Installation and operational manual

For Photon (3W)   Photon Plus (10W)

ZOLAR
Technology & MFG

WIRELESS FOOT CONTROL COMPLIANCE

FCC:

15.19 (a) (3):

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

15.21:

Caution:
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.105:

NOTE:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

IC:

RSS-GEN:

7.1.2 Transmitter Antenna

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen

that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner uniquement avec une antenne d'un certain type et d'un gain maximal (ou inférieur), approuvé pour l'émetteur, par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain, de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

7.1.3 User Manual

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts d'une licence. L'exploitation est autorisée si les deux conditions suivantes sont respectées : (1) l'appareil ne doit pas produire de brouillage et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Product Description

Photon Series Diode Laser is a surgical device at the cutting edge of technology, designed for a wide variety of oral soft tissue and tooth whitening procedures. Photon Series Diode Laser utilizes a solid state diode as laser energy source. The energy is delivered to the operating area by means of a delivery system consisting of a flexible fiber connecting the laser source and the handpiece. The device is activated by means of a footswitch.

Main Structure

The therapy instrument consists of fiber connecting semi-conductor laser system, power supply system, microcomputer control system etc.

Evaluation the Facility and Environmental Consideration

In order to insure the safe use of the laser in your facility, please check to make sure that the proposed location has the following:

Power Requirements:
AC100-240V±10%, 50/60Hz
3.7-4.2 volt Lithium battery

Working Environment:
The room where the laser is used should have good cooling and heating system so that the laser can be operated within the optimum range of 20°-30°C (68°-86°F) with a humidity level between 40-60%.
Take careful attention that the support board is steady.
Do not place the unit next to walls or other locations that could decrease laser air change, and do not cover the unit with things or clothes while working.

Transport and Storage:
The unit should always be handled carefully and never banged, jarred, jolted, dropped, or hit. Do not transport the unit unless it is completely packaged inside of the transportation box.
The unit should be stored in a cool, dry place. Avoid storing or transporting the laser in temperatures below 0°C (32°F).
Cover the unit when not in use for extended periods of time.
We recommend storing the unit into the carrying box, and placing the box in a cool, dry place.
Care should be taken to ensure the system is stored in a place where it will be protected from accidental mishandling.

Lighting:
Overhead lighting and or dental unit light should provide enough illumination to allow good operator vision when activating the laser intra-orally.

Combustible Chemicals and Gases:
All gases that are combustible or support combustion and are used in the operatory area where the laser is in use must be turned off during the procedure. Cleaning supplies or other flammable chemical compounds should be stored in an area away from the surgical site in order to avoid possible combustion.

High Speed Vacuum Systems:
Plume evacuation is a priority when vaporizing tissues. The Clinician or operator, and their chair-side assistants should keep themselves and the patient safe by using a high volume vacuum system and high filtration masks that are suitable for virus and bacterial control.

Access and Visual:
Access to the treatment area should allow the dental team t orestrict entry while the

laser is in use. There should be a Laser In Use Safety Sign placed in a designated area adjacent to the entry into the treatment area.

Photon Series Diode Laser Frequency:

Photon Series diode laser wireless technology is electronically coded. Each pedal and Photon Series diode laser share a unique serial number interlock protocol for reliable operation.

A Photon Series pedal communicates with only one Photon Series diode laser. They are interlocked to only each-other's electronic codes.

If data from another Photon Series pedal is ever received, it is always ignored and discarded because of the mismatched electronic code.

If data were ever received from another wireless device that also operates in the 2.4Ghz radio spectrum, it would be ignored and discarded in the same way.

In summary, a Photon Series can only be activated by the unique paired pedal.

Indication for Use

The photon product is intended for use by dentists in oral soft tissue and tooth whitening procedures, etc. The specific applications are as follows:

DENTAL:

- Excisional and incisional biopsies

SOFT TISSUE: The disposable tips and the fiber do not have any direct contact to the soft tissue, skin or cell during the operation.

- Exposure of unerrupted teeth
- Fibroma removal
- Frenectomy
- Gingival toughing for crown impressions
- Gingivectomy
- Gingivoplasty
- Gingival incision and excision hemostasis
- Implant recovery
- Incision and drainage of abscess
- Leukoplakia
- Operculectomy
- Oral papillectomies
- Pulpotomy
- Pulpotomy as an adjunct to root canal therapy
- Reduction of gingival hypertrophy
- Soft tissue crown lengthening
- Sulcular debridement (removal of diseased or inflamed soft tissue in the periodontal pocket to improve clinical indices including gingival index
- Gingival bleeding index
- Probe depth, attachment loss and tooth mobility),
- Treatment of aphthous ulcer
- Vestibuloplasty

LASER PERIODONTAL PROCEDURES:

- Sulcular debridement (removal of diseased or inflamed soft tissue in the periodontal pocket to improve clinical indices including: gingival index, gingival bleeding index, probe depth, attachment loss and tooth mobility)
- Laser soft tissue curettage
- Laser removal of diseased, infected, inflamed, and necrosed soft tissue within the

periodontal pocket
- Removal of highly inflamed edematous tissue affected by bacteria penetration of the pocket lining and junctional epithelium

TOOTH WHITENING INDICATIONS:
- Laser assisted whitening/bleaching of teeth
- Light activation for bleaching materials for teeth whitening

Contraindications

Warning: All the safety measures reported in the following must be scrupulously followed in order to avoid accidental exposures to laser radiation.

The clinician must understand patient's medical history prior to treatment. General medical conditions that could cause contraindicate a local procedure may include: allergy to local or topical anesthetics, heart disease, lung disease, bleeding disorders, sleeping apnea, or an immune system deficiency. Physician's advice is recommended before giving treatment.

Safety Consideration

Laser Safety Program

We recommend implementation of a Laser Safety Program appropriate for your dental office. The plan may include the following:

1. Delegation of authority and responsibility for supervision and control of the laser to a designated LaserSafety Officer;

2. Minimum Training requirements for users of the laser;

3. Security to restrict unauthorized use of the laser;

4. Standard operating procedures to regulate the work environment in order to protect the patient and office staff from laser hazards.

The safe use of a laser is the responsibility of the Laser Safety Officer (LSO) who can be a full or part-time employee, or the laser operator. It is their responsibility to train the staff, maintain records concerning training and the laser's performance, perform safety checks and prepare the laser for use on a daily basis.

The LSO must keep records of any incidents that relate to the failure of the laser or any adverse effects related to laser therapy and report such incidents as prescribed by law. The LSO assures that a medical follow-up has been sought or has occurred following any adverse incident during treatment. The LSO is responsible for training of all office personnel who are involved with the laser preparation and use. Daily checks of the facility and equipment are also the LSO's responsibility. The LSO should test fire the laser each day prior to beginning each treatment procedure.

