



SAPPHIRE DIODE 800 SERIES
USER MANUAL

Sapphire

PRECAUTIONS

This manual has been prepared for technical personnel to understand and operate the system. Do not operate the system before reading this manual and gaining a clear understanding of the system operation. Any questions, please contact us.



The Operator must read this manual before operating this system.



This system must only be used by operators who have been trained.



Never leave the key in the machine when not in use.



All personnel must use safety eyewear and must ascertain that the eyewear



Provides adequate protection for the diode laser module.



Never fire directly into the eyes.



Clean the skin before treatment.

Contents

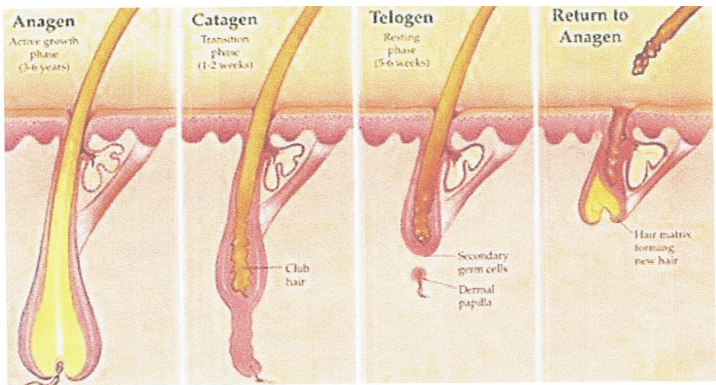
1.	Introduction	4
	1.1 Theory	4
	1.2 Technical Specifications	4
2.	Installation	5
3.	Operation	6
	Error Codes	8
4.	Clinic Procedures	9
5.	Recommended Parameter Settings	9
6.	Notice	9
7.	Course of Treatment	10
8.	Treatment Notice	10
9.	Contraindications	11
10.	Side Effects of Treatment	11
11.	Maintenance	12
12.	Warranty Notice	12
	Treatment Parameters:	13
	Body Areas	14
	Component List	15

I. INTRODUCTION

The Sapphire 800 Diode is the solution for fast hair removal using 808nm high power laser diodes. It is designed with TEC and Sapphire cooling units for skin contact. The laser beam is collimated with a patented technology of beam shaping; providing a high efficiency for hair removal. The 810nm diode laser hair removal system can be used for white to light brown skin with dark color hair. The pulse energy is up to 40J/cm². It is a permanent hair removal system using laser diode technology

I.1 THEORY

810nm diode laser effectively penetrates deep into dermis and is absorbed by the melanin in the hair follicles. The laser energy transforms to thermal energy, which damages the hair follicle without damaging the surrounding tissue to achieve effective hair removal.



I.2 TECHNICAL SPECIFICATIONS:

Parameter	Value
Type	Laser Diode
Wavelength	755nm, 808nm & 1064nm +/-10nm
Pulse Width	5~200ms
Repetition Rate	1~10Hz
Fluence	1~40J/cm ²
Spot Size	10mm x 10mm
Sapphire Window	14mm x 14mm
Skin Cooling	Double TEC + Sapphire, -5°C ~ +5°C
Water	Distilled or Pure water
LCD Screen	213 cm (8.4 inch)
Operation Temperature	+5°C ~ 30°C
Humidity non-condensing	≤80% RH
Input Mains Voltage VAC	220~240VAC, 50~60Hz, Max 10A

2. INSTALLATION

Please take following steps to start the hair removal system.

1. Unpack the system with its hand-piece and place in its intended work position.



2. Add water.

- 2.1 Obtain distilled water ± 1.2 L. Ensure there are no dust particle in the water.
- 2.2 Push the blue lock-ring down, and remove the plug. Then use the funnel with the soft tube and connect to the water inlet; add water until full.
- 2.3 When full remove the funnel and soft tube, then replace the plug.





