II SERIES
LED Operating Light

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Operating Instructions
Single Light (Mobile type)
II LED 500(with Emergency battery)

Content **Page**

1. Summary

Dear users: welcome to use the "MERMAID "LED- series operating light (mobile type):

In order to enough and effectively bring the function of the LED operating light (mobile type) into play and to master right usage and operating method, in the interest of correct repair and maintenance, please read the Instructions carefully prior to installation and use. After you understand the Instructions totally, you will use it with high proficiency.

This set of Instructions includes the Instructions for Product Usage and the Instructions for Product Technique.

The LED operating light (mobile type), a new-styled operating light, is applicable to illumination of medical institutions in operation. It integrates the advantages of operating light produced today, and furthermore, adopts CAD/CAM technique to design the new-styled optical system, the wholly-closed and streamline lamp-body frame and the balancing system. In the design, the streamline shape and the diameter of lamp body have less resistance to the flow of purified air so as to greatly reduce the phenomena that air flows in disorder. The operating light can be used for illumination in a common small-scale operation as well as for assistant illumination in a large-scale operation.

- Environmental temperature: 5℃--40℃;
- Environmental relative humidity: 10%--80%
- Security type of the equipment: I-typed equipment and the electric shock resisting degree is B type.
- Working system: continuous running

The equipment is mobile. It is unallowable to use it in the environment where there is combustible anesthetic gas. Please comply with the Instructions for antisepsis.

The LED operating light (mobile type) has kinds of the type, that is:

- LED Operating Light (mobile type)

  (please refer to 1st Sketch)

- LED Operating Light (mobile type with emergency)

  (please refer to 2nd Sketch)

2. Working Principle

As for the LED operating light (mobile type), light from the light source will be focused at a one-meter place to form a high-illuminance luminescence facula and be used for illumination for an operated position after it is reflected by a lot of special optical lens reflection assembled in the light head.

A rotatable antisepsis handle on the LED operating light (mobile type) can be loaded or unload easily for sterilization. Also, a brightness-adjusting of the control panel can be used to adjust photic brightness so as to meet the demands of different doctors on all kinds of operations.

The rotating and balancing systems of the LED operating light (mobile type) are designed to meet different demands of all kinds of operations so that illumination is at an optimal angle in operations. The working principle of the rotating system is, by taking advantage of the rotation of bearing, to rotate the operating light by up 45° or down 45° to be at a required orientation and simultaneously increase the adjustable stuffing to make handle light and handy and positioning is stable and reliable when the operating light is moved.

The working principle of the Balancer system is to pre-compress the compressing spring and generate the force which is needed by the lamp head through the four-linking pole structure so that the light head can be moved up and down smoothly and airily.

3. Technical performances

3.1 Electrical characteristics

Contents	**mobile type**	**mobile type with emergency**
Input power	150VA	150VA

3.2 Led light source characteristics

Contents	**mobile type**	**mobile type with emergency**
Dimension of light head	560 (mm)×560 (mm)	560 (mm)×560 (mm)
Depth of illumination (L1+L2)	890 (mm)	890 (mm)

Main fuse	T4AL, 250V~, φ5x20mm	T4AL, 250V~, φ5x20mm
Light source	light-emitting diode(LED) (Model: LCWCQ7P)	light-emitting diode(LED) (Model: LCWCQ7P)
Service life of the light source, (H)	50,000	50,000

3.3 Performance characteristics

Contents	**mobile type**	**mobile type with emergency**
Central illuminance (EC)	(10,000--160,000) lx	
Color temperature	4000±500K	
Color rendering index	≥95	
Focusable Light-field Size（mm）	100 ≤d10≤ 250	
Total irradiance (Ee)	500W/m2	
Remaining illuminance with one mask	50%	
Remaining illuminance with two mask	44%	
Remaining illuminance with tube	95%	
Remaining illuminance with tube and one mask	45%	
Remaining illuminance with tube and two mask	44%	
Ultraviolet radiation	1000W/m2	
Infrared radiation	Ee/ Ec≤6mW/m2*lx	
Rating	220-230V~, 50Hz, 150VA	

