

PermaICE Quattro™

Quad-Band Diode Laser

OPERATION MANUAL



PermaICE Quattro™

Quad-Band Diode Laser

Preface

Dear user:

Thank you for purchasing the PermaICE Quattro™ laser. To understand and make full and safe use of the product we suggest the following.

- 1 Please read the instruction manual in detail and keep it at hand for further reading and consultation.
- 2 Please follow the instruction manual to operate the machine correctly.
- 3 Please do not remove or change any accessories of the machine.
- 4 It forbids anyone other the appointed service engineer to open or remove the mainframe.
- 5 Please contact your local representative if there is any trouble during operation.

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1 Safety

Safety is always the first priority when using a laser. Safety for the user and safety for the client. The design of the laser has been deemed safe to European standards. This laser is safe for use on clients following correct product and core training.



Described in this chapter is the most important matters relating to the safe use of the equipment. Please make sure to read the manual and familiarize yourself with the laser and settings to avoid potential injury to clients, users or surroundings.

The PermaICE Quattro™ has an inbuilt comprehensive monitoring system. The system will only work correctly when the security conditions are adhered to. If the laser is not used correctly any error code must be reset and the laser reset to clear the error.

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★ SAFETY INTERLOCK ★

The Laser user controls the following parts of the safety interlock:

1 Safety Interlock

The laser is fitted with a safety interlock, this can either be connected to a door interlock, where required, or the connector must be connected.



2 Key switch

Laser systems are equipped with a key switch, which is to prevent unauthorized people from operating the system. The keys should be removed when the laser system is not in use and stored in a safe, preferable lock key cupboard. To turn the PermaICE Quattro™ ON, rotate the key switch clockwise by 90 degrees. To turn the PermaICE Quattro™ OFF, rotate the key switch 90 degrees anticlockwise.

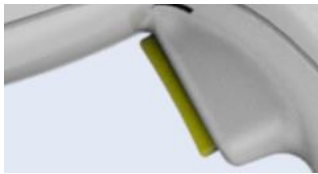
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3 Laser Firing

If the laser is ready to fire when the handpiece button is depressed the laser will fire. Releasing the hand piece button will stop the laser firing.



4 Foot switch

If the laser is ready to fire when the Foot pedal is depressed the laser will fire. Releasing the foot pedal will stop the laser firing.



5 Emergency switch

In the event of an emergency and the laser needs to be stopped, the emergency stop switch located above the key switch can be pressed. This will stop the electricity supply to the entire

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laser therefore cutting laser emission. To reset the emergency switch, rotate the button clockwise until it pops up, then then follow the standard start-up procedure.



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★GENERAL LASER SAFETY★

- 1 Do not look directly into the laser hand piece when firing. Even if you are wearing laser safety goggles, it may cause serious eye damage and even blindness.
- 2 The door of the treatment room should have a clear sign indicating the high-energy **DIODE LASER** is in use.
- 3 A sign should be placed on the treatment room door indicating that the laser is in use.
- 4 The interior of the treatment room should have no reflecting surfaces such as mirrors etc.
- 5 Make sure all persons in the room are wearing protective glasses that meet national and international standards. Protective glasses must achieve optical density of grade 5 or above to include the wavelengths delivered from the laser i.e. (808nm, 755nm, 1064nm
- 6 Make sure any safety laser blinds are closed prior to any laser treatment. There should be appropriate blinds or window covers to ensure that any light emitted from the device is contained.
- 7 The interior of the treatment room should have no reflecting surfaces such as mirrors etc.
- 8 All surfaces, including floors, should be kept clean and dust-free. For hygiene and ease of movement of the device, it is recommended that the floor surface is washable and uncarpeted.
- 9 Check regular the laser hand piece and clean to ensure the laser hand piece is in a good working condition.
- 10 Check regular the laser hand piece and clean to ensure the laser hand piece is in a good working condition.
- 11 Only fully trained operators should operate the DIODE LASER

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- 12 Qualified personnel only and those relevant to the procedure, should be present in the treatment room, and all should be aware of the safety protocols necessary to isolate the system in an emergency.
- 13 All practitioners/operators and other related personnel should read the User Manual thoroughly prior to operating the PermaICE Quattro™.
- 14 Only fire the laser within the treatment area.
- 15 Make sure the foot pedal for the laser is not confused with the foot pedal or another machine and accidentally fire the laser.
- 16 Do not use the diode laser near inflammable or other corrosive materials.
- 17 Ensure a correct patch test has been performed prior to any laser treatment.
- 18 Ensure correct consent has been received prior to any laser treatment.
- 19 Ensure a correct patch test has been performed prior to any laser treatment.
- 20 Ensure correct consent has been received prior to any laser treatment.
- 21 Be careful when treating eyebrows and do not treat eyelashes, or other areas of thin skin around the eyelids. If the treatment area is too close to the eye, it may cause severe eye damage and possible blindness.

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★Patch Test Protocol★

- 1 Prior to any treatment with the PermaICE Quattro™, it is important to perform a patch test to ensure the patient is suitable for treatment. The patch test is usually carried out close to the area that will be treated, and it is important to remember that this is a skin test to check for photo allergy and to determine optimum fluence to achieve the treatment endpoint, not to see if the hair will fall out.
- 2 When treating the face, it is recommended that the patch test is carried out on the side neck area, below the ear, this ensures that in the unlikely event of any reactions, they are not on the face.
- 3 All other treatment areas can be patch-tested alongside the proposed treatment site. Remember that this is a skin test to check for photoallergy and to determine optimum fluence to achieve the treatment endpoint, and not a test to see if the hair will drop out. If there is hair in the area to be tested, trim hair to 1 mm in length. * Remove any make-up, perfume or skin products (including deodorant) in the area to be tested.
- 4 Always consider the tone of the skin as well as the actual skin type before setting or making adjustment to the recommended parameters.
- 5 Check the area and document any reactions such as erythema (reddening) or oedema in the treated area.
- 6 In the case of Skin Types 1 – 3, it is recommended that the patient waits 24-48 hours depending on skin tone. With regards to skin types 4 – 6. The patient should wait between 7 – 14 days depending again on the tone of the skin.

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★ELECTRICAL SAFETY OF THE DEVICE★

- 1 1 (PermaICE Quattro™) semiconductor laser hair removal device. Input power supply voltage could be AC110V and AC220V.

See the label behind the machine to confirm before use the correct input power.
- 2 There are dangerous high voltages within the housing of this device and some components may carry a residual charge. Therefore, no one other than the technicians appointed by Manufacturer, or the Distributor can disassemble and repair any parts in the casing.
- 3 Do not use any water-based substance on the laser or mainframe, this action could damage the device and or cause electrical shocks.
- 4 If a water leak is detected within the machine or hand piece do not turn on or start the device. If the device is already running stop immediately. Contact Optilight Ltd immediately.
- 5 This machine is grounded (earthed) through the yellow and green lines in the three-core power supply line. Please ensure that your input power outlet has a protective ground wire and a safe grounding.
- 6 Make sure that all personnel using or within the room are familiar with the control of the machine and know how to shut it down quickly.
- 7 The fuse automatically fails if there is an internal electrical fault within the system, protecting the instrument and personal safety.

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★SAFETY IDENTIFICATION★

- 1 “AC 220V 50Hz” or “AC 110V 60Hz” refers to input power specifications identification.
- 2 “F250V L10A” and “F250V L20A” refers to Fuse models and rated values.

