

User Instructions

Laser Engraver



Technical Data/ Device Specification Mechanics

Model			
Basic info	USB350	USB350	USB460
Color	Blue and white	Blue and gray	Blue and gray
Processing/ cutting area	300 x 500mm	300 x 500mm	400 x 600mm
Workbench	Aluminum plate	Aluminum plate	Honeycomb & aluminum knife
Laser capacity	50W	50W	60W
Laser type	CO2 sealed laser tube	CO2 sealed laser tube	CO2 sealed laser tube
Power supply	110V/ 60Hz	110V/ 60Hz	110V/ 60Hz
Minimum shaped text	2mm*2mm	2mm*2mm	2mm*2mm
Maximum shaped text	1mm*1mm	1mm*1mm	1mm*1mm
Fan	Built-in	Built-in	Built-in
Software	RDWORKS V8	RDWORKS V8	RDWORKS V8
Display	LCD Digital	LCD Digital	LCD Digital
Workbench adjustment	Manual adjustment	Manual adjustment	Manual adjustment
Cutting thickness	0-10mm (varies according to materials and power capacity)	0-10mm (varies according to materials and power capacity)	0-10mm (varies according to materials and power capacity)
Resolution ratio	≤4500dpi	≤4500dpi	≤4500dpi
Supported software	Coreldraw /Autocad/ Engrave Lab/ Illustrator output	Coreldraw /Autocad/ Engrave Lab/ Illustrator output	Coreldraw /Autocad/ Engrave Lab/ Illustrator output
Dichroic cutting	256 colors	256 colors	256 colors
Assisted positioning	Red light positioning	Red light positioning	Red light positioning
Protection	Air-blowing flame retardant/ Water protection	Air-blowing flame retardant/ Water protection	Air-blowing flame retardant/ Water protection
System environment	Windows xp/win 7/win 8/win 10	Windows xp/win 7/win 8/win 10	Windows xp/win 7/win 8/win 10
Graphic format supported	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.
Data transmission	USB 2.0/ Network port/ U-disk	USB 2.0/ Network port/ U-disk	USB 2.0/ Network port/ U-disk
Optional configuration	Regular rotation axis (not included)	Regular rotation axis (not included)	Regular rotation axis (not included)
Dimensions	102*65*63cm	102*65*63cm	113*75*69cm
Net weight	75	75	95
Package dimensions	113*76*70cm	113*76*70cm	124*86*80cm
Gross weight	91kg	91kg	112kg

Model			
Basic info	USB570-60W	USB570-80W	USB570-100W
Color	Blue and gray	Red and black	Red and black
Processing/ cutting area	500 x 700mm	500 x 700mm	500 x 700mm
Workbench	Honeycomb & aluminum knife	Honeycomb & aluminum knife	Honeycomb & aluminum knife
Laser power	60W	80W	100W
Laser type	CO2 sealed laser tube	CO2 sealed laser tube	CO2 sealed laser tube
Power supply	110V/ 60Hz	110V/ 60Hz	110V/ 60Hz
Minimum shaped text	2mm*2mm	2mm*2mm	2mm*2mm
Maximum shaped text	1mm*1mm	1mm*1mm	1mm*1mm
Fan	Built-in	Built-in	Built-in
Software	RDWORKS V8	RDWORKS V8	RDWORKS V8
Display	LCD Digital	LCD Digital	LCD Digital
Laser predrilled mounting holes?	Yes	Yes	Yes
Workbench adjustment	Manual adjustment	Manual adjustment	Manual adjustment
Cutting thickness	0-10mm (varies according to materials and power capacity)	0-15mm (varies according to materials and power capacity)	0-15mm (varies according to materials and power capacity)
Resolution ratio	≤4500dpi	≤4500dpi	≤4500dpi
Supported software	Coreldraw/Autocad/Engrave Lab/ Illustrator output	Coreldraw/Autocad/Engrave Lab/ Illustrator output	Coreldraw /Autocad/ Engrave Lab/ Illustrator output
Dichroic cutting	256 colors	256 colors	256 colors
Assisted positioning	Red light positioning	Red light positioning	Red light positioning
Protection	Air-blowing flame retardant/ Water protection	Air-blowing flame retardant/ Water protection	Air-blowing flame retardant/ Water protection
System environment	Windows xp/win 7/win 8/win 10	Windows xp/win 7/win 8/win 10	Windows xp/win 7/win 8/win 10
Graphic format supported	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.	All formats that can be recognized by coreldraw and autocad, such as JPG, BMP, AI, PLT, etc.
Data transmission	USB 2.0/ Network port/ U-disk	USB 2.0/ Network port/ U-disk	USB 2.0/ Network port/ U-disk
Optional configuration	Regular rotation axis (not included)	Regular rotation axis (not included)	Regular rotation axis (not included)
Dimensions	120*87*93cm	120(150)*87*93cm	120(170)*87*93cm
Net weight	150	150	150
Package dimensions	131*98*83cm	162*98*83cm	
Gross weight	154kg	170kg	

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Introduction

This manual has been designated as the system, laser cutting machine installation and a user guide. The manual is divided into five chapters, including general information instructions, safety instructions, key components of every laser cutting system and the installation steps, operation instructions and maintenance instructions from LASER Company.

First, it should be emphasized that the installation of each system must meet the requirements and be consistent with the installation requirements of LASER. If not, the machine will not work properly: poor performance, life shortened, increased maintenance costs and even machine damage.

The note is for getting a specific requirement of system installation, and we hope every customer try to understand these notes before installation and usage. Then, you can correctly install and use it. If you have any installation problems, you can contact our technicians and customer service team.

Chapter 1 General

1.1 General Information

Caution

Please read and follow this Operation Manual carefully before installation and operation. Damage to persons and/or material can result from not following individual points of the Operation Manual!

Operation of the system is only permitted with equipment and spare parts supplied or listed in the spare parts and consumables lists.

Auxiliary equipment must be adjusted to the base machine. (Any queries, please consult the dealer or manufacturer.)

The following symbols are used for easier understanding of the Operation Manual. If the Operation Manual is not observed, this area represents a particular danger for the operating personnel or the personnel responsible for maintenance.



Caution: This component is under voltage. In these areas, strictly observe the safety instructions regarding electricity. Care is to be taken in particular during maintenance and repair work.



Caution: In this area, pay attention to the possible dangers of the laser beam.

Tips:

Notes or information on individual components of the device simplify the use or make it more understandable.

Attention

1. Read the manual carefully before operating. The following safety measures must be strictly enforced and abided by. Never operate laser machinery unless you have been properly trained.
2. Make sure to run the water pump before you switch on the laser.
3. Never leave the laser unattended. Remain with the machine when it is running at all times so that you can hear and observe abnormalities and potential hazards.
4. Never under any circumstances attempt to dismantle your machine as laser and high voltage parts can cause severe injury.
5. Always connect the ground connector to a grounded outlet to help eliminate static electricity.
6. Top lid should remain closed when the machine working.
7. Keep unit in areas that are clean and dry with good air quality, as certain pollutants can cause electrical interference with the device.
8. **Caution:** Do not open machine while in operation or while engraving reflective materials. Doing so will cause the laser to deviate or reflect which can result in blindness or serious injury requiring medical attention.
9. In rare cases of fire, please locate the nearest fire extinguisher, hose, or call your local fire department.
10. Coolant temperature should be kept between 60-85F. Store coolant at a consistent temperature as fluctuations can cause the tube to break if too cold and explode if overheated. For best results use

deionized water. If deionized water can't be used, distilled water is an acceptable substitute. Always keep your coolant clean and clear for proper functioning of your unit.

11. Requires a 110 v 60Hz power supply. Do not run laser through an unstable or incompatible power source under any circumstances.
12. Warning: Never operate laser near flammable materials. The laser beam is invisible and poses an extreme fire risk to operators.
13. DO NOT run machine continuously for more than 8 hours. To keep your laser tube working optimally, stop your machine for a half hour every 7 hours.
14. Maximum current for laser tube is 20mA
15. Currents above 20mA will result in puncturing of the tube and damaging of the laser.
16. CE iSO9001 FDA

Manufacturer shall not be held responsible for damages or injury resulting from improper use or not following the safety measures.

1.2 Designated

The machine is used for engraving and cutting signs, stamps and suchlike.

A wide variety of materials such as rubber, acrylic, coated metal, tin, special steel, anodized aluminum, cork, cardboard, glass, leather, marble, several plastics and wood can be processed on the laser.

1. The engraving process must be performed with a perfectly adjusted machine.
 2. It is absolutely necessary of using air system when process all the materials.
 3. Use of the system in other areas is against the designated use. The manufacturer does not admit liability for damage to personal and/or equipment resulting from such use.
 4. The system must be operated, maintained and repaired, by personnel that are familiar with the designated field of use and the dangers of the machine!
 5. Non-observance of the instructions for operation, maintenance and repair described in this Operation Manual excludes any liability of the manufacturer if a defect occurs.
 6. Please be cautious when processing conductive materials (carbon fibers). Conductive dust or particles in the ambient air might damage electrical components and lead to short circuits.
- Bear in mind that those defects are not warranted.

1.3 Disposal Remarks



Do not dispose the machine with domestic waste!

Electronic devices have to be disposed according to the regional directives on electronic and electric waste disposal. In case of further questions, please ask your supplier. He might take care of proper disposal.

Standard

Red Dot Pointer, Pass-through Door, Air Assist, Water Pump, Exhaust Fan, Honey Comb Table, 1.5" (38.1mm) Focus Lens, LCD Display, 3D Engraving, Water Protection, Emergency Stop Open Cover

Protection

Optional:

Rotary Attachment, Motorized Table, Auto-focus Worktable, Water Chiller Attachment, High Resolution Head (up to 1000DPI while standard laser head Max is 500DPI), Air Compressor, Water Filter

Control System

Laser power adjustable from 0 -100% (typically 10-100%)

Interface hardware USB: connect to PC and U-disk

Ethernet: connect to PC

Interface Software RDWorksV8

Operating Modes Optimized Raster, Vector, and Combined Mode

Buffer Memory 128MB Standard

Cooling System

Water Cooling System

Water Cooled

Electricity, Power, Fuse

Electricity requirement 110 to 240 volts, 50 or 60 Hz, single phase

Power consumption 1200W

Recommended fuse 15A (220V), 15A (110V)

Ambient Conditions

Ambient temperature +5 °C to +25 °C / 59 °F to 77 °F

Humidity 40% to max.70%, not condensing

Laser Safety

Laser class CDRH Laser Safety

Laser Class 4(H)

CE compliant, FDA approved

1.4 Device Specification

The manufacturer's label is located on the device (see Figure below).



It is recommended to enter data such as serial number and year of manufacture into the manufacturer's label below so that you always have this data handy if you have problems with your device or require spare parts.

Chapter 2 Safety

2.1 General Safety Information

All personnel involved in installation, set-up, operation maintenance and repair of the machine must have read and understood the Operation Manual and in particular the "Safety" section.

