Model:PC40DS

CO_2 LASER SURGICAL SYSTEM

Operation & Service Manual

This manual includes some general warnings that you have to pay special attention to when you operate the system.

Please read this manual carefully and understand thoroughly before you operate this system.

This manual should always accompany the system, and its location must be known to all personnel operating the system.

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Safety Guidelines

1. 1.

The PC40DS surgical laser system is designed to comply with CE regulations for surgical laser systems. To avoid accidental exposure to hazardous radiation, personnel operating the system must be thoroughly familiar with all its safety requirements and operating procedures.

The areas of concern for safe CO_2 laser operation are discussed below.

1.2. Burn Hazard

CO_2 laser radiation is invisible to the human eye and can cause third-degree burns or ignite inflammable materials, even when defocused.

1.3. Reflection and Direct Eye Exposure Hazard

The system emits visible and invisible laser radiation that is hazardous to the eyes. Never stare into the CO_2 laser beam or allow it to be reflected from any reflective surface-even rough metal can reflect the CO_2 laser beam. As a precaution against accidental exposure to the output beam or to its reflections, all personnel must use appropriate safety eyewear

⚠ Attention!

Never stare directly into the aiming beam. Also ensure that the aiming beam is not directed at anyone's eyes. Although this beam is low powered, direct exposure can be hazardous to the eyes.

1.4. Safety Eyewear

All personnel in the vicinity of the laser unit must use safety eyewear and must ascertain that the eyewear provides adequate protection from the 10.6 micron wavelength radiation. This is generally provided by most quality polycarbonate safety spectacles with side guards for protection from lateral exposure. In the EU countries laser eyewear must be

CE marked for 10.6 micron laser radiation.

Item	Type	OD	Manufacturer
Safety goggle	EC2	7+	NoIR Laser Co., LLC

Different safety goggles for corresponding wavelengths are available to protect the eyes. If you have further questions about safety goggles please get in contact with organization or your local distributor

⚠ Attention!

When operating in the vicinity of the patient's eyes it is advisable to cover eyes with an opaque material.

Safety Guidelines

1.5. Explosion and Fire Hazard

Do not operate the unit in the presence of flammable anesthetics or volatile substances such as alcohol, gasoline or solvents. Flammable drapes, surgical gowns, gauze and other ignitable materials must be kept out of the beam path.

The use of nonflammable materials and instruments is advised. Flame retardant surgical drapes, gowns, etc., are recommended. A readily accessible fire extinguisher in the vicinity of the unit is also recommended.

For safety it is advisable to surround the surgical area with wet towels or gauze since these will absorb any stray laser radiation. Be sure to keep them wet throughout the procedure.

1.6. High Voltage Hazard

The laser unit generates high voltages within the main cabinet. To avoid injury, do not operate the unit before ensuring that all of its panels are properly closed. Do not attempt to remove or disassemble any panels.

⚠ Attention!

Only by trained of professional personnel technical personnel may service the unit.

1.7. Using the Proper Power Receptacle and Plug

Use only the power receptacle and plug specified for your unit.

Use only a power receptacle and plug that are in good condition.

⚠ Attention!

To remove the power cord from the receptacle, hold it by the plug. Never pull on the power cord to remove the plug from the receptacle.

1.8. Grounding the Unit

The unit is grounded through the grounding conductor in the power cord. Good grounding is essential for safe operation.

To ensure grounding reliability, always plug the power cord into a properly wired power receptacle.

1.9. Equipment safety fittings

For safety, PC40DS is equipped with the following safety fittings:

a)Remote interlock connector: There's an remote interlock connector at the back panel of the unit, which connect the door's interlock of the room through cable. The unit will be shut off as soon as the door is opened. By default, the external interlock connector is disconnected.

b)Standby/Ready control: When in Standby mode, the machine is in safe mode without laser emission; When in Ready mode, laser emission is allowed.

c)Ready state warning: when machine enters into Ready mode, the Ready indicator light is on.

d)Laser Radiation Warning: Audible warning is issued when the laser radiation occurs.

e)Keyswitch: Operators' qualification limit.

f)Emergency Stop Switch: Press it to shut down power to the machine when an accident occurs.

1.10. Compliance with International Standards

The safety regulations that PC40DS CO_2 laser surgical system comply with can be grouped under 3 categories

1.Electric safety regulation

2.Laser radiation safety regulation

3.Electromagnetic radiation safety regulation These safety regulations comply with the following standards set by EN:

EN 60601-1

Medical electrical equipment part 1: General requirements for safety

EN 60601-1-2

Medical electrical equipment part 1-2: General requirements for basic safety and essential performance -Collateral Standard: Electromagnetic compatibility- Requirements and tests

EN 62304

Medical electrical equipment part 1-4:General requirements for safety-Collateral Standard: Programmable electrical medical systems

EN 60602-2-22

Medical electrical equipment Part 2-22: Par ticular requirements for the safety of diagnostic and therapeutic laser equipment

EN 60825-1

Safety of laser products Part 1: Equipment classification requirements and user's guide

Safety Guidelines

Although PC40 series CO_2 laser surgical systems are designed according to accident prevention regulations, only a proper and careful use an guarantee safety. For effective precautions, please refer to chapter3.4.7 and 9 in operator's manual.

The EMC performance of this system has been evaluated and is in compliance with EN60601-1-2.Better use this system in an environment free of strong electromagnetic field.

⚠ Attention!

In accordance with these regulations, a recommended routine inspection and maintenance schedule is provided in the Maintenance chapter of this manual.

1.11. Warning Identification and Certification Labels

The location of the important labels affixed to the unit. These include:

1.Laser emission danger label-warning against:

Possible exposure to laser radiation and specifying the types of laser present.

2.Non-interlocked warning label-warning against:

a.Risk of explosion if used in the presence of flammable anesthetics.

b.Possible electrical shock when cover is removed.

c.Possible radiation exposure when laser enclosure is opened.

3.Electric shock warning label-warning user to properly ground the unit, against opening the unit's cover and information concerning:

a.Degree and type of protection against electric shock.

b.CE marking in compliance with the requirements of 93/42/EEC directive concerning medical devices

4.Identification label-noting unit model number, serial number, electrical requirements and date of manufacture.

5.Certification label - manufacturer and/or distributor details.

6.Laser aperture warning label - indicating laser beam exit location.

Preface

2.1.

The PC40DS CO_2 laser surgical system is an intelligent laser treatment instrument. Its function is to output CO_2 laser. This product is featured by compact structure, beautiful appearance, reliable performance, convenient operation and perfect safety. The technical specifications of the product have achieved the advanced international standard.

The instrument can be applied to general surgery, gynecology, otolaryngology and dermatology etc for different treatment such as cutting, vaporizing, cauterizing and solidifying. It can be used in ward and private clinics for its portability and compactness.

WARNING

This instrument generates high voltages and laser radiation within the cabinet. Operators must pay much attention to safety during operation. Operation safety instructions are specified in this manual. Any improper use, adjustment or maintenance may cause laser radiation hazards or high-voltage electric shock.

