipment - Part 1: General requirements for basic safety and essential performance.

Full implementation of IEC 60601-2-41:2009/AMD1:2013 Amendment 1 - Medical electrical equipment - Part 2-41: Particular requirements for the basic safety and essential performance of surgical luminaires and luminaires for diagnosis.

Products fully implement IEC 60601-1-2:2014 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic disturbances - Requirements and tests.

1.3.4 Standards implemented

This product has implemented IEC 62471:2006 Photobiological safety of lights and light systems.

1.3.5 Product Contraindications

There are no contraindications to this product.

1.3.6 Legal declaration

Our products and the related manuals, advertisements and brochures have been examined and approved by the statutory supervisory authorities of the company and have legal effect.

1.4 Transport and storage of products

Transport and storage in the following environments.

1.4.1 Ambient temperature: -40°C to +55°C

1.4.2 Relative humidity: ≤93%

1.4.3 Atmospheric pressure: 500hPa～1060hPa

1.5 Product operation

Operate in the following environments.

1.5.1 Ambient temperature range: +10℃～＋40℃

1.5.2 Relative humidity range: 30 % to 75 %

1.5.3 Range of atmospheric pressure: 700hPa ~ 1060hPa

1.6 Description of safety to the environment

1.6.1 Disposal of packaging materials

1.6.1.1 Wooden boxes - environmentally sound, recyclable, should be transported to a designated storage point for recyclable materials.

1.6.1.2 Styrene packaging profiles, plastic bags - Harmful to the environment, should be transported to a designated storage point for non-recyclable materials and disposed of centrally.

1.6.2 Disposal of products

When the product has reached the end of its useful life, it must be discontinued and the dismantled product should be disposed of according to the different materials of the product components.

1.6.2.1 Metal parts - environmentally sound and recyclable, they should be transported to a designated storage site for recyclable materials.

1.6.2.2 Plastic parts - harmful to the environment, should be transported to the designated non-recyclable materials storage point and disposed of centrally.

1.6.2.3 Glass parts - environmentally sound, recyclable and should be transported to a designated recyclable materials storage site.

1.6.2.4 Electronic and electrical components - harmful to the environment, should be transported to a designated non-recyclable material storage point and disposed of centrally.

1.6.2.5 Electromagnetic compatibility: Electromagnetic compatibility requirements have been considered in the design of the product, and the product will not have an impact on the environment during use.

