

# VA-402 User's Manual

## Q-Switched Nd : YAG Laser System



**VIVA CONCEPT TECHNOLOGY CO.LTD**

Thank you for choosing our machines.

Please read this user manual carefully before operating the machine and keep it for viewing at any time.

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## **Chapter 1 System Overview**

### **1.1 System Introduction**

Tattoo removal by Q-switched laser uses a process known as the 'photoacoustic effect'. When the laser energy is absorbed by the tattoo pigment an extremely high temperature is generated - typically thousands of degrees. However, this high temperature is not sustainable and so it 'collapses.'

This produces an acoustic wave to form around the pigment particles. The result of this wave is a shattering of the particles of ink into smaller fragments. The body's own defense mechanisms then remove these smaller particles leaving behind the larger tattoo pigmentation. Subsequent treatments will induce the same 'shattering' effect on the remaining ink particles until they eventually all disappear.

## **1.2 Features**

1. Powerful 2000mJ Energy
2. Aluminum Alloy Handpiece
3. Two Korea Imported Filters
4. 2,000,000 Shots Lifespan

## **1.3 Application**

1. Remove all sorts of color tattoo.
  2. Pigmentary skin lesions and mixed pigment formation of pigmentation, dermal spots, freckles, moles, birthmarks, nevus of ota.
  3. Remove all kinds of tattooing of embroider eyebrow, eyeliner, and lip liner.
- Skin Whitening, Skin Rejuvenation, Shrink the pore size.

## **1.4 Wavelengths**

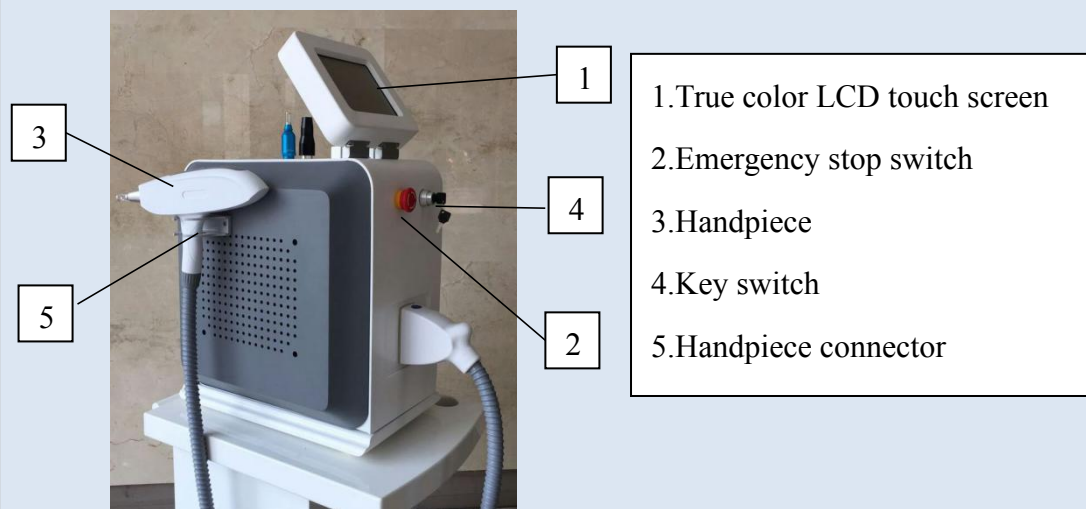
532nm: mainly for red, green, yellow tattoo. superficial layer.

1064nm: mainly for black, blue, cyan tattoo. deep layer.

