

# 808nm Diode Laser Operation Manual KES145



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**V1.0**

Beijing Kiers Science & Technology Co.,Ltd

## **1. Summary**

Thank you for using our 808nm diode laser hair removal equipment.

808nm diode laser hair removal machine is produced based on the development trend of laser hair removal market, adopts unique 808nm long pulse width laser wavelength, penetrate the skin to hair follicles, according to selective absorption principle, laser energy is absorbed by the black pigment, then make hair loss regeneration ability, during the treatment, the unique sapphire cooling system can effectively protect epidermis is not burned, to achieve painless, fast, permanent hair removal.

This product uses a warm pulse and heating pulse constitute a hair removal irradiation process, the hair follicles and the surrounding tissue get warm by the first pulse up to

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temperature up to 40°C, heating the second pulse, so that the hair follicles and surrounding stem cells lose activity, the destruction of the hair follicles, so that the hair stop growth.

There are two modes for option, Normal and Fast, make hair removal more safe, convenient and quick.

808nm laser hair removal machine is related to 4 types of laser products, can produce high power density of the laser beam, please be sure to be careful before using, to avoid danger and harm. Please read the instructions carefully before using the product. If you have more question on security, operation and use, please contact the Beijing Kiers Science& technology development co.Ltd.



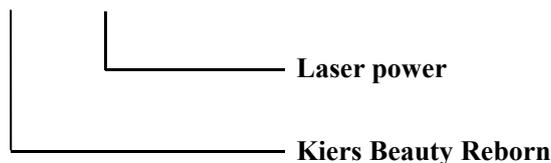
In the manual, the contents of the black body part should be paid special attention.

## 1.1 Copyright

The appearance of the product, laser micro study coupling technology, control software and other related part is part of the Beijing KIERS Science and Technology Development Co., Ltd. intellectual property, protected by patent or copyright protection, any unit or individual shall not be counterfeit t. In addition, for the full or part of the contents of this product manual to copy and reprint, the need to obtain the consent of the company. Product manual will be updated with the continuous improvement of products and upgrade. We reserves the right to upgrade and without additional notice.

## 1.2 Model No.

KES—2400W/600W



## 2. Storage and transportation requirements.

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The hair removal equipment can only be placed in the original packaging box for transportation and storage, to avoid damage. Hair removal equipment should be stored existing ventilation, drying, temperature of 5°C to 35°C, environment relative humidity not more than 70%, avoid the acid, alkali and corrosive substance pollution, to avoid strong sunlight, transport to avoid severe large amplitude vibration, is strictly prohibited to rain or excessive isolation, is strictly prohibited throw.

## **3. Installation**

### **3.1 Delivery and installation**

The machine should be installed by representative from Beijing Kiers Company, or pointed service agent, and responsible for site testing and acceptance.

### **3.2 Take the machine out of the box and Confirm**

The machine has been packed strictly before send from factory, please check carefully if the packing damaged, and check if all accessories are inside, and please keep all packaging materials. They are needed when you need to deliver the machine.

### **3.3 Request for the working room**

In addition to the warning signs, when working with 4 type's lasers, the working room should be set up with a laser work warning.

#### **3.3.1 Entrance Notice**

There should be strict mark at each entrance

- There should be laser safety warning signs in every gate, must indicated the laser wavelength;
- There should be laser warning lights in every entrance, the lights should be turned on once the laser machine turned on, this is to avoid somebody enter the room when the machine is working

#### **3.3.2 Laser radiation protection for windows**

During working, the laser beam should be prohibited to pass through the window of the working room, because it's dangerous.

#### **3.3.3 Prevent laser reflection**

Laser work should ensure that no high reflective material properties, such as mirrors, glass, etc., in order to prevent the laser beam generated by the reflection of the laser

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radiation. Because most material of medical surgical equipments are glass, surface plating or nickel plated metal, the reflectivity is very high, the operation of laser, must not let the beam irradiation in the above, otherwise, the laser beam reflected on the human will body cause damage.

### **3.3.4 Laser safety signs**

All exits, entry and laser energy emitted window, must be pasted with laser safety signs.

