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# **Triple Diode Laser & YAG Laser**

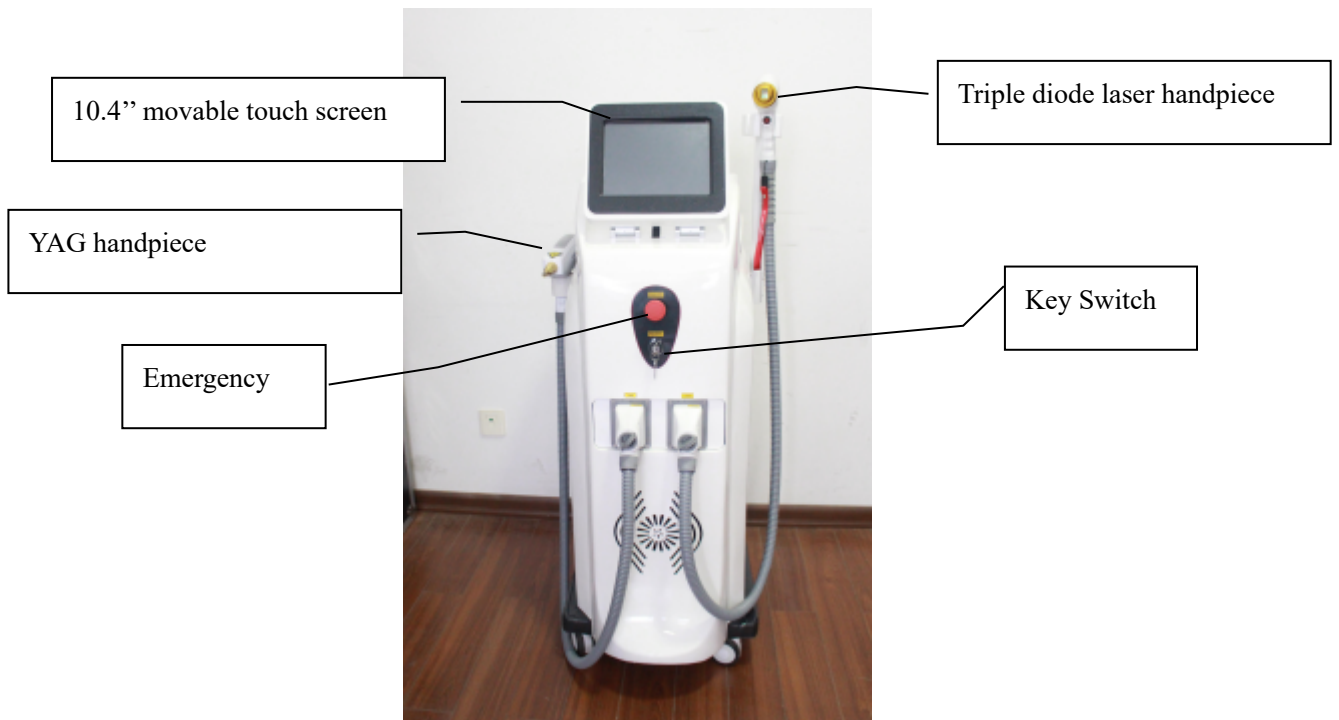
## **Operation Manual**



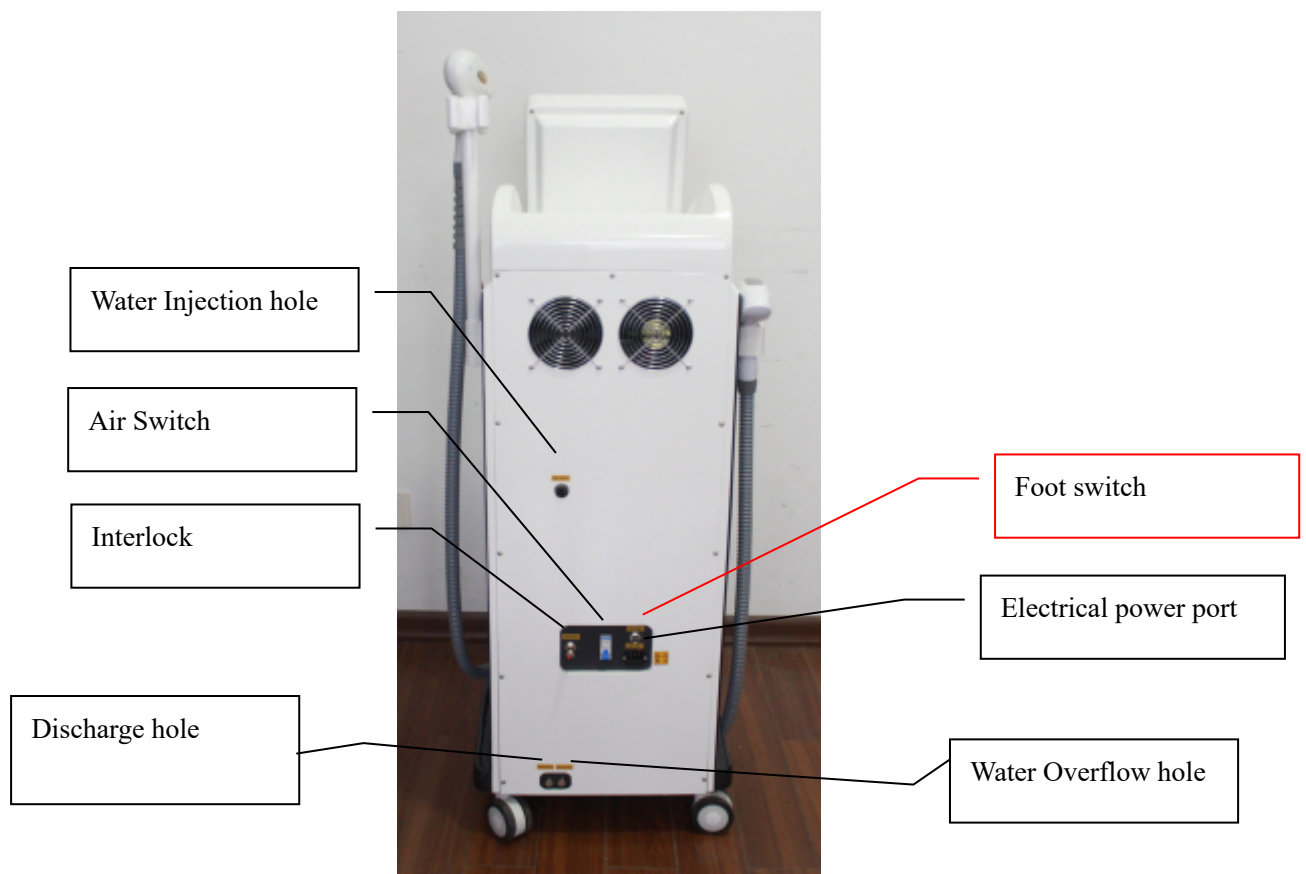
**Model Name: LS12**

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## Chapter 1: Introduce



**Front View**

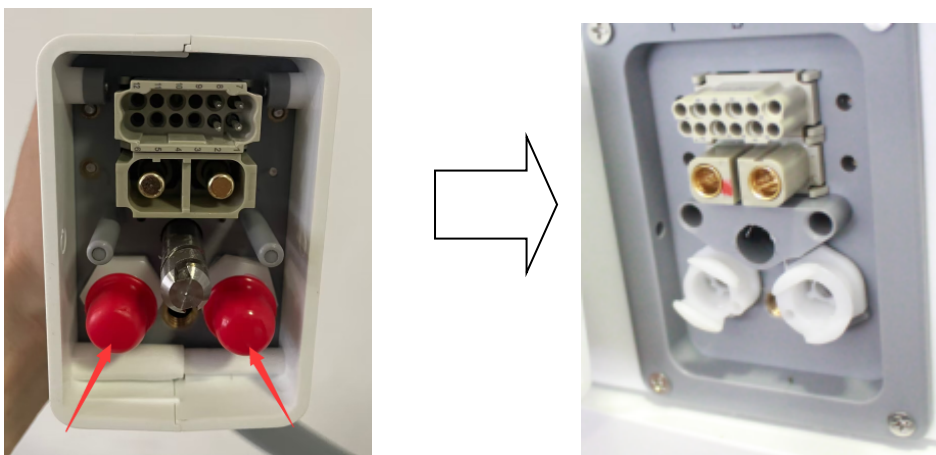
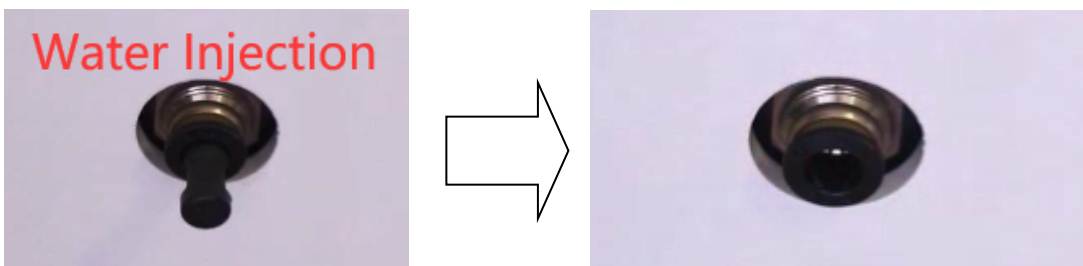
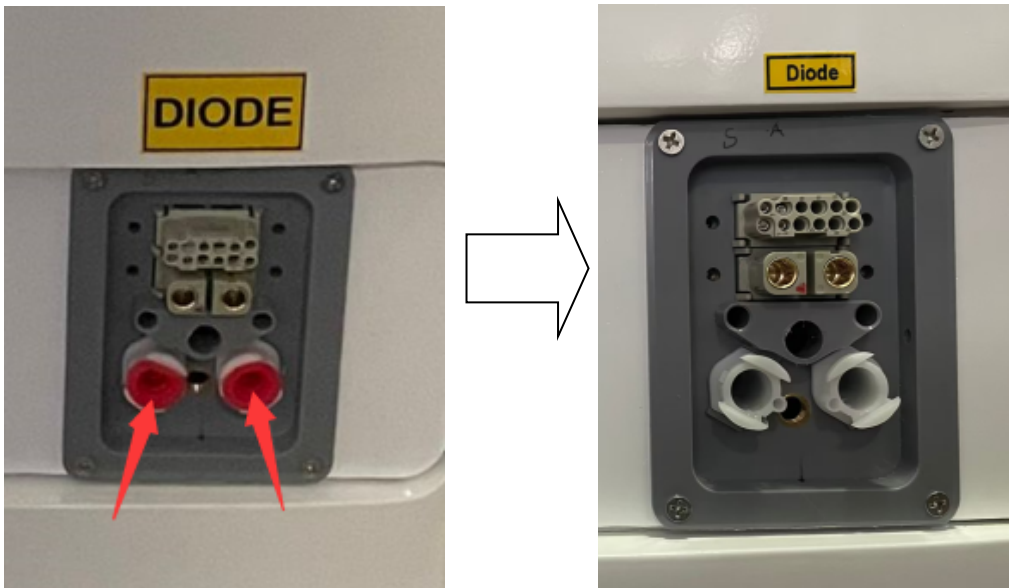