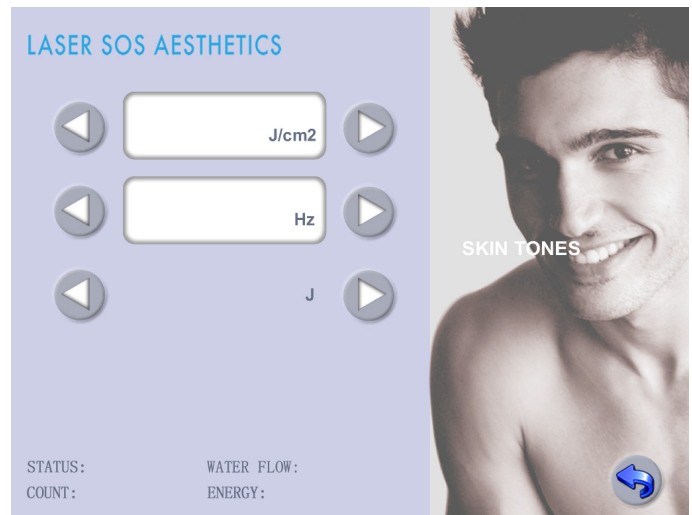
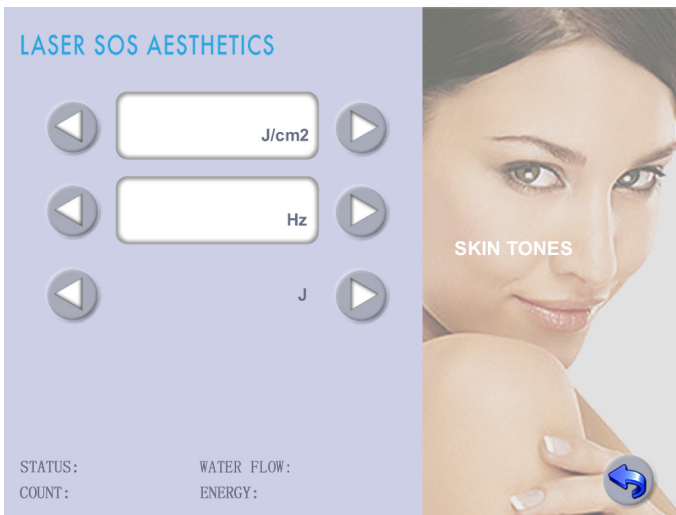
3. Ensure the hand-piece is in the cradle..
4. Plug the mains cable of the system into a wall-plug. Ensure your voltage is 230 VAC.
5. Turn on the Switch on the rear panel of the machine.
6. The preparation is complete after you finish the steps above.

3. OPERATION

1. Check the front panel of the machine.
2. The red button is Emergency Stop Switch. If pressed down, the laser will be shut off immediately. It must be released before you try to start the machine. The other one is the system key switch.
3. Turning the key on the front panel; this will start the machine.
4. After 5 seconds, you will then be able to enter the main operational interface on the LCD screen, as follows:



5. Choose Male or Female to enter the operational display. Then you can adjust the parameters on the LCD screen. There are total of 4 parameters to be set, including: Energy, Frequency, Total energy bar, Skin type. After choosing skin type, energy and frequency settings are complete; then adjust the total energy bar according to the treatment needs. Press Ready and Cooling, then the hand-piece will begin to work. Wait for a while, to allow the tip of the laser hand-piece to become cold; then you can begin to operate on the skin.



6. The Frequency shows the pulses per second of the laser. A higher repetition rate leads to higher pulse energy fluency. The Repetition Rate can be variable from 1 Hz~10 Hz.

7. The Energy shows single pulse of laser energy on the skin.

8. The blue energy bar means the total energy per treatment. Initial value 10000J. The range is from 1,000-60,000 Joules, step 1000J.

When the hand piece is emitting, the energy will reduce. When the energy bar is 0, the hand piece will stop emitting and the operation on the body part is complete. It is very convenient and safe.

The parameters need to be re-adjusted, before the next treatment can begin.

9. There are a total of 3 states on the screen: **READY / COOLING / STANDBY**

A. STATUS: READY. When parameters have been set, press the READY button on the left-bottom of the LCD, after 3 seconds, the system will enter 'Ready' state. In this state

the pump and fans are working and the laser is ready to use. Once you reset the parameters, the system will enter the 'Stand By' state again.