Chapter 2 Instructions before Insallation

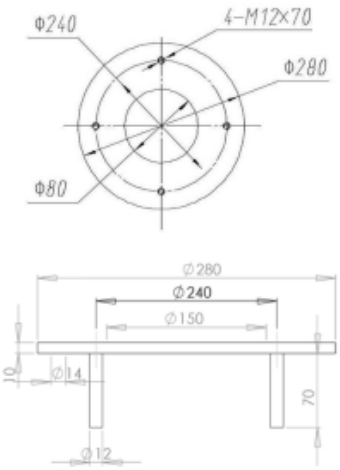
2.1 Foundation requirement

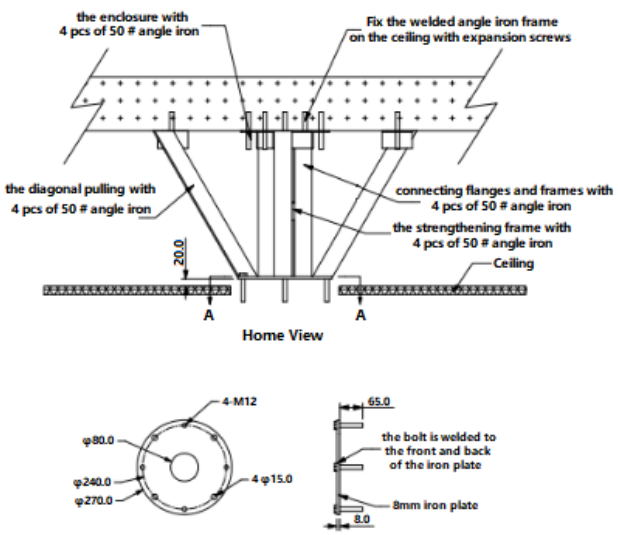
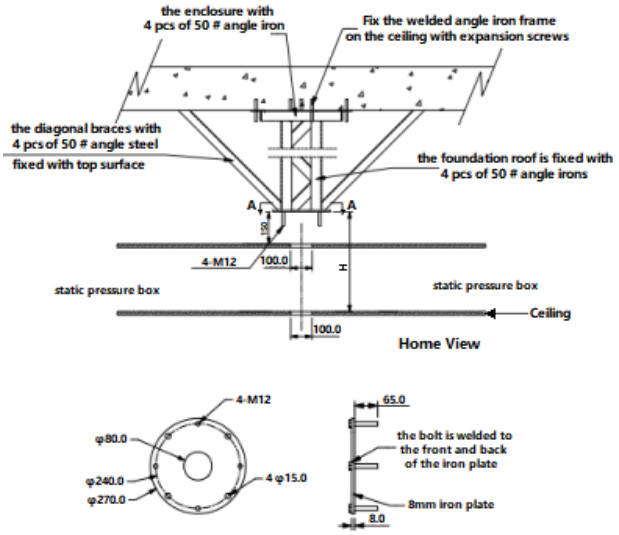
Surgical shadowless lights are operating theatre products and the pendant is suspended from the roof of the operating theatre. Therefore, it is particularly important that the foundation is safe and reliable. Our products require an equipment foundation that can carry a static load of 500 kg to ensure that it can withstand the rigidity and strength of the product.

The standard room height for operating theatres is 2.9 metres from the operating theatre floor to the ceiling.

Attention: the construction of the foundation and its safety is the responsibility of the user.

2.2 Preset method (for reference only)

Description of requirements	Diagram
2.2.1 Dimensions of basic flange plate Four Φ14 holes are processed on the flange, and the hole positions are evenly distributed among Φ240 mm diameters; Flange thickness≥10mm, and the material is 45# Steel. Basic flange external diameter≥Φ360mm, and may also be processed into square dimension≥280mm.	

2.2.2 Decontamination-free operating theatre Refer to the diagram on the right to prepare the bracket and fix them to the floor with expansion screws.	
2.2.3 With purified operating theatre Refer to the diagram on the right to make the brackets and fix them to the floor with expansion screws.	

2.2.4 Basic versatility

The mounting dimensions of our basic flange are the same as those of other companies in China. If you are replacing a product, the basic flange does not need to be changed. To be on the safe side, please check the strength and condition of the original basic flange carefully.

If the size of the existing basic flange does not match the size of it required by us, we will make a custom adapter plate for you.

2.2.5 Power supply wiring requirements

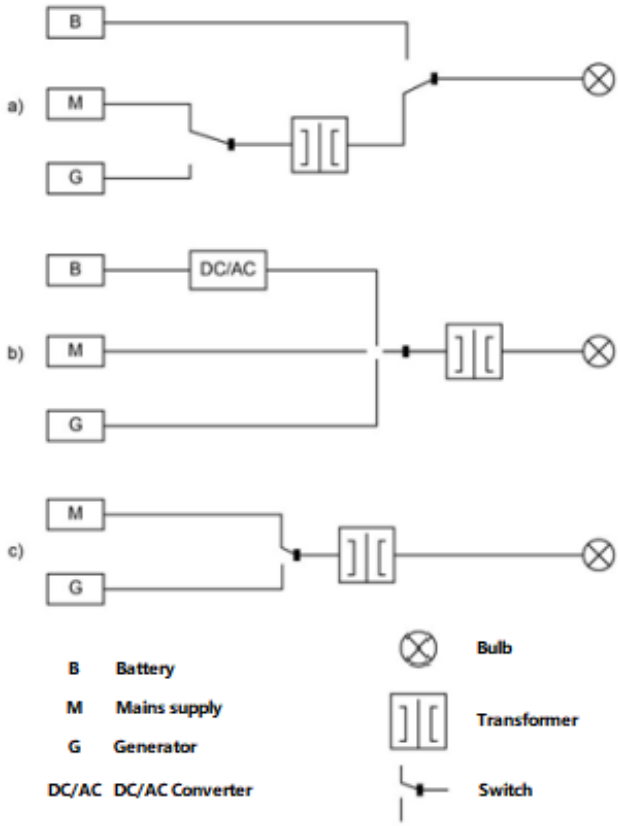
The power supply requirement for the surgical shadowless light is 220V±10% AC, 50Hz.