For more information on the contents of a Laser Safety Plan, you can review ANSI Standard Z136.3 for Safe Use of Lasers in Health Care Facilities (US) or CAN/CSA-Z386-01 Laser Safety in Health Care Facilities (Canada).

Please comply with all warnings and precautions; otherwise, it may result in exposure to radiation source and/or lead to electrical shock.

Warning

♦ Do not operate the laser in the presence of explosive or flammable materials
♦ Never direct the laser beam towards eyes and never look into the fiber connector.
♦ Eliminate from the operative area all reflecting and metallic objects, including personal belongings such as watches and rings since these objects risk reflecting the laser beam.
♦ Always test-fire the laser before using it intra-orally using a power of 1 Watt CW or less. Place the laser in the ready de, then activate the laser for 1-2 seconds while aiming the fiber onto a 2×2 gauze sponge wetted with water. Do not use alcohol or any other combustible material to wet the gauze sponge as it may ignite.
♦ In case of danger immediately press the emergency button.
♦ Using adjustments other than the specified procedures may result in hazardous radiation exposure.

Precaution

♦ The personnel, doctors, hygienists, auxiliary staff, patients, anyone working inside the laser working area must wear the protective glasses.
♦ To prevent the unauthorized use of the laser while not in use, the unit should be switched off. An electronic password is required to be entered before the unit may be used again. This code should be maintained by the Laser Safety Officer.
♦ Manual should be read thoroughly before operating the laser.
♦ Switching to a smaller diameter fiber will increase the density of the power at the fiber tip. As a result, you may need to adjust your power downward. And increasing the power may be required when switching to a larger diameter fiber. In order to achieve the same result after changing fiber diameters, remember this: a smaller diameter fiber will require less power and conversely, a larger diameter will require more power.
♦ Remove cleaved fiber remnants and place them into a sharps container for disposal. Used fiber tips should also be disposed of in a sharps container. All sponges used for cleanup of lasers and fibers should be disposed of in a bag for contaminated soft products.
♦ The fiber connector must always be covered either by the fiber or the protective cap.

Caution

♦ **Replace glasses if it is wearing away and cracking.**
♦ **These lasers have been designed and tested to meet wide range of frequency (electromagnetic, electrostatic, and radio frequency); still interference may still exist.**

Adverse Effects

♦ Do not point laser tip directly at the face, eyes or skin while emitting laser, else it may cause eye damage due to direct or scattered radiation.
♦ Avoid prolonged exposure of the laser when working in and around the cervical areas of the tooth because extended exposure to laser energy could lead to pain and possible pulpal necrosis.

SPECIFICATIONS

Dimension:	187(L)×148(W)×138(H)mm
Laser Type	Diode 810nm (3W) / Diode 980nm (10W)
Safety classess	4 class of laser I type B class of electrical safety
Power Range:	100mW to 10W
Operation mode:	continuous or pulsed
Pulse duration:	start from 0.1ms to 9.9s
Pulse frequency:	regulated from 1 Hz to 5000Hz
Duty Cycle:	adjustable
Aiming Beam:	650nm 2mW
Audible Notification:	Yes
Visual Notification:	Yes
Adapter:	AC100-240V 50/60Hz 16.8V, 3A
Battery	Rechargeable lithium polymer 2.6AH,14.8V
Wireless Foot Pedal:	Frequency: 2.4 GHz

DELIVERY SYSTEM SPECIFICATIONS

Standard
1-Permanent Fiber Handpiece
5- Disposable Bendable Tips
1-Bleaching Handpiece （only for Photon Plus）

Optional
2-Cutting Fiber Handpiece
2-Cutting Fiber (400μm)

Laser Aperture-Custom FC adaptor

WARRANTY PERIOD

The Photon Series Diode Laser is warranted against defective materials and workmanship for a period of:

   -3 years for laser
   -1 year for battery
   -6 months for handpiece and fiber assembly

From the date of purchase, and will be repaired or replaced, at our discretion, if returned prepaid to our factory. This warranty does not cover damage to the Photon Series Diode Laser unit or components caused by accident, misuse, or being tampered with. This warranty does not include postage, or delivery charges. This warranty does not apply to the external finish of the console, handpiece, fiber, power cord or foot pedal. Zolar reserves the right to make changes in design or to modify such previously manufactured products. Your Photon Series Diode Laser warranty does not become effective until registered online at www.zolartek.com, or the registration card is completed and mailed to Zolar within ten (10) days of the purchase.

PARTS

List of Related Components

Item	Parts	Remarks
1	LCD Screen	Control panel of the laser (Photon and Photon Plus)
2	Wireless footpetal with battery	Controls the laser with 1.5V size AA battery
3	Footpetal (wired with footpetal cable into footpetal connector)	Controls the laser with a footpetal cable into footpetal connector
4	Permanent handpiece with tip, protective cap and bendable steel canula	Used in the variety of operation
5	Disposable bendable tips (5)	Tips to be used with permanent handpiece
6	Bleaching handpiece	Used for teeth whitening procedure
7	Laser aperture and protective cap	Point where laser beam and fiber connect
8	Optical fibercable	Part of permanent hand piece
9	Remote Interlock connector with interlock jack	Safety feature for automatic shutoff
10	Fiber Spool	Stores fiber
11	Cutting fiber (400µm)	Fiber
12	Fiber stripper	Stripping of fiber
13	Fiber cleaver	Cutting of fiber
14	Emergency Stop Switch	Disables the unit in case of emergency
15	Fiber connector	Connects fiber
16	Cutting fiber handpiece	For cutting fiber
17	Protective Glasses	Protects eyes from laser beam
18	AC Adapter and power cord	Powers cable (100-240 V at 60Hz)
19	Power Switch	Switches the laser on and off
20	Power Supply Connector and battery	Connects power supply and recharges lithium polymer battery
21	Instruction Manual	Operation instructions manual
22	Warranty	Warranty for 3 yrs

Complies with:

