

CO2 Fractional Laser Manual

Model: HDR-CF100



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Preface

- **Overview**

The CO2 Laser treatment is suitable for general surgery, dermatology, gynecology, ENT, paediatrics, urology. It is mainly use cutting, burning, carbonization, gasification, hemostasis way to heal. This product is especially suitable for dispelling various wrinkles, acne and acne scars, surgical scars, traumatic scars, benign skin tumors, etc.. after plastic surgery.

Dermatology: excision of extra material and playing mole, body odor

Gynecology: cervical erosion, cervicitis, cervical polyps, carcinoma in situ

ENT: nasal polyps resection, rhinitis, inferior turbinate hypertrophy, benign tumor

Urology: circumcision, genital warts

Anorectal: hemorrhoids cutting etc.

Physiotherapy: skin numbness, frozen shoulder, arthritis, inflammatory mass, chronic ulcers, vasculitis, soft tissue injury, wound infection, beam expander irradiation.

CO2 Laser uses advanced CO2 laser treatment technology, safe and effective treatment for mild treat your skin. No discomfort such as burning tingling, acupuncture or peel; no swelling after the treatment, no infection.

- **Introduction of Machine**

Model: HDR-CF100

Name: CO2 fractional laser treatment instrument Picture

1.1 Instrument Appearance



Picture1.1 HDR-CF100 CO2 fractional laser treatment instrument

• **Instrument Structure**

This instrument is composed of three parts: (1) the main body of the machine (2) control panel (3) CO2 laser surgical handpieces.

The control panel is a 10.4-inch color touch screen, you can select different modes of operation, set the system parameter values. Equipped with a power switch and an emergency stop button at the bottom of the screen.

• **Components and control**

CO2 fractional laser treatment instrument is mainly composed by the power switch, laser handle, control panel (operating screen), cooling system and etc.

The main body of the machine include: power switch and radiator system.









The laser handle is mainly composed by seven joint torsion spring articulated arm and laser surgical handpiece.

The controller include: color touch screen, footswitch, key switch, and emergency stop button.

The cooling system can effectively detect the water cycle is normal or not and the water temperature, to ensure the normal operation.

• **CO2 fractional laser treatment instrument**

Accessories:

		
Main body of the machine	Foot switch	Key
		
Glasses	Goggles	Power cord
		
Articulating arm light guide	Funnel	

NOTE

It's better to unpack boxes for checking or repairing under the distributor's permission and guidance

- **Control power**

Twisting the key to control the power switch.

When an emergency situation, push the red emergency stop button can cut off the power quickly.

- **Specification**

Model: HDR-CF100

1. Laser wavelength: 10.6 μ m
2. Output power: 1-40W (Single pulse)
1-120W (Super pulse)
3. Matrix form: Pulsed light scanning

Scan pattern: Rectangular, square, circular, oval (standard), triangular, hexagonal, and straight line

Total pulse energy: 125mj-1kj

Focal spot diameter: ≤ 0.1 mm (FFLS) , ≤ 0.2 mm(HFLS)

Spots interval: 0.001s

4. Guidelines beam: red semiconductor laser (≤ 5 mw)
5. Light guide system: seven joint torsion spring articulated arm
6. Control panel: 10.4-inch color touch screen
7. Cooling system: Built-in sealed water cooling circle system
8. Power supply: 100/110V,50-60Hz; 230-260V,50-60Hz

- **Treatment range**

Skin rejuvenation, whitening

Remove wrinkles, firming

Remove all kinds of scars (burns, surgery the legacy, trauma)

Remove acne, dark spots, pigmentation

Remove chloasma and pigmentation

- **ADVICE FOR CUSTOMERS**

Advice for customers

Notice

Wrong operation will cause skin burns, so the medical staff must be familiar with the safety instructions and operating processes before the operation

Before use, the user must check the function of the machine to eliminate the hurt to patients and third parties. If the instruments connect to peripherals, the peripherals manual must be read.

- **Safe operation**

The design of the laser instrument consider the safety of medical staff and patient.

Following are main security measure:

A: Open the processor of instrument, the processor will conduct a self-testing firstly. In the next treatment, the processor will continue to automatically detect whether the instrument's internal system is running correctly.

