

# RF Metal Tube CO2 Fractional Laser Machine

## Model GL080



# Catalogue

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# Chapter 1 Introduction of CO2 Fractional Laser

## I Treatment Theory

CO2 fractional laser technology has been the latest and most focused technology these 2 years in the United States as well as in the skin community all over the world. It is a kind of minimal invasive surgery, which lies in between invasive and non-invasive treatment. This technology is known as Fractional Photothermolysis theory (dot-matrix light and heat decomposition), which was published in 2004 by Dr. Rox Anderson, one of the laser medical experts from Harvard University. This theory was immediately approved and applied by experts from all over the world.

Fractional Photothermolysis (selective photothermolysis effect) theory is an extension of the traditional theory of Selective Photothermolysis .it is not only rapid and evident results like invasive treatment, but also less side effects and shorter recovery time like the non-invasive treatment. Which means this technology combines both the advantages of the traditional technologies. It is to evenly mark with tiny holes, and then there will be a series of biochemical reactions inside the skin, thus Lift the skin and remove speckles and pigments.

As the fractional laser treatment will only cover part of the skin tissue as well as the new tiny holes do not overlap, therefore part of the normal skin stays the same, which will fasten the recovery. Patients can return to normal life in 4~5 days.

The treatment itself is safer and can treat any part of the body, for example, skin renewing and resurfacing, wrinkle removal. Skin tightening, acne and scar removal, melasma removal, smooth burnt scars and surgery scars. Traumatic scars .remove intractable chloasmas and pigmentation, sun damage recovery. Those treatments have been applied both home and abroad with very good results.

## II Functions

1. Skin renewing and resurfacing
2. Wrinkle removal. skin tightening

3. Acne and scar removal , melasma removal
4. Smooth burnt scars and surgery scars. traumatic scars ,etc
5. remove intractable chloasmas and pigmentation
6. sun damage recovery

### III Taboos

1. Pregnant
2. Isolation in the sun
3. Sensitive to light or medicine, or are taking medicine that sensitive to light
4. Using vitamin within 6 months
5. Not representative naevi or malignant pathological changes in treatment area.
6. Herpes or trauma
7. Pimple record
8. Severe diabetes patient, high blood pressure sufferer, and epileptic

### IV. Parameters

Laser mode	Fractional Co2 laser
Wavelength	10600nm
Pulse Power	40w
Pulse Radio frequency	0.530W
Control	Touching switch, microprocessor-controlled
Screen	8.4inch color touch screen
Working mode	Continuous; Single pulse; Repeat pulse; Super pulse.
Scan Pattern	Triangle/Square/Rectangle/Rhombus/Circle
Dot quantity	400 dots at most
Working mode	Fractional; Ultra pulse
Scan modes	Sequence scan or Random scan or maximum distance scan
Pulse energy	10mj~200mj (every stepping:2mj)
Condenser focus	f=100mm
Beam divergence angle	0.3 mrad
Spot size	0.12-1.25mm (Adjustable)
Radiation time	0.1~1 ms

Interval time	1-5000ms
Pulse Duration	0.1~10ms
Pulse Interval	1ms~100ms (every stepping:1mj)
Pulse distance	0.1-2.6mm
Aiming beam	635nm
Cooling system	Water+ air cooling
Beam delivery	Articulated arm with 7-joint with 360 degree rotating
Warning up time	5 min
Scan Area	10mmx10mm,20mmx20mm,30mmx30mm adjustable
Spot Density	36 spots / cm, 144spots / cm, 576spots / cm, with intermittent loading
N. weight (kg)	65kg
Size:	64x51x122cm
Power supply	220V/110V 50Hz/60Hz

## Chapter 2 Notes of CO2 fractional laser

### I The safety notice of fractional CO2 laser

CO2 fractional laser system is high-tech medical equipment, mainly used for all kinds of facial scars and gets rid of all parts of unwanted hair on body with safety and reliability. After the qualified training, the operator can safely use the machine as soon as proper operation and maintenance.

The operator for Operation and maintenance or other staff for adjustment therapy should be fully aware of safety information provided in this chapter. Most important thing to be considered is surgical safety of the person. The design process of the laser has been taken into account to maximize the safety of patients and operators. The following is a part of its security measures:

1. The self-test system of the machine will immediately start up after turn it on. It will be continuous monitoring the circuit during equipment operation.
2. The laser transmits to the patient's skin via fractional head, the laser array mirror only shot from the front face handle.