|	
IEC60601-1	IEC60825-1
IEC60601-2-22	IEC60601-1-2
UL60601-1	FCC Part 15C
CAN/CAS C22.2 NO.601.1	IC-RSS 210

This device complies with art 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: US Federal Law restricts this device to sale by or on the order of a licensed dentist.
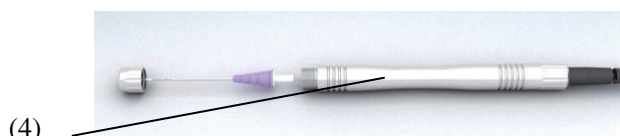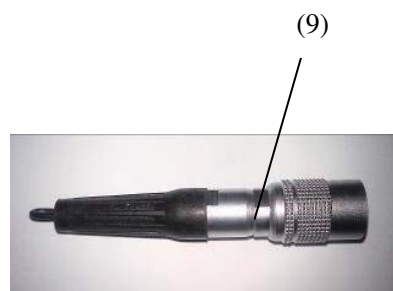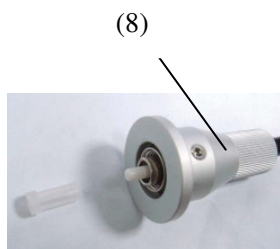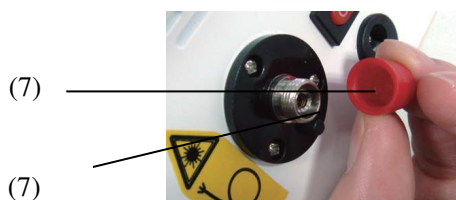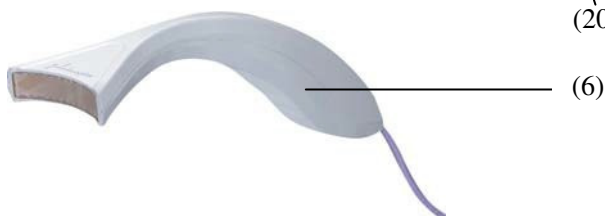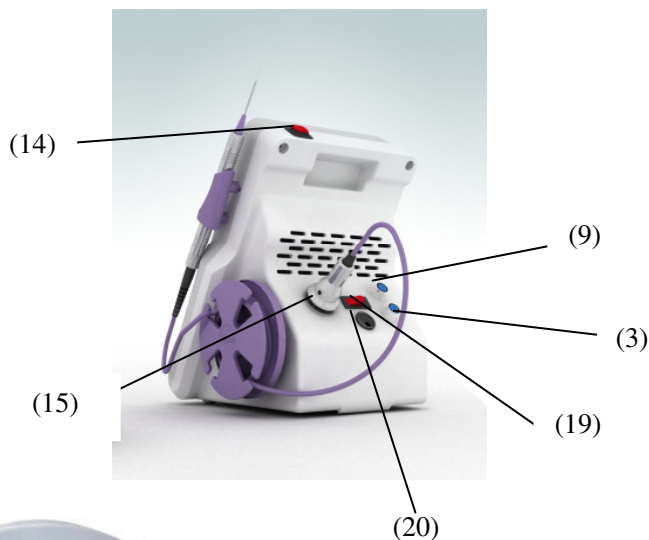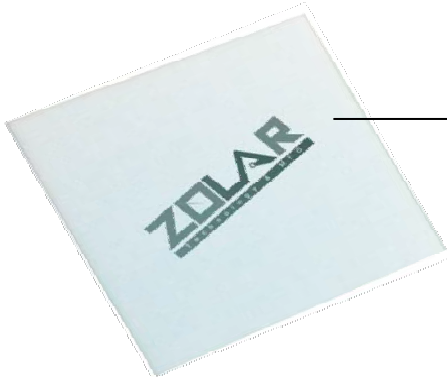
(13)

(16)

(17)

(20)

(21)

Please check all the items sent with your laser to insure that all components are accounted for.
NOTE: Shipped items are based on Package of laser choosen by you.

PROCEDURE FOR PROPER LASER ASSEMBLY

REMEMBER: Always test fire the laser outside the mouth before using it on a patient. The doctor or patient and any staff in the operatory should be wearing the appropriate safety eyewear whenever the laser is being operated.

1. Install a wireless foot pedal or a wired foot pedal.
2. Install remote interlock.
3. Install the fiber spool.
4. Assemble the handpiece and the tip, and then connect the handpiece assembly to the unit. Wind the fiber on the spool and put the handpiece into the handpiece holder.
5. Verify Emergency Stop button is depressed.
6. Turn on power.

Foot Pedal Installation Procedure
The unit can use both the wireless foot pedal and the wired foot pedal.
a. Wireless Foot Pedal
1. Make sure the laser is completely turned off before installing the wireless foot pedal.
2. Remove the battery cover on the back of the pedal, and install a 1.5V size AA battery into it.
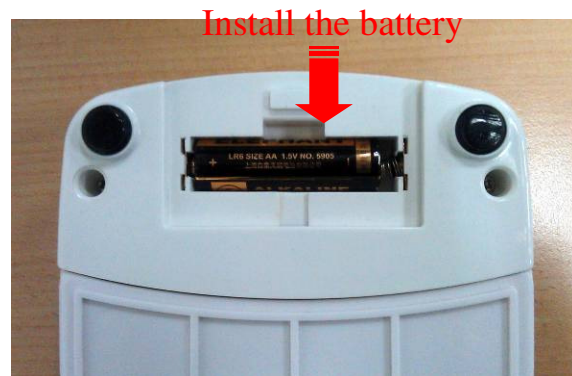
3. Press the top cover to make it open.

4. The Foot Pedal is ready. After setting the laser, press the black pedal to emit the laser.

5. When the laser is firing, there will appear a green led light on the head of the foot pedal.
6. When the battery voltage begins to drop, there will appear a flashing orange led light.

b. Wired foot pedal

1. Make sure the laser is completely turned off before installing the wired foot pedal.
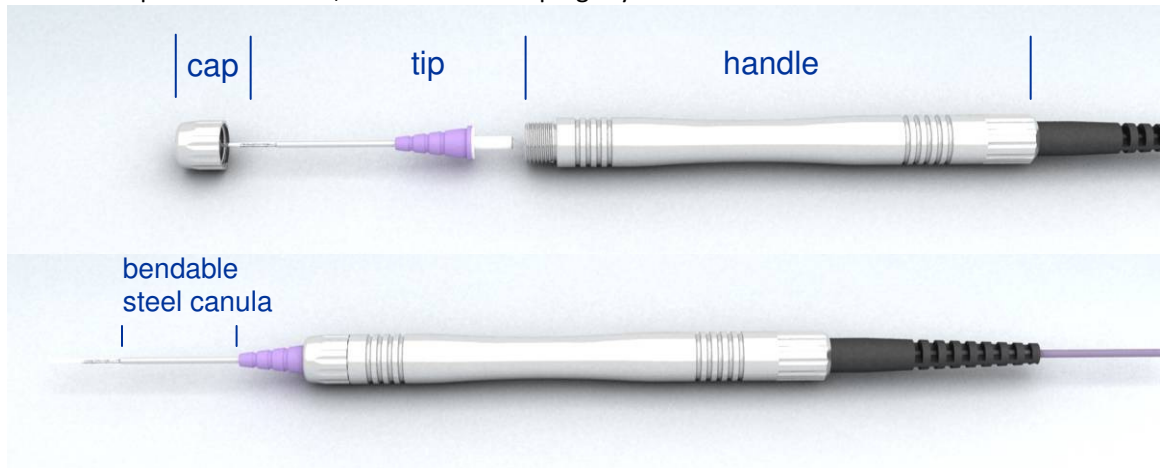2. Plug the foot pedal cable into the foot pedal connector.

Handpiece Assembly Installation Procedure

Unit Dose disposable tip

1. Remove protective cap from the handpiece.
2. Use disinfecting towelette to disinfect the handpiece.
3. Put the disposable tip out of the package.
4. unscrew the cap of the handpiece.