**Back view**

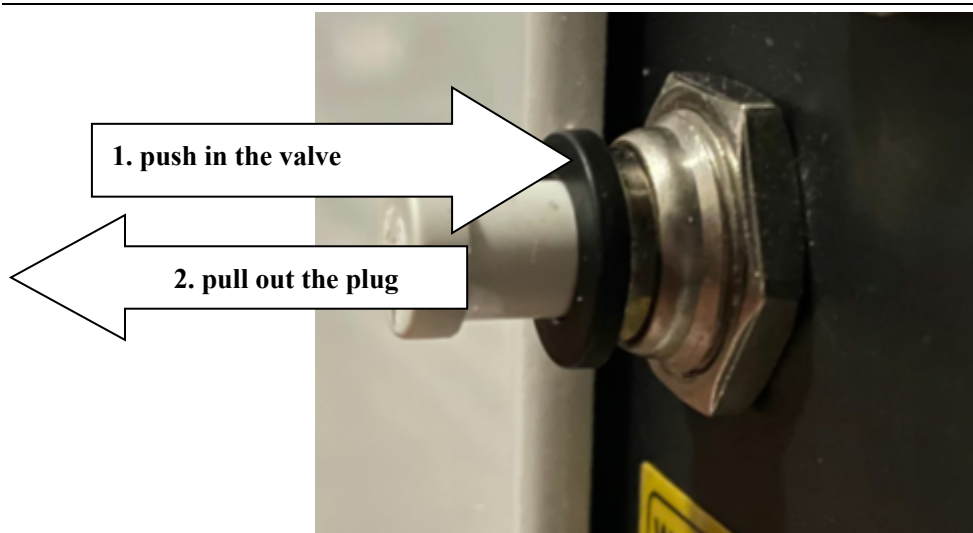
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## Chapter 2 Installation

1. Remove the 5 water plugs firstly.

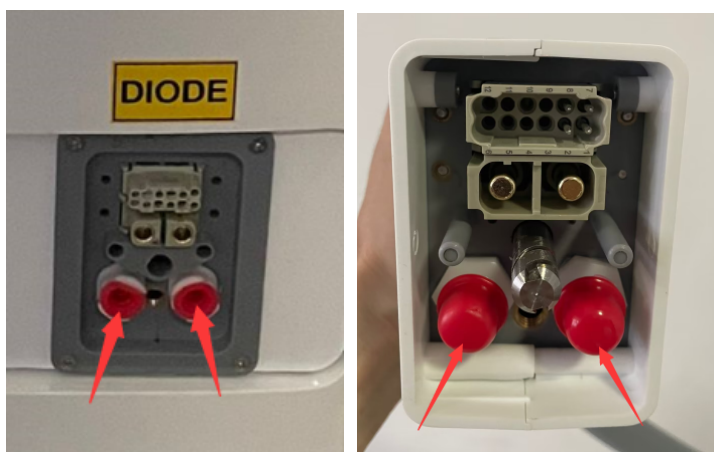


The method to take down the overflow plugs is to 1) push in the valve as below, and at the same time, pull out the plug.

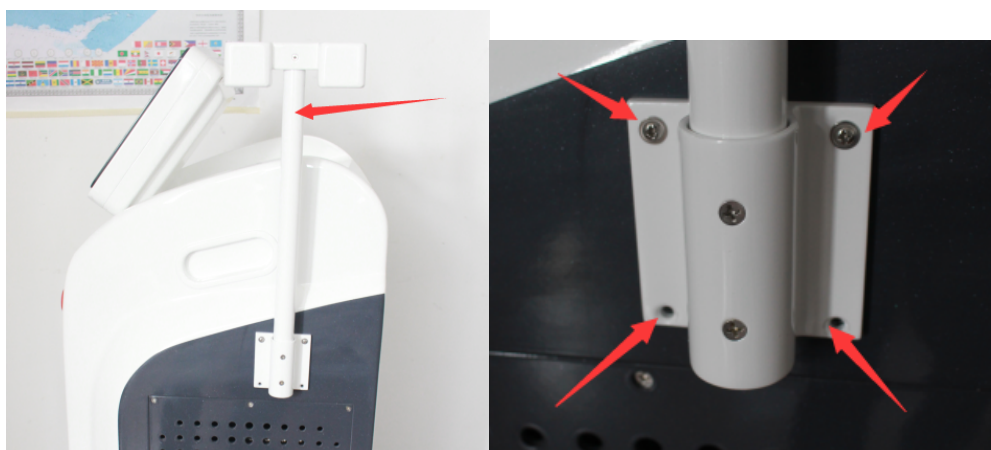


The following red plugs are only on the DIODE connectors as the water valves on the DIODE connectors are not auto-lock type. That means water inside will flow out when you unplug the handpiece. (water in machine will not run out because the connector on the machine is higher than the water tank inside).

Therefore, if you need to ship the machine, please discharge water from both machine and handpiece and plug the water valves as below to prevent the residual water from leaking.



## 2. Install the pole and handpiece holder

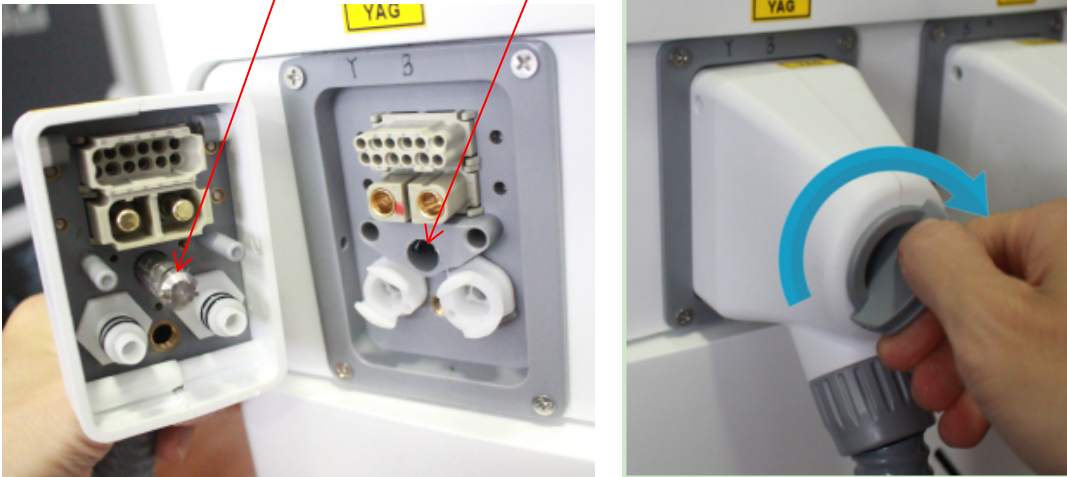




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### 3. Connect the handpiece onto the machine

Let this rotary lock cylinder align with this hole. Turn the knob clockwise until it stops.



Turn the knob counterclockwise, the plug will come off.

Pay attention to plug DIODE handle on DIODE connector, and YAG handle on YAG connector.



### 4. Water Injection

Distilled water is necessary.

Open the overflow hole.

Plug the water pipe into the water injection hole and inject water until water runs out from overflow hole. That means the water tank in the machine is full of water.



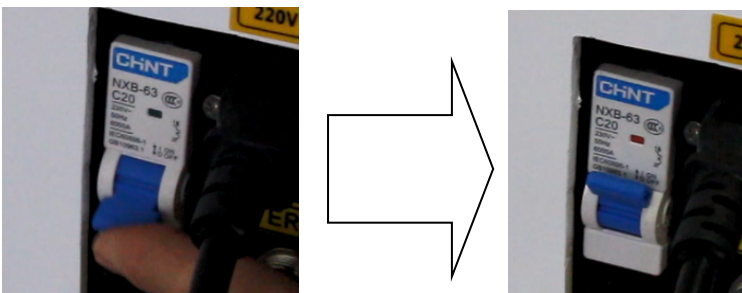
Then close the water overflow hole.

## 5. Interlock

Plug interface if your machine has it and plug the power cable.



## 6. Turn on the air switch




## 1. Turn on key switch and emergency switch



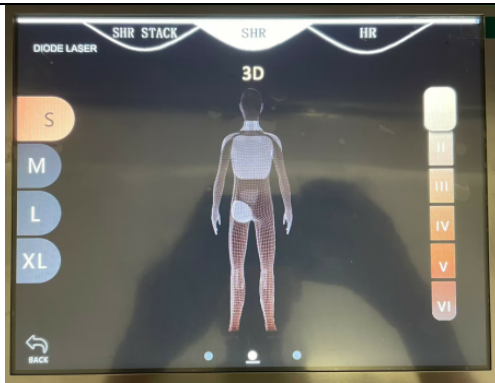
## Chapter 3. Triple Diode Laser

① Turn on the screen:



Press . On this page, treatment area size, treatment area and skin color can be selected.





If you press the round dot, it can be the front, the back of the body, and face&neck. And the highlighted area can be pressed as the treatment area.



For example, if the highlighted area of the chest is pressed, it will go to the following page and it shows that it is the chest area which is selected.





Explanation of other icons:

Press it to the main page

Press it to save the current settings after adjuston

Press it to turn on/off water level sensor waterflow sensor, temperature sensor, and language

Press it to go to the last page

Water temperature


Waterflow speed

Total shots

Single shots

Cooling Level

The screenshot shows a control interface with a top navigation bar containing 'LASER', 'SHR STACK', 'SHR', and 'HR'. Below this, there are three tabs: '3D', '2D', and '1D'. The '3D' tab is selected. The main display area shows several settings: 'FLUENCE' at 13 J/cm², 'STACK' at 2 J/cm² (burst), 'FREQUENCY' at 2 Hz, and 'COOLING' at 5 LEVEL. There is a 'STBY' button in the center. At the bottom, there are status indicators: '0.0 °C', '0.0L/min', 'T: 9S', and '0'. Callouts point to various icons: a home icon (main page), a save icon (save settings), a gear icon (turn on/off sensors and language), a back icon (go to last page), and the status indicators (water temperature, waterflow speed, total shots, single shots, and cooling level).

The following page comes from when this icon  is pressed:

Water level. Keep it off please

Choose language

Temperature sensor. Keep it ON please

Waterflow sensor. Keep it ON please

The screenshot shows a settings page with four toggle switches and a language selection menu. The first toggle switch is labeled 'Water level. Keep it off please' and is currently set to 'OFF'. The second toggle switch is labeled 'Temperature sensor. Keep it ON please' and is currently set to 'ON'. The third toggle switch is labeled 'Waterflow sensor. Keep it ON please' and is currently set to 'ON'. The fourth toggle switch is labeled 'Choose language' and shows a list of flags: UK, Spain, and Russia. A gear icon is visible in the bottom right corner.