## **4. Security and technical assurance**

### **4.1 Brief Introduction**

808nm diode is a delicate machine, only can be used for medical. The machine is strictly check and tested before send from factory, will not produce safety accident under proper operation. In order to protect the operator and patient's safety, avoid laser injury, please read the operation manual carefully. In addition, the operator should be trained by professional training organization. 808nm laser hair removal machine is related to types 4 of laser products. Type 4 laser is high energy laser, should be used carefully to avoid dangerous. Prohibited to get close to any Inflammable Materials.

### **4.2 Eye Protection**



**Dangerous**

No direct observation of the laser beam or reflection, scattering out of the beam. Otherwise it will cause damage to the retina. Nominal ocular hazard distance (NOHD)

NOHD means the irradiance or exposure is less than the corresponding MPE (MPE) distance. If it is not intended to observe, the NOHD value of the product is 4.57 M.

A safe place to be placed in a laser working room should have a wake - up goal to ensure that all personnel are included in the laser work with a safety shield to prevent any damage to the eyes.

### **4.3 Electrical protection**

- Only professional and technical engineers from Beijing Kiers Science and technology Development Co., Ltd can to the daily repair and maintenance for the hair removal machine. Any other person forbidden to disassemble. Otherwise, all the consequences of conceit.

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- There is a limited current setting in the factory, forbidden the dangerous output.
  - Ensure the machine is connected to the ground wire during working.
  - The room which place the machine should be tidy and dry, ensure no liquid products put on the machine, like: Water, oil. during the machine working.



### **Attention**

Please stop to use the machine if there is any fault, and contact supplier immediately.

## **4.4 Fire**



### **Dangerous**

Avoid laser and laser beam close to flammable, anesthetic or other flammable solvent. Paper and plastic products shall not be placed in the laser working area. These materials will result in the combustion, within a certain distance. When the machine is not working, or in the replacement of patient, the treatment of intermittent process, adjust the machine to “Standby”, under this condition the, pedal switch can't be used.

## **4.5 Prevent the scattering of laser beams**

Avoid laser beam focused on flammable material, otherwise it will cause combustion.

The hand piece should be placed in working area, and only can be controlled by the operator, forbidden to be operated by any third person.

## **4.6 Manual recovery**

Under any abnormal condition, there will be warning in the machine; the machine should be turned off. Cut off the power by key switch, then restart the power, let the machine restart, if there is still any fault in the machine, please contact supplier or representatives.

## **4.7 Marks on the machine**

- HANDLE: This is for install the handle
- INTERLOCK: Safety locks for the machine and operation room
- FOOTSWITCH: Here is for connect the foot switch
- WATER INLET/WATER OUTLET: To fill or drain out water
- ON/OFF: Key switch
- EMERGENCY SWITCH: For emergency stop



Pay special attention: Please carefully read the notice before use

## 5.Applications:



### Warning

Only trained professional users can use this hair removal machine to do the treatment.

### Applications:

**Main treatment areas are: Beard, small arms, legs, armpits, forehead and other parts.**

Make sure the customer is suitable for use this machine before every treatment.

The following person or area is prohibitive to use the machine

- Cancer especially skin cancer
- Pregnant (including IVF)
- Using Photosensitivity drugs and Chinese traditional medicine
- Sensitive to 808nm laser
- Took sunshine 3-4 weeks before treatment
- there is inflammation or herpes simplex infection
- Scar history of tumor
- diabetes mellitus
- Dry and sensitive skin
- endocrine dyscrasia
- Using Dicumarol
- Epilepsy
- blood coagulation

**The machine can't be used at the same time with the following medical**

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**equipments, otherwise, will cause personal injury and failure or error operation.**

- Hearing aids, and other medical devices embedded in the human body.
- Electronic equipments for maintenance of life, such as breathing machine, external pacemaker.
- Electronic equipments for medical use in the body, such as the dynamic electrocardiogram.