5. Insert the tip into the handle, and screw the cap tightly.


The disposable bendable tips have a bendable steel canula allowing the user to customize the angle of each tip for a specific application. The tips can be bent from 0 to a maximum of 90 degrees.

6. To bend the tip, pressure should be applied only in the middle of the metal canula to form a smooth curve.
7. If your procedure requires initiated tip, touch the fiber tip on the black dot on the back of the tip packing at about 1 Watt CW and exceed 1-2 seconds.

Note:

1. The disposable tips are for single use only.
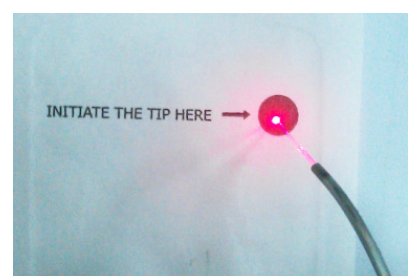
2. Do not exceed 90 degrees when bending the metal canula of the tip.

Bleaching Handpiece

The Bleaching Handpiece is used for laser whitening procedure. To use the bleaching handpiece, simply plug the connector to the unit.

Note: The bleaching handpiece is not autoclavable and should be cold sterilized only.

Connecting Handpiece Assembly to the Laser

1. Take off the protective plastic cap on the laser aperture and the one on the optical fiber cable.
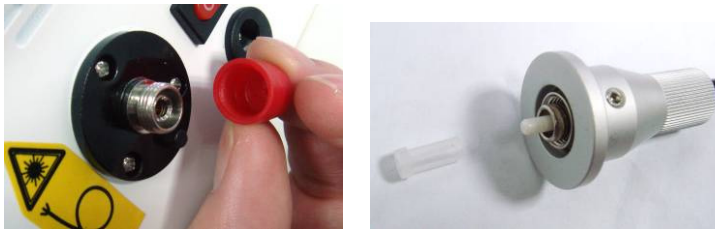
2. Connect the optical fiber cable to the unit.

3. Rotate the the terminal of the cable to screw it tightly.

Note

1. Please leave the handpiece assembly connected to the laser unit unless you have to switch handpiece assemblies or if you have to ship the laser.   Disconnecting the handpiece for even short periods can lead to contamination of the precision polished end of the fiber connector. This may result in reduced power output of your laser over time.

2. If you have to disconnect the cable, keep the fiber tip connector of the fiber cable and the laser aperture clean. Use a protective plastic cap to protect the connectors and be sure not to touch the precision polished end of the connector.

Remote Interlock

The Photon Laser is equipped with a Remote Interlock Jack. The Remote Interlock Jack is provided so that a clinician may install the laser in a dedicated laser treatment room. It is used to make the laser interlocked with the entrance door of the treatment room. By doing so, it is the laser shut down anytime the door is opened, hypothetically, to protect the eyes of the person entering the room.

It is recognized that such installment is not facilitated nor required in many operatories or clinics. To that end, the Remote Interlock is available only on request of the practitioner.

Power supply

The photon diode laser is supplied with a rechargeable lithium polymer battery

When the battery energy is low, please follow the steps below to charge the battery.

1. Connect the power supply to the unit, and plug the other terminal of the power cable into a 100-240 Volt AC outlet rated at 60Hz.

2. The battery starts charging and the led on the AC adapter turns red.
3. When the charging finishes, the led on the AC adapter will turn green instead of red.
Note: We strongly recommend turning off the unit during charging.

Emergency Stop Switch

Before you activate the laser, make sure the Emergency Stop switch is in the depressed position. The laser will activate only with the button in the depressed position.
Pushing and releasing the Emergency Stop switch will shut the laser off immediately.

Depressed
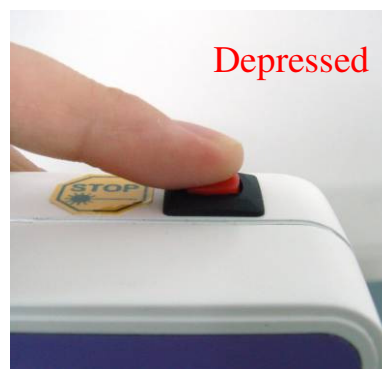
Power Switch

Press the power switch to "O" to turn on the unit. The fan will start running and the display lights up.
When operation is finished, press it to "--" to turn off the unit.

switch off   switch on

OPERATION INSTRUCTIONS

Power up the laser
Be sure the Emergency Stop button is depressed, turn on the main power switch on the side of the laser, and the device performs a self-diagnostic routine. The screen displays as follow.
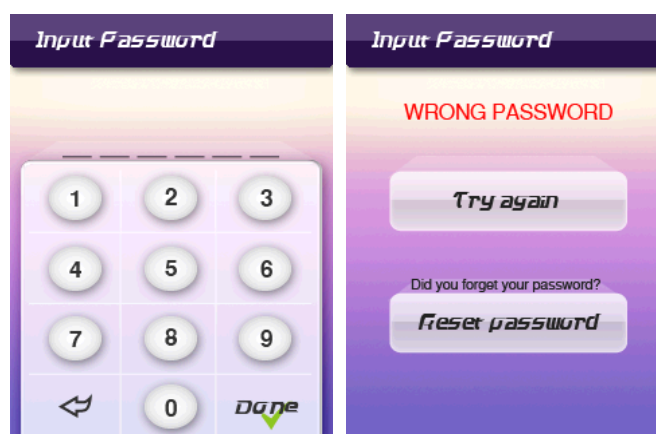

Input the password
Photon Series Laser uses digital password instead of a key for security purposes. After self-diagnostic routine, there appears password screen.
Input the password, and go to Main Operation screen.

If you input the wrong password, it will show the screen as follow.
Press "Try again" to input the password again.
Press "Reset password" to answer the secret questions, and after that you can reset your password.

NOTE: At the first time you use Photon, the default password is 000000.

Installation Test
1. Turn on the Laser and input the password.

2. Select [TREATMENT MENU] and go to the TREATMENT MENU.
3. Select the first procedure "Aphthous Ulcer".

3. Press [Done] to enter into Main Operation screen with the unit per-set to "Aphthous Ulcer - POWER=0.8W, Continuous Wave (CW)".
4. Hold the fiber approximately 2-4mm away from a piece of articulating paper.
5. Press Standby/Ready button to enter into Ready mode, and the laser is activated.
6. Depress the foot pedal to fire the laser.
7. The articulating paper will begin to develop smoke in 1-2 seconds.

REMEMBER: Always test fire the laser outside the mouth before using it on a patient. The doctor or patient and any staff in the operatory should be wearing the appropriate safety eyewear

whenever the laser is being operated.

Check of the Emergency Shutdown System

1. To check the Emergency Shutdown system, simply press the red Emergency Stop button on the top of the device while the laser is firing. The laser will stop firing immediately, and the device will be turned off.
2. Repress the red Emergency Stop button, the device is turned on and stays in Standby status.