B: in the case of an emergency, you can use the red emergency stop button to cut off the power.

C: twist the key switch to the left, when you need the instrument to stop working.

- **Security warning**

Without agreement from dealers, the operator is not allowed to repair the instrument, all processing without permission may result in damage to the instrument, and result void the warranty.

- **Training in the use**

Warning

If the instrument is used improperly, the skin will be burned by intense pulsed light severely. Therefore, before using this equipment, operators must read the manual, use the machine safely.

This laser instrument requires specialized personnel to operate. Only the personnel, who received professional training and is familiar with the operating instructions, or engaged in medical, can use this instrument. The personnel who is not trained or can not meet the requirements of the operating,

is not allowed to use this CO2 laser instrument. All users must read the user manual carefully before operating this laser instrument.

Patient safety is decided by well trained personnel and appropriate treatment room. Operator must inform the patient a security risk of all instrument.

The success of the treatment depends on the user's experience and understanding of the relevant medical knowledge.

- **Clarify**

Related matters of the treatment process must be clarified to the guests, and sign a written treatment protocols with the guests.

- **Optical security**

The operator must wear protective glasses in the process of treatment, it can filter out 20-1200nm wavelength light. Guest must wear goggles. Protective glasses and goggles are specialized for filter out the light wavelength of 200nm to 1080nm. Therefore, do not use ordinary glasses instead of it, otherwise this will hurt your eyes.

Do not stare directly at the incident light and the reflected light of the laser, even if you are wearing protective glasses.

The damp gauze helps protect the eyes during treatment, but the treated area must be kept dry. Do not turn on the power switch in the case of laser treatment tip is not installed, this operation will damage the instrument.

To tune or clean the instrument, please be sure to cut off the switching power supply.

- **Laser Safety Warning**

Issued by the laser window is the distal in the left fractional head. The design of this structure can make the laser act on the treatment area safely and effectively .

Staring directly at the laser window strictly forbidden.

Metal instrument will reflect the laser beam, the users can not make the laser beam hit the metal objects.

Reflective materials should away from the laser instrument, like jewelry, watches, surgical instruments, mirrors, etc..

Only wear appropriate protective equipment, they can receive treatment (wear protective goggles or other effective protective measures). The operator must have the Ophthalmology clinical experience. Disinfect various parts of the instrument strictly before use the instrument. Unreasonable eye protection measures will cause redness cornea or damage, severe may lead to blindness.

- **Laser treatment room**

The treatment room should be kept clean at any time, forbid other person except the staff enter the treatment room during the working time. The laser beam can only act on the site where is need for treatment, can not act on non-treatment area, otherwise it will cause unnecessary trouble. Warning label about laser radiation should be affixed at the entrance of laser treatment room.

Forbid coming and going during the treatment

Recommendation: If use this laser instrument to carry out special operations, this treatment room must have good air conditioning, dehumidifiers and other essential facilities. And during the treatment period, the operator and personnel have their respective defined area range. The treatment room should be affixed with a warning label during surgical procedures.

- **Electromechanical safety**

If laser instrument working when the voltage is 220V or 110V, rated power can not be less than 100W. The power cord which is connected to the laser must match to the international single-phase three-route AC outlet, and be able to have a good guide. The specifications of this model is 10A. The grounding resistance is very important.

After the laser stop working, the high voltage parts inside the instrument still stay in a very high energy. If the operator at this time to open the back cover to reach the interior of the instrument, is likely to lead to an electric shock.

Work period, to ensure the stability of the voltage.

- **Fire prevention**

With the growth in work time, inside the instrument to produce a certain amount of heat. Prohibited around flammable materials in the instrument, such as acetone, alcohol. If you need to instrument disinfection with alcohol before use to ensure that all of the alcohol to evaporate all. Flammable, explosive materials, be sure to stay away from the work area of the instrument. Example: anesthetic, gasoline, alcohol, etc..

- **System safety**

The personnel, who is authorized and get the key, can operate this instrument.

The red emergency stop button on the instrument can cut off the power in case of emergency.

In case of emergency, press the emergency stop button, and then counter-clockwise twist the key to turn off the power, then twist the emergency stop button to restore the original state.