## **6. Product description:**

### **6.1 Brief introduction:**

Main parts for KES-DV2400/DV600

- Control system for 808nm diode laser
- Temperature control system for cooling
- Laser hand piece
- Water Cooling system
- Safety protection system

### **6.2 Main body**

Main laser system includes 808nm diode laser bars, sapphire crystal and temperature controlling system, Circuit control system, water cooling control system, water circulation system, power supply system, Man machine dialogue system and etc.



### **6.3 Power switch**

There are three parts for the power supply, power switch, key switch and emergency switch.

The machine can only work under the three buttons turned at the same time. There are two keys for one machine; the keys should be kept by professional users.

### **6.4 Laser output**

#### **ATTENTION**

**There is a sapphire crystal in the output window, forbidden to be blocked by any objectives.**

### **6.5 Touch screen**

This machine uses 10 inches of high sensitivity, high resolution touch LCD screen as the

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operating window, the parameters, mode and status of the machine can be adjusted from the button in the screen. It is very easy to learn and operation.

## 6.6 Emergency Switch

Emergency switch connected with the general power supply, press the button, the machine will be turned off. Before restarting the machine, should switch the key switch to “OFF” , and adjust the emergency according to the mark position, then turn the key switch to “ON”

## 6.7 Laser beam output warning

As long as there is laser output, the LCD screen will appears a light warning, the warning light and the laser output completely synchronization.



### ATTENTION

If you find out the warning light is in constant light, please press the emergency switch immediately to turn off the machine.

## 6.8 Disinfection measures

As the hand piece needs to contact with, please disinfection more than 10 minutes by alcohol or iodine before use it.

## 7. Specifications

Laser type	Diode Laser
Wavelength	808 nm
Max. Input Power	3200 W
AC Power Supply	110V±10%, 220V±10%, 50~60 Hz

Big Spot Size	22*35 mm
Laser Power	1500 W
Pulse Width	15~100 ms, adjustable
Energy	0~37 J/cm <sup>2</sup> , adjustable
Frequency	1~5 Hz, adjustable

Small Spot Size	12*10 mm
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Laser Power	600 W
Energy	6~50 J/cm <sup>2</sup> , adjustable
Frequency	1~9 Hz, adjustable
Pulse Width	30~100 ms, adjustable

## 8. Operation Manual



### WARNINGS

The hair removal machine is carried out by the doctors who have received professional training and professional training of professional medical applications. The instruction manual is for the detail description of technology and use, excluding medical section.

#### 8.1 Preparation

The hair removal machine use power source: AC220V, 50Hz, the wire capacity not less than 4.8KW, and a reliable ground wire. Before connecting the outlet, make sure the technical data of the power meet the requirements, or it may cause damage to the equipment or even cause bodily injury.

1. When using the machine must maintain good ventilation environment, there is no barrier around the machine, and keep at least 30CM distance from the wall for ventilation cooling.
2. Connect the plug of the hand piece with the socket of the machine, when hear the sound, that's to say the plug and the socket have connected. After connecting, put the hand pieces into the hand piece holders.
3. Connect the power to the main engine.
4. After confirming that the technical data of the power meet the requirements, put the plug into the outlet, and make sure that the plug is connected firmly.

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## 8.2 Add water

Filling deionized cooling water: there is no deionized cooling water when use it at first time, so before open the machine, we should fill the deionized cooling water into the device.

1) Take out the water pipe, and then insert the butt joint into the water outlet of the bottom right of the back of the machine.

2) Water pipe is upright, deionized water will be added slowly from funnel.

**Notice: Don't fill the water quickly to prevent the water spill over.**



3) When filling the deionized cooling water, please notice the change of the water level. When the water spill over from the water level window, please stop filling, and take off the water pipe, clean the residual water.