2.2. Listing of controls, adjustment and procedures for operation and maintenance

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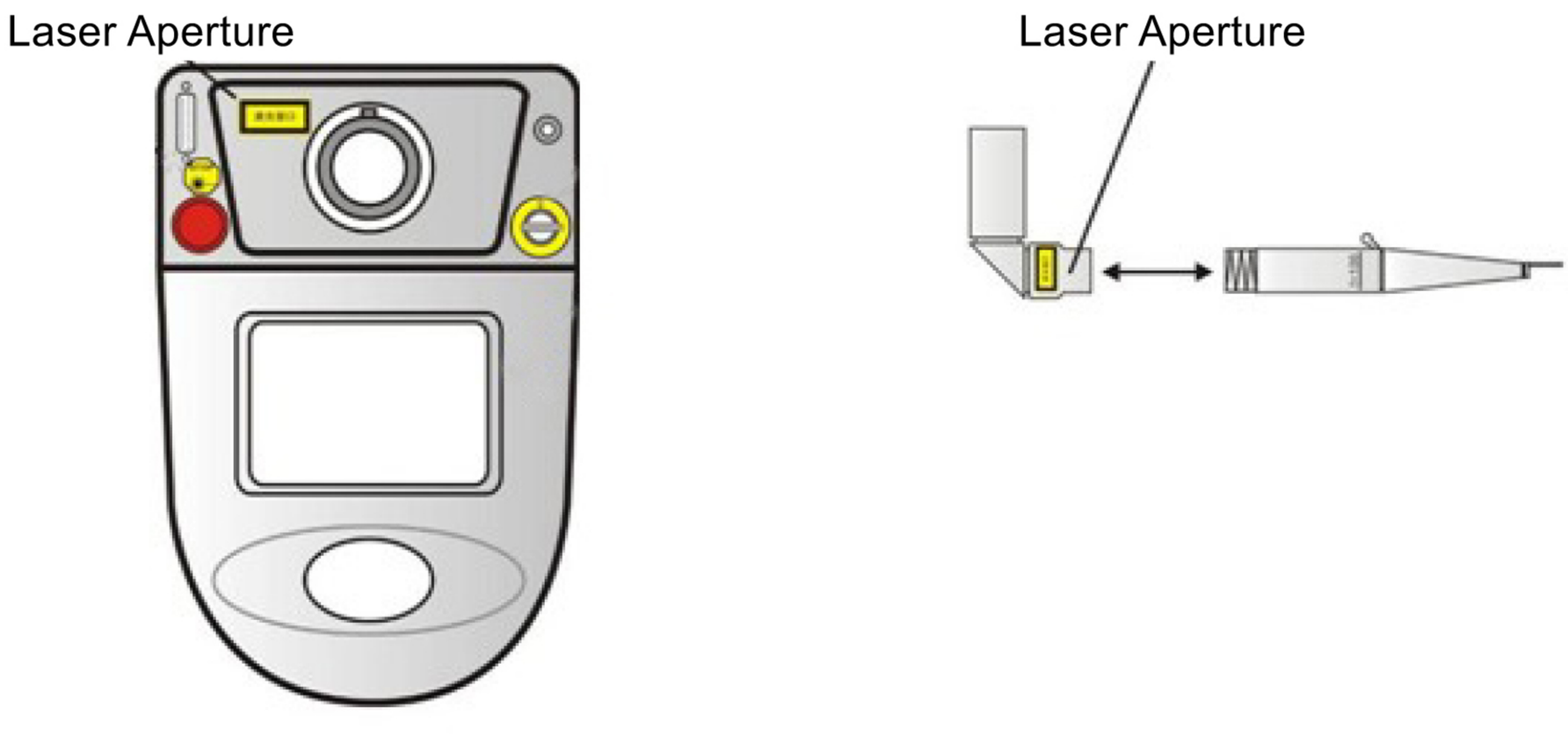
12 Maintenance	12.2. Lens cleaning 12.3. Cobinet cleaning 12.4. Handpiece disinfection	12.5. Fuse replacement 12.6. Power calibration 12.7. Calibration

Caution-Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

2.3. Laser Aperture



3. Operation principle of the system

3. 1. Principle of CO_2 laser surgical system

The CO_2 laser, with a specific wavelength of 10.6um can be absorbed by human body tissue (no matter what color the skin is) almost by 100%, with the laser slightly passing through the skin. It is the heat and electromagnetic effect of the laser that people use to conduct non-blood or less-blood cutting, cauterizing, gasification and accurate microsurgery. Most optical knives use CO_2 laser source.

The CO_2 Laser system could not be used for internal vascular surgery.

3.2. System description

The PC40DS Co_2 laser surgical system is the latest microprocessor-controlled instrument based on a sealed-off CO_2 laser providing up to 40W output power on body tissue. It is easy and safe to operate.

3.3.Main cabinet

1.CO_2 laser and aiming beam diode laser
2.Switch source with high voltage and constant current
3.Main control panel
4.Cooling system
5.Remote interlock
6.Footswitch
7.Articulated arm

3.3.1CO2 laser and aiming beam diode laser

Sealed-off laser is selected. The active medium is a mixture of CO_2 and other compound gases. The compound light consists of sealed-off CO_2 laser tube, light intensity detector, diode laser and beam combiner. The beam combiner combines CO_2 laser beam and beam diode laser beam coaxially and guides them into the articulated arm beam delivery system.

3.3.2 Switch source with high voltage and constant current

The instrument is equipped with a switching-mode power supply which converts input voltage to the high voltage required for laser emission. Compared with traditional source, it has a series of advantages, such as small volume, high efficiency and safety while increasing voltage.

3.3.3 Main control panel

The microprocessor-based main panel is used to control all functions by touching the thin film switch. Time and power are displayed digitally, which is clear and accurate.

3.3.4 Laser cooling system

The laser cooling system is a closed circulating loop. The coolant (distilled water or ion water) is circulated by a pump.

3.3.5 Remote interlock

There's an remote interlock connector at the back panel of the unit, which connect the door's interlock of the room through cable. The unit will be shut off as soon as the door is opened. By default, the remote interlock connector is disconnected.

3.3.6 Footswitch

A footswitch is used to control laser output. When the footswitch is pressed, the shutter opens and laser emits from the articulated arm.