Operation condition	1） Environmental temperature: 10℃～30℃ 2） Relative humidity: 20-80% 3 ） Atmospheric pressure: 700hPa～1060hPa	
Storage and transport condition	1) Environmental temperature: －40℃～＋55℃ 2) Relative humidity: 10-93% 3) Atmospheric pressure: 500hPa～1060hPa	
Emergency time	none	4-5 hours (if new battery used)

- LED operating light (mobile type) also can meet the customer order of voltage AC110V, 60Hz.

3.4 Main functions:

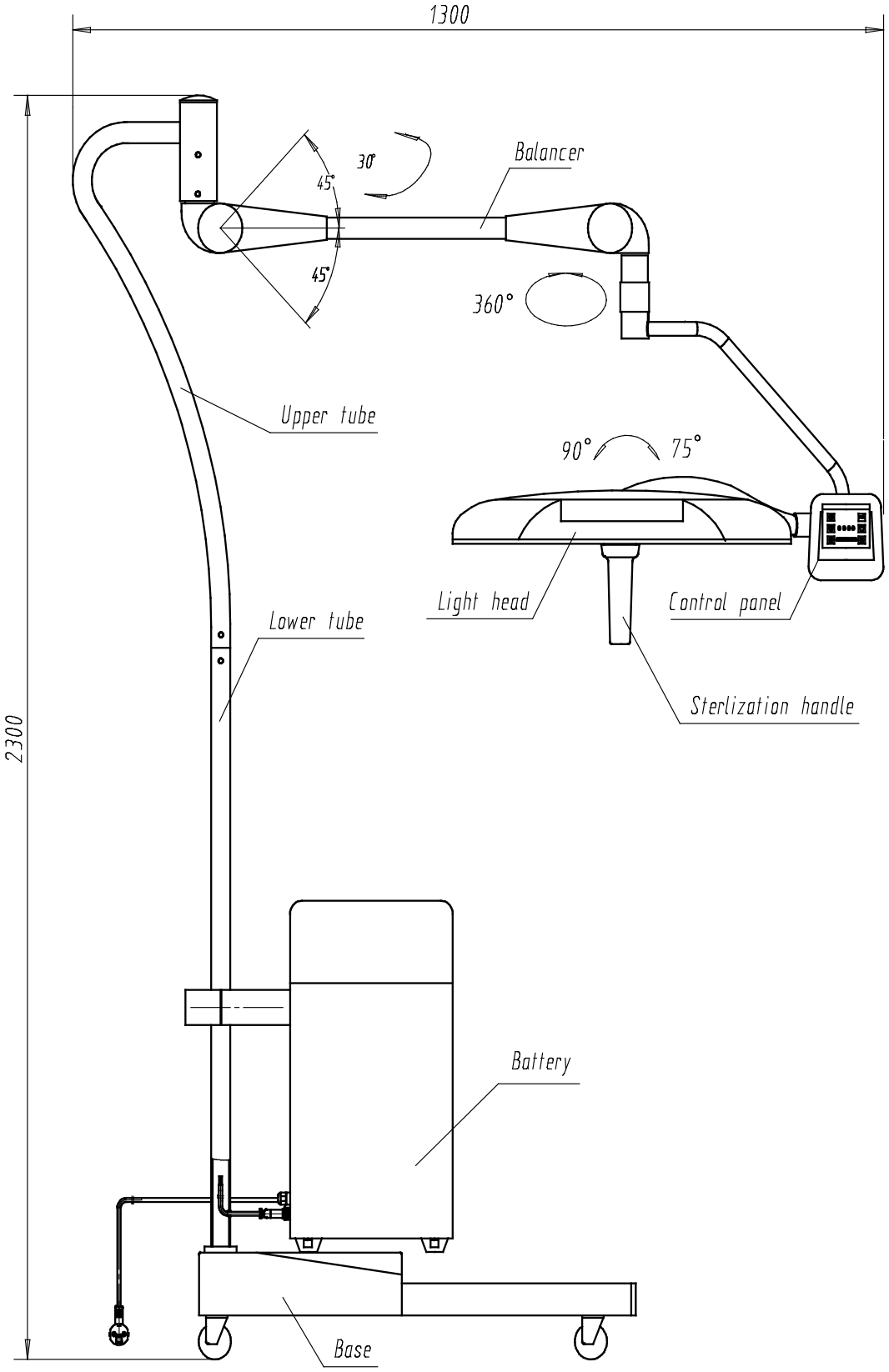
3.4.1 Microcomputer digital control, with thirty-two-section brightness selection, and having memory function and voltage negative feedback control. When the city voltage is within 220VAC±10%, the operating light can work as usual.