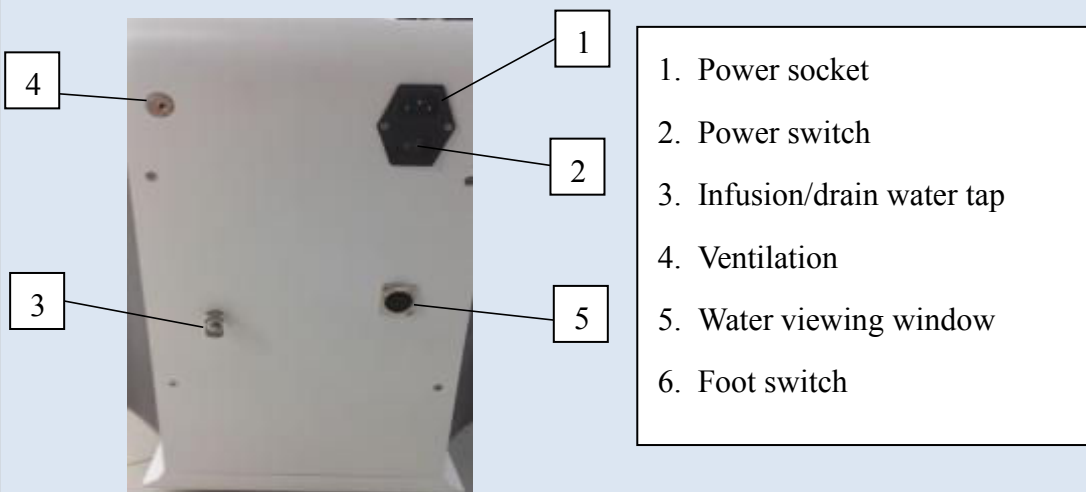
1320nm : mainly remove epidermis black acne ,shrink pore size, brighten skin with black powder, called "black face doll" project.

## 1.5 Components Introduction

### 1) Front view of the machine



### 2) Back view of the machine



Parts Picture	Name
	Key switch
	Emergency stop switch
	Power socket
	Power switch
	Infusion/drain water tap
	Ventilation
	Foot switch

## 1.6 Accessories Lists

Please check all the parts of the machine according to the following Accessories List first when you receive the machine and contact us immediately if you find any lost and damaged parts.

Name	Quantity	Specification
Handpiece	1	-----
Water Tube	1	-----
Funnel	1	-----
Power Cable	1	GB
Key	2	-----
Goggles	1	-----
Protective Eyewear	1	1064/532nm
Foot Pedal	1	-----
Support Screw	-----	-----
Cleaning Tissue	1	-----

## Chapter 2 Safety

### 2.1 Electrical and mechanical safety

Considerable thought was given during the design and producing of the system, to minimize the hazard for both operator and clientele.

The system requires 220 V, single-phase power source, the strongest output Current is not beyond 20A.

On the maintenance panel, Automatic electric leakage was installed, when electric is leaking, it will protect the system. Open the machine again, you need raise up electric leakage device.

Dangerous voltage presents inside the console during course of the treatment. After turning off the system, dangerous voltage still left. Removing the covers creates a safety hazard.

### 2.2 Movement and Transportation safety

The unit contains delicate components and no allowance of long transportation after first installation and adjustment. During the movement, the shock-absorbing package originated from the manufacturer must be used. Otherwise it might cause adverse effect to the system.

### 2.3 Optical safety

- Intense pulse light sourced from the system, can create safety hazard. All personnel including clientele in the treatment room must wear protective glasses whenever the unit is in use
- Intense pulse light emission presents an eye hazard. Take all necessary precautions in areas where the system is being used.
- Never permit reflective objects such as jewelry, mirrors and watches to reflect the intense pulse light.
- Never look directly at the intense pulse light emitted from the treatment handle, even when wearing the protective glasses.

- Never direct the intense pulse light at any skin except the test patch and the target area

## **2.4 Warnings**

- Allow access to the treatment room only to those essential to the procedure and well trained in the required safety procedures.
- Make sure that all treatment room staffs are familiar with the system's control and know how to shut down the system instantly.
- Clear identify that no igniting combustible materials present in and around the treatment area.
- Make sure the caution signs are posted in a prominent place of the treatment room.