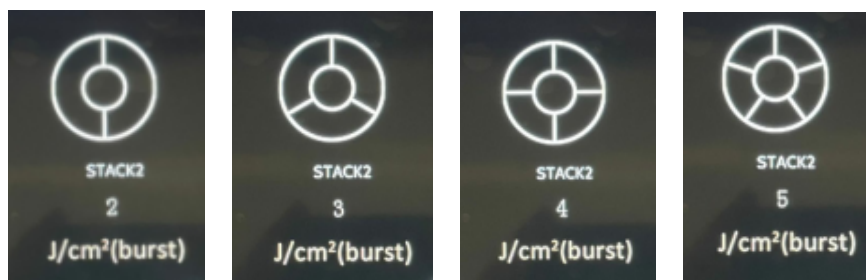


On triple diode laser treatment page, it has 3 treatment modes: **SHR STACK**, **SHR**, **HR**.

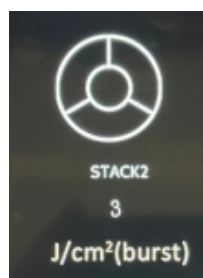
**SHR STACK.** On this page, **FLUENCE** is the energy of every laser shot. **FREQUENCY** is the shots quantity per second(it can also say the firing speed).



There are 4 kinds of STACKS as below and this icon can be pressed to get them as below:



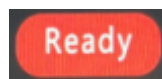
The 4 kinds of STACKS refer to the continual shots quantity. For example, if you choose the following one, it will shots 3 times on the same treatment area, and it will have a stop for the operator to move the laser handle to the next treatment area and it will shots 3 times again, then stop .....



**SHR.** On this page, **FLUENCE** is the energy of every laser shot. **TIME** is the timing and counts down by second. **ENERGY** means the total energy when all shots finishes in the **TIME**. It will stop shots when the **TIME** ends.



**HR.** HR is the simplest page and it can adjust FLUENCE and FREQUENCY only.



When you press **STBY**, it will become **Ready**. Now it will shots when the trigger on the handle is pressed.



## Chapter 4. Triple Diode Laser Treatment

### 1. Operation Steps

- 1) Shave the hair in the treatment area.



- 2) Seat the patient in the treatment chair after make him wear the protective glasses. The operator should also wear protective glasses. The operator then chooses the best operating position

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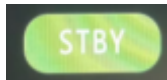
between the treatment range and the touch control screen.

- 3) Paste 1-2mm cold gel on the area need treatment, by doing this will help the skin to remain cool under the laser pulse and increase the rate of the penetration. The light pulse irradiates on the cold gel, every area that need light pulse treatment should be pasted by new cold gel.

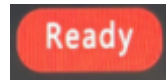


- 4) Switch the key clockwise to start the machine, and then the screen will display the main page.
- 5) Choose treatment parameters according to the specific conditions of the patient.

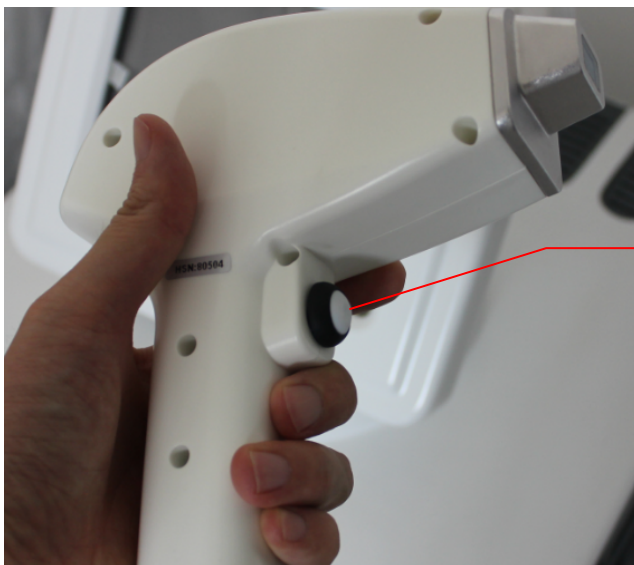
- 6) After you have adjusted all parameters, press



, it will become



- 7) Take the handle piece. Press the switch on the handle piece to shot the laser pulses. Keep pressing the button and the laser output will continue. Do not press & release for single pulse.



Press the switch



Sliding fast hair removal treatment



- 8) After you finish or pause the treatment, please press “STANDBY”.
- 9) After you finished all treatments, cleaning the treatment head, the dust or impurity on the treatment head will affect the effect of the treatment and the life of the machine, so it should be kept clean all the time. You can use soft clothes to wipe it, and then put the laser treatment head back to the groove.
- 10) Switch the key inverse clock to turn off the machine.

**NOTE :** Any sudden situations, press the Quick-stop button to stop the laser, and then turn off the key. The Quick-stop Button is designed to shut off the laser, not shut off the VAC. The Key is designed to shut off the VAC input.

## 2. Treatment Notice

- 1) The treatment of the hair removal needs experienced professionals. Do not use it if you have no experience for such kind of laser device.
- 2) Operators and patients must wear laser goggles to protect eyes from any laser damage threat.
- 3) Please notice that this is a high power laser device and if the patients feel very painful, please stop the laser and check if there is anything happens to the patients' skin. Adjust it as a proper power that the patients can stand to do the treatment.
- 4) Skin color is very important. For white to light color, you can adjust the laser power up to 80~100% for a higher performance, and the energy can be adjusted to 40~90J/cm<sup>2</sup>. For light color to light brown, you need a lower laser power (30%~60% for example), with a longer pulse width to protect any skin burning. Also you need to extend the treatment time for the dark skin to inject enough energy to the skin and follicles.
- 5) The skin must be shaved before treatment.
- 6) The handle piece is better to be operated at **SCANNING** mode. It is faster for treatment.
- 7) Skin contact gel is no necessary for treatment. It won't make the treatment better or improve the skin feeling.
- 8) You need to wait for several minutes before the cooling tip becomes cold.



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- 9) Keep contact between the cooling tip and skin. And you can also use the edge of the Aluminum head of the handle piece to cool down the skin during treatment.
  - 10) Never shot the laser pulses to eyes, or watch the laser directly.

## Chapter 5: Triple Diode Laser Clinical practice

### 7.1 Training


Triple diode laser hair removal machine should be operated by professionally trained doctors, nurses, technicians or other professionals. Recommending health care workers to participate in triple diode laser hair removal machine professional training .It can also provided by many experienced physicians.

### 7.2. Indications and contraindications

#### 7.2.1. Indications

permanent hair removal (beard, armpit hair, four limbs hair, etc.)

#### 7.2.2. Contraindications

 <b>Warning</b>
Do not treat its implementation if patients found the following characteristics


- 1, local and body inflammation;
- 2, immune system defects;
- 3, the physical scars patients;
- 4, photosensitive skin and people using photosensitive drugs;
- 5, mental unhealthy and high expectations customers;
- 6, pregnant women;
- 7, the suspected skin cancer patients;
- 8, blood clotting is not normal and are using aspirin and antioxidants;
- 9, customers have received post-exposure recently or sun exposure customer;
- 10, recent days (within 3 months) ,using cosmetics containing hormones (such as some freckle products) customers;
- 11, epilepsy, diabetes, bleeding tendency customers;
- 12,customers with skin infections in the irradiated sites
- 13, sun tan after exposure;

#### 7.2.3 Screening of patients

Ask patients their expectations for improvement in the skin is very important before the treatment .

triple diode laser hair removal machine is quite attractive for the fast-paced way of life patients. Because it does not need patients spend a lot of time waiting for recovery in the entire course of treatment .The treatment does not require patients to lay to rest. Patients can return to work immediately or lives after treatment. For the patients who are highly expected treatment results, not recommended to have a treatment.

### 7.3 Treatment guidelines

<b>Warning</b>	
<b>Before the</b> implementation of the treatment of patients ,please read this paragraph	

- 1, Physicians should conduct a comprehensive examination on their patients before the treatment time .According to the specific situation of patients,firstly give their patients a test spot in need of treatment area, (particularly for patients with dark spot test,spot test very necessary);
- 2, pregnant women, epilepsy, people with mild sexual measles, recent sunburn , treated by chemotherapy and broken capillaries,should follow doctors' recommendation to do a surgery .
- 3, skin scrape hair in the treatment area, with neutral detergent solution to clean the skin surface, do not use any cosmetics;
- 4, using a large number of Condensed eraser surface of the skin in treatment areas (preferably using a imported or dedicated cold gel, the better);
- 5, the hair removal treatment, the treatment head should be aimed at treatment areas of skin, slightly contact with the skin surface .Must keep the mirror of treatment head clean.
- 6, sometimes the treatment appear a slight skin redness .It is normal phenomenon.After treatments later it will go away within a few hours .
- 7, the treatment parameters settings should be recorded for later use;
- 8, 20 minutes after the treatment finished, washed cold gel ,do cold in the treatment region .Using frozen gauze, water soaked into the plastic bag to do cold.  
After surgery blisters and ulcers generated in the skin ,can be cured by antibiotic ointment and burn cream (such as: Silverol or Biafine, etc.). Also low concentrations of steroid cream can be used to reduce swelling.  
If the blisters scab, should use vaseline or other moisturizing cream to keep it soft. Within 24 hours, do not use any cosmetics, one month to avoid too much sun and strong exercise, adjust the diet, go out to wear sunscreen;
- 9, 808 nm laser hair removal usually takes 4-6 treatments, each treatment interval of generally 1-1.5 months.

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10, usually three times after treatment, and can be reached significant treatment effects.

## **7.4. Pre-treatment**

### **7.4.1, Inquiry**

Newly diagnosed patients, the attending physician should (or other qualified medical personnel) :

- 1),Excluding patients in recently 3-4 weeks with dark brown skin ,which caused by daylight or artificial light tan.
- 2), 3-4 weeks will be excluded from sunlight or artificial light tan dark brown skin of patients.
- 3), asked in detail about the patient's medical history, including received what forms of treatment previously to determine whether he / she is suitable to accept the triple diode laser hair removal treatment.
- 4), find out why patients seek treatment and his / her expectations.
- 5) discuss the triple diode laser hair removed treatment plan with the patient.

### **7.4.2 explanation**

Newly diagnosed, the attending physician should tell the patient the following(or other qualified medical personnel):

- treatment, there may be some discomfort / pain;
- After treatment, there may be temporary swelling / edema occur;
- To achieve the desired therapeutic effect may require several treatment, usually 4-6 times. Efficacy of the treatment need to follow the gradual expression and the patient's actual expectation;
- There have temporary hyperpigmentation and skin texture changes and other minor side effects risk.

### **7.4.3 eye protection**

When using triple diode laser hair removal machine, all persons in the treatment room (including patients and all health care workers) must wear protective glasses to protect the retina. When the intense pulsed light is used near the eye,doctors should give the patient over their eyes. Of course, the best protective measures is to let the patient closed his eyes before the laser pulse launching after the system ready to issue a "beep" sound,.

