

Yag Laser Beauty Equipment

Manual



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Chapter One Therapy principle and Application

I Therapy principle

ND: YAG Laser Cosmetic System introduces gem-adjusting Q switch, which uses high energy by instant emission of laser beam to crush and remove the pigment effectively in the pathologically changed tissues. That is an explosion led by laser beam: the laser beam at the fixed wavelength enabled by the accumulated high energy can reach the pathologically changed tissues through epidermis in a very short time (only 6 ns) to instantly crush the respective color base, then the corresponding pigment group gets swollen and outburst at last due to high energy, and part of the pigment group springs out of the human body (at shallow epidermis), and the rest (at basis tissues) pigment group will become very small particle before swallowed by the human cell which will be finally discharged out of the human body through lymphatic system circulation. The pigment of the pathological tissues will fade in color till it vanishes. And the surrounding normal tissues will not be ruined since they will not absorb the laser at that fixed wavelength

II Application

The system gem-adjusting Q switch can effectively cure the mixed pigments by pigment precipitation of extraneous source with pathological pigment change of endogenous source, inclusive of erroneous dark eyebrow-embroidery, lip-embroidery, lip-soak, eye line-embroidery, lip-line, tattoo (inclusive of tattoo by extraneous wounds), pigment precipitation by sensitive source, freckle on female's face (male's), coffee spot, old age spot, black mole, and birthmark in black, blue, purple, brown, red and etc. Treatment course for different illness case as follows:

Treatments	Treatment course required (cure times)	Treatment course interval	Remark (requirements in surgery)
eyebrow-embroidery (eyeliner grain)	1-2 times	30-60 days	Eyebrow blow, eyeball protection
Eyebrow-embroidery (eyeliner embroidery)	1-3 times	45-60 days	Eyebrow blow, eyeball protection
Lip line (red dyed lip)	1-3 times	15-45 days	Use 532nm filter
Tattoo (caused by extraneous wounds)	1-4 times	30-60 days	Blood infiltration will be fine on wounds
Freckle, age spot	1-4 times	15-30 days	Blood infiltration will be fine on wounds
Birthmark, nevus/mole	3-7 times	45-90 days	Must have Blood infiltration .

Chapter Two Laser safety

I Electrics safety

- 1 In accordance with the classification of the electric shock protection, it belongs to type B of Grade I.
- 2 Power capacity should exceed 2000 W when 220 V power source is connected.
- 3 The power source of the connecting line shall be power socket with single phase triple wire in compliance with the international standards, good earthing, and the specification is 5A or above.
- 4 There may be still remnant voltage lying in the high voltage electric appliance after instrument stops. Electric shock may occur when the instrument protection cover is open.
- 5 Please keep the voltage at stable condition.

II Transport safety

- 1 Portable instrument, which enables customer to transport it even when in usage
- 2 The handgun case is equipped with precise laser optic system. Please use the shock-proof packing material provided by the supplier for transportation. Otherwise, the maladjustment may be occurring to the laser system which will influence the energy of output.
- 3 Keep the water inlet tube smooth, and handgun body shall be packed in shockproof material.
- 4 Please replace the hole-type water tank plug with non hole-type before transporting.

III System safety

Please pay attention to the remark below which are displayed at the top of the instrument case and the handgun case:

- 1 key switch: Operation the qualifications limit;
- 2 emergency stop switches: Shut down urgently when convenient and surprised circumstance takes place.
- 3 standby and ready: forbidding the laser exportation on standby is safe appearance of the system.

IV Eyes protection

- 1 The operator shall wear eye-protection glass in laser operation area. Strict and effective

- eye-protection instruments must be provided to the patients.
- 2 The operator shall wear specially designed protection glass against laser, which is applicable for the wavelength between 200-1080nm.
 - 3 Protection glass against laser still can not entirely prevent the direct laser beam or the laser beam reflected by the glass, reflection mirror or slick metal surface. Therefore, looking straight ahead to these laser lights even with eye protection glass is strongly prohibited.
 - 4 It is effective to use gauze or to have eye cover and other measures to protect eyes.
 - 5 It is better advisable to have moist gauze to protect eyes. But the treatment area must be kept dry.
 - 6 Please switch off the instrument when adjusting the laser light or cleaning the laser mirror.