## Chapter 3 Installation

### 3.1 Installation

The system can be installed in hospitals, medical clinics and beauty salons, little preparation is needed before installation. When you purchase our company's instruments, you can enjoy our free onsite installation and commissioning services.

The system should be installed and commissioned by professional and technical personnel authorized by our company.

#### **Be familiar with the installation requirements:**

Before unpacking the Instrument, you should check whether the accessories are complete, the installation location meets the requirements of this section.

The system should be installed away from heat vents and keep an appropriate distance from other objects, the temperature should keep about 20 °C.

The instrument is preset the rated voltage of the installation place before delivery according to the user's requirements. The corresponding electrical equipment requirements are as follows:

- 1) Single phase 220V  $\pm$  10%, 10A 50Hz/110v  $\pm$  10%) )
- 2) The equipment lands the ground through the ground wire of the power sheath, passing the wall line. Good ground connection is essential for safe operation.
- 3) The input voltage can not have transients, voltage and current spikes, collapse or surge.
- 4) To ensure that the system is in the best condition, the roomtemperature

should be maintained at about 20 °C, relative humidity should not exceed 80% .The thermal power of the system is about 200W during work, so it's the best if the treatment rooms are air-conditioned.

5) Do not allow the instrument being irradiated by prolonged direct sunlight, nor being placed near a heater.

### 3.2 Installation Steps

- 1) Carefully open the package of the machine, place the machine in a preselected position
- 2) Take out the handle bracket, and install it in the corresponding position, check whether the connection is good or not, shown as below picture.



3) Plug in the power cable



4) Insert the switch key .



5) Pedal installation



6)Add water

A. First prepare 8 liters distilled or purified water. Running water or mineral water is not allowed.

B. Unscrew the water inlet of the machine.

C. Unscrew the overflow(vents) at he back of the machine. You can fill in water only when the overflow(vents) is open.

D. Fill in water with the water funnel delivered along with the machine.

**Installation:**

1. Insert A into B;

2. Fill water;

At the same time, observe water viewing window, when water reaches the water viewing window of 80%--90% ,Stop filling water.

**Note:**

1 Use purified water or water without hydrogen, strictly prohibited mineral water

2 Replace water every month.

3.Only personnel trained by the distributor are authorized to maintain the inner workings of this device. Any manipulation to the system may cause damage to the device and will void its warranty.

E. Fill in water until the overflow(vents) overflows, shows the water is enough. You can also observe by the water level viewing window.

		
<p>A Water Tube&amp;Funnel</p>	<p>B Infusion Water Tap</p>	<p>Water Viewing Window</p>

F. Do not tighten the overflow mouth at first, please wait until the machine finish debugging, then tighten the overflow mouth. The inside of the machine is a closed water loop, if tighten overflow mouth at first, there will be air inside the water tank, which will make water do not circulate, cause machine failure.

After the above water filling steps, please start power and commission.

After the above water filling steps, please start power and commission.

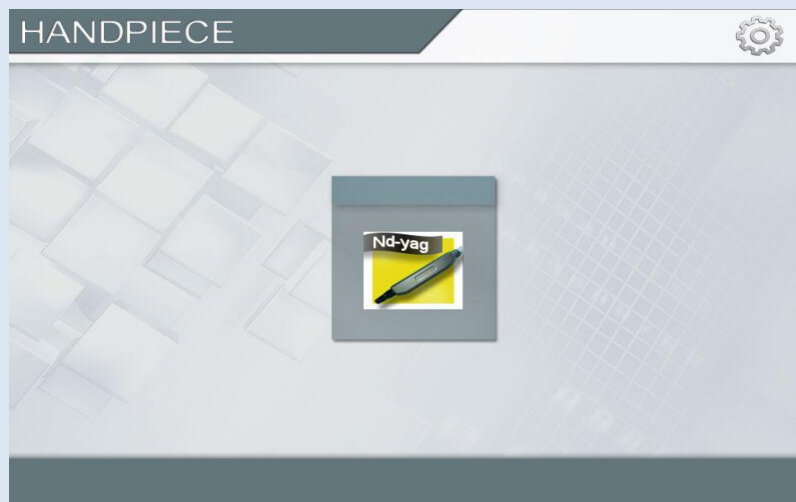
**Note: Please install the treatment handles as shown below. Press the Spring as the arrow pointed in order to avoid the rubber ring leaking water. During the use, dragging the handle is strictly prohibited.**