### **7.4.4, photo**

Photographic archive for the patient before and after surgery (the patient face left, right and front). Because many patients are unable to objectively evaluate treatment progress, these photos can be used as evidence.

Patient photography should be used in the same environment similar to the speed, flash index and the focal length, so the photos can do different time objective comparison.

## **7.5 Treatment**

- 1) • allow patients to wear protective glasses sitting in the chair. Operators also wear safety glasses, and remind the patient do not open their eyes during surgery.Operator select the best operating position between the patients' face and touch control panel.

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2) • General from inconspicuous parts of the face, such as the front of the ear begin treatment. In the treated area coated with 1-2mm cold gel, which will help cool the skin under the laser pulse and increase the penetration of light pulses on the skin. Pulse emission in the cold gel, each light pulse treatment to receive the site should be coated with a new cooling gel.

3) • placed in the treatment of head and perpendicular to the cold 1-2mm thick gel, the optical crystal contacts in the skin, rather than the cold gel

4) • When the system issued a "tick" and ready sound. Pressing the trigger switch, a laser pulse.

5) (Selection of parameter is a very important aspect in clinical training, We recommend doctors firstly beginning with triple diode laser hair removal machine to do the treatment of intense pulsed rejuvenation should be very careful to carry out parameters. If you encounter more difficult cases, clinical experts should be consulted.)

6) • in the course of treatment, when patients need referral for additional treatment, can appropriately increase the energy density to obtain better results according to requirement. However, before the start of treatment still need to launch the test spot to observe.

7) • After the treatment does not need any post-operative care. Patients can immediately put to work or lives. Only parts of the general treatment of sun treatment, proper skin care can improve the strong pulse of the relevant chromophore formation, pore size reduction and mitigation of color and light Shen aging effect.

8) • After treatment, the color Shen and brown spots will be to deepen the color, it will reduce and disappear after a few days.

## **7.6, postoperative care**

### **7.6.1 overview**

After the skin blisters or ulcers can be produced by antibiotic ointment or burn ointment. Low concentration of ointment can also be used to reduce swelling.

If the blisters scab, available moisture ointment like Vaseline to keep it moist.

### **7.6.2, to prevent sun exposure**

one month after treatment ,patients should used high-factor sunscreen to protect the treatment area from sunlight. Sun exposure may increase the regeneration rate of melanin resulting in hyperpigmentation.

### **7.6.3, make-up**

Most doctors allow patients immediately use cosmetics after surgery, but this also require the patient once found the treatment zone in the gap or crusting should should immediately inform doctor and stop makeup.

In most cases, the low energy light rejuvenation triple diode with low surgical risk, and safe to work right away or lives.

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#### 7.6.4, continue treatment

The following are the recommendations to continue treatment of the patient, only reference for doctors:  
Patients should be in a course of treatment (4-6 times) back to the hospital referral after 3 weeks.

#### 7.6.5, side effects

If in the course of treatment and after treatment typical side effects phenomenon may occur:

- 1) Low heat burning feeling may last a half hour or so;
- 2) minor redness, 4-12 hours ,a day it can generally dissipated;
- 3), purpura, blisters, edema

You can use the green cream to reduce reaction, the late stage of skin restoration BFGF (at shallow burn care).

- 4) pigmentation:

Appear in darker skin or people affected by sunlight exposure may, or vitamin C aqueous solutions by ultrasound BFGF import or whitening care in the slow fade.

- 5) hypopigmentation or depigmentation, may be related to high energy radiation, generally self-healing;

#### 7.6.6, end of treatment

When the end of the treatment depends on the doctor. Generally when the red spots on skin, telangiectasia and pigmentation, which are significantly reduced; skin texture, sun burns red light and the extent and degree of aging can be a significant improvement in the end of treatment.

#### 7.6.7, postoperative skin care

##### Morning

- Use soft, neutral ground cleaner and cold water to clean the skin
- Add synthesis of vitamin C cream on the skin
- Add sunscreen on the skin

##### Night

- Clean the skin
- Apply moisturizing cream

#### 7.7, Advantage of the treatments

- 1, no damage
- 2, the pain is not obvious
- 3, fast, effective, easy to use
- 4, no vacations after treatment
- 5, for a variety of color, can improve overall skin condition

#### Fitzpatrick Classification: Skin reaction to sun exposure

Skin Type	Color	Reaction to sun exposure
I	White	Always burn, never tanned
II	White	Easy burn but not easy tanned
III	White	Sometimes burn and tanned
IV	Medium	Not easy burn, but tanned



	Brown	
V	Dark Brown	Seldom burn but easy tanned
VI	Dark	Easy go tanned

#### Addendum: Laser Service File (for reference)

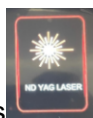
#### Material for customers

triple diode laser hair removal technology is a new optical technology, the technology for beauty. The energy density is about 10-100J/cm<sup>2</sup> in order to achieve hair removal results.

The strong laser pulse with specific wavelength and spectrum can penetrate skin, directly effect on the hair follicle tissue, and make the hair remove effectively. There are no adverse reactions for face treatment. Patient can go on normal life and learning without any interference.

## Chapter 6. YAG Laser Treatment

1. Press



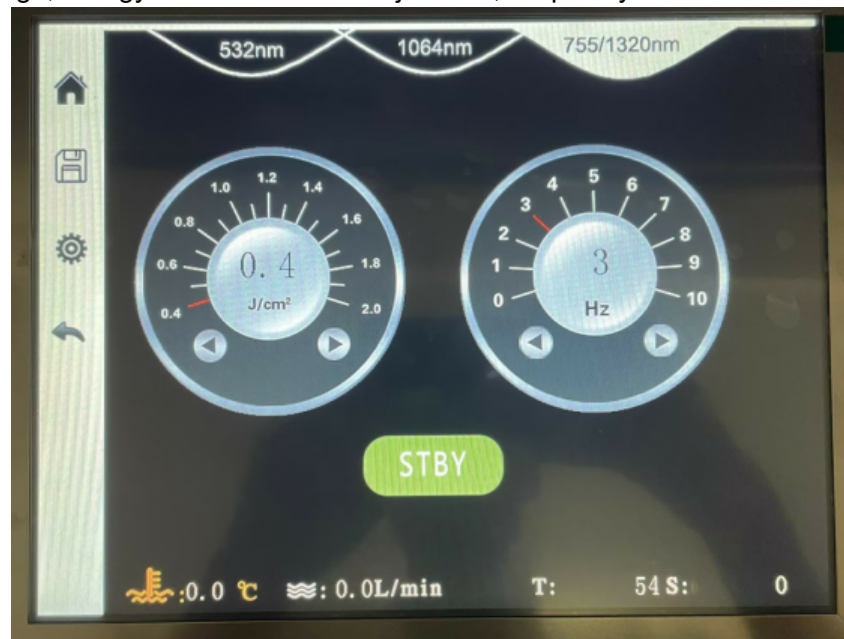
In 1064nm page, energy is from 0.4 ~ 2.0 adjustable, frequency is from 1 ~ 10hz





In 532nm page, energy is from 0.6 ~ 1.4 adjustable, frequency is from 1 ~ 10hz



In 755/1032nm page, energy is from 0.4 ~ 2.0 adjustable, frequency is from 1 ~ 10hz



Press  for decreasing, while press  for increasing.

After you have adjusted all parameters, press , it will become .

Take the handle piece. Press the switch to shot the laser pulses. Press the foot switch and hold it, the laser output will continue.

## Chapter 7 - The Operation of YAG Laser

### Client Consultation

A full consultation and patch test is to be carried out before any treatment takes place.

Consult in private and make client feel comfortable, the consultation will enable you to establish if the client is a suitable candidate for laser therapy.

### Consultation Process:

#### Explain to the client how the Q-Switched Nd: YAG treatment works

The Q-Switched laser delivers specific-wavelengths of light extremely quickly (in nano-seconds) at a very high energy. These pulses are selectively absorbed by the tattoo pigment, shattering it into tiny fragments small enough for the body to recognise the particles as a foreign object, and over the next several weeks some of particles (in shallow cuticle) are discharged from the body and the other part (in deep tissue) are absorbed

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and digested by the body's macrophages and removed out of the body by the immune system.

Since the specific wavelengths used can only be absorbed by pigment particles, no lasting injury happens to normal skin and normal tissues.

Q-Switch laser systems can now remove all types of tattoo with little or no scarring. Professional and amateur tattoos, as well as traumatic tattoos, resulting from accidents, are treated successfully.

Multiple treatments will be required

### **Matters that can Influence Laser Treatment**

There are many factors which can affect the results of successful treatments and complete removal is not always achievable.

Clients should be given realistic expectations of treatment results, and complete removal of pigment can never be guaranteed.

- a. **Amateur or professional tattoo** – Amateur tattoos are easier to remove as usually they are not as deep as professional tattoos and the ink is more sparsely applied. Amateur tattoos are usually only a single colour (black or blue), whereas many professional tattoos are multi-coloured.
- b. **Type of ink used** - The pigment divided into plants pigment, mixture pigment, and chemical pigment. The plant based pigment is the easiest to dispel, while the chemical pigment is most difficult. If pigment contains iron and lead in the mixture and chemical pigment, it may not react well to laser treatment and can be difficult to remove.
- c. **Depth of ink** - Generally speaking the deeper the pigment, the more difficult to remove. And it also takes many times to dispel. It will easy to dispel if the depth of the pigment is thin. Any treatment will not react well if the pigment is chemical based, even the depth of the pigment is thin.
- d. **Colours in tattoo** – Black and blue tattoos are the easiest to remove while the green and yellow pigments are the hardest as there is not an ideal wavelength that either of these colours absorb. Tattoo's that have had white (titanium oxide) applied cannot be removed until the white has faded. UV inks cannot be treated.
- e. **Age of tattoo - Older** tattoos usually easier to treat, new tattoos contain more pigment (ink) and often multiple colours.
- f. **Clients own healing ability** - The different physique of people. The factors include age, skin, and body immunity and so on.

### **Side Effects**

A superficial burn wound can be created by the laser tattoo removal treatment, The immediate whitening of the treated area is the inks reaction to the absorption of the lasers light energy creating steam within the surface of your skin which usually last for several minutes.

### **Clients May Experience:**

- A. Swelling or Bruising
- B. Pinprick Bleeding

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- C. Feeling of Sunburn
  - D. Blisters,
  - E. Scabs and Crusts
  - F. Pigmentation changes due to loss of skin pigment can occur (temporary except in rare cases).
  - G. Dry Itchy skin
  - H. Temporary hair loss
  - I. Infection

Although times can vary, Complete healing usually takes 4-6 weeks. Some extreme cases can be up to 3 months to heal properly.

Scabbing and blistering routinely occur following treatment and usually occur 8-72 hours after the treatment, which can last 1-2 weeks or longer. When the scabs separates, the skin in the treated area may look pale or pink.

Hemoglobin of the tissue has a strong absorption of the 532nm wavelength. Using the 532 nm wavelength increases the risk of swelling phenomenon, skin surface turning white after vaporization, epidermal necrosis, a certain loss of pigment or pigmentation.

