Kalstein®

Model YR02193

Infant Radiant Warmer

Instruction Manual

Thank you very much for purchasing our Model YR02193

Infant Radiant Warmer.

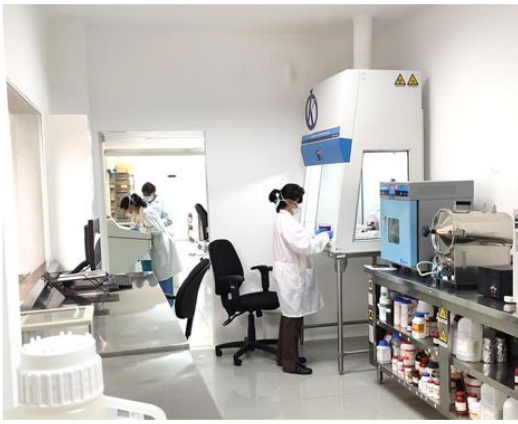
Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

 Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

OUR SERVICES

Benefits and Support

In Kalstein France, we take care of the full satisfaction of our customers, that is why we provide value-added services of the highest level based on our experience.



Online Inductions and Trainings

In any part of the world, receive your induction or training from our specialized team of engineers

Quick Response

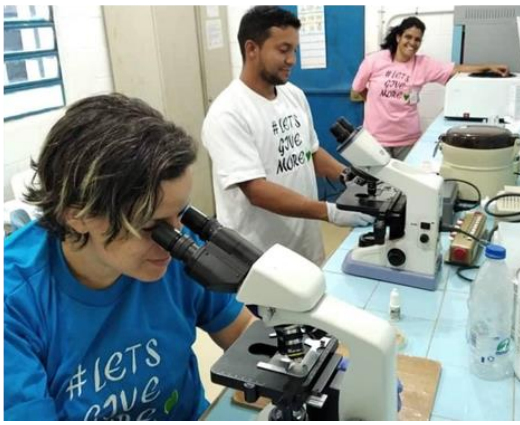
Our work team is always available to response all your consults or questions, in order to support you in any situation.

#Letsgivemore 💚

Thanks to your purchase, a donation will be made to a non-profit foundation that fights against breast cancer and helps most vulnerable communities.

Technical Support

Enjoy of personalized advice for the correct preventive and corrective maintenance of your equipment, thanks to Kalstein's manuals and articles, special catalogues and video tutorials.



Delivery Logistics

We take care of all the necessary logistics for the dispatch of your goods, whether is by sea, land or.air.

Kalstein Worldwide

With more than 25 years growing with our customers, Kalstein's multiformat and modern content, is now present in more than 10 countries and increasing.

Notes: All personnel commissioned to work on or with the device must pay attention to this instruction manual

- Please read the manual thoroughly and pay attention to the safety instructions therein and be aware of the risks!
- Choose and read only the instructions on your product model contained in this manual.
- It is essential to inspect and maintain this equipment regularly. Cleaning, disinfecting and sterilizing from time to time is necessary.

Information on electromagnetic compatibility:

- This equipment is of Class A, Group I under GB4824 with respect to EMR.
- While operating with this equipment, please pay close attention to other equipment which may have effect on the normal operation of this equipment, such as portable or mobile RF communication equipment. For related parameters, please refer to the sections below.
- This equipment is in compliance with EMC requirements under YY0505-2012. User should install and operate this equipment based on related EMC information provided in this manual.

CONTENT

Charters Page

Dear customer：

Thank you for choosing our product! Your care and support give us the confidence to make our equipments in the forefront of similar products, and to catch up with other top-level international products in the world. These will not only be reflecting in the cooperation between ourselves and the customers, but also in the dedicated service and support of all the colleagues to our customers!

We hope that you can benefit from our professionalism, our dedication and our technological strength by using our quality products.

This manual is presented as a document attached to the product for your reference at any time. Please feel free to call our customer service department at any time should you encounter any difficulties.

This manual contains operating instructions and technical specifications. It describes in details of product applications, features, performance indexes, operations, maintenance and related considerations for the infant radiant warmer.

This product is intended for infants. Therefore, please pay attention to this manual, to be able to use the device effectively - about all - safety. Only trained and certified personnel can operate on this device.

This device is warranted against defects in materials and workmanship for a period of one (1) year from the date of original retail purchase when used in accordance with the manual.

Kalstein France.

1 Symbols and Signs

Equipment of BF Type, Class I

Protective grounding

High temperature

High voltage

Manual control

Baby temperature control

Mute

2 Warning

- What you should know It must be noted that
- This product is free of charge for one year from the date of purchase, except for the following circumstances:
- a) Wrong operation.
- b) Damage caused by not following the cleaning and maintenance methods specified in the manual.
- c) Caused by using parts not designated by the company when replacing parts.
- d) Connecting accessories and devices that do not meet the safety requirements of the product, resulting in changes in safety performance, product performance and parameters.
- e) External causes of force majeure (such as disasters, etc.).
- Note: we suggest that you take part in the training courses and technical exchange activities held by our company from time to time.
- The instruction manual of this product is compiled together with the technical manual. Please read and understand the contents of the instruction carefully before using the radiation neonatal rescue table (hereinafter referred to as the rescue table).
- Please do not lose or change this instruction manual, which will result in adverse consequences.
- The service life cycle of the rescue platform: 5 years. If it exceeds the service life, it shall be scrapped according to relevant laws and regulations.
- The rescue table should be placed in an environment without strong magnetic field interference when using.
- The Ni MH Ni MH battery equipped inside the rescue table, model: 6.0V 80mah, service life of 2 years. It is not necessary to take it out at ordinary times. Pay attention to the polarity when replacing it, and it should be operated by professionals.
- The replaced batteries and other consumables should not be discarded at will, and attention should be paid to environmental protection! When using the manual control mode, you should pay attention to the running time of this mode. When you finish the operation mode, you should timely adjust to the skin temperature control mode. The manual control mode cannot be used as a long-term heat preservation for infants.
- The temperature control device in the rescue table can independently monitor the baby's temperature, but cannot be used without management.
- The distance between the crib and the heating device has been fixed by design, and it is not allowed to disassemble or change the distance at will, otherwise the temperature will be affected.
- For the alarm and conventional test methods of the equipment, see the relevant warning functions in Chapter 7.
- Some sensors used in the equipment are BF type, which are in line with the national regulations.
- In order to prevent injury to the baby, when the catheter is still connected to the baby or the crib is in an inclined state, it is not allowed to open the crib baffle of the rescue table. When the baby is nursing in the rescue table, it is not allowed to fully open the crib baffle, only partially open the crib baffle. All crib baffles should be plugged tightly to prevent accidental opening of the crib.
- The baffle of the rescue table must be fixed on the rack by the locking device provided by itself. If it is not fixed, when the rescue table tilts or moves, especially when the crib baffle is opened, the baby will slide down! If you find that the crib baffle, lock and other fixed parts are loose or other faults, please stop using immediately and ask for repair.

- The maximum bearing capacity of the bottle hanging place on both sides of the infusion rack of the rescue table is 10N, the maximum load of the tray is 20n, and the maximum load of the crib is 10kg.
- In the skin temperature control mode, the sensitive part of the skin temperature sensor must directly contact with the baby's skin surface to provide accurate monitoring information of the baby's skin surface temperature. If the sensitive part of the sensor falls off the baby's skin, it will lead to the temperature difference of the baby and cause the baby to be too cold or overheated! It is necessary to strengthen the observation of the baby's condition to ensure that the sensor is in the correct contact state, and pay close attention to whether the baby's skin is too cold or too hot.

If it is necessary to use phototherapy equipment at the same time when the rescue table is used for heat preservation of infants, you should pay attention to the mechanism of phototherapy equipment for infant treatment and the temperature change that may affect the rescue table. Please pay close attention to observation and inspection! It is not allowed to put the hyperthermia equipment too close to the rescue table! This will affect the temperature of the rescue table, crib and baby!

It is forbidden to use this equipment in the place where combustible anesthetic or other flammable substances exist.

For the description of infant temperature control method and its working principle, please refer to Chapter 6 C) infant temperature control mode in this manual.

Please use the skin temperature sensor correctly. Do not put the skin temperature sensor on the back of the baby or in the anus as a thermometer!

In the skin temperature control mode, the skin temperature sensor is pasted on the rectus abdominis of the baby, or the position required by medical clinic with medical tape. In the non-skin temperature control mode, the skin temperature sensor should be placed at the socket of the crib baffle.

It is necessary to strengthen the monitoring of infant's temperature during use. The device does not distinguish the difference between the baby's cold skin and high body temperature (fever) and low body and skin temperature (low temperature).

It is not allowed to put the rescue platform in direct sunlight, where other radiation heat sources can be received or where air convection is very severe.

The radiation source devices in the heater should be replaced after 3 years of service, so as to prevent the heating efficiency of radiation source devices from decreasing.

The rescue table should be operated under the guidance of qualified medical personnel who have received professional training, are familiar with the use of the rescue table, and understand the risks and benefits of the rescue table.

It is necessary to pay attention to the loss of moisture in infants when keeping warm for a long time.

For the technical conditions of equipment combination, please refer to sections 1, 3, 4, 5, 6, 7 and 8 of the manual.

For the parameters, data, display value and indication range, accuracy and accuracy that can be detected, please refer to sections 4 and 5 of this manuals for details;

When the rescue table is not in use: it can be kept in the room with (- 20 ~ 55) ℃, relative humidity not more than 90%, no vibration, no corrosive gas and good ventilation. If it is not used for more than six months and needs to be reused, it shall be tested according to "chapter 8.1.1 inspection before use" in this manual.

If the temperature of the baby is kept warm, it must be preheated one hour in advance. Do not put the baby into the rescue table before the preheating enters the constant temperature mode.

The rescue table should be vertical to the ground when used. If the medical care needs to tilt the bed, then the crib plate will tilt from the horizontal position, which will affect the temperature uniformity performance. Therefore, the medical staff must pay attention to the temperature distortion of the baby bed plate and the position of the baby, so as to prevent the fall and bring harm to the patients.

The equipment is not suitable for use in the situation of flammable anesthetic gas or other flammable substances, such as some cleaning liquid.

The scale on the crib baffle and the scale on the X-ray box drawer are for reference only.

If it is necessary to replace spare parts, please use the spare parts provided by our company, otherwise the consequences will be borne by the user.

When combined with other equipment, the use of auxiliary equipment that does not meet the safety requirements of the rescue table will reduce the safety performance of the product. The following points must be considered when selecting relevant equipment:

a) Auxiliary equipment without relevant product safety certification shall not be used.

b) There is evidence that the auxiliary equipment has passed the relevant national safety testing.

c) When using auxiliary equipment, the safety requirements related to the auxiliary equipment shall be observed.

If abnormal accidents still occur during the correct use of the rescue table according to the instructions, the operator or the patient will be harmed. Then, please turn off the main power switch and cut off the power supply immediately. Please check and confirm before using.

There was no adverse event in the use of the rescue table in the past. However, in the use of the product, there will still be unpredictable injuries to patients or operators. In case of similar situation, please timely isolate the defective equipment, inform the company and report to the supervision department. The use of other auxiliary equipment on the rescue table may lead to changes in the air flow mode and affect the consistency and variability of the crib temperature.

Please stop using the rescue desk if it sends out warning messages such as power failure, over temperature, deviation and sensor fault, which cannot be eliminated! The relevant maintenance services should be carried out by professionals.

When the baby is nursing in the rescue table, do not put the quilt or blanket around the baby, which may lead to the temperature change of the rescue table, thus affecting the temperature of the crib and causing injury.

The caster should be locked during the use of rescue table to prevent movement during operation and nursing.

When moving the rescue table, in order to prevent accidents, at least two people must operate, and the power plug must be pulled out before moving. Do not move the device when the baby is warming on the rescue table!

The baby mattress should be replaced in case of serious damage.

The sensor of this equipment has been tested by the third party for biocompatibility. If you want to replace it, please contact the service center of our company. Unqualified sensors will cause harm.

The power supply should meet the power requirements listed in the name plate of the rescue platform. Plug the power plug into a single-phase three wire power supply network with protective grounding. If there is any doubt about the grounding connection, please do not use this equipment.

Due to the risk of electric shock, the maintenance service must be operated by professional personnel.

It is not allowed to change the three-core power plug equipped with the rescue table into the two core power plug. When plugging the power cord, you must hold the plug by hand.

Before cleaning or maintenance, the power plug must be removed.

For the cleaning of rescue table, please refer to Chapter 10 of this manual for daily maintenance and maintenance.

It is recommended to set the temperature control mode to infant temperature control mode when the patient is receiving blue light radiation therapy.

The baby phototherapy equipment should be operated by a person who is familiar with the use of the infant phototherapy equipment and knows the knowledge of radiation equipment to reduce the concentration of bilirubin in the baby's body; or the personnel who has received professional training and obtained relevant recognition can operate it!

The total bilirubin irradiance of the infant phototherapy equipment refers to: the blue light lamp of the infant phototherapy equipment radiates the patient's surface, the upper (bilateral) blue light irradiator of the equipment takes the 60cm × 35cm area as the effective surface, and the lower (side) blue light irradiator takes the 37cm × 25cm area as the effective surface; and the total irradiance when the blue light is turned on, so as to increase or decrease the effective surface area The total irradiance of bilirubin will change.

Please pay attention to the temperature monitoring of the patient when receiving the blue light radiation therapy of infant phototherapy equipment.

When the patient is in the infant incubator or infant radiation table, (radiation heater), heated mattress, etc.; when receiving the blue

light radiation therapy of infant phototherapy equipment; please note: the blue light radiation may affect the temperature change of the infant incubator or the infant radiation table.

It is suggested that the temperature control mode should be set to infant temperature control mode when the patient is in the environment of infant incubator or infant radiation table; when receiving blue light radiation therapy of infant phototherapy equipment; it is recommended to set the temperature control mode as infant temperature control mode. When the baby phototherapy equipment is used with a heated mattress, the heating power of the heating mattress must be adjusted properly!

When receiving the blue light radiation therapy of infant phototherapy equipment, please pay attention to the measurement of the bilirubin value of the patient before and after treatment, so as to provide the basis for determining the treatment plan.

During the treatment, the user is advised to establish necessary patrol inspection system, and pay special attention to whether the patient is in the effective irradiation area and the protection around the sleeping area.

During the treatment, the patient should avoid using with other light sources with different wavelengths. When the blue light is turned on, attention should be paid to the temperature change of the crib, which may lead to the temperature instability of the crib.

When receiving blue light radiation therapy, patients should wear eye protection.

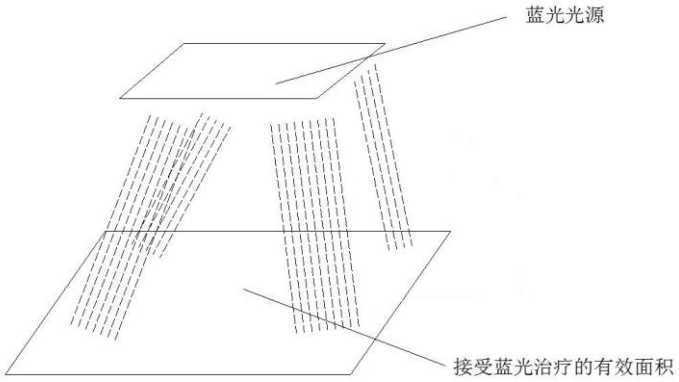
When the patient is receiving blue light radiation therapy, the operator should try to avoid being in the radiation area for a long time.

The cumulative service life of LED lamp beads of this baby phototherapy equipment is: 10000h, please replace the blue light board of infant phototherapy equipment.