It is recommended that the user should generate company-internal instructions considering the professional qualifications of the personnel employed in each case, and the receipt of the instruction/Operation Manual or the participation at introduction/training should be acknowledged in writing in each case.

Safety Conscious of Working

The machine must be operated by trained and authorized personnel.

The scopes of competence for the different activities in the scope of operating the machine must be clearly defined and observed, so that under the aspect of safety, no unclear questions of competence occur. This applies in particular to activities on the electric equipment, which must be performed by special experts.

For all activities concerning installation, set-up, start-up, operation, modifications of conditions and methods of operation, maintenance, inspection and repair, the switch-off procedures that may be provided in the Operation Manual must be observed.

Safety Information for the User and/ or Operating Personnel

1. No working methods are permitted that affect the safety of the machine.
2. The operator must also ensure that no unauthorized person works with the machine (e.g. activating equipment without authorization).
3. It is the duty of the operator to check the machine before working for externally visible damage and defects, and to immediately report changes that appear (including behavior during operation) and affect the safety.
4. The user must provide that the machine is only operated in perfect condition.
5. The user must guarantee the cleanness and accessibility at and around the machine by following corresponding instructions and controls.
6. Principally, no safety components can be removed or disabled (already here we emphasize the imminent dangers, for example severe burns and loss of eye-sight. If the removal of safety components is required during repair and service, the replacement of the safety components must be performed immediately after completion of the service and repair activities.
7. Preparation, retooling, change of work piece, maintenance and repair activities must be performed by trained personnel when the equipment is switched off.
8. It is forbidden to perform unauthorized modifications and changes to the machine. It is emphasized that any unauthorized modifications to the machine are not permitted for safety reasons.

2.2 Laser Safety Information



2. This laser engraving machine is a Class 4 laser device. Please note that improper operation of the device can override safety features and cause severe injury or death. The device emits intensive

1. To assess the potential dangers laser systems pose, they are classified into 4 safety classes. It is a device of class 4. This is guaranteed by the protective housing and the safety installations.

and invisible laser radiation. Without safety precautions, the direct radiation or even diffuse reflected radiation is dangerous!

3. Without safety precautions, the following risks exist with exposure to laser radiation:

Eyes: Burns to the cornea

Skin: Burns

Clothing: Danger of fire

4. Never try to modify or disassemble the laser and do not try to start up a system that had been modified or disassembled!

5. Dangerous radiation exposure can result from the use of operation or adjustment equipment other than that described here, and if different operational methods are performed.

2.3 Safety Precautions when Operating the Device

The machine must be operated by trained and authorized personnel.

In the operation, when there is no water, less water or dirty water, the laser machine will be off, so you should check the water situation. For example, whether there is enough water, and whether the water is clean.

We suggest you choose purified water or distilled water.

Press the "PAUSE" button, if you want to interrupt the working process.

Please remember the following safety precautions when working with this device:

A fire extinguisher must always be handy as the laser beam can ignite flammable materials. Do not store any flammable materials inside the device or in the immediate vicinity of the device. Particularly, leftovers of produced materials have to be removed to prevent fire hazard.

Unsupervised operation of the system is not permitted:

Because of their low absorption, many metals, in particular un-coated aluminum, copper, silver and gold cannot be processed with the laser and this lead to high reflections of the laser beam. Such materials must not be inserted into the beam, as a directed reflection could destroy the protection cover. Adjustment of the beam path must be performed only by especially trained personnel. An improper setting can lead to uncontrolled emission of the laser radiation.

Before processing materials, the user must verify whether harmful materials can be generated and whether the filter equipment of the exhaust system is suitable for the harmful materials. We emphasize that it is the responsibility of the user, to consider the national and regional threshold values for dust, fogs and gases when selecting the filters and the exhaust system. (The values for the maximum workplace concentration must not be exceeded.)

Please refer to the manual of the exhaust system on how and in what intervals you need to replace filters.

PVC (polyvinyl chloride) must under no circumstances be processed with the laser.

Should you have further questions before you start working, please feel free to write us an email to: help@cs-supportpro.com

2.4 Warning and Information Labels



The warning and information labels are attached in such positions of the device that could represent a source of danger during set-up and operation. Therefore, follow the information on the labels. If labels are lost or damaged, they must be replaced immediately.



Chapter 3 Process of Installing

3.1 Unpacking

You receive your machine packed in a wooden box, which contains the laser machine and additional accessories. The following steps give you an overview of the unpacking and assembly of the laser. Please follow these steps carefully.

Tips

Keep the packing box. You will require it in case of a return.

Dispose all waste according to the applicable waste disposal law.

1. Put the wooden box on a flat and spacious room for unpacking.
2. Remove the machine box, and carefully remove the foam material, which protects the viewing window of the cover and around the machine.
3. Take out the key and open the door of the laser. Remove the accessories box which contains all accessory parts required for the installation of the laser machine.

And check if there's anything damaged or missed during shipping

4. Remove the sponge and nylon cable ties inside the machine and start to install the attachment, software and so on
5. Please keep these keys.
6. Remove the sponge and nylon cable ties inside the machine, and start to install the machine, (below chapters are installation details)

3.2 Contents of Delivery

1. Transport and service packaging
2. Laser including optics
3. Other optional components that you buy
4. Accessories box and the other machine parts, containing the following parts:





ITEM	QTY
1. tools	1
2. Ground Wire	1
3. Long USB Cable	1
4. Ethernet cable	1
5. Power Cable	1
6. silicone	1
7. 7mm acrylic focus tool	1
8. Water Pump/Water chiller	1

ITEM	QTY
9. Sticker for Adjust light path	1
10. Exhaust Pipe	1
11. Hose Clamp	1
12. Water Pipe	2
13. Key	1
14. Manual	1
15. 4G U-Disk (software)	1
16. The axis of rotation (optional)	1

3.3 Location

Before you install the laser system, you should select an appropriate location. Follow the guidelines shown below:

	<ol style="list-style-type: none">1. Avoid locations where the system is exposed to high temperature, dust and high humidity. (The humidity must not exceed 70% and the temperature must not be close to the dew point.)2. Avoid locations where the system is exposed to mechanical shocks.
	<ol style="list-style-type: none">3. Fuse protection: Do not connect other devices via the laser fuse, as the laser system requires the full amperage.

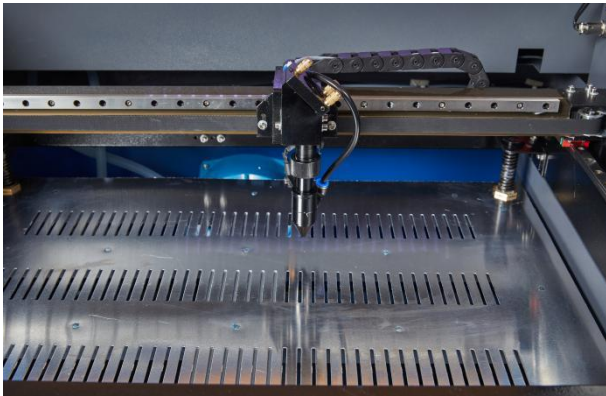
Tips:

1. Avoid locations with poor air circulation
2. Select a location, where room temperature is between 5 °C and 25 °C. Avoid higher ambient temperature and strong exposure of the engraver to the sun. Use blinds, if required.
3. Select a location close to ventilation (if available).
4. Select a location that is not more than 4.50 m away from your computer (max. cable length to avoid disturbing interferences).
5. Try to place a working table or a place to put things next to it. This shall avoid, that the machine is misused as a table.

3.4 Before Installation



Take out the sponge around the laser tube



Take out the nylon cable ties around the honeycomb plate and X axis



Open the rotary emergency switch (You must do it the first time you use the machine.)

3.5 Exhaust System – Requirements

To guarantee the right ventilation during the engraving and the cutting, the device must be equipped with a fine exhaust fan (generation of rubber dust). If you use a carbon filter (neutralize smells), it will be better for exhaust effect. A good exhaust fan of the outgoing air is also required when cutting plastics or engraving wood.

Connection - see section 3.8.3 connecting the Exhaust System.



Do not start the machine without an adequate exhaust system.

3.6 Built-in Air Pump



3.7 Computer – Requirements

The following recommendation represents the minimum requirements. When using a more powerful computer, the graphics are generated and displayed faster, and the computing times and the data transferring to the laser are reduced.

To use the newest software version, you might have to abide by other requirements.

Windows 8 (32 bit and 64 bit)

Windows 7 (32 bit and 64 bit)

Windows Vista (with Service Pack 1 or later)

Windows XP (with Service Pack 2 or later)

1024 MB of RAM, 400 MB of hard disk space

Pentium® 3 or 4 processor or AMD Athlon™ XP

1024 x 768 or better monitor resolution

1 free USB interface

1 free Ethernet interface

Mouse

3.8 Connections



Perform the connections exactly in the order described; otherwise electrostatic charging can damage your computer and/or the electronics of the laser system.

3.8.1 Connecting the Mains

Connect one end of the main cable with the connection socket at the rear side of the laser device (see Figure below) and the other end with a protected power outlet.



Main voltage and operating voltage must correspond (AC 220 V/50 Hz or AC 110 V/60 Hz). See information label beside the connection socket

Under no circumstances can you switch on the device if the voltages do not correspond.



Tips:

The main fuses are located inside the connection socket and are accessible from the exterior.

3.8.2 Connecting the Computer

Connect the Computer and the machine by using the USB cable. Like below:



Connect the Computer and the machine by using the Ethernet cable. Like below:



3.8.3 Connecting the Exhaust System

Exhaust fan, smoke pipe, is shown in Fig.



3.8.4 Built-in Air Pump



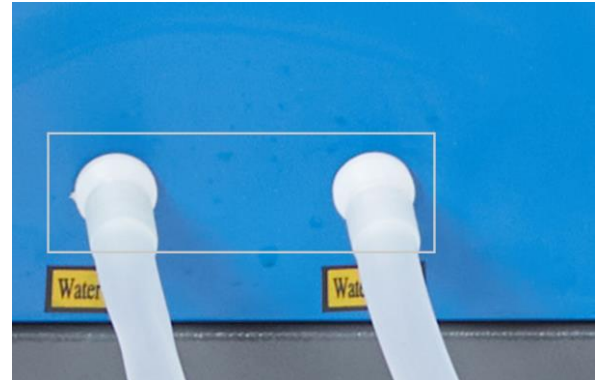
3.8.5 Connecting the Cooling System

If you have the water chiller, please connect to the water chiller priority. If not, please connect to the water pump.

The connection of the machine and the Water chiller

- ① Take out one of the water pipes. Connect it to the water chiller where marked as "OUTLET", and connect the other side of the pipe to the machine where marked as "Water IN".
- ② Please connect the other pipe to "INLET" of water chiller and "Water OUT" of machine.

We will provide a certain chiller power cable for different countries, and the power cable will be put inside a box together with the water chiller.