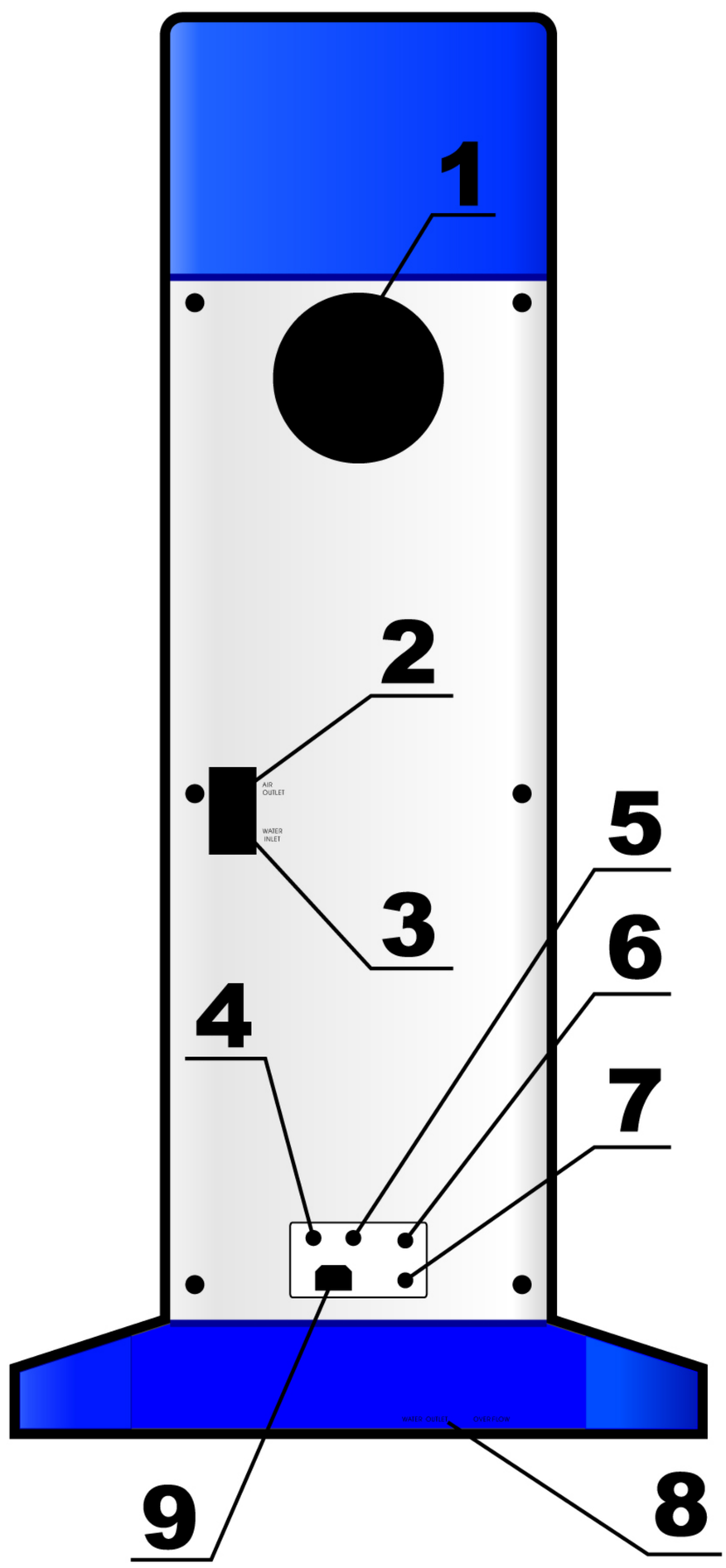
3.3.7 Articulated arm

The laser beam delivery system consists of light- weight, spring-balanced, 7-joint articulated arm. The working radius of the articulated arm at full extension is 110cm.

4. Name of the components

1. Handpieces
2. Keyswitch
3. Articulated arm
4. Emergency stop switch
5. LCD control panel

Front View



Reverse View

1. Fan
2. Air outlet
3. Water inlet
4. Fuse Holder
5. Grounded Pole
6. Footswitch Socket
7. Remote Interlock Socket
8. Over Flow and Water Outlet
9. Power Socket

5. Pre-startup preparations and installation

5.1. Upacking and inspection

After unpacking, please check to ensure that the instrument is not seriously damaged, circuit lines are well connected and accessories are available (see accessories list)

5.2. Installing articulated arm

The articulated arm is connected with the system by fixed ring, please find the following Front View.

⚠ Attention!

The fixed ring should be screwed down in order to avoid the laser beam deviated.

5.3. Pouring coolant

A.Watering

Unscrew the water inlet and air outlet orifice, add the water into water inlet orifice by funnel until the water is full. After watering, screw down the cap screw of both orifices.

B.Water Release (use for special purpose)

Unscrew the air outlet and water outlet , the water will flow out of the water outlet. After that, screw down the cap screw of both orifices.

Please find attached picture for “WATER INLET”, “AIR OUTLET”, “WATER OUTLET”.

⚠ Attention!

Never turn on power when the tank is empty.

Cooling water must be used with purified water or distilled water

5.4.Checking power voltage

Ensure that the power voltage complies with the requirement of the instrument. Socket is in working order.

5.5.Connecting power cable

Plug the two terminals of the power cable into the power input socket and the power socket. (Make sure the ground socket is in working order.)

5.6.Footswitch and remote interlock connection

Plug the footswitch and interlock cable into the sockets on the rear part of the instrument. Push in alignment of the notch until a tone is heard which means a successful lockup.

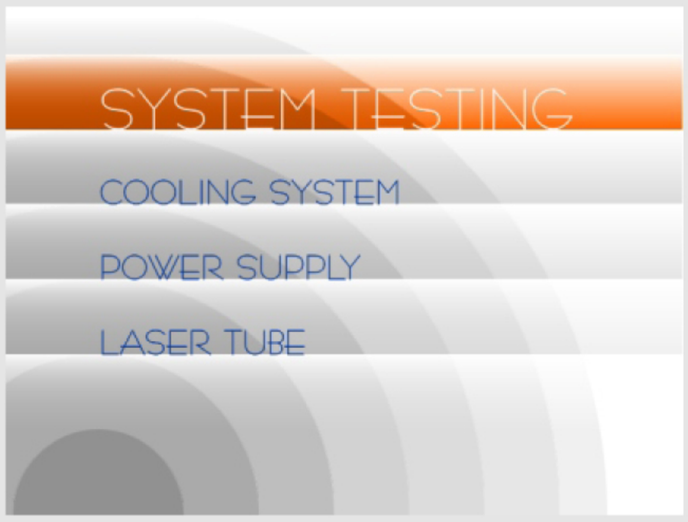
5.7.Temporary start

After several minutes of trial operation of the instrument, cut off the power supply temporarily.

6. Alignment and operation procedures

6.1. Power On & System Test

Turn on the key switch to start the machine, then cooling system starts to work, and system testing program starts, it tests cooling system, power supply, laser tube in turn, passed tests will be shown in blue. If all tests are passed, system enters the main menu.(Warning mode will be shown if some test is not passed, see 9.1.)