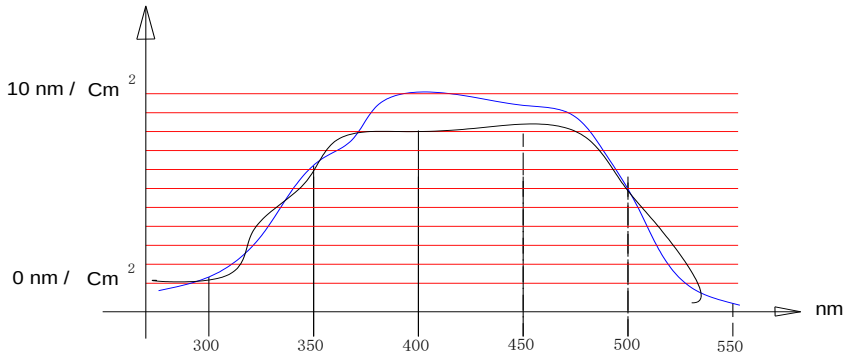
The total bilirubin irradiance of the blue LED lamp beads of the baby phototherapy equipment will be attenuated by 25% after continuous use for 10000h. Please replace all blue LED lights on the baby phototherapy equipment in time.

The brand designated by our company must be used when replacing the blue LED light on the baby phototherapy equipment, otherwise the safety performance and treatment effect of the whole equipment will be changed. When the blue light lamp on the baby phototherapy equipment is damaged during its service life, it must be replaced completely. Otherwise, it will cause the change of total irradiance value of bilirubin and affect the therapeutic effect!

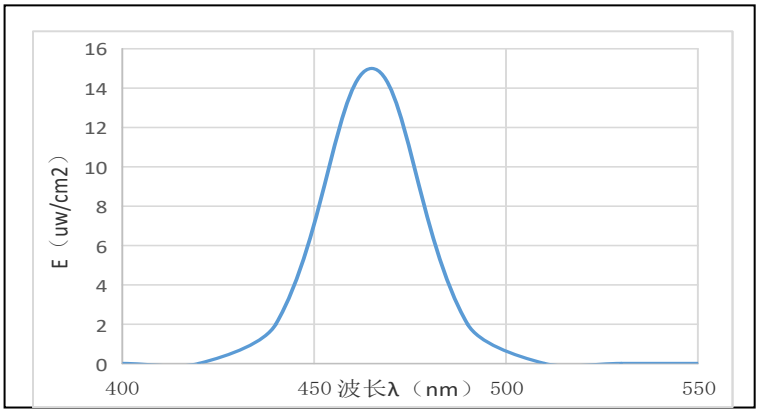
The figure below shows the location of the effective area of the patient receiving the blue light radiation therapy of the infant phototherapy equipment.



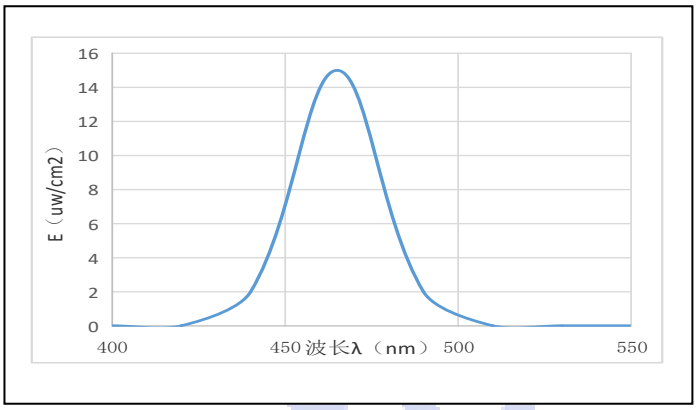
- The calibration curve of total bilirubin irradiance EBI of blue light measuring equipment is as follows：



The total bilirubin irradiance EBI of the bilateral blue light treatment device of the lamp bead baby phototherapy device is 2600 ± 25% μ w / cm2; the curve is shown in the figure below.



The total bilirubin irradiance EBI of the lower blue light treatment device of the lamp bead infant phototherapy device is: 2000 ± 25% μ w / cm2; the curve is shown in the figure below.



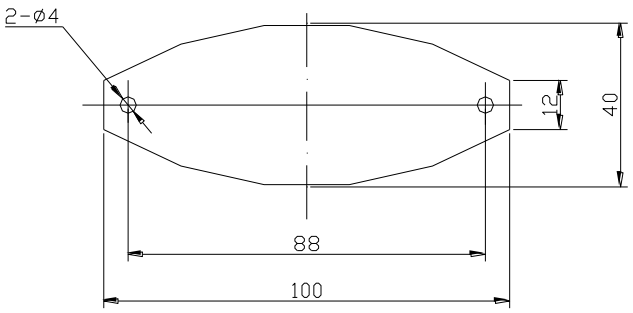
It is recommended that users buy blue irradiance meter! For the use of measuring equipment of blue irradiance meter, the requirements and methods of calibration curve of total bilirubin irradiance EBI, please refer to the attached documents of the measuring equipment.

Please note that photoisomers of bilirubin may cause toxic effects.

Please note that the patient's water balance may be broken.

This symbol indicates that eye protection must be worn. When the patient is receiving blue light radiation therapy with infant phototherapy equipment,

The patient's eyes should not be exposed to blue light radiation, and eye protection must be worn. Refer to the figure below for the reference size of eye protection



- Material of eye protection: the material can be made of black imitation leather and black flannel. The performance requirements are soft. Two holes are surrounded by flat wide tight wire, and the two round holes are fixed with the patient's head with wide

tightening band.

- When nursing patients, nurses should also pay attention to protection and wear black transparent Sunglasses (goggles).
- The infant phototherapy equipment does not use reflective foil for radiation, but it is also necessary to pay attention to the temperature change of patients when receiving blue light tube radiation therapy.
- When receiving blue light radiation therapy, patients should wear eye protection.
- When the patient is receiving blue light radiation therapy, use shading materials to protect the patient's genitals properly.
- The operator should avoid the radiation lamp in the area for a long time.
- The baby phototherapy equipment has no debugging time and can be used after starting.
- The noise of the baby phototherapy equipment is less than 60dB.
- Please do not use flammable agents, preservatives and other materials to wipe or clean the baby phototherapy equipment.
- During patients receiving blue light radiation therapy, whether some protective devices contacting with patients are effective? And check according to the safety requirements of relevant equipment.
- During the treatment, the patient should maintain the appropriate ambient temperature. It should be avoided to be used together with other light sources of different wavelengths.
- Please do not store drugs and injections in the radiation area when receiving the blue light radiation therapy of infant phototherapy equipment.
- To confirm that the building power supply meets the listed power requirements, plug the power plug into a single-phase three wire power supply network with protective grounding. If there is any doubt about the grounding connection, please do not use the baby phototherapy equipment.
- The replaced blue light and other wastes should not be discarded at will. Please follow the relevant local environmental regulations for disposal.
- Any electrical product will have end-of-life risk. After several years of service, the aging of electrical appliances will occur, which will affect the normal use of the equipment. The company suggests that the equipment should be renewed after five years of normal use.
- 2.1 EMC information
- The power line of the equipment is 250V / 2.5m/1mm2 power line; the skin sensor adopts two core powdered non-toxic elastic PVC / 65A, length: 2m wire (see the table below for other extension wires); if other cables are used, the emission of equipment or system may increase, or the immunity will be reduced. Please do not use it **!**

Sample cable list

Serial number	name	Cable length (m)	Is it shielded	remarks
1	power cord	Two point five	no	For plugging into network power supply
2	Patient cable (skin sensor)	Two	yes	Signal port to patient

本 The equipment only uses RF energy for its internal function. Therefore, its RF emission is very low and may not cause any

interference to the nearby electronic equipment.

- The equipment shall not be used close to or stacked with other equipment. If it must be used close or stacked, it shall be observed and verified that it can operate normally under the configuration used.
- The buyer or user of the equipment shall ensure that it is used in the electromagnetic environment under the electromagnetic environment specified below
- The buyer or user of the equipment shall ensure that it uses electromagnetic reactance in the electromagnetic environment specified below. 。

Guidelines and manufacturer's statement - Electromagnetic Emission		
The equipment is expected to be used in the electromagnetic environment specified below, and the buyer or user shall ensure that it is used in such electromagnetic environment		
Launch test	Compliance	Electromagnetic environment - Guidelines
Radio frequency emission gb4824	1 group	The equipment only uses RF energy for its internal functions, so its RF emission is very low and the possibility of interference to nearby electronic equipment is very small
Radio frequency emission gb4824 Harmonic emission GB 17625.1 Voltage fluctuation / flicker emission GB 17625.2	Class A Not applicable Not applicable	The equipment is suitable for all facilities that are not directly connected to the public low-voltage power supply network of non-domestic and domestic residential buildings

Guidelines and manufacturer's statement - Electromagnetic Immunity			
The equipment is expected to be used in the electromagnetic environment specified below, and the buyer or user shall ensure that it is used in such electromagnetic environment			
Immunity test	Iec60601 test level	compliance level	electromagnetic environment - Guidelines
electrostatic discharge GB/T 17626.2	± 6kV contact discharge ± 8Kv air discharge	± 6kV contact discharge ± 8Kv air discharge	The floor shall be wood, concrete or ceramic tile, and if the floor is covered with synthetic material, the relative humidity shall be at least 30%
EFT (Electrical Fast Transient) GB/T 17626.4	±2kv pair power cord ±1kv pair input/output line	±2kv pair power cord ±1kv pair input/output line	The network power supply should be of the quality used in a typical commercial or hospital environment.
Surge current 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 be of the quality used in a typical commercial or hospital environment.

Voltage sag, short-term interruption and voltage change on the power input line GB/T 17626.11	<5%UT, lasting for 0.5 cycle (>95% sag at UT) 40%UT, lasting for 5 cycles （60% sag at UT） 70%UT，lasting for 25 cycles (30% sag at UT) <5%UT，lasting for 5s (>95% sag at UT)	<5%UT, lasting for 0.5 cycle (>95% sag at UT) 40%UT, lasting for 5 cycles （60% sag at UT） 70%UT，lasting for 25 cycles (30% sag at UT) <5%UT，lasting for 5s (>95% sag at UT)	The network power supply should be of the quality used in a typical commercial or hospital environment. If the equipment needs to run continuously during power interruption, recommend use uninterruptible power supply or battery power supply.
PFMF (Power Frequency Magnetic Fields) GB/T 17626. 8	3A/m	3A/m	The PFMF should feature the level characteristics of the power frequency magnetic field in a typical place in a typical commercial or hospital environment.
Note: it refers to the AC grid voltage before the test voltage is applied			

➢ For purchaser or users, this equipment is expected to be used in the following electromagnetic environment.

Guidelines and manufacturer's declaration-electromagnetic immunity			
The equipment is expected to be used in the electromagnetic environment specified below, and the purchaser or user should ensure the electromagnetic environment			
Immunity test	Test level IEC 60601	Test level	Guidance of electromagnetic environment
RF Conduction GB/T 17626.6	3V (effective value) 150kHz ~ 80MHz ISM band） 10V (effective value) 150kHz ~ 80MHz （ISM band）	3V (effective value) 10V/m (effective value)	Portable and mobile radio frequency communication equipment should not be used closer to any part of the equipment, including cables, than the recommended isolation distance. The calculation of this distance corresponds to the transmitter frequency formula. Recommended isolation distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80MHz～800MHz $d=2.3\sqrt{P}$ 800MHz～2.5GHz : P--The maximum output rated power of the transmitter provided by the transmitter manufacturer, in watts (W). d-- Recommended isolation distance, in meters (m). The field strength of the fixed RF transmitter is determined by surveying the electromagnetic field*, and it should be lower than the compliance level in each frequency range*. Interference may occur in the vicinity of equipment marked with the following symbols.
RF Radiation GB/T 17626.3	10V/m 80MHz~2.5GHz 10V/m 26MHz~1GHz	10V/m 10V/m	

Note 1: On 80MHz and 800MHz frequencies, use the higher frequency band formula.

Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and humans.

The ISM band between 150kHz and 80kHz refers to 6.765MHz～6.795MHz, 13.553MHz～13.567MHz, 26.957MHz～27.283MHz and 40.66MHz～40.70MHz.

The compliance level in the ISM band between 150kHz and 80MHz and the frequency range between 80MHz and 2.5GHz is used to reduce the possibility of interference caused by mobile portable communication devices accidentally brought into the patient area. Therefore, an additional factor of 10/3 is used to calculate the recommended isolation distance for transmitters in these frequency ranges.

Stationary transmitting station, such as base stations for wireless (cellular/cordless) telephones and ground mobile radios, amateur radios, AM and FM radio broadcasts, and TV broadcasts, whose field strength cannot be accurately predicted in theory. In order to assess the electromagnetic environment of fixed radio frequency transmitters, electromagnetic field surveys should be considered. If the measured field strength outside the shielded location used by the equipment is higher than the above-mentioned RF compliance level, the equipment should be observed to verify its normal operation. If abnormal performance is observed, supplementary measures may be necessary, such as reorienting or relocating the device.

➢ Recommended separation distance between portable and mobile radio frequency communication device and this equipment

Recommended separation distance between portable and mobile radio frequency communication device and this equipment				
The equipment is expected to be used in an electromagnetic environment where radio frequency radiation disturbances are controlled. According to the maximum output power of communication equipment, the purchaser or user of the equipment can prevent electromagnetic interference by maintaining a minimum distance between portable and mobile radio frequency communication device (transmitter) and this equipment				
	Corresponding isolation distance of the transmitter at different frequencies /m			
Maximum rated output power of transmitter/W	150kHz～80MHz（ISM band） $d=3.5\sqrt{P}$	150kHz～80MHz（ISM band） $d=12\sqrt{P}$	80MHz～2.5GHz $d=2.3\sqrt{P}$	800MHz～2.5GHz $d=2.3\sqrt{P}$
0.01	0.35	1.2	0.12	0.23
0.1	1.1	3.8	0.38	0.73
1	3.5	12	1.2	2.3
10	11	38	3.8	7.3
100	35	120	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 transmitter manufacturer, in watts (W). Note 1: At 80MHz and 800MHz frequency points, use the higher frequency band formula. Note 2: The ISM band between 150kHz and 80MHz refers to 6.765MHz～6.795MHz, 13.553MHz～13.567MHz, 26.957MHz～27.283MHz and 40.66MHz～40.70MHz. Note 3: An additional factor of 10/3 is used in the calculation formula for the recommended distance of the transmitter within the ISM band within 150kHz～80MHz and the frequency range 80MHz～2.5GHz to reduce the possibility of interference caused by mobile portable communication devices accidentally brought into the patient area. Note 4: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and humans.				

In addition to transducers and cables sold by the equipment manufacturer as spare parts of internal components, the use of accessories, transducers and cables outside the regulations may result in an increase in equipment emission or a decrease in immunity.

The equipment should not be used close to or stacked with other equipment. If it must be used close or stacked, it should be observed to verify that it can operate normally under the configuration used.

- Any electrical products will have end-of-life risks. After the equipment is used for several years, electrical aging will occur, which will affect the normal operation of the equipment.
- Note: The temperature parameters of the infant radiant warmer have been adjusted before leaving the factory! If the user needs to know or make adjustments after maintenance, please contact our company.

3 Explanation of terms, definitions, symbols and signs involved in the product

(1) Infant radiant warmer

An electric power device including a radiant heat source that uses direct radiant energy in the infrared range of the electromagnetic spectrum to maintain the thermal balance of the infant patient.