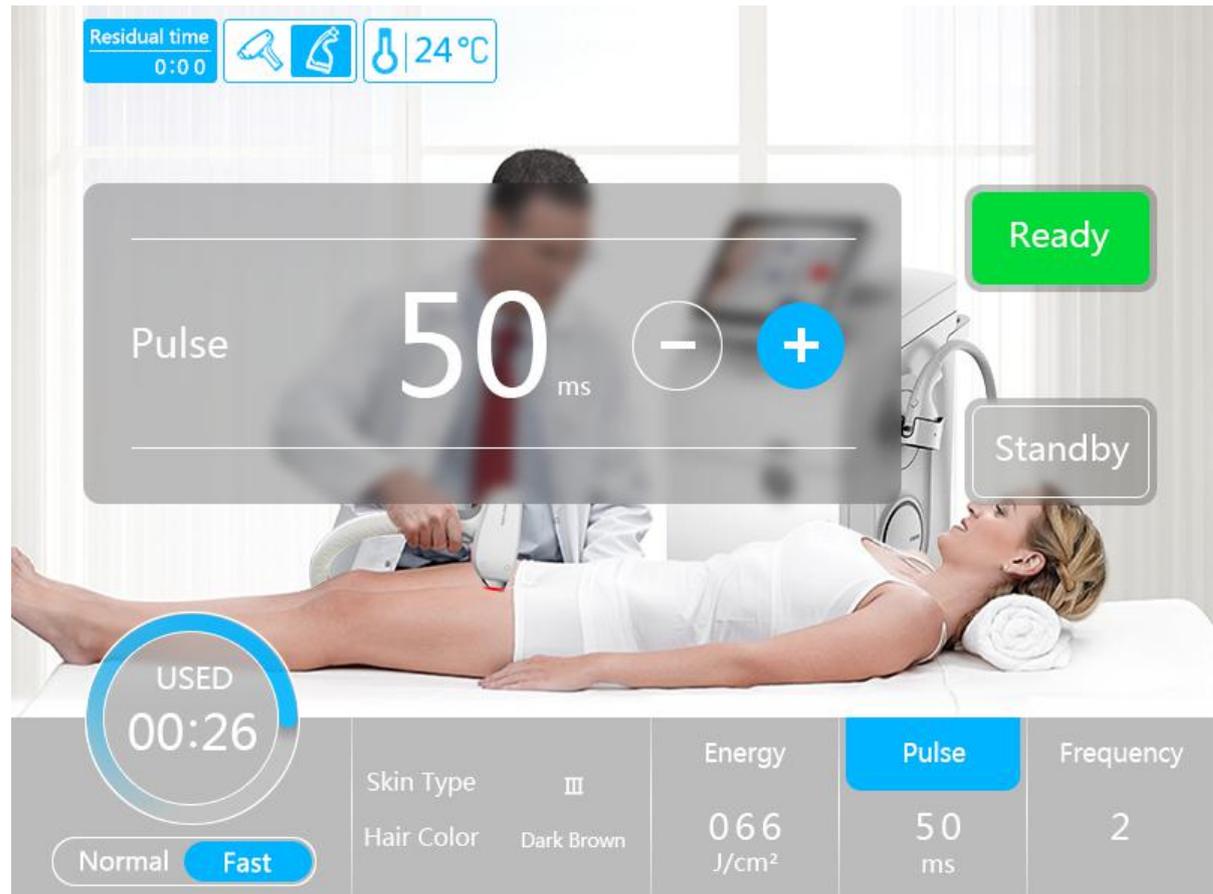
4)

●**Notice:** when using the machine at first time, there is no water in the water pump、refrigerator and the water route, so after opening the machine, the water level in water tank will go down, there will be warning on the screen. So the deionized cooling water need to be put into the device again until don't warn.

### 8.3 System start-up

Turn the switch key to “ON”, the fan works, LCD screen lights, and there will be the words “KIERS”.

After opening the system, enter the boot interface. You can adjust below button to make the right value before do hair removal, after set, press “Ready” button.



#### 8.3.1 Check the machine working-status and interface presentation

After entering the work interface, then check if the status of the device is normal and check if there is warning.

Initial working interface and the warnings:

There is no warning sign with the condition of normal status.

- ①  **Water Level Warning:** when the water level is lower than the predetermined level. So the water should be filled into the water tank until the alarm

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disappears.

- ②  **Water temperature Warning:** when the temperature of the water tank higher than 30 °C. Make the machine standby mode, and then use the machine after the temperature alarm disappears.