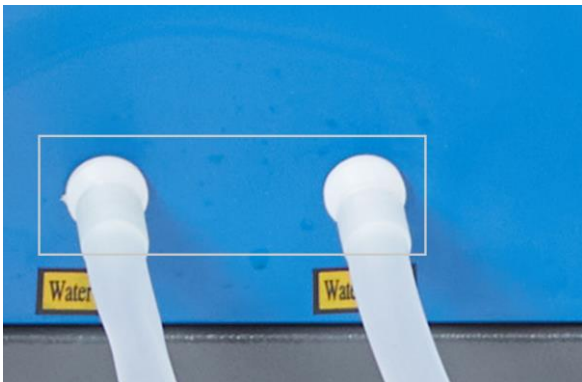


The connection of the machine and the water pump

Take out one of the water pipes. Connect it to the water pump, can the other side to the machine where marked as "Water IN".

Please connect the other pipe to the machine where marked as "Water OUT", and the other side directly into the water.

Like below:

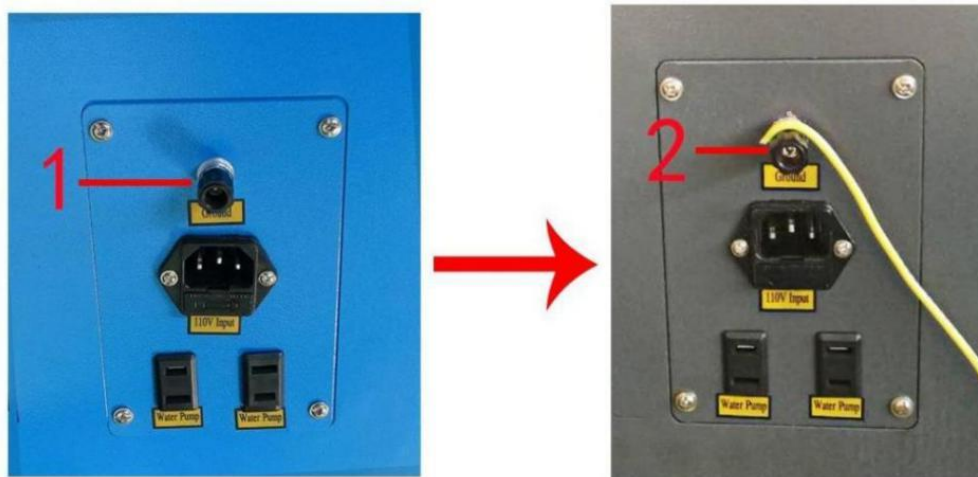


Get through the water chiller or the water pump, and turn on the main power.

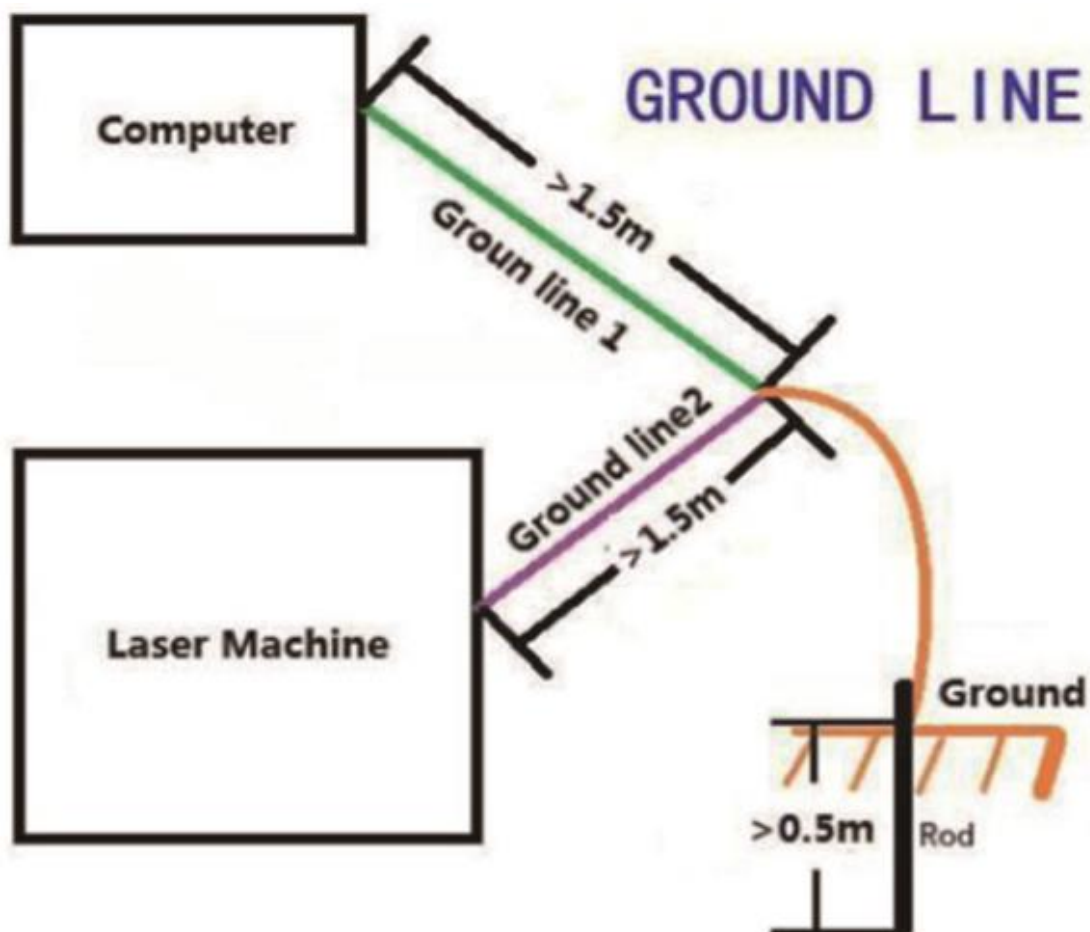
Check the water chiller or pump to work (If normally works, the green light will be on or water will flow from the pipe).

3.8.6 Safety Grounding

Co2 laser tube is the fourth type of laser. The type of drive is high-voltage-driven, so when users use the machine, they must comply with the "Safety Note". On the other hand, it asks stringent requirement about the safety grounding to the users. The safe Line-to-Ground Resistance should be less than 5. Specific connection method is shown in the below:

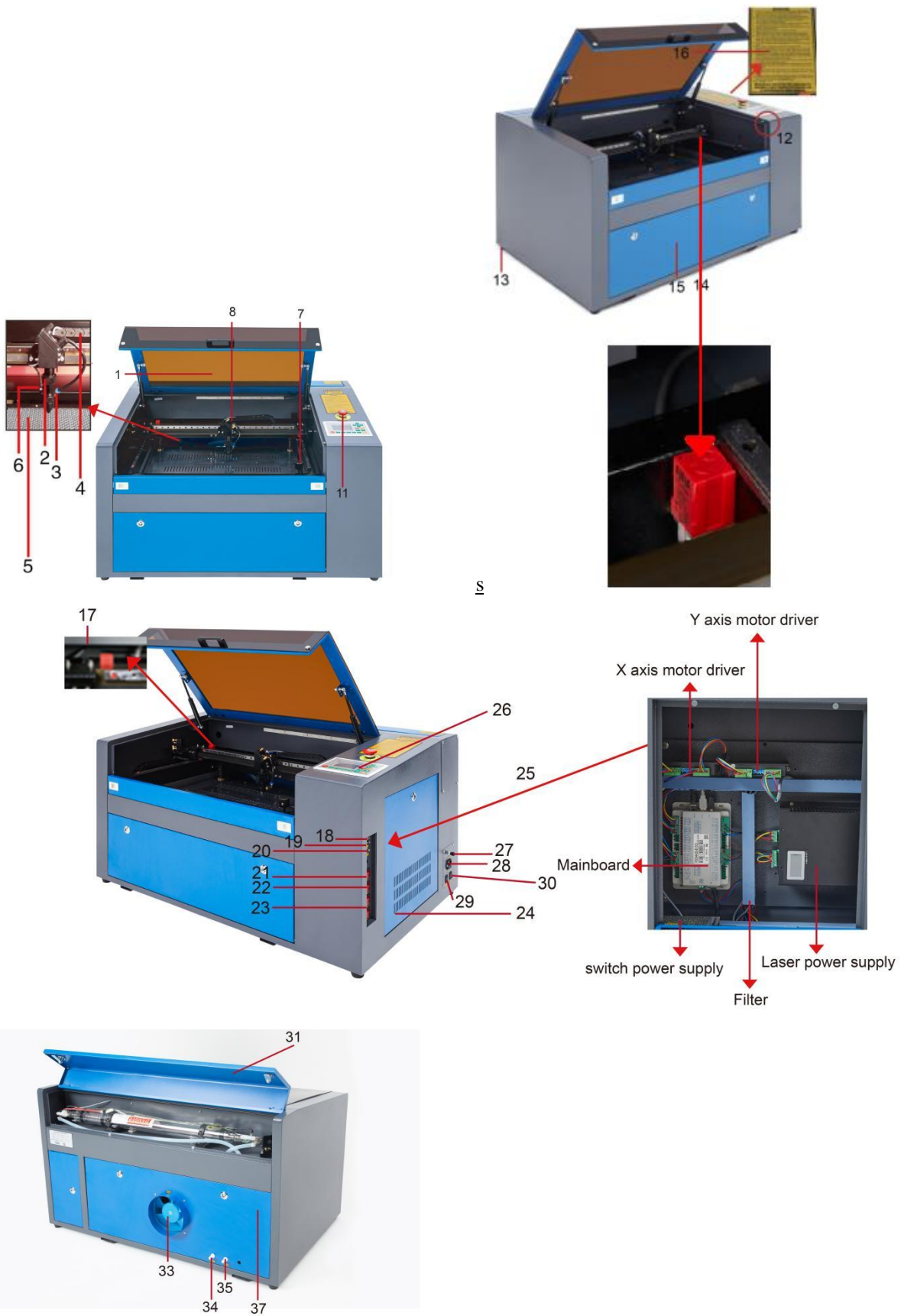


Ground wire is shown in the fig.



Chapter 4 Operation

4.1 Machine View



1:Top lid

Open the top lid when you put materials, and close the top lid when the machine is working.

2:Laser head

The laser and red dot pointer come out from the laser head.

3:Blow air conditioner

Blow away the smoke and dust, protect the lens, prevent the material from catching fire, etc

4:Leading chain

There is an air pipe for blowing air for laser head. And there is red point cable in it.

5:Honeycomb working table (optional)

According to your need, put the honeycomb working table onto the aluminum knife working table or aluminum plate working.

6:Red point

Used to indicate the position of the laser light

7:Manually regulating valve up and down

You can adjust it to make the worktable up or down.

8:LED light

You can easily see the situation of working.

11:E-stop (The rotate emergency switches)

Once there's an accident (laser catching fire or laser leakage) during working, please turn off this switch immediately.

Run the machine, and make sure it is on.