(2) Applied part

Part of the equipment in normal use:

——The part that must be in physical contact with the patient in order to perform the function of the device; or

——The part that can be touched by the patient; or

——The part that needs to be touched by the patient.

(3) Type BF applied part

The applied part of this product is a skin temperature sensor, which meets the requirements of national regulations. Type BF applied part is one level higher than Type B applied part in terms of the degree of protection against electric shock.

(4) Skin temperature sensor

A signal sensor device, including a connection part with the device, is used to detect the temperature of the newborn's skin.

(5) Test device

A safe matt blackened disc used as a receiver for reproducing radiant energy during equipment testing. (Refer Figure 1)

(6) Test load

Take five test devices as a group and arrange them in a prescribed form (refer Figure 2) for the performance test of the equipment.

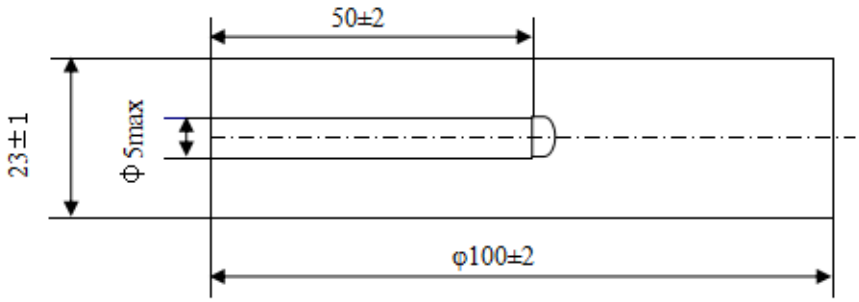


Figure 1 Test device

Note:

1. Surface coating: non-reflective black coating;
2. Disc weight: （500±10）g;
3. Disc material: aluminum with a specific gravity of 2.6g/cm3～2.9g/cm3;
4. Unit: mm

(10) Control temperature

Setting the temperature of the temperature controller.

(11) Manual mode

One running way adjusted by operator, in these running ways, heater output as the constant energy level or max output energy level.

(12) Baby thermal controlled mode

One operator setting temperature running way. In the running way, the output power will be adjusted as the baby's temperature.

(13) Infant phototherapy equipment

The main radiation spectrum emitted is in the range of 400nm ~ 550nm, which is used to reduce the concentration of bilirubin in infants.

（14）Effective surface area

Place the patient according to the designated position on the surface irradiated by the phototherapy equipment.

Note: The effective surface refers to the treatment surface irradiated by the light treatment lamp. The standard size surface：60cm×35cm.

（15）Patient

Infants treated with visible light radiation from the equipment specified in **3.1.**

(16) Total irradiance for bilirubin E_{bi}

The irradiance is equivalent to that evaluated in the range of 400nm～550nm, which is given by the integral formula (1):

$$E_{bi} = \int_{400nm}^{550nm} E_{\lambda}(\lambda)\, d\lambda \quad \text{.....(1)}$$

$E_{\lambda}(\lambda)$ — The irradiance measured at each wavelength, in W/m2.

(17) Uniformity G_2 of the total irradiance for bilirubin

The ratio of the minimum total bilirubin irradiance E_{bimin} and the maximum total bilirubin irradiance E_{bimax} on the effective surface is shown in formula (2):

$$G_2 = E_{bimin}/E_{bimax} \quad \text{.....(2)}$$

4 Overview

4.1 Main Use and Applicable Scope:

The product is applicable for the body temperature maintaining, emergency operation and intensive care of new-born baby, sick and weak infant and premature infant.

4.2 Product Composition: (refer the table below)

No.	Model	Composition	Functionality	Applicable Scope
1	YR02189	Temperature controller, skin temperature sensor, radiant head, frame column, mattress, lighting lamp	Baby temperature control, manual control, Apgar score, lighting	Applied to temperature preservation and emergency operations of newborns, sick and weak infants and premature infants.
2	YR02190	Temperature controller, skin temperature sensor, radiant head, frame column, mattress, lighting lamp	Baby temperature control, manual control, Apgar score, lighting, X-ray box	Applied to temperature preservation and emergency operations of newborns, sick and weak infants and premature infants.
3	YR02192	Temperature controller, skin temperature sensor, radiant head, frame column, mattress, bed lifting, lighting lamp and lower blue light irradiator(underside)	Baby temperature control, manual control, Apgar score, lighting, X-ray box, bed lifting, blue light treatment for jaundice patient (underside)	Applied to temperature preservation, emergency operations temperature monitoring and jaundice treatment of newborns, sick and weak infants and premature infants.
4	YR02191	Temperature controller, skin temperature sensor, radiant head, frame column, mattress, lighting lamp and blue light irradiator(underside)	Baby temperature control, manual control, Apgar score, lighting, X-ray box, blue light treatment for jaundice patient (underside)	Applied to temperature preservation, emergency operations temperature monitoring and jaundice treatment of newborns, sick and weak infants and premature infants.
5	YR02193	Temperature controller, skin temperature sensor, radiant head, frame column, mattress, lighting lamp, low negative pressure/low flow suction device, upper (double side) blue light irradiator, lower blue light irradiator	Baby temperature control, manual control, Apgar score, lighting, X-ray box, bed lifting, upper (double side) and lower blue light treatment for jaundice patients, electric low-pressure suction, adding oxygen cylinders to place stents	Applied to temperature preservation, emergency operations temperature monitoring and jaundice treatment of newborns, sick and weak infants and premature infants.

4.3 Safety of the Equipment

a) The equipment is IPXO ordinary type, the pedal open light water proof level is IPX4；

b) The equipment running type is continuous running；

c) This equipment cannot be used in the presence of flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrous oxide;

d)The equipment accord with the I group A class electromagnetic compatibility of GB4824

e） Basic performance identification of the equipment:：

1) Skin temperature control mode, the mattress is in a horizontal position, and the difference between the temperature measured by the skin temperature sensor and the control temperature shall not exceed ±0.5℃;

2) The low negative pressure/low flow suction device should be able to open normally and continue to work;

3) The blue light on both sides and lower blue light should be adjustable between 0～99% power, and it should be able to turn on normally and work continuously

4.4 Normal Working Environment

a) Ambient temperature: 18~30℃, with the control temperature being at least 3℃ higher than the ambient temperature;

b) Relative humidity： (45～75)%；

c) Atmospheric pressure： (70～106)Kpa；

d) Ambient air speed： ＜ 0.3 m/s,

e) Placed in an area with relatively static air flow and without direct sunlight and other heat sources.

Notice: the equipment normal running condition should accord with the above condition, if departure the normal working condition, it will cause the equipment data unsteady, and get the huge risk to the patient.

4.5 Model Naming

4.5.1 Software Component Name and Version Number

a) SCM for main control, version number: YR-A2-1

b) SCM for secondary control, version number: YR-A2-2

c) SCM for blue light radiation control and timing, version number: YR-A2-3

4.6 Model Classification

Table 1

Model / Main Functions	YR02189	YR02190	YR02192	YR02191	YR02193
Bed & Bracket	Small bed, bracket type	big bed, streamline frame	big bed, streamline frame	big bed, streamline frame	big bed, streamline frame
X ray box		▲	▲	▲	▲
Apgar score	▲	▲	▲	▲	▲
Upper bilateral blue light					▲
Lower blue light			▲	▲	▲
Bed lifter			▲		▲
Negative pressure suction device					▲
Cylinder Holder					▲

4.7 Basic Parameters：refer to Table 2

Table 2 Basic parameters of infant radiant warmers

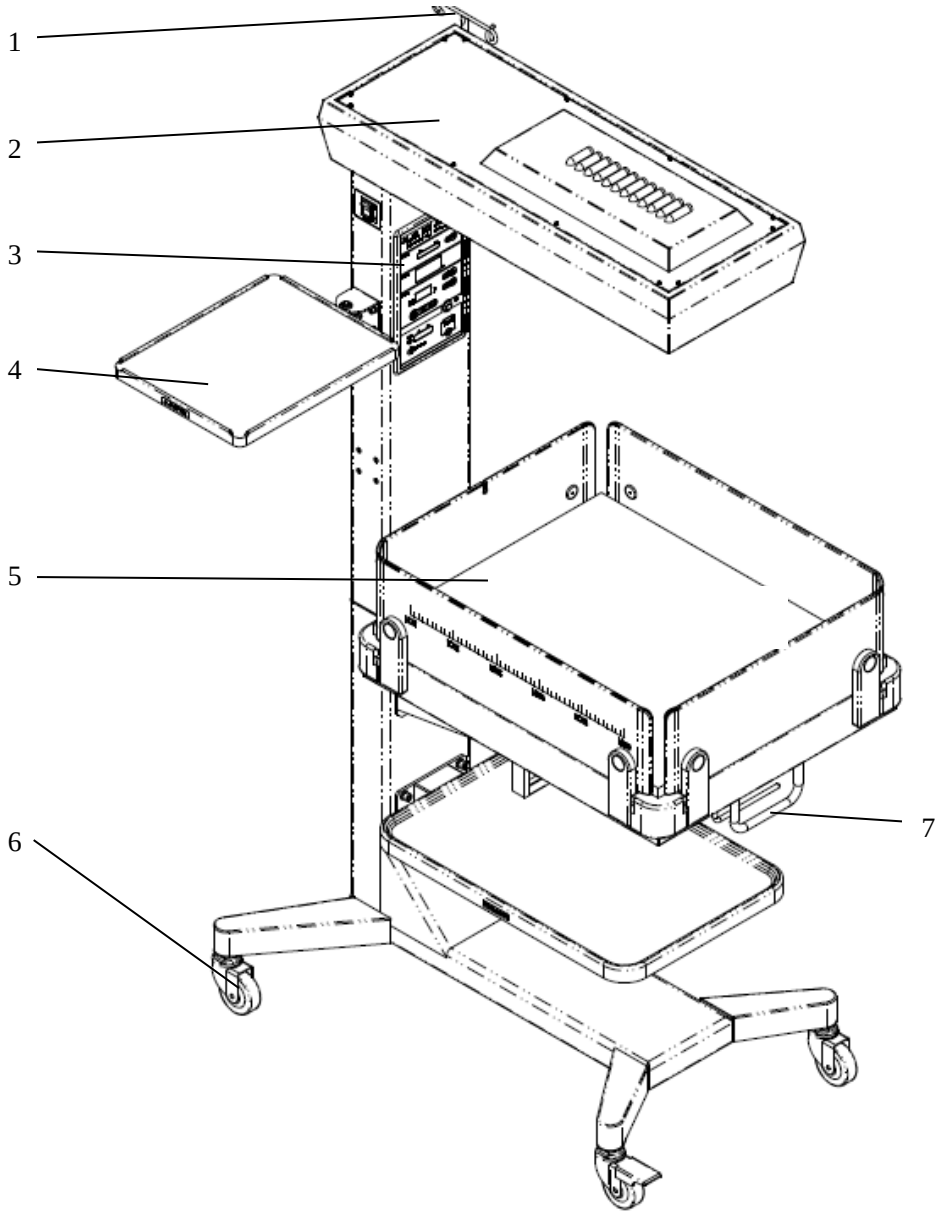
No.1	Model / Parameters	YR02189	YR02190	YR02192	YR02191	YR02193
1	Power supply voltage	～220 V 50Hz				
2	Power consumption	No more than 700VA	No more than1000 VA			
3	Skin temp-controlled mode	No more than±0.5℃				
4	The average temperature of the bed surface	No more than 2℃				
5	Display accuracy of skin temperature sensor	±0.3℃				
6	Control range of skin temperature	25.0℃～37.0℃				
7	Temperature display range	No less than 20℃～45℃				
8	Temperature display step length	0.1℃				
9	Skin temperature control deviation alarm	±1℃				
10	Over-temperature alarm	The first time ＜38℃, the second time ＜40℃				
11	Manual output power≤49%	There is no limit time, an alarm will prompt every 5 minutes；				
12	Manual output power≥50%	The limit time is 5 minutes. Automatic adjustment to ≤49% after 5 minutes. An alarm will prompt every 5 minutes.				
13	APGAR timing deviation	No more than ±4s				
14	Tilt adjustment of the bed surface	The horizontal direction is not less than ±5°, stepless adjustable.				
15	Center illuminance on the bed surface	≥100Lx				
16	Telescopic bed lifting	The speed shall not be greater than 38mm/s, from the bed to the ground level of 780±20mm to the highest position 980±20mm.				
17	Maximum bearing capacity of the tray	20N				
18	Maximum bearing mass of the crib	10kg				
19	Maximum endurance of the infusion stand	10N on both sides of the bottle				
20	Total bilirubin irradiance of upper (both sides) blue light E_{bi}	2600±25% μW/cm^2				
21	Total bilirubin irradiance of lower blue light E_{bi}	2000±25% μW/cm^2				
22	The relative regional distribution of Ebi	The ratio of min Ebi and max Ebi is not less than 0.4				

23	Matching suction device	Low negative pressure/low flow (drainage)
24	Collection container of matching suction device	1000ml collection container
25	Load-bearing of matching oxygen bottle rack	50N respectively
Note: Please read the relevant content refer to Table 1 for the configuration of the above parameters.		

Please read selectively according to the model you choose!