Chapter Three Installment and Use

I The Description of Product

The Laser machine is made up of light-path system, the system of electrical source, the computer controlling system, the cooling system and so on .The light-path system is installed in the shell of operating handle. The electrical source, controlling and cooling systems are installed in the engine case of electrical source.

1.Main technical parameter: :

Laser type: Q-switch Nd: YAG

Laser output wave length: 1064nm/532nm

The pulse energy: 0~1000mJ

Pulse width: ~6ns

Recurrence rate: 1, 2, 3, 4, 5Hz

Cooling condition: wind system+closed circulating+cooling system

Power source: 110v~220v

2. Main physical parameter:

Size: 48*37*36cm³

Net weight: 18Kg

II Working Condition

Regular working condition:

(1) Ambient temperature: 15 °C ~30 °C

- (2)Relative humidity below 70%
- (3) Atmospheric pressure: 860~1060hPa
- (4). Power source: single-phase $220\pm 10\%$ 5A

Working way: : Load the continuous running way intermittently. Outputting 4,000 pulses continuously each time and intermittence:10 minutes are suitable。 The "PULSE": 004000 on the screen.

Cooling: distilled water makes cooling circularly.

III Distribution of Power Source

- power source: Single-phase $220V\pm 10\%$ $60Hz\pm 2\%$ 5A
- Pay attention: The power line of LS450 has standard three -core international plug. You must insure that power-source plug of electrical network has protecting line. The protecting line can meet the ground reliably.
- Attention: the scope of power source is 200V~250V. If the voltage of electrical network surpasses this scope, please select the manostat. The power of manostat is 800VA.

IV Installment

The installment of foot operated-switch: put the plug of this switch into the faucet behind engine case tight.

Change the imperforate cover of radiator into the aperture cover of radiator.

V Operating Way

A. Pour distilled water or pure water with small funnel, not mineral water or running water.

Pour water into the machine until it is spilling. The height of the water is about 1cm above the plastic platform in the machine.

Pour water into the machine again and the height should be 1cm above the plastic platform in the machine also. Then, use it again.

As shown below:



● Link the foot switch, tightening the nut



- Link the power line



- Depending on the treatments to choose the right outputting head.
As the pictures shown, left is 1064nm, right is 532 nm.



Warning: 532nm can damage the epidermis of human body. You must read and understand the appendix 2 of this instruction booklet in detail!

- Fix the outputting head to the handle .





B. The operation of opening machine:

Notice before first use: please add distilled water or purified water through water input hole for the first use. Change water once a month so as to extend working life of the machine.

1. Switch on: spin the power switch clockwise, the machine is electrified. You will see the main interface as follow:



2. Press the "+" button  to confirm adjusting frequency ranging from 1Hz to 5Hz, then press "+" button  to increase frequency and press "-" button  to decrease. Wait for 3 seconds to confirm by hearing an alert prompt.

3. Press "-" button  to confirm adjusting pulse energy ranging from 0-1000mJ, then press "+" button  to increase frequency and press "-" button  to decrease. Wait for 3 seconds to confirm by hearing an alert prompt.

4. Press the "enter" button  to confirm the above settings and you will see the empty gun image  filled with yellow color. This means you can step the

foot switch now and light output will be affected.

5. Press the “menu” button to confirm to adjust system mode with 5 different ones. Then press “menu” button to adjust to different modes. Wait for 3 seconds to confirm.

6. From the main interface, you will see “pulse” followed by a number as



. This shows the counts of laser light output.

7. Adjust the distance between hand piece and treatment site according to the explosion sound. The stronger the sound is, the stronger the laser energy is, which is supposed to be the best distance.

8. close the machine:

First, don't touch the foot operated switch; quit simmering condition with pressing the " " key. Revolve the locking switch widdershins again to close the machine several minutes after the circulation of system cooling.

The use of 532nm:

Dismantle the 1064nm treating-head and install 532nm treating-head; other operating procedures are the same.

Warning: 532nm can damage the epidermis of human body. You must read and understand the appendix 2 of this instruction booklet in detail!

VI Disinfection

Clean the lens in the handle with the gauze or the cotton by dipping 75% medical ethyl alcohol every time 1~2 time.