Due to personal immune system difference an increased restoration period between treatments may be required.

## **Treatment Aftercare**

### **After Laser Tattoo Removal Treatment**

- a. Cold compresses (not ice) and recommended skin care products may be useful to reduce swelling or discomfort.
- b. You may take over-the-counter pain or anti-inflammatory medication. Hydrocortisone (steroid) cream may decrease any itching or skin irritation. Antibiotic ointment (such as Neosporin) may be used if skin is broken to prevent infection.
- c. Your skin will be fragile for 2 to 3 days. Use gentle cleansers, but do not rub the skin vigorously and avoid hot water during this time. Skin moisturisers may be used and make-up can be applied if the skin is not broken.
- d. Avoid sun exposure and tanning creams during the entire course of treatments. Use SPF 30 or greater on the treatment area at all times.
- e. The treatment area may be left open and uncovered. Do not scrub the area. Do not use any products on the treated area without first consulting our staff.
- f. Avoid soaking for 24 to 48 hours. No hot tubs, whirlpools or baths, but showers are okay.
- g. Avoid excessive sweating for 24 to 48 hours. No saunas or vigorous working out.
- h. Keep areas well moisturised and allow scabs to fall off on their own. This is an expected occurrence with tattoo/pigment removal.
- i. Avoid irritants such as Retin-A, Retinol, Renova, glycolics, bleaching creams and exfoliants for one week.
- j. Refrain from alcohol for 3-7 days.
- k. It is best avoid smoking for a period of several weeks before and after your procedure, as smoking



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constricts the capillaries and taxes the immune system, thereby slowing healing and results

## **Medical History**

Operator must record details of clients medical history. All patients must complete and sign the history profile prior to treatment. The medical history is reviewed and confirmed with the patient during their consultation.

## **Contraindications**

**DO NOT** treat anyone with the following conditions unless client obtains a signed letter from his/her doctor confirming that the medical condition(s) will not prevent client having laser treatments;

- A. Lupus or other autoimmune deficiency
- B. Pregnant or Breast Feeding
- C. Bleeding abnormalities
- D. Treatment of Acne in the last six months
- E. Keloid or very thick scarring
- F. Inflammatory Skin Conditions (e.g: Psoriasis) or Injuries
- G. Hypo-Pigmentation
- H. Rheumatoid Arthritis "Gold" Therapy
- I. Herpes simplex or fever blisters
- J. Diabetes
- K. Epilepsy
- L. Cancer
- M. HIV/AIDS
- N. Used St John's Wort in the past 3 months
- O. Newly Tanned skin (includes; natural suntan, tanning bed, fake tans) in last 30 days
- P. Waxing/Plucking/Electrolysis/Sugaring within last 6 weeks
- Q. Wearing a Pacemaker, or any Metal Pins/Plates

Note:

This list is not fully comprehensive and others factors may arise during consultation

## **Photosensitivity Considerations**

Many prescription drugs and herbal remedies can cause increased Photosensitivity meaning the skin becomes more sensitive to light.

Photosensitivity reactions are generally either Photo-Toxic or Photo-Allergic. Photo-toxic drugs are more common than photo-allergic drugs. Reactions can include:

1. Extreme sunburn
2. Swelling
3. Stinging and Burning
4. Hives

It is important that you obtain a list of common photosensitising medications for reference.

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## Skin Typing

One of the important parameters for the success of laser treatments is the correct typing of the skin.

Skin type is often categorized according to the Fitzpatrick skin type scale, which ranges from very fair (skin type I) to very dark (skin type VI). The two main factors that influence skin type and the treatment programme devised by physicians are:

- Genetic disposition
- Reaction to sun exposure and tanning habits

Skin type is determined genetically and is one of the many aspects of your overall appearance, which also includes the colour of eyes, hair, etc. The way skin reacts to sun exposure is another important factor in correctly assessing skin types. Recent tanning (sun bathing, artificial tanning or tanning creams) has a major impact on the evaluation of your skin colour. Treat as next darker type if unsure.

## Client Consent

All patients must complete and sign client consent to treatment form prior to treatment. The medical history is reviewed and confirmed with the patient during their consultation.

## Patch Test

Patch tests should be applied to establish the highest level of energy that the patient's skin can tolerate without adverse reaction.

1. Determine the patient's skin type and select the settings for the three test spots accordingly.
2. Remove any make-up or lotions and cleanly shave the area to be tested. Make sure the area is completely dry.
3. Each test spot should be clearly delineated. Increasing energy for each successive spot left to right or bottom to top for consistency in assessment and documentation.
4. After 5-10 minutes, record the initial reaction on the test spot notes.
5. Test spots on patients with skin types V and VI should be at least 2 weeks prior to treatment in case of late emerging side effects. Other skin types may not have to wait as long.
6. Upon return, treat the patient at the highest energy tested that did not cause an adverse reaction (crusting, blistering or pigment change).

## Treatment

1. We advise you take the second treatment 6 weeks after the first.
2. You can shave the eyebrow before removing the eyebrow with device in order to examine the effect.
3. Take photos before and after every treatment for reference
4. We advise you that you should treat large tattoos and nevus little by little and time by time to avoid to much discomfort to the client. You can also help build client confidence by seeing the contrast

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between before and after the treatments.

5. There maybe the sound of the pigment breaking when you treat the deep tissue of the tattoo because of the strong absorption to laser energy with 1064nm. The tint colour of the pigment can come out the cuticle after absorbing the energy.
6. Use a lower energy over bony and thin-skinned areas,
7. The results of tattoo removal will be more noticeable in the first few treatments, due to there being more pigment.
8. The function of digesting and transportation of the macrophage can continue for a long time, and the colour can fade more during this period.

## Chapter 8 - Operation Skill and Technique of YAG laser

### Demands before operation

- Before each treatment, the user must check the functional performance of the device in order to avoid any risk of harm to patients or other persons. If the device is used in together with peripheral units, the User's Manuals for the peripheral units must also be read thoroughly and understood.
- Operators should complete a consultation and build a client file.
- Clean the treatment area, disinfect utensil, and shave the treatment area if necessary. You must pay attention that the area to be treated must be dry, as the treatment will be affected if there is water in the treatment area.
- The operator should wear white clothes and relevant wavelength glasses. Keep the operation room clean and make sure illumination is bright enough.  
You should keep the temperature is between 22 and 28°C, and avoid the laser irradiating non treatment area.

### The suggested laser parameters during the operation

Treatment Mode	Frequency	Treatment Distance	Energy
<b>Eyebrow removal</b>	2--3Hz	1—2cm	300—400mj
<b>Eye line removal</b>	1--2Hz	1—2cm	300—400mj
<b>Lip line removal</b>	3—4Hz	2—3cm	300—400mj
<b>Tattoo removal</b>	3--4Hz	3—5cm	500—600mj

<b>Spots and naevi removal</b>	3--4Hz	3—5cm	500—600mj
<b>Birthmark removal</b>	3--4Hz	3—5cm	550—700mj

**Notice:**

- A. 1064nm gets rid of blue, black and cyan pigment.
- B. 532nm gets rid of red, coffee and brown pigment.

The light beams should be vertical all the time. All the treatment doses are the parameters referring to the vertical laser beam. If it deviated from the vertical position, the laser flow will be reduced and the laser energy can not be completely utilised.

The light spots should fold and translation to a line when you remove eyebrow, eye line and lip line.

You should remove the spot and naevus gradually in small areas.  
The treatment area should ooze blood when you treat the area.

**How to Change Treatment Heads of Laser**

The laser has two inter-changeable treatment tips, each offering different wavelengths: 1064 nm & 532nm, these screw into the end of the hand piece.

1. **1064nm wavelength** for black, blue, brown, and other darker colours tattoo removal, this tip is slightly shorter and has a round mirror inside.
2. **532nm wavelength** for red, orange, pink, and other lighter colours tattoo removal, this tip is longer and has a square mirror.



Picture - The Handle of laser and treatment tips.

**Directions:**

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Select the treatment tip according to the treatment of wavelength based on the examples above.

Screw treatment tip in a clockwise direction to attach to hand piece

Screw treatment head counter-clockwise to remove.

**NOTICE:**

- 11) Please don't screw the treatment heads too tight.
- 12) Please stop the machine, or enter safe mode when you are changing the treatment heads.

**【Quick Tips】**

1. The result will be better that treating part by part when you treat large area tattoo.
- a. Please treat with 532nm head first when you treat lighter colour like red. After 2-3 times treatment, the red colour tattoo may possibly turn black or brown. Then treat it with 1064nm head.

**Adjusting The Focal Point (Spot Size)**

**How to adjust energy after you set the power on LCD during treatment**



1. Put the head on the skin first



2. Then, prolong the distance between skin and head.



3. The power is most strongest when the laser beam get the focus.



4. Power will be weaker again after the distance between skin and head is longer than the focal point.



**Notice:**

Larger Focal Point (spot size) = Lower Power Density

Smaller Focal Point (spot size) = Higher Power Density.

5. Looking for a good distance to control the power during the treatment.

### **How to control the energy of laser treatment**

In the early stage of the use of laser treatment, you can consider the experience of others. The parameters of the treatment of a certain disease are:

Laser energy Q, pulse frequency Y and spot size D (direct).

Energy and Frequency can be adjusted directly through the machines interface and the select button. The spot size can be achieved by adjusting the distance between treatment tip and treatment area.

Energy density = laser energy /  $\pi \cdot D^2$  namely:  $E = Q / 0.787 \cdot D^2$

**A: In the actual operation, the energy also needs following points to consider:**

The skin colour, thickness, rough conditions vary from person to person and due to different sites.

Therefore, the dose is different. When you operate the instrument, the dose should be gradually increased from small to large. You can find a suitable parameter this moment. For instance, first use some spot to experiment, the spot become smaller gradually (that is closing to the scheduling and to lift the treatment head gradually, finally to find the focus position), at the moment energy density (flow) changes from small to large.

**B: Please pay more attention to the changes of the skin colour in normal part.**

The target pigmentation always exist in corium or deeper in the skin, it should be treated by laser until blood oozing slightly. Another treatment is needed if the pigment cannot be removed thoroughly after 1 treatment.

C: Whether it is skin pigment or vascular skin diseases, we change the energy according to the colour depth. If the colour of the same lesion changes from deep to shallow gradient, the treatment should begin at the darker areas. While moving to the light-coloured, we should raise treatment tip position. This will make the spot size get larger, the energy get lower.

D: If treatment area is large and location is deep, too deep and large area treatment once will lead to local edema, blisters and exudates. So a layered and slicing treatment is suggested.

### **Operating Technique Introduction for Different Treatments**

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## **Eyebrow Removal**

### **a. Removing single blue and black eyebrow:**

The light speed can be set to 5Hz; the distance from treatment tip to skin is 1 ~ 2cm. You may treat from the head or may from the tail of the eyebrow. You can take the second treatment if there is colour restoration. The energy can add 20-40mJ and the treatment tip to skin distance can increase up 2-3cm in order to increase the effect

### **b. Shaded eyebrow removal ( the shaded eyebrow can be removed clearly 2 or 3 times)**

Set the light speed to 3Hz and the energy can be selected according to the above form.