★FIRE PREVENTION★

- 1 Do not use this device in an environment with any flammable and explosive materials.
- 2 After cleaning or the device or the skin with any substance containing alcohol. Wait for the alcohol to dry before using the machine.
- 3 If any anesthesia is used it needs to be a non-flammable substance.
- 4 If any oxygen is used within the surroundings pay special attention as it can cause a more flammable environment.
- 5 With the area of operation be careful with the use of flammable substances such as towels and tissues.
- 6 Do not leave the laser turned on and unattended.
- 7 Unplug the power cord if not in use for long time.
- 8 As absorption of optical energy can increase the temperature of any absorbing substance precautions should be in placed to reduce the risk of igniting combustible materials in and around the treatment area.
- 9 Unstable or flammable solvents should not be used near or on the system.

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- 10 Unstable or flammable solvents or substances should not be used on the treatment area or in preparation of the skin prior to treatment with the PermaICE Quattro™. If required, use soap and water to clean and prepare the skin.

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Benannt durch/Designated by
Zentralstelle der Länder
für Gesundheitsschutz
bei Arzneimitteln und
Medizinprodukten
ZLG-BS-244.10.08



Product Service

EC Certificate

Full Quality Assurance System
Directive 93/42/EEC on Medical Devices (MDD), Annex II excluding (4)
(Devices in Class IIa, IIb or III)

No. G1 094011 0009 Rev. 00

Manufacturer:

Zhengzhou PZ Laser Slim

Technology Co., Ltd

Room 201, 2nd Floor, Building 2

No. 52 Hongsong Road

High-tech Development Zone

450001 Zhengzhou City, Henan Province

PEOPLE'S REPUBLIC OF CHINA

Facility(ies):

Zhengzhou PZ Laser Slim Technology Co., Ltd

Room 201, 2nd Floor, Building 2, No. 52 Hongsong Road, High-tech Development Zone, 450001 Zhengzhou City, Henan Province, PEOPLE'S REPUBLIC OF CHINA

Product Category(ies): Diode Laser Hair Removal Device
for Medical Use Only

The Certification Body of TÜV SÜD Product Service GmbH declares that the aforementioned manufacturer has implemented a quality assurance system for design, manufacture and final inspection of the respective devices / device categories in accordance with MDD Annex II. This quality assurance system conforms to the requirements of this Directive and is subject to periodical surveillance. For marketing of class III devices an additional Annex II (4) certificate is mandatory. See also notes overleaf.

Report No.: SH19101301

Valid from: 2019-10-21

Valid until: 2024-05-26

Date, 2019-10-21

S. Pennit

Stefan Preiß
Head of Certification/Notified Body

Page 1 of 1

TÜV SÜD Product Service GmbH is Notified Body with identification no. 0123

TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

TUV®

The PermaICE Quattro™ complies with Medical CE certification as above

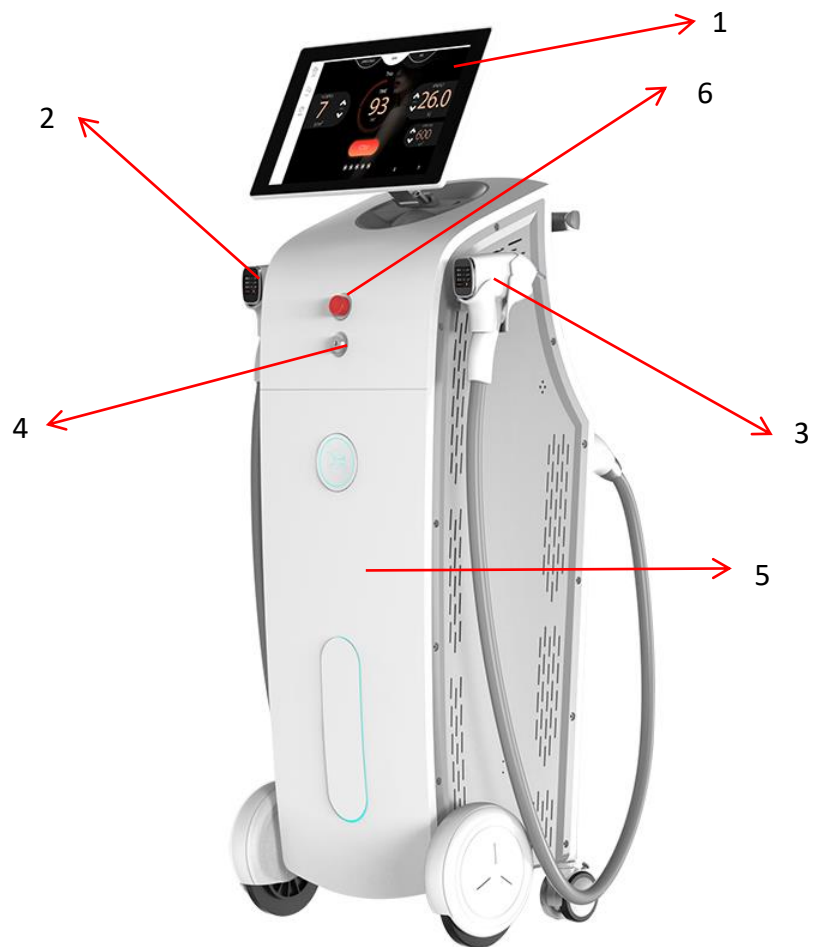
PermalCE Quattro V1.1

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2 Product Structure

Figure 1 identifies the following parts:

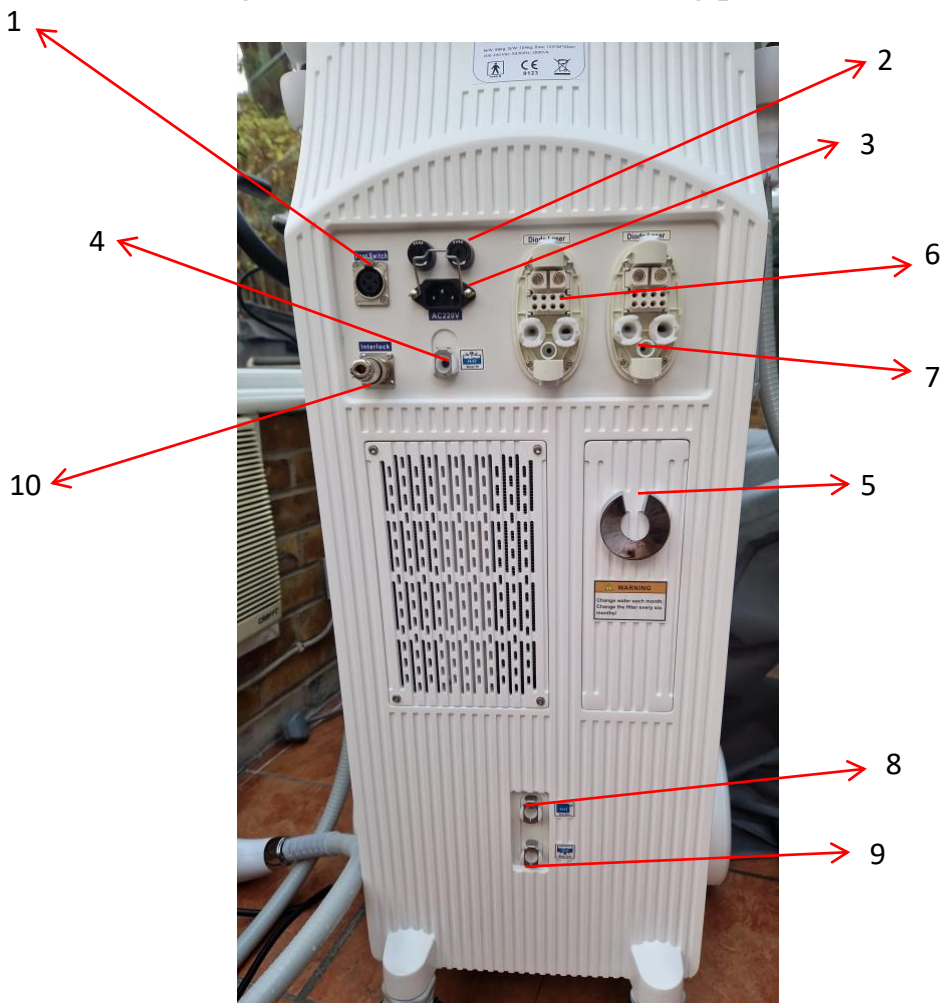


1	Touch control panel	5	Machine
2	Small Laser hand piece	6	Emergency stop switch
3	Large Laser hand piece		
4	Key switch		

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Figure 2 identifies the following parts:



1	Foot switch interface	7	Laser hand piece socket 2
2	Fuses	8	Overflow
3	Power Inlet	9	Water outlet
4	Water Inlet	10	Door Interlock
5	Filter maintenance window		
6	Laser hand piece socket 1		

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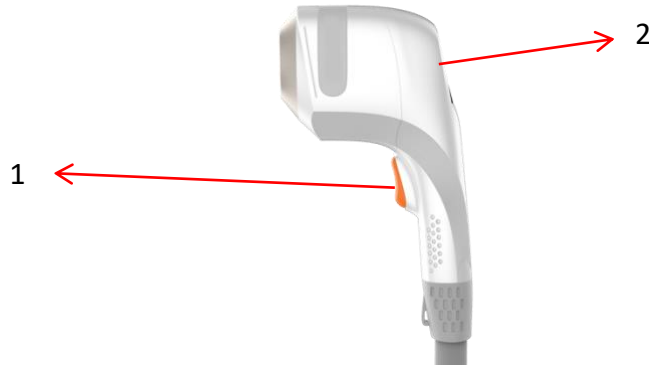
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★PARTS LIST★

Name	Picture
Laser Hand Piece	
Protective eyewear	
Protective patient blacking specs	
Foot switch	
CPC head of a drainage	
Water adding funnel	
Power cord	

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- 1 Laser hand piece switch.
- 2 Shot count display.

★STANDARD DELIVERY LIST★

The following is the standard shipping list to a client. Please note these may change for the specific circumstances.

No.	Name	Quantity	Remarks
1	Laser device	1 unit	
2	Laser hand piece	2 off	1 Large and 1 small
3	8mm tip	1 set	
4	Key Switch	2 pcs	
5	fuse	2 pcs	(1) Mode NA FUSE:“F250V L20A” (2) Mode NB FUSE:“F250V L10A”

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6	Foot switch	1 set	
7	Water adding funnel	1 set	With CPC head of a drainage
8	Power cord	1 pc	
9	rubber sealed loop	10pcs	
10	Protective glass	1pc	Operator wear
11	Protective blacking specs	1pc	Customers wear
12	Gel	1 case	
13	Bracket	2 set	Includes bracket for hand piece

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3 Machine Specification

Main parameters:

- 1 Rated input power: AC110V/60Hz or AC220V/50Hz
- 2 Maximum input power: 3600W
- 3 Laser wavelength: 755nm+808nm+940nm+1064nm combination
- 4 Adjustable frequencies: 1~10HZ
- 5 Adjustable pulse width: 10ms to 50ms
- 6 Adjustable energy density: 1 to 50 J/cm²
- 7 Semiconductor Handset Refrigeration Level: 0 to 5 degrees
- 8 Refrigeration system: water refrigeration + semiconductor refrigeration + air cooling
- 9 Working Mode: HR, SHR and SHR Stack
- 10 Operational Capability: Supports 24 Hours of Uninterrupted Work
- 11 Treatment handle indicator: Green
- 12 Coolant: distilled or deionized water
- 13 Volume: 132cm×63cm×57cm
- 14 Total weight (net weight): 85kg
- 15 Fuses: F250V L20A (110V power) or F250V L15A (220V power)
- 16 Operating temperatures: 10 °C ~ 32 °C Storage temperature: 5 °C ~ 55 °C
- 17 Relative Humidity: ≤80%

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★PRODUCT CHARACTERISTICS★

The PermaICE Quattro™ is a semiconductor laser hair removal device, based on the semiconductor laser technology known as solid art, this some competitive advantages:

- 1 High speed and efficiency, the frequency is up to 20Hz making the treatment time short.
- 2 The machine is designed to work for 24 hours a day.
- 3 Excellent hair reduction on all skin types and all hair types.
- 4 Super cooling, integrated skin cooler for comfortable, cold and painless treatments as well as ice hand piece for patient aftercare.
- 5 Touch-screen computer control, easy to use user interface designed to make treatments more comfortable and convenient with intelligent and expert modes.

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4 Working Principle

1064nm + 940nm + 755nm + 808nm Hand piece

The laser hand piece is a semiconductor laser using tri-clustered diode technology. This provides the benefits of 4 effective laser wavelengths for hair removal in one device with energy delivered simultaneously (808nm, 755nm, 940nm and 1064nm). Each wavelength targets a different structure within the hair follicle.

The 3 main target areas are the Bulge, Bulb and Papilla.

The 808nm wavelength can reach the dermal papilla which is deep penetration of the hair follicle. 808nm has a moderate melanin absorption making it relatively safe for all skin types including darker skins (except skin type 6). Its deep penetration capabilities target also the bulb and bulb of the hair follicle.

The Alexandrite 755nm wavelength offers more powerful energy absorption by melanin making it ideal for most hair types and hair colour and is especially useful for lighter hairs and thinner hairs. The 755nm wavelength targets the bulge of the hair follicle.

The Diode laser 940nm has a characteristic for reaching deep into the skin, making it possible to remove hair efficiently. It is a medical laser effective in eliminating inflammation.

The Nd:Yag 1064nm wavelength is characterized by lower melanin absorption making it more focused for darker skin types. The Nd:Yag also offers the deepest penetration for the hair follicle allowing it to target the bulb and Papilla. Higher water absorption generates a higher temperature increasing the thermal profile of the laser treatment for most effective hair removal.

By combining these characteristics with the correct pulse duration ensures enough thermal damage to the target tissues of the hair follicle leaving the surrounding tissues unaffected. By providing the correct energy density it ensures energy output is strong enough and long enough

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to damage the target tissue. The use of epidermal protection in the form of cooling ensures the protection of the patient during the treatment.

808nm wavelength (Available as an additional hand piece)

The 808nm wavelength can reach the dermal papilla which is deep penetration of the hair follicle. 808nm has a moderate melanin absorption making it relatively safe for all skin types including darker skins (except skin type 6). Its deep penetration capabilities target also the bulb and bulb of the hair follicle.

1064nm Hand piece (Available as an additional hand piece)

The Nd:Yag 1064nm wavelength is characterized by lower melanin absorption making it more focused for darker skin types. The Nd:Yag also offers the deepest penetration for the hair follicle allowing it to target the bulb and Papilla. Higher water absorption generates a higher temperature increasing the thermal profile of the laser treatment for most effective hair removal.