3. The machine has designed a separate safety circuit, when there is leakage of the circuit, it can be cut power off automatically.
4. That can be quickly cut off the power by the red emergency switch when emergency situation appears.
5. Key switch to prevent any person free to open the device.

➤ **Please note:**

As the laser will bring high-pressure during operation, incorrect use of any laser device will cause injury. The operator of strong light device should always take care, according to the manual, and take necessary protective measure.

**1. Patient:**

The Safety of patients mainly relies on well-trained surgeons and the treatment environment. Patients should also aware of the attentions, like eye protection in operation.

**2. Operator:**

Operators may suffer a laser beam in the treatment process, so the operator should wear 10600 nm (wavelength) protective laser glasses.

**3. Treatment room:**

The treatment room should be clearly marked with using high-intensity light

➤ **Warning of operation:**

To ensure the safety use of this system, please pay attention to the safety precautions:

1. Except our company authorized technician, others are forbidden taking the machine apart, repairing it, including power, cooling system, optical components and treatment head etc. Please note that the machine has dangerous high-pressure inside.

2. Confirm that the system's rated voltage is 220V/110V AC
3. Do not turn off the switches and plug the power out when not using it. Because it may cause damage of the equipment and hurt people.
4. Photoconductive crystals should always be kept clean. Do not let light coupling infiltrate into the treatment head.
5. When the light treatment head leaks water, don't turn it on. If the machine is working, must shut it down.

➤ **Warning of the laser:**

1. Take necessary protective measures during treatment, because laser may damage the eyes and cause fire or burns.
2. Excessive light to the treatment area may cause skin hurt, causing hyperplasia / atrophy or abnormal pigmentation
3. Do not stare at the laser issued from the treatment head, even if wear the protective glasses.
4. Do not point laser treatment head to air-launched. Point it to the surgical site when treating, and place it on the holder when not using.

## **II Electrical and mechanical safety**

1. Keep all of the panels and cover plates closed, opening the cover may be dangerous.
2. Except for our company's appointed technician, others are forbidden from detaching the equipment. For the system inside has high voltage, and some parts may still store electricity even if disconnected from the power cord.
3. Do not turn on the power, open the cover plate or keep the device in an unattended state when maintaining the equipment.
4. It will cause injury if moved improperly. The machine weight is 35kg, well

balanced and removable, but it can only be slow-moving carefully.

5. The machine grounding through the earthing wire of the three cores power line.

Good grounding is very important for the operation safety.

➤ **Fire Prevention**

1. Take measures to prevent ignite danger by reduce the flammable of treatment area or around. Because the object temperature will increase after absorbing light energy.
2. The skin should not be clean and processing by alcohol or acetone and other inflammable before operation, if necessary, use soap and water.
3. It must be dry before turn on the machine, if use alcohol to clean off the treatment head or any other components.

➤ **System security device**

1. The machine is equipped with some safety device, all the operation people must be familiar with their location and function.
2. Key switches: the key switch is used to turn on and turn off the power. The machine can only be turned on by the key we offer.
3. Power indicator light: red light indicating the machine has processing power.
4. Emergency button: A red mushroom-shaped button, used for turning off machine in emergency situation. Pressed it, no matter what state, the power would immediately be cut off. Clockwise rotate can turn on it, or the equipment will keep in off state.

➤ **Device self-test**

After turning on, the circuit of machine instantly goes into the self-test state. In this case, the operator should allow the machine to run 1-3 minutes before the next step.