The user installs a power switch (10A) and fuse type (F5AL250V) on the wall of the operating room. The power switch must cut off both the phase and zero lines of the power supply at the same time. The power cable wiring should be routed from the power switch to the basic flange. The safe loading capacity of the power supply line is 15A.

Warning: The earth wire of the power supply section must be reliable. A separate safety earth wire is provided and is connected to the protective earth terminal of the surgical shadowless light.

Attention: The power switch should be in accordance with IEC 328, we do not supply a mains switch.

Examples of power supply for surgical shadowless lights:



Chapter 3 Installation

3.1 Packing box

Product model	Packing box name	Quntity
PANALEX-B	Central axis system, balance arm	1
	Camera light head	1
	Conventional light head	1
	Monitor	1

3.2 Open the box

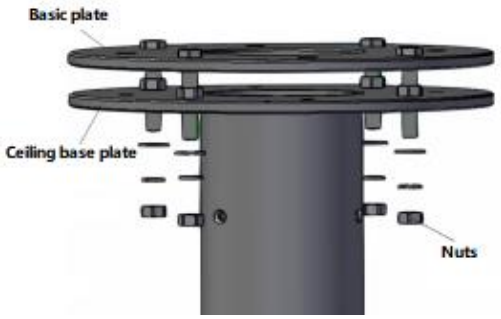
Please check the packing list according to the purchased product model, if there is shortage or damaged products in the box, please contact the transport agent immediately.

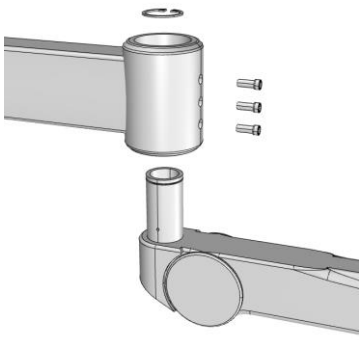
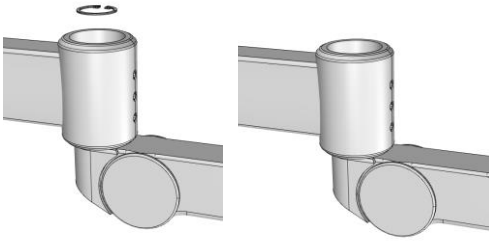
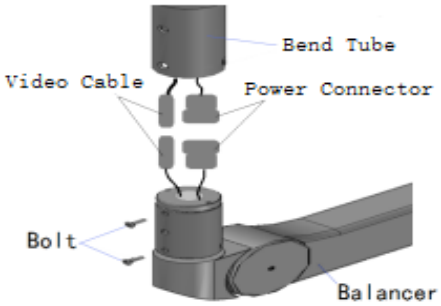
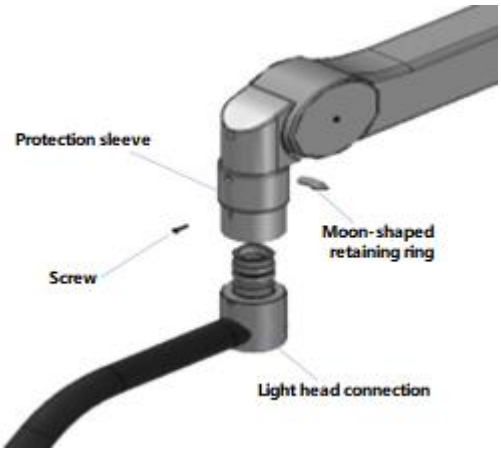
Open the boxes of central axis system, balance arm and light head. Remove the packing material, and take out all parts of operating light. Please check all parts according to the packing list in packing box, if there is any shortage, please contact us immediately.