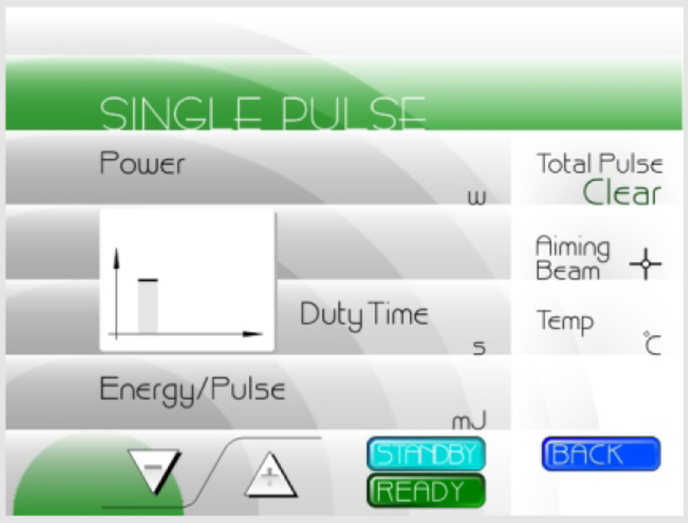


6.2. Operating & Setting

If the scanner is not connected, the screen will be displayed as following after system test, there are four modes to choose, select the one you need.

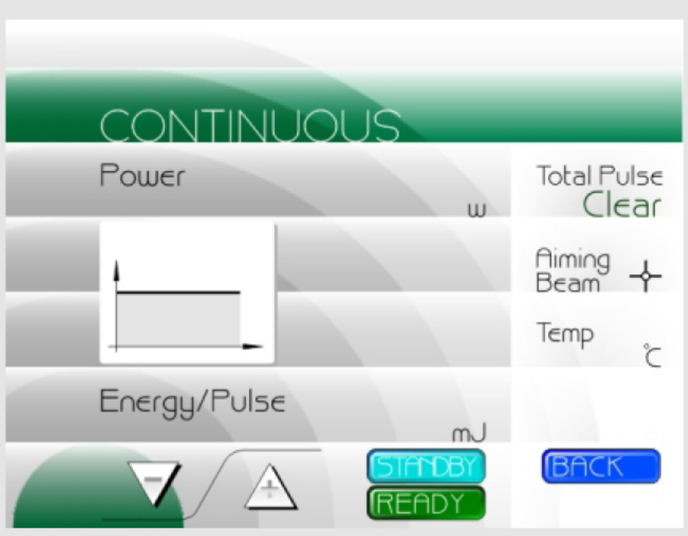
I. Single Pulse

Press "SINGLE PULSE" on the main menu and enter into "SINGLE PULSE" Setting Menu, Press “Power” button and the power value (like 0.5w) will turn blue, then press "+" or "-" to adjust power to that you need. The laser pulse will output once each time you press the footswitch.



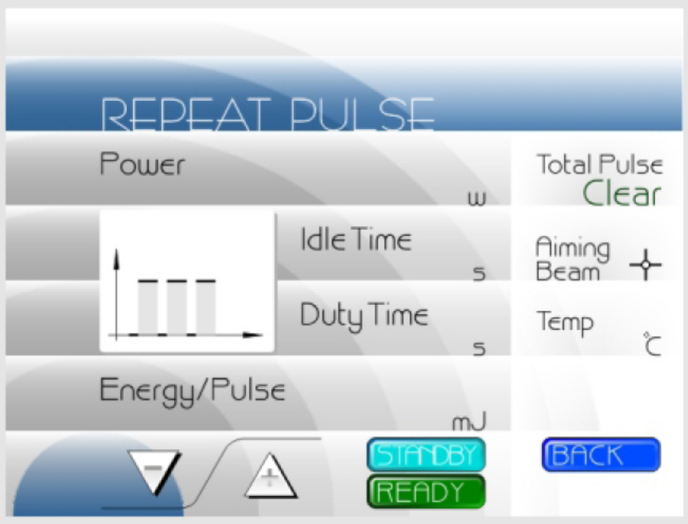
II. Continuous

Press "CONTINUOUS" on the main menu and enter into "Continuous" Setting Menu, Press “Power” button and the power value (like 0.5w) will turn blue, then press "+" or "-" to adjust power to that you need. The laser beam will output continuously when pressing the footswitch.



III. Repeat Pulse

Press “REPEAT PULSE” on the main menu and enter into “Repeat Pulse” Setting Menu, Press “Power” button and the power value (like 0.5w) will turn blue, then press "+" or "-" to adjust power to that you need. The same manner to adjust "Idle Time" and "Duty Time". The laser beam will output continuously when pressing the footswitch.



IV. Magic Pulse

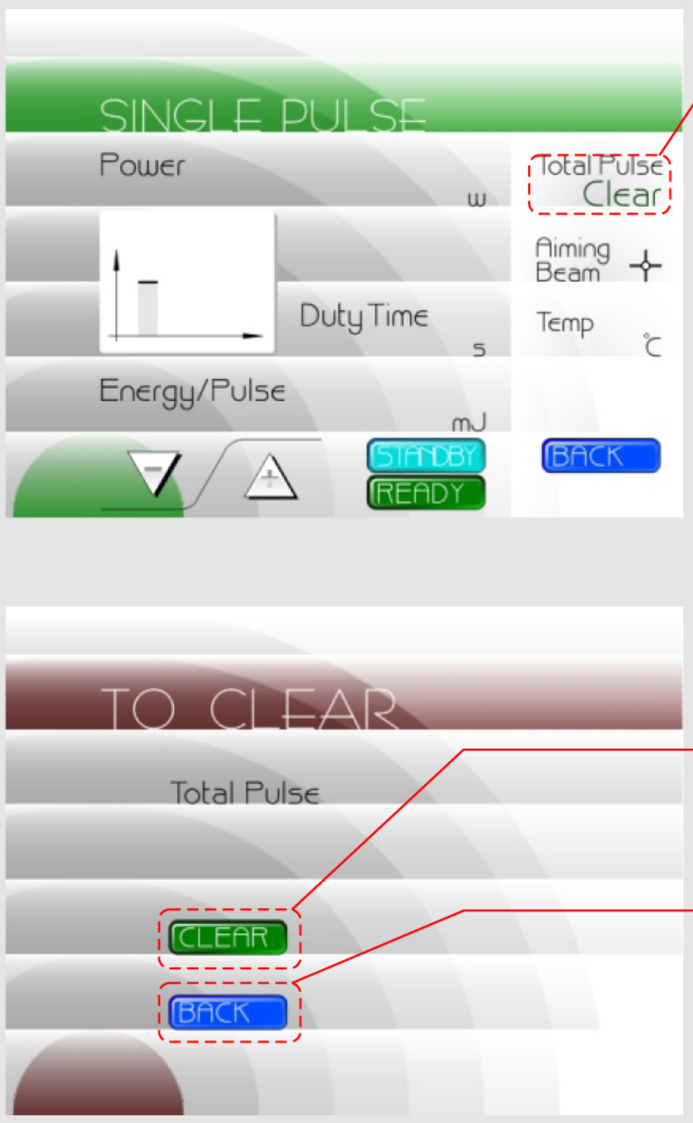
Press “MAGIC PULSE” on the main menu and enter into “Magic Pulse” Setting Menu, Press “Power” button and the power value (like 0.5w) will turn blue, then press "+" or "-" to adjust power to that you need. The same manner to adjust "Idle Time" and "Duty Time". The laser beam will output continuously when pressing the footswitch.