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5 Scope of Application

- 1 Quad-Cluster hand piece suitable for all skin types, including suntanned skin. Please note that whilst it is possible to treat skin types 6 with this hand piece it is highly recommended to use the 1064nm wavelength on its own.
- 2 1064nm hand piece suitable for all skin types, including suntanned skin but better for darker skin types 4-6.
- 3 808nm hand piece suitable for all skin types, including suntanned skin. Please note that whilst it is possible to treat skin types 6 with this hand piece it is highly recommended to use the 1064nm wavelength on its own.
- 4 The lasers are suitable to remove all types of hair including (cheek hair, lip hair, beard hair, neck hair, back hair, chest hair, chin hair, arm hair, bikini hair, leg hair).
- 5 Can help reduce lighter hairs.
- 6 Can treat pseudo folliculitis.

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6 Contraindications

No contraindications to semiconductor lasers have been found yet, but care should be taken when laser hair removal treatment is performed on the following customers (This is not a definitive list and correct consent should always be obtained prior to any laser treatment)

- 1 A person with a history of scarring or a known scar in treatment area.
- 2 Persons who are susceptible to or have a history of herpes in the treatment area.
- 3 People who have used a hair removal method (such as waxing) within last 6 weeks.
- 4 People with immune deficiency.
- 5 If you use hydroquinone or other bleaching agents, you need to know if the customer is highly sensitive to it.
- 6 People who used oral liquid Accutane (Isotretinoin) within six months.
- 7 People who have used anticoagulants within six months.
- 8 Individuals with a personal or family history of melanoma.
- 9 People with abnormal growth in the treatment area.
- 10 Person with a history of lentigines, an autoimmune vascular disease that causes color changes in the legs or arms due to obstruction or stenosis of blood vessels.
- 11 A person with a history of erythema, an acquired, long-lasting reticulocyte red and pigmented rash, caused by persistent or repeated exposure to intense heat or infrared radiation.
- 12 People who have had other laser treatments and have had subsequent problems.
- 13 Person who is unable or unwilling to follow the schedule of treatment.
- 14 Pregnancy.

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15 Infants.

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7 General laser treatment

Skin Test: A skin test is recommended before every treatment course.

A recommended area for skin test is as per the diagram below (under ear) this is because this is a sensitive area of the skin. If the patient tolerates the energy delivered here normally the rest of the body is safe to treat.



Deliver 1-2 shots on this area, stay 2-3 minutes to assess any changes on the skin and ask patient's feedback. Increase or decrease the energy a little according to your patient's feedback before commencing treatments.

Remember to start from the lowest energy point and work upwards.

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Shave the hair: It is recommended to leave 2/3mm of hair growth only to ensure laser energy is delivered to the hair follicle.



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Clean: Before any laser treatment clean the area to be treated as shown below



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Conductive gel: Before any laser treatment you need to put 1-2mm of gel onto the treatment area. This is to maximize protection of the skin and aid movement of the headpiece, as shown below.



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Delivery of laser energy: Set the parameters as described in this manual and then deliver energy to the area required.



After treatment: Clean off the gel and put the laser device into standby and use the cooling hand piece if required for 5-10 minutes or as per patient feedback.

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Patient expectations:

- 1 The patient should be advised of the following after laser treatment.
- 2 The skin may show redness and a thermal sensation (heat). Patients can use ice if required to relieve any discomfort though this is not normally required. Redness normally dissipates within 48 hours.
- 3 Sometimes there maybe itching after treatment.
- 4 Sometime there maybe scabs after treatment though this does not happen very often.
- 5 Always keep the skin moist and used sun protection 3-6 months after hair removal treatment to protect from UV rays.
- 6 Avoid excessive scrubbing at treatment site and avoid hot conditions immediately after treatment.

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7 Basic operation

This chapter describes the operation of laser device not the specific treatment parameters. Please see chapter of treatments.

★Definitions★

Fluence

The pulse energy (measured in Joules) is the total energy delivered in the selected pulse duration (measured in ms). The pulse energy divided by the spot size (measured in cm²) gives the energy density (or fluence), which is measured in Joules per square centimeter (J/cm²) and is set by the practitioner for every treatment.

With a large spot size, the scattering effect in human tissue is minimized and therefore deeper penetration is achieved.

The temperature of the target chromophore (hair), surrounding tissue and epidermis is intensified if the fluence is increased.

Kilojoules (kJ)

Accumulative or total energy delivered to the tissue for a given area is measured in kilojoules (kJ). This is calculated as Fluence (J/cm²) x Time (seconds) divided by 1000.

Gridding or Division

Gridding or division of the larger treatment areas such as the back, legs or arms is a method of delivery of a fixed dose of energy which will be conveyed in KJ (example: 6-8.KJ).

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Pulse Type – Duration

The energy emitted from PermaICE Quattro™ is emitted in pulses – this refers to the length of time between the pulses. Pulse management is defined by the software Which uses a specific technique to raise the temperature gradually and effectively whilst minimalizing damage to surrounding tissue.

★Photography★

1. It is always recommended to include photography as part of the treatment process as this can prove to be extremely valuable for both the practitioner and the patient. Many patients are unable to assess the progression of the treatments as the improvement is generally gradual. A photograph taken prior to the first treatment and another at say the 5th or 6th treatment enables the patient to see the progress.
2. This is also valuable for the practitioner as they also will be able to evaluate the results and make necessary changes to each treatment given.
3. Always ensure that any photographs taken are standardised with similar camera speed, flash (if required) and focal distance as this ensures consistency enabling an objective evaluation of photographs that have been taken at different times.

★BOOT STEPS★

- 1 Make sure the laser system has been correctly installed and tested by a qualified engineer before turning on. The system should be filled with water by the engineer.
- 2 The instrument power cord is plugged in and turned on.

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- 3 The emergency stop switch is in the off position.
- 4 Turn the key switch on 90 degrees clockwise. The machine will self-test and purged water. Leave the machine for approximately 2 minutes before operation and until welcome screen.

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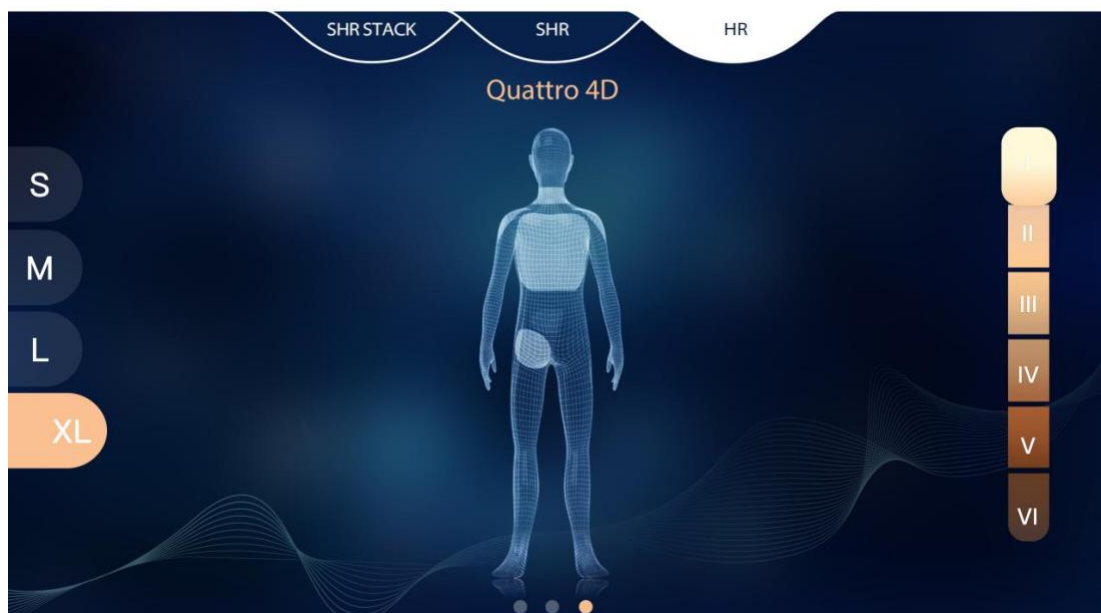
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★MACHINE INTERFACE OPERATION★

- 1 After turning on the machine, you will see welcome interface.
- 2 Select the correct the handpiece that you are wishing to use. Either 4D (small handpiece) or Quattro 4D (large handpiece)



- 3 After this screen you will be asked to select the Area Size, the Treatment Area and also the Skin Type



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	Select the size of the treatment area according to the part to be treated, S means the smallest area, M means the medium area, L means the large area, and XL means the largest area.
	To choose the treatment areas. You can swipe left or right on the screen to choose the correct body area, or click the bottom to choose , the sequence, the front of the human body, the face, and the back of the human body; The current icon represents the chest on the front of the human body, and you can click each part in the icon to switch.
	Choose the skin types from from I to VI

To navigate between screens, use the following buttons.



