

PHI LASER TYPE - R

ND:Yag laser Tattoo Removal Laser Machine  
**OPERATOR MANUAL**

PHI  LASER  
TYPE-R 2.0



## CAUTION

- Do not directly look at the hole of the laser gun; it will cause permanent blindness.
- Make sure the stopper is revolved off before the water injection, and then keep the water flowing normally.
- Water must be distilled or purified water when injecting the cooling water into the machine, tap water or mineral water is absolutely forbidden because it will result in water scale when heated, which will cause mechanical error of the machine.
- Make sure to check the water circulation and the joint between the machine and the hand-piece before running the machine.
- The operation should be done when everything is ready. If there are any abnormal sounds, please stop working immediately; and lighten on again after the capacitance being charged up inside machine.
- Make sure the machine is absolutely discharged before transportation.
- Make sure to change the water once a month.

## WARNING

The treatment handle contains delicate and fragile optical components. During transportation, the case shock-absorbing package should be used, otherwise it may cause malfunction.

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## **1. SAFETY ITEMS**

### **1.1. Equipment safety**

The laser machine uses single phase power supply of 220V, and the maximum output is no more than 3A. The power supply must be three wire battery outlets, the spec is 10A.

It is dangerous to open the protective cover optionally because the high tension exists inside machine during operation, even after the machine is powered off, some parts of the machine could possibly have residue pressure.

### **1.2. Transportation safety**

This ND:YAG Laser system can be moved and transported easily, but the treatment handle contains delicate and fragile optical components. So during transportation, the case shock-absorbing package should be used, otherwise it may cause malfunction.

### **1.3. System safety**

For the system safety, please notice the following devices:

Simmer button: no laser can output in “standby” status.

Key switch: avoid unauthorized operation.

## 2. INSTALLATION & OPERATION

### 2.1 System description

This ND:YAG Laser system contains optical-circuit system in the treatment handle, and electric-circuit system, computer system and cooling system in the console.

#### Specifications

Light source -----Q-switched Nd: YAG solid-state laser  
Wavelength-----1064nm/532nm/1320nm  
Energy level-----100-2000mj  
Fluence ----- $\leq 15\text{mJ/cm}^2$   
Pulse duration ----- 2ns  
Frequency-----1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Hz Cooling  
system-----Built-in distilled water-circle system Power  
requirement-----Single-phase 220V/10A  
Size of the machine-----60x45x40cm  
Weight-----23kg

#### Components and functions

- Key switch (general power switch): to turn on the system in clockwise and to power off the machine in anticlockwise.
- Simmer button: to press down, and the system comes into ready for work status; to press down again, and the system goes back into standby status.
- Power indicator: to adjust the voltage.
- Frequency button: to adjust the speed of frequency
- Setting button: to set the language and the system interface.
- Foot-switch port: to step on the pedal for outputting laser.
- Insurance-cube port: to link with 10A , 5×20 insurance cube.
- Power socket: to exchange 110v/220v input plug with wire.

### 2.2. Environmental conditions

- ⊙ **Normal conditions**
  - Temperature: 15C~25C
  - Relative humidity: 70%
  - Air pressure: 860-1060hpa
  - Power requirement: single-phase 110v/ 220v $\pm 10\%$ ;10A
- ⊙ **Conducting way:** Continuous running with intervals at every 5.000 times pulsing, 10 minute intermission is better.

- **Cooling system:** Built-in distilled water circle cooling system

### 2.3. Power requirement

**Power source:** single phase 110v/ 220v±10%,50hz±2%, 10A

➤ **Caution:** The power supply of this ND:YAG Laser system must match with international standard three-hole plug in order to make sure the socket well grounded.

➤ **Caution:** The voltage range is between 110v, 220v and 240v. Firm-voltage device is necessary, which power requirement is 800VA.

### 2.4. Installation and operation:

#### 2.4.1. Foot-switch installation

- Insert the foot-switch plug into the socket at the back of the case.
- Take off the non-hole stopper and change it with the hole stopper.

#### 2.4.2. Operation

(The adoption of 1064nm head or 532nm head is according to the treatment)

- First fill the tank with distilled water or purified water by a funnel (mineral water is not permitted). When you add water, please open the spillway and close the scupper, then keep on observing it. Close the spillway when the water is full enough to outflow from the spillway.

- Start machine.

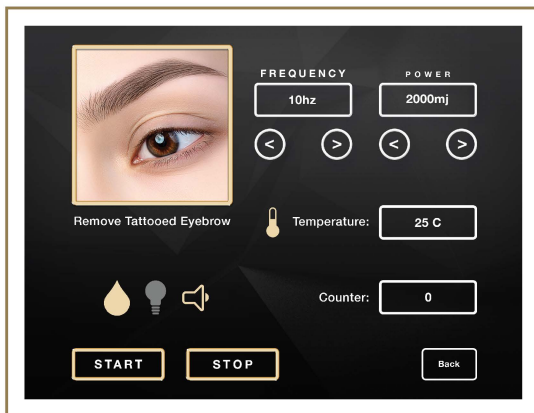
Turn the key in clock, and choose language



PICTURE 1





PICTURE 2





PICTURE 3





When entered into the work platform, you can press the Frequency button and Power button to adjust the frequency and power: press the first button in the left to light up the machine; when Xe light is light up successfully, ; press standby button, and the state indicating area need press “OK”, then you can operate the foot pedal; Meanwhile the system starts counting every pulse. When closing the system, press the “ok” button to quit the work state; press the “back” button to quit the simmer state; and then turn off the machine with the key. (You can quit the simmer state by pressing trigger button during the treatment. When you keep stepping on the foot switch, all of the button will be without function.)