6.3. Laser Beam Outputting

After the parameter is setting like chapter 6.2., press”Ready” button and make the system to ready status, then the laser beam will output after you press the foot switch.

6.4. Clear

The working time can be cleared like the following:
For Instance: on "Single Pulse Setting Menu"



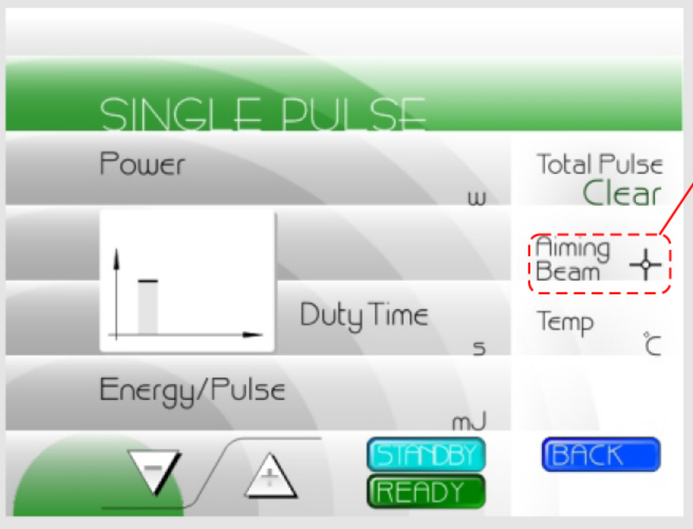
Press "Clear" button to " Clear" menu

Then press "Clear" to zero

Press "Back" to "SINGLE PULSE".

6.5.1 Additional Adjustment

Both aiming beam can be adjusted on each mode setting menu.



Press "Aiming Beam" Button and press "+" or "-" to adjust brightness.

6.5.2 Temperature Display

Temperature of cooling water is shown at Temp, if it exceeds 40℃ the number will turn red, system will automatically shut down if it exceeds 45℃.

6.6. Operation Method

After adjusting the parameters according to Charpter 6.2 and press the button “ready”, the instrument stands by for the operation. Aim the handpiece at the infected part, press the foot switch to operate the surgery.

⚠ Attention!

1 During the surgery, please make sure to prevent the hand piece from touching the patient's body.

2 The specific surgical parameters should be adjusted according to the actual situation.

3 Only doctors or certified professionals are allowed to use the instruments.

7. Articulated Arm

7.1.

The articulated arm is shipped separately from the laser cabinet. Unpack the arm and carefully install it over the arm port on the main cabinet. Lock the side screw to secure the arm in place. The arrow on the arm's main joint should point at the direction at which the joint rotates when the arm is pulled down. Attach the focusing handpiece with the focal plane indicator tip to the end of the articulated arm. Verify that the arm rotates freely in all directions and is sufficiently balanced.

7.2. Alignment Check

Turn the system on and verify that the aiming beam is emitted through the articulated arm. If necessary, press the aiming beam key to turn on the aiming beam. Remove the focusing handpiece and place a transparent piece of paper (or Scotch tape) over the opening of the articulated arm.

Check that the aiming beam is approximately centered to the arm port. Repeat this check at various different positions of the arm. Attach the focusing handpiece with the focal plane indicator. Place any target (such as a wooden tongue depressor) at the tip of the focal plane indicator and check that the aiming beam is approximately centered to an imaginary tube extending from the focusing handpiece tube.

After reading the instructions below, turn on the CO_2 laser, set for 5 Watt, 0.1 sec pulse, fire at a moistened wooden tongue depressor (or other appropriate target) and check that the focal spots of the CO_2 and aiming beam lasers coincide. For convenience, mark a cross on the tongue depressor, position the aiming beam on the cross and fire a single laser pulse. The resulting burn mark should coincide with the cross. Some displacement is allowed provided that a portion of the burn mark covers the center of the cross.

⚠ Attention!

Repeat this check at various positions of the articulated arm.

⚠ Attention!

If misalignment is noticed-contact your local representative.

8. Aiming beam

In view of the invisibility of the 10.6um CO_2 laser, a visible red diode laser emitting coaxially with CO_2 laser is provided to help the operator locate laser beam conveniently. Before each treatment, please test if the laser beam is doubling with the aiming beam, by setting of 1W on continuous output. If there has been misalignment, please ask the technician for calibration.

9. Protection and Alarm

9.1. Indication of coolant circulation

When the water pump begins to work shortly after the power is turned on, the coolant doesn't circulate normally, with the indicator flashing and the buzzer beeping. After the coolant circulates normally and the warning device, which will alarm in case of no water, is connected, the alarm stops beeping.

9.2. Overheat protection

Prevent the instrument from being overheated: when the temperature of the circulating water is higher than 40℃, the indicator will flash and the buzzer will beep. Before normal operation is restored, cut off power supply and wait till the temperature of cooling water goes down below 25℃. Then restart the instrument. In case of the two aforesaid alarming states, if the footswitch is pressed, laser will not emit.

After 15 minutes continuous working or temperature alarm, it needs to power off the system for 30 minutes and make the system cool.

9.3. Over-current Protection

If the working current exceeds 20% of the rated current, the high voltage power supply would shut down and the instrument stops working. The LCD display shows the waring of “POWER SUPPLY”. Please check the whole power supply system . The instrument could be operated after all the problems are solved.

9.4. Interlock

The system has the micro switch. When the housing of the instrument is opened, the high voltage power supply whould shut down and the the instrument stops working.

10. Warnings

10.1. Under no circumstances, should the laser beam be directed at an eye or healthy skin.

10.2. Laser beam should not be directed at any reflective surface, such as stainless steel or mirror surface.

10.3. If alcohol is used to clean any part of the instrument or to prepare surgical site, allow sufficient time for alcohol evaporation before turning on the laser beam. Avoid other inflammable or explosive substances in the vicinity of the laser beam.

10.4. In order to prevent contamination of the focusing lens it is recommended to always use a suitable smoke evacuation unit and, in addition, to connect the nozzle on the handpiece to a low pressure air or inert gas source.

10.5. The operator and all personnel in the room should wear appropriate laser safety eyewear whenever the laser is turned on. The system should be stored in an area where the temperature is always within 1-50ºC and relative humidity is below 80%.

11. Precautions

11.1. Never let the laser beam be directed to human eyes or healthy skin.

11.2. To prevent human eyes or skin from being hurt by the reflection of laser light, never allow the laser beam, be directed to any smooth reflective surface, such as stainless steel device surface, mirror surface, etc.

11.3. If 75%, alcohol is used to clean or disinfect relevant part of the instrument, don't use the instrument till the alcohol vaporizes. Never operate the instrument in the presence of flammable anesthetics or Oxide gas.

11.4. In order to prevent the focus lens of the handpiece from being polluted and to keep a clear view of the surgical area, a smoke evacuator is recommended to the operator. The handpiece and focus lens must be cleaned every 3 months.