HOME

Click to return to the home page.



BACK

Click to return to the previous interface.



RESET

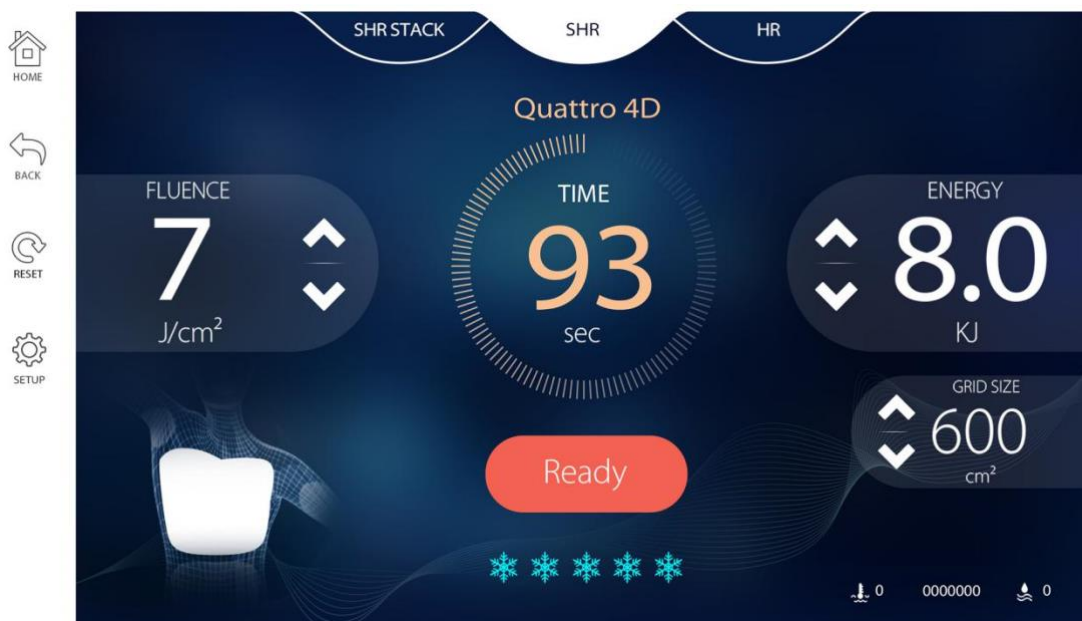
Click to restore default values.

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★Working Modes★

★SHR Mode★



- 1 **Energy Intensity.** The energy per pulse, the Fluence J/cm², is pre-set by the treatment parameters entered in the previous screen. However, this can be adjusted manually using the up and down arrow located within the Fluence window.
- 2 **Working Time.** The time is auto set by the laser. This is dependent on the Energy Density, the Treatment Area and the Energy to be delivered. This cannot be adjusted.
- 3 **Total Energy.** This is the energy that is to be delivered into the area set by the laser according to the parameters set by the user in the previous screen. This can be manually adjusted by the operator if required by using the up and down arrows located within the Energy window.

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- 4 **Grid Size.** This is the size of each grid. This has been set within the previous screen, however, if the operator needs to adjust this size manually this can be achieved by using the up and down arrow within the window for the Grid Size.
- 5 **Working Mode.** On the top of the screen is detailed the mode of operation. The mode of operation will be highlighted.
- 6 **Treatment Area.** The treatment area that has been selected in the previous screen will be detailed in the bottom left-hand corner of the screen.
- 7 **Water Temperature.** This is an indication of the water temperature. If the water temperature is too high, then this icon will turn red and the laser will not work until the water has cooled down. If the icon turns red after a short period of time, then the service department will need to be contacted.
- 8 **Total Shot Count.** The total shot count for the applicator will be displayed in the lower right-hand corner of the screen.
- 9 **Water Flow.** The water flow is an indicator on the flow of the water. If there is insufficient water flow this icon will turn red. If this icon turns red then the service department will need to be contacted.
- 10 **Cooling level.** This is the level of cooling that is applied to the tip of the laser applicator. The more blue stars indicates the colder the tip will become.
- 11 **Standby/Ready.** To operate the laser, press the 'Standby' button. The button will turn red and display 'Ready'. In this state the laser can be used by either pressing the footswitch (if connected) or the trigger on the applicator. Once you wish to stop the treatment then press the 'Ready' button and the laser will go into standby.

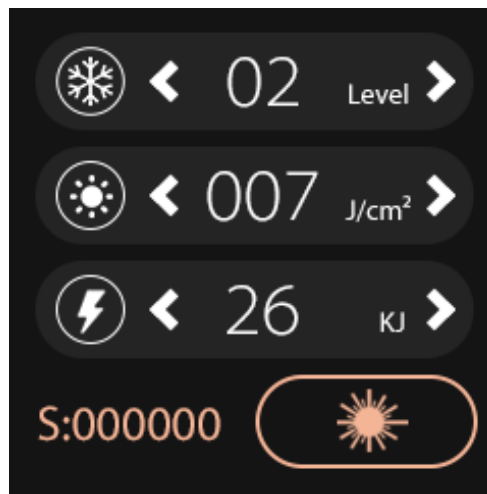
Please note:- the settings cannot be adjusted once the laser is in 'Ready' mode. Only when the laser is in 'Standby' mode adjustments can be made.

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★Applicator Interface in SHR Mode★

With the PermaICE Quattro, the user can adjust the setting and operate the laser by using the touch screen on the rear of the applicator.



- 1 **Cooling Level.** This can be adjusted by using the top controls. This can be adjusted by using the left and right arrows for the cooling level.
- 2 **Energy Intensity.** The energy intensity can be adjusted using the left and right arrows within the middle control. The arrows will increase and decrease the J/cm².
- 3 **Total Energy.** The total energy delivered to each grid can be adjusted by using the left and right arrows in the lower control settings. The energy can be increased and decreased accordingly in increase and decrease the KJs.
- 4 **Shot Count.** The shout count for the treatment can also be seen via this display.
- 5 **Standby/Ready button.** The laser can be placed into 'Ready' mode and also 'Standby' mode by using this button. The same button is used to place the laser into standby.

Please note:- the settings cannot be adjusted once the laser is in 'Ready' mode.

Only when the laser is in 'Standby' mode adjustments can be made.