# Chapter 4 Operation

## 4.1 Operation Interface Introduction

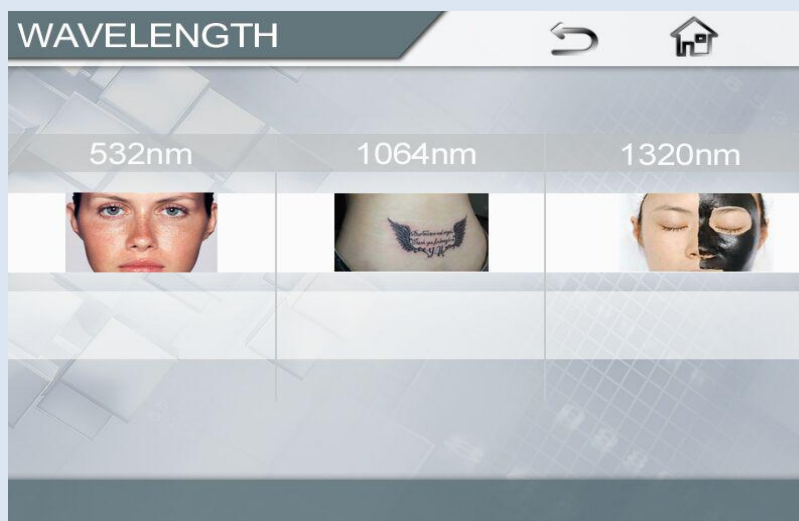
### 1) Start-up interface






Turning on the equipment by rotating the key in a clockwise direction, the screen will enter into start-up interface. As shown below:



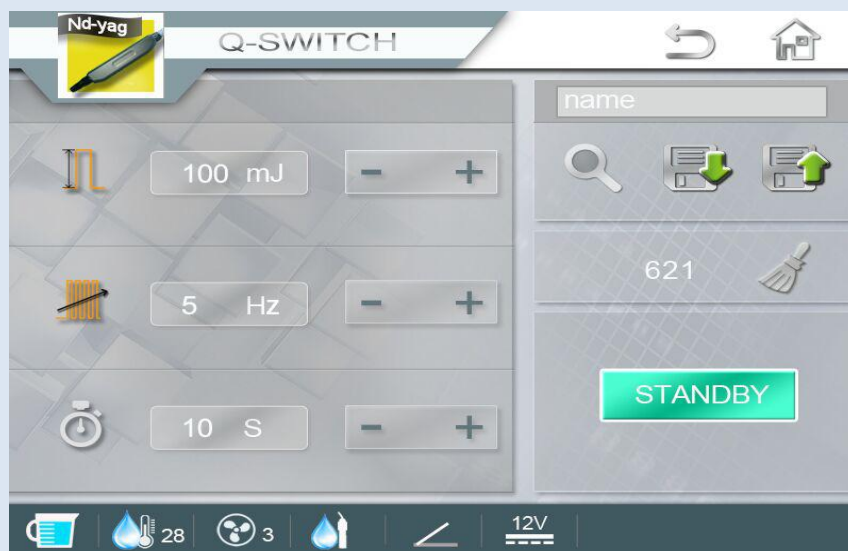
Icon	Name	Specification
	Q-switch	Press it and enter into skin type of Q-switch interface.