11.5. The laser beam generated by this instrument is hazardous to eyes in the area within 35m from the instrument (when someone is staring directly at the laser) operators must use safety eyewears when operating. Eye shields must be worn by the patients during the surgery.

11.6. This instrument generates high voltages inside. No attempt should be made by non-professional to open the cabinet of the instrument to avoid electric shock risk.

11.7. If the instrument gives out abnormal smell or sound, stop operation at once. Cut off the power first before any inspection.

⚠ **Warning!**

The laser tube in made of glass. Handle with care to avoid damage.

11.8. Keep the instrument in an environment with the temperature between 1C~50C and the relative humidity between 10%~80%.

11.9. Empty the water tank before transportation to prevent the laser tube from being frozen to break.

11.10. Don't leave around laser tube and the instrument recklessly when their service lives end. Recycle according to the local environment protection regulations.

11.11. To avoid improper use of the instrument, remove the key from the keyswitch and keep it properly when the instrument is not in use. The instrument generates high voltages within the power supply and laser tube. Please refer to professional personnel for maintenance to avoid electric shock.

11.12. Operation room should be equipped with a dust or fume exhauster, because the dust arising during operations may be mixed with biological tissue particles.

11.13. Do not use the unit near flammable anesthetics or other flammable substances.

12. Maintenance

12.1.

The instrument generates high voltages within power supply and laser tube. Refer to professional personnel for maintenance to avoid electric shock.

12.2. Lens cleaning

The output power may drop slightly after the instrument has been put into use for half a year. This may be caused by the stained focus lens of the handpiece. Wipe the lens gently with moistened cotton ball once or twice. Be sure not to damage the lens.

12.3. Cobinet cleaning

If there is dirt on the cabinet, wipe gently with moistened cotton cloth and some detergent or toothpaste. Don't use over-wet cloth in case the water leaks into the inner part of the instrument, causing short circuit and damage. Please refer to chapter 9 for precautions.

12.4. Handpiece disinfection

Handpiece must be disinfected after use. Refer to chapter 12.3 for details.

12.5. Fuse replacement

Open the fuse holder with a screwdriver and remove the original fuse. Before replacement, check and ensure the new fuse is identical in type and specification to the original one (Φ 5*20mm, 5A, for AC230V) to avoid damage arising from unfit fuses.

⚠ Attention!

Repeat this check at various positions of the articulated arm.

12.6. Power calibration

The practical laser output power and the preset panel power must be calibrated each year with standard laser power meter within validity period by trained of professional personnel.

12.7. Calibration

This system should be calibrated once two years. CO_2 laser dynamometer can measure laser output.

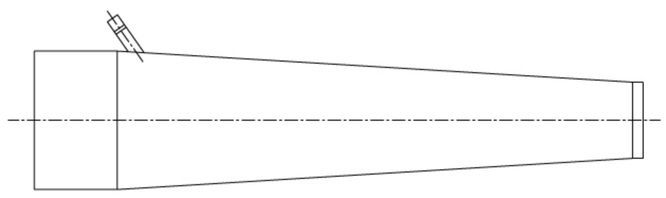
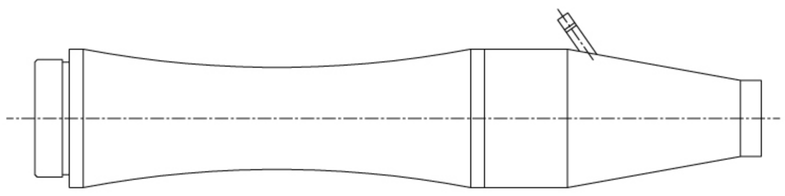
when the actual power values and setting power value is +/- 20% response, the system should be to reseted by trained of professional personnel.

13. Accessories

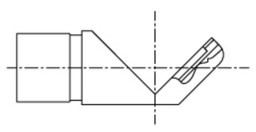
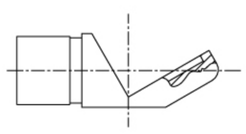
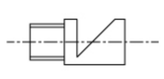
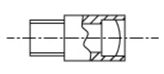
Operator's manual and service manual	1copy
Articulated arm :7 Joint Articulated Arm	1pc
Footswitch: Model : HRF-M5Y	1pc
Interlock key	2pcs
Fuse : Ø5x20mm:5A, spare parts, for AC230V	2pcs
CO_2 Laser Protective Eye Wear:	
Model :CO2 ,Wavelength :190−398nm+10600nm,OD:7+,93%VLT	1pc
Eye shield	1pc
Power Wire:250V, HD5VV-F, 2.5m	1pc
Funnel	1pc
Remote control	1pc

Handpieces (see table below)

Standard Handpieces

DWG NO.	FIGURE
JH-DT-01	
JH-DT-02	

Handpieces By Customer Order

DWG NO.	FIGURE
JH-DT-06	
JH-DT-07	
JH-DT-08	
JH-DT-09	
JH-DT-10	

For each use. Please clean and disinfect the handpiece by 75% surgical alcohol.

⚠ Attention!

The surgical alcohol must be volatilized before use.

14. Troubleshooting Guide

Please refer to professional personnel for maintenance

SYMPTOMS	POSSIBLE CAUSES	ACTIONS
After the main power is on, the panel does not light, the water pump does not work either.(when the water pump works, there are slight vibration and sound.)	The power plug has not been property plugged. The emergency stop switch is pressed down.	Check the two plugs at the two ends of the power cable. Replug properly turn the red mushroom- shaped button of the emergency key in the indicated direction to have the emergency key connected.
No laser beam emits out though the instrument seems running normally.	The plug of the footswitch is not properly inserted. The setting of the control panel isn't suitable. When the instrument is used for the first time, after water is filled the cover is not closed tightly. The interlock keys are not pressed down. The joint of the articulated arm is loosened.	Insert the plug of footswitch tightly according to operator's manual.Set the panel again according to operator's manual.Close the cover and press the interlock keys.Screw the joint tightly.
No laser emits. The instrument alarms.	The instrument has been working for too long and the coolant is too hot.	Stop running the instrument. Wait till the temperature of the cooling water goes down below 25℃, then restart the instrument.
The instrument makes big noise when running.	The instrument is not Well-balanced.	Place the instrument on a stable and flat surface.
Red pilot beam doesn't converge or doesn't emit from the end of the tube. CO_2 laser is off the center.	The articulated arm is either damaged inside or not working normally. No laser emits or output power drops significantly.	Refer to professional personnel for service.

⚠ Warning!