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Quad-Band Diode Laser

★ SHR Stack Mode★



- 1 **Energy Intensity.** The energy per pulse, the Fluence J/cm², is pre-set by the treatment parameters entered in the previous screen. However, this can be adjusted manually using the up and down arrow located within the Fluence window.
- 2 **Stack Mode.** The 'Stack' mode function allows a series of pulses to be fired, in a short burst, set by the number of pulses required. Stack 1, one pulse, stack 3, three pulses will be fired within the burst. The max is Stack 5. The energy density that is set will be fired the number of stacks that have been set. (e.g. 5J/cm² energy density, with stack 3, the laser will deliver a burst of 3 pulses at 5J/cm² each, delivering a total of 15J/cm²). Each time a stack is to be delivered the trigger or the foot switch will need to be pressed each and every time.
- 3 **Total Energy.** This is the total energy that has been delivered whilst using the stack mode.
- 4 **Working Mode.** On the top of the screen is detailed the mode of operation. The mode of operation will be highlighted.

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- 5 **Treatment Area.** The treatment area that has been selected in the previous screen will be detailed in the bottom left-hand corner of the screen.
- 6 **Water Temperature.** This is an indication of the water temperature. If the water temperature is too high, then this icon will turn red, and the laser will not work until the water has cooled down. If the icon turns red after a short period of time, then the service department will need to be contacted.
- 7 **Total Shot Count.** The total shot count for the applicator will be displayed in the lower right-hand corner of the screen.
- 8 **Water Flow.** The water flow is an indicator on the flow of the water. If there is insufficient water flow this icon will turn red. If this icon turns red, then the service department will need to be contacted.
- 9 **Cooling Level.** This is the level of cooling that is applied to the tip of the laser applicator. The more blue stars indicates the colder the tip will become.
- 10 **Standby/Ready.** To operate the laser, press the 'Standby' button. The button will turn red and display 'Ready'. In this state the laser can be used by either pressing the footswitch (if connected) or the trigger on the applicator. Once you wish to stop the treatment then press the 'Ready' button and the laser will go into standby.

Please note:- the settings cannot be adjusted once the laser is in 'Ready' mode. Only when the laser is in 'Standby' mode adjustments can be made.

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Parameters for the SHR mode as follows: Quad-cluster hand piece.

Please note: - this is for guidance only and can be used for patch test. The final parameters should be determined by operator by increasing or decreasing energy as per clinical end points.

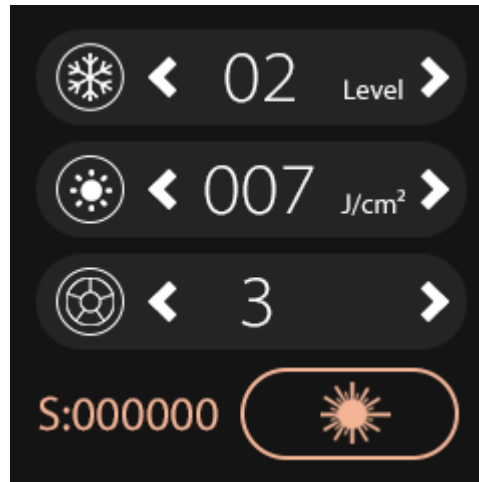
Skin Type	Skin Test Fluence (J/cm ²)	Grid Size (cm ²)	Accumulative Energy(kJ)	Cooling level
I	10	150	8-10	4-5
II	10	150	8-10	4-5
III	10	150	8-10	4-5
IV	8	150	8-10	4-5
V	7	150	7-9	4-5
VI	5	150	7-9	4-5

★Applicator Interface in SHR Stack Mode★

With the PermaICE Quattro, the user can adjust the setting and operate the laser by using the touch screen on the rear of the applicator.

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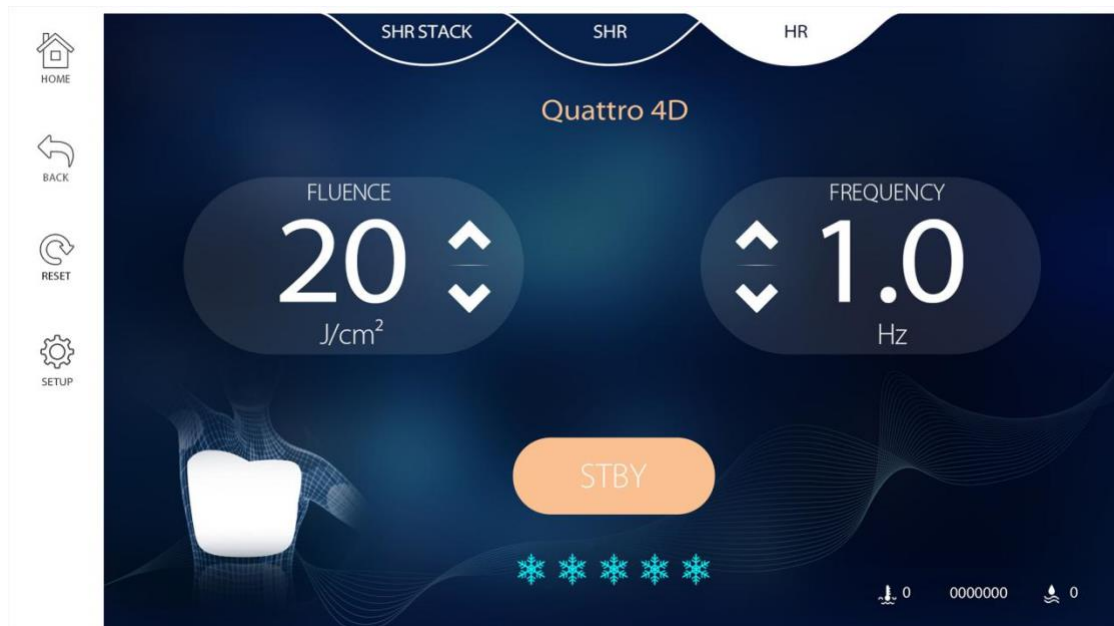
- 1 **Cooling Level.** This can be adjusted by using the top controls. This can be adjusted by using the left and right arrows for the cooling level.
- 2 **Energy Intensity.** The energy intensity can be adjusted using the left and right arrows within the middle control. The arrows will increase and decrease the J/cm².
- 3 **Stack Control.** The Operator can control the quantity of pulses within each Stack/burst. This ranges from one to five.
- 4 **Shot Count.** The shout count for the treatment can also be seen via this display.
- 5 **Standby/Ready button.** The laser can be placed into 'Ready' mode and also 'Standby' mode by using this button. The same button is used to place the laser into standby.

***Please note:- the settings cannot be adjusted once the laser is in 'Ready' mode.
Only when the laser is in 'Standby' mode adjustments can be made.***

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★HR Mode★



- 1 **Energy Density.** The energy per pulse, the Fluence J/cm², is pre-set by the treatment parameters entered in the previous screen. However, this can be adjusted manually using the up and down arrow located within the Fluence window.
- 2 **Frequency.** This is the quantity of shots the laser will fire, per second, during the treatment. This can be adjusted by using the up and down arrows in the frequency window.
- 3 **Treatment Area.** The treatment area that has been selected in the previous screen will be detailed in the bottom left-hand corner of the screen.
- 4 **Standby/Ready.** To operate the laser, press the 'Standby' button. The button will turn red and display 'Ready'. In this state the laser can be used by either pressing the footswitch (if connected) or the trigger on the applicator. Once you wish to stop the treatment then press the 'Ready' button and the laser will go into standby.
- 5 **Working Mode.** On the top of the screen is detailed the mode of operation. The mode of operation will be highlighted.