12: Cover Protection

If the cover opens when the machine is operating, the machine will stop working

13: Base foot

Support machine for working

14. Y limit switch

It will give a stop instruction to the motor when the laser head get to origin.

15: Front door

Open this door for cleaning the waste after working

16: Attention

Please read it carefully before the machine works.

17: X limit switch

It will give a stop instruction to the motor when the laser head gets to origin.

18: U-disk connection port (USB)

You can transport the data by U-disk, and it is very useful for different situation.

19: USB cable port (PC connection port)

This USB is for connecting computer.

20: Ethernet port

This port is connecting the laser machine and PC by Ethernet cable.

21: Control switch

Turn on it when the machine is running. Otherwise, there is no instruction for the machine.

22:Laser switch

Turn on the laser switch when the machine is running. Otherwise, there is no laser.

23: WATER PUMP SWITCH

Turn on the water pump switch before start the machine. optional

24/25: Right in side door

There are laser power supplier, main board, switch power supply, X and Y motor driver. Please open this door to check these parts. You must pay attention to the electric current.

26: Control panel

You can control the X-axis and Y-axis (Z-axis optional) by the display panel. It also shows the working time, power, speed and the whole working time, and affords many function options (please view this chapter 4.4 for detailed information).

27: Ground line

This point is for connecting cable from machine to ground, and to make sure the machine works better.

28: Power supply socket

To connect the main power and the extend power according to the label information, and there are fuses in it.

29: Water pump power socket

You can connect the water pump to it when you do not have enough sockets on your work place.

30: Air pump power socket

You can connect the air pump to it when you do not have enough sockets on your work place.

31: Laser tube cover

There installed the laser tube and the first reflective mirror inside.

33: Exhaust hose

This is for installing the exhaust device.

34: Water inlet

This port is for connecting water out pipe of water pump or water chiller.

35: Water outlet

This port is for connecting water in pipe of water pump or water chiller.

37: Back door

Open the door and you can see the water protector.

4.2 On/ Off Switch



Switches the E-stop and the laser supply power ON/OFF

The following conditions must be fulfilled for correct start up:

- Unrestricted freedom of motion of the mechanics
- No materials under the engraving table
- When turning on the power of machine, turn on the E-stop switch first and then the laser supply power.

When the referencing process is completed correctly, there will be an acoustic signal sounds and the device is ready for operation. The operation panel will display the home screen when the laser is completely reset.

Before switching on the device, the user must make sure that no objects of any kind are located inside the operating space, which could limit or obstruct the mechanics of the device.

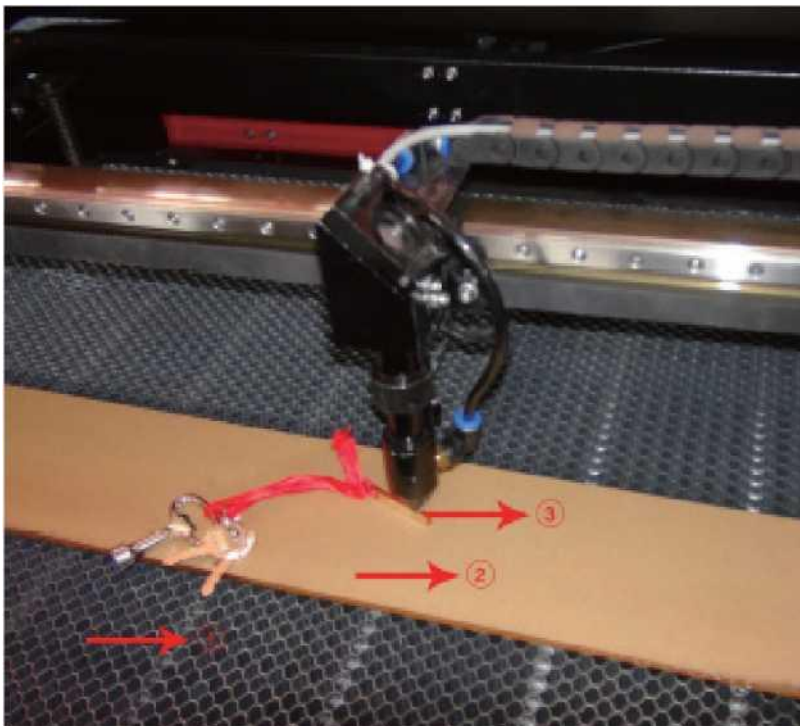
Tips:

When switching off the main supply, all processing data is lost.

4.3 How to adjust focus distance

For standard laser head:

Find the 7mm Acrylic Focus Tool for help to adjust the focus directly like below:



- ① Working Table
- ② Material
- ③ Focus Tool

4.4 How to use the control panel


4.4.1 Function of the Buttons



Arrow buttons: control the movement of the laser head (also can be used to change the parameters in the control panel)

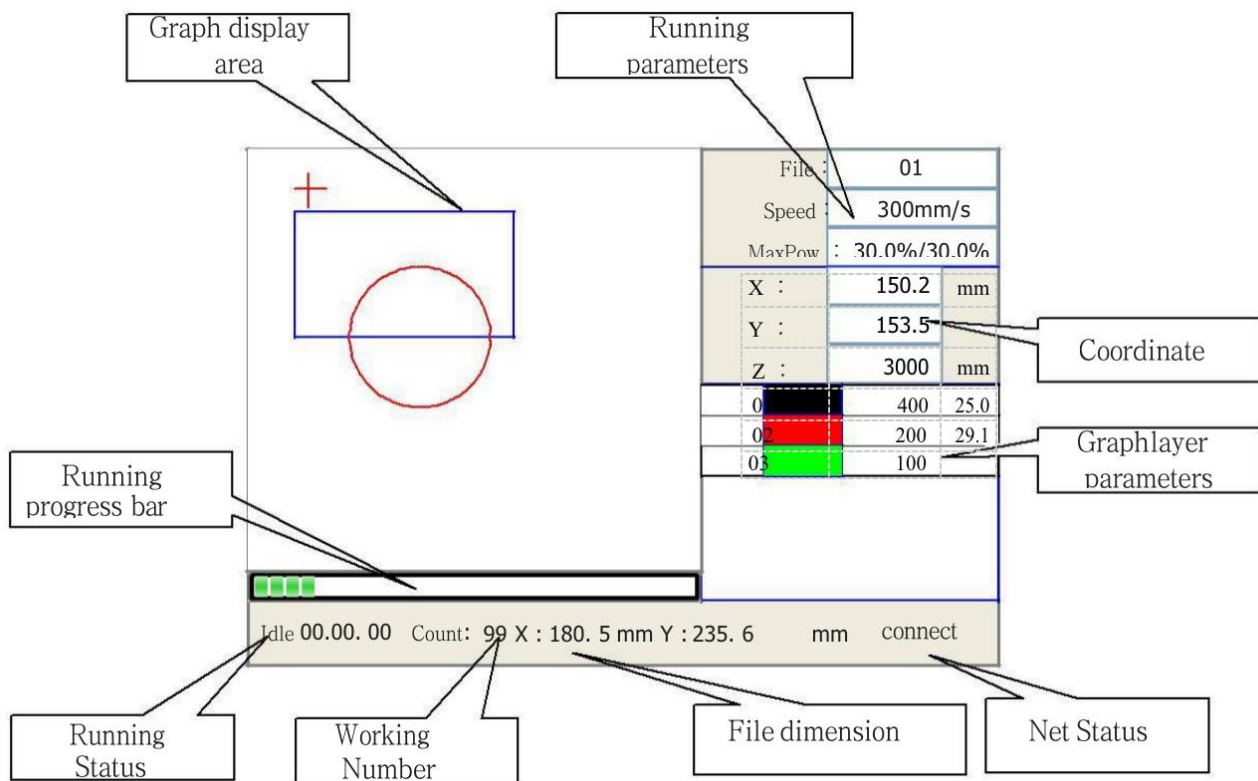


Z/U button: The Z/U key can be pressed when the system is idle or the work is finished. On pressing this key, it will show some entries in the interface, each entry includes some functions: Z axes move, U axes move, each axes to go home etc.

	Reset button: reset the machine.
	Pulse button: single press to draw a dot, press and hold to drill a hole.
	Speed button: Set the speed of the current running layer, or set the direction keys' move speed.
	Min-Power button: Set the min laser power of the current running layer.
	Max-Power button: Set the max laser power of the current running layer, or set the power of "Laser" Key.
	File button: The management of the memory and U disc files.
	Start-Pause button: run/pause the current job.
	Origin button: set the starting point for the laser head.
	Frame button: To track by the current file's frame.
	Esc button: To stop work, or return to the last menu.
	Enter button: confirm your selection.

4.4.2 The Main Interface

When the system is powered on, the screen will show as below:

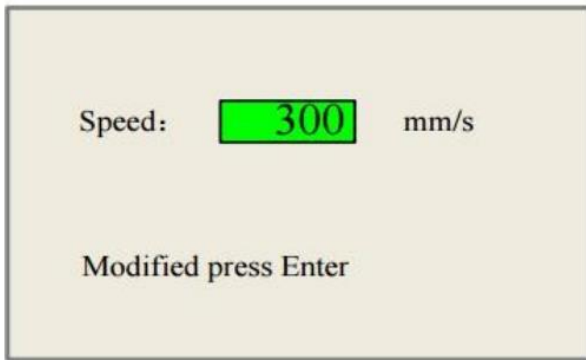


Graph Display Area: To display the whole file's track and display the running track

- Running parameters:** To display the running file's file number, speed, max power etc.
- Coordinate:** To display the current coordinate of X, Y and Z axes
- Graph layer parameters:** To display the layers' information of the current file, such as max or min power, speed etc. When system is idle, double click the layer. Then, users can change the layer's parameters and the changing would be saved.
- Running Status:** To display the current status of the machine, such as Idle, Run, Pause, Finish, etc.
- Running Progress Bar:** To display the progress bar of the current running file
- Working Number:** To accumulate the work number of the current file
- File Dimension:** To display the dimension of the current file
- Net status:** To display the connecting status of the Ethernet

When work is idle or finished, all keys can be pushed. Users can select a file to run, set some parameters, preview to a select file, etc. But, when work is running or paused, some keys don't respond when they are pushed.