- ③  **Sensor alarm:** when the temperature of the water, hand piece and the sensor have malfunction, the temperature sensor will warn. Then check whether the sensor is connected properly or damaged.

- ④  **Water flow alarm:** it will alarm when it's wrong with the water circulation.

- ⑤  **Hand piece alarm:** It will warn when the hand piece is not connected or connection is failure

- ⑥  **Gate interlock alarm:** it will warn when the interlock is open or don't connect the gate interlock.

- ⑦  **Laser light warning:** it will alarm when the laser is lighting

**Notice:** after the exclusion of all the alarm information to the normal operation of the laser.

## 8.4 Operation

### 8.4.1 Preparation before use

1. Before using the equipment must check the installation of the equipment to meet the requirements of the device carefully every time.

2. Every time before using the equipment must carry the mobile phone and other electronic products as well as the key, necklace and other metal items placed in other places to keep properly, so as avoiding the adverse effects of the equipment operation

3. Every time you use the equipment, you must check whether the patient has a

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"prohibit" list.

4. Before using the equipment must be properly installed laser hand, specific methods are allowed.

1) before/after use, Laser hand must be cleaned by medical alcohol wipe, in case of cross infection.

2) The laser hand with a link plug must be firmly, tight, otherwise there may be a leak or not work

5. Before using the equipment should be in patients with facial skin clean and clear of sweat, grease and keep the surface of the skin in a dry state

#### **8.4.2 Safety precautions for the use of the normal operation of the machine**

1. According to the requirements of the equipment, enter the initial work interface, according to the actual need to choose the appropriate mode of operation. Enter the hair removal operation interface

2.Hair removal screen operation:

1)Normal Mode:

Key description

- Ready: the energy output is controlled by two levels that is the "Ready" button, press and hold the key to the hand to have the energy output.
- Standby: after clicking on the "Standby" button, the device is in standby mode, and the laser is not output with a switch or a pedal switch.
- Energy: Energy Setting Button, 1~37J/CM<sup>2</sup>.
- Pulse: Pulse width setting button,15~100ms
- Vacuum : Adjust the vacuum time, 1~3, setting from 1 and make adjustable besides on skin color.
- Vacuum Power: Adjust the vacuum power by the Vacuum button in front of the Kes145.

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2) Fast Mode:

Key Description:

- **Notice:**

1) When the operation must be kept hand piece and skin close contact, in order to achieve better results.

2) The energy output is controlled by two levels, that is, the "Ready" button is pressed, and then the energy output.

3) At the end of the treatment, click the "Standby" button, so that the device is in standby mode.

4) Setting-up energy output must be gradually increased, and the body feels comfortable, avoid high energy, otherwise it may lead to skin damage. When it's in operation, please maintain communication with patients, according to patients' feeling to adjust parameters at any time.

Note: once the patient's skin mild burns, must immediately stop operating, and in time to carry out the necessary treatment to prevent wound infection.

5) Before the operation the headpiece must be disinfected, can use 75% medical alcohol to wipe, then dry, prohibited the use of sharp scratch head surface, working head prohibited bump, avoid damage.

Prevent the hand with water, causing permanent damage to the laser.

## In addition



Touch these buttons to change handpiece



Touch these buttons to change Mode of Big handpiece



Touch these buttons to change Skin & Hair Color



Touch these buttons to Adjust Energy ,Pulse and Frequency

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## 8.5 Hair removal operation guidance

### 8.5.1 Arm hair removal:

#### Step 1: cleaning

Before hair removal, need to clean the area where the hair will be removed, the area for disinfection treatment.



#### Step 2: shaving hair

In order to carry out the hair removal, the laser can better conduction. The surface of the hair need to be shaved.



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### Step 3: Smearing gel

In order to maximize protection of the skin, in the process of hair removal is not suitable for the lowest, before hair removal, smear gel evenly to the area of hair removal.



### Step 4: Setting Parameters:

The energy output, frequency output and laser output can be adjustable, to achieve the best user experience.