4.8 model diagram

4.8.2 YR02189

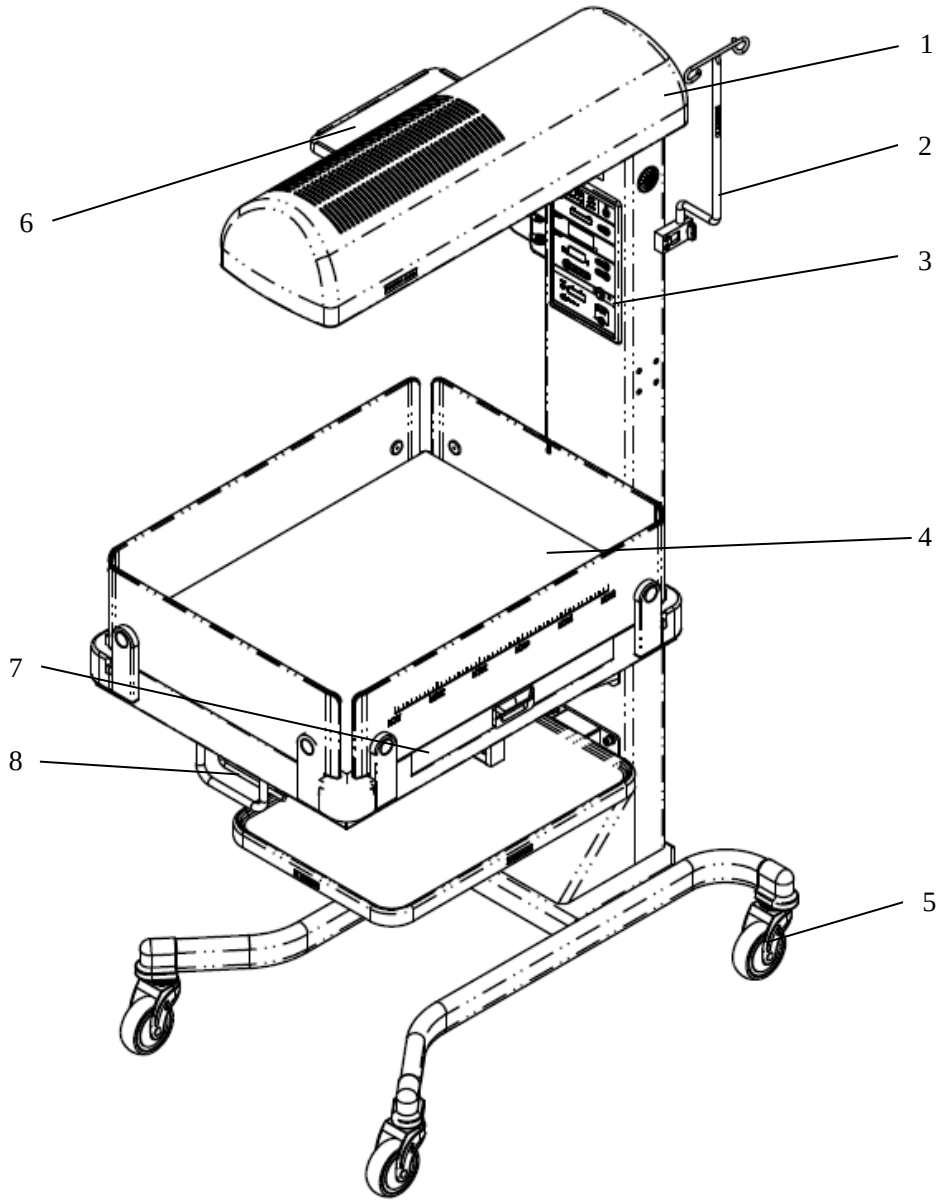


YR02189 Schematic diagram

The structure is subject to change without notice

1. Salt water rack 2. Heating radiation box 3. Heating controller 4. Tray 5. Bed 6. Wheel foot 7. Bed tilt handle

4.8.2 YR02190

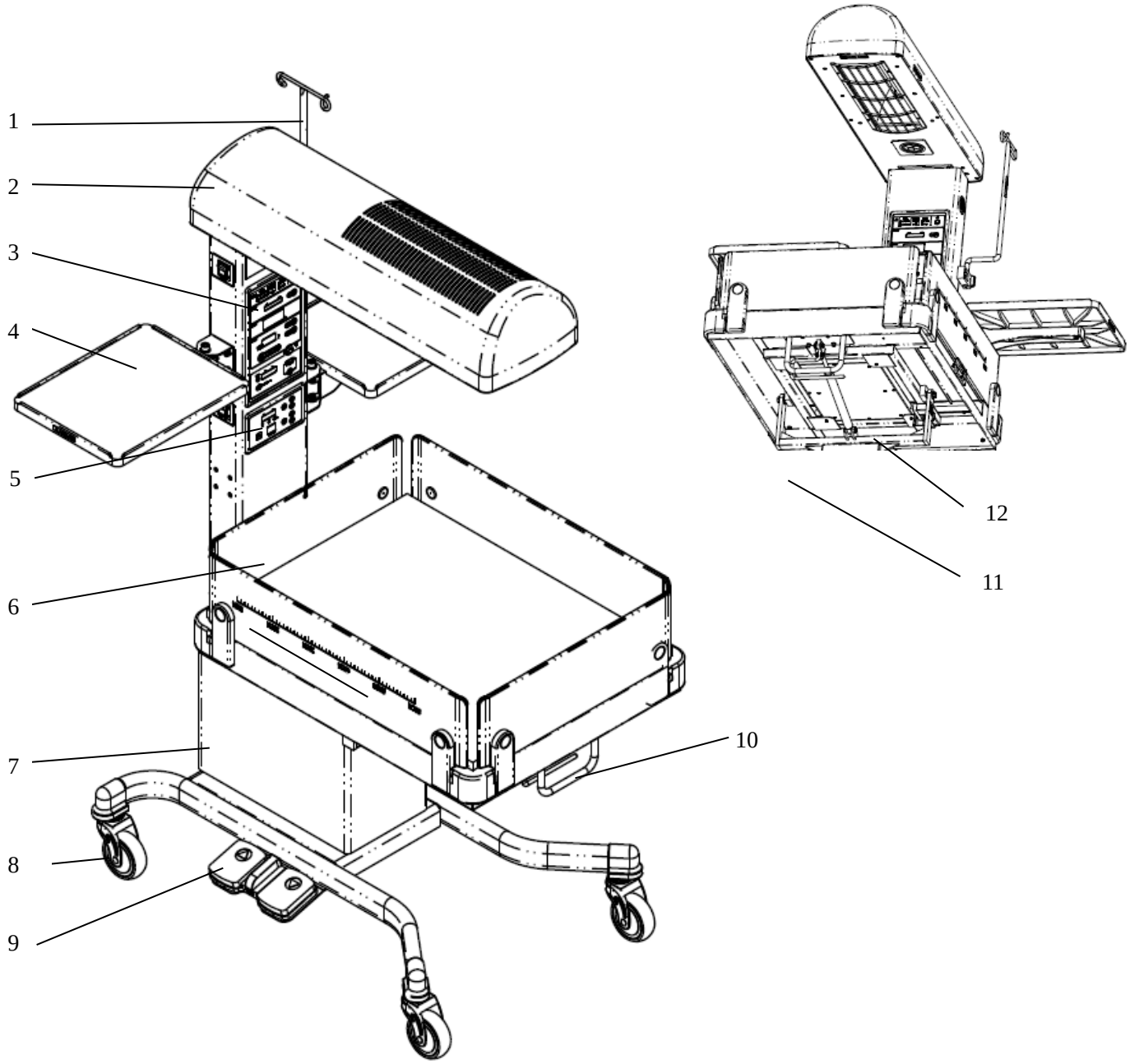


YR02190 Schematic diagram

The structure is subject to change without notice

1. Heating radiation box 2. Salt water rack 3. Heating controller 4. Bed 5. Wheel foot 6. Tray 7. Film box 8. Bed tilt handle4

8.3 YR02192



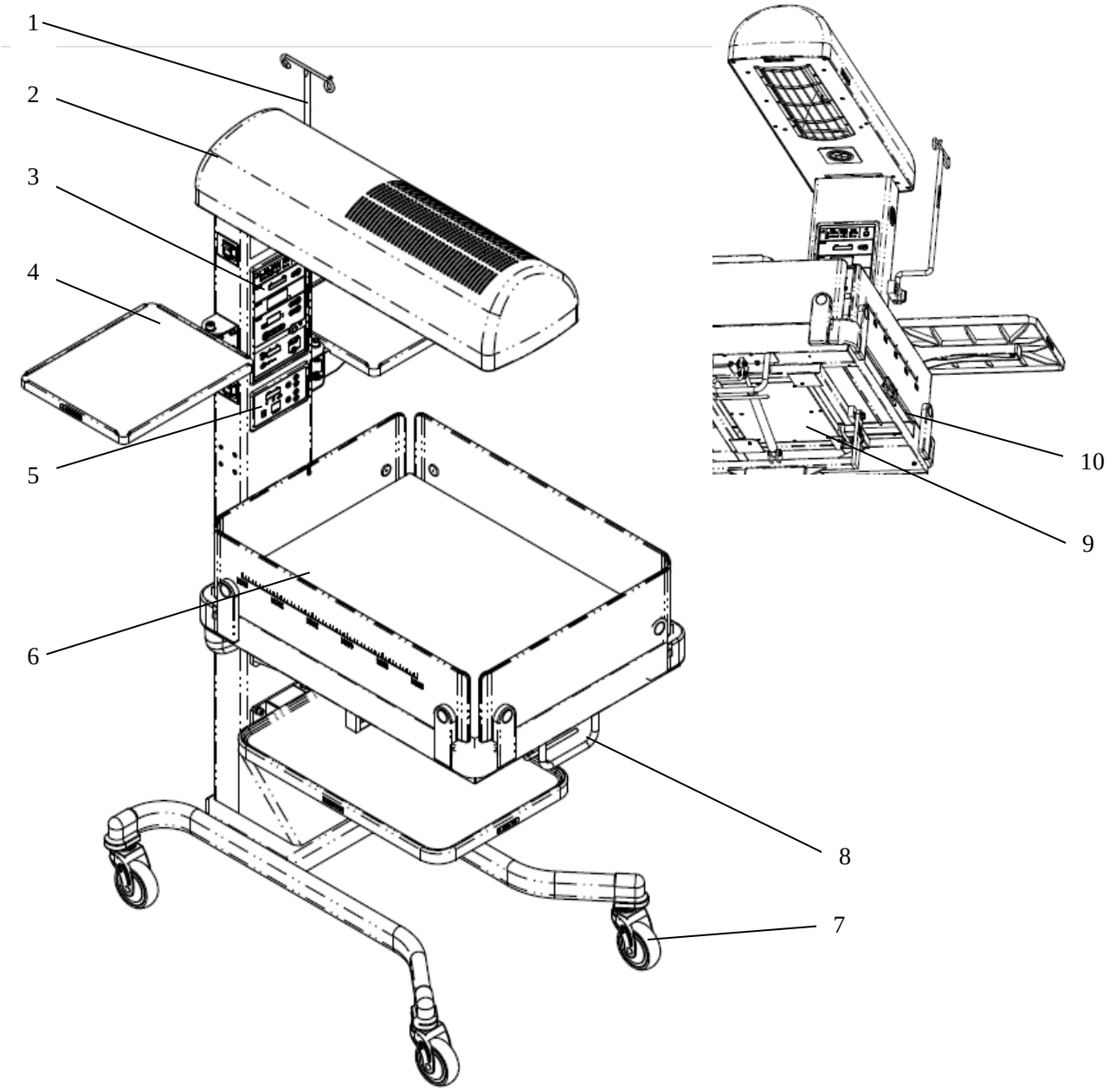
YR02192 schematic diagram

The structure is subject to change without notice

1. Salt water rack 2. Heating radiation box 3. Heating controller 4. Tray 5. Blue light controller 6. Bed

7. Frame elevator 8. Wheel foot 9. Elevator pedal 10. Bed tilt handle 11. Lower (side) blue light irradiator 12. Film box

4.8.YR02191

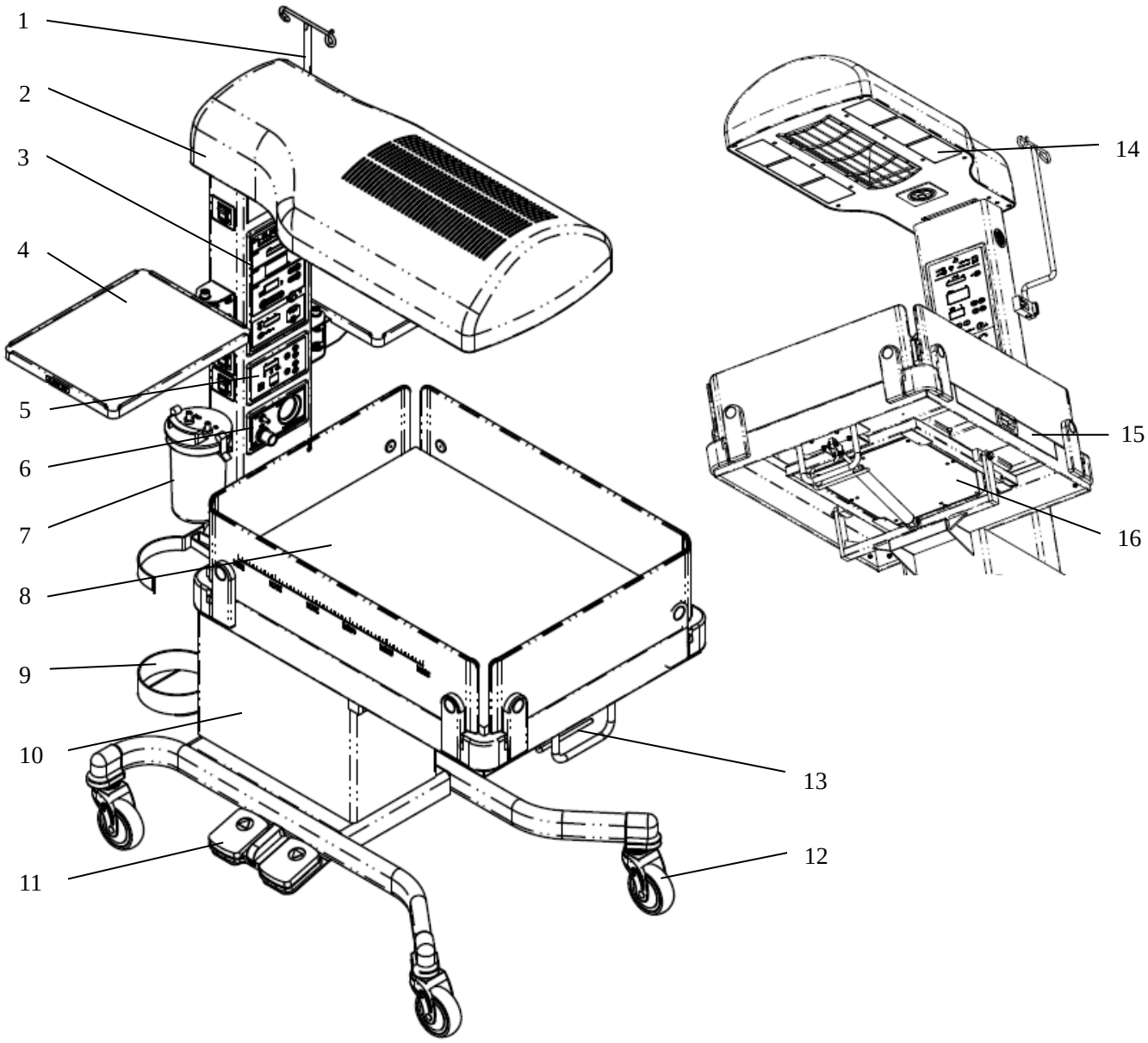


YR02191 schematic diagram

The structure is subject to change without notice

1. IV pole 2. Heating radiation box 3. Heating controller 4. Tray 5. Blue light controller 6. Bed 7. Wheel foot

8. Bed tilt handle 9. Lower (side) blue light irradiator 10. Film box 4.8.



YR02193 schematic diagram

The structure is subject to change without notice

1. Salt water rack 2. Heating radiation box 3. Heating controller 4. Tray 5. Blue light controller 6. Low pressure / low flow aspirator7. Waste container 8. Bed 9. Gas cylinder bracket 10. Rack elevator 11. Elevator pedal 12. Wheel foot13. Bed tilt handle 14. Upper (bilateral) blue light irradiator 15. Film box 16. Lower (side) blue light irradiator

5 Structure introduction

- Baby bed：

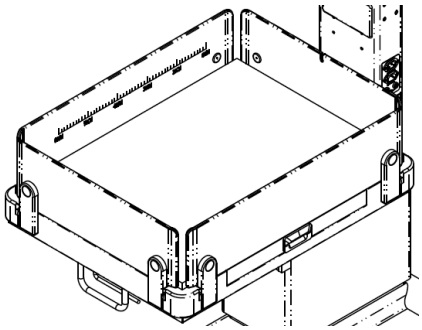


Diagram 1

This is a position for heat preservation and care of sick, weak and premature infants. When using, put the baby in the crib and lock the lock of the crib.

Note: 1. The crib baffle is fragile, and should be careful in normal operation. Do not wipe with solvent materials.

2. Always check whether the lock hinge of the crib baffle is damaged. Do not use it when it is damaged!

- Lifting frame：

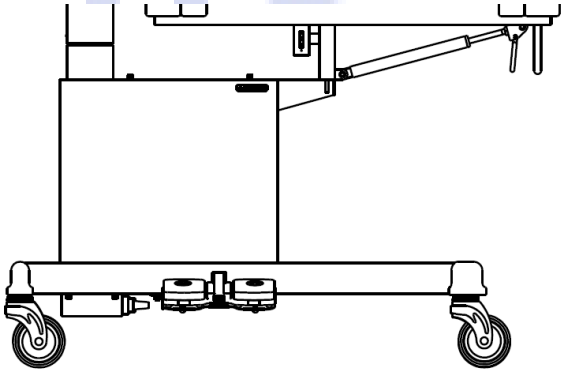
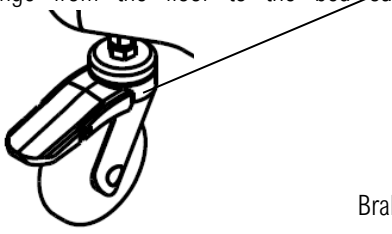


Diagram 2

This is a part used to support the whole rescue table and crib.