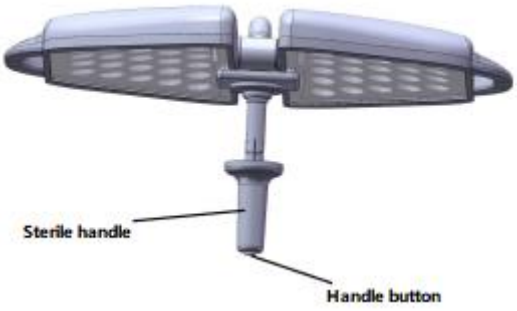
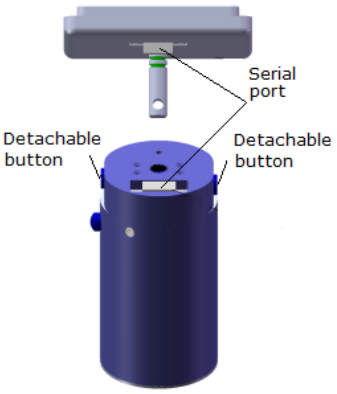
3.3 Installation

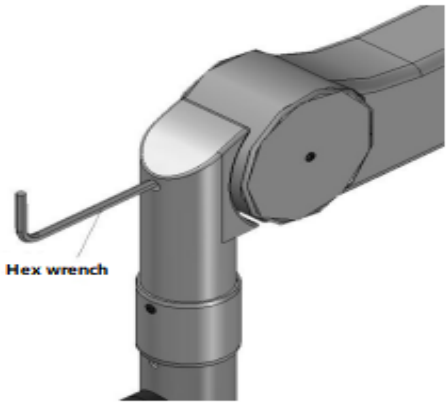
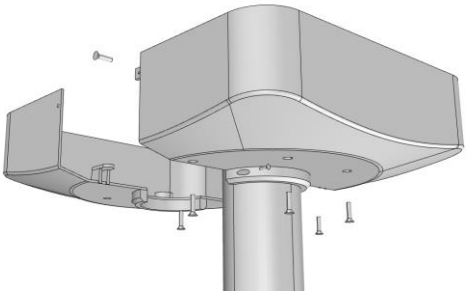
Warning: DoubleCheck again the condition of the basic flange to ensure its safty. Make sure the electrical connections well and safty;

Please install the light strictly according to the following requirment and process.

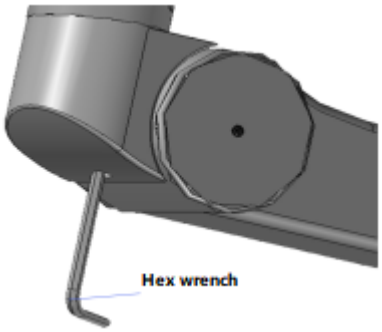
Installation description	Diagram
3.3.1 Central axis system installation Screw four M12 nuts into the foundation flange; set the 4 holes of the central axis flange into the 4 screws of the foundation flange, screw on the flat washers, spring washers and nuts. Adjust the nuts to make sure the flange of the central axis at the horizontal position and tighten the nuts.	

Installation description	Diagram
3.3.2 Installation of balancer 1 Adjust the damping on the rotating body bushing to the proper position and use a circlip pliers to remove the circlip on one end of the balancer and align it vertically with the lower end of the rotating body beam.	
3.3.3 Installation of balancer 2 Push the balancer vertically upward into the bushing on the rotating body beam, place the previously removed circlip into the upper end of the rotating body bushing, use a circlip clight to secure it to the balancer, and adjust the damping on the rotating body bushing to the proper position.	
3.3.4 Installation of balancer 3 The light head with camera or the monitor, connect the video cable and power connector, dismantle 4 bolts of the balancer, push the balancer into the axis hole of the revolver, and screw 4 bolts into the screw.	
3.3.5 Installation of the light head Unscrew the screw in the protective sleeve at the front of the balance arm, push the sleeve up and pull out the moon-shaped retaining ring. Push the light head connection shaft into the coupling hole at the front of the balance arm, press the moon ring inside, push the protective sleeve back into place and screw in the screw. **Caution:** the moon ring must be pressed into the slot completely.	

Installation description	Diagram
3.3.6 Installation of the sterile handle The sterile handle is pushed into the sterile stem shaft of the light source and is positioned when a "click" is heard. **Note:** Spare sterile handle should be kept in a safe place so that they can be sterilized and replaced after use.	
3.3.7 Installation of the camera Press the detachable buttons on both sides with your finger, insert the hole in the middle of the detachable camera into the camera connection bar. Make the video serial port connect with the male and female plugs. Install the camera to make the detachable button can pop out. **Note:** There is a risk that the camera will fall off if the detach button does not pop out.	