For reference as below:

	Blonde/red		Light brown		Dark brown		Black	
Skin Type I	4.6J/cm <sup>2</sup>  50ms	30J/cm <sup>2</sup>  60ms	4.4J/cm <sup>2</sup>  50ms	28J/cm <sup>2</sup>  60ms	4.2J/cm <sup>2</sup>  50ms	28J/cm <sup>2</sup>  60ms	4.0J/cm <sup>2</sup>  50ms	26J/cm <sup>2</sup>  60ms
Skin Type II	4.0J/cm <sup>2</sup>  50ms	24J/cm <sup>2</sup>  50ms	3.8J/cm <sup>2</sup>  45ms	22J/cm <sup>2</sup>  50ms	3.6J/cm <sup>2</sup>  45ms	20J/cm <sup>2</sup>  50ms	3.4J/cm <sup>2</sup>  45ms	20J/cm <sup>2</sup>  45ms
Skin Type III	3.6J/cm <sup>2</sup>  45ms	22J/cm <sup>2</sup>  45ms	3.4J/cm <sup>2</sup>  40ms	20J/cm <sup>2</sup>  45ms	3.2J/cm <sup>2</sup>  40ms	20J/cm <sup>2</sup>  40ms	3.0J/cm <sup>2</sup>  35ms	20J/cm <sup>2</sup>  40ms
Skin Type IV	3.0J/cm <sup>2</sup>  30ms	20J/cm <sup>2</sup>  40ms	2.8J/cm <sup>2</sup>  30ms	20J/cm <sup>2</sup>  40ms	2.6J/cm <sup>2</sup>  25ms	18J/cm <sup>2</sup>  35ms	2.4J/cm <sup>2</sup>  25ms	16J/cm <sup>2</sup>  35ms
Skin Type V	1.4J/cm <sup>2</sup>  70ms	10J/cm <sup>2</sup>  70ms	1.2J/cm <sup>2</sup>  70ms	10J/cm <sup>2</sup>  70ms	1.0J/cm <sup>2</sup>  60ms	8J/cm <sup>2</sup>  60ms	1.0J/cm <sup>2</sup>  60ms	8J/cm <sup>2</sup>  60ms
Skin Type VI	1.0J/cm <sup>2</sup>  80ms	8J/cm <sup>2</sup>  80ms	1.0J/cm <sup>2</sup>  80ms	8J/cm <sup>2</sup>  80ms	1.0J/cm <sup>2</sup>  70ms	6J/cm <sup>2</sup>  70ms	1.0J/cm <sup>2</sup>  70ms	6J/cm <sup>2</sup>  70ms
	Large Handle	Small Handle						

Note: hair removal laser input energy from the mini value at the beginning then gradually increase to prevent the excessive damage to the skin caused by laser output.

Step 5: Hair removal

Hair removal techniques: the spot is closed to the skin using cross method, the intensity of uniform and then repeated sliding hair removal.

Step 6: after cleaning, after apply ice gel 3-5 minutes then cleaning.



## 9. Fault diagnosis and analysis

Failure phenomenon	Cause analysis	Exclusion method	Remark
There is no response after the equipment opens	<ol style="list-style-type: none"> <li>1. Power line contact not well.</li> <li>2. Power insurance damage.</li> <li>3, the existence of equipment fault or line.</li> </ol>	<ol style="list-style-type: none"> <li>1. Plug in the power plug.</li> <li>2.Replacement insurance.</li> <li>3. Please professional worker check.</li> </ol>	Power insurance specification is 16A
Equipment alarm information, can not work	<ol style="list-style-type: none"> <li>1. not filled with DI water cooling water</li> <li>2. Equipment failure.</li> </ol>	<ol style="list-style-type: none"> <li>1.filling with deionized water</li> <li>2. Please professional worker check.</li> </ol>	Equipment with water temperature, water level, water function, please pay attention to observe the screen information
After landing can not carry out hair removal function	<ol style="list-style-type: none"> <li>1.equipment failure</li> <li>2.the device has a warning</li> </ol>	<ol style="list-style-type: none"> <li>1. please professional worker check</li> <li>2. Eliminate alarm information</li> </ol>	
Refrigeration shortage	<ol style="list-style-type: none"> <li>1.Water shortage or need to replace</li> <li>2.refrigeration system failure</li> </ol>	<ol style="list-style-type: none"> <li>1, add or replace deionized water</li> <li>2, please professional worker check</li> </ol>	Replace the deionized water regularly.