System Menu
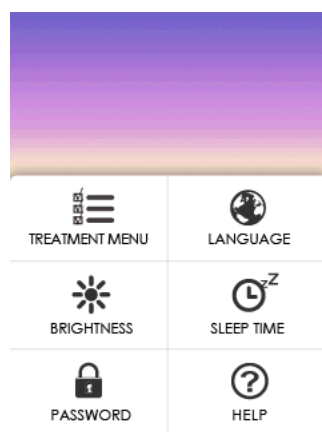
Treatment Menu

Photon series diode lasers provides 25 preset precedures in Treatment Menu. All the settings of the precedures can be changed and saved as required.

Item	Precedure	POWER(W)	TIMER	Pulse Mode	Tip
1	Aphthous Ulcer	0.8	continue	Continuous Wave	Un-initiated
2	Biostimulation	0.8	continue	Continuous Wave	Un-initiated
3	Canal Sterilization	0.8	00:30	Continuous Wave	Un-initiated
4	Crown Lengthening	1.0	continue	Continuous Wave	Initiated
5	De-Pigmentation	0.5	continue	Continuous Wave	Initiated
6	De-sensitivity	0.8	continue	Continuous Wave	Initiated
7	Expose Teeth	1.0	continue	Continuous Wave	Initiated
8	Fibroma	1.0	continue	Continuous Wave	Initiated
9	Frenectomy	0.8	continue	Continuous Wave	Initiated
10	Gingivectomy	1.0	continue	Continuous Wave	Initiated
11	Gingivoplasty	1.0	continue	Continuous Wave	Initiated
12	Hemostasis	1.0	continue	Continuous Wave	Un-initiated
13	Herpetic Lesion	1.7	00:30	Pulse Duration=50ms Interval=50ms	Un-initiated
14	Implant exposure	1.0	continue	Continuous Wave	Initiated
15	Laser Bacterial Reduction	0.5	continue	Continuous Wave	LBR Un-initiated
16	Lesion Removal	1.0	continue	Continuous Wave	Initiated
17	Operculectomy	1.5	continue	Continuous Wave	Initiated
18	Perio Pocketing	0.5	continue	Continuous Wave	Un-initiated
19	Sulcular Debridement	0.8	00:30	Continuous Wave	Un-initiated
20	Troughing	0.7	continue	Continuous Wave	Initiated
21	Vestibuloplasty	1.0	continue	Continuous Wave	Initiated

※22	Teeth Whitening	7.0	0:30	Continuous Wave	Bleaching Handpiece
23	Custom 1	0.1W,continue,Continuous Wave in default.			
24	Custom 2	They are user defined procedures so that users can save their favorites without worrying about covering the treatment pre-sets.			
25	Custom 3				

※ *Teeth Whitening is available only in Photon Plus Diode Laser.*

a. ![icon] Next page
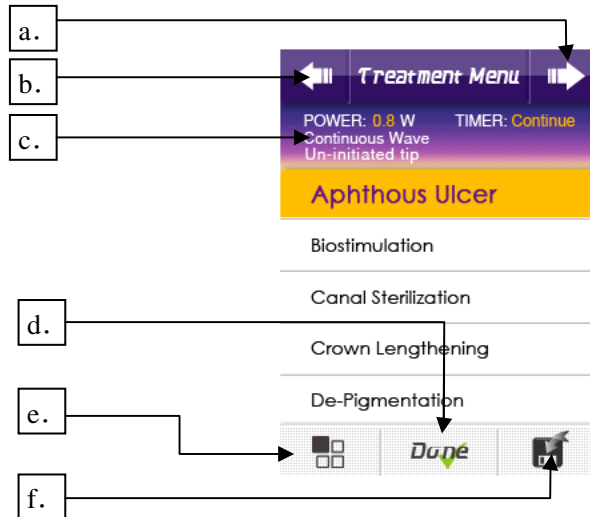
b. ![icon] Previous page

c. Here show the settings of the highlighted procedure.

d. ![Done] Confirm to use the highlighted procedure and enter into operation screen. After selecting a procedure, the settings may be manually adjusted to suit your needs during a clinical procedure.

Please refer to "Main Operation Screen" for details.

e. ![icon] Back to System Menu.

f. ![icon] Save the settings that are changed in the operation screen to the highlighted procedure. The old settings will be covered.

Before saving, software will require the password. If the password is not correct, the new settings will not be saved.

NOTE: TREATMENT MENU is meant as a general guideline for usage. Operator must use individual judgment for each procedure and patient.

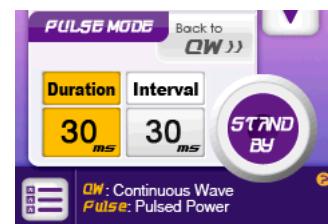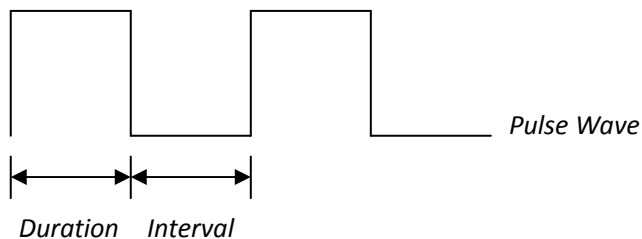**Main Operation Screen**

MODE

There are 2 kinds of laser emission modes.

CW: Continuous Wave

Pulse: Pulse Power

Press CW button to select CW mode. The selected button will be displayed in orange.

Press Pulse button to select Pulse Power mode, and the screen will display as follow.

Pulse Wave

Duration   Interval

The Duration and Interval values of a pulse can be adjusted as required

1. Press the Duration or Interval box which you'd like to adjust, and it will be highlighted in orange.
2. The highlighted value can be adjusted by pressing UP/DOWN arrow button.
   The UP arrow button is used to increase the value, and the DOWN arrow button is used to decrease the value.

Both Duration and Interval values range from 0.1ms to 9.9s.

Range	Increment
0.1-1.0ms	0.1ms
1-10ms	1ms
10-100ms	10ms
100ms-9.9s	100ms

POWER

The power settings ranges 0.1W - 3.0W (Photon) and 0.1W – 10W (Photon Plus), with the increment of 0.1W.

1. Press the Power box to activate it, and it will be highlighted in orange.
2. Adjust the highlighted Power value by UP/DOWN arrow button.

TIMER

The TIMER setting allows you to set the treatment duration so that the laser emission will be automatically interrupted at a predetermined amount of time.

The TIMER setting ranges from off (00:00) to 10min with the increment of 1s.

1. Press the TIMER box, and it is highlighted in orange with the value of minute activated.

2. Press UP/DOWN arrow button to adjust the value of minute.
3. Press the TIMER box again, and the value of second is activated.
4. Press UP/DOWN arrow button to adjust the value of second.