The lifting range from the floor to the bed surface is 780 ± 20mm to 980 ± 20mm, with automatic limit control device.

Mobile state



Braking state

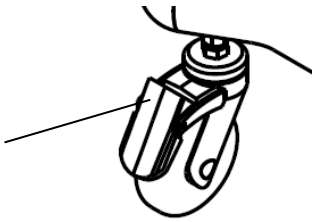


Diagram3 Diagram4

- Note: two castors with locks should be locked to prevent accidental movement. It should be placed in a flat place, and it is forbidden to use it when the whole machine inclines more than 5 degrees.

Temperature control device:

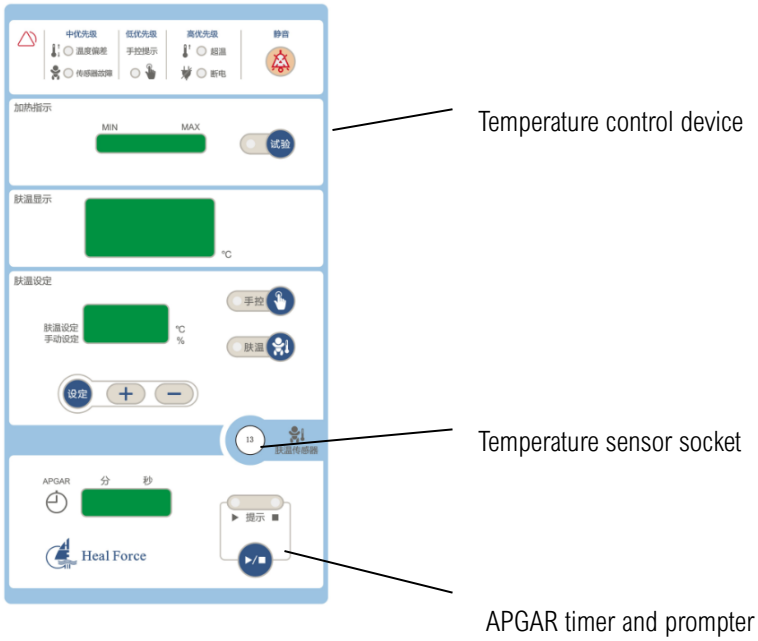


Diagram 5

This is a temperature control device. The electric heating device generates heat source, which is conducted by the temperature sensor, and sends the change temperature signal to the control system

Intelligent control of resumption.

APGAR timing, prompting device, which is equivalent to an electronic clock, but its working mode is designed according to medical requirements. It can send out the prompt sound in 1, 5, 10 minutes of standard time, so that the medical staff can score the newborn according to the medical requirements.

Attention: 1. The temperature sensor must be careful, do not strongly impact or pull the temperature sensor.

2. When the electronic clock is damaged or the timing is not accurate, it will misjudge the health status of the newborn. Therefore, please check the electronic clock regularly to prevent unnecessary misjudgment.● Salt water rack and tray device：

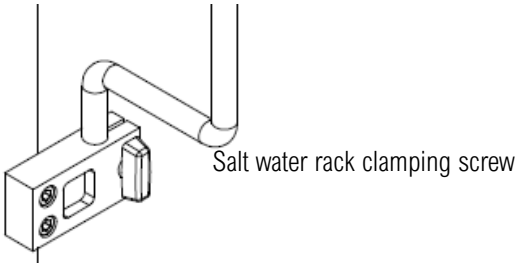


Diagram 6

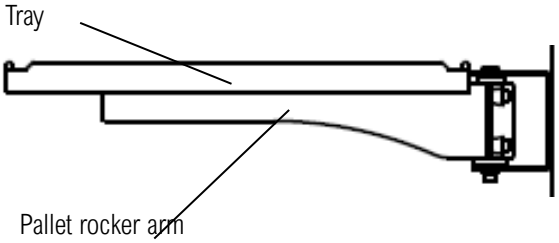


Diagram7

This is a tray specially designed for the rescue table.

- Note: 1. The maximum load of the pallet is 20n (including the dead weight of the container) and do not overload.
- 2. Check the clamping screw frequently for damage!
- 3. The maximum bearing capacity of the bottle hanging place on both sides of the infusion rack is 10N (including the dead weight of the

container). Do not overload.

X Camera box drawer：

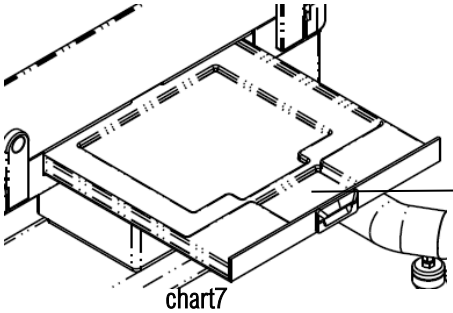
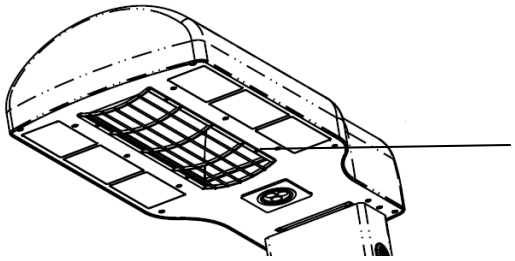


chart7

● ： Radiation hood



chartp8

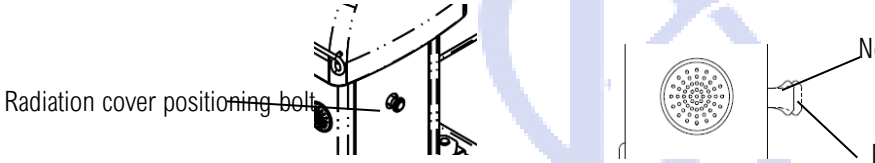


chart9 chart 10

The radiation cover is the part that produces heat source

Attention:

1. When the whole machine is working, do not touch the heat insulation net cover!

2. The surface temperature of electric heater is very high, do not touch it.

3. During normal use, the positioning bolt of radiation hood should be in this position! (see Figure 10).

4. The self weight of radiation cover is 4kg, and it is forbidden to pull or put articles.

- Lifting pedal：

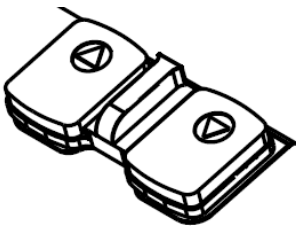


chart11

The lifting range of the distance from the ground to the bed surface is 780 ± 10 mm to 980 ± 10 mm, with automatic limit control device.

6 Function introduction

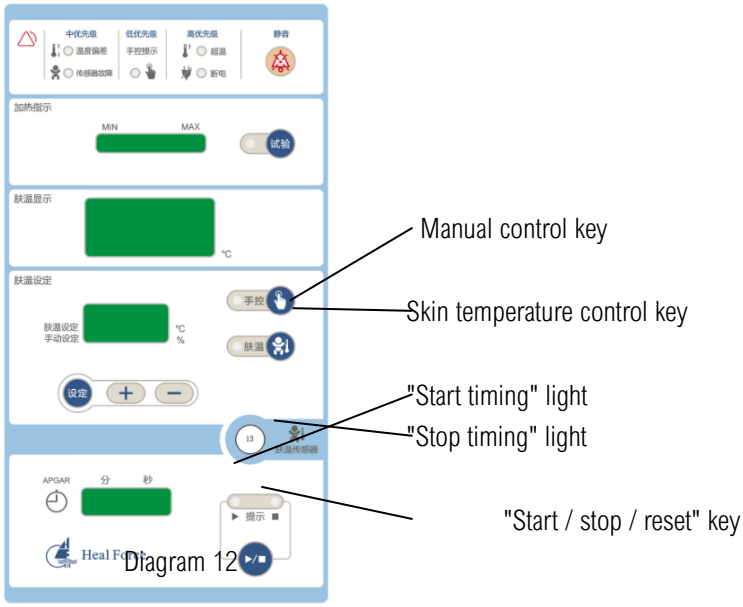


Diagram 12

a) Preheating mode

Warm up mode is a mode that starts automatically after the infant temperature control mode is turned on. In this mode, the self-control indicator for skin temperature keeps flashing. When the preheating mode is over, the indicator light will be normally on, that is, it will enter the constant temperature state. Do not put the newborn in the rescue table until the end of preheating mode.

b) Manual control mode

The manual control mode of rescue table is a mode of environmental temperature control set by the operator according to clinical needs. In this mode, the temperature control system on the rescue table outputs according to the power level set by the operator, so as to gradually approach the power required by the operator, so that the bed surface temperature of the rescue table can reach the power range set by the operator.

When the output power of manual control is less than or equal to 49%, the sound and light alarm of manual control state will give an alarm every 5 minutes until the manual switch to skin temperature control mode.

When the output power of manual control is greater than or equal to 50%, the heating power will automatically switch to ≤ 49% after 5 minutes; the sound and light alarm in manual control state will give an alarm every 5 minutes until the manual switch to skin temperature control mode .Note: this mode is only used for nursing or rescue, not for long-term insulation!

a) Infant temperature control mode

In this mode, the temperature in the rescue table is set by the operator according to the clinical medical requirements and the physiological characteristics of the baby's body temperature. During operation, the skin temperature sensor is attached to the baby's surface. In this control mode, the sampling signals and change trend of the sensors on the baby's body surface are collected to the temperature control system on the

rescue table for logical analysis and judgment, and adjustment or control are made to maintain the temperature field of the infant's body temperature on the rescue table.

Note: the principle of this control mode is to change the heating heat according to the baby's temperature, which is the basic temperature control mode and use method of the rescue table.Apgarb) Timer function

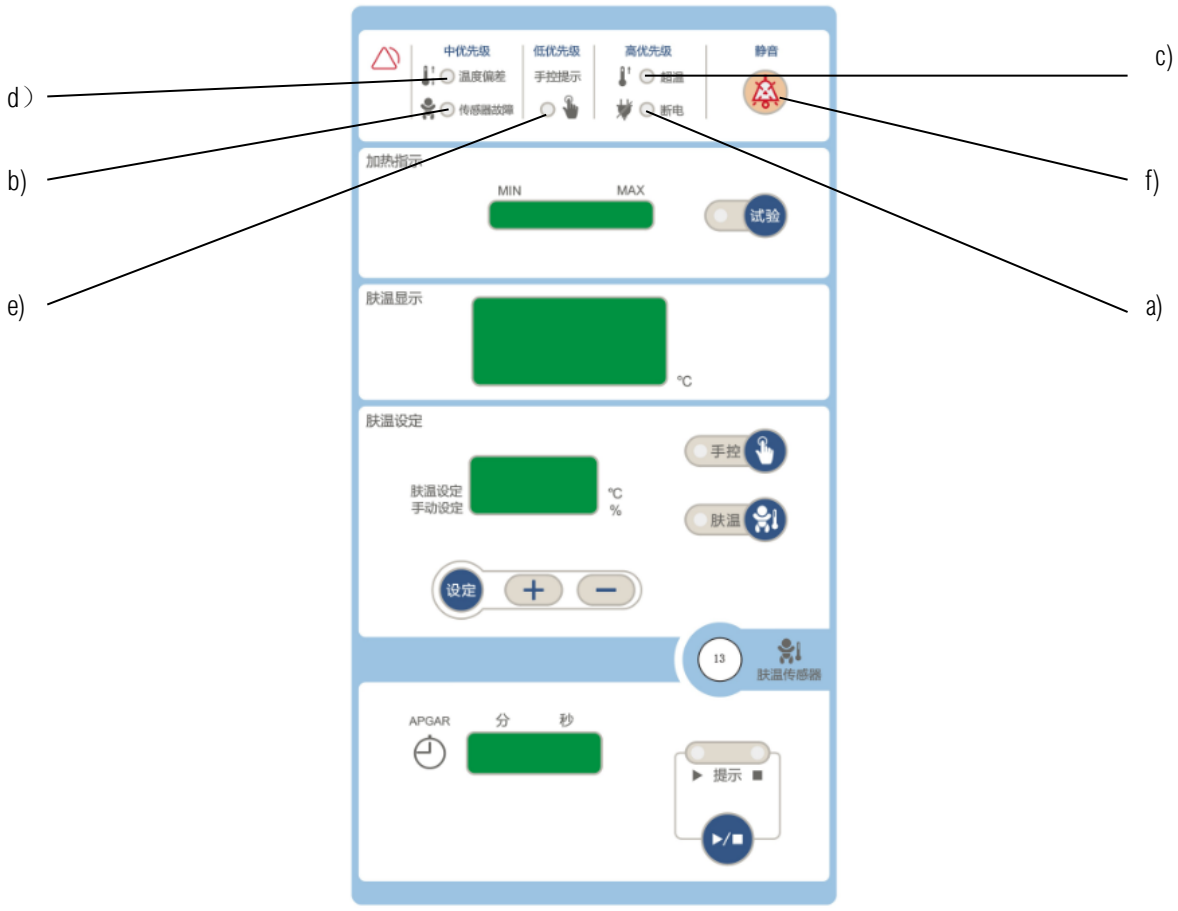
Maximum timing time: 99 minutes 59 seconds

Prompt time: 50 seconds - 1 minute; 4 minutes 50 seconds - 5 minutes; 9 minutes 50 seconds - 10 minutes; 10 seconds prompt tone.

Press the start / stop / reset key once to start the timing, and press again to stop the timing.

Press the start / stop / clear key for 2 seconds to clear the timer.

7 Relevant warning function



Sketch Map13

7.1Brief introduction of warning sound and light alarm

a) Power failure alarm (high priority）

When the main power supply in the rescue table fails or the network power supply is disconnected accidentally, the alarm will be started within 1 s, and the "red" light of the power failure alarm indicator will always be on, and "Dang" will occur at the same time Dang Dang - Dang - Dang - dang Dang "Dang Dang Dang" is a long ringing alarm.

When there is no power failure alarm and indicator light flashing, and "dang Dang Dang - Dang - Dang - dang Dang The "Dang

Dang" alarm sounds for a long time. It may be necessary to replace the internal battery. (see Figure 13)

b) Skin temperature sensor failure (medium priority)

In the skin temperature control mode, when the skin temperature sensor internal short circuit or open circuit fault, or poor connection, the alarm will start within 3S, the sensor alarm indicator "yellow" light will flash, and intermittent "dang Dang Dang - dang Dang The alarm sounds "bang". (see Figure 13)

c) Overtemperature alarm (high priority)

In the skin temperature control mode, when the skin temperature sensor of the rescue station detects the temperature exceeds 37 ℃ and is less than 38.5 ℃, it will send out the first limit temperature alarm indication. The "red" light of the over temperature alarm indicator will flash within 1 s, and the "dang Dang Dang - Dang - Dang - dang Dang The alarm sound of "Dang Dang Dang". (see Figure 13)

In the skin temperature control mode, the skin temperature sensor of the rescue station can real-time detect the temperature exceeding 38.5 ℃ and less than 40 ℃. When the temperature is lower than 40 ℃, it will send out the second limit temperature alarm indication. The "red" light of the over temperature alarm indicator will flash within 1 s, and the "dang Dang Dang - Dang - Dang - dang Dang The alarm sound of "Dang Dang Dang". (see Figure 13)

d) Temperature deviation alarm (medium priority)

In the process of use, when the skin temperature displayed on the rescue table is lower than 1.0 ℃ of the set value, the alarm will be started after 1 s delay, and the deviation alarm indicator "yellow" light will be on, and the "Dang" will be sent out intermittently Dang Dang - dang Dang The alarm sounds "bang". (see Figure 13)

In the process of use, when the skin temperature displayed by the rescue table is 1.0 ℃ higher than the set value, the alarm will start after 1 s delay, and the deviation alarm indicator "yellow" light will be on, and the "Dang" will be sent out intermittently Dang Dang - dang Dang At the same time, cut off the power supply of the internal electric heater. (see Figure 13)

● If the radiation temperature of the device does not reach the set control temperature after the device is started up or reset, the device will not trigger the temperature deviation alarm because it does not meet the control requirements.