Chapter Four Maintenance

I Instrument general maintenance

- 1 Clean the output lens: after usage for a while, regular inspection with lens cleanliness shall be carried out. During the surgery, the pigment particle will flash into the lens of the aiming post which may severely affect the laser output. Screw down the lens and apply lens paper or cotton tick with non-water alcohol to clean the lens slightly. Make the convex side of the lens towards inside upon completion of cleanness. If the lens installation direction is wrong, it will cause the laser front lens crash and can not be in use any more.

- 2 After usage for a while, pure water exchange is required every 7 to 10 days. Extract 2/3 of the water tank volume, and then infuse same amount of water into the tank. Closely watch the water level. Turn the key right to On position to observe the water flow till the water flow smoothly. Press simmer READY button after 5 minutes.
- 3 Cooling water must be distilled water or pure water. Be advised to adopt distilled water for medical use or pure water. No mineral water or tap water is allowed to prevent impurity from affecting the instrument.
- 4 The instrument cannot be dismantled without permission. We will not provide any maintenance work once the strip is damaged or spoiled.

II Instrument troubleshooting

- 1 The instrument can not be started due to power failure.
 - (1)Check the power supply and the socket connection
 - (2)The red emergency switch is not on. Please turn the switch right to be lifted.
 - (3)Check the fuse. If necessary, please change it.

- 2 No water flow when the instrument is on
 - (1) The trouble

No water flow or the circulation is not smooth when the instrument is on. To assure the smooth operation, we introduce the sealed transportation. Only 1/5 of water remains in the water tank. The water infusion orifice is equipped with non-hole type water tank plug to prevent any water leakage. Press Simmer button, the light is on, while the xenon light is not on.
 - (2) Solution

Realize that the water level is too low through observatory hole. Screw down the non-hole type water tank plug and infuse water to the standard level, replace with hole type water tank plug, then put the laser handgun handle at the position lower than the instrument. Restart the instrument, then press Simmer button, if “pa” can be heard, that means the joint is good and water circulation is normal. It enters into standby mode.

- 3 No laser output when footswitch is pressed
 - (1)Check the instrument if it is on ready mode.
 - (2)Check the footswitch. If necessary, please change the footswitch.
 - (3)Check whether button work is pressed.
 - (4)Check the energy output. Please adjust the energy output by selecting VOLT.ADJ.

- 4 No laser output or infirmness of laser output
 - (1)Low voltage makes instrument abnormality
 - (2)Output lens is dirty. Please clean the lens in compliance with the regulation mentioned above.
 - (3)Xenon light burned inside the laser handgun case. Change the handgun.
 - (4)Instrument overheated. Stop the instrument and restart after 30 minutes.

- (5)Screw down the head, and inspect the front lens. If spoiled, please change the lens.
 - (6)Check the handgun and head if any water leakage. Please change the handgun if so.
- 5 Power failure without any reason during operation. No laser output yet after restart-up.
- (1)Auto power cut for water temperature activates
- Trouble
- The instrument keeps working for over 15 minutes and using high energy output at 5 Hz frequency for curing endocentric pathologically changed pigment, which leads to instant cooling water temperature increase, handgun handle and exterior crust becoming so hot. In order to prevent xenon light in the handgun case from damage caused by overheating, we specially designed auto power cut for water temperature. When cooling water temperature reaches 55°C, it will automatically cut the power supply, and all the indicating lights are off on the control panel. The instrument goes back to standby mode.
- Solution
- Please extract 2/3 of the cooling water in the water tank. And infuse the distilled water for medical use or pure water stored in the refrigerator into the water tank (frozen cooling water is prohibited to prevent water route from blockage). Restart the instrument and continue.
- (2)If electrical trouble occurs, please carry out the inspection.
- 6 An electric shock occurs when operating the instrument
- (1)During dry weather, static electric may occur between people. Be advised to dress with less chemical fiber.
 - (2)No three line earthing socket. Please replace with three-line socket. And the power supply socket is equipped with the earthing wire.
 - (3)Unstable power voltage occurs in the operation area. Try to install a voltage regulator.
- 7 Water leakage
- (1)Water leakage with handgun handle
 - (2)Water leakage caused by the severe shock during transportation.
 - (3)Water tank and pump leakage
- Please claim compensation from the dealer or forwarding company upon immediate return of the instrument if the above mentioned occurs.
- 8 Sound “chi chi” can be heard after SIMMER is pressed
- (1) Not worked for a long time, which lead to slow simmer. Repeat starting instrument.
 - (2) Low temperature in the operation room. Adjust the room temperature accordingly. Be advised to install air conditioner.
 - (3) Disconnection with light route. Be advised to check the wire route.
 - (4) Excessive humidity. Please remain relevant dry in the operation room.
 - (5) Xenon light is damaged. Please change it.
- 9 The energy output is infirm during operation
- (1)Check whether the lens is contaminated with dirt. If any pigment precipitates on the

surface, please use non-water alcohol to clean.