NOTE:

1. When the laser starts firing, the TIMER starts counting down till 0 with the laser shutting down and going to Standby status, even if the foot pedal is still depressed.
2. Once the foot pedal is released, the laser shuts down immediately no matter whether the TIMER finishes counting down, and the Timer stops counting and displays the remaining time. You can continue the laser emission with the remaining time by depressing the foot pedal again.
3. Once the device is turned to Standby mode, the Timer will forget the remaining time and back to the value you set.

Aiming Beam

The aiming beam is a low level power (650 nm, 2mW) visible laser. Since the working laser is invisible, the 650 nm "laser pointer" is used to illuminate the focal point of the "working beam", which allows the operator to aim prior to and during laser activation.

The aiming beam can be set in high brightness , low brightness , and off by pressing the aiming beam symbol.

Speaker volume

The speaker volume can be set in high , low , and off by pressing the speaker symbol.

Standby/Ready

After all the settings have been adjusted as required, Turn the laser into Ready status to be ready to fire the laser.

 Standby status.

Settings can be adjusted in Standby status. However, laser energy will not be emitted even if the foot pedal is depressed..

Press this button to enter into Ready status and activate the laser.

 Ready status

Laser will be emitted only in Ready status. However, the settings can not be adjusted.

Press this button to go back to Standby status.

Emission Indicator

In Ready status, there will appear the Emission Indicator .

Flashing: Laser is activated and ready to fire.
On continuously: Laser is firing.

Battery Symbol
The battery symbol on the up-left screen indicates current battery level.

  full   low   flashing symbol, empty
The Photon Plus Diode Laser is supplied with a rechargeable lithium polymer battery.

Photon	endurance at 3W, CW:	30min
	endurance at 0.1W, CW:	180min
	standby time:	≥24 h
	Charge time:	6h
Photon Plus	endurance at 10W, CW:	≥20 min
	endurance at 0.1W, CW:	≥120 min
	standby time:	≥24 h
	Charge time:	6 h

When the battery symbol shows the battery is empty, please turn off the unit and connect the power supply to charge the battery. There is an LED indicator on the power supply, which lights in orange when charging and lights in green when fully charged.
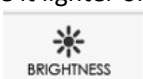**Note: Do not use any chargers other than those recommended.**

Back to Treatment Menu

Press button to back to Treatment Menu.

Screen Brightness
Here you can adjust the display to make it lighter or darker.

1. Enter into System Menu, and select .
2. The screen BRIGHTNESS can be adjusted from level 1 to level 10.

 is used to decrease the brightness level, and is used to increase the brightness level.
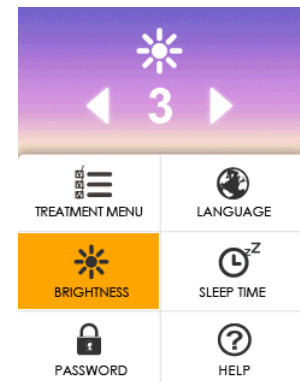
Sleep Time
Here you can adjust the display sleep time from 1min to 10min with the increment of 1min. Also it can be set "- -" in which the screen is always activated.

1. Enter into System Menu, and select .
2. is used to decrease the sleep time, and is used to increase the sleep time.
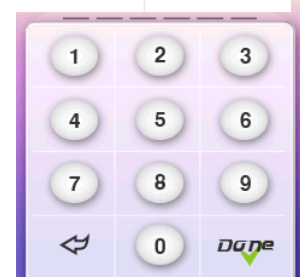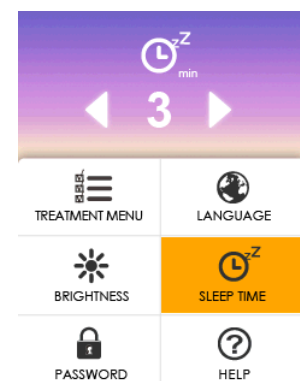
Password setting

Here you can change the password and set the secret question.

↩   backspace and cancel

Done   confirm the input and proceed

1. Enter into System Menu, and select [PASSWORD] .
2. Input the old password to proceed.
3. Input the new password that you want to set.
4. Input the new password again to confirm the password. Press "Done" to proceed to set secret question.
5. Please follow the procedure to set the 3 secret questions.
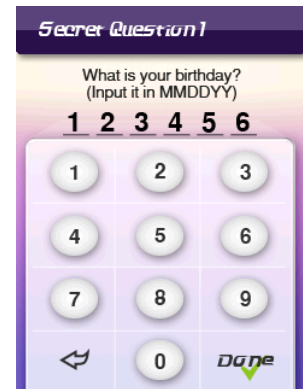we recommend you to set the secret questions at the first time you set the password. When you forget the password it can help you to re-set the password

Language

The unit provides multiple languages. Users can select the system language among English, Spanish, French, German, Portuguese and Russian.
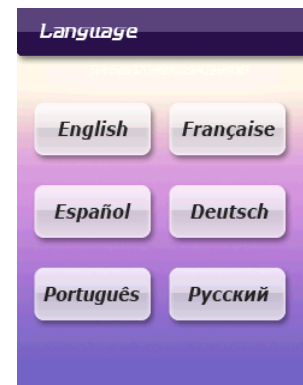
Help

Here you can get a guidance of operation.

1. Enter into System Menu, and select [HELP] .

◀❚   Previous page

❚▶   Next page

▦   Back to Main Operation screen.
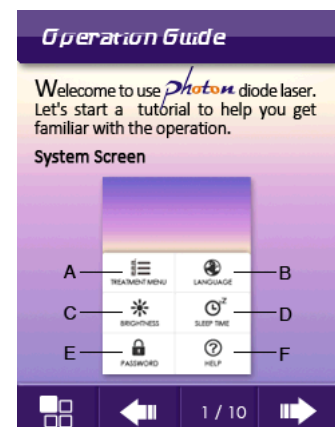
System Errors

The system advises the operator of any malfunction by a message on the screen and a warning sound.
Then the system will put itself automatically to a safe state: the laser source will be automatically shut down, and the system will be in Standby status.
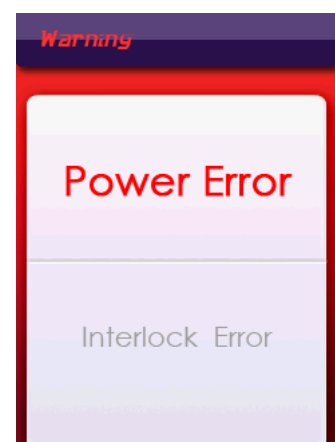
The system does not allow the operator to enter Ready state until all the errors have been resolved.

Power Error:
The output power overruns the set level.
Please turn off the power, then turn on the unit and fire the laser again. If the Power Error appears again, please contact with your distributor. The unit needs to be recalibrated before used.

Interlock Error:
Please connect the Interlock.