### 2) Select Wavelength Mode








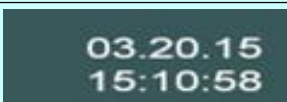






Icon	Name	Specification
	532nm	Press it and system enter into 532nm treatment interface.
	1064nm	Press it and system enter into 1064nm treatment interface.
	1320nm	Press it and system enter into 1320nm treatment interface.
	Return button	Press it and return to previous interface.
	Return button	Press it and return to start-up interface.

### 3)Treatment Interface



Adjustable Parameter	Description	Maximum	Minimum
 300 mJ	Energy	1600MJ	100MJ
 3 Hz	Frequency	10Hz	1Hz
 10 S	Timer	30S	1S

Function Button	Description
	Ready/Stand by button
Display Parameter	Description
	To clean the current count of the transmitting times of laser. For example:621
	Cooling water temperature, it will alarm when higher than the safe range.
	The flow rate of cooling water, it will alarm when lower than the safe range
	Conductivity of cooling water, it will alarm when higher than the safe range
	The on-off state of handset button
	Internal Voltage
	Time
Customer Record	Description
	Lick here, the key soft keyboard will pop up for you to input customer's name
	Research the treatment record of customer
	Save the current parameter to customer record
	Load the latest customer record



## 4.2 Technical Specification

Power	800W
Wavelength	532nm/1064nm/1320nm
Frequency	1-10Hz
Pulse width	20-30ns
Spot Diameter	1-10mm
Pulse energy	2000mj
YAG Bar Size	ϕ 7 + ϕ 8
Operation Interface	10.4" Dual color LCD screen
Cooling Systems	Air Cooling & Close Water Circulation
Electrical requirements	110V±10%, 50/60HZ or 220V±10%, 50/60HZ
Net Weight	30Kg
Dimension(L×W×H)	40×52×50(mm)

## 4.3 Relevant Requirements

Running environment of this system:

Environmental temperature : 10°C~30°C


Relative humidity: no more than 80%

Storage environment of this system:

Environmental temperature : 0°C~40°C

Relative humidity: no more than 80%

## Chapter 5 Operation Procedures

- 1) Connect between power cable and the equipment.
- 2) Rotate key in a clockwise direction. Equipment checks system automatically and enter into main interface.
- 3) Enter into choice interface of wavelength.
- 4) Choose proper treatment wavelength.
- 5) Press and enter into course treatment interface, according to skin problems of guests, adjust proper parameters.
- 6) Adjust cooling degrees from 1-5 level. 
- 7) After press “Standby button”, it can emit energy through step yellow foot pedal.
- 8) Clean treatment position.
- 9) Guest and operator must wear professionally protective glasses/goggles during the treatment.
- 10) During the whole treatment, observe the skin and reaction of guest at all times, adjust and calibrate parameters so as to reduce the feeling of uncomfortable at any moment.
- 11) After finishing treatment courses, clean the treatment areas.
- 12) After finishing treatment courses, makes equipment standby mode so as to avoid fault operate.
- 13) Record parameters used of treatment courses.
- 14) Rotate key in a anti-clockwise direction to turn off the equipment, clean the treatment head with wet cotton cloth or soft face towel, and cover the handpiece protective casing, then put the equipment back to support.

### **Note:**

The light generated by this device is very intense. Exercise Optical safety measures by wearing the protective goggles. Avoid looking directly into the treatment area during operation even when wearing the goggles.

## Chapter 6 Clinical Introduction

### 6.1 Contraindication

- 1) Suckling or pregnant.
- 2) Light allergic constitution.
- 3) Green surgical wound (Surgical wound don't heal).
- 4) Serious heart disease, diabetes, hypertension and Epilepsy etc..
- 5) Hemophilia and serious hemorrhage.
- 6) There are herpes infection and large areas of damaging.
- 7) Pigment close to skin color or expectation too high.
- 8) Inflammation or infectious disease.