Installation description	Diagram
3.3.6 Balance arm adjustment Once the light head is installed ready, push the plastic cap on the front of the arm forward with the hexagonal spanner at the point where the balance arm is attached to the light head and loosen one of the hexagonal screws in the balance arm. The light head is then adjusted up and down to the appropriate position. **Warning:** The following procedure must be observed for the removal of the light head: adjust the balance arm to an upward angle of 0 degrees and remove the light head body. It should be avoided that when the balance arm is suddenly left at the head body load, the balance arm will spring up sharply due to the internal compression spring, causing damage to the balance arm components or even dangerous incidents of injury or death to personnel.	
3.3.7 Install the top cover Loosen the socket head cap screws on the top cover retaining ring, close the top cover over the rotating body, and connect the top cover with four self-tapping screws (two on the side and two on the bottom). Close the top cover retaining ring and push the top cover up so that the top is flush with the chassis of the rotating body or flush with the ceiling, tighten the hexagonal screws of the top cover retaining ring. Place the six sealing caps into the corresponding holes at the lower end of the top set.	

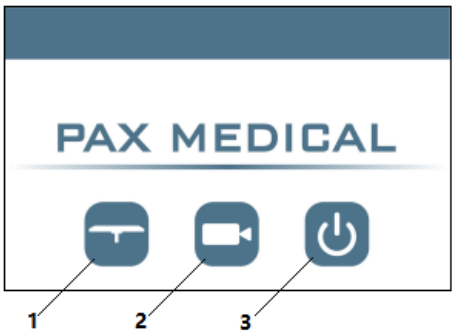
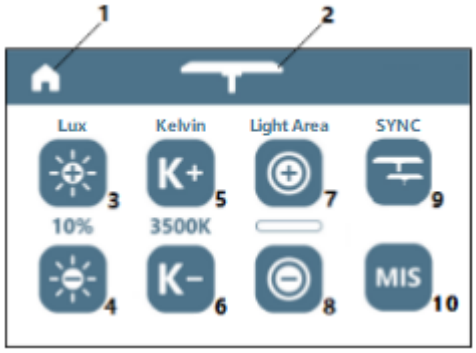
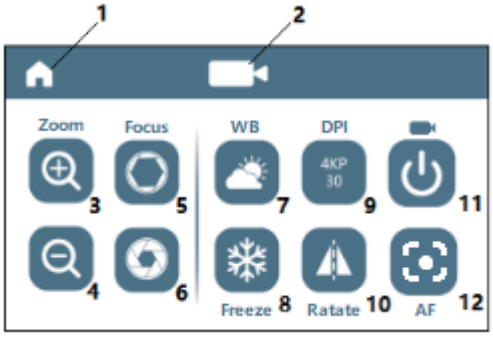
Chapter 4 Debugging

Description	Drawing
4.1 Horizontal adjustment Install the ceiling base in a balance position by gradienter. If there is no gradienter, please loose the damping screws on ceiling base, then fully extend the light to the maximum range. Then tight up the flange nut in the inclined direction of the light, until the rotation part of the light stop. Then it is in balance..	Please refer to the drawing 3.3.1 from Chapter 3
4.2 Damping Adjustment After balance adjustment, adjust the damping screw to a suitable strength so that the light can be stopped in any position, and the light will not move without force.	
4.3 Spring balance arm adjustment At the joint place between the balance arm and the elbow of the rotary body, push up the plastic cover at the lower end of the balance arm with a hex wrench, adjust the screws in the balance arm, pull the light and adjust the tension of the balance arm until it is suitable.	
4.4 Adjustment of light body connecting tube Adjust inner hexagon bolt with inner hexagon wrench until appropriately rotating force. **Notice:** The light body's rotation pull has been adjusted before leaving the factory, and therefore the users basically do not need to make any adjustment.	

Chapter 5 How to use

Notice: Please make sure the operation light has been installed and debugged according to chapter 3 & chapter 4.