3.4.2 With the function of safe illumination. When no more than 12 Light Emitting Diode is burnt out, the other Diode will keep light up for need of operation. If the case happened, it will remind people of timely repair after an operating. Repairs or adjustments must be made only by the manufacturer, or by an agent expressly authorized by it or their official authorized agent.

3.5 Brief introduction of the instrument

3.5.1 Brief introduction of LED Operating Light, see 1st Sketch Map.

3.5.2 Installation of LED Operating Light (**mobile type with emergency**) see 2nd Sketch Map.



1st Sketch Map

- It is important that long-life Light Emitting Diode is adopted. The normal work can be maintained for 50,000 hours.

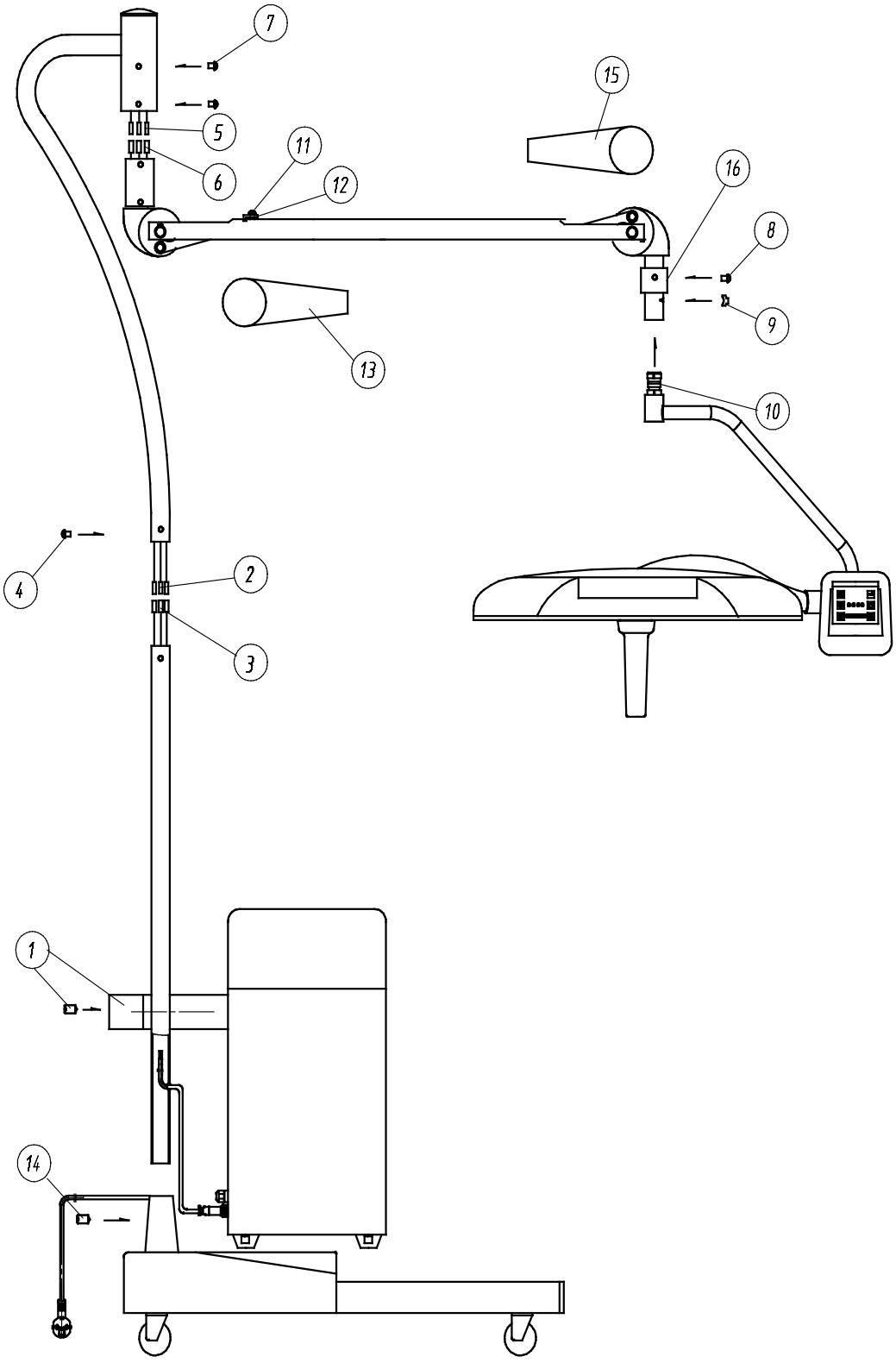
Caution: Don't connect the anode and cathode in a wrong way.