B. STATUS: COOLING. When you press the READY button, the TEC & Sapphire cooling system begins to work. The tip of the Hand-piece becomes cold. You do not need to press the cooling button.

C. STATUS: STANDBY. When you press 'READY' button again, the system will enter the 'Stand By' state. In this state the pump and fans will stop.

D. STATUS: ERROR 01~13. This means a system protection has operated.. You need to check it.

Error Code	Error Description	Position
Error 01	Water Level	PT1 (Water Level Protection)
Error 02	PT2	N/A
Error 03	PT3	N/A
Error 07	PCB Temp	PCB Heatsink Temperature High
Error 08	Water Flow	Water Flow Rate Protection
Error 09	Laser Triode	Laser Triode Error
Error 10	Over Current	Over Current Protection
Error 11	HandPT	PT_H

COMMON ERRORS : PT2, PT3, OR WATER FLOW

• ERROR 02 PT2

Problem: Push the emergency switch

The wire is not connected well

Solutions: Turn the emergency switch

If not the problem, check the wires connected with the emergency stop switch

• ERROR 03 PT3:

Problem: No Voltage for the Laser Hand-piece

Solutions: Check if the wires connecting the laser hand-piece to the laser power supply are tight.

Check if the connector pins are damaged .

Check if the wires connecting the laser power supply and control board are tight.

• ERROR 08 WATER FLOW

Problems: The water level is lower than normal

The Water Flow Sensor is faulty

The water pump is faulty (This situation is rare)

Solutions: Check the water level, if it is lower than normal, please add water.

Check the water flow sensor, if faulty, replace it.

Check the water pump, if faulty, replace it.

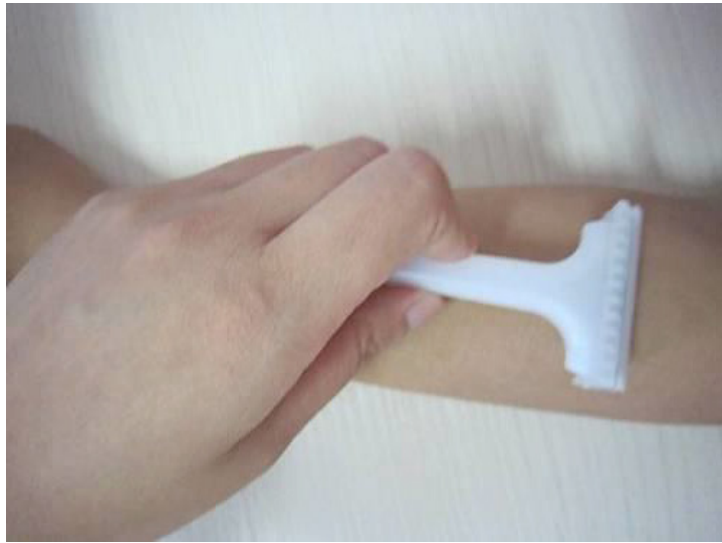
10. Take the hand-piece. Keep pressing the button, then the laser will fire.

11. You can stop the machine anytime by turn off the key on the front panel.

12. Any sudden situations, press the Emergency Button to stop the laser, and then turn off the key. The Emergency Button is designed to shut off the laser, not shut off the mains input. The switch on the rear of the machine is designed to isolate the system from the mains input.

4. CLINIC OPERATION

1. The skin must be shaved before treatment.



2. Use a little gel.
3. Hair Removal.
4. After the hand-piece tip gets cold, allow 2-3 minutes, ensure that the cooling tip has good contact with the skin. Slide the hand-piece at a constant speed backwards and forwards over the area to be treated.
5. After treatment, clean the gel from the hand-piece, and put it back to its cradle.
6. Record the treatment data for the patient.