A 10A circuit breaker is installed in the rear of the device, near the power line. If the load exceeds 10A, circuit breaker switch automatically tripped. Simply push the breaker switch up, the system will restore power. The instrument self-test initialization process, the operation of the circuit will

continue to be detected in the whole operation process.

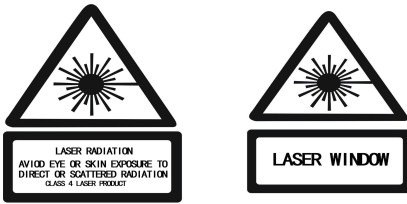
- **Transportation Safety instructions**

Although this instrument is very strong, we should clutch the armrest when we move it.

The external guide light structure of this laser instrument is a very sophisticated optical path system, when you need to transport this instrument, pls. according to the factory packaging to reduce the vibration of the machine during transport, otherwise, too strong vibration will cause the

offset of the internal structure of the instrument, and affect the light output.

- **Security identifications**



These two security identifications must be affixed to the packaging (obvious place) at the top.

Warning

Any non-standard use can cause damage to the human body. The operator should be vigilant and take appropriate protective measures in the event of an emergency.

- **The assembly instructions of the instrument**

- **Instrument assembly process:**

- 1) Move the instrument from the Aluminum Case.
- 2) Place the instrument in a ventilated environment for one day (not wet), because the internal of instrument will produce a higher moisture after a long period of transport.
- 3) Check the instrument appearance and parts
- 4) to empty distilled water into the water tank.
- 5) Install the light guide arm, treatment of head and connect the power
- 6) start the instrument to test machine's function

- **The major components of the carbon dioxide laser treatment**

- 1 Main body of the machine
- 2 laser treatment tip
- 3 Light guide arm (instrument parts)
- 4 glasses
- 5 goggles
- 6 power cord
- 7 funnel
- 8 plastic pipes
- 9 Manual

- **Attentions before use**

Before unpacking, ensure that the surrounding environment meets the following requirements:

- 1) **position**

The instrument should be placed in a well-ventilated treatment room. Make sure that the internal parts of the instrument can not be high humidity.

- 2) **Power**

Power switch and power cord have been provided according to local rated voltage and customers requirements before the instrument is shipped from the factory.

AC220V \pm 10%, 10A, 50/60HZ. AC110V \pm 10%, 20A, 50/60HZ

Input current will not cause a voltage or current high and low status.

The internal switching power supply of the instrument is designed specifically for CO2 laser

treatment, with its own unique circuit breaker device.

Note

Make sure that the instrument voltage matches the rated voltage of the local, or the very high voltage can damage the instrument, low voltage instrument is not functioning properly.

3) Requirements of the working environment

Ambient air must not contain corrosive particles (such as acidic particles), it will damage the wire, some parts of the instrument and instrument control screen.

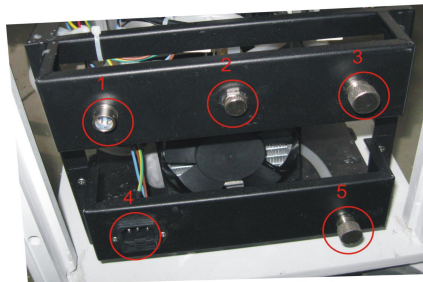
Dust in the air as little as possible, otherwise it will continue to absorb light energy, when it falls on the filter, it will affect the normal operation of the filter.

Metal particles are also will bring damage to some parts of the instrument .

Working temperature of CO2 laser treatment instrument should between 15 ° C to -30 ° C; wet should not be higher than 80%; when the instrument is working properly, the power should be about 2KW. The treatment environment is the best indoor air circulation better treatment.

• Water Description of the instrument

1. the external ambient temperature in the instrument work best at 15 ° C to -30 ° C; wet is not higher than 80%; operating and treatment rooms to keep clean.
2. before injection will open to ensure that the vent hole is open, otherwise the water column into the chassis.
3. connected to the funnel injection.



- Foot switch
- Overflow
- Water injection
- Power port
- Water port

4. to the funnel and the machine connection
5. Step 4) in the white connector into the step 3) water. Water overflow water overflow fill.
6. the injection device is removed from the instrument.