5.1 Control panel instructions

1	Turn on the power switch,display initial LCD touch screen interface: 	1 Enter the light control interface 2 Enter the camera system control interface 3 Light on/off Hold the blank space 10 seconds to enter the menu setting interface
2	Light head control interface: 	1 Back to the initial interface 2 Current surgical light graphic interface 3 Brightness increase 4 Brightness decrease 5 Color temperature increase 6 Color temperature decrease 7 Light spot size bigger 8 Light spot size smaller 9 SYNC control 10 MIS mode
3	Camera control interface: 	1 Back to the initial interface 2 Current camera graphic interface 3 Zoom in 4 Zoom out 5 Focus 6 Focus 7 White balance adjustment 8 Freezing the picture 9 Resolution adjustment 10 Flip the picture 11 Camera on/off button 12 Auto focus

5.2 Position change

Different surgery site request different light position, Pull the sterile handle or blue handle on both sides of the operating light to rotate the rotating body around the central axis, or rotate the balance arm around the elbow of the rotating body, or move the balance arm up and down, or rotate the light around the balance arm until the light reaches the desired position.

When the light has moved to the desired position, the rotation between the light and light arm should be achieved by pulling the sterile handle, so that the light cast on the surgical site.

5.3 How to use combination light

The combined lights are generally used with one as the main light and the other as the auxiliary light.

Warning： When the spots of the two lights are overlapped together, the temperature rise of the surgical wound may exceed the standard, resulting in excessive thermal radiation and causing danger.

Chapter 6 Maintenance

6.1 Cleaning

After being in use for a while, the operating light must be cleaned as dust, blood and body fluids will accumulate on the shell and panel of the light.

6.1.1 Shell Cleaning

Scrubbing with liquid wax and soft cloth can clean the shell, and protect the paint layer as well. Alcohol can be used repeatedly for the severe dirt.

Note: Do not scrub with acid, alkaline solution or abrasive.

6.1.2 Panel Cleaning

Since the light panel is made of high polymer material, the severe dirt or bristles on the surface will have a great impact on the light source. Only neutral detergent and clean soft cloth without impurities can be used for cleaning.

Note: Do not scrub with acid, alkaline solution or abrasive.

6.2 Sterilization of the handle

The handle is made of high temperature resistant materials. According to the requirements of the Technical Specification for Disinfection of Medical Institutions (WS/T 367-2012), it is sterilized in saturated steam with a temperature of 134 ℃ and a pressure of 210 KPa for 3.5 min. And it can be also sterilized with medical alcohol.

Note: The laws and regulations related to the disinfection of medical devices are applicable to this product.

6.3 Routine inspection

6.3.1 Joint inspection

As the operating light is a hanging fixed product, its safety is extremely important.

The condition of the connecting nuts and other connecting screws of the rotating body flange must be checked regularly. In case of looseness, tighten them immediately.

Operate according to the Section III of Chapter III

6.3.2 Electrical inspection

Check the connection of electrical equipment such as power switch and power strip. If the connection is loose, insert the plug or tighten the screw immediately. Use

resistance measuring instrument to check whether the performance of protective grounding wire is safe.

Note: The above inspections shall be conducted at least once a year.

Warning: The network power must be cut off for electrical inspection.

If you sign a service agreement with our company, we will make regular inspections for you.

Chapter 7 Troubleshooting

7.1 Troubleshooting performed by the users

Phenomenon	Possible Reason	Solution
The light head doesn't work	The power supply is not connected	Turn on the power switch
Balancing force is too tight or too loose	The spring force is too large or too small	Adjust the spring force of the balance arm
Rotating body can’t be positioned	Flange plate of rotating body is not horizontal	Adjust the nuts of the flange
	The damper is loose	Tighten the damp
light head can’t be positioned	The screw of light head elbow is loose	Tighten the screw

Please refer to the Chapter III and Chapter IV when conducting the above troubleshooting.

Warning: The network power must be cut off when troubleshooting.

7.2 Notify the maintenance provider or our company

If the LED operating light still can’t work properly when the above troubleshooting is done, please inform the local authorized maintenance provider or the maintenance department of our company. And we will solve the problems for you in the shortest time.

Chapter 8 EMC

8.1 EMC Performance

This product may cause electromagnetic interference to other equipment through air or connecting cables. EMC (electromagnetic compatibility) refers to the ability of equipment to suppress electromagnetic interference of other equipment without causing similar electromagnetic radiation interference to other equipment. This product complies with GB/T 17743-2007.