In the skin temperature control mode, if the skin temperature sensor is not placed in the recommended position of the company, it deviates from the radiation range of the equipment. The power will be automatically switched to 30% in four minutes. If no one put the sensor back to the correct position, the sensor alarm indicator "yellow" light flashing, and intermittent "dang Dang Dang - dang Dang The sound of "bang"

e） Manual prompt (low priority)

When the output power of manual control is less than or equal to 50%, the sound light prompt of manual control will send out "dang..." every 5 minutes The "blue" light will be on for a long time until it is manually switched to the skin temperature control mode.

When the output power of manual control is more than 50%, the heating power will automatically switch to ≤ 50% after 5 minutes; the sound light prompt of manual control will send out "Bang..." every 5 minutes The "blue" light will be on for a long time until it is manually switched to the skin temperature control mode.

f) Alarm silence key

In addition to breaking the telegraph alarm, pressing this key can eliminate the alarm sound, but it can not eliminate the fault of the alarm. If the fault is not eliminated, the sound alarm will be restarted after 3min. (see Figure 13)

f) When the Apgar timer is turned on, the "Dang" will be sent out in 50 s to 1 min, 4 min 50 s to 5 min and 9 min 50 s to 10 min Dang The timer can be reset manually in any accumulated time.

g) Volume of audible alarm and information signals

Alarm volume: the sound alarm A-weighted sound level generated at 3 meters in front of the control device shall not be lower than 65dB; the sound alarm A-weighted sound level at 5cm above the mattress Center shall not exceed 80dB.

Except for the volume when the output power is more than 50% manually, the volume of other medium priority is lower than that of high priority and higher than that of low priority.

7.2Characteristics of alarm indicator (see table below)

Characteristics of alarm indicator

Alarm type	Indicator color	Flicker frequency	Duty cycle
High priority (power off, over temperature)	RED	1.4Hz～2.8Hz	20%～60%
Medium priority (abnormal sensor, temperature deviation)	Yellow	0.4Hz～0.8Hz	20%～60%

7.3 Characteristics of pulse train of auditory alarm signal (see table below)

Characteristics of pulse train of auditory alarm signal

features	High priority alarm	Medium priority alarm	Low priority alarm
Pulse number in pulse train	10	3	2
Pulse interval (TS)	100ms	150ms	200ms
Between the 3rd and 4th pulses	400ms	NA	NA
Burst interval (TB)	4s	5s	20s
The amplitude difference of any two pulses	MAX10dB		
The power-off alarm pulse chimes continuously;			

7.4After the alarm is used for the first time or reused after being placed for a long time, the alarm can only be used after it is in good condition. The inspection method is as follows:

——Test conditions: 23 ℃± 2 ℃

a) Power failure alarm

After normal start up, make the equipment work normally, and then unplug the power socket, and the equipment shall be able to send out the alarm sound specified in 7.1 a) above;

Note: the power failure alarm of this equipment will not change the setting of alarm and warning.

b) Over temperature alarm

The first over temperature alarm test: after the equipment is set at 36 ℃ to make the equipment work normally and reach the constant temperature state, then let the skin temperature sensor simulate 38 ℃ heating. When the temperature of the sensor does not exceed 38 ℃, the equipment should be able to send out the alarm sound of the above 7.1 C);

The second over temperature alarm test: after the equipment is set at 36 ℃ to make the equipment work normally and reach the constant temperature state, then let the skin temperature sensor simulate 39 ℃ heating. When the temperature of the sensor does not exceed 39 ℃, the equipment should be able to send out the alarm sound specified in 7.1 C) (Note: when the temperature reaches 38 ℃, it can be ignored);

After the over temperature alarm sound and light alarm, to return to normal working state, you must restart to work.

c) Temperature deviation alarm

Temperature deviation alarm test: after the equipment is set at 34 ℃ to make the equipment work normally and reach the constant temperature state, the skin temperature sensor is allowed to simulate 36 ℃ heating. When the temperature of the sensor reaches 35 ℃, the equipment shall be able to send out the alarm sound mentioned in 7.1 d) above and cut off the heating power supply;

Temperature deviation alarm test: after the equipment is set at 34 ℃ to make the equipment work normally and reach the constant temperature state, then let the skin temperature sensor not be placed within the control range of the heating pipe, then the temperature display of the skin sensor will drop. When the temperature drops to 33 ℃, the equipment should be able to send out the alarm sound of the above 7.1 d);

d) Skin temperature sensor fault alarm test

When the device is set at 34 ℃ to make the equipment work normally and reach the constant temperature state, then pull out the skin temperature sensor. At this time, the equipment should be able to send out the alarm sound in 7.1 b) above;

e) Manual prompt test

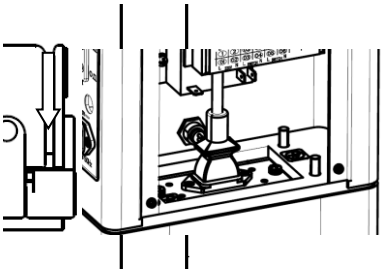
The test method and procedure of the equipment shall be operated according to 7.1 E) above.

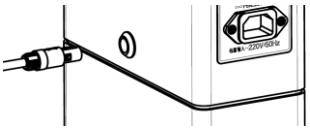
8 operation method

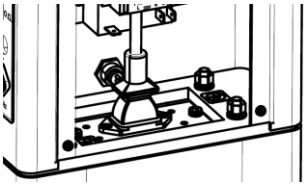
8.1 installation and use of radiation rescue platform

1) Open the packing box, check the accessories according to the packing list, and remove the inner packing;
2) Insert the upper lamp bracket into the lower bracket as shown in FIG. 14. In the process of inserting, refer to FIG. 15 and insert into the elevator power socket; as shown in FIG. 16, insert the lower blue light power socket;
3) As shown in FIG. 17, tighten the upper bracket and lower bracket with four M6 nuts in the attachment;
4) Install the tray with packing accessories as shown in Fig. 7;
5) Install salt water rack with packing accessories according to Fig. 6;
6) Install the crib breast board with packing accessories according to the schematic diagram 1;

7) After the above installation is confirmed to be correct, plug in the power supply and start the machine for inspection.







Exhibition14 Exhibition15 Exhibition16 Exhibition17

a) 8.1.1Inspection before use

b) Note: 1) before the first use of the rescue table and after each cleaning or maintenance, check before use!

c) 2) Infants should not be placed on the rescue table during the examination.

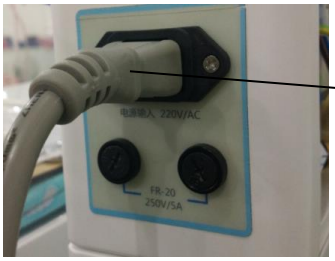
d) If the rescue table fails to pass the following inspection procedures or any foreseeable damage information has been found, it shall not be used continuously. The relevant maintenance service must be carried out by professionals.

e) a) For the inspection of rechargeable battery and buzzer, see (schematic diagram 18)

f) ——Pull out the power line and turn on the power switch. At this time, the buzzer should sound for a long time, and the power-off alarm light is always on, indicating that the battery and buzzer are in good condition.

g) ——If it is not in the above state, please repair and replace the buzzer or battery.

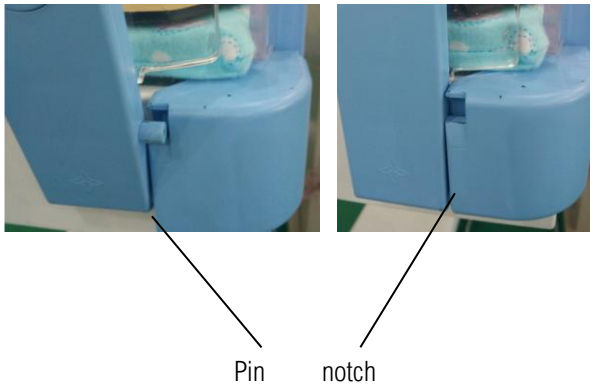
h) b) Connect the AC power line to the rescue table and check the power-off alarm function



i) Note: to ensure that the power supply meets the power specifications indicated on the name plate of the rescue platform, in order to make the rescue table correctly grounded, the power line must be connected to the single-phase three wire power socket, and the power line shall not be changed without authorization.

j) Inspection of crib baffles

Sketch Map19



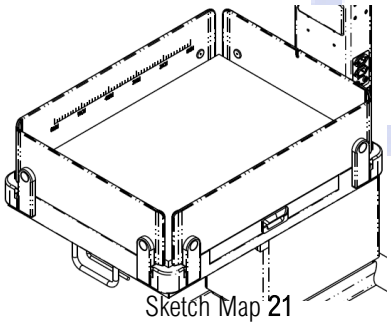
Sketch Map20

Note: carry out this inspection before the first use of the rescue table and after each cleaning or maintenance disassemble. Before inspection, please make sure that all auxiliary equipment installed in the crib has been removed to avoid interference with the whole machine.

Remove the skin sensor from the baby,

Press and hold the crib baffle, and slowly lift the crib baffle upward.

d) Check the baby mattress

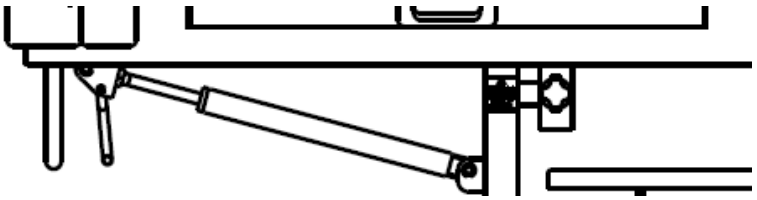


Sketch Map 21

Note: keep dry and undamaged. It must be replaced after getting damp or wet!

e) Check the crib:

Crib tilt handle



Sketch Map22

b) Pull the tilt handle of the crib, and the crib should be free of obstruction and damage.

c) Note: in case of the above situation, the replacement shall be eliminated in time.

d) Note: after the baby bed tilt angle is selected, it must be tightened! The damaged knob should be replaced in time.

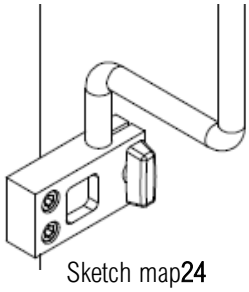
Check the skin temperature sensor

Sketch map23

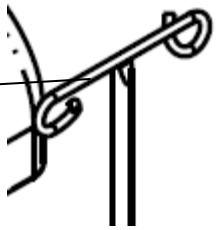
This is the sensitive part of the skin temperature sensor. Keep it dry without pulling it!

Note: This is the sensitive part of the skin temperature sensor. Keep it dry.

g) Check the infusion stand



Sketch map24



Sketch map25

This is a special infusion stand for this rescue table.

Note: 1. The maximum bearing capacity of the bottle hanging place on both sides of the infusion rack is 10N (including the dead weight of the container) respectively. Do not overload.

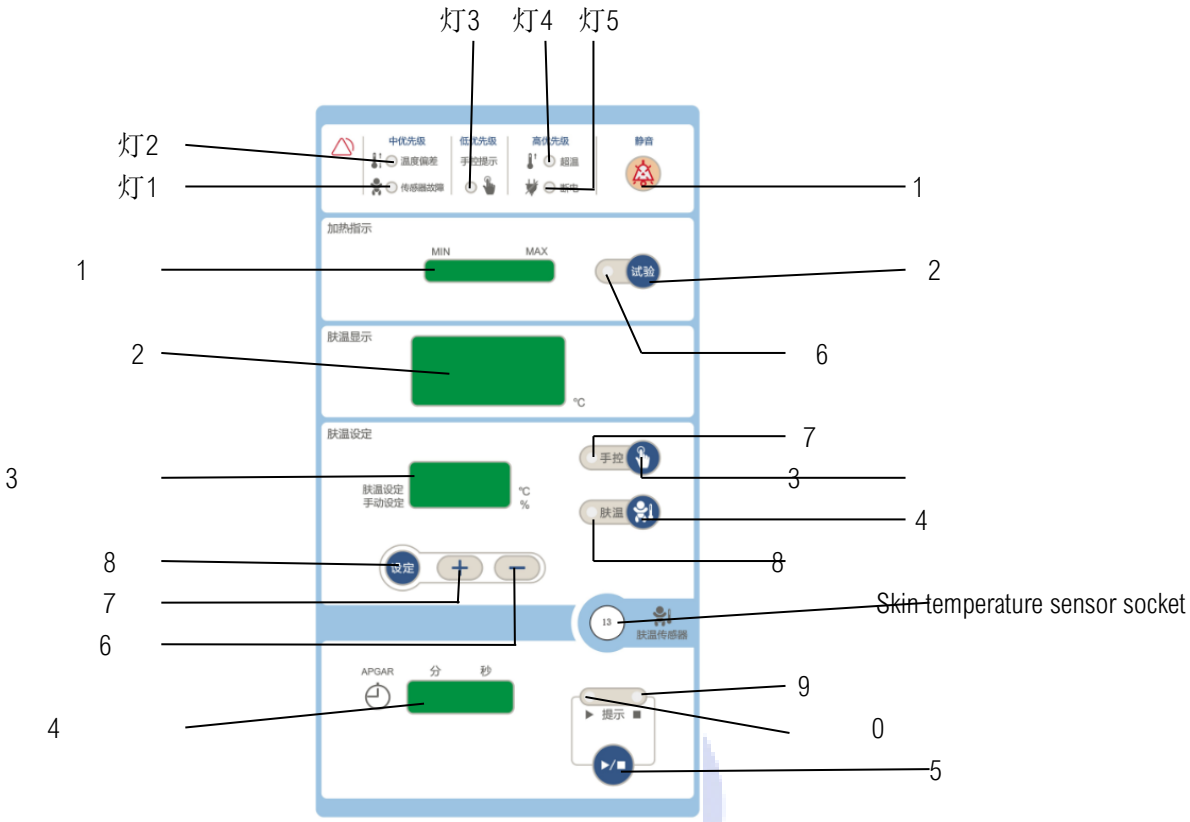
2. Check the clamping screw frequently for damage!

8.1.2 operation calibration of temperature control instrument

Note: if the rescue table fails to pass this calibration, it shall not be used and shall be maintained by qualified personnel.