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## **10. Special attention**

1.The equipment power: AC220V, 50Hz; line capacity is not less than 1.5KW, and has a reliable grounding wire, before connecting power, please confirm the power parameters meet the requirements of the equipment, otherwise it may cause damage to the equipment and even lead to personal injury. If the power does not meet the requirements of the installation of the equipment, it is necessary to check and repair to meet the requirements by professional personnel.

2. The laser output energy of equipments must be from low-energy to high energy gradually, the patients must feel comfortable, avoid energy is too high, otherwise it may lead to damage the skin. If the skin damage, need to immediately stop the current operation, and timely disposal of the necessary.

3. The equipment has the function of fault alarm, when the equipment alarm, must immediately stop the current operation, check the cause of the failure, as soon as possible troubleshooting.

## **11. Maintenance & Warranty**

1 Equipment for the use and storage of certain conditions must be strictly in accordance with the relevant requirements of the use and storage.

2. When stop working, must close the system as the normal operation and pull off the plug, to prohibit the operation of off power.

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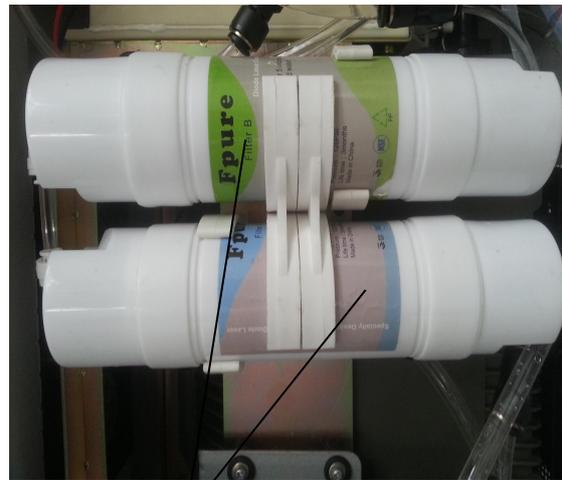
3. Replace the filter element and de ionized water cooling water regularly.

Note: 1 DI water cooling water must be replaced each week.

2 figure right for the ion exchange resin filter, ion exchange resin filter 1 months to replace.



Remove the bottom  
of the equipment



Replace the ion resin filter

4 the machine is a precision equipment, the operator have a certain professional skills to ensure the safety of the equipment, the operator must undergo professional training, otherwise it may cause damage to the equipment and even lead to personal injury.

5. when the breakdown of the equipment , please examine the machine according to the table, if the fault cannot be eliminated, contact our after-sales service in time, professional maintenance staff is strictly prohibited without permission open the equipment, otherwise not warranty.

#### 6. Environmental protection and others

Materials for the equipment and its packaging materials have no adverse effects on the environment. Please keep the package in right way.

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## **12. Disclaimer**

1. This equipment is a precision equipment, the operator is required to have some professional skills, in order to ensure safe use the machine, the operator must be trained; for all the consequences without professional training, blind operation has caused, our company is without any responsibility.

2. The equipment is a precision equipment, during transport must be properly transported, if damaged by improper operation during transportation, our company does not assume any responsibility.

3. There are some conditions for the equipments' installation, use, storage, it must be in strict accordance with the relevant requirements of the installation, use, storage; or our company does not stand any responsibility.

4. If the fault can't be excluded, please contact with our service personnel; disassembling the machine without our company service's permission is prohibited, otherwise no warranty, or stopping warranty; our company does not undertake any responsibility.

5. Supplied equipment signs, certificate, manual, packing lists and other random file, once signs, certificate damaged, the equipment will stop the warranty; our company do not assume any responsibility.

## **13. Service**

1. Supply the professional laser knowledge;
2. Supply the expert clinical guidance;
3. Quick response with in 24hours.