Operators are not allowed to adjust the components listed below:

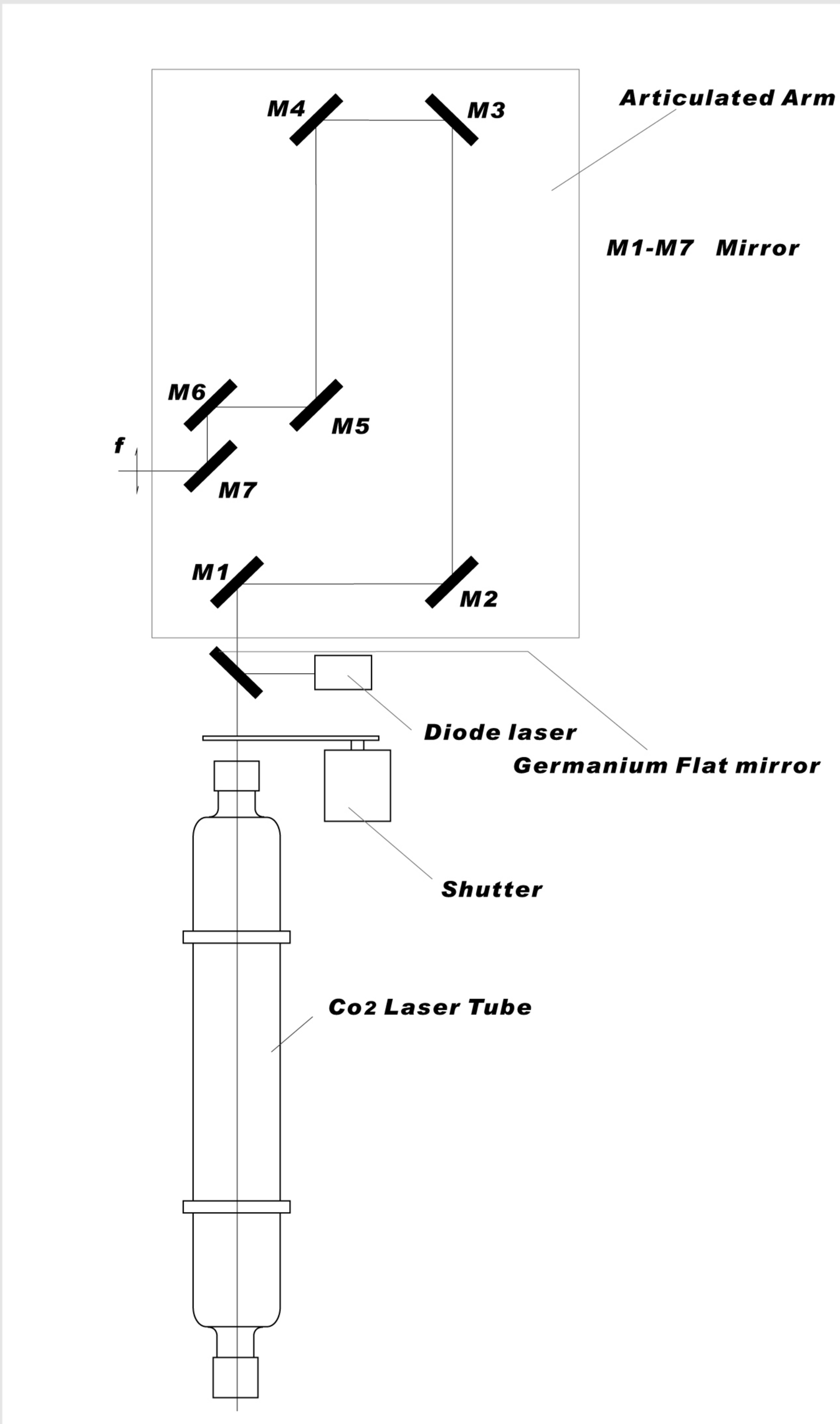
Laser tube, articulated arm, diode pilot beam, microprocessor board.

15. Technical Specification

Laser Type:	Sealed off CO_2 gas laser
Laser Wavelength:	10.6 microns
Laser Mode:	Low-valance mode
Output Power:	0~40W. cont adjustable
Focus Spot Diameter:	0.4mm
Divergence:	6mrad
Lens Focal Distance:	f=100mm
Power Instability:	±10%
Delivery System:	Spring-balanced 7-joint articulated arm
Aiming Beam Wavelength:	650nm
Aiming Beam Output Power:	≤3mW
Operation and control:	Touching switch Microprocessor- controlled
Working Modes:	Continuous, single pulse repeat pulse and magic pulse
Pulse Duration:	0.05~1s
Applied Part	Type B, Class I
Display:	LCD display
Cooling System:	Closed loop circulating water
Power Supply:	~230V, 50Hz (see supply circulating water)
Input Power:	600VA
Environment Temperature:	5~40℃
Relative Humidity:	<80%
temperature in transit:	-40~50℃
Humidity in transit:	<85%
Gross weight:	50kg
Atomospheric pressure:	86.0kpa~106.0kpa
Warning up time:	5min
Electromagnetic requirement:	No electromagnetic Field interference
Other working conditions:	No obvious vibration Or airflow

Specifications subject to change without notice

16. System schematics



17. Warranty & Service

The instrument is a well designed, user friendly laser surgical system with high quality. It performs perfectly under normal use and maintenance. Within a year from the date of purchasing, any damage caused by manufacturing or components defects can enjoy free repairing service.

Such service is valid only if the instrument is properly used. Any damage cause by improper use of the instrument, such as using unfitted power supply and wrong accessories, operating in a manner other than specified in this operators manual, damages caused by transportation, accidents unauthorized installation or maintenance, etc, such free service will be invalid immediately. The free service does not include accessories transportation free and door-to-door service charge of professional personnel.

Please refer to local laws and Regulations, WEEE directive:

Environment Protection &Waste Disposal When coming into disuse, the disposal of the machine, its components and accessories should proceeded by professional company.

MARK of Waste Electrical and
Electronic Equipment Directive

18. Identification & Labels

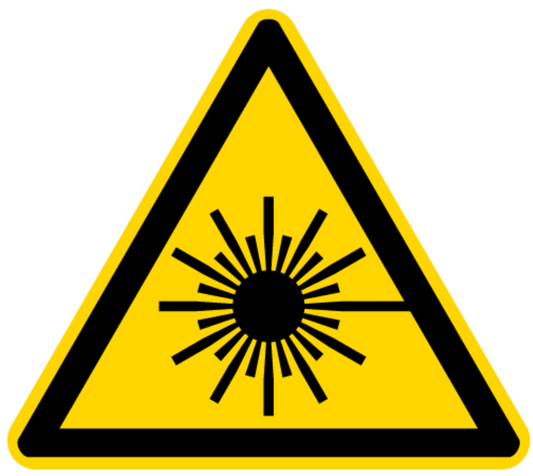
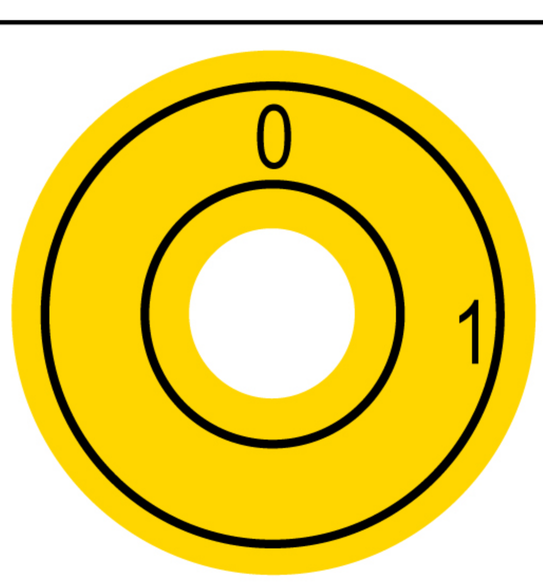
Label Explanations