PREPARATIONS, CARE AND MAINTENANCE

Fiber Preparation

The fiber is fairly flexible but can be broken if bent into a small circle or bent at an angle of 90 degrees. The cladding will burn as protein from the gingival accumulates on the fiber and will deteriorate the tip. It can fracture if not cleaved once the blackened area has reached 3-4 mm. Stop lasing and wipe off the tip regularly as you work to avoid accumulation of protein debris. Use water on a 2 x 2 gauze sponge to clean the tip. Do not use flammable materials like alcohol products when cleaning a hot tip. Dispose of all small fiber remnants after you have cleaved the fiber. They should be kept in a small box with a lid until they can be properly disposed of in the "sharps" container.

Stripping and Cleaving the Fiber

When use a handpiece with cutting fiber, the fiber should be cleave/scribed after each procedure.

The disposable tips are pre-cleaved and pre-stripped piece of fiber and designed for single use. Also if necessary, the disposable tips can be cleaved in the same way.

1. Select a fiber stripper that corresponds to the fiber diameter size.

2. Slide the black stop marker on the stripper to approximately 1 inch (25 mm). Insert fiber into the stripper until the end of the fiber touches the marker. Squeeze the stripper handles pulling the stripper away from the handpiece in a smooth motion to ensure that the fiber coating is cleanly removed.

3. Use the fiber cleaver to lightly scratch the end of the fiber. Place the fiber against a flat surface. Position the edge of the cleaver approximately ¼ inch (0.6 cm) from the end of the fiber, and make a gentle scratch perpendicularly across the fiber. Gently cleave the surface at a 45 degree angle with the cleaver, and make sure that the edge of the cleaver is always perpendicular to the fiber during cleaving.

4. Hold the end of the fiber and slightly bend it. It is easily broken at the scratch mark.

5. Verify the scribe/cleave quality by aiming the fiber at a flat surface and observe the shape of the spot created by the visible aiming beam. If the visible spot is a full circle, then the power output is optimal. If the circle is distorted, repeat the steps 3 and 4 until you obtain a circular beam.

Good Cleave	Bad Cleave
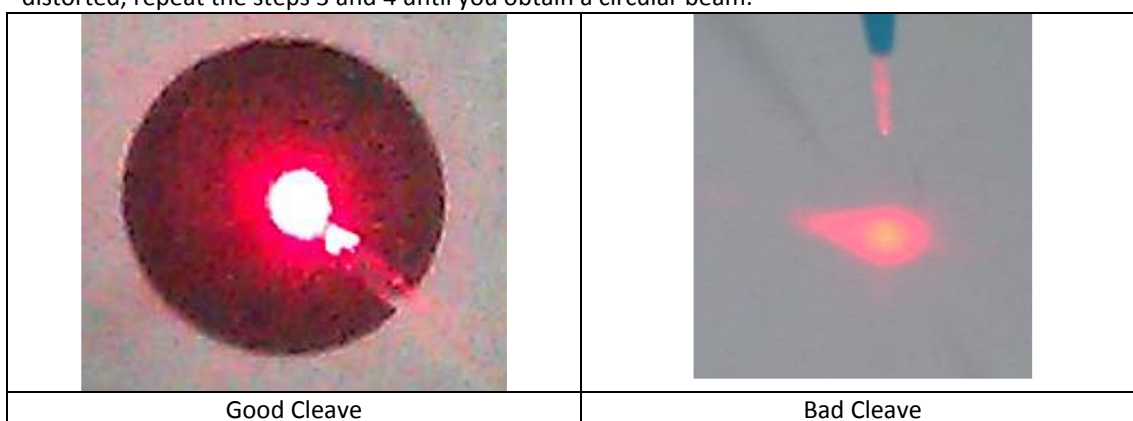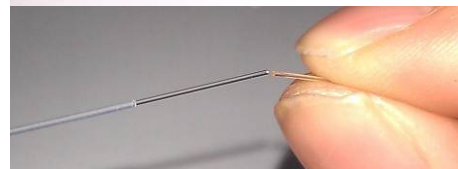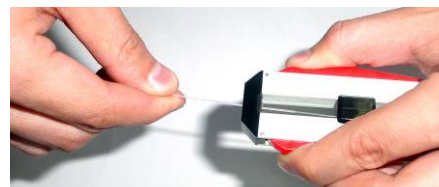
Initiating the Fiber

Certain treatment procedures require the fiber tip to be initiated.
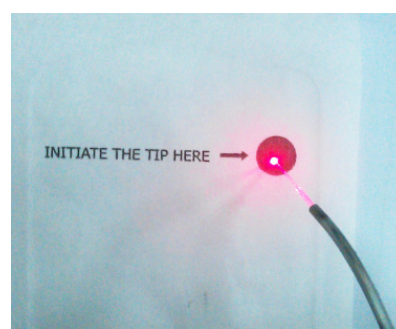
The tip of the fiber should be cleaved to provide a flat surface that can be prepared to retain heat by introducing it to a dark material. The easiest way to prepare the tip is to lightly move the flat surface of the tip across a piece of articulating paper at about 1 Watt CW. The tip will retain the ink and the ink will make the tip glow if you exceed 1-2 seconds while in contact with the paper. Prolonged heating will accelerate the deterioration of the tip.

Cleaning the Handpiece assembly and Bleaching Handpiece
The fiber optic cable, handpiece, and bleaching handpiece are reusable accessories that require cleaning and sterilization before and after each use.
The fiber optic cable and bleaching handpiece are not autoclavable and should be cold sterilized only. Please follow the recommended instructions provided by the manufacturer for using the Disinfectant and Cleaner and disposal.
With good cleaning and handling practices, the bleaching handpiece should last indefinitely. However, you should visually inspect the device before each use. You should discard the device if you notice any of the following:
   -Liquid behind the window.
   -Cracks in the window, mouthpiece or handle.
   -Hazing or Fogging of the window.

Installing the Cutting Fiber Handpiece and Fiber optic assembly

1. Loosen the handpiece base.
2. Slide fiber through handpiece base, handle and tip.
3. Approximately 3-4 inches (appx. 7-10 cm) of fiber should protrude.
4. Strip and cleave the fiber.
5. Adjust the protruding fiber to desired length.
6. Gently tighten the handpiece base to secure the fiber.

Disinfection Instructions for Cutting Fiber Optic Cable
1. Transport the delivery system to a decontamination/sterilization work area.
2. Take the fiber and strip 1 inch (25mm) off of the distal end of the fiber using the fiber cleaver. Make sure the part that has debris is removed entirely. Dispose of the contaminated fiber tip accordingly.
3. Prepare a sterilizing and disinfecting solution of a CAVICIDE equivalent and submerge approximately 12 inches (30cm) of the fiber's distal end into the solution for 5 minutes. For high level of disinfecting, immerse the fiber end for 30 minutes at 68°F (20°C).
4. After this process is completed, thoroughly rinse and dry the fiber.
5. For disposal of CAVICIDE equivalent disinfecting solution, please follow the manufacturer's instructions.