First you can treat with 1064nm in 2-3cm distance, and then you can treat with 532nm the second time. The brown pigment contains mixed pigment, so it could take more than two treatments; the treatment interval period is from 45 to 90 days. You can choose different light head according to the remaining colour.

## **Eye Line Removal**

The light speed can be set to 5Hz, and the energy should be set to the lowest point. It is about 2-3cm distance from treatment tip to the treatment area, and the light will be seen as reference.

The client's eyes should be protected with thick medical cloth and eye coverings.

First you remove the client's lower eye line, and the client should close his/her eyes, at the same time the clients eyeball needs to be looking upwards.

The operator presses the cloth with index finger, and peels away the lower eyelid with middle finger.

When you remove the upper eye line the client should close his/her eyes with eyeball looking downwards.

The operator presses the cloth with middle finger and pulls the eyelid with index finger.

## **Lip line removal**

The light speed can be set to 5Hz, and the energy can be selected according to the reference table above.

The distance from treatment tip to the treatment area is 3-4cm space.

You can remove the black, coffee and deep red with 1064nm for the first treatment and then use 532nm for the second.

You can use 532nm to remove thin red, red, thin coffee and thin brown. You must pay attention that you carry out the second treatment of removing lip line, soak lip and the lip's tattoo within 6 months of the first treatment.

The course of treatment is from 45 to 60 days until it is clear.

## **Tattoo removal**

The light speed can be set to 3Hz/5Hz, and you can select the energy according to the reference table above.

The distance between treatment tip to treatment area is 3 or 4cm.

The effect will be best if there is blood speckles/pinprick bleeding.

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The light head of 1064nm gets rid of blue and black pigment while 532nm gets rid of red and coffee pigment. The interval between treatments is from 45 to 90 days and course continued until it is clear.

### **Speckle and naevi removal**

The light speed can be set to 3Hz/5Hz, and you can select the energy according to the reference table above. The distance between treatment tip and treatment area is 3 or 4cm. The effect will be best if there is blood speckles/pinprick bleeding.

The light head of 532nm gets rid of red pigmentation while 1064nm gets rid of speckle and naevi.

The course of treatment is from 15 to 30 days until it is clear.

### **Birthmark and nevus of Ota removal**

The light speed can be set to 3Hz/5Hz, and you can select the energy according to the reference table above. The distance between treatment tip to treatment area is 3 or 4cm. The effect will be best if there is blood speckles/pinprick bleeding.

The light head of 532nm gets rid of red pigmentation while 1064nm gets rid of birthmark.

The course of treatment is from 45 to 90 days until it is clear.

## **Chapter 9 - Detailed Function**

### **Makeup Removal**

Many women love to embroider their eyebrow with different colour ink. It is very popular in China. The embroider eyebrow can be removed easily after women do not require it any more.



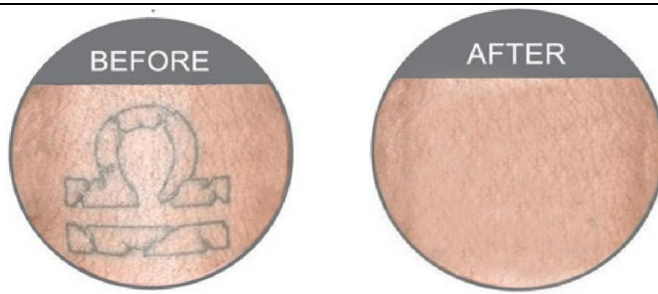
### **Tattoo Removal**

Tattoo removal is the major function. It has two wavelength treatment heads.

1064nm wavelength for black, blue, brown, and other darker colours tattoo removal;

532nm wavelength for red, orange, pink, and other lighter colours tattoo removal.





## Carbon Peeling

THE LASER can do carbon peeling and it needs a third laser tip - a black tip and carbon cream.

### Further Information;

1. The LASER also has good effect for other pigmentation formed by pathological changes of pigmented skin and mixed colour.
2. The 6 separate programs of therapy can be selected freely. And the parameters (Power, Frequency) in each application (e.g. Tattoo) can be stored in its own file, which can be directly used next time. The data in an application does not need re-adjustment. It makes easy operation and quicker treatment.

## Chapter 10 - The knowledge YAG Laser

### 1. The differences between the first and the second eye brow removal:

You should use the energy which near the focus energy for the first treatment. Distance can be greater than the first time and the energy can be gradually increased during subsequent treatments.

### 2. The reason that the coffee turns to blue and black: -

It is normal reaction if the coffee turns to blue and black because the coffee is a mixture pigment which includes iron, lead ion, iron ion. And all these ion can produces pigmentation, so we advice you remove the pigment with 1064nm for the first time and then use 532nm. You can examine the effect half one month later. You can use 1064nm to remove if the colour turns to blue, and use 532nm if it turns to red.

### 3. Why does some red eyebrow have no reaction after removing?

The pigment does not belong to plant pigment but the chemical pigment, and the iron has reached in to derma layer so it is difficult to remove. You should use the focus energy of 1064nm to break up the pigment until blood spots appear, and then you remove it with 532nm.

### 4. How to remove the speckle of the face?

There are good effects on removing drought spot and butterfly speckle which can be caused by climate. The deep and hereditary speckles are difficult to remove while shallow and formed by acquired factors. You can use the focus energy to remove the senile plaque until blood spots appear. There are three treatment courses with an interval of 45 days between treatments.

### 5. The treatment ways to remove naevi.

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Using the focus energy to remove the naevi until blood spots appear.

**6. Can the scar constitution be removed?**

A few people can be removed but the effect is not great. You should not use the focus energy, Use a large spot size and low energy.

**7. Can the pregnant woman be removed the eyebrow?**

Pregnant women are not allowed to accept the laser removal treatment.

**8. How to remove the red blood streak and what degree will be OK?**

We don't suggest that you remove the red blood streak, because the 532nm can absorb the hemoglobin in the blood. It can form the purpura to cause the operation fail.

## Chapter 11 - The Advantages of laser treatment

Laser treatment has many advantages as below for eyebrow and eye line removal, compared to the tradition surgery such as dispelling, frozen, electrocautery, chemical (medicine) +dispelling.

1. **Less bleeding**, the laser beam is very narrow and easy to target only exposure lesions. It doesn't hurt or injure the surrounding systems: at the same time laser has the effect of "hot welding" to the vessel. It can close the vessel. Therefore it will be less likely to bleed.
2. **It has less pain**. On the one hand because of the thermal coagulation, the nerve ending is damaged and reduces the feeling of pain. On the other hand the treatment area is small and the treatment time is short. Therefore, patients feel less pain. This treatment doesn't need anesthesia, although some patients may prefer to apply a topical anaesthetic or numbing cream to the skin surface before any treatment.
3. **The quality of surgery is high**. Because there is minimal bleeding during treatment, it leaves a clear view to remove target. Of course it also needs the quality assurance and responsibility of the operator.
4. **The time of surgery is short**. The energy of laser is large and centralized. Completing the point of the treatment only needs a few nanoseconds and a few milliseconds.
5. **less scar**: As following the advanced "the principle of selective absorption" to finish laser beauty, it won't cause normal tissue irreversible damage, so there is no scar.
6. **Fewer recrudescences**: as the laser treatment to the lesions is complete, the injury to the surrounding normal tissue is minimal. Therefore, the rate of the recrudescence is much smaller than traditional therapy.

## Chapter 12 - Maintenance of Laser Instrument

This section describes daily maintenance of the Laser treatment system that can carried out by the customer. Only personnel trained and/or approved by the manufacturer are authorised to maintain the inner workings of this device. Any manipulation to the system may cause damage to the device and will void any warranty.

### Ordinary maintenance of the machine

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## General Cleaning

Clean the outer part of the equipment regularly with soft damp cloth or microfibre cloth. You may also use a neutral detergent, and alcohol free wipes, but do not allow any liquid to seep into the machine.

### Clean the output lens

You should clean the lens regularly after use. The spatter of pigment and tissue which splash into the lens in the treatment period may influence the light energy and make the laser become hot. You can loosen off the lens with screwdriver and clean the lens with anhydrous alcohol and a cotton swab. You must keep the gleaming convex surface towards to the inside. Otherwise, it can break if the direction is wrong.

### Regular cooling water changes are required

**The frequency of water changing depends on usage;**

- If you operate the machine on a daily basis, change water every 14 days.
- If you operate the machine once or twice a week, change water after 30 days.

Remove the screw cap from the Discharge Water Hole and drain approximately 2/3 of the water and replace screw.

Remove screw caps from the Overflow Hole and Water Immit Hole; refill the cooling water level as per installation instructions. Allow the water to properly circulate for 5 minutes before preheating.

**PLEASE NOTE:** The cooling water must be distilled water or pure water, and we advice you use prepared distilled water or pure water which is sold in the market. Mineral water and tap water is not suitable to use, as the impurities in the water will cause a build up of scale which will affect the normal workings of the device and cause irreparable damage which will void any warranty.

### Transport, Storage and Moving

- A. The machine is portable equipment, easy to move.
- B. Keep and use the original packaging when moving or storing
- C. Do not shake or drop the device
- D. If relocating in treatment room, keep device level when carrying.
- E. Must not hit the light head of treatment, because it has exact optics system.
- F. Keep water pipe and treatment handle securely packaged by sprung materials.
- G. Before carrying any long distance, empty cooling water from the water tank.

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## Troubleshooting Guide

### 1. The machine will not start

1. Check the power supply has electricity and the attaching plugs are securely inserted both ends and socket is switched on
2. Check the red emergency button is released.
3. Check key is in correct position
4. Examine fuse and replace if necessary

### 2. The water cycle is abnormal when you start the machine

1. Check the water level, if there is not enough water inside to cycle properly this will trigger the water level cut-out switch.
2. Holding the tube of hand piece, then start the machine to feel water cycle.
3. Replace the cooling water inside as per instructions and shake the machine gently to reset the water level switch.

### 3. There is no laser beam output when you press the pedal.

1. Check that the machine is in the correct working state
2. Check the pedal, cable and connecting plug for damage, if any part is damaged contact us for a replacement.
3. Check the working key is pressed.
4. Check energy level output. You can increase the energy through adjust the energy key.

### 4. The energy becomes weak or there is no light that comes out.

1. The machine can not work as effectively if the energy is too low, increase energy level
2. The lens is dirty. You should clean the lens as directed.
3. The X-light is burnt out; you should change the laser gun.
4. You must stop working and not use the machine in 30 minutes if the apparatus has overheated.
5. Loosen off the light head and examine if the primary lens is damaged.
6. Check the handle and the light head carefully for signs of water leakage. You must change them if there are any leaks.