Note: 15 days plus water.

• starts Machine

- 1) before starting the instrument, to ensure that the red emergency stop button is thrown up. If the red emergency stop button is pressed state, twist it clockwise so that it pops up.
- 2) Connect the power cord and foot line.
- 3) the instrument behind the breaker switch to the "ON" position.
- 4) clockwise twist of the key switch, the the instrument internal water circulation and cooling system will automatically run.



- 5) observed the water cycle of the instrument is operating properly.
- 6) If no leaks, water alarm, let the instrument automatically run more than a minute, and then turn off the power.

Note: To change the water to the instrument regularly

To change the water every 2-3 months to instrument. Open the back cover of the back of the instrument, and open the vent. As much as possible to discharge all the residual water in the cooling system, plug it in water injection pipe vent valve was opened.

The installment of the Articulated arm

Take out of the machine installment of the probe

A. The installment of the articulated arm

- ① uninstall the screw
- ② Take out of the articulated arm and put it into the cylinder, which is on the top of the machine, the aperture between them is about 2mm. The pictures as follows (Do The articulated arm must be over the steel tube)
- ③ Take out of the balancing device and install the equipment as the following pictures (Notice: Do handle with care, beware of falling and the grooving side in in your left hand)
- ④ **customers can adjust the articulated arm to up and down or left and right according to their needs so that they can handle the machine more easier**
- ⑤ .install the screw that you uninstall in the first step

B. The installment of the probe

- ① First tie the black wire and air-duck together, then bundling them to the articulated arm with white ribbon according to some certain proportion
- ② connecting up the probe and articulated arm
- ③ Finally connecting up the wire and air-duct as per the pictures

Warning

- 1 Do not put pure distilled water into the machine
- 2 first time use the machine, you must let the machine work a few times with pure distilled water, then drain off the water and clean up the machine,
- 3 keep the machine always has enough pure distilled water
- 4 put the pure distilled water into the machine regularly ,especially when the temperature is higher
- 5 Make sure the treatment handle is installed to the machine before treatment.

Usually moving of the machine

- 1 turn off the machine ,stop working
- 2 power off
- 3 handle well the treatment handle
- 4 move away the machine (do not lean the machine)

Warming

If you want to move the machine to a further place, please contact your supplier for more specific details

instruction of shipment and storage

- 1) Drain off the distilled water before shipment or storage
- 2) Put the machine vertically into the package before shipment, the package provided by supplier is the best and standard one ,because it can avoid moving during shipment
- 3) The out package must be lined with waterproof material and cushion. Do move the machine carefully to avoid damage .
- 4) the temperature is $+5^{\circ}\text{C}$ _ $+55^{\circ}\text{C}$ during shipment or storage
- 5) The scope of humidity :30%—80%
- 6) The scope of atmospheric pressure.:86kpa-106kpa

- **HANDLE**

This chapter tell you how to handle Fractional CO2 laser screen

Waring

- 1) There is high voltage capacitor in the laser machine , so please make sure he screen connect well with the laser machine so as to prevent leakage
- 2) please make sure the laser machine is within the scope of your operating before turn on the machine
- 3) The patient must wear goggles during treating
- 4) Make sure the laser light shine on the treatment skin

4.1 handing instruction of Fractional CO2 Laser screen

1. Turning on the machine with key, there is a progress bar, after it fills up, the screen picture as follows
Press Enter key, the screen display as follow
2. choose treatment pattern from the screen. The Fractional Pattern is used for different shape, area and density. This pattern is used for cosmetology. The Normal pattern is pulse , which is divided into monopulse and super pulse is used for laser surgery.
3. After the machine goes on standby, you can choose the patterns and set up parameters