Caution: After the installation is over, it is required to clean and tidy up.

Warning: Disassembly of stopper block must be performed after the Lamp body is installed. And without stopper block in the balancer, the strong compression strength possibly causes harm of human.

4. Installation methods for LED Operating Light (mobile type with emergency) (please refer to 2th Sketch Map)

(1). Passing the wires (red,yellow,yellow and green) ① through the lower tube. Then, insert the lower tube into a hole of lower tube. Then, fix emergency box to lower tube with the screw.
(2). Connecting the electric wire connector ③ from the lower tube into the connector ② from the upper tube. Then, insert the upper tube to the lower tube.
(3). Screwing down three screws ④.
(4). Connecting the electric wire connector ⑤ into the connector ⑥. Then, insert the balancer to the sleeve.
(5). Screwing down four screws ⑦.
(6). Screwing out screw ⑧, Putting the sleeve ⑯ up, Taking out the cresent location plate ⑨
(7). Pushing the lamp body ⑩ into the balancer, and do opposite action to the context of (6).
(8). Disassemble the screw ⑪ on the stopper block ⑫
(9). Folding the plastic cover ⑬ and ⑮.
(10). Screwing down two screws ⑭.



2nd Sketch Map

5. Function table (mains controller panel for the operating light)

1. ON/OFF
   Switch on/off the light
2. Endoscopy adjustment
3. Color temperature adjustment
4. Brightness adjustment

5th Sketch Map

(ON/OFF) Press the button 1 (please refer to 5th Sketch Map), the instrument is connected to the LAN power: press the button again, the LAN power is broken.

5.1 The indication of battery voltage in the panel (please refer to 5th Sketch Map)

(1) Blue indicator indicates that the battery back-up for the emergency ability is sufficient.
(2) Red indicator indicates that the battery back-up for the emergency ability is failure. So, the product shall be connected to LAN power and the battery shall be charged at once.

6. Safty

6.1 When changing the burnt fuse, cut off the power after the burnt bulb cool off, then it can be changed.

6.2 Check the connection condition of all the connectors and the screw nails regularly, and screw the loose nails immediately. **(Please check once every quarter in each year).**

6.3 When the lamp body is wrong positioned, then the damping screw nails and nuts should be adjusted to obtain its balance.

6.4 The lamp body should be often wiped up by a soft cloth to prevent the dust concentrating.

6.5 Before an operation, all the operation parts should be sterilized.

6.6 After the operation, the power source must be disconnected; otherwise, the transformer keeps a "turn on" status for a long time, the transformer is easily burnt.