9 operation examples

9.1 schematic description of panel operation



Sketch Map26

Display Description: display 1: heating power indication 0-100%

Display 2

Display 3 set temperature indication

Display 4

Key Description: key 1 -------- silencing key indicator light Description: lamp 1 -------- sensor fault alarm (yellow)

Key 2 --- test key lamp 2 --- temperature deviation alarm (yellow)

Key 3 -------- manual control key light 3 -------- manual prompt (blue)

Key 4 -------- skin temperature control key light 4 -------- over temperature alarm (red)

Key 5 -------- start / stop / clear key (press for 2 seconds) light 5 -------- power failure alarm (red)

Key 6 --- key reduction lamp 6 --- over temperature test prompt (green)

Key 7 -------- key light 7 -------- manual indication (green)

Key 8 --- Set / confirm key light 8 --- skin temperature indicator (green)

Lamp 9: stop timing indicator (green)

Light 10 --- start timing indicator (green)

9.2 operation method of rescue table:

9.2.1 use and start of radiation neonatal rescue platform

Close the power switch at the front of the upper radiation head, the temperature controller enters the self-test program, and all indicator lights are on; after the self-test program is passed, the temperature controller enters the setting of temperature control mode.

9.2.2 the temperature control modes are manual and automatic

Operation steps:

a. a. Key 3, light 7 is on;

b. b. With keys 6 and 7, the heating power can be set, and the display 1 shows the heating power.

- When the output power of manual control is less than or equal to 50%, the sound light prompt of manual control will send out "dang..." every 5 minutes The "blue" light will be on for a long time until it is manually switched to the skin temperature control mode.

When the output power of manual control is more than 50%, the heating power will automatically switch to ≤ 50% after 5 minutes; the sound light prompt of manual control will send out "Bang..." every 5 minutes The "blue" light will be on for a long time until it is manually switched to the skin temperature control mode.

When using the manual control mode, the operator should pay close attention to the patient's condition. Overheating or supercooling temperature may bring danger to patients;

When using manual control mode, it is recommended not to remove skin temperature sensor, and operators should continuously monitor skin temperature;

The temperature value of display 2, especially pay attention to the fluctuation of skin temperature;

- when using the manual control mode, the operator should not leave the patient, so as not to bring danger to the patient.

When the rescue table is in normal use, the medical staff should stand on both sides or in front of the crib and pay attention to the temperature change of the rescue table to avoid failure.

a. Operation steps:

b. a. Key 4, light 8 is on;

c. b. Press key 8 and display 3 will flash;

d. c. With key 6 and key 7, the infant temperature setting value can be set (display 3);

e. d. After modifying the temperature setting value, press key 8 to confirm, otherwise the modification is invalid.

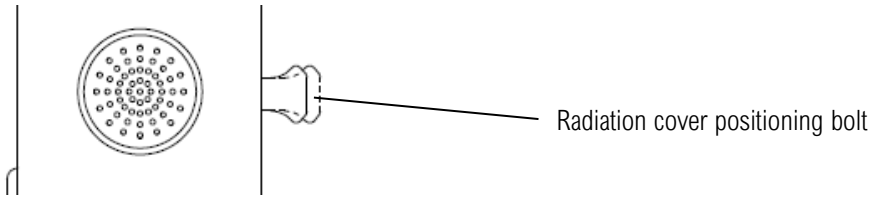
- When setting the control temperature in the infant temperature control mode, the guidance of clinicians should be especially followed;
- In the skin temperature mode, the temperature of display 3 is automatically constant to the set temperature value;
- If the skin temperature sensor is not placed properly or falls off the skin, it can not accurately monitor the skin temperature. Therefore, in the automatic temperature control mode, special attention should be paid to prevent this kind of situation, so as to avoid scalding the baby;

9.2.3 alarm silencing:

Key 1 (can be silenced for 3 minutes in case of failure)

When there is a fault alarm, press key 1 to silence for 3 minutes. Key 1 is invalid when there is no fault.

9.2.4 X-ray operation:



Schematic diagram 27

1) Turn off the power supply of the whole machine;

2) Pull the positioning bolt of the radiation cover outwards (see Fig. 27);

3) Rotate the radiation cover to the appropriate position;

4) Put the appropriate film into the X-box drawer;

5) Move the mobile X-ray machine to a suitable position;

6) Enter the operation procedure of X-ray photography;

7) After shooting, remove the X-ray machine, rotate the radiation cover to the original position, and lock the radiation cover with the positioning bolt (refer to Fig. 27).

Attention: 1. The X-ray machine must be operated in strict accordance with the relevant safety requirements and operating procedures.

2. This rescue table is not equipped with an X-ray machine, only a crib for X-ray photography is provided for your convenience.

9.3 instructions for low pressure / low flow aspirator:

9.3.1 overview of low pressure / low flow aspirator

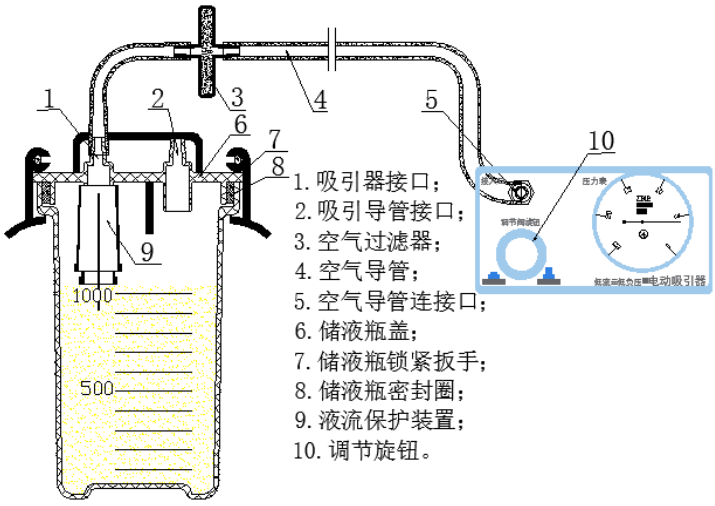
——The low pressure / low flow aspirator is suitable for suction of sputum and negative pressure suction of oral mucosa.

9.3.2 installation and commissioning of negative pressure suction device

9.3.3 connect the pipeline (refer to schematic diagram 28, the suction pipe will not be connected temporarily)

a) Take out the accessory "suction pipe" in the waste container and insert it into the suction pipe connector on the cap of the liquid storage bottle;

b) Insert the "suction pipe port" into the aspirator interface of the low pressure / low flow aspirator into the pipe.



Note 1: before installation, press the cork into the mouth of the bottle

Apply a small amount of distilled water on the flange

To press the cork and enhance its sealing.

Note 2: there are green dots on the air filter

The head is the air inlet, which should be connected with the

The exit is connected.

9.3.4 power on

Connect the power supply and set the power switch of the aspirator to the "I" position to turn on the power.9.3.5 calibration pipeline

Screw the negative pressure regulating valve clockwise, block the suction port with fingers or rubber tip of dropper, or fold and hold the suction hose.

Turn on the suction switch, the machine will run, the pointer on the vacuum gauge will rise to the limit negative pressure value; release the suction port, the gauge needle will return to below 0.02MPa. The above conditions are consistent with the description that the pipeline connection is correct.

Adjusting negative pressure

Block the suction inlet, open the suction switch, and adjust the negative pressure regulating valve. The reading on the vacuum gauge should be within the range of 0.02MPa ~ the limit negative pressure value. In clinical use, negative pressure regulating valve is used to control the negative pressure value needed in suction.

Turn negative pressure regulating valve clockwise by 1.

Note 2 the negative pressure must be reduced to below 0.02MPa before shutdown.9.3.7 inspection and test of overflow device

Open the bottle plug, clean the valve port seat, and connect it with the float well. The float should move flexibly in the guide tube without rolling resistance.

Hold the cork to make the float contact the water surface vertically. Move the cap down slowly. The float should be able to float in the fixed frame.

Close the bottle plug, connect the suction hose at the suction port, screw the regulating valve, and run the suction device.

The soft suction pipe is inserted into a clear water bucket, or the liquid is sucked into the liquid storage bottle with overflow device by simulating the normal use. The rising liquid level will drive the float to float up until the valve port is closed and the suction stops automatically. The final liquid level will change with the different suction methods.

Loosen the regulating valve, close the suction switch, open the bottle plug and empty the liquid storage bottle. When the cork is closed again, the float should be at the bottom of the holder and the valve port should be open.

The overflow device works normally and can be used in clinic.

Note 1: when the closing valve of the overflow device acts, the liquid level continues to rise. There are two possible situations: (1) due to the residual negative pressure in the liquid storage bottle; (2) the valve port is not completely closed. In the former case, the liquid level in the liquid storage bottle will not rise again when the suction soft pipe leaves the absorbed liquid and then extends into it; in the latter case, the liquid level will still rise. Therefore, it is necessary to observe carefully. When the liquid storage bottle is

nearly full, immediately lift the suction soft pipe from the absorbed liquid, close the suction device, stop the suction, and find out the cause of valve port closing failure.

Note 2: after the float closes the valve port, the suction stops. However, due to the negative pressure in the pipe, the float may still be sucked on the valve port. At this time, the regulating valve should be relaxed or the suction device should be closed, that is to release the negative pressure in the pipeline and let the float fall down according to its own weight. It is strictly forbidden to pull the float by hand to prevent the rubber valve piece from detaching from the float.

Note 3: after the machine is shut down, the negative pressure can be released before the bottle plug can be opened.

Note 4: it is strictly forbidden to use suction device when removing overflow device and guide pipe.9.3.8 shutdown

After installation, debugging or use, turn off the power switch on the aspirator and cut off the power supply.

9.4 use of phototherapy equipment for infants

9.4.1 overview of phototherapy equipment for infants

——The upper and lower blue light products are used for the treatment of neonatal hyperbilirubinemia.9.4.2 use of upper blue light (bilateral) and lower blue light infant equipment

a) Connect the power supply and turn the blue light power switch to the "I" position to turn on the power.

b) Press the key to start blue light therapy;

c) Press the key to start the blue light treatment; press the "switch" key to switch between the upper and lower blue light, upper blue light and lower blue light; cycle operation.

d) Press the key to start the blue light treatment; press the "set" key to switch between timing, timing and accumulation;

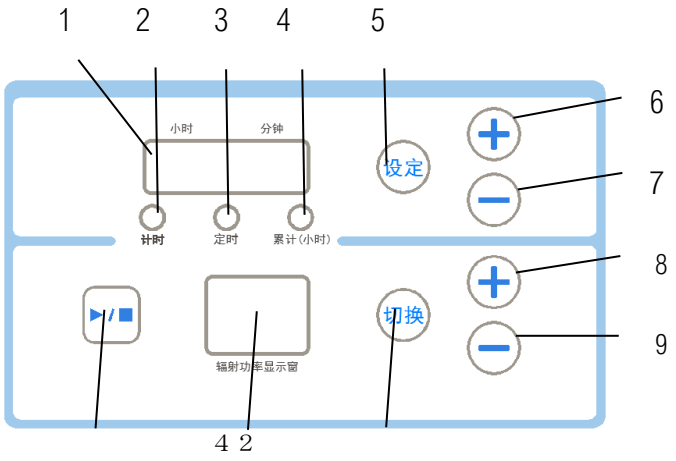
When the timing light is on, switch to the "timing" mode, and the time display window displays the blue light treatment time of the start up, and the minimum display unit is minutes;

When the timing light is on, switch to the "timing" mode, and the time display window displays the timing shutdown time, the minimum unit is minutes; long press the "set" key, the display window display value flickers, at this time, press the timing plus key and the timing minus key to adjust the timing time, and press the "set" key to switch between the values.

The four values displayed in the time display window from left to right are: hour X10 and hour X1, min X10, min X1; finally press the "set" key to confirm; the timing setting is not reserved after shutdown

;When the cumulative light is on, switch to the "timing" mode, and the time display window shows the accumulated blue light treatment time since the delivery of the neonatal blue light treatment machine, and the minimum display unit is hours.

e) Press the key to start the blue light therapy; press the power plus key and the power decrease key to adjust the radiation power.



12 11 10

Sketch Map 29

1. Time display window 2. Timing light 3. Timing light 4. Cumulative light 5. Setting key 6. Timing key

7. Timing decrease key 8. Power increase key 9. Power decrease key 10. Switch key 11. Radiation power display window 12. Start / stop key The maximum service life of the blue light panel assembly is 10000h. If it is more than 10000h, the effective blue light irradiance and therapeutic effect will be reduced.

⚠ 9.4.3 please refer to the precautions in the previous chapter for the relevant precautions of using blue light**10 daily maintenance and maintenance**

10.1 general

The cleaning, maintenance and maintenance provided in this section are only guidance.

Special notice: before cleaning and maintenance, all connections between the rescue table and the outside world must be cut off.

Before using this rescue table in another baby, be sure to clean and disinfect. After the purchase of the first use, be sure to clean and disinfect the rescue table.

The rescue table was delivered without disinfection. It is recommended to clean and disinfect the rescue table at least once a week. The most effective cleaning method is to remove the detachable parts first, then clean them according to the cleaning methods required in this chapter, and then assemble and install these parts.

Warning: when replacing the heating tube, please replace the model and specification specified by our company. When removing the upper plate of lamp cover, please pay attention to electric shock caused by high temperature and strong current.

10.2 cleaning of rescue table

10.2.1 disassemble before cleaning

Note: for routine cleaning, there is no need to remove all parts or separate the rack from the crib.

a) Turn off the power supply, unplug the power cord, and disconnect the sensor.

b) Lift up the crib baffle to make the pin shaft out of the pin slot, turn down the crib baffle, take out the baby mattress, and then remove it. (see sketch 19, 20)

10.2.2 cleaning after disassemble

A neutral detergent / disinfectant conforming to national standards should be used and removed as described in the above sections before cleaning. When using any detergent / disinfectant, the guidelines for the use of the detergent / disinfectant must be followed. After removing all fixed dirt and dirt on the disassembled parts, the following procedures can be carried out. After cleaning / disinfection, keep them clean and install them as soon as possible.

a) Carefully wipe the surface of the skin temperature sensor with disinfectant, and then dry it with sterilized cloth or paper towel. Do not immerse the whole sensor plug into the disinfectant, or the liquid into the sensor plug.

Note: some chemical cleaners may conduct electricity or leave some residues, which may lead to the accumulation of dust or dirt that

will conduct electricity.

Do not allow the cleaner to touch any electrical components. Do not spray / pour any detergent on the surface of these parts.

b） Rescue table crib - thoroughly clean all surfaces and all contact baffles with detergent. Make sure that all holes and depressions are cleaned and dried with a clean cloth or paper towel.

Note: alcohol can leave traces on Plexiglas. Do not use organic solvents such as alcohol to clean the crib baffle.

c) Baby mattress, crib baffle - clean the surface with detergent and dry with a clean cloth or paper towel.

Note: do not lubricate the crib support with oil or other flammable materials.

d) Bed cover - brush with detergent, rinse with water and dry at high temperature.

e) Mattress - rinse with detergent, rinse with water and dry.

10.2.3 reassembly after cleaning

a) Return to assembly in order of disassemble and assembly

Warning: after being disassembled, cleaned and installed, please refer to (8.1.1 inspection before use) for inspection before use.

10.3 cleaning of low pressure / low flow aspirator of rescue table

10.3.1 cleaning of storage bottles for low pressure / low flow aspirator

10.3.2 disassemble before cleaning

a) Pull out the air duct connecting port pipe and take down the storage bottle;

b) Open the reservoir lock wrench on the cap of the storage bottle (see illustration 28)

c) Recommended cleaning of storage bottles: remove the sputum, oral mucosa or other wastes and wash them with clean water, or according to the hospital regulations. (waste should be discarded in special waste disposal bucket)

10.3.3 replacement of air filter

If the air filter inhaled foam or filled with dust, the color of the filter membrane would be deepened and the suction of the entrance would be reduced or even disappeared. The negative pressure on the vacuum gauge would rise to 0.025MPa above the pressure gauge. This should be replaced by the air filter in our factory.