### 5. You may get an electric shock when you touch the machine.

1. Dry weather and chemical fibre clothes can increase static shocks.
2. You should use the three grounding plugs and the electrical outlet must be correctly earthed.
3. The voltage is unstable, you should introduce a voltage stabilizer

### 6. The machine leaks water

1. Manipulation handle leaks water.
2. Water leaks because of strong shaking or dropping during transportation.
3. The water tank and the water pump leak water.
4. Please send the equipment to the company at once or counter-claim from the freight company according to the above situation.

### 7. There is noise in the operating process when you press the preheating key.

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- A. If the device has not been used for a long time, the instrument will simmer slowly. Please turn off and restart the machine.
  - B. Please raise the temperature appropriately if indoor temperature is too low. You can install air conditioning.
  - C. The fans are broken or the fans have friction with other parts. Please change a new fan or clear the fans obstruction.
  - D. The indoor humidity is too high, keep the room dry.
  - E. If the xenon is burnt out, please replace the xenon lamp.

**8. Energy weakens gradually during use of instrument**

- 1) Any impurities adhered to the treatment tip lens will lead to blocking the light, please check the lens. If there is any pigmentation, dirt or dust etc.; clean as directed.
- 2) Check if the operation hand piece is hot, please let the instrument rest for 30 minutes or replace the cooling water.
- 3) Check the lens. If it is broken, please contact the manufacturer or distributor immediately.

## Chapter 13 Taboo Instructions

### Taboo

The apparatus cannot be used on people as follows:

- i. Pregnant woman, people with hypertension, heart disease or diabetes;
- ii. People with photoallergy;
- iii. Not be used on the open wound;
- iv. People cannot be exposed under intense light;
- v. Female in menses;
- vi. People who are using shall stop using the products getting effect instantly for 1-3 months before the operation by this apparatus.

**【Notice】**

- 7. There is dangerous high voltage, please keep all faceplates and cover boards close;
- 8. The treatment head should be on the pothook when not in use;
- 9. The treatment head shoots intense pulsed light. Please keep directing it only at operating part;
- 10. Confirming that all operators and patients who may be exposed under the intense light are taking safety measures (no matter the light shoots from the treatment head or is reflected). All operators shall wear goggle provided by our company;
- 11. Never look directly at the intense light even wearing goggle.

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**【Warning】**

If an operating part receives superfluous light, it may cause heat injury, and then tissue may be hyperplastic and (or) atrophic and (or) pigments appear on the skin.

## **Chapter 14 Maintenance Manual**

### Daily Maintenance

[Notice] Our customers can only take the steps stated in this chapter for maintenance. Only technicians authorized by our company shall make other repairs.

**【Caution】**

5. The apparatus shall be turned off and the power supply shall be cut off. Maintenance with electricity on may injure both of the user and the apparatus;
6. Cleaning the surface: The apparatus shall be cleaned every time. Wet soft cloth or mild scour may be used to wipe the surface of the whole apparatus;
7. Cleaning the light guiding crystal: Keep the light guiding crystal clean all the time. It shall be cleaned every time after using it. When to clean it, dry it with clean soft cloth firstly; secondly, clean it with soft cloth dipping alcohol. At last, wait for its dryness or wipe it with saline water;
8. Water: Water in the system shall be changed once a month. It must be purifying water or distilled water;
9. Energy adjustment;

Part of its security measures is as follows:

- a) Self-inspection system is activated instantly when the apparatus is turned on and the system will monitor the circuit continuously in the operation of the apparatus;
- b) Filter / light guiding crystal are used and transmitted onto skin. Impulse light can only shoot from the front of the light guiding crystal;
- c) Independent safety circuit can be cut off when the intense light is too strong;
- d) Using the red emergency switch to quickly cut off power supply if need;
- e) Using the key switch, the apparatus can only be turned on by the appointed person;
- f) High-quality molded shell is to prevent electrical leakage caused harm to person.

**【Warning】**

Any intense light device and harm the people if you operate improper. The equipment can exert high voltage, so people must pay attention when operating the device and take the necessary protection measures.

Sufferer: The safety of the sufferer depends on the high qualified director, and the operating room which decorates properly. The cultural quality of the sufferer is also important, they must know well the treatment principle, and the eyes of them should be protected.



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Operator: The operator may contact with high-intension light, and she must wear special safety glasses.

Operating room: You must paste the notice that the high-intension light is working.

**【Main Warning】** In order to assure the safety of equipment, you must read the warning items following:

- a. Anyone mustn't examine this apparatus except the technician who has been authorized by ESC. Attention that dangerous high-voltage inside the machine.
- b. Make sure that the specified voltage in accordance with the voltage in your own country.
- c. You can maintain this machine only after you turn off the machine and power-line. It can make personal and equipment damaged.
- d. The light head should keep clear and prevent the gule from permeating into the light head.
- e. You must turn off the machine if you find the light head seeping water.

**【Warning about Intense Light】**

5. The intense light can hurt the eyes can cause fire, so you must take the protection measures.
6. Radiating excessive light to the cure part of the body can damage the skin and make the usual pigment increase.
7. You can't see the light directly.
8. Don't radiate the light to the skin. You should put the head on the hook hitch.

1. The safety of electricity and machinery

- i. Keep both panel board and blind flange closed. It's dangerous if you open the blind flange.
- ii. There is still the rest electricity even if you disconnect the mains lead, so you can't take apart the machine except the technician.
- iii. You can't open the electricity when maintain the equipment.
- iv. The equipment weight more than 40 kilograms. You must pay attention when move it. Don't pull the machine by light head.
- v. It is important for the earth wire to touch the ground.

**【Prevent fire】**

- a. The temperature becomes high if object absorb the light, so we must take measure to decrease the number of the inflammable material.
- b. Don't use the inflammable materials, such as ethyl alcohol. If necessary, please use the soap-suds and distilled water.
- c. The light head must parch when use it.

**【System fire】**

- A. The equipment has some safety device; all the operators must know the instruction manual.
- B. Key switch: The function of the key is to turn on or turn off the current source; all the keys must be provided by our company.

- 
- C. Hurry-up switch: The red mushroom switch can turn off the source. It cut down the current whatever condition it should be. Turn it in clockwise direction and the equipment can work again.

Electric shock protection: class one and class BF

Anti-corrosion: common

Don't use the machine in the environment with flammable anesthetic and the mixture of gas and nitric oxide.

Operation way: continuation

## Instrument troubleshooting guide

Following list some problem of the machine as well as the solve solution.

1. The system can not function properly	J. Check whether the power cable is well connected; K. Check whether the emergency button is pressed down, turn the button inverse clock can release it; L. If can not be solved, please contact the engineer.
2. Turning black within the treatment head	C. The treatment head exceeded the life, please replace it; D. Ensure the water flow is normal, please try again; E. The treatment head may be damaged, please contact the engineer.
3. Leaking water from the treatment head	The treatment head is damaged, please contact the engineer.
4. Voltage failure	Contact the maintenance engineer
5. Open failure	Contact the maintenance engineer
6. Comparative high temperature of the cooling system	F. Close the system, let the machine become cool, then restart it G. Contact the maintenance engineer

7. Reduced power of the treatment head	It implies that the treatment head is near the limit of useful life.
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## Chapter 15 Knowledge about Skin

### 1. More Advantages. It can improve various skin flaws:

The treatment mode of IPL has breached the limit of traditional partial focus treatment, which can cure the whole face. The IPL apparatus can also cure the diseases as follows: capillary vessel expanding, erythema, pigment, petty wrinkle, sunburn, brown splash, enlarged pores, whiten skin. The treatment results show that over 75% of skin of 49% of patients has been improved. Facial erythema (75% of patients) and capillary vessel expanding (49% of patients) have been improved. The improving rate of wrinkle of 73% of patients has reached 25%, wherein the improving rate of 36% of patients have reached more than 50% and the improving rate of facial wrinkle and enlarged pores of 76% of patients has reached over 50%. In clinic reflections, skin structure, petty wrinkle, atactic pigment, enlarged pores and capillary vessel expending of all patients are improved.

### 2. Treatment on the whole face to improve skin's character in order to resume skin's flexibility:

New collagenous fibre produces smooth structure: pores become large, petty lines and wrinkles become less and can be reduced to utmost-to make skin more flexible.

### 3. Excellent results after 14 months and positive appraisal from patients.

Many treatment cases show that the long-time data of treatment with IPL technology is 14-18 months of patients with facial erythema and red face after treatment. The status of 80% of patients is the same as that after their last treatments. Few people get purpura edema. Most people's convalescence is 1-5 days and two treatments with an interval of 21-45 day leads to better curative effect. There is no report about scars in all of cases. The IPL technology indeed provides safe treatment of nonintervention and non-exfoliation for people with love of beauty and is accepted by general suffers.

### 4. IPL Skin Rejuvenation is a nontraumatic technology:

Traditional skin rejuvenation technology adopts the grinding way and chemical deep-seated exuviations. Then laser dispelling deep-seated wrinkles method followed. Although these methods have a certain remedy for some parts of skin aging treatment, patients usually need a rest from work and oppressive pain is accompanied. Potential side effect and shutdown seriously disturbs normal life and work. Photon skin rejuvenation adopts the treatment of nonintervention and non-exfoliation to rejuvenate skin with low-density energy. Accordingly, this technique brings no pain, no side effect, no shutdown and wins higher satisfaction of patients.

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## 5. What is freckle?

It is a kind of small brown or filemot pigmentation on face and is autosomal dominant inheritance, which is serious especially in summer. The development of pathological changes is related to solarization. Freckle occurs mostly to women and emerges in childhood after the age of 6-7 usually. It becomes obvious in youth. Skin lesion due to solarization gets serious in summer but mitigatory in winter. Skin lesion is canary or filemot or brown splash, which is rotundity or elliptical or irregularly shaped. Freckle is concentrated mainly on face, especially from eyes to cheekbones.

## 6. What is chloasma?

It has another three names, which are butterfly spot, cloasma hepaticum and soot-black macules in physic. It is common and a frequently encountered disease for women. The incidence of the disease becomes more obviously and seriously for the past few years.

In the beginning, chloasmas are in light color. They may be multiple but gradually syncretize into spot in different sizes and shapes with clear borderline. They intersperse symmetrically on exposure parts, usually on cheekbones, forehead and cheeks. They have no subjective symptom.

Chloasma has three types according to their location: it is called superficial type one if it locates on cuticle, shallow-seated type if deep in cuticle and deep-seated type if in corium. This classification is mainly related to treatment. The deeper the location is, the longer the treatment time is and the more difficult the treatment is.

Aetiological agent is very complicated. It may occur to healthy women from youthhood to climacteric. The incidence rate of chloasma caused by oral contraceptive reaches over 80%. Some chronic diseases, especially female diseases of reproductive system, such as menoxenia, adnexitis, acyesis, ovarian cyst and hysteromyoma, may cause chloasma. In addition, chloasma may be caused by other diseases, such as hepatopathy, chronic alcoholism, thyrotoxicosis, tuberculosis and viscera tumor. Many kinds of medicine may cause chloasma. It also can be induced and deepened by sunshine and hereditary factors, sleep disorder, psychic factor and so on are somewhat related to chlosama.