4.4.3 Speed Key

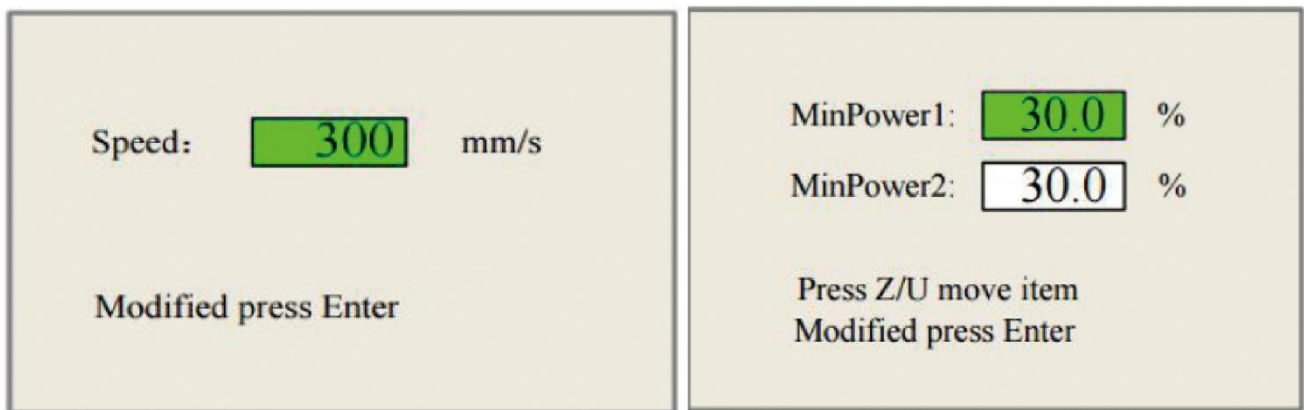


Push the "Speed" key when the screen is on the main interface, and it will show as below:

Push the "X+/-" Keys to move the cursor in the numeral area, and push the "Y+/-" keys to change the value. Then, push the "Enter" key to save the change, and push the "Esc" key to invalidate the change.

4.4.4 Max/ Min Power Keys

Push the "Max Power" or the "Min Power" keys when the screen is on the main interface, and it will show as below:



Push the "X+/-" Keys to move the cursor in the numeral area, and push the "Y+/-" keys to change the value. Then, push the "Enter" key to save the change, and push the key to invalidate the change.

When "Z/U" key is pushed, the green block can move up and down to denote the changing item, and then "Y+/-" keys and "X+/-u keys can be used to change the value.

4.4.5 Set the Layer Parameters

After selecting a file to preview on the main interface, user can push "Enter" key to let the cursor move to the first layer. Then, "Y+A" Keys can be pushed to select the intent layer. At that time, user can push "Enter" key to check the selected layer's parameters showing as below:

01		400 25.1
02		200 29.1
03		100 31.5

Layer0:

Speed: mm/s

MinPower1: %

MinPower2: %

MaxPower1: %

MaxPower2: %

Press Z/U move item
Modified press Enter

User can push "Z/U" Keys to move the green block on the intent parameter, and then he could change the parameter if needed. "OK" to validate the change, and "Esc" to invalidate the change.

4.4.6 Z/ U Key

The Z/ U keys can be pressed when the system is idle or the work is finished. On pressing the key, it will show some entries in the following interface:

Z move	Language+
U move	IP setup+
Axis reset+	Diagnoses+
Manual Set+	Screen Origin+
Laser Set+	
Origin set+	
Set Fact Para	
Def Fact Para	
Auto Focus	

Press up and down arrow keys to move the green block to the anticipant item, and then push the "Enter" key to display the sub menu.

4.4.7 Z Move

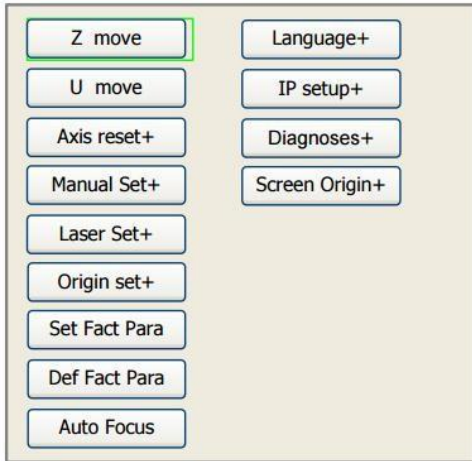
When the green block is on "Z Move" item, move the Z-axis table up and down by pressing left and right arrow keys. Then, press ESC to go back to normal X&Y axis control.

4.4.8 U Move

When the green block is on "U Move" item, move the Z-axis table up and down by pressing left and right arrow keys.

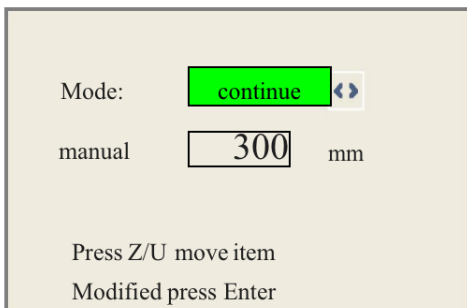
4.4.9 Axis Reset+

When the green block is on this item, push the "Enter" key to show as below:



Press up and down arrow keys to move the cursor to one of the entry, and then push "Enter" key to restart the selected axis. The screen will show some information when resetting.

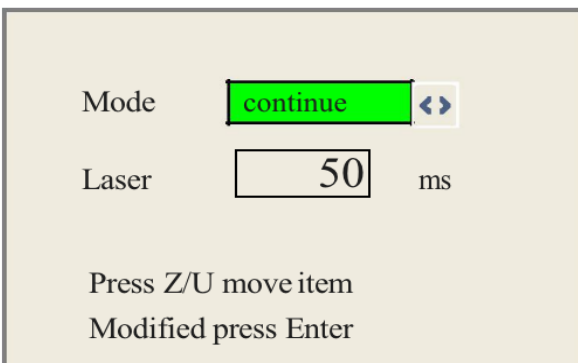
4.4.10 Manual Set+



When the green block is on this item, push the "Enter" key to show as below:

Push "Z/U" keys to move the green block, and when the green block is on the "Mode" item, push "X+-" keys to select the anticipant value "Continue" or "Manual". When "Continue" item is selected, then the "Manual" item is not valid. At that time, push the direction keys to move the corresponding axes, and when the pushed key is loosed, the corresponding axes will finish moving. When the Mode item is "manual", please push the direction key once. The corresponding axes will move a fixed length unless the scope is overstepped.

4.4.11 Laser Set+



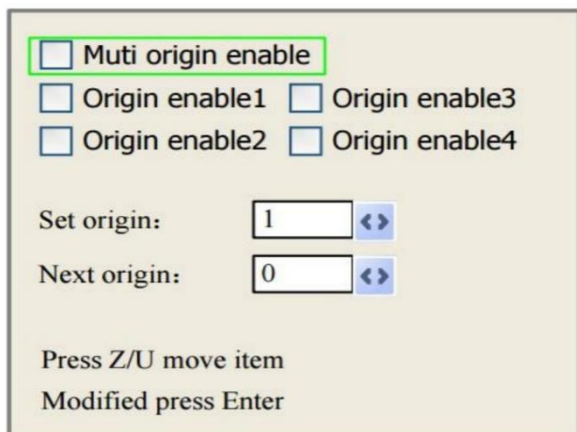
When the green block is on this item, push the "Enter" key to show as below:

Push "Z/U" key to move the green block, and when the green block is on the "Mode" item, push "X+-"

" keys to select the anticipant value "Continue" or "Manual".

When "Continue" item is selected, then the "Laser Set" item is not valid. At that time, push the Laser key to splash the enabled lasers, and when Laser key is loosed, the lasers will finish splashing. When the Mode item is "manual", push the Laser key one time, and the enabled lasers will splash a fixed time.

4.4.12 Origin Set



When the green block is on this item, push the "Enter" key to show as below: Push "Z/U" key to move the green block to the anticipant item, and when the green block is on "enable" items, push "Enter" key to enable or disable the item. When enabled, the small diamonds is green, and when disabled, the small diamonds is grey. When the green block is on the "Set origin" item or the "Next origin" item, push the "X+-" keys to select the value.

Pay attention to it when the green block is on the "Set origin" item. Push the "X+-" keys to select a value, and then "Enter" key must be pushed to valid the change, or the change is invalid.

Each item introduced as below:

- Multiple Origins Enable: "Yes" or "No" can be selected. If you select "No", the system will use the single-origin logic. You can press the "Origin" key and set the origin, and only this origin can become valid. If you select "Yes", the system will use the multiple origin logic and the "Origin" key on the keyboard becomes invalid.

In such a case, the parameter of each origin must be set in the menu as follows.

- Origin Enable 1/2/3/4: After the multiple-origin logic is enabled, the four origins can independently be prohibited and enabled.

- Set Origin 1/2/3/4: After the multiple- origin logic is enabled, you can stop the cursor at "Set as Origin 1/2/3/4". Press the "Enter" key on the keyboard and the system will take the coordinate figures of current X/Y axles as the corresponding ones to the origin 1/2/3/4.

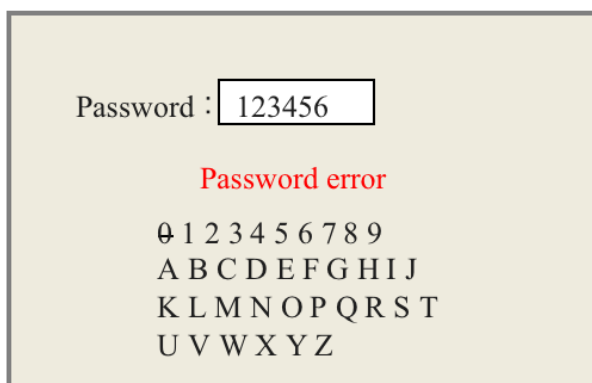
Next Origin: There are such five digits as 0~4 for option, which are the origins to be used for the next figure. Origin 0 means the origin set by the "Origin" key on the panel in the single- origin logic. 1~4 means the serial number of the origins in the multiple- origin logic. Next origin can be modified to any one of origin 1-4, so as to control the start location of next work (The premise is that the origin is enabled.), but it can't be modified to origin 0.

Prompt


Once the multiple-origin logic is selected, if the serial number of the next origin is 1 and four origins are enabled, and when the memory file function is started or the processing file is uploaded into the PC and this file selects "Take the Original Origin as current Origin", the work started for each time will use different origins. The rotation order of origin is 1->2->3->4->1->2...

4.4.13 Set Fact Parameters

After the "Set Fact Para" is selected and the Enter key pressed, the interface will show the specific password to be entered when set as default parameter.



Push "X+/-" keys and "Y+Z-" keys to select the characters, and push the "Enter" key to valid the characters when finishing enter the password. That is to say, six characters. If the password is wrong, it prompts there is some error, or all parameters are stored.

 Prompt	<p>After the manufacturer regulates all parameters of the machine well (including all manufacturer parameters and user parameters), this function can be used to store the well-regulated parameters to help users to recover the original parameters (including all manufacturer parameters and user parameters) through selecting "Recover Para" when they regulate parameters improperly.</p>
---	--

4.4.14 Def. Fact Parameters

Push "X+/-" keys and "Y+Z-" keys to select the characters, and push the "Enter" key to valid the characters, when finishing entering the password. That is to say, six characters. If the password is wrong, it prompts there is some error, or all parameters are stored.