### 6.2 Operation Skill of Cosmetology

#### Attention

1. Please find out whether the customer has scar constitution, peeling skin or allergic skin first. Ask customers if they have artificial eyebrow, or purified of embroider, eyebrow and tattooed with other methods before. Observe if the scar had existed already. Explain to the patient that the pigmentation trace will remain for a period. The treatment must be repeated after 45 days
2. When treating black or blue color pigmentation with the 1064nm laser, the operator must explain briefly to the patient about the principle of treatment and the possible reaction during and after surgical (as follows). Because the patient does not understand the surgical operation circumstance, the surgical response and recovering process, there may be dispute. Before undo the artificial eyebrow, shave the eyebrow first for the observation in the surgery.
3. You may use the 1064nm Laser which was stabbed pigment in the skin deeply. Don't be afraid of the high loudness from the Laser during the treatment. Because the laser energy which crack the melanin of the pigment. The shallow tissue of pigment will be left because of absorbing strong laser energy from epidermis. Only a minority thinner cuticle person who is easy to infiltrates of the blood spot. The pigment tissue will be shallow after the first treatment. The pigment will be restored after at least ten minutes. It is a normal reaction by tissue. The macro-phage will swallow the function and the transportation function continues long tome. The stabbed pigment tissue

will become gradually shallow in this period time. We suggest the treatment interval of 6 weeks between two treatments.

4. When treats black and blue pigment with 1064nm laser, the hair color will be taken off and fall off after surgical probably. But it will refresh new hair after two weeks, and may be thicker compared to the original hair temporarily. It will be able to tend to normal gradually. The treatment spot has infiltrated the blood, or /and the slight dropsy. You might feel itches and tissue hardens after swollen areas lessen. These are the normal response of the organization. All bad feelings will disappear within 2 to 4 weeks. But it will depend on different person.
5. When treats brown and red pigment with 532nm laser, because the body tissue's hemoglobin has the certain absorption to the 532nm wave length, so the skin surface will vaporized white after the laser irradiation. The epidermis necrosis and produces the pigment to fall off and pigmentation.
6. When treats brown and red pigment with 532nm laser, hypodermic capillary absorbs the 532nm laser to burst and cause the hypodermic bloody, purple skin and even may cause to tie with scab. The recovering time will be depends on different person, it will take about 20-60 days normally.
7. It is forbidden to black eyebrow, washing, touches of the bloody affected part after surgical within one to three days to avoid causing the infection. You should notice prevent suntan to avoid pigmentation. The patient that bleed profusely and swelling seriously should obey the doctor's advice to take Acetylspiramycin Tablets and antibiotic medicine. 72 hours after surgical external use erythromycin ointment, also wipe the repair fluid or the eyebrow fluid to the trouble place and help to deal. In a week avoid massive diets pungent foods the patient color stabbed deeply also cannot drink wine.
8. The beautician should build up the treatment file for the customer.
9. When the treatment head touch on the skin, the energy will be in weakest. When the treatment head is apart from the skin around 4~6cm, the energy will be in strongest.

### **6.3 Purify of Embroider Eyebrow**

1. First finds out if the customer has scar physique, or change skin or allergic skin. If they are covered eyebrow, or purify of embroider eyebrow, tattoo with other methods before, then use the weak (low) energy big facular to remove, but cannot remove to get a bleed.
2. Before purify of embroider the stabbed eyebrow, should scrape off the eyebrow first. Set optical frequency at 3-5Hz, the treatment head is apart from the skin from 0-3 cm.