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- 6 **Water Temperature.** This is an indication of the water temperature. If the water temperature is too high, then this icon will turn red, and the laser will not work until the water has cooled down. If the icon turns red after a short period of time, then the service department will need to be contacted.
- 7 **Total Shot Count.** The total shot count for the applicator will be displayed in the lower right-hand corner of the screen.
- 8 **Water Flow.** The water flow is an indicator on the flow of the water. If there is insufficient water flow this icon will turn red. If this icon turns red then the service department will need to be contacted.
- 9 **Cooling Level.** This is the level of cooling that is applied to the tip of the laser applicator. The more blue stars indicates the colder the tip will become.

★Applicator Interface in SHR Stack Mode★

With the PermaICE Quattro, the user can adjust the setting and operate the laser by using the touch screen on the rear of the applicator.



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- 1 **Cooling Level.** This can be adjusted by using the top controls. This can be adjusted by using the left and right arrows for the cooling level.
- 2 **Energy Intensity.** The energy intensity can be adjusted using the left and right arrows within the middle control. The arrows will increase and decrease the J/cm².
- 3 **Frequency.** This is the quantity of shots the laser will fire, per second, during the treatment. This can be adjusted by using the up and down arrows in the frequency window.
- 4 **Shot Count.** The shout count for the treatment can also be seen via this display.
- 5 **Standby/Ready button.** The laser can be placed into 'Ready' mode and also 'Standby' mode by using this button. The same button is used to place the laser into standby.

Please note:- the settings cannot be adjusted once the laser is in 'Ready' mode.

Only when the laser is in 'Standby' mode adjustments can be made.

The below tables give some examples of parameters used in hair removal on all skin types and numerous areas of the body. These are only guide and skin patch test should always be performed first, and settings determined from reaction.

Skin Type/ Body Part	Face (J/cm ² , Hz)	Underarm (J/cm ² , Hz)	Arm (J/cm ² , Hz)	Cooling Level
I	1Hz: 12-25J/cm ²	1Hz: 13-28J/cm ² 3Hz: 12-27J/cm ² 5Hz: 10-26J/cm ²	10Hz: 10-25J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-23J/cm ²	4-5
II	1Hz: 12-20J/cm ²	1Hz: 10-16J/cm ² 3Hz: 10-16J/cm ² 5Hz: 10-16J/cm ²	10Hz: 10-24J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-25J/cm ²	4-5
III	1Hz: 11-20J/cm ²	1Hz: 13-18J/cm ² 3Hz: 12-17J/cm ² 5Hz: 10-16J/cm ²	10Hz: 10-21J/cm ² 15Hz: 10-20J/cm ² 20Hz: 10-19J/cm ²	4-5
IV	1Hz: 7-18J/cm ²	1Hz: 9-19J/cm ² 3Hz: 8-18J/cm ²	10Hz: 8-19J/cm ² 15Hz: 8-18J/cm ²	5

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		5Hz: 7-18J/cm ²	20Hz: 8-17J/cm ²	
V	1Hz: 7-19J/cm ²	1Hz: 7-16J/cm ² 3Hz: 6-13J/cm ² 5Hz: 7-18J/cm ²	10Hz: 6-16J/cm ² 15Hz: 5-15J/cm ² 20Hz: 5-14J/cm ²	5
VI	1Hz: 5-18J/cm ²	1Hz: 5-16J/cm ² 3Hz: 5-13J/cm ² 5Hz: 5-18J/cm ²	10Hz: 5-14J/cm ² 15Hz: 5-14J/cm ² 20Hz: 5-15J/cm ²	5

Skin Type/ Body Part	Leg (J/cm ² , Hz)	Upper Lip (J/cm ² , Hz)	Bikini (J/cm ² , Hz)	Back (J/cm ² , Hz)	Cooling Level
I	10Hz: 10-25J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-23J/cm ²	1Hz: 12-25J/cm ²	1Hz: 12-25J/cm ²	10Hz: 10-25J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-23J/cm ²	4-5
II	10Hz: 10-24J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-25J/cm ²	1Hz: 12-20J/cm ²	1Hz: 12-20J/cm ²	10Hz: 10-24J/cm ² 15Hz: 11-24J/cm ² 20Hz: 10-25J/cm ²	4-5
III	10Hz: 10-21J/cm ² 15Hz: 10-20J/cm ² 20Hz: 10-19J/cm ²	1Hz: 11-20J/cm ²	1Hz: 11-20J/cm ²	10Hz: 10-21J/cm ² 15Hz: 10-20J/cm ² 20Hz: 10-19J/cm ²	4-5
IV	10Hz: 8-19J/cm ² 15Hz: 8-18J/cm ² 20Hz: 8-17J/cm ²	1Hz: 7-18J/cm ²	1Hz: 7-18J/cm ²	10Hz: 8-19J/cm ² 15Hz: 8-18J/cm ² 20Hz: 8-17J/cm ²	5
V	10Hz: 7-16J/cm ² 15Hz: 7-15J/cm ² 20Hz: 7-14J/cm ²	1Hz: 7-19J/cm ²	1Hz: 7-19J/cm ²	10Hz: 7-16J/cm ² 15Hz: 7-15J/cm ² 20Hz: 7-14J/cm ²	5
VI	10Hz: 6-16J/cm ² 15Hz: 6-14J/cm ² 20Hz: 6-15J/cm ²	1Hz: 5-18J/cm ²	1Hz: 5-18J/cm ²	10Hz: 6-16J/cm ² 15Hz: 6-15J/cm ² 20Hz: 6-14J/cm ²	5

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★TREATMENT CONSIDERATIONS★

The deeper the pigment of the skin, the greater the risk of similar epidermal damage during the treatment process. Patients who have darker skin after prolonged sun exposure have a higher risk of skin pigmentation in the treated area. These patients need to be treated with a lower energy density and greater pulse width than those who do not have sun exposure on the same skin types.

I.e. If they are a skin type 4 maybe treatment them as a skin type 5.

Exposure to direct sunlight on the treated skin immediately or within a month after surgery will also increase the risk of pigmentation.

In general, higher energy density will produce better therapeutic effects, but at the same time it will produce a larger inflammatory response that resembles epidermal damage. Therefore, we must start with a conservative approach (low energy density), perform a test patch treatment at the site where the customer needs treatment, and gradually increase the energy density until a satisfactory result is obtained.

The maximum allowable volume density is inversely proportional to the pigment depth of the customer's skin.

In order to achieve the same effect, customers with light hair need to use higher energy density because of less melanin in their hair.

The pulse width is usually proportional to the diameter of the hair. The shorter pulse width is better for finer hairs, and the longer pulse width is better for coarser hairs.

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★CLASICAL RESEARCH★

If the hair loss in the treatment area is displayed longer than a complete period of hair growth in this area, then we say that hair loss in this area is stable or permanent. The hair growth cycle is not the same in different parts of the body. The table below shows the growth cycle of hair in various parts of the body mentioned in the report.

Part	Hair Regression Cycle (Monthly)	Hair Growth Cycle (Monthly)	Total (Monthly)
Back	3-6	3-6	6-12
Thigh	3-6	3-6	6-12
Arm	3-5	1-2	4-7
Shank	3-4	4-5	7-9

Treatment studies have demonstrated the use of the PermaICE Quattro™ for permanent hair removal treatment is safe and effective. A total of one hundred and 2 (102) customers used the PermaICE Quattro™ laser hair removal apparatus to perform 1 or 2 treatments and were followed up at 1, 3, 6 and 9 months after the operation. Thirty-five (35) of them were followed for twelve (12) months. The removal of hair is defined by the number of hairs after treatment compared to the number before treatment. After a treatment of 1 to 2 visits, the percentage of hair removal was evaluated.

The results of this study show that treatment has two independent effects: delayed hair regeneration and permanent hair loss. Hair energy regeneration delays and temporary hair loss

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occur at every energy density used in all customers (100%). Transient hair loss usually lasts from 1 to 3 months.