4. When finishing parameters setting range, you can put your foot on the foot pedal and start treating
5. The instructions of different patterns as follows power range: 1% ~ 40% . use Δ/∇ button to set up power range
6. Duration range: 0.1ms ~ 10ms, use Δ/∇ button to set up duration range. the meaning of duration is the time that the light stay on your skin. The unit is ms, the larger figure is, the larger power you obtain
7. Repeat range : 1ms ~ 5000ms, use Δ/∇ button to adjust the time interval between two points, Unit of scan interval is second , The time interval for each point of light is longer Skin cooling time is longer too.
8. Overlap: 1th ~ 20th, Use Δ/∇ to set over lap, (repeat times is scanning times, the more scanning time is, the more falling skin exfoliation is)
9. Point distance: Adjustment range : 0.1mm to 2.6mm , use Δ/∇ select point distance, the point distance refers to the distance between each point , the further distance is, the larger repairing area , while the deeper reaches the level of the skin ; smaller the distance , the surface of the exploitation of the more obvious , reaches the level of the skin is more shallow .
10. Treatment graphical selection and the shape and size options: Select shape (shape) mode to set Emission form Emission form: Line, square, rectangle, triangle, regular hexagon, round and oval (Each time you press the shape is changed). Use the right side button of the screen, "change the size of the graphics to adjust range: 0.1mm ~ 20mm , bottom Δ / ∇ to set the size , which is setted based on the size of the treating area that patient needs.
11. Select the scanning mode (scanning) and set the transmit mode (Each time you press, the model is changed), a total of three kinds. Transmit mode: Shuffle , this model has strong energy, random play. from one side to another side . The maximum distance between two points Use the Save button (SAVE) to save the setted parameter values. Save the value that setted in the assigned number key. For example: press the number 1 in the setted value, and then press the settings (SAVE) key, when you press the number 1 key, the machine itself will enter into the setted value before.
12. Setting is completed, turn standby (STANDBY) key to ready (READY) mode, tread on the pedal and the laser will be shot
13. Before firing the laser, press the (PREVIEW) key to preview the effect of red light
14. After treatment is completed, press the the Back arrow keys which is at the upper right of the screen to return to the standby screen.

CO2 NORMAL(CW)

Danger

- (1) when the machine working, the laser head can only be aligned with the treatment area, do not act in the non-treated area, as well as others.
- (2) even if there are a lot of security and export certifications , do not let the optical head directed at the operator and non-therapeutic staff Do not let the optical head directed at eyes.

Press the normal key in the the the standby screen to enter into the the state of CO2 in normal mode..

1. Energy (power) adjustable range: 1% to 40% , the use Δ / ∇ key that on the right side of the screen to set the power. The higher the number, the greater light energy will be, the higher heat the skin will get.
2. extension time (duration) adjustable range: 10ms to 1000ms, select the extension time, use Δ / ∇ key on the right side of the screen to set the stay time of the laser in the skin

The extended time means that the light stay on the skin time , the unit is milliseconds, the larger the number is, the longer the heating time to reach the deeper level of the skin will be .

3. Press mode button and use Δ / ∇ key that on the right side of the screen to set the desired mode of treatment.
4. Transmit mode: the first mode: single (Single); refers to stepping on the pedal once ,and the light emit once, this mode is suitable for mole removal.
5. The second mode: continuous (Continuous); refers to stepping on the pedal, the laser head will be

always light emit, move away your foot from the pedal, the light will be stopped, This mode is suitable for cutting surgery.

6. The third mode: Pulse (PULSE); the light pattern is similar to laser eyebrow washing machines, step on the pedal with your foot, and the light emits three times a second

1) On Time (ignition time) adjustable range: 10ms to 1000ms. Press Δ / ∇ that On the right side of the screen to adjust the time.

2) Off Time (interval) adjustable range: 10ms to 1000ms, press Δ / ∇ that on the right side of the screen to adjust the time

Setting range:

Continuous mode (continuous) only need to adjust the power energy, No need to adjust the duration and the interval time (on / off time); Single mode (single) simply adjust the power energy and duration extension of time, ((On / off time) no need to adjust burning and interval;

Pulse mode (pulse) simply adjust the power energy ((ON / OFF time) burning and the time interval, no need to adjust duration.

after setting mode, turn the STANDBY (Standby) state to READY (ready) state, step on the pedal and the laser will emit. For the return back, turn ready state to standby state, press the right upper end (blue arrow) to return to return to the previous screen and turn off the machine

Chapter Five instrument maintenance

this chapter mainly introduces how maintenance the machine, but does not include the maintenance of the specific maintenance staff. Also cited some of the common system troubleshooting.