➤ **Device level**

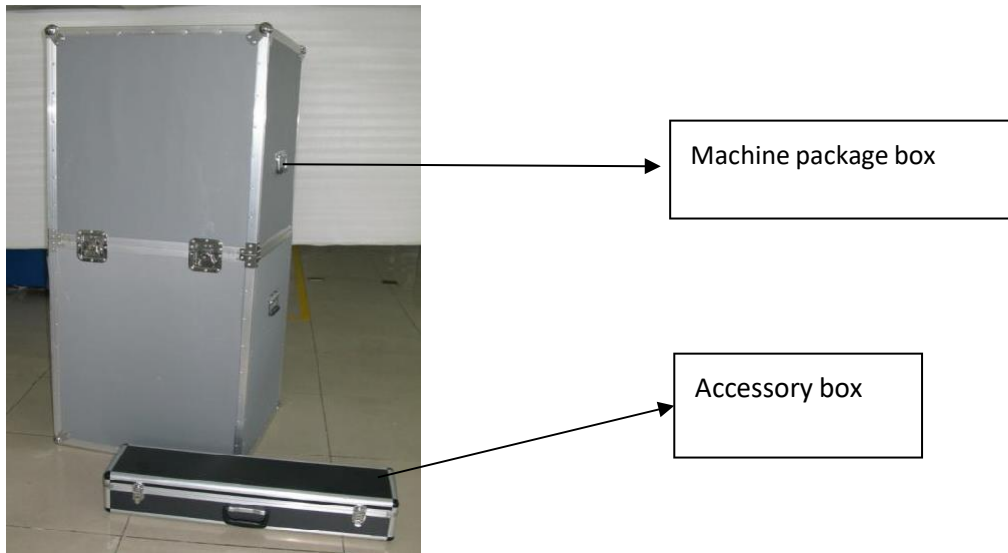


1. Electric shock protection: 1 level, BF-level
2. Anti-corrosive liquids: common
3. Please don't use the device in the environment that mix the flammable anesthetic with air nitrous oxide
4. Operation mode: Continuous.

## Chapter 3 Installation of fractional CO2 laser

### I Instruction of the machine components

1. The machine when received just like the following picture:



2. Accessories:



7 joints arm with scanner



cut head



Protective glass



goggle



foot pedal



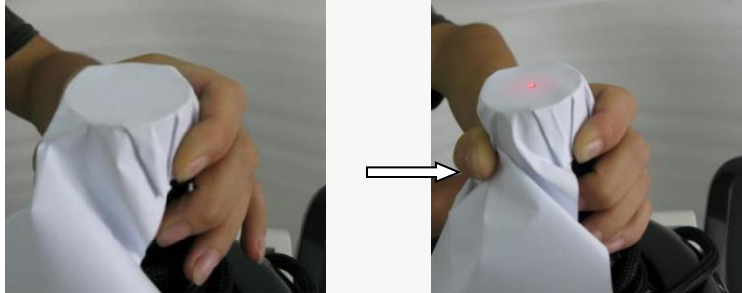
water funnel



power line

## II Installation of machine

1. Lay up: Place the machine on stable ground. Make sure the treatment room is clean, and the room temperature is about 22~28°C and humidity not more than 20%
2. Check out the red light if in the light emit centre.
  - a. Install the power line: one end of the power line plugs into the machine power plug, the other end to the power socket.
  - b. Install the foot pedal.
  - c. Insert the switch key, rotate right, then the machine start up. Wait 2 minutes, and then cover the probe by an paper. Like following:



After the turn on the machine, the red light is in the centre site. If it is off centre, that means we have to adjust the red light.

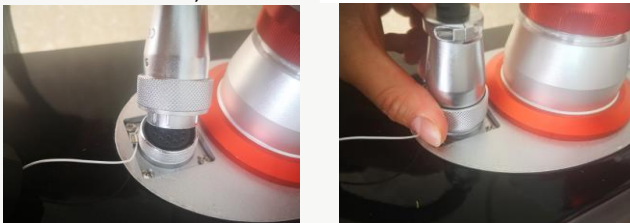
### 3. Installation:

#### A. Install the 7 articulated arm

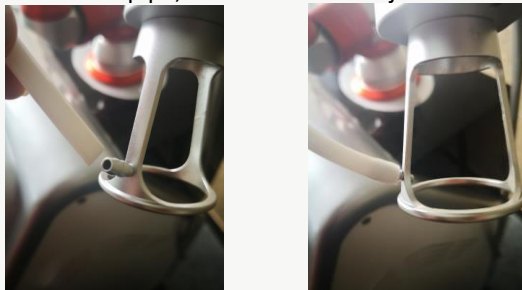
- A) Take out the articulated arm first, then insert it in the bottom, as follows:



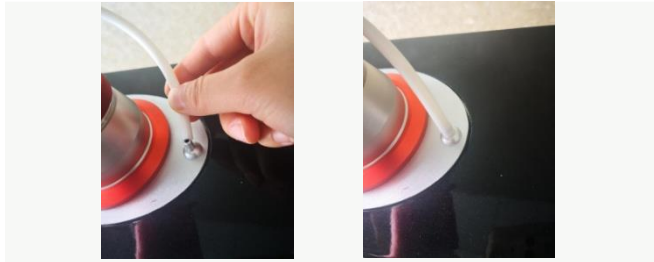
- b) Insert the data line, As bellow:



- c) Take out the windpipe, and insert the one joint side directly, as below:



- d) Insert another side in the air faucet, as the following picture.



(Remark: data line and windpipe haven't to dead angle of 90°, it can turn 360° easily.)