No.	Symbol	Definition
Label 1	**CO2 Laser Surgical System** Model: PC40DS Input: ~230V Hz Input power: 600VA Mode of operation: continuous operation with intermittent loading Class 4 laser product SN/xxxxxxxxxxxxx 20xx-xx **Shanghai Jue Hua Medical Laser Co., Ltd.** 2F, No. 33, Lane 2, Suide Rd., Shanghai, P.R. China EC REP **Innova Medical** 63-71 El. Venizelour Str Nea Ionia, Athens 14231, Greece	MANUFACTURER AND PRODUCT INFORMATION
Label 2	DANGER VISIBLE AND INVISIBLE LASER RADIATION AVOID EYE RO SKIN EXPOSURE TO DIRECT OR SCATTED RADIATION CO_2 10600 nm max 30W CW Diode 650 nm max 3mW CW CLASS 4 LASER PRODUCT	WARNING AND EXPLANATORY LABEL
Label 3	DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT	DOOR INTERLOCK SWITCH WARNNING
Label 4	CAUTION Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Therefore, personnel operating the system must be thoroughly familiar with all safety requierments and operating procedures.	WARNING LABEL

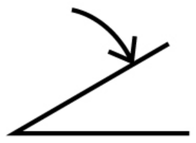
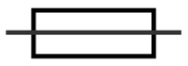
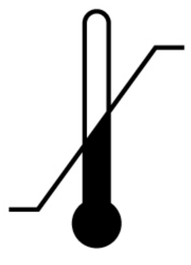
Label Explanations

No.	Symbol	Definition
Label 5	LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER PRODUCT CO_2 10600nm Max.Power 30W CW Working Modes:  IEC60601-2-22:1995 IEC60825-1:1993+A1:1997+A2:2001	EXPLANATORY LABEL
Label 6	LASER RADIATION AVOID DIRECT EYE EXPOSURE CLASS 3R LASER PRODUCT Diode 650nm Max. Power 3mW IEC60601-2-22:1995 IEC60825-1:1993+A1:1997+A2:2001	EXPLANATORY LABEL
Label 7	CAUTION-CLASS 4 LASER RADIATION WHEN OPEN AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION	LABEL FOR PANELS
Label 8	CAUTION-CLASS 4 LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION	LABEL FOR SAFETY INTERLOCKED PANELS
Label 9	CAUTION-CLASS 3R LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EYE OR SKIN EXPOSURE	LABEL FOR SAFETY INTERLOCKED PANELS

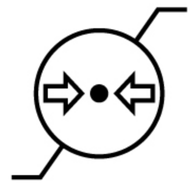
Label Explanations

No.	Symbol	Definition
Label 10	CAUTION-CLASS 3R LASER RADIATION WHEN OPEN AVOID EYE OR SKIN EXPOSURE	LABEL FOR PANELS
Label 11		WARNING LABEL HAZARD SYMBOL
Label 12		EMERGENCY STOP
Label 13		KEY SWITCH
Label 14		CAUTION

Label Explanations

No.	Symbol	Definition
Label 15		REMOTE INTERLOCK CONNECTOR
Label 16		FOOTSWITCH
Label 17		LASER APERTURE
Label 18		FUSE
Label 19		CONSULT INSTRUCTION FOR USE
Label 20		DANGEROUS VOLTAGE
Label 21		PROTECTIVELY EARH
Label 22	CE 0197	SYMBOL FOR CE
Label 23		TYPE B APPLIED PART
Label 24		DATE OF MANUFACTURE
Label 25		MANUFACTURER
Label 26	EC REP	AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY
Label 27		TEMPERATURE LIMIT

Label Explanations

No.	Symbol	Definition
Label 28		MAKE OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT DIRECTIVE
Label 29		ALTERNATING CURRENT
Label 30		POTENTIAL EQUALIZATION
Label 31		HUMIDITY LIMITATION
Label 32		ATMOSPHERIC PRESSURE LIMITATION

19. EMC Declaration

Guidance and manufacture's declaration-electromagnetic emissions		
The model PC40DS is intended for use in the electromagnetic environment specified below. The customer or the user of the Model PC40DS should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR II	Group 1 Class B	The Model PC40DS uses RF energy only for its internal function. Therefore,its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
Harmonic emissions IEC 61000-3-2	Class A	The Model PC40DS is suitable for use in all establishments,other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes
Voltage fluctuations/ Flicker emissions IEC61000-3-3	Complies	

Guidance and manufacturer's declaration-electromagnetic immunity			
The model PC40DS Carbon dioxide laser surgical Systems for use in the electromagnetic environment specified below.The customer or the user of the Model PC40DS Carbon dioxide laser surgical Systems should assure that it is used in such an environment.			
Immunity test	IEC60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic Discharge(ESD) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood,concrete or ceramic tile .If floors are covered with synthetic material,the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 Kv differential mode ±2 kV common mode	±1 Kv differential mode ±2 kV common mode	Maine power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5%U_T (>95% dip in U_T) For0,5 cycle 40% U_T (60% dip in U_T) For 5 cycles 70% U_T (30% dip in U_T) For 25 cycles <5% U_T (>95% dip in U_T) For 5s	<5% U_T (>95% dip in U_T) For0,5 cycle 40% U_T (60% dip in U_T) For 5 cycles 70% U_T (30% dip in U_T) For 25 cycles <5% U_T (>95% dip in U_T) For 5s	Mains power quality should be that of a typical commercial or hospital environment.If the user of the Model PC40DS Carbon dioxide laser surgical Systems requires continued operation during power mains interruptions, it is recommended that the Model PC40DS Fractional Diode laser surgical systems be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fieldsshould be at levels characteristic of atypical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacture's declaration – electromagnetic immunity			
The Model PC40DS Fractional Diode laser surgical systems for use in the electromagnetic environment specified below.The customer or the user of the Model PC40DS Carbon dioxide laser surgical Systems should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3Vrms 150kHz to 80 MHz 3V/m 80 MHz to 2,5 GHz	3Vrms 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the Model CO2 -1A, including cables,than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance d=1,2? $\overline{P}$ d=1,2? $\overline{P}$ 80MHz~800MHz d=2,3? $\overline{P}$ 800Hz~2,5GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters(m). Filed strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range .[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE1 At 80MHz and 800 MHz, the higher frequency range applies. NOTE2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio(cellular/cordless)telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters,an electromagnetic site survey should be considered. If the measured filed strength in the location in which the Model Victroy-5 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Model PC40DS. [b] Over the frequency range 150kHz to 80MHz, field strengths should be less than 3 V/m			