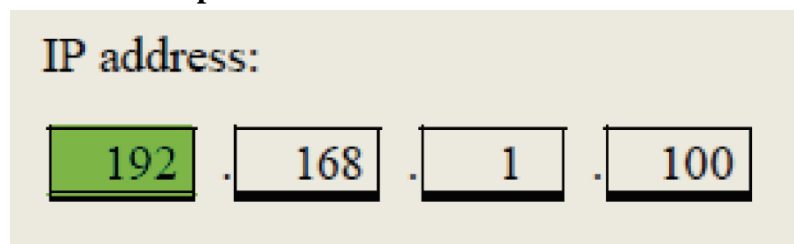
4.4.15 Auto Focus (Optional)

When the cursor stops at "Auto Focus", press the Enter key to search for the focus (When there is z axes and the z axes reset function is enabled, the auto focusing is valid). Press the Esc key to return to the prior menu.

4.4.16 Language

The item "Language" helps you to select an appropriate language which is displayed on the pane:

4.4.17 IP Setup



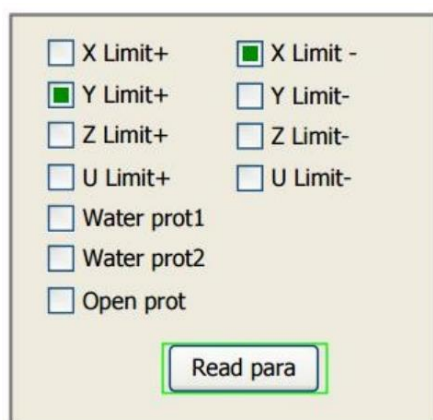
IP address:

192 . 168 . 1 . 100

When the green block is on this item, push the "Enter" key to show as below:

Push "Z/U" key to move the changing item, and then push "X+/-" keys and "Y+/-" keys to change the value. When all the IP value and the Gateway value are changed, push "Enter" key to validate the change, or "Esc" key to invalidate the change.

4.4.18 Diagnoses



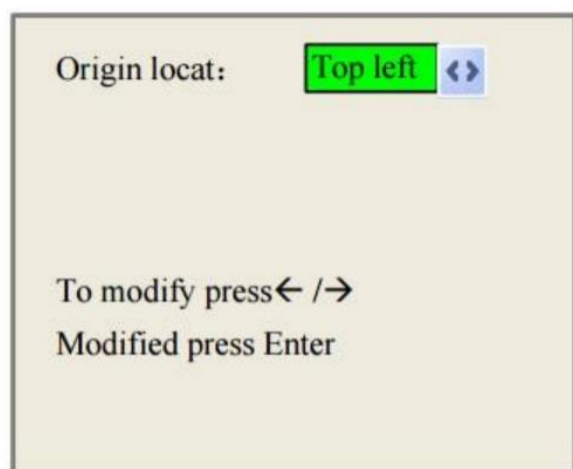
☐ X Limit+ ☒ X Limit -
☒ Y Limit+ ☐ Y Limit-
☐ Z Limit+ ☐ Z Limit-
☐ U Limit+ ☐ U Limit-
☐ Water prot1
☐ Water prot2
☐ Open prot

Read para

If the "Diagnoses" item is pressed, the system will show as below:

This interface shows some system input information, such as limiter status, the status of the water protecting, the status of the foot switch, etc. When the input is validated, the color frame will be green. Otherwise, it's gray.

4.4.19 Screen Origin



Origin locat: **Top left** <>

To modify press < />

Modified press Enter

If the "Screen Origin" item is pressed, the system will show as below:

There are four entries to be selected: Top Left, Top Right, Bottom Left and Bottom Right

When one is selected, the previewed graph on the screen would be enantiomorphously based on X or Y direction. pressed, the system will show as below:

There are four entries to be selected: Top Left, Top Right, Bottom Left and Bottom Right

When one is selected, the previewed graph on the screen would be enantiomorphously based on X or Y direction.



This item is only used to preview the file on the screen, and it is no meaning to the machine's movement.

4.4.20 File Key

1). Memory File

On the main interface, if "File" key is pressed, it will show as below:

When showing this menu, the system would read the memory file firstly. The file name and the work times would be listed in the area, and the selected file is previewed in the bottom right area. "Y+/-" keys could be used to move the cursor on the file name list. When the cursor is on a target file name, press the "Enter*" key and the selected file will be previewed on the main interface. Then, if "Esc" key is pushed, the preview will disappear.

"X+/-" keys could be used to move the cursor left and right. All the items show as below:

Read mem file: read the memory file list;

-U-disk: read the U disk file list;

- Other: The other operation of the memory files;

- Run: To run the selected file;

- Work time: To forecast the running time of the selected file, and the time is accurate to 1ms;

- Clear count: To clear the running time of the selected file;

- Delete: To delete the selected file in the memory;

-Copy to U-disk: To copy the selected file to U-disk;

If the "Other" entry is pressed, the system will show as below:

- Current work time: To forecast the running time of the current file (the current file No. is shown on the main interface), and the time is accurate to 1 ms

- Clear all count: To clear the running time of every file in the memory

- Delete all files: To delete all memory files

- Format speedily: To format memory speedily, and then all the files in memory will be deleted.

-Format drastically: to format memory drastically, and then all the files in memory will be deleted.

Total: the total running time of all the files.


2). U-Disk File

If the "U-disk" entry in figure 8.4-1 is pressed, the system will show as figure 8.4-3, and the operation method is all the same as figure 8.4-1.

- Read U-disk: Read the file list in the U-disk

- Copy to memory: Copy the target U-disk file to the memory

- Delete: Delete the selected U-disk file

File:	Count:		File:	
01	400	Read mem file	01	
02	200	Udisk+	Speed:	300mm/s
03	100	Other+	MaxPow:	30.0%/30.0%
		Run	X:	150.2 mm
		Track	Y:	153.5 mm
		Work time	Z:	3000 mm
		Clear count		
		Delete		
		Copy to usdisk		
Idle 00.00.00 Count: 99 X: 180.5 mm Y: 235.6 mm connect				

Current work time

Clear all count

delete all file

Format speedly

Format drastically

Total: 10

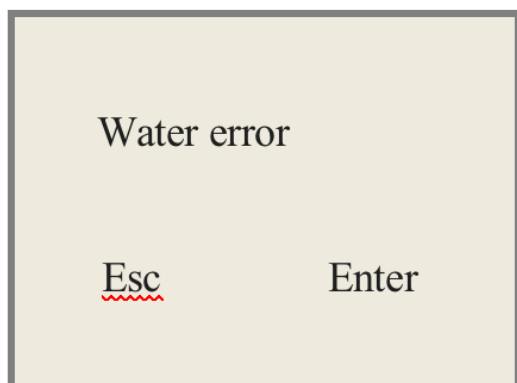
Clear

File:	
01	Read usdisk
02	
03	Copy to memery
	Delete

Prompt

This system supports such file formats of U-disk as FAT32 and FAT16, but it can identify them when files are put under the root directory of U-disk. The file name of more than 8 characters will automatically be cut out by the system. The file name that has only English letters and digits will not show when they are copied to the mainboard. The files copied from the mainboard to U-disk will be placed under the root directory of U-disk.

4.4.21 Alarm Information of Display



When users are operating the system, or when the machine is running, some alarm information such as water protecting error maybe shows as below:

Push "Enter*" key or "Esc" key, the system will execute some relative steps.

4.5 The First Time Running the Laser



1. Using the machine for the first time, and please note that the machine working voltage of 220V (110V for USA).
2. Please put the honeycomb on the standard table .Unless you need to engrave on thick material or use the rotary axis.
3. Lower the laser head, and the upper part of the head tube must be longer than 38mm
4. Please reset Z-axis after turn on the laser machine (watch the guiding video to learn how to reset the Z-axis, and refer to the operation video).
5. Please don't use the autofocus function if there's no materials on the table.

For example, first engraving tests

The following steps describe how to successfully engrave a first pattern. Please follow the individual steps:

1. First switch on the computer and the Laser.

Tips: When turn on the power of machine, and note that turn on the main switch first and then the laser supply power.

2. Put the object to be engraved into the laser and move into the desired position on the engraving table. Usually the object is positioned in the upper left-hand comer. Use the rulers to determine the dimensions of the object to be engraved.

3. With the positioning keys the lens is positioned over the material to be engraved. You focus with the help of the focus tool or by auto focus.

4. Generate a graphic with the help of your graphics software, or lead in a picture that you want to engrave, but before this, you must click the Tort setting'* in the software.

The size of the graphic does not matter as the printer driver adjusts it to the work piece automatically if requested.

If you have any questions, and also consult the Software Manual for further information.

5. Double-click the Work in the window of "Work", then you can modify the parameters such as speed, Min Power, Max Power, ramp Effect, Ramp Length, Interval and so on.
6. Select "download", you can change the file name. If you don't change the file name, that will be the default name for "default", and will be covered the last file.
7. Click "Origin" and "Frame" on the display, please make sure that the material is in the right location and there is enough space for working.
8. Please check the water cooling system is working property; the water is running into and filling the laser tube. Please do not start your work if the laser tube isn't full of water, because that may led to laser tube damage due to the high temperature.
9. Finally press the "Start-Pause" button in the display, to start the engraving process.
10. While the laser is engraving, you can generate the next graphic.

When the engraving is complete, the laser machine will give out the notification sound and the laser head will go back to the original point. The warning light will return to the green light, and then you can repeat engraving.

4.6 Rotary Axis Attachment

The rotary axis attachment option in the printer driver is used in combination of the rotary axis attachment to engrave cylindrical objects. To compensate for the different diameters of different objects, the image must be adjusted. This is performed automatically by the engraving driver, by selecting the rotary engraving option and entering the diameter of the object to be engraved.