## 7. What is acne?

Acne is a familiar hair follicle thylacitis in youthhood. It is also called acne vulgaris and commonly referred to as wheelk (Qingchundou in Chinese). Acne is usually found on face, sometimes looks like papilla, blain and so on. Sebum is often accompanied and overbrims. The pathogeny has not been clear yet but may be formed synthetically by various factors.

- b. Androgen-mediated lipid overflow - androgen and its metabolites, such as dual-oxygen copper and sulfuric acid dehydrogenation Cremaster epidermal-steroidal copper increase, which strengthens the activity of sebaceous gland. Secretion of patients with acne skin is higher than that of normal people.
- c. Funnel of hair follicle keratosis - acne patients' keratosis of of hair follicle funnel boosts up and its epicyte becomes

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thick and dense, so it is difficult to drop off. It has not been clear yet why the keratosis of hair follicle funnel boosts up, but it may be related to free fatty acids in the cortex. In addition, the amount sebum linoleic acid of patients with acne is less than normal, which might be another reason.

- d. Acne propionibacterium increases- acne propionibacterium belongs to anaerobic organism and is a resident bacterium. Why it increases may be related to funnel of hair follicle keratosis, sebum discharge blocking and relative anoxic environment.
- e. Inflammation - acne propionibacterium excrete dissolved lipase, which will decompose the triglyceride into glycerol and free fatty acids. Glycerol and free fatty acids further stimulate gland wall keratosis, so the adenovirus mouth is blocked. Experiments prove that carbon atoms containing 8-14 can penetrate hair follicle and goes into corium and then causes more obvious inflammation. In addition, acne propionibacterium can not only produce dissolved lipase but also proleuse, hyaluronidase and some chemotactic factor activating complement, which all can bring inflammation of the hair follicle sebaceous gland and papilla, blain, nodules and so on.
- f. Acne caused by cosmetic – (a) improper cosmetics are used, i.e. people with oily skin use oily cosmetics, making the hair follicle mouth metabolism sluggish. Hair follicles are blocked by hard, dense keratose substance, which leads to expand, these keratose substance forms keratose bolt, plugging in the hair follicle mouth. Accordingly, acne arises. (b) Some cosmetics containing substance of particles, such as a great deal of superfine titanium pigment, whose particles are agglutinated with sebum or stroma. It is easy to plug holes of hair follicle and causes acne. And young people indulge in the cosmetic, making light acnes serious.

Moreover, inheritance may be an important factor causing acne, and orally taking medicine containing iodine, bromine, cortex steroid and so on can make acne more seriously.

## **8. Six inducements making skin dark and spotted**

Specifically, inducement causing skin black and spotted mainly is:

- a. The arch-criminal-ultraviolet radiation;
- b. Some sensitive food, such as animal liver and kidney, oyster, shrimp, crab, legume, walnut seed, currant and so on;
- c. Drinking and smocking;
- d. Some diseases;
- e. Some medicine: quina, tranquillizer containing chlorpromazine;
- f. External cause: rubbing skin hard when having wash.

## **9. How wrinkle come?**

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Wrinkle is the result of skin aging. Wrinkle is synthetically formed by internal cause, external cause and other factors.

- a. Internal cause: in youth, skin is rich of moisture and all kinds of glands' body fluid are excreted noticeably. Skin is at its best time at this time. Wrinkle is not easy to arise. However, wrinkle will come and temporarily exist if skin is of over hydropenia for reason that skin is not taken good care or diseases arise. If moisture is makeup to skin once, the temporary wrinkle will disappear. But in middle age, the horny layer's ability of keeping moisture declines. Sebaceous gland is excreted less. Elastic fibers in corium are of denaturation and ruptured. Adipose layer decreases.... All these factors lead to skin's change. Wrinkle is the symbol of skin aging, which can be seen with our naked eyes.
- b. External cause: skin is the surface layer, which receipts sunshine, wind, and dryness. These are all factors making more and deep wrinkles. We all know that people living on Qinghai-Tibet Plateau all have deep wrinkles on their faces. This is brought about by wind and sunshine. Ultraviolet radiation in sunshine is one of the reasons for skin aging and wrinkles. Therefore, people should prevent skin from being sunburned. Sunburn prevention and moisture keeping are both important.

In addition, too much make-up is a direct harm to skin. All cosmetics are chemical. Although some cosmetics adopt natural materials, synthetics, such as coloring matters and flavors are also used in their production. Therefore, make-up provides beauty temporarily. It also damages skin and causes wrinkles.

What should attract our attention is that some wrinkles on women's face are caused by cortex steroids ointment used in external way, such as fludrocortisone ointment, triamcinolone acetonide ointment, compound dexamethasone acetate ointment. These ointments lead to skin shrinking, thinning and wrinkles.

## **10. Four-step wrinkle prevention**

Wrinkle can be divided into kinetic energy wrinkle and static energy wrinkle. Static energy wrinkle is a kind of wrinkle that can be seen even a person has no facial motion, i.e. part under eyes, at altercates. That is brought from skin aging and from cuticle and corium becoming thin. Kinetic energy wrinkle is a kind of wrinkle that can be seen when a person's face has a motion, i.e. wrinkles on glabella, sides of eye tail and forehead. But wrinkles can be also caused if a person's bodily form is thin with less subcutaneous fat.

According to external changes in different ages, wrinkle' formation can be divided into four stages: a. Mild aging stage: at the age of about 28-25. Fundamentally no wrinkle can be seen;

b. intermediate aging stage: at the age of about 35-40. Kinetic energy wrinkle arises;

c. relative serious aging stage: at the age of about 50-60. Static energy wrinkle arises;

d. most serious aging staging: at the age of over 60-75. Obvious wrinkles and skin prolapse can be seen.

## **11. Wrinkle arisen rate of all ages**

Wrinkle arisen rate of all ages is recorded in percent form as follows:



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At the age of 18-29: wrinkles arise on 44% of women's forehead

At the age of 30-39: wrinkles arise on 56% of women's glabellas

At the age of 40-49: wrinkles arise under the eyes of 72% of women and on glabellas of 75% of women

At the age of 50-59: 65% of women have goosefoot lines and 60% have nose-chin veins.

## **12. How sensitive skin comes?**

Is delicate skin easy to form sensitive skin?

No exactly. Sensitive skin is divided into congenital type and postnatal type. The former one is related to inheritance. It is usually sensitive skin. The later one is related to many factors, such as: a. environment, season alternation. Lines are caused by changes of humidity, air pollution and ultraviolet radiation; b. internal disease and incretion disorder, i.e. long-term disorder of stomach and intestines' function; c. unbalanced nutrition and long-term innutrition; d. spirit, long-term instable spirit, high pressure and excessive blabs; e. medicament, i.e. skin may has dependency on medicine if keeping using punchy or steroids medicine; f. improper maintenance, i.e. skin is cleaned excessively using alkaline products, or excessively remove cutin.

## **13. How hypersusceptibility comes?**

There are four factors that tend to bring and induce hypersusceptibility:

5. Food: irritative food, such as seafood, pollen and capsicum and so on;
6. Medication: eternal medicine, such as liniment, lintment; medicine, such as aspirin, anodyne, diuretic and so on;
7. Cosmetics: alcohol, coloring matter, flavor, antiseptic and sun-screening agent, and hair dye, cold wave lotion and so on;
8. Eyewinker: such as animal hair, leather goods, K gold, oil paint and so on.

## **14. Why sensitivity and hypersusceptibility occur?**

Healthy skin has a layer of natural protective membrane-sebum membrane. In normal conditions, it contains about 5%-7% of axunge, 20%-30% of moisture, both of which are in subacidity. It can prevent not only moisture from excessive evaporation, but also ultraviolet and air pollution from hurting skin. Once sebum is damaged, moisture-keeping function will become weak, skins is getting dry, itch, even peels, and becomes weak in guarding against cold and hot and pressure. In this situation, we can see inflammation, red in some parts of skin. That is sensitivity.

Hypersusceptibility refers to that a series of reflection will arise when skin contacts anaphylactogen.

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**15. Characteristics of hypersusceptibility and sensitivity:**

Characteristics of sensitive skin are: a. hair pores are closed and fine. The surface of skin is dry, coarse. Skin is thin, and capillary vessel and asymmetric rubeosis can be seen; b. dryness and itch tend to occur to surrounding of eyes, mouth margin, arthrosis and so on. c. many cosmetics and some medication lead to hypersusceptibility, which is marked by partial rubefaction, itch and anthema if not serious, and swelling, exuviations, many irritable pimples, water seepage and even exuviations in large area and fever heat on the whole body if it is serious.

**16. Treatment of hypersusceptibility and sensitivity:**

Words from exports:

- 13) For sensitive skin, irritative food and herb cosmetic should not be eaten and used; no contact on hotness, alkali and electricity; do not rub skin excessively; avoid being irradiation by ultraviolet radiation and wash face with cold or warm water.
- 14) Once hypersusceptibility occurs, we should go to find out why. We should keep away from anaphylactogen. Simultaneously, adjusting immunity and improving sensitive constitution through eliminating free radical.

If hypersusceptibility occurs during nursing:

- a. Stop using cosmetics. Have a treatment if it is not serious and smear antianaphylaxis medication if it is serious, and stop using the medication at once when the disease straightens up. If it is very serious, go to hospital for a treatment.
- b. Nursing order in beauty parlor can be improved. The order is: cleansing cream-skin lotion- cold spraying (B6 vitamin or antianaphylaxis essence can be added)- shiatsu on facial points- antianaphylaxis collagen face mask- cold compress-basic maintaining.

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## Chapter 16 Recommended settings

The following settings are just for reference but not final. Please adjust the settings base on the following chart according to different people.

### Triple Diode Laser

Skin type	Laser Power	Frequency
I	40	3~5
II	37	3~5
III	35	3~5
IV	30	3~5
V	20	3~5
VI	10	3~5

### YAG Laser

Item	Energy	Frequency	Distance
Makeup Removal	1064nm: 0.4~0.6J 532nm: 0.6~0.8J	2~3HZ	1~2cm
Tattoo Removal	1064nm: 0.4~0.6J 532nm: 0.6~0.8J	3~5HZ	3~5cm
Carbon Peeling	0.6~0.8J	3~5HZ	4~5cm

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**Specifications:**

Type of machine	Triple Diode Laser + YAGLaser
Wavelength	Diode Laser: 755nm/808nm/1064nm Nd:Yag: 1064nm/532nm/1320nm
Energy density	Diode Laser: 1-100J/cm2 adjustable Nd:Yag: 0.4-2Jadjustable
Spot size	Diode Laser15x20mmor other sizes Nd:Yag: 1-8mm adjustable
SHR and YAG Shot frequency	1-10HZ
Display	10.4' Movable color LCD touch screen
Cooling system	Semiconductor+ air + water + cooling gel
Skin Cooling	-6C~ 0C
Output power	3500W
Voltage	100~240V 50/60Hz
Multi software languages	Yes
Product size	59x45x41cm
Package size	75x57x61cm
Net weight	30KG
Gross weight	48KG