**C. Installation Notice:**

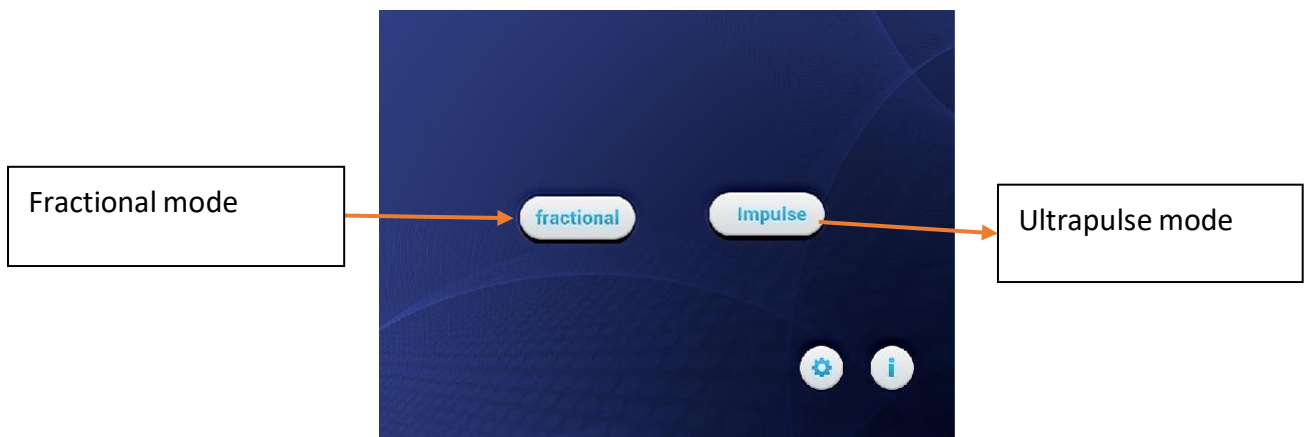
Fractional co2 laser machine can be use in hospital and beauty salon, the notice item about the installment including:

- Open the package, and place the machine on level ground
- Check the machine and the components enough or not
- Check the power supply has electricity or not
- Install probe, and have to well-knit, data line well
- Testing all the function of the machine is normal or not.

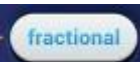
## Chapter 4 Co2 fractional laser operation instruction

### I First interface

Turn on the machine; the first picture will appear on the screen.



Picture 1



It is fractional button, click here and enter fractional pattern interface.



For impulse mode button, click and enter ultra pulse mode interface.



It is setting button, click and then enter setup interface.



For system information button, click and enter into system information Interface.

## II . Fractional pattern interface



Press “minus” or “ plus” button to decrease or increase the power, from 1-40W.



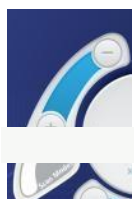
Press “minus” or “ plus” button to set the duration time, control the laser action time from 0.1 ms~10ms in each point during the scanning process



Press “minus” or “ plus” button to set the interval time, to control the aperture time of the scanning process is 1-5000ms.



Press “minus” or “ plus” button to set the point distance, control the distance of fractional points between points 0.1-2.6 mm, and that has reached purpose of control dot matrix density.



Press “minus” or “ plus” button to set the scan mode. there are three types that control fractional scanning.

- 1) Sequence modes: from one side to another side in sequence.
- 2) Random sequence modes: scanning spot without order, random.
- 3) Parting mode: scanning spot with counterpart's next scanning point keep 1/2 of the distance.



Press “ minus” or “ plus” button to choose scan time, we can control the fractional scanning number 1-20<sup>th</sup>.



Choose 1-5 for the choice of digital storage space. Press save is save all the parameters in current page to change in the space,



Press middle area to choose different scan pattern.

**Using up and down** to add and subtract button adjust fractional graphics fluctuation in the direction of the largest Length is 0-20mm.

**Using left and right buttons** could adjust fractional graphics fluctuation in the direction of the largest Height is 0-20mm.



After adjusting parameters, press ready button, and make the scan aimed at the right direction. Step the pedal and the laser begins scanning.



Click to return to main boundary.

### III. Normal Interface:



Press “ minus” or “ plus” button to decrease or increase the power, from 1-40W.