Adjust the frequency:

Release the foot pedal, Choose one treatment picture button to enter into the working frequency adjusting menu, press (  ) to increase the frequency, and press (  ) to decrease it,

**Adjust the Power:**

Release the foot switch, press Power button to enter into the working voltage adjusting menu, press (  ) to increase the voltage, and press (  ) to decrease it ( the step is 10V, it is available to adjust from 100mj-2000mj),  
Temperature display and protection.

 this is instead of water flow,  this is for aiming beam(guide light)  
 This is voice of button. When press  , it will show you how many shots have used.

The system has the temperature indicating function, from which the temperature of the circulating water can be checked at any time. When the water temperature is higher than the programmed protective temperature, the “excessive temperature” will show on the screen with the alarming buzzer, and the machine will stop working in that case; when the temperature of the circulating water is lower than the enactment protection temperature, the machine will run normally.

4) When closing the system, firstly please release the foot pedal, then move away the hand-piece, next press the work button to quit the simmer state, and then turn off the machine with the key in anticlockwise, pull off the plug at last.

#### 5) Usage of the head with wavelength of 532nm

Take off the 1064nm-wavelength transformer and change with the 532nm-wavelength head; other operations are as the same.

**Caution:** The light with wavelength of 532nm is harmful to your skin. Please read Annex 2 before operation.

#### 2.5. Cleanness

Please clean the transformer with alcoholic gauze or tampon stick before and after each treatment.



### 3. MAINTENANCE AND TROUBLESHOOTING

#### 1) Basic maintenance

- **Clean the camera lens:**

The camera lens is at the back of the laser-sighting device, so before or after each treatment, please examine the surface of lens to see if there is any splash on it. If there is, please wipe the lens softly with alcoholic tampon stick.

- **Refilling cooling water:**

After the system has been running for 10 days, please screw off the spillway and scupper to draw off the water. Screw on the scupper after the water has been drawn off, and then refill the distilled water or purified water. If the water flows out from the spillway, it means the tank is full, and then screw on the spillway.

**Caution: the cooling water must be distilled water or purified water.**

#### 2) Troubleshooting

Troubleshooting	Examinable parts
No power	<ul style="list-style-type: none"><li>• Examine the electric circuit</li><li>• Examine power plug and cable</li><li>• Examine the 10A insurance cube</li><li>• Examine the emergency shutoff knob</li></ul>
No laser output and buzz when step on the pedal	<ul style="list-style-type: none"><li>• Examine whether the system is in simmer status</li><li>• Examine whether the pedal switch is out of work</li></ul>
The output of energy becomes weak or blank shoot happens	<ul style="list-style-type: none"><li>• Examine whether the power supply is normal</li><li>• Examine whether the lens has been cleaned</li><li>• Examine whether the cooling water is flowing in circulating</li></ul>

## 4. ACCESSORIES

4.1 Attention: 1064nm wavelength Q-switch laser should be used in the treatment of the black and the blue pigment.

### 1). Preparation before treatment

Before treatment sun exposure is not allowed for 4 weeks. Skin must be clean, without any medical problem, or active process before treatment. Explain clients possible side effects and whole process of removal. Before treatment, Technician and client HAS TO HAVE PROTECTIVE GLASSES and it must be always used during treatment while machine is ON.

### 2) Possible situation during treatment

When treating the very deep pigment tissue, since the pigment would absorb laser energy in great quantity, there may be burst of pigments accompanied with noisy sound. The client's skin may swell for the breakage of pigments, even bleed.

Just after the first time treatment, the pigment may become very thin but it will recover in several minutes. This is the regular reaction of organism. Next treatment can be done after 6 weeks.

**Caution:** During the operation, the eyelid board that is used for protecting the client's eyes must be used. Otherwise, the operation is very dangerous for the clients, because the blindness caused by laser radiation cannot be cured.

### 3) Possible situation after treatment

After treatment use Skin Candy after laser treatment gel or any product that is for sunburns. Also, if client feels warm in treated area, cold compresses can be used.

### 4) Physician care after treatment

No washing eyebrow lining with water within 3 to 7 days.

Sunbathing and sunbeds are forbidden next 2 weeks after treatment.

Avoid hot baths, jacuzzi, sauna for 7 days. Avoid make up on treated area. Do not scratch and rub treated area.

4.2 Attention: 532nm-wavelength Q-switch laser should be used in the treatment of the brown and red pigment.

The 532nm wavelength laser is green light, which is different from the laser with wavelength of 1064nm.

The hemoglobin and man-made brown or red pigments absorb the laser with

wavelength of 532nm. Since the normal skin can also absorb it, the cuticle tissue may vaporize in surface, and there may be blood clots called “purpura” in the medical service.

#### **4.2.1 Side-effects from the treatment of the black and blue pigments**

1) There may be swelling or blood clot under skin, however it will recover in 3 weeks, varied with individuals. Low energy density (small spot) shall be used in the treatment of the brown or red pigment with 532nm wavelength laser.

2) before starting the treatment, explain to clients the possible side-effect. In some cases the tattoo contains iron ion, which will cause the paint oxidized and make the treatment failure. (No washing with water and sunburn after the treatment against infection and pigment precipitation)

#### **4.3 Instructions and attentions for Carbon peelingg**

Before treatment clean skin. Put Carbon Gel in thin layer on skin. Protective glasses must be used by client and Technician. Use black head (1320 nm). After treatment clean face from mask residuals. Treatment can be done every 2 weeks.

## 5. CONFIGURATION

Main body	Protective glasses	Foot switch	Power supply wire
Power supply key	Instructions	Laser output head (1064nm)	Frequency multiplier (532nm)
Water filter			

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