The Rotary size:

Cylindrical rotary device enables you to
work on any cylindrical objects (diameter: 0.8"-6")

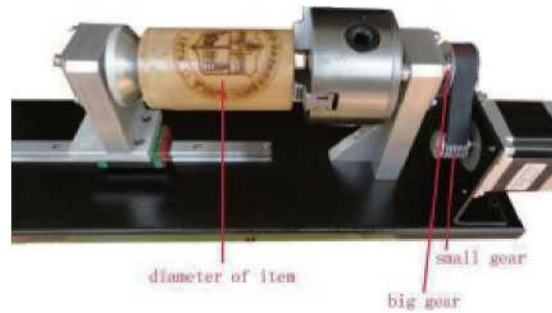


OR



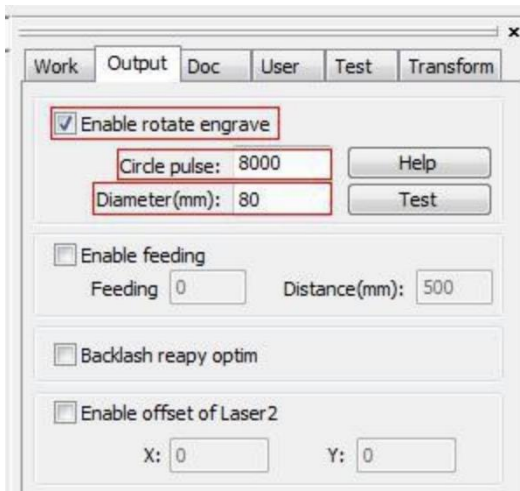
To install and set up the rotary axis attachment, proceed as described as follows:

1. Move the working table to the lower position, switch off the laser and open the top lid
2. Put the rotary axis attachment onto the working table and connect the rotary axis attachment to the working table. Before you fix the rotary axis attachment, align it so that its sides are parallel to X axis and Y axis of the machine.
3. Connect the rotary axis attachment via the control cable with the connector of the motion system. The connector is located inside the right front of the laser. Connect it to this interface and fix. Then, reset the rotary device by pressing the "reset" button on the display. At last, you have finished the device connection. Like below:



To install and set-up the rotary axis attachment proceed as described as follows:

1. Move the working table to the lower position, switch off the laser and open the top lid
2. Put the rotary axis attachment onto the working table and connect the rotary axis attachment to the working table. Before you fix the rotary axis attachment, align it so that its sides are parallel to the rulers. The rulers offer a visual aid for placing the graphic.
3. Connect the rotary axis attachment via the control cable with the connector of the motion system. The connector is located inside the right front of the laser. Connect it to this interface and fix. Then, turn on the switch and reset the rotary device by pressing the "reset" button on the display. At last, you have finished the device connection. Like below:
5. Adjust and fix the slider to make the work piece fit into the rotary axis attachment
6. Now switch on the laser and wait until the referencing is finished. Position the working head over the object at the position, where you want to engrave. Now focus the object with the focus tool or by auto focus.
7. Generate a graphic with the help of the graphics software. The graphics size must be adjusted until less than the dimensions of the work piece.
8. Select "Output", then input the diameter of the object and the circle pulse. Like below:



Select "Output", and then tick "Enable rotate engrave"

- ① The Circle pulse is set to 8000
- ② The diameter of the target item

9. Select "Download", and click "Original" and "Frame" on the display. Please make sure that the material is in the right location and there is enough space for working.

10. Switch on the cooling system, and connect the exhaust system and the air pump to behind of the laser. Please check whether the water cooling system is working properly. The water is running into and filling the laser tube. Please do not start your work if laser tube isn't full of water because that may led to laser tube damage due to high temperature.
11. Finally press the "Start-Pause" button in the display to start the engraving or cutting process
12. When you don't need to use the rotary axis attachment to work, please turn the rotary axis switch off and remove it out of the working table. Then, reset the laser machine.

4.7 For Laser Engraving

The engraving depth can easily be varied through the laser power or the speed. To increase the engraving depth, reduce the speed or increase the power setting. This way you increase the amount of energy per area unit. Engraving too deep, however, reduces the quality of the details. With coated materials, the required power depends on the kind and thickness of the coating. With power set too high, the individual lines become too thick and a sharp picture cannot be achieved. The resolution of the graphics should usually be at 500 dpi. The dpi setting (number of laser dots per inch) depends on the material. The lower this setting is, the lower the resolution of the engraved picture will be. This, however, reduces flaming and increases the energy of a pulse, which can improve the overall result (e.g. when engraving some sorts of plastic materials).

1. Plastics

Plastics for engraving are available in many different colors and thicknesses and with many different coatings and surfaces. The majority of available plastics can be well engraved and cut with the laser. Plastics with a micro-porous surface seem to give the best result, because less surface material needs to be removed. As most plastic materials have a low melting point, a low pip setting should be selected to reduce the danger of melting.

2. Acrylic

There are two different types of acrylic - cast and extruded. The cast acrylic becomes white or mat after engraving, and the extruded acrylic remains clear. Use extruded acrylic for engravings that are filled with paint and cast acrylic for normal engravings. Cast acrylic can be best engraved without protection foil. It is better to engrave the entire surface with a low energy setting.

4. Engrave the rubber material

The various mixtures and densities of rubber plates cause a slightly varying engraving depth. The settings in the overview table give a good indication. Since engraving a standard rubber material requires a relatively high laser power, the laser power is principally set to 50% or higher and only the speed is varied. Due to their lower density, so-called micro porous rubber materials allow a significantly higher engraving speed. Test the rubber first, to find out the correct speed setting.

The RDWorksV8 software uses the engraving function, and you can choose "Ramp Effect" or common engraving. Once you choose "Ramp Effect", you will need to set a minimum power lower than Max Power. Generally, we set it to about 15%, and input a value with the Ramp Length that you want. But if you want to make it better, you may need to test different kinds of power and speed by yourself. Then, you can get the best result. Engraving rubber produces a considerable amount of dust and terrible gas. Therefore, a well-dimensioned exhaust system and its regular maintenance are very important

Laser Processing Parameters for Different Materials.

Laser Processing Parameters for Different Materials

Power and speed is regulated by software. You can set up them in the software. Current in Ammeter is controlled manually.

Power	%	20	30	40	50	65-75	80	90	100
Current	MA	6MA	10MA	12MA	15MA	18MA	23MA	25MA	30MA

Description		Cutting Thickness of Leather			
		1mm	3mm	5mm	10mm
60W	Power	15MA	20MA	20MA	
	Speed	20MM/S	10MM/S	6MM/S	
80w	Power	12MA	15MA	18MA	20MA
	Speed	50MM/S	12MM/S	8MM/S	2MM/S
100w	Power	18MA	18MA	18MA	20MA
	Speed	50MM/S	28MM/S	12MM/S	4MM/S

Description		Cutting Thickness of Paper Board				
		0.3mm	0.5mm	1mm	1.5mm	2mm
60 W	Power	8MA	10MA	12MA	15MA	15MA
	Speed	300MM/S	300MM/S	200MM/S	200MM/S	160MM/S
80 w	Power	8MA	10MA	13MA	18MA	16MA
	Speed	400MM/S	400MM/S	300MM/S	300MM/S	200MM/S
100w	Power	6MA	8MA	12MA	12MA	16MA
	Speed	120MM/S	120MM/S	130MM/S	130MM/S	100MM/S

Description		Cutting Thickness of Cloth	
		0.3mm	0.5mm
60W	Power	10MA	12MA
	Speed	50MM/S	40MM/S
80w	Power	8MA	10MA
	Speed	70MM/S	60MM/S
100w	Power	6MA	8MA
	Speed	150MM/S	140MM/S

Chapter 5 Maintenance

5.1 Cleaning the Laser Machine



1. Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.
2. Before starting cleaning and maintenance work, always switch off the device and unplug the main plug.
3. Always keep the system clean, as flammable parts in the working area or exhaust area rise the fire hazard.

Tips:

You should check at least once a day, whether dust has accumulated in the engraving system. In case of soiling, the machine must be cleaned. The cleaning interval strongly depends on the material that is being processed and the operating time of the device. Please bear in mind that only a clean machine guarantees optimal performance and reduces the service costs.

General Cleaning Notes:

1. Make sure that the device is switched off and unplugged. Open the protective cover.
2. Move the working table into a position in which it is easier for you to clean the surface with a window cleaning agent and paper towels.
3. Thoroughly remove all dirt particles and deposits in the interior of the machine
4. Clean the cover of the laser tube
5. You can clean the viewing window with a cotton cloth. Do not use paper towels as they could scratch the acrylic.

5.2 Cleaning the Optical Parts

The lens has a durable multi-coating and won't be damaged by correct and careful cleaning.

You should inspect the focus lens, the mirrors, and the beam combiner according to the maintenance plan. If you discover a veil of haze or dirt you must clean them.



It is suggested to clean the mirrors/lens before work every day in order to run the machine at max efficiency.

Follow the instructions below for the cleaning of optical parts:

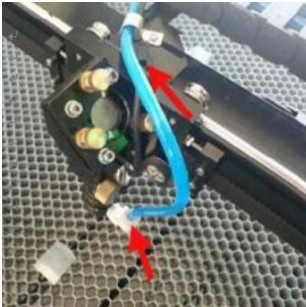
5.2.1 Cleaning the Focus Lens

1. Move the engraving table to a distance approx. 10 cm under the lens holder.
2. Move the working head into the center of the working surface and put a cloth under the lens holder

(so that the lens is not damaged if it accidentally falls out of its holder).

3. Now, you can unscrew the lens holder.
4. Once positioned over a clean lens cleaning tissue, remove the lens from the lens holder by carefully turning the lens holder and letting the lens and the O-ring drop onto the cleaning cloth.
5. Examine the O-ring, and if necessary, clean it with a cotton bud and a lens cleaning tissue/cloth
6. Remove the coarse dust as good as possible by blowing air onto the lens surface.
Check the surface and if necessary clean the lens with the lens cleaning liquid and lens tissue/cloth
8. Hold the lens assembly by its edge with a lens cleaning tissue and use a drop of lens cleaning liquid. While holding the lens on an angle, flush both surfaces to wash away coarse soiling.
9. Put the lens on a clean lens cleaning tissue and put some lens cleaning liquid on one side of the lens. Leave the liquid to take effect for approximately one minute and then gently wipe it away with lens cleaning tissues soaked with lens cleaning liquid.
10. Finally, dry this side of the lens with dry lens cleaning tissues/cloth and repeat the cleaning process on the other side of the lens. Never use a cleaning tissue twice.
Dust accumulated in the cleaning tissue could scratch the lens surface.
11. Examine the lens. If it is still soiled, repeat the cleaning process until the lens is clean.
12. Carefully insert the lens into the lens holder and ensure that the rounded side (= convex) of the lens is facing upwards. Then, put the O-ring on top of the lens.
13. Carefully assemble the lens in reverse order

How to take out the focus lens? Please just do as the following pictures indicate:



1. Remove the air pipe



2. Rotate to the left, and the head is divided into two parts



3. Install and please concave downward (convex side of the lens is facing

upwards)

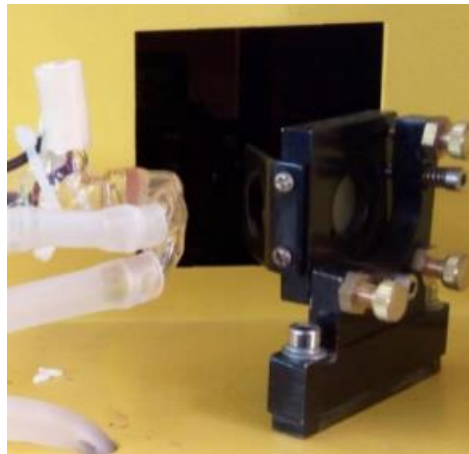


Fix back the focus lens, be careful not to scratch the lens, and then merge both parts together

5.2.2 Clean the Mirrors

There are three mirrors in the operating area of the laser, which may have to be cleaned if they are soiled. To clean the reflector, follow the instructions below.

The Mirror#1



The mirrors are easy to be dirty. And this will reduce the efficiency of the laser beam. Meanwhile, laser energy absorbed by the mirror may cause heat and destroy the mirrors, too. For the first mirror, you can clean it directly.