3. The 1064nm laser is used to purify the black and blue-stabbed eyebrow. If the color present out after 5-10 minutes, we can purify for the second. Select the stronger energy to crush the pigment and promotes the organism absorption. Reexamines after 6 weeks, if the pigment or the light pigment trace is not shed, carry on treat once more.
4. Purify of embroider pink color tabbed eyebrow may use 532nm wavelength directly.
5. Purify the scarlet red and brown color eyebrow can use 1064nm wavelength first, then use the 532nm wavelength again. After 6 weeks, use the 532nm wavelength to carry on the second treatment.
6. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
7. Suggestive number of treatment need: 1-3 times

## 6.4 Purify of Eyeliner

1. Must insure strict protection for the eyeball; the damage of eyeball created by laser is irreversible.
2. Set light frequency at 3-5Hz, and select low energy, small light spot, the treatment head is apart from the skin 0-3cm. The operator can use 1cm thick gauze to protect the eyeball of the patient.
3. Purify the lower eyeliner request the patient to close eye tightly, and the eyeball see upwards. The operator suppress the gauze with the index finger, suppress and push the upper eyelids upwardly, the middle finger pokes the lower eyelid to reveal the eyeliner, carry on the fast treatment with speed of light 3Hz. Advise the patient if feeling painful, do not move and tell the doctor to pause.
4. Purify the upper eyeliner requests the patient to close eye tightly, and the eyeball see downwards. The operators suppress the gauze with the middle finger, suppress the eyelid to underneath, the index finger push the upper eyelid upwards to reveals the eyeliner, and carry on the treatment with speed of light 3Hz.
5. Do not use the anesthetic as far as possible. After 6 weeks, carry on treats once more to deep part.
6. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
7. Suggestive number of treatment need: 1-3 times

## 6.5 Purify Soak Lip and Lips Line

1. While purify the red lips line and red lips, choose corners of the mouth first for experiment. If the test spot change immediately to black after the laser strike, cannot purify again.
2. 2, Set light frequency at 3~5Hz, the treatment head should apart from the skin 0-3cm.
3. While purify black, scarlet red and the deep coffee color lips, purify with

the 1064nm wavelength first, follows closely with the 532nm wavelength. After 6 weeks, carry on the second treatment with the 532nm wavelength.

4. Purify the pink red and red lips with the 532nm wavelength directly.
5. Notice: All the lip line and soak lips should carry on treatment after 6 months, otherwise the surgical will fail.
6. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
7. Suggestive number of treatment need: 1-3 times

## **6.6 Purify Tattoo and Wound Tattoo**

1. Set a light frequency at 3Hz or 5Hz, the treatment head is apart from the skin 0-3 cm, use the small light spot and high energy possibly.
2. The operation skill is as same as purify soak eyebrow.
3. The bigger area only purify once time then, do not purify again as far as possible. Avoid the energy gathering to create the skin swelling or the blister.
4. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up
5. Suggestive number of treatment need: 1-4 times

## **6.7 Purify Old-age Spot and Nevus**

1. Set a light frequency at 3~5Hz and the treatment head is apart from skin 0-6 cm. Choose small light spot and high energy.
2. Purify the old-age spot should use the 1064nm wavelength at first until the spot of bleeding appears. Change to 532nm wavelength to purify if no reaction.
3. Adopt the 1064nm wavelength to purify nevus generally, change to 532nm wavelength to purify if have no reaction.
4. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
5. Suggestive number of treatment need : 1-2 times

## **6.8 Purify Birthmark and Nevus of OTA**

1. Set a light frequency at 3Hz or 5Hz, the treatment head is apart from the skin 0-4 cm. Choose the small light spot and high energy.
2. Strike the trouble place until it seep the blood.
3. Best carry on the treatment with the 1064nm wavelength.
4. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
5. Suggestive number of treatment need: 3-5 times

## 6.9 Purify Coffee-spots, Freckles and Yellow Brown Spot

1. Set a light frequency at 3Hz or 5Hz, the treatment head is apart from the skin 0-4 cm. Choose the small light spot and high energy.
2. Continuously strike the trouble place with the 1064nm wavelength about 15 minutes.
3. The treatment time avoids June, July, August and September every year.
4. The yellow brown spot can be cured by this machine. Suggest using carefully because of responding phenomenon.
5. The treatment interval of 6 weeks between two treatments. Treat periodically until clean up.
6. Suggestive number of treatment need: 2-5 times