Press “ minus” or “ plus” button to control the fractional button scanning mode. It is divided into three types:

1. Single mode: trample down pedal switch after only launch a laser.

2. Continuous mode: step on pedal switch after continue to launch laser, raise feet after the launch end

3. Pulse mode: trample down pedal, and the lasing is continuously firing pulse, laser pulse and time are controlled by



Press “ minus” or “ plus” button to control the time of duration between 1~100ms



Press “ minus” or “ plus” button to adjust, pulse width and gaps is lesser for super pulse, raise feet and then launch ends.



After parameters adjustment, press ready button, and make the scanner aimed at preparing position, as well as trample down pedal, we can make lasing come true.



Click to return to main interface.

## Chapter5 Clinic applications

### I Treatment parameters for reference

#### A. Reference parameters for fractional mode.

Fractional mode	Point Energy	Envei l	Power	Duration	Interval	Distance	Scan Modes	Time	Treatment courses	Interval treatment time
skin rejuvenation	12mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	2-3 treatments per course	3-4 weeks
Scar removal	10mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	4-6 treatments per course	4-5 weeks
Wrinkle removal	12mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	3-5 treatments per course	3-4 weeks
Large pores	7mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	2-3 treatments per course	3-4 weeks
Fine line	7mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	2-3 treatments per course	3-4 weeks
Skin whitening	12mj-15.0mj	31%	10w-20w	1.0ms-2.0ms	1.0-3.0ms	0.8-1.0mm	Sequence mode	1 th	2-3 treatments per course	3-4 weeks

#### B. Reference parameters for impulse mode:

Normal mode	Power	Mode	Duration	Pulse width	Interval	Treatment courses	Interval treatment time
Acne removal	10w-15w	Single mode or Pulse mode	1.0ms-2.0ms	1.0ms-1.5ms	1.0-3.0ms	2-3 treatments per course	3-4 weeks

Pigment removal	10w-15w	Single mode or Pulse mode	1.0ms-2.0ms	1.0ms-1.5ms	1.0-3.0ms	2-3 treatments per course	3-4 weeks
Spot removal	10w-15w	Single mode or Pulse mode	1.0ms-2.0ms	1.0ms-1.5ms	1.0-3.0ms	2-3 treatments per course	3-4 weeks
Mole removal	10w-15w	Single mode or Pulse mode	1.0ms-2.0ms	1.0ms-1.5ms	1.0-3.0ms	2-3 treatments per course	3-4 weeks
Gyneco	5w-10w	Single mode or Pulse mode	1.0ms-2.0ms	1.0ms-1.5ms	1.0-3.0ms	2-3 treatments per course	4-5 weeks

## II Treatment attention:

1. Adjust energy from low to higher, little by little, or may burn skin
2. It's not less than 3 weeks every treatment.
3. Water prohibited on treatment area in 24 hours.
4. Guard the treatment area against the sun in 7 days.
5. It's not allowed to use Co<sub>2</sub> mode except there are professional doctors.

## Chapter6 Simple machine maintenance

### I Common malfunctions & problems:

#### 1. No electricity circle the machine

Solutions: a. Check up "emergency button": bounce up is turn on, or it is not power on

b. Check up "air switch": above is for open, down for turn off.

c. Check up if fuse of the power input behind machine damage or no.

d. Check up "power cord", whether is in a good condition or not

e. Check up whether power supply to machine in the power socket

#### 2. Water flow alarm:

Solutions: a. Check up whether enough water inside water tank

b. Check up whether pump work well or not

c. Maybe water pump has bubble, should turn on/off machine times to wash away the bubble; or make water flow out and input water again.

d. Check up whether water flow switch broken, replace by new one or make those two wire (connect to water flow switch) short circuit.

#### 3. System halted/crash

Solutions: a. High-pressure interference, check whether big power electrical applications grid around.

b. Software out of control, replace new LCD controller.

#### **4. Graphics output energy uneven off position:**

Solutions: a. Adjust laser beam path

b. Lens (on probe) is dirty, clean by alcohol swab. Using after dry, or alcohol maybe burn and damage lens

#### **5. No infrared ray indicator:**

Solutions: a. Check if there have 3V DC power supply for infrared ray output

b. Change infrared ray sighting device.

#### **6. Blowing device does not work; no air output.**

Solutions: a. Check if the pump work well or not.

b. Check if the pipe leak or not

## **II Daily maintenance:**

1. Cannot insolent.

2. Cover the machine by cloth or mantel to prevent dust. That is very important.

3. Treatment head must be handled with care.

4. Change water every 3 months, using pure water or distilled water

5. Keep machine in dry, ventilated and no dust room. (Very important)

6. Except professional operator, others are forbidden to operating the machine