This product follows the following EMC emission and EMC immunity instructions (Table 8-1, Table 8-2):

Table 8-1

<table>
<tr><td colspan="3">Guidance and manufacturer's declaration - Electromagnetic emissions</td></tr>
<tr><td colspan="3">PANALEX is intended to be used in the electromagnetic environment specified below, and the purchaser or user shall guarantee its use in this electromagnetic environment:</td></tr>
<tr><td>Emission Experiment</td><td>Compliance</td><td>Electromagnetic Environment - Guidelines</td></tr>
<tr><td>RF emission
Group 1 Class A</td><td>Pass</td><td>PANALEX is not suitable for interconnection with other devices</td></tr>
<tr><td>Harmonic emission
GB 17625.1</td><td>Not applicable</td><td rowspan="2">PANALEX is suitable for use in all facilities that are not directly connected to the low-voltage power supply network shared by the household and the household.</td></tr>
<tr><td>Voltage fluctuation/flicker emission
GB 17625.2</td><td>Not applicable</td></tr>
</table>

Table 8-2

<table>
<tr><td colspan="4">Guidance and manufacturer's declaration - Electromagnetic immunity</td></tr>
<tr><td colspan="4">PANALEX is intended to be used in the electromagnetic environment specified below, and the purchaser or user shall guarantee its use in this electromagnetic environment:</td></tr>
<tr><td>Immunity tests</td><td>IEC60601
Test level</td><td>Compliance level</td><td>Electromagnetic Environment - Guidelines</td></tr>
</table>

Electrostatic discharge GB/T 17626.2	± 6kV contact discharge ± 8kV air discharge	± 6kV contact discharge ± 8kV air discharge	The floor should be made of wood, concrete or ceramic tiles. If the floor is covered with synthetic materials, the relative humidity should be at least 30%
Electrical fast transient burst GB/T 17626.4	± 2kV for power line ± 1kV for input/output line	± 2kV for power line Not applicable	The network power supply should have the quality used in typical commercial or hospital environments
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 typical commercial or hospital environments
GB/T 17626.11 voltage sag, short interruption and voltage change on power input line GB/T 17626.11	<5% UT, lasting for 0.5 cycle (>95% sag on UT) 40% UT, lasting for 5 cycles (60% sag on UT) 70% UT, lasting for 25 cycles (30% sag on UT)	<5% UT, lasting for 0.5 cycle (>95% sag on UT) 40% UT, lasting for 5 cycles (60% sag on UT) 70% UT, lasting for 25 cycles	The network power supply should have the quality used in typical commercial or hospital environments. If PANALEX users

	<5% UT, lasting for 5s (>95% sag on UT)	(30% sag on UT) <5% UT, lasting for 5s (>95% sag on UT)	need continuous operation during power interruption, it is recommended that the system be powered by UPS or battery.
Power frequency magnetic field（50Hz/60Hz） GB/T 17626.8	3A/m	3A/m	The power frequency magnetic field should have the characteristics of the ones in typical commercial or hospital environments
Note: U_T refers to the AC network voltage before applying the test voltage.			

Warning:

This product should not be used close to or stacked with other equipment. If the product must be used close to or stacked with other equipment, observe and verify that the product can operate normally in its configuration.

In addition to the transducers and cables sold by our company as spare parts, the use of unspecified accessories, transducers and cables from outside may lead to increased emission or reduced immunity of equipment or systems.

8.2 Precautions for installation

Install the product as far away from other electrical equipment as possible to ensure that the original power cord is used.

8.2.1 General precautions:

8.2.1.1 Specify peripheral devices that can be connected to this product.

8.2.1.2 Avoid using other unspecified equipment.

Failure to comply with this provision will result in the degradation of EMC performance of this product.

8.2.2 Precautions for user modification:

8.2.2.1 Do not make any changes to this product.

8.2.2.2 Unilateral changes by the user will cause the EMC performance of the product to decline.

8.2.3 Changes to this product include:

8.2.3.1 Change of power cord (length, material, connection, etc.).

8.2.3.2 Changes in system installation/layout.

8.2.3.3 Changes in system configuration/components.

8.2.3.4 Changes in fixed systems/parts.

8.3 Measures to resolve problems related to EMC

Solving problems regarding EMC is usually difficult and takes a lot of time and money.