5. RECOMMENDED PARAMETERS

1. Firstly, choose the skin color on the screen.
2. Secondly, adjust FREQUENCY (Hz), Recommend: 3-6Hz
3. Lastly, adjust Energy(J/cm²) is between 5-10J/cm² (Recommend) Slide the Hand-piece back and forth about 6-8 times.
4. About the lip, hair line, recommend Fix-Point mode. It's also ok to slide the hand-piece.
Recommended Frequency: 1Hz

6. NOTICE:

1. For white skin choose a higher Energy.
2. For brown skin choose a lower Energy.
3. Dark color hair choose a lower Energy.

7. COURSE OF TREATMENT

1. Usually, it needs 5 course of treatment. (For thin hair, more courses will be required)
2. Treatment interval is according to the hair cycle. Usually, treatment interval of the face is about 20-30 days; treatment interval for Arms, Legs, and Body is about 30-40 days.

8. TREATMENT NOTICE

1. The treatment of the hair removal needs experienced professionals. Do not use the system if you have not been trained.
2. Operators and patients must all wear laser goggles to protect eyes from any laser damage threat, including anyone in the room just observing.
3. Please notice that this is a high power laser device and should patients feel high pain, stop the laser immediately and check if there is reaction with the patients' skin. Adjust the to a lower power that the patient can stand for the treatment.
4. The skin must be shaved before treatment.
5. The hand-piece is better used in a SCANNING mode (frequency 5-10Hz). This provides faster treatment.
6. Skin contact gel is not necessary for treatment. It will not make the treatment better or improve the feel of the skin.
7. You need to wait for 2~3 minutes before the cooling tip becomes cold.
8. Maintain good contact between the cooling tip and the skin. You can also use the edge of the Aluminum head of the hand-piece to cool down the skin during treatment.
9. Never fire the laser pulses towards the eyes, or watch the laser directly.
10. Please refer to the Treatment Parameters (attachment 1) see Pg 13.

9. CONTRAINDICATIONS

1. Cancer; particularly, skin cancer, melanoma.
2. Pregnancy (including IVF).
3. Use of photosensitive medication and herbs for which laser exposure is contraindicated.
4. Diseases which may be stimulated by laser exposure.
5. Prolonged exposure to sun or artificial tanning during the 3 to 4 weeks prior to treatment and post treatment.
6. Active infection of herpes simplex in the treatment area.
7. History of keloid scarring.
8. Fragile and dry skin.
9. Hormonal disorders (that are stimulated under intense light).
10. Use of anticoagulants.
11. Epilepsy.
12. History of coagulopathy symptoms.

10. SIDE EFFECTS OF TREATMENT

This system is similar to other laser system, and the usual use of such systems can result in controllable or uncontrollable damage to the human tissue. Including:

1. Severe Erythema and Oedema within 2-24 hours after treatment, this may last for several weeks.
2. 48 hours after surgery, allergies, itching, mild burning sensation or pain symptoms in the treatment area.
3. Postoperative blisters, epidermal necrosis or peripheral skin pigmentation. It may last for several days to several weeks.
4. Due to prolonged use, glare and laser exposure can cause damage the eyes, so throughout the treatment all must wear appropriate protective goggles to protect the eyes.
5. It is very important to observe the skin's response during treatment, and improper screening or excessive energy may cause thermal damage and lead to side effects.

11. MAINTENANCE

1. The machine must be operated in a room with an air-conditioner.
2. The environment temperature must not go below + 5°C; the ice may damage the water tanks and water channels inside the machine as well as the hand-piece.
3. Clear the gel on the hand-piece and make sure there is no dust or dirt attached to the hand-piece window.
4. Do not bend the umbilical of the hand-piece too sharply, as this may cause a water flow ERROR.
5. Do not fire the laser at random targets, or it may cause burning or a fire.

12. WARRANTY NOTICE

Please take all necessary precautions for the safe operation of the machine and hand-piece, and take note that the following situations can **not** be warranted:

1. Regular drops of the hand-piece.
2. Incorrect mains input voltage.
3. Disassemble of the system without factory authorisation.