(2) Any warm feeling on the handgun handle. Stop the instrument for 30 minutes or change the cooling water.

(3) Check the front lens. If it is broken, please contact the manufacturer.

Chapter Five Appendix

Appendix 1: The attention about treating black and blue pigments by using 1064nm laser.

(1) Preparation before surgery.

Learn whether the visitor is scar physique or has been used other means to wash the eyebrow, tattoo. Pay attention to see the visitor whether has scar. Tell the visitor that it may remain trace of pigment; these traces were the result of solarization. Tell the visitor that his/her material may be the compound pigment. It may remain coffee or red pigment after removing blue and black. Treat it again with green light after 2 months.

Tell the visitor that the possible phenomenon after surgery (As shown bellow). Avoid disputation between us and visitor because of her misunderstanding the situation of surgery, the response to the surgery, and recovery.

Shaving the eyebrows is better for observing during the surgery.

(2) possible phenomenon during the surgery:

The pigment may rupture with a stronger sound because of black pigment absorbing the energy of laser intensively when you treat deep organization. The tissue of body can swell because the pigment is crushed. And the shallow pigments are dashed out the epidermis because of absorbing the energy, forming blood spot.

The color of the organization becomes shallow at first treatment, the color can resume after a period of time (several minutes-several dozens minutes), this also is normal. The phagocytes and transportation of macrophage will keep a longer time and the color of organization will become shallow gradual. The second treatment should carry on after 2-3 months.

Pay attention : Use the board of eyelid to protect the eyeball absolute before washing eye line, otherwise do not carry on the treatment (The operation of laser to eyeball is irreversible)!! !

3) Possible phenomenon after surgery

Hair may fade or have the possibility to fall off, but it will grow new bushy hair than before with four weeks. And it will tend to normality gradually. The degree of swelling is different from

person to person. After lessening the swollen area, you may feel itching and harden about this part. But it is normal. The entire bad phenomenon will disappear in one week--one month and the length is different from person to person.

4) The doctor's advice after surgery

Do not thrush and wash within 3-7 days. Against exposing to the sun, if you swell seriously, taking the antibiotic medicine will be better.

Appendix 2: Attention about treating the brown and red pigment by using 532nm

The wave length of 532nm is green laser. It has very big difference with the wave length of 1064nm laser for biological tissue's function.

The hemoglobin of human body and the brown and red pigment of organization have stronger absorption for 532nm laser. The capillary vessels under surface burst and form gore after absorbing 532nm laser --called "peliosis". The brown and the red pigment will demolish or is crushed after absorbing the laser of 532nm in order to be discharged through metabolism.

The possible side effect about removing red and brown pigment by the laser of 532nm:

- (1) The surface of skin turning white, possibly let the characteristic pigment lose or sediment.
- (2) The treating spot produces inflamed part and peliosis. It may tie scab, if it is damaged oversized. The time of restoration may be within 20 -- 60 day.

Use the density of small energy---named big faculae to remove red and brown pigment with the laser of 532nm. There are many ways to treat deeper pigment. Each interval of treatment is not smaller than 2 months.

Tell the visitor the possible side effect and possible existing iron ion in the individual pigment before treatment. Iron ion can become oxide of iron after absorbing laser and make the color becomes blacker, causing the failure of the treatment.

Avoid water, touching and so on after the treatment .Pay attention: do not expose to the sun, in order to avoid sediment of the pigment.

The eyes of people are extremely sensitive to the laser of 532nm, which possibly causes dropping the vision of the eyes or losing one's sight permanently. Therefore, the visitor must wear the protective mirror of laser to protect his/her eyes. The irrelevant person should leave the room for medical treatment.