Steam Sterilization for Autoclaveable Handpiece
1. Before sterilization, the handpiece must be cleaned and disassembled.
2. Disassemble the handpiece, remove the rubber insert and store in a secure location for reassembly (do not autoclave the rubber insert)
3. Place the handpiece and interchangeable tips inside a single wrap self-seal autoclave pouch.
4. Remove autoclave tray and place pouch(s) on the tray.
5. Place tray inside the autoclave chamber and set controls to the following values:
   -Temperature: 250°F (121°C)

-Pressure: 15 PSI (1 Bar)
-Time Cycle: 20 minutes
6. At the completion of the autoclave cycle, remove the tray and let the handpiece cool and dry.
7. Attach the handpiece and the fiber optic cable to the unit for the next procedure.

Calibration Procedure

Photon and Photon Plus comes factory calibrated and certified to use. Calibration is recommended every 12 months from the installation date. All calibration should be performed by Zolar trained certified technicians; otherwise, it could result in electrical shock, personal injury or death. Every practice should establish an internal calibration program for their laser.

EQUIPMENT NEEDED TO PERFROM CALIBRATION:

- A calibrated hand held power meter approved for use with 810nm/980nm devices to check power output can be used.
- PC with Windows XP or better
- RS-232 port
- Zolar laser Calibration Software
- Zolar Calibration Data Cable
- #1 Philips Head Screw Driver

LASER

Improper calibration could lead to damage or failure to calibration; therefore, it should be performed by a certified technician.

TURN LASER OFF AND UNPLUG PRIOR TO CALIBRATION PROCEDURE

1. Set up software and connect laser to computer. Reconnect front and side panel.
2. Turn laser "on" and start the laser with the fiber tip approximately 1-2 mm from the power meter laser head.
3. The laser should be set at 0.1, 0.5, 1, 2, 3, 4… up to 3 Watts (Photon) and up to 10 Watts (Photon Plus) with output checked at each level. When appropriate output power is reached, select "save"   and proceed to next setting
4. The output display should be within 20% of the meter reading. (If not, re-cleave the fiber and re-check.)
5. If the output display is still outside the 20% tolerance, return the unit to the Zolar facility for recalibration.

There are no methods available for the user to adjust the calibration of the unit and the unit chassis must not be removed by the user for any reason.

Calibration Schedule

Dates: **Authorized by:**

Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(12 months after purchase date)
Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(24 months after purchase date)
Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(36 months after purchase date)
Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(48 months after purchase date)
Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(60 months after purchase date)
Purchase Date   _____//_____//_____
Calibration 1   _____//_____//_____   _____
(72 months after purchase date)
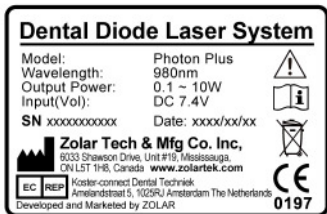
*This procedure is intended for reference only. All service to your laser (including calibration) is to be done by a trained technician at a local Zolar authorized dealer.

TROUBLE SHOOTING

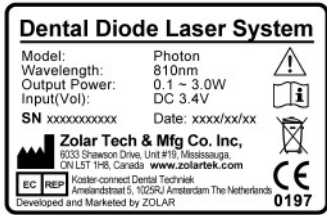| SYMPTOMS	POSSIBLE CAUSE	ACTIONS
After turn on the power switch, the screen does not light.	The battery is empty. The emergency stop button isn't pressed down.	Connect the power supply to the unit. Depress the emergency stop button.
No laser beam emits out though the unit seems running normally.	The unit is in STANDBY status. The joint of the fiber cable connector is loosened. The wireless foot pedal does not pair with the unit.	Set the unit to READY status by pressing . Reconnect the fiber cable tightly. Check the SN on the unit and the wireless foot pedal to see whether they are accordant.
Aiming beam does not emit.	Aiming beam is set OFF	Press to turn on the aiming beam.
The screen displays "Power Error."	The actual output power is overrun the set level.	Turn off the unit for a while, then try again. If the Power Error appears again, the unit should be calibrated before used. Please refer to professional personnel for service.
The screen displays "Interlock Error."	The Interlock is not connected.	Please insert the Interlock connector.
The unit makes big noise when running.	The unit is not well-balance.	Place the unit on a stable and flat surface.
Forget the password		Try following the password resetting procedure. If you are not able to answer the secret question, contact with your distributor for help.

Label Descriptions

1		Warning for laser aperture port
2	**STOP**	Emergency laser stop
3	Foot Pedal	Foot pedal jack
4	Remote Control	Remote interlock jack
5	**Dental Diode Laser System** Model: Photon Wavelength: 810nm Output Power: 0.1 ~ 3.0W Input(Vol): DC 3.4V SN xxxxxxxxxxx Date: xxxx/xx/xx Zolar Tech & Mfg Co. Inc, 6033 Shawson Drive, Unit #19, Mississauga, ON L5T 1H8, Canada www.zolartek.com EC REP Koster-connect Dental Techniek Amelandstraat 5, 1025RU Amsterdam The Netherlands Developed and Marketed by ZOLAR CE 0197	Manufacturer label (Photon)
6	**Dental Diode Laser System** Model: Photon Plus Wavelength: 980nm Output Power: 0.1 ~ 10W Input(Vol): DC 7.4V SN xxxxxxxxxxx Date: xxxx/xx/xx Zolar Tech & Mfg Co. Inc, 6033 Shawson Drive, Unit #19, Mississauga, ON L5T 1H8, Canada www.zolartek.com EC REP Koster-connect Dental Techniek Amelandstraat 5, 1025RU Amsterdam The Netherlands Developed and Marketed by ZOLAR CE 0197	Manufacturer label (Photon Plus)
7	**EN/IEC 60825-1:2007** **EN/IEC 60601-2-22:1995** VISIBLE AND INVISIBLE LASER RADIATION AVOAID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT Working beam: 810 nm, Max. 3W, Continuous radiation Aiming beam: 650nm, Max. 2mW, Continuous radiation	Explanatory label (Photon)

8	EN/IEC 60825-1:2007 EN/IEC 60601-2-22:1995 VISIBLE AND INVISIBLE LASER RADIATION AVOAID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT Working beam: 980nm, Max. 10W, Continuous radiation Aiming beam: 650nm, Max. 2mW, Continuous radiation	Explanatory label (Photon Plus)
9	DANGER VISIBLE & INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION Diode 810 nm, max. 3W, CW CLASS 4 LASER PRODUCT	Laser danger label (Photon)
10	DANGER VISIBLE & INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION Diode 980 nm, max. 10W, CW CLASS 4 LASER PRODUCT	Laser danger label (Photon Plus)
11		Safty label for working area

ZOLAR LASERS
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