After 6 months, the regeneration of the hair was stable, and there was no significant difference from the follow-up results after 6 months, 9 months, and 12 months later. The recently published expanded study indicated that there was a sustained stabilizing effect within an average of 20 months after treatment, suggesting that many defined hairs were removed, which also meets the definition of permanent hair loss.

During follow-up after the 12th month, significant permanent hair loss was achieved on all treatment sites of the customer including at different energy densities compared to the non-treated area. The number of hair loss increases with the increase of energy density and the number of treatments.

The results of traditional treatments for pseudo folliculitis (such as topical retinoid cream, ocular steroids, topical or oral antibiotics, surgical depilation, electrolysis, and tedious shaving methods) are disappointing. The present laser system provides effective tissue penetration for the destruction of hair follicles, can cause hair density reduction in the treated area, temporary or permanent decrease of hair follicles, and thus improve the acute and chronic development of pseudo folliculitis.

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★BEFORE AND AFTER★



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★CLASICAL RESEARCH★

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The results of this study show that treatment has two independent effects: delayed hair regeneration and permanent hair loss. Hair energy regeneration delays and temporary hair loss occur at every energy density used in all customers (100%). Transient hair loss usually lasts from 1 to 3 months.

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9 Maintenance and repair

Please be sure to follow the suggestions below, otherwise it may damage the laser device.

★MAINTENANCE TOUCH SCREEN★

- 1 Do not touch the touch screen with a sharp object.
- 2 Please keep the touch screen clean and avoid contact with water or any water-based substance.
- 3 Do not scrub the touch screen with alcohol or detergent. If necessary, wipe carefully with a soft, dust-free cotton fabric.
- 4 Do not hit the touch screen.

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★DAILY CHECKS AND MAINTENANCE★

- 1 Check the power cord. If there is any damage to the cord replace immediately.
- 2 Check laser hand piece if there is any abnormality contact your local representative immediately.
- 3 Check parameters before any treatment.
- 4 Do not place the instrument against a wall during use. Keep a minimum distance of 30 cm from the wall so that the instrument's cooling system can operate normally.
- 5 Avoid using the instrument in a humid environment and use a dehumidify if the environment is humid.
- 6 When the temperature is too low, or the instrument is not used for a long period of time, the temperature of the instrument must be restored to above 5 °C before turning on the instrument.
- 7 Do not use this instrument in an environment with a strong electromagnetic field.
- 8 When cleaning the device, the dust must be wiped with a dry, soft cloth, and then wiped with a soft, damp cloth. Before cleaning the instrument, you must turn off the power switch and disconnect the power cord.
- 9 Maintenance such as topping up the water, should only be carried out when the device is fully switched off and disconnected from the electrical supply as this could be hazardous to the operator.

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10 Common faults and troubleshooting methods

When the machine fails during operation, the user can refer to the following instructions to diagnose and resolve it. If you can't solve it yourself, please contact your local representative ASAP.

What if the instrument does not respond after turning on the main power switch?

- 1 Confirm that the AC power supplied is normal.
- 2 Check if the power cord is broken.
- 3 Check if the fuse is normal. If the fuse is blown, replace it with a new one immediately.

How to replace the fuse? (see the machine specification for the correct fuse)

- 1 Unplug the power cord and rotate the fuse holder in the direction of the arrow in the figure.

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- 2 Take out the damaged fuse and replace it with a new one.
- 3 Put the fuse cover back in place after replacing the fuse.
- 4 Connect the power plug and turn it on. If the instrument interface is normal, the fuse is working properly.

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What to do if the touch screen becomes inactive?

Please gently press the four corners and the center of the screen with your hand, then turn off the machine and wait for one minute before turning it on again.

What to do if the touch screen breaks?

Please contact your local representative.

What to do if the touch screen shows an error?

Please shut down and wait for one minute before turning it on. If the problem persists, contact your local representative.

After the boot, the screen prompts the lack of water how to do?

Contact the local representative who will talk through the process of adding water if needed or determine why the machine has lost water.

What can I do if the laser hand piece is not working?

Please check whether the indicator light on the tail of the laser hand piece is on. If it is not on, check whether the simmer function is on. If the problem persists, contact your local representative.

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11 Storage/Transportation/installation

★INSTRUMENT STORAGE PRECAUTIONS★

- 1 The user must store the instrument in a well ventilated, clean and safe room.
- 2 Please use medical alcohol to clean the treatment hand piece, ensure the hand piece is clean and dry.
- 3 Do not store the instrument in a hot and humid environment. The ambient temperature is 5°C to 55°C, the relative humidity does not exceed 80%, and the atmospheric pressure is 86Kpa to 106Kpa.
- 4 Do not store this instrument in a dusty and corrosive atmosphere.
- 5 Do not expose the machine to sunlight, do not shake or move the machine.
- 6 If it is not used for a long time, the water in the instrument must be completely drained.
- 7 The PermaICE Quattro™ is heavy and could cause injury if suitable caution is not observed when moving the device. The system is stable but should be moved with caution and never pulled by the umbilical cord.

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★Installation★

The PermaICE Quattro™ is designed to be installed and used in a clinical environment. On delivery, the laser system is installed completely on-site, and this includes testing and calibration.

The transportation and installation of the PermaICE Quattro™ is carried out by an authorized technical engineer who will:

- * Unpack the laser device and position it in the agreed location.
- * Check the system and agree all components are present.
- * Connect all attachments including handset module, footswitch, interlock etc.
- * Connect the laser device into the electrical outlet.
- * Fill the cooling reservoir of the device with deionized water.
- * Calibrate the device and test the functionality of all components and software.

Carry out a final on-site safety inspection of the energy output of the device

★Position★

The site allocated for the device should have adequate ventilation and airflow and in accordance with the dimensions of the system, allow at least 50 cm (20 inches) from any wall or other obstructions.

- * Flooring should be suitable to enable ease of movement of the device within the treatment room. The PermaICE Quattro™ has smooth functioning wheels that have a brake lock that, when applied, stabilises and locks the movement of the device.

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* After the device has been positioned, it is recommended to apply the wheel lock before treatment commences

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★ENVIROMENTAL PROTECTION INSTRUCTION★

Harmful substances and elements contained in products.

Part Name	Toxic and Hazardous Substance or Element						Note
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenylethers (PBDE)	
Plastic parts	○	○	○	○	×	×	
Metal structures/decorations	×	○	○	○	○	○	
Printed Circuit Assembly	×	○	○	○	○	○	
Power line	×	○	○	○	○	○	
Power cord	×	○	○	○	○	○	
Relay	○	○	×	○	○	○	

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○: Indicates that the harmful components contained in the component materials meet the SJ/T11363-2006 limit.

×: Indicates that the harmful components contained in at least one of the components exceed the SJ/T11363—2006 limit.

▼ After the product reaches the end of its useful life, discard it or refer to relevant legal regulations for repair and reuse

Environmental note notes:

The machine hardware frame structure, injection molded parts and most of the electronic components are in compliance with EU and Chinese hazardous substance restrictions. At present, because of technical restrictions, there is no effective substitute for harmful materials for the purpose of ensuring product performance. However, under normal working conditions, the product will not harm human health.

Environmental protection:

When the machine exceeds the service life, the instrument of the use period needs to be examined and approved by the engineer if it continues to be used, and the performance of the instrument must be periodically tested by the engineer in the subsequent use.

The scrapped instruments and accessories that exceed the service life should be recycled or reused in accordance with the relevant local laws to avoid environmental pollution.

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Chapter 12 – Contact Us



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