8.3.1 The general measures are as follows:

8.3.1.1 Electromagnetic interference with other equipment:

8.3.1.1.1 Keeping other devices away from the product can reduce electromagnetic interference;

8.3.1.1.2 Electromagnetic interference can be reduced by adjusting the relative position/installation Angle between the product and other devices;

8.3.1.1.3 Electromagnetic interference can be reduced by changing the wiring positions of power/signal cables of other devices;

8.3.1.1.4 Electromagnetic interference can be reduced by changing the power path of other devices;

8.3.1.1.5 Portable and mobile RF communication devices may affect the performance of PANALEX. Avoid strong electromagnetic interference when using it, such as near mobile phones and microwave ovens;

8.3.2 The specified EMC environment is shown in Table 8-3:

Table 8-3

Guidelines and Manufacturer's Statement - Electromagnetic Immunity
PANALEX is intended for use in the electromagnetic environment specified below, and the purchaser or user shall guarantee its use in such electromagnetic environment.

<table>
<tr><th>Immunity tests</th><th>IEC60601 test level</th><th>Compliance level</th><th>Electromagnetic Environment - Guidelines</th></tr>
<tr><td>Radiofrequency conduction
GB/T 17626.6</td><td>3V (valid value)
150kHz-80MHz</td><td>3V (valid value)</td><td rowspan="2">Portable and mobile RF communication equipment shall not be used closer to any part of PANALEX than the recommended isolation distance, including cables. The distance shall be calculated by the formula corresponding to the transmitter frequency.

Recommended separation distance:

d = $1.2\sqrt{P}$

d = $1.2\sqrt{P}$ 80 MHz～800 MHz

d = $2.3\sqrt{P}$ 800 MHz～2.5 GHz

Herein:
P —According to the maximum rated output power of the transmitter provided by the manufacturer, in Watts (W);
d—The recommended isolation distance, in meters (m).

The field strength of the fixed RF transmitter is determined by surveying the electromagnetic site, and d should be lower than the compliance level in each frequency range.

Interference may occur near equipment marked with the following symbols.
  </td></tr>
<tr><td>RF radiation
GB/T 17626.3</td><td>3V/m
80MHz-2.5GHz</td><td>3V/m</td></tr>
<tr><td colspan="4">Note 1: At the frequency point quotient of 80MHz and 800MHz, the formula of higher frequency band should be adopted.</td></tr>
</table>

Note 2: These guidelines may not be applicable to all situations. Electromagnetic transmission is affected by absorption and reflection of buildings, objects and human bodies.

A: The field strength of the fixed transmitter, such as the base station of wireless (cellular/cordless) telephone and ground mobile radio, amateur radio, AM and FM radio broadcasting and TV broadcasting, cannot be predicted accurately in theory. In order to evaluate the electromagnetic environment of fixed RF transmitter, electromagnetic site survey should be considered. If the measured field strength of the place where the system is located is higher than the above applicable RF compliance level, observe PANALEX to verify its normal operation. If abnormal performance is observed, additional measures may be necessary, such as readjusting the direction or position of PANALEX.

B: In the whole frequency range of 150kHz to 80MHz, the field strength shall be lower than 3V/m.

Recommended isolation distance between portable and mobile RF communication equipment and PANALEX

PANALEX is intended for use in electromagnetic environments where radio frequency radiated disturbances are controlled. According to the maximum output power of communication equipment, the purchaser or user of PANALEX can prevent electromagnetic interference by maintaining the minimum distance between portable and mobile RF communication equipment (transmitter) and PANALEX.

Maximum rated output power of transmitter W	Isolation distance corresponding to different frequencies of transmitter/m		
	150kHz - 80MHz $d = 1.2\sqrt{P}$	80MHz - 800MHz $d = 1.2\sqrt{P}$	800MHz - 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For the maximum rated output power of the transmitter not listed in the above table, the recommended isolation distance d, in meters (m), can be determined by the formula in the corresponding transmitter frequency column, where P is the maximum rated output power of the transmitter provided by the manufacturer, in watts (W).

NOTE 1: At 80MHz and 800MHz frequency points, the formula of higher frequency band should be adopted.

NOTE 2: These guidelines may not be appropriate for all situations. Electromagnetic propagation is affected by absorption and reflection of buildings, objects and human bodies.

8.4 Precautions for Maintenance

Make sure that all screws are tightened after maintenance. The EMC performance will be reduced in case the screws get loosened.

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