TREATMENT PARAMETERS:

1 GRID=10 X 10CM = 100 CM²

SKIN TONES	FLUENCE (J/cm ²)	Repetition Rate(Hz)	Total Energy per Grid (J)
I	10	5-10	6000-8000
II	10	5-10	6000-8000
III	10	5-10	6000-8000
IV	8	5-10	6000-8000
V	7	5-10	5000-7000
VI	5	5-10	5000-7000

BODY AREA	NAME	TREATMENT AREA (GRID)	ENERGY PER TREATMENT (J)
1	UPPER ARM	8-10	50000-80000
2	FORE ARM	6-8	40000-60000
3	LEG (TOP)	11-13	650000-100000
4	LEG (BOTTOM)	10-12	60000-90000
5	CHEST & ABDOMEN	12-14	75000-110000
6	BIKINI LINE	1	6000-8000
7	UNDER-ARM	1	6000-8000
8	BACK	12-14	75000-110000

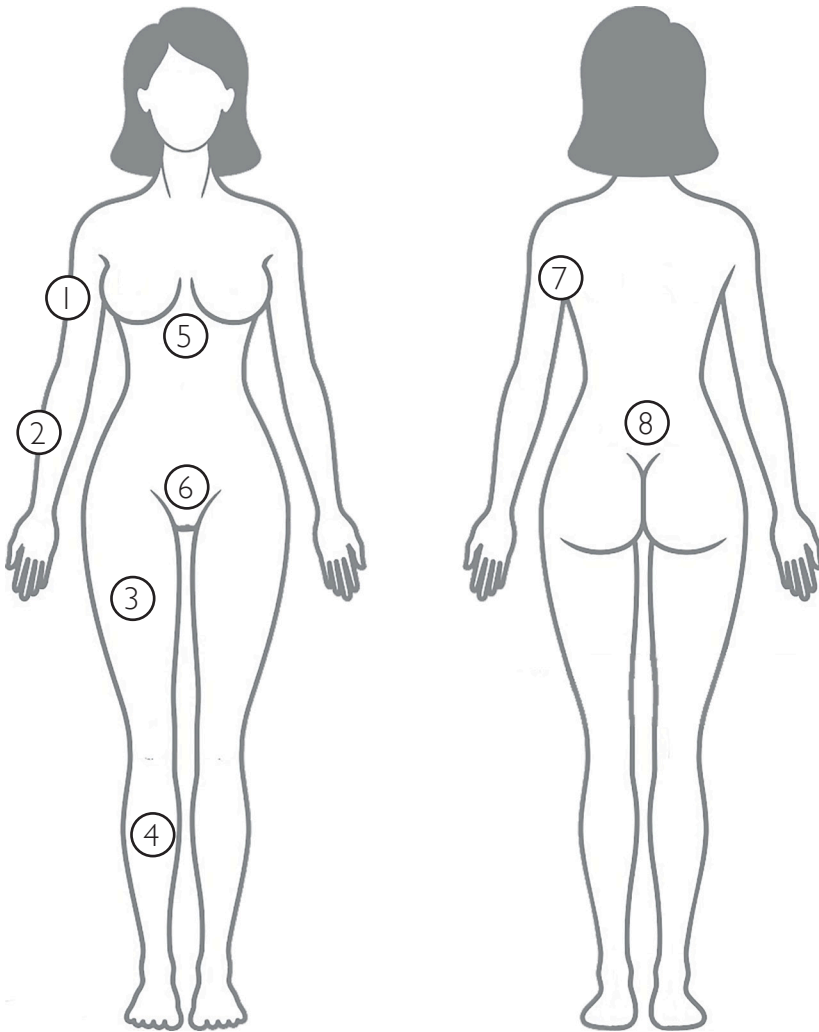
SKIN TYPE	HAIR TYPE	SLIDE TIMES	ENERGY(J/cm ²)	TREATMENT AREA(cm)
I	THICK	8-10	10	10 x 10
	THIN		9	
II	THICK	8-10	10	10 x 10
	THIN		9	
III	THICK	8-10	10	10 x 10
	THIN		9	
IV	THICK	8-10	9	10 x 10
	THIN		8	
V	THICK	8-10	8	10 x 10
	THIN		7	
VI	THICK	8-10	8	10 x 10
	THIN		7	

NOTE:

THESE PARAMETER ARE JUST OUR SUGGESTION,THE ACTUAL PARAMETERS CAN BE ADJUSTED ACCORDING TO THE SKIN COLOR AND HAIR SIZE OF PATIENTS.