## 6.10 Clinical Parameter Table

### 1064nm/532nm

Skin	Project	Times	Interval (day)	Wavelength (nm)	Energy (J/c m <sup>2</sup> )	Frequency (Hz)
I & II	black, blue eyebrow tattooing	1-3	35-60	1064	700-850	2-5
	red,brown eyebrow tattooing	1-3	45-60	532	750-1200	2-5
	black,blue eye liner	1-2	45-60	1064	700-850	1-3
	black, blue tattoo	2-4	35-60	1064	700-850	3-5
	red, brown tattoo	2-5	60-90	532	750-1200	3-5
	other colorful tattoo	3-5	60-90	1064+532	750-1200	3-5
	melanin nevus	2-5	45-60	1064	650-750	1-3
	nevus of Ota	3-6	45-60	1064	750-850	4-6
	freckle	2-3	45-60	532	650-750	1-2
	black, blue eyebrow tattooing	1-3	45-60	1064	700-850	2-5
	red,brown eyebrow tattooing	1-3	60-90	532	750-1200	2-5

III &IV	black,blue eye liner	1-2	45-60	1064	700-850	1-3
	black, blue tattoo	2-4	45-60	1064	700-850	2-5
	red, brown tattoo	1-4	60-90	532	750-1200	3-5
	other colorful tattoo	3-6	60-90	1064+532	750-1200	3-5
	melanin nevus	1-3	45-60	1064	650-750	1-2
	nevus of Ota	3-6	60-90	1064	750-850	4-6
	freckle	2-3	45-60	1064+532	650-750	1-2
V	black, blue eyebrow tattooing	1-2	45-60	1064	600-700	2-5
	red,brown eyebrow tattooing	1-3	45-60	532	650-750	2-5
	black,blue eye liner	1-2	45-60	1064	600-700	1-3
	black, blue tattoo	2-4	45-60	1064	600-700	2-5
	red, brown tattoo	1-4	60-90	532	650-750	2-5
	other colorful tattoo	3-5	60-90	1064+532	660-780	2-5
	melanin nevus	1-3	45-60	1064	600-700	1-2
	nevus of Ota	3-6	60-90	1064	650-750	4-6
freckle	2-3	45-60	532	600-700	1-2	

**1320nm** (Black face doll treatment using black powder)

Skin	Project	Times	Interval (day)	Wavelength (nm)	Energy (J/c m <sup>2</sup> )	Frequency (HZ)
I&II	Black face doll	10	7-15	1320nm	450-550	6HZ
III &IV	Black face doll	10	7-15	1320nm	450-550	6HZ
V	Black face doll	10	7-15	1320nm	400-500	6HZ



## Chapter 7 Maintenance

### 7.1 Cleaning the unit

Clean the system exterior at least once a week. Wipe all surfaces with soft, damp, non-abrasive cloth. Mild cleansing solution may be used. Not spill liquids in the unit.

### 7.2 Cleaning the crystal on hand piece

The crystal on hand piece should be kept clean at all times and should be cleaned after each treatment.

To clean the crystal on hand piece, first dry it with a lint-free cloth. Then clean it with a cloth moistened with water-free alcohol and let it dry thoroughly.

### 7.3 Troubleshooting

Problem	Solution
Machine cannot open	Check the power line loose or not Check fuse
Water warning	If add enough water Check if the followed the order of adding water Add water mouth, release air inside
Handle working but no cooling	Check water cycling
Connector leak water	Check rubber ring broken or not
Handle no flash	1 check if you press Work Button on LCD 2, check if the counter work well, if counter not working, the handle button broken
Output energy weak	Check whether the power supply voltage is too low

	clean the crystal check if the energy you chose is too low check if the handle need to be changed
Warning in shot time	Check if the setting protecting Temperature is too low(normal 35°C) The environment temperature is too high