The Mirror#2



Make sure that the power of the laser machine is turned off while cleaning. The 2nd mirror is installed on the left side of X rail. For the second mirror, you can clean them directly.

The Mirror#3



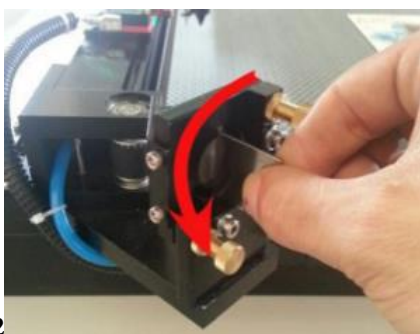
Cautions:

- 1) Mirrors must be cleaned carefully by using lens cleaning paper/lens cleaning cloth to avoid scratching the surface.
- 2) Do not touch the surface of the mirrors/lens after cleaning
- 3) The concave side of the lens must be on the bottom when installed.

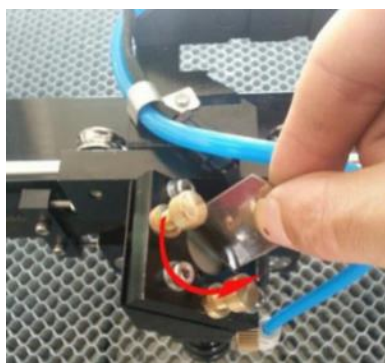
How to take out mirror#1 #2 and#3? Please do as following pictures indicate:



1. The mirror#1

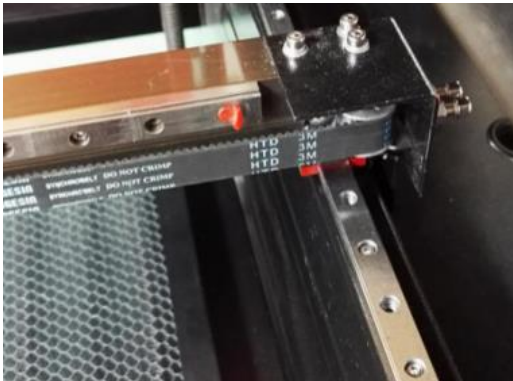


2. The mirror#2



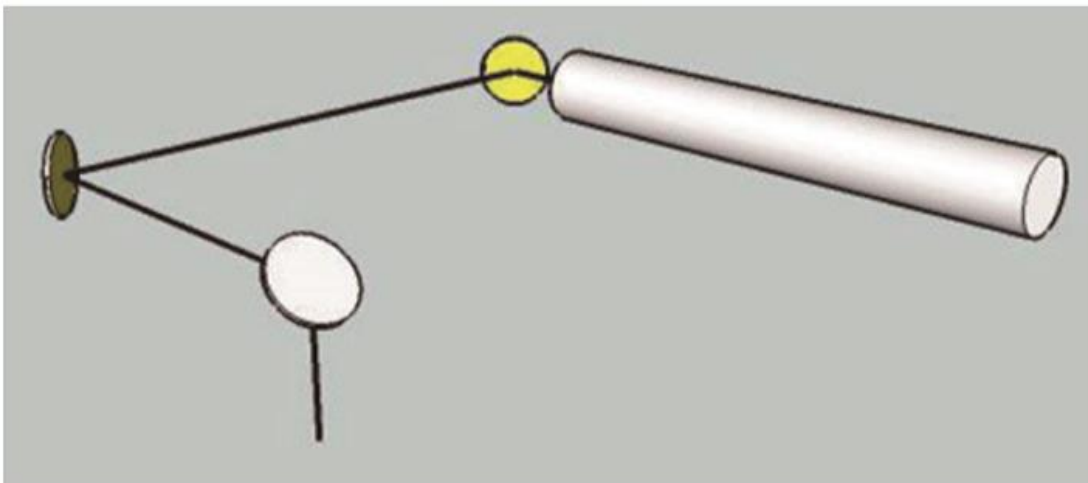
3. The mirror#3

5.3 Maintenance the X/Y Rails



It is suggested to add lubricant oil (or Rust Preventative Grease) to the rails/screws at least every two weeks.

5.4 Check the Beam Path



After being used for a long time, the beam path might be deflective. This will reduce the efficiency of the laser beam or even cause no laser beam. At this moment, you will need to re-adjust the beam path again.

5.5 Change Cooling Water for the Water Chiller



It is suggested to change the water at least once every month and make sure the laser tube is filled with water before starting the machine. It is advised to add water every 3 days. The quality and temperature of the cooling water affects the life time of the laser tube. You need to use pure (distilled) water and control the temperature below 35°C (95 °F).

5.6 Maintenance Plan

1. The lens and the mirror#3 must be checked daily, and cleaned if required.
2. The mirror#1 and the mirror#2 must be checked every month, and cleaned if required.
3. The working table must be cleaned daily.
4. The whole laser machine must be cleaned every month.
5. The exhaust system must be checked every week, and cleaned if required.
6. The air blower must be checked every month, and cleaned if required.
7. The other component (as the water cooling system) must be checked every month, and cleaned if required.

5.7 Maintenance Plan

Below are some solutions to this problem, and we advise that customers consult the following thinking before encounter problems, and hope customers can revise our thinking at any time.

Laser head impacts limit switch while resetting.

Here are the fault factors:

1. Wrong pulse settings
2. Limit switch type mismatches the laser controller.
3. Wiring mistake

5.8 Cover Protection

If the cover opens when the machine is operating, the machine will stop working and you will see the screen shows below:



Press “Enter” on the screen and the machine will start working again.

5.9 Digital Display Power Supply

5.9.1 Images

Embedded LCD Type



LCD Display Current and Fault Code

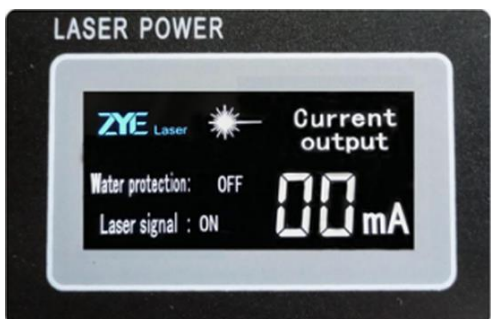
5.9.2 Function



Display condition for normal working



Display condition for no laser signal



Display condition for no water protection

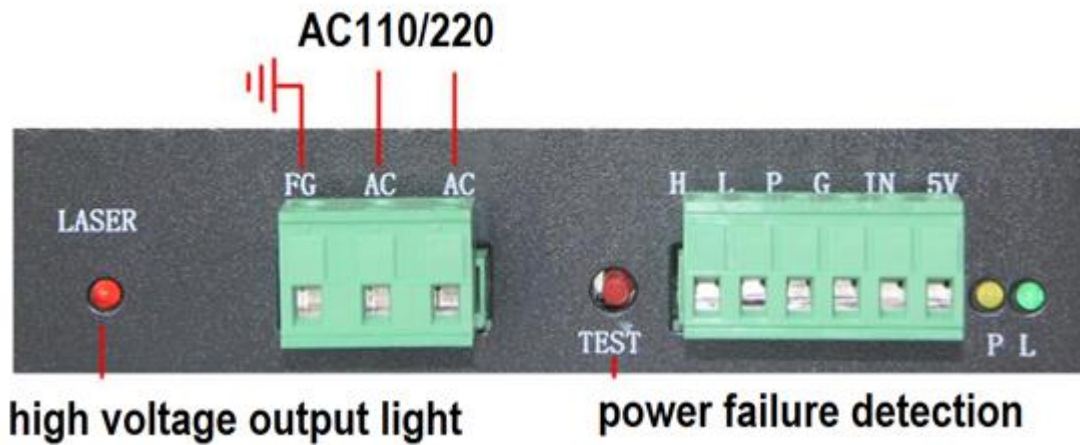


Display condition for neither water protection nor laser signal

5.9.3 Advantages

1. This series power supply has high stability feature. Because of low repair rate, it is widely used by most machine factories.
2. The high-end LCD makes display function integrate into power supply. Besides beautiful appearance, it also displays current and judges fault automatically.
3. External connected LCD module reduces damage rate on tube and power supply when bad wiring connection with ammeter. Also it reduces cumbersome wiring during machine production and improves productive efficiency.
4. All mounting holes of 50W,60W,80W, 100W or 150W power supplies are the same, which is good for assembly line mount.

5.9.4 Connection of Laser Power Supply



AC: Input Voltage AC220V or AC110V

H: Laser output control (When high level, it is effective)

L: Laser output control (When low level, it is effective)

P: Water protection switch (When ground connected, it is effective)

G: Signal ground

IN: Laser control signal (0~5V)

5V: 5V/50mA signal output



Water protection indicator light



Laser signal input indicator light

Troubleshooting

Here are the solutions:

Step 1. Wrong pulse setting

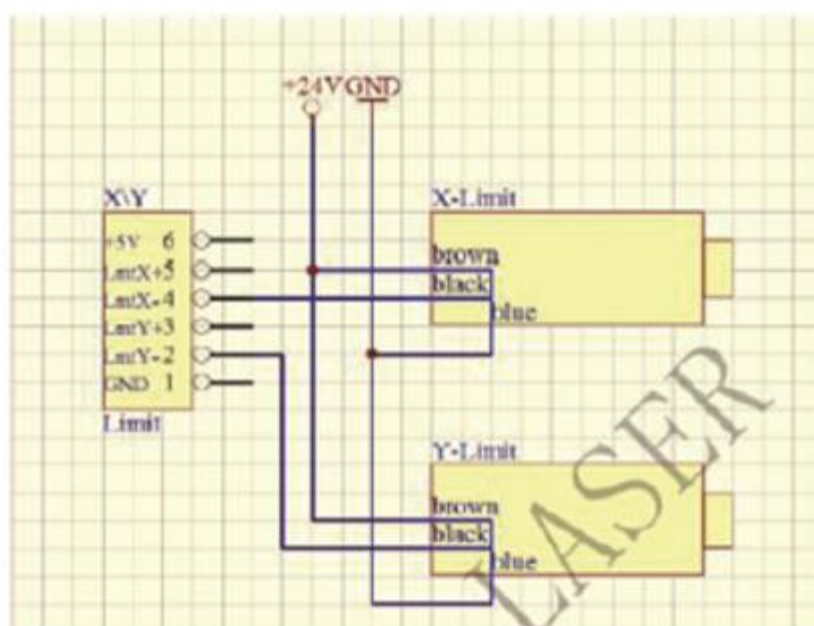
Reset the pulse equivalent, and for how to reset, please refer to the lesson "why cutting size doesn't match design size"

Step 2. Limit switch type mismatches laser controller.

Our controller supports sensor switch.

Step 3. Wiring mistake

Please refer to the following diagram for how to wire the limit switch.



Thanks for your purchase. Any questions, please don't hesitate to contact us. We'll try our best to resolve your issue ASAP.

Should you have any concern, please contact us by emailing to: help@cs-supportpro.com.

Thank you for using our products.