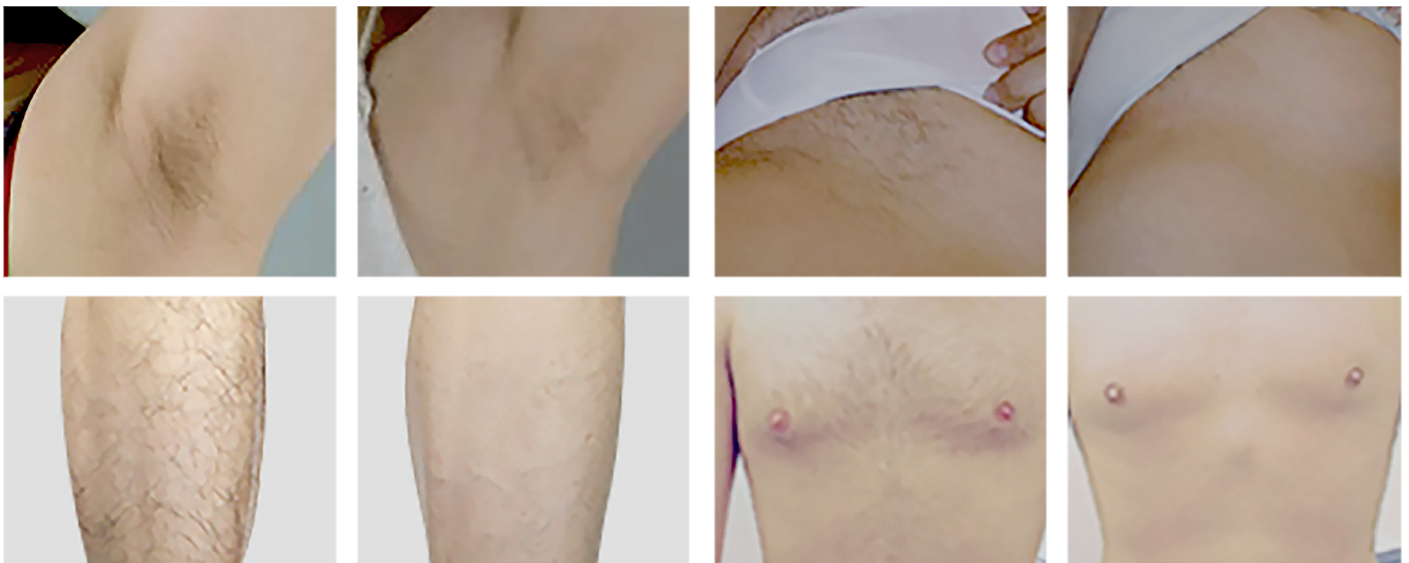
1. For white skin choose a little higher energy, brunette skin should choose a little lower energy.
2. The thick hair use a little lower energy, thin hair should use a little higher energy.
3. As the treatment courses increase, a higher energy can be chosen. For example, in the first course you can choose a lower energy, in the fourth and fifth courses you can choose a higher energies.
4. It needs 4~5 treatment courses for complete hair removal.
5. When the patient feels a little hot (it just like faint Prickling), this time the effect is best.

BODY AREAS



BODY AREA	NAME
1	UPPER ARM
2	FORE ARM
3	LEG (TOP)
4	LEG (BOTTOM)
5	CHEST & ABDOMEN
6	BIKINI LINE
7	UNDER-ARM
8	BACK

BEFORE AND AFTER



COMPONENT LIST

MODEL:

Sapphire 800 Diode

No.	Name	Quantity
1	Main Machine	1 set
2	Hand-piece (800w)	1 pc
3	Goggle (808nm)	1 pc
4	Funnel	1 pc
5	Key	2 pcs
6	Power line (European Standard 230 VAC)	1pc



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