Warning

Before maintenance, turn off the machine and power supply, otherwise the machine will be destroyed or electric shock, do not attempt to open the rear panel of the machine, it will become invalid without permission of opening the machine inside

- **Keep the machine clean and attention**

With a soft, damp cloth to clean the host, but do avoid the liquid into the interior of the machine

- **keep the light guide arm and the treatment of head clean**

Use for some time, clean the surface of the probe arm and the treatment of head regularly. For long period of use, the treatment head will be attached to the dust and it will affect the light output, use pure alcohol to clean the lens

• System Troubleshooting

Daily problems	Solutions
Screen does not display	Check the power line
	Check the red emergency stop button whether it is in the up state
	Check the circuit breaker which is at the bottom left of the machine , if it is tripping please contact your operators
	For other questions, please contact your operators
When the machine working , it is no light	Check whether the READY key is turn on try to increase the operating voltage, Check the foot switch ,weather it is good
the laser light energy is weaker and weaker, and even there is no light	<p>2 The inner parts of the machine generated a lot of heat, you should stop the machine working for 30 minutes</p> <p>3 Light guide arm joints mirror and treatment of head and the lens need to be cleaned (cotton ball moistened with pure alcohol to clean) take down the treatment of head, check the lens of the treatment head weather it is ok</p> <p>4 unstable Operating voltage will affect the normal operation of the laser (lower) whether the laser arm is damaged, you can change it with manufacturer if Light guide arm or the treatment of head has cracks or get watered, please contact with your manufacturer</p>
Hearing "creak" during the machine working	<p>May be a long time did not use the machine and pre-combustion is more difficult</p> <p>The indoor temperature is too low, there is an urgent need to heat up, it is recommended that good ventilation treatment rooms</p> <p>Indoor humidity is too high, keep dry The laser head may be damaged</p>
Temperature of the cooling system is too high	stops the machine working, and keep the machine inside cool Please contact manufacturer if there is other problem
laser treatment head is weakened	Perhaps the life of treatment head is end
Treatment head is broke	Please contact the manufacturer

Excursus

Treatment instructions

1. Attention

1) Before treatment please analysis if the customers skin is suitable for laser treatment . For example Whether the have allergic skin or peeling skin, whether they have been artificial eyebrows, tattoos or others. If they are treated, you need to tell the patients that the treatment scars will take some time to be healed

2) Beautician give the patient the related documents

2. The parameters and clinical recommendations

Course of treatment:

1) Wrinkle removal and acne scars

3-5 course of treatment, Every 3-4-week a course of treatment

2) Scar removal

4-6 months course of treatment, every 4-5 weeks a course of treatment

3) Facial beauty

2-3 course of treatment, every 3-4-week a course of treatment

3. Treatment Description:

A: During treatment, adjust the energy from low to high and step by step, preventing burning the skin

B: in each course of treatment at least 3 weeks

C: Within 24-hour of treatment, treatment area Do not touch water

D: Within 7 days after the treatment, Do not let strong sunlight shine the treatment area for a long time

E: Only the professional medical personnel can Operation laser machine treatment instrument

4. Daily maintenance

1. Avoiding exposure of the laser machine

2. After using the machine, cover the laser machine with a hood, reducing the dust fall on the laser machine, especially for the light guide arm and the treatment head

3. Every 2-3 months to change the water that inside the machine. (the water must be cleanliness distilled water)

4. maintain the treatment rooms air flowing. (dust-proof very important)

5. No standardized operating

5. Before and after treatment

Before and After



repairing

When the machine is unable normal working, or you have a brief maintenance as the above described ,the machine still can not enter the normal operating procedures, please contact with our company service department , If factory repair is needed,please contact us as the following way

Delivery:

- 1, the local train station for Railway Express;
- 2, the local airport for air express;
- 3, the local long-distance passenger transport (steam) kiosks Automotive.

Note:

1,Before the date of returning back the machine to our company ,fax notes to the service department of my company, mark the fax,With the words :with the fax pick up, so as to we send our technician to pick up the machine in time, and ensure the timely maintenance of the machine

2, Before effect shipment ,contact with the service department to make sure the contact telephone number, pick-up locations, the consignee.

When calling to the service department, ask for the technician's phone number, name, so that if the service is not good , we can hold his accountable