6.7 The maintenance of the operating light should be done by the professionals appointed by our factory; otherwise, you will make yourself responsible for it.

7. Failure Elimination and Repair & Maintenance

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

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

WARN: (1) When performing the troubleshooting, network power shall be cut off.

(2) Repairs or adjustments must be made only by the

manufacturer, or by an agent expressly authorized by it or their official authorized agent.

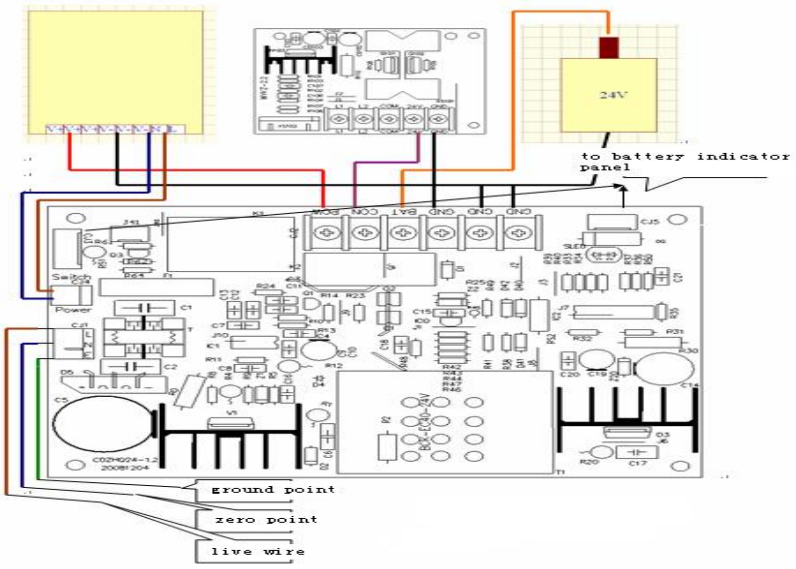
(3) Interference by a third party will invalidate any customer claims under our guarantee.

8. A List of Packing and Icon

8.1 A list of packing

Type	Encased components（No.1）
mobile type	1. One lamp body of the LED operating light. 2. Spare fuse: two RTT-4A 3. One set of balancer components 4. One upper tube 5. One lower tube 6. One base
mobile type with emergency	1. One lamp body of the LED operating light. 2. Spare fuse: two RTT-4A 3. One set of balance components 4. One upper tube 5. One lower tube 6. One base 7. One battery box

8.2 Icon of emergence circuit



9. Explanation for Signs

ATTENTION!

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

ATTENTION!

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

ATTENTION!

The sign appears on the light source parts

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

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

WARNING!

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

WARNING!

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

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

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

Do not use oxygen with this system.

Don't use in the place filled with inflammable gases, anaesthetics and NO gas. No use-serviceable parts inside, before servicing to authorized representative or manufacturer!

CAUTION!

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

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

To reduce the risk of increased bacterial growth, infection, illness, or injury from contamination,thoroughly clean, disinfecting, sterilizing and dry all reusable detachable part of the device and thoroughly dry

any moisture or condensation in the tubing at the end of every treatment, following the instruments for it.

CAUTION!

Electric equipment should never be left unattended when power on. Always switch off immediately after using.
Main power must be off before cleaning.
Do not use or store outside of specified environmental conditions.
Not use accessories not recommended by the manufacturer.
The device must be used for the designated purpose only.
DO NOT use attachments not recommended by manufacturer.
Before use, check the device for proper assembly. All parts should be seated firmly in place.
Improper use of the grounding plug can result in a risk of electrical shock.

10. Environmental Condition for Transportation and storage

10.1 Relative humidity: 10%——93%

10.2 Environmental temperature: -40℃ —— +70℃

10.3 Without corrosive gas and with good aeration

10.4 Indication for transportation and storage: guard against humidity, put down carefully and don’t place upside down.