Note 1: when the overflow device is closed and the pipeline is blocked, the suction will decrease or disappear, and the negative pressure value will increase. See "troubleshooting".

Note 2: the air filter should be replaced frequently and destroyed intensively.

a) 10.3.4 maintenance

b) a) It is recommended that a small amount of clean water be sucked into the suction pipe to clean the inner wall of the pipe before the suction device is shut down.

c) b) After the suction device is shut down, empty the liquid storage bottle, remove the dirt on the bottle and bottle stopper with soft brush or cloth, and then rinse with water, including overflow device and various pipes. If necessary, screw off the overflow protection device and separate its components for thorough cleaning.

d) c) The liquid storage bottle, bottle stopper and various pipes of the aspirator can be soaked for 1 hour with disinfectant solution prepared by Conrad disinfectant tablets (0.5g per tablet) at the concentration of 1:500.

e) d) The suction tube of metal material can be sterilized with saturated steam at 134 ± 4 ℃ for 20 minutes.

f) e) The outer surface of the case is wiped with a slightly wet cloth soaked in disinfectant to prevent the liquid from penetrating

into the slot of the case.

g) When the equipment is not in use, it should be placed in a dry and clean place, and it should be started up and operated regularly (usually half a year).

Note 1: screw down the overflow protection device from the bottle cap anticlockwise, rotate the fixing frame, and take out the float.

Note 2: before using the equipment again, the overflow protection device and other pipelines must be installed as shown in Fig. 28.

11Fault analysis and troubleshooting

11.1Troubleshooting

The following table lists the general failures that may occur during the service life of the rescue table. The maintenance shall be carried out by trained and qualified personnel. If the cause of the fault cannot be found out from the table, please contact the after-sales service center of our company for maintenance.。

Phenomenon	Possible causes	Resolve
There is no display and no alarm.	The power switch is not turned on.	Turn on the power switch
The power failure alarm light is on and accompanied by an alarm sound	power failure	Turn off the power switch
	Power cord not connected	Connect the power cord
	Fuse tube damaged	Replace fuse tube and repair by maintenance personnel
Skin temperature sensor alarm	1. The skin temperature sensor is not connected	Connect the skin temperature sensor
	2. The plug of skin temperature sensor inside the machine falls off or the connection is poor and damaged	Ask maintenance personnel to repair
	3. The skin temperature sensor is damaged	Replace skin temperature sensor
Over temperature alarm	1. The temperature control system is out of control	Ask maintenance personnel to repair
	2. The independent over temperature sensor is damaged	Ask maintenance personnel to repair
Skin temperature deviation alarm	1. The ambient temperature changes greatly	Control ambient temperature
	2. The skin temperature sensor is not in correct contact with the baby	Pay attention to observation
	3. The skin temperature sensor is damaged	Ask maintenance personnel to repair
Panel operation key failure	1. Poor contact of panel plug-in	Ask maintenance personnel to repair
	2. The panel button is damaged	Ask maintenance personnel to repair
No display on the display	The power supply, socket or components are damaged	Ask maintenance personnel to repair
No heating	The power supply, socket or components are damaged	Ask maintenance personnel to repair

The negative pressure value is greater than 0.025mpa, but the suction at the pipe mouth decreases or disappears obviously	1) Overflow device closed 2) The pipeline is blocked 3) Air filter clogged	1) After shutdown, loosen the regulating valve anticlockwise, release the negative pressure in the pipeline, and then tighten it 2) Dredge, clean or replace the hose 3) Replace the air filter of our factory
The power supply voltage is normal and the indicator light is not on	1) Loose socket 2) Fuse tube blown 3) Indicator light damaged	1) Repair or replace the socket 2) Replace the fuse tube 3) Replace the indicator light
Fuse tube blown	1) Voltage over pressure 2) Internal circuit failure 3) Relay failure 4) The pump body is resistant to rolling and the current increases	1) Check the circuit and remove the fault 2) Adjust or replace the relay 3) Check the pump body and motor
Water accumulation in suction pump	1) Overflow protection device failure 2) For a long time, it is caused by the cooling of water vapor in the pump	1) Check, repair or replace the overflow protection device 2) Removing and washing suction pump
The power indicator and light tube are not on after start up	1) The power cord is not connected properly 2) There is no electricity in the power socket of the external network 3) Fuse damaged	4) Re connect the power supply 5) Check the external power socket 6) Replace the fuse
The power indicator and light tube are not on after start up	1) LED lamp bead damaged 2) Poor contact of LED lamp beads	1) Replace the lamp bead 2) Re install the light panel

11.2Replacement information of main wearing parts

Schedule

Serial number	Code name	Specifications	number	remarks
1	External fuse	φ5×20 F5AL250V	2	Radiation type neonatal rescue table
2	External fuse	φ5×20 F1AL250V	2	For aspirator
3	Ni-MHNickel metal hydride battery	6.0V 80mAh	1	Radiation type neonatal rescue table
4	Radiation source device in heater	220V，680W	1	Radiation type neonatal rescue table
5	Suction air duct	φ5.5Xφ8.5X300	1	Silica gel tube

6	Suction catheter	φ5.5Xφ8.5X2000	1	Silica gel tube
7	Air filter	0.4um	2	For aspirator
8	Lamp board and lamp bead	504SBC1B-05S	288*2	Radiation type neonatal rescue table

Warning: if the customer does not replace the components according to the company's requirements, the equipment will be seriously damaged and the risk of harm to patients will be brought.

12 Packing accessories and spare parts list

Packing list

Serial number	name	UNIT	number	remarks
1	complete machine		1	
2	Skin temperature sensor		1	In the file bag
3	power cord		1	In the file bag
4	Baby mattress		1	In the crib
5	Technical instruction manual		1	In the file bag
6	warranty card		1	In the file bag
7	guarantee		1	In the file bag
8	certificate		1	In the file bag
9	Fuse φ 5 × 20 f5al250v		2	In the file bag
10	Fuse φ 5 × 20 f1al250v		2	In the file bag
11	Suction catheter φ 5.5x φ 8.5x2000		1	In the file bag
12	Air filter filtration 0.4um		2	In the file bag
Note: select component configuration according to specification, model and sales contract				

13 transportation and storage

13.1 environmental conditions for transportation and storage:

Ambient temperature: (- 20 ～ + 55) ℃

Relative humidity: ≤ 90%

Atmospheric pressure: (50-106) kPa

13.2 transportation

After packaging, the products are allowed to be transported by common means of transportation, but the rain and snow splashing and mechanical collision should be avoided.

13.3 storage

The packaged rescue table should be kept in a room with temperature (- 20 ～ + 55) ℃, relative humidity not more than 90%, no vibration, no corrosive gas and good ventilation.

14 others

14.1 commitment:

If the ordering unit fails to work normally within one year from the date of purchase under the storage and use conditions stipulated by the company, the company shall be responsible for repairing or replacing the parts free of charge; if the warranty period is exceeded, the repair cost may be charged accordingly. If the repair within the warranty period is found to be improper use or artificial damage, the repair cost shall be charged according to the circumstances.

As an important random document, this "instruction manual for use and technology" should be properly kept and allowed to be copied as a common operation guide for full-time nursing staff.

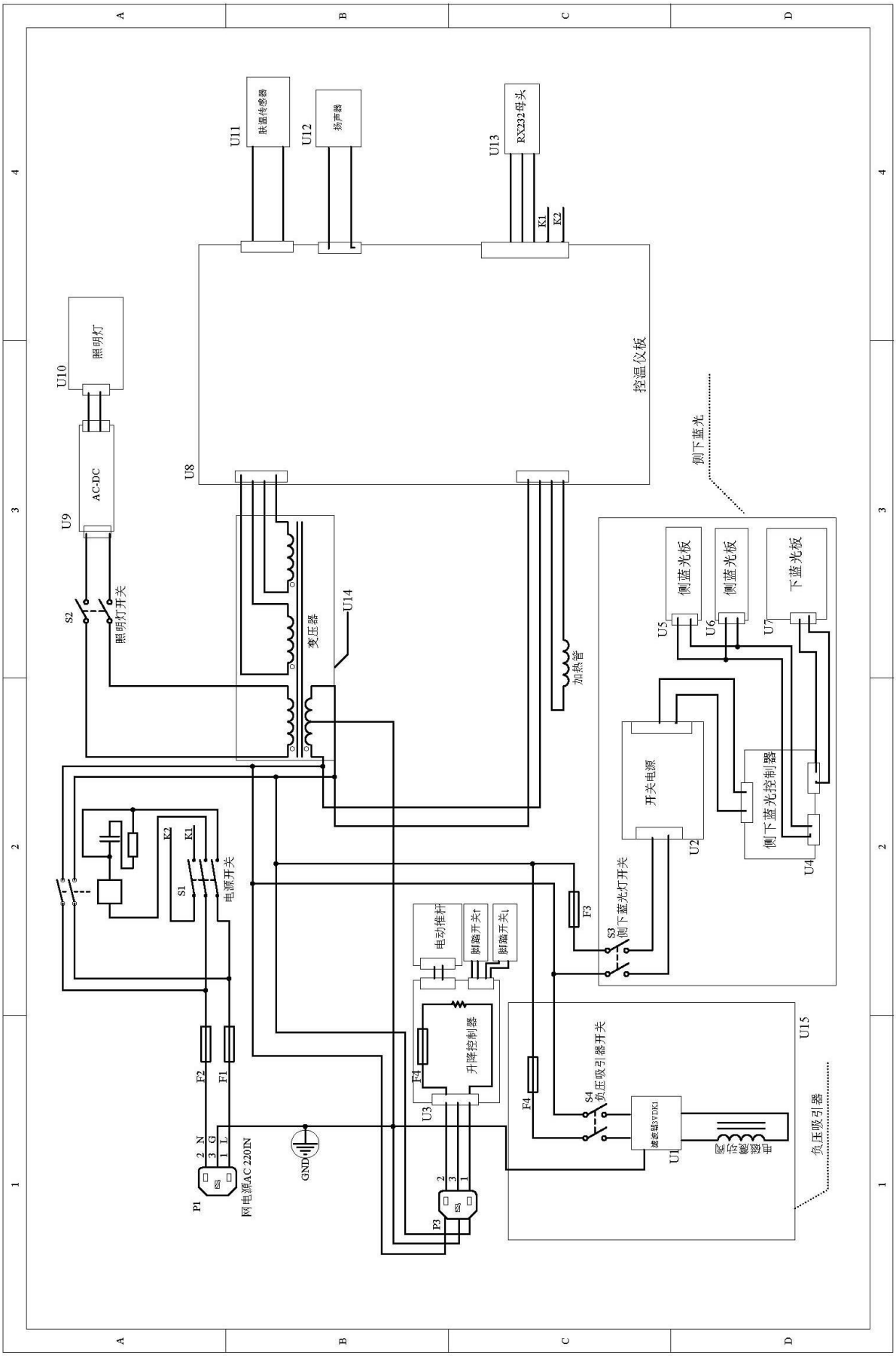
14.2 statement:

If any fault is found in the use of the rescue desk, please contact the after-sales service center of our company in time to obtain the technical support of the company at the first time. As a precision instrument component, the temperature control instrument is strictly prohibited to open and repair without authorization, otherwise, it shall be treated as "man-made damage".

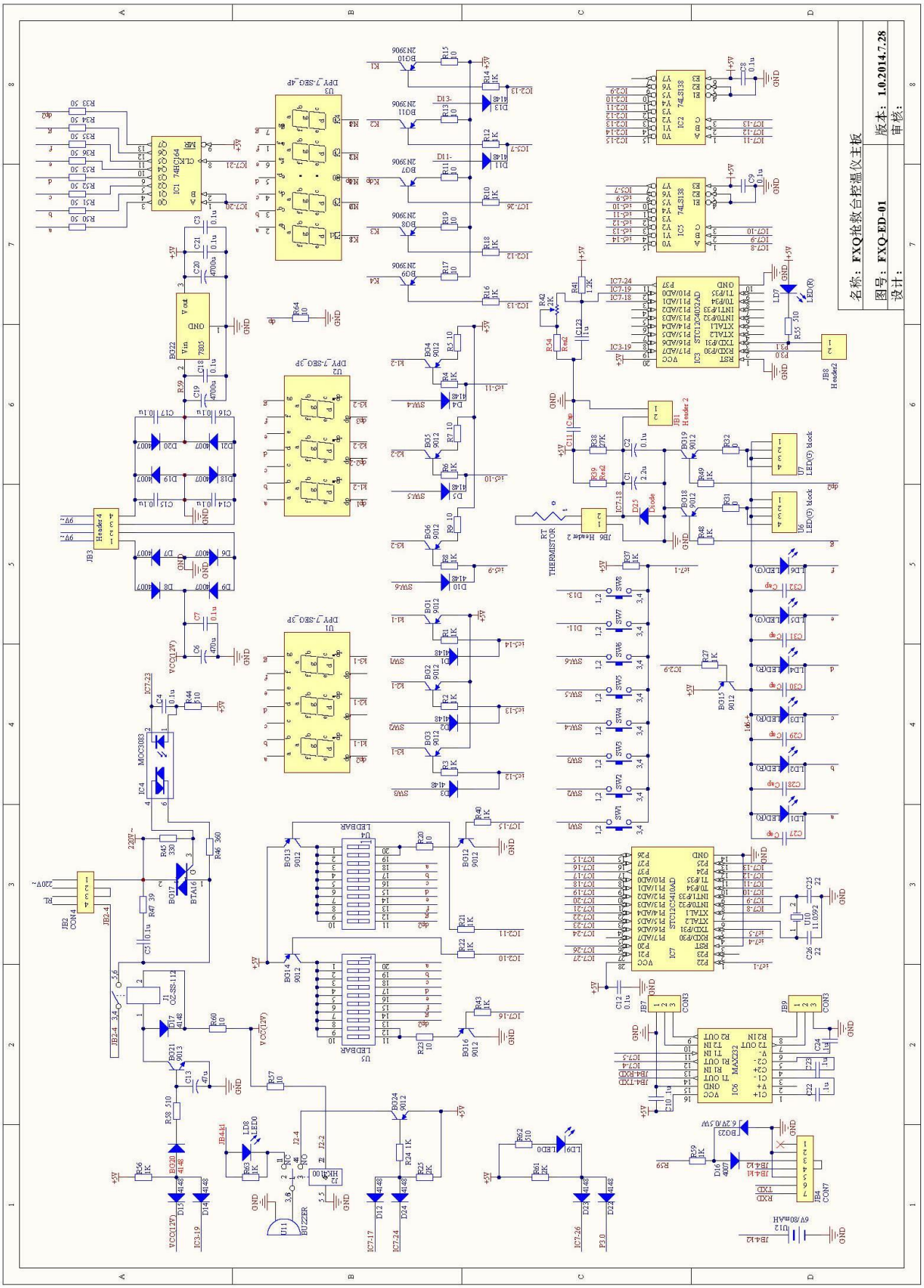
The figure mark on the sign of rescue table indicates that the electric shock resistance of the product is BF type.

There is a "warranty card" in the packing attachment. Please fill in the relevant contents as required and seal your company's official seal and send it back to our after-sales service center in time, so that we can establish relevant after-sales service files for you as soon as possible and provide better service for you.

Appendix 1: peripheral wiring diagram of radiation neonatal rescue table



Appendix 2: electrical schematic diagram of main board of temperature control instrument in rescue station


名称：FXQ推救台控温仪主板
图号：FXQ-ED-01
设计：
版本：1.0.2014.7.28
审核：